MAK-6571B

AUTOMATIC DISTORTION METER

SER. NO.

V AC OPERATION

MEGURO ELECTRONICS CORPORATION

1-5, 2-CHOME CHUO-CHO

MEGURO-KU TOKYO JAPAN

The Meguro Electronics Corporation would like to thank you for purchasing this instrument. In order for you to get the most out of your new instrument, please read carefully and follow the instructions for use and care given in this document.

PRECAUTIONS FOR USE

1. Before applying power to the MAK-6571B, be sure to verify that the line voltage of the unit matches the line voltage of the location in which it is to be operated.

2. Before turning the POWER switch to ON, make sure that the METER is mechanically zeroed. If it has not been, make the required adjustment using the access hole on the front panel.

3. To prolong life of components and improve their reliability, it is recommended that the instrument be powered from a line source within 10 percent of the rated line voltage.

4. The operating environment of the MAK-6571B is 5 - 35° Centigrade.

5. To insure stable operation of the MAK-6571B over long periods, care should be taken to avoid subjecting it to vibration, direct sunlight, extreme temperature variations, high humidity, dust and electromagnetic fields.

TABLE OF CONTENTS

SECTION 1 INTRODUCTION 1
1.1 GENERAL 1
1.2 CONFIGURATION 1
1.3 FEATURES 1
1.4 ACCESSORIES 2
SECTION 2 SPECIFICATIONS 3
2.1 DISTORTION MEASUREMENT SECTION 3
2.2 LEVEL MEASUREMENT SECTION 4
2.3 GENERAL SPECIFICATIONS 4
SECTION 3 OPERATION 5
3.1 CONTROLS AND INPUT/OUTPUT CONNECTORS 5
3.2 FUNCTIONS OF CONTROLS AND CONNECTORS 6
SECTION 4 CIRCUIT DESCRIPTION 9
4.2 PREAMPLIFIER 10
4.3 ALC CIRCUIT 10
4.4 400HZ AND 1000HZ HIGHPASS FILTERS 10
4.5 PREAMPLIFIER AND POSTAMPLIFIER 10
4.6 LP FILTER AND DISTORTION METERING CIRCUIT 10
4.7 LEVEL AMPLIFIER CIRCUIT 10
4.8 POWER SUPPLY CIRCUIT 11

SECTION 5 GENERAL MAINTENANCE 12
5.1 PERIODIC RECALIBRATION 12
5.2 VISUAL INSPECTION 12
5.3 FUSE REPLACEMENT 12
5.4 PARTS REPLACEMENT 13
SECTION 6 CALIBRATION AND ADJUSTMENT 14
6.1 INSTRUMENTS REQUIRED FOR CALIBRATION 14
6.2 POWER SUPPLY VOLTAGE CHECK 15
6.3 LEVEL METER CALIBRATION 16
6.4 INPUT RANGE CALIBRATION 17
6.5 DISTORTION METER CALIBRATION 17
SECTION 7 CIRCUIT CALIBRATION PROCEDURES 20
7.1 LEVEL MEASUREMENT CIRCUIT CALIBRATION 20
7.2 DISTORTION MEASUREMENT CIRCUIT CALIBRATION 22
SECTION 8 TROUBLESHOOTING 26
8.1 POWER SUPPLY SECTION 26
8.2 LEVEL MEASUREMENT SECTION 27
8.3 DISTORTION MEASUREMENT SECTION 28

SECTION I

INTRODUCTION

1.1 GENERAL

The MAK-6571B is intended for use as a total harmonic distortion meter at 400Hz and 1000Hz and as a level meter in the range 20Hz to 100kHz.

Since input level variations are automatically compensated for, the unit is particularly well suited to measurements on tape recorders, radios, and in the TV production line environments in which measurement speed is of the essence. Fundamental elimination is achieved by use of an LC highpass filter, allowing accurate distortion measurements of even signals containing wow and flutter components.

1.2 CONFIGURATION

The configuration of the MAK-6571B is described in the block diagram included in this document.

1.3 FEATURES

* Simultaneous distortion and level measurements
* Variations in input level are automatically compensated
* No necessity for fullscale calibration
* Tape recorder and record player signals having wow or flutter components can be accurately measured
* Low frequency noise components such as hum do not affect distortion measurement accuracy
* Useable as a high-sensitivity level meter
* External highpass filters having cutoffs other than 400Hz or 1000Hz may be used

1.4 ACCESSORIES

ITEM	QTY	REMARKS
Input Cable	1	U-plug - Alligator Clips
Fuse	2	0.2A or 0.1A
Instruction Manual	1	

SECTION 2

SPECIFICATIONS

2.1 DISTORTION MEASUREMENT SECTION

Input Fundamental Frequencies:	400Hz ± 10% (total harmonic distortion) 1000Hz ± 10% (total harmonic distortion) (As an option, total harmonic distortion and third harmonic distortion may be measured in the range 300Hz ∿ 3kHz.)
Measured Range:	0.1% ∿ 30% and CAL (fullscale) in 7 ranges 0 ∿ 0.1% 0 ∿ 0.3% 0 ∿ 1% 0 ∿ 3% 0 ∿ 10% 0 ∿ 30%
Input Level Range:	3mVrms ∿ 100Vrms in 9 ranges 0.003 ∿ 0.01V 0.01 ∿ 0.03V 0.03 ∿ 0.1V 0.1 ∿ 0.3V 0.3 ∿ 1V 1 ∿ 3V 3 ∿ 10V 10 ∿ 30V 30 ∿ 100V
Input Impedance:	Approximately 100kΩ, unbalanced
ALC Control Range:	13dB
Measurement Accuracy:	±5% of fullscale on all ranges Except ±10% for the 0.1% range
Fundamental Elimination:	HP filter is used for measurement of total harmonic distortion
Fundamental Elimination: Characteristics:	-70dB at 400Hz and 1000Hz ±10% (min.) -76dB at 400Hz and 1000Hz ±5% (min.)
Output Connector Level:	Approximately 1Vrms for fullscale on all ranges

2.2 LEVEL MEASUREMENT SECTION

Frequency Range:	20Hz ∿ 50kHz ±0.5dB (1kHz reference) 20Hz ∿ 100kHz ±1dB (1kHz reference)
Measurement Range:	1mVrms ∿ 100Vrms in 9 ranges 0 ∿ 0.01V 0 ∿ 0.03V 0 ∿ 0.1V 0 ∿ 0.3V 0 ∿ 1V 0 ∿ 3V 0 ∿ 10V 0 ∿ 30V 0 ∿ 100V
Measurement Accuracy:	±3% of fullscale (at 1kHz)
Input Impedance:	Approximately 100kΩ, unbalanced
Output Connector Level:	Approximately 1Vrms for fullscale on all ranges

2.3 GENERAL SPECIFICATIONS

Operating Temperature Range:	0 ∿ 40°C (specifications guaranteed in the range 5 ∿ 35°C)
Power Requirements:	90 ∿ 126VAC, 194 ∿ 253VAC 50/60Hz
Maximum Dimensions:	270(W) x 165(H) x 290(D)mm
Weight:	Approx. 8kg

