SERIES 67XXB
SWEPT FREQUENCY SYNTHESIZER

TEST AND CALIBRATION MANUAL

WILTRON

490 JARVIS DRIVE
MORGAN HILL, CA 95037-2809

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GENERAL INFORMATION

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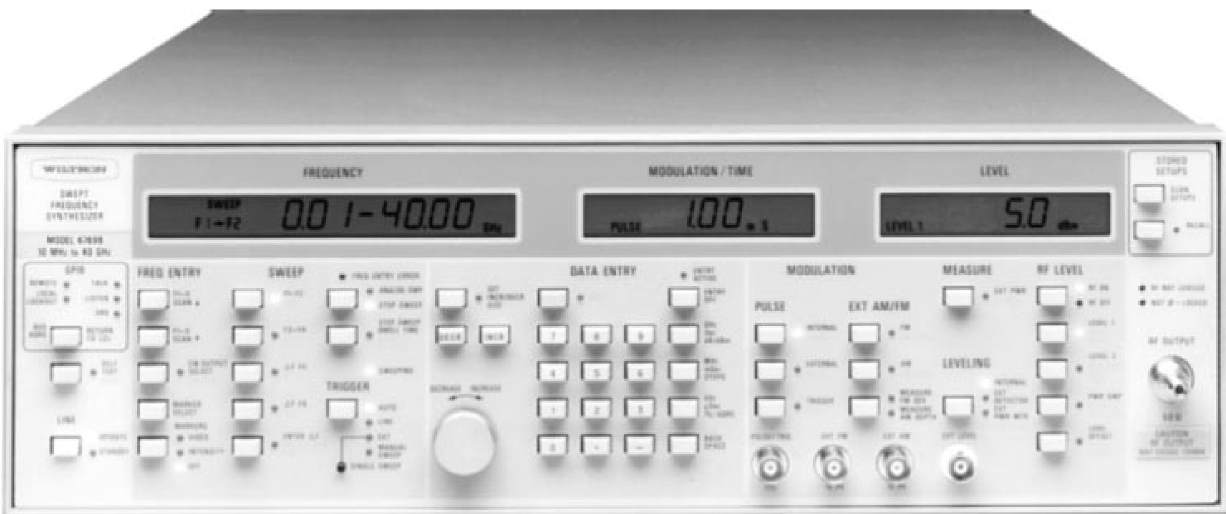


Figure 1-1. Typical Series 67XXB Swept Frequency Synthesizer

SECTION 1
GENERAL INFORMATION

1-1 SCOPE OF THE MANUAL

This manual provides general information, performance verification test procedures, calibration and adjustment procedures, and test records for the model number indicated on the title page. The majority of the information in this manual applies to all models in the 67XXB series; these pages are indicated by “67XXB” notation at the base of the page and in text. Specific model number references are made where the information presented is unique to that model only.

1-2 INTRODUCTION

Section 1 provides a general description of the equipment, its identification number, related manuals, performance specifications, and options. Static-sensitive component handling precautions and a list of recommended test equipment are also provided.

1-3 DESCRIPTION

The Series 67XXB Swept Frequency Synthesizers (Figure 1-1) are microprocessor-based, GPIB, synthesized signal sources that generate swept and CW frequencies in one or more frequency bands between 10 MHz and 60 GHz. The series, which will expand as additional frequency ranges are added, presently consists of 30 models covering a variety of frequency and power ranges. Table 1-1 lists all models presently available, their frequency range, and their output power level.

1-4 IDENTIFICATION NUMBER

All WILTRON instruments are assigned a unique six-digit ID number, such as "405001." Each 67XXB has two ID numbers assigned – one for the basic frame and one for the RF microwave deck. The ID number for the RF microwave deck is affixed to the outside of the rear panel, while that for the basic frame is affixed to chassis floor, below the swing-out RF microwave deck. The RF microwave deck ID number, on the outside, is the primary number. Please use it when ordering parts or corresponding with the WILTRON Customer Service department.

Table 1-1. 67XXB Series Swept Frequency Synthesizers

67XXB Model	Frequency (GHz)	Output * Power
6709B 6709B-40	0.01 to 2.0	+10 dBm +16 dBm
6717B 6717B-20	0.01 to 8.4	+10 dBm +13 dBm
6719B	2.0 to 8.4	+13 dBm
6721B 6721B-20	2.0 to 12.4	+10 dBm +13 dBm
6722B 6722B-20	0.01 to 12.4	+10 dBm +13 dBm
6728B 6728B-40	8.0 to 12.4	+13 dBm +16 dBm
6729B 6729B-20	8.0 to 20	+10 dBm +13 dBm
6730B 6730B-40	12.4 to 20	+13 dBm +16 dBm
6736B 6736B-10	18.0 to 26.5	+7 dBm +10 dBm
6737B 6737B-20	2.0 to 20.0	+10 dBm +13 dBm
6740B	26.5 to 40.0	+10 dBm
6745B	0.01 to 18.0	+10 dBm
6747B 6747B-20	0.01 to 20.0	+10 dBm +13 dBm
6753B 6753B-10	2.0 to 26.5	+10 dBm,≤20 GHz +5 dBm,>20 GHz +10 dBm
6759B 6759B-10	0.01 to 26.5	+10 dBm,≤20 GHz +5 dBm,>20 GHz +10 dBm
6760B	12.4 to 40.0	+10 dBm,≤20 GHz +5 dBm,>20 GHz
6763B	2.0 to 40.0	+10 dBm,≤20 GHz +5 dBm,>20 GHz
6769B	0.01 to 40.0	+10 dBm,≤20 GHz +5 dBm,>20 GHz
6772B	40.0 to 60.0	0 dBm

* Optional attenuators reduce rated power by 3 to 4 dB.

1-5 RELATED MANUALS

This is one of a three manual set that consists of an Operating Manual (OM), a Test and Calibration Manual (T&C), and a Maintenance Manual (MM). The OM and MM provide coverage for all models in the 67XXB series. Conversely, the T&Cs contain model-dependent information. Because of this model dependency there are nineteen different T&Cs—one for each frequency model.

Operating Manual (OM). The OM provides general, installation, and operation information for all 67XXB models. The WILTRON part number for the OM is 10370-10202.

Maintenance Manual (MM). The MM supplies service information (circuit descriptions, troubleshooting data, schematics, and block diagrams) and parts lists for all 67XXB models. The WILTRON part number for the MM is 10370-10242.

Test and Calibration Manual (T&C). The WILTRON part number for this manual is listed on the title page; the part numbers for all T&Cs are listed in Table 1-2.

Table 1-2. Test & Calibration Manual Part Numbers

67XXB Model Number(s)	Manual Part Number
6709B & 6709B-40	10370-10204
6717B & 6717B-20	10370-10206
6719B	10370-10208
6721B & 6721B-20	10370-10210
6722B & 6722B-20	10370-10212
6728B & 6728B-40	10370-10214
6729B & 6729B-20	10370-10216
6730B & 6730B-40	10370-10218
6736B & 6736B-10	10370-10220
6737B & 6737B-20	10370-10222
6740B	10370-10224
6745B	10370-10226
6747B & 6747B-20	10370-10228
6753B & 6753B-10	10370-10230
6759B & 6759B-10	10370-10232
6760B	10370-10240
6763B	10370-10234
6769B	10370-10236
6772B	10370-10238

1-6 OPTIONS

The following standard instrument options are available.

Option 1, Rack Mount. A kit is available containing mounting brackets and chassis track slides.

Option 2A, 110 dB Step Attenuator. Each synthesizer comes supplied with a 110 dB Step Attenuator installed. Rated output power is reduced by 3 dB. This option is available for all models having an upper frequency of ≤20 GHz.

Option 2B, 110 dB Step Attenuator. Each synthesizer comes supplied with a 110 dB Step Attenuator installed. Rated output power is reduced by 3 dB. This option is available for all models having an upper frequency limit of 26.5 GHz.

Option 2C, 110 dB Step Attenuator. Each synthesizer comes supplied with a 110 dB Step Attenuator installed. Rated output power is reduced by 4 dB. This option is available for all models having an upper frequency limit of 40 GHz.

Option 9K, K Connector. Each synthesizer comes supplied with a rear panel K Connector® RF Output instead of the type of connector that would normally be installed on the front panel. The front panel connector is deleted. Rated output power, flatness, and SWR are slightly degraded.

1-7 PERFORMANCE SPECIFICATIONS

Performance specifications for all 67XXB series synthesizers are listed in Section 1 of the Operating Manual.

1-8 STATIC-SENSITIVE COMPONENT HANDLING PRECAUTIONS

The 67XXB synthesizer contains components that can be damaged by static electricity. Figure 1-2 contains a list of precautions for handling static-sensitive components. If followed, these precautions will minimize the possibilities of static-shock damage to these components.

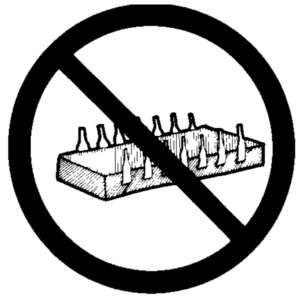
1-9 RECOMMENDED TEST EQUIPMENT

Table 1-3 provides a list of recommended test equipment needed to perform the performance verification test procedures and calibration/adjustment procedures. The entries are coded to show procedural usage. The codes are:

Code	Type of Procedure
C	Calibration/Adjustment (Section 3)
P	Performance Verification (Section 2)

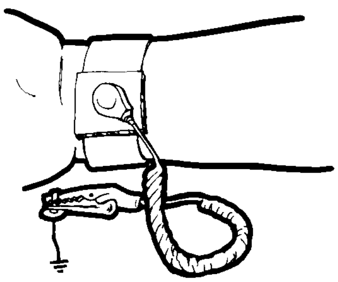
K Connector® is a registered trademark of WILTRON Company

1. Do not touch exposed contacts on any static sensitive component.



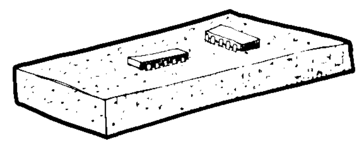
2. Do not slide static sensitive component across any surface.

3. Do not handle static sensitive components in areas where the floor or work surface covering is capable of generating a static charge.

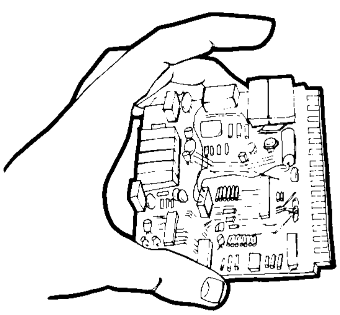


4. Wear a static-discharge wristband when working with static sensitive components.

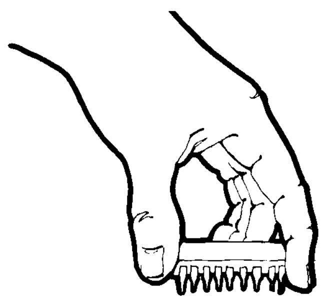
5. Label all static sensitive devices.



6. Keep component leads shorted together whenever possible.



7. Handle PCBs only by their edges. Do not handle by the edge connectors.



8. Lift & handle solid state devices by their bodies – never by their leads.

9. Transport and store PCBs and other static sensitive devices in static-shielded containers.

10. ADDITIONAL PRECAUTIONS:

- Keep workspaces clean and free of any objects capable of holding or storing a static charge.
- Connect soldering tools to an earth ground.
- Use only special anti-static suction or wick-type desoldering tools.

Figure 1-2. Static-Sensitive Component Handling Precautions

Table 1-3. Recommended Test Equipment for Performance Verification Testing and Calibration/Adjustments (1 of 2)

INSTRUMENT	CRITICAL SPECIFICATION	RECOMMENDED MANUFACTURER/MODEL	USAGE[1]
Spectrum Analyzer, with Diplexer and External Mixers	*Frequency Range:* 0.01 to 60 GHz *Resolution Bandwidth:* 10 Hz	Tektronix, Model 494AP, with External Mixers: WM 490K (18 to 26.5 GHz) WM 490A (26.5 to 40 GHz) WM 490U (40 to 60 GHz) Diplexer PN: 015-3085-00	P, C
Spectrum Analyzer	*Frequency Range:* 20 Hz to 40 MHz *Resolution Bandwidth:* ≤3 MHz	Hewlett-Packard, Model 3585A	P
Frequency Counter, with External Mixers	*Frequency Range:* 0.01 to 60 GHz *Input Impedance:* 50Ω *Resolution:* 1 Hz *Other:* Ext Time Base Input	EIP Microwave, Inc., Model 578A, with External Mixers: Option 91 (26.5 to 40 GHz) Option 92 (40 to 60 GHz)	P, C
Power Meter, with Power Sensors	*Power Range:* –30 to +20 dBm	Hewlett-Packard, Model 436A, with Power Sensors: HP 8484A (0.01 to 20 GHz) HP 8485A (0.01 to 26.5 GHz) HP R8486A (26.5 to 40 GHz)	P
Power Meter with Power Sensor	*Power Range:* –20 to +10 dBm	Hewlett-Packard, Model 432A, with Hughes Power Sensor Model: 45773H-1100 (40 to 60 GHz)	P
Digital Voltmeter	*Resolution:* 4-1//2 digits (to 20V) *DC Accuracy:* 0.002% +2 counts *DC Input Impedance:* 10 MΩ *AC Accuracy:* 0.07% +100 counts (to 20 kHz) *AC Input Impedance:* 1 MΩ	John Fluke, Inc., Model 8840A, with Option 8840A-09 (True RMS AC)	P, C
Frequency Standard	*Frequency:* 10 MHz *Accuracy:* 1 x 10^{-10} parts/day	Spectracom Corp., Model 8161	P, C
Function Generator	*Output Voltage:* 300 mV to 10V *Functions:* 200 kHz sine wave 100 Hz square wave	Hewlett-Packard, Model 8116A	P, C
Modulation Analyzer	*Frequency Input:* 10 MHz (or the IF of the spectrum analyzer) *FM Max Deviation:* 500 kHz *FM Accuracy:* ±1% to 100 kHz rate *AM Depth:* 0% to 90% *AM Modulation Rates:* dc to 100 kHz *AM Accuracy:* ±3% *Filters:* 50 Hz lowpass, 15 kHz highpass	Hewlett-Packard, Model 8901A	P, C
Oscilloscope	*Bandwidth:* dc to 150 MHz *Sensitivity:* 2 mV *Horizontal Sensitivity:* 50 ns/division	Tektronix, Model 2445	P, C
Mixer	*Frequency Range:* 1 to 26 GHz	RHG Electronics Laboratory, Inc. Model DMS1-26A	P

Table 1-3. Recommended Test Equipment for Performance Verification Testing and Calibration/Adjustments (2 of 2)

INSTRUMENT	CRITICAL SPECIFICATION	RECOMMENDED MANUFACTURER/MODEL	USAGE(1)
Scalar Network Analyzer, with RF Detectors	*Frequency Range:* 0.01 to 40 GHz	WILTRON, Model 562, with RF Detectors: 560-7N50 (0.01 to 18 GHz) 560-7K50 (0.01 to 40 GHz)	P, C
Attenuator	*Frequency Range:* DC to 26.5 GHz *Max Input Power:* >+16 dBm *Attenuation:* 10 dB	WILTRON, Model 41BK-10	P
Microwave (Pulse) Detector	*Output Polarity:* Negative *Frequency Range:* 0.01 to 40 GHz	WILTRON, Model SC3800 (K input/BNC output connectors)	P
Microwave Detector	*Output Polarity:* Negative *Frequency Range:* 40 to 60 GHz	Hughes, Model 47323H-1211 (WR-19 waveguide input/SMA output connectors)	C
Adapter Cable	Adapts the Model 562, Scalar Network Analyzer to Microwave Detectors with SMA output.	WILTRON, Model 560-10BX-1	C
High Pass Filter	150 MHz High-Pass Filter (DC Block)	Narda, Model 4564	P
Low Pass Filter	450 MHz Low-Pass Filter	Mini-Circuits, Model LP-450	P
Tee	*Connectors:* 50Ω BNC	Any common source	P, C
Cables	*Connectors:* 50Ω BNc	Any common source	P, C

NOTES: (1) P = Performance Verification Test Procedures (Section 2);
C = Calibration/Adjustment Procedures (Section 3)
(2) This table does not include the recommended test equipment that is necessary to perform the automated RF Level Calibration procedure; refer to Section 3.
(3) Please contact WILTRON Customer Service at (408) 778-2000 for help regarding test equipment compatibility.

SECTION 2
PERFORMANCE VERIFICATION

CONTENTS

SECTION 2
PERFORMANCE VERIFICATION

2-5 INTRODUCTION

This section contains procedures used to verify the performance of 67XXB Swept Frequency Synthesizers to specifications. These procedures cover all units having any version of firmware. Instruments with Option 2 (110 dB) step attenuator are also supported.

NOTE

For brevity, the standard and high power versions of a particular 67XXB model are referred to jointly throughout these procedures. For example, the term "6747B/-20" is used to refer to either the 6747B (+10 dBm RF output) or the 6747B-20 (+13 dBm RF output). Reference is made to a specific version of the instrument model only when the procedure for that model type requires special instructions.

The generic "67XXB" reference refers to any synthesizer model; model number is not critical in such a case.

2-6 RECOMMENDED TEST EQUIPMENT

Table 2-1 lists the recommended test equipment for the performance verification test procedures.

The procedures refer to specific test equipment front panel control labels when the setup parameters of the test are critical to making an accurate measurement. In some cases, the user may substitute equipment having the same critical specifications as those of the recommended test equipment listed in Table 2-1.

Contact the WILTRON Customer Service department at (408) 778-2000 if you need clarification of any equipment or procedural reference.

2-7 PERFORMANCE VERIFICATION TEST RECORD

A blank copy of a sample performance verification test record is provided in Section 4. The test record contains the model-specific variables called for by the procedures in this section. It also provides the means for maintaining an accurate and complete record of instrument performance. We recommend that you copy these pages and use them to record the results from your initial testing of the instrument. These initial test results can later be used as benchmark values for future tests of the same instrument (referenced by its rear panel instrument serial number).

2-8 CONNECTOR AND KEY LABEL NOTATION

The test procedures include many references to equipment interconnections and control settings. For all 67XXB references, specific labels are used to denote the appropriate control key or connector (such as CW OUTPUT SELECT or RF OUTPUT). Most references to supporting test equipment use general labels for commonly used controls and connections (such as Span or RF Input). In some cases, a specific label is used that is a particular feature of the test equipment listed in Table 2-1.

When pressed, many of the 67XXB front panel control keys cause a corresponding LED indicator to light, verifying the selection. Observe the lighting of the LED indicator to ensure that the desired function is enabled.

During the test sequence, the following three LED indicators should be monitored continuously: ENTRY ACTIVE, RF NOT LEVELED, and NOT Ø-LOCKED. The lighting of the ENTRY ACTIVE LED indicates that the Data Entry function is active. When in step sweep or CW mode, the lighting of the RF NOT LEVELED LED or NOT Ø-LOCKED LED may signal a situation that is the result of an instrument failure and may cause errant test results.

Table 2-1. Recommended Test Equipment for Performance Verification Test Procedures (1 of 2)

INSTRUMENT	CRITICAL SPECIFICATION	RECOMMENDED MANUFACTURER/MODEL	PROCEDURE NUMBER
Spectrum Analyzer, with Diplexer and External Mixers	*Frequency Range:* 0.01 to 60 GHz *Resolution Bandwidth:* 10 Hz	Tektronix, Model 494AP, with External Mixers: WM 490K (18 to 26.5 GHz) WM 490A (26.5 to 40 GHz) WM 490U (40 to 60 GHz) Diplexer PN: 015-3085-00	2-8, 2-9, 2-10,2-11, 2-13, 2-14, 2-17, 2-18, 2-21
Spectrum Analyzer	*Frequency Range:* 20 Hz to 40 MHz *Resolution Bandwidth:* ≤3 MHz	Hewlett-Packard, Model 3585A	2-15
Frequency Counter with External Mixers	*Frequency Range:* 0.01 to 60 GHz *Input Impedance:* 50Ω *Resolution:* 1 Hz *Other:* Ext Time Base Input	EIP Microwave, Inc, Model 578A, with External Mixers: Option 91 (26.5 to 40 GHz) Option 92 (40 to 60 GHz)	2-6
Power Meter, with Power Sensors	*Power Range:* –30 to +20 dBm	Hewlett-Packard, Model 436A, with Power Sensors: HP 8484A (0.01 to 20 GHz) HP 8485A (0.01 to 26.5 GHz) HP R8486A (26.5 to 40 GHz)	2-16, 2-19
Power Meter with Power Sensor	*Power Range:* –20 to +10 dBm	Hewlett-Packard, Model 432A, with Hughes Power Sensor Model: 45773H-1100 (40 to 60 GHz)	2-16
Digital Voltmeter	*Resolution:* 4-1/2 digits (to 20V) *DC Accuracy:* 0.002% +2 counts *DC Input Impedance:* 10 MΩ *AC Accuracy:* 0.07% +100 counts (to 20 kHz) *AC Input Impedance:* 1 MΩ	John Fluke, Inc., Model 8840A, with: Option 8840-09 (True RMS AC)	2-17, 2-18
Frequency Standard	*Frequency:* 10 MHz *Accuracy:* 1 x 10^{-10} parts/day	Spectracom Corp., Model 8161	2-5
Function Generator	*Output Voltage:* 300 mV to 10V *Functions:* 200 kHz sine wave, 100 kHz square wave	Hewlett-Packard, Model 8116A	2-17, 2-18
Modulation Analyzer	*Frequency Input:* 10 MHz (or the IF of the spectrum analyzer) *FM Max Deviation:* 500 kHz *FM Accuracy:* ±1% to 100 kHz rate *AM Depth:* 0% to 90% *AM Modulation Rates:* dc to 100 kHz *Filters:* 50 Hz lowpass, 15 kHz highpass	Hewlett-Packard, Model 8901A	2-18
Oscilloscope	*Bandwidth:* dc to 150 MHz *Sensitivity:* 2 mV *Horizontal Sensitivity:* 50 ns/division	Tektronix, Model 2445	2-5, 2-7, 2-16, 2-19, 2-20
Mixer	*Frequency Range:* 1 to 26 GHz	RHG Electronics Laboratory, Inc. Model DMS1-26A	2-15

Table 2-1. Recommended Test Equipment for Performance Verification Test Procedures (2 of 2)

INSTRUMENT	CRITICAL SPECIFICATION	RECOMMENDED MANUFACTURER/MODEL	PROCEDURE NUMBER
Scalar Network Analyzer, with RF Detectors	*Frequency Range:* 0.01 to 40 GHz	WILTRON, Model 562, with RF Detectors: 560-7N50 (0.01 to 18 GHz) 560-7K50 (0.01 to 40 GHz)	2-12
Attenuator	*Frequency Range:* DC to 26.5 GHz *Max Input Power:* >+16 dBm *Attenuation:* 10 dB	WILTRON, Model 41BK-10	2-15
Microwave (Pulse) Detector	*Output Polarity:* Negative *Frequency Range:* 0.01 to 40 GHz	WILTRON, Model SC3800 (K input/BNC output connectors)	2-19
High Pass Filter	150 MHz High-Pass Filter (DC Block)	Narda, Model 4564	2-19
Low Pass Filter	450 MHz Low-Pass Filter	Mini-Circuits, Model LP-450	2-20
Tee	*Connectors:* 50Ω BNC	Any common source	2-15, 2-17, 2-18
Cables	*Connectors:* 50Ω BNC	Any common source	All procedures

2-5 INTERNAL TIME BASE AGING RATE TEST

a. Test Description

The following procedure verifies that the 67XXB 10 MHz time base is within its aging specification. The 67XXB derives its frequency accuracy from an internal 10 MHz crystal oscillator standard. An inherent characteristic of crystal oscillators is the effect of crystal "aging" within the first few days to weeks of operation. Typically, a crystal oscillator's frequency increases slightly at first, then settles to a relatively constant value for the rest of its life. The 67XXB reference oscillator aging is specified as $5x10^{-10}$ parts per day (24 hour period).

NOTE

> Do not confuse crystal aging with other short-term frequency instabilities; i.e., noise and temperature.

For greatest absolute frequency accuracy, allow the 67XXB to warm up until its RF output frequency has stabilized (usually 7 to 30 days) before adjustment (calibration). After calibration, the change in reference oscillator frequency should remain within the aging rate if: (1) the time base oven is not allowed to cool, (2) the instrument orientation with respect to the earth's magnetic field is maintained, and (3) the instrument does not sustain any mechanical shock. This test should be performed upon receipt of the instrument and again after a period of several days to weeks to fully qualify the aging rate.

The time (in seconds) required for a specific phase change of 1 cycle (360°) is measured at the start and finish of the test time period (at least 3 but preferably 24 hours or more). Aging rate is calculated with a formula that (inversely) relates time and frequency.

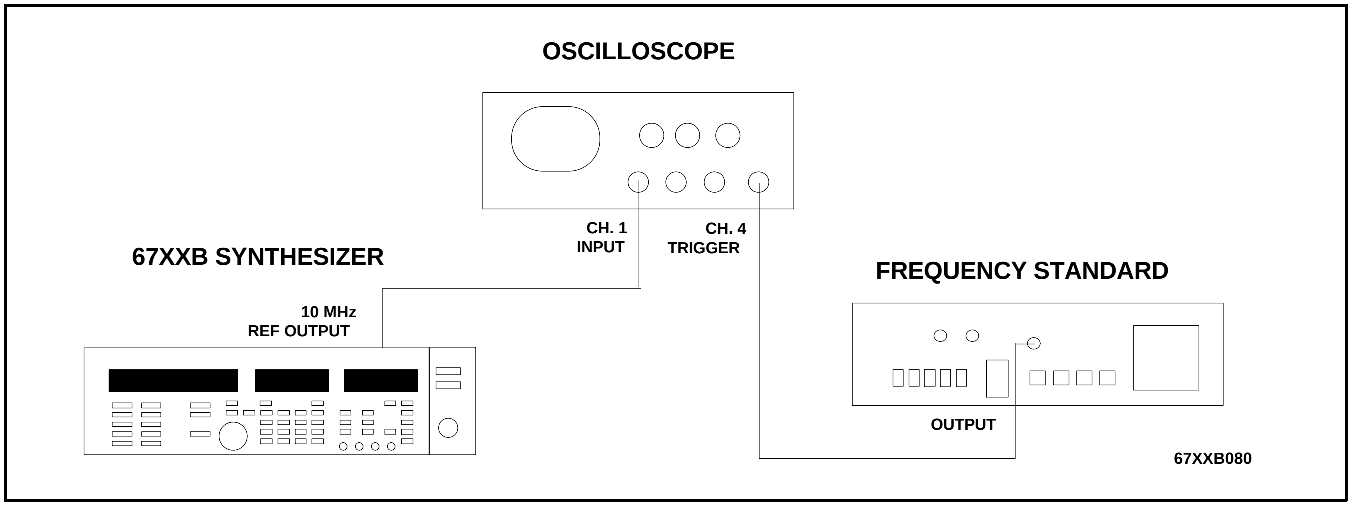


Figure 2-1. Equipment Setup for Internal Time Base Aging Rate Test

b. Test Setup

1. Connect the equipment as shown in Figure 2-1.
   (a) Connect the 67XXB rear panel 10 MHZ REF OUTPUT to the Oscilloscope vertical input.
   (b) Connect the Frequency Standard (having long term stability $\leq 1 \text{ X } 10^{-10}$) to the Oscilloscope external trigger input.
   (c) Set the Oscilloscope controls as follows:
      (1) TRIGGER on CH.1
      (2) TIME/DIV: 50 ns
      (3) VOLT/DIV: 0.5

NOTE

> Before beginning this procedure, *always* let the 681XXA warm up for a miminum of 72 hours. Failure to do so can cause inaccurate aging rate measurements.

c. Test Procedure

1. Adjust the Oscilloscope external triggering controls for a stable display of the 67XXB 10 MHz REF OUTPUT signal.

2. Record the start time of the test period as T_S in the Test Record.

3. On the 67XXB, adjust the 10 MHz reference oscillator for a phase change of 1 cycle (360^o) in a time period of ≥30 seconds. (See Figure 3-6 on page 3-15 for the location of the 10 MHz reference oscillator adjustment screw.)
4. Measure and the time (in seconds) required for a 360^o phase change to occur on the Oscilloscope display. Record this as T_1 in the Test Record.

5. Wait for a period of time (at least 3 but preferably 24 hours) and remeasure the time required for a 360^o phase change. Record this as T_2 in the Test Record.

6. Immediately record the finish time of the test period as T_F in the Test Record.

7. Calculate the aging rate using the following formula (refer to the example at the end of the procedure):

$$\text{Aging Rate} = \left(\frac{1cycle}{F_{STD}}\right) \times \left(\left|\frac{1}{T_1} - \frac{1}{T_2}\right|\right) \times \left(\frac{T_{SPEC}}{TP}\right)$$

Where:
1 cycle=Phase change reference for the time measurement (360^o)
F_{STD}=$10x10^6$ Hertz (67XXB ref. oscillator frequency)
T_1=Initial 360° phase change time (seconds)
T_2=Final 360° phase change time (seconds)
T_{SPEC}=Spec. reference period (i.e., per day)
TP=Test period (hours) = $T_F - T_S$
T_F=Test period end time (hours)
T_S=Test period start time (hours)

8. Record the computed result in the Test Record. To meet the specification, the calculated aging rate must be ≤$5x10^{-10}$ per day.

EXAMPLE:

The 10 MHz reference oscillator was adjusted so that a 360^o phase change occurs every 30 seconds.
T_1 = 30 (seconds)

After a test period of 24 hours, the time required for a 360^o phase change to occur is measured at 32 seconds.
T_2 = 32 (seconds)
TP = 24 (hours)

$$\text{Aging Rate} = \left(\frac{1}{10 \times 10^6}\right) \times \left(\left|\frac{1}{30} - \frac{1}{32}\right|\right) \times \left(\frac{24}{24}\right)$$

$$= (1 \times 10^{-7}) \times (2.08 \times 10^{-3}) \times 1$$

$$= 2.08 \times 10^{-10}$$

2-6 FREQUENCY SYNTHESIS TESTS

a. Test Description

The frequency synthesis tests are divided into two main parts: fine loop tests and coarse loop/YIG loop tests. The coarse loop/YIG loop test steps the synthesizer through its full frequency range in 1 GHz steps. The fine loop test steps the instrument through 1 kHz steps for frequencies up to 26.5 GHz, 2 kHz steps for frequencies from 26.5 to 40 GHz, and 3 kHz steps above 40 GHz. Ten steps of 1, 2, or 3 kHz are needed to verify the fine loop.

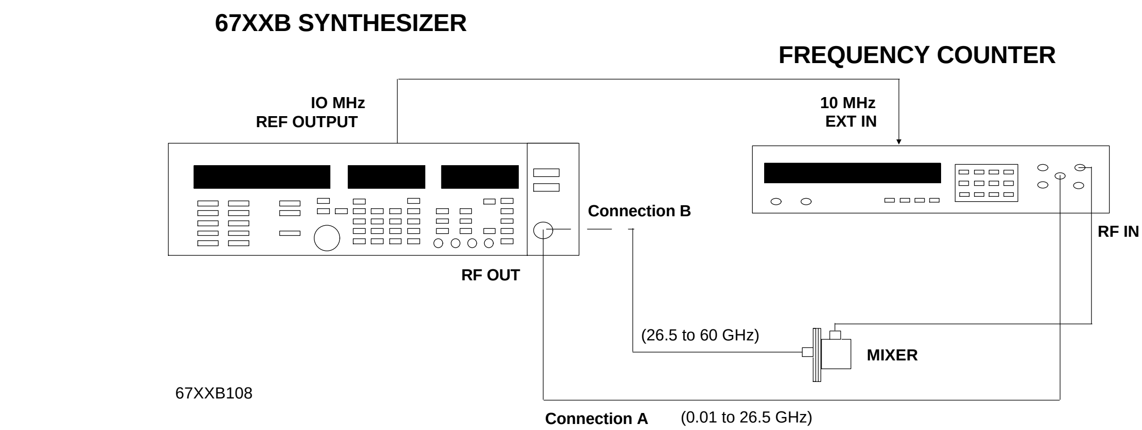


Figure 2-2. Equipment Setup for Frequency Synthesis Tests

b. Test Setup

1. Connect the equipment as shown in Figure 2-2.
   (a) Connect the 67XXB rear panel 10 MHZ REF OUTPUT to the Frequency Counter 10 MHz External Reference input. If the Frequency Counter has an INT/EXT toggle switch, ensure the switch is set to EXT.
   (b) Connect the 67XXB RF OUTPUT to the Frequency Counter RF Input.

NOTE

For measuring frequencies in the range of 0.01 to 26.5 GHz, connect the 67XXB RF OUT to the Frequency Counter RF IN as shown in Connection A. For measuring frequencies in the range of 26.5 to 60 GHz connect the 67XXB RF OUT to the Frequency Counter RF IN as shown in Connection B using the appropriate waveguide mixer; Option 91 (26.5 to 40 GHz) or Option 92 (40 to 60 GHz).

c. Coarse Loop/YIG Loop Test Procedure

1. Initialize the 67XXB for 1 GHz steps as follows:
   (a) Press <Shift> RESET.
   (b) Press CW OUTPUT SELECT.
   (c) Enter the frequency indicated on the Test Record.
   (d) Press SET INCR/DECR SIZE.
   (e) Enter 1 GHz (0.5 GHz for model 6709B).

2. Record the Frequency Counter reading on the Test Record. The Frequency Counter reading must be within ±100 Hz of the displayed 67XXB frequency (±200 Hz for frequencies 26.5 to 40 GHz; ±300 Hz for frequencies above 40 GHz) to accurately complete this test.

NOTE

The counter is typically within ±1 Hz since the instruments use a common time base. Differences of a few Hertz can be caused by noise and counter limitations. Differences of ≥±100 Hz (±200 Hz above 26.5 GHz; ±300 Hz above 40 GHz) indicate a frequency synthesis problem.

3. On the 67XXB, press INCR. Record the Frequency Counter reading in the Test Record.

4. Repeat step c.3 until all frequencies listed in the Test Record have been recorded.

d. Fine Loop Test Procedure

1. Set the 67XXB for steps of 1, 2, or 3 kHz as follows:
   (a) Press <Shift> RESET.
   (b) Press CW OUTPUT SELECT.
   (c) Enter the frequency indicated on the Test Record.
   (d) Press SET INCR/DECR SIZE.
   (e) Enter 1 kHz for frequencies up to 26.5 GHz, 2 kHz for frequencies from 26.5 to 40 GHz, or 3 kHz for frequencies above 40 GHz.

2. Record the Frequency Counter reading in the Test Record. It must be within ±100 Hz of the 67XXB displayed frequency to meet specification (±200 Hz for frequencies 26.5 to 40 GHz; ±300 Hz for frequencies above 40 GHz).

3. On the 67XXB, press INCR. Record the Frequency Counter reading in the Test Record.

4. Repeat step d.3 until all frequencies listed in the Test Record have been recorded.

2-7 MARKER AND BLANKING VERIFICATION

a. Test Description

This test verifies correct operation of the markers and blanking signals. Operation and programmability are both tested.

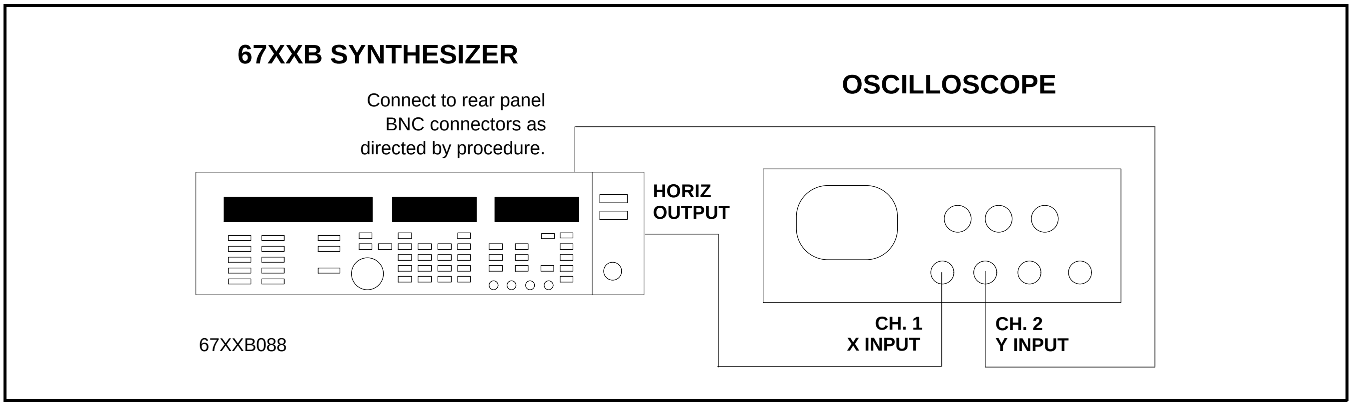


Figure 2-3. Equipment Setup for Marker and Blanking Verification

b. Test Setup

1. Connect the equipment as shown in Figure 2-3.
   (a) Connect the 67XXB rear panel MARKER OUTPUT to the Oscilloscope Ch. 2 input (Y-axis input).
   (b) Connect the 67XXB rear panel HORIZ OUTPUT to the Oscilloscope Ch. 1 input (X-axis input).

2. Set up the Oscilloscope as follows:
   (a) X input - DC Input Impedance
   (b) Y input - Vertical Input to 2V/div
   (c) Set Oscilloscope to X-Y mode
   (d) Adjust X-axis input to center presentation.

c. Marker Selection Procedure

1. Set up the 67XXB for a full-range sweep:
   (a) Press <Shift> RESET.
   (b) Press F1-F2.
   (c) Press <Shift> TRIGGER 0 8 0 to unlock the 67XXB’s YIG loop; this permits easier viewing of the markers on the Oscilloscope display.

2. Press F1-F9 SCAN ▲ to display the F1 frequency noted on the Test Record. Press the 67XXB MARKER SELECT button, then press MARKERS VIDEO. Verify that a marker appears on the Oscilloscope. Note its presence on the Test Record.

3. Check the other eight markers as follows:
   (a) Press F1-F9 SCAN ▲ to display the F2 frequency noted on the Test Record.
   (b) Press MARKER SELECT to select the next marker. Verify that a marker appears on the Oscilloscope. Note its presence on the Test Record.

4. Repeat step 3 until all nine markers have been selected and verified. Note their presence on the Test Record.

d. Marker Output Verification Procedure

1. Observe the oscilloscope display and verify that +5V (TTL high) marker signals appear at nine points along the horizontal axis. (All markers have already been selected in the previous Marker Selection procedure.) Note their presence on the Test Record.

2. On the 67XXB, select MARKERSINTENSITY.

3. Verify that each marker changes from a +5V (TTL high) signal to an intensified spot. Note the presence of each on the Test Record. *Do not confuse bandswitch and the CS band switched-filter intensity dots with the marker intensified spots.*

4. Move the Oscilloscope Y-axis input from the 67XXB rear panel MARKER OUTPUT to the 67XXB rear panel SEQ SYNC OUTPUT.

5. On the 67XXB, select MARKERS VIDEO and verify that the waveform changes:
   (a) To a +5V (TTL high) signal at retrace;
   (b) To a +5V (minimum) signal at each bandswitch point;

   NOTE

   Bandswitching is not applicable to models 6709B/-40, 6719B, 6728B/-40, 6730B/-40, 6736B, 6740B, and 6772B.

   (c) To a +5V (minimum) signal at each switched-filter switch point;

   NOTE

   Switched-filter switching is not applicable to models 6709B/-40, 6728B/-40, 6729B/-20, 6730B/-40, 6736B, 6740B, 6760B, and 6772B.

   (d) To a –10V (minimum) signal at the selected (active) video marker frequency;
   (e) To a–5V (minimum) signal at all other marker frequencies.
   (f) Note the result of steps d.5(a), d.5(b), d.5(c), d.5(d), and d.5.(e) on the Test Record.

6. Press the F1-F9 SCAN ▲ key to select another marker. Verify that the newly selected marker changes from a –5V (minimum) signal to a –10V (minimum) signal, and that the previously selected marker changes to a –5V (minimum) signal. Note the result on the Test Record.

e. Retrace Blanking Output Verification Procedure

1. Move the Oscilloscope Y-axis input from the 67XXB rear panel SEQ SYNC OUTPUT connector to the 67XXB rear panel RETRACE BLANK OUTPUT connector.

2. Press <Shift> TRIGGER 110 to set the 67XXB rear panel for a –BLANK output. Verify that the signal changes to –5V (minimum) during retrace. Note the result on the Test Record.

3. Press <Shift> TRIGGER 109 to set the 67XXB rear panel for a +BLANK output. Verify that the signal changes to +5V (minimum) during retrace. Note the result on the Test Record.

f. Bandswitch Blanking Output Verification Procedure

(Not applicable to models 6709B/-40, 6719B, 6728B/-40, 6730B/-40, 6736B, 6740B, and 6772B)

1. Move the Oscilloscope Y-axis input from the 67XXB rear panel RETRACE BLANK OUTPUT connector to the 67XXB rear panel BANDSWITCH BLANK OUTPUT connector.

2. Verify that the signal is +5V (minimum) during the bandswitch dwell points listed on the Test Record. Note the result on the Test Record.

3. Press <Shift> TRIGGER 110 to set the 67XXB rear panel for a –BLANK output. Verify that the signal only changes to –5V (minimum) during the bandswitch dwell points listed on the Test Record. Note the result on the Test Record.

g. 67XXB Relock Procedure

1. Press <SHIFT> TRIGGER 081 to relock the 67XXB's YIG loop.

2-8 NARROW BAND SPURIOUS TESTS

a. Test Description

This test verifies that the fine and coarse loop fractional division filters are functioning properly.

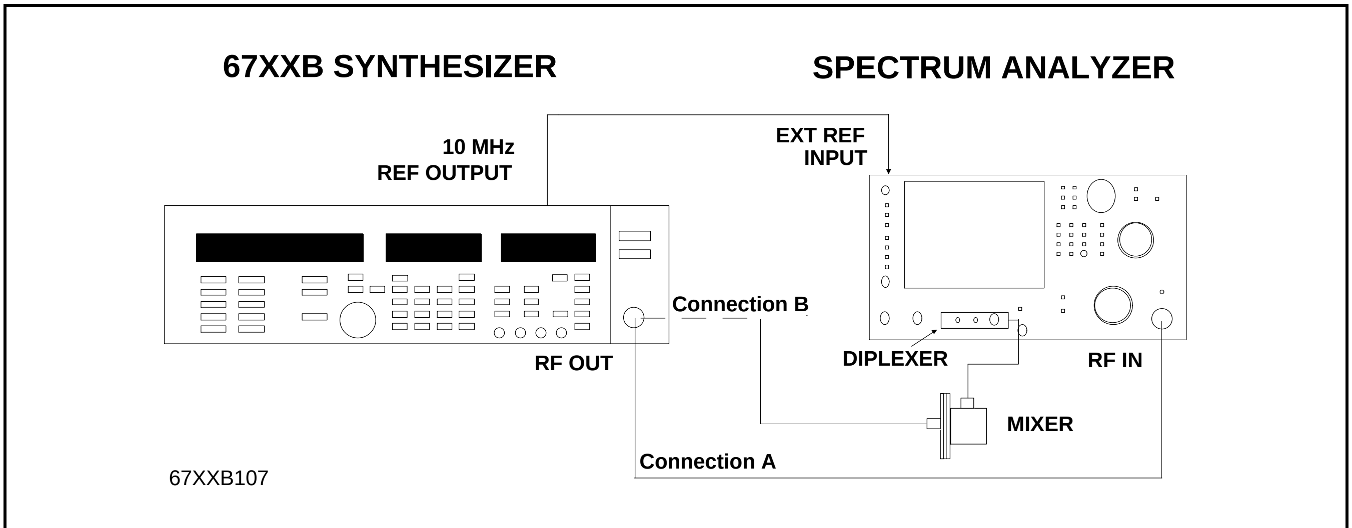


Figure 2-4. Equipment Setup for Narrow Band Spurious Tests

b. Test Setup

1. Connect the equipment as shown in Figure 2-4.

2. *For all 67XXB models except the 6740B and the 6772B:*
   (a) Connect the 67XXB rear panel 10 MHZ REF OUTPUT to the Spectrum Analyzer External Reference Input.
   (b) Connect the 67XXB RF OUTPUT to the Spectrum Analyzer RF Input as shown in Connection A (67XXB RF OUT to the Spectrum Analyzer RF IN).

3. *For the 6740B and 6772B models:*
   (a) Connect the 67XXB rear panel 10 MHZ REF OUTPUT to the Spectrum Analyzer External Reference Input.
   (b) Connect the diplexer and appropriate external waveguide mixer to the Spectrum Analyzer.
   (c) Connect the 67XXB RF OUTPUT to the Spectrum Analyzer as shown in Connection B (67XXB RF OUT to the external waveguide mixer input).

c. Fine Loop Test Procedure

1. Set up the 67XXB for fractional division on the fine loop as follows:
   (a) Press <Shift> RESET.
   (b) Press CW OUTPUT SELECT and enter the frequency indicated on the Test Record.
   (c) Press SET INCR/DECR SIZE.
   (d) Enter 1 kHz.
   (e) Press INCR.

2. Set up the Spectrum Analyzer as follows:
   (a) CF: Set to 10 kHz higher than 67XXB frequency value.
   (b) RF Level: Set signal peak to top graticule.
   (c) Span: Set to 100 Hz
   (d) RBW: 10 Hz
   (e) Video Filter: On (if necessary)

NOTE

In order to make an accurate measurement of the 67XXB spurious responses, the noise floor of the Spectrum Analyzer must be clearly below –65 dBc, preferably below –75 dBc.

3. Measure and record on the Test Record, any discrete spurious signal above the noise floor of the display or –60 dBc, which ever is greater, at 10, 20, 30, 40, and 50 kHz away from the carrier. (On the Spectrum Analyzer, increase the center frequency by 10 kHz for each measurement to keep any measured peak at center screen.)

d. Coarse Loop Test Procedure

1. Set up the 67XXB for fractional division on the coarse loop as follows:
   (a) Press <Shift> RESET.
   (b) Press CW OUTPUT SELECT and enter the frequency indicated on the Test Record.
   (c) Press SET INCR/DECR SIZE.
   (d) Enter 2 MHz.
   (e) Press INCR.

2. Set up the Spectrum Analyzer as follows:
   (a) Span: 100 kHz/div
   (b) CF: Set to 200 kHz higher than the 67XXB frequency value.
   (c) RBW: 1 kHz
   (d) Wide Video Filter: On

3. Measure and record on the Test Record, any spurious signals at 200 and 400 kHz away from the carrier. (On the spectrum analyzer, increase the center frequency by 200 kHz for each measurement to keep any measured peak at center screen.)

2-9 SPURIOUS AND HARMONIC TESTS: RF OUTPUT SIGNALS ≤2 GHz

a. Test Description

This test is applicable to the following 67XXB models only: 6709B/-40, 6717B/-20, 6722B/-20, 6745B, 6747B/-20, 6759B/-10, and 6769B. This test verifies that the 67XXB synthesizer meets its 0.01–2 GHz harmonic specifications.

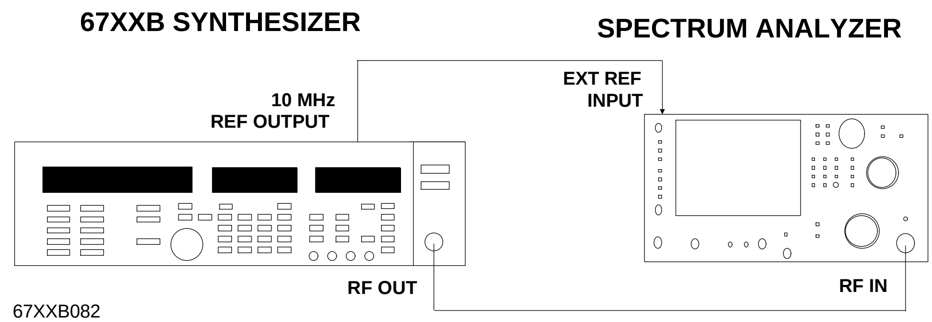


Figure 2-5. Equipment Setup for Spurious and Harmonic Tests: RF Output Signals ≤2 GHz

b. Test Setup

1. Connect the equipment as shown in Figure 2-5.
   (a) Connect the 67XXB rear panel 10 MHZ REF OUTPUT to the Spectrum Analyzer External Reference Input.
   (b) Connect the 67XXB RF OUTPUT to the Spectrum Analyzer RF Input.

c. Test Procedure

1. Set up the Spectrum Analyzer as follows:
   (a) Span: 10 MHz/div
   (b) CF: 50 MHz
   (c) RBW: 1 MHz
   (d) Sweep Time/Div: Auto (to resolve signal peaks clearly)

2. Set the the 67XXB as follows:
   (a) Press <Shift> RESET
   (b) Press CW OUTPUT SELECT
   (c) Enter 10 MHz.

3. On the Spectrum Analyzer, measure and record on the Test Record the presence of the worst case harmonic of the 10 MHz carrier that is ≤–40 dBc (≤-–30 dBc for the 6709B-40, 6717B-20, 6722B-20, and 6747B-20 models) and the worst case spurious response that is ≤–60 dBc (≤-–50 dBc for the 6709B-40, 6717B-20, 6722B-20, and 6747B-20 models).

NOTE

Harmonics appear at multiples of the CW frequency and diminish quickly as the CW frequency goes greater than 1 GHz.

4. Repeat step c.3 with the 67XXB CW frequency set first to 20 MHz, then set to 30 MHz. Measure and record the presence of the worst case harmonics and spurious responses.

5. Change the Spectrum Analyzer as follows:
   (a) Span: 100 MHz/div
   (b) CF: 500 MHz

6. Repeat step c.3 with the 67XXB CW frequency set to 40 MHz. Measure and record the presence of the worst case harmonic and spurious response.

7. Change the Spectrum Analyzer as follows:
   (a) Span: 200 MHz/div (or maximum span width)
   (b) CF: 1 GHz (N/A if at maximum span width)

8. Repeat step c.3 with the 67XXB CW frequency set to 350 MHz. Measure and record the presence of the worst case harmonic and spurious response.

9. Change the 67XXB CW frequency to 1.6 GHz. Measure and record the presence of the worst case spurious response.

10. Change the Spectrum Analyzer as follows:
    (a) Span: 10 MHz/div
    (b) CF: 1.6 GHz
    (c) RBW: 1 MHz

11. Adjust the Spectrum Analyzer Reference Level control to place the signal at the top of the screen graticule.

12. Change the Spectrum Analyzer CF to 3.2 GHz and then to 4.8 GHz. Compare the harmonic levels with the levels at 1.6 GHz. Measure and record the 3.2 and 4.8 GHz harmonic levels on the Test Record.

2-10 HARMONIC TEST: RF OUTPUT SIGNALS FROM 2 TO 10 GHz

a. Test Description

This test applies to all 67XXB models except 6709B/-40, 6730B/-40, 6736B/-10, 6740B, 6760B, and 6772B. This test verifies that the 67XXB meets its harmonic specifications for RF Output signals from 2 to 10 GHz. Test Record entries are supplied for harmonics up to a frequency limit of 20 GHz. Additional harmonic checks may be made at any frequency of interest up to the RF output frequency limit of the 67XXB model being tested and through the use of waveguide mixers to extend the frequency range of the Spectrum Analyzer.

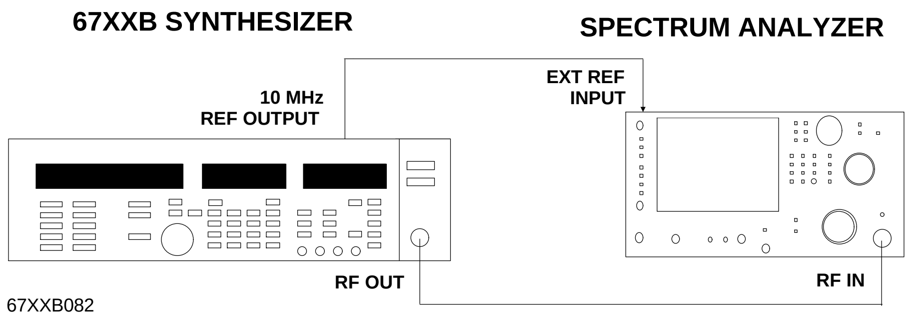


Figure 2-6. Equipment Setup for Harmonic Test: RF Output Signals From 2 to 10 GHz

b. Test Setup

1. Connect equipment as shown in Figure 2-6.
   (a) Connect the 67XXB rear panel 10 MHZ REF OUTPUT to the Spectrum Analyzer External Reference Input.
   (b) Connect the 67XXB RF OUTPUT to the Spectrum Analyzer RF Input.

c. Test Procedure

1. Set the 67XXB CW frequency as follows:
   (a) Press <Shift> RESET
   (b) Press CW OUTPUT SELECT
   (c) Enter the frequency indicated on the Test Record

2. Set up the Spectrum Analyzer as follows:
   (a) Span: 5 kHz/div
   (b) CF: Set to the 67XXB frequency value
   (c) RBW: 1 kHz
   (d) Video Filter Wide: On

3. Adjust the Spectrum Analyzer Peaking control for maximum signal level; then adjust the Reference Level control to place the signal at the top of the screen graticule.

4. Change the Spectrum Analyzer CF to the harmonic frequencies listed on the Test Record and record the harmonic levels. To meet specifications, all harmonics must be ≤–60 dBc.

5. Repeat steps 1 through 4 for the Test Record 67XXB CW carrier frequencies and harmonic frequencies. Record the results on the Test Record.

2-11 HARMONIC TEST: RF OUTPUT SIGNALS FROM 11 TO 20 GHz

a. Test Description

This test applies only to the following 67XXB models: 6753B/-10, 6759B/-10, 6760B, 6763B, and 6769B. This test verifies that the 67XXB meets its harmonic specifications for RF Output signals from 11 to 20 GHz. In order to perform the following procedures, the 67XXB RF output must cover the harmonic frequency of the carrier frequency being tested; i.e., if the 67XXB RF output maximum frequency is 26.5 GHz, then the maximum carrier frequency that can be tested for harmonics is 13.25 GHz.

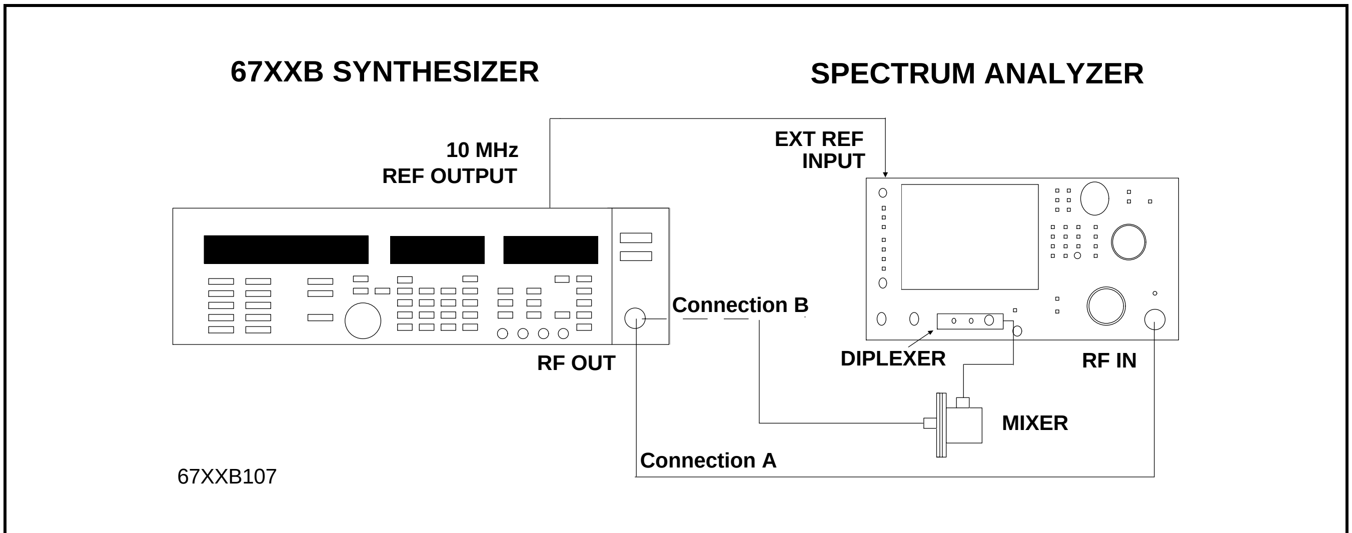


Figure 2-7. Equipment Setup for Harmonic Test: RF Output Signals From 11 to 20 GHz

b. Test Setup

1. Connect equipment as shown in Figure 2-7.
   (a) Connect the 67XXB rear panel 10 MHZ REF OUTPUT to the Spectrum Analyzer External Reference Input.
   (b) Connect the diplexer and appropriate external waveguide mixer to the Spectrum Analyzer.
   (c) Connect the 67XXB RF OUTPUT to the Spectrum Analyzer as shown in Connection A (67XXB RF OUT to Spectrum Analyzer RF IN).

c. Test Procedure

NOTE

Since the external mixer is required for these measurements, the RF output flatness of the 67XXB instrument is used to correct for: (1) variations caused by switching from the fundamental input to the external mixer input of the spectrum analyzer, and (2) the flatness of the mixer.

1. Set up the 67XXB as follows:
   (a) Press <Shift> RESET.
   (b) Press CW OUTPUT SELECT.
   (c) Enter the frequency indicated on the Test Record.
   (d) Set the output power to –30 dBm.

NOTE

If the 67XXB is not fitted with Option 2, install a 30 dB attenuator (Wiltron 43KC-20 and 43 KC-10) and set the 67XXB output power to 0 dBm.

2. Set up the Spectrum Analyzer as follows:
   (a) CF: Same as the 67XXB frequency noted in step c.1.(c).
   (b) Span/Div: 5 kHz/div
   (c) RBW: 1 kHz
   (d) Video Filter Wide: On

3. Adjust the Spectrum Analyzer Peaking control for maximum signal, then adjust the Reference Level control to place the signal at the top of the screen graticule. It may be necessary to also adjust the 67XXB output power slightly to accomplish this; however, *do not exceed –20 dBm output power.*

4. Remove Connection A and connect the 67XXB RF OUTPUT to the Spectrum Analyzer as shown in Connection B (67XXB RF OUT to the waveguide mixer input).

5. On the 67XXB, remove 30 dB of attenuation from the RF output. Do this by either increasing the output power by 30 dB or by removing the 30 dB attenuator installed in step c.1.(d).

6. Change the Spectrum Analyzer CF to the harmonic frequency listed on the Test Record and verify that the signal displayed on the Spectrum Analyzer is ≥30 dB below the top of the screen graticule.

NOTE

–30 dB plus the 30 dB attenuation provided by the waveguide mixer equals a harmonic frequency level of –60 dBc (specification).

7. Record the harmonic level on the Test Record.

8. Repeat steps 1 through 7 for the Test Record 67XXB CW carrier frequencies and harmonic frequencies.

2-12 HARMONIC TEST (ALTERNATE METHOD): RF OUTPUT SIGNALS FROM 10 TO 30 GHz

a. Test Description

This test applies to all 67XXB models except 6709B/-40, 6717B/-20, 6719B, and 6772B. This test describes an alternate method of verifying that the 67XXB meets its harmonic specifications for RF Output signals from 10 to 30 GHz. The test uses the high-pass characteristics of waveguide to block the 67XXB fundamental frequencies and pass only their harmonics to a crystal detector.

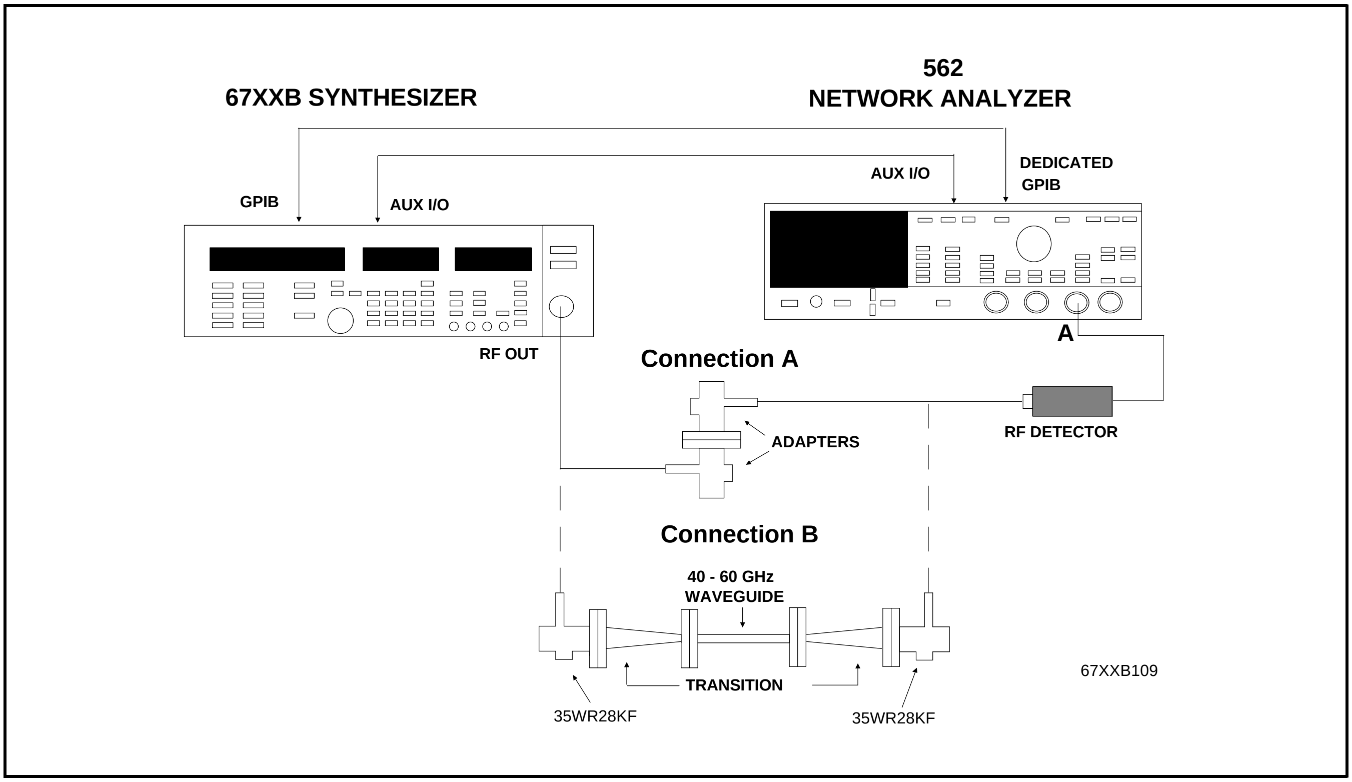


Figure 2-8. Equipment Setup for Harmonic Test: RF Output Signals From 10 to 30 GHz

The following waveguide bands can be used for checking the harmonics of the fundamental frequencies listed.

Waveguide Band	Fundamental Frequency Range
18 - 26.5 GHz	7 - 14 GHz
18 - 40 GHz	8 - 20 GHz
26.5 - 40 GHz	11 - 20 GHz
40 - 60 GHz	16 - 30 GHz

The following Waveguide-to-Coaxial Adapters are used to produce the Waveguide Band filters used in this test procedure.

Waveguide-to-Coxial Adapters		
18 - 40 GHz	26.5 - 40 GHz	18 - 26.5 GHz
35WRD180KF 35WR180K	35WR28KF 35WR28K	35WR42KF 35WR42K

b. Test Setup

1. Connect the equipment as shown in Figure 2-8.
   (a) Connect the 67XXB rear panel AUX I/O to the 562 Network Analyzer AUX I/O.
   (b) Connect the 562 Network Analyzer DEDICATED GPIB to the 67XXB rear panel GPIB.
   (c) Connect the RF Detector (Wiltron 560-7K50) to the 562 Network Analyzer Channel A Input.
   (d) Calibrate the 562 Network Analyzer with the RF Detector.
   (e) Connect the 67XXB RF OUTPUT to the RF Detector Input as follows:
      (1) *(To test harmonics of 67XXB fundamental frequencies between 7 and 20 GHz)* Select the appropriate Waveguide-to-Coaxial Adapters for the fundamental frequency band being tested for harmonics and connect as shown in Connection A of Figure 2-8.
      (2) *(To test harmonics of 67XXB fundamental frequencies between 16 and 30 GHz)* Referring to Connection B of Figure 2-8, connect the Adapters and Waveguide components shown between the 67XXB RF OUTPUT and the RF Detector Input.

c. Test Procedure

1. Set up the 562 Network Analyzer as follows:
   (a) Press the SYSTEM MENU key.
   (b) From the System Menu display, select RESET. This resets both the 562 and the 67XXB.
   (c) Press CHANNEL 2 DISPLAY: OFF
   (d) Press CHANNEL 1 DISPLAY: ON
   (e) Press CHANNEL 1 MENU key.
   (f) From the Channel 1 Menu display, select POWER.

2. Set up the 67XXB as follows:
   (a) Press <Shift> RESET.
   (b) Press F1-F9 SCAN▲ to display the F1 frequency.
   (c) Enter the frequency indicated on the Test Record.
   (d) Press F1-F2 SWEEP.

3. Observe the 562 Network Analyzer display. At frequencies below cutoff, the RF power displayed is caused by harmonics. At frequencies above cutoff, the displayed signal is the total RF power – fundamental and harmonic – being received by the RF Detector.

4. The difference between the RF levels at the frequencies below and the frequencies above cutoff indicate the harmonic level of the useful frequency range. Record the value of this difference on the Test Record and compare it to the value noted as acceptable.

5. Repeat steps 1 through 4 for any other frequencies indicated on the Test Record.

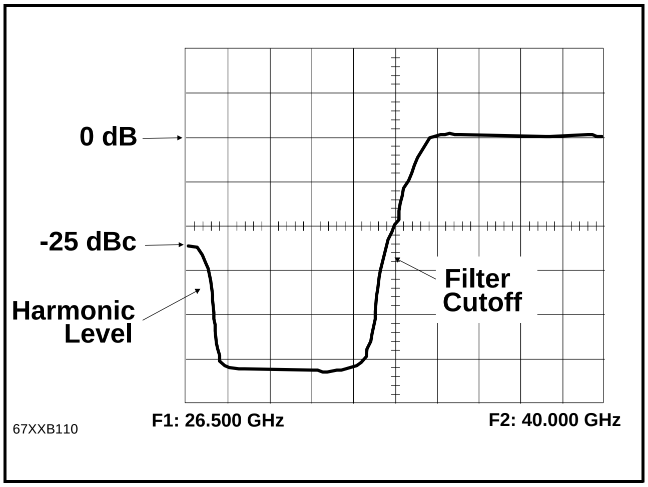


Figure 2-9. Typical Waveform for the Alternate Harmonic Test Procedure

NOTE

Figure 2-9 shows a typical 562 Network Analyzer display when sweeping from 26.5 to 40 GHz. The power on the left side of the screen represents the power of the 3/2 product (13.25 GHz × 3 = 39.75 GHz) and the second harmonic (26.5 GHz × 2 = 53 GHz). The power on the right side of the screen represents the total power, fundamental and harmonic, above the filter cutoff.

2-13 HARMONIC TEST: RF OUTPUT SIGNALS FROM 26.5 TO 40 GHz

a. Test Description

This test applies only to the following 67XXB models: 6740B, 6760B, 6763B, and 6769B. This test verifies that the 67XXB meets its harmonic specifications for RF Output signals from 26.5 to 40 GHz. This is accomplished by checking the level of the worst case harmonic related signal in the frequency band. The worst case harmonic related signal occurs at 26.5 GHz.

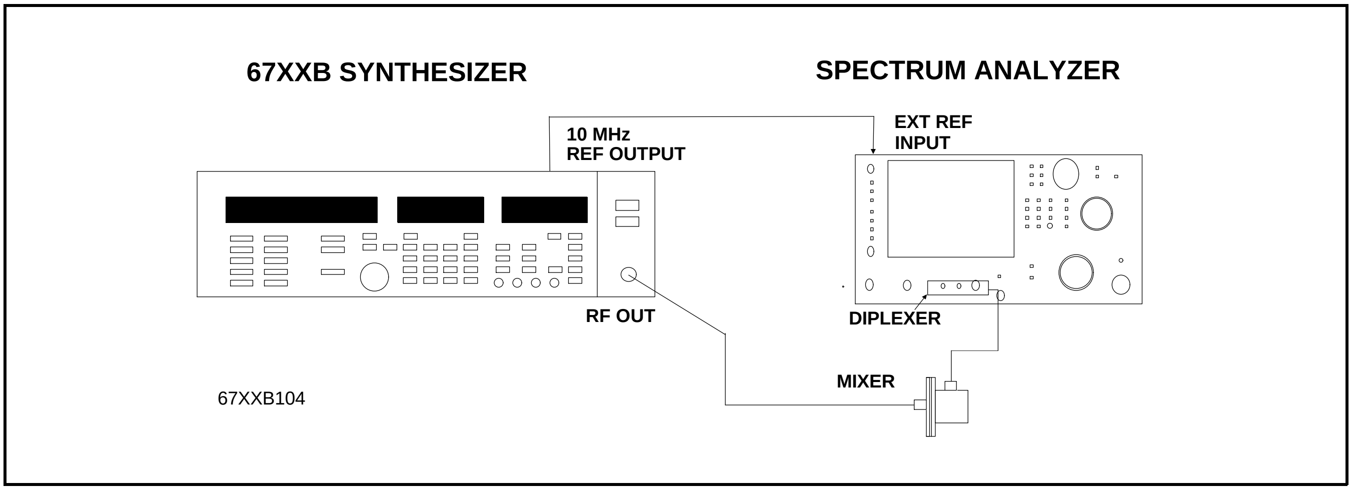


Figure 2-10. Equipment Setup for Harmonic Test: RF Output Signals From 26.5 to 40 GHz

b. Test Setup

1. Connect equipment as shown in Figure 2-10.
   (a) Connect the 67XXB rear panel 10 MHZ REF OUTPUT to the Spectrum Analyzer External Reference Input.
   (b) Connect the diplexer and external waveguide mixer to the Spectrum Analyzer.
   (c) Connect the 67XXB RF OUTPUT to the waveguide mixer input.

c. Test Procedure

1. Set up the 67XXB as follows:
   (a) Press <Shift> RESET.
   (b) Press CW OUTPUT SELECT.
   (c) Enter 39.75 GHz.
   (d) Set the output power to –30 dBm.

NOTE

If the 67XXB is not fitted with Option 2, install a 30 dB attenuator (Wiltron 43KC-20 and 43KC-10) and set the 67XXB output power to 0 dBm.

2. Set up the Spectrum Analyzer as follows:
   (a) CF: Set to 39.75 GHz
   (b) Span/Div: 5 kHz/div
   (c) RBW: 1 kHz
   (d) Video Filter Wide: On

3. Adjust the Spectrum Analyzer Peaking control for maximum signal, then adjust the Reference Level control to place the signal at the top of the screen graticule. It may be necessary to also adjust the 67XXB output power slightly to accomplish this; however, *do not exceed –20 dBm output power.*

4. On the 67XXB, change the CW output frequency to 26.5 GHz.

5. Verify that the signal displayed on the Spectrum Analyzer is ≥ 20 dB below the top of the screen graticule.

6. Record the signal level on the Test Record.

2-14 HARMONIC TEST: RF OUTPUT SIGNALS FROM 40 TO 60 GHz

a. Test Description

This test applies only to the 6772B model. This test verifies that the 67XXB meets its harmonic specifications for RF Output signals from 40 to 60 GHz. This is accomplished by checking the level of the worst case harmonic related signal in the frequency band. The worst case harmonic related signal occurs at 40 GHz.

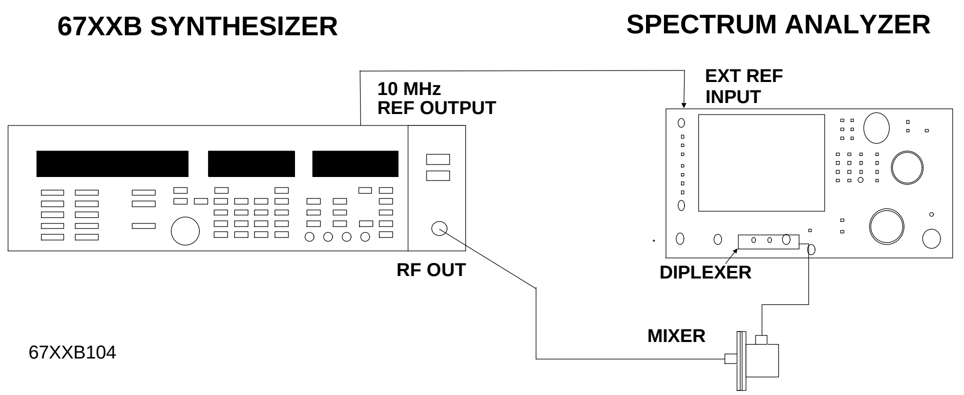


Figure 2-11. Equipment Setup for Harmonic Test: RF Output Signals From 40 to 60 GHz

b. Test Setup

1. Connect equipment as shown in Figure 2-11.
   (a) Connect the 67XXB rear panel 10 MHZ REF OUTPUT to the Spectrum Analyzer External Reference Input.
   (b) Connect the diplexer and external waveguide mixer to the Spectrum Analyzer.
   (c) Connect the 67XXB RF OUTPUT to the waveguide mixer input.

c. Test Procedure

1. Set up the 67XXB as follows:
   (a) Press <Shift> RESET.
   (b) Press CW OUTPUT SELECT.
   (c) Enter 60 GHz.
   (d) Set the output power to –30 dBm, as follows:
      (1) Using the appropriate adapters, install a 30 dB attenuator (Wiltron 43KC-20 and 43KC-10).
      (2) Set the 67XXB output power to 0 dBm.

2. Set up the Spectrum Analyzer as follows:
   (a) CF: Set to 60 GHz
   (b) Span/Div: 5 kHz/div
   (c) RBW: 1 kHz
   (d) Video Filter Wide: On

3. Adjust the Spectrum Analyzer Peaking control for maximum signal, then adjust the Reference Level control to place the signal at the top of the screen graticule. It may be necessary to also adjust the 67XXB output power slightly to accomplish this; however, *do not exceed –20 dBm output power.*

4. On the 67XXB, change the CW output frequency to 40 GHz.

5. Verify that the signal displayed on the Spectrum Analyzer is ≥ 20 dB below the top of the screen graticule.

6. Record the signal level on the Test Record.

2-15 SINGLE SIDEBAND PHASE NOISE TEST

a. Test Description

This test applies to all 67XXB models except 6740B and 6772B. This test verifies that the 67XXB meets its single sideband phase noise specifications. For this test, a second 67XXB is required. This additional synthesizer acts as a local oscillator. The CW RF output from the 67XXB under test (DUT) is mixed with the CW RF output from the 67XXB LO which is offset by 1 MHz. Single sideband phase noise is measured at offsets of 30 Hz, 100 Hz, 1 kHz, 10 kHz, and 100 kHz away from the resultant 1 MHz IF.

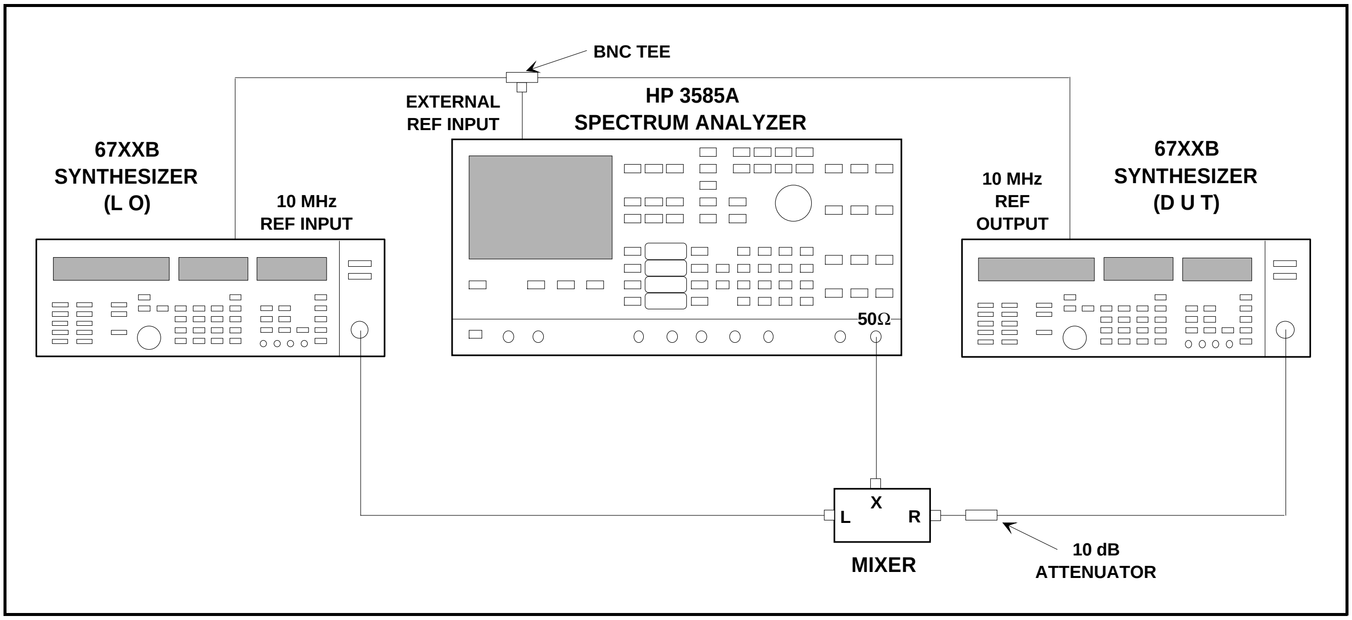


Figure 2-12. Equipment Setup for Single Sideband Phase Noise Test

b. Test Setup

1. Connect the equipment, shown in Figure 2-12, as follows:
   - (a) Connect the 67XXB DUT rear panel 10 MHZ REF OUTPUT to the BNC tee. Connect one leg of the tee to 67XXB LO rear panel 10 MHZ REF INPUT. Connect the other leg of the tee to the Spectrum Analyzer External Reference Input.
   - (b) Connect the 67XXB DUT RF OUTPUT to the Mixer's R input via a 10 dB Attenuator.
   - (c) Connect the 67XXB LO RF OUTPUT to the Mixer's L input.
   - (d) Connect the Mixer's X output to the Spectrum Analyzer 50 Ω input.

NOTE

The following technique is a measurement of phase noise and AM noise. To avoid erroneous results, on the 67XXB DUT set RF LEVEL to MAX LEVEL and select EXT DETECTOR LEVELING. This will prevent any AM noise from degrading the phase noise measurements

c. Test Procedure

1. Set up the 67XXB DUT as follows:
   - (a) Press <Shift> RESET.
   - (b) Press CW OUTPUT SELECT.
   - (c) Enter the frequency indicated on the Test Record.

2. Set up the 67XXB LO as follows:
   - (a) Press <Shift> RESET.
   - (b) Press CW OUTPUT SELECT.
   - (c) Enter a frequency that is 1 MHz lower than the 67XXB DUT frequency set in step c.1.(c).
   - (d) Set the RF LEVEL to 13 dBm. If the RF NOT LEVELED LED lights, reduce the

level to 10 dBm and verify the RF is leveled. Then return the RF LEVEL to 13 dBm.

NOTE

If the 67XXB LO output is less than 10 dBm, the Mixer's local oscillator port will not be saturated and the resulting measurements may be in error.

3. Set up the Spectrum Analyzer as follows:
   (a) Center Frequency: 1 MHz.
   (b) Frequency Span: 100 Hz
   (c) RBW: 3 Hz
   (d) Position the Marker to the peak of the signal.
   (e) Select OFFSET, ENTER OFFSET, and MKRCF.
   (f) Adjust the Marker for a 30 Hz offset.
   (g) Select NOISE LVL.

4. Record the phase noise level 30 Hz offset from the carrier frequency on the Test Record.

5. On the Spectrum Analyzer:
   (a) Deselect NOISE LVL.
   (b) Set Frequency Span to 300 Hz.
   (c) Adjust the Marker for an offset frequency as near to 100 Hz as possible without interference from the vibration related sidebands.
   (d) Select NOISE LVL.

6. Record the phase noise level 100 Hz offset from the carrier frequency on the Test Record.

7. On the Spectrum Analyzer:
   (a) Deselect NOISE LVL.
   (b) Set Frequency Span to 20 kHz.
   (c) Set RBW to 100 Hz
   (d) Adjust the Marker for a 1 kHz offset.
   (e) Select NOISE LVL.