SECTION 3

OPERATION

3.1 CONTROLS AND INPUT/OUTPUT CONNECTORS

Front Panel

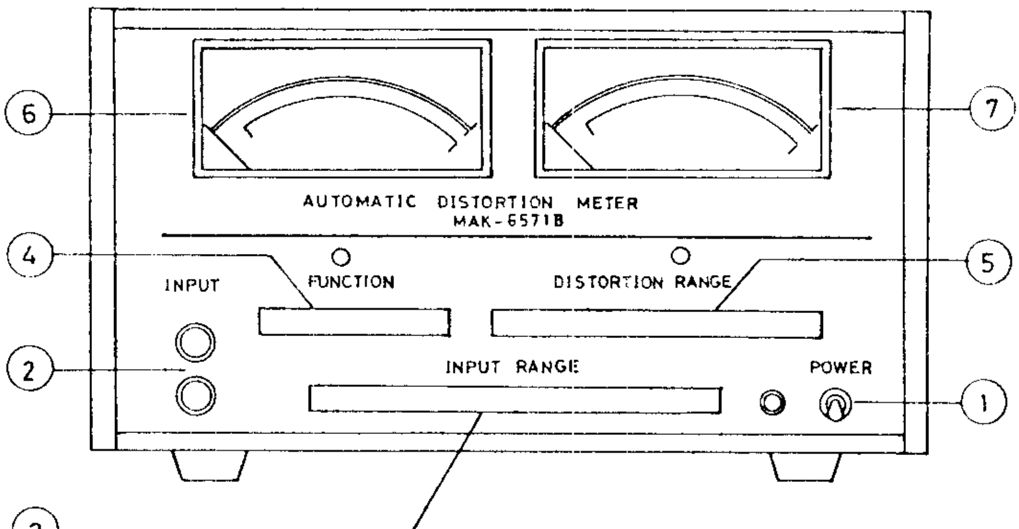


Fig. 3-1

Rear Panel

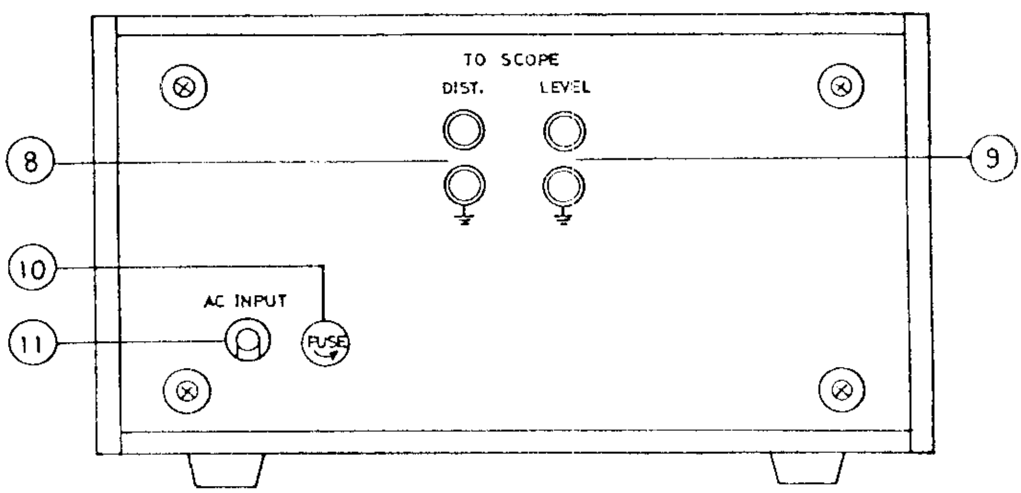


Fig. 3-2

3.2 FUNCTIONS OF CONTROLS AND CONNECTORS (Refer to Fig. 3-1, 3-2, on page 5)

1 POWER Toggle Switch

This switch is used to apply power to the unit when set to the ON position. When thus set, the pilot lamp above the switch will light.

2 INPUT Terminals

The input impedance of the MAK-6571B is approximately 100kΩ, unbalanced.

3 INPUT Range Pushbutton Switches

Used to select the input level measurement range by means of a 10dB step attenuator. For distortion measurements, these pushbutton switches are set so that the level meter reads in the range 0 ∿ -13dB (within the red arc on the level meter scale).

4 FUNCTION Pushbutton Switches

LEVEL	Depressed when the unit is to be used as a level meter.
400Hz	Depressed to measure distortion on a 400Hz signal. When depressed the unit may be used to make simultaneous level measurements at 400Hz.
1000Hz	Depressed to measure distortion on a 1000Hz signal. When depressed the unit may be used to make simultaneous level measurements at 1000Hz.
OPTION	Used when an optional filter has been built into the instrument. Simultaneous level measurements may also be made using the optional filter.

5 DISTORTION RANGE Pushbutton Switches

This group of pushbutton switches is used to select the distortion measurement range by switching a 10dB per step attenuator. The CAL position is used for calibration of the MAK-6571B.

6 LEVEL METER

This meter displays the input level in units of volts or dB, average value.

7 DISTORTION METER

This meter displays the distortion expressed in % or dB, average value.

8 TO SCOPE DISTORTION Terminal

This output is provided to allow observation of the measured distortion component using a device such as an oscilloscope.

9 TO SCOPE LEVEL Terminal

This output is provided to allow observation of the measured level using a device such as an oscilloscope.

10 FUSE

Power supply fuse holder.

11 AC INPUT

AC power cord for the supply to the MAK-6571B of the specified line power voltage.

3.3 PREPARATIONS FOR MEASUREMENTS

Set the POWER switch to OFF and connect the instrument to an AC power source of the proper voltage.

3.3.1 Distortion Measurements

Set up the front panel controls as follows:

FUNCTION	400Hz or 1000Hz
DISTORTION RANGE	30%
INPUT RANGE	100V

Set the POWER switch to ON and apply the signal to be measured to the INPUT terminals.

Adjust the INPUT RANGE switches to that the level meter reads in the 0 ∿ -13dB region (as indicated by the red arc on the meter scale).

Next, set the DISTORTION RANGE switches through the sequence 10%, 3%, etc., until the display is easy to read on the meter.

The distortion value measured is determined by the meter reading in combination with the RANGE switch is depressed, expressed in dB.

The MAK-6571B makes use of an LC highpass filter, enabling the measurement of distortion on signals which have a frequency of 400Hz or 1000Hz ±10%.

3.3.2 Level Measurements

Set up the front panel controls as follows:

FUNCTION	LEVEL
INPUT RANGE	100V (+40dB)

After setting up the panel controls as described above, apply the signal to be measured (20Hz ∿ 100kHz) to the INPUT terminals. Adjust the INPUT RANGE switches through the sequence 30V, 10V, 3V, etc., to obtain an easy-to-read meter display.

The level of the measured signal is then determined using the meter display value in combination with the range selected, in either V or dB.

SECTION 4

CIRCUIT DESCRIPTION

4.1 BLOCK DIAGRAM

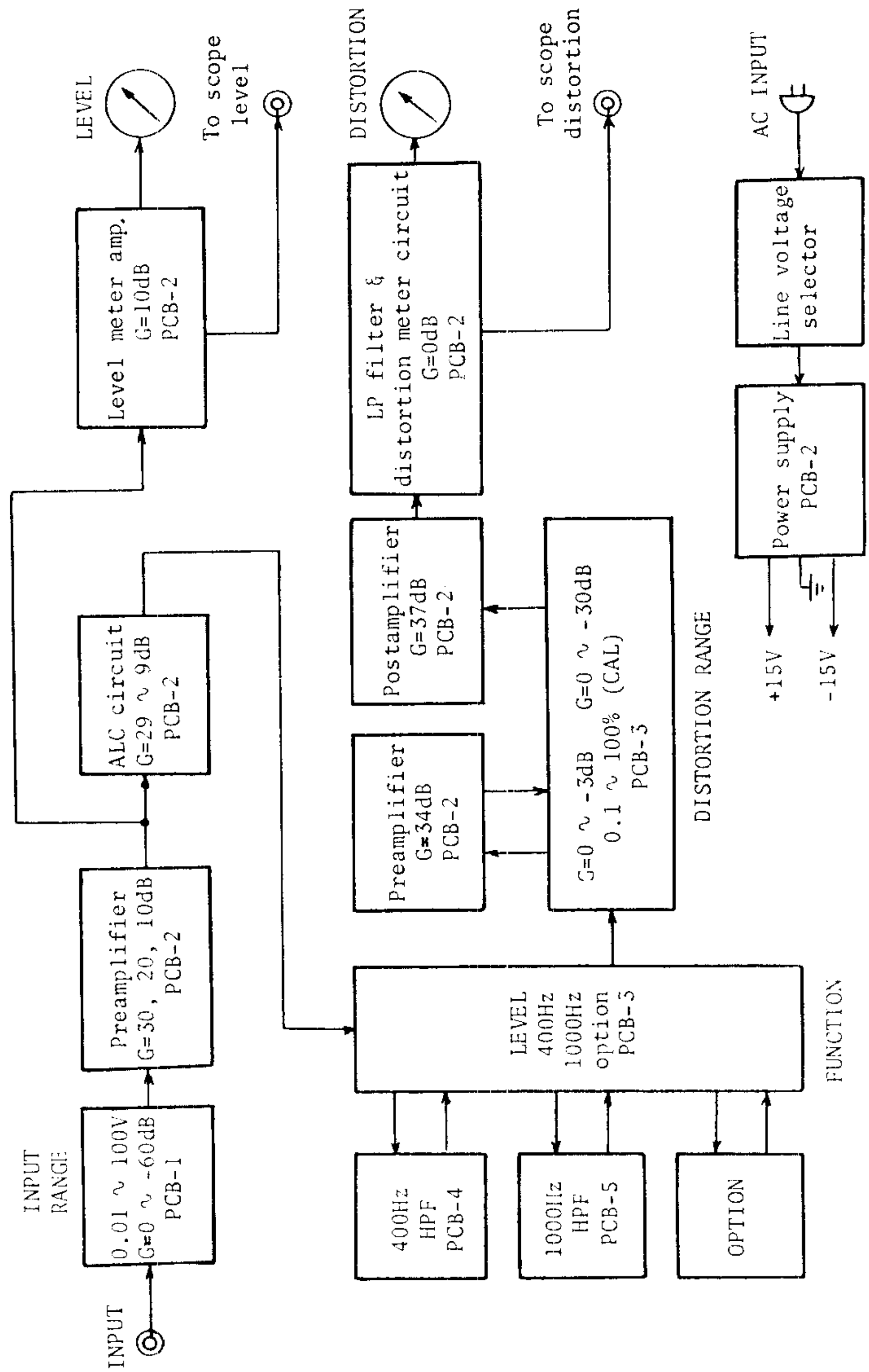


Fig. 4-1

4.2 PREAMPLIFIER (PCB-2)

This 100kΩ input impedance amplifier stage has a gain of +30dB when the INPUT RANGE is in the 0.01V (-40dB) position, +20dB in the 0.03V (-30dB) position and +10dB in all other ranges.