8. Record the phase noise level 1 kHz offset from the carrier frequency on the Test Record.

Table 2-2. Single Sideband Phase Noise Test Specification

CW Carrier Frequency	Offset From Carrier	Test Specification*
0.01 to 8 GHz	30 Hz 100 Hz 1 kHz 10 kHz 100 kHz	≤–67 dBc ≤–72 dBc ≤–76 dBc ≤–80 dBc ≤–98 dBc
8 to 12.4 GHz	30 Hz 100 Hz 1 kHz 10 kHz 100 kHz	≤–64 dBc ≤–69 dBc ≤–73 dBc ≤–77 dBc ≤–100 dBc
12.4 to 20 GHz	30 Hz 100 Hz 1 kHz 10 kHz 100 kHz	≤–60 dBc ≤–65 dBc ≤–69 dBc ≤–73 dBc ≤–100 dBc
20 to 26.5 GHz	30 Hz 100 Hz 1 kHz 10 kHz 100 kHz	≤–58 dBc ≤–63 dBc ≤–67 dBc ≤–71 dBc ≤–97 dBc

* 3 dB difference from 67XXB SSB phase noise performance specifications to account for LO phase noise.

9. On the Spectrum Analyzer:
   (a) Deselect NOISE LVL.
   (b) Set Frequency Span to 100 kHz.
   (c) Adjust the Marker for a 10 kHz offset.
   (d) Select NOISE LVL.

10. Record the phase noise level 10 kHz offset from the carrier frequency on the Test Record.

11. On the Spectrum Analyzer:
    (a) Deselect NOISE LVL.
    (b) Set Frequency Span to 300 kHz.
    (c) Adjust the Marker for a 99 kHz offset (99 kHz is used to avoid the 100 kHz power supply switching sidebands).
    (d) Select Noise LVL.

12. Record the phase noise level 100 kHz offset from the carrier frequency on the Test Record.

13. Repeat steps 1 through 12 for all frequencies listed on the Test Record.

2-16 POWER LEVEL ACCURACY AND FLATNESS VERIFICATION

a. Test Description

These tests apply to all 67XXB models except the 6772B (external leveling only). Power level verification is divided into two sections, accuracy and flatness. Power level flatness is initially checked by observing a full band sweep; first in step sweep, then in analog sweep. Power level accuracy is then checked by stepping the power down in twelve 1 dB increments from its maximum rated power level. Note that the Power Level Flatness in Analog Sweep is a typical value, not a specification.

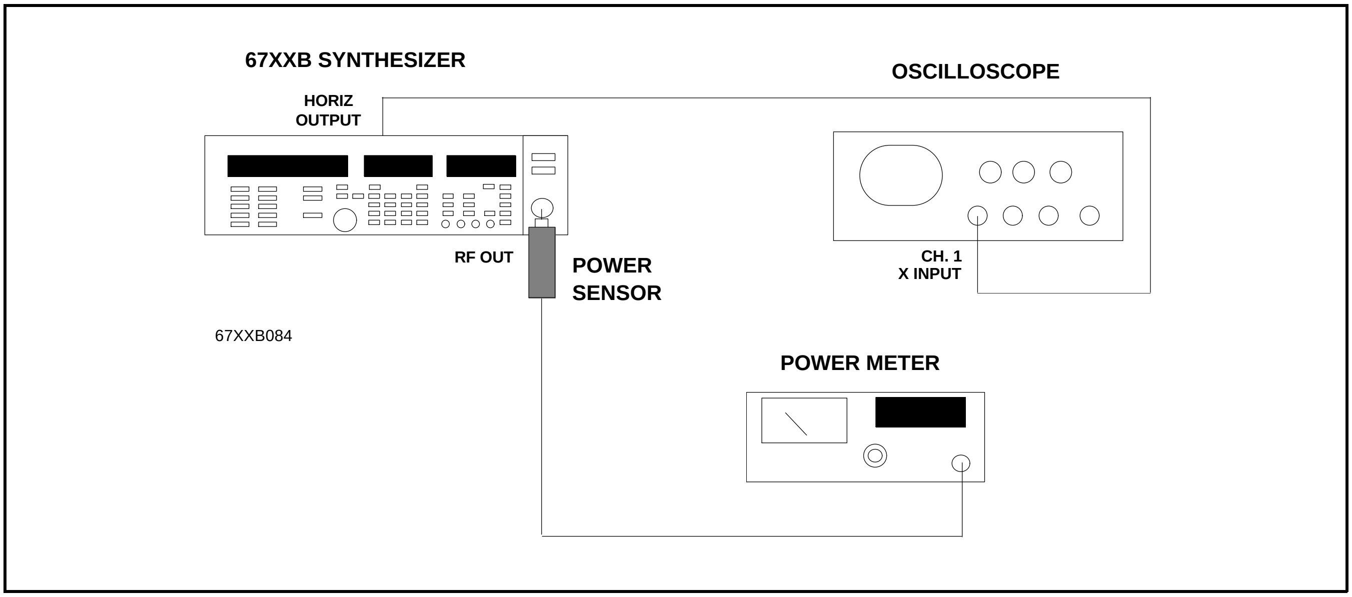


Figure 2-13. Equipment Setup for Power Level Accuracy and Flatness Verification

b. Test Setup

1. Connect the equipment as shown in Figure 2-13.
   (a) Calibrate the Power Meter with the appropriate Power Sensor.

   NOTE

   For 67XXB models with an upper frequency limit of 20 GHz, use Power Sensor HP 8484A. For 67XXB models with an upper frequency limit of 26.5 GHz, use Power Sensor HP 8485A. For measuring power within the frequency range of 26.5 to 40 GHz use Power Sensor HP R8486A.

   For measuring power from the 6772B (40 to 60 GHz), use Power Meter HP 432A with Hughes Power Sensor Model 45773H-1100.

   (b) Connect the Power Meter's Power Sensor to the RF OUTPUT of the 67XXB.
   (c) Connect the 67XXB rear panel HORIZ OUTPUT to the Oscilloscope Ch.1 input (X-axis input).

   NOTE

   During this test it will be necessary to adjust the Power Meter's CAL FACTOR % setting as applicable for the frequency being tested.

c. Power Level Flatness Procedure

1. Set up the 67XXB for full band sweep at maximum rated power as follows:
   (a) Press <Shift> RESET.
   (b) Press F1-F2.
   (c) Press STEP SWEEP DWELL TIME.
   (d) Enter 1 sec.
   (e) Select STEP SWEEP.

NOTE

Monitor the 67XXB's Horizontal Output on the Oscilloscope to determine sweep start and stop.

2. As the 67XXB steps through the full frequency range, measure the maximum and minimum Power Meter readings and record the values on the Test Record. Verify that the variation (difference between the maximum and minimum readings) does not exceed the value noted on the Test Record.

3. Use the following 67XXB keystrokes to verify the accuracy and flatness of the analog sweep.
   (a) Press <Shift> TRIGGER 103 to set the RF on during sweep retrace.
   (b) Press TRIGGER twice to light the EXT indicator.
   (c) Press ANALOG SWEEP.
   (d) Press <Shift> ANALOG SWP TIME.
   (e) Enter 99 Sec.
   (f) Press SINGLE SWEEP to initiate a sweep.

4. During the analog sweep, measure the maximum and minimum Power Meter readings and record the values on the Test Record. Verify that the variation (difference between the maximum and minimum readings) does not exceed the value noted on the Test Record.

NOTE

Repeat section d as needed to cover all of the installed bands in the 67XXB instrument under test. The Test Record lists the specific bands that need to be tested.

d. Power Level Accuracy Procedure

1. To set up the 67XXB for the power level accuracy procedure:
   (a) Press <Shift> RESET.
   (b) Press CW OUTPUT SELECT.
   (c) Enter the CW Frequency noted in the Test Record.
   (d) Press LEVEL 1.
   (e) Press SET INCR/DECR SIZE.
   (f) Enter 1 dB.

2. Measure and record the Power Meter reading on the Test Record.

3. On the 67XXB, press DECR. Measure and record the Power Meter reading on the Test Record.

4. Repeat step d.3 with the other levels listed in the Test Record.

5. Repeat steps d.1 through d.4 for all installed bands as directed by the Test Record. Record the results of each on the Test Record.

2-17 FM MODULATION TESTS

a. Test Description

This procedure verifies the operation of the 67XXB frequency modulation input sensitivity circuit and the accuracy of the front panel MODULATION display.

After calibrating a Function Generator's sine wave output (1 Vpeak; 0.707 Vrms) with a Digital Voltmeter, the signal is connected to the 67XXB's (front panel) EXT FM input. The RF OUTPUT of the 67XXB is monitored on a Spectrum Analyzer display. The magnitude of power carried in the FM sidebands is determined by the amount of signal decrease in the carrier level on the Spectrum Analyzer display. This qualifies how the FM input signal affects the synthesizer's RF OUPUT.

Once the FM circuit's proper operation is verified, the accuracy of the front panel MODULATION display is checked. The displayed FM deviation value (resulting from the previous FM sensitivity test) is noted. Then an FM sensitivity parameter (determined by computation from the displayed value) is entered to generate a carrier level decrease. The value of the decrease verifies the proper operation of the meter circuits.

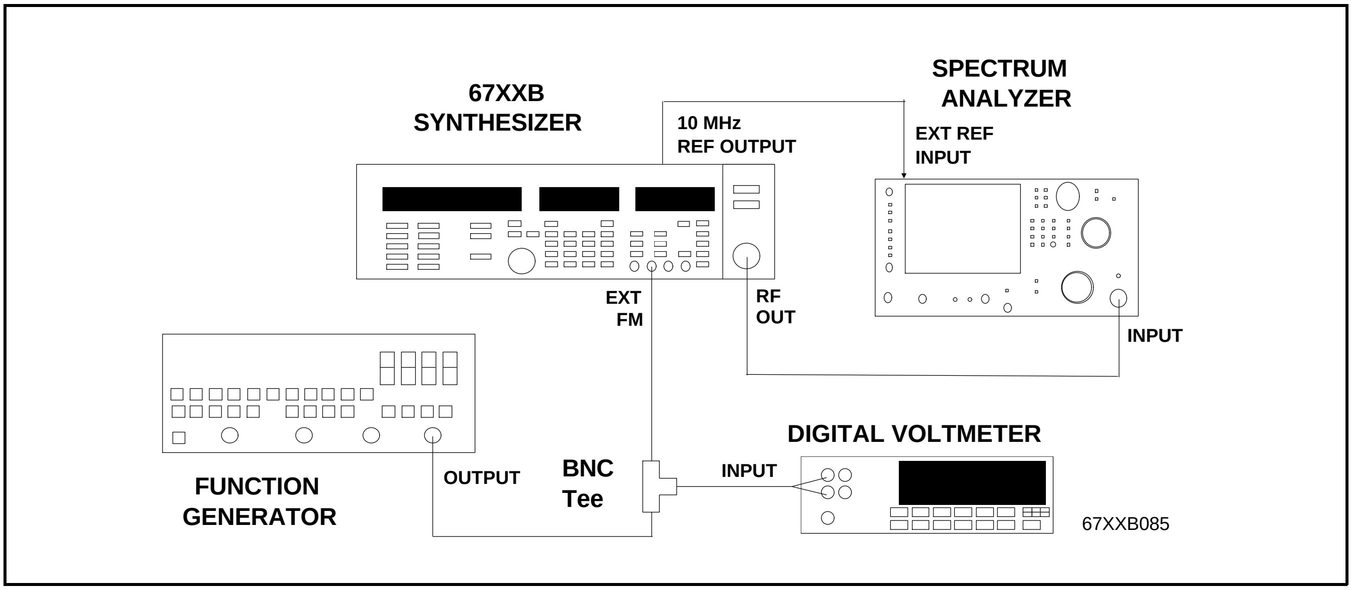


Figure 2-14. Equipment Setup for FM Modulation Tests (0.01 to 20 GHz)

b. Test Setup (for frequencies 0.01 to 20 GHz)

1. Connect the equipment, shown in Figure 2-14, as follows:
   - (a) Connect the 67XXB rear panel 10 MHZ REF OUTPUT to the Spectrum Analyzer External Reference Input.
   - (b) Connect the Function Generator Output to the BNC tee. Connect one leg of the tee to the 67XXB front panel EXT FM input. Connect the other leg of the tee to the Digital Voltmeter input.
   - (c) Connect the 67XXB RF OUTPUT to the Spectrum Analyzer RF Input.

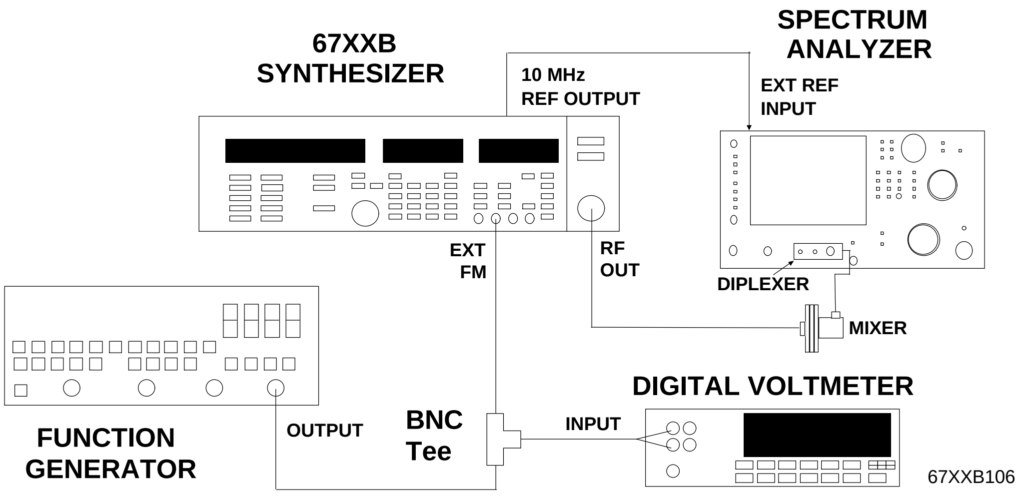


Figure 2-15. Equipment Setup for FM Modulation Tests (20 to 60 GHz)

c. Test Setup (for frequencies 20 to 60 GHz)

1. Connect the equipment, shown in Figure 2-15, as follows:
   - (a) Connect the 67XXB rear panel 10MHZ REF OUTPUT to the Spectrum Analyzer External Reference Input.
   - (b) Connect the Function Generator Output to the BNC tee. Connect one leg of the tee to the 67XXB front panel EXT FM input. Connect the other leg of the tee to the Digital Voltmeter input.
   - (c) Connect the diplexer and the appropriate external waveguide mixer to the Spectrum Analyzer.
   - (d) Connect the 67XXB RF OUTPUT to the waveguide mixer input.

NOTE

Repeat section d as needed to cover all of the installed bands in the 67XXB instrument under test. The Test Record lists the specific bands that need to be tested.

d. FM Input Sensitivity Procedure

1. Adjust the Function Generator for a 40 kHz ±200 Hz sine wave, 0.707 Vrms ±0.5%, with no dc offset. The generator voltage must be set while connected to the 67XXB EXT FM input through the BNC tee.

2. Set up the 67XXB as follows:
   - (a) Press <Shift> RESET.
   - (b) Press CW OUTPUT SELECT.
   - (c) Enter the frequency noted on the Test Record.
   - (d) Press <Shift> FM SENS.
   - (e) Enter 96 kHz.

3. Set up the Spectrum Analyzer as follows:
   - (a) CF: Same as the 67XXB CW frequency set in step d.2(c)
   - (b) Span/Div: 10 kHz
   - (c) RBW: 1 kHz.
   - (d) Video Filter Wide: On
   - (e) Reference Level: Adjust to place the signal at the top graticule of the display.

4. On the 67XXB, press FM.

5. Observe the first Bessel null (Figure 2-16) at the carrier frequency (modulation index = 2.4). Measure the drop in carrier level and record it on the Test Record. The carrier level must have decreased by ≥26 dB to meet specification.

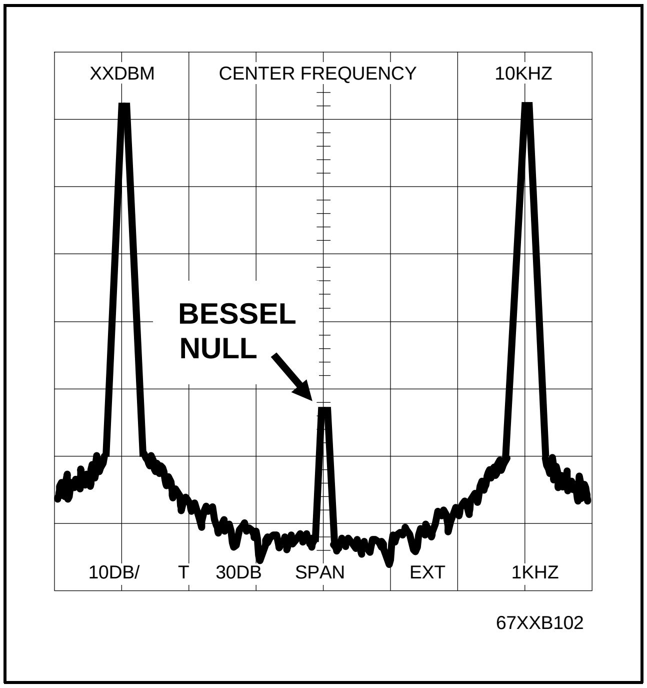


Figure 2-16. Typical Spectrum Analyzer Display of Bessel Null on FM Modulation Waveform

e. FM Meter Accuracy Procedure

1. Press the MEASURE FM DEV key once (the key directly below the AM key). The MEASURE FM DEV indicator next to the key will light. Record the number shown in the MODULATION display in the Test Record.

2. Divide 9216 by the number recorded previously in step e.1. Record the result in the Test Record.

3. On the 67XXB, press <Shift> FM SENS.

4. Enter the calculated value from step e.2 above using the keypad. Then press the kHz key as the data terminator.

5. Measure the drop in carrier level and record it on the Test Record. The carrier level must have decreased by ≥26 dB to meet specification.

6. Repeat steps d.2 thru e.5 for all installed bands as directed by the Test Record. Record the results of each on the Test Record.

7. On the 67XXB, press <Shift> RESET.

2-18 AM MODULATION TESTS

a. Test Description

This procedure verifies the operation of the 67XXB amplitude modulation input sensitivity circuit and accuracy of the front panel MODULATION display.

After calibrating a Function Generator's sine wave output (1 Vpeak; 0.707 Vrms) with a Digital Voltmeter, the signal is connected to the 67XXB's (front panel) EXT AM input. The RF OUTPUT of the 67XXB is monitored on a Spectrum Analyzer display. The (modulated) IF Output of the Spectrum Analyzer is monitored with a Modulation Analyzer. A 30% AM modulation (default value) signal is set to a reference point on the Spectrum Analyzer. The actual modulation value is then computed from the indicated Modulation Meter values. (The absolute values of the AM PK+ and AM PK– readings are used in the given formula to compensate for non-linearity errors in the test equipment.)

Once the AM circuit's proper operation is verified, the accuracy of the front panel MODULATION display is checked. The displayed AM deviation value (resulting from the previous AM sensitivity test) is noted. Then a corresponding AM sensitivity parameter is determined by manual calculation. The comparison of the calculated value to the displayed value indicates the accuracy of the meter circuits.

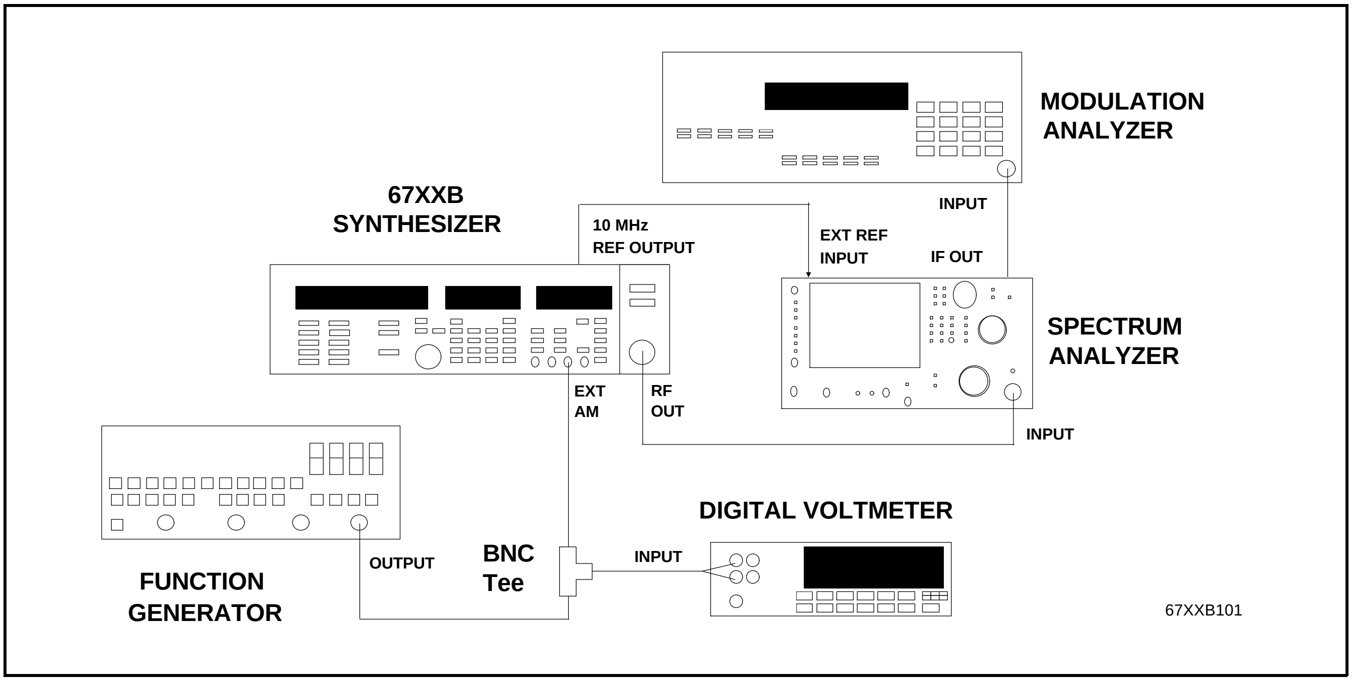


Figure 2-17. Equipment Setup for AM Modulation Tests (0.01 to 20 GHz)

b. Test Setup (for frequencies 0.01 to 20 GHz)

1. Connect the equipment, shown in Figure 2-17, as follows:
   - (a) Connect the 67XXB rear panel 10 MHZ REF OUTPUT to the Spectrum Analyzer External Reference Input.
   - (b) Connect the Function Generator Output to the BNC tee. Connect one leg of the tee to the 67XXB front panel EXT AM input. Connect the other leg of the tee to the Digital Voltmeter input.
   - (c) Connect the IF Output of the Spectrum Analyzer to the RF Input of the Modulation Analyzer.
   - (d) Connect the 67XXB RF OUTPUT to the Spectrum Analyzer RF Input.

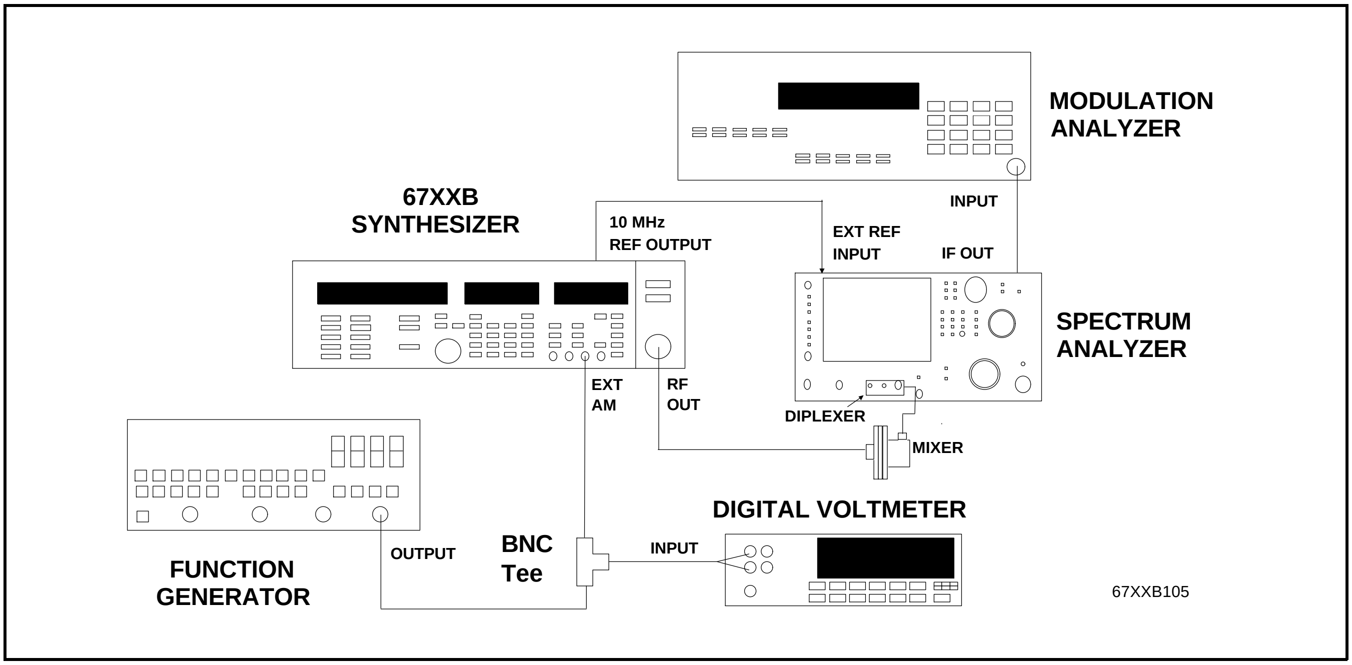


Figure 2-18. Equipment Setup for AM Modulation Tests (20 to 60 GHz)

c. Test Setup (for frequencies 20 to 60 GHz)

1. Connect the equipment, shown in Figure 2-18, as follows:
   (a) Connect the 67XXB rear panel 10 MHZ REF OUTPUT to the Spectrum Analyzer External Reference Input.
   (b) Connect the Function Generator Output to the BNC tee. Connect one leg of the tee to the 67XXB front panel EXT AM input. Connect the other leg of the tee to the Digital Voltmeter input.
   (c) Connect the IF Output of the Spectrum Analyzer to the RF Input of the Modulation Analyzer.
   (d) Connect the diplexer and the appropriate external waveguide mixer to the Spectrum Analyzer.
   (e) Connect the 67XXB RF OUTPUT to the waveguide mixer input.

NOTE

Repeat section d as needed to cover all of the installed bands in the 67XXB instrument under test. The Test Record lists the specific bands that need to be tested.

d. AM Input Sensitivity Procedure

1. Connect the Digital Voltmeter to the Function Generator and adjust the output voltage for a 1 kHz sinewave at 0.707 Vrms ±0.5%, while the generator is connected to the EXT AM connector.

2. Set up the 67XXB as follows:
   (a) Press <Shift> RESET.
   (b) Press LEVEL 1.
   (c) Enter a power level that is 4 dB below maximum rated power.
   (d) Press CW OUTPUT SELECT.
   (e) Enter the frequency noted on the Test Record.
   (f) Press AM.

3. Set up the Spectrum Analyzer as follows:
   (a) CF: Same as 67XXB CW frequency set in step d.2(e)
   (b) Span/Div: 0 Hz (labeled as 10 mSec setting on Tektronix Model 494)
   (c) RBW: 100 kHz
   (d) MIN Noise: Activate

4. On the Spectrum Analyzer, adjust the reference level to place the trace 6 to 8 dB below the top graticule of the display.

5. Set up the Modulation Analyzer for:
   (a) AM PK (+)
   (b) 300 Hz High-Pass Filter
   (c) 3 kHz Low-Pass Filter

6. Measure the peak AM on the Modulation Analyzer. Note the AM PK(+) reading on the Test Record.

7. Press PK(–) on the Modulation Analyzer.

8. Measure the peak AM on the Modulation Analyzer. Note the AM PK(–) reading on the Test Record.

9. Compute the actual AM input sensitivity with the following formula:

$$\%AM = 100 \times \left[\frac{|AM\ PK(+)| + |AM\ PK(-)|}{200 + |AM\ PK(+)| - |AM\ PK(-)|} \right]$$

10. The calculated result should be between 26% and 34% AM. Note this result in the Test Record; it will be used in the AM Meter Accuracy check that follows.

e. AM Meter Accuracy Procedure

1. Complete steps d.1 through d.10 in the previous AM Input Sensitivity Procedure.

2. On the 67XXB, press the MEASURE AM DEPTH key twice to light the indicator next to the MEASURE AM DEPTH key label.

3. Record the number shown in the 67XXB MODULATION display on the Test Record .

4. Divide 30 by the number recorded in the previous step. Calculate the result to a three-digit accuracy and record it on the Test Record.

5. Multiply the result of step 4 above by the result obtained in step 10 of the AM Input Sensitivity Procedure. Record this result on the Test Record. The product of the calculation must be between 26% and 34% AM.

6. Repeat steps d.2 through e.5 for all installed bands as directed by the Test Record. Record the results of each in the Test Record.

7. On the 67XXB, press <Shift> RESET.

2-19 PULSE MODULATION TESTS: RISE TIME, FALL TIME, OVERSHOOT, AND LEVEL

a. Test Description

These tests apply to all 67XXB models except the 6772B (external leveling only). Pulse modulation tests verify correct operation as well as rise time, fall time, overshoot, and leveling.

The Pulse Leveling Accuracy test compares the pulsed RF output level to the CW output level to verify the performance of the level detector(s), detector/preamplifier(s), and ALC sample/hold circuits. The 67XXB LEVEL display power meter reading is calibrated with an external power meter. Any minor displayed power difference is offset before the test is performed.

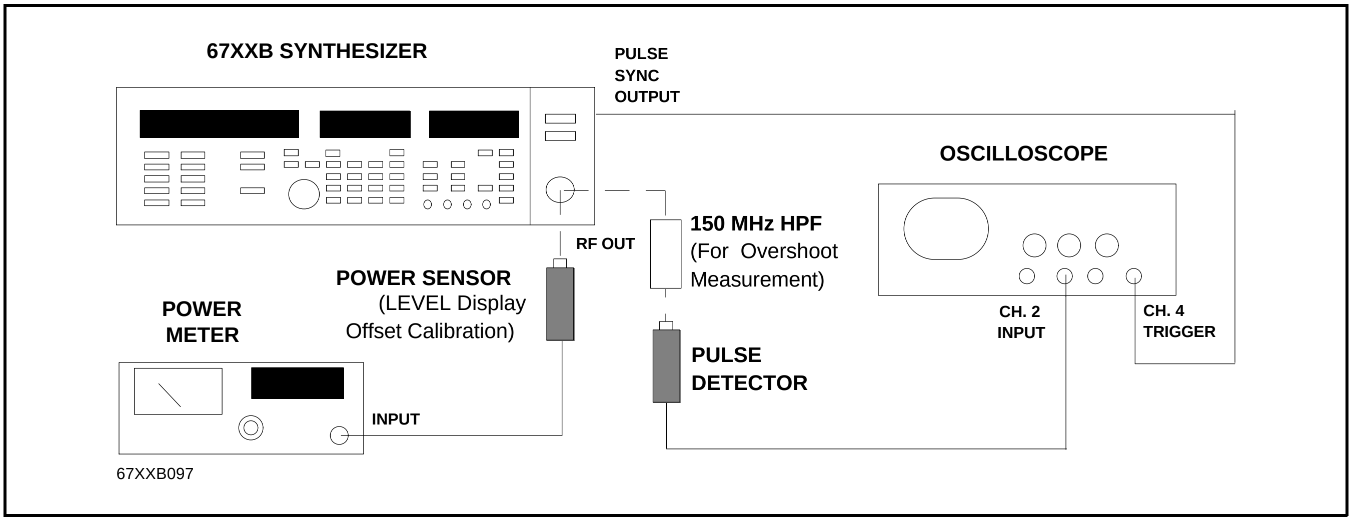


Figure 2-19. Equipment Setup for Pulse Modulation Tests: (Rise Time, Fall Time, Overshoot, and Level)

b. Test Setup

1. For all models, connect the equipment, shown in Figure 2-19, as follows:
   - (a) Connect the 67XXB rear panel PULSE SYNC OUTPUT to the Oscilloscope Trigger Input.
   - (b) Connect the appropriate Pulse Detector Output to the Vertical Input of the Oscilloscope.
   - (c) On the Oscilloscope select 50Ω input impedance.
   - (d) Connect the Pulse Detector Input through a 150 MHz High Pass Filter to the 67XXB RF OUTPUT.

NOTE

Repeat section c as needed to cover all of the installed bands in the 67XXB instrument under test. The Test Record lists the specific bands that need to be tested.

c. Rise Time, Fall Time, Overshoot, and Level Test Procedure

1. Set up the 67XXB as follows:
   - (a) Press <Shift> RESET.
   - (b) Press CW OUTPUT SELECT.
   - (c) Enter the frequency noted in the Test Record.
   - (d) Press INTERNAL (PULSE).
   - (e) Press <Shift> WIDTH (PULSE).
   - (f) Enter 5 µs.
   - (g) Press <Shift> PERIOD (PULSE).
   - (h) Enter 50 kHz.

2. On the Oscilloscope, turn off CH.4. Observe the output of the Pulse Detector on the Oscilloscope. Refer to Figure 2-20 to interpret the detector waveform. Adjust the Oscilloscope controls to measure and record the following on the Test Record:
   - (a) Rise Time: <10 ns
   - (b) Pulse Width: 5 µs (±10 ns, typical)
   - (c) Pulse Rate: 50 kHz
   - (d) Overshoot: <10% (typical)

3. Repeat step c.2 for all installed bands as directed by the Test Record. Record the results of each on the Test Record.

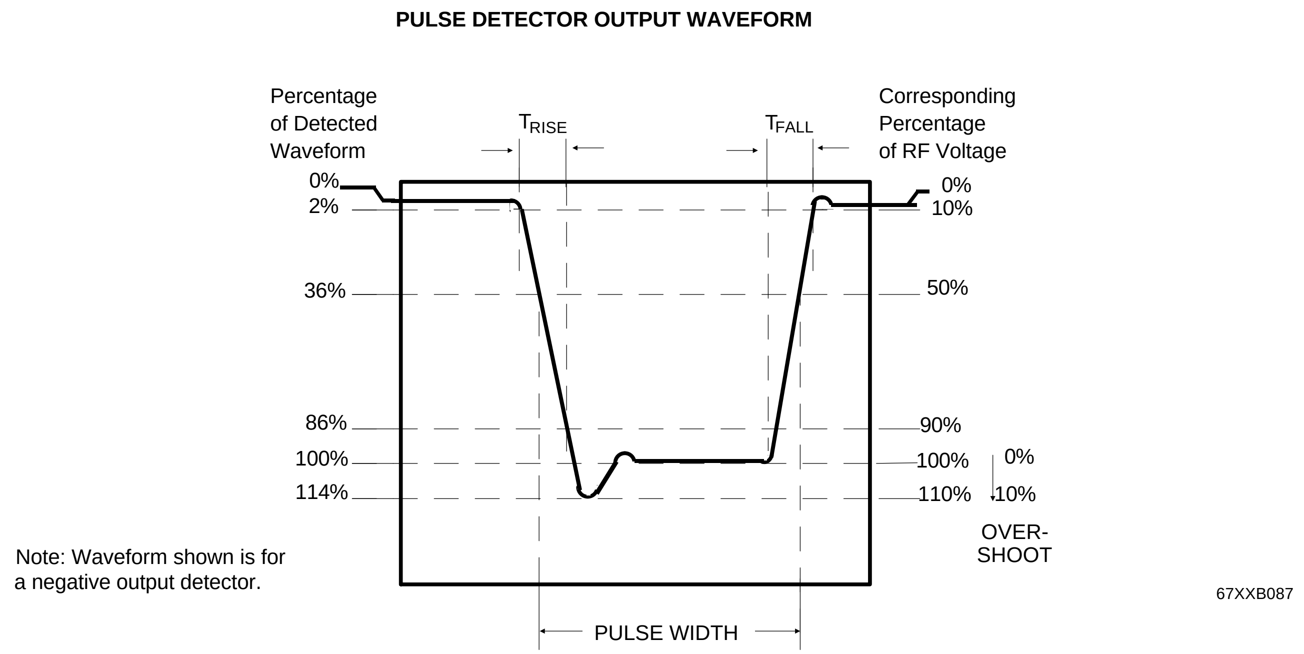


Figure 2-20. Measurement Parameters for Pulse Modulation Waveform

d. Pulse Leveling Accuracy Check Preliminary Test Setup

1. Set up the test equipment as described in step b.1. In addition, do the following:
   (a) Calibrate the Power Meter with the appropriate Power Sensor.

NOTE

For 67XXB models with an upper frequency limit of 20 GHz, use Power Sensor HP 8484A. For 67XXB models with an upper frequency limit of 26.5 GHz, use Power Sensor HP 8485A. For measuring power within the frequency range of 26.5 to 40 GHz, use Power Sensor HP R8486A.

   (b) Disconnect the Pulse Detector from the 67XXB RF OUTPUT and connect the Power Meter's Power Sensor in its place.

2. On the 67XXB:
   (a) Press LEVEL 1.
   (b) Press SET INCR/DECR.
   (c) Enter 0.01 dBm.

3. On the 67XXB, press INTERNAL (PULSE) to turn pulse modulation off [turned on in step c.1(d)]; the INTERNAL (PULSE) indicator should go out. The 67XXB is now generating a CW output frequency.

4. On the 67XXB change the CW output frequency as follows:
   (a) Press CW OUTPUT SELECT.
   (b) Enter the frequency noted in the Test Record.

e. 67XXB LEVEL Display Calibration

1. Note the value displayed in the 67XXB LEVEL display on the Test Record. Then Press LEVEL 1.

2. Using the 67XXB INCR and DECR keys, adjust the synthesizer's power output in 0.01 dB increments until the value in the the Power Meter's display matches the value previously noted in step e.1. Note this level on the Test Record.

3. On the Test Record, compute the difference of the readings noted in steps e.1 and e.2.

4. On the 67XXB:
   (a) Press <Shift> ENTER OFFSET.
   (b) Enter the value recorded in step e.3.
   (c) Press LEVEL OFFSET.
   (d) Press LEVEL 1.
   (e) Press SET INCR/DECR SIZE.
   (f) Enter 0.1 dBm.
   (g) Press LEVEL OFFSET twice.

5. The 67XXB LEVEL display reading should now indicate and track the power meter display reading to within 0.1 dB as the test procedure is performed.

f. Pulse Leveling Accuracy Test Procedure

1. Disconnect the Power Sensor and reconnect the Pulse Detector to the 67XXB RF OUTPUT.

2. On the 67XXB change the CW output frequency as follows:
   (a) Press CW OUTPUT SELECT.
   (b) Enter the frequency noted in the Test Record.

3. On the Oscilloscope:
   (a) Adjust the vertical offset to place the trace exactly on the center graticule; this is used as the CW-level reference line.
   (b) Use the Auto Triggering mode to continue sweeping the display when the pulse is off.
   (c) Adjust the vertical sensitivity to the most sensitive setting (mV/div) possible while keeping the trace at the center graticule reference line.

4. On the 67XXB:
   (a) Press INTERNAL (PULSE).
   (b) Press <Shift> WIDTH (PULSE).
   (c) Enter the pulse width noted in the Test Record.

5. On the Oscilloscope, observe that the nominal level of the displayed pulse peak has shifted vertically, slightly off of the centerline. It may be necessary to readjust the scope trigger level.

6. Record the value indicated on the 67XXB LEVEL display on the Test Record.

7. On the 67XXB:
   (a) Press LEVEL 1.
   (b) Press SET INCR/DECR SIZE.
   (c) Enter 0.1 dB.
   (d) Press the INCR or DECR key a few times until the nominal peak level is evenly centered on the display centerline reference.

8. Record the value indicated on the 67XXB LEVEL display on the Test Record.

9. Subtract the LEVEL display reading recorded in step f.8, from the reading recorded in step f.6. This is the pulse level error. Record it on the Test Record.

10. On the 67XXB:
    (a) Press INTERNAL (PULSE); the INTERNAL (PULSE) indicator should go out.
    (b) Press LEVEL 1 and return to Level display noted in step f.6.

11. Repeat steps f.2 through f.9 for the remaining frequencies and pulse widths noted in the Test Record. Record the results on the Test Record.

2-20 PULSE MODULATION TEST: VIDEO FEEDTHROUGH

a. Test Description

This pulse modulation test verifies that video feedthrough is within specifications.

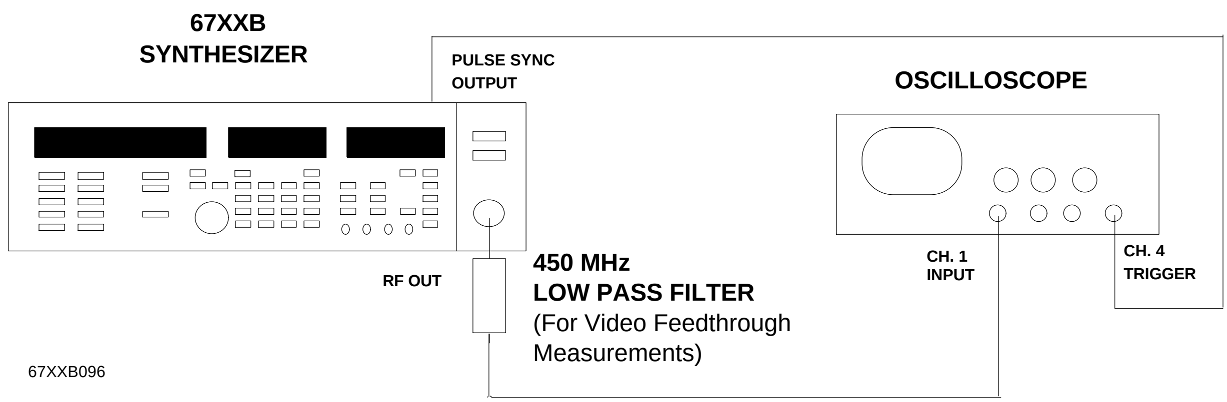


Figure 2-21. Equipment Setup for Pulse Modulation Test: Video Feedthrough

b. Test Setup

1. Connect the equipment, shown in Figure 2-21, as follows:
   (a) Connect the 67XXB rear panel PULSE SYNC OUTPUT to the Oscilloscope Trigger Input.
   (b) On the Oscilloscope select 50 Ω input impedance.
   (c) Connect the 67XXB RF OUTPUT to the Oscilloscope Vertical Input through a 450 MHz Low Pass Filter.

NOTE

Repeat section c as needed to cover all of the installed bands in the 67XXB instrument under test. The Test Record lists the specific bands that need to be tested.

c. Test Procedure

1. Set up the 67XXB as follows:
   (a) Press <Shift> RESET.
   (b) Press CW OUTPUT SELECT.
   (c) Enter the frequency noted on the Test Record.
   (d) Press INTERNAL (PULSE).
   (e) Press <Shift> WIDTH (PULSE).
   (f) Enter 5 μs.
   (g) Press <Shift> PERIOD (PULSE).
   (h) Enter 100 kHz.

2. Set the Oscilloscope controls as follows:
   (a) Vertical Sensitivity: 5 mV/division
   (b) External Trigger: On the positive slope of the Channel 1 signal input
   (c) Horiz Time Base: 1 μSec/division

NOTE

Use the Oscilloscope's 20 MHz bandwidth limit to aid in viewing the voltage spikes. It may be necessary to adjust the Oscilloscope's horizontal level as any ripple or voltage spikes are generally very small in amplitude.

3. Measure and record the voltage spikes (video feedthrough) on the Test Record. To meet specifications, they must be:
   (a) Output Frequencies ≤2 GHz:
   2% max for power levels ≤10 dBm
   5% max for power levels >10 dBm
   (b) Output Frequencies 2-26.5 GHz:
   ±10 mV peak max.
   (c) Output Frequencies >26.5 GHz:
   ±5 mV peak max.

4. Repeat steps c.1 through c.3 for all installed bands as directed by the Test Record. Record the results of each on the Test Record.

2-21 PULSE MODULATION TEST: RF ON/OFF RATIO

a. Test Description

This pulse modulation test verifies that the ratio of RF on power to RF off power is within specifications. For frequencies of 0.01 to 20 GHz, use the section b test setup and section c test procedure. For frequencies of 20 to 60 GHz, use the section d test setup and section e test procedure.

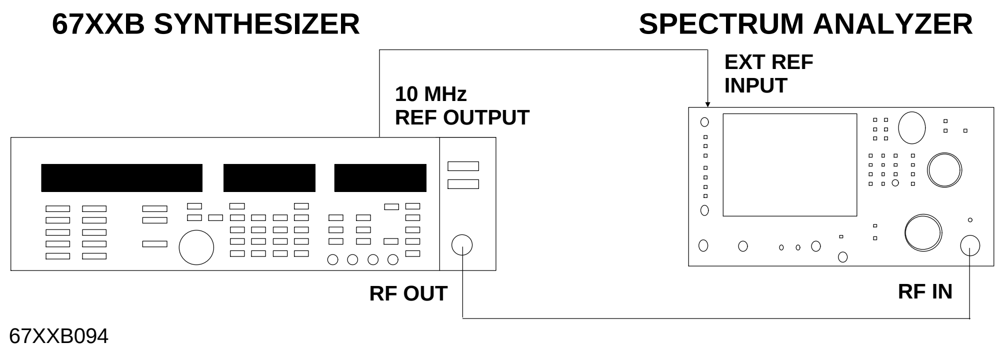


Figure 2-22. Equipment Setup for Pulse Modulation Test: RF ON/OFF Ratio (0.01 to 20 GHz)

b. Test Setup (for frequencies of 0.01 to 20 GHz)

1. Connect the equipment, shown in Figure 2-22, as follows:
   (a) Connect the 67XXB rear panel 10 MHZ REF OUTPUT to the Spectrum Analyzer External Reference Input.
   (b) Connect the 67XXB RF OUTPUT to the Spectrum Analyzer RF Input.

NOTE

Repeat section c, as needed, to cover all of the installed bands in the 67XXB instrument under test. The Test Record lists the specific bands that need to be tested.

c. Test Procedure (for frequencies of 0.01 to 20 GHz)

1. Set up the 67XXB as follows:
   (a) Press <Shift> RESET.
   (b) Press <Shift> TRIGGER 107 to set the front panel for a +PULSE input.
   (c) Press CW OUTPUT SELECT.
   (d) Enter the frequency noted on the Test Record.
   (e) Press EXTERNAL (PULSE).

2. Set up the spectrum analyzer as follows:
   (a) CF: Same as the 67XXB CW frequency noted in step c.1(d)
   (b) Span/Div: 10 kHz
   (c) RBW: 1 kHz
   (d) Video Filter: Wide
   (e) MIN Noise: Activated
   (f) Reference Level: Adjust to place the signal at the top graticule of the screen.

3. Connect a short between the 67XXB front panel PULSE/TRIG TTL BNC connector center and outer conductors.

4. On the Spectrum Analyzer, decrease the Reference Level by 20 dB, then measure the signal amplitude and record it on the Test Record. The measured signal must be ≥60 dB from the top graticule.

NOTE

A 60 dB level change plus a 20 dB decrease in the reference level equals an 80 dB on/off ratio (specification).

5. If the signal level drifts slowly after connecting the short, remove the short momentarily and apply it again. (Make the measurement as soon as possible after applying the short.) This drift is due to the Sample/Hold circuit not holding the level because of the pulse duty factor (ratio of RF ON to RF OFF). This drift will not be present in normal pulse operation as the minimum pulse repetition rate is 10 Hz.

6. Remove the short.

7. Repeat steps c.1 thru c.5 for all installed bands (for frequencies of 0.01 to 20 GHz) as directed by the Test Record. Record the results of each on the Test Record. For 67XXB instruments with installed frequency bands above 20 GHz, proceed to the section d Test Setup and the section e Test Procedure as directed by the Test Record.

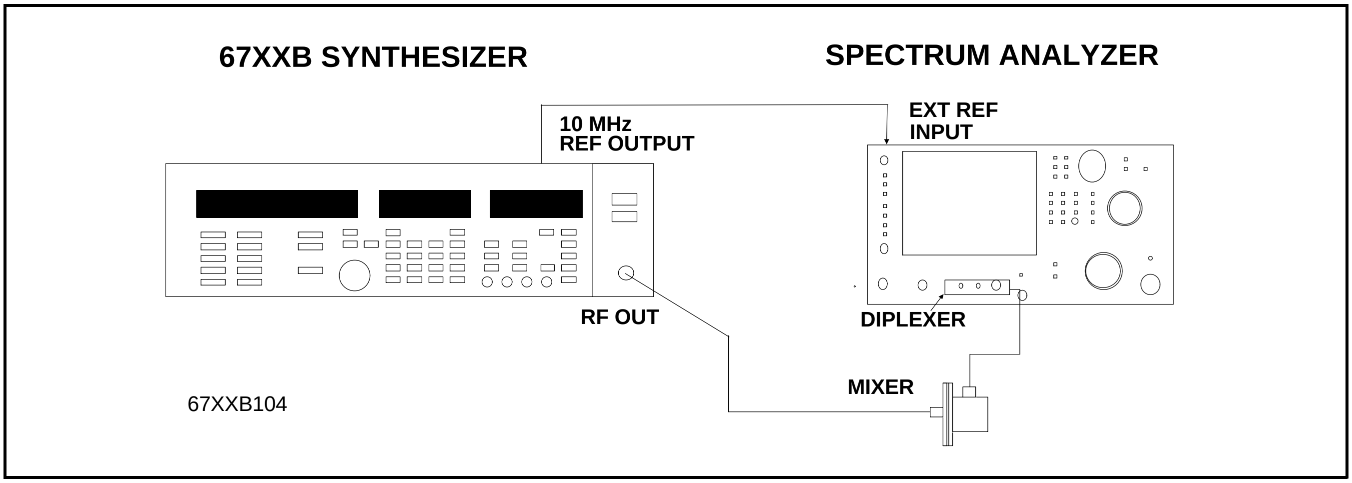


Figure 2-23. Equipment Setup for Pulse Modulation Test: RF ON/OFF Ratio (20 to 60 GHz)

d. Test Setup (for frequencies of 20 to 60 GHz)

1. Connect the equipment, shown in Figure 2-23, as follows:.
   (a) Connect the 67XXB rear panel 10 MHZ REF OUTPUT to the Spectrum Analyzer External Reference Input.
   (b) Connect the diplexer and appropriate external waveguide mixer to the Spectrum Analyzer.
   (c) Connect the 67XXB RF OUTPUT to the waveguide mixer input.

NOTE

Repeat section e, as needed, to cover all of the installed bands in the 67XXB instrument under test. The Test Record lists the specific bands that need to be tested.

e. Test Procedure (for frequencies of 20 to 60 GHz)

1. Set up the 67XXB as follows:
   (a) Press <Shift> RESET.
   (b) Press <Shift> TRIGGER 107 to set the front panel for a+PULSE input.
   (c) Press CW OUTPUT SELECT.
   (d) Enter the frequency noted on the Test Record.
   (e) Set the output power to –30 dBm.

NOTE

If the 67XXB is not fitted with Option 2, install a 30 dB attenuator (Wiltron 43KC–20 and 43KC–10) and set the 67XXB output power to 0 dBm.

   (f) Press EXTERNAL (PULSE).

2. Set up the Spectrum Analyzer as follows:
   (a) CF: Same as the 67XXB frequency noted in step e.1.(d).
   (b) Span/Div: 10 kHz
   (c) RBW: 1 kHz
   (d) Video Filter: Wide
   (e) MIN Noise: Activated
   (f) Reference Level: Adjust to place the signal at the top graticule of the screen.

3. Connect a Short between the 67XXB front panel PULSE/TRIG TTL BNC connector center and outer conductors.

4. On the 67XXB, remove 30 dB of attenuation from the RF output. Do this by either increasing the output power 30 dB or by removing the 30 db attenuator installed in step e.1.(e). On the Spectrum Analyzer, verify that the measured signal is ≥50 dB from the top of the screen.

NOTE

50 dB plus a 30 dB increase in the 67XXB output level equals a 80 dB RF on/off ratio (specification).

5. If the signal level drifts slowly after connecting the short, remove the short momentarily and apply it again. (Make the measurement as soon as possible after applying the short.) This drift is due to the Sample/Hold circuit not holding the level because of the pulse duty factor (ratio of RF ON to RF OFF).

6. Remove the short.

7. Repeat steps e.1 thru e.5 for all installed bands as directed by the Test Record. Record the results of each on the Test Record.

SECTION 3
CALIBRATION/ADJUSTMENTS

CONTENTS

SECTION 3
CALIBRATION/ADJUSTMENTS

3-1 INTRODUCTION

This section contains calibration and adjustment procedures for 67XXB Swept Frequency Synthesizers. These procedures are typically accomplished due to out-of-tolerance conditions having been noted during performance verification testing (see Section 2) or as a result of the repair or replacement of subassemblies or microwave components.

NOTE

The calibration procedures herein use hidden-key routines that were implemented with version 8.03 operating firmware. It is recommended that you upgrade your instrument's operating firmware to the latest available version prior to calibration. For assistance in calibrating instruments containing older versions of operating firmware or for firmware upgrade details, contact the WILTRON Customer Service department at (408) 778-2000.

Calibration of the 10 MHz Reference Oscillator (paragraph 3-11) should not be attempted until the 67XXB has been running in standby mode for a minimum of 48 continuous hours.

3-2 RECOMMENDED TEST EQUIPMENT

Table 3-1 lists the test equipment recommended for these calibration and adjustment procedures.

The procedures refer to specific test equipment front panel control labels when the setup parameters of the procedure are critical to making accurate measurements. In some cases, the user may substitute equipment having the same critical specifications as those of the recommended test equipment listed in Table 3-1.

Contact the WILTRON Customer Service department at (408) 778-2000 if you need clarification of any equipment or procedural reference.

3-3 CALIBRATION/ADJUSTMENT TEST RECORD

A blank copy of a sample calibration/adjustments test record is provided in Section 4. The test record contains model-specific variables called for by the procedures in this section. It also provides the means for maintaining an accurate and complete record of calibration/adjustments to the synthesizer. We recommend that you copy these pages and use them to record the results from: (1) your initial calibration/adjustment of out-of-tolerance 67XXB circuits, or (2) your initial calibration/adjustment of the 67XXB following repair or replacement of subassemblies or microwave components. These initial readings can later be used as benchmark values for future tests of the same serial-numbered instrument.

3-4 STATIC HANDLING PROCEDURES

The 67XXB synthesizer contains components that can be damaged by static electricity. Figure 1-2 contains a list of precautions that, when followed, will minimize the possibilities of static-shock damage to these components.

3-5 CALIBRATION/ADJUSTMENTS FOLLOWING COMPONENT REPAIR OR REPLACEMENT

Table 3-2 lists the calibration/adjustments that should be performed following the repair or replacement of 67XXB subassemblies or microwave components.

3-6 CONNECTOR AND KEY LABEL NOTATION

The calibration and adjustment procedures include many references to equipment interconnections and control settings. For all 67XXB references, specific labels are used to denote the appropriate control key or connector (such as CW OUTPUT SELECT or RF

OUTPUT). Most references to supporting test equipment use general labels for commonly used controls and connections (such as Span or RF Input). In some cases, a specific label is used that is a particular feature of the test equipment listed in Table 3-1.

When pressed, many of the 67XXB front panel control keys cause a corresponding LED indicator to light, verifying the selection. Observe the lighting of the LED indicator to ensure that the desired function is enabled.

During calibration/adjustment procedures, the following three LED indicators should be monitored continously: ENTRY ACTIVE, RF NOT LEVELED, and NOT Ø-LOCKED. The lighting on the ENTRY ACTIVE LED indicates that the Data Entry function is active. When in the step sweep or CW modes of operation, the lighting of the RF NOT LEVELED LED or NOT Ø-LOCKED LED may signal a situation that is the result of an instrument failure and may cause errant calibration/adjustment results.

3-7 HIDDEN-KEY ROUTINES

The <Shift> TRIGGER key in conjunction with a 3 digit code inplements the 67XXB's hidden-key routines. These routines are used for calibration, troubleshooting, and implementation of some of the synthesizer's functions. Table 3-3 provides descriptions of the routines used in calibration. Hidden-key routines used for troubleshooting are covered in the 67XXB Maintenance Manual. Once a hidden-key routine has been activated, the keys used (except for the DATA ENTRY keypad) have different functions than are indicated by the 67XXB's front panel markings.

Care must be exercised when entering <Shift> TRIGGER codes during calibration or troubleshooting procedures. Entry of an incorrect <Shift> TRIGGER code may damage or erase stored calibration data.

3-8 GENERATING EEPROM CHECKSUMS FOLLOWING CALIBRATION

During calibration procedures, calibration data is stored in the non-volatile memory (EEPROMs) located on the A23 Microprocessor PCB. Upon completion of 67XXB calibration, you should generate new checksums for the EEPROMs. Failure to do so will result in checksum error codes E23-17, E23-18, and E23-19.

EEPROM checksums are generated by (1) placing the CAL/NORM jumper on the A23 Microprocessor PCB in the CAL position and (2) pressing <Shift> TRIGGER 089, then <Shift> TRIGGER 397. The EEPROM checksums have now been generated. Restore the CAL/NORM jumper to the NORM position.

Table 3-1. Recommended Test Equipment for Calibration/Adjustment Procedures

INSTRUMENT	CRITICAL SPECIFICATION	RECOMMENDED MANUFACTURER/MODEL	PROCEDURE NUMBER
Spectrum Analyzer, with Diplexer and External Mixers	*Frequency:* 0.01 to 60 GHz *Resolution:* 10 Hz	Tektronix, Model 494AP, with External Mixers: WM 490K (18 to 26.5 GHz) WM 490A (26.5 to 40 GHz) WM 490U (40 to 60 GHz) Diplexer PN: 015-3085-00	3-17, 3-19 3-20
Frequency Counter with External Mixers	*Frequency:* 0.01 to 60 GHz *Input Impedance:* 50Ω *Resolution:* 1 Hz *Other:* Ext Time Base Input	EIP Microwave, Inc, Model 578A, with External Mixers: Option 91 (26.5 to 40 GHz) Option 92 (40 to 60 GHz)	3-11, 3-14
Digital Voltmeter	*Resolution:* 4-1/2 digits (to 20V) *DC Accuracy:* 0.002% +2 counts *DC Input Impedance:* 10 MΩ *AC Accuracy:* 0.07% +100 counts (to 20 kHz) *AC Input Impedance:* 1 MΩ	John Fluke, Inc., Model 8840A, with: Option 8840-09 (True RMS AC)	3-9, 3-10, 3-12, 3-17, 3-18, 3-19, 3-20, 3-21
Frequency Standard	*Frequency:* 10 MHz *Accuracy:* 1 x 10-10 parts/day	Spectracom Corp., Model 8161	3-11
Function Generator	*Output Voltage:* 300 mV to 10V *Functions:* 30 Hz to 40 kHz sine, square, and sawtooth waveforms	Hewlett-Packard, Model 8116A	3-9, 3-12, 3-17,3-18, 3-19,3-20, 3-21
Modulation Analyzer	*Frequency Input:* 10 MHz (or the IF of the spectrum analyzer) *FM Max Deviation:* 500 kHz *FM Accuracy:* ±1% to 100 Khz rate *AM Depth:* 0% to 90% *AM Modulation Rates:* dc to 100 kHz *Filters:* 50 Hz lowpass, 15 kHz highpass	Hewlett-Packard, Model 8901A	3-17
Oscilloscope	*Bandwidth:* dc to 150 MHz *Sensitivity:* 2 mV *Horizontal Sensitivity:* 50 ns/division	Tektronix, Model 2445	3-9, 3-12
Scalar Network Analyzer, with RF Detectors	*Frequency Range:* 0.01 to 60 GHz	WILTRON, Model 562, with RF Detectors: 560-7N50 (0.01 to 18 GHz) 560-7K50 (0.01 to 40 GHz)	3-9, 3-16
Microwave Detector	*Output Polarity:* Negative *Frequency Range:* 40 to 60 GHz	Hughes, Model 47323H-1211 (WR-19 Input/SMA output)	3-9
Adapter Cable	Adapts the Model 562, Scalar Network Analyzer to Microwave Detectors with SMA output.	WILTRON, Model 560-10BX-1	3-9
Tee	*Connectors:* 50Ω BNC	Any common source	3-9, 3-12, 3-17, 3-18, 3-19, 3-20, 3-21
Cables	*Connectors:* 50Ω BNC	Any common source	All procedures

Table 3-2. Calibration/Adjustments Following 67XXB Component Repair or Replacement

If a Repair or Replacement Action Was Made To:	Perform the Following Adjustment(s) or Calibration(s) in Paragraph(s):
A1 Front Panel PCB	None
A2 Front Panel Control PCB	3-10
A3 Coarse Loop Mixer PCB	None
A4 Coarse Loop Oscillator PCB	Contact WILTRON Customer Service for calibration/adjustment procedures.
A5 Reference Oscillator PCB	None
A6 Coarse Loop Divider PCB	None
A7 Reference Divider PCB	None
A8 Serial I/O PCB	None
A9 Fine Loop Oscillator PCB	None
A10 Reference Buffer PCB	None
A11 Fine Loop Divider PCB	None
A12 YIG Phase Detector PCB	3-21
A13 Pulse Generator PCB	None
A15 ALC PCB	3-9, 3-15, 3-16, 3-17, 3-18
A16 FM PCB	3-13, 3-14, 3-19, 3-20, 3-21
A17 Analog Instruction PCB	3-13, 3-14
A18 thru A21 YIG Driver PCBs	3-14, 3-19, 3-20
A22 Regulator Interface PCB	None
A23 Microprocessor PCB	3-12 thru 3-21. None, if firmware EEPROMs are reused.
A24 GPIB PCB	None
A25 Switching Power Supply PCB	Contact WILTRON Customer Service (i.e., –18V or –21V for the A4 PCB)
A27 Aux I/O PCB	None
A28 Motherboard PCB	None
A29 Rear Panel Interface PCB	3-9, 3-12, 3-16
A30 Sampler/IF Amplifier PCB	None
A31 Power Amplifier PCB	None
Any YIG-tuned Oscillator	3-9, 3-14, 3-19, 3-20
Any Isolator	3-9
Any Control Modulator	3-9, 3-12
Any Low Pass Filter	3-9
0.01 to 2 GHz Down Converter	3-9, 3-15, 3-16
Switched Filter	3-9
Frequency Doubler or Tripler	3-9
Main Multiplexer (PIN) Switch	3-9
Leveling Detector/Directional Coupler	3-9, 3-15, 3-16
Sampler Multiplexer (PIN) Switch	None
Any RF Amplifier (High Power Option) and/or Optional Step Attenuator	3-9 (Both), 3-15, 3-16 (Step Attenuators Only)

Table 3-3. Descriptions of Calibration Related Hidden-Key Routines (1 of 2)

<Shift> TRIGGER Code	Function
009	Displays the firmware version number in the FREQUENCY display. <Shift> exits this function.
080	Unlocks the 67XXB's YIG loop. It is disabled by reset or <Shift> TRIGGER 081.
081	Disables hidden-key routine 080. Reset the 67XXB to normal YIG loop locking.
089	Enables access to hidden-key routines that have <Shift> TRIGGER codes from 300 to 599. These routines are used in calibration or to check out the DACs to be calibrated.
101	Selects RF level to be on during frequency switching in the CW or step sweep modes (except bandswitch points).
102	Selects RF to be off during frequency switching in the CW or step sweep modes only.
103	Selects the RF to be on during sweep retrace.
104	Selects the RF to be off during sweep retrace.
105	Selects ac coupling for the front panel EXT AM input and the rear panel AM INPUT.
106	Selects dc coupling for the front panel EXT AM input and the rear panel AM INPUT.
107	Causes RF to turn on when a TTL-high signal is applied to the front panel PULSE/TRIG TTL input and the rear panel PULSE/GATE/TRIG INPUT and the INTERNAL (PULSE) key is activated.
108	Causes RF to turn on when a TTL-low signal is applied to the front panel PULSE/TRIG TTL input and the rear panel PULSE/GATE/TRIG INPUT and the INTERNAL (PULSE) key is activated.
109	Sets the RETRACE BLANK OUTPUT and the BANDSWITCH BLANK output to +5V.
110	Sets the RETRACE BLANK OUTPUT and the BANDSWITCH BLANK ouput to –5V.
115	Turns on the internally-gated pulse mode of operation.
116	Turns off the internally-gated pulse mode of operation.
135	Sets the ALC loop to the fixed gain (unleveled) mode. In this mode the power level is controlled by the ALC Level DAC. At +10 dBm in the LEVEL display, the DAC is set to full scale (maximum power output). At 0 dBm in the LEVEL display, the DAC is set for minimum output.
136	Sets the 67XXB back to normal leveling by the ALC loop.
300	Enables direct control of the A17 PCB Tune DAC. No calibration is performed.
301	Enables direct control of the A17 PCB Linearizer DAC. No calibration is performed.
302	Enables direct control of the A15 PCB ALC Level DAC. No calibration is performed.
303	Enables direct control of the A15 PCB ALC Level Range DAC. No calibration is performed.
305	Enables direct control of the A15 PCB External ALC Gain DAC. No calibration is performed.
306	Enables direct control and calibration of the A15 PCB %AM DAC (AM Sensitivity). (The <Shift> TRIGGER code must be re-entered prior to calibration of each installed frequency band).
307	Enables direct control of the A16 PCB FM Sensitivity Cal DAC (FM Driver Output). No calibration is performed.
308	Enables direct control and calibration of the A16 PCB FM Attn DAC (FM Input Sensitivity). (The <Shift> TRIGGER code must be re-entered prior to calibration of each installed frequency band).
309	Enables direct control of the A15 PCB ALC Slope DAC. No calibration is performed.
310	Enables direct control of the A17 PCB Sweep Width DAC. No calibration is performed.

Table 3-3. Descriptions of Calibration Related Hidden-Key Routines (2 of 2)

<Shift> TRIGGER Code	Function
312	Enables direct control of the A17 PCB Sweep Time DAC. No calibration is performed.
313	Enables direct control of the A17 PCB Marker/Switch Point DAC. No calibration is performed.
314	Enables direct control of the A29 PCB CW Horiz DAC. No calibration is performed.
315	Enables direct control of the A29 PCB V/GHz Slope DAC. No calibration is performed.
316	Enables direct control of the A29 V/GHz Offset DAC. No calibration is performed.
317	Enables direct control and calibration of the A16 PCB Phase Mod Cal DAC (FM Flatness). (The <Shift> TRIGGER code must be re-entered prior to calibration of each installed frequency band).
319	Enables direct control of the A17 PCB Linearizer DAC. No calibration is performed.
340	Calibrates the FM meter when there is no input voltage.
341	Calibrates the FM meter when there is a 1V peak (.707 Vrms) input.
342	Calibrates the AM meter when there is no input voltage.
343	Calibrates the AM meter when there is a 1V peak (.707 Vrms) input.
390	Zeros out the A17 PCB Linearizer DAC calibration.
391	Zeros out the frequency calibration for the C/S Band (2 to 8 GHz).
392	Zeros out the frequency calibration for the X Band (8 to 12.4 GHz).
393	Zeros out the frequency calibration for the Ku Band (12.4 to 20 GHz).
394	Zeros out the frequency calibration for the K Band (20 to 26.5 GHz).
395	Zeros out the A16 PCB FM Attn DAC (FM Input Sensitivity) calibration.
396	Zeros out the A15 PCB %AM DAC (AM Sensitivity) calibration.
397	Generates memory shecksum for the A23 PCB EEPROMs. Must be done anytime calibration of the 67XXB instrument is performed to eliminate dhecksum error codes.
398	Zeros out the AM meter calibration.
399	Zeros out the frequency calibration for the Ka Band (26.5 to 40 GHz).
400	Automatically calibrates the A16 PCB FM Sensitivity Cal DAC (FM Driver Output) for each installed frequency band.
402	Calibrates the ALC bandwidth for each installed frequency band except for the Ka Band (26.5 to 40 GHz). (The <Shift> TRIGGER code must be re-entered prior to calibration of each installed frequency band.)
403	Automatically calibrates the analog sweep time, both the ≤1 second and >1 second ranges.
405	Automatically calibrates the paths used by analog sweeps.
406	Automatically calibrates the paths used by narrow band sweeps (analog sweeps of ≤50 MHz).
407	Calibrates the ALC Slope for the heterodyne band (<2 GHz) and the ≥2 GHz frequency bands.
460	Calibrates the YIG output frequency for each band. (The <Shift> TRIGGER code must be re-entered prior to calibration of each installed frequency band.)

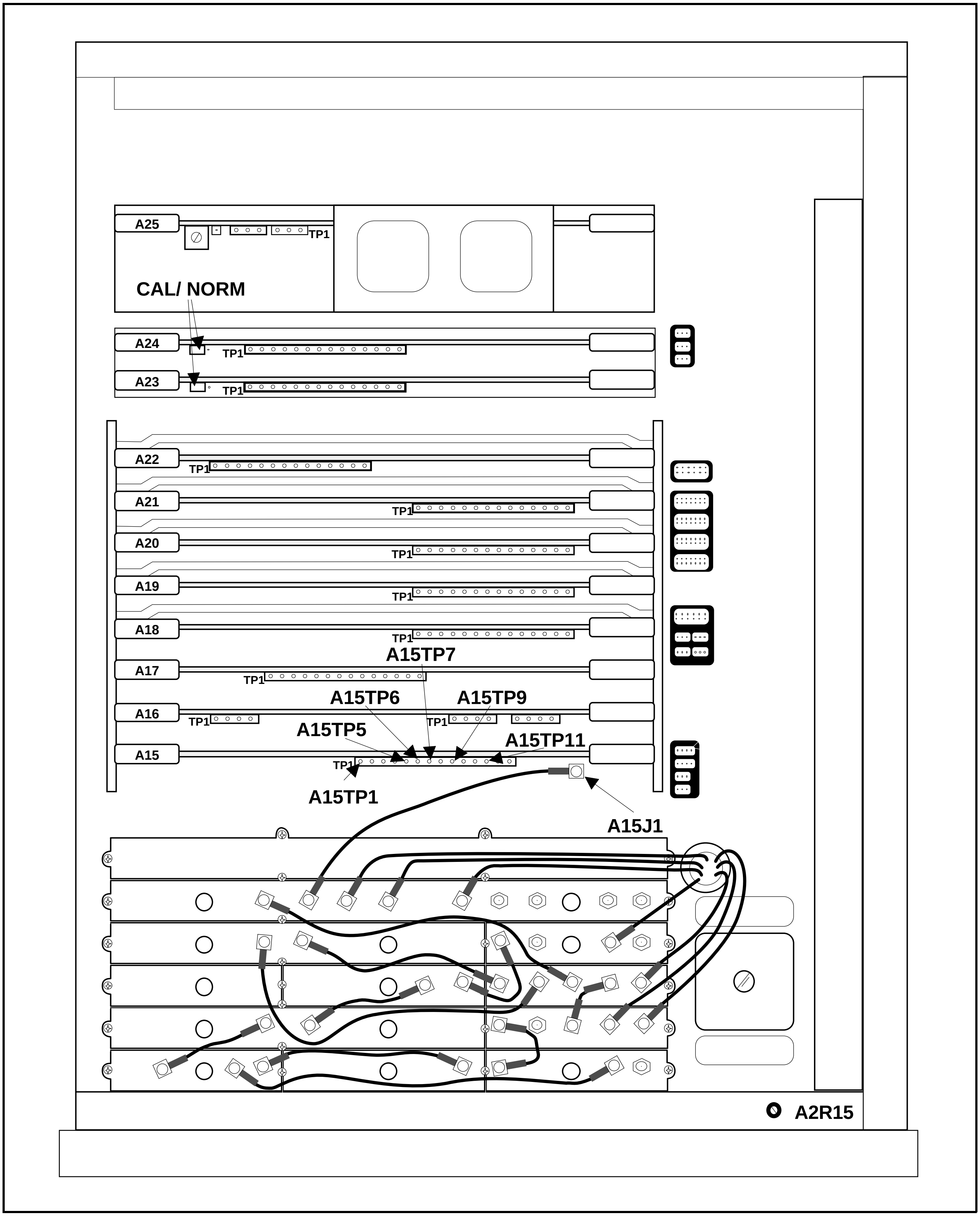


Figure 3-1. Top View of 67XXB Showing Adjustment, Connector, and Test Point Locations

3-9 ALC LEVEL OFFSET ADJUSTMENTS

a. Procedure Description

This procedure provides the steps necessary to perform the ALC Level Offset adjustments. These adjustments are required following replacement of the A15 ALC PCB, the A29 Rear Panel Interface PCB, a YIG-tuned Oscillator, an Isolator, a Control Modulator, a Low Pass Filter, the 0.01 to 2 GHz Down Converter, the Switched Filter, the Frequency Doubler, the Frequency Tripler, a High Power RF Amplifier, the Main Multiplexer (PIN) Switch, the Leveling Detector/Directional Coupler, or a Step Attenuator. The offset adjustments (1) balance the ALC Band 0 and Band 1 to 4 Detector Preamplifier outputs and (2) set the output of the ALC Detector Shaper circuits to provide a more constant gain with power level changes.

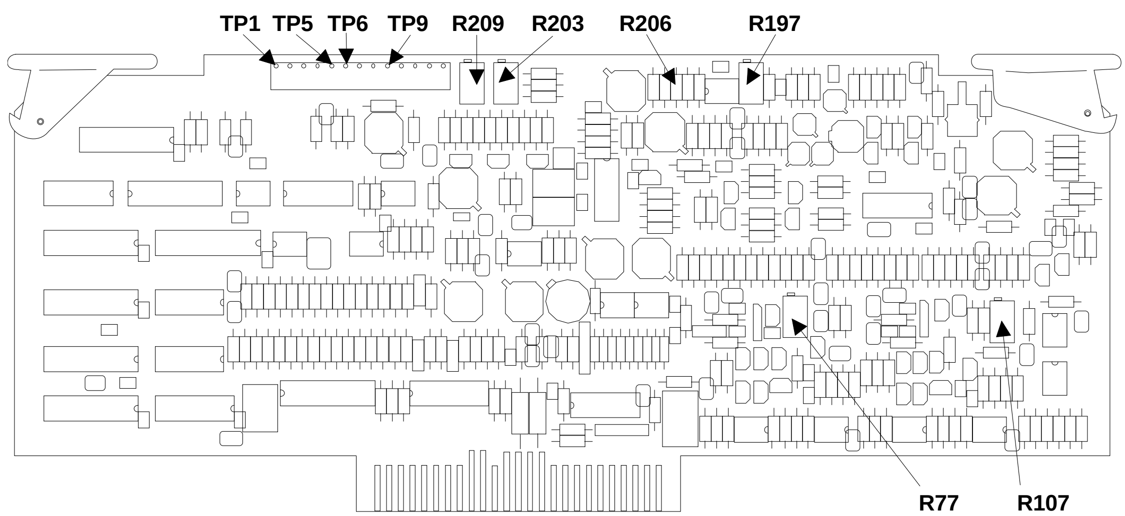


Figure 3-2. A15 ALC PCB Test Point and Adjustment Locations

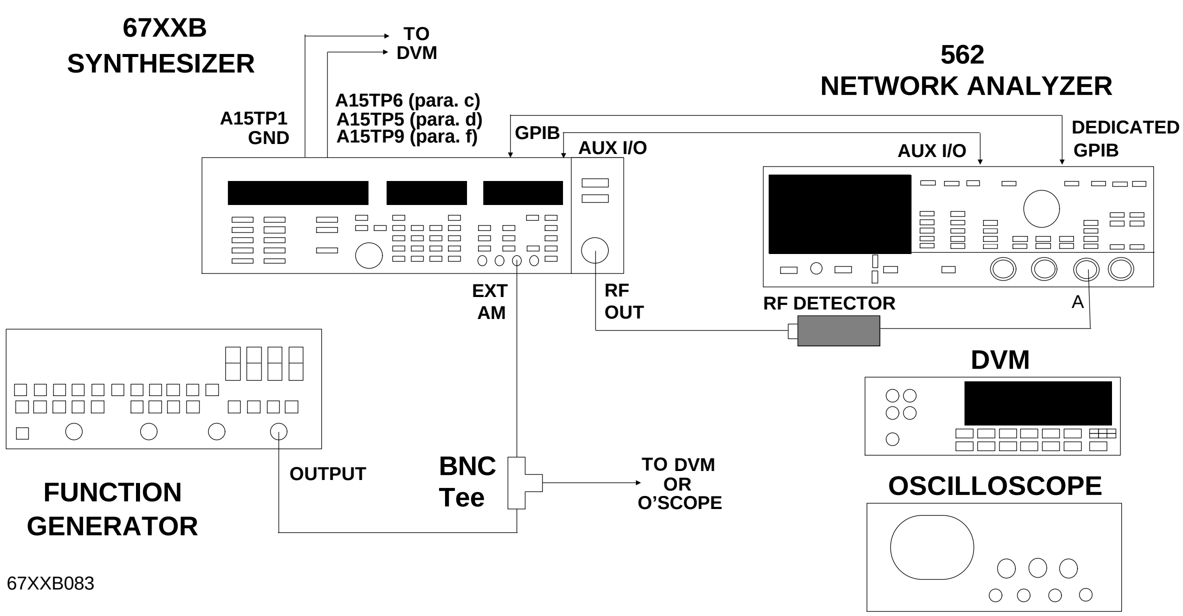


Figure 3-3. Test Equipment Setup for ALC Level Offset Adjustments

b. Test Equipment Setup for Detector Preamplifier Level Offset Adjustment

1. Connect the DVM to the 67XXB's test points A15TP1, A15TP5, and A15TP6 as indicated in the following procedures.

NOTE

For 67XXB models without Band 0 (0.01 to 2 GHz), skip to paragraph d.

c. Band 0 Level Offset Adjustment

1. Set up the 67XXB as follows:
   (a) Press <Shift> RESET.
   (b) Press CW OUTPUT SELECT.
   (c) Enter the frequency indicated on the Test Record.
   (d) Press RF ON/OFF to turn the RF off (RF OFF indicator will light).

2. Set the Digital Voltmeter (DVM) to read dc voltage and connect the (+) lead to the 67XXB test point A15TP6 and the (–) lead to the 67XXB test point A15TP1 (see Figure 3-1).

3. On the 67XXB A15 PCB, adjust A15R77 for 0 Vdc ±10 µVdc (see Figure 3-2). Record this voltage on the Test Record.

d. Band 1 to 4 Level Offset Adjustment

1. On the 67XXB:
   (a) Press CW OUTPUT SELECT.
   (b) Enter the frequency indicated on the Test Record.

2. Connect the DVM (+) lead to 67XXB test point A15TP5 (see Figure 3-1).

3. On the 67XXB A15PCB, adjust A15R107 for 0 Vdc ±10 µVdc (see Figure 3-2). Record this voltage on the Test Record.

e. Test Equipment Setup for ALC Detector Shaper Level Offset Adjustment

1. Calibrate the 562 Network Analyzer with the appropriate RF Detector.

NOTE

For 67XXB models with an upper frequency limit of 20 GHz, use RF Detector 560-7N50. For 67XXB models with an upper frequency limit of 40 GHz, use RF Detector 560-7K50. For model 6772B (40 to 60 GHz), use Hughes Model 47323H-1211 Detector with a WILTRON Model 560-10BX-1 Adapter Cable.

2. Connect the equipment, shown in Figure 3-3, as follows:
   (a) Connect the 67XXB rear panel AUX I/O to the 562 Network Analyzer AUX I/O.
   (b) Connect the 562 Network Analyzer DEDICATED GPIB to the 67XXB rear panel GPIB.
   (c) Connect the RF Detector to the 562 Network Analyzer Channel A Input.
   (d) Connect the 67XXB RF OUTPUT to the RF Detector Input.
   (e) Connect the Function Generator Output to the BNC tee. Connect one leg of the tee to the 67XXB front panel EXT AM input. Connect the other leg of the tee to the vertical input of the Oscilloscope when directed by the procedure.
   (f) Connect the DVM to the 67XXB's test points A15TP1 and A15TP9 or the BNC tee as indicated in the following procedure.

NOTE

RF Level calibration of the 67XXB (paragraph 3-15) is required whenever the ALC Detector Shaper Level Offset adjustments are performed.

f. ALC Detector Shaper Level Offset Adjustment

1. On the 67XXB A15PCB, connect a jumper across A15R206.

2. Set the DVM to read dc voltage and connect the (+) lead to 67XXB test point A15TP9 and the (–) lead to 67XXB test point A15TP1 (See Figure 3-1).

3. On the 67XXB:
   (a) Press <Shift> RESET.
   (b) Press RF ON/RF OFF to turn the RF off (RF OFF indicator will light).
   (c) On the A15PCB, set A15R197 to mid-range and adjust A15R209 for 0 Vdc ±1 mVdc.

4. Disconnect the DVM test leads from the 67XXB test points A15TP1 and A15TP9.

5. Set up the 562 Network Analyzer as follows:
   (a) Press the SYSTEM MENU key.
   (b) From the System Menu display, select RESET.
   (c) Press CHANNEL 2 DISPLAY: OFF
   (d) Press CHANNEL 1 DISPLAY: ON
   (e) Press CHANNEL 1 MENU key.
   (f) From the Channel 1 Menu display, select POWER.

6. Set up the 67XXB as follows:
   (a) Press <Shift> RESET.
   (b) Press CW OUTPUT SELECT.
   (c) Enter the frequency indicated on the Test Record.
   (d) Press <Shift> CW RAMP.
   (e) Press LEVEL 1 and set to the reset power level.
   (f) Press LEVEL 2 and set for 12 dB less than the reset power level.
   (g) Press LEVEL 1.

7. Set the Oscilloscope's vertical input for 1 V/div and time base for 5 ms/div. Then connect the vertical input of the Oscilloscope to one leg of the BNC tee from the Function Generator.

8. While observing the display on the Oscilloscope, adjust the Function Generator for a 2V peak-to-peak, 30 Hz square wave output with no dc offset. The generator voltage should be set while connected to the 67XXB EXT AM input through the BNC tee.

9. Disconnect the Oscilloscope from the BNC tee.

10. On the 67XXB:
    (a) Press <Shift> AM SENS.
    (b) Enter 50%.
    (c) Press AM. (Ignore the flashing NOT CAL indicator at this time.)
    (d) Observe the 562 display. (A squarewave signal should be displayed.)

11. On the 67XXB:
    (a) Press LEVEL 1.
    (b) Note the amplitude of the squarewave signal displayed on the 562.
    (c) Press LEVEL 2.
    (d) Adjust A15R197 for a squarewave signal amplitude that is within ±0.5 dB of the signal amplitude noted in step f.11(b).

12. Disconnect the function generator from the BNC tee.

13. Set the DVM to read dc voltage and connect the (+) lead to 67XXB test point A15TP9 and the (–) lead to 67XXB test point A15TP1.

14. On the 67XXB:
    (a) Press RF OFF.
    (b) Adjust A15R209 for 0 Vdc ±0.1 mVdc.

15. Reconnect the function generator to the BNC tee.

16. On the 67XXB:
    (a) Press RF ON.
    (b) Press AM.
    (c) Readjust A15R197 for a squarewave signal amplitude that is within ±0.5 dB of the signal amplitude noted in step f.11(b).

17. Repeat steps f.11 through f.16 until the LEVEL 1 and LEVEL 2 squarewave signals displayed on the 562 are within ±0.5 dB of each other.

18. On the 67XXB:
    (a) Press RF OFF.
    (b) Press AM to off.
    (c) Remove the jumper across A15R206.

19. Set the DVM to read dc voltage and connect the (–) lead to 67XXB test point A15TP1 and the (+) lead to the top lead of A15R206.

20. On the 67XXB:
    (a) Adjust A15R203 for 0 Vdc ±0.1 mVdc.

21. Repeat steps f.11 through f.16 after adjustment of A15R203 to ensure constant squarewave signal amplitude.

22. Disconnect all test equipment.

23. This completes the ALC Level Offset adjustments.

3-10 EXTERNAL LEVELING OFFSET ADJUSTMENT

a. Procedure Description

This procedure provides the steps necessary to perform the External Leveling Offset adjustment. This adjustment is required following replacement of the A2 Front Panel PCB. The adjustment sets the offset voltage to balance the External Level Detector Amplifier.

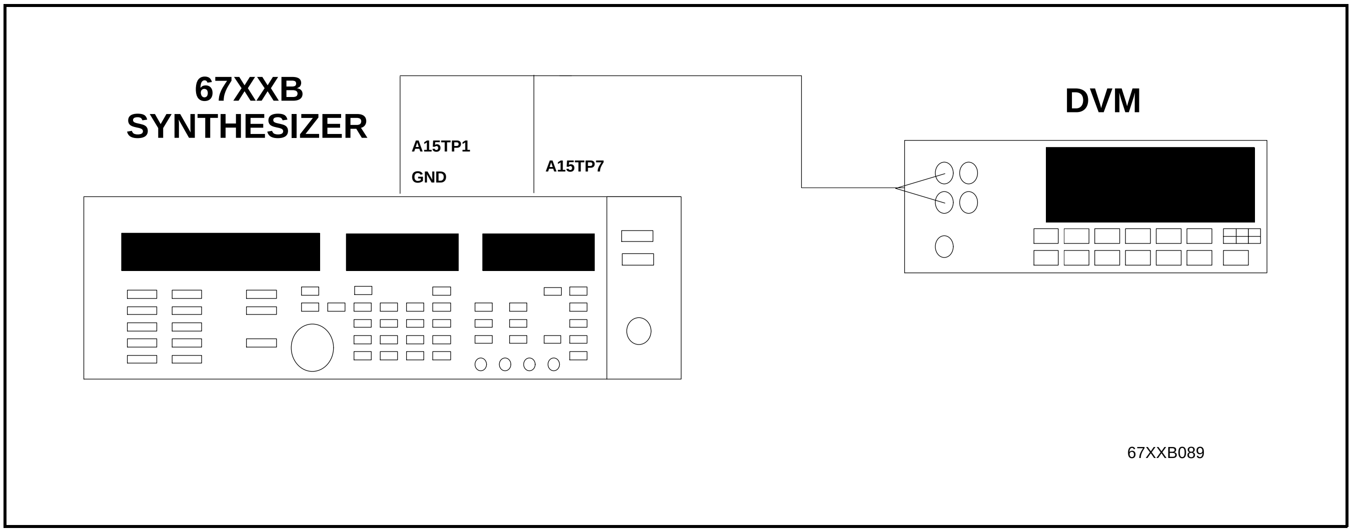


Figure 3-4. Test Equipment Setup for External Leveling Offset Adjustment

b. Test Equipment Setup.

1. Connect the DVM to the 67XXB's test points as indicated in the following procedure.

c. Leveling Offset Adjustment

1. Set up the 67XXB as follows:
   (a) Press <Shift> RESET.
   (b) Press the LEVELING key to light the EXT DETECTOR indicator.

2. Set the DVM to read dc voltage and connect as follows:
   (a) Connect the DVM (+) lead to the 67XXB test point A15TP7 (see Figure 3-1).
   (b) Connect the DVM (–) lead to the 67XXB test point A15TP1 (see Figure 3-1).

3. On the 67XXB A2 PCB, adjust A2R15 for 0 Vdc ±1 mVdc (see Figure 3-1 for A2R15 location). Record this voltage on the Test Record.

4. Disconnect the DVM test leads from the 67XXB's test points.

5. This completes the External Leveling Offset adjustment.

3-11 10 MHz REFERENCE OSCILLATOR CALIBRATION

a. Procedure Description

This procedure provides the steps necessary to perform the 10 MHz Reference Oscillator calibration. This calibration may be required at periodic intervals and following replacement of the 10 MHz Reference Oscillator.

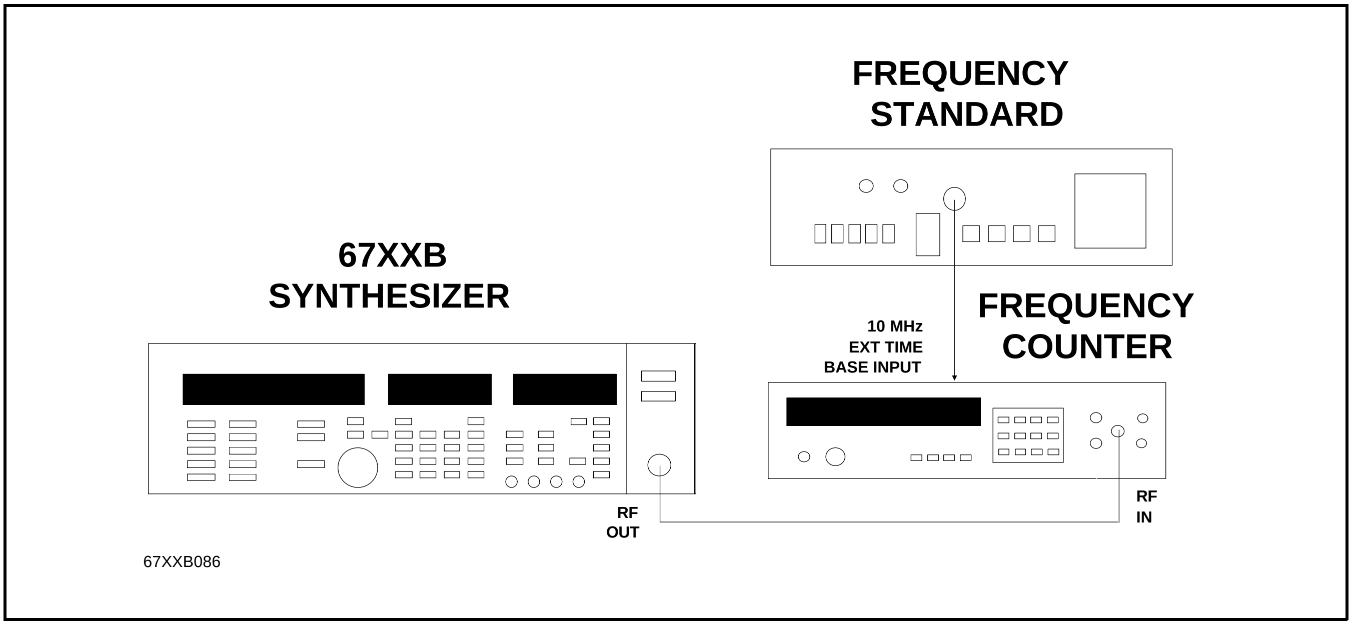


Figure 3-5. Test Equipment Setup for 10 MHz Reference Oscillator Calibration

b. Test Equipment Setup

1. Connect the equipment, shown in Figure 3-5, as follows:
   (a) Connect the 67XXB RF OUTPUT to the Frequency Counter RF Input.
   (b) Connect the Frequency Standard 10 MHz Output to the Frequency Counter 10 MHz External Time Base Input.

2. On the 67XXB, press the LINE key to STANDBY (STANDBY indicator will light). Allow the 67XXB to run in standby mode for 48 continuous hours.

3. Press the LINE key to OPERATE two hours prior to calibration.

c. Reference Oscillator Calibration

1. Set up the 67XXB as follows:
   (a) Press <Shift> RESET.
   (b) Press CW OUTPUT SELECT.
   (c) Enter the frequency indicated on the Test Record.

2. Remove the adjustment-access screw from the top of the 10 MHz Reference Oscillator oven (see Figure 3-6).

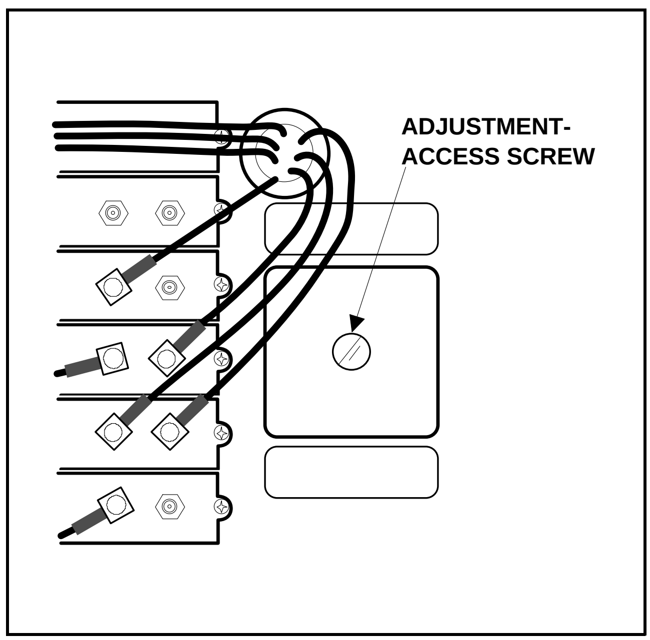


Figure 3-6. 10 MHz Reference Oscillator Oven Tuning Screw Location

3. Using a non-magnetic screwdriver, adjust the potentiometer located inside the oven housing to obtain a Frequency Counter reading equal to the frequency shown on the Test Record (to within ±100 Hz).

4. Using the handle of a screwdriver or similar device, tap the 10 MHz Reference Oscillator oven housing sharply while watching the frequency counter display for any variance. Readjust the potentiometer if necessary.

5. Repeat step c.4 as necessary to ensure frequency stability of the oscillator.

6. Replace the adjustment-access screw.

7. Disconnect all test equipment.

8. This completes the 10 MHz Reference Oscillator calibration.

3-12 ALC BANDWIDTH CALIBRATION

a. Procedure Description

This procedure provides the steps necessary to perform ALC Bandwidth calibration. This calibration may be required following replacement of either the A29 Rear Panel Interface PCB, a Control Modulator, or the A23U27 IC. The ALC Detector Shaper Level Offset adjustments (Paragraph 3-10) must be completed prior to this calibration. The calibration determines the correct settings for the A29 PCB Shaper DACs (A29U8 DAC A and DAC B) and saves the values in EEPROM (A23U27). The A29 PCB DACs adjust the shape and gain of the PIN Driver outputs to the Control Modulators. These adjustments cause the Control Modulators to produce more linear outputs resulting in a more constant ALC Loop gain. A more constant ALC Loop gain results in a more constant ALC Bandwidth. This calibration procedure is required for all 67XXB frequency bands except band 5 (26.5 to 40 GHz). The Frequency Doubler used in the development of frequency band 5 contains a control modulator that produces a linear output.

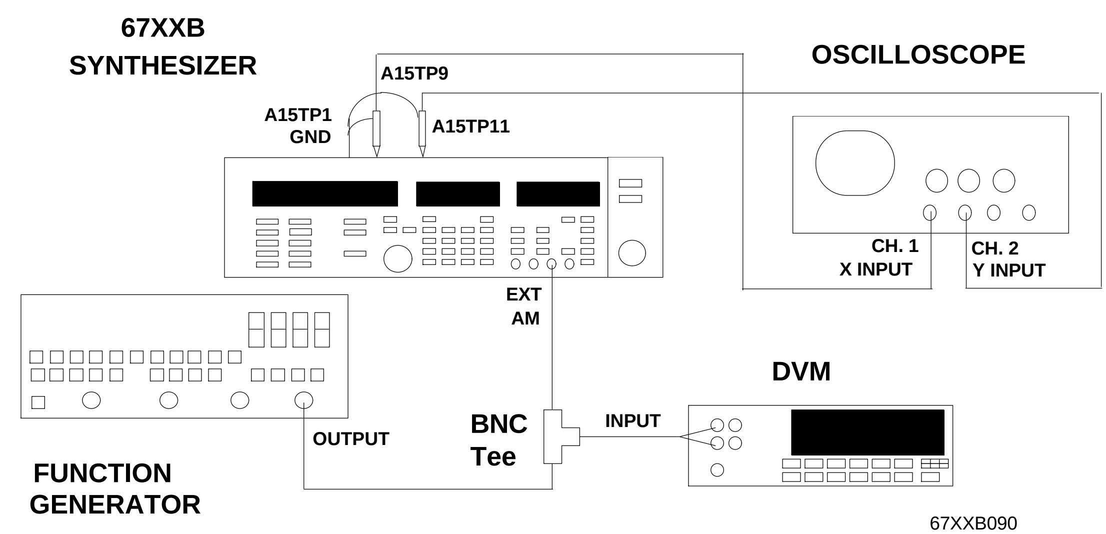


Figure 3-7. Test Equipment Setup for ALC Bandwidth Calibration

b. Test Equipment Setup

1. Connect the equipment, shown in Figure 3-7, as follows:
   - (a) Connect the Function Generator output to the BNC tee. Connect one leg of the tee to the 67XXB front panel EXT AM input. Connect the other leg of the tee to the DVM input.
   - (b) Set the Oscilloscope controls as follows:
     - (1) CH 1 (X input): Set for 20 mV/div DC coupled
     - (2) CH 2 (Y input): Set for 0.2 V/div DC coupled
     - (3) MODE: CH 2 (Turn CH 1 OFF)
     - (4) A and B SEC/DIV: XY
   - (c) Connect a X10 probe from the Oscilloscope Channel 1 to A15TP9. Connect the Probe ground lead to A15TP1. (See Figure 3-1 for test point locations.)
   - (d) Connect a X10 probe from the Oscilloscope Channel 2 to A15TP11. Connect the Probe ground lead to A15TP1. (See Figure 3-1 for test point locations.)

CAUTION

Care must be exercised when entering <Shift> TRIGGER codes during calibration procedures. Entry of an incorrect <Shift> TRIGGER code may damage or erase stored calibration data.

c. Bandwidth Calibration

1. Adjust the Function Generator for a sawtooth output of 50 Hz, with an amplitude of 1.5 V peak, and no dc offset. The generator voltage must be set while connected to the 67XXA EXT AM input through the BNC tee.

2. Set up the 67XXB as follows:
   (a) Press <Shift> RESET.
   (b) Press CW OUTPUT SELECT.
   (c) Enter the frequency indicated on the Test Record.
   (d) Press <Shift> TRIGGER 135 to place the instrument in the unleveled mode.
   (e) Press LEVEL 1 and set for maximum power output.
   (f) Press <Shift> AM SENS.
   (g) Enter 100%.
   (h) Press AM (Ignore the flashing OVER-RANGE indication at this time).

3. On the Oscilloscope:
   (a) Press GND on the CH 1 and CH 2 inputs and adjust the beam to position it in the upper right corner of the display.
   (b) Release GND on the CH 1 and CH 2 inputs and adjust the vertical VOLTS/DIV and VOLTS/DIV vernier for an 8 division peak-to-peak vertical deflection as shown in Figure 3-8.

4. On the 67XXB, press CW OUTPUT SELECT. Using the DECREASE/INCREASE knob, adjust the display on the Oscilloscope for maximum horizontal displacement.

5. On the Oscilloscope, adjust the horizontal VOLTS/DIV and VOLTS/DIV vernier for a 4 division peak-to-peak horizontal deflection as shown in Figure 3-8.

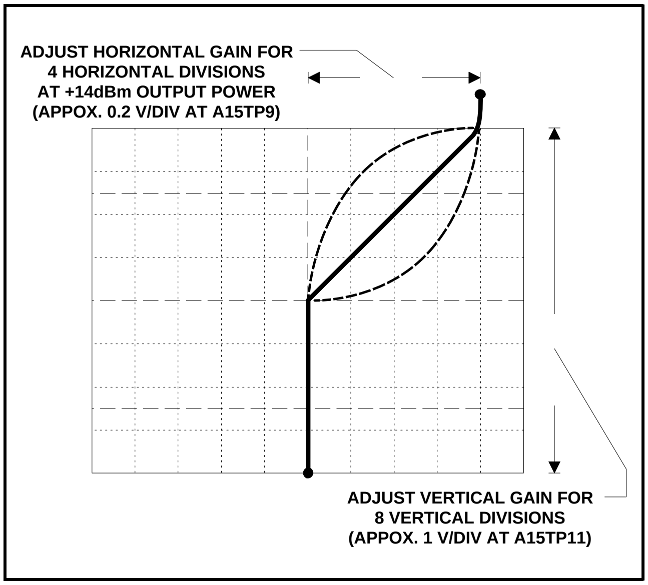


Figure 3-8. Typical Waveform for the ALC Bandwidth Calibration.

NOTE

In Figure 3-8, the dashed lines show the possible waveform that may be obtained initially. The heavy line shows the optimum waveform after calibration.

6. On the 67XXB:
   (a) On the A23 Microprocessor PCB, move the CAL/NORM jumper to the CAL position (see Figure 3-1).
   (b) Press <Shift> TRIGGER 089, then <Shift> TRIGGER 402.
   (c) Press SET INCR/DECR SIZE.
   (d) Enter 1 MHz.

NOTE

This procedure calibrates both A29U8 DAC A (1) and DAC B (2). The number of the active DAC is displayed in the lower left corner of the 67XXB's FREQUENCY window. Use the F1-F9 SCAN ▲ and the F1-F9 SCAN ▼ keys to alternate between the DACs during calibration.

7. While observing the Oscilloscope display, press the 67XXB INCR or DECR keys or use the DECREASE/INCREASE knob to adjust the DAC for the best straight line display.

8. On the 67XXB, press the F1-F9 SCAN ▲ or F1-F9 SCAN ▼ key to select the other DAC. Press the 67XXB INCR or DECR keys or use the DECREASE/INCREASE knob to adjust the DAC for the best straight line display.

9. Repeat steps c.7 and c.8 until the most linear waveform is obtained.

10. On the 67XXB, press RECALL. This causes the FREQUENCY display indication to advance to the next calibration frequency. This calibration is performed at 400 MHz intervals.

11. Repeat steps c.7 through c.10 until all the frequencies in the band have been calibrated.

12. On the 67XXB, press <Shift> to return from the calibration mode.

13. If the 67XXB instrument is a multiband unit, press CW OUTPUT SELECT, then enter the next frequency indicated on the Test Record. If the 67XXB instrument is a single band unit, skip to step c.16.

NOTE

It is best to always calibrate Band 1 (2 to 8 GHz) before calibrating Band 0 (0.01 to 2 GHz).

14. On the 67XXB, press <Shift> TRIGGER 089, then <Shift> TRIGGER 402 to place the instrument in calibration mode.

15. Repeat steps c.7 through c.14 for each remaining band.

16. When all bands have been calibrated, press <Shift> to exit the calibration mode.

17. On the 67XXB:
    (a) Press <Shift> TRIGGER 089, then <Shift> TRIGGER 397. This generates new EEPROM checksums.
    (b) Restore the A23 PCB CAL/NORM jumper to the NORM position.
    (c) Press <Shift> TRIGGER 136. This places the instrument back in the normal leveling mode.

18. Disconnect all equipment.

19. This completes the ALC Bandwidth calibration.

3-13 ANALOG SWEEP CALIBRATION

a. Procedure Description

This procedure provides the steps necessary to perform Analog Sweep calibration. This calibration is required following replacement of either the A16 FM PCB, the A17 Analog Instruction PCB, or the A23U27 IC. The procedure calibrates the analog sweep times and analog sweep tuning ramps for all installed frequency bands, and saves the calibration data in EEPROM (A23U27). Analog sweep time is controlled by the setting of the A17 Sweep Time DAC. The analog sweep tuning ramps are controlled by the settings of the A17 Marker-Switch Point DAC, the A17 Sweep Width DAC, and the A17 Tune DAC.

b. Test Equipment Setup.

1. No test equipment is required for this calibration.

CAUTION

Care must be exercised when entering <Shift> TRIGGER codes during calibration procedures. Entry of an incorrect <Shift> TRIGGER code may damage or erase stored calibration data.

c. Sweep Calibration

1. Set up the 67XXB as follows:
   (a) Press <Shift> RESET.
   (b) On the A23 Microprocessor PCB, move the CAL/NORM jumper to the CAL position (see Figure 3-1).
   (c) Press CW OUTPUT SELECT.
   (d) Enter the frequency indicated on the Test Record.
   (e) Press <Shift> TRIGGER 089, then <Shift> TRIGGER 403. This automatically calibrates the analog sweep time for the ≤1 second and the >1 second ranges.
   (f) Press <Shift> TRIGGER 405. This automatically calibrates the different paths used by the analog sweep.
   (g) Press <Shift> TRIGGER 406. This automatically calibrates the path used by narrow band sweeps (analog sweeps of ≤50 MHz).
   (h) Press <Shift> TRIGGER 397. This will generate new EEPROM checksums.

2. Restore the A23 PCB CAL/NORM jumper to the NORM position. This completes the Analog Sweep calibration.

3-14 YIG-TUNED OSCILLATOR FREQUENCY CALIBRATION

a. Procedure Description

This procedure provides the steps necessary to perform YIG-tuned Oscillator Frequency calibration. This calibration is required following the replacement of either the A16 FM PCB, the A17 Analog Instruction PCB, any of the A18 thru A21 YIG Driver PCBs, any of the YIG-tuned Oscillators, or the A23U27 IC. The procedure determines the correct settings for the A17 Tune DAC and the A17 Linearizer DAC for each installed frequency band and stores the calibration data in EEPROM (A23U27). The A17 Tune DAC and the A17 Linearizer DAC adjust the YIG-tuned Oscillators for an accurate, linear frequency output (to within ±2 MHz) throughout the range of each installed frequency band.

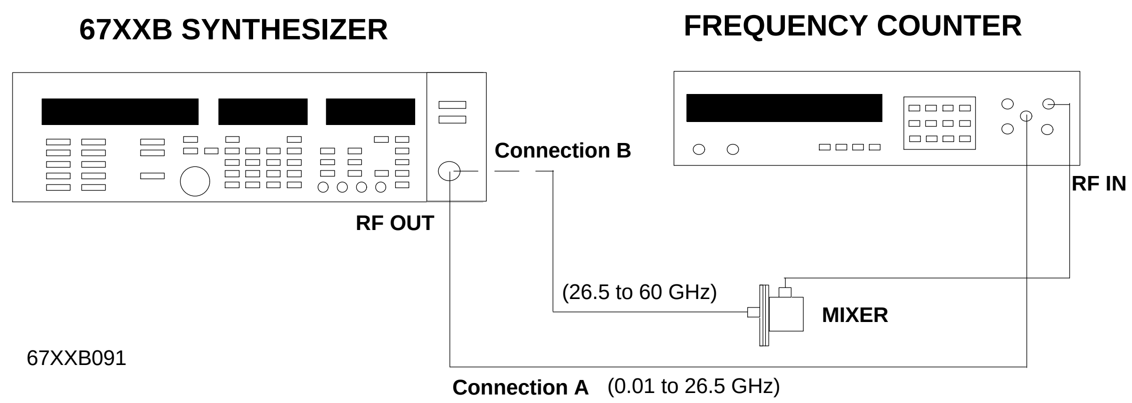


Figure 3-9. Test Equipment Setup for YIG Oscillator Frequency Calibration

b. Test Equipment Setup

1. Connect the equipment, shown in Figure 3-9, as follows:
   (a) Connect the 67XXB RF OUTPUT to the Frequency Counter RF Input.

NOTE

For measuring frequencies in the range of 0.01 to 26.5 GHz, connect the 67XXB RF OUT to the Frequency Counter RF IN as shown in Connection A. For measuring frequencies in the range of 26.5 to 60 GHz, connect the 67XXB RF OUT to the Frequency Counter RF IN as shown in Connection B using the appropriate waveguide mixer; Option 91 (26.5 to 40 GHz) or Option 92 (40 to 60 GHz).

CAUTION

Care must be exercised when entering <Shift> TRIGGER codes during calibration procedures. Entry of an incorrect <Shift> TRIGGER code may damage or erase stored calibration data.

c. Frequency Calibration

1. Set up the 67XXB as follows:
   (a) Press <Shift> RESET.
   (b) On the A23 Microprocessor PCB, move the CAL/NORM jumper to the CAL position (see Figure 3-1).
   (c) If the A23U27 EEPROM was replaced, press <Shift> TRIGGER 089, then <Shift> TRIGGER 390 to erase any previous A17 Linearizer DAC calibration data.
   (d) Press CW OUTPUT SELECT.
   (e) Enter the frequency indicated on the Test Record.
   (f) Press <Shift> TRIGGER 089, then <Shift> TRIGGER 460.

(g) Press SET INCR/DECR SIZE.
(h) Enter 1 MHz.

2. Observe the frequency displayed on the Frequency Counter. Using the 67XXB INCR and DECR keys, adjust the counter frequency to agree with the 67XXB FREQUENCY display to within ±2 MHz.

NOTE

If the counter frequency differs greatly from the 67XXB frequency (or if you have difficulty making the two frequencies match), you may wish to select a larger incremental MHz value for the SET INCR/DECR SIZE step size. As the counter frequency gets closer to the 67XXB frequency, select a smaller incremental MHz value for the SET INCR/DECR SIZE step size.

3. When the counter frequency agrees with the 67XXB frequency to within ±2 MHz, press RECALL. This saves the calibration data and sets the 67XXB to the next frequency to be calibrated in the band.

4. Repeat steps c.2 and c.3 for the remaining frequencies to be calibrated in the band.

5. When all frequencies in the band have been calibrated, record on the Test Record the maximum difference between the counter frequency and the 67XXB frequency for the band being calibrated (should not exceed ±2 MHz). On the 67XXB, press <Shift>. This enables the 67XXB for the next series of functions.

6. If the 67XXB instrument is a multi-band unit, press CW OUTPUT SELECT, then enter the next frequency indicated on the Test Record. If the 67XXB instrument is a single-band unit skip to step c.8.

7. Repeat steps c.1(f) through c.6 for the remaining bands appearing in the Test Record.

8. When all bands have been calibrated, press <Shift> twice, then RESET to exit the calibration mode.

9. On the 67XXB, press <Shift> TRIGGER 089, then <Shift> TRIGGER 397. This generates new EEPROM checksums.

10. Restore the A23 PCB CAL/NORM jumper to the NORM position.

11. Disconnect all equipment.

12. This completes the YIG-tuned Oscillator Frequency calibration.

3-15 RF LEVEL CALIBRATION

RF level calibration requires the use of an automated test system. A computer-controlled power meter measures the 67XXB power output at many frequencies and power levels for each installed frequency band. Correction factors are then calculated and stored in EEPROM (A23U27 or A23U28).

This calibration is required following replacement of either the A15 ALC PCB, the 0.01 to 2 GHz Down Converter, the Leveling Detector/Directional Coupler, a Step Attenuator, or the A23U27 or A23U28 ICs.

The RF level calibration software is available on two types of floppy disks, depending on the WILTRON part number ordered. Table 3-4 lists the part numbers, the media type, the media format, and the media capacity.

Table 3-4. Floppy Disk Information

WILTRON Part Number	Media	Format	Capacity
B37620-1	5.25-inch	MS-DOS	1.2M
B37620-2	3.5-inch	MS-DOS	720K

For information concerning test equipment requirements and ordering of the automated program, contact the WILTRON Customer Service department at (408) 778-2000.

3-16 ALC SLOPE CALIBRATION

a. Procedure Description

This procedure provides the steps necessary to perform the ALC Slope calibration. This calibration is required following replacement of either the A15 ALC PCB, the A29 Rear Panel Interface PCB, the 0.01 to 2 GHz Down Converter, the Leveling Detector/Directional Coupler, a Step Attenuator, or the A23U27 IC. This calibration determines the correct settings for the ALC Slope DAC and saves the values in EEPROM (A23U27). During the analog sweep mode, the ALC Slope DAC adjusts for an increasing or decreasing output power-vs.-output frequency. The ALC Slope DAC has two calibrations; one for ≤2 GHz level detector circuitry, and one for >2 GHz level detector circuitry. This calibration is not applicable to the model 6772B synthesizer.

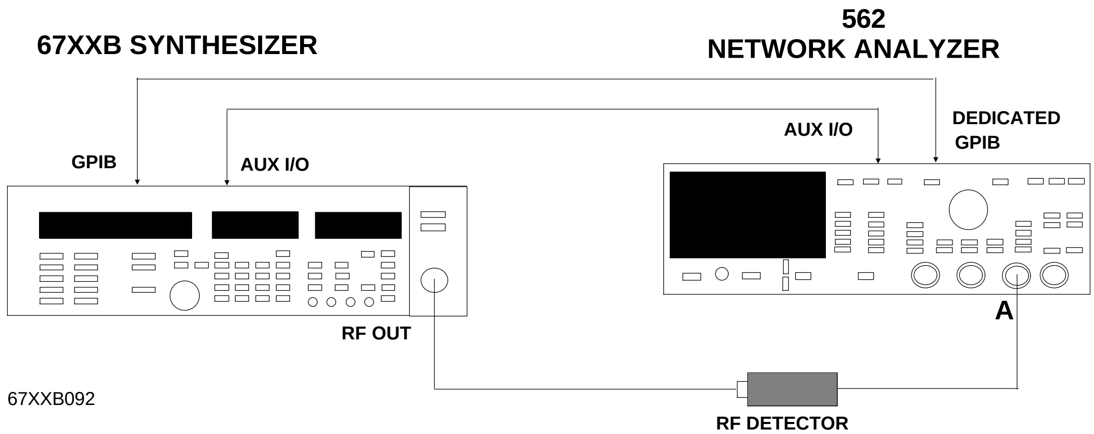


Figure 3-10. Test Equipment Setup for ALC Slope Calibration

b. Test Equipment Setup

1. Calibrate the 562 Network Analyzer with the appropriate RF Detector.

NOTE

For 67XXB models with an upper frequency limit of 20 GHz, use RF Detector 560-7N50. For 67XXB models with an upper frequency limit of 40 GHz, use RF Detector 560-7K50.

2. Connect the equipment, shown in Figure 3-10, as follows:
   - (a) Connect the 67XXB rear panel AUX I/O to the 562 Network Analyzer AUX I/O.
   - (b) Connect the 562 Network Analyzer DEDICATED GPIB to the 67XXB rear panel GPIB.
   - (c) Connect the RF Detector to the 562 Network Analyzer Channel A Input.
   - (d) Connect the 67XXB RF OUTPUT to the RF Detector Input.

CAUTION

Care must be exercised when entering <Shift> TRIGGER codes during calibration procedures. Entry of an incorrect <Shift> TRIGGER code may damage or erase stored calibration data.

c. Slope Calibration

1. Set up the 562 Network Analyzer as follows:
   - (a) Press the SYSTEM MENU key.
   - (b) From the System Menu display, select RESET. This resets both the 562 and the 67XXB.

(c) Press CHANNEL 2 DISPLAY: OFF
(d) Press CHANNEL 1 DISPLAY: ON
(e) Press CHANNEL 1 MENU key.
(f) From the Channel 1 Menu display, select POWER.

2. Set up the 67XXB as follows:
   (a) Press <Shift> RESET.
   (b) On the A23 Microprocessor PCB, move the CAL/NORM jumper to the CAL position (see Figure 3-1).
   (c) Press F1-F9 SCAN ▲ to light the F1 annunciator.
   (d) Enter the frequency indicated on the Test Record for F1.
   (e) Press F1-F9 SCAN ▲ to light the F2 annunciator.
   (f) Enter the frequency indicated on the Test Record for F2.
   (g) Press F1–F2 to start an analog sweep.
   (h) Press <Shift> TRIGGER 089, then <Shift> TRIGGER 407.
   (i) Press INTERNAL (PULSE).
   (j) Enter 9 kHz.
   (k) Press CW OUTPUT SELECT.
   (l) Enter 128 MHz.
   (m) Press SET INCR/DECR SIZE
   (n) Enter 10 MHz.

3. On the 562 Network Analyzer, observe that the waveform displayed is similar to that shown in Figure 3-11.

4. While observing the 562 Network Analyzer display, press the 67XXB DECR and INCR keys to adjust the displayed waveform for best flatness.

NOTE

Press F1-F9 SCAN ▲ to select slope calibration for frequencies ≤2 GHz; press F1-F9 SCAN ▼ to select slope calibration for frequencies >2 GHz.

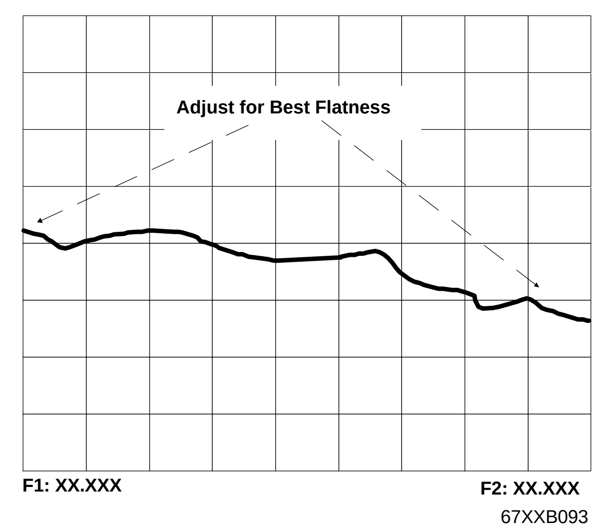


Figure 3-11. Level Detector Waveform

5. On the 67XXB, press RECALL to save the ALC slope calibration values and to exit the calibration mode. Record the waveform on the Test Record.

6. If the Test Record calls for a second ALC Slope calibration, repeat steps c.2(c) through c.5 using the F1 and F2 frequencies indicated on the Test Record. When completed proceed to step c.7.

7. Press <Shift> TRIGGER 089, then <Shift> TRIGGER 397 to generate new EEPROM checksums.

8. Restore the A23 PCB CAL/NORM jumper to the NORM position.

9. Disconnect all equipment.

10. This completes the ALC Slope calibration.

3-17 AM SENSITIVITY CALIBRATION

a. Procedure Description

This procedure provides the steps necessary to perform AM Sensitivity calibration. This calibration is required following replacement of either the A15 ALC PCB or the A23U27 IC. The calibration procedure determines the correct setting of the A15 %AM DAC for each installed frequency band and stores the calibration data in EEPROM (A23U27). The %AM DAC sets the %AM-per-volt sensitivity of the external AM input for each installed frequency band.

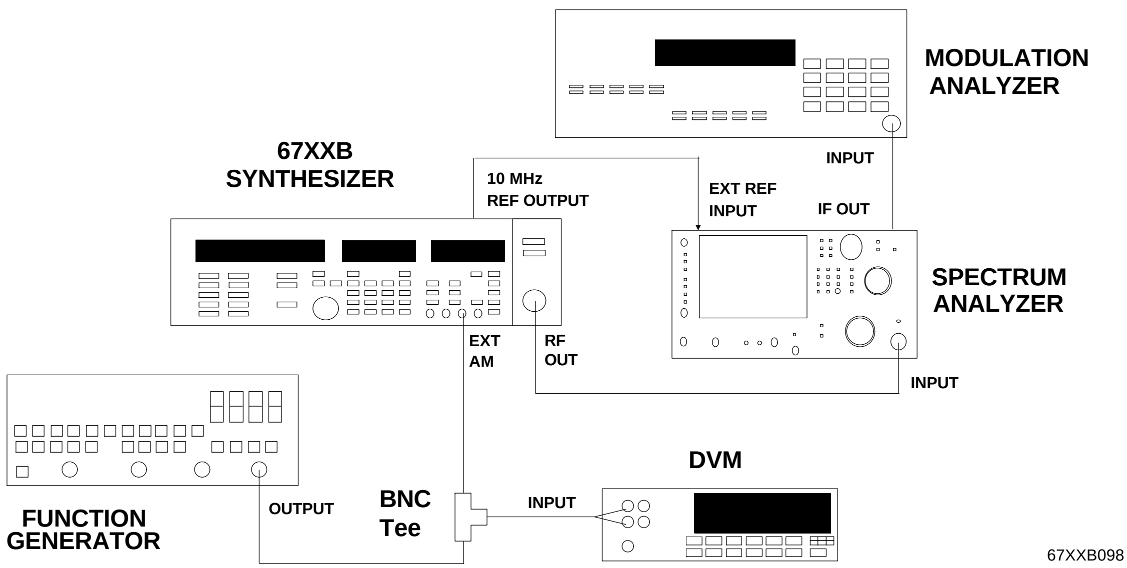


Figure 3-12. Test Equipment Setup for AM Sensitivity Calibration (0.01 to 20 GHz)

b. Test Equipment Setup (for frequencies from 0.01 to 20 GHz)

1. Connect the equipment, shown in Figure 3-12, as follows:
   - (a) Connect the 67XXB rear panel 10 MHZ REF OUTPUT to the Spectrum Analyzer External Reference Input.
   - (b) Connect the Function Generator Output to the BNC tee. Connect one leg of the tee to the 67XXB front panel EXT AM input. Connect the other leg of the tee to the DVM input.
   - (c) Connect the IF Output of the Spectrum Analyzer to the RF Input of the Modulation Analyzer.
   - (d) Connect the 67XXB RF OUTPUT to the Spectrum Analyzer RF Input.

c. Test Equipment Setup (for frequencies from 20 to 60 GHz)

1. Connect the equipment, shown in Figure 3-13, as follows:
   - (a) Connect the 67XXB rear panel 10 MHZ REF OUTPUT to the Spectrum Analyzer External Reference Input.
   - (b) Connect the Function Generator Output to the BNC tee. Connect one leg of the tee to the 67XXB front panel EXT AM input. Connect the other leg of the tee to the DVM input.
   - (c) Connect the IF Output of the Spectrum Analyzer to the RF Input of the Modulation Analyzer.
   - (d) Connect the diplexer and the appropriate external waveguide mixer to the Spectrum Analyzer.
   - (e) Connect the 67XXB RF OUTPUT to the waveguide mixer input.

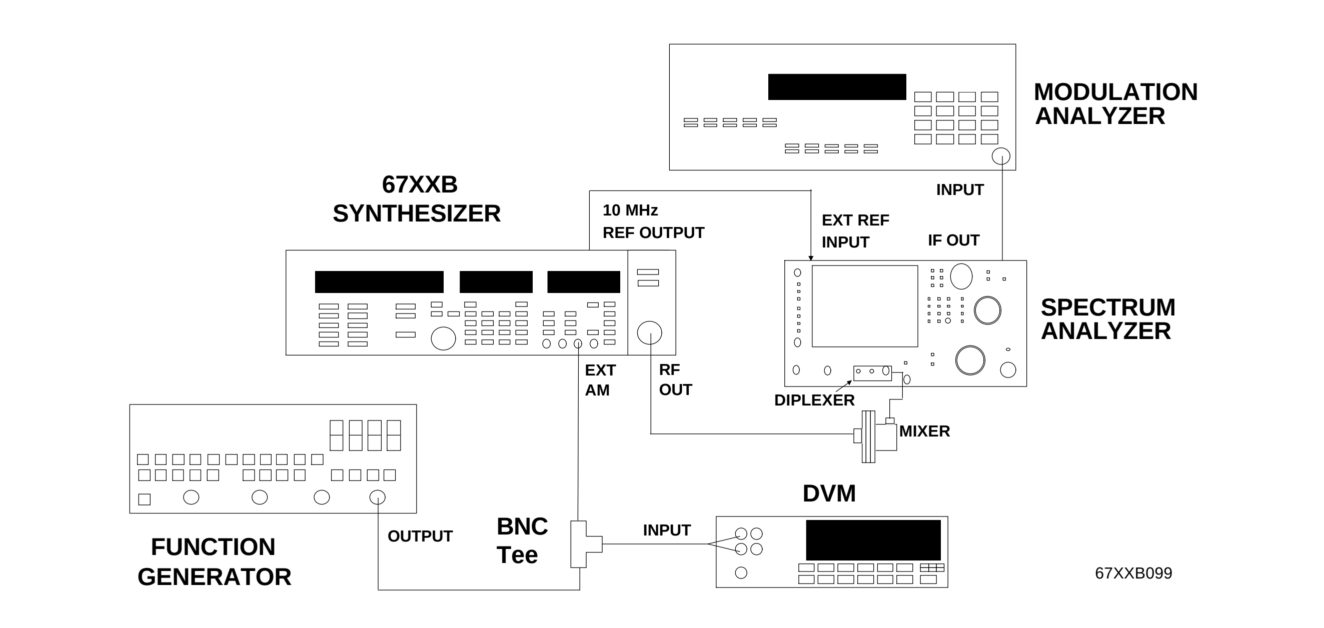


Figure 3-13. Test Equipment Setup for AM Sensitivity Calibration (20 to 60 GHz)

CAUTION

Care must be exercised when entering <Shift> TRIGGER codes during calibration procedures. Entry of an incorrect <Shift> TRIGGER code may damage or erase stored calibration data.

d. AM Sensitivity Calibration

1. Adjust the Function Generator for a sinewave output of 1 kHz, with an amplitude of 0.707 Vrms ±0.5% and no dc offset. The generator voltage must be set while connected to the 67XXB EXT AM input through the BNC tee.

2. Set up the 67XXB as follows:
   (a) Press <Shift> RESET.
   (b) On the A23 Microprocessor PCB, move the CAL/NORM jumper to the CAL position (see Figure 3-1).
   (c) Press CW OUTPUT SELECT.
   (d) Enter the frequency noted on the Test Record.
   (e) Press LEVEL 1.
   (f) Enter a power level that is 3 dB below maximum rated output power.

3. Set up the Spectrum Analyzer as follows:
   (a) Locate the fundamental frequency and adjust the analyzer to place the peak of the fundamental at the top most graticule line.
   (b) Span/Div: 0 Hz (labeled as 10 mSec setting on Tektronix Model 494)
   (c) Resolution BW: 100 kHz
   (d) MIN Noise: Activated

4. On the Spectrum Analyzer, adjust the reference level to place the signal 10 dB below the top graticule line.

5. Set up the Modulation Analyzer for:
   (a) MEASURE AM
   (b) 300 Hz High-Pass Filter
   (c) 3 kHz Low-Pass Filter

6. On 67XXB;
   (a) Press AM.

NOTE

A flashing OVERRANGE annunciator, located in the 67XXB's MODULATION/TIME display window, indicates that AM Meter calibration is required (see paragraph 3-18).

   (b) Press <Shift> AM SENS.
   (c) Enter 50%.

(d) Press <Shift> TRIGGER 089, then <Shift> TRIGGER 306.
(e) Press CW OUTPUT SELECT.
(f) Enter 100 MHz.
(g) Press SET INCR/DECR SIZE.
(h) Enter 1 MHz.

7. While observing the %AM display on the Modulation Analyzer, press the 67XXB DECR and INCR keys to obtain an AM reading of 50% ± 3%.

8. On the Modulation Analyzer, press AM PK(+) and record the reading on the Test Record. Press AM PK(–) and record the reading on the Test Record. Average the AM PK(+) and AM PK(–) readings together and record the result on the Test Record. The average should be >47.0% and <53.0%.

9. On the 67XXB, press RECALL to save the calibration results.

10. If the 67XXB instrument is a multiband unit, repeat steps d.2 thru d.9 for each of the remaining bands. If the 67XXB is a single band unit, go to step d.11.

11. On the 67XXB, press <Shift> TRIGGER 089, then <Shift> TRIGGER 397 to generate new EEPROM checksums.

12. Restore the A23 PCB CAL/NORM jumper to the NORM position.

13. Disconnect all equipment.

14. This completes the AM Sensitivity calibration.

3-18 AM METER CALIBRATION

a. Procedure Description

This procedure provides the steps necessary to perform AM Meter calibration. This calibration is required following replacement of either the A15 ALC PCB or the A23U27 IC. The procedure calibrates the metering function of the AM circuitry (% AM readout on the MODULATION display) and stores the calibration data in EEPROM (A23U27).

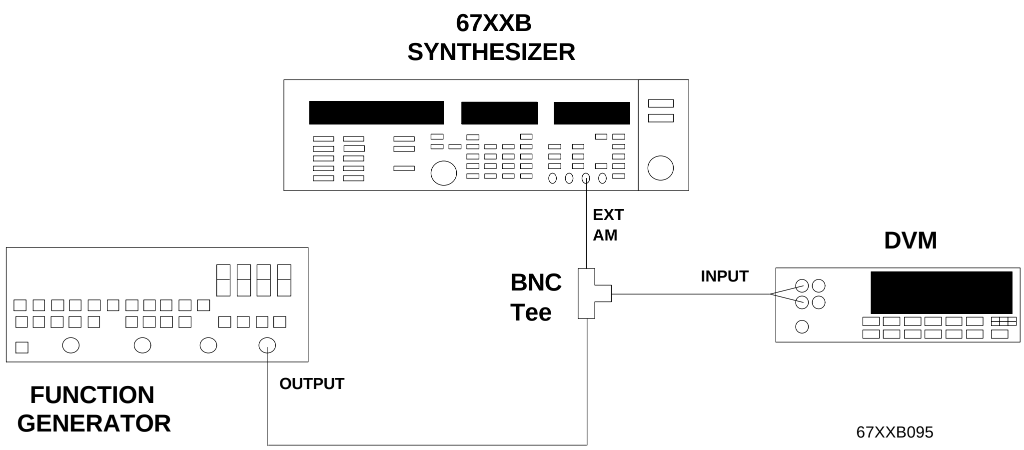


Figure 3-14. Test Equipment Setup for AM Meter Calibration

b. Test Equipment Setup

1. Connect the equipment, shown in Figure 3-14, as follows:
   (a) Connect the Function Generator output to the BNC tee.
   (b) Connect one leg of the tee to the 67XXB front panel EXT AM input.
   (c) Connect the other leg of the tee to the DVM input.

CAUTION

Care must be exercised when entering <Shift> TRIGGER codes during calibration procedures. Entry of an incorrect <Shift> TRIGGER code may damage or erase stored calibration data.

c. AM Meter Calibration

1. Adjust the Function Generator for a sine-wave output of 1 kHz, with an amplitude of 0.707 Vrms ±0.5% and no dc offset. The generator voltage must be set while connected to the 67XXB EXT AM input through the BNC tee.

2. Set up the 67XXB as follows:
   (a) Press <Shift> RESET.
   (b) On the A23 Microprocessor PCB, move the CAL/NORM jumper to the CAL position (see Figure 3-1).
   (c) Press CW OUTPUT SELECT.
   (d) Enter the frequency noted on the Test Record.
   (e) Press AM.

3. Disconnect the Function Generator from the 67XXB EXT AM input.

4. On the 67XXB, press <Shift > TRIGGER 089, then <Shift> TRIGGER 398. This zeros the AM meter calibration data.

5. On the 67XXB, press <Shift> TRIGGER 342. This calibrates the AM meter when there is no input voltage.

6. Reconnect the Function Generator to the 67XXB EXT AM input.

7. On the 67XXB, press <Shift> TRIGGER 343. This calibrates the AM meter to a .707 Vrms input and saves the calibration data.

8. On the 67XXB, press <Shift> TRIGGER 089, then <Shift> TRIGGER 397 to generate new EEPROM checksums.

9. Restore the A23 PCB CAL/NORM jumper to the NORM position.

d. AM Meter Calibration Verification

1. On the 67XXB:
   (a) Press <Shift> RESET.
   (b) Press CW OUTPUT SELECT.
   (c) Enter the frequency indicated on the Test Record.
   (d) Press <Shift> AM SENSE then enter 50%.
   (e) Press AM.
   (f) Press MEASURE AM DEPTH.
   (g) The AM depth is displayed in the MODULATION/TIME window and should indicate >47.5% and <52.5%. Record the displayed AM depth on the Test Record.

2. Disconnect the equipment.

3. This completes the AM Meter calibration.

3-19 FM DRIVER/SENSITIVITY CALIBRATION

a. Procedure Description

This procedure provides the steps necessary to perform FM Driver/Sensitivity calibration. This calibration is required following replacement of either the A16 FM PCB, any of the A18 thru A21 YIG Driver PCBs, any of the YIG-tuned Oscillators, or the A23U27 IC. The calibration procedure determines the correct settings for the A16 PCB's FM Sensitivity Cal DAC and the FM Attn DAC for each installed frequency band and stores the calibration data in EEPROM (A23U27). The FM Sensitivity Cal DAC compensates for variations in YIG-tuned Oscillator sensitivities and YIG loop components by setting a YIG driver sensitivity of 5 MHz/V for each installed YIG-tuned Oscillator. This results in more constant YIG loop gain. The FM Attn DAC sets the MHz/kHz-per-volt sensitivity of the external FM input for each installed frequency band.

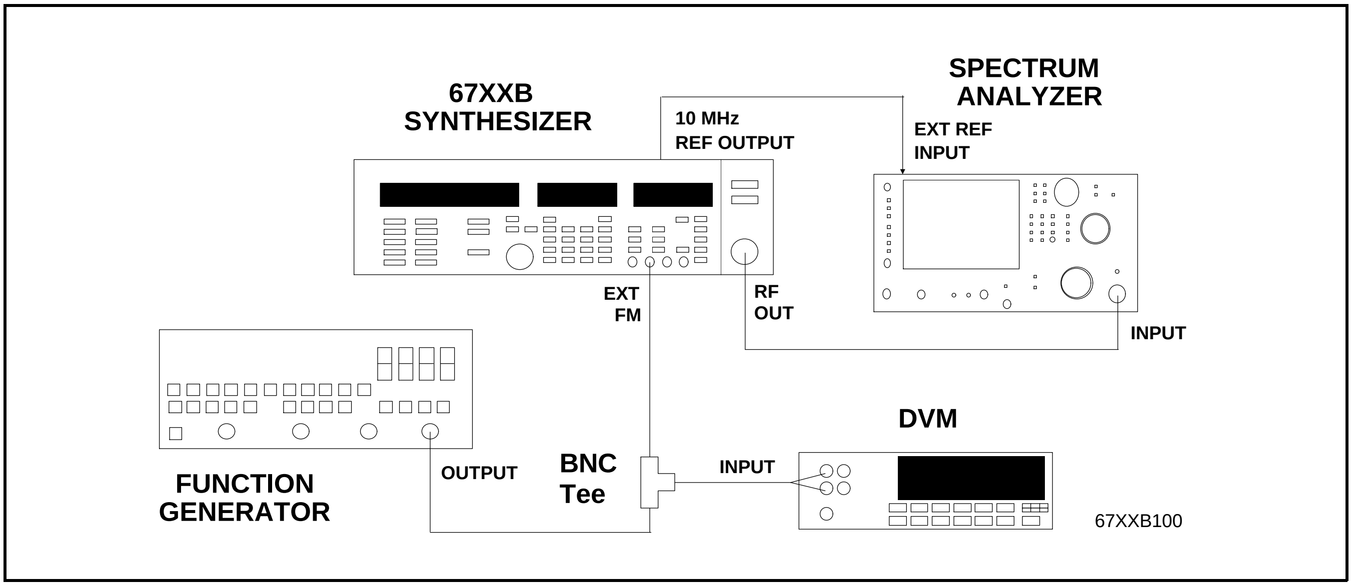


Figure 3-15. Test Equipment Setup for FM Sensitivity Calibration (0.01 to 20 GHz)

b. Test Equipment Setup (for frequencies from 0.01 to 20 GHz)

1. Connect the equipment, shown in Figure 3-15, as follows:
   (a) Connect the 67XXB rear panel 10 MHZ REF OUTPUT to the Spectrum Analyzer External Reference Input.
   (b) Connect the Function Generator Output to the BNC tee.
   (c) Connect one leg of the tee to the 67XXB front panel EXT FM input.
   (d) Connect the other leg of the tee to the DVM input.
   (e) Connect the 67XXB RF OUTPUT to the Spectrum Analyzer RF Input.

c. Test Equipment Setup (for frequencies from 20 to 60 GHz)

1. Connect the equipment, shown in Figure 3-16, as follows:
   (a) Connect the 67XXB rear panel 10 MHZ REF OUTPUT to the Spectrum Analyzer External Reference Input.
   (b) Connect the Function Generator Output to the BNC tee.
   (c) Connect one leg of the tee to the 67XXB front panel EXT FM input.
   (d) Connect the other leg of the tee to the DVM input.
   (e) Connect the diplexer and the appropriate external waveguide mixer to the Spectrum Analyzer.
   (f) Connect the 67XXB RF OUTPUT to the waveguide mixer input.

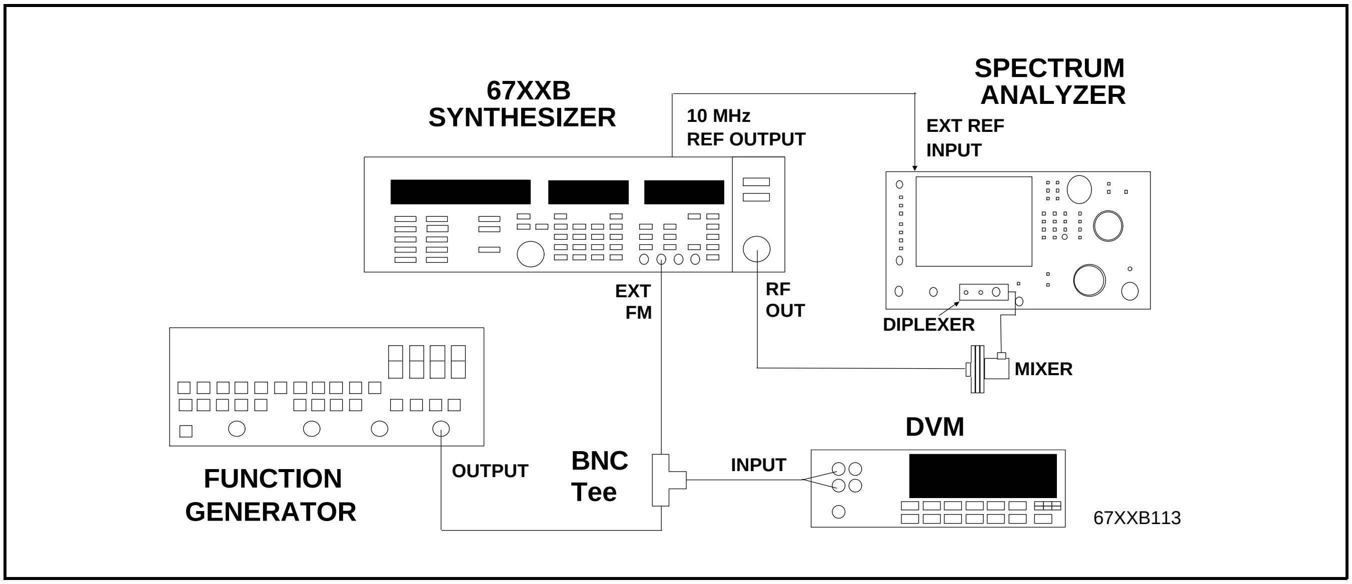


Figure 3-16. Test Equipment Setup for FM Sensitivity Calibration (20 to 60 GHz)

CAUTION
Care must be exercised when entering <Shift> TRIGGER codes during calibration procedures. Entry of an incorrect <Shift> TRIGGER code may damage or erase stored calibration data.

d. FM Driver/Sensitivity Calibration

1. Adjust the Function Generator for a sinewave output of 40 kHz ±200 Hz with an amplitude of 0.707 Vrms ±0.5% and no dc offset. The generator voltage must be set while connected to the 67XXB EXT FM input through the BNC tee.

2. Set up the 67XXB as follows:
   (a) Press <Shift> RESET.
   (b) On the A23 Microprocessor PCB, move the CAL/NORM jumper to the CAL position (see Figure 3-1).
   (c) Press CW OUTPUT SELECT.
   (d) Enter the frequency indicated on the Test Record.
   (e) Press <Shift> TRIGGER 089, then press <Shift> TRIGGER 400. This automatically performs FM Driver calibration for the selected frequency band.

3. Set the Spectrum Analyzer as follows:
   (a) CF: Same as the 67XXB CW frequency set in step d.2(d)
   (b) Span/Div: 10 kHz
   (c) RBW: 10 kHz
   (d) Filter: Wide
   (e) Ref Level: Adjust to place the signal peak at the top graticule of the display.

4. On the 67XXB;
   (a) Press <Shift> FM SENS.
   (b) Enter 96 kHz.
   (c) Press FM.
   (d) Press <Shift> TRIGGER 089, then press <Shift> TRIGGER 308.
   (e) Press CW OUTPUT SELECT.
   (f) Enter 2300 MHz
   (if calibrating a 26.5 to 40 GHz frequency band, enter 1200 MHz;
   if calibrating a 40 to 60 GHz frequency band, enter 800 MHz).
   (g) Press SET INCR/DECR SIZE.
   (h) Enter 100 MHz.

5. While observing the Spectrum Analyzer display, press the 67XXB DECR and INCR keys to adjust the waveform displayed so that the center portion (Bessel null) is at minimum amplitude (see Figure 3-17).

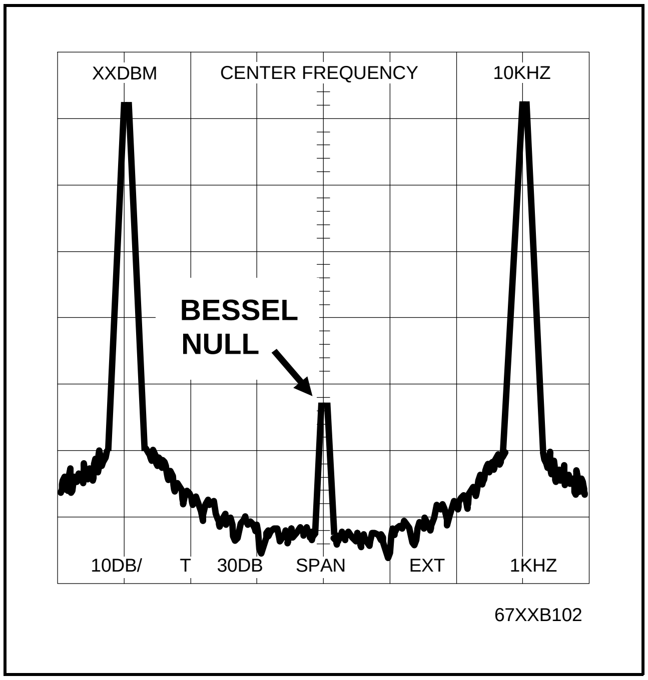


Figure 3-17. Typical Spectrum Analyzer Display of Bessel Null on FM Modulation Waveform

6. On the 67XXB, press SET INCR/DECR SIZE and enter a step size of 10 MHz.

7. Using the 67XXB DECR and INCR keys, fine-adjust the Bessel null to at least 40 dB below the top graticule (if necessary, change the step size to 1 MHz).

8. On the 67XXB, press RECALL to store the calibration data. Record the waveform on the Test Record.

9. If the 67XXB instrument is a multiband unit, press CW OUTPUT SELECT, then enter the next frequency indicated on the Test Record. If the 67XXB instrument is a single-band unit, skip to step d.11.

10. Repeat steps d.2(e) through d.9 for the remaining band(s) to be calibrated.

11. When all bands have been calibrated, press <Shift> to exit the calibration mode.

12. On the 67XXB, press <Shift> TRIGGER 089, then <Shift> TRIGGER 397 to generate new EEPROM checksums.

13. Restore the A23 PCB CAL/NORM jumper to the NORM position.

14. Disconnect all equipment.

15. This completes the FM Driver/Sensitivity calibration.

3-20 FM FLATNESS CALIBRATION

a. Procedure Description

This procedure provides the steps necessary to perform FM Flatness calibration. This calibration is required following replacement of either the A12 YIG Phase Detector PCB, the A16 FM PCB, any of the A18 thru A21 YIG Driver PCBs, any of the YIG-tuned Oscillators, or the A23U27 IC. The calibration procedure determines the correct setting of the A16 Phase Mod Cal DAC for each installed frequency band and stores the calibration data in EEPROM (A23U27). The Phase Mod Cal DAC sets the flatness of the FM circuit response by adjusting the FM deviation in the phase-lock mode.

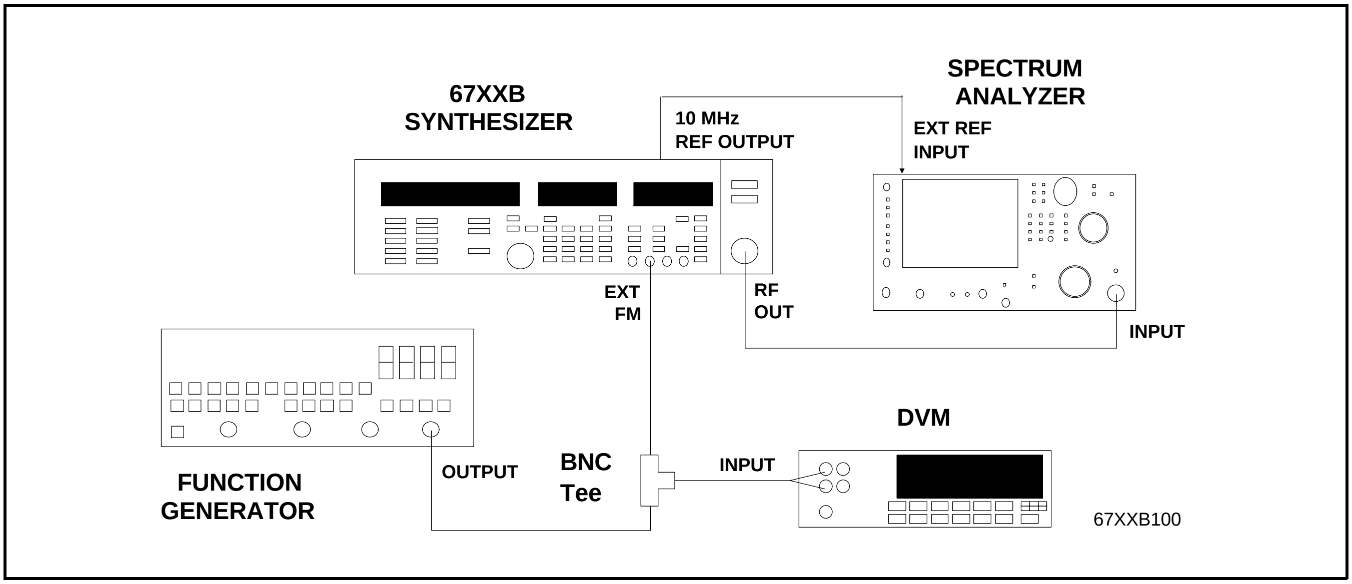


Figure 3-18. Test Equipment Setup for FM Flatness Calibration (0.01 to 20 GHz)

b. Test Equipment Setup (for frequencies from 0.01 to 20 GHz)

1. Connect the equipment, shown in Figure 3-18, as follows:
   - (a) Connect the 67XXB rear panel 10 MHZ REF OUTPUT to the Spectrum Analyzer External Reference Input.
   - (b) Connect the Function Generator Output to the BNC tee.
   - (c) Connect one leg of the tee to the 67XXB front panel EXT FM input.
   - (d) Connect ther other leg of the tee to the DVM input.
   - (e) Connect the 67XXB RF OUTPUT to the Spectrum Analyzer RF Input.

c. Test Equipment Setup (for frequencies from 20 to 60 GHz)

1. Connect the equipment, shown in Figure 3-19, as follows:
   - (a) Connect the 67XXB rear panel 10 MHZ REF OUTPUT to the Spectrum Analyzer External Reference Input.
   - (b) Connect the Function Generator Output to the BNC tee.
   - (c) Connect one leg of the tee to the 67XXB front panel EXT FM input.
   - (d) Connect the other leg of the tee to the DVM input.
   - (e) Connect the diplexer and the appropriate external waveguide mixer to the Spectrum Analyzer.
   - (f) Connect the 67XXB RF OUTPUT to the waveguide mixer.

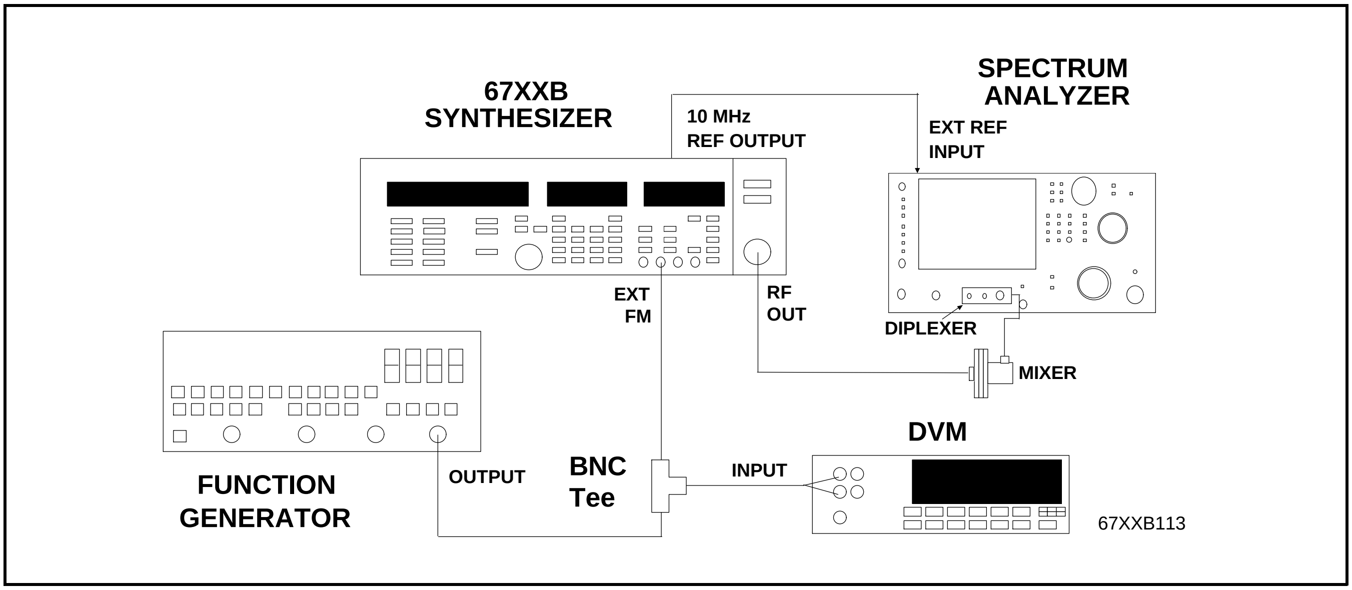


Figure 3-19. Test Equipment Setup for FM Flatness Calibration (20 to 60 GHz)

CAUTION

Care must be exercised when entering <Shift> TRIGGER codes during calibration procedures. Entry of an incorrect <Shift> TRIGGER code may damage or erase stored calibration data.

d. FM Flatness Calibration

1. Adjust the Function Generator for a sinewave output of 2 kHz ±10 Hz with an amplitude of 0.339 Vrms ±0.003 Vrms and no dc offset. The generator voltage must be set while connnected to the 67XXB EXT FM input through the BNC tee.

2. Set up the 67XXB as follows:
   (a) Press <Shift> RESET.
   (b) On the A23 Microprocessor PCB, move the CAL/NORM jumper to the CAL position (see Figure 3-1).
   (c) Press CW OUTPUT SELECT.
   (d) Enter the frequency indicated on the Test Record.

3. Set the Spectrum Analyzer as follows:
   (a) CF: Same as the 67XXB CW frequency set in step d.2(d)
   (b) Span/Div: 500 Hz
   (c) RBW: 1 kHz
   (d) Ref Level: Adjust to place the signal peak at the top graticule of the display (with 67XXB FM off)

4. On the 67XXB;
   (a) Press <Shift> FM SENS.
   (b) Enter 10 kHz.
   (c) Press FM.

5. On the Spectrum Analyzer, observe that the fundamental has dropped in amplitude and has 2 kHz sidebands (see Figure 3-20).

6. On the 67XXB;
   (a) Press <Shift> TRIGGER 089, then <Shift> TRIGGER 317.
   (b) Press CW.
   (c) Enter 80 MHz.
   (d) Press SET INCR/DECR SIZE.
   (e) Enter 10 MHz.

7. While observing the Spectrum Analyzer display, press the 67XXB DECR and INCR keys to adjust the fundamental as far down as possible from the reference established in step d.3(d).

8. On the 67XXB, press SET INCR/DECR SIZE and enter a step size of 1 MHz.

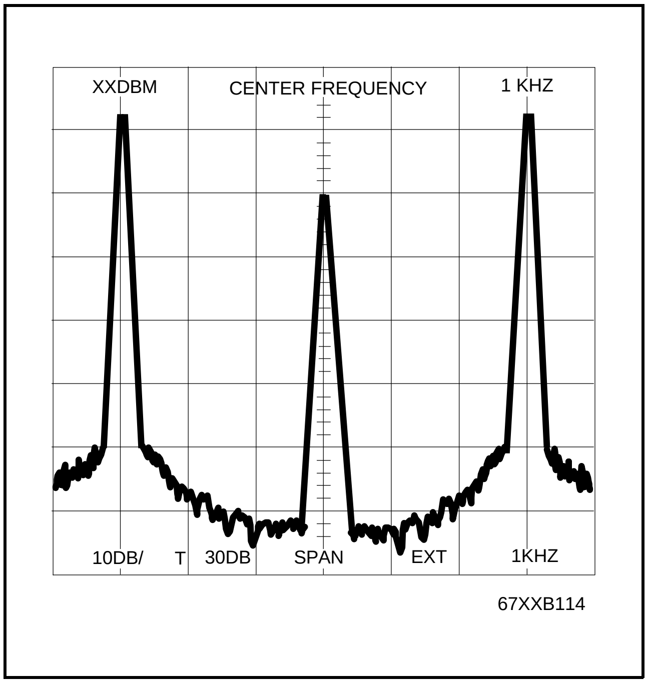


Figure 3-20. Typical Spectrum Analyzer Display of FM Flatness Response

9. Using the 67XXB DECR and INCR keys, fine adjust to set the fundamental level to at least 10 dB below the top graticule.

10. On the 67XXB, press RECALL to store the calibration data. Record the waveform on the Test Record..

11. If the 67XXB instrument is a multiband unit, press CW OUTPUT SELECT, then enter the next frequency indicated on the Test Record. If the 67XXB instrument is a single band unit, skip to step d.13.

12. Repeat steps d.3 thru d.11 for the remaining band(s) to be calibrated.

13. When all bands have been calibrated, press <Shift> to exit the calibration mode.

14. On the 67XXB, press <Shift> TRIGGER 089, then <Shift> TRIGGER 397 to generate new EEPROM checksums.

15. Restore the A23 PCB CAL/NORM jumper to the NORM position.

16. Disconnect all equipment.

17. This completes the FM Flatness calibration.

3-21 FM METER CALIBRATION

a. Procedure Description

This procedure provides the steps necessary to perform FM Meter calibration. This calibration is required following replacement of the A16 FM PCB or the A23U27 IC. The procedure calibrates the metering function of the FM circuitry (FM MHz/V or FM KHz/V readout on the MODULATION display) and stores the calibration data in EEPROM (A23U27).

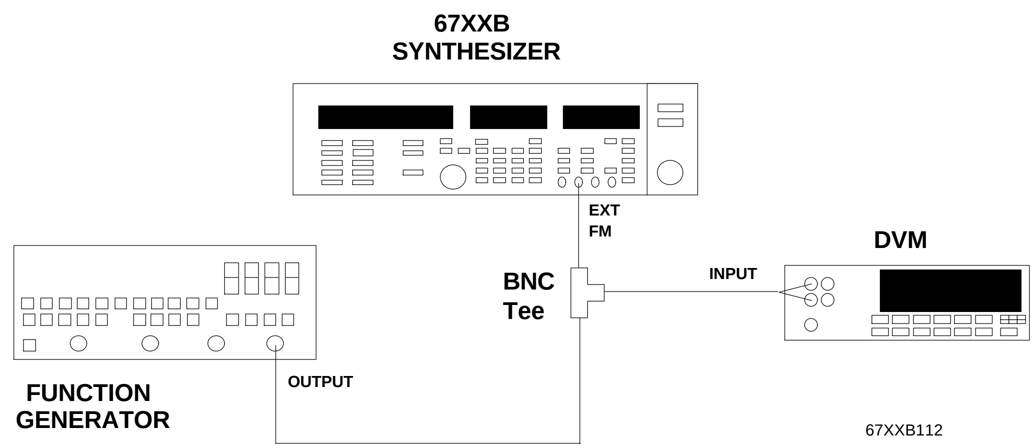


Figure 3-21. Test Equipment Setup for FM Meter Calibration

b. Test Equipment Setup

1. Connect the equipment, shown in Figure 3-21, as follows:
   (a) Connect the Function Generator output to the BNC tee.
   (b) Connect one leg of the tee to the 67XXB front panel EXT FM input.
   (c) Connect the other leg of the tee to the DVM input.

CAUTION

Care must be exercised when entering <Shift> TRIGGER codes during calibration procedures. Entry of an incorrect <Shift> TRIGGER code may damage or erase stored calibration data.

c. FM Meter Calibration

1. Adjust the Function Generator for a sine-wave output of 40 kHz, with an amplitude of 0.707 Vrms ±0.5% and no dc offset. The generator voltage must be set while connected to the 67XXB EXT FM input through the BNC tee.

2. Set up the 67XXB as follows:
   (a) Press <Shift> RESET.
   (b) On the A23 Microprocessor PCB, move the CAL/NORM jumper to the CAL position (see Figure 3-1).

3. Disconnect the Function Generator from the 67XXB EXT FM input.

4. On the 67XXB, press <Shift> TRIGGER 089, then <Shift> TRIGGER 340. This calibrates the FM meter when there is no input voltage.

5. Reconnect the Function Generator to the EXT FM input.

6. On the 67XXB, press <Shift> TRIGGER 341. This calibrates the FM meter to a .707 Vrms input and saves the calibration data.

d. FM Meter Calibration Verification

1. On the 67XXB;
   (a) Press FM.
   (b) Press MEASURE FM DEV.
   (c) The FM deviation is displayed in the MODULATION/TIME window and should be 300 kHz/V ±15 kHz/V. Record the displayed FM deviation on the Test Record.

2. On the 67XXB, press <Shift> TRIGGER 089, then <Shift> TRIGGER 397 to generate new EEPROM checksums.

3. Restore the A23 CAL/NORM jumper to the NORM position.

4. Disconnect the equipment.

5. This completes the FM Meter calibration.

MODELS
6709B AND 6709B-40
SWEPT FREQUENCY SYNTHESIZER

TEST AND CALIBRATION
MANUAL

WILTRON

490 JARVIS DRIVE
MORGAN HILL, CA 95037-2809

P/N: 10370-10204
REVISION: D
PRINTED: OCTOBER 1993

SECTION 4
TEST RECORD

CONTENTS

SECTION 4
TEST RECORDS

4-1 INTRODUCTION

This section provides two Test Record tables for recording the results of the Performance Verification Tests (in Section 2) and the Calibration/Adjustments (in Section 3). They jointly provide the means for maintaining an accurate and complete record of instrument performance.

The test record provided here has been customized for the 6709B and 6709B-40 models. It should only be used with matching procedures in Section 2 and 3 that cover the 6709B and 6709B-40 models. Specific references to frequency parameters, power levels, and non-applicable procedures make each Test Record easy to follow.

We recommend that you make a copy of these pages each time the test procedures are performed. By dating each Test Record copy, a detailed history of instrument performance can be accumulated.

4-2 PERFORMANCE VERIFICATION TEST RECORD

The Test Record for the Performance Verification procedures supplied in Section 2 is located immediately following this page.

4-3 CALIBRATION/ADJUSTMENTS TEST RECORD

The Test Record for the Calibration/Adjustment procedures supplied in Section 3 follows the Performance Verification Test Record.

NOTE

Results of the automated RF Level Calibration procedure in Section 3 are not included in this Test Record. Calibration data is stored in instrument memory. Contact the WILTRON Customer Service department at (408) 778-2000 for more details.

WILTRON Model 6709B and 6709B-40 **Date: ______________________**

Serial Number____________________ **Tested By: _____________________**

2-5. Internal Time Base Aging Rate Test

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure				
2	Record T_S value		______hours	
4	Record T_1 value		______sec	
5	Record T_2 value		______sec	
6	Record T_F value		______hours	
8	Record the calculated aging rate		______per day	5×10^{-10} per day

2-6. Frequency Synthesis Tests

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Coarse Loop/YIG Loop Test Procedure				
1(c)	Enter 0.01 GHz			
2	Record the Frequency Counter Reading	0.009 999 900 GHz	___________ GHz	0.010 000 100 GHz
3	Record the Frequency Counter Reading	0.509 999 900 GHz	___________ GHz	0.510 000 100 GHz
4	Record the Frequency Counter Readings . . .	1.009 999 900 GHz	___________ GHz	1.010 000 100 GHz
		1.509 999 900 GHz	___________ GHz	1.510 000 100 GHz
d. Fine Loop Test Procedure				
1(c)	Enter 1 GHz			
2	Record the Frequency Counter Reading	0.999 999 900 GHz	___________ GHz	1.000 000 100 GHz
3	Record the Frequency Counter Reading	1.000 000 900 GHz	___________ GHz	1.000 001 100 GHz
4	Record the Frequency Counter Readings . . .	1.000 001 900 GHz	___________ GHz	1.000 002 100 GHz
		1.000 002 900 GHz	___________ GHz	1.000 003 100 GHz
		1.000 003 900 GHz	___________ GHz	1.000 004 100 GHz
		1.000 004 900 GHz	___________ GHz	1.000 005 100 GHz
		1.000 005 900 GHz	___________ GHz	1.000 006 100 GHz
		1.000 006 900 GHz	___________ GHz	1.000 007 100 GHz
		1.000 007 900 GHz	___________ GHz	1.000 008 100 GHz
		1.000 008 900 GHz	___________ GHz	1.000 009 100 GHz
		1.000 009 900 GHz	___________ GHz	1.000 010 100 GHz

2-7. Marker and Blanking Verification

Step	Procedure Comments	Marker/Signal Presence
c. Marker Selection Procedure		
2	F1 Frequency Marker = 0.01 GHz	
2	Verify that a marker appears on the left side of the scope at the start of trace	_______
3(a)	F2 Frequency Marker = 2 GHz	
3(b)	Verify that a marker appears on the right side of the scope at the end of trace	_______
4	F3 Frequency Marker = 0.25 GHz	
4	Verify that a marker appears on the scope	_______
4	F4 Frequency Marker = 0.5 GHz	
4	Verify that a marker appears on the scope	_______
4	F5 Frequency Marker = 0.75 GHz	
4	Verify that a marker appears on the scope	_______
4	F6 Frequency Marker = 1 GHz	
4	Verify that a marker appears on the scope	_______
4	F7 Frequency Marker = 1.25 GHz	
4	Verify that a marker appears on the scope	_______
4	F8 Frequency Marker = 1.5 GHz	
4	Verify that a marker appears on the scope	_______
4	F9 Frequency Marker = 1.75 GHz	
4	Verify that a marker appears on the scope	_______
d. Marker Output Verification Procedure		
1	Verify +5V (TTL high) markers at nine points on scope display	_______
3	Verify that all markers change to intensified spots	_______
5(a)	Verify +5V (TTL high) signal at retrace	_______
5(d)	Verify –10V (minimum) signal at selected marker frequency	_______
5(e)	Verify –5V (minimum) signal at all other marker frequencies	_______
6	Verify that new marker changes from –5V (minimum) to –10V (minimum)	_______
	Verify that previous marker changes from –10V (minimum) to –5V (minimum)	_______
e. Retrace Blanking Output Verification Procedure		
2	Verify –5V (minimum) signal during retrace	_______
3	Verify +5V (minimum) signal during retrace	_______

2-8. Narrowband Spurious Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Fine Loop Test Procedure				
1(b)	Enter 1.1 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	10 kHz	N/A	_______dBc	–60 dBc*
	20 khz	N/A	_______dBc	–60 dBc*
	30 kHz	N/A	_______dBc	–60 dBc*
	40 kHz	N/A	_______dBc	–60 dBc*
	50 kHz	N/A	_______dBc	–60 dBc*
d. Coarse Loop Test Procedure				
1(b)	Enter 1.1 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	200 kHz	N/A	_______dBc	–60 dBc*
	400 khz	N/A	_______dBc	–60 dBc*

* = –50 dBc for the 6709B-40 model.