4.3 ALC (Automatic Level Control) CIRCUIT (PCB-2)

This circuit serves to make the necessary automatic adjustments to the input level when making distortion measurements. It operates properly when the INPUT RANGE has been adjusted so that the meter indication is in the range 0 ∿ -13dB. The gain of this circuit depends on the level of the input signal and varies from 9dB to 29dB providing a 0.5Vrms signal level over an input signal range of approximately 20dB.

4.4 400HZ AND 1000HZ HIGHPASS FILTERS (PCB-4 and PCB-5)

These constant-K inductive M-type filters are used to reduce the fundamental frequency component to at least a -76dB level with less than 5dB variation in the passband.

4.5 PREAMPLIFIER AND POST AMPLIFIER CIRCUITS (PCB-2)

These amplifiers, used to amplify the distortion component consist of 2 IC amplifier stages. The gains are 34dB and 37dB for the pre and post amplifier respectively.

4.6 LP FILTER AND DISTORTION METERING CIRCUIT (PCB-2)

The lowpass filter has a cutoff frequency of approximately 16kHz with a rolloff of 18dB/octave. The output of the filter is then average-value rectified and used to drive the meter. In addition, part of the lowpass filter output, representing the distortion wave form, is used to provide an output at the TO SCOPE DISK terminals, enabling oscilloscope observation.

4.7 LEVEL AMPLIFIER CIRCUIT (PCB-2)

This is a 10dB gain level metering amplifier circuit, the output of which is average-value rectified and used to drive the meter. In addition, part of the circuit's output representing the level wave form, is available at the TO SCOPE LEVEL output to enable oscillo-scope observation.

4.8 POWER SUPPLY CIRCUIT (PCB-2)

This IC regulated power supply provides both +15V and -15V. A ripple filter has been provided for the supply to the input circuit, ensuring low noise.

SECTION 5

GENERAL MAINTENANCE

If the MAK-6571B experiences a failure or unstable operation, a check should be made of component failures, the printed circuit boards, and interconnections. Should the cause of the failure be impossible to determine, contact your authorized service representative or Meguro Electronics directly.

5.1 PERIODIC RECALIBRATION

This instrument is designed to operate with high stability over long periods. However, to insure the accuracy and reliability of measurements, it is recommended that a recalibration be performed every 500 hours for units used every day and every 6 months for units used less often.

5.2 VISUAL INSPECTION

As a preventative maintenance measure, the following items should be checked for at time of recalibration.

Loose switches
Loose screws
Signs of burnt wiring or resistors
Faulty connections

5.3 FUSE REPLACEMENT

When the MAK-6571B fuse has blown, turn the fuse holder cap in the direction of the arrow, remove the cap and replace with a new fuse. The proper fuse rating depends on the line voltage, the relationship being summarized in Table 5-3.

LINE VOLTAGE	FUSE RATING
90 ∿ 126V	0.2A
194 ∿ 253V	0.1A

Some instrument failures will result in repeated fuse blowings after replacement, so that under no circumstances should an oversized fuse be used; for such cases follow the trouble-shooting procedures given in Section 8 and correct the instrument failure before replacing the fuse with one of the proper rating.

5.4 PARTS REPLACEMENT

To maintain accuracy, this unit uses specially selected components. When component replacement is required, every effort should be made to use components as close as possible to the originals, and parts replacement should be done only after the true cause of the malfunction has been clearly determined.

SECTION 6

CALIBRATION AND ADJUSTMENT

While this instrument is inspected and adjusted at the factory before shipping and normally does not require readjustment, if errors are noticed after long periods of use, or if readjustment after a repair becomes necessary, the following equipment should be made available for these adjustments.

6.1 INSTRUMENTS REQUIRED FOR CALIBRATION

ITEM	DESCRIPTION	RECOMMENDED TYPE
Oscilloscope	10MHz bandwidth 10mV/cm sensitivity	
Signal generator	20Hz ∿ 100kHz 10V output with less than 0.01% distortion	Meguro MCR-4021
Resistive attenuator	0 ∿ -110dB in 0.1dB steps 600Ω impedance	
AC voltmeter	1% accuracy level measurement over the range 20Hz to 100kHz	Meguro MN-445A MN-445B
DVM	AC/DC 200V	
Distortion calibrator	Calibrator from -10dB to -60dB at 400Hz and 1000Hz	
Voltage calibrator	20Hz to 100kHz Calibration from -60dB to +40dB	

Table 6-1

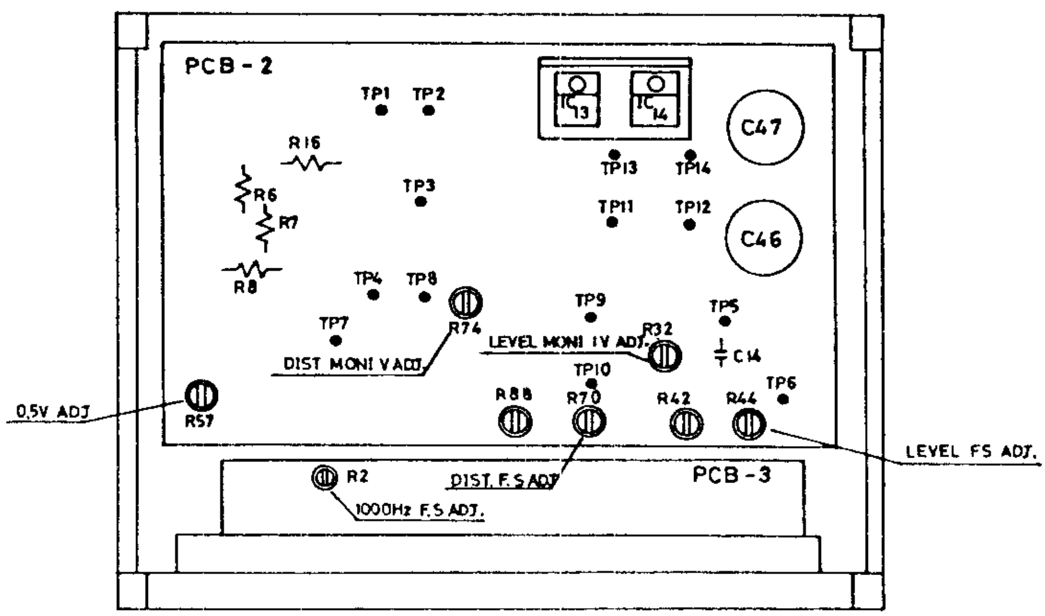
6.2 POWER SUPPLY VOLTAGE CHECK

VOLTAGE TO GROUND	NORMAL RANGE	LOCATION
+15V	+14.4 ∿ +15.6V	PCB-2 TP13
-15V	-14.4 ∿ -15.6V	PCB-2 TP14
+12V (ripple filter output)	+11.4 ∿ +13.6V	PCB-2 TP-2
-12V (ripple filter output)	-11.4 ∿ -13.6V	PCB-2 TP-3

Table 6-2

6.2.1 ±15V Power Supply

Remove the cabinet upper cover (refer to Fig. 6-1) and measure the voltage to ground of TP13 and TP14 of PCB-2, using a digital voltmeter to verify that these voltages are within the limits shown in Table 6-2. Note that an IC circuit determines these voltages, so that if the voltages are out of range, an IC failure may be suspected.



Front panel side

Fig. 6-1

7/B

6.2.2 ±15V Ripple Filter Output

Remove the top cover of the instrument (refer to Fig. 6-1) and measure the voltage between TP-2 and TP-3 and ground using a digital voltmeter, verifying that these voltages are within the limits shown in Table 6-2. If these voltages are significantly out of range in spite of the fact that the ±15V voltages checked in Section 6.2.1 are normal, a failure of TR8 or TR9 may be suspected.

6.3 LEVEL METER CALIBRATION

Connect an AC voltmeter and oscillator to the MAK-6571B as shown in Fig. 6-2. Set the front panel controls as follows:

FUNCTION	LEVEL
DISTORTION RANGE	CAL
INPUT RANGE	0.1V (-20dB)

With the above front panel setup, apply a 1000Hz, 0.1Vrms signal to the INPUT. Adjust R32 on PCB-2 such that the meter reads fullscale (refer to Fig. 6-1).

Next, vary the oscillator frequency from 20Hz to 100kHz and verify that the meter indication varies only within the following limit.

20Hz ∿ 50kHz	±0.5dB
20Hz ∿ 100kHz	±1.0dB

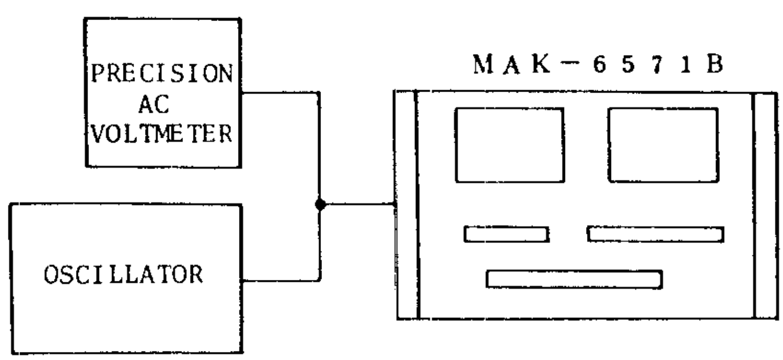


Fig. 6-2

6.4 INPUT RANGE CALIBRATION

Connect a voltage calibrator to the MAK-6571B as shown in Fig. 6-3 and set up the front panel controls as follows:

FUNCTION	LEVEL
DISTORTION RANGE	CAL
INPUT RANGE	100V (+40dB)

Apply a 1kHz, 100Vrms standard voltage to the INPUT and verify that the MAK-6571B meter indication is within 5% of fullscale.