2-9. Spurious and Harmonic Tests: RF Output Signals ≤2 GHz

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
	c. Test Procedure			
3	Record the presence of the worst case harmonic of the 10 MHz carrier	N/A	_______dBc	-40 dBc*
3	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc**
4	Record the presence of the worst case harmonic of the 20 MHz carrier	N/A	_______dBc	–40 dBc*
4	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc**
4	Record the presence of the worst case harmonic of the 30 MHz carrier	N/A	_______dBc	–40 dBc*
4	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc**
6	Record the presence of the worst case harmonic of the 40 MHz carrier	N/A	_______dBc	–40 dBc*
6	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc**
8	Record the presence of the worst case harmonic of the 350 MHz carrier	N/A	_______dBc	–40 dBc*
8	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc**
9	Record the presence of the worst case spurious response of the 1.6 GHz carrier on the Spectrum Analyzer display	N/A	_______dBc	–60 dBc**
12	Record the level of harmonics of the 1.6 GHz carrier:			
	3.2 GHz (2nd harmonic)	N/A	_______dBc	–40 dBc*
	4.8 GHz (3rd harmonic)	N/A	_______dBc	–40 dBc*

* = –30 dBc for the 6709B-40 model.

** = –50 dBc for the 6709B-40 model.

2-10. Harmonic Tests: RF Output Signals From 2 to 10 GHz

These tests are not applicable to the 6709B and 6709B-40 models.

2-11. Harmonic Tests: RF Output Signals From 11 to 20 GHz

These tests are not applicable to the 6709B and 6709B-40 models.

2-12. Harmonic Tests (Alternate Method): RF Output Signals From 10 to 30 GHz

These tests are not applicable to the 6709B and 6709B-40 models.

2-13. Harmonic Tests: RF Output Signals From 2 6.5 to 40 GHz

These tests are not applicable to the 6709B and 6709B-40 models.

2-14. Harmonic Tests: RF Output Signals From 40 to 60 GHz

These tests are not applicable to the 6709B and 6709B-40 models.

2-15. Single Sideband Phase Noise Test

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure (Band 0; 0.01 to 2 GHz)				
1(c)	Enter 1.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–67 dBc
6	100 Hz	N/A	_______dBc	–72 dBc
8	1 kHz	N/A	_______dBc	–76 dBc
10	10 kHz	N/A	_______dBc	–80 dBc
12	100 kHz	N/A	_______dBc	–98 dBc

2-16. Power Level Accuracy and Flatness Verification (6709B Models without Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 0.8 dB			
	** = Maximum Variation is 2.0 dB			
d. Power Level Accuracy Procedure				
1(c)	Enter 50 MHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm

2-16. Power Level Accuracy and Flatness Verification (6709B Models with 110 dB Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 1.6 dB			
	** = Maximum Variation is 6.0 dB			
d. Power Level Accuracy Procedure				
1(c)	Enter 50 MHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6709B-40 Models without Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 0.8 dB			
	** = Maximum Variation is 2.0 dB			
d. Power Level Accuracy Procedure				
1(c)	Enter 50 MHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+15.4 dBm	________ dBm	+16.6 dBm
3	Measure and record the Power Meter reading	+14.4 dBm	________ dBm	+15.6 dBm
4	Measure and record the Power Meter readings	+13.4 dBm	________ dBm	+14.6 dBm
		+12.4 dBm	________ dBm	+13.6 dBm
		+11.4 dBm	________ dBm	+12.6 dBm
		+10.4 dBm	________ dBm	+11.6 dBm
		+9.4 dBm	________ dBm	+10.6 dBm
		+8.4 dBm	________ dBm	+9.6 dBm
		+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6709B-40 Models with 110 dB Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Power Level Flatness Procedure			
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 1.6 dB			
	** = Maximum Variation is 6.0 dB			
	d. Power Level Accuracy Procedure			
1(c)	Enter 50 MHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+11.6 dBm	________ dBm	+14.4 dBm
3	Measure and record the Power Meter reading	+10.6 dBm	________ dBm	+13.4 dBm
4	Measure and record the Power Meter readings	+9.6 dBm	________ dBm	+12.4 dBm
		+8.6 dBm	________ dBm	+11.4 dBm
		+7.6 dBm	________ dBm	+10.4 dBm
		+6.6 dBm	________ dBm	+9.4 dBm
		+5.6 dBm	________ dBm	+8.4 dBm
		+4.6 dBm	________ dBm	+7.4 dBm
		+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+1.4 dBm

2-17. FM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. FM Input Sensitivity Procedure (Band 0; 0.01 to 2 GHz)				
2(c)	Enter 1.1 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 0; 0.01 to 2 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A

2-18. AM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. AM Input Sensitivity and Meter Accuracy (Band 0; 0.01 to 2 GHz)				
2(e)	Enter 1.1 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 0; 0.01 to 2 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Rise Time, Fall Time, Overshoot, and Level (Band 0; 0.01 to 2 GHz)			
1(c)	Enter 1.1 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
	d. Pulse Leveling Accuracy Check, Preliminary Test Setup			
4(b)	Enter 1.1 GHz			
	e. 67XXB LEVEL Display Calibration			
1	Note the 67XXB LEVEL display value			______dBm
2	Note the 67XXB LEVEL display value			______dBm
3	Calculate the difference between steps e.1 and e.2. Note this value			______dB
	f. Pulse Level Accuracy Test Procedure (Band 0, 0.01 to 2 GHz; Pulse Width = 5 µs)			
2(b)	Enter 1.1 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.6 dB	______dB	+0.6 dB
	f. Pulse Level Accuracy Test Procedure (Band 0, 0.01 to 2 GHz; Pulse Width = 2 µs)			
2(b)	Enter 1.1 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.9 dB	______dB	+0.9 dB
	f. Pulse Level Accuracy Test Procedure (Band 0, 0.01 to 2 GHz; Pulse Width = 1 µs)			
2(b)	Enter 1.1 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.4 dB	______dB	+1.4 dB

2-20. Pulse Modulation Test: Video Feedthrough

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure (Band 0; 0.01 to 2 GHz)				
1(c)	Enter 1.1 GHz			
3	Measure and record the Video Feedthrough voltage spikes.	N/A	______mV peak	* mV peak

* Specification: 2% maximum for power levels ≤10 dBm
5% maximum for power levels >10 dBm

2-21. Pulse Modulation Test: RF On/Off Ratio

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure (Band 0; 0.01 to 2 GHz)				
1(d)	Enter 1.1 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.	60 dB	______dB	N/A

WILTRON Model 6709B and 6709B-40 **Date: ______________________**

Serial Number____________________ **Tested By: _____________________**

CALIBRATION/ADJUSTMENT PERFORMANCE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-9 ALC Level Offset Adjustments		
This instrument uses only one leveling circuit; Band 0.		
c. Band 0 Level Offset 1.(c) 3.	Frequency = 1.1 GHz A15TP6 = 0V ±10 µV	___________volts
f. ALC Detector Shaper Level Offset 6.(c)	Frequency =1.1 GHz Follow steps f.1 through f.21.	
3-10 External Leveling Offset Adjustment		
c.3	A15TP7 = 0V ±1 mV	___________volts
3-11 10 MHz Reference Oscillator Calibration		
c.1.(c) c.3	Frequency = 2 GHz Adjust for Frequency Counter Reading = 2 GHz ±100 Hz	___________GHz
3-12 ALC Bandwidth Calibration		
This calibration is required for the installed frequency band:		
c. 0.01-2 GHz Band 2.(c)	Frequency = 1.1 GHz Follow steps c.1 through c.13 then steps c.16 and c.17.	

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-13 Analog Sweep Calibration This calibration is automatically completed for the installed frequency band. c.1.(d)	Frequency = 1.1 GHz	
3-14 YIG-tuned Oscillator Frequency Calibration This calibration is required for the installed frequency band: c. 0.01-2 GHz Band 1.(e) 5.	Frequency = 1.1 GHz Maximum difference in MHz between frequency counter and 6709B	__________MHz
3-15 RF Level Calibration This calibration is performed using an automatic test system. Contact WILTRON Customer Service at (408) 778–2000 for further information.		
3-16 ALC Slope Adjustment This calibration is required for the ≤2 GHz level detector. c. 0.01-2 GHz Band 2.(d) 2.(f) 5.	F1 = 0.01 GHz F2 = 2 GHz Record the resulting waveform	Draw Waveform Flatness for the 0.01-2 GHz Band

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-17 AM Sensitivity Calibration		
This calibration is required for the installed frequency band:		
d. 0.01-2 GHz Band		
2.(d)	Frequency = 1.1 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
3-18 AM Meter Calibration		
c. Meter Calibration		
2.(d)	Frequency = 1.1 GHz	
d. Meter Verification		
1.(c)	Frequency = 1.1 GHz	
1.(g)	Measure and record AM DEPTH	__________%
3-19 FM Driver/Sensitivity Calibration		
This calibration is required for the installed frequency band:		
d. 0.01-2 GHz Band		
2.(d)	Frequency = 1.1 GHz	
8.	Record the Waveform Null	Draw Waveform Null

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-20 FM Flatness Calibration		
This calibration is required for the installed frequency band:		
d. 0.01-2 GHz Band 2.(d) 10.	Frequency = 1.1 GHz Record the Waveform	Draw Waveform
3-21 FM Meter Calibration		
c. Meter Calibration	Follow steps c.1 through c.6	
d. Meter Verification 1.(c)	Measure FM Deviation	__________kHz

MODELS
6717B AND 6717B-20
SWEPT FREQUENCY SYNTHESIZER

TEST AND CALIBRATION
MANUAL

WILTRON

490 JARVIS DRIVE
MORGAN HILL, CA 95037-2809

P/N: 10370-10206
REVISION: D
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SECTION 4
TEST RECORD

CONTENTS

SECTION 4
TEST RECORDS

4-1 INTRODUCTION

This section provides two Test Record tables for recording the results of the Performance Verification Tests (in Section 2) and the Calibration/Adjustments (in Section 3). They jointly provide the means for maintaining an accurate and complete record of instrument performance.

This test record provided here has been customized for the 6717B and 6717B-20 models. It should only be used with matching procedures in Section 2 and 3 that cover the 6717B or 6717B-20 models. Specific references to frequency parameters, power levels, and non-applicable procedures make each Test Record easy to follow.

We recommend that you make a copy of these pages each time the test procedures are performed. By dating each Test Record copy, a detailed history of instrument performance can be accumulated.

4-2 PERFORMANCE VERIFICATION TEST RECORD

The Test Record for the Performance Verification procedures supplied in Section 2 is located immediately following this page.

4-3 CALIBRATION/ADJUSTMENTS TEST RECORD

The Test Record for the Calibration/Adjustment procedures supplied in Section 3 follows the Performance Verification Test Record.

NOTE

Results of the automated RF Level Calibration procedure in Section 3 are not included in this Test Record. Calibration data is stored in instrument memory. Contact the WILTRON Customer Service department at (408) 778-2000 for more details.

WILTRON Model 6717B and 6717B-20 **Date: ______________________**

Serial Number____________________ **Tested By: _____________________**

2-5. Internal Time Base Aging Rate Test

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure				
2	Record T_S value		______hours	
4	Record T_1 value		______sec	
5	Record T_2 value		______sec	
6	Record T_F value		______hours	
8	Record the calculated aging rate		______per day	5×10^{-10} per day

2-6. Frequency Synthesis Tests

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Coarse Loop/YIG Loop Test Procedure				
1(c)	Enter 1 GHz			
2	Record the Frequency Counter Reading	0.999 999 900 GHz	__________ GHz	1.000 000 100 GHz
3	Record the Frequency Counter Reading	1.999 999 900 GHz	__________ GHz	2.000 000 100 GHz
4	Record the Frequency Counter Readings . . .	2.999 999 900 GHz	__________ GHz	3.000 000 100 GHz
		3.999 999 900 GHz	__________ GHz	4.000 000 100 GHz
		4.999 999 900 GHz	__________ GHz	5.000 000 100 GHz
		5.999 999 900 GHz	__________ GHz	6.000 000 100 GHz
		6.999 999 900 GHz	__________ GHz	7.000 000 100 GHz
		7.999 999 900 GHz	__________ GHz	8.000 000 100 GHz

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
d. Fine Loop Test Procedure				
1(c)	Enter 1 GHz			
2	Record the Frequency Counter Reading	0.999 999 900 GHz	__________ GHz	1.000 000 100 GHz
3	Record the Frequency Counter Reading	1.000 000 900 GHz	__________ GHz	1.000 001 100 GHz
4	Record the Frequency Counter Readings . . .	1.000 001 900 GHz	__________ GHz	1.000 002 100 GHz
		1.000 002 900 GHz	__________ GHz	1.000 003 100 GHz
		1.000 003 900 GHz	__________ GHz	1.000 004 100 GHz
		1.000 004 900 GHz	__________ GHz	1.000 005 100 GHz
		1.000 005 900 GHz	__________ GHz	1.000 006 100 GHz
		1.000 006 900 GHz	__________ GHz	1.000 007 100 GHz
		1.000 007 900 GHz	__________ GHz	1.000 008 100 GHz
		1.000 008 900 GHz	__________ GHz	1.000 009 100 GHz
		1.000 009 900 GHz	__________ GHz	1.000 010 100 GHz

2-7. Marker and Blanking Verification

Step	Procedure Comments	Marker/Signal Presence
c. Marker Selection Procedure		
2	F1 Frequency Marker = 0.01 GHz	
2	Verify that a marker appears on the left side of the scope at the start of trace	_______
3(a)	F2 Frequency Marker = 8.4 GHz	
3(b)	Verify that a marker appears on the right side of the scope at the end of trace	_______
4	F3 Frequency Marker = 1 GHz	
4	Verify that a marker appears on the scope	_______
4	F4 Frequency Marker = 2 GHz	
4	Verify that a marker appears on the scope	_______
4	F5 Frequency Marker = 3 GHz	
4	Verify that a marker appears on the scope	_______
4	F6 Frequency Marker = 4 GHz	
4	Verify that a marker appears on the scope	_______
4	F7 Frequency Marker = 5 GHz	
4	Verify that a marker appears on the scope	_______
4	F8 Frequency Marker = 6 GHz	
4	Verify that a marker appears on the scope	_______
4	F9 Frequency Marker = 7 GHz	
4	Verify that a marker appears on the scope	_______
d. Marker Output Verification Procedure		
1	Verify +5V (TTL high) markers at nine points on scope display	_______
3	Verify that all markers change to intensified spots	_______
5(a)	Verify +5V (TTL high) signal at retrace	_______
5(b)	Verify +5V (minimum) signal at bandswitch point	_______
5(c)	Verify +5V (minimum) signal at each switched filter point:	
	3.5 GHz switch point	_______
	6.0 GHz switch point	_______
5(d)	Verify –10V (minimum) signal at selected marker frequency	_______
5(e)	Verify –5V (minimum) signal at all other marker frequencies	_______
6	Verify that new marker changes from –5V (minimum) to –10V (minimum)	_______
	Verify that previous marker changes from –10V (minimum) to –5V (minimum)	_______
e. Retrace Blanking Output Verification Procedure		
2	Verify –5V (minimum) signal during retrace	_______
3	Verify +5V (minimum) signal during retrace	_______
f. Bandswitch Blanking Output Verification Procedure		
2	Verify +5V (minimum) signal during the following bandswitch dwell points:	
	2.0 GHz bandswitch dwell point	_______
3	Verify –5V (minimum) signal during the following bandswitch dwell points:	
	2.0 GHz bandswitch dwell point	_______

2-8. Narrowband Spurious Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Fine Loop Test Procedure			
1(b)	Enter 2.1 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	10 kHz	N/A	_______dBc	–60 dBc
	20 khz	N/A	_______dBc	–60 dBc
	30 kHz	N/A	_______dBc	–60 dBc
	40 kHz	N/A	_______dBc	–60 dBc
	50 kHz	N/A	_______dBc	–60 dBc
	d. Coarse Loop Test Procedure			
1(b)	Enter 5.1 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	200 kHz	N/A	_______dBc	–60 dBc
	400 khz	N/A	_______dBc	–60 dBc

2-9. Spurious and Harmonic Tests: RF Output Signals ≤2 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure			
3	Record the presence of all harmonics of the 10 MHz carrier	N/A	_______dBc	–40 dBc*
3	Record the presence of all spurious responses on the Spectrum Analyzer display	N/A	_______dBc	–60 dBc**
4	Record the presence of all harmonics of the 20 MHz carrier	N/A	_______dBc	–40 dBc*
4	Record the presence of all spurious responses on the Spectrum Analyzer display	N/A	_______dBc	–60 dBc**
4	Record the presence of all harmonics of the 30 MHz carrier	N/A	_______dBc	–40 dBc*
4	Record the presence of all spurious responses on the Spectrum Analyzer display	N/A	_______dBc	–60 dBc**
6	Record the presence of all harmonics of the 40 MHz carrier	N/A	_______dBc	–40 dBc*
6	Record the presence of all spurious responses on the Spectrum Analyzer display	N/A	_______dBc	–60 dBc**
8	Record the presence of all harmonics of the 350 MHz carrier	N/A	_______dBc	–40 dBc*
8	Record the presence of all spurious responses on the Spectrum Analyzer display	N/A	_______dBc	–60 dBc**
9	Record the presence of all spurious responses of the 1.6 GHz carrier on the Spectrum Analyzer display	N/A	_______dBc	–60 dBc**
12	Record the level of harmonics of the 1.6 GHz carrier:			
	3.2 GHz (2nd harmonic)	N/A	_______dBc	–40 dBc*
	4.8 GHz (3rd harmonic)	N/A	_______dBc	–40 dBc*

* = –30 dBc for the 6717B-20 model.

** = –50 dBc for the 6717B-20 model.

2-10. Harmonic Tests: RF Output Signals From 2 to 10 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure				
4	Record the level of all harmonics of the 2.1 GHz carrier:			
	4.2 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
	6.3 GHz (3rd harmonic)	N/A	_______dBc	–60 dBc
	8.4 GHz (4th harmonic)	N/A	_______dBc	–60 dBc
	10.5 GHz (5th harmonic)	N/A	_______dBc	–60 dBc
	12.6 GHz (6th harmonic)	N/A	_______dBc	–60 dBc
	14.7 GHz (7th harmonic)	N/A	_______dBc	–60 dBc
	16.8 GHz (8th harmonic)	N/A	_______dBc	–60 dBc
	18.9 GHz (9th harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 3.6 GHz carrier:			
	7.2 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
	10.8 GHz (3rd harmonic)	N/A	_______dBc	–60 dBc
	14.4 GHz (4th harmonic)	N/A	_______dBc	–60 dBc
	18 GHz (5th harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 7 GHz carrier:			
	14 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc

2-11. Harmonic Tests: RF Output Signals From 11 to 20 GHz

These tests are not applicable to the 6717B and 6717B-20 models.

2-12. Harmonic Tests (Alternate Method): RF Output Signals From 10 to 30 GHz

These tests are not applicable to the 6717B and 6717B-20 models.

2-13. Harmonic Tests: RF Output Signals From 26.5 to 40 GHz

These tests are not applicable to the 6717B and 6717B-20 models.

2-14. Harmonic Tests: RF Output Signals From 40 to 60 GHz

These tests are not applicable to the 6717B and 6717B-20 models.

2-15. Single Sideband Phase Noise Test

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure (Band 0; 0.01 to 2 GHz)				
1(c)	Enter 1.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–67 dBc
6	100 Hz	N/A	_______dBc	–72 dBc
8	1 kHz	N/A	_______dBc	–76 dBc
10	10 kHz	N/A	_______dBc	–80 dBc
12	100 kHz	N/A	_______dBc	–98 dBc
13	Repeat steps c.1 through c.12 for the remaining bands.			
c. Test Procedure (Band 1; 2 to 8.4 GHz)				
1(c)	Enter 5.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–67 dBc
6	100 Hz	N/A	_______dBc	–72 dBc
8	1 kHz	N/A	_______dBc	–76 dBc
10	10 kHz	N/A	_______dBc	–80 dBc
12	100 kHz	N/A	_______dBc	–98 dBc

2-16. Power Level Accuracy and Flatness Verification (6717B Models without Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 0.8 dB			
	** = Maximum Variation is 2.0 dB			
d. Power Level Accuracy Procedure (0.01 to 2 GHz)				
1(c)	Enter 50 MHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
d. Power Level Accuracy Procedure (2 to 8.4 GHz)				
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm

		Lower Limit	Measured Value	Upper Limit
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm

2-16. Power Level Accuracy and Flatness Verification (6717B Models with 110 dB Optional Attenuator)

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 1.6 dB			
	** = Maximum Variation is 6.0 dB			
d. Power Level Accuracy Procedure (0.01 to 2 GHz)				
1(c)	Enter 50 MHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
d. Power Level Accuracy Procedure (2 to 8.4 GHz)				
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm

		Lower Limit	Measured Value	Upper Limit
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6717B-20 Models without Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	

* = Maximum Variation is 0.8 dB

** = Maximum Variation is 2.0 dB

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. Power Level Accuracy Procedure (0.01 to 2 GHz)				
1(c)	Enter 50 MHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+12.4 dBm	________ dBm	+13.6 dBm
3	Measure and record the Power Meter reading	+11.4 dBm	________ dBm	+12.6 dBm
4	Measure and record the Power Meter readings	+10.4 dBm	________ dBm	+11.6 dBm
		+9.4 dBm	________ dBm	+10.6 dBm
		+8.4 dBm	________ dBm	+9.6 dBm
		+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
d. Power Level Accuracy Procedure (2 to 8.4 GHz)				
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+12.4 dBm	________ dBm	+13.6 dBm
3	Measure and record the Power Meter reading	+11.4 dBm	________ dBm	+12.6 dBm
4	Measure and record the Power Meter readings	+10.4 dBm	________ dBm	+11.6 dBm
		+9.4 dBm	________ dBm	+10.6 dBm
		+8.4 dBm	________ dBm	+9.6 dBm
		+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm

		Lower Limit	Measured Value	Upper Limit
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6717B-20 Models with 110 dB Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	

* = Maximum Variation is 1.6 dB

** = Maximum Variation is 6.0 dB

d. Power Level Accuracy Procedure (0.01 to 2 GHz)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
1(c)	Enter 50 MHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+8.6 dBm	________ dBm	+11.4 dBm
3	Measure and record the Power Meter reading	+7.6 dBm	________ dBm	+10.4 dBm
4	Measure and record the Power Meter readings	+6.6 dBm	________ dBm	+9.4 dBm
		+5.6 dBm	________ dBm	+8.4 dBm
		+4.6 dBm	________ dBm	+7.4 dBm
		+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm

d. Power Level Accuracy Procedure (2 to 8.4 GHz)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+8.6 dBm	________ dBm	+11.4 dBm
3	Measure and record the Power Meter reading	+7.6 dBm	________ dBm	+10.4 dBm
4	Measure and record the Power Meter readings	+6.6 dBm	________ dBm	+9.4 dBm
		+5.6 dBm	________ dBm	+8.4 dBm
		+4.6 dBm	________ dBm	+7.4 dBm
		+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm

		Lower Limit	Measured Value	Upper Limit
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm

2-17. FM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. FM Input Sensitivity Procedure (Band 0; 0.01 to 2 GHz)				
2(c)	Enter 1.1 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 0; 0.01 to 2 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
6	Repeat steps d.2 through e.5 for the remaining bands.			
d. FM Input Sensitivity Procedure (Band 1; 2 to 8.4 GHz)				
2(c)	Enter 5 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 1; 2 to 8.4 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A

2-18. AM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. AM Input Sensitivity and Meter Accuracy (Band 0; 0.01 to 2 GHz)				
2(e)	Enter 1.1 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 0; 0.01 to 2 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%
6	Repeat steps d.2 through e.5 for the remaining bands.			
d. AM Input Sensitivity and Meter Accuracy (Band 1; 2 to 8.4 GHz)				
2(e)	Enter 5 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 1; 2 to 8.4 GHz)				
3	Record the number in the MODULATION display			______

4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Rise Time, Fall Time, Overshoot, and Level (Bands 0 and 1; 0.01 to 8.4 GHz)				
1(c)	Enter 5 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
d. Pulse Leveling Accuracy Check, Preliminary Test Setup				
4(b)	Enter 1.1 GHz			
e. 67XXB LEVEL Display Calibration				
1	Note the 67XXB LEVEL display value			______dBm
2	Note the 67XXB LEVEL display value			______dBm
3	Calculate the difference between steps e.1 and e.2. Note this value			______dB
f. Pulse Level Accuracy Test Procedure (Band 0, 0.01 to 2 GHz; Pulse Width = 5 µs)				
2(b)	Enter 1.1 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.6 dB	______dB	+0.6 dB
f. Pulse Level Accuracy Test Procedure (Band 0, 0.01 to 2 GHz; Pulse Width = 2 µs)				
2(b)	Enter 1.1 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.9 dB	______dB	+0.9 dB
f. Pulse Level Accuracy Test Procedure (Band 0, 0.01 to 2 GHz; Pulse Width = 1 µs)				
2(b)	Enter 1.1 GHz			
4(c)	Enter 1 µs			

6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.4 dB	______dB	+1.4 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8.4 GHz; Pulse Width = 5 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8.4 GHz; Pulse Width = 2 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8.4 GHz; Pulse Width = 1 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8.4 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8.4 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8.4 GHz; Pulse Width = 0.1 µs)				

2(b)	Enter 5 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9‘	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-20. Pulse Modulation Test: Video Feedthrough

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure (Band 0; 0.01 to 2 GHz)				
1(c)	Enter 1.1 GHz			
3	Measure and record the Video Feedthrough voltage spikes.	N/A	______mV peak	* mV peak
	* Specification: 2% maximum for power levels ≤10 dBm 5% maximum for power levels >10 dBm			
4	Repeat steps c.1 through c.3 for the remaining band.			
c. Test Procedure (Band 1; 2 to 8.4 GHz)				
1(c)	Enter 5 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak

2-21. Pulse Modulation Test: RF On/Off Ratio

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure (Band 0; 0.01 to 2 GHz)				
1(d)	Enter 1.1 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A
7	Repeat steps c.1 through c.5 for the remaining band.			
c. Test Procedure (Band 1; 2 to 8.4 GHz)				
1(d)	Enter 5 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A

WILTRON Model 6717B and 6717B-20 **Date:** ______________________

Serial Number____________________ **Tested By:** _____________________

CALIBRATION/ADJUSTMENT PERFORMANCE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-9 ALC Level Offset Adjustments		
This instrument uses two leveling circuits; Band 0 and Band 1 thru 4.		
c. Band 0 Level Offset 1.(c) 3.	Frequency = 1.1 GHz A15TP6 = 0V ±10 µV	___________volts
d. Band 1 thru 4 Level Offset 1.(b) 3.	Frequency = 5 GHz A15TP5 = 0V ±10 µV	___________volts
f. ALC Detector Shaper Level Offset 6.(c)	Frequency = 2.1 GHz Follow steps f.1 through f.21.	
3-10 External Leveling Offset Adjustment		
c.3	A15TP7 = 0V ±1 mV	___________volts
3-11 10 MHz Reference Oscillator Calibration		
c.1.(c) c.3	Frequency = 8 GHz Adjust for Frequency Counter Reading = 8 GHz ±100 Hz	___________GHz

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-12 ALC Bandwidth Calibration		
This calibration is required for each installed frequency band:		
c. 2-8.4 GHz Band 2.(c)	Frequency = 5 GHz Follow steps c.1 through c.15.	
c. 0.01-2 GHz Band 2.(c)	Frequency = 1.1 GHz Repeat steps c.7 through c.13; then steps c.16 and c.17.	
3-13 Analog Sweep Calibration		
This calibration is automatically completed for all of the installed frequency bands		
c.1.(d)	Frequency = 1.1 GHz	
3-14 YIG-tuned Oscillator Frequency Calibration		
This calibration is required for each installed frequency band:		
c. 0.01-2 GHz Band 1.(e) 5.	Frequency = 1.1 GHz Maximum difference in MHz between frequency counter and 6717B	__________MHz
c. 2-8.4 GHz Band 1.(e) 5.	Frequency = 5 GHz Maximum difference in MHz between frequency counter and 6717B	_________MHz
3-15 RF Level Calibration		
This calibration is performed using an automatic test system. Contact WILTRON Customer Service at (408) 778–2000 for further information.		

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-16 ALC Slope Adjustment This calibration is required for the ≤2 GHz level detector and for the >2 GHz level detector.		
c. 0.01-2 GHz Band 2.(d) 2.(f) 5.	F1 = 0.01 GHz F2 = 2 GHz Record the resulting waveform	Draw Waveform Flatness for the 0.01-2 GHz Band
c. 2-8.4 GHz Band 2.(d) 2.(f) 5.	F1 = 2 GHz F2 = 8.4 GHz Record the resulting waveform	Draw Waveform Flatness for the 2-8.4 GHz Band
3-17 AM Sensitivity Calibration This calibration is required for each installed frequency band:		
d. 0.01-2 GHz Band 2.(d) 8. 8. 8.	Frequency = 1.1 GHz Measure and Record AM PK(+) Measure and record AM PK(–) Calculate and record average	 __________% __________% __________%
d. 2-8.4 GHz Band 2.(d) 8. 8. 8.	Frequency = 5 GHz Measure and Record AM PK(+) Measure and record AM PK(–) Calculate and record average	 __________% __________% __________%

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-18 AM Meter Calibration		
c. Meter Calibration 2.(d)	Frequency = 1.1 GHz	
d. Meter Verification 1.(c) 1.(g)	Frequency = 1.1 GHz Measure and record AM DEPTH	__________%
3-19 FM Driver/Sensitivity Calibration		
This calibration is required for each installed frequency band:		
d. 0.01-2 GHz Band 2.(d) 8.	Frequency = 1.1 GHz Record the Waveform Null	Draw Waveform Null
d. 2-8.4 GHz Band 2.(d) 8.	Frequency = 5 GHz Record the Waveform Null	Draw Waveform Null

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-20 FM Flatness Calibration		
This calibration is required for each installed frequency band:		
d. 0.01-2 GHz Band 2.(d) 10.	Frequency = 1.1 GHz Record the Waveform	Draw Waveform
b. 2-8.4 GHz Band 2.(d) 10.	Frequency = 5 GHz Record the Waveform	Draw Waveform
3-21 FM Meter Calibration		
c. Meter Calibration	Follow steps c.1 through c.6	
d. Meter Verification 1.(c)	Measure FM Deviation	__________kHz

MODEL 6719B
SWEPT FREQUENCY SYNTHESIZER

TEST AND CALIBRATION
MANUAL

WILTRON

490 JARVIS DRIVE
MORGAN HILL, CA 95037-2809

P/N: 10370-10208
REVISION: D
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SECTION 4
TEST RECORD

CONTENTS

SECTION 4
TEST RECORDS

4-1 INTRODUCTION

This section provides two Test Record tables for recording the results of the Performance Verification Tests (in Section 2) and the Calibration/Adjustments (in Section 3). They jointly provide the means for maintaining an accurate and complete record of instrument performance.

The test record provided here has been customized for the 6719B model. It should only be used with matching procedures in Section 2 and 3 that cover the 6719B model. Specific references to frequency parameters, power levels, and non-applicable procedures make each Test Record easy to follow.

We recommend that you make a copy of these pages each time the test procedures are performed. By dating each Test Record copy, a detailed history of instrument performance can be accumulated.

4-2 PERFORMANCE VERIFICATION TEST RECORD

The Test Record for the Performance Verification procedures supplied in Section 2 is located immediately following this page.

4-3 CALIBRATION/ADJUSTMENTS TEST RECORD

The Test Record for the Calibration/Adjustment procedures supplied in Section 3 follows the Performance Verification Test Record.

NOTE

Results of the automated RF Level Calibration procedure in Section 3 are not included in this Test Record. Calibration data is stored in instrument memory. Contact the WILTRON Customer Service department at (408) 778-2000 for more details.

WILTRON Model 6719B **Date:** ______________________

Serial Number____________________ **Tested By:** _____________________

2-5. Internal Time Base Aging Rate Test

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure				
2	Record T_S value		______hours	
4	Record T_1 value		______sec	
5	Record T_2 value		______sec	
6	Record T_F value		______hours	
8	Record the calculated aging rate		______per day	5×10^{-10} per day

2-6. Frequency Synthesis Tests

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Coarse Loop/YIG Loop Test Procedure				
1(c)	Enter 2 GHz			
3	Record the Frequency Counter Reading	1.999 999 900 GHz	__________ GHz	2.000 000 100 GHz
4	Record the Frequency Counter Readings . . .	2.999 999 900 GHz	__________ GHz	3.000 000 100 GHz
		3.999 999 900 GHz	__________ GHz	4.000 000 100 GHz
		4.999 999 900 GHz	__________ GHz	5.000 000 100 GHz
		5.999 999 900 GHz	__________ GHz	6.000 000 100 GHz
		6.999 999 900 GHz	__________ GHz	7.000 000 100 GHz
		7.999 999 900 GHz	__________ GHz	8.000 000 100 GHz
d. Fine Loop Test Procedure				
1(c)	Enter 2 GHz			
2	Record the Frequency Counter Reading	1.999 999 900 GHz	__________ GHz	2.000 000 100 GHz
3	Record the Frequency Counter Reading	2.000 000 900 GHz	__________ GHz	2.000 001 100 GHz
4	Record the Frequency Counter Readings . . .	2.000 001 900 GHz	__________ GHz	2.000 002 100 GHz
		2.000 002 900 GHz	__________ GHz	2.000 003 100 GHz
		2.000 003 900 GHz	__________ GHz	2.000 004 100 GHz
		2.000 004 900 GHz	__________ GHz	2.000 005 100 GHz
		2.000 005 900 GHz	__________ GHz	2.000 006 100 GHz
		2.000 006 900 GHz	__________ GHz	2.000 007 100 GHz
		2.000 007 900 GHz	__________ GHz	2.000 008 100 GHz
		2.000 008 900 GHz	__________ GHz	2.000 009 100 GHz
		2.000 009 900 GHz	__________ GHz	2.000 010 100 GHz

2-7. Marker and Blanking Verification

Step	*Procedure Comments*	*Marker/Signal Presence*
	c. Marker Selection Procedure	
2	F1 Frequency Marker = 2 GHz	
2	Verify that a marker appears on the left side of the scope at the start of trace	_______
3(a)	F2 Frequency Marker = 8.4 GHz	
3(b)	Verify that a marker appears on the right side of the scope at the end of trace	_______
4	F3 Frequency Marker = 3 GHz	
4	Verify that a marker appears on the scope	_______
4	F4 Frequency Marker = 3.5 GHz	
4	Verify that a marker appears on the scope	_______
4	F5 Frequency Marker = 4 GHz	
4	Verify that a marker appears on the scope	_______
4	F6 Frequency Marker = 5 GHz	
4	Verify that a marker appears on the scope	_______
4	F7 Frequency Marker = 6 GHz	
4	Verify that a marker appears on the scope	_______
4	F8 Frequency Marker = 7 GHz	
4	Verify that a marker appears on the scope	_______
4	F9 Frequency Marker = 8 GHz	
4	Verify that a marker appears on the scope	_______
	d. Marker Output Verification Procedure	
1	Verify +5V (TTL high) markers at nine points on scope display	_______
3	Verify that all markers change to intensified spots	_______
5(a)	Verify +5V (TTL high) signal at retrace	_______
5(c)	Verify +5V (minimum) signal at each switched filter point:	
	3.5 GHz switch point	_______
	6.0 GHz switch point	_______
5(d)	Verify –10V (minimum) signal at selected marker frequency	_______
5(e)	Verify –5V (minimum) signal at all other marker frequencies	_______
6	Verify that new marker changes from –5V (minimum) to –10V (minimum)	_______
	Verify that previous marker changes from –10V (minimum) to –5V (minimum)	_______
	e. Retrace Blanking Output Verification Procedure	
2	Verify –5V (minimum) signal during retrace	_______
3	Verify +5V (minimum) signal during retrace	_______

2-8. Narrowband Spurious Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Fine Loop Test Procedure				
1(b)	Enter 5.1 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	10 kHz	N/A	_______dBc	–60 dBc
	20 khz	N/A	_______dBc	–60 dBc
	30 kHz	N/A	_______dBc	–60 dBc
	40 kHz	N/A	_______dBc	–60 dBc
	50 kHz	N/A	_______dBc	–60 dBc
d. Coarse Loop Test Procedure				
1(b)	Enter 5.1 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	200 kHz	N/A	_______dBc	–60 dBc
	400 khz	N/A	_______dBc	–60 dBc

2-9. Spurious and Harmonic Tests: RF Output Signals ≤2 GHz

These tests are not applicable to the 6719B model.

2-10. Harmonic Tests: RF Output Signals From 2 to 10 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure				
4	Record the level of all harmonics of the 2.1 GHz carrier:			
	4.2 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
	6.3 GHz (3rd harmonic)	N/A	_______dBc	–60 dBc
	8.4 GHz (4th harmonic)	N/A	_______dBc	–60 dBc
	10.5 GHz (5th harmonic)	N/A	_______dBc	–60 dBc
	12.6 GHz (6th harmonic)	N/A	_______dBc	–60 dBc
	14.7 GHz (7th harmonic)	N/A	_______dBc	–60 dBc
	16.8 GHz (8th harmonic)	N/A	_______dBc	–60 dBc
	18.9 GHz (9th harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 3.6 GHz carrier:			
	7.2 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
	10.8 GHz (3rd harmonic)	N/A	_______dBc	–60 dBc
	14.4 GHz (4th harmonic)	N/A	_______dBc	–60 dBc
	18 GHz (5th harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 7 GHz carrier:			
	14 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc

2-11. Harmonic Tests: RF Output Signals From 11 to 20 GHz

These tests are not applicable to the 6719B model.

2-12. Harmonic Tests (Alternate Method): RF Output Signals From 10 to 30 GHz

These tests are not applicable to the 6719B model.

2-13. Harmonic Tests : RF Output Signals From 26.5 to 40 GHz

These tests are not applicable to the 6719B model.

2-14. Harmonic Tests : RF Output Signals From 40 to 60 GHz

These tests are not applicable to the 6719B model.

2-15. Single Sideband Phase Noise Test

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure (Band 1; 2 to 8.4 GHz)				
1(c)	Enter 5.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	-67 dBc
6	100 Hz	N/A	_______dBc	-72 dBc
8	1 kHz	N/A	_______dBc	–76 dBc
10	10 kHz	N/A	_______dBc	–80 dBc
12	100 kHz	N/A	_______dBc	–98 dBc

2-16. Power Level Accuracy and Flatness Verification (6719B Models without Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Power Level Flatness Procedure			
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 0.8 dB			
	** = Maximum Variation is 2.0 dB			
	d. Power Level Accuracy Procedure			
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+12.4 dBm	________ dBm	+13.6 dBm
3	Measure and record the Power Meter reading	+11.4 dBm	________ dBm	+12.6 dBm
4	Measure and record the Power Meter readings	+10.4 dBm	________ dBm	+11.6 dBm
		+9.4 dBm	________ dBm	+10.6 dBm
		+8.4 dBm	________ dBm	+9.6 dBm
		+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6719B Models with 110 dB Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 1.6 dB			
	** = Maximum Variation is 6.0 dB			
d. Power Level Accuracy Procedure				
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+8.6 dBm	________ dBm	+11.4 dBm
3	Measure and record the Power Meter reading	+7.6 dBm	________ dBm	+10.4 dBm
4	Measure and record the Power Meter readings	+6.6 dBm	________ dBm	+9.4 dBm
		+5.6 dBm	________ dBm	+8.4 dBm
		+4.6 dBm	________ dBm	+7.4 dBm
		+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm

2-17. FM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. FM Input Sensitivity Procedure (Band 1; 2 to 8.4 GHz)				
2(c)	Enter 5 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 1; 2 to 8.4 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A

2-18. AM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. AM Input Sensitivity and Meter Accuracy (Band 1; 2 to 8.4 GHz)				
2(e)	Enter 5 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 1; 2 to 8.4 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Rise Time, Fall Time, Overshoot, and Level (Band 1; 2 to 8.4 GHz)				
1(c)	Enter 5 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
d. Pulse Leveling Accuracy Check, Preliminary Test Setup				
4(b)	Enter 5 GHz			
e. 67XXB LEVEL Display Calibration				
1	Note the 67XXB LEVEL display value			______dBm
2	Note the 67XXB LEVEL display value			______dBm
3	Calculate the difference between steps e.1 and e.2. Note this value			______dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8.4 GHz; Pulse Width = 5 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value		______dBm	
8	Record the 67XXB LEVEL display value		______dBm	
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8.4 GHz; Pulse Width = 2 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value		______dBm	
8	Record the 67XXB LEVEL display value		______dBm	
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8.4 GHz; Pulse Width = 1 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value		______dBm	
8	Record the 67XXB LEVEL display value		______dBm	
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8.4 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value		______dBm	
8	Record the 67XXB LEVEL display value		______dBm	
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8.4 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value		______dBm	
8	Record the 67XXB LEVEL display value		______dBm	
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8.4 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value		______dBm	
8	Record the 67XXB LEVEL display value		______dBm	
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-20. Pulse Modulation Test: Video Feedthrough

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure (Band 1; 2 to 8.4 GHz)			
1(c)	Enter 5 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak

2-21. Pulse Modulation Test: RF On/Off Ratio

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure (Band 1; 2 to 8.4 GHz)			
1(d)	Enter 5 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A

WILTRON Model 6719B **Date:** ______________________

Serial Number____________________ **Tested By:** ______________________

CALIBRATION/ADJUSTMENT PERFORMANCE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-9 ALC Level Offset Adjustments This instrument uses only one leveling circuit; Band 1 thru 4. d. Band 1 thru 4 Level Offset 1.(b) 3.	Frequency = 5 GHz A15TP5 = 0V ±10 µV	___________volts
f. ALC Detector Shaper Level Offset 6.(c)	Frequency = 2.1 GHz Follow steps f.1 through f.21.	
3-10 External Leveling Offset Adjustment c.3	A15TP7 = 0V ±1 mV	___________volts
3-11 10 MHz Reference Oscillator Calibration c.1.(c) c.3	Frequency = 8 GHz Adjust for Frequency Counter Reading = 8 GHz ±100 Hz	___________GHz
3-12 ALC Bandwidth Calibration This calibration is required for the installed frequency band: c. 2-8.4 GHz Band 2.(c)	Frequency = 5 GHz Follow steps c.1 through c.13; then step c.16 and c.17.	

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-13 Analog Sweep Calibration		
This calibration is automatically completed for the installed frequency band.		
c.1.(d)	Frequency = 5 GHz	
3-14 YIG-tuned Oscillator Frequency Calibration		
This calibration is required for the installed frequency band:		
c. 2-8.4 GHz Band 1.(e) 5.	Frequency = 5 GHz Maximum difference in MHz between frequency counter and 6719B	_________MHz
3-15 RF Level Calibration		
This calibration is performed using an automatic test system. Contact WILTRON Customer Service at (408) 778–2000 for further information.		

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-16 ALC Slope Adjustment		
This calibration is required for the >2 GHz level detector.		
c. 2-8.4 GHz Band		
2.(d)	F1 = 2 GHz	
2.(f)	F2 = 8.4 GHz	
5.	Record the resulting waveform	Draw Waveform Flatness for the 2-8.4 GHz Band
3-17 AM Sensitivity Calibration		
This calibration is required for the installed frequency band:		
d. 2-8.4 GHz Band		
2.(d)	Frequency = 5 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
3-18 AM Meter Calibration		
c. Meter Calibration		
2.(d)	Frequency = 5 GHz	
d. Meter Verification		
1.(c)	Frequency = 5 GHz	
1.(g)	Measure and record AM DEPTH	__________%

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-19 FM Driver/Sensitivity Calibration This calibration is required for the installed frequency band:		
d. 2-8.4 GHz Band 2.(d) 8.	Frequency = 5 GHz Record the Waveform Null	Draw Waveform Null
3-20 FM Flatness Calibration This calibration is required for the installed frequency band:		
b. 2-8.4 GHz Band 2.(d) 10.	Frequency = 5 GHz Record the Waveform	Draw Waveform
3-21 FM Meter Calibration		
c. Meter Calibration	Follow steps c.1 through c.6	
d. Meter Verification 1.(c)	Measure FM Deviation	__________kHz

MODELS
6721B AND 6721B-20
SWEPT FREQUENCY SYNTHESIZER

TEST AND CALIBRATION
MANUAL

WILTRON

490 JARVIS DRIVE
MORGAN HILL, CA 95037-2809

P/N: 10370-10210
REVISION: D
PRINTED: OCTOBER 1993

SECTION 4
TEST RECORD

CONTENTS

SECTION 4
TEST RECORDS

4-1 INTRODUCTION

This section provides two Test Record tables for recording the results of the Performance Verification Tests (in Section 2) and the Calibration/Adjustments (in Section 3). They jointly provide the means for maintaining an accurate and complete record of instrument performance.

This test record provided here has been customized for the 6721B and 6721B-20 models. It should only be used with matching procedures in Section 2 and 3 that cover the 6721B or 6721B-20 models. Specific references to frequency parameters, power levels, and non-applicable procedures make each Test Record easy to follow.

We recommend that you make a copy of these pages each time the test procedures are performed. By dating each Test Record copy, a detailed history of instrument performance can be accumulated.

4-2 PERFORMANCE VERIFICATION TEST RECORD

The Test Record for the Performance Verification procedures supplied in Section 2 is located immediately following this page.

4-3 CALIBRATION/ADJUSTMENTS TEST RECORD

The Test Record for the Calibration/Adjustment procedures supplied in Section 3 follows the Performance Verification Test Record.

NOTE

Results of the automated RF Level Calibration procedure in Section 3 are not included in this Test Record. Calibration data is stored in instrument memory. Contact the WILTRON Customer Service department at (408) 778-2000 for more details.

WILTRON Model 6721B and 6721B-20 **Date: ______________________**

Serial Number____________________ **Tested By: _____________________**

2-5. Internal Time Base Aging Rate Test

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure				
2	Record T_S value		______hours	
4	Record T_1 value		______sec	
5	Record T_2 value		______sec	
6	Record T_F value		______hours	
8	Record the calculated aging rate		______per day	5 x 10^{-10} per day

2-6. Frequency Synthesis Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Coarse Loop/YIG Loop Test Procedure				
1(c)	Enter 2 GHz			
2	Record the Frequency Counter Reading	1.999 999 900 GHz	___________ GHz	2.000 000 100 GHz
4	Record the Frequency Counter Readings . . .	2.999 999 900 GHz	___________ GHz	3.000 000 100 GHz
		3.999 999 900 GHz	___________ GHz	4.000 000 100 GHz
		4.999 999 900 GHz	___________ GHz	5.000 000 100 GHz
		5.999 999 900 GHz	___________ GHz	6.000 000 100 GHz
		6.999 999 900 GHz	___________ GHz	7.000 000 100 GHz
		7.999 999 900 GHz	___________ GHz	8.000 000 100 GHz
		8.999 999 900 GHz	___________ GHz	9.000 000 100 GHz
		9.999 999 900 GHz	___________ GHz	10.000 000 100 GHz
		10.999 999 900 GHz	___________ GHz	11.000 000 100 GHz
		11.999 999 900 GHz	___________ GHz	12.000 000 100 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. Fine Loop Test Procedure				
1(c)	Enter 2 GHz			
2	Record the Frequency Counter Reading	1.999 999 900 GHz	___________ GHz	2.000 000 100 GHz
3	Record the Frequency Counter Reading	2.000 000 900 GHz	___________ GHz	2.000 001 100 GHz
4	Record the Frequency Counter Readings . . .	2.000 001 900 GHz	___________ GHz	2.000 002 100 GHz
		2.000 002 900 GHz	___________ GHz	2.000 003 100 GHz
		2.000 003 900 GHz	___________ GHz	2.000 004 100 GHz
		2.000 004 900 GHz	___________ GHz	2.000 005 100 GHz
		2.000 005 900 GHz	___________ GHz	2.000 006 100 GHz
		2.000 006 900 GHz	___________ GHz	2.000 007 100 GHz
		2.000 007 900 GHz	___________ GHz	2.000 008 100 GHz
		2.000 008 900 GHz	___________ GHz	2.000 009 100 GHz
		2.000 009 900 GHz	___________ GHz	2.000 010 100 GHz

2-7. Marker and Blanking Verification

Step	Procedure Comments	Marker/Signal Presence
c. Marker Selection Procedure		
2	F1 Frequency Marker = 2 GHz	
2	Verify that a marker appears on the left side of the scope at the start of trace	_______
3(a)	F2 Frequency Marker = 12.4 GHz	
3(b)	Verify that a marker appears on the right side of the scope at the end of trace	_______
4	F3 Frequency Marker = 3 GHz	
4	Verify that a marker appears on the scope	_______
4	F4 Frequency Marker = 5 GHz	
4	Verify that a marker appears on the scope	_______
4	F5 Frequency Marker = 7 GHz	
4	Verify that a marker appears on the scope	_______
4	F6 Frequency Marker = 8 GHz	
4	Verify that a marker appears on the scope	_______
4	F7 Frequency Marker = 9 GHz	
4	Verify that a marker appears on the scope	_______
4	F8 Frequency Marker = 10 GHz	
4	Verify that a marker appears on the scope	_______
4	F9 Frequency Marker = 11 GHz	
4	Verify that a marker appears on the scope	_______
d. Marker Output Verification Procedure		
1	Verify +5V (TTL high) markers at nine points on scope display	_______
3	Verify that all markers change to intensified spots	_______
5(a)	Verify +5V (TTL high) signal at retrace	_______
5(b)	Verify +5V (minimum) signal at bandswitch point	_______
5(c)	Verify +5V (minimum) signal at each switched filter point:	
	3.5 GHz switch point	_______
	6.0 GHz switch point	_______
5(d)	Verify –10V (minimum) signal at selected marker frequency	_______
5(e)	Verify –5V (minimum) signal at all other marker frequencies	_______
6	Verify that new marker changes from –5V (minimum) to –10V (minimum)	_______
	Verify that previous marker changes from –10V (minimum) to –5V (minimum)	_______
e. Retrace Blanking Output Verification Procedure		
2	Verify –5V (minimum) signal during retrace	_______
3	Verify +5V (minimum) signal during retrace	_______
f. Bandswitch Blanking Output Verification Procedure		
2	Verify +5V (minimum) signal during the following bandswitch dwell point:	
	8.0 GHz bandswitch dwell point	_______
3	Verify –5V (minimum) signal during the following bandswitch point:	
	8.0 GHz bandswitch dwell point	_______

2-8. Narrowband Spurious Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Fine Loop Test Procedure				
1(b)	Enter 5.1 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	10 kHz	N/A	_______dBc	–60 dBc
	20 khz	N/A	_______dBc	–60 dBc
	30 kHz	N/A	_______dBc	–60 dBc
	40 kHz	N/A	_______dBc	–60 dBc
	50 kHz	N/A	_______dBc	–60 dBc
d. Coarse Loop Test Procedure				
1(b)	Enter 10.3 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	200 kHz	N/A	_______dBc	–60 dBc
	400 khz	N/A	_______dBc	–60 dBc

2-9. Spurious and Harmonic Tests: RF Output Signals ≤2 GHz

These tests are not applicable to the 6721B and 6721B-20 models.

2-10. Harmonic Tests: RF Output Signals From 2 to 10 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure				
4	Record the level of all harmonics of the 2.1 GHz carrier:			
	4.2 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
	6.3 GHz (3rd harmonic)	N/A	_______dBc	–60 dBc
	8.4 GHz (4th harmonic)	N/A	_______dBc	–60 dBc
	10.5 GHz (5th harmonic)	N/A	_______dBc	–60 dBc
	12.6 GHz (6th harmonic)	N/A	_______dBc	–60 dBc
	14.7 GHz (7th harmonic)	N/A	_______dBc	–60 dBc
	16.8 GHz (8th harmonic)	N/A	_______dBc	–60 dBc
	18.9 GHz (9th harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 3.6 GHz carrier:			
	7.2 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
	10.8 GHz (3rd harmonic)	N/A	_______dBc	–60 dBc
	14.4 GHz (4th harmonic)	N/A	_______dBc	–60 dBc
	18 GHz (5th harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 7 GHz carrier:			
	14 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 10 GHz carrier:			
	20 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc

2-11. Harmonic Tests: RF Output Signals From 11 to 20 GHz

These tests are not applicable to the 6721B and 6721B-20 models.

2-12. Harmonic Tests (Alternate Method): RF Output Signals From 10 to 30 GHz

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure				
2(c)	Enter 10 GHz			
4	Measure and record the difference between RF levels above and below filter cutoff.			
	10 to 12.4 GHz harmonic level	N/A	_______dBc	–60 dBc

2-13. Harmonic Tests : RF Output Signals From 26.5 to 40 GHz

These tests are not applicable to the 6721B and 6721B-20 models.

2-14. Harmonic Tests : RF Output Signals From 40 to 60 GHz

These tests are not applicable to the 6721B and 6721B-20 models.

2-15. Single Sideband Phase Noise Test

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure (Band 1; 2 to 8 GHz)				
1(c)	Enter 5.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–67 dBc
6	100 Hz	N/A	_______dBc	–72 dBc
8	1 kHz	N/A	_______dBc	–76 dBc
10	10 kHz	N/A	_______dBc	–80 dBc
12	100 kHz	N/A	_______dBc	–98 dBc
13	Repeat steps c.1 through c.12 for the remaining band.			
c. Test Procedure (Band 2; 8 to 12.4 GHz)				
1(c)	Enter 10.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–64 dBc
6	100 Hz	N/A	_______dBc	–69 dBc
8	1 kHz	N/A	_______dBc	–73 dBc
10	10 kHz	N/A	_______dBc	–77 dBc
12	100 kHz	N/A	_______dBc	–100 dBc

2-16. Power Level Accuracy and Flatness Verification (6721B Models without Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 0.8 dB			
	** = Maximum Variation is 2.0 dB			
d. Power Level Accuracy Procedure (2 to 8 GHz)				
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
d. Power Level Accuracy Procedure (8 to 12.4 GHz)				
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm

2-16. Power Level Accuracy and Flatness Verification (6721B Models with 110 dB Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 1.6 dB			
	** = Maximum Variation is 6.0 dB			
d. Power Level Accuracy Procedure (2 to 8 GHz)				
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
d. Power Level Accuracy Procedure (8 to 12.4 GHz)				
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6721B-20 Models without Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Power Level Flatness Procedure			
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 0.8 dB			
	** = Maximum Variation is 2.0 dB			
	d. Power Level Accuracy Procedure (2 to 8 GHz)			
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+12.4 dBm	________ dBm	+13.6 dBm
3	Measure and record the Power Meter reading	+11.4 dBm	________ dBm	+12.6 dBm
4	Measure and record the Power Meter readings	+10.4 dBm	________ dBm	+11.6 dBm
		+9.4 dBm	________ dBm	+10.6 dBm
		+8.4 dBm	________ dBm	+9.6 dBm
		+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
	d. Power Level Accuracy Procedure (8 to 12.4 GHz)			
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+12.4 dBm	________ dBm	+13.6 dBm
3	Measure and record the Power Meter reading	+11.4 dBm	________ dBm	+12.6 dBm
4	Measure and record the Power Meter readings	+10.4 dBm	________ dBm	+11.6 dBm
		+9.4 dBm	________ dBm	+10.6 dBm
		+8.4 dBm	________ dBm	+9.6 dBm
		+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6721B-20 Models with 110 dB Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 1.6 dB			
	** = Maximum Variation is 6.0 dB			
d. Power Level Accuracy Procedure (2 to 8 GHz)				
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+8.6 dBm	________ dBm	+11.4 dBm
3	Measure and record the Power Meter reading	+7.6 dBm	________ dBm	+10.4 dBm
4	Measure and record the Power Meter readings	+6.6 dBm	________ dBm	+9.4 dBm
		+5.6 dBm	________ dBm	+8.4 dBm
		+4.6 dBm	________ dBm	+7.4 dBm
		+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
d. Power Level Accuracy Procedure (8 to 12.4 GHz)				
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+8.6 dBm	________ dBm	+11.4 dBm
3	Measure and record the Power Meter reading	+7.6 dBm	________ dBm	+10.4 dBm
4	Measure and record the Power Meter readings	+6.6 dBm	________ dBm	+9.4 dBm
		+5.6 dBm	________ dBm	+8.4 dBm
		+4.6 dBm	________ dBm	+7.4 dBm
		+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm

2-17. FM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. FM Input Sensitivity Procedure (Band 1; 2 to 8 GHz)				
2(c)	Enter 5 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 1; 2 to 8 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
6	Repeat steps d.2 through e.5 for the remaining bands.			
d. FM Input Sensitivity Procedure (Band 2; 8 to 12.4 GHz)				
2(c)	Enter 10 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 2; 8 to 12.4 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A

2-18. AM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. AM Input Sensitivity and Meter Accuracy (Band 1; 2 to 8 GHz)				
2(e)	Enter 5 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 1; 2 to 8 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%
6	Repeat steps d.2 through e.5 for the remaining bands.			
d. AM Input Sensitivity and Meter Accuracy (Band 2; 8 to 12.4 GHz)				
2(e)	Enter 10 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 2; 8 to 12.4 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Rise Time, Fall Time, Overshoot, and Level (Band 1; 2 to 8 GHz)				
1(c)	Enter 5 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
c. Rise Time, Fall Time, Overshoot, and Level (Band 2; 8 to 12.4 GHz)				
1(c)	Enter 10 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
d. Pulse Leveling Accuracy Check, Preliminary Test Setup				
4(b)	Enter 5 GHz			
e. 67XXB LEVEL Display Calibration				
1	Note the 67XXB LEVEL display value			______dBm
2	Note the 67XXB LEVEL display value			______dBm
3	Calculate the difference between steps e.1 and e.2. Note this value			______dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 5 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 2 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 1 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 5 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 2 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 1 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-20. Pulse Modulation Test: Video Feedthrough

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure (Band 1; 2 to 8 GHz)			
1(c)	Enter 5 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak
4	Repeat steps c.1 through c.3 for the remaining bands.			
	c. Test Procedure (Band 2; 8 to 12.4 GHz)			
1(c)	Enter 10 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak

2-21. Pulse Modulation Test: RF On/Off Ratio

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure (Band 1; 2 to 8 GHz)			
1(d)	Enter 5 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A
7	Repeat steps c.1 through c.5 for the remaining band.			
	c. Test Procedure (Band 2; 8 to 12.4 GHz)			
1(d)	Enter 10 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A

WILTRON Model 6721B and 6721B-20 **Date:** ______________________

Serial Number____________________ **Tested By:** _____________________

CALIBRATION/ADJUSTMENT PERFORMANCE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-9 ALC Level Offset Adjustments		
This instrument uses only one leveling circuit; Band 1 thru 4.		
d. Band 1 thru 4 Level Offset 1.(b) 3.	Frequency = 5 GHz A15TP5 = 0V ±10 µV	___________volts
f. ALC Detector Shaper Level Offset 6.(c)	Frequency = 2.1 GHz Follow steps f.1 through f.21.	
3-10 External Leveling Offset Adjustment		
c.3	A15TP7 = 0V ±1 mV	___________volts
3-11 10 MHz Reference Oscillator Calibration		
c.1.(c) c.3	Frequency = 12 GHz Adjust for Frequency Counter Reading = 12 GHz ±100 Hz	___________GHz
3-12 ALC Bandwidth Calibration		
This calibration is required for each installed frequency band:		
c. 2-8 GHz Band 2.(c)	Frequency = 5 GHz Follow steps c.1 through c.15.	
c. 8-12.4 GHz Band 2.(c)	Frequency = 10 GHz Repeat steps c.7 through c.13; then steps c.16 and c.17.	

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-13 Analog Sweep Calibration		
This calibration is automatically completed for all of the installed frequency bands		
c.1.(d)	Frequency = 5 GHz	
3-14 YIG-tuned Oscillator Frequency Calibration		
This calibration is required for each installed frequency band:		
c. 2-8 GHz Band		
1.(e)	Frequency = 5 GHz	
5.	Maximum difference in MHz between frequency counter and 6721B	__________MHz
c. 8-12.4 GHz Band		
1.(e)	Frequency = 10 GHz	
5.	Maximum difference in MHz between frequency counter and 6721B	_________MHz
3-15 RF Level Calibration		
This calibration is performed using an automatic test system. Contact WILTRON Customer Service at (408) 778–2000 for further information.		

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-16 ALC Slope Adjustment		
This calibration is required for the >2 GHz level detector.		
c. 2-12.4 GHz Band		
2.(d)	F1 = 2 GHz	
2.(f)	F2 = 12.4 GHz	
5.	Record the resulting waveform	Draw Waveform Flatness for the 2-12.4 GHz Band
3-17 AM Sensitivity Calibration		
This calibration is required for each installed frequency band:		
d. 2-8 GHz Band		
2.(d)	Frequency = 5 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
d. 8-12.4 GHz Band		
2.(d)	Frequency = 10 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-18 AM Meter Calibration		
c. Meter Calibration 2.(d)	Frequency = 5 GHz	
d. Meter Verification 1.(c) 1.(g)	Frequency = 5 GHz Measure and record AM DEPTH	__________%
3-19 FM Driver/Sensitivity Calibration		
This calibration is required for each installed frequency band:		
d. 2-8 GHz Band 2.(d) 8.	Frequency = 5 GHz Record the Waveform Null	Draw Waveform Null
d. 8-12.4 GHz Band 2.(d) 8.	Frequency = 10 GHz Record the Waveform Null	Draw Waveform Null

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-20 FM Flatness Calibration		
This calibration is required for each installed frequency band:		
d. 2-8 GHz Band 2.(d) 10.	Frequency = 5 GHz Record the Waveform	Draw Waveform
b. 8-12.4 GHz Band 2.(d) 10.	Frequency = 10 GHz Record the Waveform	Draw Waveform
3-21 FM Meter Calibration		
c. Meter Calibration	Follow steps c.1 through c.6	
d. Meter Verification 1.(c)	Measure FM Deviation	__________kHz

MODELS
6722B AND 6722B-20
SWEPT FREQUENCY SYNTHESIZER

TEST AND CALIBRATION
MANUAL

WILTRON

490 JARVIS DRIVE
MORGAN HILL, CA 95037-2809

P/N: 10370-10212
REVISION: D
PRINTED: OCTOBER 1993

SECTION 4
TEST RECORD

CONTENTS

SECTION 4
TEST RECORDS

4-1 INTRODUCTION

This section provides two Test Record tables for recording the results of the Performance Verification Tests (in Section 2) and the Calibration/Adjustments (in Section 3). They jointly provide the means for maintaining an accurate and complete record of instrument performance.

This test record provided here has been customized for the 6722B and 6722B-20 models. It should only be used with matching procedures in Section 2 and 3 that cover the 6722B or 6722B-20 models. Specific references to frequency parameters, power levels, and non-applicable procedures make each Test Record easy to follow.

We recommend that you make a copy of these pages each time the test procedures are performed. By dating each Test Record copy, a detailed history of instrument performance can be accumulated.

4-2 PERFORMANCE VERIFICATION TEST RECORD

The Test Record for the Performance Verification procedures supplied in Section 2 is located immediately following this page.

4-3 CALIBRATION/ADJUSTMENTS TEST RECORD

The Test Record for the Calibration/Adjustment procedures supplied in Section 3 follows the Performance Verification Test Record.

NOTE

Results of the automated RF Level Calibration procedure in Section 3 are not included in this Test Record. Calibration data is stored in instrument memory. Contact the WILTRON Customer Service department at (408) 778-2000 for more details.

WILTRON Model 6722B and 6722B-20 **Date: ______________________**

Serial Number____________________ **Tested By: ______________________**

2-5. Internal Time Base Aging Rate Test

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure				
2	Record T_S value		______hours	
4	Record T_1 value		______sec	
5	Record T_2 value		______sec	
6	Record T_F value		______hours	
8	Record the calculated aging rate		______per day	5×10^{-10} per day

2-6. Frequency Synthesis Tests

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Coarse Loop/YIG Loop Test Procedure				
1(c)	Enter 1 GHz			
2	Record the Frequency Counter Reading	0.999 999 900 GHz	__________ GHz	1.000 000 100 GHz
3	Record the Frequency Counter Reading	1.999 999 900 GHz	__________ GHz	2.000 000 100 GHz
4	Record the Frequency Counter Readings . . .	2.999 999 900 GHz	__________ GHz	3.000 000 100 GHz
		3.999 999 900 GHz	__________ GHz	4.000 000 100 GHz
		4.999 999 900 GHz	__________ GHz	5.000 000 100 GHz
		5.999 999 900 GHz	__________ GHz	6.000 000 100 GHz
		6.999 999 900 GHz	__________ GHz	7.000 000 100 GHz
		7.999 999 900 GHz	__________ GHz	8.000 000 100 GHz
		8.999 999 900 GHz	__________ GHz	9.000 000 100 GHz
		9.999 999 900 GHz	__________ GHz	10.000 000 100 GHz
		10.999 999 900 GHz	__________ GHz	11.000 000 100 GHz
		11.999 999 900 GHz	__________ GHz	12.000 000 100 GHz
d. Fine Loop Test Procedure				
1(c)	Enter 1 GHz			
2	Record the Frequency Counter Reading	0.999 999 900 GHz	__________ GHz	1.000 000 100 GHz
3	Record the Frequency Counter Reading	1.000 000 900 GHz	__________ GHz	1.000 001 100 GHz
4	Record the Frequency Counter Readings . . .	1.000 001 900 GHz	__________ GHz	1.000 002 100 GHz
		1.000 002 900 GHz	__________ GHz	1.000 003 100 GHz
		1.000 003 900 GHz	__________ GHz	1.000 004 100 GHz
		1.000 004 900 GHz	__________ GHz	1.000 005 100 GHz
		1.000 005 900 GHz	__________ GHz	1.000 006 100 GHz
		1.000 006 900 GHz	__________ GHz	1.000 007 100 GHz
		1.000 007 900 GHz	__________ GHz	1.000 008 100 GHz
		1.000 008 900 GHz	__________ GHz	1.000 009 100 GHz
		1.000 009 900 GHz	__________ GHz	1.000 010 100 GHz

2-7. Marker and Blanking Verification

Step	Procedure Comments	Marker/Signal Presence
c. Marker Selection Procedure		
2	F1 Frequency Marker = 0.01 GHz	
2	Verify that a marker appears on the left side of the scope at the start of trace	_______
3(a)	F2 Frequency Marker = 12.4 GHz	
3(b)	Verify that a marker appears on the right side of the scope at the end of trace	_______
4	F3 Frequency Marker = 2 GHz	
4	Verify that a marker appears on the scope	_______
4	F4 Frequency Marker = 3 GHz	
4	Verify that a marker appears on the scope	_______
4	F5 Frequency Marker = 5 GHz	
4	Verify that a marker appears on the scope	_______
4	F6 Frequency Marker = 6 GHz	
4	Verify that a marker appears on the scope	_______
4	F7 Frequency Marker = 8 GHz	
4	Verify that a marker appears on the scope	_______
4	F8 Frequency Marker = 10 GHz	
4	Verify that a marker appears on the scope	_______
4	F9 Frequency Marker = 11 GHz	
4	Verify that a marker appears on the scope	_______
d. Marker Output Verification Procedure		
1	Verify +5V (TTL high) markers at nine points on scope display	_______
3	Verify that all markers change to intensified spots	_______
5(a)	Verify +5V (TTL high) signal at retrace	_______
5(b)	Verify +5V (minimum) signal at bandswitch point	_______
5(c)	Verify +5V (minimum) signal at each switched filter point:	
	3.5 GHz switch point	_______
	6.0 GHz switch point	_______
5(d)	Verify –10V (minimum) signal at selected marker frequency	_______
5(e)	Verify –5V (minimum) signal at all other marker frequencies	_______
6	Verify that new marker changes from –5V (minimum) to –10V (minimum)	_______
	Verify that previous marker changes from –10V (minimum) to –5V (minimum)	_______
e. Retrace Blanking Output Verification Procedure		
2	Verify –5V (minimum) signal during retrace	_______
3	Verify +5V (minimum) signal during retrace	_______
f. Bandswitch Blanking Output Verification Procedure		
2	Verify +5V (minimum) signal during the following bandswitch dwell points:	
	2.0 GHz bandswitch dwell point	_______
	8.0 GHz bandswitch dwell point	_______
3	Verify –5V (minimum) signal during the following bandswitch dwell points:	
	2.0 GHz bandswitch dwell point	_______
	8.0 GHz bandswitch dwell point	_______

2-8. Narrowband Spurious Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Fine Loop Test Procedure				
1(b)	Enter 2.1 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	10 kHz	N/A	_______dBc	–60 dBc
	20 khz	N/A	_______dBc	–60 dBc
	30 kHz	N/A	_______dBc	–60 dBc
	40 kHz	N/A	_______dBc	–60 dBc
	50 kHz	N/A	_______dBc	–60 dBc
d. Coarse Loop Test Procedure				
1(b)	Enter 10.3 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	200 kHz	N/A	_______dBc	–60 dBc
	400 khz	N/A	_______dBc	–60 dBc

2-9. Spurious and Harmonic Tests: RF Output Signals ≤2 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure				
3	Record the presence of the worst case harmonic of the 10 MHz carrier	N/A	_______dBc	–40 dBc*
3	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc**
4	Record the presence of the worst case harmonic of the 20 MHz carrier	N/A	_______dBc	–40 dBc*
4	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc**
4	Record the presence of the worst case harmonic of the 30 MHz carrier	N/A	_______dBc	–40 dBc*
4	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc**
6	Record the presence of the worst case harmonic of the 40 MHz carrier	N/A	_______dBc	–40 dBc*
6	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc**
8	Record the presence of the worst case harmonic of the 350 MHz carrier	N/A	_______dBc	–40 dBc*
8	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc**
9	Record the presence of the worst case spurious response of the 1.6 GHz carrier on the Spectrum Analyzer display	N/A	_______dBc	–60 dBc**
12	Record the level of harmonics of the 1.6 GHz carrier:			
	3.2 GHz (2nd harmonic)	N/A	_______dBc	–40 dBc*
	4.8 GHz (3rd harmonic)	N/A	_______dBc	–40 dBc*

* = –30 dBc for the 6722B-20 model.

** = –50 dBc for the 6722B-20 model.

2-10. Harmonic Tests: RF Output Signals From 2 to 10 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure				
4	Record the level of all harmonics of the 2.1 GHz carrier:			
	4.2 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
	6.3 GHz (3rd harmonic)	N/A	_______dBc	–60 dBc
	8.4 GHz (4th harmonic)	N/A	_______dBc	–60 dBc
	10.5 GHz (5th harmonic)	N/A	_______dBc	–60 dBc
	12.6 GHz (6th harmonic)	N/A	_______dBc	–60 dBc
	14.7 GHz (7th harmonic)	N/A	_______dBc	–60 dBc
	16.8 GHz (8th harmonic)	N/A	_______dBc	–60 dBc
	18.9 GHz (9th harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 3.6 GHz carrier:			
	7.2 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
	10.8 GHz (3rd harmonic)	N/A	_______dBc	–60 dBc
	14.4 GHz (4th harmonic)	N/A	_______dBc	–60 dBc
	18 GHz (5th harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 7 GHz carrier:			
	14 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 10 GHz carrier:			
	20 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc

2-11. Harmonic Tests: RF Output Signals From 11 to 20 GHz

These tests are not applicable to the 6722B and 6722B-20 models.

2-12. Harmonic Tests (Alternate Method): RF Output Signals From 10 to 30 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure)				
2(c)	Enter 10 GHz			
4	Measure and record the difference between RF levels above and below filter cutoff.			
	10 to 12.4 GHz harmonic level	N/A	_______dBc	–60 dBc

2-13. Harmonic Tests: RF Output Signals From 26.5 to 40 GHz

These tests are not applicable to the 6722B and 6722B-20 models.

2-14. Harmonic Tests: RF Output Signals From 40 to 60 GHz

These tests are not applicable to the 6722B and 6722B-20 models.

2-15. Single Sideband Phase Noise Test

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure (Band 0; 0.01 to 2 GHz)				
1(c)	Enter 1.0 GHz Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–67 dBc
6	100 Hz	N/A	_______dBc	–72 dBc
8	1 kHz	N/A	_______dBc	–76 dBc
10	10 kHz	N/A	_______dBc	–80 dBc
12	100 kHz	N/A	_______dBc	–98 dBc
13	Repeat steps c.1 through c.12 for the remaining bands.			
c. Test Procedure (Band 1; 2 to 8.4 GHz)				
1(c)	Enter 5.0 GHz Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–67 dBc
6	100 Hz	N/A	_______dBc	–72 dBc
8	1 kHz	N/A	_______dBc	–76 dBc
10	10 kHz	N/A	_______dBc	–80 dBc
12	100 kHz	N/A	_______dBc	–98 dBc
c. Test Procedure (Band 2; 8 to 12.4 GHz)				
1(c)	Enter 10.0 GHz Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–64 dBc
6	100 Hz	N/A	_______dBc	–69 dBc
8	1 kHz	N/A	_______dBc	–73 dBc
10	10 kHz	N/A	_______dBc	–77 dBc
12	100 kHz	N/A	_______dBc	–100 dBc

2-16. Power Level Accuracy and Flatness Verification (6722B Models without Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 0.8 dB			
	** = Maximum Variation is 2.0 dB			
d. Power Level Accuracy Procedure (0.01 to 2 GHz)				
1(c)	Enter 50 MHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
d. Power Level Accuracy Procedure (2 to 8 GHz)				
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm

2-16. Power Level Accuracy and Flatness Verification (6722B Models without Optional Attenuator) (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	d. Power Level Accuracy Procedure (8 to 12.4 GHz)			
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm

2-16. Power Level Accuracy and Flatness Verification (6722B Models with 110 dB Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Power Level Flatness Procedure			
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 1.6 dB			
	** = Maximum Variation is 6.0 dB			
	d. Power Level Accuracy Procedure (0.01 to 2 GHz)			
1(c)	Enter 50 MHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6722B Models with 110 dB Optional Attenuator) (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. Power Level Accuracy Procedure (2 to 8 GHz)				
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
d. Power Level Accuracy Procedure (8 to 12.4 GHz)				
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6722B-20 Models without Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Power Level Flatness Procedure			
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 0.8 dB			
	** = Maximum Variation is 2.0 dB			
	d. Power Level Accuracy Procedure (0.01 to 2 GHz)			
1(c)	Enter 50 MHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+12.4 dBm	________ dBm	+13.6 dBm
3	Measure and record the Power Meter reading	+11.4 dBm	________ dBm	+12.6 dBm
4	Measure and record the Power Meter readings	+10.4 dBm	________ dBm	+11.6 dBm
		+9.4 dBm	________ dBm	+10.6 dBm
		+8.4 dBm	________ dBm	+9.6 dBm
		+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
	d. Power Level Accuracy Procedure (2 to 8 GHz)			
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+12.4 dBm	________ dBm	+13.6 dBm
3	Measure and record the Power Meter reading	+11.4 dBm	________ dBm	+12.6 dBm
4	Measure and record the Power Meter readings	+10.4 dBm	________ dBm	+11.6 dBm
		+9.4 dBm	________ dBm	+10.6 dBm
		+8.4 dBm	________ dBm	+9.6 dBm
		+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6722B-20 Models without Optional Attenuator) (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. Power Level Accuracy Procedure (8 to 12.4 GHz)				
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+12.4 dBm	________ dBm	+13.6 dBm
3	Measure and record the Power Meter reading	+11.4 dBm	________ dBm	+12.6 dBm
4	Measure and record the Power Meter readings	+10.4 dBm	________ dBm	+11.6 dBm
		+9.4 dBm	________ dBm	+10.6 dBm
		+8.4 dBm	________ dBm	+9.6 dBm
		+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6722B-20 Models with 110 dB Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	

* = Maximum Variation is 1.6 dB

** = Maximum Variation is 6.0 dB

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. Power Level Accuracy Procedure (0.01 to 2 GHz)				
1(c)	Enter 50 MHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+8.6 dBm	________ dBm	+11.4 dBm
3	Measure and record the Power Meter reading	+7.6 dBm	________ dBm	+10.4 dBm
4	Measure and record the Power Meter readings	+6.6 dBm	________ dBm	+9.4 dBm
		+5.6 dBm	________ dBm	+8.4 dBm
		+4.6 dBm	________ dBm	+7.4 dBm
		+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6722B-20 Models with 110 dB Optional Attenuator) (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. Power Level Accuracy Procedure (2 to 8 GHz)				
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+8.6 dBm	________ dBm	+11.4 dBm
3	Measure and record the Power Meter reading	+7.6 dBm	________ dBm	+10.4 dBm
4	Measure and record the Power Meter readings	+6.6 dBm	________ dBm	+9.4 dBm
		+5.6 dBm	________ dBm	+8.4 dBm
		+4.6 dBm	________ dBm	+7.4 dBm
		+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
d. Power Level Accuracy Procedure (8 to 12.4 GHz)				
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+8.6 dBm	________ dBm	+11.4 dBm
3	Measure and record the Power Meter reading	+7.6 dBm	________ dBm	+10.4 dBm
4	Measure and record the Power Meter readings	+6.6 dBm	________ dBm	+9.4 dBm
		+5.6 dBm	________ dBm	+8.4 dBm
		+4.6 dBm	________ dBm	+7.4 dBm
		+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm

2-17. FM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. FM Input Sensitivity Procedure (Band 0; 0.01 to 2 GHz)				
2(c)	Enter 1.1 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 0; 0.01 to 2 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
6	Repeat steps d.2 through e.5 for the remaining bands.			
d. FM Input Sensitivity Procedure (Band 1; 2 to 8 GHz)				
2(c)	Enter 5 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 1; 2 to 8 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
d. FM Input Sensitivity Procedure (Band 2; 8 to 12.4 GHz)				
2(c)	Enter 10 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 2; 8 to 12.4 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A

2-18. AM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. AM Input Sensitivity and Meter Accuracy (Band 0; 0.01 to 2 GHz)				
2(e)	Enter 1.1 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 0; 0.01 to 2 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%
6	Repeat steps d.2 through e.5 for the remaining bands.			
d. AM Input Sensitivity and Meter Accuracy (Band 1; 2 to 8 GHz)				
2(e)	Enter 5 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 1; 2 to 8 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%
d. AM Input Sensitivity and Meter Accuracy (Band 2; 8 to 12.4 GHz)				
2(e)	Enter 10 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 2; 8 to 12.4 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Rise Time, Fall Time, Overshoot, and Level (Bands 0 and 1; 0.01 to 8 GHz)				
1(c)	Enter 5 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
c. Rise Time, Fall Time, Overshoot, and Level (Band 2; 8 to 12.4 GHz)				
1(c)	Enter 10 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
d. Pulse Leveling Accuracy Check, Preliminary Test Setup				
4(b)	Enter 1.1 GHz			
e. 67XXB LEVEL Display Calibration				
1	Note the 67XXB LEVEL display value			______dBm
2	Note the 67XXB LEVEL display value			______dBm
3	Calculate the difference between steps e.1 and e.2. Note this value			______dB
f. Pulse Level Accuracy Test Procedure (Band 0, 0.01 to 2 GHz; Pulse Width = 5µs)				
2(b)	Enter 1.1 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.6 dB	______dB	+0.6 dB
f. Pulse Level Accuracy Test Procedure (Band 0, 0.01 to 2 GHz; Pulse Width = 2µs)				
2(b)	Enter 1.1 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.9 dB	______dB	+0.9 dB
f. Pulse Level Accuracy Test Procedure (Band 0, 0.01 to 2 GHz; Pulse Width = 1µs)				
2(b)	Enter 1.1 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.4 dB	______dB	+1.4 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 5 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 2 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 1 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9				

	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 5 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 2 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 1 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm

9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-20. Pulse Modulation Test: Video Feedthrough

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
	c. Test Procedure (Band 0; 0.01 to 2 GHz)			
1(c)	Enter 1.1 GHz			
3	Measure and record the Video Feedthrough voltage spikes.	N/A	______mV peak	* mV peak
	* Specification: 2% maximum for power levels ≤10 dBm 5% maximum for power levels >10 dBm			
4	Repeat steps c.1 through c.3 for the remaining bands.			
	c. Test Procedure (Band 1; 2 to 8 GHz)			
1(c)	Enter 5 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak
	c. Test Procedure (Band 2; 8 to 12.4 GHz)			
1(c)	Enter 10 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak

2-21. Pulse Modulation Test: RF On/Off Ratio

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
	c. Test Procedure (Band 0; 0.01 to 2 GHz)			
1(d)	Enter 1.1 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A
7	Repeat steps c.1 through c.5 for the remaining bands.			
	c. Test Procedure (Band 1; 2 to 8 GHz)			
1(d)	Enter 5 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A
	c. Test Procedure (Band 2; 8 to 12.4 GHz)			
1(d)	Enter 10 GHz			
4				

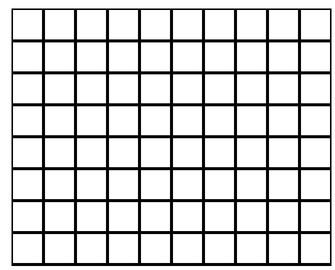
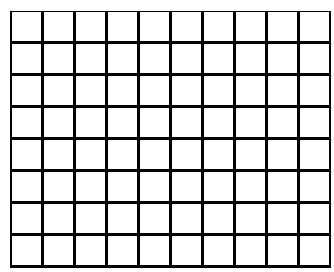
Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A

WILTRON Model 6722B and 6722B-20 **Date:** ______________________

Serial Number____________________ **Tested By:** _____________________

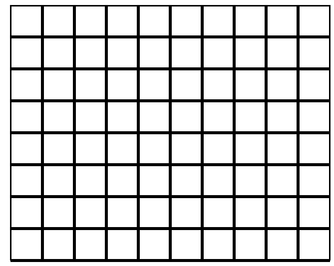
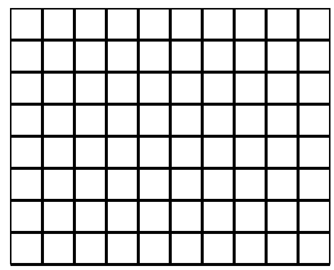
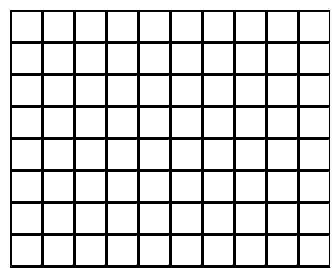
CALIBRATION/ADJUSTMENT PERFORMANCE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-9 ALC Level Offset Adjustments		
This instrument uses two leveling circuits; Band 0 and Bands 1 thru 4.		
c. Band 0 Level Offset 1.(c) 3.	Frequency = 1.1 GHz A15TP6 = 0V ±10 µV	___________volts
d. Band 1 thru 4 Level Offset 1.(b) 3.	Frequency = 5 GHz A15TP5 = 0V ±10 µV	___________volts
f. ALC Detector Shaper Level Offset 6.(c)	Frequency = 2.1 GHz Follow steps f.1 through f.21.	
3-10 External Leveling Offset Adjustment		
c.3	A15TP7 = 0V ±1 mV	___________volts
3-11 10 MHz Reference Oscillator Calibration		
c.1.(c) c.3	Frequency = 12 GHz Adjust for Frequency Counter Reading = 12 GHz ±100 Hz	___________GHz

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-12 ALC Bandwidth Calibration		
This calibration is required for each installed frequency band:		
c. 2-8 GHz Band 2.(c)	Frequency = 5 GHz Repeat steps c.1 through c.15.	
c. 0.01-2 GHz Band 2.(c)	Frequency = 1.1 GHz Follow steps c.7 through c.15.	
c. 8-12.4 GHz Band 2.(c)	Frequency = 10 GHz Repeat steps c.7 through c.13; then steps c.16 and c.17.	
3-13 Analog Sweep Calibration		
This calibration is automatically completed for all of the installed frequency bands		
c.1.(d)	Frequency = 1.1 GHz	
3-14 YIG-tuned Oscillator Frequency Calibration		
This calibration is required for each installed frequency band:		
c. 0.01-2 GHz Band 1.(e) 5.	Frequency = 1.1 GHz Maximum difference in MHz between frequency counter and 6722B	__________MHz
c. 2-8 GHz Band 1.(e) 5.	Frequency = 5 GHz Maximum difference in MHz between frequency counter and 6722B	_________MHz
c. 8-12.4 GHz Band 1.(e) 5.	Frequency = 10 GHz Maximum difference in MHz between frequency counter and 6722B	__________MHz

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-15 RF Level Calibration This calibration is performed using an automatic test system. Contact WILTRON Customer Service at (408) 778–2000 for further information.		
.3-16 ALC Slope Adjustment This calibration is required for the ≤2 GHz level detector and for the >2 GHz level detector.		
c. 0.01-2 GHz Band 2.(d) 2.(f) 5.	F1 = 0.01 GHz F2 = 2 GHz Record the resulting waveform	 Draw Waveform Flatness for the 0.01-2 GHz Band
c. 2-12.4 GHz Band 2.(d) 2.(f) 5.	F1 = 2 GHz F2 = 12.4 GHz Record the resulting waveform	 Draw Waveform Flatness for the 2-12.4 GHz Band

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-17 AM Sensitivity Calibration		
This calibration is required for each installed frequency band:		
d. 0.01-2 GHz Band		
2.(d)	Frequency = 1.1 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
d. 2-8 GHz Band		
2.(d)	Frequency = 5 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
d. 8-12.4 GHz Band		
2.(d)	Frequency = 10 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
3-18 AM Meter Calibration		
c. Meter Calibration		
2.(d)	Frequency = 1.1 GHz	
d. Meter Verification		
1.(c)	Frequency = 1.1 GHz	
1.(g)	Measure and record AM DEPTH	__________%

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-19 FM Driver/Sensitivity Calibration This calibration is required for each installed frequency band:		
d. 0.01-2 GHz Band 2.(d) 8.	Frequency = 1.1 GHz Record the Waveform Null	Draw Waveform Null
d. 2-8 GHz Band 2.(d) 8.	Frequency = 5 GHz Record the Waveform Null	Draw Waveform Null
d. 8-12.4 GHz Band 2.(d) 8.	Frequency = 10 GHz Record the Waveform Null	Draw Waveform Null

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-20 FM Flatness Calibration This calibration is required for each installed frequency band:		
d. 0.01-2 GHz Band 2.(d) 10.	Frequency = 1.1 GHz Record the Waveform	 Draw Waveform
b. 2-8 GHz Band 2.(d) 10.	Frequency = 5 GHz Record the Waveform	 Draw Waveform
d. 8-12.4 GHz Band 2.(d) 10.	Frequency = 10 GHz Record the Waveform	 Draw Waveform
3-21 FM Meter Calibration		
c. Meter Calibration	Follow steps c.1 through c.6	
d. Meter Verification 1.(c)	Measure FM Deviation	__________kHz

MODELS
6728B AND 6728B-40
SWEPT FREQUENCY SYNTHESIZER

TEST AND CALIBRATION
MANUAL

WILTRON

490 JARVIS DRIVE
MORGAN HILL, CA 95037-2809

P/N: 10370-10214
REVISION: D
PRINTED: OCTOBER 1993

SECTION 4
TEST RECORD

CONTENTS

SECTION 4
TEST RECORDS

4-1 INTRODUCTION

This section provides two Test Record tables for recording the results of the Performance Verification Tests (in Section 2) and the Calibration/Adjustments (in Section 3). They jointly provide the means for maintaining an accurate and complete record of instrument performance.