Next, set the voltage calibrator output to 31.6V, 10V, 3.16V, and so forth, verifying that the meter indicates fullscale for the other ranges within 5%.

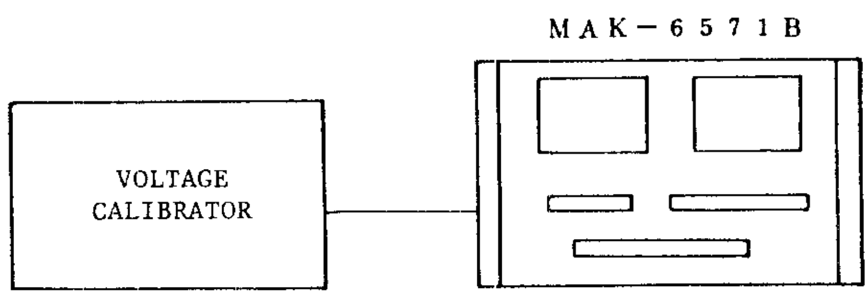


Fig. 6-3

6.5 DISTORTION METER CALIBRATION

6.5.1 400Hz HP Filter Check

As shown in Fig. 6-2, connect a precision voltmeter and oscillator to the MAK-6571B and set the front panel switches as follows:

FUNCTION	400Hz
DISTORTION RANGE	CAL
INPUT RANGE	0.1V (-20dB)

With the above front panel set up, set the oscillator frequency to 800Hz and the output level to 0.056V (-25dB) applying the output signal to the INPUT.

Adjust R74 on PCB-2 such that the distortion meter reads full-scale (refer to Fig. 6-1).

Next, verify that the meter reads fullscale 0dB ±0.5dB for an oscillator frequency of 1200Hz.

Set the oscillator frequency to 400Hz and the DISTORTION RANGE to 0.1% (-60dB), and verify that the distortion meter reads less than 0.016% (-76dB).

6.5.2 1kHz HP Filter Check

Again referring to Fig. 6-2, connect an oscillator and precision voltmeter to the MAK-6571B and set the front panel controls as follows:

FUNCTION	1kHz
DISTORTION RANGE	CAL
INPUT RANGE	0.1V (-20dB)

Set the oscillator frequency to 2kHz and the output level to 0.056V (-25dB), applying the output signal to the INPUT.

Verify that the distortion meter reads fullscale.

The matching of the filters is performed at the factory. Should there be a major difference in the filters, use R2 on PCB-3 to adjust this difference out (refer to Fig. 6-1).

NOTE
Since the fullscale calibration of the distortion meter has already been performed in accordance with Section 6.4.1, the trimmer R74 on PCB-2 should not be touched during this procedure part.

Next, set the oscillator frequency to 3kHz and verify that the distortion meter reading is 0dB ±0.5dB.

Set the oscillator frequency to 1kHz and the DISTORTION RANGE to 0.1% (-60dB). Verify that the distortion meter reads less than 0.016% (-76dB).

6.5.3 DISTORTION RANGE calibration

As shown in Fig. 6-4, connect a distortion calibrator to the MAK-6571B and set up the front panel controls as follows:

FUNCTION	400Hz
DISTORTION RANGE	CAL
INPUT RANGE	0.1V (-20dB)

Set the distortion calibrator to -10dB, -20dB, -30dB, and so forth to check the error of the MAK-6571B in each range.

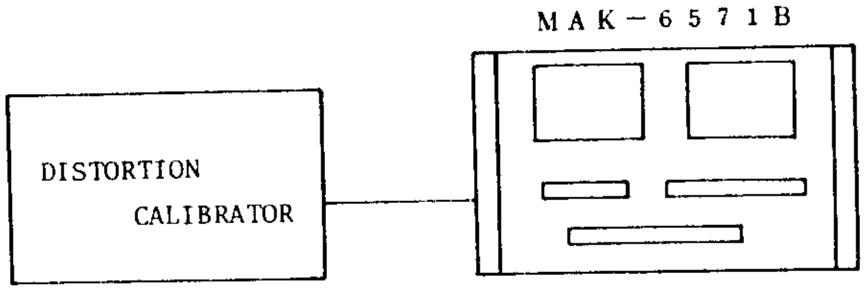


Fig. 6-4

If a distortion calibrator is not available, use the test set up as shown in Fig. 6-5, following the procedure below.

As shown in Fig. 6-5, connect an oscillator and resistive attenuator to the MAK-6571B and set the panel controls as follows:

FUNCTION	400Hz
DISTORTION RANGE	CAL
INPUT RANGE	1V (0dB)

Set the resistive attenuator to 0dB and the oscillator frequency to 800Hz.

Next, adjust the oscillator output level so that the distortion meter indication drops to -2dB from the fullscale value. Using this point as a reference, use the attenuator and the DISTORTION RANGE switch group to check the variations (errors) for all ranges from -10 through -60dB in order.

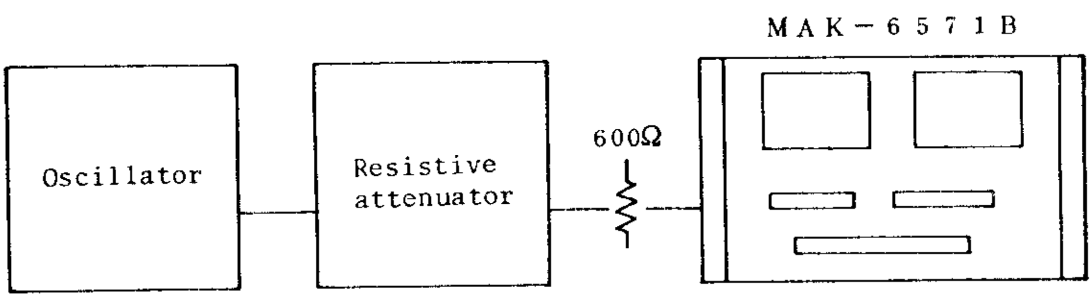


Fig. 6-5

SECTION 7

CIRCUIT CALIBRATION PROCEDURES

The calibration procedures for the circuits of the MAK-6571B are divided between those for the level meter function and those for the distortion measurement function. The entire procedure should be followed in the order given, as accurate calibration cannot be achieved by starting the procedure in the middle or changing the order of adjustments.

7.1 LEVEL MEASUREMENT CIRCUIT CALIBRATION

As shown in Fig. 7-1, connect an oscillator, resistive attenuator, and accurate AC voltmeter to the MAK-6571B. Set up the front panel controls as follows:

FUNCTION	LEVEL
DISTORTION RANGE	CAL
INPUT RANGE	0.1V (-20dB)

Next, set the resistive attenuator to 0dB and adjust the oscillator frequency to 1kHz and the output level such that the AC voltmeter reads 0.1V (-20dB).

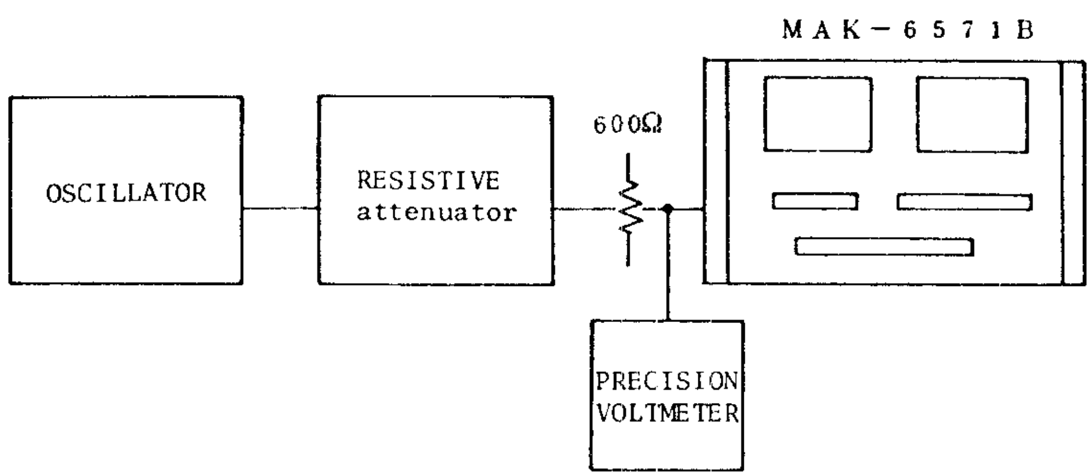


Fig. 7-1

Next, in this set up condition, remove the top cover (refer to Fig. 6-1, page 15) and perform the following procedure in sequence.