This test record provided here has been customized for the 6728B and 6728B-40 models. It should only be used with matching procedures in Section 2 and 3 that cover the 6728B or 6728B-40 models. Specific references to frequency parameters, power levels, and non-applicable procedures make each Test Record easy to follow.

We recommend that you make a copy of these pages each time the test procedures are performed. By dating each Test Record copy, a detailed history of instrument performance can be accumulated.

4-2 PERFORMANCE VERIFICATION TEST RECORD

The Test Record for the Performance Verification procedures supplied in Section 2 is located immediately following this page.

4-3 CALIBRATION/ADJUSTMENTS TEST RECORD

The Test Record for the Calibration/Adjustment procedures supplied in Section 3 follows the Performance Verification Test Record.

NOTE

Results of the automated RF Level Calibration procedure in Section 3 are not included in this Test Record. Calibration data is stored in instrument memory. Contact the WILTRON Customer Service department at (408) 778-2000 for more details.

WILTRON Model 6728B and 6728B-40 **Date:** ______________________

Serial Number____________________ **Tested By:** ______________________

2-5. Internal Time Base Aging Rate Test

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure				
2	Record T_S value		______hours	
4	Record T_1 value		______sec	
5	Record T_2 value		______sec	
6	Record T_F value		______hours	
8	Record the calculated aging rate		______per day	5×10^{-10} per day

2-6. Frequency Synthesis Tests

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Coarse Loop/YIG Loop Test Procedure				
1(c)	Enter 8 GHz			
2	Record the Frequency Counter Readings. . . .	7.999 999 900 GHz	__________ GHz	8.000 000 100 GHz
3	Record the Frequency Counter Reading	8.999 999 900 GHz	__________ GHz	9.000 000 100 GHz
4	Record the Frequency Counter Reading	9.999 999 900 GHz	__________ GHz	10.000 000 100 GHz
		10.999 999 900 GHz	__________ GHz	11.000 000 100 GHz
		11.999 999 900 GHz	__________ GHz	12.000 000 100 GHz

d. Fine Loop Test Procedure				
1(c)	Enter 8 GHz			
2	Record the Frequency Counter Reading	7.999 999 900 GHz	__________ GHz	8.000 000 100 GHz
3	Record the Frequency Counter Reading	8.000 000 900 GHz	__________ GHz	8.000 001 100 GHz
4	Record the Frequency Counter Readings . . .	8.000 001 900 GHz	__________ GHz	8.000 002 100 GHz
		8.000 002 900 GHz	__________ GHz	8.000 003 100 GHz
		8.000 003 900 GHz	__________ GHz	8.000 004 100 GHz
		8.000 004 900 GHz	__________ GHz	8.000 005 100 GHz
		8.000 005 900 GHz	__________ GHz	8.000 006 100 GHz
		8.000 006 900 GHz	__________ GHz	8.000 007 100 GHz
		8.000 007 900 GHz	__________ GHz	8.000 008 100 GHz
		8.000 008 900 GHz	__________ GHz	8.000 009 100 GHz
		8.000 009 900 GHz	__________ GHz	8.000 010 100 GHz

2-7. Marker and Blanking Verification

Step	Procedure Comments	Marker/Signal Presence
c. Marker Selection Procedure		
2	F1 Frequency Marker = 8 GHz	
2	Verify that a marker appears on the left side of the scope at the start of trace	_______
3(a)	F2 Frequency Marker = 12.4 GHz	
3(b)	Verify that a marker appears on the right side of the scope at the end of trace	_______
4	F3 Frequency Marker = 8.5 GHz	
4	Verify that a marker appears on the scope	_______
4	F4 Frequency Marker = 9 GHz	
4	Verify that a marker appears on the scope	_______
4	F5 Frequency Marker = 9.5 GHz	
4	Verify that a marker appears on the scope	_______
4	F6 Frequency Marker = 10 GHz	
4	Verify that a marker appears on the scope	_______
4	F7 Frequency Marker = 10.5 GHz	
4	Verify that a marker appears on the scope	_______
4	F8 Frequency Marker = 11 GHz	
4	Verify that a marker appears on the scope	_______
4	F9 Frequency Marker = 11.5 GHz	
4	Verify that a marker appears on the scope	_______
d. Marker Output Verification Procedure		
1	Verify +5V (TTL high) markers at nine points on scope display	_______
3	Verify that all markers change to intensified spots	_______
5(a)	Verify +5V (TTL high) signal at retrace	_______
5(d)	Verify –10V (minimum) signal at selected marker frequency	_______
5(e)	Verify –5V (minimum) signal at all other marker frequencies	_______
6	Verify that new marker changes from –5V (minimum) to –10V (minimum)	_______
	Verify that previous marker changes from –10V (minimum) to –5V (minimum)	_______
e. Retrace Blanking Output Verification Procedure		
2	Verify –5V (minimum) signal during retrace	_______
3	Verify +5V (minimum) signal during retrace	_______

2-8. Narrowband Spurious Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Fine Loop Test Procedure				
1(b)	Enter 8.1 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	10 kHz	N/A	_______dBc	–60 dBc
	20 khz	N/A	_______dBc	–60 dBc
	30 kHz	N/A	_______dBc	–60 dBc
	40 kHz	N/A	_______dBc	–60 dBc
	50 kHz	N/A	_______dBc	–60 dBc
d. Coarse Loop Test Procedure				
1(b)	Enter 10.3 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	200 kHz	N/A	_______dBc	–60 dBc
	400 khz	N/A	_______dBc	–60 dBc

2-9. Spurious and Harmonic Tests: RF Output Signals ≤2 GHz

These tests are not applicable to the 6728B and 6728B-40 models.

2-10. Harmonic Tests: RF Output Signals From 2 to 10 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure				
4	Record the level of all harmonics of the 8 GHz carrier:			
	16 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 10 GHz carrier:			
	20 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc

2-11. Harmonic Tests: RF Output Signals From 11 to 20 GHz

These tests are not applicable to the 6728B and 6728B-40 models.

2-12. Harmonic Tests (Alternate Method): RF Output Signals From 10 to 30 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure				
2(c)	Enter 10 GHz			
4	Measure and record the difference between RF levels above and below filter cutoff:			
	10 to 12.4 GHz harmonic level	N/A	_______dBc	–60 dBc

2-13. Harmonic Tests: RF Output Signals From 26.5 to 40 GHz

These tests are not applicable to the 6728B and 6728B-40 models.

2-14. Harmonic Tests: RF Output Signals From 40 to 60 GHz

These tests are not applicable to the 6728B and 6728B-40 models.

2-15. Single Sideband Phase Noise Test

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure (Band 2; 8 to 12.4 GHz)				
1(c)	Enter 10.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–64 dBc
6	100 Hz	N/A	_______dBc	–69 dBc
8	1 kHz	N/A	_______dBc	–73 dBc
10	10 kHz	N/A	_______dBc	–77 dBc
12	100 kHz	N/A	_______dBc	–100 dBc

2-16. Power Level Accuracy and Flatness Verification (6728B Models without Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Power Level Flatness Procedure			
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 0.8 dB			
	** = Maximum Variation is 2.0 dB			
	d. Power Level Accuracy Procedure			
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+12.4 dBm	________ dBm	+13.6 dBm
3	Measure and record the Power Meter reading	+11.4 dBm	________ dBm	+12.6 dBm
4	Measure and record the Power Meter readings	+10.4 dBm	________ dBm	+11.6 dBm
		+9.4 dBm	________ dBm	+10.6 dBm
		+8.4 dBm	________ dBm	+9.6 dBm
		+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6728B Models with 110 dB Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Power Level Flatness Procedure			
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 1.6 dB			
	** = Maximum Variation is 6.0 dB			
	d. Power Level Accuracy Procedure			
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+8.6 dBm	________ dBm	+11.4 dBm
3	Measure and record the Power Meter reading	+7.6 dBm	________ dBm	+10.4 dBm
4	Measure and record the Power Meter readings	+6.6 dBm	________ dBm	+9.4 dBm
		+5.6 dBm	________ dBm	+8.4 dBm
		+4.6 dBm	________ dBm	+7.4 dBm
		+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6728B-40 Models without Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Power Level Flatness Procedure			
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 0.8 dB			
	** = Maximum Variation is 2.0 dB			
	d. Power Level Accuracy Procedure			
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+15.4 dBm	________ dBm	+16.6 dBm
3	Measure and record the Power Meter reading	+14.4 dBm	________ dBm	+15.6 dBm
4	Measure and record the Power Meter readings	+13.4 dBm	________ dBm	+14.6 dBm
		+12.4 dBm	________ dBm	+13.6 dBm
		+11.4 dBm	________ dBm	+12.6 dBm
		+10.4 dBm	________ dBm	+11.6 dBm
		+9.4 dBm	________ dBm	+10.6 dBm
		+8.4 dBm	________ dBm	+9.6 dBm
		+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6728B-40 Models with 110 dB Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 1.6 dB			
	** = Maximum Variation is 6.0 dB			
d. Power Level Accuracy Procedure				
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+11.6 dBm	________ dBm	+14.4 dBm
3	Measure and record the Power Meter reading	+10.6 dBm	________ dBm	+13.4 dBm
4	Measure and record the Power Meter readings	+9.6 dBm	________ dBm	+12.4 dBm
		+8.6 dBm	________ dBm	+11.4 dBm
		+7.6 dBm	________ dBm	+10.4 dBm
		+6.6 dBm	________ dBm	+9.4 dBm
		+5.6 dBm	________ dBm	+8.4 dBm
		+4.6 dBm	________ dBm	+7.4 dBm
		+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm

2-17. FM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. FM Input Sensitivity Procedure (Band 2; 8 to 12.4 GHz)				
2(c)	Enter 10 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 2; 8 to 12.4 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A

2-18. AM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. AM Input Sensitivity and Meter Accuracy (Band 2; 8 to 12.4 GHz)				
2(e)	Enter 10 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 2; 8 to 12.4 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Rise Time, Fall Time, Overshoot, and Level (Band 2; 8 to 12.4 GHz)				
1(c)	Enter 10 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
d. Pulse Leveling Accuracy Check, Preliminary Test Setup				
4(b)	Enter 10 GHz			
e. 67XXB LEVEL Display Calibration				
1	Note the 67XXB LEVEL display value			______dBm
2	Note the 67XXB LEVEL display value			______dBm
3	Calculate the difference between steps e.1 and e.2. Note this value			______dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 5 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 2 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 1 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-20. Pulse Modulation Test: Video Feedthrough

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure (Band 2; 8 to 12.4 GHz)			
1(c)	Enter 10 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak

2-21. Pulse Modulation Test: RF On/Off Ratio

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure (Band 2; 8 to 12.4 GHz)			
1(d)	Enter 10 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A

WILTRON Model 6728B and 6728B-40 **Date:** ______________________

Serial Number____________________ **Tested By:** ______________________

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-9 ALC Level Offset Adjustments		
This instrument uses only one leveling circuit; Band 1 thru 4.		
d. Band 1 thru 4 Level Offset 1.(b) 3.	Frequency = 10 GHz A15TP5 = 0V ±10 µV	___________volts
f. ALC Detector Shaper Level Offset 6.(c)	Frequency = 8 GHz Follow steps f.1 through f.21.	
3-10 External Leveling Offset Adjustment		
c.3	A15TP7 = 0V ±1 mV	___________volts
3-11 10 MHz Reference Oscillator Calibration		
c.1.(c) c.3	Frequency = 12 GHz Adjust for Frequency Counter Reading = 12 GHz ±100 Hz	___________GHz
3-12 ALC Bandwidth Calibration		
This calibration is required for the installed frequency band:		
c. 8-12.4 GHz Band 2.(c)	Frequency = 10 GHz Follow steps c.1 through c.13; then steps c.16 and c.17.	

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-13 Analog Sweep Calibration		
This calibration is automatically completed for the installed frequency band.		
c.1.(d)	Frequency = 10 GHz	
3-14 YIG-tuned Oscillator Frequency Calibration		
This calibration is required for the installed frequency band:		
c. 8-12.4 GHz Band 1.(e) 5.	Frequency = 10 GHz Maximum difference in MHz between frequency counter and 6728B	_________MHz
3-15 RF Level Calibration		
This calibration is performed using an automatic test system. Contact WILTRON Customer Service at (408) 778–2000 for further information.		

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-16 ALC Slope Adjustment		
This calibration is required for the >2 GHz level detector.		
c. 8-12.4 GHz Band		
2.(d)	F1 = 8 GHz	
2.(f)	F2 = 12.4 GHz	
5.	Record the resulting waveform	Draw Waveform Flatness for the 8-12.4 GHz Band
3-17 AM Sensitivity Calibration		
This calibration is required for the installed frequency band:		
d. 8-12.4 GHz Band		
2.(d)	Frequency = 10 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
3-18 AM Meter Calibration		
c. Meter Calibration		
2.(d)	Frequency = 10 GHz	
d. Meter Verification		
1.(c)	Frequency = 10 GHz	
1.(g)	Measure and record AM DEPTH	__________%

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-19 FM Driver/Sensitivity Calibration		
This calibration is required for the installed frequency band:		
d. 8-12.4 GHz Band 2.(d) 8.	Frequency = 10 GHz Record the Waveform Null	Draw Waveform Null
3-20 FM Flatness Calibration		
This calibration is required for the installed frequency band:		
b. 8-12.4 GHz Band 2.(d) 10.	Frequency = 10 GHz Record the Waveform	Draw Waveform
3-21 FM Meter Calibration		
c. Meter Calibration	Follow steps c.1 through c.6	
d. Meter Verification 1.(c)	Measure FM Deviation	__________kHz

MODELS
6729B AND 6729B-20
SWEPT FREQUENCY SYNTHESIZER

TEST AND CALIBRATION
MANUAL

WILTRON

490 JARVIS DRIVE
MORGAN HILL, CA 95037-2809

P/N: 10370-10216
REVISION: D
PRINTED: OCTOBER 1993

SECTION 4
TEST RECORD

CONTENTS

SECTION 4
TEST RECORDS

4-1 INTRODUCTION

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4-2 PERFORMANCE VERIFICATION TEST RECORD

The Test Record for the Performance Verification procedures supplied in Section 2 is located immediately following this page.

4-3 CALIBRATION/ADJUSTMENTS TEST RECORD

The Test Record for the Calibration/Adjustment procedures supplied in Section 3 follows the Performance Verification Test Record.

NOTE

Results of the automated RF Level Calibration procedure in Section 3 are not included in this Test Record. Calibration data is stored in instrument memory. Contact the WILTRON Customer Service department at (408) 778-2000 for more details.

WILTRON Model 6729B and 6729B-20 **Date:** ______________________

Serial Number____________________ **Tested By:** _____________________

2-5. Internal Time Base Aging Rate Test

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure				
2	Record T_S value		______hours	
4	Record T_1 value		______sec	
5	Record T_2 value		______sec	
6	Record T_F value		______hours	
8	Record the calculated aging rate		______per day	5×10^{-10} per day

2-6. Frequency Synthesis Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Coarse Loop/YIG Loop Test Procedure				
1(c)	Enter 8 GHz			
2	Record the Frequency Counter Reading	7.999 999 900 GHz	__________ GHz	8.000 000 100 GHz
3	Record the Frequency Counter Reading	8.999 999 900 GHz	__________ GHz	9.000 000 100 GHz
4	Record the Frequency Counter Reading	9.999 999 900 GHz	__________ GHz	10.000 000 100 GHz
		10.999 999 900 GHz	__________ GHz	11.000 000 100 GHz
		11.999 999 900 GHz	__________ GHz	12.000 000 100 GHz
		12.999 999 900 GHz	__________ GHz	13.000 000 100 GHz
		13.999 999 900 GHz	__________ GHz	14.000 000 100 GHz
		14.999 999 900 GHz	__________ GHz	15.000 000 100 GHz
		15.999 999 900 GHz	__________ GHz	16.000 000 100 GHz
		16.999 999 900 GHz	__________ GHz	17.000 000 100 GHz
		17.999 999 900 GHz	__________ GHz	18.000 000 100 GHz
		18.999 999 900 GHz	__________ GHz	19.000 000 100 GHz
		19.999 999 900 GHz	__________ GHz	20.000 000 100 GHz
d. Fine Loop Test Procedure				
1(c)	Enter 8 GHz			
2	Record the Frequency Counter Reading	7.999 999 900 GHz	__________ GHz	8.000 000 100 GHz
3	Record the Frequency Counter Reading	8.000 000 900 GHz	__________ GHz	8.000 001 100 GHz
4	Record the Frequency Counter Readings . . .	8.000 001 900 GHz	__________ GHz	8.000 002 100 GHz
		8.000 002 900 GHz	__________ GHz	8.000 003 100 GHz
		8.000 003 900 GHz	__________ GHz	8.000 004 100 GHz
		8.000 004 900 GHz	__________ GHz	8.000 005 100 GHz
		8.000 005 900 GHz	__________ GHz	8.000 006 100 GHz
		8.000 006 900 GHz	__________ GHz	8.000 007 100 GHz
		8.000 007 900 GHz	__________ GHz	8.000 008 100 GHz
		8.000 008 900 GHz	__________ GHz	8.000 009 100 GHz
		8.000 009 900 GHz	__________ GHz	8.000 010 100 GHz

2-7. Marker and Blanking Verification

Step	Procedure Comments	Marker/Signal Presence
	c. Marker Selection Procedure	
2	F1 Frequency Marker = 8 GHz	
2	Verify that a marker appears on the left side of the scope at the start of trace	_______
3(a)	F2 Frequency Marker = 20 GHz	
3(b)	Verify that a marker appears on the right side of the scope at the end of trace	_______
4	F3 Frequency Marker = 10 GHz	
4	Verify that a marker appears on the scope	_______
4	F4 Frequency Marker = 11 GHz	
4	Verify that a marker appears on the scope	_______
4	F5 Frequency Marker = 13 GHz	
4	Verify that a marker appears on the scope	_______
4	F6 Frequency Marker = 14 GHz	
4	Verify that a marker appears on the scope	_______
4	F7 Frequency Marker = 16 GHz	
4	Verify that a marker appears on the scope	_______
4	F8 Frequency Marker = 18 GHz	
4	Verify that a marker appears on the scope	_______
4	F9 Frequency Marker = 19 GHz	
4	Verify that a marker appears on the scope	_______
	d. Marker Output Verification Procedure	
1	Verify +5V (TTL high) markers at nine points on scope display	_______
3	Verify that all markers change to intensified spots	_______
5(a)	Verify +5V (TTL high) signal at retrace	_______
5(b)	Verify +5V (minimum) signal at bandswitch point	_______
5(d)	Verify –10V (minimum) signal at selected marker frequency	_______
5(e)	Verify –5V (minimum) signal at all other marker frequencies	_______
6	Verify that new marker changes from –5V (minimum) to –10V (minimum)	_______
	Verify that previous marker changes from –10V (minimum) to –5V (minimum)	_______
	e. Retrace Blanking Output Verification Procedure	
2	Verify –5V (minimum) signal during retrace	_______
3	Verify +5V (minimum) signal during retrace	_______
	f. Bandswitch Blanking Output Verification Procedure	
2	Verify +5V (minimum) signal during the following bandswitch dwell points:	
	12.4 GHz bandswitch dwell point	_______
3	Verify –5V (minimum) signal during the following bandswitch dwell points:	
	12.4 GHz bandswitch dwell point	_______

2-8. Narrowband Spurious Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Fine Loop Test Procedure				
1(b)	Enter 8.1 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	10 kHz	N/A	_______dBc	–60 dBc
	20 khz	N/A	_______dBc	–60 dBc
	30 kHz	N/A	_______dBc	–60 dBc
	40 kHz	N/A	_______dBc	–60 dBc
	50 kHz	N/A	_______dBc	–60 dBc
d. Coarse Loop Test Procedure				
1(b)	Enter 18.3 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	200 kHz	N/A	_______dBc	–60 dBc
	400 khz	N/A	_______dBc	–60 dBc

2-9. Spurious and Harmonic Tests: RF Output Signals ≤2 GHz

These tests are not applicable to the 6729B and 6729B-20 models.

2-10. Harmonic Tests: RF Output Signals From 2 to 10 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure				
4	Record the level of all harmonics of the 8.4 GHz carrier:			
	16.8 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 10 GHz carrier:			
	20 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc

2-11. Harmonic Tests: RF Output Signals From 11 to 20 GHz

These tests are not applicable to the 6729B and 6729B-20 models.

2-12. Harmonic Tests (Alternate Method): RF Output Signals From 10 to 30 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure				
2(c)	Enter 10 GHz			
4	Measure and record the difference between RF levels above and below filter cutoff:			
	10 to 20 GHz harmonic level	N/A	_______dBc	–60 dBc

2-13. Harmonic Tests: RF Output Signals From 26.5 to 40 GHz

These tests are not applicable to the 6729B and 6729B-20 models.

2-14. Harmonic Tests: RF Output Signals From 40 to 60 GHz

These tests are not applicable to the 6729B and 6729B-20 models.

2-15. Single Sideband Phase Noise Test

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure (Band 2; 8 to 12.4 GHz)				
1(c)	Enter 10.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–64 dBc
6	100 Hz	N/A	_______dBc	–69 dBc
8	1 kHz	N/A	_______dBc	–73 dBc
10	10 kHz	N/A	_______dBc	–77 dBc
12	100 kHz	N/A	_______dBc	–100 dBc
6	Repeat steps c.1 through c.12 for the remaining band.			
c. Test Procedure (Band 3; 12.4 to 20 GHz)				
1(c)	Enter 15.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–60 dBc
6	100 Hz	N/A	_______dBc	–65 dBc
8	1 kHz	N/A	_______dBc	–69 dBc
10	10 kHz	N/A	_______dBc	–73 dBc
12	100 kHz	N/A	_______dBc	–100 dBc

2-16. Power Level Accuracy and Flatness Verification (6729B Models without Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Power Level Flatness Procedure			
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximium Variation is 0.8 dB			
	** = Maximum Variation is 2.0			
	d. Power Level Accuracy Procedure (8 to 12.4 GHz)			
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
	d. Power Level Accuracy Procedure (12.4 to 20 GHz)			
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm

2-16. Power Level Accuracy and Flatness Verification (6729B Models with 110 dB Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Power Level Flatness Procedure			
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 1.6 dB			
	** = Maximum Variation is 6.0 dB			
	d. Power Level Accuracy Procedure (8 to 12.4 GHz)			
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
	d. Power Level Accuracy Procedure (12.4 to 20 GHz)			
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6729B-20 Models without Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Power Level Flatness Procedure			
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 0.8 dB			
	** = Maximum Variation is 2.0 dB			
	d. Power Level Accuracy Procedure (8 to 12.4 GHz)			
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+12.4 dBm	________ dBm	+13.6 dBm
3	Measure and record the Power Meter reading	+11.4 dBm	________ dBm	+12.6 dBm
4	Measure and record the Power Meter readings	+10.4 dBm	________ dBm	+11.6 dBm
		+9.4 dBm	________ dBm	+10.6 dBm
		+8.4 dBm	________ dBm	+9.6 dBm
		+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
	d. Power Level Accuracy Procedure (12.4 to 20 GHz)			
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+12.4 dBm	________ dBm	+13.6 dBm
3	Measure and record the Power Meter reading	+11.4 dBm	________ dBm	+12.6 dBm
4	Measure and record the Power Meter readings	+10.4 dBm	________ dBm	+11.6 dBm
		+9.4 dBm	________ dBm	+10.6 dBm
		+8.4 dBm	________ dBm	+9.6 dBm
		+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6729B-20 Models with 110 dB Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 1.6 dB			
	** = Maximum Variation is 6.0 dB			
d. Power Level Accuracy Procedure (8 to 12.4 GHz)				
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+8.6 dBm	________ dBm	+11.4 dBm
3	Measure and record the Power Meter reading	+7.6 dBm	________ dBm	+10.4 dBm
4	Measure and record the Power Meter readings	+6.6 dBm	________ dBm	+9.4 dBm
		+5.6 dBm	________ dBm	+8.4 dBm
		+4.6 dBm	________ dBm	+7.4 dBm
		+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
d. Power Level Accuracy Procedure (12.4 to 20 GHz)				
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+8.6 dBm	________ dBm	+11.4 dBm
3	Measure and record the Power Meter reading	+7.6 dBm	________ dBm	+10.4 dBm
4	Measure and record the Power Meter readings	+6.6 dBm	________ dBm	+9.4 dBm
		+5.6 dBm	________ dBm	+8.4 dBm
		+4.6 dBm	________ dBm	+7.4 dBm
		+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm

2-17. FM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. FM Input Sensitivity Procedure (Band 2; 8 to 12.4 GHz)				
2(c)	Enter 10 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 2; 8 to 12.4 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
6	Repeat steps d.2 through e.5 for the remaining bands.			
d. FM Input Sensitivity Procedure (Band 3; 12.4 to 20 GHz)				
2(c)	Enter 16 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 3; 12.4 to 20 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A

2-18. AM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. AM Input Sensitivity and Meter Accuracy (Band 2; 8 to 12.4 GHz)				
2(e)	Enter 10 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 2; 8 to 12.4 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%
6	Repeat steps d.2 through e.5 for the remaining bands.			
d. AM Input Sensitivity and Meter Accuracy (Band 3; 12.4 to 20 GHz)				
2(e)	Enter 16 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 3; 12.4 to 20 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Rise Time, Fall Time, Overshoot, and Level (Band 2; 8 to 12.4 GHz)				
1(c)	Enter 10 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
c. Rise Time, Fall Time, Overshoot, and Level (Band 3; 12.4 to 20 GHz)				
1(c)	Enter 16 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
d. Pulse Leveling Accuracy Check, Preliminary Test Setup				
4(b)	Enter 10 GHz			
e. 67XXB LEVEL Display Calibration				
1	Note the 67XXB LEVEL display value			______dBm
2	Note the 67XXB LEVEL display value			______dBm
3	Calculate the difference between steps e.1 and e.2. Note this value			______dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 5 µs)			
2(b)	Enter 10 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
	f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 2 µs)			
2(b)	Enter 10 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
	f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 1 µs)			
2(b)	Enter 10 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
	f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.5 µs)			
2(b)	Enter 10 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
	f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.2 µs)			
2(b)	Enter 10 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
	f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.1 µs)			
2(b)	Enter 10 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 20 GHz; Pulse Width = 5 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 20 GHz; Pulse Width = 2 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 20 GHz; Pulse Width = 1 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 20 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 20 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 20 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-20. Pulse Modulation Test: Video Feedthrough

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure (Band 2; 8 to 12.4 GHz)			
1(c)	Enter 10 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak
4	Repeat steps c.1 through c.3 for the remaining bands.			
	c. Test Procedure (Band 3; 12.4 to 20 GHz)			
1(c)	Enter 16 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak

2-21. Pulse Modulation Test: RF On/Off Ratio

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure (Band 2; 8 to 12.4 GHz)			
1(d)	Enter 10 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A
7	Repeat steps c.1 through c.5 for the remaining band.			
	c. Test Procedure (Band 3; 12.4 to 20 GHz)			
1(d)	Enter 16 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A

WILTRON Model 6729B and 6729B-20 **Date:** ______________________

Serial Number____________________ **Tested By:** _____________________

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-9 ALC Level Offset Adjustments		
This instrument uses only one leveling circuit; Band 1 thru 4.		
d. Band 1 thru 4 Level Offset 1.(b) 3.	Frequency = 10 GHz A15TP5 = 0V ±10 µV	___________volts
f. ALC Detector Shaper Level Offset 6.(c)	Frequency = 8 GHz Follow steps f.1 through f.21.	
3-10 External Leveling Offset Adjustment		
c.3	A15TP7 = 0V ±1 mV	___________volts
3-11 10 MHz Reference Oscillator Calibration		
c.1.(c) c.3	Frequency = 20 GHz Adjust for Frequency Counter Reading = 20 GHz ±100 Hz	___________GHz

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-12 ALC Bandwidth Calibration		
This calibration is required for each installed frequency band:		
c. 8-12.4 GHz Band 2.(c)	Frequency = 10 GHz Follow steps c.1 through c.15.	
c. 12.4-20 GHz Band 2.(c)	Frequency = 16 GHz Repeat steps c.7 through c.13; then steps c.16 and c.17.	
3-13 Analog Sweep Calibration		
This calibration is automatically completed for all of the installed frequency bands		
c.1.(d)	Frequency = 10 GHz	
3-14 YIG-tuned Oscillator Frequency Calibration		
This calibration is required for each installed frequency band:		
c. 8-12.4 GHz Band 1.(e) 5.	Frequency = 10 GHz Maximum difference in MHz between frequency counter and 6729B	__________MHz
c. 12.4-20 GHz Band 1.(e) 5.	Frequency = 16 GHz Maximum difference in MHz between frequency counter and 6729B	_________MHz

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-15 RF Level Calibration		
This calibration is performed using an automatic test system. Contact WILTRON Customer Service at (408) 778–2000 for further information.		
3-16 ALC Slope Adjustment		
This calibration is required for the >2 GHz level detector.		
c. 8-20 GHz Band		
2.(d)	F1 = 8 GHz	
2.(f)	F2 = 20 GHz	
5.	Record the resulting waveform	Draw Waveform Flatness for the 8-20 GHz Band
3-17 AM Sensitivity Calibration		
This calibration is required for each installed frequency band:		
d. 8-12.4 GHz Band		
2.(d)	Frequency = 10 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
d. 12.4-20 GHz Band		
2.(d)	Frequency = 16 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-18 AM Meter Calibration		
c. Meter Calibration		
2.(d)	Frequency = 10 GHz	
d. Meter Verification		
1.(c)	Frequency = 10 GHz	
1.(g)	Measure and record AM DEPTH	__________%
3-19 FM Driver/Sensitivity Calibration		
This calibration is required for each installed frequency band:		
d. 8-12.4 GHz Band		
2.(d)	Frequency = 10 GHz	
8.	Record the Waveform Null	Draw Waveform Null
d. 12.4-20 GHz Band		
2.(d)	Frequency = 16 GHz	
8.	Record the Waveform Null	Draw Waveform Null

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-20 FM Flatness Calibration		
This calibration is required for each installed frequency band:		
d. 8-12.4 GHz Band 2.(d) 10.	Frequency = 10 GHz Record the Waveform	Draw Waveform
b. 12.4-20 GHz Band 2.(d) 10.	Frequency = 16 GHz Record the Waveform	Draw Waveform
3-21 FM Meter Calibration		
c. Meter Calibration	Follow steps c.1 through c.6	
d. Meter Verification 1.(c)	Measure FM Deviation	__________kHz

MODELS
6730B AND 6730B-40
SWEPT FREQUENCY SYNTHESIZER

TEST AND CALIBRATION
MANUAL

WILTRON

490 JARVIS DRIVE
MORGAN HILL, CA 95037-2809

P/N: 10370-10218
REVISION: D
PRINTED: OCTOBER 1993

SECTION 4
TEST RECORD

CONTENTS

SECTION 4
TEST RECORDS

4-1 INTRODUCTION

This section provides two Test Record tables for recording the results of the Performance Verification Tests (in Section 2) and the Calibration/Adjustments (in Section 3). They jointly provide the means for maintaining an accurate and complete record of instrument performance.

This test record provided here has been customized for the 6730B and 6730B-40 models. It should only be used with matching procedures in Section 2 and 3 that cover the 6730B or 6730B-40 models. Specific references to frequency parameters, power levels, and non-applicable procedures make each Test Record easy to follow.

We recommend that you make a copy of these pages each time the test procedures are performed. By dating each Test Record copy, a detailed history of instrument performance can be accumulated.

4-2 PERFORMANCE VERIFICATION TEST RECORD

The Test Record for the Performance Verification procedures supplied in Section 2 is located immediately following this page.

4-3 CALIBRATION/ADJUSTMENTS TEST RECORD

The Test Record for the Calibration/Adjustment procedures supplied in Section 3 follows the Performance Verification Test Record.

NOTE

Results of the automated RF Level Calibration procedure in Section 3 are not included in this Test Record. Calibration data is stored in instrument memory. Contact the WILTRON Customer Service department at (408) 778-2000 for more details.

WILTRON Model 6730B and 6730B-40 **Date: ______________________**

Serial Number______________________ **Tested By: ______________________**

2-5. Internal Time Base Aging Rate Test

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure				
2	Record T_S value		______hours	
4	Record T_1 value		______sec	
5	Record T_2 value		______sec	
6	Record T_F value		______hours	
8	Record the calculated aging rate		______per day	5×10^{-10} per day

2-6. Frequency Synthesis Tests

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Coarse Loop/YIG Loop Test Procedure				
1(c)	Enter 13 GHz			
2	Record the Frequency Counter Reading	12.999 999 900 GHz	___________ GHz	13.000 000 100 GHz
3	Record the Frequency Counter Reading	13.999 999 900 GHz	___________ GHz	14.000 000 100 GHz
4	Record the Frequency Counter Reading	14.999 999 900 GHz	___________ GHz	15.000 000 100 GHz
		15.999 999 900 GHz	___________ GHz	16.000 000 100 GHz
		16.999 999 900 GHz	___________ GHz	17.000 000 100 GHz
		17.999 999 900 GHz	___________ GHz	18.000 000 100 GHz
		18.999 999 900 GHz	___________ GHz	19.000 000 100 GHz
		19.999 999 900 GHz	___________ GHz	20.000 000 100 GHz
d. Fine Loop Test Procedure				
1(c)	Enter 13 GHz			
2	Record the Frequency Counter Reading	12.999 999 900 GHz	___________ GHz	13.000 000 100 GHz
3	Record the Frequency Counter Reading	13.000 000 900 GHz	___________ GHz	13.000 001 100 GHz
4	Record the Frequency Counter Readings . . .	13.000 001 900 GHz	___________ GHz	13.000 002 100 GHz
		13.000 002 900 GHz	___________ GHz	13.000 003 100 GHz
		13.000 003 900 GHz	___________ GHz	13.000 004 100 GHz
		13.000 004 900 GHz	___________ GHz	13.000 005 100 GHz
		13.000 005 900 GHz	___________ GHz	13.000 006 100 GHz
		13.000 006 900 GHz	___________ GHz	13.000 007 100 GHz
		13.000 007 900 GHz	___________ GHz	13.000 008 100 GHz
		13.000 008 900 GHz	___________ GHz	13.000 009 100 GHz
		13.000 009 900 GHz	___________ GHz	13.000 010 100 GHz

2-7. Marker and Blanking Verification

Step	Procedure Comments	Marker/Signal Presence
c. Marker Selection Procedure		
2	F1 Frequency Marker = 12.4 GHz	
2	Verify that a marker appears on the left side of the scope at the start of trace	_______
3(a)	F2 Frequency Marker = 20 GHz	
3(b)	Verify that a marker appears on the right side of the scope at the end of trace	_______
4	F3 Frequency Marker = 13 GHz	
4	Verify that a marker appears on the scope	_______
4	F4 Frequency Marker = 14 GHz	
4	Verify that a marker appears on the scope	_______
4	F5 Frequency Marker = 15 GHz	
4	Verify that a marker appears on the scope	_______
4	F6 Frequency Marker = 16 GHz	
4	Verify that a marker appears on the scope	_______
4	F7 Frequency Marker = 17 GHz	
4	Verify that a marker appears on the scope	_______
4	F8 Frequency Marker = 18 GHz	
4	Verify that a marker appears on the scope	_______
4	F9 Frequency Marker = 19 GHz	
4	Verify that a marker appears on the scope	_______
d. Marker Output Verification Procedure		
1	Verify +5V (TTL high) markers at nine points on scope display	_______
3	Verify that all markers change to intensified spots	_______
5(a)	Verify +5V (TTL high) signal at retrace	_______
5(d)	Verify –10V (minimum) signal at selected marker frequency	_______
5(e)	Verify –5V (minimum) signal at all other marker frequencies	_______
6	Verify that new marker changes from –5V (minimum) to –10V (minimum)	_______
	Verify that previous marker changes from –10V (minimum) to –5V (minimum)	_______
e. Retrace Blanking Output Verification Procedure		
2	Verify –5V (minimum) signal during retrace	_______
3	Verify +5V (minimum) signal during retrace	_______

2-8. Narrowband Spurious Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Fine Loop Test Procedure				
1(b)	Enter 12.5 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	10 kHz	N/A	_______dBc	–60 dBc
	20 khz	N/A	_______dBc	–60 dBc
	30 kHz	N/A	_______dBc	–60 dBc
	40 kHz	N/A	_______dBc	–60 dBc
	50 kHz	N/A	_______dBc	–60 dBc
d. Coarse Loop Test Procedure				
1(b)	Enter 18.3 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	200 kHz	N/A	_______dBc	–60 dBc
	400 khz	N/A	_______dBc	–60 dBc

2-9. Spurious and Harmonic Tests: RF Output Signals ≤2 GHz

These tests are not applicable to the 6730B and 6730B-40 models.

2-10. Harmonic Tests: RF Output Signals From 2 to 10 GHz

These tests are not applicable to the 6730B and 6730B-40 models.

2-11. Harmonic Tests: RF Output Signals From 11 to 20 GHz

These tests are not applicable to the 6730B and 6730B-40 models.

2-12. Harmonic Tests (Alternate Method): RF Output Signals From 10 to 30 GHz

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure				
2(c)	Enter 12.4 GHz			
4	Measure and record the difference between RF levels above and below filter cutoff:			
	12.4 to 20 GHz harmonic level	N/A	_______dBc	–60 dBc

2-13. Harmonic Tests: RF Output Signals From 26.5 to 40 GHz

These tests are not applicable to the 6730B and 6730B-40 models.

2-14. Harmonic Tests: RF Output Signals From 40 to 60 GHz

These tests are not applicable to the 6730B and 6730B-40 models.

2-15. Single Sideband Phase Noise Test

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure (Band 3; 12.4 to 20 GHz)				
1(c)	Enter 15.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–60 dBc
6	100 Hz	N/A	_______dBc	–65 dBc
8	1 kHz	N/A	_______dBc	–69 dBc
10	10 kHz	N/A	_______dBc	–73 dBc

12	100 kHz	N/A	_______dBc	–100 dBc

2-16. Power Level Accuracy and Flatness Verification (6730B Models without Optional Attenuator)

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 0.8 dB			
	** = Maximum Variation is 2.0 dB			
d. Power Level Accuracy Procedure				
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+12.4 dBm	________ dBm	+13.6 dBm
3	Measure and record the Power Meter reading	+11.4 dBm	________ dBm	+12.6 dBm
4	Measure and record the Power Meter readings	+10.4 dBm	________ dBm	+11.6 dBm
		+9.4 dBm	________ dBm	+10.6 dBm
		+8.4 dBm	________ dBm	+9.6 dBm
		+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm

		Lower Limit	Measured Value	Upper Limit
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6730B Models with 110 dB Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Power Level Flatness Procedure			
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 1.6 dB			
	** = Maximum Variation is 6.0 dB			
	d. Power Level Accuracy Procedure			
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+8.6 dBm	________ dBm	+11.4 dBm
3	Measure and record the Power Meter reading	+7.6 dBm	________ dBm	+10.4 dBm
4	Measure and record the Power Meter readings	+6.6 dBm	________ dBm	+9.4 dBm
		+5.6 dBm	________ dBm	+8.4 dBm
		+4.6 dBm	________ dBm	+7.4 dBm
		+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm

		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6730B-40 Models without Optional Attenuator)

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 0.8 dB			
	** = Maximum Variation is 2.0 dB			
d. Power Level Accuracy Procedure				
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+15.4 dBm	________ dBm	+16.6 dBm
3	Measure and record the Power Meter reading	+14.4 dBm	________ dBm	+15.6 dBm
4	Measure and record the Power Meter readings	+13.4 dBm	________ dBm	+14.6 dBm
		+12.4 dBm	________ dBm	+13.6 dBm
		+11.4 dBm	________ dBm	+12.6 dBm
		+10.4 dBm	________ dBm	+11.6 dBm
		+9.4 dBm	________ dBm	+10.6 dBm
		+8.4 dBm	________ dBm	+9.6 dBm

		Lower Limit	Measured Value	Upper Limit
		+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6730B-40 Models with 110 dB Optional Attenuator)

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	

* = Maximum Variation is 1.6 dB

** = Maximum Variation is 6.0 dB

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
d. Power Level Accuracy Procedure				
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+11.6 dBm	________ dBm	+14.4 dBm
3	Measure and record the Power Meter reading	+10.6 dBm	________ dBm	+13.4 dBm
4	Measure and record the Power Meter readings	+9.6 dBm	________ dBm	+12.4 dBm
		+8.6 dBm	________ dBm	+11.4 dBm
		+7.6 dBm	________ dBm	+10.4 dBm
		+6.6 dBm	________ dBm	+9.4 dBm
		+5.6 dBm	________ dBm	+8.4 dBm
		+4.6 dBm	________ dBm	+7.4 dBm
		+3.6 dBm	________ dBm	+6.4 dBm

+2.6 dBm	________ dBm	+5.4 dBm
+1.6 dBm	________ dBm	+4.4 dBm
+0.6 dBm	________ dBm	+3.4 dBm
–0.4 dBm	________ dBm	+2.4 dBm

2-17. FM Modulation Tests

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
d. FM Input Sensitivity Procedure (Band 3; 12.4 to 20 GHz)				
2(c)	Enter 16 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 3; 12.4 to 20 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A

2-18. AM Modulation Tests

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
d. AM Input Sensitivity and Meter Accuracy (Band 3; 12.4 to 20 GHz)				
2(e)	Enter 16 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 3; 12.4 to 20 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Rise Time, Fall Time, Overshoot, and Level (Band 3; 12.4 to 20 GHz)				
1(c)	Enter 16 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
d. Pulse Leveling Accuracy Check, Preliminary Test Setup				
4(b)	Enter 16 GHz			
e. 67XXB LEVEL Display Calibration				
1	Note the 67XXB LEVEL display value			______dBm

2	Note the 67XXB LEVEL display value		______dBm	
3	Calculate the difference between steps e.1 and e.2. Note this value		______dB	

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 20 GHz; Pulse Width = 5 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value		______dBm	
8	Record the 67XXB LEVEL display value		______dBm	
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 20 GHz; Pulse Width = 2 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value		______dBm	
8	Record the 67XXB LEVEL display value		______dBm	
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 20 GHz; Pulse Width = 1 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value		______dBm	
8	Record the 67XXB LEVEL display value		______dBm	
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 20 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value		______dBm	
8	Record the 67XXB LEVEL display value		______dBm	
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 20 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value		______dBm	
8	Record the 67XXB LEVEL display value		______dBm	
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 20 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value		______dBm	
8	Record the 67XXB LEVEL display value		______dBm	

9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-20. Pulse Modulation Test: Video Feedthrough

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure (Band 3; 12.4 to 20 GHz)				
1(c)	Enter 16 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak

2-21. Pulse Modulation Test: RF On/Off Ratio

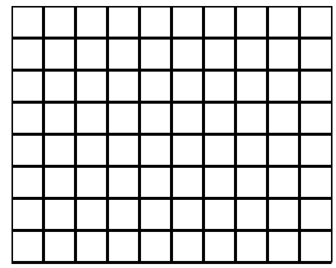
Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure (Band 3; 12.4 to 20 GHz)				
1(d)	Enter 16 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A

WILTRON Model 6730B and 6730B-40 **Date:** ______________________

Serial Number____________________ **Tested By:** _____________________

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-9 ALC Level Offset Adjustments This instrument uses only one leveling circuit; Band 1 thru 4.		
d. Band 1 thru 4 Level Offset 1.(b) 3.	Frequency = 16 GHz A15TP5 = 0V ±10 µV	___________volts
f. ALC Detector Shaper Level Offset 6.(c)	Frequency = 12.4 GHz Follow steps f.1 through f.21.	
3-10 External Leveling Offset Adjustment		
c.3	A15TP7 = 0V ±1 mV	___________volts
3-11 10 MHz Reference Oscillator Calibration		
c.1.(c) c.3	Frequency = 20 GHz Adjust for Frequency Counter Reading = 20 GHz ±100 Hz	___________GHz

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-12 ALC Bandwidth Calibration		
This calibration is required for the installed frequency band:		
c. 12.4-20 GHz Band		
2.(c)	Frequency = 16 GHz Follow steps c.1 through c.13; then steps c.16 and c.17.	
3-13 Analog Sweep Calibration		
This calibration is automatically completed for the installed frequency band.		
c.1.(d)	Frequency = 16 GHz	
3-14 YIG-tuned Oscillator Frequency Calibration		
This calibration is required for the installed frequency band:		
c. 12.4-20 GHz Band		
1.(e)	Frequency = 16 GHz	
5.	Maximum difference in MHz between frequency counter and 6730B	_________MHz
3-15 RF Level Calibration		
This calibration is performed using an automatic test system. Contact WILTRON Customer Service at (408) 778–2000 for further information.		

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-16 ALC Slope Adjustment		
This calibration is required for the >2 GHz level detector.		
c. 12.4-20 GHz Band		
2.(d)	F1 = 12.4 GHz	
2.(f)	F2 = 20 GHz	
5.	Record the resulting waveform	Draw Waveform Flatness for the 12.4-20 GHz Band
3-17 AM Sensitivity Calibration		
This calibration is required for the installed frequency band:		
d. 12.4-20 GHz Band		
2.(d)	Frequency = 16 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
3-18 AM Meter Calibration		
c. Meter Calibration		
2.(d)	Frequency = 16 GHz	
d. Meter Verification		
1.(c)	Frequency = 16 GHz	
1.(g)	Measure and record AM DEPTH	__________%

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-19 FM Driver/Sensitivity Calibration		
This calibration is required for the installed frequency band:		
d. 12.4-20 GHz Band 2.(d) 8.	Frequency = 16 GHz Record the Waveform Null	Draw Waveform Null
3-20 FM Flatness Calibration		
This calibration is required for the installed frequency band:		
b. 12.4-20 GHz Band 2.(d) 10.	Frequency = 16 GHz Record the Waveform	Draw Waveform
3-21 FM Meter Calibration		
c. Meter Calibration	Follow steps c.1 through c.6	
d. Meter Verification 1.(c)	Measure FM Deviation	__________kHz

MODELS
6736B AND 6736B-10
SWEPT FREQUENCY SYNTHESIZER

TEST AND CALIBRATION
MANUAL

WILTRON

490 JARVIS DRIVE
MORGAN HILL, CA 95037-2809

P/N: 10370-10220
REVISION: D
PRINTED: OCTOBER 1993

SECTION 4
TEST RECORD

CONTENTS

SECTION 4
TEST RECORDS

4-1 INTRODUCTION

This section provides two Test Record tables for recording the results of the Performance Verification Tests (in Section 2) and the Calibration/Adjustments (in Section 3). They jointly provide the means for maintaining an accurate and complete record of instrument performance.

This test record provided here has been customized for the 6736B and 6736B-10 models. It should only be used with matching procedures in Section 2 and 3 that cover the 6736B and 6736B-10 models. Specific references to frequency parameters, power levels, and non-applicable procedures make each Test Record easy to follow.

We recommend that you make a copy of these pages each time the test procedures are performed. By dating each Test Record copy, a detailed history of instrument performance can be accumulated.

4-2 PERFORMANCE VERIFICATION TEST RECORD

The Test Record for the Performance Verification procedures supplied in Section 2 is located immediately following this page.

4-3 CALIBRATION/ADJUSTMENTS TEST RECORD

The Test Record for the Calibration/Adjustment procedures supplied in Section 3 follows the Performance Verification Test Record.

NOTE

Results of the automated RF Level Calibration procedure in Section 3 are not included in this Test Record. Calibration data is stored in instrument memory. Contact the WILTRON Customer Service department at (408) 778-2000 for more details.

WILTRON Model 6736B and 6736B-10 **Date: ______________________**

Serial Number____________________ **Tested By: _____________________**

2-5. Internal Time Base Aging Rate Test

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure				
2	Record T_S value		______hours	
4	Record T_1 value		______sec	
5	Record T_2 value		______sec	
6	Record T_F value		______hours	
8	Record the calculated aging rate		______per day	5×10^{-10} per day

2-6. Frequency Synthesis Tests

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Coarse Loop/YIG Loop Test Procedure				
1(c)	Enter 18 GHz			
2	Record the Frequency Counter Reading	17.999 999 900 GHz	___________ GHz	18.000 000 100 GHz
3	Record the Frequency Counter Reading	18.999 999 900 GHz	___________ GHz	19.000 000 100 GHz
4	Record the Frequency Counter Readings . . .	19.999 999 900 GHz	___________ GHz	20.000 000 100 GHz
		20.999 999 900 GHz	___________ GHz	21.000 000 100 GHz
		21.999 999 900 GHz	___________ GHz	22.000 000 100 GHz
		22.999 999 900 GHz	___________ GHz	23.000 000 100 GHz
		23.999 999 900 GHz	___________ GHz	24.000 000 100 GHz
		24.999 999 900 GHz	___________ GHz	25.000 000 100 GHz
		25.999 999 900 GHz	___________ GHz	26.000 000 100 GHz
d. Fine Loop Test Procedure				
1(c)	Enter 18 GHz			
2	Record the Frequency Counter Reading	17.999 999 900 GHz	___________ GHz	18.000 000 100 GHz
3	Record the Frequency Counter Reading	18.000 000 900 GHz	___________ GHz	18.000 001 100 GHz
4	Record the Frequency Counter Readings . . .	18.000 001 900 GHz	___________ GHz	18.000 002 100 GHz
		18.000 002 900 GHz	___________ GHz	18.000 003 100 GHz
		18.000 003 900 GHz	___________ GHz	18.000 004 100 GHz
		18.000 004 900 GHz	___________ GHz	18.000 005 100 GHz
		18.000 005 900 GHz	___________ GHz	18.000 006 100 GHz
		18.000 006 900 GHz	___________ GHz	18.000 007 100 GHz
		18.000 007 900 GHz	___________ GHz	18.000 008 100 GHz
		18.000 008 900 GHz	___________ GHz	18.000 009 100 GHz
		18.000 009 900 GHz	___________ GHz	18.000 010 100 GHz

2-7. Marker and Blanking Verification

Step	Procedure Comments	Marker/Signal Presence
	c. Marker Selection Procedure	
2	F1 Frequency Marker = 18 GHz	
2	Verify that a marker appears on the left side of the scope at the start of trace	_______
3(a)	F2 Frequency Marker = 26.5 GHz	
3(b)	Verify that a marker appears on the right side of the scope at the end of trace	_______
4	F3 Frequency Marker = 19 GHz	
4	Verify that a marker appears on the scope	_______
4	F4 Frequency Marker = 20 GHz	
4	Verify that a marker appears on the scope	_______
4	F5 Frequency Marker = 21 GHz	
4	Verify that a marker appears on the scope	_______
4	F6 Frequency Marker = 22 GHz	
4	Verify that a marker appears on the scope	_______
4	F7 Frequency Marker = 23 GHz	
4	Verify that a marker appears on the scope	_______
4	F8 Frequency Marker = 24 GHz	
4	Verify that a marker appears on the scope	_______
4	F9 Frequency Marker = 25 GHz	
4	Verify that a marker appears on the scope	_______
	d. Marker Output Verification Procedure	
1	Verify +5V (TTL high) markers at nine points on scope display	_______
3	Verify that all markers change to intensified spots	_______
5(a)	Verify +5V (TTL high) signal at retrace	_______
5(d)	Verify –10V (minimum) signal at selected marker frequency	_______
5(e)	Verify –5V (minimum) signal at all other marker frequencies	_______
6	Verify that new marker changes from –5V (minimum) to –10V (minimum)	_______
	Verify that previous marker changes from –10V (minimum) to –5V (minimum)	_______
	e. Retrace Blanking Output Verification Procedure	
2	Verify –5V (minimum) signal during retrace	_______
3	Verify +5V (minimum) signal during retrace	_______

2-8. Narrowband Spurious Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Fine Loop Test Procedure			
1(b)	Enter 18.3 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	10 kHz	N/A	_______dBc	–60 dBc
	20 kHz	N/A	_______dBc	–60 dBc
	30 kHz	N/A	_______dBc	–60 dBc
	40 kHz	N/A	_______dBc	–60 dBc
	50 kHz	N/A	_______dBc	–60 dBc
	d. Coarse Loop Test Procedure			
1(b)	Enter 22.1 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	200 kHz	N/A	_______dBc	–60 dBc
	400 kHz	N/A	_______dBc	–60 dBc

2-9. Spurious and Harmonic Tests: RF Output Signals ≤2 GHz

These tests are not applicable to the 6736B model.

2-10. Harmonic Tests: RF Output Signals From 2 to 10 GHz

These tests are not applicable to the 6736B model.

2-11. Harmonic Tests: RF Output Signals From 11 to 20 GHz

These tests are not applicable to the 6736B model.

2-12. Harmonic Tests (Alternate Method): RF Output Signals From 10 to 30 GHz

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure				
2(c)	Enter 18 GHz			
4	Measure and record the difference between RF levels above and below filter cutoff:			
	18 to 26.5 GHz harmonic level	N/A	_______dBc	–60 dBc

2-13. Harmonic Tests: RF Output Signals From 26.5 to 40 GHz

These tests are not applicable to the 6736B model.

2-14. Harmonic Tests: RF Output Signals From 40 to 60 GHz

These tests are not applicable to the 6736B model.

2-15. Single Sideband Phase Noise Test

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure (Band 4; 18 to 26.5 GHz)				
1(c)	Enter 22.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–58 dBc
6	100 Hz	N/A	_______dBc	–63 dBc
8	1 kHz	N/A	_______dBc	–67 dBc
10	10 kHz	N/A	_______dBc	–71 dBc
12	100 kHz	N/A	_______dBc	–97 dBc

2-16. Power Level Accuracy and Flatness Verification (6736B Models without Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 0.8 dB			
	** = Maximum Variation is 3.0 dB			
d. Power Level Accuracy Procedure				
1(c)	Enter 18.0 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+6.4 dBm	________ dBm	+7.6 dBm
3	Measure and record the Power Meter reading	+5.4 dBm	________ dBm	+6.6 dBm
4	Measure and record the Power Meter readings	+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
		–3.6 dBm	________ dBm	-2.4 dBm
		–4.6 dBm	________ dBm	–3.4 dBm
		–5.6 dBm	________ dBm	–4.4 dBm

2-16. Power Level Accuracy and Flatness Verification (6736B Models with 110 dB Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Power Level Flatness Procedure			
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 2.0 dB			
	** = Maximum Variation is 6.2 dB			
	d. Power Level Accuracy Procedure			
1(c)	Enter 18.0 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+2.6 dBm	________ dBm	+5.4 dBm
3	Measure and record the Power Meter reading	+1.6 dBm	________ dBm	+4.4 dBm
4	Measure and record the Power Meter readings	+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
		–7.4 dBm	________ dBm	–4.6 dBm
		–8.4 dBm	________ dBm	–5.6 dBm
		–9.4 dBm	________ dBm	–6.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6736B-10 Models without Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 0.8 dB			
	** = Maximum Variation is 3.0 dB			
d. Power Level Accuracy Procedure				
1(c)	Enter 18.0 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm

2-16. Power Level Accuracy and Flatness Verification (6736B-10 Models with 110 dB Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 2.0 dB			
	** = Maximum Variation is 6.2 dB			
d. Power Level Accuracy Procedure				
1(c)	Enter 18.0 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm

2-17. FM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	d. FM Input Sensitivity Procedure (Band 4; 18 to 26.5 GHz)			
2(c)	Enter 22 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
	e. FM Meter Accuracy Procedure (Band 4; 18 to 26.5 GHz)			
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A

2-18. AM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	d. AM Input Sensitivity and Meter Accuracy (Band 4; 18 to 26.5 GHz)			
2(e)	Enter 22 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
	e. AM Meter Accuracy Procedure (Band 4; 18 to 26.5 GHz)			
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Rise Time, Fall Time, Overshoot, and Level (Band 4; 18 to 26.5 GHz)			
1(c)	Enter 22 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
	d. Pulse Leveling Accuracy Check, Preliminary Test Setup			
4(b)	Enter 22 GHz			
	e. 67XXB LEVEL Display Calibration			
1	Note the 67XXB LEVEL display value			______dBm
2	Note the 67XXB LEVEL display value			______dBm
3	Calculate the difference between steps e.1 and e.2. Note this value			______dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 5 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 2 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 1 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-20. Pulse Modulation Test: Video Feedthrough

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure (Band 4; 18 to 26.5 GHz)				
1(c)	Enter 22 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak

2-21. Pulse Modulation Test: RF On/Off Ratio

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure (Band 4; 18 to 26.5 GHz)				
1(d)	Enter 22 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >50 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	50 dB	______dB	N/A

WILTRON Model 6736B and 6736B-10 **Date:** ______________________

Serial Number____________________ **Tested By:** _____________________

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-9 ALC Level Offset Adjustments This instrument uses only one leveling circuit; Band 1 thru 4.		
d. Band 1 thru 4 Level Offset 1.(b) 3.	Frequency = 22 GHz A15TP5 = 0V ±10 µV	___________volts
f. ALC Detector Shaper Level Offset 6.(c)	Frequency = 18 GHz Follow steps f.1 through f.21.	
3-10 External Leveling Offset Adjustment c.3	A15TP7 = 0V ±1 mV	___________volts
3-11 10 MHz Reference Oscillator Calibration c.1.(c) c.3	Frequency = 26.5 GHz Adjust for Frequency Counter Reading = 26.5 GHz ±100 Hz	___________GHz

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-12 ALC Bandwidth Calibration		
This calibration is required for the installed frequency band:		
c. 18-26.5 GHz Band 2.(c)	Frequency = 22 GHz Follow steps c.1 through c.13; then steps c.16 and c.17.	
3-13 Analog Sweep Calibration		
This calibration is automatically completed for the installed frequency band.		
c.1.(d)	Frequency = 22 GHz	
3-14 YIG-tuned Oscillator Frequency Calibration		
This calibration is required for the installed frequency band:		
c. 18-26.5 GHz Band 1.(e) 5.	Frequency = 22 GHz Maximum difference in MHz between frequency counter and 6736B	_________MHz
3-15 RF Level Calibration		
This calibration is performed using an automatic test system. Contact WILTRON Customer Service at (408) 778–2000 for further information.		

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-16 ALC Slope Adjustment		
This calibration is required for the >2 GHz level detector.		
c. 18-26.5 GHz Band		
2.(d)	F1 = 18 GHz	
2.(f)	F2 = 26.5 GHz	
5.	Record the resulting waveform	Draw Waveform Flatness for the 18-26.5 GHz Band
3-17 AM Sensitivity Calibration		
This calibration is required for the installed frequency band:		
d. 18-26.5 GHz Band		
2.(d)	Frequency = 22 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
3-18 AM Meter Calibration		
c. Meter Calibration		
2.(d)	Frequency = 22 GHz	
d. Meter Verification		
1.(c)	Frequency = 22 GHz	
1.(g)	Measure and record AM DEPTH	__________%

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-19 FM Driver/Sensitivity Calibration		
This calibration is required for the installed frequency band:		
d. 18-26.5 GHz Band 2.(d) 8.	Frequency = 22 GHz Record the Waveform Null	Draw Waveform Null
3-20 FM Flatness Calibration		
This calibration is required for the installed frequency band:		
b. 18-26.5 GHz Band 2.(d) 10.	Frequency = 22 GHz Record the Waveform	Draw Waveform
3-21 FM Meter Calibration		
c. Meter Calibration	Follow steps c.1 through c.6.	
d. Meter Verification 1.(c)	Measure FM Deviation	__________kHz

MODELS
6737B AND 6737B-20
SWEPT FREQUENCY SYNTHESIZER

TEST AND CALIBRATION
MANUAL

WILTRON

490 JARVIS DRIVE
MORGAN HILL, CA 95037-2809

P/N: 10370-10222
REVISION: D
PRINTED: OCTOBER 1993

SECTION 4
TEST RECORD

CONTENTS

SECTION 4
TEST RECORDS

4-1 INTRODUCTION

This section provides two Test Record tables for recording the results of the Performance Verification Tests (in Section 2) and the Calibration/Adjustments (in Section 3). They jointly provide the means for maintaining an accurate and complete record of instrument performance.

This test record provided here has been customized for the 6737B and 6737B-20 models. It should only be used with matching procedures in Section 2 and 3 that cover the 6737B or 6737B-20 models. Specific references to frequency parameters, power levels, and non-applicable procedures make each Test Record easy to follow.

We recommend that you make a copy of these pages each time the test procedures are performed. By dating each Test Record copy, a detailed history of instrument perfomance can be accumulated.

4-2 PERFORMANCE VERIFICATION TEST RECORD

The Test Record for the Performance Verification procedures supplied in Section 2 is located immediately following this page.

4-3 CALIBRATION/ADJUSTMENTS TEST RECORD

The Test Record for the Calibration/Adjustment procedures supplied in Section 3 follows the Performance Verification Test Record.

NOTE

Results of the automated RF Level Calibration procedure in Section 3 are not included in this Test Record. Calibration data is stored in instrument memory. Contact the WILTRON Customer Service department at (408) 778-2000 for more details.

WILTRON Model 6737B and 6737B-20 **Date:** ______________________

Serial Number____________________ **Tested By:** _____________________

2-5. Internal Time Base Aging Rate Test

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure				
2	Record T_S value		______hours	
4	Record T_1 value		______sec	
5	Record T_2 value		______sec	
6	Record T_F value		______hours	
8	Record the calculated aging rate		______per day	5×10^{-10} per day

2-6. Frequency Synthesis Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Coarse Loop/YIG Loop Test Procedure				
1(c)	Enter 2 GHz			
2	Record the Frequency Counter Reading	1.999 999 900 GHz	___________ GHz	2.000 000 100 GHz
3	Record the Frequency Counter Readings . . .	2.999 999 900 GHz	___________ GHz	3.000 000 100 GHz
4	Record the Frequency Counter Readings . . .	3.999 999 900 GHz	___________ GHz	4.000 000 100 GHz
		4.999 999 900 GHz	___________ GHz	5.000 000 100 GHz
		5.999 999 900 GHz	___________ GHz	6.000 000 100 GHz
		6.999 999 900 GHz	___________ GHz	7.000 000 100 GHz
		7.999 999 900 GHz	___________ GHz	8.000 000 100 GHz
		8.999 999 900 GHz	___________ GHz	9.000 000 100 GHz
		9.999 999 900 GHz	___________ GHz	10.000 000 100 GHz
		10.999 999 900 GHz	___________ GHz	11.000 000 100 GHz
		11.999 999 900 GHz	___________ GHz	12.000 000 100 GHz
		12.999 999 900 GHz	___________ GHz	13.000 000 100 GHz
		13.999 999 900 GHz	___________ GHz	14.000 000 100 GHz
		14.999 999 900 GHz	___________ GHz	15.000 000 100 GHz
		15.999 999 900 GHz	___________ GHz	16.000 000 100 GHz
		16.999 999 900 GHz	___________ GHz	17.000 000 100 GHz
		17.999 999 900 GHz	___________ GHz	18.000 000 100 GHz
		18.999 999 900 GHz	___________ GHz	19.000 000 100 GHz
		19.999 999 900 GHz	___________ GHz	20.000 000 100 GHz
d. Fine Loop Test Procedure				
1(c)	Enter 2 GHz			
2	Record the Frequency Counter Reading	1.999 999 900 GHz	___________ GHz	2.000 000 100 GHz
3	Record the Frequency Counter Reading	2.000 000 900 GHz	___________ GHz	2.000 001 100 GHz
4	Record the Frequency Counter Readings . . .	2.000 001 900 GHz	___________ GHz	2.000 002 100 GHz
		2.000 002 900 GHz	___________ GHz	2.000 003 100 GHz
		2.000 003 900 GHz	___________ GHz	2.000 004 100 GHz
		2.000 004 900 GHz	___________ GHz	2.000 005 100 GHz
		2.000 005 900 GHz	___________ GHz	2.000 006 100 GHz
		2.000 006 900 GHz	___________ GHz	2.000 007 100 GHz
		2.000 007 900 GHz	___________ GHz	2.000 008 100 GHz
		2.000 008 900 GHz	___________ GHz	2.000 009 100 GHz
		2.000 009 900 GHz	___________ GHz	2.000 010 100 GHz

2-7. Marker and Blanking Verification

Step	*Procedure Comments*	*Marker/Signal Presence*
	c. Marker Selection Procedure	
2	F1 Frequency Marker = 2 GHz	
2	Verify that a marker appears on the left side of the scope at the start of trace	_______
3(a)	F2 Frequency Marker = 20 GHz	
3(b)	Verify that a marker appears on the right side of the scope at the end of trace	_______
4	F3 Frequency Marker = 4 GHz	
4	Verify that a marker appears on the scope	_______
4	F4 Frequency Marker = 7 GHz	
4	Verify that a marker appears on the scope	_______
4	F5 Frequency Marker = 10 GHz	
4	Verify that a marker appears on the scope	_______
4	F6 Frequency Marker = 11 GHz	
4	Verify that a marker appears on the scope	_______
4	F7 Frequency Marker = 13 GHz	
4	Verify that a marker appears on the scope	_______
4	F8 Frequency Marker = 15 GHz	
4	Verify that a marker appears on the scope	_______
4	F9 Frequency Marker = 18 GHz	
4	Verify that a marker appears on the scope	_______
	d. Marker Output Verification Procedure	
1	Verify +5V (TTL high) markers at nine points on scope display	_______
3	Verify that all markers change to intensified spots	_______
5(a)	Verify +5V (TTL high) signal at retrace	_______
5(b)	Verify +5V (minimum) signal at bandswitch point	_______
5(c)	Verify +5V (minimum) signal at each switched filter point:	
	3.5 GHz switch point	_______
	6.0 GHz switch point	_______
5(d)	Verify –10V (minimum) signal at selected marker frequency	_______
5(e)	Verify –5V (minimum) signal at all other marker frequencies	_______
6	Verify that new marker changes from –5V (minimum) to –10V (minimum)	_______
	Verify that previous marker changes from –10V (minimum) to –5V (minimum)	_______
	e. Retrace Blanking Output Verification Procedure	
2	Verify –5V (minimum) signal during retrace	_______
3	Verify +5V (minimum) signal during retrace	_______
	f. Bandswitch Blanking Output Verification Procedure	
2	Verify +5V (minimum) signal during the following bandswitch dwell points:	
	8.0 GHz bandswitch dwell point	_______
	12.4 GHz bandswitch dwell point	_______
3	Verify –5V (minimum) signal during the following bandswitch dwell points:	
	8.0 GHz bandswitch dwell point	_______
	12.4 GHz bandswitch dwell point	_______

2-8. Narrowband Spurious Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Fine Loop Test Procedure				
1(b)	Enter 5.1 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	10 kHz	N/A	_______dBc	–60 dBc
	20 khz	N/A	_______dBc	–60 dBc
	30 kHz	N/A	_______dBc	–60 dBc
	40 kHz	N/A	_______dBc	–60 dBc
	50 kHz	N/A	_______dBc	–60 dBc
d. Coarse Loop Test Procedure				
1(b)	Enter 18.3 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	200 kHz	N/A	_______dBc	–60 dBc
	400 khz	N/A	_______dBc	–60 dBc

2-9. Spurious and Harmonic Tests: RF Output Signals ≤2 GHz

The tests are not applicable to the 6737B and 6737B-20 models.

2-10. Harmonic Tests: RF Output Signals From 2 to 10 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure				
4	Record the level of all harmonics of the 2.1 GHz carrier:			
	4.2 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
	6.3 GHz (3rd harmonic)	N/A	_______dBc	–60 dBc
	8.4 GHz (4th harmonic)	N/A	_______dBc	–60 dBc
	10.5 GHz (5th harmonic)	N/A	_______dBc	–60 dBc
	12.6 GHz (6th harmonic)	N/A	_______dBc	–60 dBc
	14.7 GHz (7th harmonic)	N/A	_______dBc	–60 dBc
	16.8 GHz (8th harmonic)	N/A	_______dBc	–60 dBc
	18.9 GHz (9th harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 3.6 GHz carrier:			
	7.2 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
	10.8 GHz (3rd harmonic)	N/A	_______dBc	–60 dBc
	14.4 GHz (4th harmonic)	N/A	_______dBc	–60 dBc
	18 GHz (5th harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 7 GHz carrier:			
	14 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 10 GHz carrier:			
	20 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc

2-11. Harmonic Tests: RF Output Signals From 11 to 20 GHz

These tests are not applicable to the 6737B and 6737B-20 models.

2-12. Harmonic Tests (Alternate Method): RF Output Signals From 10 to 30 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure			
2(c)	Enter 10 GHz			
4	Measure and record the difference between RF levels above and below filter cutoff:			
	10 to 20 GHz harmonic level	N/A	_______dBc	–60 dBc

2-13. Harmonic Tests: RF Output Signals From 26.5 to 40 GHz

These tests are not applicable to the 6737B and 6737B-20 models.

2-14. Harmonic Tests: RF Output Signals From 40 to 60 GHz

These tests are not applicable to the 6737B and 6737B-20 models.