(1) Connect a precision voltmeter to TP-1 and verify that the signal level at this point is -10dB ±0.3dB. If it is not in this range, adjust R6 or R16 on PCB-2.

(2) In this condition, adjust R44 of PCB-2 such that the level meter reads fullscale (refer to Fig. 6-1, page 15).

(3) Now set the resistive attenuator such that the input level is -21dB, -22dB, and so forth to verify the scale accuracy of the level meter.

(4) Using the resistive attenuator, set the input signal level to -30dB and simultaneously set the MAK-6571B INPUT RANGE to the -30dB position, verifying that the level meter reads fullscale within ±0.3dB. If it does not, adjust R7 of PCB-2 (refer to Fig. 6-1, page 15). Next, set the input level to -40dB and the INPUT RANGE to -40dB, verifying that the level meter reads fullscale within ±3%. If it does not, adjust R9 of PCB-2.

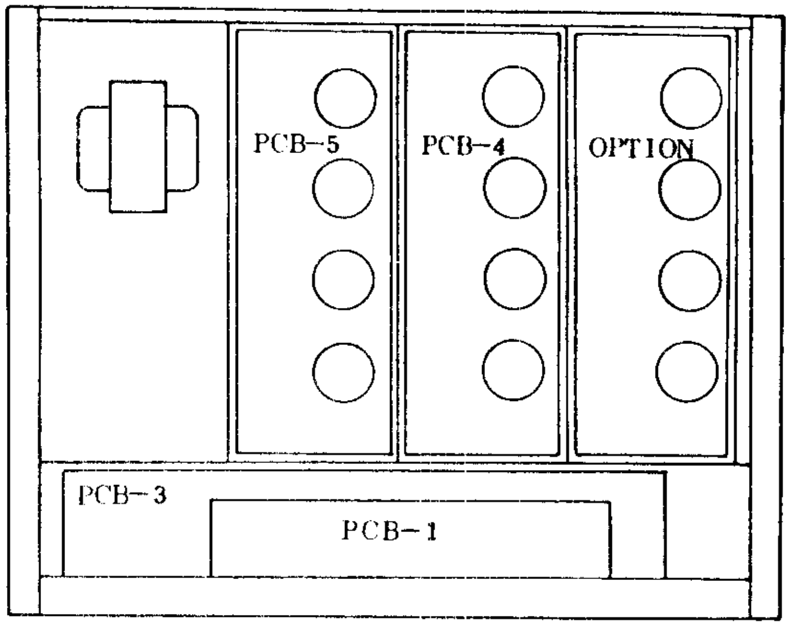
(5) Using the oscillator and resistive attenuator, adjust the input level from -10 to +40dB in 10dB steps, adjusting the INPUT RANGE accordingly from -10 to +40dB, verifying that the level meter reading is fullscale within ±0.3dB. If it is not within this range, adjust R1 through R12 of PCB-1 (refer to Fig. 7-2, page 22).

NOTE

For measurements of over +20dB, use a voltage calibrator as shown in Fig. 6-3.

(6) Set the INPUT RANGE to -20dB and use the oscillator output level control or the resistive attenuator to set the input level to -21dB, verifying that the level meter indication drops to -1dB. In this condition, vary the oscillator frequency from 20Hz to 100kHz and verify that with the 1kHz point as a reference, the frequency response of the MAK-6571B is within ±0.3dB over this range. If it is not, adjust C14 on PCB-2 (refer to Fig. 6-1, page 15).

(7) Next, set the INPUT RANGE to -30dB and -40dB and perform the same check as was done in step (6) over the range 20Hz to 100kHz with the value at 1kHz as a reference, checking that the response is within ±0.3dB.



Front panel side

Fig. 7-2

(8) Set the INPUT RANGE from -10 to +40dB and verify that the frequency response is within the following limits, with respect to 1kHz as a reference.

20Hz ∿ 50kHz	±0.5dB
20Hz ∿ 100kHz	±1.0dB

If the response does not fall within these limits, adjustment of the capacitors on the input attenuator PCB-1 should be made (refer to Fig. 7-2).

NOTE

For measurements over +20dB, use a voltage calibrator as shown in Fig. 6-3 on page 17.

7.2 DISTORTION MEASUREMENT CIRCUIT CALIBRATION

As shown in Fig. 7-1, connect an oscillator, voltmeter, and resistive attenuator to the MAK-6571B and set up the front panel controls as follows:

FUNCTION	1000Hz
DISTORTION RANGE	CAL
INPUT RANGE	0.1V (-20dB)

Next, set the attenuator to -5dB and set the oscillator frequency to 1kHz and the level such that the voltmeter reads -25dB.

In this condition, remove the top cover (refer to Fig. 6-1, page 15), and perform the following procedures in sequence.

(1) Connect a precision voltmeter to TP-4 and adjust R57 on PCB-2 such that the signal level reads -6dB (0.5V)(refer to Fig. 6-1, page 15).

(2) Using the resistive attenuator, set the input signal level to -33dB through -20dB, verifying that the signal level measured at TP-4 is constant within ±0.3dB.

(3) Set up the front panel controls as follows:

FUNCTION	400Hz
DISTORTION RANGE	CAL
INPUT RANGE	0.1V (-20dB)

Next, set the resistive attenuator to -5dB and with the oscillator frequency at 800Hz, adjust the output level so that the precision voltmeter reads -25dB. In this condition, adjust R90 on PCB-2 such that the distortion meter reads fullscale (refer to Fig. 6-1, page 15).

(4) Set the FUNCTION switch group to 1000Hz and the oscillator output frequency to 2kHz. Adjust R2 of PCB-3 such that the distortion meter reads fullscale (refer to Fig. 6-1, page 15).

(5) As shown in Fig. 6-4 on page 19, connect a distortion calibrator to the MAK-6571B and set the front panel controls as follows:

FUNCTION	1000Hz
DISTORTION RANGE	CAL
INPUT RANGE	1V (0dB)

In the above condition, step the distortion through -10, -20, -30dB and so forth in sequence.

For all the ranges of the DISTORTION RANGE, verify that the error is within ±0.3dB.

NOTE

If a distortion calibrator is not available, a procedure similar to that described on page 19 for distortion range calibration without a distortion calibrator may be followed.

(6) Set the front panel controls as follows:

FUNCTION	400Hz or 1000Hz
DISTORTION	-60dB
INPUT RANGE	+40dB

Leave the INPUT open and verify that the distortion meter reading represents residual noise below -76dB.

(7) As shown in Fig. 7-1, connect an oscillator, precision voltmeter, and resistive attenuator to the MAK-6571B, setting the front panel controls as follows:

FUNCTION	400Hz or 1000Hz
DISTORTION RANGE	-60dB
INPUT RANGE	-20dB

Next, adjust the resistive attenuator or oscillator output level such that the input level to the MAK-6571B is -25dB. In this condition, very the oscillator frequency and verify the MAK-6571B's fundamental rejection as listed below.

FUNCTION 400Hz

400Hz	-76dB or below
420Hz	-76dB or below
440Hz	-70dB or below

FUNCTION 1000Hz

1000Hz	-76dB or below
1050Hz	-76dB or below
1100Hz	-70dB or below

If this level of rejection is not observed, the characteristics of the HP filters should be examined (PCB-4 and PCB-5).

(8) Set up the front panel controls as follows:

FUNCTION	400Hz or 1000Hz
DISTORTION RANGE	CAL
INPUT RANGE	0.1V (-20dB)

Next, set the resistive attenuator to -5dB and adjust the oscillator output level such that the AC voltmeter reads -25dB. In this condition, vary the oscillator frequency and verify that the filter skirt response is as listed below.