2-15. Single Sideband Phase Noise Test

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure (Band 1; 2 to 8 GHz)			
1(c)	Enter 5.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–67 dBc
6	100 Hz	N/A	_______dBc	–72 dBc
8	1 kHz	N/A	_______dBc	–76 dBc
10	10 kHz	N/A	_______dBc	–80 dBc
12	100 kHz	N/A	_______dBc	–98 dBc
13	Repeat steps c.1 through c.12 for the remaining bands.			
	c. Test Procedure (Band 2; 8 to 12.4 GHz)			
1(c)	Enter 10.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–64 dBc
6	100 Hz	N/A	_______dBc	–69 dBc
8	1 kHz	N/A	_______dBc	–73 dBc
10	10 kHz	N/A	_______dBc	–77 dBc
12	100 kHz	N/A	_______dBc	–100 dBc

2-15. Single Sideband Phase Noise Test (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure (Band 3; 12.4 to 20 GHz)			
1(c)	Enter 16.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–60 dBc
6	100 Hz	N/A	_______dBc	–65 dBc
8	1 kHz	N/A	_______dBc	–69 dBc
10	10 kHz	N/A	_______dBc	–73 dBc
12	100 kHz	N/A	_______dBc	–100 dBc

2-16. Power Level Accuracy and Flatness Verification (6737B Models without Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Power Level Flatness Procedure			
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	

* = Maximum Variation is 0.8 dB

** = Maximum Variation is 2.0 dB

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	d. Power Level Accuracy Procedure (2 to 8 GHz)			
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm

2-16. Power Level Accuracy and Flatness Verification (6737B Models without Optional Attenuator) (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. Power Level Accuracy Procedure (8 to 12.4 GHz)				
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
d. Power Level Accuracy Procedure (12.4 to 20 GHz)				
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm

2-16. Power Level Accuracy and Flatness Verification (6737B Models with 110 dB Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Power Level Flatness Procedure			
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 1.6 dB			
	** = Maximum Variation is 6.0 dB			
	d. Power Level Accuracy Procedure (2 to 8 GHz)			
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
	d. Power Level Accuracy Procedure (8 to 12.4 GHz)			
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6737B Models with 110 dB Optional Attenuator) (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. Power Level Accuracy Procedure (12.4 to 20 GHz)				
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6737B-20 Models without Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Power Level Flatness Procedure			
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 0.8 dB			
	** = Maximum Variation is 2.0 dB			
	d. Power Level Accuracy Procedure (2 to 8 GHz)			
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+12.4 dBm	________ dBm	+13.6 dBm
3	Measure and record the Power Meter reading	+11.4 dBm	________ dBm	+12.6 dBm
4	Measure and record the Power Meter readings	+10.4 dBm	________ dBm	+11.6 dBm
		+9.4 dBm	________ dBm	+10.6 dBm
		+8.4 dBm	________ dBm	+9.6 dBm
		+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
	d. Power Level Accuracy Procedure (8 to 12.4 GHz)			
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+12.4 dBm	________ dBm	+13.6 dBm
3	Measure and record the Power Meter reading	+11.4 dBm	________ dBm	+12.6 dBm
4	Measure and record the Power Meter readings	+10.4 dBm	________ dBm	+11.6 dBm
		+9.4 dBm	________ dBm	+10.6 dBm
		+8.4 dBm	________ dBm	+9.6 dBm
		+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6737B-20 Models without Optional Attenuator) (Continued)

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
	d. Power Level Accuracy Procedure (12.4 to 20 GHz)			
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+12.4 dBm	________ dBm	+13.6 dBm
3	Measure and record the Power Meter reading	+11.4 dBm	________ dBm	+12.6 dBm
4	Measure and record the Power Meter readings	+10.4 dBm	________ dBm	+11.6 dBm
		+9.4 dBm	________ dBm	+10.6 dBm
		+8.4 dBm	________ dBm	+9.6 dBm
		+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6737B-20 Models with 110 dB Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Power Level Flatness Procedure			
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 1.6 dB			
	** = Maximum Variation is 6.0 dB			
	d. Power Level Accuracy Procedure (2 to 8 GHz)			
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+8.6 dBm	________ dBm	+11.4 dBm
3	Measure and record the Power Meter reading	+7.6 dBm	________ dBm	+10.4 dBm
4	Measure and record the Power Meter readings	+6.6 dBm	________ dBm	+9.4 dBm
		+5.6 dBm	________ dBm	+8.4 dBm
		+4.6 dBm	________ dBm	+7.4 dBm
		+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
	d. Power Level Accuracy Procedure (8 to 12.4 GHz)			
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+8.6 dBm	________ dBm	+11.4 dBm
3	Measure and record the Power Meter reading	+7.6 dBm	________ dBm	+10.4 dBm
4	Measure and record the Power Meter readings	+6.6 dBm	________ dBm	+9.4 dBm
		+5.6 dBm	________ dBm	+8.4 dBm
		+4.6 dBm	________ dBm	+7.4 dBm
		+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6737B-20 Models with 110 dB Optional Attenuator) (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. Power Level Accuracy Procedure (12.4 to 20 GHz)				
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+8.6 dBm	________ dBm	+11.4 dBm
3	Measure and record the Power Meter reading	+7.6 dBm	________ dBm	+10.4 dBm
4	Measure and record the Power Meter readings	+6.6 dBm	________ dBm	+9.4 dBm
		+5.6 dBm	________ dBm	+8.4 dBm
		+4.6 dBm	________ dBm	+7.4 dBm
		+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm

2-17. FM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. FM Input Sensitivity Procedure (Band 1; 2 to 8 GHz)				
2(c)	Enter 5 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 1; 2 to 8 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
6	Repeat steps d.2 through e.5 for the remaining bands.			
d. FM Input Sensitivity Procedure (Band 2; 8 to 12.4 GHz)				
2(c)	Enter 10 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 2; 8 to 12.4 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
d. FM Input Sensitivity Procedure (Band 3; 12.4 to 20 GHz)				
2(c)	Enter 16 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 3; 12.4 to 20 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A

2-18. AM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. AM Input Sensitivity and Meter Accuracy (Band 1; 2 to 8 GHz)				
2(e)	Enter 5 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 1; 2 to 8 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%
6	Repeat steps d.2 through e.5 for the remaining bands.			
d. AM Input Sensitivity and Meter Accuracy (Band 2; 8 to 12.4 GHz)				
2(e)	Enter 10 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 2; 8 to 12.4 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%
d. AM Input Sensitivity and Meter Accuracy (Band 3; 12.4 to 20 GHz)				
2(e)	Enter 16 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 3; 12.4 to 20 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Rise Time, Fall Time, Overshoot, and Level (Band 1; 2 to 8 GHz)				
1(c)	Enter 5 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
c. Rise Time, Fall Time, Overshoot, and Level (Band 2; 8 to 12.4 GHz)				
1(c)	Enter 10 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
c. Rise Time, Fall Time, Overshoot, and Level (Band 3; 12.4 to 20 GHz)				
1(c)	Enter 16 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
d. Pulse Leveling Accuracy Check, Preliminary Test Setup				
4(b)	Enter 5 GHz			
e. 67XXB LEVEL Display Calibration				
1	Note the 67XXB LEVEL display value			______dBm
2	Note the 67XXB LEVEL display value			______dBm
3	Calculate the difference between steps e.1 and e.2. Note this value			______dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 5 µs)			
2(b)	Enter 5 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
	f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 2 µs)			
2(b)	Enter 5 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
	f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 1 µs)			
2(b)	Enter 5 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
	f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 0.5 µs)			
2(b)	Enter 5 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
	f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 0.2 µs)			
2(b)	Enter 5 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
	f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 0.1 µs)			
2(b)	Enter 5 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 5 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 2 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 1 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 20 GHz; Pulse Width = 5 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 20 GHz; Pulse Width = 2 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 20 GHz; Pulse Width = 1 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 20 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 20 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 20 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-20. Pulse Modulation Test: Video Feedthrough

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure (Band 1; 2 to 8 GHz)			
1(c)	Enter 5 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak
4	Repeat steps c.1 through c.3 for the remaining bands.			
	c. Test Procedure (Band 2; 8 to 12.4 GHz)			
1(c)	Enter 10 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak
	c. Test Procedure (Band 3; 12.4 to 20 GHz)			
1(c)	Enter 16 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak

2-21. Pulse Modulation Test: RF On/Off Ratio

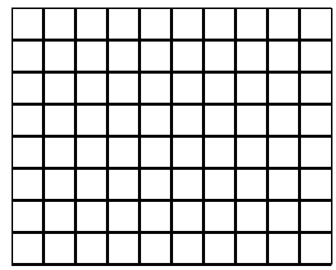
Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure (Band 1; 2 to 8 GHz)			
1(d)	Enter 5 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A
7	Repeat steps c.1 through c.5 for the remaining bands.			
	c. Test Procedure (Band 2; 8 to 12.4 GHz)			
1(d)	Enter 10 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A
	c. Test Procedure (Band 3; 12.4 to 20 GHz)			
1(d)	Enter 16 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A

WILTRON Model 6737B and 6737B-20 **Date:** ______________________

Serial Number____________________ **Tested By:** _____________________

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-9 ALC Level Offset Adjustments		
This instrument uses only one leveling circuit; Band 1 thru 4.		
d. Band 1 thru 4 Level Offset		
1.(b) 3.	Frequency = 5 GHz A15TP5 = 0V ±10 µV	___________volts
f. ALC Detector Shaper Level Offset 6.(c)	Frequency = 2.1 GHz Follow steps f.1 through f.21.	
3-10 External Leveling Offset Adjustment		
c.3	A15TP7 = 0V ±1 mV	___________volts
3-11 10 MHz Reference Oscillator Calibration		
c.1.(c) c.3	Frequency = 20 GHz Adjust for Frequency Counter Reading = 20 GHz ±100 Hz	___________GHz

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-12 ALC Bandwidth Calibration		
This calibration is required for each installed frequency band:		
c. 2-8 GHz Band 2.(c)	Frequency = 5 GHz Follow steps c.1 through c.15.	
c. 8-12.4 GHz Band 2.(c)	Frequency = 10 GHz Repeat steps c.7 through c.15.	
c. 12.4-20 GHz Band 2.(c)	Frequency = 16 GHz Repeat steps c.7 through c.13; then steps c.16 and c.17.	
3-13 Analog Sweep Calibration		
This calibration is automatically completed for all of the installed frequency bands		
c.1.(d)	Frequency = 5 GHz	
3-14 YIG-tuned Oscillator Frequency Calibration		
This calibration is required for each installed frequency band:		
c. 2-8 GHz Band 1.(e) 5.	Frequency = 5 GHz Maximum difference in MHz between frequency counter and 6737B	__________MHz
c. 8-12.4 GHz Band 1.(e) 5.	Frequency = 10 GHz Maximum difference in MHz between frequency counter and 6737B	__________MHz
c. 12.4-20 GHz Band 1.(e) 5.	Frequency = 16 GHz Maximum difference in MHz between frequency counter and 6737B	_________MHz

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-15 RF Level Calibration		
This calibration is performed using an automatic test system. Contact WILTRON Customer Service at (408) 778–2000 for further information.		
3-16 ALC Slope Adjustment		
This calibration is required for the >2 GHz level detector.		
c. 2-20 GHz Band		
2.(d)	F1 = 2 GHz	
2.(f)	F2 = 20 GHz	
5.	Record the resulting waveform	Draw Waveform Flatness for the 2-20 GHz Band
3-17 AM Sensitivity Calibration		
This calibration is required for each installed frequency band:		
d. 2-8 GHz Band		
2.(d)	Frequency = 5 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
d. 8-12.4 GHz Band		
2.(d)	Frequency = 10 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
d. 12.4-20 GHz Band		
2.(d)	Frequency = 16 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-18 AM Meter Calibration		
c. Meter Calibration 2.(d)	Frequency = 5 GHz	
d. Meter Verification 1.(c)	Frequency = 5 GHz	
1.(g)	Measure and record AM DEPTH	__________%
3-19 FM Driver/Sensitivity Calibration		
This calibration is required for each installed frequency band:		
d. 2-8 GHz Band 2.(d) 8.	Frequency = 5 GHz Record the Waveform Null	Draw Waveform Null
d. 8-12.4 GHz Band 2.(d) 8.	Frequency = 10 GHz Record the Waveform Null	Draw Waveform Null
d. 12.4-20 GHz Band 2.(d) 8.	Frequency = 16 GHz Record the Waveform Null	Draw Waveform Null

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-20 FM Flatness Calibration		
This calibration is required for each installed frequency band:		
d. 2-8 GHz Band 2.(d) 10.	Frequency = 5 GHz Record the Waveform	Draw Waveform
d. 8-12.4 GHz Band 2.(d) 10.	Frequency = 10 GHz Record the Waveform	Draw Waveform
b. 12.4-20 GHz Band 2.(d) 10.	Frequency = 16 GHz Record the Waveform	Draw Waveform
3-21 FM Meter Calibration		
c. Meter Calibration	Follow steps c.1 through c.6.	
d. Meter Verification 1.(c)	Measure FM Deviation	__________kHz

MODEL 6740B
SWEPT FREQUENCY SYNTHESIZER

TEST AND CALIBRATION
MANUAL

WILTRON

490 JARVIS DRIVE
MORGAN HILL, CA 95037-2809

P/N: 10370-10224
REVISION: D
PRINTED: OCTOBER 1993

SECTION 4
TEST RECORD

CONTENTS

SECTION 4
TEST RECORDS

4-1 INTRODUCTION

This section provides two Test Record tables for recording the results of the Performance Verification Tests (in Section 2) and the Calibration/Adjustments (in Section 3). They jointly provide the means for maintaining an accurate and complete record of instrument performance.

This test record provided here has been customized for the 6740B model. It should only be used with matching procedures in Section 2 and 3 that cover the 6740B model. Specific references to frequency parameters, power levels, and non-applicable procedures make each Test Record easy to follow.

We recommend that you make a copy of these pages each time the test procedures are performed. By dating each Test Record copy, a detailed history of instrument performance can be accumulated.

4-2 PERFORMANCE VERIFICATION TEST RECORD

The Test Record for the Performance Verification procedures supplied in Section 2 is located immediately following this page.

4-3 CALIBRATION/ADJUSTMENTS TEST RECORD

The Test Record for the Calibration/Adjustment procedures supplied in Section 3 follows the Performance Verification Test Record.

NOTE

Results of the automated RF Level Calibration procedure in Section 3 are not included in this Test Record. Calibration data is stored in instrument memory. Contact the WILTRON Customer Service department at (408) 778-2000 for more details.

WILTRON Model 6740B **Date:** ______________________

Serial Number____________________ **Tested By:** ______________________

2-5. Internal Time Base Aging Rate Test

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure				
2	Record T_S value		______hours	
4	Record T_1 value		______sec	
5	Record T_2 value		______sec	
6	Record T_F value		______hours	
8	Record the calculated aging rate		______per day	5×10^{-10} per day

2-6. Frequency Synthesis Tests

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Coarse Loop/YIG Loop Test Procedure				
1(c)	Enter 27 GHz			
2	Record the Frequency Counter Reading	26.999 999 800 GHz	__________ GHz	27.000 000 200 GHz
3	Record the Frequency Counter Reading	27.999 999 800 GHz	__________ GHz	28.000 000 200 GHz
4	Record the Frequency Counter Readings . . .	28.999 999 800 GHz	__________ GHz	29.000 000 200 GHz
		29.999 999 800 GHz	__________ GHz	30.000 000 200 GHz
		30.999 999 800 GHz	__________ GHz	31.000 000 200 GHz
		31.999 999 800 GHz	__________ GHz	32.000 000 200 GHz
		32.999 999 800 GHz	__________ GHz	33.000 000 200 GHz
		33.999 999 800 GHz	__________ GHz	34.000 000 200 GHz
		34.999 999 800 GHz	__________ GHz	35.000 000 200 GHz
		35.999 999 800 GHz	__________ GHz	36.000 000 200 GHz
		36.999 999 800 GHz	__________ GHz	37.000 000 200 GHz
		37.999 999 800 GHz	__________ GHz	38.000 000 200 GHz
		38.999 999 800 GHz	__________ GHz	39.000 000 200 GHz
		39.999 999 800 GHz	__________ GHz	40.000 000 200 GHz
d. Fine Loop Test Procedure				
1(c)	Enter 27 GHz			
2	Record the Frequency Counter Reading	26.999 999 800 GHz	__________ GHz	27.000 000 200 GHz
3	Record the Frequency Counter Reading	27.000 001 800 GHz	__________ GHz	27.000 002 200 GHz
4	Record the Frequency Counter Readings . . .	27.000 003 800 GHz	__________ GHz	27.000 004 200 GHz
		27.000 005 800 GHz	__________ GHz	27.000 006 200 GHz
		27.000 007 800 GHz	__________ GHz	27.000 008 200 GHz
		27.000 009 800 GHz	__________ GHz	27.000 010 200 GHz
		27.000 011 800 GHz	__________ GHz	27.000 012 200 GHz
		27.000 013 800 GHz	__________ GHz	27.000 014 200 GHz
		27.000 015 800 GHz	__________ GHz	27.000 016 200 GHz
		27.000 017 800 GHz	__________ GHz	27.000 018 200 GHz
		27.000 019 800 GHz	__________ GHz	27.000 020 200 GHz

2-7. Marker and Blanking Verification

Step	Procedure Comments	Marker/Signal Presence
c. Marker Selection Procedure		
2	F1 Frequency Marker = 26.5 GHz	
2	Verify that a marker appears on the left side of the scope at the start of trace	_______
3(a)	F2 Frequency Marker = 40 GHz	
3(b)	Verify that a marker appears on the right side of the scope at the end of trace	_______
4	F3 Frequency Marker = 28 GHz	
4	Verify that a marker appears on the scope	_______
4	F4 Frequency Marker = 30 GHz	
4	Verify that a marker appears on the scope	_______
4	F5 Frequency Marker = 32 GHz	
4	Verify that a marker appears on the scope	_______
4	F6 Frequency Marker = 33 GHz	
4	Verify that a marker appears on the scope	_______
4	F7 Frequency Marker = 34 GHz	
4	Verify that a marker appears on the scope	_______
4	F8 Frequency Marker = 36 GHz	
4	Verify that a marker appears on the scope	_______
4	F9 Frequency Marker = 38 GHz	
4	Verify that a marker appears on the scope	_______
d. Marker Output Verification Procedure		
1	Verify +5V (TTL high) markers at nine points on scope display	_______
3	Verify that all markers change to intensified spots	_______
5(a)	Verify +5V (TTL high) signal at retrace	_______
5(d)	Verify –10V (minimum) signal at selected marker frequency	_______
5(e)	Verify –5V (minimum) signal at all other marker frequencies	_______
6	Verify that new marker changes from –5V (minimum) to –10V (minimum)	_______
	Verify that previous marker changes from –10V (minimum) to –5V (minimum)	_______
e. Retrace Blanking Output Verification Procedure		
2	Verify –5V (minimum) signal during retrace	_______
3	Verify +5V (minimum) signal during retrace	_______

2-8. Narrowband Spurious Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Fine Loop Test Procedure				
1(b)	Enter 26.5 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	10 kHz	N/A	_______dBc	–60 dBc
	20 kHz	N/A	_______dBc	–60 dBc
	30 kHz	N/A	_______dBc	–60 dBc
	40 kHz	N/A	_______dBc	–60 dBc
	50 kHz	N/A	_______dBc	–60 dBc
d. Coarse Loop Test Procedure				
1(b)	Enter 33.1 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	200 kHz	N/A	_______dBc	–60 dBc
	400 kHz	N/A	_______dBc	–60 dBc

2-9. Spurious and Harmonic Tests: RF Output Signals ≤2 GHz

These tests are not applicable to the 6740B model.

2-10. Harmonic Tests: RF Output Signals From 2 to 10 GHz

These tests are not applicable to the 6740B model.

2-11. Harmonic Tests: RF Output Signals From 11 to 20 GHz

These tests are not applicable to the 6740B model.

2-12. Harmonic Tests (Alternate Method): RF Output Signals From 10 to 30 GHz

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure				
2(c)	Enter 26.5 GHz			
4	Measure and record the difference between RF levels above and below filter cutoff:			
	26.5 to 30 GHz harmonic level	N/A	_______dBc	–20 dBc

2-13. Harmonic Tests: RF Output Signals From 26.5 to 40 GHz

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure				
6	Measure and record the 26.5 GHz signal level	N/A	_______dBc	–20 dBc

2-14. Harmonic Tests: RF Output Signals From 40 to 60 GHz

These tests are not applicable to the 6740B model.

2-15. Single Sideband Phase Noise Test

Th1s test is not applicable to the 6740B model.

2-16. Power Level Accuracy and Flatness Verification (6740B Models without Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 1.2 dB			
	** = Maximum Variation is 4.0 dB			
d. Power Level Accuracy Procedure				
1(c)	Enter 26.5 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.2 dBm	________ dBm	+10.8 dBm
3	Measure and record the Power Meter reading	+8.2 dBm	________ dBm	+9.8 dBm
4	Measure and record the Power Meter readings	+7.2 dBm	________ dBm	+8.8 dBm
		+6.2 dBm	________ dBm	+7.8 dBm
		+5.2 dBm	________ dBm	+6.8 dBm
		+4.2 dBm	________ dBm	+5.8 dBm
		+3.2 dBm	________ dBm	+4.8 dBm
		+2.2 dBm	________ dBm	+3.8 dBm
		+1.2 dBm	________ dBm	+2.8 dBm
		+0.2 dBm	________ dBm	+1.8 dBm
		–0.8 dBm	________ dBm	+0.8 dBm
		–1.8 dBm	________ dBm	–0.2 dBm
		–2.8 dBm	________ dBm	–1.2 dBm

2-16. Power Level Accuracy and Flatness Verification (6740B Models with 110 dB Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 4.0 dB			
	** = Maximum Variation is 8.2 dB			
d. Power Level Accuracy Procedure				
1(c)	Enter 26.5 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+3.0 dBm	________ dBm	+9.0 dBm
3	Measure and record the Power Meter reading	+2.0 dBm	________ dBm	+8.0 dBm
4	Measure and record the Power Meter readings	+1.0 dBm	________ dBm	+7.0 dBm
		+0.0 dBm	________ dBm	+6.0 dBm
		–1.0 dBm	________ dBm	+5.0 dBm
		–2.0 dBm	________ dBm	+4.0 dBm
		–3.0 dBm	________ dBm	+3.0 dBm
		–4.0 dBm	________ dBm	+2.0 dBm
		–5.0 dBm	________ dBm	+1.0 dBm
		–6.0 dBm	________ dBm	+0.0 dBm
		–7.0 dBm	________ dBm	–1.0 dBm
		–8.0 dBm	________ dBm	–2.0 dBm
		–9.0 dBm	________ dBm	–3.0 dBm

2-17. FM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. FM Input Sensitivity Procedure (Band 5; 26.5 to 40 GHz)				
2(c)	Enter 33 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 5; 26.5 to 40 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A

2-18. AM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. AM Input Sensitivity and Meter Accuracy (Band 5; 26.5 to 40 GHz)				
2(e)	Enter 33 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 5; 26.5 to 40 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Rise Time, Fall Time, Overshoot, and Level (Band 5; 26.5 to 40 GHz)				
1(c)	Enter 33 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
d. Pulse Leveling Accuracy Check, Preliminary Test Setup				
4(b)	Enter 33 GHz			
e. 67XXB LEVEL Display Calibration				
1	Note the 67XXB LEVEL display value			______dBm
2	Note the 67XXB LEVEL display value			______dBm
3	Calculate the difference between steps e.1 and e.2. Note this value			______dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
f. Pulse Level Accuracy Test Procedure (Band 5, 26.5 to 40 GHz; Pulse Width = 5 µs)				
2(b)	Enter 33 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 5, 26.5 to 40 GHz; Pulse Width = 2 µs)				
2(b)	Enter 33 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 5, 26.5 to 40 GHz; Pulse Width = 1 µs)				
2(b)	Enter 33 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 5, 26.5 to 40 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 33 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 5, 26.5 to 40 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 33 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 5, 26.5 to 40 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 33 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-20. Pulse Modulation Test: Video Feedthrough

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure (Band 5; 26.5 to 40 GHz)				
1(c)	Enter 33 GHz			
4	Measure and record the Video Feedthrough voltage spikes (specification = <±5 mV peak).	N/A	______mV peak	±5 mV peak

2-21. Pulse Modulation Test: RF On/Off Ratio

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure (Band 5; 26.5 to 40 GHz)				
1(d)	Enter 33 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >50 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	50 dB	______dB	N/A

WILTRON Model 6740B **Date:** ______________________

Serial Number____________________ **Tested By:** _____________________

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-9 ALC Level Offset Adjustments		
This instrument uses only one leveling circuit; Band 1 thru 4.		
d. Band 1 thru 4 Level Offset 1.(b) 3.	Frequency = 33 GHz A15TP5 = 0V ±10 µV	___________volts
f. ALC Detector Shaper Level Offset 6.(c)	Frequency = 26.5 GHz Follow steps f.1 through f.21.	
3-10 External Leveling Offset Adjustment		
c.3	A15TP7 = 0V ±1 mV	___________volts
3-11 10 MHz Reference Oscillator Calibration		
c.1.(c) c.3	Frequency = 40 GHz Adjust for Frequency Counter Reading = 40 GHz ±100 Hz	___________GHz

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-12 ALC Bandwidth Calibration		
This calibration is not required for the installed frequency band: 26.5 - 40 GHz.		
3-13 Analog Sweep Calibration		
This calibration is automatically completed for the installed frequency band.		
c.1.(d)	Frequency = 33 GHz	
3-14 YIG-tuned Oscillator Frequency Calibration		
This calibration is required for the installed frequency band:		
c. 26.5-40 GHz Band 1.(e) 5.	Frequency = 33 GHz Maximum difference in MHz between frequency counter and 6740B	_________MHz
3-15 RF Level Calibration		
This calibration is performed using an automatic test system. Contact WILTRON Customer Service at (408) 778–2000 for further information.		

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-16 ALC Slope Adjustment		
This calibration is required for the >2 GHz level detector.		
c. 26.5-40 GHz Band		
2.(d)	F1 = 26.5 GHz	
2.(f)	F2 = 40 GHz	
5.	Record the resulting waveform	Draw Waveform Flatness for the 26.5-40 GHz Band
3-17 AM Sensitivity Calibration		
This calibration is required for the installed frequency band:		
d. 26.5-40 GHz Band		
2.(d)	Frequency = 33 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
3-18 AM Meter Calibration		
c. Meter Calibration		
2.(d)	Frequency = 33 GHz	
d. Meter Verification		
1.(c)	Frequency = 33 GHz	
1.(g)	Measure and record AM DEPTH	__________%

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-19 FM Driver/Sensitivity Calibration		
This calibration is required for the installed frequency band:		
d. 26.5-40 GHz Band 2.(d) 8.	Frequency = 33 GHz Record the Waveform Null	Draw Waveform Null
3-20 FM Flatness Calibration		
This calibration is required for the installed frequency band:		
b. 26.5-40 GHz Band 2.(d) 10.	Frequency = 33 GHz Record the Waveform	Draw Waveform
3-21 FM Meter Calibration		
c. Meter Calibration	Follow steps c.1 through c.6.	
d. Meter Verification 1.(c)	Measure FM Deviation	__________kHz

MODEL 6745B
SWEPT FREQUENCY SYNTHESIZER

TEST AND CALIBRATION
MANUAL

WILTRON

490 JARVIS DRIVE
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P/N: 10370-10226
REVISION: D
PRINTED: OCTOBER 1993

SECTION 4
TEST RECORD

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SECTION 4
TEST RECORDS

4-1 INTRODUCTION

This section provides two Test Record tables for recording the results of the Performance Verification Tests (in Section 2) and the Calibration/Adjustments (in Section 3). They jointly provide the means for maintaining an accurate and complete record of instrument performance.

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We recommend that you make a copy of these pages each time the test procedures are performed. By dating each Test Record copy, a detailed history of instrument performance can be accumulated.

4-2 PERFORMANCE VERIFICATION TEST RECORD

The Test Record for the Performance Verification procedures supplied in Section 2 is located immediately following this page.

4-3 CALIBRATION/ADJUSTMENTS TEST RECORD

The Test Record for the Calibration/Adjustment procedures supplied in Section 3 follows the Performance Verification Test Record.

NOTE

Results of the automated RF Level Calibration procedure in Section 3 are not included in this Test Record. Calibration data is stored in instrument memory. Contact the WILTRON Customer Service department at (408) 778-2000 for more details.

WILTRON Model 6745B **Date:** ______________________

Serial Number____________________ **Tested By:** _____________________

2-5. Internal Time Base Aging Rate Test

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure				
2	Record T_S value		______hours	
4	Record T_1 value		______sec	
5	Record T_2 value		______sec	
6	Record T_F value		______hours	
8	Record the calculated aging rate		______per day	5×10^{-10} per day

2-6. Frequency Synthesis Tests

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Coarse Loop/YIG Loop Test Procedure				
1(c)	Enter 1 GHz			
2	Record the Frequency Counter Reading	0.999 999 900 GHz	__________ GHz	1.000 000 100 GHz
3	Record the Frequency Counter Reading	1.999 999 900 GHz	__________ GHz	2.000 000 100 GHz
4	Record the Frequency Counter Readings . . .	2.999 999 900 GHz	__________ GHz	3.000 000 100 GHz
		3.999 999 900 GHz	__________ GHz	4.000 000 100 GHz
		4.999 999 900 GHz	__________ GHz	5.000 000 100 GHz
		5.999 999 900 GHz	__________ GHz	6.000 000 100 GHz
		6.999 999 900 GHz	__________ GHz	7.000 000 100 GHz
		7.999 999 900 GHz	__________ GHz	8.000 000 100 GHz
		8.999 999 900 GHz	__________ GHz	9.000 000 100 GHz
		9.999 999 900 GHz	__________ GHz	10.000 000 100 GHz
		10.999 999 900 GHz	__________ GHz	11.000 000 100 GHz
		11.999 999 900 GHz	__________ GHz	12.000 000 100 GHz
		12.999 999 900 GHz	__________ GHz	13.000 000 100 GHz
		13.999 999 900 GHz	__________ GHz	14.000 000 100 GHz
		14.999 999 900 GHz	__________ GHz	15.000 000 100 GHz
		15.999 999 900 GHz	__________ GHz	16.000 000 100 GHz
		16.999 999 900 GHz	__________ GHz	17.000 000 100 GHz
		17.999 999 900 GHz	__________ GHz	18.000 000 100 GHz
d. Fine Loop Test Procedure				
1(c)	Enter 1 GHz			
2	Record the Frequency Counter Reading	0.999 999 900 GHz	__________ GHz	1.000 000 100 GHz
3	Record the Frequency Counter Reading	1.000 000 900 GHz	__________ GHz	1.000 001 100 GHz
4	Record the Frequency Counter Readings . . .	1.000 001 900 GHz	__________ GHz	1.000 002 100 GHz
		1.000 002 900 GHz	__________ GHz	1.000 003 100 GHz
		1.000 003 900 GHz	__________ GHz	1.000 004 100 GHz
		1.000 004 900 GHz	__________ GHz	1.000 005 100 GHz
		1.000 005 900 GHz	__________ GHz	1.000 006 100 GHz
		1.000 006 900 GHz	__________ GHz	1.000 007 100 GHz
		1.000 007 900 GHz	__________ GHz	1.000 008 100 GHz
		1.000 008 900 GHz	__________ GHz	1.000 009 100 GHz
		1.000 009 900 GHz	__________ GHz	1.000 010 100 GHz

2-7. Marker and Blanking Verification

Step	Procedure Comments	Marker/Signal Presence
c. Marker Selection Procedure		
2	F1 Frequency Marker = .01 GHz	
2	Verify that a marker appears on the left side of the scope at the start of trace	_______
3(a)	F2 Frequency Marker = 18 GHz	
3(b)	Verify that a marker appears on the right side of the scope at the end of trace	_______
4	F3 Frequency Marker = 2 GHz	
4	Verify that a marker appears on the scope	_______
4	F4 Frequency Marker = 5 GHz	
4	Verify that a marker appears on the scope	_______
4	F5 Frequency Marker = 8 GHz	
4	Verify that a marker appears on the scope	_______
4	F6 Frequency Marker = 10 GHz	
4	Verify that a marker appears on the scope	_______
4	F7 Frequency Marker = 12 GHz	
4	Verify that a marker appears on the scope	_______
4	F8 Frequency Marker = 14 GHz	
4	Verify that a marker appears on the scope	_______
4	F9 Frequency Marker = 16 GHz	
4	Verify that a marker appears on the scope	_______
d. Marker Output Verification Procedure		
1	Verify +5V (TTL high) markers at nine points on scope display	_______
3	Verify that all markers change to intensified spots	_______
5(a)	Verify +5V (TTL high) signal at retrace	_______
5(b)	Verify +5V (minimum) signal at bandswitch point	_______
5(c)	Verify +5V (minimum) signal at each switched filter point:	
	3.5 GHz switch point	_______
	6.0 GHz switch point	_______
5(d)	Verify –10V (minimum) signal at selected marker frequency	_______
5(e)	Verify –5V (minimum) signal at all other marker frequencies	_______
6	Verify that new marker changes from –5V (minimum) to –10V (minimum)	_______
	Verify that previous marker changes from –10V (minimum) to –5V (minimum)	_______
e. Retrace Blanking Output Verification Procedure		
2	Verify –5V (minimum) signal during retrace	_______
3	Verify +5V (minimum) signal during retrace	_______
f. Bandswitch Blanking Output Verification Procedure		
2	Verify +5V (minimum) signal during the following bandswitch dwell points:	
	2.0 GHz bandswitch dwell point	_______
	8.0 GHz bandswitch dwell point	_______
	12.4 GHz bandswitch dwell point	_______
3	Verify –5V (minimum) signal during the following bandswitch dwell points:	
	2.0 GHz bandswitch dwell point	_______
	8.0 GHz bandswitch dwell point	_______
	12.4 GHz bandswitch dwell point	_______

2-8. Narrowband Spurious Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Fine Loop Test Procedure				
1(b)	Enter 5.1 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	10 kHz	N/A	_______dBc	–60 dBc
	20 khz	N/A	_______dBc	–60 dBc
	30 kHz	N/A	_______dBc	–60 dBc
	40 kHz	N/A	_______dBc	–60 dBc
	50 kHz	N/A	_______dBc	–60 dBc
d. Coarse Loop Test Procedure				
1(b)	Enter 16.3 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	200 kHz	N/A	_______dBc	–60 dBc
	400 khz	N/A	_______dBc	–60 dBc

2-9. Spurious and Harmonic Tests: RF Output Signals ≤2 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure				
3	Record the presence of the worst case harmonic of the 10 MHz carrier	N/A	_______dBc	–40 dBc
3	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc
4	Record the presence of the worst case harmonic of the 20 MHz carrier	N/A	_______dBc	–40 dBc
4	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc
4	Record the presence of the worst case harmonic of the 30 MHz carrier	N/A	_______dBc	–40 dBc
4	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc
6	Record the presence of the worst case harmonic of the 40 MHz carrier	N/A	_______dBc	–40 dBc
6	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc
8	Record the presence of the worst case harmonic of the 350 MHz carrier	N/A	_______dBc	–40 dBc
8	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc
9	Record the presence of the worst case spurious response of the 1.6 GHz carrier on the Spectrum Analyzer display	N/A	_______dBc	–60 dBc
12	Record the level of harmonics of the 1.6 GHz carrier:			
	3.2 GHz (2nd harmonic)	N/A	_______dBc	–40 dBc
	4.8 GHz (3rd harmonic)	N/A	_______dBc	–40 dBc

2-10. Harmonic Tests: RF Output Signals From 2 to 10 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure				
4	Record the level of all harmonics of the 2.1 GHz carrier:			
	4.2 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
	6.3 GHz (3rd harmonic)	N/A	_______dBc	–60 dBc
	8.4 GHz (4th harmonic)	N/A	_______dBc	–60 dBc
	10.5 GHz (5th harmonic)	N/A	_______dBc	–60 dBc
	12.6 GHz (6th harmonic)	N/A	_______dBc	–60 dBc
	14.7 GHz (7th harmonic)	N/A	_______dBc	–60 dBc
	16.8 GHz (8th harmonic)	N/A	_______dBc	–60 dBc
	18.9 GHz (9th harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 3.6 GHz carrier:			
	7.2 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
	10.8 GHz (3rd harmonic)	N/A	_______dBc	–60 dBc
	14.4 GHz (4th harmonic)	N/A	_______dBc	–60 dBc
	18 GHz (5th harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 7 GHz carrier:			
	14 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 9 GHz carrier:			
	18 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc

2-11. Harmonic Tests: RF Output Signals 11 to 20 GHz

These tests are not applicable to the 6745B model.

2-12. Harmonic Tests (Alternate Method): RF Output Signals From 10 to 30 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure				
2(c)	Enter 10 GHz			
4	Measure and record the difference between RF levels above and below filter cutoff:			
	10 to 18 GHz harmonic level	N/A	_______dBc	–60 dBc

2-13. Harmonic Tests: RF Output Signals From 26.5 to 40 GHz

These tests are not applicable to the 6745B model.

2-14. Harmonic Tests: RF Output Signals From 40 to 60 GHz

These tests are not applicable to the 6745B model.

2-14. Single Sideband Phase Noise Test

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure (Band 0; 0.01 to 2 GHz)			
1(c)	Enter 1.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–67 dBc
6	100 Hz	N/A	_______dBc	–72 dBc
8	1 kHz	N/A	_______dBc	–76 dBc
10	10 kHz	N/A	_______dBc	–80 dBc
12	100 kHz	N/A	_______dBc	–98 dBc
13	Repeat steps c.1 through c.12 for the remaining bands.			
	c. Test Procedure (Band 1; 2 to 8.4 GHz)			
1(c)	Enter 5.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–67 dBc
6	100 Hz	N/A	_______dBc	–72 dBc
8	1 kHz	N/A	_______dBc	–76 dBc
10	10 kHz	N/A	_______dBc	–80 dBc
12	100 kHz	N/A	_______dBc	–98 dBc
	c. Test Procedure (Band 2; 8 to 12.4 GHz)			
1(c)	Enter 10.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–64 dBc
6	100 Hz	N/A	_______dBc	–69 dBc
8	1 kHz	N/A	_______dBc	–73 dBc
10	10 kHz	N/A	_______dBc	–77 dBc
12	100 kHz	N/A	_______dBc	–100 dBc
	c. Test Procedure (Band 3; 12.4 to 18 GHz)			
1(c)	Enter 15.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–60 dBc
6	100 Hz	N/A	_______dBc	–65 dBc
8	1 kHz	N/A	_______dBc	–69 dBc
10	10 kHz	N/A	_______dBc	–73 dBc
12	100 kHz	N/A	_______dBc	–100 dBc

2-16. Power Level Accuracy and Flatness Verification (6745B Models without Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 0.8 dB			
	** = Maximum Variation is 2.0 dB			
d. Power Level Accuracy Procedure (0.01 to 2 GHz)				
1(c)	Enter 50 MHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
d. Power Level Accuracy Procedure (2 to 8 GHz)				
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm

2-16. Power Level Accuracy and Flatness Verification (6745B Models without Optional Attenuator) (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. Power Level Accuracy Procedure (8 to 12.4 GHz)				
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
d. Power Level Accuracy Procedure (12.4 to 18 GHz)				
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm

2-16. Power Level Accuracy and Flatness Verification (6745B Models with 110 dB Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Power Level Flatness Procedure			
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 1.6 dB			
	** = Maximum Variation is 6.0 dB			
	d. Power Level Accuracy Procedure (0.01 to 2 GHz)			
1(c)	Enter 50 MHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
	d. Power Level Accuracy Procedure (2 to 8 GHz)			
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dB

2-16. Power Level Accuracy and Flatness Verification (6745B Models with 110 dB Optional Attenuator) (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. Power Level Accuracy Procedure (8 to 12.4 GHz)				
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
d. Power Level Accuracy Procedure (12.4 to 18 GHz)				
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm

2-17. FM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. FM Input Sensitivity Procedure (Band 0; 0.01 to 2 GHz)				
2(c)	Enter 1.1 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 0; 0.01 to 2 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
6	Repeat steps d.2 through e.5 for the remaining bands.			
d. FM Input Sensitivity Procedure (Band 1; 2 to 8 GHz)				
2(c)	Enter 5 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 1; 2 to 8 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
d. FM Input Sensitivity Procedure (Band 2; 8 to 12.4 GHz)				
2(c)	Enter 10 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 2; 8 to 12.4 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
d. FM Input Sensitivity Procedure (Band 3; 12.4 to 18 GHz)				
2(c)	Enter 15 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 3; 12.4 to 18 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A

2-18. AM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. AM Input Sensitivity and Meter Accuracy (Band 0; 0.01 to 2 GHz)				
2(e)	Enter 1.1 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 0; 0.01 to 2 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%
6	Repeat steps d.2 through e.5 for the remaining bands.			
d. AM Input Sensitivity and Meter Accuracy (Band 1; 2 to 8 GHz)				
2(e)	Enter 5 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 1; 2 to 8 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%
d. AM Input Sensitivity and Meter Accuracy (Band 2; 8 to 12.4 GHz)				
2(e)	Enter 10 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 2; 8 to 12.4 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%
d. AM Input Sensitivity and Meter Accuracy (Band 3; 12.4 to 18 GHz)				
2(e)	Enter 15 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 3; 12.4 to 18 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Rise Time, Fall Time, Overshoot, and Level (Bands 0 and 1; 0.01 to 8 GHz)			
1(c)	Enter 5 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
	c. Rise Time, Fall Time, Overshoot, and Level (Band 2; 8 to 12.4 GHz)			
1(c)	Enter 10 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
	c. Rise Time, Fall Time, Overshoot, and Level (Band 3; 12.4 to 18 GHz)			
1(c)	Enter 15 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
	d. Pulse Leveling Accuracy Check, Preliminary Test Setup			
4(b)	Enter 1.1 GHz			
	e. 67XXB LEVEL Display Calibration			
1	Note the 67XXB LEVEL display value			______dBm
2	Note the 67XXB LEVEL display value			______dBm
3	Calculate the difference between steps e.1 and e.2. Note this value			______dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
f. Pulse Level Accuracy Test Procedure (Band 0, 0.01 to 2 GHz; Pulse Width = 5 µs)				
2(b)	Enter 1.1 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.6 dB	______dB	+0.6 dB
f. Pulse Level Accuracy Test Procedure (Band 0, 0.01 to 2 GHz; Pulse Width = 2 µs)				
2(b)	Enter 1.1 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.9 dB	______dB	+0.9 dB
f. Pulse Level Accuracy Test Procedure (Band 0, 0.01 to 2 GHz; Pulse Width = 1 µs)				
2(b)	Enter 1.1 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.4 dB	______dB	+1.4 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 5 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 2 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 1 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXBG LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 5 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 2 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 1 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 5 µs)				
2(b)	Enter 15 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 2 µs)				
2(b)	Enter 15 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 1 µs)				
2(b)	Enter 15 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 15 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 15 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 15 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-20. Pulse Modulation Test: Video Feedthrough

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure (Band 0; 0.01 to 2 GHz)			
1(c)	Enter 1.1 GHz			
3	Measure and record the Video Feedthrough voltage spikes.	N/A	______mV peak	* mV peak
	* Specification: 2% maximum for power levels ≤10 dBm 5% maximum for power levels >10 dBm			
4	Repeat steps c.1 through c.3 for the remaining bands.			
	c. Test Procedure (Band 1; 2 to 8 GHz)			
1(c)	Enter 5 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak
	c. Test Procedure (Band 2; 8 to 12.4 GHz)			
1(c)	Enter 10 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak
	c. Test Procedure (Band 3; 12.4 to 18 GHz)			
1(c)	Enter 15 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak

2-21. Pulse Modulation Test: RF On/Off Ratio

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure (Band 0; 0.01 to 2 GHz)				
1(d)	Enter 1.1 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A
7	Repeat steps c.1 through c.5 for the remaining bands.			
c. Test Procedure (Band 1; 2 to 8 GHz)				
1(d)	Enter 5 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A
c. Test Procedure (Band 2; 8 to 12.4 GHz)				
1(d)	Enter 10 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A
c. Test Procedure (Band 3; 12.4 to 18 GHz)				
1(d)	Enter 15 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A

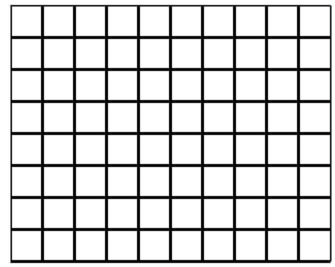
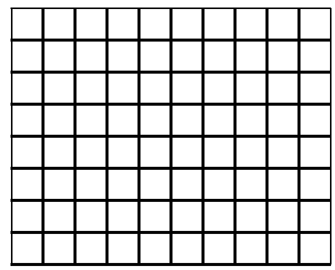
WILTRON Model 6745B **Date:** ______________________

Serial Number____________________ **Tested By:** ______________________

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-9 ALC Level Offset Adjustments		
This instrument uses two leveling circuits; Band 0 and Bands 1 thru 4.		
c. Band 0 Level Offset 1.(c) 3.	Frequency = 1.1 GHz A15TP6 = 0V ±10 µV	___________volts
d. Band 1 thru 4 Level Offset 1.(b) 3.	Frequency = 5 GHz A15TP5 = 0V ±10 µV	___________volts
f. ALC Detector Shaper Level Offset 6.(c)	Frequency = 2.1 GHz Follow steps f.1 through f.21.	
3-10 External Leveling Offset Adjustment		
c.3	A15TP7 = 0V ±1 mV	___________volts
3-11 10 MHz Reference Oscillator Calibration		
c.1.(c) c.3	Frequency = 18 GHz Adjust for Frequency Counter Reading = 18 GHz ±100 Hz	___________GHz

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-12 ALC Bandwidth Calibration		
This calibration is required for each installed frequency band:		
c. 2-8 GHz Band 2.(c)	Frequency = 5 GHz Repeat steps c.1 through c.15.	
c. 0.01-2 GHz Band 2.(c)	Frequency = 1.1 GHz Follow steps c.7 through c.15.	
c. 8-12.4 GHz Band 2.(c)	Frequency = 10 GHz Repeat steps c.7 through c.15.	
c. 12.4-18 GHz Band 2.(c)	Frequency = 15 GHz Repeat steps c.7 through c.13; then steps c.16 and c.17.	
3-13 Analog Sweep Calibration		
This calibration is automatically completed for all of the installed frequency bands		
c.1.(d)	Frequency = 1.1 GHz	

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-14 YIG-tuned Oscillator Frequency Calibration		
This calibration is required for each installed frequency band:		
c. 0.01-2 GHz Band 1.(e) 5.	Frequency = 1.1 GHz Maximum difference in MHz between frequency counter and 6745B	__________MHz
c. 2-8 GHz Band 1.(e) 5.	Frequency = 5 GHz Maximum difference in MHz between frequency counter and 6745B	_________MHz
c. 8-12.4 GHz Band 1.(e) 5.	Frequency = 10 GHz Maximum difference in MHz between frequency counter and 6745B	__________MHz
c. 12.4-18 GHz Band 1.(e) 5.	Frequency =15 GHz Maximum difference in MHz between frequency counter and 6745B	__________MHz
3-15 RF Level Calibration		
This calibration is performed using an automatic test system. Contact WILTRON Customer Service at (408) 778–2000 for further information.		

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-16 ALC Slope Adjustment This calibration is required for the ≤2 GHz level detector and for the >2 GHz level detector.		
c. 0.01-2 GHz Band 2.(d) 2.(f) 5.	F1 = 0.01 GHz F2 = 2 GHz Record the resulting waveform	 Draw Waveform Flatness for the 0.01-2 GHz Band
c. 2-18 GHz Band 2.(d) 2.(f) 5.	F1 = 2 GHz F2 = 18 GHz Record the resulting waveform	 Draw Waveform Flatness for the 2-18 GHz Band

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-17 AM Sensitivity Calibration		
This calibration is required for each installed frequency band:		
d. 0.01-2 GHz Band		
2.(d)	Frequency = 1.1 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
d. 2-8 GHz Band		
2.(d)	Frequency = 5 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
d. 8-12.4 GHz Band		
2.(d)	Frequency = 10 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
d. 12.4-18 GHz Band		
2.(d)	Frequency = 15 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
3-18 AM Meter Calibration		
c. Meter Calibration		
2.(d)	Frequency = 1.1 GHz	
d. Meter Verification		
1.(c)	Frequency = 1.1 GHz	
1.(g)	Measure and record AM DEPTH	__________%

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-19 FM Driver/Sensitivity Calibration This calibration is required for each installed frequency band:		
d. 0.01-2 GHz Band 2.(d) 8.	Frequency = 1.1 GHz Record the Waveform Null	Draw Waveform Null
d. 2-8 GHz Band 2.(d) 8.	Frequency = 5 GHz Record the Waveform Null	Draw Waveform Null
d. 8-12.4 GHz Band 2.(d) 8.	Frequency = 10 GHz Record the Waveform Null	Draw Waveform Null
d. 12.4-18 GHz Band 2.(d) 8.	Frequency =15 GHz Record the Waveform Null	Draw Waveform Null

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-20 FM Flatness Calibration This calibration is required for each installed frequency band:		
d. 0.01-2 GHz Band 2.(d) 10.	Frequency = 1.1 GHz Record the Waveform	Draw Waveform
b. 2-8 GHz Band 2.(d) 10.	Frequency = 5 GHz Record the Waveform	Draw Waveform
d. 8-12.4 GHz Band 2.(d) 10.	Frequency = 10 GHz Record the Waveform	Draw Waveform
d. 12.4-18 GHz Band 2.(d) 10.	Frequency = 15 GHz Record the Waveform	Draw Waveform

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-21 FM Meter Calibration		
c. Meter Calibration	Follow steps c.1 through c.6	
d. Meter Verification 1.(c)	Measure FM Deviation	__________kHz

MODELS
6747B AND 6747B-20
SWEPT FREQUENCY SYNTHESIZER

TEST AND CALIBRATION
MANUAL

WILTRON

490 JARVIS DRIVE
MORGAN HILL, CA 95037-2809

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SECTION 4
TEST RECORD

CONTENTS

SECTION 4
TEST RECORDS

4-1 INTRODUCTION

This section provides two Test Record tables for recording the results of the Performance Verification Tests (in Section 2) and the Calibration/Adjustments (in Section 3). They jointly provide the means for maintaining an accurate and complete record of instrument performance.

This test record provided here has been customized for the 6747B and 6747B-20 models. It should only be used with matching procedures in Section 2 and 3 that cover the 6747B or 6747B-20 models. Specific references to frequency parameters, power levels, and non-applicable procedures make each Test Record easy to follow.

We recommend that you make a copy of these pages each time the test procedures are performed. By dating each Test Record copy, a detailed history of instrument perfomance can be accumulated.

4-2 PERFORMANCE VERIFICATION TEST RECORD

The Test Record for the Performance Verification procedures supplied in Section 2 is located immediately following this page.

4-3 CALIBRATION/ADJUSTMENTS TEST RECORD

The Test Record for the Calibration/Adjustment procedures supplied in Section 3 follows the Performance Verification Test Record.

NOTE

Results of the automated RF Level Calibration procedure in Section 3 are not included in this Test Record. Calibration data is stored in instrument memory. Contact the WILTRON Customer Service department at (408) 778-2000 for more details.

WILTRON Model 6747B and 6747B-20 **Date:** ______________________

Serial Number____________________ **Tested By:** ______________________

2-5. Internal Time Base Aging Rate Test

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure				
2	Record T_S value		______hours	
4	Record T_1 value		______sec	
5	Record T_2 value		______sec	
6	Record T_F value		______hours	
8	Record the calculated aging rate		______per day	5×10^{-10} per day

2-6. Frequency Synthesis Tests

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Coarse Loop/YIG Loop Test Procedure				
1(c)	Enter 1 GHz			
2	Record the Frequency Counter Reading	0.999 999 900 GHz	__________ GHz	1.000 000 100 GHz
3	Record the Frequency Counter Reading	1.999 999 900 GHz	__________ GHz	2.000 000 100 GHz
4	Record the Frequency Counter Readings . . .	2.999 999 900 GHz	__________ GHz	3.000 000 100 GHz
		3.999 999 900 GHz	__________ GHz	4.000 000 100 GHz
		4.999 999 900 GHz	__________ GHz	5.000 000 100 GHz
		5.999 999 900 GHz	__________ GHz	6.000 000 100 GHz
		6.999 999 900 GHz	__________ GHz	7.000 000 100 GHz
		7.999 999 900 GHz	__________ GHz	8.000 000 100 GHz
		8.999 999 900 GHz	__________ GHz	9.000 000 100 GHz
		9.999 999 900 GHz	__________ GHz	10.000 000 100 GHz
		10.999 999 900 GHz	__________ GHz	11.000 000 100 GHz
		11.999 999 900 GHz	__________ GHz	12.000 000 100 GHz
		12.999 999 900 GHz	__________ GHz	13.000 000 100 GHz
		13.999 999 900 GHz	__________ GHz	14.000 000 100 GHz
		14.999 999 900 GHz	__________ GHz	15.000 000 100 GHz
		15.999 999 900 GHz	__________ GHz	16.000 000 100 GHz
		16.999 999 900 GHz	__________ GHz	17.000 000 100 GHz
		17.999 999 900 GHz	__________ GHz	18.000 000 100 GHz
		18.999 999 900 GHz	__________ GHz	19.000 000 100 GHz
		19.999 999 900 GHz	__________ GHz	20.000 000 100 GHz
d. Fine Loop Test Procedure				
1(c)	Enter 1 GHz			
2	Record the Frequency Counter Reading	0.999 999 900 GHz	__________ GHz	1.000 000 100 GHz
3	Record the Frequency Counter Reading	1.000 000 900 GHz	__________ GHz	1.000 001 100 GHz
4	Record the Frequency Counter Readings . . .	1.000 001 900 GHz	__________ GHz	1.000 002 100 GHz
		1.000 002 900 GHz	__________ GHz	1.000 003 100 GHz
		1.000 003 900 GHz	__________ GHz	1.000 004 100 GHz
		1.000 004 900 GHz	__________ GHz	1.000 005 100 GHz
		1.000 005 900 GHz	__________ GHz	1.000 006 100 GHz
		1.000 006 900 GHz	__________ GHz	1.000 007 100 GHz
		1.000 007 900 GHz	__________ GHz	1.000 008 100 GHz
		1.000 008 900 GHz	__________ GHz	1.000 009 100 GHz
		1.000 009 900 GHz	__________ GHz	1.000 010 100 GHz

2-7. Marker and Blanking Verification

Step	Procedure Comments	Marker/Signal Presence
c. Marker Selection Procedure		
2	F1 Frequency Marker = .01 GHz	
2	Verify that a marker appears on the left side of the scope at the start of trace	_______
3(a)	F2 Frequency Marker = 20 GHz	
3(b)	Verify that a marker appears on the right side of the scope at the end of trace	_______
4	F3 Frequency Marker = 1 GHz	
4	Verify that a marker appears on the scope	_______
4	F4 Frequency Marker = 4 GHz	
4	Verify that a marker appears on the scope	_______
4	F5 Frequency Marker = 8 GHz	
4	Verify that a marker appears on the scope	_______
4	F6 Frequency Marker = 10 GHz	
4	Verify that a marker appears on the scope	_______
4	F7 Frequency Marker = 12 GHz	
4	Verify that a marker appears on the scope	_______
4	F8 Frequency Marker = 15 GHz	
4	Verify that a marker appears on the scope	_______
4	F9 Frequency Marker = 18 GHz	
4	Verify that a marker appears on the scope	_______
d. Marker Output Verification Procedure		
1	Verify +5V (TTL high) markers at nine points on scope display	_______
3	Verify that all markers change to intensified spots	_______
5(a)	Verify +5V (TTL high) signal at retrace	_______
5(b)	Verify +5V (minimum) signal at bandswitch point	_______
5(c)	Verify +5V (minimum) signal at each switched filter point:	
	3.5 GHz switch point	_______
	6.0 GHz switch point	_______
5(d)	Verify –10V (minimum) signal at selected marker frequency	_______
5(e)	Verify –5V (minimum) signal at all other marker frequencies	_______
6	Verify that new marker changes from –5V (minimum) to –10V (minimum)	_______
	Verify that previous marker changes from –10V (minimum) to –5V (minimum)	_______
e. Retrace Blanking Output Verification Procedure		
2	Verify –5V (minimum) signal during retrace	_______
3	Verify +5V (minimum) signal during retrace	_______
f. Bandswitch Blanking Output Verification Procedure		
2	Verify +5V (minimum) signal during the following bandswitch dwell points:	
	2.0 GHz bandswitch dwell point	_______
	8.0 GHz bandswitch dwell point	_______
	12.4 GHz bandswitch dwell point	_______
3	Verify –5V (minimum) signal during the following bandswitch dwell points:	
	2.0 GHz bandswitch dwell point	_______
	8.0 GHz bandswitch dwell point	_______
	12.4 GHz bandswitch dwell point	_______

2-8. Narrowband Spurious Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Fine Loop Test Procedure				
1(b)	Enter 5.1 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	10 kHz	N/A	_______dBc	–60 dBc
	20 khz	N/A	_______dBc	–60 dBc
	30 kHz	N/A	_______dBc	–60 dBc
	40 kHz	N/A	_______dBc	–60 dBc
	50 kHz	N/A	_______dBc	–60 dBc
d. Coarse Loop Test Procedure				
1(b)	Enter 18.3 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	200 kHz	N/A	_______dBc	–60 dBc
	400 khz	N/A	_______dBc	–60 dBc

2-9. Spurious and Harmonic Tests: RF Output Signals ≤2 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure				
3	Record the presence of the worst case harmonic of the 10 MHz carrier	N/A	_______dBc	–40 dBc*
3	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc**
4	Record the presence of the worst case harmonic of the 20 MHz carrier	N/A	_______dBc	–40 dBc*
4	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc**
4	Record the presence of the worst case harmonic of the 30 MHz carrier	N/A	_______dBc	–40 dBc*
4	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc**
6	Record the presence of the worst case harmonic of the 40 MHz carrier	N/A	_______dBc	–40 dBc*
6	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc**
8	Record the presence of the worst case harmonic of the 350 MHz carrier	N/A	_______dBc	–40 dBc*
8	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc**
9	Record the presence of the worst case spurious response of the 1.6 GHz carrier on the Spectrum Analyzer display	N/A	_______dBc	–60 dBc**
12	Record the level of harmonics of the 1.6 GHz carrier:			
	3.2 GHz (2nd harmonic)	N/A	_______dBc	–40 dBc*
	4.8 GHz (3rd harmonic)	N/A	_______dBc	–40 dBc*

* = –30 dBc for the 6747B-20 model.

** = –50 dBc for the 6747B-20 model.

2-10. Harmonic Tests: RF Output Signals From 2 to 10 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure				
4	Record the level of all harmonics of the 2.1 GHz carrier:			
	4.2 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
	6.3 GHz (3rd harmonic)	N/A	_______dBc	–60 dBc
	8.4 GHz (4th harmonic)	N/A	_______dBc	–60 dBc
	10.5 GHz (5th harmonic)	N/A	_______dBc	–60 dBc
	12.6 GHz (6th harmonic)	N/A	_______dBc	–60 dBc
	14.7 GHz (7th harmonic)	N/A	_______dBc	–60 dBc
	16.8 GHz (8th harmonic)	N/A	_______dBc	–60 dBc
	18.9 GHz (9th harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 3.6 GHz carrier:			
	7.2 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
	10.8 GHz (3rd harmonic)	N/A	_______dBc	–60 dBc
	14.4 GHz (4th harmonic)	N/A	_______dBc	–60 dBc
	18 GHz (5th harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 7 GHz carrier:			
	14 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 10 GHz carrier:			
	20 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc

2-11. Harmonic Tests: RF Output Signals 11 to 20 GHz

These tests are not applicable to the 6747B and 6747B-20 models.

2-12. Harmonic Tests (Alternate Method): RF Output Signals From 10 to 30 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure				
2(c)	Enter 10 GHz			
4	Measure and record the difference between RF levels above and below filter cutoff:			
	10 to 20 GHz harmonic level	N/A	_______dBc	–60 dBc

2-13. Harmonic Tests: RF Output Signals From 26.5 to 40 GHz

These tests are not applicable to the 6747B and 6747B-20 models.

2-14. Harmonic Tests: RF Output Signals From 40 to 60 GHz

These tests are not applicable to the 6747B and 6747B-20 models.

2-15. Single Sideband Phase Noise Test

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure (Band 0; 0.01 to 2 GHz)			
1(c)	Enter 1.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–67 dBc
6	100 Hz	N/A	_______dBc	–72 dBc
8	1 kHz	N/A	_______dBc	–76 dBc
10	10 kHz	N/A	_______dBc	–80 dBc
12	100 kHz	N/A	_______dBc	–98 dBc
13	Repeat steps c.1 through c.12 for the remaining bands.			
	c. Test Procedure (Band 1; 2 to 8.4 GHz)			
1(c)	Enter 5.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–67 dBc
6	100 Hz	N/A	_______dBc	–72 dBc
8	1 kHz	N/A	_______dBc	–76 dBc
10	10 kHz	N/A	_______dBc	–80 dBc
12	100 kHz	N/A	_______dBc	–98 dBc
	c. Test Procedure (Band 2; 8 to 12.4 GHz)			
1(c)	Enter 10.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–64 dBc
6	100 Hz	N/A	_______dBc	–69 dBc
8	1 kHz	N/A	_______dBc	–73 dBc
10	10 kHz	N/A	_______dBc	–77 dBc
12	100 kHz	N/A	_______dBc	–100 dBc
	c. Test Procedure (Band 3; 12.4 to 20 GHz)			
1(c)	Enter 16.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–60 dBc
6	100 Hz	N/A	_______dBc	–65 dBc
8	1 kHz	N/A	_______dBc	–69 dBc
10	10 kHz	N/A	_______dBc	–73 dBc
12	100 kHz	N/A	_______dBc	–100 dBc

2-16. Power Level Accuracy and Flatness Verification (6747B Models without Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 0.8 dB			
	** = Maximum Variation is 2.0 dB			
d. Power Level Accuracy Procedure (0.01 to 2 GHz)				
1(c)	Enter 50 MHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
d. Power Level Accuracy Procedure (2 to 8 GHz)				
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm

2-16. Power Level Accuracy and Flatness Verification (6747B Models without Optional Attenuator) (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. Power Level Accuracy Procedure (8 to 12.4 GHz)				
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
d. Power Level Accuracy Procedure (12.4 to 20 GHz)				
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm

2-16. Power Level Accuracy and Flatness Verification (6747B Models with 110 dB Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 1.6 dB			
	** = Maximum Variation is 6.0 dB			
d. Power Level Accuracy Procedure (0.01 to 2 GHz)				
1(c)	Enter 50 MHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
d. Power Level Accuracy Procedure (2 to 8 GHz)				
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dB

2-16. Power Level Accuracy and Flatness Verification (6747B Models with 110 dB Optional Attenuator) (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	d. Power Level Accuracy Procedure (8 to 12.4 GHz)			
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
	d. Power Level Accuracy Procedure (12.4 to 20 GHz)			
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6747B-20 Models without Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Power Level Flatness Procedure			
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 0.8 dB			
	** = Maximum Variation is 2.0 dB			
	d. Power Level Accuracy Procedure (0.01 to 2 GHz)			
1(c)	Enter 50 MHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+12.4 dBm	________ dBm	+13.6 dBm
3	Measure and record the Power Meter reading	+11.4 dBm	________ dBm	+12.6 dBm
4	Measure and record the Power Meter readings	+10.4 dBm	________ dBm	+11.6 dBm
		+9.4 dBm	________ dBm	+10.6 dBm
		+8.4 dBm	________ dBm	+9.6 dBm
		+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
	d. Power Level Accuracy Procedure (2 to 8 GHz)			
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+12.4 dBm	________ dBm	+13.6 dBm
3	Measure and record the Power Meter reading	+11.4 dBm	________ dBm	+12.6 dBm
4	Measure and record the Power Meter readings	+10.4 dBm	________ dBm	+11.6 dBm
		+9.4 dBm	________ dBm	+10.6 dBm
		+8.4 dBm	________ dBm	+9.6 dBm
		+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6747B-20 Models without Optional Attenuator) (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	d. Power Level Accuracy Procedure (8 to 12.4 GHz)			
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+12.4 dBm	________ dBm	+13.6 dBm
3	Measure and record the Power Meter reading	+11.4 dBm	________ dBm	+12.6 dBm
4	Measure and record the Power Meter readings	+10.4 dBm	________ dBm	+11.6 dBm
		+9.4 dBm	________ dBm	+10.6 dBm
		+8.4 dBm	________ dBm	+9.6 dBm
		+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
	d. Power Level Accuracy Procedure (12.4 to 20 GHz)			
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+12.4 dBm	________ dBm	+13.6 dBm
3	Measure and record the Power Meter reading	+11.4 dBm	________ dBm	+12.6 dBm
4	Measure and record the Power Meter readings	+10.4 dBm	________ dBm	+11.6 dBm
		+9.4 dBm	________ dBm	+10.6 dBm
		+8.4 dBm	________ dBm	+9.6 dBm
		+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6747B-20 Models with 110 dB Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 1.6 dB			
	** = Maximum Variation is 6.0 dB			
d. Power Level Accuracy Procedure (0.01 to 2 GHz)				
1(c)	Enter 50 MHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+8.6 dBm	________ dBm	+11.4 dBm
3	Measure and record the Power Meter reading	+7.6 dBm	________ dBm	+10.4 dBm
4	Measure and record the Power Meter readings	+6.6 dBm	________ dBm	+9.4 dBm
		+5.6 dBm	________ dBm	+8.4 dBm
		+4.6 dBm	________ dBm	+7.4 dBm
		+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
d. Power Level Accuracy Procedure (2 to 8 GHz)				
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+8.6 dBm	________ dBm	+11.4 dBm
3	Measure and record the Power Meter reading	+7.6 dBm	________ dBm	+10.4 dBm
4	Measure and record the Power Meter readings	+6.6 dBm	________ dBm	+9.4 dBm
		+5.6 dBm	________ dBm	+8.4 dBm
		+4.6 dBm	________ dBm	+7.4 dBm
		+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6747B-20 Models with 110 dB Optional Attenuator) (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	d. Power Level Accuracy Procedure (8 to 12.4 GHz)			
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+8.6 dBm	________ dBm	+11.4 dBm
3	Measure and record the Power Meter reading	+7.6 dBm	________ dBm	+10.4 dBm
4	Measure and record the Power Meter readings	+6.6 dBm	________ dBm	+9.4 dBm
		+5.6 dBm	________ dBm	+8.4 dBm
		+4.6 dBm	________ dBm	+7.4 dBm
		+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
	d. Power Level Accuracy Procedure (12.4 to 20 GHz)			
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+8.6 dBm	________ dBm	+11.4 dBm
3	Measure and record the Power Meter reading	+7.6 dBm	________ dBm	+10.4 dBm
4	Measure and record the Power Meter readings	+6.6 dBm	________ dBm	+9.4 dBm
		+5.6 dBm	________ dBm	+8.4 dBm
		+4.6 dBm	________ dBm	+7.4 dBm
		+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm

2-17. FM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. FM Input Sensitivity Procedure (Band 0; 0.01 to 2 GHz)				
2(c)	Enter 1.1 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 0; 0.01 to 2 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
6	Repeat steps d.2 through e.5 for the remaining bands.			
d. FM Input Sensitivity Procedure (Band 1; 2 to 8 GHz)				
2(c)	Enter 5 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 1; 2 to 8 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
d. FM Input Sensitivity Procedure (Band 2; 8 to 12.4 GHz)				
2(c)	Enter 10 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 2; 8 to 12.4 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
d. FM Input Sensitivity Procedure (Band 3; 12.4 to 20 GHz)				
2(c)	Enter 16 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 3; 12.4 to 20 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A

2-18. AM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. AM Input Sensitivity and Meter Accuracy (Band 0; 0.01 to 2 GHz)				
2(e)	Enter 1.1 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 0; 0.01 to 2 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%
6	Repeat steps d.2 through e.5 for the remaining bands.			
d. AM Input Sensitivity and Meter Accuracy (Band 1; 2 to 8 GHz)				
2(e)	Enter 5 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 1; 2 to 8 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%
d. AM Input Sensitivity and Meter Accuracy (Band 2; 8 to 12.4 GHz)				
2(e)	Enter 10 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 2; 8 to 12.4 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%
d. AM Input Sensitivity and Meter Accuracy (Band 3; 12.4 to 20 GHz)				
2(e)	Enter 16 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 3; 12.4 to 20 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Rise Time, Fall Time, Overshoot, and Level (Bands 0 and 1; 0.01 to 8 GHz)				
1(c)	Enter 5 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
c. Rise Time, Fall Time, Overshoot, and Level (Band 2; 8 to 12.4 GHz)				
1(c)	Enter 10 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
c. Rise Time, Fall Time, Overshoot, and Level (Band 3; 12.4 to 20 GHz)				
1(c)	Enter 16 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
d. Pulse Leveling Accuracy Check, Preliminary Test Setup				
4(b)	Enter 1.1 GHz			
e. 67XXB LEVEL Display Calibration				
1	Note the 67XXB LEVEL display value			______dBm
2	Note the 67XXB LEVEL display value			______dBm
3	Calculate the difference between steps e.1 and e.2. Note this value			______dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
f. Pulse Level Accuracy Test Procedure (Band 0, 0.01 to 2 GHz; Pulse Width = 5 µs)				
2(b)	Enter 1.1 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.6 dB	______dB	+0.6 dB
f. Pulse Level Accuracy Test Procedure (Band 0, 0.01 to 2 GHz; Pulse Width = 2 µs)				
2(b)	Enter 1.1 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.9 dB	______dB	+0.9 dB
f. Pulse Level Accuracy Test Procedure (Band 0, 0.01 to 2 GHz; Pulse Width = 1 µs)				
2(b)	Enter 1.1 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.4 dB	______dB	+1.4 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 5 µs)			
2(b)	Enter 5 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
	f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 2 µs)			
2(b)	Enter 5 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
	f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 1 µs)			
2(b)	Enter 5 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
	f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 0.5 µs)			
2(b)	Enter 5 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
	f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 0.2 µs)			
2(b)	Enter 5 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
	f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 0.1 µs)			
2(b)	Enter 5 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9				

	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 5 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value		______dBm	
8	Record the 67XXB LEVEL display value		______dBm	
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 2 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value		______dBm	
8	Record the 67XXB LEVEL display value		______dBm	
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 1 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value		______dBm	
8	Record the 67XXB LEVEL display value		______dBm	
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value		______dBm	
8	Record the 67XXB LEVEL display value		______dBm	
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value		______dBm	
8	Record the 67XXB LEVEL display value		______dBm	
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value		______dBm	

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 20 GHz; Pulse Width = 5 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 20 GHz; Pulse Width = 2 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 20 GHz; Pulse Width = 1 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 20 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 20 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 20 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 0.1 µs			

6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-20. Pulse Modulation Test: Video Feedthrough

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure (Band 0; 0.01 to 2 GHz)				
1(c)	Enter 1.1 GHz			
3	Measure and record the Video Feedthrough voltage spikes.	N/A	______mV peak	* mV peak
	* Specification: 2% maximum for power levels ≤10 dBm 5% maximum for power levels >10 dBm			
4	Repeat steps c.1 through c.3 for the remaining bands.			
c. Test Procedure (Band 1; 2 to 8 GHz)				
1(c)	Enter 5 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak
c. Test Procedure (Band 2; 8 to 12.4 GHz)				
1(c)	Enter 10 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak

c. Test Procedure (Band 3; 12.4 to 20 GHz)

1(c)	Enter 16 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak

2-21. Pulse Modulation Test: RF On/Off Ratio

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
	c. Test Procedure (Band 0; 0.01 to 2 GHz)			
1(d)	Enter 1.1 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A
7	Repeat steps c.1 through c.5 for the remaining bands.			
	c. Test Procedure (Band 1; 2 to 8 GHz)			
1(d)	Enter 5 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A
	c. Test Procedure (Band 2; 8 to 12.4 GHz)			
1(d)	Enter 10 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A
	c. Test Procedure (Band 3; 12.4 to 20 GHz)			
1(d)	Enter 16 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A

WILTRON Model 6747B and 6747B-20 **Date:** ______________________

Serial Number____________________ **Tested By:** _____________________

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-9 ALC Level Offset Adjustments		
This instrument uses two leveling circuits; Band 0 and Bands 1 through 4.		
c. Band 0 Level Offset 1.(c) 3.	Frequency = 1.1 GHz A15TP6 = 0V ±10 µV	___________volts
d. Band 1 thru 4 Level Offset 1.(b) 3.	Frequency = 5 GHz A15TP5 = 0V ±10 µV	___________volts
f. ALC Detector Shaper Level Offset 6.(c)	Frequency = 2.1 GHz Follow steps f.1 through f.21.	
3-10 External Leveling Offset Adjustment		
c.3	A15TP7 = 0V ±1 mV	___________volts
3-11 10 MHz Reference Oscillator Calibration		
c.1.(c) c.3	Frequency = 20 GHz Adjust for Frequency Counter Reading = 20 GHz ±100 Hz	___________GHz

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-12 ALC Bandwidth Calibration		
This calibration is required for each installed frequency band:		
c. 2-8 GHz Band 2.(c)	Frequency = 5 GHz Repeat steps c.1 through c.15.	
c. 0.01-2 GHz Band 2.(c)	Frequency = 1.1 GHz Follow steps c.7 through c.15.	
c. 8-12.4 GHz Band 2.(c)	Frequency = 10 GHz Repeat steps c.7 through c.15.	
c. 12.4-20 GHz Band 2.(c)	Frequency = 16 GHz Repeat steps c.7 through c.13; then steps c.16 and c.17.	
3-13 Analog Sweep Calibration		
This calibration is automatically completed for all of the installed frequency bands		
c.1.(d)	Frequency = 1.1 GHz	

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-14 YIG-tuned Oscillator Frequency Calibration This calibration is required for each installed frequency band:		
c. 0.01-2 GHz Band 1.(e) 5.	Frequency = 1.1 GHz Maximum difference in MHz between frequency counter and 6747B	__________MHz
c. 2-8 GHz Band 1.(e) 5.	Frequency = 5 GHz Maximum difference in MHz between frequency counter and 6747B	_________MHz
c. 8-12.4 GHz Band 1.(e) 5.	Frequency = 10 GHz Maximum difference in MHz between frequency counter and 6747B	__________MHz
c. 12.4-20 GHz Band 1.(e) 5.	Frequency =16 GHz Maximum difference in MHz between frequency counter and 6747B	__________MHz
3-15 RF Level Calibration This calibration is performed using an automatic test system. Contact WILTRON Customer Service at (408) 778–2000 for further information.		

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-16 ALC Slope Adjustment This calibration is required for the ≤2 GHz level detector and for the >2 GHz level detector.		
c. 0.01-2 GHz Band 2.(d) 2.(f) 5.	F1 = 0.01 GHz F2 = 2 GHz Record the resulting waveform	Draw Waveform Flatness for the 0.01-2 GHz Band
c. 2-20 GHz Band 2.(d) 2.(f) 5.	F1 = 2 GHz F2 = 20 GHz Record the resulting waveform	Draw Waveform Flatness for the 2-20 GHz Band

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-17 AM Sensitivity Calibration		
This calibration is required for each installed frequency band:		
d. 0.01-2 GHz Band		
2.(d)	Frequency = 1.1 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
d. 2-8 GHz Band		
2.(d)	Frequency = 5 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
d. 8-12.4 GHz Band		
2.(d)	Frequency = 10 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
d. 12.4-20 GHz Band		
2.(d)	Frequency = 16 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
3-18 AM Meter Calibration		
c. Meter Calibration		
2.(d)	Frequency = 1.1 GHz	
d. Meter Verification		
1.(c)	Frequency = 1.1 GHz	
1.(g)	Measure and record AM DEPTH	__________%

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-19 FM Driver/Sensitivity Calibration This calibration is required for each installed frequency band:		
d. 0.01-2 GHz Band 2.(d) 8.	Frequency = 1.1 GHz Record the Waveform Null	Draw Waveform Null
d. 2-8 GHz Band 2.(d) 8.	Frequency = 5 GHz Record the Waveform Null	Draw Waveform Null
d. 8-12.4 GHz Band 2.(d) 8.	Frequency = 10 GHz Record the Waveform Null	Draw Waveform Null
d. 12.4-20 GHz Band 2.(d) 8.	Frequency =16 GHz Record the Waveform Null	Draw Waveform Null

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-20 FM Flatness Calibration This calibration is required for each installed frequency band: d. 0.01-2 GHz Band 2.(d) 10.	Frequency = 1.1 GHz Record the Waveform	Draw Waveform
b. 2-8 GHz Band 2.(d) 10.	Frequency = 5 GHz Record the Waveform	Draw Waveform
d. 8-12.4 GHz Band 2.(d) 10.	Frequency = 10 GHz Record the Waveform	Draw Waveform
d. 12.4-20 GHz Band 2.(d) 10.	Frequency = 16 GHz Record the Waveform	Draw Waveform

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-21 FM Meter Calibration		
c. Meter Calibration	Follow steps c.1 through c.6	
d. Meter Verification 1.(c)	Measure FM Deviation	__________kHz

MODELS
6753B AND 6753B-10
SWEPT FREQUENCY SYNTHESIZER

TEST AND CALIBRATION
MANUAL

WILTRON

490 JARVIS DRIVE
MORGAN HILL, CA 95037-2809

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SECTION 4
TEST RECORD

CONTENTS

SECTION 4
TEST RECORDS

4-1 INTRODUCTION

This section provides two Test Record tables for recording the results of the Performance Verification Tests (in Section 2) and the Calibration/Adjustments (in Section 3). They jointly provide the means for maintaining an accurate and complete record of instrument performance.

This test record provided here has been customized for the 6753B and 6753B-10 models. It should only be used with matching procedures in Section 2 and 3 that cover the 6753B or 6753B-10 models. Specific references to frequency parameters, power levels, and non-applicable procedures make each Test Record easy to follow.

We recommend that you make a copy of these pages each time the test procedures are performed. By dating each Test Record copy, a detailed history of instrument perfomance can be accumulated.

4-2 PERFORMANCE VERIFICATION TEST RECORD

The Test Record for the Performance Verification procedures supplied in Section 2 is located immediately following this page.

4-3 CALIBRATION/ADJUSTMENTS TEST RECORD

The Test Record for the Calibration/Adjustment procedures supplied in Section 3 follows the Performance Verification Test Record.

NOTE

Results of the automated RF Level Calibration procedure in Section 3 are not included in this Test Record. Calibration data is stored in instrument memory. Contact the WILTRON Customer Service department at (408) 778-2000 for more details.

WILTRON Model 6753B and 6753B-10 **Date: ______________________**

Serial Number____________________ **Tested By: _____________________**

2-5. Internal Time Base Aging Rate Test

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure				
2	Record T_S value		______hours	
4	Record T_1 value		______sec	
5	Record T_2 value		______sec	
6	Record T_F value		______hours	
8	Record the calculated aging rate		______per day	5×10^{-10} per day

2-6. Frequency Synthesis Tests

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Coarse Loop/YIG Loop Test Procedure				
1(c)	Enter 2 GHz			
2	Record the Frequency Counter Reading	1.999 999 900 GHz	___________ GHz	2.000 000 100 GHz
3	Record the Frequency Counter Readings . . .	2.999 999 900 GHz	___________ GHz	3.000 000 100 GHz
4	Record the Frequency Counter Readings . . .	3.999 999 900 GHz	___________ GHz	4.000 000 100 GHz
		4.999 999 900 GHz	___________ GHz	5.000 000 100 GHz
		5.999 999 900 GHz	___________ GHz	6.000 000 100 GHz
		6.999 999 900 GHz	___________ GHz	7.000 000 100 GHz
		7.999 999 900 GHz	___________ GHz	8.000 000 100 GHz
		8.999 999 900 GHz	___________ GHz	9.000 000 100 GHz
		9.999 999 900 GHz	___________ GHz	10.000 000 100 GHz
		10.999 999 900 GHz	___________ GHz	11.000 000 100 GHz
		11.999 999 900 GHz	___________ GHz	12.000 000 100 GHz
		12.999 999 900 GHz	___________ GHz	13.000 000 100 GHz
		13.999 999 900 GHz	___________ GHz	14.000 000 100 GHz
		14.999 999 900 GHz	___________ GHz	15.000 000 100 GHz
		15.999 999 900 GHz	___________ GHz	16.000 000 100 GHz
		16.999 999 900 GHz	___________ GHz	17.000 000 100 GHz
		17.999 999 900 GHz	___________ GHz	18.000 000 100 GHz
		18.999 999 900 GHz	___________ GHz	19.000 000 100 GHz
		19.999 999 900 GHz	___________ GHz	20.000 000 100 GHz
		20.999 999 900 GHz	___________ GHz	21.000 000 100 GHz
		21.999 999 900 GHz	___________ GHz	22.000 000 100 GHz
		22.999 999 900 GHz	___________ GHz	23.000 000 100 GHz
		23.999 999 900 GHz	___________ GHz	24.000 000 100 GHz
		24.999 999 900 GHz	___________ GHz	25.000 000 100 GHz
		25.999 999 900 GHz	___________ GHz	26.000 000 100 GHz

2-6. Frequency Synthesis Tests (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. Fine Loop Test Procedure				
1(c)	Enter 2 GHz			
2	Record the Frequency Counter Reading	1.999 999 900 GHz	___________ GHz	2.000 000 100 GHz
3	Record the Frequency Counter Reading	2.000 000 900 GHz	___________ GHz	2.000 001 100 GHz
4	Record the Frequency Counter Readings . . .	2.000 001 900 GHz	___________ GHz	2.000 002 100 GHz
		2.000 002 900 GHz	___________ GHz	2.000 003 100 GHz
		2.000 003 900 GHz	___________ GHz	2.000 004 100 GHz
		2.000 004 900 GHz	___________ GHz	2.000 005 100 GHz
		2.000 005 900 GHz	___________ GHz	2.000 006 100 GHz
		2.000 006 900 GHz	___________ GHz	2.000 007 100 GHz
		2.000 007 900 GHz	___________ GHz	2.000 008 100 GHz
		2.000 008 900 GHz	___________ GHz	2.000 009 100 GHz
		2.000 009 900 GHz	___________ GHz	2.000 010 100 GHz

2-7. Marker and Blanking Verification

Step	Procedure Comments	Marker/Signal Presence
c. Marker Selection Procedure		
2	F1 Frequency Marker = 2 GHz	
2	Verify that a marker appears on the left side of the scope at the start of trace	_______
3(a)	F2 Frequency Marker = 26.5 GHz	
3(b)	Verify that a marker appears on the right side of the scope at the end of trace	_______
4	F3 Frequency Marker = 5 GHz	
4	Verify that a marker appears on the scope	_______
4	F4 Frequency Marker = 8 GHz	
4	Verify that a marker appears on the scope	_______
4	F5 Frequency Marker = 11 GHz	
4	Verify that a marker appears on the scope	_______
4	F6 Frequency Marker = 14 GHz	
4	Verify that a marker appears on the scope	_______
4	F7 Frequency Marker = 17 GHz	
4	Verify that a marker appears on the scope	_______
4	F8 Frequency Marker = 20 GHz	
4	Verify that a marker appears on the scope	_______
4	F9 Frequency Marker = 23 GHz	
4	Verify that a marker appears on the scope	_______
d. Marker Output Verification Procedure		
1	Verify +5V (TTL high) markers at nine points on scope display	_______
3	Verify that all markers change to intensified spots	_______
5(a)	Verify +5V (TTL high) signal at retrace	_______
5(b)	Verify +5V (minimum) signal at bandswitch point	_______
5(c)	Verify +5V (minimum) signal at each switched filter point:	
	3.5 GHz switch point	_______
	6.0 GHz switch point	_______
5(d)	Verify –10V (minimum) signal at selected marker frequency	_______
5(e)	Verify –5V (minimum) signal at all other marker frequencies	_______
6	Verify that new marker changes from –5V (minimum) to –10V (minimum)	_______
	Verify that previous marker changes from –10V (minimum) to –5V (minimum)	_______
e. Retrace Blanking Output Verification Procedure		
2	Verify –5V (minimum) signal during retrace	_______
3	Verify +5V (minimum) signal during retrace	_______
f. Bandswitch Blanking Output Verification Procedure		
2	Verify +5V (minimum) signal during the following bandswitch dwell points:	
	8.0 GHz bandswitch dwell point	_______
	12.4 GHz bandswitch dwell point	_______
	18 GHz bandswitch dwell point	_______
3	Verify –5V (minimum) signal during the following bandswitch dwell points:	
	8.0 GHz bandswitch dwell point	_______
	12.4 GHz bandswitch dwell point	_______
	18 GHz bandswitch dwell point	_______

2-8. Narrowband Spurious Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Fine Loop Test Procedure				
1(b)	Enter 5.1 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	10 kHz	N/A	_______dBc	–60 dBc
	20 kHz	N/A	_______dBc	–60 dBc
	30 kHz	N/A	_______dBc	–60 dBc
	40 kHz	N/A	_______dBc	–60 dBc
	50 kHz	N/A	_______dBc	–60 dBc
d. Coarse Loop Test Procedure				
1(b)	Enter 18.1 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	200 kHz	N/A	_______dBc	–60 dBc
	400 kHz	N/A	_______dBc	–60 dBc

2-9. Spurious and Harmonic Tests: RF Output Signals ≤2 GHz

These tests are not applicable to the 6753B and 6753B-10 models.

2-10. Harmonic Tests: RF Output Signals From 2 to 10 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure				
4	Record the level of all harmonics of the 2.1 GHz carrier:			
	4.2 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
	6.3 GHz (3rd harmonic)	N/A	_______dBc	–60 dBc
	8.4 GHz (4th harmonic)	N/A	_______dBc	–60 dBc
	10.5 GHz (5th harmonic)	N/A	_______dBc	–60 dBc
	12.6 GHz (6th harmonic)	N/A	_______dBc	–60 dBc
	14.7 GHz (7th harmonic)	N/A	_______dBc	–60 dBc
	16.8 GHz (8th harmonic)	N/A	_______dBc	–60 dBc
	18.9 GHz (9th harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 3.6 GHz carrier:			
	7.2 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
	10.8 GHz (3rd harmonic)	N/A	_______dBc	–60 dBc
	14.4 GHz (4th harmonic)	N/A	_______dBc	–60 dBc
	18 GHz (5th harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 7 GHz carrier:			
	14 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 10 GHz carrier:			
	20 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc

2-11. Harmonic Test: RF Output Signals From 11 to 20 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure				
7	Record the level of the 2nd harmonic of the 11 GHz carrier:			
	22 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
7	Record the level of the 2nd harmonic of the 12.4 GHz carrier:			
	24.8 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
7	Record the level of the 2nd harmonic of the 13.25 GHz carrier:			
	26.5 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc

2-12. Harmonic Tests (Alternate Method): RF Output Signals From 10 to 30 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure				
2(c)	Enter 10 GHz			
4	Measure and record the difference between RF levels above and below filter cutoff:			
	10 to 20 GHz harmonic level	N/A	_______dBc	–60 dBc
5	Enter 20 GHz			
	Measure and record the difference between RF levels above and below filter cutoff:			
	20 to 26.5 GHz harmonic level	N/A	_______dBc	–60 dBc

2-13. Harmonic Tests: RF Output Signals From 26.5 to 40 GHz

These tests are not applicable to the 6753B and 6753B-10 models.

2-14. Harmonic Tests: RF Output Signals From 40 to 60 GHz

These tests are not applicable to the 6753B and 6753B-10 models.

2-15. Single Sideband Phase Noise Test

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure (Band 1; 2 to 8 GHz)				
1(c)	Enter 5.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–67 dBc
6	100 Hz	N/A	_______dBc	–72 dBc
8	1 kHz	N/A	_______dBc	–76 dBc
10	10 kHz	N/A	_______dBc	–80 dBc
12	100 kHz	N/A	_______dBc	–98 dBc
13	Repeat steps c.1 through c.12 for the remaining bands.			
c. Test Procedure (Band 2; 8 to 12.4 GHz)				
1(c)	Enter 10.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–64 dBc
6	100 Hz	N/A	_______dBc	–69 dBc
8	1 kHz	N/A	_______dBc	–73 dBc
10	10 kHz	N/A	_______dBc	–77 dBc
12	100 kHz	N/A	_______dBc	–100 dBc
c. Test Procedure (Band 3; 12.4 to 18 GHz)				
1(c)	Enter 15.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–60 dBc
6	100 Hz	N/A	_______dBc	–65 dBc
8	1 kHz	N/A	_______dBc	–69 dBc
10	10 kHz	N/A	_______dBc	–73 dBc
12	100 kHz	N/A	_______dBc	–100 dBc
c. Test Procedure (Band 1; 18 to 26.5 GHz)				
1(c)	Enter 22 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–58 dBc
6	100 Hz	N/A	_______dBc	–63 dBc
8	1 kHz	N/A	_______dBc	–67 dBc
10	10 kHz	N/A	_______dBc	–71 dBc
12	100 kHz	N/A	_______dBc	–97 dBc

2-16. Power Level Accuracy and Flatness Verification (6753B Models without Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 0.8 dB			
	** = Maximum Variation is 2.0 dB (2 to 20 GHz)/3.0 dB (20 to 26.5 GHz)			
d. Power Level Accuracy Procedure (2 to 8 GHz)				
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+4.4 dBm	________ dBm	+5.6 dBm
3	Measure and record the Power Meter reading	+3.4 dBm	________ dBm	+4.6 dBm
4	Measure and record the Power Meter readings	+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
		–3.6 dBm	________ dBm	–2.4 dBm
		–4.6 dBm	________ dBm	–3.4 dBm
		–5.6 dBm	________ dBm	–4.4 dBm
		–6.6 dBm	________ dBm	–5.4 dBm
		–7.6 dBm	________ dBm	–6.4 dBm
d. Power Level Accuracy Procedure (8 to 12.4 GHz)				
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+4.4 dBm	________ dBm	+5.6 dBm
3	Measure and record the Power Meter reading	+3.4 dBm	________ dBm	+4.6 dBm
4	Measure and record the Power Meter readings	+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
		–3.6 dBm	________ dBm	–2.4 dBm
		–4.6 dBm	________ dBm	–3.4 dBm
		–5.6 dBm	________ dBm	–4.4 dBm
		–6.6 dBm	________ dBm	–5.4 dBm
		–7.6 dBm	________ dBm	–6.4 dBm

2-16. Power Level Accuracy and Flatness Verification (6753B Models without Optional Attenuator) (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	d. Power Level Accuracy Procedure (12.4 to 18 GHz)			
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+4.4 dBm	________ dBm	+5.6 dBm
3	Measure and record the Power Meter reading	+3.4 dBm	________ dBm	+4.6 dBm
4	Measure and record the Power Meter readings	+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
		–3.6 dBm	________ dBm	–2.4 dBm
		–4.6 dBm	________ dBm	–3.4 dBm
		–5.6 dBm	________ dBm	–4.4 dBm
		–6.6 dBm	________ dBm	–5.4 dBm
		–7.6 dBm	________ dBm	–6.4 dBm
	d. Power Level Accuracy Procedure (18 to 26.5 GHz)			
1(c)	Enter 18 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+4.4 dBm	________ dBm	+5.6 dBm
3	Measure and record the Power Meter reading	+3.4 dBm	________ dBm	+4.6 dBm
4	Measure and record the Power Meter readings	+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
		–3.6 dBm	________ dBm	–2.4 dBm
		–4.6 dBm	________ dBm	–3.4 dBm
		–5.6 dBm	________ dBm	–4.4 dBm
		–6.6 dBm	________ dBm	–5.4 dBm
		–7.6 dBm	________ dBm	–6.4 dBm

2-16. Power Level Accuracy and Flatness Verification (6753B Models with 110 dB Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	

* = Maximum Variation is 1.6 dB (2 to 20 GHz)/2.0 dB (20 to 26.5 GHz)

** = Maximum Variation is 6.0 dB (2 to 20 GHz)/6.2 dB (20 to 26.5 GHz)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. Power Level Accuracy Procedure (2 to 8 GHz)				
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+0.6 dBm	________ dBm	+3.4 dBm
3	Measure and record the Power Meter reading	–0.4 dBm	________ dBm	+2.4 dBm
4	Measure and record the Power Meter readings	–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
		–7.4 dBm	________ dBm	–4.6 dBm
		–8.4 dBm	________ dBm	–5.6 dBm
		–9.4 dBm	________ dBm	–6.6 dBm
		–10.4 dBm	________ dBm	–7.6 dBm
		–11.4 dBm	________ dBm	–8.6 dBm
d. Power Level Accuracy Procedure (8 to 12.4 GHz)				
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+0.6 dBm	________ dBm	+3.4 dBm
3	Measure and record the Power Meter reading	–0.4 dBm	________ dBm	+2.4 dBm
4	Measure and record the Power Meter readings	–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
		–7.4 dBm	________ dBm	–4.6 dBm
		–8.4 dBm	________ dBm	–5.6 dBm
		–9.4 dBm	________ dBm	–6.6 dBm
		–10.4 dBm	________ dBm	–7.6 dBm
		–11.4 dBm	________ dBm	–8.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6753B Models with 110 dB Optional Attenuator) (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. Power Level Accuracy Procedure (12.4 to 18 GHz)				
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+0.6 dBm	________ dBm	+3.4 dBm
3	Measure and record the Power Meter reading	–0.4 dBm	________ dBm	+2.4 dBm
4	Measure and record the Power Meter readings	–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
		–7.4 dBm	________ dBm	–4.6 dBm
		–8.4 dBm	________ dBm	–5.6 dBm
		–9.4 dBm	________ dBm	–6.6 dBm
		–10.4 dBm	________ dBm	–7.6 dBm
		–11.4 dBm	________ dBm	–8.6 dBm
d. Power Level Accuracy Procedure (18 to 26.5 GHz)				
1(c)	Enter 18 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+0.6 dBm	________ dBm	+3.4 dBm
3	Measure and record the Power Meter reading	–0.4 dBm	________ dBm	+2.4 dBm
4	Measure and record the Power Meter readings	–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
		–7.4 dBm	________ dBm	–4.6 dBm
		–8.4 dBm	________ dBm	–5.6 dBm
		–9.4 dBm	________ dBm	–6.6 dBm
		–10.4 dBm	________ dBm	–7.6 dBm
		–11.4 dBm	________ dBm	–8.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6753B-10 Models without Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	

* = Maximum Variation is 0.8 dB

** = Maximum Variation is 2.0 dB (2 to 20 GHz)/3.0 dB (20 to 26.5 GHz)

d. Power Level Accuracy Procedure (2 to 8 GHz)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm

d. Power Level Accuracy Procedure (8 to 12.4 GHz)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm

2-16. Power Level Accuracy and Flatness Verification (6753B-10 Models without Optional Attenuator) (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. Power Level Accuracy Procedure (12.4 to 18 GHz)				
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
d. Power Level Accuracy Procedure (18 to 26.5 GHz)				
1(c)	Enter 18 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm

2-16. Power Level Accuracy and Flatness Verification (6753B-10 Models with 110 dB Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	

* = Maximum Variation is 1.6 dB (2 to 20 GHz)/2.0 dB (20 to 26.5 GHz)

** = Maximum Variation is 6.0 dB (2 to 20 GHz)/6.2 dB (20 to 26.5 GHz)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. Power Level Accuracy Procedure (2 to 8 GHz)				
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
d. Power Level Accuracy Procedure (8 to 12.4 GHz)				
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6753B-10 Models with 110 dB Optional Attenuator) (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. Power Level Accuracy Procedure (12.4 to 18 GHz)				
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
d. Power Level Accuracy Procedure (18 to 26.5 GHz)				
1(c)	Enter 18 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm

2-17. FM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. FM Input Sensitivity Procedure (Band 1; 2 to 8 GHz)				
2(c)	Enter 5 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 1; 2 to 8 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
6	Repeat steps d.2 through e.5 for the remaining bands.			
d. FM Input Sensitivity Procedure (Band 2; 8 to 12.4 GHz)				
2(c)	Enter 10 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 2; 8 to 12.4 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
d. FM Input Sensitivity Procedure (Band 3; 12.4 to 18 GHz)				
2(c)	Enter 16 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 3; 12.4 to 18 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
d. FM Input Sensitivity Procedure (Band 4; 18 to 26.5 GHz)				
2(c)	Enter 22 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 4; 18 to 26.5 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A

2-18. AM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	d. AM Input Sensitivity and Meter Accuracy (Band 1; 2 to 8 GHz)			
2(e)	Enter 5 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
	e. AM Meter Accuracy Procedure (Band 1; 2 to 8 GHz)			
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%
6	Repeat steps d.2 through e.5 for the remaining bands.			
	d. AM Input Sensitivity and Meter Accuracy (Band 2; 8 to 12.4 GHz)			
2(e)	Enter 10 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
	e. AM Meter Accuracy Procedure (Band 2; 8 to 12.4 GHz)			
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%
	d. AM Input Sensitivity and Meter Accuracy (Band 3; 12.4 to 18 GHz)			
2(e)	Enter 16 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
	e. AM Meter Accuracy Procedure (Band 3; 12.4 to 18 GHz)			
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%
	d. AM Input Sensitivity and Meter Accuracy (Band 4; 18 to 26.5 GHz)			
2(e)	Enter 22 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
	e. AM Meter Accuracy Procedure (Band 4; 18 to 26.5 GHz)			
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Rise Time, Fall Time, Overshoot, and Level (Band 1; 2 to 8 GHz)				
1(c)	Enter 5 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
c. Rise Time, Fall Time, Overshoot, and Level (Band 2; 8 to 12.4 GHz)				
1(c)	Enter 10 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
c. Rise Time, Fall Time, Overshoot, and Level (Band 3; 12.4 to 18 GHz)				
1(c)	Enter 16 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
c. Rise Time, Fall Time, Overshoot, and Level (Band 4; 18 to 26.5 GHz)				
1(c)	Enter 22 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
d. Pulse Leveling Accuracy Check, Preliminary Test Setup				
4(b)	Enter 5 GHz			
e. 67XXB LEVEL Display Calibration				
1	Note the 67XXB LEVEL display value			______dBm
2	Note the 67XXB LEVEL display value			______dBm
3	Calculate the difference between steps e.1 and e.2. Note this value			______dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 5 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 2 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 1 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 5 µs)			
2(b)	Enter 10 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
	f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 2 µs)			
2(b)	Enter 10 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
	f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 1 µs)			
2(b)	Enter 10 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
	f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.5 µs)			
2(b)	Enter 10 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
	f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.2 µs)			
2(b)	Enter 10 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
	f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.1 µs)			
2(b)	Enter 10 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 5 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 2 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 1 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 5 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 2 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 1 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-20. Pulse Modulation Test: Video Feedthrough

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure (Band 1; 2 to 8 GHz)				
1(c)	Enter 5 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak
4	Repeat steps c.1 through c.3 for the remaining bands.			
c. Test Procedure (Band 2; 8 to 12.4 GHz)				
1(c)	Enter 10 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak
c. Test Procedure (Band 3; 12.4 to 18 GHz)				
1(c)	Enter 16 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak
c. Test Procedure (Band 4; 18 to 26.5 GHz)				
1(c)	Enter 22 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak

2-21. Pulse Modulation Test: RF On/Off Ratio

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure (Band 1; 2 to 8 GHz)			
1(d)	Enter 5 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A
7	Repeat steps c.1 through c.5 for the remaining bands.			
	c. Test Procedure (Band 2; 8 to 12.4 GHz)			
1(d)	Enter 10 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A
	c. Test Procedure (Band 3; 12.4 to 18 GHz)			
1(d)	Enter 16 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A
	c. Test Procedure (Band 4; 18 to 26.5 GHz)			
1(d)	Enter 22 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >50 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	50 dB	______dB	N/A

WILTRON Model 6753B and 6753B-10 **Date:** ______________________

Serial Number____________________ **Tested By:** _____________________

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-9 ALC Level Offset Adjustments		
This instrument uses only one leveling circuit; Band 1 thru 4.		
d. Band 1 thru 4 Level Offset 1.(b) 3.	Frequency = 5 GHz A15TP5 = 0V ±50 µV	___________volts
f. ALC Detector Shaper Level Offset 6.(c)	Frequency = 2.1 GHz Follow steps f.1 through f.21.	
3-10 External Leveling Offset Adjustment		
c.3	A15TP7 = 0V ±1 mV	___________volts
3-11 10 MHz Reference Oscillator Calibration		
c.1.(c) c.3	Frequency = 26.5 GHz Adjust for Frequency Counter Reading = 26.5 GHz ±100 Hz	___________GHz

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-12 ALC Bandwidth Calibration		
This calibration is required for each installed frequency band:		
c. 2-8 GHz Band 2.(c)	Frequency = 5 GHz Follow steps c.1 through c.15.	
c. 8-12.4 GHz Band 2.(c)	Frequency = 10 GHz Repeat steps c.7 through c.15.	
c. 12.4-18 GHz Band 2.(c)	Frequency = 16 GHz Repeat steps c.7 through c.15.	
c. 18-26.5 GHz Band 2.(c)	Frequency = 22 GHz Repeat steps c.7 through c.13; then steps c.16 and c.17.	
3-13 Analog Sweep Calibration		
This calibration is automatically completed for all of the installed frequency bands		
c.1.(d)	Frequency = 5 GHz	

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-14 YIG-tuned Oscillator Frequency Calibration This calibration is required for each installed frequency band:		
c. 2-8 GHz Band 1.(e) 5.	Frequency = 5 GHz Maximum difference in MHz between frequency counter and 6753B	__________MHz
c. 8-12.4 GHz Band 1.(e) 5.	Frequency = 10 GHz Maximum difference in MHz between frequency counter and 6753B	__________MHz
c. 12.4-18 GHz Band 1.(e) 5.	Frequency = 16 GHz Maximum difference in MHz between frequency counter and 6753B	_________MHz
c. 18-20 GHz Band 1.(e) 5.	Frequency = 22 GHz Maximum difference in MHz between frequency counter and 6753B	_________MHz
3-15 RF Level Calibration This calibration is performed using an automatic test system. Contact WILTRON Customer Service at (408) 778–2000 for further information.		
3-16 ALC Slope Adjustment This calibration is required for the >2 GHz level detector.		
c. 2-26.5 GHz Band 2.(d) 2.(f) 5.	F1 = 2 GHz F2 = 26.5 GHz Record the resulting waveform	Draw Waveform Flatness for the 2-26.5 GHz Band

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-17 AM Sensitivity Calibration		
This calibration is required for each installed frequency band:		
d. 2-8 GHz Band		
2.(d)	Frequency = 5 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
d. 8-12.4 GHz Band		
2.(d)	Frequency = 10 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
d. 12.4-18 GHz Band		
2.(d)	Frequency = 16 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
d. 18-26.5 GHz Band		
2.(d)	Frequency = 22 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
3-18 AM Meter Calibration		
c. Meter Calibration		
2.(d)	Frequency = 5 GHz	
d. Meter Verification		
1.(c)	Frequency = 5 GHz	
1.(g)	Measure and record AM DEPTH	__________%

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-19 FM Driver/Sensitivity Calibration This calibration is required for each installed frequency band:		
d. 2-8 GHz Band 2.(d) 8.	Frequency = 5 GHz Record the Waveform Null	Draw Waveform Null
d. 8-12.4 GHz Band 2.(d) 8.	Frequency = 10 GHz Record the Waveform Null	Draw Waveform Null
d. 12.4-18 GHz Band 2.(d) 8.	Frequency = 16 GHz Record the Waveform Null	Draw Waveform Null
d. 18-26.5 GHz Band 2.(d) 8.	Frequency = 22 GHz Record the Waveform Null	Draw Waveform Null

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-20 FM Flatness Calibration This calibration is required for each installed frequency band:		
d. 2-8 GHz Band 2.(d) 10.	Frequency = 5 GHz Record the Waveform	Draw Waveform
d. 8-12.4 GHz Band 2.(d) 10.	Frequency = 10 GHz Record the Waveform	Draw Waveform
b. 12.4-18 GHz Band 2.(d) 10.	Frequency = 16 GHz Record the Waveform	Draw Waveform
b. 18-26.5 GHz Band 2.(d) 10.	Frequency = 22 GHz Record the Waveform	Draw Waveform

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-21 FM Meter Calibration		
c. Meter Calibration	Follow steps c.1 through c.6	
d. Meter Verification 1.(c)	Measure FM Deviation	__________kHz

MODELS
6759B AND 6759B-10
SWEPT FREQUENCY SYNTHESIZER

TEST AND CALIBRATION
MANUAL

WILTRON

490 JARVIS DRIVE
MORGAN HILL, CA 95037-2809

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SECTION 4
TEST RECORD

CONTENTS

SECTION 4
TEST RECORDS

4-1 INTRODUCTION

This section provides two Test Record tables for recording the results of the Performance Verification Tests (in Section 2) and the Calibration/Adjustments (in Section 3). They jointly provide the means for maintaining an accurate and complete record of instrument performance.

This test record provided here has been customized for the 6759B and 6759B-10 models. It should only be used with matching procedures in Section 2 and 3 that cover the 6759B or 6759B-10 models. Specific references to frequency parameters, power levels, and non-applicable procedures make each Test Record easy to follow.

We recommend that you make a copy of these pages each time the test procedures are performed. By dating each Test Record copy, a detailed history of instrument perfomance can be accumulated.

4-2 PERFORMANCE VERIFICATION TEST RECORD

The Test Record for the Performance Verification procedures supplied in Section 2 is located immediately following this page.

4-3 CALIBRATION/ADJUSTMENTS TEST RECORD

The Test Record for the Calibration/Adjustment procedures supplied in Section 3 follows the Performance Verification Test Record.

NOTE

Results of the automated RF Level Calibration procedure in Section 3 are not included in this Test Record. Calibration data is stored in instrument memory. Contact the WILTRON Customer Service department at (408) 778-2000 for more details.

WILTRON Model 6759B and 6759B-10 **Date: ______________________**

Serial Number____________________ **Tested By: _____________________**

2-5. Internal Time Base Aging Rate Test

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure				
2	Record T_S value		______hours	
4	Record T_1 value		______sec	
5	Record T_2 value		______sec	
6	Record T_F value		______hours	
8	Record the calculated aging rate		______per day	5×10^{-10} per day

2-6. Frequency Synthesis Tests

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Coarse Loop/YIG Loop Test Procedure				
1(c)	Enter 1 GHz			
2	Record the Frequency Counter Reading	0.999 999 900 GHz	__________ GHz	1.000 000 100 GHz
3	Record the Frequency Counter Reading	1.999 999 900 GHz	__________ GHz	2.000 000 100 GHz
4	Record the Frequency Counter Readings . . .	2.999 999 900 GHz	__________ GHz	3.000 000 100 GHz
		3.999 999 900 GHz	__________ GHz	4.000 000 100 GHz
		4.999 999 900 GHz	__________ GHz	5.000 000 100 GHz
		5.999 999 900 GHz	__________ GHz	6.000 000 100 GHz
		6.999 999 900 GHz	__________ GHz	7.000 000 100 GHz
		7.999 999 900 GHz	__________ GHz	8.000 000 100 GHz
		8.999 999 900 GHz	__________ GHz	9.000 000 100 GHz
		9.999 999 900 GHz	__________ GHz	10.000 000 100 GHz
		10.999 999 900 GHz	__________ GHz	11.000 000 100 GHz
		11.999 999 900 GHz	__________ GHz	12.000 000 100 GHz
		12.999 999 900 GHz	__________ GHz	13.000 000 100 GHz
		13.999 999 900 GHz	__________ GHz	14.000 000 100 GHz
		14.999 999 900 GHz	__________ GHz	15.000 000 100 GHz
		15.999 999 900 GHz	__________ GHz	16.000 000 100 GHz
		16.999 999 900 GHz	__________ GHz	17.000 000 100 GHz
		17.999 999 900 GHz	__________ GHz	18.000 000 100 GHz
		18.999 999 900 GHz	__________ GHz	19.000 000 100 GHz
		19.999 999 900 GHz	__________ GHz	20.000 000 100 GHz
		20.999 999 900 GHz	__________ GHz	21.000 000 100 GHz
		21.999 999 900 GHz	__________ GHz	22.000 000 100 GHz
		22.999 999 900 GHz	__________ GHz	23.000 000 100 GHz
		23.999 999 900 GHz	__________ GHz	24.000 000 100 GHz
		24.999 999 900 GHz	__________ GHz	25.000 000 100 GHz
		25.999 999 900 GHz	__________ GHz	26.000 000 100 GHz

2-6. Frequency Synthesis Tests (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	d. Fine Loop Test Procedure			
1(c)	Enter 1 GHz			
2	Record the Frequency Counter Reading	0.999 999 900 GHz	___________ GHz	1.000 000 100 GHz
3	Record the Frequency Counter Reading	1.000 000 900 GHz	___________ GHz	1.000 001 100 GHz
4	Record the Frequency Counter Readings . . .	1.000 001 900 GHz	___________ GHz	1.000 002 100 GHz
		1.000 002 900 GHz	___________ GHz	1.000 003 100 GHz
		1.000 003 900 GHz	___________ GHz	1.000 004 100 GHz
		1.000 004 900 GHz	___________ GHz	1.000 005 100 GHz
		1.000 005 900 GHz	___________ GHz	1.000 006 100 GHz
		1.000 006 900 GHz	___________ GHz	1.000 007 100 GHz
		1.000 007 900 GHz	___________ GHz	1.000 008 100 GHz
		1.000 008 900 GHz	___________ GHz	1.000 009 100 GHz
		1.000 009 900 GHz	___________ GHz	1.000 010 100 GHz

2-7. Marker and Blanking Verification

Step	Procedure Comments	Marker/Signal Presence
	c. Marker Selection Procedure	
2	F1 Frequency Marker = 0.01 GHz	
2	Verify that a marker appears on the left side of the scope at the start of trace	_______
3(a)	F2 Frequency Marker = 26.5 GHz	
3(b)	Verify that a marker appears on the right side of the scope at the end of trace	_______
4	F3 Frequency Marker = 1 GHz	
4	Verify that a marker appears on the scope	_______
4	F4 Frequency Marker = 5 GHz	
4	Verify that a marker appears on the scope	_______
4	F5 Frequency Marker = 10 GHz	
4	Verify that a marker appears on the scope	_______
4	F6 Frequency Marker = 15 GHz	
4	Verify that a marker appears on the scope	_______
4	F7 Frequency Marker = 18 GHz	
4	Verify that a marker appears on the scope	_______
4	F8 Frequency Marker = 20 GHz	
4	Verify that a marker appears on the scope	_______
4	F9 Frequency Marker = 23 GHz	
4	Verify that a marker appears on the scope	_______
	d. Marker Output Verification Procedure	
1	Verify +5V (TTL high) markers at nine points on scope display	_______
3	Verify that all markers change to intensified spots	_______
5(a)	Verify +5V (TTL high) signal at retrace	_______
5(b)	Verify +5V (minimum) signal at bandswitch point	_______
5(c)	Verify +5V (minimum) signal at each switched filter point:	
	3.5 GHz switch point	_______
	6.0 GHz switch point	_______
5(d)	Verify –10V (minimum) signal at selected marker frequency	_______
5(e)	Verify –5V (minimum) signal at all other marker frequencies	_______
6	Verify that new marker changes from –5V (minimum) to –10V (minimum)	_______
	Verify that previous marker changes from –10V (minimum) to –5V (minimum)	_______
	e. Retrace Blanking Output Verification Procedure	
2	Verify –5V (minimum) signal during retrace	_______
3	Verify +5V (minimum) signal during retrace	_______
	f. Bandswitch Blanking Output Verification Procedure	
2	Verify +5V (minimum)signal during the following bandswitch dwell points:	
	2.0 GHz bandswitch dwell point	_______
	8.0 GHz bandswitch dwell point	_______
	12.4 GHz bandswitch dwell point	_______
	18 GHz bandswitch dwell point	_______
3	Verify –5V (minimum) signal during the following bandswitch dwell points:	
	2.0 GHz bandswitch dwell point	_______
	8.0 GHz bandswitch dwell point	_______
	12.4 GHz bandswitch dwell point	_______
	18 GHz bandswitch dwell point	_______

2-8. Narrowband Spurious Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Fine Loop Test Procedure				
1(b)	Enter 5.1 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	10 kHz	N/A	_______dBc	–60 dBc
	20 kHz	N/A	_______dBc	–60 dBc
	30 kHz	N/A	_______dBc	–60 dBc
	40 kHz	N/A	_______dBc	–60 dBc
	50 kHz	N/A	_______dBc	–60 dBc
d. Coarse Loop Test Procedure				
1(b)	Enter 18.3 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	200 kHz	N/A	_______dBc	–60 dBc
	400 kHz	N/A	_______dBc	–60 dBc

2-9. Spurious and Harmonic Tests: RF Output Signals ≤2 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure				
3	Record the presence of the worst case harmonic of the 10 MHz carrier	N/A	_______dBc	–40 dBc
3	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc
4	Record the presence of the worst case harmonic of the 20 MHz carrier	N/A	_______dBc	–40 dBc
4	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc
4	Record the presence of the worst case harmonics of the 30 MHz carrier	N/A	_______dBc	–40 dBc
4	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc
6	Record the presence of the worst case harmonic of the 40 MHz carrier	N/A	_______dBc	–40 dBc
6	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc
8	Record the presence of the worst case harmonic of the 350 MHz carrier	N/A	_______dBc	–40 dBc
8	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc
9	Record the presence of the worst case spurious response of the 1.6 GHz carrier on the Spectrum Analyzer display	N/A	_______dBc	–60 dBc
12	Record the level of harmonics of the 1.6 GHz carrier:			
	3.2 GHz (2nd harmonic)	N/A	_______dBc	–40 dBc
	4.8 GHz (3rd harmonic)	N/A	_______dBc	–40 dBc

2-10. Harmonic Tests: RF Output Signals From 2 to 10 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure			
4	Record the level of all harmonics of the 2.1 GHz carrier:			
	4.2 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
	6.3 GHz (3rd harmonic)	N/A	_______dBc	–60 dBc
	8.4 GHz (4th harmonic)	N/A	_______dBc	–60 dBc
	10.5 GHz (5th harmonic)	N/A	_______dBc	–60 dBc
	12.6 GHz (6th harmonic)	N/A	_______dBc	–60 dBc
	14.7 GHz (7th harmonic)	N/A	_______dBc	–60 dBc
	16.8 GHz (8th harmonic)	N/A	_______dBc	–60 dBc
	18.9 GHz (9th harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 3.6 GHz carrier:			
	7.2 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
	10.8 GHz (3rd harmonic)	N/A	_______dBc	–60 dBc
	14.4 GHz (4th harmonic)	N/A	_______dBc	–60 dBc
	18 GHz (5th harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 7 GHz carrier:			
	14 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 10 GHz carrier:			
	20 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc

2-11. Harmonic Tests: RF Output Signals From 11 to 20 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure			
7	Record the level of the 2nd harmonic of the 11 GHz carrier:			
	22 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
7	Record the level of the 2nd harmonic of the 12.4 GHz carrier:			
	24.8 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
7	Record the level of the 2nd harmonic of the 13.25 GHz carrier:			
	26.5 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc

2-12. Harmonic Tests (Alternate Method): RF Output Signals From 10 to 30 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure			
2 (c)	Enter 10 GHz			
4	Measure and record the difference between RF levels above and below filter cutoff:			
	10 to 20 GHz harmonic level	N/A	_______dBc	–60 dBc
5	Enter 20 GHz			
	Measure and record the difference between RF levels above and below filter cutoff:			
	20 to 26.5 GHz harmonic level	N/A	_______dBc	–60 dBc

2-13. Harmonic Tests: RF Output Signals From 26.5 to 40 GHz

These tests are not applicable to the 6759B and 6759B-10 models.

2-14. Harmonic Tests: RF Output Signals From 40 to 60 GHz

These tests are not applicable to the 6759B and 6759B-10 models.

2-15. Single Sideband Phase Noise Test

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure (Band 0; 0.01 to 2 GHz)			
1(c)	Enter 1.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–67 dBc
6	100 Hz	N/A	_______dBc	–72 dBc
8	1 kHz	N/A	_______dBc	–76 dBc
10	10 kHz	N/A	_______dBc	–80 dBc
12	100 kHz	N/A	_______dBc	–98 dBc
13	Repeat steps c.1 through c.12 for the remaining bands.			
	c. Test Procedure (Band 1; 2 to 8.4 GHz)			
1(c)	Enter 5.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–67 dBc
6	100 Hz	N/A	_______dBc	–72 dBc
8	1 kHz	N/A	_______dBc	–76 dBc
10	10 kHz	N/A	_______dBc	–80 dBc
12	100 kHz	N/A	_______dBc	–98 dBc
	c. Test Procedure (Band 2; 8 to 12.4 GHz)			
1(c)	Enter 10.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–64 dBc
6	100 Hz	N/A	_______dBc	–69 dBc
8	1 kHz	N/A	_______dBc	–73 dBc
10	10 kHz	N/A	_______dBc	–77 dBc
12	100 kHz	N/A	_______dBc	–100 dBc
	c. Test Procedure (Band 3; 12.4 to 18 GHz)			
1(c)	Enter 15.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–60 dBc
6	100 Hz	N/A	_______dBc	–65 dBc
8	1 kHz	N/A	_______dBc	–69 dBc
10	10 kHz	N/A	_______dBc	–73 dBc
12	100 kHz	N/A	_______dBc	–100 dBc

2-15. Single Sideband Phase Noise Test (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure (Band 4; 18 to 26.5 GHz)			
1(c)	Enter 22 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–58 dBc
6	100 Hz	N/A	_______dBc	–63 dBc
8	1 kHz	N/A	_______dBc	–67 dBc
10	10 kHz	N/A	_______dBc	–71 dBc
12	100 kHz	N/A	_______dBc	–97 dBc

2-16. Power Level Accuracy and Flatness Verification (6759B Models without Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	
	* = Maximum Variation is 0.8 dB			
	** = Maximum Variation is 2.0 dB (0.01 to 20 GHz)/3.0 dB (20 to 26.5 GHz)			
d. Power Level Accuracy Procedure (0.01 to 2 GHz)				
1(c)	Enter 50 MHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+4.4 dBm	________ dBm	+5.6 dBm
3	Measure and record the Power Meter reading	+3.4 dBm	________ dBm	+4.6 dBm
4	Measure and record the Power Meter readings	+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
		–3.6 dBm	________ dBm	–2.4 dBm
		–4.6 dBm	________ dBm	–3.4 dBm
		–5.6 dBm	________ dBm	–4.4 dBm
		–6.6 dBm	________ dBm	–5.4 dBm
		–7.6 dBm	________ dBm	–6.4 dBm
d. Power Level Accuracy Procedure (2 to 8 GHz)				
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+4.4 dBm	________ dBm	+5.6 dBm
3	Measure and record the Power Meter reading	+3.4 dBm	________ dBm	+4.6 dBm
4	Measure and record the Power Meter readings	+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
		–3.6 dBm	________ dBm	–2.4 dBm
		–4.6 dBm	________ dBm	–3.4 dBm
		–5.6 dBm	________ dBm	–4.4 dBm
		–6.6 dBm	________ dBm	–5.4 dBm
		–7.6 dBm	________ dBm	–6.4 dBm

2-16. Power Level Accuracy and Flatness Verification (6759B Models without Optional Attenuator) (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	d.Power Level Accuracy Procedure (8 to 12.4 GHz)			
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+4.4 dBm	________ dBm	+5.6 dBm
3	Measure and record the Power Meter reading	+3.4 dBm	________ dBm	+4.6 dBm
4	Measure and record the Power Meter readings	+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
		–3.6 dBm	________ dBm	–2.4 dBm
		–4.6 dBm	________ dBm	–3.4 dBm
		–5.6 dBm	________ dBm	–4.4 dBm
		–6.6 dBm	________ dBm	–5.4 dBm
		–7.6 dBm	________ dBm	–6.4 dBm
	d. Power Level Accuracy Procedure (12.4 to 18 GHz)			
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+4.4 dBm	________ dBm	+5.6 dBm
3	Measure and record the Power Meter reading	+3.4 dBm	________ dBm	+4.6 dBm
4	Measure and record the Power Meter readings	+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
		–3.6 dBm	________ dBm	–2.4 dBm
		–4.6 dBm	________ dBm	–3.4 dBm
		–5.6 dBm	________ dBm	–4.4 dBm
		–6.6 dBm	________ dBm	–5.4 dBm
		–7.6 dBm	________ dBm	–6.4 dBm
	d. Power Level Accuracy Procedure (18 to 26.5 GHz)			
1(c)	Enter 18 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+4.4 dBm	________ dBm	+5.6 dBm
3	Measure and record the Power Meter reading	+3.4 dBm	________ dBm	+4.6 dBm
4	Measure and record the Power Meter readings	+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
		–3.6 dBm	________ dBm	–2.4 dBm
		–4.6 dBm	________ dBm	–3.4 dBm
		–5.6 dBm	________ dBm	–4.4 dBm
		–6.6 dBm	________ dBm	–5.4 dBm
		–7.6 dBm	________ dBm	–6.4 dBm

2-16. Power Level Accuracy and Flatness Verification (6759B Models with 110 dB Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Power Level Flatness Procedure			
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	

* = Maximum Variation is 1.6 dB (0.01 to 20 GHz)/2.0 dB (20 to 26.5 GHz)

** = Maximum Variation is 6.0 dB (0.01 to 20 GHz)/6.2 dB (20 to 26.5 GHz)

d. Power Level Accuracy Procedure (0.01 to 2 GHz)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
1(c)	Enter 50 MHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+0.6 dBm	________ dBm	+3.4 dBm
3	Measure and record the Power Meter reading	–0.4 dBm	________ dBm	+2.4 dBm
4	Measure and record the Power Meter readings	–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
		–7.4 dBm	________ dBm	–4.6 dBm
		–8.4 dBm	________ dBm	–5.6 dBm
		–9.4 dBm	________ dBm	–6.6 dBm
		–10.4 dBm	________ dBm	–7.6 dBm
		–11.4 dBm	________ dBm	–8.6 dBm

d. Power Level Accuracy Procedure (2 to 8 GHz)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+0.6 dBm	________ dBm	+3.4 dBm
3	Measure and record the Power Meter reading	–0.4 dBm	________ dBm	+2.4 dBm
4	Measure and record the Power Meter readings	–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
		–7.4 dBm	________ dBm	–4.6 dBm
		–8.4 dBm	________ dBm	–5.6 dBm
		–9.4 dBm	________ dBm	–6.6 dBm
		–10.4 dBm	________ dBm	–7.6 dBm
		–11.4 dBm	________ dBm	–8.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6759B Models with 110 dB Optional Attenuator) (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. Power Level Accuracy Procedure (8 to 12.4 GHz)				
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+0.6 dBm	________ dBm	+3.4 dBm
3	Measure and record the Power Meter reading	–0.4 dBm	________ dBm	+2.4 dBm
4	Measure and record the Power Meter readings	–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
		–7.4 dBm	________ dBm	–4.6 dBm
		–8.4 dBm	________ dBm	–5.6 dBm
		–9.4 dBm	________ dBm	–6.6 dBm
		–10.4 dBm	________ dBm	–7.6 dBm
		–11.4 dBm	________ dBm	–8.6 dBm
d. Power Level Accuracy Procedure (12.4 to 18 GHz)				
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+0.6 dBm	________ dBm	+3.4 dBm
3	Measure and record the Power Meter reading	–0.4dBm	________ dBm	+2.4 dBm
4	Measure and record the Power Meter readings	–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
		–7.4 dBm	________ dBm	–4.6 dBm
		–8.4 dBm	________ dBm	–5.6 dBm
		–9.4 dBm	________ dBm	–6.6 dBm
		–10.4 dBm	________ dBm	–7.6 dBm
		–11.4 dBm	________ dBm	–8.6 dBm
d. Power Level Accuracy Procedure (18 to 26.5 GHz)				
1(c)	Enter 18 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+0.6 dBm	________ dBm	+3.4 dBm
3	Measure and record the Power Meter reading	–0.4 dBm	________ dBm	+2.4 dBm
4	Measure and record the Power Meter readings	–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBM	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
		–7.4 dBm	________ dBm	–4.6 dBm
		–8.4 dBm	________ dBm	–5.6 dBm
		–9.4 dBm	________ dBm	–6.6 dBm
		–10.4 dBm	________ dBm	–7.6 dBm
		–11.4 dBm	________ dBm	–8.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6759B-10 Models without Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Power Level Flatness Procedure			
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	

* = Maximum Variation is 0.8 dB

** = Maximum Variation is 2.0 dB (0.01 to 20 GHz)/3.0 dB (20 to 26.5 GHz)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	d. Power Level Accuracy Procedure (0.01 to 2 GHz)			
1(c)	Enter 50 MHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
	d. Power Level Accuracy Procedure (2 to 8 GHz)			
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm

2-16. Power Level Accuracy and Flatness Verification (6759B-10 Models without Optional Attenuator) (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. Power Level Accuracy Procedure (8 to 12.4 GHz)				
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
d. Power Level Accuracy Procedure (12.4 to 18 GHz)				
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
d. Power Level Accuracy Procedure (18 to 26.5 GHz)				
1(c)	Enter 18 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+9.4 dBm	________ dBm	+10.6 dBm
3	Measure and record the Power Meter reading	+8.4 dBm	________ dBm	+9.6 dBm
4	Measure and record the Power Meter readings	+7.4 dBm	________ dBm	+8.6 dBm
		+6.4 dBm	________ dBm	+7.6 dBm
		+5.4 dBm	________ dBm	+6.6 dBm
		+4.4 dBm	________ dBm	+5.6 dBm
		+3.4 dBm	________ dBm	+4.6 dBm
		+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm

2-16. Power Level Accuracy and Flatness Verification (6759B-10 Models with 110 dB Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Power Level Flatness Procedure			
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	

* = Maximum Variation is 1.6 dB (0.01 to 20 GHz)/2.0 dB (20 to 26.5GHz)

** = Maximum Variation is 6.0 dB (0.01 to 20 GHz)/6.2 dB (20 to 26.5 GHz)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	d. Power Level Accuracy Procedure (0.01 to 2 GHz)			
1(c)	Enter 50 MHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
	d. Power Level Accuracy Procedure (2 to 8 GHz)			
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6759B-10 Models with 110 dB Optional Attenuator) (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. Power Level Accuracy Procedure (8 to 12.4 GHz)				
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
d. Power Level Accuracy Procedure (12.4 to 18 GHz)				
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
d. Power Level Accuracy Procedure (18 to 26.5 GHz)				
1(c)	Enter 18 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+5.6 dBm	________ dBm	+8.4 dBm
3	Measure and record the Power Meter reading	+4.6 dBm	________ dBm	+7.4 dBm
4	Measure and record the Power Meter readings	+3.6 dBm	________ dBm	+6.4 dBm
		+2.6 dBm	________ dBm	+5.4 dBm
		+1.6 dBm	________ dBm	+4.4 dBm
		+0.6 dBm	________ dBm	+3.4 dBm
		–0.4 dBm	________ dBm	+2.4 dBm
		–1.4 dBm	________ dBm	+1.4 dBm
		–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm

2-17. FM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. FM Input Sensitivity Procedure (Band 0; 0.01 to 2 GHz)				
2(c)	Enter 1.1 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 0; 0.01 to 2 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
6	Repeat steps d.2 through e.5 for the remaining bands.			
d. FM Input Sensitivity Procedure (Band 1; 2 to 8 GHz)				
2(c)	Enter 5 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 1; 2 to 8 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
d. FM Input Sensitivity Procedure (Band 2; 8 to 12.4 GHz)				
2(c)	Enter 10 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 2; 8 to 12.4 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
d. FM Input Sensitivity Procedure (Band 3; 12.4 to 18 GHz)				
2(c)	Enter 16 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 3; 12.4 to 18 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
d. FM Input Sensitivity Procedure (Band 4; 18 to 26.5 GHz)				
2(c)	Enter 22 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 4; 18 to 26.5 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A

2-18. AM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. AM Input Sensitivity and Meter Accuracy (Band 0; 0.01 to 2 GHz)				
2(e)	Enter 1.1 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 0; 0.01 to 2 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%
6	Repeat steps d.2 through e.5 for the remaining bands.			
d. AM Input Sensitivity and Meter Accuracy (Band 1; 2 to 8 GHz)				
2(e)	Enter 5 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 1; 2 to 8 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%
d. AM Input Sensitivity and Meter Accuracy (Band 2; 8 to 12.4 GHz)				
2(e)	Enter 10 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 2; 8 to 12.4 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%
d. AM Input Sensitivity and Meter Accuracy (Band 3; 12.4 to 18 GHz)				
2(e)	Enter 16 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 3; 12.4 to 18 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%

2-18. AM Modulation Tests (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. AM Input Sensitivity and Meter Accuracy (Band 4; 18 to 26.5 GHz)				
2(e)	Enter 22 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 4; 18 to 26.5 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Rise Time, Fall Time, Overshoot, and Level (Bands 0 and 1; 0.01 to 8 GHz)			
1(c)	Enter 5 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
	c. Rise Time, Fall Time, Overshoot, and Level (Band 2; 8 to 12.4 GHz)			
1(c)	Enter 10 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
	c. Rise Time, Fall Time, Overshoot, and Level (Band 3; 12.4 to 18 GHz)			
1(c)	Enter 16 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
	c. Rise Time, Fall Time, Overshoot, and Level (Band 4; 18 to 26.5 GHz)			
1(c)	Enter 22 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
	d. Pulse Leveling Accuracy Check, Preliminary Test Setup			
4(b)	Enter 1.1 GHz			
	e. 67XXB LEVEL Display Calibration			
1	Note the 67XXB LEVEL display value			______dBm
2	Note the 67XXB LEVEL display value			______dBm
3	Calculate the difference between steps e.1 and e.2. Note this value			______dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
f. Pulse Level Accuracy Test Procedure (Band 0, 0.01 to 2 GHz; Pulse Width = 5 µs)				
2(b)	Enter 1.1 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.6 dB	______dB	+0.6dB
f. Pulse Level Accuracy Test Procedure (Band 0, 0.01 to 2 GHz; Pulse Width = 2 µs)				
2(b)	Enter 1.1 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.9 dB	______dB	+0.9 dB
f. Pulse Level Accuracy Test Procedure (Band 0, 0.01 to 2 GHz; Pulse Width = 1 µs)				
2(b)	Enter 1.1 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.4 dB	______dB	+1.4 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 5 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 2 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 1 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 5 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 2 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 1 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 10 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 5 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 2 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 1 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 5 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 2 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 1 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-20. Pulse Modulation Test: Video Feedthrough

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure (Band 0; 0.01 to 2 GHz)				
1(c)	Enter 1.1 GHz			
3	Measure and record the Video Feedthrough voltage spikes.	N/A	______mV peak	* mV peak
	* Specification: 2% maximum for power levels ≤10 dBm 5% maximum for power levels >10 dBm			
4	Repeat steps c.1 through c.3 for the remaining bands.			
c. Test Procedure (Band 1; 2 to 8 GHz)				
1(c)	Enter 5 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak
c. Test Procedure (Band 2; 8 to 12.4 GHz)				
1(c)	Enter 10 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak
c. Test Procedure (Band 3; 12.4 to 18 GHz)				
1(c)	Enter 16 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak
e. Test Procedure (Band 4; 18 to 26.5 GHz)				
1(c)	Enter 22 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak

2-21. Pulse Modulation Test: RF On/Off Ratio

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure (Band 0; 0.01 to 2 GHz)			
1(d)	Enter 1.1 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A
7	Repeat steps c.1 through c.5 for the remaining installed bands (e.1 through e.5 for frequencies above 20 GHz).			
	c. Test Procedure (Band 1; 2 to 8 GHz)			
1(d)	Enter 5 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A
	c. Test Procedure (Band 2; 8 to 12.4 GHz)			
1(d)	Enter 10 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A
	c. Test Procedure (Band 3; 12.4 to 18 GHz)			
1(d)	Enter 16 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A
	e. Test Procedure (Band 4; 18 to 26.5 GHz)			
1(d)	Enter 22 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >50 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	50 dB	______dB	N/A

WILTRON Model 6759B and 6759B-10 **Date:** ______________________

Serial Number____________________ **Tested By:** _____________________

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-9 ALC Level Offset Adjustments		
This instrument uses two leveling circuits; Band 0 and Bands 1 through 4.		
c. Band 0 Level Offset		
1.(c)	Frequency = 1.1 GHz	
3.	A15TP6 = 0V ±10 µV	___________volts
d. Band 1 thru 4 Level Offset		
1.(b)	Frequency = 5 GHz	
3.	A15TP5 = 0V ±10 µV	___________volts
f. ALC Detector Shaper Level Offset		
6.(c)	Frequency = 2.1 GHz Follow steps f.1 through f.21.	
3-10 External Leveling Offset Adjustment		
c.3	A15TP7 = 0V ±1 mV	___________volts
3-11 10 MHz Reference Oscillator Calibration		
c.1.(c)	Frequency = 26.5 GHz	
c.3	Adjust for Frequency Counter Reading = 26.5 GHz ±100 Hz	___________GHz

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-12 ALC Bandwidth Calibration		
This calibration is required for each installed frequency band:		
c. 2-8 GHz Band 2.(c)	Frequency = 5 GHz Repeat steps c.1 through c.15.	
c. 0.01-2 GHz Band 2.(c)	Frequency = 1.1 GHz Follow steps c.7 through c.15.	
c. 8-12.4 GHz Band 2.(c)	Frequency = 10 GHz Repeat steps c.7 through c.15.	
c. 12.4-18 GHz Band 2.(c)	Frequency = 16 GHz Repeat steps c.7 through c.15.	
c. 18-26.5 GHz Band 2.(c)	Frequency = 22 GHz Repeat steps c.7 through c.13; then steps c.16 and c.17.	
3-13 Analog Sweep Calibration		
This calibration is automatically completed for all of the installed frequency bands		
c.1.(d)	Frequency = 1.1 GHz	

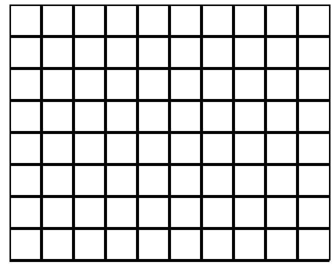
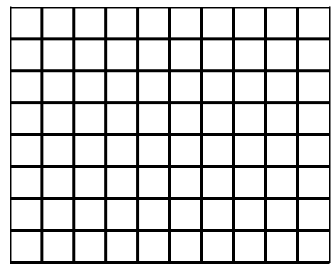
CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-14 YIG-tuned Oscillator Frequency Calibration This calibration is required for each installed frequency band:		
c. 0.01-2 GHz Band 1.(e) 5.	Frequency = 1.1 GHz Maximum difference in MHz between frequency counter and 6759B	__________MHz
c. 2-8 GHz Band 1.(e) 5.	Frequency = 5 GHz Maximum difference in MHz between frequency counter and 6759B	_________MHz
c. 8-12.4 GHz Band 1.(e) 5.	Frequency = 10 GHz Maximum difference in MHz between frequency counter and 6759B	__________MHz
c. 12.4-18 GHz Band 1.(e) 5.	Frequency =16 GHz Maximum difference in MHz between frequency counter and 6759B	__________MHz
c. 18-26.5 GHz Band 1.(e) 8.	Frequency = 22 GHz Maximum difference in MHz between frequency counter and 6759B	__________MHz
3-15 RF Level Calibration This calibration is performed using an automatic test system. Contact WILTRON Customer Service at (408) 778–2000 for further information.		

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-16 ALC Slope Adjustment This calibration is required for the ≤2 GHz level detector and for the >2 GHz level detector.		
c. 0.01-2 GHz Band 2.(d) 2.(f) 5.	F1 = 0.01 GHz F2 = 2 GHz Record the resulting waveform	Draw Waveform Flatness for the 0.01-2 GHz Band
c. 2-26.5 GHz Band 2.(d) 2.(f) 5.	F1 = 2 GHz F2 = 26.5 GHz Record the resulting waveform	Draw Waveform Flatness for the 2-26.5 GHz Band

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-17 AM Sensitivity Calibration		
This calibration is required for each installed frequency band:		
d. 0.01-2 GHz Band		
2.(d)	Frequency = 1.1 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
d. 2-8 GHz Band		
2.(d)	Frequency = 5 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
d. 8-12.4 GHz Band		
2.(d)	Frequency = 10 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
d. 12.4-18 GHz Band		
2.(d)	Frequency = 16 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
d. 18-26.5 GHz Band		
2.(d)	Frequency = 22 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
3-18 AM Meter Calibration		
c. Meter Calibration		
2.(d)	Frequency = 1.1 GHz	
d. Meter Verification		
1.(c)	Frequency = 1.1 GHz	
1.(g)	Measure and record AM DEPTH	__________%

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-19 FM Driver/Sensitivity Calibration This calibration is required for each installed frequency band:		
d. 0.01-2 GHz Band 2.(d) 8.	Frequency = 1.1 GHz Record the Waveform Null	Draw Waveform Null
d. 2-8 GHz Band 2.(d) 8.	Frequency = 5 GHz Record the Waveform Null	Draw Waveform Null
d. 8-12.4 GHz Band 2.(d) 8.	Frequency = 10 GHz Record the Waveform Null	Draw Waveform Null
d. 12.4-18 GHz Band 2.(d) 15.	Frequency =16 GHz Record the Waveform Null	Draw Waveform Null

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-19 FM Driver/Sensitivity Calibration (Continued)		
d. 18-26.5 GHz Band 2.(d) 8.	Frequency = 22 GHz Record the Waveform Null	Draw Waveform Null
3-20 FM Flatness Calibration This calibration is required for each installed frequency band:		
d. 0.01-2 GHz Band 2.(d) 10.	Frequency = 1.1 GHz Record the Waveform	Draw Waveform
b. 2-8 GHz Band 2.(d) 10.	Frequency = 5 GHz Record the Waveform	Draw Waveform
d. 8-12.4 GHz Band 2.(d) 10.	Frequency = 10 GHz Record the Waveform	Draw Waveform

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-20 FM Flatness Calibration (Continued)		
d. 12.4-18 GHz Band 2.(d) 10.	Frequency = 16 GHz Record the Waveform	 Draw Waveform
d. 18-26.5 GHz Band 2.(d) 10.	Frequency = 22 GHz Record the Waveform	 Draw Waveform
3-21 FM Meter Calibration		
c. Meter Calibration	Follow steps c.1 through c.6	
d. Meter Verification 1.(c)	Measure FM Deviation	__________kHz

MODEL 6760B
SWEPT FREQUENCY SYNTHESIZER

TEST AND CALIBRATION
MANUAL

WILTRON

490 JARVIS DRIVE
MORGAN HILL, CA 95037-2809

P/N: 10370-10240
REVISION: D
PRINTED: OCTOBER 1993

SECTION 4
TEST RECORD

CONTENTS

SECTION 4
TEST RECORDS

4-1 INTRODUCTION

This section provides two Test Record tables for recording the results of the Performance Verification Tests (in Section 2) and the Calibration/Adjustments (in Section 3). They jointly provide the means for maintaining an accurate and complete record of instrument performance.

This test record provided here has been customized for the 6760B model. It should only be used with matching procedures in Section 2 and 3 that cover the 6760B model. Specific references to frequency parameters, power levels, and non-applicable procedures make each Test Record easy to follow.

We recommend that you make a copy of these pages each time the test procedures are performed. By dating each Test Record copy, a detailed history of instrument performance can be accumulated.

4-2 PERFORMANCE VERIFICATION TEST RECORD

The Test Record for the Performance Verification procedures supplied in Section 2 is located immediately following this page.

4-3 CALIBRATION/ADJUSTMENTS TEST RECORD

The Test Record for the Calibration/Adjustment procedures supplied in Section 3 follows the Performance Verification Test Record.

NOTE

Results of the automated RF Level Calibration procedure in Section 3 are not included in this Test Record. Calibration data is stored in instrument memory. Contact the WILTRON Customer Service department at (408) 778-2000 for more details.

WILTRON Model 6760B **Date:** ______________________

Serial Number____________________ **Tested By:** _____________________

2-5. Internal Time Base Aging Rate Test

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure				
2	Record T_S value		______hours	
4	Record T_1 value		______sec	
5	Record T_2 value		______sec	
6	Record T_F value		______hours	
8	Record the calculated aging rate		______per day	5×10^{-10} per day

2-6. Frequency Synthesis Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Coarse Loop/YIG Loop Test Procedure				
1(c)	Enter 13 GHz			
2	Record the Frequency Counter Reading	12.999 999 900 GHz	___________ GHz	13.000 000 100 GHz
3	Record the Frequency Counter Reading	13.999 999 900 GHz	___________ GHz	14.000 000 100 GHz
4	Record the Frequency Counter Readings . . .	14.999 999 900 GHz	___________ GHz	15.000 000 100 GHz
		15.999 999 900 GHz	___________ GHz	16.000 000 100 GHz
		16.999 999 900 GHz	___________ GHz	17.000 000 100 GHz
		17.999 999 900 GHz	___________ GHz	18.000 000 100 GHz
		18.999 999 900 GHz	___________ GHz	19.000 000 100 GHz
		19.999 999 900 GHz	___________ GHz	20.000 000 100 GHz
		20.999 999 900 GHz	___________ GHz	21.000 000 100 GHz
		21.999 999 900 GHz	___________ GHz	22.000 000 100 GHz
		22.999 999 900 GHz	___________ GHz	23.000 000 100 GHz
		23.999 999 900 GHz	___________ GHz	24.000 000 100 GHz
		24.999 999 900 GHz	___________ GHz	25.000 000 100 GHz
		25.999 999 900 GHz	___________ GHz	26.000 000 100 GHz
		26.999 999 900 GHz	___________ GHz	27.000 000 200 GHz
		27.999 999 800 GHz	___________ GHz	28.000 000 200 GHz
		28.999 999 800 GHz	___________ GHz	29.000 000 200 GHz
		29.999 999 800 GHz	___________ GHz	30.000 000 200 GHz
		30.999 999 800 GHz	___________ GHz	31.000 000 200 GHz
		31.999 999 800 GHz	___________ GHz	32.000 000 200 GHz
		32.999 999 800 GHz	___________ GHz	33.000 000 200 GHz
		33.999 999 800 GHz	___________ GHz	34.000 000 200 GHz
		34.999 999 800 GHz	___________ GHz	35.000 000 200 GHz
		35.999 999 800 GHz	___________ GHz	36.000 000 200 GHz
		36.999 999 800 GHz	___________ GHz	37.000 000 200 GHz
		37.999 999 800 GHz	___________ GHz	38.000 000 200 GHz
		38.999 999 800 GHz	___________ GHz	39.000 000 200 GHz
		39.999 999 800 GHz	___________ GHz	40.000 000 200 GHz

d. Fine Loop Test Procedure

1(c)	Enter 13 GHz			
2	Record the Frequency Counter Reading	12.999 999 900 GHz	___________ GHz	13.000 000 100 GHz
3	Record the Frequency Counter Reading	13.000 000 900 GHz	___________ GHz	13.000 001 100 GHz
4	Record the Frequency Counter Readings . . .	13.000 001 900 GHz	___________ GHz	13.000 002 100 GHz
		13.000 002 900 GHz	___________ GHz	13.000 003 100 GHz
		13.000 003 900 GHz	___________ GHz	13.000 004 100 GHz
		13.000 004 900 GHz	___________ GHz	13.000 005 100 GHz
		13.000 005 900 GHz	___________ GHz	13.000 006 100 GHz
		13.000 006 900 GHz	___________ GHz	13.000 007 100 GHz
		13.000 007 900 GHz	___________ GHz	13.000 008 100 GHz
		13.000 008 900 GHz	___________ GHz	13.000 009 100 GHz
		13.000 009 900 GHz	___________ GHz	13.000 010 100 GHz

2-7. Marker and Blanking Verification

Step	Procedure Comments	Marker/Signal Presence
c. Marker Selection Procedure		
2	F1 Frequency Marker = 12.4 GHz	
2	Verify that a marker appears on the left side of the scope at the start of trace	_______
3(a)	F2 Frequency Marker = 40 GHz	
3(b)	Verify that a marker appears on the right side of the scope at the end of trace	_______
4	F3 Frequency Marker = 16 GHz	
4	Verify that a marker appears on the scope	_______
4	F4 Frequency Marker = 20 GHz	
4	Verify that a marker appears on the scope	_______
4	F5 Frequency Marker = 24 GHz	
4	Verify that a marker appears on the scope	_______
4	F6 Frequency Marker = 28 GHz	
4	Verify that a marker appears on the scope	_______
4	F7 Frequency Marker = 31 GHz	
4	Verify that a marker appears on the scope	_______
4	F8 Frequency Marker = 35 GHz	
4	Verify that a marker appears on the scope	_______
4	F9 Frequency Marker = 38 GHz	
4	Verify that a marker appears on the scope	_______
d. Marker Output Verification Procedure		
1	Verify +5V (TTL high) markers at nine points on scope display	_______
3	Verify that all markers change to intensified spots	_______
5(a)	Verify +5V (TTL high) signal at retrace	_______
5(b)	Verify +5V (minimum) signal at bandswitch point	_______
5(d)	Verify –10V (minimum) signal at selected marker frequency	_______
5(e)	Verify –5V (minimum) signal at all other marker frequencies	_______
6	Verify that new marker changes from –5V (minimum) to –10V (minimum)	_______
	Verify that previous marker changes from –10V (minimum) to –5V (minimum)	_______
e. Retrace Blanking Output Verification Procedure		
2	Verify –5V (minimum) signal during retrace	_______
3	Verify +5V (minimum) signal during retrace	_______
f. Bandswitch Blanking Output Verification Procedure		
2	Verify +5V (minimum) signal during the following bandswitch dwell points:	
	18 GHz bandswitch dwell point	_______
	26.5 GHz bandswitch dwell point	_______
3	Verify –5V (minimum) signal during the following bandswitch dwell points:	
	18 GHz bandswitch dwell point	_______
	26.5 GHz bandswitch dwell point	_______

2-8. Narrowband Spurious Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Fine Loop Test Procedure				
1(b)	Enter 12.5 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	10 kHz	N/A	_______dBc	–60 dBc
	20 kHz	N/A	_______dBc	–60 dBc
	30 kHz	N/A	_______dBc	–60 dBc
	40 kHz	N/A	_______dBc	–60 dBc
	50 kHz	N/A	_______dBc	–60 dBc
d. Coarse Loop Test Procedure				
1(b)	Enter 18.3 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	200 kHz	N/A	_______dBc	–60 dBc
	400 kHz	N/A	_______dBc	–60 dBc

2-9. Spurious and Harmonic Tests: RF Output Signals ≤2 GHz

These tests are not applicable to the 6760B model.

2-10. Harmonic Tests: RF Output Signals From 2 to 10 GHz

These tests are not applicable to the 6760B model.

2-11. Harmonic Tests: RF Output Signals From 11 to 20 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure				
7	Record the level of all harmonics of the 12.4 GHz carrier:			
	24.2 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
	37.2 GHz (3rd harmonic)	N/A	_______dBc	–60 dBc
7	Record the level of all harmonics of the 16 GHz carrier:			
	32 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
7	Record the level of all harmonics of the 20 GHz carrier:			
	40 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc

2-12. Harmonic Tests (Alternate Method): RF Output Signals From 10 to 30 GHz

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure				
2(c)	Enter 12.4 GHz			
4	Measure and record the difference between RF levels above and below filter cutoff:			
	12.4 to 20 GHz harmonic level	N/A	_______dBc	–60 dBc
5	Enter 20 GHz			
	Measure and record the difference between RF levels above and below filter cutoff:			
	20 to 30 GHz harmonic level	N/A	_______dBc	-60 dBc*

* = –20 dBc above 26.5 GHz

2-13. Harmonic Tests: RF Output Signals From 26.5 to 40 GHz

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Proocedure				
6	Measure and record the 26.5 GHz signal level	N/A	_______dBc	–20 dBc

2-14. Harmonic Tests: RF Output Signals From 40 to 60 GHz

These tests are not applicable to the 6760B model.

2-15. Single Sideband Phase Noise Test

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure (Band 3; 12.4 to 18 GHz)			
1(c)	Enter 15.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–60 dBc
6	100 Hz	N/A	_______dBc	–65 dBc
8	1 kHz	N/A	_______dBc	–69 dBc
10	10 kHz	N/A	_______dBc	–73 dBc
12	100 kHz	N/A	_______dBc	–100 dBc
13	Repeat steps c.1 through c.12 for the remaining band.			
	c. Test Procedure (Band 4; 18 to 26.5 GHz)			
1(c)	Enter 22.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–58 dBc
6	100 Hz	N/A	_______dBc	–63 dBc
8	1 kHz	N/A	_______dBc	–67 dBc
10	10 kHz	N/A	_______dBc	–71 dBc
12	100 kHz	N/A	_______dBc	–97 dBc

2-16. Power Level Accuracy and Flatness Verification (6760B Models without Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Meaure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	

* = Maximum Variation is 0.8 dB (12.4 to 26.5 GHz)/1.2 dB (26.5 to 40 GHz)

** = Maximum Variation is 2.0 dB (12.4 to 20 GHz)/3.0 dB (20 to 26.5 GHz)/+4.0 dB (26.5 to 40 GHz)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. Power Level Accuracy Procedure (12.4 to 18 GHz)				
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+4.4 dBm	________ dBm	+5.6 dBm
3	Measure and record the Power Meter reading	+3.4 dBm	________ dBm	+4.6 dBm
4	Measure and record the Power Meter readings	+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
		–3.6 dBm	________ dBm	–2.4 dBm
		–4.6 dBm	________ dBm	–3.4 dBm
		–5.6 dBm	________ dBm	–4.4 dBm
		–6.6 dBm	________ dBm	–5.4 dBm
		–7.6 dBm	________ dBm	–6.4 dBm
d. Power Level Accuracy Procedure (18 to 26.5 GHz)				
1(c)	Enter 18 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+4.4 dBm	________ dBm	+5.6 dBm
3	Measure and record the Power Meter reading	+3.4 dBm	________ dBm	+4.6 dBm
4	Measure and record the Power Meter readings	+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
		–3.6 dBm	________ dBm	–2.4 dBm
		–4.6 dBm	________ dBm	–3.4 dBm
		–5.6 dBm	________ dBm	–4.4 dBm
		–6.6 dBm	________ dBm	–5.4 dBm
		–7.6 dBm	________ dBm	–6.4 dBm

2-16. Power Level Accuracy and Flatness Verification (6760B Models without Optional Attenuator) (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	d. Power Level Accuracy Procedure (26.5 to 40 GHz)			
1(c)	Enter 26.5 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+4.2 dBm	________ dBm	+5.8 dBm
3	Measure and record the Power Meter reading	+3.2 dBm	________ dBm	+4.8 dBm
4	Measure and record the Power Meter readings	+2.2 dBm	________ dBm	+3.8 dBm
		+1.2 dBm	________ dBm	+2.8 dBm
		+0.2 dBm	________ dBm	+1.8 dBm
		–0.8 dBm	________ dBm	+0.8 dBm
		–1.8 dBm	________ dBm	–0.2 dBm
		–2.8 dBm	________ dBm	–1.2 dBm
		–3.8 dBm	________ dBm	–2.2 dBm
		–4.8 dBm	________ dBm	–3.2 dBm
		–5.8 dBm	________ dBm	–4.2 dBm
		–6.8 dBm	________ dBm	–5.2 dBm
		–7.8 dBm	________ dBm	–6.2 dBm

2-16. Power Level Accuracy and Flatness Verification (6760B Models with 110 dB Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Power Level Flatness Procedure			
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	

* = Maximum Variation is 1.6 dB (12.4 to 20 GHz)/2.0 dB (20 to 26.5 GHz)/4.0 dB (26.5 to 40 GHz)

** = Maximum Variation is 6.0 dB (12.4 to 20 GHz)/6.2 dB (20 to 26.5 GHz)/8.2 dB (26.5 to 40 GHz)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	d. Power Level Accuracy Procedure (12.4 to 18 GHz)			
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	–0.4 dBm	________ dBm	+2.4 dBm
3	Measure and record the Power Meter reading	–1.4 dBm	________ dBm	+1.4 dBm
4	Measure and record the Power Meter readings	–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
		–7.4 dBm	________ dBm	–4.6 dBm
		–8.4 dBm	________ dBm	–5.6 dBm
		–9.4 dBm	________ dBm	–6.6 dBm
		–10.4 dBm	________ dBm	–7.6 dBm
		–11.4 dBm	________ dBm	–8.6 dBm
		–12.4 dBm	________ dBm	–9.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6760B Models with 110 dB Optional Attenuator) (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. Power Level Accuracy Procedure (18 to 26.5 GHz)				
1(c)	Enter 18 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	–1.0 dBm	________ dBm	+3.0 dBm
3	Measure and record the Power Meter reading	–2.0 dBm	________ dBm	+2.0 dBm
4	Measure and record the Power Meter readings	–3.0 dBm	________ dBm	+1.0 dBm
		–4.0 dBm	________ dBm	+0.0 dBm
		–5.0 dBm	________ dBm	–1.0 dBm
		–6.0 dBm	________ dBm	–2.0 dBm
		–7.0 dBm	________ dBm	–3.0 dBm
		–8.0 dBm	________ dBm	–4.0 dBm
		–9.0 dBm	________ dBm	–5.0 dBm
		–10.0 dBm	________ dBm	–6.0 dBm
		–11.0 dBm	________ dBm	–7.0 dBm
		–12.0 dBm	________ dBm	–8.0 dBm
		–13.0 dBm	________ dBm	–9.0 dBm
d. Power Level Accuracy Procedure (26.5 to 40 GHz)				
1(c)	Enter 26.5 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	–2.0 dBm	________ dBm	+4.0 dBm
3	Measure and record the Power Meter reading	–3.0 dBm	________ dBm	+3.0 dBm
4	Measure and record the Power Meter readings	–4.0 dBm	________ dBm	+2.0 dBm
		–5.0 dBm	________ dBm	+1.0 dBm
		–6.0 dBm	________ dBm	+0.0 dBm
		–7.0 dBm	________ dBm	–1.0 dBm
		–8.0 dBm	________ dBm	–2.0 dBm
		–9.0 dBm	________ dBm	–3.0 dBm
		–10.0 dBm	________ dBm	–4.0 dBm
		–11.0 dBm	________ dBm	–5.0 dBm
		–12.0 dBm	________ dBm	–6.0 dBm
		–13.0 dBm	________ dBm	–7.0 dBm
		–14.0 dBm	________ dBm	–8.0 dBm

2-17. FM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. FM Input Sensitivity Procedure (Band 3; 12.4 to 18 GHz)				
2(c)	Enter 16 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 3; 12.4 to 18 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
6	Repeat steps d.2 through e.5 for the remaining bands.			
d. FM Input Sensitivity Procedure (Band 4; 18 to 26.5 GHz)				
2(c)	Enter 22 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 4; 18 to 26.5 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
d. FM Input Sensitivity Procedure (Band 5; 26.5 to 40 GHz)				
2(c)	Enter 33 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 5; 26.5 to 40 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A

2-18. AM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. AM Input Sensitivity and Meter Accuracy (Band 3; 12.4 to 18 GHz)				
2(e)	Enter 16 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 3; 12.4 to 18 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%
6	Repeat steps d.2 through e.5 for the remaining bands.			
d. AM Input Sensitivity and Meter Accuracy (Band 4; 18 to 26.5 GHz)				
2(e)	Enter 22 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 4; 18 to 26.5 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%
d. AM Input Sensitivity and Meter Accuracy (Band 5; 26.5 to 40 GHz)				
2(e)	Enter 33 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 5; 26.5 to 40 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Rise Time, Fall Time, Overshoot, and Level (Band 3; 12.4 to 18 GHz)				
1(c)	Enter 16 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
c. Rise Time, Fall Time, Overshoot, and Level (Band 4; 18 to 26.5 GHz)				
1(c)	Enter 22 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
c. Rise Time, Fall Time, Overshoot, and Level (Band 5; 26.5 to 40 GHz)				
1(c)	Enter 33 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
d. Pulse Leveling Accuracy Check, Preliminary Test Setup				
4(b)	Enter 16 GHz			
e. 67XXB LEVEL Display Calibration				
1	Note the 67XXB LEVEL display value			______dBm
2	Note the 67XXB LEVEL display value			______dBm
3	Calculate the difference between steps e.1 and e.2. Note this value			______dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 5 µs)			
2(b)	Enter 16 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
	f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 2 µs)			
2(b)	Enter 16 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
	f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 1 µs)			
2(b)	Enter 16 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
	f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 0.5 µs)			
2(b)	Enter 16 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
	f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 0.2 µs)			
2(b)	Enter 16 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
	f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 0.1 µs)			
2(b)	Enter 16 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 5 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 2 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 1 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
f. Pulse Level Accuracy Test Procedure (Band 5, 26.5 to 40- GHz; Pulse Width = 5 µs)				
2(b)	Enter 33 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 5, 26.5 to 40 GHz; Pulse Width = 2 µs)				
2(b)	Enter 33 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 5, 26.5 to 40 GHz; Pulse Width = 1 µs)				
2(b)	Enter 33 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 5, 26.5 to 40 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 33 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 5, 26.5 to 40 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 33 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 5, 26.5 to 40 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 33 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-20. Pulse Modulation Test: Video Feedthrough

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
	c. Test Procedure (Band 3; 12.4 to 18 GHz)			
1(c)	Enter 16 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±105 μς πεακ).	N/A	______mV peak	±10 mV peak
4	Repeat steps c.1 through c.3 for the remaining bands.			
	c. Test Procedure (Band 4; 18 to 26.5 GHz)			
1(c)	Enter 22 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak
	c. Test Procedure (Band 5; 26.5 to 40 GHz)			
1(c)	Enter 33 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±5 mV peak).	N/A	______mV peak	±5 mV peak

2-21. Pulse Modulation Test: RF On/Off Ratio

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
	c. Test Procedure (Band 3; 12.4 to 18 GHz)			
1(d)	Enter 16 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A
7	Repeat steps c.1 through c.5 for the remaining bands (e.1 through e.5 for frequencies above 20 GHz).			
	e. Test Procedure (Band 4; 18 to 26.5 GHz)			
1(d)	Enter 22 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >50 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	50 dB	______dB	N/A
	e. Test Procedure (Band 5; 26.5 to 40 GHz)			
1(d)	Enter 33 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >50 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	50 dB	______dB	N/A

WILTRON Model 6760B **Date:** ______________________

Serial Number____________________ **Tested By:** ______________________

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-9 ALC Level Offset Adjustments This instrument uses only one leveling circuit; Band 1 thru 4.		
d. Band 1 thru 4 Level Offset 1.(b) 3.	Frequency = 16 GHz A15TP5 = 0V ±10 µV	___________volts
f. ALC Detector Shaper Level Offset 6.(c)	Frequency = 12.4 GHz Follow steps f.1 through f.21.	
3-10 External Leveling Offset Adjustment		
c.3	A15TP7 = 0V ±1 mV	___________volts
3-11 10 MHz Reference Oscillator Calibration		
c.1.(c) c.3	Frequency = 40 GHz Adjust for Frequency Counter Reading = 40 GHz ±100 Hz	___________GHz

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-12 ALC Bandwidth Calibration		
This calibration is required for each installed frequency band: **NOTE** This calibration is not required for the 26.5 - 40 GHz Band		
c. 12.4-18 GHz Band 2.(c)	Frequency = 16 GHz Repeat steps c.1 through c.15.	
c. 18-26.5 GHz Band 2.(c)	Frequency = 22 GHz Repeat steps c.7 through c.13; then steps c.16 and c.17	
3-13 Analog Sweep Calibration		
This calibration is automatically completed for all of the installed frequency bands		
c.1.(d)	Frequency = 16 GHz	

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-14 YIG-tuned Oscillator Frequency Calibration		
This calibration is required for each installed frequency band:		
c. 12.4-18 GHz Band		
1.(e)	Frequency = 16 GHz	
5.	Maximum difference in MHz between frequency counter and 6760B	_________MHz
c. 18-26.5 GHz Band		
1.(e)	Frequency = 22 GHz	
5.	Maximum difference in MHz between frequency counter and 6760B	_________MHz
c. 26.5-40 GHz Band		
1.(e)	Frequency = 33 GHz	
5.	Maximum difference in MHz between frequency counter and 6760B	_________MHz
3-15 RF Level Calibration		
This calibration is performed using an automatic test system. Contact WILTRON Customer Service at (408) 778–2000 for further information.		
3-16 ALC Slope Adjustment		
This calibration is required for the >2 GHz level detector.		
c. 12.4-40 GHz Band		
2.(d)	F1 = 12.4 GHz	
2.(f)	F2 = 40 GHz	
5.	Record the resulting waveform	Draw Waveform Flatness for the 12.4-40 GHz Band

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-17 AM Sensitivity Calibration		
This calibration is required for each installed frequency band:		
d. 12.4-18 GHz Band		
2.(d)	Frequency = 16 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
d. 18-26.5 GHz Band		
2.(d)	Frequency = 22 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
d. 26.5-40 GHz Band		
2.(d)	Frequency = 33 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
3-18 AM Meter Calibration		
c. Meter Calibration		
2.(d)	Frequency = 16 GHz	
d. Meter Verification		
1.(c)	Frequency = 16 GHz	
1.(g)	Measure and record AM DEPTH	__________%

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-19 FM Driver/Sensitivity Calibration		
This calibration is required for each installed frequency band:		
d. 12.4-18 GHz Band 2.(d) 8.	Frequency = 16 GHz Record the Waveform Null	Draw Waveform Null
d. 18-26.5 GHz Band 2.(d) 8.	Frequency = 22 GHz Record the Waveform Null	Draw Waveform Null
d. 26.5-40 GHz Band 2.(d) 8.	Frequency = 33 GHz Record the Waveform Null	Draw Waveform Null

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-20 FM Flatness Calibration		
This calibration is required for each installed frequency band:		
b. 12.4-18 GHz Band 2.(d) 10.	Frequency = 16 GHz Record the Waveform	Draw Waveform
b. 18-26.5 GHz Band 2.(d) 10.	Frequency = 22 GHz Record the Waveform	Draw Waveform
b. 26.5-40 GHz Band 2.(d) 10.	Frequency = 33 GHz Record the Waveform	Draw Waveform
3-21 FM Meter Calibration		
c. Meter Calibration	Follow steps c.1 through c.6	
d. Meter Verification 1.(c)	Measure FM Deviation	__________kHz

MODEL 6763B
SWEPT FREQUENCY SYNTHESIZER

TEST AND CALIBRATION
MANUAL

WILTRON

490 JARVIS DRIVE
MORGAN HILL, CA 95037-2809

P/N: 10370-10234
REVISION: D
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SECTION 4
TEST RECORD

CONTENTS

SECTION 4
TEST RECORDS

4-1 INTRODUCTION

This section provides two Test Record tables for recording the results of the Performance Verification Tests (in Section 2) and the Calibration/Adjustments (in Section 3). They jointly provide the means for maintaining an accurate and complete record of instrument performance.

This test record provided here has been customized for the 6763B model. It should only be used with matching procedures in Section 2 and 3 that cover the 6763B model. Specific references to frequency parameters, power levels, and non-applicable procedures make each Test Record easy to follow.

We recommend that you make a copy of these pages each time the test procedures are performed. By dating each Test Record copy, a detailed history of instrument performance can be accumulated.

4-2 PERFORMANCE VERIFICATION TEST RECORD

The Test Record for the Performance Verification procedures supplied in Section 2 is located immediately following this page.

4-3 CALIBRATION/ADJUSTMENTS TEST RECORD

The Test Record for the Calibration/Adjustment procedures supplied in Section 3 follows the Performance Verification Test Record.

NOTE

Results of the automated RF Level Calibration procedure in Section 3 are not included in this Test Record. Calibration data is stored in instrument memory. Contact the WILTRON Customer Service department at (408) 778-2000 for more details.

WILTRON Model 6763B **Date: ______________________**

Serial Number____________________ **Tested By: _____________________**

2-5. Internal Time Base Aging Rate Test

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure				
2	Record T_S value		______hours	
4	Record T_1 value		______sec	
5	Record T_2 value		______sec	
6	Record T_F value		______hours	
8	Record the calculated aging rate		______per day	5×10^{-10} per day

2-6. Frequency Synthesis Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Coarse Loop/YIG Loop Test Procedure				
1(c)	Enter 2 GHz			
2	Record the Frequency Counter Reading	1.999 999 900 GHz	___________ GHz	2.000 000 100 GHz
3	Record the Frequency Counter Reading	2.999 999 900 GHz	___________ GHz	3.000 000 100 GHz
4	Record the Frequency Counter Readings . . .	3.999 999 900 GHz	___________ GHz	4.000 000 100 GHz
		4.999 999 900 GHz	___________ GHz	5.000 000 100 GHz
		5.999 999 900 GHz	___________ GHz	6.000 000 100 GHz
		6.999 999 900 GHz	___________ GHz	7.000 000 100 GHz
		7.999 999 900 GHz	___________ GHz	8.000 000 100 GHz
		8.999 999 900 GHz	___________ GHz	9.000 000 100 GHz
		9.999 999 900 GHz	___________ GHz	10.000 000 100 GHz
		10.999 999 900 GHz	___________ GHz	11.000 000 100 GHz
		11.999 999 900 GHz	___________ GHz	12.000 000 100 GHz
		12.999 999 900 GHz	___________ GHz	13.000 000 100 GHz
		13.999 999 900 GHz	___________ GHz	14.000 000 100 GHz
		14.999 999 900 GHz	___________ GHz	15.000 000 100 GHz
		15.999 999 900 GHz	___________ GHz	16.000 000 100 GHz
		16.999 999 900 GHz	___________ GHz	17.000 000 100 GHz
		17.999 999 900 GHz	___________ GHz	18.000 000 100 GHz
		18.999 999 900 GHz	___________ GHz	19.000 000 100 GHz
		19.999 999 900 GHz	___________ GHz	20.000 000 100 GHz
		20.999 999 900 GHz	___________ GHz	21.000 000 100 GHz
		21.999 999 900 GHz	___________ GHz	22.000 000 100 GHz
		22.999 999 900 GHz	___________ GHz	23.000 000 100 GHz
		23.999 999 900 GHz	___________ GHz	24.000 000 100 GHz
		24.999 999 900 GHz	___________ GHz	25.000 000 100 GHz
		25.999 999 900 GHz	___________ GHz	26.000 000 100 GHz
		26.999 999 900 GHz	___________ GHz	27.000 000 200 GHz
		27.999 999 800 GHz	___________ GHz	28.000 000 200 GHz
		28.999 999 800 GHz	___________ GHz	29.000 000 200 GHz
		29.999 999 800 GHz	___________ GHz	30.000 000 200 GHz
		30.999 999 800 GHz	___________ GHz	31.000 000 200 GHz
		31.999 999 800 GHz	___________ GHz	32.000 000 200 GHz
		32.999 999 800 GHz	___________ GHz	33.000 000 200 GHz
		33.999 999 800 GHz	___________ GHz	34.000 000 200 GHz
		34.999 999 800 GHz	___________ GHz	35.000 000 200 GHz
		35.999 999 800 GHz	___________ GHz	36.000 000 200 GHz
		36.999 999 800 GHz	___________ GHz	37.000 000 200 GHz
		37.999 999 800 GHz	___________ GHz	38.000 000 200 GHz
		38.999 999 800 GHz	___________ GHz	39.000 000 200 GHz
		39.999 999 800 GHz	___________ GHz	40.000 000 200 GHz
d. Fine Loop Test Procedure				
1(c)	Enter 2 GHz			
2	Record the Frequency Counter Reading	1.999 999 900 GHz	___________ GHz	2.000 000 100 GHz
3	Record the Frequency Counter Reading	2.000 000 900 GHz	___________ GHz	2.000 001 100 GHz
4	Record the Frequency Counter Readings . . .	2.000 001 900 GHz	___________ GHz	2.000 002 100 GHz
		2.000 002 900 GHz	___________ GHz	2.000 003 100 GHz
		2.000 003 900 GHz	___________ GHz	2.000 004 100 GHz
		2.000 004 900 GHz	___________ GHz	2.000 005 100 GHz
		2.000 005 900 GHz	___________ GHz	2.000 006 100 GHz
		2.000 006 900 GHz	___________ GHz	2.000 007 100 GHz
		2.000 007 900 GHz	___________ GHz	2.000 008 100 GHz
		2.000 008 900 GHz	___________ GHz	2.000 009 100 GHz
		2.000 009 900 GHz	___________ GHz	2.000 010 100 GHz

2-7. Marker and Blanking Verification

Step	Procedure Comments	Marker/Signal Presence
	c. Marker Selection Procedure	
2	F1 Frequency Marker = 2 GHz	
2	Verify that a marker appears on the left side of the scope at the start of trace	_______
3(a)	F2 Frequency Marker = 40 GHz	
3(b)	Verify that a marker appears on the right side of the scope at the end of trace	_______
4	F3 Frequency Marker = 7 GHz	
4	Verify that a marker appears on the scope	_______
4	F4 Frequency Marker = 11 GHz	
4	Verify that a marker appears on the scope	_______
4	F5 Frequency Marker = 16 GHz	
4	Verify that a marker appears on the scope	_______
4	F6 Frequency Marker = 21 GHz	
4	Verify that a marker appears on the scope	_______
4	F7 Frequency Marker = 26 GHz	
4	Verify that a marker appears on the scope	_______
4	F8 Frequency Marker = 32 GHz	
4	Verify that a marker appears on the scope	_______
4	F9 Frequency Marker = 36 GHz	
4	Verify that a marker appears on the scope	_______
	d. Marker Output Verification Procedure	
1	Verify +5V (TTL high) markers at nine points on scope display	_______
3	Verify that all markers change to intensified spots	_______
5(a)	Verify +5V (TTL high) signal at retrace	_______
5(b)	Verify +5V (minimum) signal at bandswitch point	_______
5(c)	Verify +5V (minimum) signal at each switched filter point:	
	3.5 GHz switch point	_______
	6.0 GHz switch point	_______
5(d)	Verify –10V (minimum) signal at selected marker frequency	_______
5(e)	Verify –5V (minimum) signal at all other marker frequencies	_______
6	Verify that new marker changes from –5V (minimum) to –10V (minimum)	_______
	Verify that previous marker changes from –10V (minimum) to –5V (minimum)	_______
	e. Retrace Blanking Output Verification Procedure	
2	Verify –5V (minimum) signal during retrace	_______
3	Verify +5V (minimum) signal during retrace	_______
	f. Bandswitch Blanking Output Verification Procedure	
2	Verify +5V (minimum) signal during the following bandswitch dwell points:	
	8.0 GHz bandswitch dwell point	_______
	12.4 GHz bandswitch dwell point	_______
	18 GHz bandswitch dwell point	_______
	26.5 GHz bandswitch dwell point	_______
3	Verify –5V (minimum) signal during the following bandswitch dwell points:	
	8.0 GHz bandswitch dwell point	_______
	12.4 GHz bandswitch dwell point	_______
	18 GHz bandswitch dwell point	_______
	26.5 GHz bandswitch dwell point	_______

2-8. Narrowband Spurious Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Fine Loop Test Procedure				
1(b)	Enter 5.1 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	10 kHz	N/A	_______dBc	–60 dBc
	20 kHz	N/A	_______dBc	–60 dBc
	30 kHz	N/A	_______dBc	–60 dBc
	40 kHz	N/A	_______dBc	–60 dBc
	50 kHz	N/A	_______dBc	–60 dBc
d. Coarse Loop Test Procedure				
1(b)	Enter 32.1 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	200 kHz	N/A	_______dBc	–60 dBc
	400 kHz	N/A	_______dBc	–60 dBc

2-9. Spurious and Harmonic Tests: RF Output Signals ≤2 GHz

These tests are not applicable to the 6763B model.

2-10. Harmonic Tests: RF Output Signals From 2 to 10 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure				
4	Record the level of all harmonics of the 2.1 GHz carrier:			
	4.2 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
	6.3 GHz (3rd harmonic)	N/A	_______dBc	–60 dBc
	8.4 GHz (4th harmonic)	N/A	_______dBc	–60 dBc
	10.5 GHz (5th harmonic)	N/A	_______dBc	–60 dBc
	12.6 GHz (6th harmonic)	N/A	_______dBc	–60 dBc
	14.7 GHz (7th harmonic)	N/A	_______dBc	–60 dBc
	16.8 GHz (8th harmonic)	N/A	_______dBc	–60 dBc
	18.9 GHz (9th harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 3.6 GHz carrier:			
	7.2 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
	10.8 GHz (3rd harmonic)	N/A	_______dBc	–60 dBc
	14.4 GHz (4th harmonic)	N/A	_______dBc	–60 dBc
	18 GHz (5th harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 7 GHz carrier:			
	14 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 10 GHz carrier:			
	20 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc

2-11. Harmonic Tests: RF Output Signals From 11 to 20 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure				
7	Record the level of all harmonics of the 11 GHz carrier:			
	22 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
	33 GHz (3rd harmonic)	N/A	_______dBc	–60 dBc
7	Record the level of all harmonics of the 13.25 GHz carrier:			
	26.5 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
	39.75 GHz (3rd harmonic)	N/A	_______dBc	–60 dBc
7	Record the level of all harmonics of the 16 GHz carrier:			
	32 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
7	Record the level of all harmonics of the 20 GHz carrier:			
	40 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc

2-12. Harmonic Tests (Alternate Method): RF Output Signals From 10 to 30 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure				
2(c)	Enter 10 GHz			
4	Measure and record the difference between RF levels above and below filter cutoff:			
	10 to 20 GHz harmonic level	N/A	_______dBc	–60 dBc
5	Enter 20 GHz			
	Measure and record the difference between RF levels above and below filter cutoff:			
	20 to 30 GHz harmonic level	N/A	_______dBc	-60 dBc*

* = –20 dBc above 26.5 GHz

2-13. Harmonic Tests: RF Output Signals From 26.5 to 40 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Proocedure				
6	Measure and record the 26.5 GHz signal level	N/A	_______dBc	–20 dBc

2-14. Harmonic Tests: RF Output Signals From 40 to 60 GHz

These tests are not applicable to the 6763B model.

2-15. Single Sideband Phase Noise Test

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure (Band 1; 2 to 8 GHz)			
1(c)	Enter 5.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–67 dBc
6	100 Hz	N/A	_______dBc	–72 dBc
8	1 kHz	N/A	_______dBc	–76 dBc
10	10 kHz	N/A	_______dBc	–80 dBc
12	100 kHz	N/A	_______dBc	–98 dBc
13	Repeat steps c.1 through c.12 for the remaining bands.			
	c. Test Procedure (Band 2; 8 to 12.4 GHz)			
1(c)	Enter 10.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–64 dBc
6	100 Hz	N/A	_______dBc	–69 dBc
8	1 kHz	N/A	_______dBc	–73 dBc
10	10 kHz	N/A	_______dBc	–77 dBc
12	100 kHz	N/A	_______dBc	–100 dBc
	c. Test Procedure (Band 3; 12.4 to 18 GHz)			
1(c)	Enter 15.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–60 dBc
6	100 Hz	N/A	_______dBc	–65 dBc
8	1 kHz	N/A	_______dBc	–69 dBc
10	10 kHz	N/A	_______dBc	–73 dBc
12	100 kHz	N/A	_______dBc	–100 dBc
	c. Test Procedure (Band 1; 18 to 26.5 GHz)			
1(c)	Enter 22 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–58 dBc
6	100 Hz	N/A	_______dBc	–63 dBc
8	1 kHz	N/A	_______dBc	–67 dBc
10	10 kHz	N/A	_______dBc	–71 dBc
12	100 kHz	N/A	_______dBc	–97 dBc

2-16. Power Level Accuracy and Flatness Verification (6763B Models without Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Power Level Flatness Procedure			
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Meaure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	

* = Maximum Variation is 0.8 dB (2 to 26.5 GHz)/1.2 dB (26.5 to 40 GHz)

** = Maximum Variation is 2.0 dB (2 to 20 GHz)/3.0 dB (20 to 26.5 GHz)/+4.0 dB (26.5 to 40 GHz)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	d. Power Level Accuracy Procedure (2 to 8 GHz)			
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+4.4 dBm	________ dBm	+5.6 dBm
3	Measure and record the Power Meter reading	+3.4 dBm	________ dBm	+4.6 dBm
4	Measure and record the Power Meter readings	+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
		–3.6 dBm	________ dBm	–2.4 dBm
		–4.6 dBm	________ dBm	–3.4 dBm
		–5.6 dBm	________ dBm	–4.4 dBm
		–6.6 dBm	________ dBm	–5.4 dBm
		–7.6 dBm	________ dBm	–6.4 dBm
	d. Power Level Accuracy Procedure (8 to 12.4 GHz)			
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+4.4 dBm	________ dBm	+5.6 dBm
3	Measure and record the Power Meter reading	+3.4 dBm	________ dBm	+4.6 dBm
4	Measure and record the Power Meter readings	+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
		–3.6 dBm	________ dBm	–2.4 dBm
		–4.6 dBm	________ dBm	–3.4 dBm
		–5.6 dBm	________ dBm	–4.4 dBm
		–6.6 dBm	________ dBm	–5.4 dBm
		–7.6 dBm	________ dBm	–6.4 dBm

2-16. Power Level Accuracy and Flatness Verification (6763B Models without Optional Attenuator) (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. Power Level Accuracy Procedure (12.4 to 18 GHz)				
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+4.4 dBm	________ dBm	+5.6 dBm
3	Measure and record the Power Meter reading	+3.4 dBm	________ dBm	+4.6 dBm
4	Measure and record the Power Meter readings	+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
		–3.6 dBm	________ dBm	–2.4 dBm
		–4.6 dBm	________ dBm	–3.4 dBm
		–5.6 dBm	________ dBm	–4.4 dBm
		–6.6 dBm	________ dBm	–5.4 dBm
		–7.6 dBm	________ dBm	–6.4 dBm
d. Power Level Accuracy Procedure (18 to 26.5 GHz)				
1(c)	Enter 18 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+4.4 dBm	________ dBm	+5.6 dBm
3	Measure and record the Power Meter reading	+3.4 dBm	________ dBm	+4.6 dBm
4	Measure and record the Power Meter readings	+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
		–3.6 dBm	________ dBm	–2.4 dBm
		–4.6 dBm	________ dBm	–3.4 dBm
		–5.6 dBm	________ dBm	–4.4 dBm
		–6.6 dBm	________ dBm	–5.4 dBm
		–7.6 dBm	________ dBm	–6.4 dBm
d. Power Level Accuracy Procedure (26.5 to 40 GHz)				
1(c)	Enter 26.5 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+4.2 dBm	________ dBm	+5.8 dBm
3	Measure and record the Power Meter reading	+3.2 dBm	________ dBm	+4.8 dBm
4	Measure and record the Power Meter readings	+2.2 dBm	________ dBm	+3.8 dBm
		+1.2 dBm	________ dBm	+2.8 dBm
		+0.2 dBm	________ dBm	+1.8 dBm
		–0.8 dBm	________ dBm	+0.8 dBm
		–1.8 dBm	________ dBm	–0.2 dBm
		–2.8 dBm	________ dBm	–1.2 dBm
		–3.8 dBm	________ dBm	–2.2 dBm
		–4.8 dBm	________ dBm	–3.2 dBm
		–5.8 dBm	________ dBm	–4.2 dBm
		–6.8 dBm	________ dBm	–5.2 dBm
		–7.8 dBm	________ dBm	–6.2 dBm

2-16. Power Level Accuracy and Flatness Verification (6763B Models with 110 dB Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	

* = Maximum Variation is 1.6 dB (2 to 20 GHz)/2.0 dB (20 to 26.5 GHz)/4.0 dB (26.5 to 40 GHz)

** = Maximum Variation is 6.0 dB (2 to 20 GHz)/6.2 dB (20 to 26.5 GHz)/8.2 dB (26.5 to 40 GHz)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. Power Level Accuracy Procedure (2 to 8 GHz)				
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	–0.4 dBm	________ dBm	+2.4 dBm
3	Measure and record the Power Meter reading	–1.4 dBm	________ dBm	+1.4 dBm
4	Measure and record the Power Meter readings	–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
		–7.4 dBm	________ dBm	–4.6 dBm
		–8.4 dBm	________ dBm	–5.6 dBm
		–9.4 dBm	________ dBm	–6.6 dBm
		–10.4 dBm	________ dBm	–7.6 dBm
		–11.4 dBm	________ dBm	–8.6 dBm
		–12.4 dBm	________ dBm	–9.6 dBm
d. Power Level Accuracy Procedure (8 to 12.4 GHz)				
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	–0.4 dBm	________ dBm	+2.4 dBm
3	Measure and record the Power Meter reading	–1.4 dBm	________ dBm	+1.4 dBm
4	Measure and record the Power Meter readings	–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
		–7.4 dBm	________ dBm	–4.6 dBm
		–8.4 dBm	________ dBm	–5.6 dBm
		–9.4 dBm	________ dBm	–6.6 dBm
		–10.4 dBm	________ dBm	–7.6 dBm
		–11.4 dBm	________ dBm	–8.6 dBm
		–12.4 dBm	________ dBm	–9.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6763B Models with 110 dB Optional Attenuator) (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. Power Level Accuracy Procedure (12.4 to 18 GHz)				
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	–0.4 dBm	________ dBm	+2.4 dBm
3	Measure and record the Power Meter reading	–1.4 dBm	________ dBm	+1.4 dBm
4	Measure and record the Power Meter readings	–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
		–7.4 dBm	________ dBm	–4.6 dBm
		–8.4 dBm	________ dBm	–5.6 dBm
		–9.4 dBm	________ dBm	–6.6 dBm
		–10.4 dBm	________ dBm	–7.6 dBm
		–11.4 dBm	________ dBm	–8.6 dBm
		–12.4 dBm	________ dBm	–9.6 dBm
d. Power Level Accuracy Procedure (18 to 26.5 GHz)				
1(c)	Enter 18 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	–1.0 dBm	________ dBm	+3.0 dBm
3	Measure and record the Power Meter reading	–2.0 dBm	________ dBm	+2.0 dBm
4	Measure and record the Power Meter readings	–3.0 dBm	________ dBm	+1.0 dBm
		–4.0 dBm	________ dBm	+0.0 dBm
		–5.0 dBm	________ dBm	–1.0 dBm
		–6.0 dBm	________ dBm	–2.0 dBm
		–7.0 dBm	________ dBm	–3.0 dBm
		–8.0 dBm	________ dBm	–4.0 dBm
		–9.0 dBm	________ dBm	–5.0 dBm
		–10.0 dBm	________ dBm	–6.0 dBm
		–11.0 dBm	________ dBm	–7.0 dBm
		–12.0 dBm	________ dBm	–8.0 dBm
		–13.0 dBm	________ dBm	–9.0 dBm
d. Power Level Accuracy Procedure (26.5 to 40 GHz)				
1(c)	Enter 26.5 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	–2.0 dBm	________ dBm	+4.0 dBm
3	Measure and record the Power Meter reading	–3.0 dBm	________ dBm	+3.0 dBm
4	Measure and record the Power Meter readings	–4.0 dBm	________ dBm	+2.0 dBm
		–5.0 dBm	________ dBm	+1.0 dBm
		–6.0 dBm	________ dBm	+0.0 dBm
		–7.0 dBm	________ dBm	–1.0 dBm
		–8.0 dBm	________ dBm	–2.0 dBm
		–9.0 dBm	________ dBm	–3.0 dBm
		–10.0 dBm	________ dBm	–4.0 dBm
		–11.0 dBm	________ dBm	–5.0 dBm
		–12.0 dBm	________ dBm	–6.0 dBm
		–13.0 dBm	________ dBm	–7.0 dBm
		–14.0 dBm	________ dBm	–8.0 dBm

2-17. FM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. FM Input Sensitivity Procedure (Band 1; 2 to 8 GHz)				
2(c)	Enter 5 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 1; 2 to 8 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
6	Repeat steps d.2 through e.5 for the remaining bands.			
d. FM Input Sensitivity Procedure (Band 2; 8 to 12.4 GHz)				
2(c)	Enter 10 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 2; 8 to 12.4 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
d. FM Input Sensitivity Procedure (Band 3; 12.4 to 18 GHz)				
2(c)	Enter 16 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 3; 12.4 to 18 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
d. FM Input Sensitivity Procedure (Band 4; 18 to 26.5 GHz)				
2(c)	Enter 22 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 4; 18 to 26.5 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
d. FM Input Sensitivity Procedure (Band 5; 26.5 to 40 GHz)				
2(c)	Enter 33 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 5; 26.5 to 40 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A

2-18. AM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. AM Input Sensitivity and Meter Accuracy (Band 1; 2 to 8 GHz)				
2(e)	Enter 5 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 1; 2 to 8 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%
6	Repeat steps d.2 through e.5 for the remaining bands.			
d. AM Input Sensitivity and Meter Accuracy (Band 2; 8 to 12.4 GHz)				
2(e)	Enter 10 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 2; 8 to 12.4 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%
d. AM Input Sensitivity and Meter Accuracy (Band 3; 12.4 to 18 GHz)				
2(e)	Enter 16 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 3; 12.4 to 18 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%
d. AM Input Sensitivity and Meter Accuracy (Band 4; 18 to 26.5 GHz)				
2(e)	Enter 22 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 4; 18 to 26.5 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%

2-18. AM Modulation Tests (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. AM Input Sensitivity and Meter Accuracy (Band 5; 26.5 to 40 GHz)				
2(e)	Enter 33 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 5; 26.5 to 40 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Rise Time, Fall Time, Overshoot, and Level (Band 1; 2 to 8 GHz)				
1(c)	Enter 5 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
c. Rise Time, Fall Time, Overshoot, and Level (Band 2; 8 to 12.4 GHz)				
1(c)	Enter 10 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
c. Rise Time, Fall Time, Overshoot, and Level (Band 3; 12.4 to 18 GHz)				
1(c)	Enter 16 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
c. Rise Time, Fall Time, Overshoot, and Level (Band 4; 18 to 26.5 GHz)				
1(c)	Enter 22 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
c. Rise Time, Fall Time, Overshoot, and Level (Band 5; 26.5 to 40 GHz)				
1(c)	Enter 33 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
d. Pulse Leveling Accuracy Check, Preliminary Test Setup				
4(b)	Enter 5 GHz			
e. 67XXB LEVEL Display Calibration				
1	Note the 67XXB LEVEL display value			______dBm
2	Note the 67XXB LEVEL display value			______dBm
3	Calculate the difference between steps e.1 and e.2. Note this value			______dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 5 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 2 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 1 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 5 µs)			
2(b)	Enter 10 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
	f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 2 µs)			
2(b)	Enter 10 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
	f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 1 µs)			
2(b)	Enter 10 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
	f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.5 µs)			
2(b)	Enter 10 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
	f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.2 µs)			
2(b)	Enter 10 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
	f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.1 µs)			
2(b)	Enter 10 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 5 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 2 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 1 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 5 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 2 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 1 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
f. Pulse Level Accuracy Test Procedure (Band 5, 26.5 to 40- GHz; Pulse Width = 5 µs)				
2(b)	Enter 33 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 5, 26.5 to 40 GHz; Pulse Width = 2 µs)				
2(b)	Enter 33 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 5, 26.5 to 40 GHz; Pulse Width = 1 µs)				
2(b)	Enter 33 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 5, 26.5 to 40 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 33 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 5, 26.5 to 40 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 33 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 5, 26.5 to 40 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 33 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-20. Pulse Modulation Test: Video Feedthrough

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure (Band 1; 2 to 8 GHz)			
1(c)	Enter 5 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak
4	Repeat steps c.1 through c.3 for the remaining bands.			
	c. Test Procedure (Band 2; 8 to 12.4 GHz)			
1(c)	Enter 10 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak
	c. Test Procedure (Band 3; 12.4 to 18 GHz)			
1(c)	Enter 16 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak
	c. Test Procedure (Band 4; 18 to 26.5 GHz)			
1(c)	Enter 22 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak
	c. Test Procedure (Band 5; 26.5 to 40 GHz)			
1(c)	Enter 33 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±5 mV peak).	N/A	______mV peak	±5 mV peak

2-21. Pulse Modulation Test: RF On/Off Ratio

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure (Band 1; 2 to 8 GHz)			
1(d)	Enter 5 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A
7	Repeat steps c.1 through c.5 for the remaining bands (e.1 through e.5 for frequencies above 20 GHz).			
	c. Test Procedure (Band 2; 8 to 12.4 GHz)			
1(d)	Enter 10 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A
	c. Test Procedure (Band 3; 12.4 to 18 GHz)			
1(d)	Enter 16 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A
	e. Test Procedure (Band 4; 18 to 26.5 GHz)			
1(d)	Enter 22 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >50 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	50 dB	______dB	N/A
	e. Test Procedure (Band 5; 26.5 to 40 GHz)			
1(d)	Enter 33 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >50 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	50 dB	______dB	N/A

WILTRON Model 6763B **Date:** ______________________

Serial Number____________________ **Tested By:** ______________________

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-9 ALC Level Offset Adjustments		
This instrument uses only one leveling circuit; Band 1 thru 4.		
d. Band 1 thru 4 Level Offset 1.(b) 3.	Frequency = 5 GHz A15TP5 = 0V ±10 µV	___________volts
f. ALC Detector Shaper Level Offset 6.(c)	Frequency = 2.1 GHz Follow steps f.1 through f.21.	
3-10 External Leveling Offset Adjustment		
c.3	A15TP7 = 0V ±1 mV	___________volts
3-11 10 MHz Reference Oscillator Calibration		
c.1.(c) c.3	Frequency = 40 GHz Adjust for Frequency Counter Reading = 40 GHz ±100 Hz	___________GHz

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-12 ALC Bandwidth Calibration		
This calibration is required for each installed frequency band: **NOTE** This calibration is not required for the 26.5 - 40 GHz Band		
c. 2-8 GHz Band 2.(c)	Frequency = 5 GHz Follow steps c.1 through c.15.	
c. 8-12.4 GHz Band 2.(c)	Frequency = 10 GHz Repeat steps c.7 through c.15.	
c. 12.4-18 GHz Band 2.(c)	Frequency = 16 GHz Repeat steps c.7 through c.15.	
c. 18-26.5 GHz Band 2.(c)	Frequency = 22 GHz Repeat steps c.7 through c.13; then steps c.16 and c.17	
3-13 Analog Sweep Calibration		
This calibration is automatically completed for all of the installed frequency bands		
c.1.(d)	Frequency = 5 GHz	

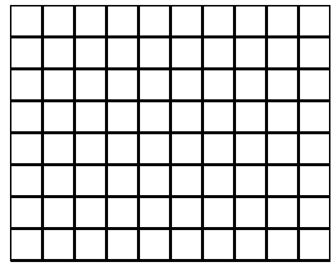
CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-14 YIG-tuned Oscillator Frequency Calibration		
This calibration is required for each installed frequency band:		
c. 2-8 GHz Band		
1.(e)	Frequency = 5 GHz	
5.	Maximum difference in MHz between frequency counter and 6763B	__________MHz
c. 8-12.4 GHz Band		
1.(e)	Frequency = 10 GHz	
5.	Maximum difference in MHz between frequency counter and 6763B	__________MHz
c. 12.4-18 GHz Band		
1.(e)	Frequency = 16 GHz	
5.	Maximum difference in MHz between frequency counter and 6763B	_________MHz
c. 18-26.5 GHz Band		
1.(e)	Frequency = 22 GHz	
5.	Maximum difference in MHz between frequency counter and 6763B	_________MHz
c. 26.5-40 GHz Band		
1.(e)	Frequency = 33 GHz	
5.	Maximum difference in MHz between frequency counter and 6763B	_________MHz
3-15 RF Level Calibration		
This calibration is performed using an automatic test system. Contact WILTRON Customer Service at (408) 778–2000 for further information.		

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-16 ALC Slope Adjustment		
This calibration is required for the >2 GHz level detector.		
c. 2-40 GHz Band		
2.(d)	F1 = 2 GHz	
2.(f)	F2 = 40 GHz	
5.	Record the resulting waveform	Draw Waveform Flatness for the 2-40 GHz Band
3-17 AM Sensitivity Calibration		
This calibration is required for each installed frequency band:		
d. 2-8 GHz Band		
2.(d)	Frequency = 5 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
d. 8-12.4 GHz Band		
2.(d)	Frequency = 10 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
d. 12.4-18 GHz Band		
2.(d)	Frequency = 16 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
d. 18-26.5 GHz Band		
2.(d)	Frequency = 22 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-17 AM Sensitivity Calibration (Continued)		
d. 26.5-40 GHz Band		
2.(d)	Frequency = 33 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
3-18 AM Meter Calibration		
c. Meter Calibration		
2.(d)	Frequency = 5 GHz	
d. Meter Verification		
1.(c)	Frequency = 5 GHz	
1.(g)	Measure and record AM DEPTH	__________%
3-19 FM Driver/Sensitivity Calibration		
This calibration is required for each installed frequency band:		
d. 2-8 GHz Band		
2.(d)	Frequency = 5 GHz	
8.	Record the Waveform Null	Draw Waveform Null
d. 8-12.4 GHz Band		
2.(d)	Frequency = 10 GHz	
8.	Record the Waveform Null	Draw Waveform Null

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-19 FM Driver/Sensitivity Calibration (Continued)		
d. 12.4-18 GHz Band 2.(d) 8.	Frequency = 16 GHz Record the Waveform Null	Draw Waveform Null
d. 18-26.5 GHz Band 2.(d) 8.	Frequency = 22 GHz Record the Waveform Null	Draw Waveform Null
d. 26.5-40 GHz Band 2.(d) 8.	Frequency = 33 GHz Record the Waveform Null	Draw Waveform Null

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-20 FM Flatness Calibration This calibration is required for each installed frequency band:		
d. 2-8 GHz Band 2.(d) 10.	Frequency = 5 GHz Record the Waveform	Draw Waveform
d. 8-12.4 GHz Band 2.(d) 10.	Frequency = 10 GHz Record the Waveform	Draw Waveform
b. 12.4-18 GHz Band 2.(d) 10.	Frequency = 16 GHz Record the Waveform	Draw Waveform
b. 18-26.5 GHz Band 2.(d) 10.	Frequency = 22 GHz Record the Waveform	Draw Waveform

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-20 FM Flatness Calibration (Continued)		
b. 26.5-40 GHz Band 2.(d) 10.	Frequency = 33 GHz Record the Waveform	 Draw Waveform
3-21 FM Meter Calibration		
c. Meter Calibration	Follow steps c.1 through c.6	
d. Meter Verification 1.(c)	Measure FM Deviation	__________kHz

MODEL 6769B
SWEPT FREQUENCY SYNTHESIZER

TEST AND CALIBRATION
MANUAL

WILTRON

490 JARVIS DRIVE
MORGAN HILL, CA 95037-2809

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SECTION 4
TEST RECORD

CONTENTS

SECTION 4
TEST RECORDS

4-1 INTRODUCTION

This section provides two Test Record tables for recording the results of the Performance Verification Tests (in Section 2) and the Calibration/Adjustments (in Section 3). They jointly provide the means for maintaining an accurate and complete record of instrument performance.

This test record provided here has been customized for the 6769B model. It should only be used with matching procedures in Section 2 and 3 that cover the 6769B model. Specific references to frequency parameters, power levels, and non-applicable procedures make each Test Record easy to follow.

We recommend that you make a copy of these pages each time the test procedures are performed. By dating each Test Record copy, a detailed history of instrument performance can be accumulated.

4-2 PERFORMANCE VERIFICATION TEST RECORD

The Test Record for the Performance Verification procedures supplied in Section 2 is located immediately following this page.

4-3 CALIBRATION/ADJUSTMENTS TEST RECORD

The Test Record for the Calibration/Adjustment procedures supplied in Section 3 follows the Performance Verification Test Record.

NOTE

Results of the automated RF Level Calibration procedure in Section 3 are not included in this Test Record. Calibration data is stored in instrument memory. Contact the WILTRON Customer Service department at (408) 778-2000 for more details.

WILTRON Model 6769B **Date: ______________________**

Serial Number____________________ **Tested By: _____________________**

2-5. Internal Time Base Aging Rate Test

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure				
2	Record T_S value		______hours	
4	Record T_1 value		______sec	
5	Record T_2 value		______sec	
6	Record T_F value		______hours	
8	Record the calculated aging rate		______per day	5 x 10^{-10} per day

2-6. Frequency Synthesis Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Coarse Loop/YIG Loop Test Procedure				
1(c)	Enter 1 GHz			
2	Record the Frequency Counter Reading	0.999 999 900 GHz	___________ GHz	1.000 000 100 GHz
3	Record the Frequency Counter Reading	1.999 999 900 GHz	___________ GHz	2.000 000 100 GHz
4	Record the Frequency Counter Readings . . .	2.999 999 900 GHz	___________ GHz	3.000 000 100 GHz
		3.999 999 900 GHz	___________ GHz	4.000 000 100 GHz
		4.999 999 900 GHz	___________ GHz	5.000 000 100 GHz
		5.999 999 900 GHz	___________ GHz	6.000 000 100 GHz
		6.999 999 900 GHz	___________ GHz	7.000 000 100 GHz
		7.999 999 900 GHz	___________ GHz	8.000 000 100 GHz
		8.999 999 900 GHz	___________ GHz	9.000 000 100 GHz
		9.999 999 900 GHz	___________ GHz	10.000 000 100 GHz
		10.999 999 900 GHz	___________ GHz	11.000 000 100 GHz
		11.999 999 900 GHz	___________ GHz	12.000 000 100 GHz
		12.999 999 900 GHz	___________ GHz	13.000 000 100 GHz
		13.999 999 900 GHz	___________ GHz	14.000 000 100 GHz
		14.999 999 900 GHz	___________ GHz	15.000 000 100 GHz
		15.999 999 900 GHz	___________ GHz	16.000 000 100 GHz
		16.999 999 900 GHz	___________ GHz	17.000 000 100 GHz
		17.999 999 900 GHz	___________ GHz	18.000 000 100 GHz
		18.999 999 900 GHz	___________ GHz	19.000 000 100 GHz
		19.999 999 900 GHz	___________ GHz	20.000 000 100 GHz
		20.999 999 900 GHz	___________ GHz	21.000 000 100 GHz
		21.999 999 900 GHz	___________ GHz	22.000 000 100 GHz
		22.999 999 900 GHz	___________ GHz	23.000 000 100 GHz
		23.999 999 900 GHz	___________ GHz	24.000 000 100 GHz
		24.999 999 900 GHz	___________ GHz	25.000 000 100 GHz
		25.999 999 900 GHz	___________ GHz	26.000 000 100 GHz
		26.999 999 900 GHz	___________ GHz	27.000 000 200 GHz
		27.999 999 800 GHz	___________ GHz	28.000 000 200 GHz
		28.999 999 800 GHz	___________ GHz	29.000 000 200 GHz
		29.999 999 800 GHz	___________ GHz	30.000 000 200 GHz
		30.999 999 800 GHz	___________ GHz	31.000 000 200 GHz
		31.999 999 800 GHz	___________ GHz	32.000 000 200 GHz
		32.999 999 800 GHz	___________ GHz	33.000 000 200 GHz
		33.999 999 800 GHz	___________ GHz	34.000 000 200 GHz
		34.999 999 800 GHz	___________ GHz	35.000 000 200 GHz
		35.999 999 800 GHz	___________ GHz	36.000 000 200 GHz
		36.999 999 800 GHz	___________ GHz	37.000 000 200 GHz
		37.999 999 800 GHz	___________ GHz	38.000 000 200 GHz
		38.999 999 800 GHz	___________ GHz	39.000 000 200 GHz
		39.999 999 800 GHz	___________ GHz	40.000 000 200 GHz
d. Fine Loop Test Procedure				
1(c)	Enter 1 GHz			
2	Record the Frequency Counter Reading	0.999 999 900 GHz	___________ GHz	1.000 000 100 GHz
3	Record the Frequency Counter Reading	1.000 000 900 GHz	___________ GHz	1.000 001 100 GHz
4	Record the Frequency Counter Readings . . .	1.000 001 900 GHz	___________ GHz	1.000 002 100 GHz
		1.000 002 900 GHz	___________ GHz	1.000 003 100 GHz
		1.000 003 900 GHz	___________ GHz	1.000 004 100 GHz
		1.000 004 900 GHz	___________ GHz	1.000 005 100 GHz
		1.000 005 900 GHz	___________ GHz	1.000 006 100 GHz
		1.000 006 900 GHz	___________ GHz	1.000 007 100 GHz
		1.000 007 900 GHz	___________ GHz	1.000 008 100 GHz
		1.000 008 900 GHz	___________ GHz	1.000 009 100 GHz
		1.000 009 900 GHz	___________ GHz	1.000 010 100 GHz

2-7. Marker and Blanking Verification

Step	Procedure Comments	Marker/Signal Presence
	c. Marker Selection Procedure	
2	F1 Frequency Marker = .01 GHz	
2	Verify that a marker appears on the left side of the scope at the start of trace	_______
3(a)	F2 Frequency Marker = 40 GHz	
3(b)	Verify that a marker appears on the right side of the scope at the end of trace	_______
4	F3 Frequency Marker = 6 GHz	
4	Verify that a marker appears on the scope	_______
4	F4 Frequency Marker = 10 GHz	
4	Verify that a marker appears on the scope	_______
4	F5 Frequency Marker = 15 GHz	
4	Verify that a marker appears on the scope	_______
4	F6 Frequency Marker = 20 GHz	
4	Verify that a marker appears on the scope	_______
4	F7 Frequency Marker = 26 GHz	
4	Verify that a marker appears on the scope	_______
4	F8 Frequency Marker = 32 GHz	
4	Verify that a marker appears on the scope	_______
4	F9 Frequency Marker = 36 GHz	
4	Verify that a marker appears on the scope	_______
	d. Marker Output Verification Procedure	
1	Verify +5V (TTL high) markers at nine points on scope display	_______
3	Verify that all markers change to intensified spots	_______
5(a)	Verify +5V (TTL high) signal at retrace	_______
5(b)	Verify +5V (minimum) signal at bandswitch point	_______
5(c)	Verify +5V (minimum) signal at each switched filter point:	
	3.5 GHz switch point	_______
	6.0 GHz switch point	_______
5(d)	Verify –10V (minimum) signal at selected marker frequency	_______
5(e)	Verify –5V (minimum) signal at all other marker frequencies	_______
6	Verify that new marker changes from –5V (minimum) to –10V (minimum)	_______
	Verify that previous marker changes from –10V (minimum) to –5V (minimum)	_______
	e. Retrace Blanking Output Verification Procedure	
2	Verify –5V (minimum) signal during retrace	_______
3	Verify +5V (minimum) signal during retrace	_______
	f. Bandswitch Blanking Output Verification Procedure	
2	Verify +5V (minimum) signal during the following bandswitch dwell points:	
	2.0 GHz bandswitch dwell point	_______
	8.0 GHz bandswitch dwell point	_______
	12.4 GHz bandswitch dwell point	_______
	18.0 GHz bandswitch dwell point	_______
	26.5 GHz bandswitch dwell point	_______
3	Verify –5V (minimum) signal during the following bandswitch dwell points:	
	2.0 GHz bandswitch dwell point	_______
	8.0 GHz bandswitch dwell point	_______
	12.4 GHz bandswitch dwell point	_______
	18.0 GHz bandswitch dwell point	_______
	26.5 GHz bandswitch dwell point	_______

2-8. Narrowband Spurious Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Fine Loop Test Procedure				
1(b)	Enter 5.1 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	10 kHz	N/A	_______dBc	–60 dBc
	20 kHz	N/A	_______dBc	–60 dBc
	30 kHz	N/A	_______dBc	–60 dBc
	40 kHz	N/A	_______dBc	–60 dBc
	50 kHz	N/A	_______dBc	–60 dBc
d. Coarse Loop Test Procedure				
1(b)	Enter 18.3 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	200 kHz	N/A	_______dBc	–60 dBc
	400 kHz	N/A	_______dBc	–60 dBc

2-9. Spurious and Harmonic Tests: RF Output Signals ≤2 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Test Procedure				
3	Record the presence of the worst case harmonic of the 10 MHz carrier	N/A	_______dBc	–40 dBc
3	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc
4	Record the presence of the worst case harmonic of the 20 MHz carrier	N/A	_______dBc	–40 dBc
4	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc
4	Record the presence of the worst case harmonic of the 30 MHz carrier	N/A	_______dBc	–40 dBc
4	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc
6	Record the presence of the worst case harmonic of the 40 MHz carrier	N/A	_______dBc	–40 dBc
6	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc
8	Record the presence of the worst case harmonic of the 350 MHz carrier	N/A	_______dBc	–40 dBc
8	Record the presence of the worst case spurious response on the Spectrum Analyzer display . .	N/A	_______dBc	–60 dBc
9	Record the presence of the worst case spurious response of the 1.6 GHz carrier on the Spectrum Analyzer display	N/A	_______dBc	–60 dBc
12	Record the level of harmonics of the 1.6 GHz carrier:			
	3.2 GHz (2nd harmonic)	N/A	_______dBc	–40 dBc
	4.8 GHz (3rd harmonic)	N/A	_______dBc	–40 dBc

2-10. Harmonic Tests: RF Output Signals From 2 to 10 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure			
4	Record the level of all harmonics of the 2.1 GHz carrier:			
	4.2 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
	6.3 GHz (3rd harmonic)	N/A	_______dBc	–60 dBc
	8.4 GHz (4th harmonic)	N/A	_______dBc	–60 dBc
	10.5 GHz (5th harmonic)	N/A	_______dBc	–60 dBc
	12.6 GHz (6th harmonic)	N/A	_______dBc	–60 dBc
	14.7 GHz (7th harmonic)	N/A	_______dBc	–60 dBc
	16.8 GHz (8th harmonic)	N/A	_______dBc	–60 dBc
	18.9 GHz (9th harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 3.6 GHz carrier:			
	7.2 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
	10.8 GHz (3rd harmonic)	N/A	_______dBc	–60 dBc
	14.4 GHz (4th harmonic)	N/A	_______dBc	–60 dBc
	18 GHz (5th harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 7 GHz carrier:			
	14 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
5	Record the level of all harmonics of the 10 GHz carrier:			
	20 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc

2-11. Harmonic Tests: RF Output Signals From 11 to 20 GHz

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure			
4	Record the level of all harmonics of the 12.4 GHz carrier:			
	24.8 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc
	37.2 GHz (3rd harmonic)	N/A	_______dBc	–60 dBc
8	Record the level of all harmonics for the 16 GHz carrier:			
	32 GHz (2nd harmonic)	N/A	_______dBc	–60 dB
8	Record the level of all harmonics of the 20 GHz carrier:			
	40 GHz (2nd harmonic)	N/A	_______dBc	–60 dBc

2-12. Harmonic Tests(Alternate Method): RF Output Signals From 10 to 30 GHz

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure				
2 (c)	Enter 10 GHz			
4	Measure and record the difference between RF levels above and below filter cutoff:			
	10 to 20 GHz harmonic level	N/A	_______dBc	–60 dBc
5	Enter 16 GHz			
	Measure and record the difference between RF levels above and below filter cutoff:			
	16 to 30 GHz harmonic level	N/A	_______dBc	–60 dBc*

* –20 dBc above 26.5 GHz

2-13. Harmonic Tests: RF Output Signals From 26.5 to 40 GHz

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure				
6	Record the 26.5 GHz signal level	N/A	_______dBc	–20 dBc

2-14. Harmonic Tests: RF Output Signals From 40 to 60 GHz

This test is not applicable to the 6769B model.

2-15. Single Sideband Phase Noise Test

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c.Test Procedure (Band 0; 0.01 to 2 GHz)				
1(c)	Enter 1.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–67 dBc
6	100 Hz	N/A	_______dBc	–72 dBc
8	1 kHz	N/A	_______dBc	–76 dBc
10	10 kHz	N/A	_______dBc	–80 dBc
12	100 kHz	N/A	_______dBc	–98 dBc
13	Repeat steps c.1 through c.12 for the remaining bands.			
c. Test Procedure (Band 1; 2 to 8.4 GHz)				
1(c)	Enter 5.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–67 dBc
6	100 Hz	N/A	_______dBc	–72 dBc
8	1 kHz	N/A	_______dBc	–76 dBc
10	10 kHz	N/A	_______dBc	–80 dBc
12	100 kHz	N/A	_______dBc	–98 dBc
c. Test Procedure (Band 2; 8 to 12.4 GHz)				
1(c)	Enter 10.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–64 dBc
6	100 Hz	N/A	_______dBc	–69 dBc
8	1 kHz	N/A	_______dBc	–73 dBc
10	10 kHz	N/A	_______dBc	–77 dBc
12	100 kHz	N/A	_______dBc	–100 dBc
c. Test Procedure (Band 3; 12.4 to 18 GHz)				
1(c)	Enter 15.0 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–60 dBc
6	100 Hz	N/A	_______dBc	–65 dBc
8	1 kHz	N/A	_______dBc	–69 dBc
10	10 kHz	N/A	_______dBc	–73 dBc
12	100 kHz	N/A	_______dBc	–100 dBc
c. Test Procedure (Band 4; 18 to 26.5 GHz)				
1(c)	Enter 22 GHz			
	Record the phase noise levels at these offsets:			
4	30 Hz	N/A	_______dBc	–58 dBc
6	100 Hz	N/A	_______dBc	–63 dBc
8	1 kHz	N/A	_______dBc	–67 dBc
10	10 kHz	N/A	_______dBc	–71 dBc
12	100 kHz	N/A	_______dBc	–97 dBc

2-16. Power Level Accuracy and Flatness Verification (6769B Models without Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Power Level Flatness Procedure				
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	

* = Maximum Variation is 0.8 dB (0.01 to 26.5 GHz)/1.2 dB (26.5 to 40 GHz)

** = Maximum Variation is 2.0 dB (0.01 to 20 GHz)/3.0 dB (20 to 26.5 GHz)/4.0 dB (26.5 to 40 GHz)

d. Power Level Accuracy Procedure (0.01 to 2 GHz)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
1(c)	Enter 50 MHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+4.4 dBm	________ dBm	+5.6 dBm
3	Measure and record the Power Meter reading	+3.4 dBm	________ dBm	+4.6 dBm
4	Measure and record the Power Meter readings	+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
		–3.6 dBm	________ dBm	–2.4 dBm
		–4.6 dBm	________ dBm	–3.4 dBm
		–5.6 dBm	________ dBm	–4.4 dBm
		–6.6 dBm	________ dBm	–5.4 dBm
		–7.6 dBm	________ dBm	–6.4 dBm

d. Power Level Accuracy Procedure (2 to 8 GHz)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+4.4 dBm	________ dBm	+5.6 dBm
3	Measure and record the Power Meter reading	+3.4 dBm	________ dBm	+4.6 dBm
4	Measure and record the Power Meter readings	+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
		–3.6 dBm	________ dBm	–2.4 dBm
		–4.6 dBm	________ dBm	–3.4 dBm
		–5.6 dBm	________ dBm	–4.4 dBm
		–6.6 dBm	________ dBm	–5.4 dBm
		–7.6 dBm	________ dBm	–6.4 dBm

2-16. Power Level Accuracy and Flatness Verification (6769B Models without Optional Attenuator) (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d.Power Level Accuracy Procedure (8 to 12.4 GHz)				
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+4.4 dBm	________ dBm	+5.6 dBm
3	Measure and record the Power Meter reading	+3.4 dBm	________ dBm	+4.6 dBm
4	Measure and record the Power Meter readings	+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
		–3.6 dBm	________ dBm	–2.4 dBm
		–4.6 dBm	________ dBm	–3.4 dBm
		–5.6 dBm	________ dBm	–4.4 dBm
		–6.6 dBm	________ dBm	–5.4 dBm
		–7.6 dBm	________ dBm	–6.4 dBm
d. Power Level Accuracy Procedure (12.4 to 18 GHz)				
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+4.4 dBm	________ dBm	+5.6 dBm
3	Measure and record the Power Meter reading	+3.4 dBm	________ dBm	+4.6 dBm
4	Measure and record the Power Meter readings	+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
		–3.6 dBm	________ dBm	–2.4 dBm
		–4.6 dBm	________ dBm	–3.4 dBm
		–5.6 dBm	________ dBm	–4.4 dBm
		–6.6 dBm	________ dBm	–5.4 dBm
		–7.6 dBm	________ dBm	–6.4 dBm
d. Power Level Accuracy Procedure (18 to 26.5 GHz)				
1(c)	Enter 18 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+4.4 dBm	________ dBm	+5.6 dBm
3	Measure and record the Power Meter reading	+3.4 dBm	________ dBm	+4.6 dBm
4	Measure and record the Power Meter readings	+2.4 dBm	________ dBm	+3.6 dBm
		+1.4 dBm	________ dBm	+2.6 dBm
		+0.4 dBm	________ dBm	+1.6 dBm
		–0.6 dBm	________ dBm	+0.6 dBm
		–1.6 dBm	________ dBm	–0.4 dBm
		–2.6 dBm	________ dBm	–1.4 dBm
		–3.6 dBm	________ dBm	–2.4 dBm
		–4.6 dBm	________ dBm	–3.4 dBm
		–5.6 dBm	________ dBm	–4.4 dBm
		–6.6 dBm	________ dBm	–5.4 dBm
		–7.6 dBm	________ dBm	–6.4 dBm

2-16. Power Level Accuracy and Flatness Verification (6769B Models without Optional Attenuator) (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	d. Power Level Accuracy Procedure (26.5 to 40 GHz)			
1(c)	Enter 26.5 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	+4.2 dBm	________ dBm	+5.8 dBm
3	Measure and record the Power Meter reading	+3.2 dBm	________ dBm	+4.8 dBm
4	Measure and record the Power Meter readings	+2.2 dBm	________ dBm	+3.8 dBm
		+1.2 dBm	________ dBm	+2.8 dBm
		+0.2 dBm	________ dBm	+1.8 dBm
		–0.8 dBm	________ dBm	+0.8 dBm
		–1.8 dBm	________ dBm	–0.2 dBm
		–2.8 dBm	________ dBm	–1.2 dBm
		–3.8 dBm	________ dBm	–2.2 dBm
		–4.8 dBm	________ dBm	–3.2 dBm
		–5.8 dBm	________ dBm	–4.2 dBm
		–6.8 dBm	________ dBm	–5.2 dBm
		–7.8 dBm	________ dBm	–6.2 dBm

2-16. Power Level Accuracy and Flatness Verification (6769B Models with 110 dB Optional Attenuator)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Power Level Flatness Procedure			
2	Measure and record the maximum power level reading (step sweep)		________ dBm	* dBm
2	Measure and record the minimum power level reading (step sweep)	* dBm	________ dBm	
4	Measure and record the maximum power level reading (analog sweep; typical, not a spec) . .		________ dBm	** dBm
4	Measure and record the minimum power level reading (analog sweep; typical, not a spec) . .	** dBm	________ dBm	

* = Maximum Variation is 1.6 dB (0.01 to 20 GHz)/2.0 dB (20 to 26.5 GHz)/4.0 dB (26.5 to 40 GHz)

** = Maximum Variation is 6.0 dB (0.01 to 20 GHz)/6.2 dB (20 to 26.5 GHz)/8.2 dB (26.5 to 40 GHz)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	d. Power Level Accuracy Procedure (0.01 to 2 GHz)			
1(c)	Enter 50 MHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	–0.4 dBm	________ dBm	+2.4 dBm
3	Measure and record the Power Meter reading	–1.4 dBm	________ dBm	+1.4 dBm
4	Measure and record the Power Meter readings	–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
		–7.4 dBm	________ dBm	–4.6 dBm
		–8.4 dBm	________ dBm	–5.6 dBm
		–9.4 dBm	________ dBm	–6.6 dBm
		–10.4 dBm	________ dBm	–7.6 dBm
		–11.4 dBm	________ dBm	–8.6 dBm
		–12.4 dBm	________ dBm	–9.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6769B Models with 110 dB Optional Attenuator) (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	d. Power Level Accuracy Procedure (2 to 8 GHz)			
1(c)	Enter 2.050 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	–0.4 dBm	________ dBm	+2.4 dBm
3	Measure and record the Power Meter reading	–1.4 dBm	________ dBm	+1.4 dBm
4	Measure and record the Power Meter readings	–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
		–7.4 dBm	________ dBm	–4.6 dBm
		–8.4 dBm	________ dBm	–5.6 dBm
		–9.4 dBm	________ dBm	–6.6 dBm
		–10.4 dBm	________ dBm	–7.6 dBm
		–11.4 dBm	________ dBm	–8.6 dBm
		–12.4 dBm	________ dBm	–9.6 dBm
	d. Power Level Accuracy Procedure (8 to 12.4 GHz)			
1(c)	Enter 8.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	–0.4 dBm	________ dBm	+2.4 dBm
3	Measure and record the Power Meter reading	–1.4 dBm	________ dBm	+1.4 dBm
4	Measure and record the Power Meter readings	–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
		–7.4 dBm	________ dBm	–4.6 dBm
		–8.4 dBm	________ dBm	–5.6 dBm
		–9.4 dBm	________ dBm	–6.6 dBm
		–10.4 dBm	________ dBm	–7.6 dBm
		–11.4 dBm	________ dBm	–8.6 dBm
		–12.4 dBm	________ dBm	–9.6 dBm
	d. Power Level Accuracy Procedure (12.4 to 18 GHz)			
1(c)	Enter 12.450 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	–0.4 dBm	________ dBm	+2.4 dBm
3	Measure and record the Power Meter reading	–1.4 dBm	________ dBm	+1.4 dBm
4	Measure and record the Power Meter readings	–2.4 dBm	________ dBm	+0.4 dBm
		–3.4 dBm	________ dBm	–0.6 dBm
		–4.4 dBm	________ dBm	–1.6 dBm
		–5.4 dBm	________ dBm	–2.6 dBm
		–6.4 dBm	________ dBm	–3.6 dBm
		–7.4 dBm	________ dBm	–4.6 dBm
		–8.4 dBm	________ dBm	–5.6 dBm
		–9.4 dBm	________ dBm	–6.6 dBm
		–10.4 dBm	________ dBm	–7.6 dBm
		–11.4 dBm	________ dBm	–8.6 dBm
		–12.4 dBm	________ dBm	–9.6 dBm

2-16. Power Level Accuracy and Flatness Verification (6769B Models with 110 dB Optional Attenuator) (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. Power Level Accuracy Procedure (18 to 26.5 GHz)				
1(c)	Enter 18 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	–1.0 dBm	________ dBm	+3.0 dBm
3	Measure and record the Power Meter reading	–2.0 dBm	________ dBm	+2.0 dBm
4	Measure and record the Power Meter readings	–3.0 dBm	________ dBm	+1.0 dBm
		–4.0 dBm	________ dBm	+0.0 dBm
		–5.0 dBm	________ dBm	–1.0 dBm
		–6.0 dBm	________ dBm	–2.0 dBm
		–7.0 dBm	________ dBm	–3.0 dBm
		–8.0 dBm	________ dBm	–4.0 dBm
		–9.0 dBm	________ dBm	–5.0 dBm
		–10.0 dBm	________ dBm	–6.0 dBm
		–11.0 dBm	________ dBm	–7.0 dBm
		–12.0 dBm	________ dBm	–8.0 dBm
		–13.0 dBm	________ dBm	–9.0 dBm
d. Power Level Accuracy Procedure (26.5 to 40 GHz)				
1(c)	Enter 26.5 GHz			
2	Measure and record the Power Meter reading at maximum leveled power (LEVEL 1)	–2.0 dBm	________ dBm	+4.0 dBm
3	Measure and record the Power Meter reading	–3.0 dBm	________ dBm	+3.0 dBm
4	Measure and record the Power Meter readings	–4.0 dBm	________ dBm	+2.0 dBm
		–5.0 dBm	________ dBm	+1.0 dBm
		–6.0 dBm	________ dBm	+0.0 dBm
		–7.0 dBm	________ dBm	–1.0 dBm
		–8.0 dBm	________ dBm	–2.0 dBm
		–9.0 dBm	________ dBm	–3.0 dBm
		–10.0 dBm	________ dBm	–4.0 dBm
		–11.0 dBm	________ dBm	–5.0 dBm
		–12.0 dBm	________ dBm	–6.0 dBm
		–13.0 dBm	________ dBm	–7.0 dBm
		–14.0 dBm	________ dBm	–8.0 dBm

2-17. FM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	d. FM Input Sensitivity Procedure (Band 0; 0.01 to 2 GHz)			
2(c)	Enter 1.1 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
	e. FM Meter Accuracy Procedure (Band 0; 0.01 to 2 GHz)			
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
6	Repeat steps d.2 through e.5 for the remaining bands.			
	d. FM Input Sensitivity Procedure (Band 1; 2 to 8 GHz)			
2(c)	Enter 5 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
	e. FM Meter Accuracy Procedure (Band 1; 2 to 8 GHz)			
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
	d. FM Input Sensitivity Procedure (Band 2; 8 to 12.4 GHz)			
2(c)	Enter 10 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
	e. FM Meter Accuracy Procedure (Band 2; 8 to 12.4 GHz)			
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
	d. FM Input Sensitivity Procedure (Band 3; 12.4 to 18 GHz)			
2(c)	Enter 16 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
	e. FM Meter Accuracy Procedure (Band 3; 12.4 to 18 GHz)			
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A
	d. FM Input Sensitivity Procedure (Band 4; 18 to 26.5 GHz)			
2(c)	Enter 22 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
	e. FM Meter Accuracy Procedure (Band 4; 18 to 26.5 GHz)			
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A

2-17. FM Modulation Tests (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. FM Input Sensitivity Procedure (Band 5; 26.5 to 40 GHz)				
2(c)	Enter 33 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 5; 26.5 to 40 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A

2-18. AM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. AM Input Sensitivity and Meter Accuracy (Band 0; 0.01 to 2 GHz)				
2(e)	Enter 1.1 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 0; 0.01 to 2 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%
6	Repeat steps d.2 through e.5 for the remaining bands.			
d. AM Input Sensitivity and Meter Accuracy (Band 1; 2 to 8 GHz)				
2(e)	Enter 5 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 1; 2 to 8 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%

2-18. AM Modulation Tests (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. AM Input Sensitivity and Meter Accuracy (Band 2; 8 to 12.4 GHz)				
2(e)	Enter 10 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 2; 8 to 12.4 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%
d. AM Input Sensitivity and Meter Accuracy (Band 3; 12.4 to 18 GHz)				
2(e)	Enter 16 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 3; 12.4 to 18 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%
d. AM Input Sensitivity and Meter Accuracy (Band 4; 18 to 26.5 GHz)				
2(e)	Enter 22 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 4; 18 to 26.5 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%
d. AM Input Sensitivity and Meter Accuracy (Band 5; 26.5 to 40 GHz)				
2(e)	Enter 33 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 5; 26.5 to 40 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Rise Time, Fall Time, Overshoot, and Level (Bands 0 and 1; 0.01 to 8 GHz)				
1(c)	Enter 5 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
c. Rise Time, Fall Time, Overshoot, and Level (Band 2; 8 to 12.4 GHz)				
1(c)	Enter 10 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
c. Rise Time, Fall Time, Overshoot, and Level (Band 3; 12.4 to 18 GHz)				
1(c)	Enter 16 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
c. Rise Time, Fall Time, Overshoot, and Level (Band 4; 18 to 26.5 GHz)				
1(c)	Enter 22 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
c. Rise Time, Fall Time, Overshoot, and Level (Band 5;26.5 to 40 GHz)				
1(c)	Enter 33 GHz			
	Measure and record the following:			
2(a)	Rise Time	N/A	______ns	10 ns
2(b)	Pulse Width (typical; not a specification)	N/A	______µs	N/A
2(c)	Pulse Rate is 50 kHz	N/A	_____kHz	N/A
2(d)	Overshoot (typical; not a specification)	N/A	______%	10%
d. Pulse Leveling Accuracy Check, Preliminary Test Setup				
4(b)	Enter 1.1 GHz			
e. 67XXB LEVEL Display Calibration				
1	Note the 67XXB LEVEL display value			______dBm
2	Note the 67XXB LEVEL display value			______dBm
3	Calculate the difference between steps e.1 and e.2. Note this value			______dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	f. Pulse Level Accuracy Test Procedure (Band 0, 0.01 to 2 GHz; Pulse Width = 5 µs)			
2(b)	Enter 1.1 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.6 dB	______dB	+0.6 dB
	f. Pulse Level Accuracy Test Procedure (Band 0, 0.01 to 2 GHz; Pulse Width = 2 µs)			
2(b)	Enter 1.1 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.9 dB	______dB	+0.9 dB
	f. Pulse Level Accuracy Test Procedure (Band 0, 0.01 to 2 GHz; Pulse Width = 1 µs)			
2(b)	Enter 1.1 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.4 dB	______dB	+1.4 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 5 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 2 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 1 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 1, 2 to 8 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 5 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 5 µs)			
2(b)	Enter 10 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
	f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 2 µs)			
2(b)	Enter 10 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
	f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 1 µs)			
2(b)	Enter 10 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
	f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.5 µs)			
2(b)	Enter 10 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
	f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.2 µs)			
2(b)	Enter 10 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
	f. Pulse Level Accuracy Test Procedure (Band 2, 8 to 12.4 GHz; Pulse Width = 0.1 µs)			
2(b)	Enter 10 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 5 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 2 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 1 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 3, 12.4 to 18 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 16 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 5 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 2 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 1 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 18 to 26.5 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 22 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level (Continued)

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
f. Pulse Level Accuracy Test Procedure (Band 5, 26.5 to 40 GHz; Pulse Width = 5 µs)				
2(b)	Enter 33 GHz			
4(c)	Enter 5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 5, 26.5 to 40 GHz; Pulse Width = 2 µs)				
2(b)	Enter 33 GHz			
4(c)	Enter 2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.3 dB	______dB	+0.3 dB
f. Pulse Level Accuracy Test Procedure (Band 4, 26.5 to 40 GHz; Pulse Width = 1 µs)				
2(b)	Enter 33 GHz			
4(c)	Enter 1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.5 dB	______dB	+0.5 dB
f. Pulse Level Accuracy Test Procedure (Band 5, 26.5 to 40 GHz; Pulse Width = 0.5 µs)				
2(b)	Enter 33 GHz			
4(c)	Enter 0.5 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–0.8 dB	______dB	+0.8 dB
f. Pulse Level Accuracy Test Procedure (Band 5, 26.5 to 40 GHz; Pulse Width = 0.2 µs)				
2(b)	Enter 33 GHz			
4(c)	Enter 0.2 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB
f. Pulse Level Accuracy Test Procedure (Band 5, 26.5 to 40 GHz; Pulse Width = 0.1 µs)				
2(b)	Enter 33 GHz			
4(c)	Enter 0.1 µs			
6	Record the 67XXB LEVEL display value			______dBm
8	Record the 67XXB LEVEL display value			______dBm
9	Calculate and record the Pulse Level Error as the value noted in step f.6 minus that recorded in step f.8.	–1.5 dB	______dB	+1.5 dB

2-20. Pulse Modulation Test: Video Feedthrough

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure (Band 0; 0.01 to 2 GHz)			
1(c)	Enter 1.1 GHz			
3	Measure and record the Video Feedthrough voltage spikes.	N/A	______mV peak	* mV peak
	* Specification: 2% maximum for power levels ≤10 dBm 5% maximum for power levels >10 dBm			
4	Repeat steps c.1 through c.3 for the remaining bands.			
	c. Test Procedure (Band 1; 2 to 8 GHz)			
1(c)	Enter 5 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±5 mV peak
	c. Test Procedure (Band 2; 8 to 12.4 GHz)			
1(c)	Enter 10 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak
	c. Test Procedure (Band 3; 12.4 to 18 GHz)			
1(c)	Enter 16 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak
	c. Test Procedure (Band 4; 18 to 26.5 GHz)			
1(c)	Enter 22 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±10 mV peak).	N/A	______mV peak	±10 mV peak
	c. Test Procedure (Band 5; 26.5 to 40 GHz)			
1(c)	Enter 33 GHz			
3	Measure and record the Video Feedthrough voltage spikes (specification = <±5 mV peak).	N/A	______mV peak	±5 mV peak

2-21. Pulse Modulation Test: RF On/Off Ratio

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
	c. Test Procedure (Band 0; 0.01 to 2 GHz)			
1(d)	Enter 1.1 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A
7	Repeat steps c.1 through c.5 for the remaining bands (e.1 through e.5 for frequencies above 20 GHz).			
	c. Test Procedure (Band 1; 2 to 8 GHz)			
1(d)	Enter 5 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A
	c. Test Procedure (Band 2; 8 to 12.4 GHz)			
1(d)	Enter 10 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A
	c. Test Procedure (Band 3; 12.4 to 18 GHz)			
1(d)	Enter 16 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >60 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	60 dB	______dB	N/A
	e. Test Procedure (Band 4; 18 to 26.5 GHz)			
1(d)	Enter 22 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >50 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	50 dB	______dB	N/A
	e. Test Procedure (Band 5; 26.5 to 40 GHz)			
1(d)	Enter 33 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >50 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	50 dB	______dB	N/A

WILTRON Model 6769B **Date:** ______________________

Serial Number____________________ **Tested By:** _____________________

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-9 ALC Level Offset Adjustments		
This instrument uses two leveling circuits; Band 0 and Band 1 thru 4.		
c. Band 0 Level Offset 1.(c) 3.	Frequency = 1.1 GHz A15TP6 = 0V ±10 µV	___________volts
d. Band 1 thru 4 Level Offset 1.(b) 3.	Frequency = 5 GHz A15TP5 = 0V ±10 µV	___________volts
f. ALC Detector Shaper Level Offset 6.(c)	Frequency = 2.1 GHz Follow steps f.1 through f.21.	
3-10 External Leveling Offset Adjustment		
c.3	A15TP7 = 0V ±1 mV	___________volts
3-11 10 MHz Reference Oscillator Calibration		
c.1.(c) c.3	Frequency = 40 GHz Adjust for Frequency Counter Reading = 40 GHz ±100 Hz	___________GHz

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-12 ALC Bandwidth Calibration		
This calibration is required for each installed frequency band: **NOTE** This calibration is not required for the 26.5 - 40 GHz Band		
c. 2-8 GHz Band 2.(c)	Frequency = 5 GHz Follow steps c.1 through c.15.	
c. 0.01-2 GHz Band 2.(c)	Frequency = 1.1 GHz Repeat steps c.7 through c.15.	
c. 8-12.4 GHz Band 2.(c)	Frequency = 10 GHz Repeat steps c.7 through c.15.	
c. 12.4-18 GHz Band 2.(c)	Frequency = 15 GHz Repeat steps c.7 through c.15.	
c. 18-26.5 GHz Band 2.(c)	Frequency = 22 GHz Repeat steps c.7 through c.13; then steps c.16 and c.17.	
3-13 Analog Sweep Calibration		
This calibration is automatically completed for all of the installed frequency bands		
c.1.(d)	Frequency = 1.1 GHz	

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-14 YIG-tuned Oscillator Frequency Calibration		
This calibration is required for each installed frequency band:		
c. 0.01-2 GHz Band 1.(e) 5.	Frequency = 1.1 GHz Maximum difference in MHz between frequency counter and 6769B	__________MHz
c. 2-8 GHz Band 1.(e) 5.	Frequency = 5 GHz Maximum difference in MHz between frequency counter and 6769B	_________MHz
c. 8-12.4 GHz Band 1.(e) 5.	Frequency = 10 GHz Maximum difference in MHz between frequency counter and 6769B	__________MHz
c. 12.4-18 GHz Band 1.(e) 5.	Frequency =15 GHz Maximum difference in MHz between frequency counter and 6769B	__________MHz
c. 18-26.5 GHz Band 1.(e) 5.	Frequency = 22 GHz Maximum difference in MHz between frequency counter and 6769B	__________MHz
c. 26.5-40 GHz Band 1.(e) 5.	Frequency = 33 GHz Maximum difference in MHz between frequency counter and 6769B	__________MHz
3-15 RF Level Calibration		
This calibration is performed using an automatic test system. Contact WILTRON Customer Service at (408) 778–2000 for further information.		

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-16 ALC Slope Adjustment		
This calibration is required for the ≤2 GHz level detector and for the >2 GHz level detector.		
c. 0.01-2 GHz Band		
2.(d)	F1 = 0.01 GHz	
2.(f)	F2 = 2 GHz	
5.	Record the resulting waveform	Draw Waveform Flatness for the 0.01-2 GHz Band
c. 2-40 GHz Band		
2.(d)	F1 = 2 GHz	
2.(f)	F2 = 40 GHz	
5.	Record the resulting waveform	Draw Waveform Flatness for the 2-40 GHz Band
3-17 AM Sensitivity Calibration		
This calibration is required for each installed frequency band:		
d. 0.01-2 GHz Band		
2.(d)	Frequency = 1.1 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
d. 2-8 GHz Band		
2.(d)	Frequency = 5 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
d. 8-12.4 GHz Band		
2.(d)	Frequency = 10 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-17 AM Sensitivity Calibration (Continued)		
d. 12.4-18 GHz Band		
2.(d)	Frequency = 15 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
d. 18-26.5 GHz Band		
2.(d)	Frequency = 22 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
d. 26.5-40 GHz Band		
2.(d)	Frequency = 33 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
3-18 AM Meter Calibration		
c. Meter Calibration		
2.(d)	Frequency = 1.1 GHz	
d. Meter Verification		
1.(c)	Frequency = 1.1 GHz	
1.(g)	Measure and record AM DEPTH	__________%

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-19 FM Driver/Sensitivity Calibration This calibration is required for each installed frequency band:		
d. 0.01-2 GHz Band 2.(d) 8.	Frequency = 1.1 GHz Record the Waveform Null	Draw Waveform Null
d. 2-8 GHz Band 2.(d) 8.	Frequency = 5 GHz Record the Waveform Null	Draw Waveform Null
d. 8-12.4 GHz Band 2.(d) 8.	Frequency = 10 GHz Record the Waveform Null	Draw Waveform Null
d. 12.4-18 GHz Band 2.(d) 8.	Frequency =15 GHz Record the Waveform Null	Draw Waveform Null

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-19 FM Driver/Sensitivity Calibration (Continued)		
d. 18-26.5 GHz Band 2.(d) 8.	Frequency = 22 GHz Record the Waveform Null	Draw Waveform Null
d. 26.5-40 GHz Band 2.(d) 8.	Frequency = 33 GHz Record the Waveform Null	Draw Waveform Null
3-20 FM Flatness Calibration This calibration is required for each installed frequency band:		
d. 0.01-2 GHz Band 2.(d) 10.	Frequency = 1.1 GHz Record the Waveform	Draw Waveform
b. 2-8 GHz Band 2.(d) 10.	Frequency = 5 GHz Record the Waveform	Draw Waveform

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-20 FM Flatness Calibration (Continued)		
d. 8-12.4 GHz Band 2.(d) 10.	Frequency = 10 GHz Record the Waveform	Draw Waveform
d. 12.4-18 GHz Band 2.(d) 10.	Frequency = 15 GHz Record the Waveform	Draw Waveform
d. 18-26.5 GHz Band 2.(d) 10.	Frequency = 22 GHz Record the Waveform	Draw Waveform
d. 26.5-40 GHz Band 2.(d) 10.	Frequency =33 GHz Record the Waveform	Draw Waveform
3-21 FM Meter Calibration		
c. Meter Calibration	Follow steps c.1 through c.6	
d. Meter Verification 1.(c)	Measure FM Deviation	__________kHz

MODEL 6772B
SWEPT FREQUENCY SYNTHESIZER

TEST AND CALIBRATION
MANUAL

WILTRON

490 JARVIS DRIVE
MORGAN HILL, CA 95037-2809

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SECTION 4
TEST RECORD

CONTENTS

SECTION 4
TEST RECORDS

4-1 INTRODUCTION

This section provides two Test Record tables for recording the results of the Performance Verification Tests (in Section 2) and the Calibration/Adjustments (in Section 3). They jointly provide the means for maintaining an accurate and complete record of instrument performance.

This test record provided here has been customized for the 6772B model. It should only be used with matching procedures in Section 2 and 3 that cover the 6772B model. Specific references to frequency parameters, power levels, and non-applicable procedures make each Test Record easy to follow.

We recommend that you make a copy of these pages each time the test procedures are performed. By dating each Test Record copy, a detailed history of instrument performance can be accumulated.

4-2 PERFORMANCE VERIFICATION TEST RECORD

The Test Record for the Performance Verification procedures supplied in Section 2 is located immediately following this page.

4-3 CALIBRATION/ADJUSTMENTS TEST RECORD

The Test Record for the Calibration/Adjustment procedures supplied in Section 3 follows the Performance Verification Test Record.

NOTE

Results of the automated RF Level Calibration procedure in Section 3 are not included in this Test Record. Calibration data is stored in instrument memory. Contact the WILTRON Customer Service department at (408) 778-2000 for more details.

WILTRON Model 6772B **Date:** ______________________

Serial Number____________________ **Tested By:** ______________________

2-5. Internal Time Base Aging Rate Test

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure				
2	Record T_S value		______hours	
4	Record T_1 value		______sec	
5	Record T_2 value		______sec	
6	Record T_F value		______hours	
8	Record the calculated aging rate		______per day	5×10^{-10} per day

2-6. Frequency Synthesis Tests

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Coarse Loop/YIG Loop Test Procedure				
1(c)	Enter 40 GHz			
2	Record the Frequency Counter Reading	39.999 999 700 GHz	__________ GHz	40.000 000 300 GHz
3	Record the Frequency Counter Reading	40.999 999 700 GHz	__________ GHz	41.000 000 300 GHz
4	Record the Frequency Counter Readings . . .	41.999 999 700 GHz	__________ GHz	42.000 000 300 GHz
		42.999 999 700 GHz	__________ GHz	43.000 000 300 GHz
		43.999 999 700 GHz	__________ GHz	44.000 000 300 GHz
		44.999 999 700 GHz	__________ GHz	45.000 000 300 GHz
		45.999 999 700 GHz	__________ GHz	46.000 000 300 GHz
		46.999 999 700 GHz	__________ GHz	47.000 000 300 GHz
		47.999 999 700 GHz	__________ GHz	48.000 000 300 GHz
		48.999 999 700 GHz	__________ GHz	49.000 000 300 GHz
		49.999 999 700 GHz	__________ GHz	50.000 000 300 GHz
		50.999 999 700 GHz	__________ GHz	51.000 000 300 GHz
		51.999 999 700 GHz	__________ GHz	52.000 000 300 GHz
		52.999 999 700 GHz	__________ GHz	53.000 000 300 GHz
		53.999 999 700 GHz	__________ GHz	54.000 000 300 GHz
		54.999 999 700 GHz	__________ GHz	55.000 000 300 GHz
		55.999 999 700 GHz	__________ GHz	56.000 000 300 GHz
		56.999 999 700 GHz	__________ GHz	57.000 000 300 GHz
		57.999 999 700 GHz	__________ GHz	58.000 000 300 GHz
		58.999 999 700 GHz	__________ GHz	59.000 000 300 GHz
		59.999 999 700 GHz	__________ GHz	60.000 000 300 GHz
d. Fine Loop Test Procedure				
1(c)	Enter 40 GHz			
2	Record the Frequency Counter Reading	39.999 999 700 GHz	__________ GHz	40.000 000 300 GHz
3	Record the Frequency Counter Reading	40.000 002 700 GHz	__________ GHz	40.000 003 300 GHz
4	Record the Frequency Counter Readings . . .	40.000 005 700 GHz	__________ GHz	40.000 006 300 GHz
		40.000 008 700 GHz	__________ GHz	40.000 009 300 GHz
		40.000 011 700 GHz	__________ GHz	40.000 012 300 GHz
		40.000 014 700 GHz	__________ GHz	40.000 015,300 GHz
		40.000 017 700 GHz	__________ GHz	40.000 018 300 GHz
		40.000 020 700 GHz	__________ GHz	40.000 021 300 GHz
		40.000 023 700 GHz	__________ GHz	40.000 024 300 GHz
		40.000 026 700 GHz	__________ GHz	40.000 027 300 GHz
		40.000 029 700 GHz	__________ GHz	40.000 030 300 GHz

2-7. Marker and Blanking Verification

Step	Procedure Comments	Marker/Signal Presence
c. Marker Selection Procedure		
2	F1 Frequency Marker = 40 GHz	
2	Verify that a marker appears on the left side of the scope at the start of trace	_______
3(a)	F2 Frequency Marker = 60 GHz	
3(b)	Verify that a marker appears on the right side of the scope at the end of trace	_______
4	F3 Frequency Marker = 42 GHz	
4	Verify that a marker appears on the scope	_______
4	F4 Frequency Marker = 44 GHz	
4	Verify that a marker appears on the scope	_______
4	F5 Frequency Marker = 47 GHz	
4	Verify that a marker appears on the scope	_______
4	F6 Frequency Marker = 50 GHz	
4	Verify that a marker appears on the scope	_______
4	F7 Frequency Marker = 53 GHz	
4	Verify that a marker appears on the scope	_______
4	F8 Frequency Marker = 55 GHz	
4	Verify that a marker appears on the scope	_______
4	F9 Frequency Marker = 58 GHz	
4	Verify that a marker appears on the scope	_______
d. Marker Output Verification Procedure		
1	Verify +5V (TTL high) markers at nine points on scope display	_______
3	Verify that all markers change to intensified spots	_______
5(a)	Verify +5V (TTL high) signal at retrace	_______
5(d)	Verify –10V (minimum) signal at selected marker frequency	_______
5(e)	Verify –5V (minimum) signal at all other marker frequencies	_______
6	Verify that new marker changes from –5V (minimum) to –10V (minimum)	_______
	Verify that previous marker changes from –10V (minimum) to –5V (minimum)	_______
e. Retrace Blanking Output Verification Procedure		
2	Verify –5V (minimum) signal during retrace	_______
3	Verify +5V (minimum) signal during retrace	_______

2-8. Narrowband Spurious Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
c. Fine Loop Test Procedure				
1(b)	Enter 40.1 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	10 kHz	N/A	_______dBc	–60 dBc
	20 kHz	N/A	_______dBc	–60 dBc
	30 kHz	N/A	_______dBc	–60 dBc
	40 kHz	N/A	_______dBc	–60 dBc
	50 kHz	N/A	_______dBc	–60 dBc
d. Coarse Loop Test Procedure				
1(b)	Enter 54.9 GHz.			
3	Record the presence of all spurious signals at a carrier offset of:			
	200 kHz	N/A	_______dBc	–60 dBc
	400 kHz	N/A	_______dBc	–60 dBc

2-9. Spurious and Harmonic Tests: RF Output Signals ≤2 GHz

These tests are not applicable to the 6772B model.

2-10. Harmonic Tests: RF Output Signals From 2 to 10 GHz

These tests are not applicable to the 6772B model.

2-11. Harmonic Tests: RF Output Signals From 11 to 20 GHz

These tests are not applicable to the 6772B model.

2-12. Harmonic Tests (Alternate Method): RF Output Signals From 10 to 30 GHz

These tests are not applicable to the 6772B model.

2-13. Harmonic Tests: RF Output Signals From 26.5 to 40 GHz

These tests are not applicable to the 6772B model.

2-14. Harmonic Tests: RF Output Signals From 40 to 60 GHz

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure				
6	Measure and record the 40 GHz signal level	N/A	_______dBc	–20 dBc

2-15. Single Sideband Phase Noise Test

This test is not applicable to the 6772B model.

2-16. Power Level Accuracy and Flatness Verification

These tests are not applicable to the 6772B model.

2-17. FM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. FM Input Sensitivity Procedure (Band 6; 40 to 60 GHz)				
2(c)	Enter 50 GHz			
5	Measure and record the signal level of the Bessel null displayed on the Spectrum Analyzer	26 dB decrease	______ dB decrease	N/A
e. FM Meter Accuracy Procedure (Band 6; 40 to 60 GHz)				
1	Record the number in the MODULATION display			_______
2	Divide 9216 by the number noted in the previous line			_______
5	Measure and record the decrease in carrier level	26 dB decrease	______ dB decrease	N/A

2-18. AM Modulation Tests

Step	Procedure Comments	Lower Limit	Measured Value	Upper Limit
d. AM Input Sensitivity and Meter Accuracy (Band 6; 40 to 60 GHz)				
2(e)	Enter 50 GHz			
6	Measure and note the Modulation Analyzer AM PK (+) reading			______
8	Measure and note the Modulation Analyzer AM PK (–) reading			______
10	Calculate and note the actual AM sensitivity . .	26%	____%	34%
e. AM Meter Accuracy Procedure (Band 6; 40 to 60 GHz)				
3	Record the number in the MODULATION display			______
4	Divide 30 by the number noted in the previous line. Note the result			______
5	Multiply the result of the previous step by the result of the calculation in step c.10. Verify that the product of the calculation is between 26% and 34% AM	26%	______%	34%

2-19. Pulse Modulation Tests: Rise Time, Fall Time, Overshoot, and Level

These tests are not applicable to the 6772B model.

2-20. Pulse Modulation Test: Video Feedthrough

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure (Band 6; 40 to 60 GHz)				
1(c)	Enter 50 GHz			
4	Measure and record the Video Feedthrough voltage spikes (specification = <±5 mV peak).	N/A	______mV peak	±5 mV peak

2-21. Pulse Modulation Test: RF On/Off Ratio

Step	*Procedure Comments*	*Lower Limit*	*Measured Value*	*Upper Limit*
c. Test Procedure (Band 6; 40 to 60 GHz)				
1(d)	Enter 50 GHz			
4	Measure and record the peak of the signal on the Spectrum Analyzer. (Measured signal must be >50 dB below top graticule to meet specification; this represents an On/Off Ratio of >80 dB.)	50 dB	______dB	N/A

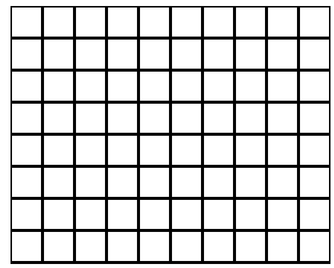
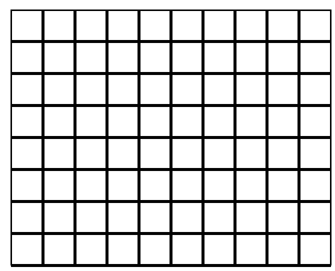
WILTRON Model 6772B **Date:** ______________________

Serial Number____________________ **Tested By:** ______________________

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-9 ALC Level Offset Adjustments		
This instrument uses external leveling only		
Band 0 and Band 1 thru 4 Level Offset adjustments do not apply		
f. ALC Detector Shaper Level Offset 6.(c)	Frequency = 40.1 GHz Follow steps f.1 through f.21.	
3-10 External Leveling Offset Adjustment		
c.3	A15TP7 = 0V ±1 mV	___________volts
3-11 10 MHz Reference Oscillator Calibration		
c.1.(c) c.3	Frequency = 60 GHz Adjust for Frequency Counter Reading = 60 GHz ±100 Hz	___________GHz
3-12 ALC Bandwidth Calibration		
This calibration is required for the installed frequency band:		
c. 40 - 60 GHz Band 2(c)	Frequency = 50 GHz Follow steps c.1 through c.13; then steps c.16 and c.17.	

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-13 Analog Sweep Calibration		
This calibration is automatically completed for the installed frequency band.		
c.1.(d)	Frequency = 50 GHz	
3-14 YIG-tuned Oscillator Frequency Calibration		
This calibration is required for the installed frequency band:		
c. 40 - 60 GHz Band 1.(e) 5.	Frequency = 50 GHz Maximum difference in MHz between frequency counter and 6772B	_________MHz
3-15 RF Level Calibration		
This calibration is performed using an automatic test system. Contact WILTRON Customer Service at (408) 778–2000 for further information.		

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-16 ALC Slope Adjustment		
This instrument uses external leveling only.		
ALC Slope calibration does not apply.		
3-17 AM Sensitivity Calibration		
This calibration is required for the installed frequency band:		
d. 40-60 GHz Band		
2.(d)	Frequency = 50 GHz	
8.	Measure and Record AM PK(+)	__________%
8.	Measure and record AM PK(–)	__________%
8.	Calculate and record average	__________%
3-18 AM Meter Calibration		
c. Meter Calibration		
2.(d)	Frequency = 50 GHz	
d. Meter Verification		
1.(c)	Frequency = 50 GHz	
1.(g)	Measure and record AM DEPTH	__________%

CALIBRATION/ADJUSTMENT PROCEDURE STEP	CALIBRATION/ADJUSTMENT CONDITIONS	MEASURED VALUE
3-19 FM Driver/Sensitivity Calibration		
This calibration is required for the installed frequency band:		
d. 40-60 GHz Band 2.(d) 8.	Frequency = 50 GHz Record the Waveform Null	 Draw Waveform Null
3-20 FM Flatness Calibration		
This calibration is required for the installed frequency band:		
b. 40-60 GHz Band 2.(d) 10.	Frequency = 50 GHz Record the Waveform	 Draw Waveform
3-21 FM Meter Calibration		
c. Meter Calibration	Follow steps c.1 through c.6.	
d. Meter Verification 1.(c)	Measure FM Deviation	__________kHz