FUNCTION 400Hz

720Hz	±0.5dB
800Hz	0dB (reference)
1200Hz	±0.5dB
1320Hz	±0.5dB

FUNCTION 1000Hz

1800Hz	±0.5dB
2000Hz	0dB (reference)
3000Hz	±0.5dB
3300Hz	±0.5dB

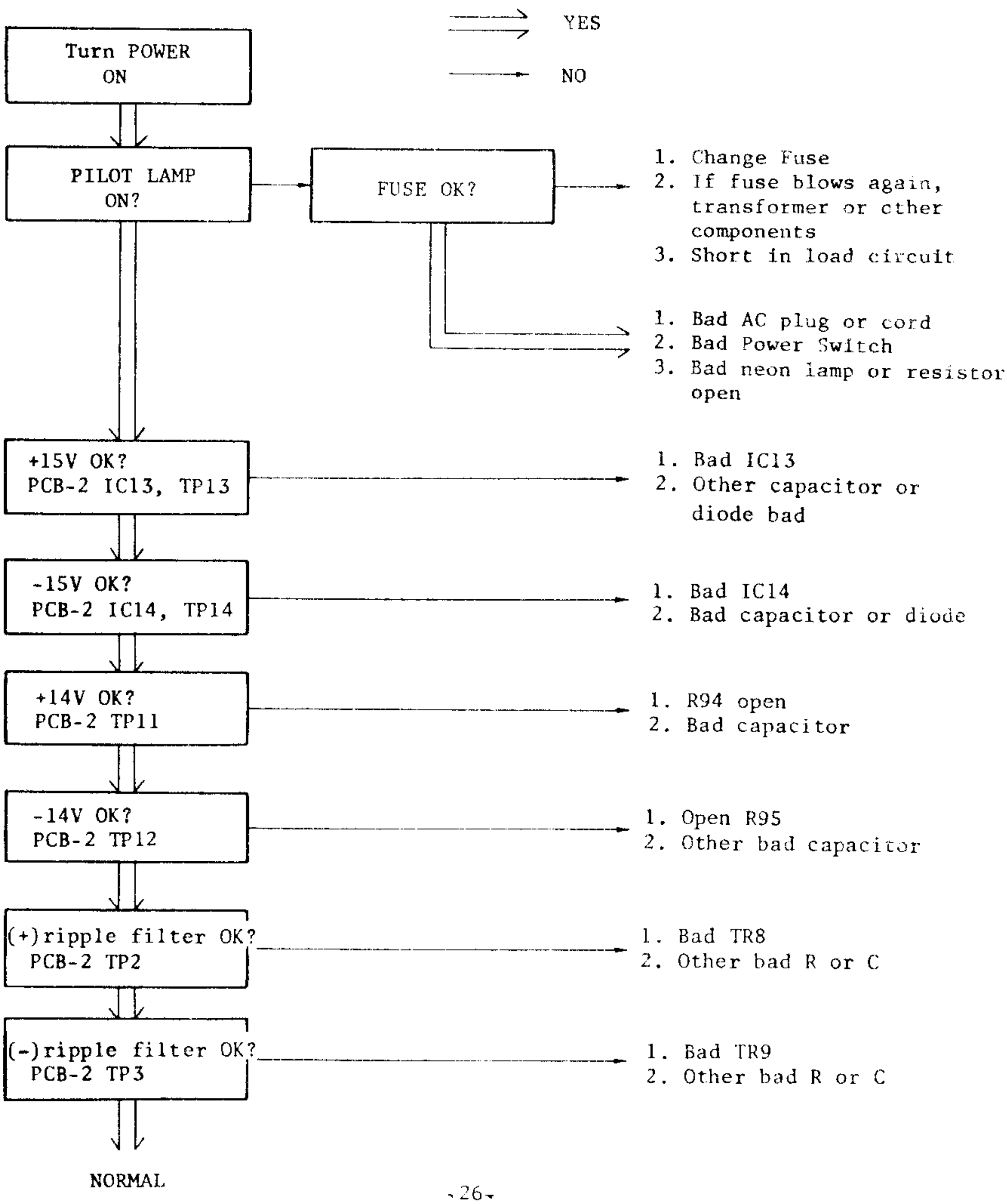
If the above listed skirt response is not observed, the characteristics of the HP filters should be examined (PCB-4 and PCB-5).

SECTION 8

TROUBLESHOOTING

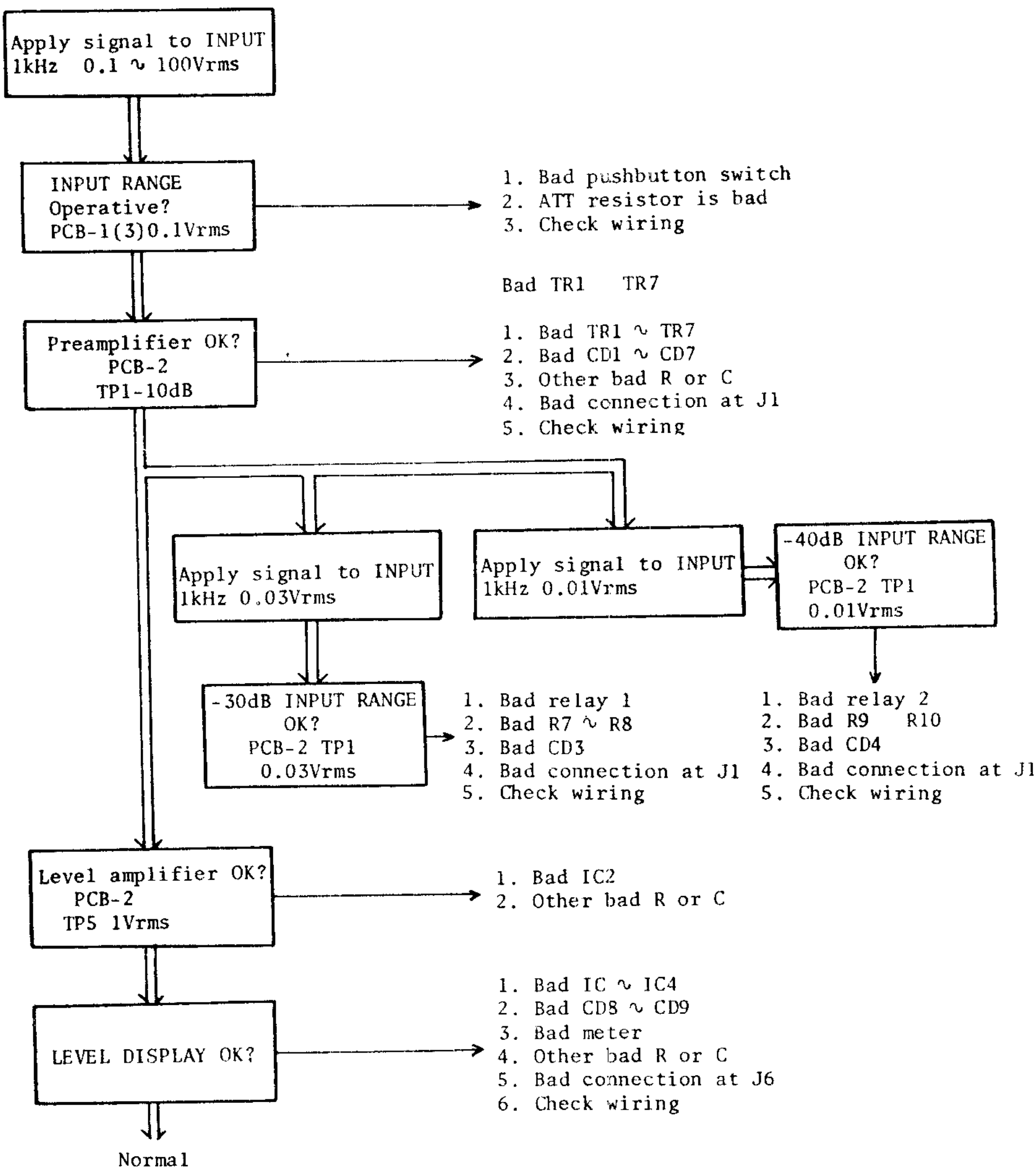
Should a failure of the MAK-6571B occur, use the following troubleshooting procedures in conjunction with this Instruction Manual and the circuit diagram to diagnose the failure.

8.1 POWER SUPPLY SECTION

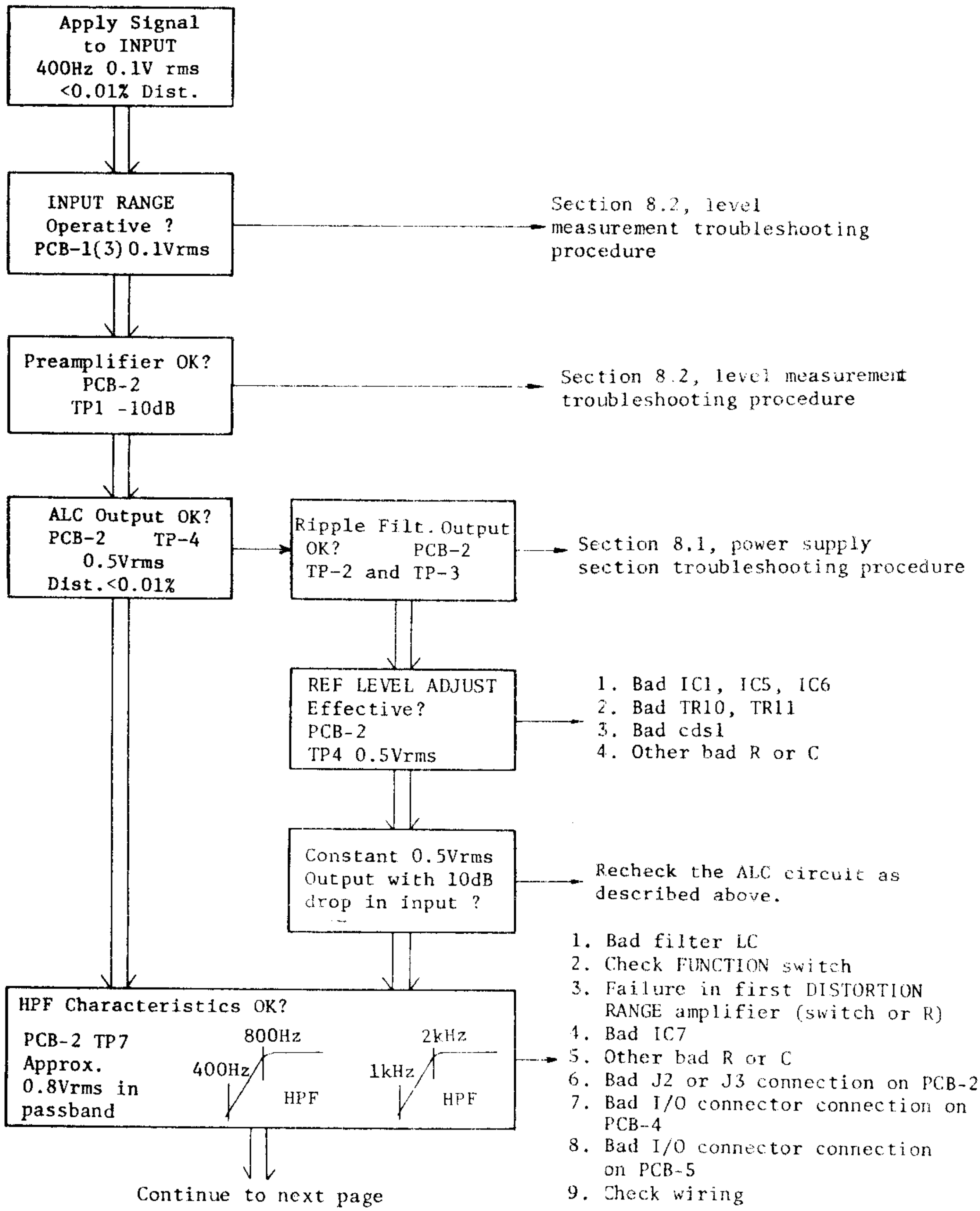


-26-

8.2 LEVEL MEASUREMENT SECTION



8.3 DISTORTION MEASUREMENT SECTION



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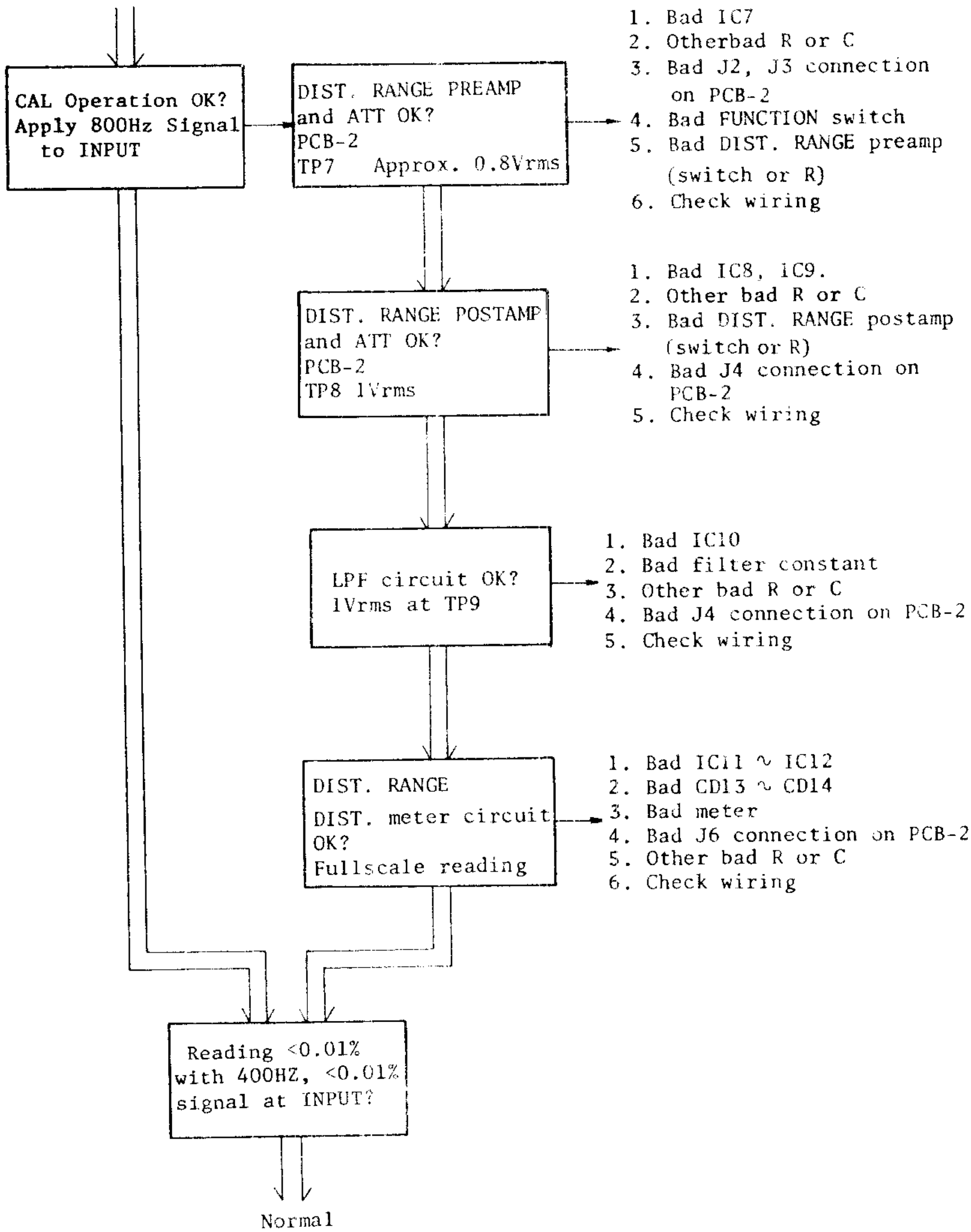
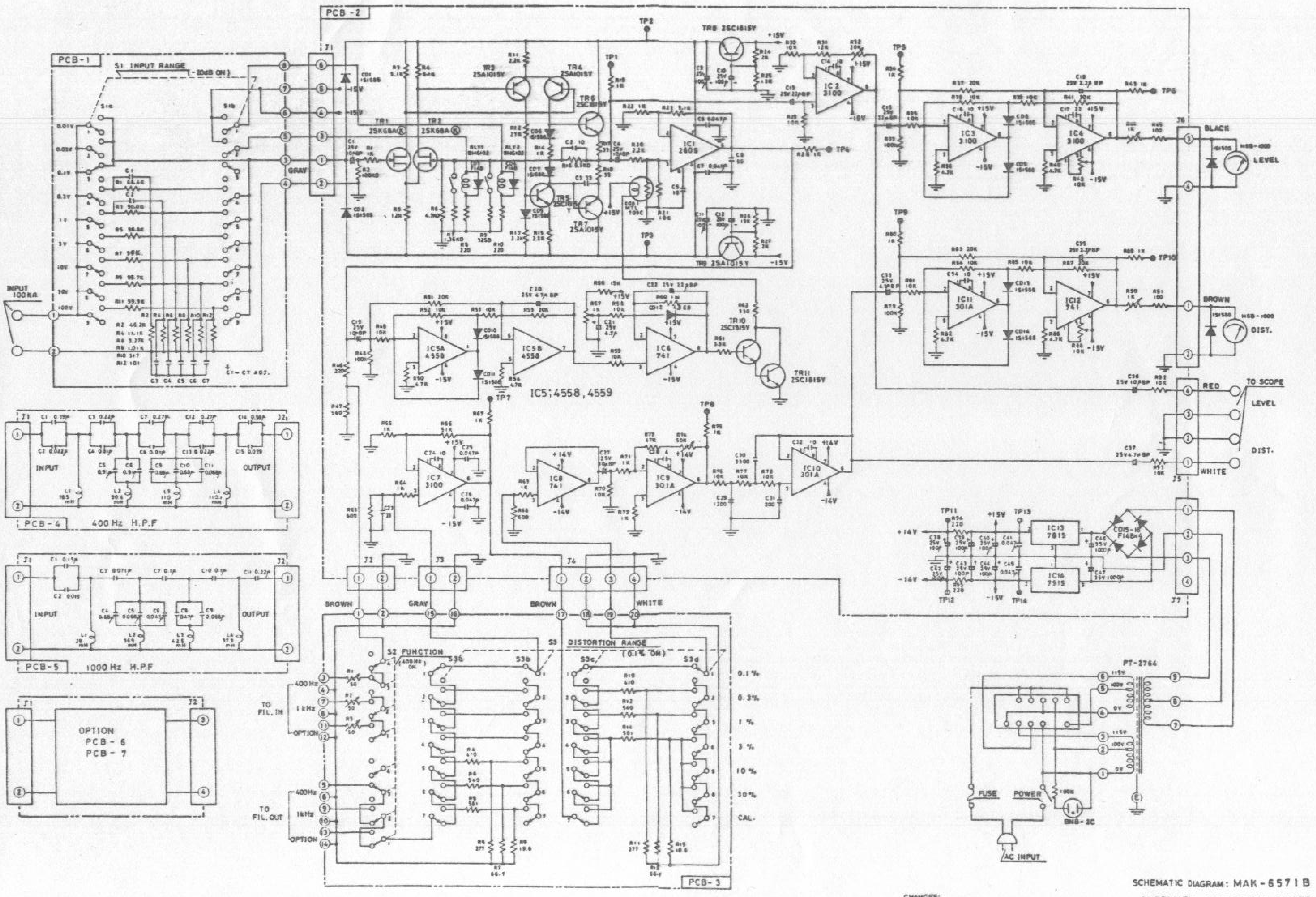
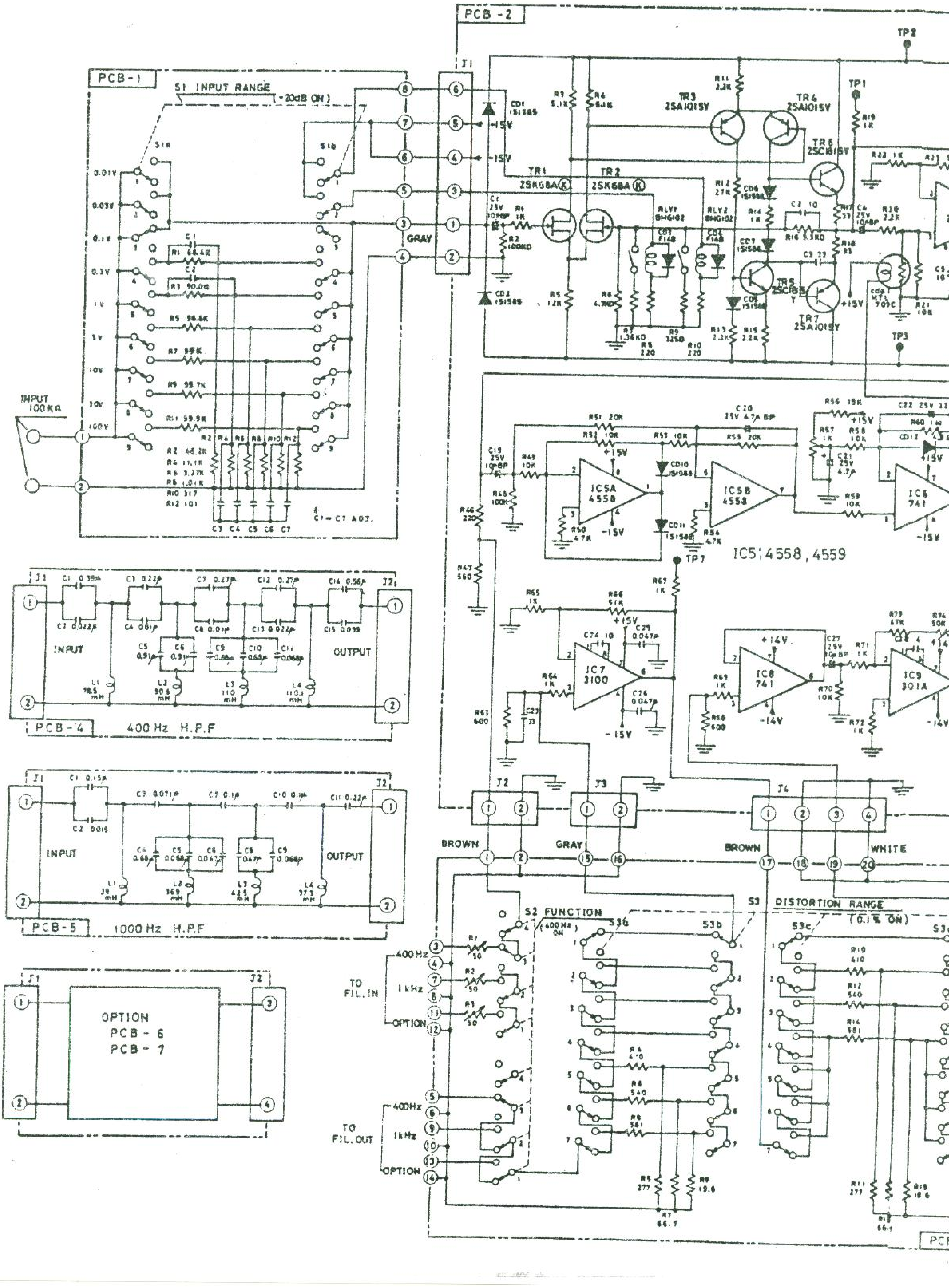
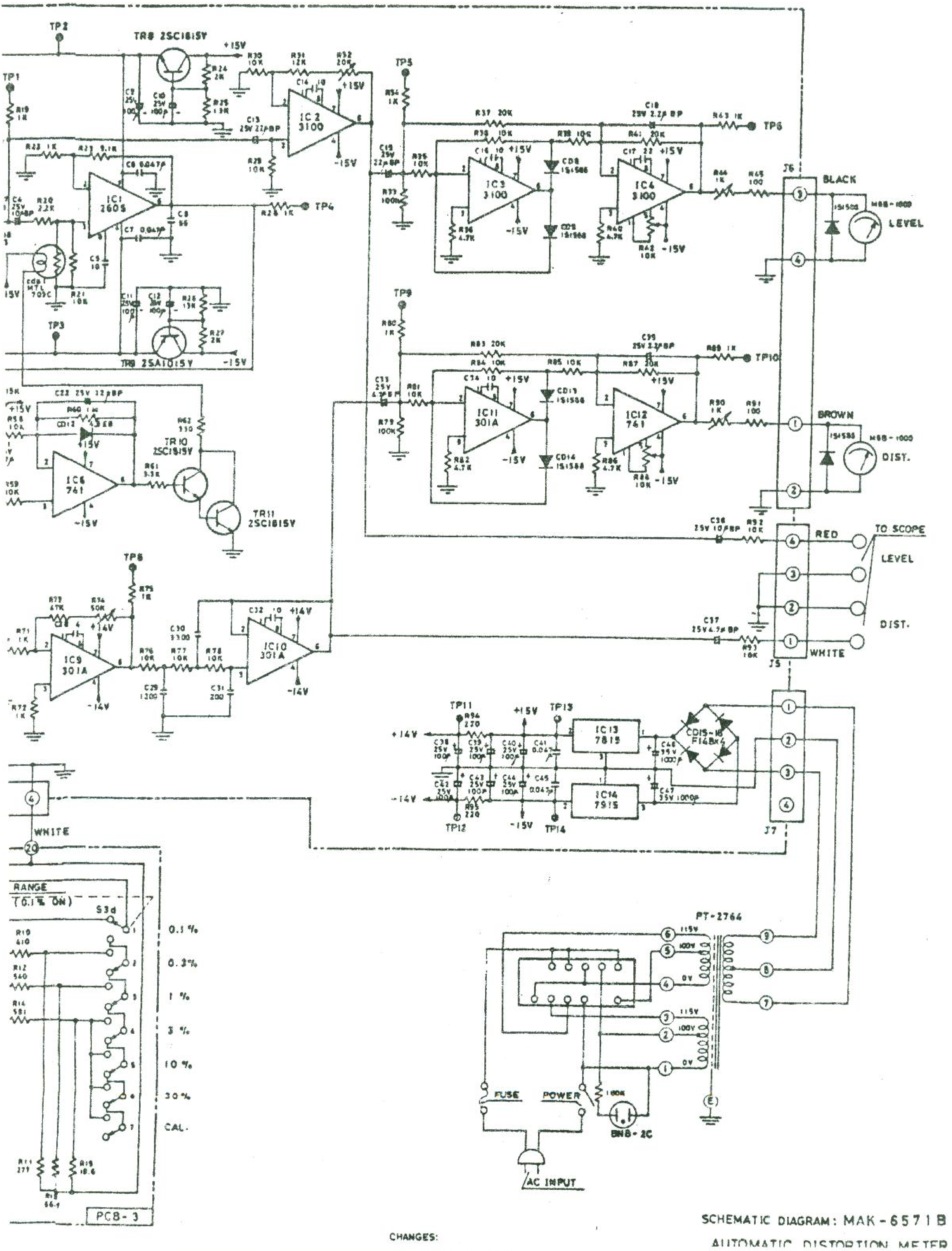




CHANGES:
DRAWING: KUBOTA
CHECK:

SCHEMATIC DIAGRAM: MAK-6571B
AUTOMATIC DISTORTION METER


PCB-1
S1 INPUT RANGE
(-20dB ON)
INPUT 100KΩ
C1~C7 ADJ.
PCB-2
TP1
TP2
TP3
TP7
TR1 2SK68A
TR2 2SK68A
TR3 2SA1015Y
TR6 2SA1015Y
TR5 2SC1815Y
TR7 2SA1015Y
RLY1 BHG102
RLY2 BHG102
GRAY
IC5A 4558
IC5B 4558
IC6 741
IC5; 4558, 4559
IC7 3100
IC8 741
IC9 301A
+15V
-15V
+14V
-14V
PCB-4 400 Hz H.P.F
INPUT
OUTPUT
PCB-5 1000 Hz H.P.F
OPTION
PCB-6
PCB-7
BROWN
GRAY
WHITE
S2 FUNCTION
(400Hz ON)
S3 DISTORTION RANGE
(0.1% ON)
TO FIL. IN
TO FIL. OUT
400Hz
1kHz
OPTION



SCHEMATIC DIAGRAM: MAK-6571B

AUTOMATIC DISTORTION METER

CHANGES: