

PRELIMINARY

Mainframe
Operating Manual

HP 37717C
Communications
Performance Analyzer

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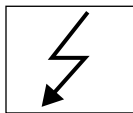
WARNING

For details of safety, see
Safety information at the
front of this manual.

Warning Symbols Used on the Product



The product is marked
with this symbol when the
user should refer to the
instruction manual in order
to protect the apparatus
against damage.



The product is marked
with this symbol to
indicate that hazardous
voltages are present



EN 60825 1991

The product is marked
with this symbol to
indicate that a laser is
fitted. The user should
refer to the laser safety
information in the
Calibration Manual.

Mainframe Operating Manual

**HP 37717C Communications Performance
Analyzer**

About This Book

“**The HP 37717C Mainframe Operating Manual**” explains how to perform instrument tasks associated with the HP 37717C irrespective of the option configuration. These tasks include:

How to obtain the required display

How to use the front panel keys

How to interpret the status indicators

How to connect to external equipment

How to log results

How to store and retrieve instrument set-ups and measurement data

“**The HP 37717C PDH /DSn Operating Manual**” describes the selection of PDH / DSn features and how to perform PDH / DSn tests with the HP 37717C Communications Performance Analyzer.

“**The HP 37717C SDH / SONET Operating Manual**” describes the selection of SDH /Sonet features and how to perform SDH / SONET tests with the HP 37717C Communications Performance Analyzer.

“**The HP 37717C Jitter Operating Manual**” describes the selection of Jitter features and how to perform Jitter tests with the HP 37717C Communications Performance Analyzer.

“**The HP 37717C ATM Operating Manual**” describes the selection of ATM features and how to perform ATM tests with the HP 37717C Communications Performance Analyzer.

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About the HP 37717C

This short chapter describes the capabilities of the various optional modules available, how to upgrade your instrument and some general information.

Instrument Options

The HP 37717C is a multi-rate bit error measuring test set. It can generate and receive a range of data patterns, and provide analysis to ITU-T Rec. G.821, G.826, M2100, M2110, M2120 depending on the options fitted.

75 Ω unbalanced data interfaces are provided at all PDH / DS_n data rates (except DS1, option UKZ) and STM-1 only. In addition 120 Ω balanced data interfaces are provided at 2.048 Mbit/s (and 704 kb/s in Option UKK [USB]). 100 Ω balanced data interface is provided for DS1 (UKZ only). AMI, HDB3, B8ZS or CMI coding is used depending on the selected rate.

Accurate error measurements can still be made in the presence of half-rate cable loss of up to 12 dB, and at protected monitor points.

Option UKK[USB] provides unstructured PDH measurements at standard bit rates of 704 kbit/s, 2.048 Mbit/s, 8.448 Mbit/s, 34.368 Mbit/s and 139.264 Mbit/s. Frequency offset capability of ± 100 ppm about the standard rates, is provided. At 704 kbit/s and 2.048 Mbit/s the generator timing can be recovered from the received data. In-Service FAS measurements are available at 2 Mb/s 8 Mb/s, 34 Mb/s and 140 Mb/s.

Option UKJ [USA] provides structured PDH generation and measurement at standard bit rates of 2.048 Mbit/s, 8.448 Mbit/s, 34.368 Mbit/s and 139.264 Mbit/s. Full Mux/Demux testing from 64 kb/s to 140 Mb/s including N X 64 kb/s, 2 Mb/s, 8 Mb/s and 34 Mb/s. Frequency offset capability of ± 100 ppm about the standard rates, is provided. At 2.048 Mbit/s the generator timing can be recovered from the received data.

Option UKN (USE) provides ATM generation and measurement at the Physical and Cell layers at bit rates of 2.048 Mb/s, 34.368 Mb/s, 139.264 Mb/s and if an SDH option is fitted 155.52 Mb/s.

Option UKZ provides ATM generation and measurement at the Physical and Cell layers at bit rates of 1.544 Mb/s (DS1), 44.736 Mb/s (DS3), 2.048 Mb/s (E1) and 34.368 Mb/s (E3). SDH/SONET rates are available via an SDH optional module.

Option USK Provides ATM Services layer generation and measurement with selectable header, payload and distribution for 1 foreground and up to 9 background channels. Graphic displays of the traffic at a point in the network, rate history and

About the HP 37717C Instrument Options

cell delay variation are provided. AAL-1, AAL-3/4 and AAL5 sublayer measurements are also included.

Option OYK Provides broadband auxiliary ATM generation and measurement with selectable header, payload and distribution for 1 foreground and up to 9 background channels. Graphic displays of the traffic at a point in the network, rate history and cell delay variation are provided. AAL-1, AAL-3/4 and AAL5 sublayer measurements are also included.

Option UHC (US6) Provides 3 additional data outputs, which are a replica of PDH Signal Out, each delayed by a defined amount.

Option US1[US5] provides generation and analysis of mapped, 140 Mb/s, 34 Mb/s and 2 Mb/s, SDH signals at STM-1 (155.52 Mb/s). Errors can be added to the mapped payload. A frequency offset capability is provided, allowing the SDH line rate frequency to be offset from its synchronized rate. In addition the capability of generating SDH Alarms and Errors is available.

Option A1T[A1U] provides the capability of US1[US5] and allows generation of ITU-T G.783 Pointer sequences and access to Overhead at STM-1 including Overhead Sequence generation and Capture.

Option URU provides a STM-1/STM-4 optical interface at 1550 nm, for long reach applications.

Option UKT provides a STM-1/STM-4 optical interface at 1330 nm with access to STM-4 overhead and Optical power measurement.

Option USN provides a STM-1/STM-4 optical interface at 1330 nm and 1550 nm with access to STM-4 overhead and Optical power measurement.

Option OYH provides binary interfaces for Options UKT and USN only.

Option UHK Adds Jitter generation at all PDH rates except 704 kb/s if a PDH option is fitted, and if Option US1[US5] or A1T [A1U] is fitted adds Jitter generation at STM-1/STM-4.

Option UHN [US9] Adds PDH Jitter measurement at all PDH rates except 704 kb/s, and adds Wander and Estimated Slips measurement at 2.048 Mb/s.

Option A1M [A1Q] adds Jitter measurement at STM-1 Electrical rate and all PDH rates except 704 kb/s.

Option A1N [A1R] adds SDH Jitter measurement at STM-1 Electrical and Optical rate and all PDH rates except 704 kb/s.

Option A1P [A1S] adds SDH Jitter measurement at STM-1 and STM-4 Optical rates, STM-1 Electrical rate and all PDH rates except 704 kb/s.

About the HP 37717C

Instrument Options

Option A3B provides an external printer port and remote control via RS-232-C, HP-IB and LAN.

Option A3D provides an external printer port and remote control via RS-232-C and HP-IB.

Option USS provides Distributed Network Analyser capability.

Option UKX provides an in lid printing facility.

About the HP 37717C
Instrument Options

Option Summary

The following table provides a summary of the available HP 37717C options. Standard options are fitted with BNC connectors. Options identified in [] have Siemens connectors.

Option No.	Description
UKK [USB]	Unstructured PDH generation and measurement.
UKJ [USA]	Structured PDH generation and measurement.
UKL [USC]	Structured PDH measurement only. (No Longer available).
UKN [USE]	ATM generation and measurement.
UKZ	ATM generation and measurement at DS1, DS3, E1 and E3 rates.
USK	ATM Services layer generation and measurement
0YK	Broadband auxiliary ATM generation and measurement
UHC [US6]	Multiple PDH outputs.
US1 [US5]	Generation and analysis of STM-1 electrical SDH signals, SDH frequency offset and Alarm/Error generation.
A1T [A1U]	As US1[US5] plus Pointer generation and Overhead access.
UH1	STM-1 Optical interface at 1310 nm.(No Longer available).
UH2	STM-1/STM-4 Optical interfaces at 1310 nm.(No Longer available).
URU	STM-1/STM-4 Optical interfaces at 1550 nm.
UKT	STM-1/STM-4 Optical Interface at 1310 nm, STM-4 overhead access and Optical power measurement.
USN	STM-1/STM-4 Optical Interface at 1310/1550 nm STM-4 overhead access and Optical power measurement.
0YH	SDH binary interface for Option UKT and USN only.
UH4	FC/PC optical adaptor for options UH1, UH2 and URU.
UH5	DIN47256 optical adaptor for options UH1, UH2 and URU.
UH6	ST optical adaptor for options UH1, UH2 and URU.
UH7	Biconic optical adaptor for options UH1, UH2 and URU.

About the HP 37717C

Instrument Options

Option No.	Description
UH8	NEC D4 optical adaptor for options UH1, UH2 and URU.
UHK	Jitter generation.
UHN [US9]	PDH Jitter measurement, Wander and estimated Slips.
A1M [A1Q]	STM-1 Electrical and PDH Jitter measurement.
A1N [A1R]	STM-1 Optical an electrical and PDH Jitter measurement.
A1P [A1S]	STM-1 Optical and Electrical, STM-4 Optical and PDH Jitter measurement.
A3B	Remote Control via RS-232-C, HP-IB and LAN, plus a Parallel Printer Port.
A3D	Remote Control via RS-232-C and HP-IB, plus a Parallel Printer Port
USS	Distributed Network Analyser capability.
UKX	In-lid Printer
1A8	Remote Control via HP-IB. (No Longer available).
1CW	Remote Control via RS-23-C. (No Longer available).
1F7	Remote Control via LAN. (No Longer available).
USE	Virtual Remoter capability.
OB2	Provides one additional operating manual.
OBF	Provides one additional remote control manual.
OB3	Provides a service manual.
W30	Provides two additional years of hardware support beyond the standard one year warranty.

About the HP 37717C
Installing Upgrade Modules

Installing Upgrade Modules

The HP 37717C Communications Performance Analyzer can be upgraded to include extra modules as your test needs change. If you have suitably qualified bench service technicians, aware of ESD (Electrostatic Discharge) hazards, then the module upgrade may be performed at your premises. If you do not have suitably qualified bench service technicians then we strongly recommend that the upgrade is performed at your nearest HP service office.

Ordering Upgrade Modules

1. Note the Model number and Serial number.
2. Affixed to the rear panel of the HP 37717C is a BUILD STATUS label. Note the information given on this label.
3. Determine the extra modules needed using the option numbers given in the glossy data sheet.
4. Pass the information gathered in 1, 2 and 3 to your local HP Sales and Service office.

NOTE

An upgrade module cannot be delivered unless the Serial number and Build Status information is provided.

Power Requirements

The HP 37717C Communications Performance Analyzer requires a power source of 90 V to 264 V at a frequency between 47 Hz and 63 Hz. Power consumption is 450 VA maximum.

The fuse rating for the power source is, 5A Timed 250V, HP part number 2110-1120.

About the HP 37717C
Power Requirements

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Getting Started

This chapter shows you how to select and change displays

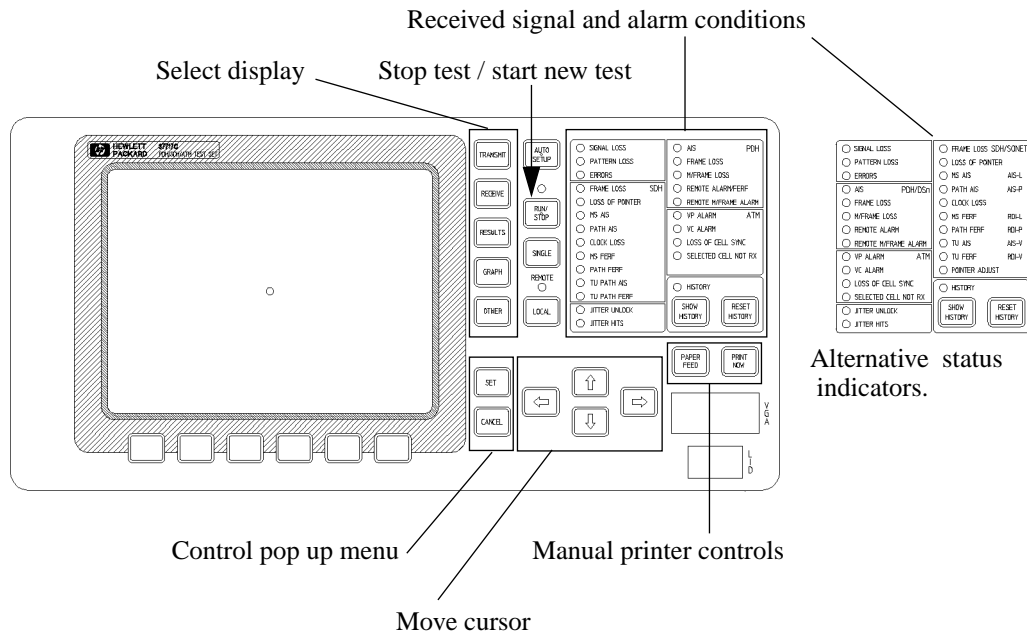
Getting Started

Getting Started shows you how to select displays and use them to change the instrument settings. Getting started includes the following :

- How to select single or multiple windows
- How to obtain the required display using the display select keys, **TRANSMIT** ; **RECEIVE** ; **RESULTS** ; **GRAPH** ; **OTHER**
- How to modify the display information, using    and  and the display softkeys or pop-up menus
- How to use the other front panel keys
- How to interpret the front panel status indicators
- How to connect to external equipment

Getting Started
Introduction to the 37717C Front Panel

Introduction to the 37717C Front Panel



The operator interface is provided by the display and the front panel keys.
The display may be multiple windows or a single window.
When the display is multiple windows, the "active" window is indicated with a colour which is different from the colour of the three "inactive" windows.

Getting Started Selecting Displays

Selecting Displays

Five different pages are available using the five page keys, **TRANSMIT**; **RECEIVE**; **RESULTS**; **GRAPH** and **OTHER** immediately to the right of the display. Any four of these may be displayed together in multiple windows:

TRANSMITTER OUTPUT [SDH]		RECEIVER INPUT [SDH]	
SDH [TEST] [OVERHEAD] FUNCTION SETUP	SDH [TEST] [OVERHEAD] FUNCTION MONITOR		
SIGNAL STM-1 [INTERNAL] CLOCK SYNC [INTERNAL] FREQUENCY OFFSET [OFF]	SIGNAL STM-1 LEVEL [TERMINATE]		
PAYLOAD [140 Mb/s]	PAYLOAD [140 Mb/s]		
PAYLOAD TYPE UNFRAMED PATTERN [2 ⁿ 23-1 PRBS] PRBS POLARITY [INV] CCITT 140M OFFSET [0 ppm]	PAYLOAD TYPE UNFRAMED PATTERN [2 ⁿ 23-1 PRBS] PRBS POLARITY [INV] CCITT		
RESULTS [TROUBLE SCAN]		FUNCTION [STORED SETTINGS]	
		STORED SETTING NUMBER [0] ACTION [OFF]	
		SETTING 0 FACTORY DEFAULT SETTINGS 1 2 3 4 5 6 7 8 9	
ELAPSED TIME			
STATUS: SDH [ATM]		SINGLE WINDOW	

TRANSMIT

Allows control of the settings associated with the generated signal.

RECEIVE

Allows control of the settings associated with the received signal.

RESULTS

Allows control of the Test timing and displays the selected measurement results.

GRAPH

Allows management of the stored graphical results.

OTHER

Allows control of Stored Settings, Settings Control, Time & Date, Keyboard Lock, Logging, Remote Control, Beep On Error, Analysis Control, Analysis Display Mode, Floppy Disk and Self Test.

A list of Options fitted is also displayed.

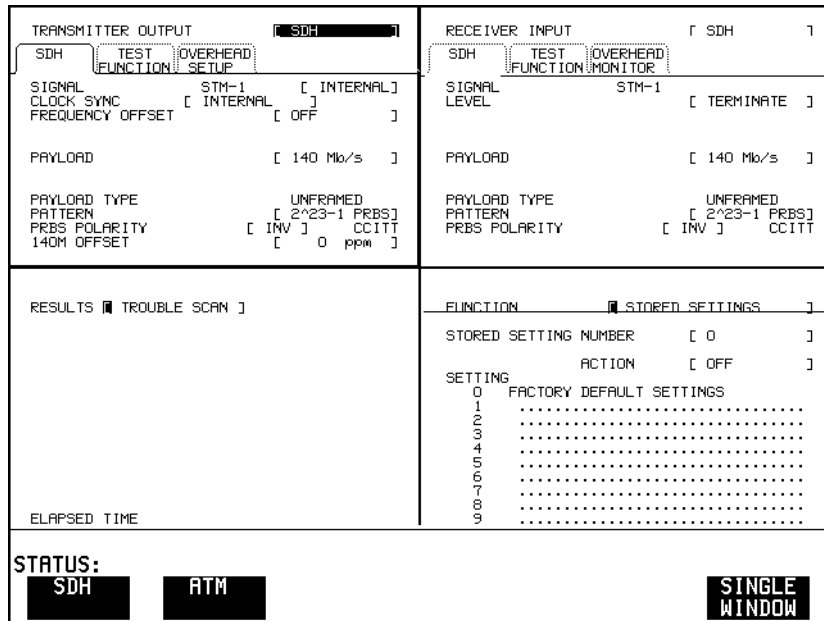
Getting Started
Selecting Displays

Selecting Multiple or Single Windows

To select single window, use the display keys **TRANSMIT**; **RECEIVE**; **RESULTS**; **GRAPH** and **OTHER** , to select the display required and then press **SINGLE WINDOW**

Most examples in this manual use SINGLE window.To return to multiple windows, press **MULTIPLE WINDOW**

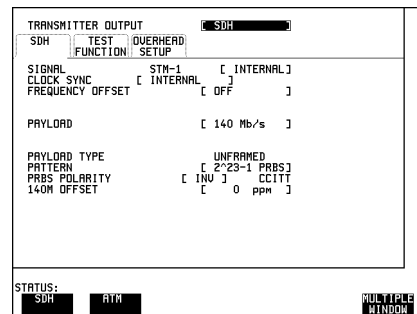
Example: To obtain a single window transmit display, Use **TRANSMIT** to make the transmit window active



Use **SINGLE WINDOW** to obtain a single transmit window display

To change the page displayed in the single window, Press the page key for the page required.

When returning to multiple windows, the current single window display will become the active display within the multiple windows.



Getting Started Selecting Displays

Moving Around Multiple Windows

To move the cursor to another of the displayed windows, press the display selection key for that window.

Example: The cursor is in the TRANSMITTER OUTPUT window at the top left of the display.

TRANSMITTER OUTPUT [SDH] SDH [TEST OVERHEAD] FUNCTION SETUP SIGNAL STM-1 [INTERNAL] CLOCK SYNC [INTERNAL] FREQUENCY OFFSET [OFF] PAYLOAD [140 Mb/s] PAYLOAD TYPE UNFORMED PATTERN [2 ²³ -1 PRBS] PRBS POLARITY [INV] CCITT 140M OFFSET [0 ppm]		RECEIVER INPUT [SDH] SDH [TEST OVERHEAD] FUNCTION MONITOR SIGNAL STM-1 LEVEL [TERMINATE] PAYLOAD [140 Mb/s] PAYLOAD TYPE UNFORMED PATTERN [2 ²³ -1 PRBS] PRBS POLARITY [INV] CCITT	
RESULTS [TROUBLE SCAN] ELAPSED TIME		FUNCTION [STORED SETTINGS] STORED SETTING NUMBER [0] ACTION [OFF] SETTING 0 FACTORY DEFAULT SETTINGS 1 2 3 4 5 6 7 8 9	
STATUS: SDH ATM		SINGLE WINDOW	

If you want to make changes to the receive display, you need to make the receive display "active". To move the cursor to the RECEIVER INPUT window at the top right of the display, press **RECEIVE**.

TRANSMITTER OUTPUT [SDH] SDH [TEST OVERHEAD] FUNCTION SETUP SIGNAL STM-1 [INTERNAL] CLOCK SYNC [INTERNAL] FREQUENCY OFFSET [OFF] PAYLOAD [140 Mb/s] PAYLOAD TYPE UNFORMED PATTERN [2 ²³ -1 PRBS] PRBS POLARITY [INV] CCITT 140M OFFSET [0 ppm]		RECEIVER INPUT [SDH] SDH [TEST OVERHEAD] FUNCTION MONITOR SIGNAL STM-1 LEVEL [TERMINATE] PAYLOAD [140 Mb/s] PAYLOAD TYPE UNFORMED PATTERN [2 ²³ -1 PRBS] PRBS POLARITY [INV] CCITT	
RESULTS [TROUBLE SCAN] ELAPSED TIME		FUNCTION [STORED SETTINGS] STORED SETTING NUMBER [0] ACTION [OFF] SETTING 0 FACTORY DEFAULT SETTINGS 1 2 3 4 5 6 7 8 9	
STATUS: SDH ATM		SINGLE WINDOW	

Getting Started

Selecting Displays

Selecting the Undisplayed Window in Multiple Windows

Select the window that you want to replace.

Press the display function that you want to replace it with.

Example: To change the top left window from TRANSMITTER OUTPUT to GRAPH. Press **TRANSMIT** to move the cursor to the top left window.

TRANSMITTER OUTPUT [SDH] SDH [TEST] [OVERHEAD] FUNCTION [SETUP] SIGNAL STM-1 [INTERNAL] CLOCK SYNC [INTERNAL] FREQUENCY OFFSET [OFF] PAYLOAD [140 Mb/s] PAYLOAD TYPE UNFRAMED PATTERN [2 ²³ -1 PRBS] PRBS POLARITY [INV] CCITT 140M OFFSET [0 ppm]		RECEIVER INPUT [SDH] SDH [TEST] [OVERHEAD] FUNCTION [MONITOR] SIGNAL STM-1 LEVEL [TERMINATE] PAYLOAD [140 Mb/s] PAYLOAD TYPE UNFRAMED PATTERN [2 ²³ -1 PRBS] PRBS POLARITY [INV] CCITT	
RESULTS [TROUBLE SCAN] ELAPSED TIME		FUNCTION [STORED SETTINGS] STORED SETTING NUMBER [0] ACTION [OFF] SETTING 0 FACTORY DEFAULT SETTINGS 1 2 3 4 5 6 7 8 9	
STATUS: SDH [ATM]		SINGLE WINDOW	



Press **GRAPH** to select the graph display.

STORE [ZOOM] 60 MINS [BURST] MON 00:00 LAST [BAR] 1-JAN-1990 BIT 10 ⁴ ERROR 10 ⁴ COUNT 10 ⁴ NO DATA 10 ⁴ 10 ⁴ 10 ⁴ 10 ⁴ 0 POWER TIME TIME TIME RESULTS PATTERN PATTERN 00:00 MON 00:00 TUE 00:00		RECEIVER INPUT [SDH] SDH [TEST] [OVERHEAD] FUNCTION [MONITOR] SIGNAL STM-1 LEVEL [TERMINATE] PAYLOAD [140 Mb/s] PAYLOAD TYPE UNFRAMED PATTERN [2 ²³ -1 PRBS] PRBS POLARITY [INV] CCITT	
RESULTS [TROUBLE SCAN] ELAPSED TIME		FUNCTION [STORED SETTINGS] STORED SETTING NUMBER [0] ACTION [OFF] SETTING 0 FACTORY DEFAULT SETTINGS 1 2 3 4 5 6 7 8 9	
STATUS: TEXT [ZOOM] [CHANGE] [CHANGE] [PRINT] [SINGLE] RESULTS [IN] [UPPER] [LOWER] [WINDOW]			

Getting Started

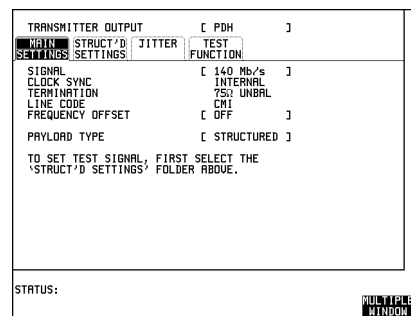
Changing the Displayed Folder

Changing the Displayed Folder

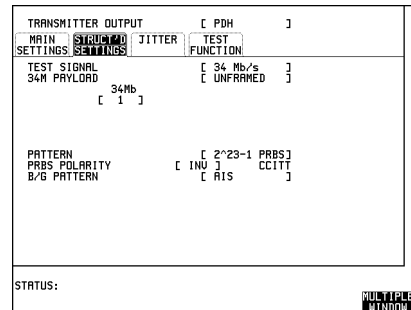
Many windows displayed with the **TRANSMIT** ; **RECEIVE** ; and **RESULTS** keys contain a number of “folders” which may be selected with  and .

Example

To change the PDH display shown from MAIN SETTINGS to STRUCTURED SETTINGS.



Use .



Getting Started
Changing the Instrument Settings

Changing the Instrument Settings

Settings which may be changed are displayed in a different colour to those which are fixed. In this manual, variable settings are shown on the displays in [].

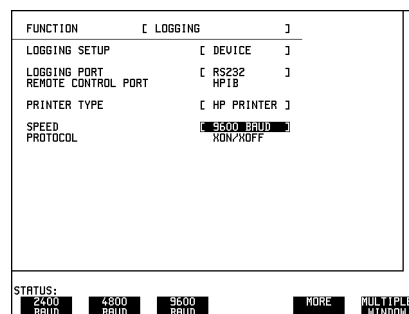
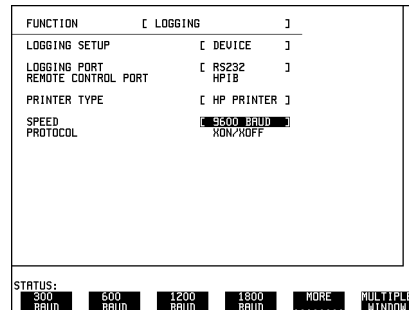
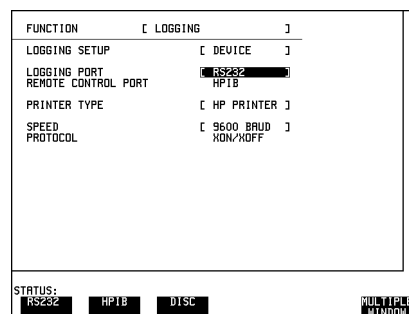
In each of the display areas the field currently able to be changed is marked by a highlighted cursor

The highlighted cursor is moved around the display using    and .

The menu of selections available, for the highlighted field, appears at the bottom of the display : **RS232** ; **HP IB** ; **DISK** . The choice from the menu is made using the display softkeys situated immediately below the display.

When a field has more than five choices, as in SPEED shown here, a softkey labelled **MORE** is provided.

When **MORE** is chosen the remainder of the menu is revealed .



Getting Started

Changing the Instrument Settings

Modifying Displays with Pop-up Menus

Although the method of modifying the displays with softkeys is always available, it is easier in many cases to use the Pop-up menus.

The pop-up menus are particularly useful for:

- Text entry
- Date/time entry
- Integer, Hexadecimal and Binary entry
- Trace data entry
- Menu selection when there are a large number of choices
- SDH payload mapping
- ATM physical and adaptation layer selections
- Jitter mask selections

If an attempt is made to set out of range values, the instrument will adopt the nearest possible legal value.

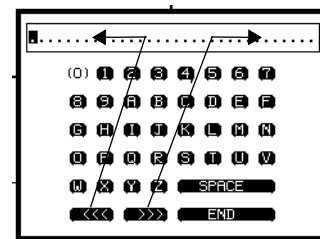
Text, Trace Data, Date and Time, Integer and Hexadecimal Selection.

Move the cursor to the field to be changed.

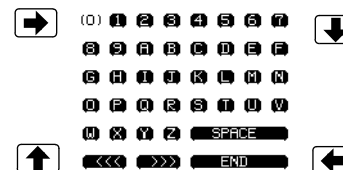
Press **SET** for the pop-up menu.

The current setting is shown in a window at the top of the pop-up menu.

To move through the current setting in the pop-up menu use **<<<** and **>>>**.



Select the required character or function on the pop-up menu with **↓**, **↑**, **→** and **←**.



Getting Started

Changing the Instrument Settings

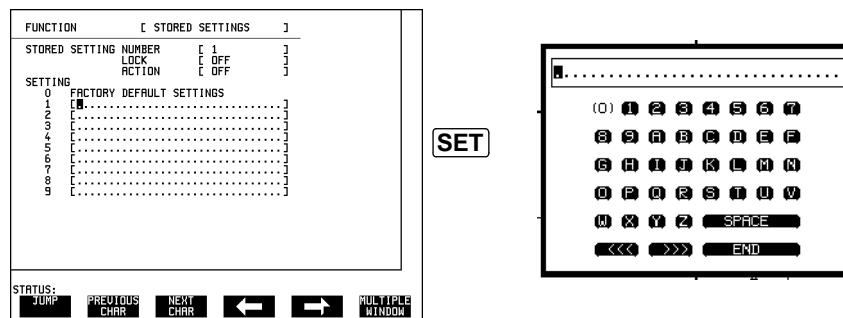
Press **SET** to set the selection in the window at the top of the pop-up menu.

When the required content is displayed in the window at the top of the pop-up menu, select **END** and press **SET** to change the instrument setting to the new value.

To exit the menu display without making the change, press **CANCEL**.

Example:

The pop-up menu provides a more convenient method of entering stored setting titles. Move the cursor into one of the title fields and press **SET**.



Binary Entry

For fields which require binary data entry, use **SET** to display the pop-up menu.

The current setting is shown in a window at the top of the pop-up menu.

To move through the selected entry with the pop-up menu use **<<<** and **>>>** see page 18.

Binary selection is achieved with **←** = 0 and **→** = 1. This operation enters the selected character, 0 or 1, and moves to the next character.

This method allows rapid setting of binary words. For example:

To set the word 11110011 Use **→ → → → ← ← → →**.

Selection of the last character changes the instrument setting to the new value.

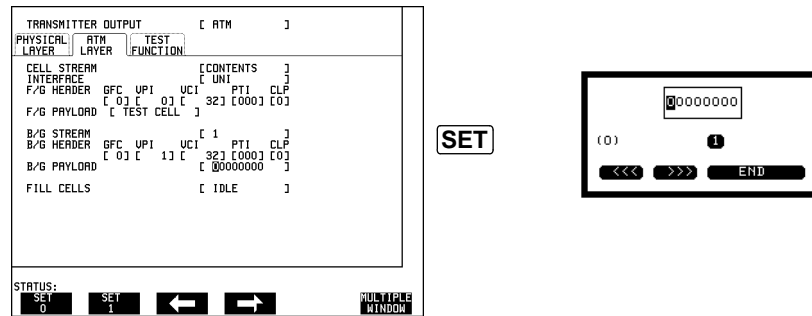
To exit the menu display without making the change, press **CANCEL**.

Getting Started

Changing the Instrument Settings

Example:

The binary pop-up menu maybe used to set up a user defined word. In this example the user defined word is an ATM payload background byte.

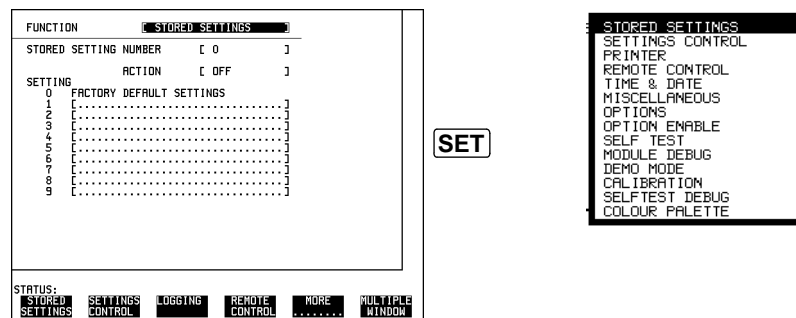


Menu Selection

There is a menu selection available as an alternative to any group of soft keys. Display the menu with **SET**. Use **↑** and **↓** to make the selection.

To change to the new value, press **SET**. To exit the display without making the change, press **CANCEL**.


Example:



Getting Started

Changing the Instrument Settings


Making Selections using Pictorial and Graphic Displays.

In some cases selection is simplified with a pictorial or graphic "map" display. This facility is available where the display has a  symbol. These displays are obtained in the same way as the pop-up menus using **SET**. Some of these displays include menus which allow the settings to be changed.

NOTE

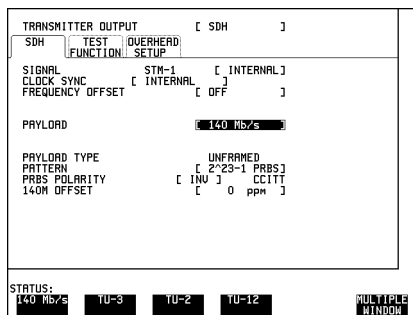
Details of the pictorial display depend on the optional modules fitted to the instrument.

SDH Payload Mapping

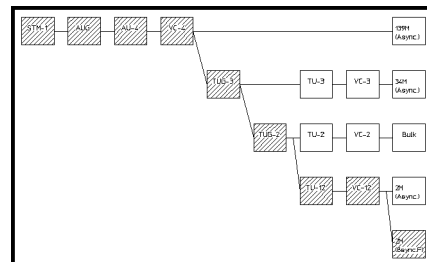
With the cursor in the SDH PAYLOAD field, Press **SET** to display the payload map. Use  and  to select the mapping you want.

To change to the new value, press **SET**. To exit the map display without making the change, press **CANCEL**.

Example:



SET



Getting Started

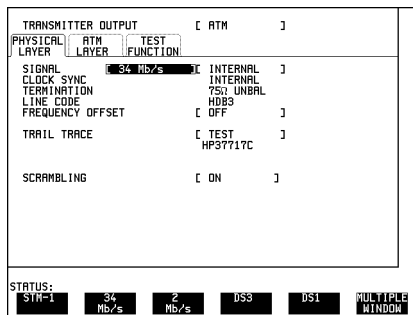
Changing the Instrument Settings

ATM Physical and Adaptation Layer Selections

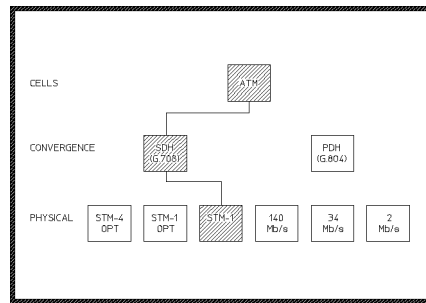
With the cursor in the ATM, PHYSICAL LAYER, SIGNAL field, Press **SET** to display the physical interface. Use **←** and **→** to select the interface you want.

To change to the new value, press **SET**. To exit the map display without making the change, press **CANCEL**.

Example:

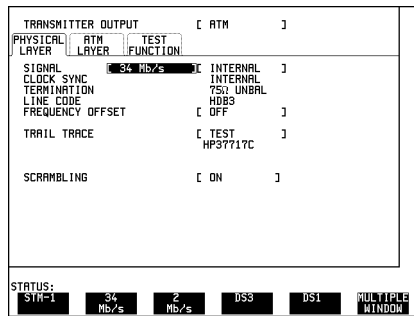


SET

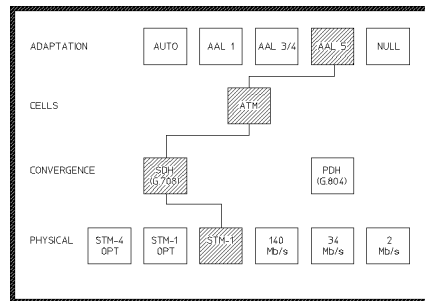


With the cursor in the ATM, ADAPTATION LAYER (AAL) field, Press **SET** to display the adaptation and physical interface. Use **↑** and **↓** to select the adaptation or physical layer and use **←** and **→** to select the interface you want.

To change to the new value, press **SET**. To exit the map display without making the change, press **CANCEL**.



SET



Getting Started

Changing the Instrument Settings

Jitter Mask Selection

Graphical displays of jitter mask selections are available. The current settings are shown by a marker on the graphical display.

Jitter Mask set to Off

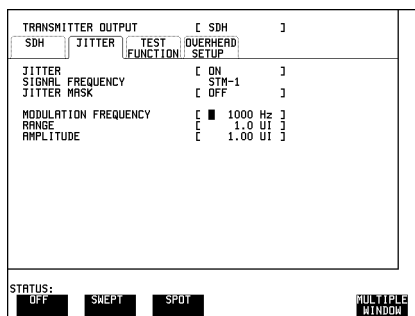
To obtain a graphical display, move the cursor to MODULATION FREQUENCY, RANGE or AMPLITUDE and press **SET**.

To change a value, use **←** **→** **↑** and **↓** to select the parameter you want to change.

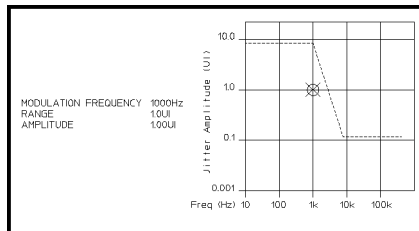
Press **SET** for a pop-up menu of the values available for the parameter selected. Use **↑** and **↓** to make your selection from the pop-up menu and press **SET** again to select to the new value.

The marker on the graphical display will move to the new position and set the new value.

To exit the graphical display with the new value set, press **CANCEL**.



SET



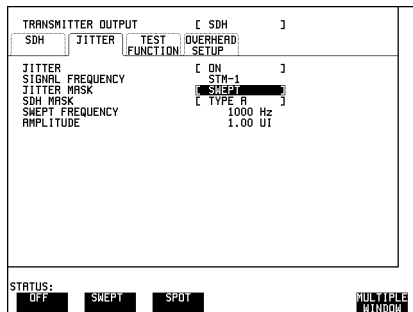
Getting Started

Changing the Instrument Settings

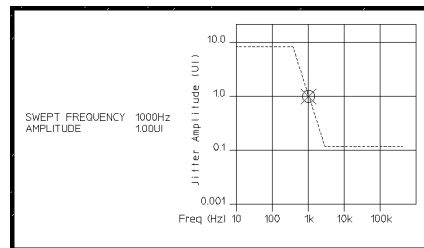
Jitter Mask set to Swept

To obtain a pictorial display, move the cursor to JITTER MASK [SWEPT] and press **SET**. The marker moves continuously through the sweep range.

To exit the pictorial display use **CANCEL**.



SET



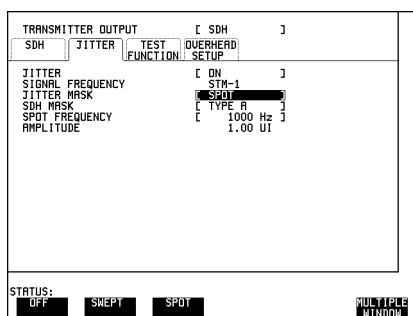
Jitter Mask set to Spot

To obtain a graphical display, move the cursor to SPOT FREQUENCY and press **SET**.

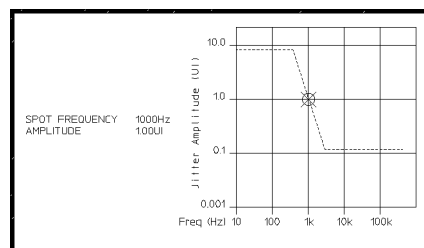
To change the frequency press **SET** for a pop-up menu of the values available.

Use **←** **→** **↑** and **↓** to make your selection from the pop-up menu and press **SET** again to select to the new value. The marker on the graphical display will move to the new position and update the value.

To exit the graphical display with the new value set, press **CANCEL**.



SET



Getting Started

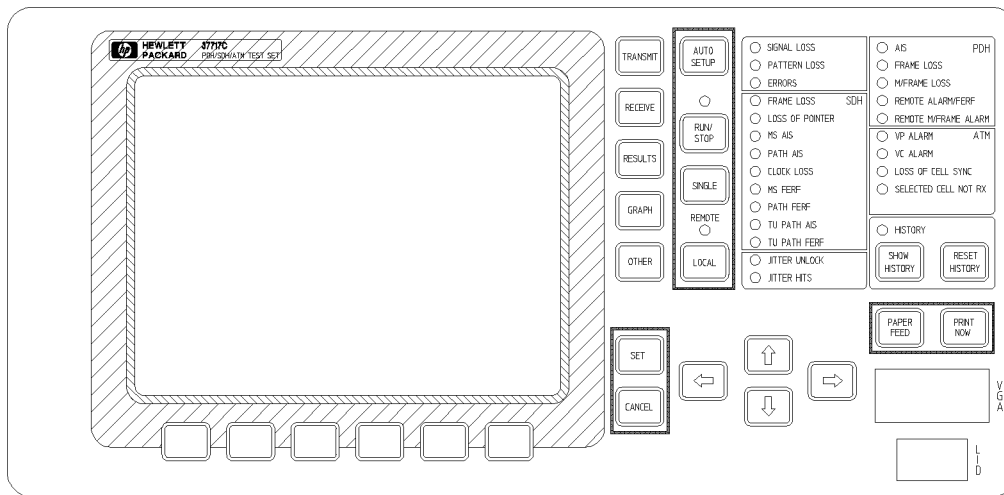
Changing the Instrument Settings

Use with a Monitor

For ease of viewing at a distance, the instrument display may be presented on a monitor. The monitor should be connected to the front panel VGA connector.

Getting Started
Other Front Panel Keys

Other Front Panel Keys



AUTO SETUP

The test set attempts to match the settings to the received signal.

RUN/STOP

Terminates the current test period if one is in progress. Starts a new test period. The indicator above the key is lit when a test period is in progress.

SINGLE

Adds a single bit error to the output data pattern each time the key is pressed.

LOCAL

Returns the instrument from remote operation to Local (keyboard) operation. The indicator above the key is lit when the instrument is under Remote Control.

SET

Displays the pop-up menu for the currently highlighted field. This key also confirms the selection made.

CANCEL

Clears the pop-up menu without changing the selection.

PRINT NOW

The selected measurement results are logged, immediately, to the selected printer.

PAPER FEED

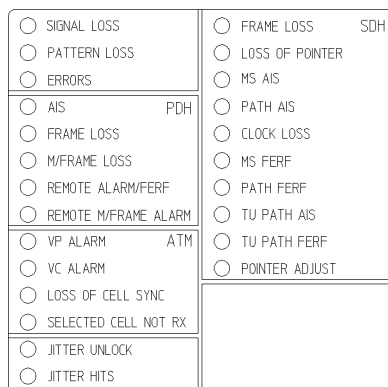
The paper in the internal printer rolls up.

CAUTION

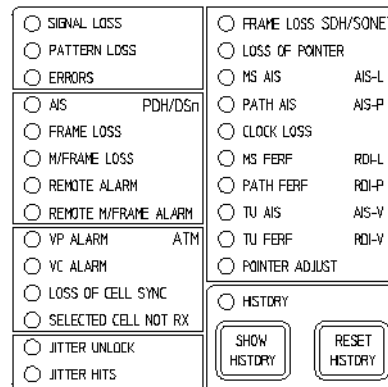
Do not press **PAPER FEED** while attempting to load a new roll of paper in the printer. It could result in a paper jam and disable the printer. Wait until the paper is fed through the printer mechanism before pressing **PAPER FEED**.

Getting Started
Status Indicators

Status Indicators



ETSI Version Indicators



ETSI / ANSI Version Indicators

History Keys

The Status indicators on the front panel convey information regarding the current status of the instrument. If an alarm has occurred during the current Test Period the indicator above **SHOW HISTORY** is lit. To view which alarms have occurred press and hold **SHOW HISTORY**. When **SHOW HISTORY** is released the status indicators return to displaying the current status.

SHOW HISTORY

When pressed and held the Status indicators display any alarms which have been set during the current Test Period. This continues until **SHOW HISTORY** is released at which time the current status is displayed. The indicator above the key is lit to signify that an alarm has occurred during the current Test Period.

RESET HISTORY

Resets the history store such that the historical and present status are the same. This can also be achieved by starting a new Test Period.

General Alarm Indicators

Signal Loss No data transitions at the input port.

Pattern Loss The received data pattern is not in synchronization with the internally generated reference data.

Errors A measured error has occurred. The indicator will remain lit for 100 ms

Getting Started

Status Indicators

PDH / DS_n Alarm Indicators

These are active when a PDH / DS_n rate is received

AIS	The All Ones AIS signal is detectable in the presence of a 1 in 10 ⁻³ error rate.
Frame Loss	Frame alignment lost.
M/Frame Loss	Multiframe alignment lost.
Remote Alarm	Remote alarm bit is set.
Remote M/Frame Alarm	Remote Multiframe Alarm bit is set.

SDH Alarm Indicators

These are active when an SDH rate is received.

Frame Loss	Loss Of Frame or Out Of Frame has been detected. Status message on bottom of display states which has occurred.
Loss Of Pointer	Loss of AU4 pointer has been detected.
MS AIS	Multiplexer Section AIS has been detected.
Path AIS	Path AIS has been detected.
Pattern Loss	The received data pattern is not in synchronization with the internally generated reference data.
Clock Loss	The transmitter clock is not synchronized to the selected reference.
MS FERF	Multiplexer Section has been detected.
Path FERF	Path FERF has been detected.
TU Path AIS	TU Path AIS has been detected. Only valid when 2 Mb/s or 34 Mb/s receiver payload is selected.
TU Path FERF	TU Path FERF has been detected. Only valid when 2 Mb/s or 34 Mb/s receiver payload is selected.
Pointer Adjust	A change in the AU4 pointer has been detected.

Getting Started

Status Indicators

SONET Alarm Indicators

These are active when a SONET rate is received.

Frame Loss	Loss Of Frame or Out Of Frame has been detected. Status message on bottom of display states which has occurred.
Loss Of Pointer	Loss of AU4 pointer has been detected.
AIS-L	Line AIS has been detected.
AIS-P	Path AIS has been detected.
Clock Loss	The transmitter clock is not synchronized to the selected reference.
RDI-L	Line Remote Defect Indication has been detected.
RDI-P	Path Remote Defect Indication has been detected.
AIS-V	Virtual tributary AIS has been detected. Only valid when 2 Mb/s or 34 Mb/s receiver payload is selected.
RDI-V	Virtual tributary RDI has been detected. Only valid when 2 Mb/s or 34 Mb/s receiver payload is selected.
Pointer Adjust	A change in the AU4 pointer has been detected.

ATM Alarm Indicators

These are active when an ATM signal is received.

VP Alarm	Virtual Path AIS or FERF has been detected.
VC Alarm	Virtual Channel AIS or FERF has been detected.
Loss of Cell Sync	Cell Sync Loss has been detected.
Selected Cell Not RX	The selected cell has not been received.

Connectors

- PDH IN (Opt UKJ/UKK/UKN)** PDH receiver input interface. Allows the connection of 75 Ω unbalanced data signals (all rates) and 120 Ω balanced data signals at 2 Mbit/s (and 704 kb/s Option UKK[USB]).
- PDH OUT (Opt UKJ/UKK/UKN)** PDH transmitter output interface. Provides 75 Ω unbalanced data output (all rates) and 120 Ω balanced data output at 2 Mbit/s (and 704 kb/s Option UKK[USB]).
- DS3, 2Mb/s, 34Mb/s 75 Ω IN (Opt UKZ)** PDH / DS3 receiver input interface. Allows the connection of 75 Ω unbalanced DS3, 2 MB/s and 34 Mb/s data signals.
- DS3, 2Mb/s, 34Mb/s 75 Ω OUT (Opt UKZ)** PDH / DS3 transmitter output interface. Provides 75 Ω unbalanced DS3, 2 MB/s and 34 Mb/s data output.
- DS1 100 Ω , 2Mb/s 120 Ω IN (Opt UKZ)** PDH / DS1 receiver input interface. Allows the connection of 100 Ω balanced DS1 and 120 Ω balanced 2 Mb/s data signals.
- DS1 100 Ω , 2Mb/s 120 Ω OUT (Opt UKZ)** PDH / DS1 transmitter output interface. Provides 100 Ω balanced DS1 and 120 Ω balanced 2 Mb/s data signals.
- 75 Ω OUT 1 (Opt UHC)** Replica of PDH / DS_n OUT delayed by 4 bits at all rates except 140 Mb/s.
- 75 Ω OUT 2 (Opt UHC)** Replica of PDH / DS_n OUT delayed by 8 bits at all rates except 140 Mb/s.
- 75 Ω OUT 3 (Opt UHC)** Replica of PDH / DS_n OUT delayed by 12 bits at all rates except 140 Mb/s.

Getting Started

Connectors

ERROR OUT (Opt UKK)

Provides an ECL pulse each time an error occurs. If 2 or more errors occur within 16 clock periods only 1 pulse is output.

STM-1 OUT (Opt US1/A1T)

SDH transmitter output interface. Provides a 75 Ω unbalanced STM-1 electrical output.

STM-1 IN (Opt US1/A1T)

SDH receiver input interface. Allows the connection of 75 Ω unbalanced STM-1 electrical signals.

EXT MTS CLOCK (Opt US1/A1T)

Allows connection of a, 75 Ω or 120 Ω , timing reference as per CCITT G.811. The reference format may be either clock or data. Options US1[US5] and A1T[A1U] only.

OPTICAL IN (Opt UH1, UH2, URU, UKT, USN)

Allows connection of an STM-1 or STM-4 optical signal. Option UH1 only accepts STM-1, Wavelength 1200 to 1600 nm, at a maximum power level of -8 dBm. Options UH2, URU, UKT and USN accept STM-1 or STM-4, Wavelength 1200 to 1600 nm, at a maximum power level of -8 dBm.

OPTICAL OUT (Opt UH1, UH2, URU, UKT, USN)

Provides a STM-1 or STM-4 optical signal. Option UH1 provides a STM-1 optical signal, wavelength 1280 to 1330 nm, at a nominal power level of -10 dBm. Options UH2 and UKT provide a STM-1 and STM-4 optical signal, wavelength 1280 to 1330 nm, at a nominal power level of -10 dBm. Option URU provides a STM-1 and STM-4 optical signal, wavelength 1550 to 1565 nm, at a nominal power level of -1 dBm. Option USN provides a STM-1 and STM-4 optical signal, wavelength 1280 to 1330 nm and 1550 to 1565 nm, at a nominal power level of -1 dBm.

CLOCK IN (Opt OYH)

Allows connection of STM-1/STM-4 binary clock to Options USN or UKT.

DATA IN (Opt OYH)

Allows connection of STM-1/STM-4 binary data to Options USN or UKT.

Getting Started Connectors

CLOCK OUT (Opt OYH)	Provides a STM-1/STM-4 binary clock from Options USN or UKT.
CLOCK OUT (Opt UKZ)	Provides an output of the transmitter clock.
DATA OUT (Opt OYH)	Provides STM-1/STM-4 binary data from Options USN or UKT.
HANDSET (Opt UKJ)	Allows connection of a telephone handset for communication across the network.
MUX (Opt UKJ)	Allows the insertion of an external 2 Mb/s tributary into the transmitted payload.
MUX DS1 100 Ω (Opt UKZ)	Allows the insertion of an external DS1 into the transmitted payload.
MUX 2 Mb/s 75 Ω (Opt UKZ)	Allows the insertion of an external 2 Mb/s tributary into the transmitted payload.
DEMUX (Opt UKJ)	Provides a 2 Mb/s tributary dropped from the received payload.
DEMUX DS1 100 Ω (Opt UKZ)	Provides a DS1 dropped from the received payload.
DEMUX 2 Mb/s 75 Ω	Provides a 2 Mb/s tributary dropped from the received payload
2M REF IN (Opt UHN, A1M, A1N, A1P)	Allows the connection of a 2 Mb/s reference, either Clock or Data for Wander measurement.

Getting Started

Connectors

DEMOD OUT

(Opt UHN, A1M.

A1N, A1P)

Provides a demodulated Jitter output.

RS 449 (Opt A1T) Allows the Drop and Insert of Regenerator Section (192 kb/s) and Multiplexer Section (576 kb/s) Data Communication Channels (DCC).

TRIG OUT (Opt

UKZ)

Provides an output pulse when the selected error is received: Bit Error, Errored Cell, Single HEC Error or Double HEC Error

LID

Provides the output for the option UKX printer which is fitted in the cover (LID) of the instrument.

VGA

Provides the output for a display monitor.

Getting Started

Basic Error Measurement Example

Basic Error Measurement Example

This simple procedure explains how to perform the following:

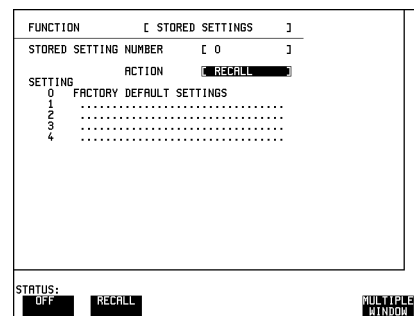
- Recall the factory default settings using the STORED SETTINGS function.
- Set up a simple back-to-back bit error measurement.
- Start the measurement and monitor the results.

This example uses the structured PDH module (UKJ [USA]). A similar sequence of operations will apply to instruments with alternative modules.

Recall Factory Default Settings

1. Set up the STORED SETTINGS function on the **OTHER** display as shown opposite and select STORED SETTING NUMBER [0].

Press **RECALL** to recall the factory default settings.



The recalling of factory default settings will configure the instrument in a defined state. One important feature of the factory default settings is that the Graphics Store capability is turned off. This prevents the possibility of any previously stored graphics data being discarded.

Getting Started

Basic Error Measurement Example

Structured PDH Setup (Option UKJ (USA))

- 1 Set up the **TRANSMIT** MAIN SETTINGS display as shown..

TRANSMITTER OUTPUT	[PDH]
MAIN SETTINGS	STRUCT'D TEST
SETTINGS	SETTINGS FUNCTION
SIGNAL	[140 Mb/s]
CLOCK SYNC	INTERNAL
TERMINATION	75% UNBAL
LINE CODE	CM
FREQUENCY OFFSET	[OFF]
PAYLOAD TYPE	STRUCTURED
TO SET TEST SIGNAL, FIRST SELECT THE 'STRUCT'D SETTINGS' FOLDER ABOVE.	
STATUS:	
<input type="checkbox"/> UNFRAMED	<input type="checkbox"/> FRAMED
<input type="checkbox"/> STRUCT'D	<input type="checkbox"/> MULTIPLE WINDOW

- 2 Set up the **TRANSMIT** STRUCTURED SETTINGS display as shown..

TRANSMITTER OUTPUT	[PDH]
MAIN SETTINGS	STRUCT'D TEST
SETTINGS	SETTINGS FUNCTION
TEST SIGNAL	[2 Mb/s]
ZH PAYLOAD	[PCM30]
	[34Mb 8Mb 2Mb]
	[1] [1] [1]
PATTERN	[2 ¹⁵ -1 PRBS]
PRBS POLARITY	[INU]
B/G PATTERN	[CCITT]
	[AIS]
STATUS:	
	<input type="checkbox"/> MULTIPLE WINDOW

- 3 Set up the **TRANSMIT** TEST FUNCTION display as shown to enable the **SINGLE**(error add) key. .

TRANSMITTER OUTPUT	[PDH]
MAIN SETTINGS	STRUCT'D TEST
SETTINGS	SETTINGS FUNCTION
TEST FUNCTION	[PDH]
ERROR ADD TYPE	ERRORS
RATE	[BIT (TEST)]
	[OFF]
STATUS:	
<input type="checkbox"/> NONE	<input type="checkbox"/> PDH
	<input type="checkbox"/> MULTIPLE WINDOW

Getting Started

Basic Error Measurement Example

- 4 Set up the **RECEIVE** MAIN SETTINGS display as shown..

RECEIVER INPUT	[PDH]
MAIN SETTINGS	STRUCT'D SETTINGS
SIGNAL	[140 Mb/s]
TERMINATION	75Ω UNBAL
LINE CODE	CM1
LEVEL	[MONITOR]
EQUALIZER	[OFF] GAIN [20 dB]
PAYLOAD TYPE	[STRUCTURED]
TO SET TEST SIGNAL, FIRST SELECT THE 'STRUCT'D SETTINGS' FOLDER ABOVE	
STATUS:	
MULTIPLE WINDOW	

- 5 Set up the **RECEIVE** STRUCTURED SETTINGS display as shown below.

RECEIVER INPUT	[PDH]
MAIN SETTINGS	STRUCT'D SETTINGS
TEST SIGNAL	[2 Mb/s]
2M PAYLOAD	[PCM30]
	34Mb 8Mb 2Mb
	[1] [1] [1]
PATTERN	[2 ⁿ -15-1 PRBS]
PRBS POLARITY	[INU] CCITT
STATUS:	
MULTIPLE WINDOW	

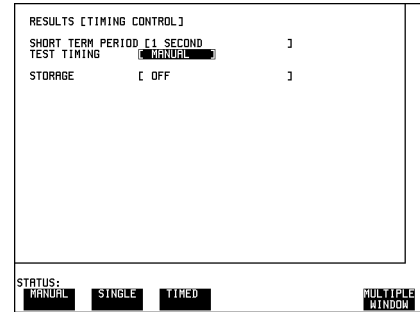
- 6 Set up the **RESULTS** display as shown opposite. Any of the other results can be viewed on the display by making a choice from the softkey menu.

RESULTS	[PDH]	[CUMULATIVE]
		BIT
BIT EC		
BIT ER		
ELAPSED TIME		
STATUS:		
TROUBLE SHOOT	TUNING CONTROL	PDH RESULTS
		PDH ALM. SCAN
MULTIPLE WINDOW		

Getting Started

Basic Error Measurement Example

- 7 Set up the **RESULTS** **TIMING CONTROL** display as shown opposite.



Start the Measurement and Monitor the Results

- 1 Connect PDH IN to PDH OUT.
- 2 Press **RUN/STOP** to start the measurement and monitor the RESULTS display.
- 3 Press **SINGLE** and check that the Error Results change.

Getting Started
Basic Error Measurement Example

3

Storing Measurement Data	page 40
Graphics	page 41
Logging Results	page 49
Internal Printer (Option UKX)	page 56
External HP 550C DeskJet Printer	page 60
Autosetup	page 62
Stored Settings	page 63
Coupling Transmit and Receive Settings	page 87
Disk Drive	page 75
Suspending a Test on Signal Loss	page 87
Time & Date	page 88
Keyboard Lock	page 89
Beep On Received Error	page 90
Analysis Control (Option UKK[USB] only)	page 90
Self Test	page 91

Mainframe Features

This chapter tells you how to set functions which enhance the instrument operation.

Storing Measurement Data

Storage facilities are provided in the instrument and on disk as follows:

1 Storing Instrument Configurations in the Instrument

The internal STORED SETTINGS which provides 1 fixed (default) instrument configuration setting and has the capacity for up to 4 selectable instrument configurations. See Storing and Recalling Instrument Configurations (Example) page 70.

2 Storing Graphics and Graphics Text Results in the Instrument

Graphics results available from the graphics display including “text results”, may be stored in the instrument **GRAPH** store by setting the **RESULTS** **TIMING CONTROL** to a storage resolution and selecting **INTERNAL**. The store has a capacity of approximately 20,000 events which may be distributed over up to 10 sets of measurement results. See Obtaining Graphics Results page 42.

3 Storing Instrument Configurations and Measurement Data on Disk.

- Instrument configurations may be saved to and downloaded from disk providing unlimited capacity in addition to the internal storage facility as in 1 above.
- The graphics results available from the GRAPHICS display including text results may be saved to and downloaded from disk providing a capacity of 320,000 events in addition to the internal storage facility as in 2 above.
- Data logging may be to disk as an alternative to a printer. In this case, the data saved to disk is the same as the output to a printer.

See Disk Drive page 75.

4 Copying Data Between Instrument Stores to Disk

In addition to the storage of the current measurement functions on disk, configurations and graphics results may be copied between the internal instrument stores and disk. See Disk Drive page 75.

Mainframe Features

Graphics

Graphics

The Graphics function provides the following displays:

- bar graph display of the results obtained during the test period.
- display of the measurement error summary and alarm summary during the test period.
- display of the graphics Store, content and capacity.

Each of these displays can be viewed in the **GRAPH** display. The bar graph display and the error and alarm summaries can be logged on an external HP 550C DeskJet printer.

Bar Graphs of PDH Frame Count; PDH CRC Count; PDH REBE Count; PDH Code Count; Bit Error Count and PDH Alarms 1 and 2 are available.

If Option UKJ[USA] or UKL[USC], Structured PDH, is fitted additional Bar graphs of Frame 140 Count, Frame 34 Count, Frame 8 Count, Frame 2 Count and M2120 REPORTS are provided.

If Option UKN, ATM measurement, is fitted additional Bar Graphs of EM BIP Count, FEBE Count, CRC4 Count, REBE Count, Corrected HEC Count, Non Corrected HEC Count, Non Conforming Cell Count, Bit Error Count, Cell Loss Count, Errored Cell Count, Misinserted Cell Count, BEDC Count and ATM Alarms 1, 2 and 3 are provided.

If Option UKZ (DS1, DS3, E1 and E3 Interfaces with ATM Payloads) is fitted, the bar graphs provided are those for Option UKN above and the following additional bar graphs: DS1 and DS3 Code and Frame; DS1 CRC6, DS3 P-Parity; CP-Parity and FEBE; 2.048 Mb/s CRC4 and REBE; 34.368 Mb/s EM-BIP and FEBE; DS1, DS3, 2.048 Mb/s and 34.368 Mb/s: Loss of Signal, AIS, Frame Loss and Remote FERF; PLCP Errors; B1 (BIP-8), PLCP-FEBE and Trailer Mismatch; PLCP Alarms; PLCP Frame Loss, PLCP RAI.

If option US1[US5] or A1T[A1U], SDH module, is fitted additional Bar Graphs of RS B1 BIP Count; MS B2 BIP Count; Path B3 BIP Count; Path FEBE Count; TU BIP Count; TU FEBE Count; Bit Error Count and SDH Alarms 1, 2 and 3 are available. Option A1T[A1U] also provides MS FEBE count, Path IEC count and A1A2 Frame count.

If option UHN[US9], PDH Jitter measurement + Wander and Slips, is fitted additional Bar Graphs of Jitter Hit Count; Wander Bit -ve Slips; Wander Bit +ve

Mainframe Features

Graphics

Slips; Wander Frame -ve Slips; Wander Frame +ve Slips and Jitter Alarms are available.

If Option UKT or USN, STM-1/STM-4 Optical Interface is fitted additional Bar Graphs of STM-4 - RS B1 BIP, MS B2 BIP and Alarms are available.

Up to 10 sets of bar graphs, error summaries and alarm summaries, and the status of the stored results can be stored in non volatile memory.

The internal graphics store capacity is normally 20,000 events. If GRAPH STORAGE RESOLUTION [FULL] is selected on the **OTHER** **MISCELLANEOUS** display the capacity reduces to 10,000 events.

The resolution, determined by the selection made under STORAGE on the RESULTS display, affects the ZOOM capability when viewing the bar graphs. If 1 MIN is selected only 1 MIN/BAR, 15 MINS/BAR and 60 MINS/BAR are available. If 15 MINS is selected only 15 MINS/BAR and 60 MINS/BAR are available. If 1 HOUR is selected only 60 MINS/BAR is available.

Up to 4 sets of graphical results can be stored in the internal store. If an attempt is made to store more than 4 sets of results, then a first in first out policy is operated and the oldest set of results will be lost. If graphics are enabled and a test is run which exceeds the remaining storage capacity, then some previously stored graphical results will be lost.

To prevent accidental overwriting of graphics data the graphics capability should be disabled when graphical results are not required. To disable the graphics capability select STORAGE [OFF] on the RESULTS display.

Obtaining Graphics Results

To obtain graphical results enable the graphics by selecting STORAGE [1 SEC RESOLUTION] or [1 MIN RESOLUTION] or [15 MINS RESOLUTION] or [1 HOUR RESOLUTION] on the RESULTS display. The resolution selected affects the ZOOM capability when viewing the bar graphs. If 1 MIN is selected only 1 MIN/BAR, 15 MINS/BAR and 60 MINS/BAR are available. If 15 MINS is selected only 15 MINS/BAR and 60 MINS/BAR are available. If 1 HOUR is selected only 60 MINS/BAR is available.

Mainframe Features

Graphics

STORAGE [1 MIN RESOLUTION] enables the graphics and allows storage of the graphics results including the graphics text results in the **INTERNAL** store or on **DISK**.

Storage to disk will use a default file name unless a file name is specified on the **OTHER FLOPPY DISK** DISK OPERATION **SAVE** Display.

When a measurement is started by pressing **RUN/STOP** graphical results will be recorded.

RESULTS [TIMING CONTROL]					
SHORT TERM PERIOD	[1 SECOND]			
TEST TIMING	[SINGLE	]	[ 1 HOUR]	
GRAPH STORAGE	[1 MIN RESOL'N]			
	[INTERNAL]			
STATUS:					
OFF	1 SEC RESOL'N	1 MIN RESOL'N	15 MIN RESOL'N	1 HR RESOL'N	MULTIPLE WINDOW

Mainframe Features Graphics

Recalling Previously Stored Results

Results stored from a previous test period can be recalled to the graphics displays for viewing and printing. If currently viewing the bar graph display, select **TEXT RESULTS** then **STORE STATUS**. If currently viewing the error or alarm summary, select **STORE STATUS**.

1. Using **↑** and **↓** move the highlighted cursor to the store location which contains the required results.
2. If you wish to view the bar graphs, select **GRAPH RESULTS**.
3. If you wish to view the error or alarm Summaries, select **TEXT RESULTS**.

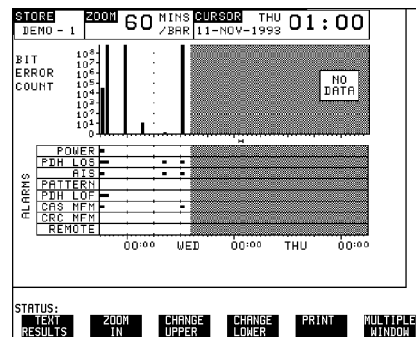
Viewing the Bar Graph Display

The bar graph display can be viewed at any time.

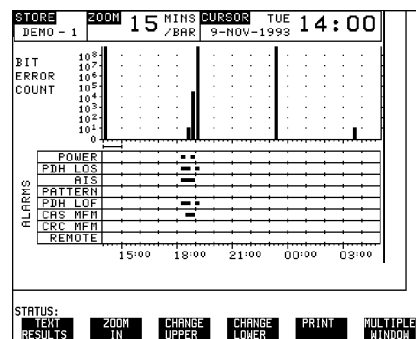
1. To view the current bar graphs, press **GRAPH** and use **CHANGE UPPER** and **CHANGE LOWER** to obtain the bar graphs required.

2. To view a set of previously stored bar graphs, press **GRAPH TEXT RESULTS** and **STORE STATUS**.

Using **↑** and **↓** move the highlighted cursor to the store location which contains the required results, and select **GRAPH RESULTS**.



3. For more detailed inspection of the bar graph, position the cursor centrally within the area of interest using **→** and **←** and select **ZOOM IN** to reduce the time axis to 15 MINS/BAR. This is only possible if the graphics results were stored with a STORAGE resolution of 1 SEC, 1 MINS or 15 MINS.







Mainframe Features

Graphics

For further reduction of the time axis, to 01 MINS/BAR or 01 SECS/BAR, position the cursor centrally within the area of interest and select **ZOOM IN** until the required time axis is obtained.

The top row of the display comprises three fields:

- | | |
|---------------|--|
| Store | Memory location in which the displayed bar graph data is stored. Store can only be changed when the status of stored results is displayed. Select TEXT RESULTS and then STORE STATUS and move the highlighted cursor, to the STORE location desired, using  and  . |
| Zoom | The width, in minutes, of each "bar" in the bar graph, controlled by ZOOM IN ZOOM OUT |
| Cursor | The cursor position in terms of time and date, controlled by  and  . The cursor position changes in steps of 1 minute, 15 minutes or 60 minutes dependent upon the ZOOM setting. The cursor is physically located between the two graphs. |

Mainframe Features

Graphics

Viewing the Error and Alarm Summaries

The error summary or alarm summary can be viewed at any time.

1. To view the error or alarm summary associated with the current bar graphs, press **GRAPH** then **TEXT RESULTS**

2. To view the error or alarm summary associated with previously stored bargraphs, press **GRAPH**; **TEXT**

RESULTS and **STORE STATUS**.

Using **↑** and **↓** move the highlighted cursor to the store location which contains the required results, and select **TEXT RESULTS**.

STORE	START	02:40	STOP	02:40
LAST	MON	26-FEB-1990	MON	26-FEB-1990
SDH ERROR SUMMARY				
		COUNT		RATIO
CODE		.....		.....
DS3 FRM		.....		.....
DS1 FRM		.....		.....
CRC		.....		.....
FEBE		.....		.....
P PARITY		.....		.....
C PARITY		.....		.....
STATUS:				
STORE	GRAPH	PRINT	NEXT	ALARM
STATUS	RESULTS		SUMMARY	SUMMARY
				MULTIPLE
				WINDOW

3. To view the Alarms which have occurred during the measurement select **ALARM SUMMARY**. Use **NEXT SUMMARY** to view the PDH; JITTER; ATM and SDH Alarm Summaries in turn if applicable.

4. To view the Errors which have occurred during the measurement select **ERROR SUMMARY**. Use **NEXT SUMMARY** to view the PDH; JITTER; ATM and SDH Error Summaries in turn if applicable.

The top row of the display comprises three fields:

- Store** Memory location in which the bar graphs, error summary and alarm summary are stored. Store can only be changed when the status of stored results is displayed. Select **STORE STATUS** and move the highlighted cursor, to the STORE location desired, using **↑** and **↓**.
- Start** The start time and date of the test, which produced the displayed results.
- Stop** The stop time and date of the test, which produced the displayed results.

Mainframe Features
Graphics

Viewing the Stored Results Status

Select **TEXT RESULTS**; **STORE STATUS** if viewing the bar graph display.

Select **STORE STATUS** if viewing the error or alarm summary.

GRAPH RESULTS displays the bar graphs from the highlighted store location.

TEXT RESULTS displays the error or alarm summary from the highlighted store location.



DELETE STORE deletes the results in the highlighted store location.

STORE	START DATE	START TIME	TEST DURATION	STORE USE
-9				
-8				
-7				
-6				
-5				
-4				
-3				
-2				
-1				
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
STORAGE RESOLUTION		-----		TOTAL
FREE STORE		##### EVENTS		USED FREE
				N11 100%

STATUS:
GRAPH RESULTS **TEXT RESULTS** **DELETE STORE** **DELETE ALL** **MULTIPLE WINDOW**

If **DELETE ALL** is selected, a **CONFIRM DELETE**; **ABORT DELETE** choice is provided to prevent accidental deletion of all the stored results.

The top row of the display comprises five fields:

- Store** Memory location in which the displayed bar graph data is stored. Move the highlighted cursor, to the STORE location desired, using  and .
- Start Date** The start date of the test, which produced the stored results.
- Start Time** The start time of the test, which produced the stored results.
- Test Duration** The duration of the test, which produced the stored results. The storage capacity of the graphics capability is expressed in days, hours and minutes. The percentage (%) of storage capacity used and the percentage still available for use is given at the bottom of the TEST DURATION column under TOTAL USED and FREE respectively.
- Store Use** The percentage (%) of the overall storage capacity occupied by each set of stored results. The percentage used and the percentage still available is provided at the bottom of the STORE USE column.

Mainframe Features

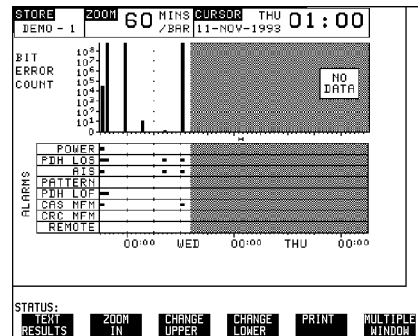
Graphics

Printing Graphics Displays

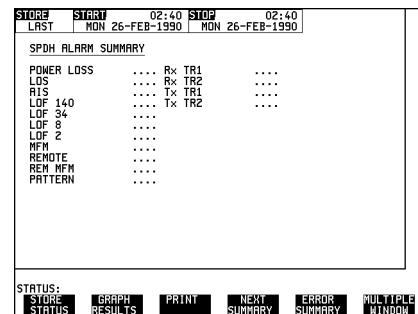
If Option A3B or Option A3D, Remote Control, is fitted the bar graphs and error and alarm summary can be logged to an external HP 550C DeskJet printer at the end of the test period. If a printer is not immediately available the graphics results remain in memory and can be logged at a later time when a printer becomes available.

To print a graphics display on an external HP 550C DeskJet printer:

1. Connect an external RS-232-C HP 550C DeskJet printer to the HP 37717C RS232 port or an external HP-IB HP 550C DeskJet printer to the HP 37717C HP-IB port. See *External HP 550C DeskJet Printer*.
2. Make the required selections on the **OTHER** **LOGGING** display: LOGGING PORT[HPiB] or [RS232] and LOGGING [ON].
3. Obtain the graphics display required and select **PRINT** on the bar graph display to log The Error and Alarm summaries, the displayed Bar graphs and the Alarm graph to the printer..



Select **PRINT** on the Text Results display to log the selected Error and Alarm summaries to the printer.



Mainframe Features

Logging Results

Logging Results

The results obtained during the test are retained in memory until they are overwritten by the next set of results. The results can be logged at any time during the test period and at the end of the test period. The results required are selected using **OTHER LOGGING LOGGING SETUP CONTROL**.

Any Alarm occurrence results in a timed and dated message being logged.

BER and Analysis results can be selected by the user.

Cumulative and Period versions of the results are calculated and can be selected by the user.

Period The results obtained over a set period of time during the test. The Period is defined by the LOGGING PERIOD selection.

Cumulative The results obtained over the time elapsed since the start of the test.

The Results can be Logged to the following devices selectable using **OTHER LOGGING LOGGING SETUP DEVICE**:

- External HP-IB printer (options A3B & A3D)
- External RS-232-C printer (options A3B & A3D)
- Disk Drive
- Parallel Centronics interface (options A3B & A3D).
- Optional Internal printer fitted into the instrument front cover (Option UKX).

NOTE

1. A full list of results and events available for logging is contained in Appendix A, Logging Messages. 2. Definitions of all the results is contained in Appendix B, Results.

Test Period Logging

If degradations in system performance can be observed at an early stage, then the appropriate remedial action can be taken to maximize circuit availability and avoid system crashes. Period logging allows you to monitor the error performance of your circuit. At the end of the test period the selected results are logged. Results can be logged at regular intervals during the test period by selecting a LOGGING PERIOD

Mainframe Features

Logging Results

of shorter duration than the test period. Without affecting the test in progress an instant summary of the results can be demanded by pressing **PRINT NOW**.

LOGGING [ON] enables the Logging of ALARM conditions.

LOGGING PERIOD determines how regularly the results are logged

RESULTS LOGGED [ALL] provides a complete set of, Cumulative, BER and Analysis results at the end of each print period and at the end of the test period.

FUNCTION	[LOGGING]
LOGGING SETUP	[CONTROL]
LOGGING PERIOD	[1 HOUR]
RESULTS LOGGED	[ALL]
LOG ERROR SECONDS	[OFF]
LOG AT END OF TEST	[ALL RESULTS]
LOG ON DEMAND	RESULTS

STATUS: **ALL** **SELECTED** **MULTIPLE WINDOW**

Error Event Logging

Manual tracing of intermittent faults is time consuming. Error event logging allows you to carry out unattended long term monitoring of the circuit. Each occurrence of the selected error event is logged.

LOGGING [ON] enables the Logging of ALARM conditions.

LOG ERROR SECONDS [ON] determines that each time an error second is detected, a timed and dated message will be logged.

FUNCTION	[LOGGING]
LOGGING SETUP	[CONTROL]
LOGGING PERIOD	[OFF]
LOG ERROR SECONDS	[ON]
LOG AT END OF TEST	[ALL RESULTS]
LOG ON DEMAND	RESULTS

STATUS: **OFF** **ON** **MULTIPLE WINDOW**

When SDH / SONET modules are fitted, there is a choice of logging a results snapshot, overhead snapshot or overhead capture on demand with **PRINT NOW**.

When making long term out-of-service bit error measurements it is often desirable only to log results when an error has occurred.

FUNCTION	[LOGGING]
LOGGING SETUP	[CONTROL]
LOGGING PERIOD	[1 HOUR]
RESULTS LOGGED	[SELECTED]
WHEN	[PERIOD EC>]
CONTENT	[ER & ANRL]
LOG ERROR SECONDS	[PER & CUMUL]
LOG AT END OF TEST	[ON]
LOG ON DEMAND	[RESULTS]

STATUS: **RESULTS SNAPSHOT** **OVERHEAD SNAPSHOT** **OVERHEAD CAPTURE** **MULTIPLE WINDOW**

Mainframe Features

Logging Results

WHEN [PERIOD BEC>0] determines the action taken at the end of the selected Logging Period. If the bit error count during a Logging Period is greater than 0 then the selected results for that period only, are logged. If the bit error count is 0 then the message *NO BIT ERRORS* is logged at the end of the Logging Period. A complete set of the selected results are logged at the end of the test period.

FUNCTION	[LOGGING]
LOGGING SETUP	[CONTROL]
LOGGING PERIOD	[ON] [1 HOUR]
RESULTS LOGGED WHEN	[SELECTED] [PERIOD BEC>0]
CONTENT	[ER & ANAL]
LOG ERROR SECONDS	[PER & CUMUL] [ON]
LOG AT END OF TEST	ALL RESULTS
LOG ON DEMAND	RESULTS

STATUS: ERROR RESULTS ANALYSIS ER & ANALYSIS MULTIPLE WINDOW

CONTENT [ER & ANAL] provides both BER and Analysis results at the end of each Logging Period and at the end of the test period.

CONTENT [PER & CUMUL] provides both Period and Cumulative results at the end of each Logging Period.

LOG ERROR SECONDS [ON] determines that each time an error second is detected, a timed and dated message will be logged.

Internal Printer

If Option UKX is fitted, the results can be logged to the internal printer fitted in the instrument front cover.

The presence of the printer is detected at “Power-on”. The printer should not be disconnected and reconnected with the instrument power on.

For printer status indications, paper replacement and print head cleaning see page 56.

FUNCTION	[LOGGING]
LOGGING SETUP	[DEVICE]
LOGGING PORT	[INTERNAL]
REMOTE CONTROL PORT	HPTB

STATUS: INTERNAL RS232 HPTB DISK PARALLEL MULTIPLE WINDOW

Mainframe Features

Logging Results

When the internal printer is selected, LOG ON DEMAND may be set to **SCREEN DUMP**. This allows the screen display to be printed using **PRINT NOW**.

FUNCTION	[LOGGING]
LOGGING SETUP	[CONTROL]
LOGGING PERIOD	[ON] [OFF]
LOG ERROR SECONDS	[OFF]
LOG AT END OF TEST	[ALL RESULTS]
LOG ON DEMAND	[SCREEN DUMP]

STATUS:
RESULTS SHAPSHOT SCREEN DUMP MULTIPLE WINDOW

HP-IB External Printer

If Remote Control Option, A3B or A3D, is fitted the results can be logged to an External printer connected to the HP-IB port.

Selection of HP-IB External printer prevents the use of HP-IB Remote Control.

For HP 550C Desk Jet setup information see page 60.

FUNCTION	[LOGGING]
LOGGING SETUP	[DEVICE]
LOGGING PORT	[HP-IB]
REMOTE CONTROL PORT	RS232

STATUS:
INTERNAL RS232 HP-IB DISK PARALLEL MULTIPLE WINDOW

RS- 232-C External Printer

If Remote Control Option, A3B or A3D, is fitted the results can be logged to an external printer connected to the RS232 port.

An HP RS-232-C External printer e.g. 550C DeskJet or an alternate suppliers RS-232-C printer, which is Epson compatible, can be used for logging results.

FUNCTION	[LOGGING]
LOGGING SETUP	[DEVICE]
LOGGING PORT	[RS232]
REMOTE CONTROL PORT	HP-IB
PRINTER TYPE	[ALT. PRINTER]
MODE	[NORMAL]
SPEED	[3600 BAUD]
PROTOCOL	[XON/XOFF]

STATUS:
INTERNAL RS232 HP-IB DISK PARALLEL MULTIPLE WINDOW

Mainframe Features

Logging Results

Selection of an RS-232-C External printer prevents the use of RS-232-C Remote Control.

The SPEED selection determines the Printer Baud Rate.

The HP PRINTER flow control is always Xon/Xoff.

FUNCTION	[LOGGING]
LOGGING SETUP	[DEVICE]
LOGGING PORT	[RS232]
REMOTE CONTROL PORT	HP1B]
PRINTER TYPE	[HP PRINTER]
SPEED	[9600 BAUD]
PROTOCOL	[XON/XOFF]

STATUS:
HP PRINTER ALT PRINTER MULTIPLE WINDOW

The ALT PRINTER MODE can be selected as **NORMAL** (80 column) or **COMPRESS** (40 column).

The SPEED selection determines the Printer Baud Rate.

The ALT Printer PROTOCOL can be Xon/Xoff or DTR.

FUNCTION	[LOGGING]
LOGGING SETUP	[DEVICE]
LOGGING PORT	[RS232]
REMOTE CONTROL PORT	HP1B]
PRINTER TYPE	[ALT PRINTER]
MODE	[NORMAL]
SPEED	[9600 BAUD]
PROTOCOL	[XON/XOFF]

STATUS:
NORMAL COMPRESS MULTIPLE WINDOW

For printer connection see page 60

Centronics Parallel Printer

If Remote Control Option, A3B or A3D, is fitted the results can be logged to a printer connected to the Parallel port. The Parallel port provides a standard IEEE 1284-A compatible interface.

CAUTION

Damage to the instrument may result if a serial connection is made to this port.

Mainframe Features

Logging Results

An HP centronics printer e.g. 550C DeskJet or an alternate suppliers Centronics printer can be used for logging results.

FUNCTION	[LOGGING]
LOGGING SETUP	[DEVICE]
LOGGING PORT	[PARALLEL]
REMOTE CONTROL PORT	HP1B
PRINTER TYPE	[HP PRINTER]

STATUS:
 HP PRINTER ALT PRINTER MULTIPLE WINDOW

The ALT PRINTER MODE can be selected as **NORMAL** (80 column) or **COMPRESS** (40 column).

FUNCTION	[LOGGING]
LOGGING SETUP	[DEVICE]
LOGGING PORT	[PARALLEL]
REMOTE CONTROL PORT	HP1B
PRINTER TYPE	[ALT PRINTER]
MODE	[NORMAL]

STATUS:
 NORMAL COMPRESS MULTIPLE WINDOW

The **OTHER LOGGING CONTROL** display should be set as required.

For printer connection see page 61

Disk Drive

The Results can be logged to a file on the Disk Drive.

FUNCTION	[LOGGING]
LOGGING SETUP	[DEVICE]
LOGGING PORT	[DISK]
REMOTE CONTROL PORT	HP1B

STATUS:
 RS232 HP1B DISK PARALLEL MULTIPLE WINDOW

Mainframe Features

Logging Results

To enter a file name, select **OTHER**
FLOPPY DISK When the file name has been set up the display does not have to remain selected.

Enter the File Name. The file name can contain up to 8 alphanumeric characters.

The Results can be Appended to the end of the selected file or Overwrite the selected file.

Select APPEND TO FILE - data logging is appended to the named file on the disk in the available free space, or OVERWRITE - data logging overwrites the contents of the named file.

When the named file has been opened, data is appended to the file thereafter.

FUNCTION	[FLOPPY DISK]
DISK OPERATION	[SAVE]
FILE TYPE	[DATA LOGGING]
NAME	[PRN]
	[OVERWRITE FILE]
A:\ LABEL: ABCDEFGHIJK FREE: Bytes	
STATUS: CONFIGURATION GRAPHICS DATA LOGGING RESULTS MULTIPLE WINDOWS	

Printing from Disk

When you wish to print the contents of the Disk, remove the Disk from the HP 37717C and insert in a Personal Computer (PC).

To Print from DOS Prompt

copy /b a:\<filename> <printer name>

To Print from Windows

Select the required file from Filemanager.

Select **FILE - COPY FILE TO**

<printer name>

Mainframe Features
Internal Printer (Option UKX)

Internal Printer (Option UKX)

The printer supplied with Option UKX is a thermal printer fitted into the instrument front cover. The printer is connected to the main instrument via the front panel LID connector.

WARNING

The paper tearoff edge is SHARP. This edge is exposed when the printer cover is raised. Note the  CAUTION SHARP EDGE label on the cover.

Tearing off Printouts.

To tear off a printout, pull the paper up across the sharp edge of the printer outer cover.

Printer Operation Indication

The printer status is shown on three indicators on the leftmost side of the printer.

The indicators may be ON ●, OFF ○ or FLASHING ON and OFF *

The information is coded as follows:

●		●	Power on - normal operation
●	○	●	Data buffer empty
●	*	●	Receiving data from instrument
●	●	●	Buffer contains unprinted data
*	*	*	System error
*	*	○	Data input / output error
*	● or ○	○	Print head overheating

Mainframe Features
Internal Printer (Option UKX)

Replacing the Printer Paper

Paper Suitable for the Internal Printer

The printer accepts rolls of thermal paper with the following dimensions:

Width: 216 mm (8.5 in) or 210 mm (8.27 in) (A4), tolerance +2.0 mm - 1.0 mm

Maximum Outside Diameter: 40 mm

Inside Core Diameter: Between 12.5 mm and 13.2 mm

Suitable rolls of paper are available from Hewlett Packard, Part Number 9270-1360.

Opening the Printer Outer Cover

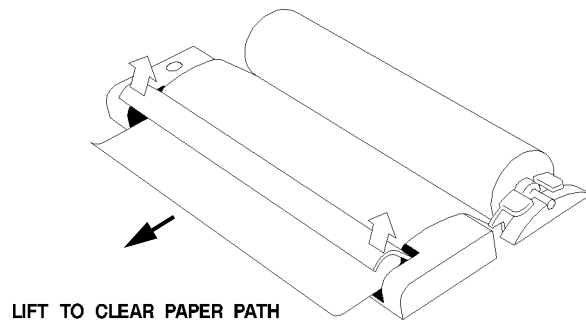
Raise the two locking tabs on the sides of the printer cover and then raise the cover.

WARNING

The paper tearoff edge is SHARP. This edge is exposed when the printer cover is raised. Note the  CAUTION SHARP EDGE label on the cover.

Removing any Remaining Paper

Raise the printer mechanism front cover, this releases the paper drive. Remove any remaining paper from the front (in the normal direction of operation).

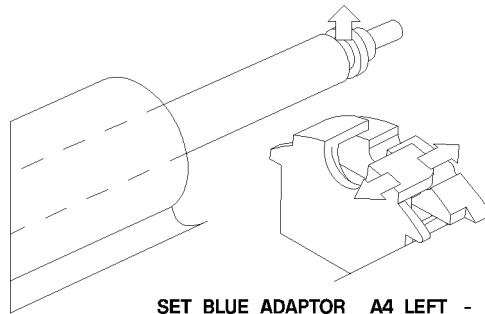


Mainframe Features Internal Printer (Option UKX)

Installing a New Roll of Paper

The paper must be installed such that when it is in the print mechanism, the sensitive side (slightly shiny) is the underside

Lift out the spindle.
Adjust the paper width adaptor to the width of the paper being used.

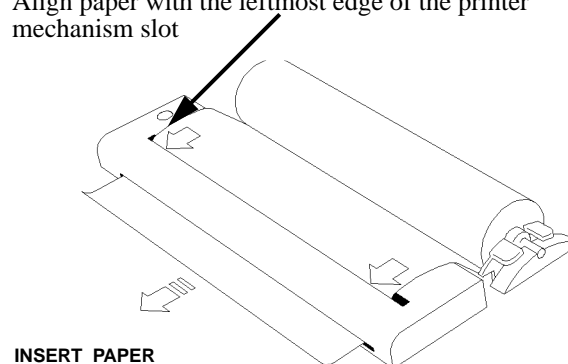


Put the paper roll on the spindle such that the sensitive side will be on the underside of the print mechanism. Ensure that the relocation of the spindle locks the blue width adaptor in position. The illustrations here show the correct fitting for HP 9270-1360 paper which has the sensitive side on the outside of the roll.

Feed the paper into the upper entry of the print mechanism. When the front cover of the print mechanism is closed, the printer should automatically feed the paper through until there is approximately 2.5 cm (1 in) clear at the front of the print mechanism.

Do not close the outer cover until the automatic paper feed is complete.

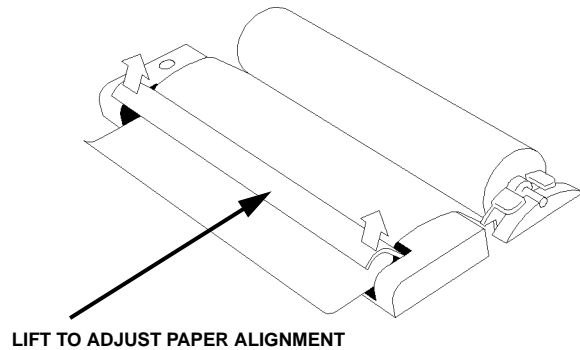
Align paper with the leftmost edge of the printer mechanism slot



Mainframe Features
Internal Printer (Option UKX)

Alignment of the Printer Paper

If the printer paper is incorrectly aligned, raise the printer mechanism front cover to release the paper drive and realign the paper.



Cleaning the Print Head

The print head is cleaned with a special cleaning paper. This cleaning paper is supplied with the instrument.

Open the printer as for changing the paper. Feed the cleaning paper into the top entry of the print mechanism. When the automatic feed is complete and the paper stops moving use the instrument front panel key **PAPER FEED** to move the cleaning paper through the print mechanism.

Remove the cleaning paper and replace the normal printer paper.

Mainframe Features
External HP 550C DeskJet Printer

External HP 550C DeskJet Printer

If Remote Control Option, A3B or A3D, is fitted the HP 37717C has the capability of interfacing with an RS-232-C HP 550C DeskJet printer or, an alternative suppliers RS-232-C printer, via the RS-232-C port.

NOTE

Selection of an External RS-232-C printer prevents the use of RS-232-C Remote Control.

Connecting an HP 550C DeskJet Printer to the RS-232-C Port

1. Connect the HP 37717C RS-232-C port to the HP 550C DeskJet RS-232-C port.

NOTE

The DeskJet Mode Configuration switches are located on the printers front base, under the IN tray. To change the switch settings, use a pen or pencil to set the switches in the desired (up or down) position. After each change in settings press RESET on the printer to establish the new settings.

2. Set the DeskJet Configuration switches as follows:

A1	A2	A3	A4	A5	A6	A7	A8
Down	Down	Down	Down	Down	Down	Down	Up

B1	B2	B3	B4	B5	B6	B7	B8
Up	Down	Down	Down	Down	Down	Down	Down

3. Press RESET on the printer to establish the new settings.
4. Select [FONT] - PORTRAIT on the printer.

Mainframe Features

External HP 550C DeskJet Printer

5. Switches B5 and B6 match the instrument Baud rate to the printer Baud rate. The settings listed above are for 9600 Baud. To change the Baud rate setting of the printer set B5 and B6 as follows:

B5	B6	Baud Rate
Down	Down	9600 Baud
Up	Down	2400 Baud
Up	Up	1200 Baud

NOTE

Parity is not selectable on the HP 37717C Printer interface and as a result B7 and B8 are set to Parity NONE - both switches down.

Connecting an HP 550C DeskJet Printer to Parallel Port

1. Connect the HP 37717C Parallel port to the HP 550C DeskJet Centronics port using printer cable HP part number 24542D.

CAUTION

Do not connect a serial printer e.g. RS-232-C or HPIB to the HP 37717C Parallel port as this will damage the interface.

Mainframe Features

Autosetup

Autosetup

The Autosetup function of the HP 37717C can speed up the setting up of the instrument when making PDH or SDH measurements.

This feature is activated by pressing **AUTO SETUP** when the PDH or SDH signal is connected to the HP 37717C. If both a PDH and SDH signal are connected the PDH signal will take priority and the HP 37717C will attempt Autosetup on the PDH signal.

PDH Input

The HP 37717C will attempt to match the receiver settings of: Pattern, Signal Level, Rate, Code, Framing type and Multiframe type to those of the received signal.

If the PDH signal is **STRUCTURED** Autosetup will fail to lock on to the received signal.

If the PDH signal is **LIVE TRAFFIC** Autosetup will fail to lock on to the received signal.

SDH Input

The HP 37717C will attempt to match the receiver settings of: Pattern, Rate and Payload type to those of the received signal.

It is possible to have both the receive and transmit settings configured by Autosetup by selecting **COUPLED** on the **OTHER SETTINGS CONTROL** display before pressing **AUTO SETUP**.

If the Payload signal is **STRUCTURED** Autosetup will fail to lock on to the received signal.

If the Payload signal is **LIVE TRAFFIC** Autosetup will fail to lock on to the received signal.

Mainframe Features
Stored Settings

Stored Settings

Fixed Stored Instrument Configuration

It is often desirable to store measurement settings which are used regularly and be able to recall those settings at a moments notice. This capability is provided in the HP 37717C on the **OTHER** **SETTINGS CONTROL** display.

One preset store is provided which cannot be overwritten, STORED SETTING NUMBER [0], and is used to set the HP 37717C to a known state. The known state is the **FACTORY DEFAULT SETTINGS** as listed below.

TRANSMIT Display PDH (Option UKK)

Signal	140 Mb/s	Clock Sync	Internal
Code	CMI	Pattern	2 ²³ -1
Termination	75 Ω Unbal		

TRANSMIT Display SPDH (Option UKJ)

Settings	Main	Signal	140 Mb/s
Clock Sync	Internal	Termination	75 Ω Unbal
Line Code	CMI	Frequency Offset	Off
Payload Type	Unframed	Pattern	2 ²³ -1
PRBS Polarity	INV	Test Signal	34 Mb/s
34M Payload	Unframed	2M Payload	Unframed
2M Payload	Unframed	34 Mb	1
8 Mb	1	2 Mb	1
64 kb	1	BG Pattern	AIS
User Word	1111111111111111	Error Add	Bit
Error Add Rate	None		

Mainframe Features

Stored Settings

TRANSMIT Display SDH (Options US1, A1T)

Signal	STM-1	Clock Sync	Internal
Payload	140 Mb/s	Payload Pattern	2 ²³ -1
TUG3	1	TUG2	1
TU	1	2 Mb/s Pattern	2 ¹⁵ -1

TRANSMIT Display ATM (Option UKN)

Signal	140 Mb/s, Internal	Clock Sync	Internal
Code	CMI	Termination	75 Ω Unbal
Frequency Offset	Off	Trail Trace	Test
Cell Stream	Distribution	F/G Bandwidth	326,037 c/s
B/G 1 Bandwidth	0	B/G 2 Bandwidth	0
B/G 3 Bandwidth	0	F/G Distribution	Burst
Burst Size	1 Cell	Interface	UNI
F/G GFC	0	F/G VPI	0
F/G VCI	32	F/G PTI	000
F/G CLP	0	F/G Payload	Test Cell
B/G Stream	1	B/G GFC	All 0
B/G VPI	1, 2, 3	B/G VCI	All 32
B/G PTI	All 000	B/G CLP	All 0
B/G 1 Payload	00000001	B/G 2 Payload	00000010
B/G 3 Payload	00000011	Fill Cells	Idle

Mainframe Features
Stored Settings

TRANSMIT Display ATM (Option UKZ)

Signal	DS3, Internal	Clock Sync	Internal
Output Level	DS3-HI	Termination	75 Ω Unbal
Line Code	B3ZS	Frequency Offset	Off
Convergence Sub-layer	Direct	Cell Scrambling	On
Cell Stream	Distribution	F/G Bandwidth	104,268 c/s
B/G 1 Bandwidth	0	B/G 2 Bandwidth	0
B/G 3 Bandwidth	0	F/G Distribution	Burst
Burst Size	1 Cell	Interface	UNI
F/G GFC	0	F/G VPI	0
F/G VCI	32	F/G PTI	000
F/G CLP	0	F/G Payload	Test Cell
B/G Stream	1	B/G GFC	All 0
B/G VPI	1, 2, 3	B/G VCI	All 32
B/G PTI	All 000	B/G CLP	All 0
B/G 1 Payload	00000001	B/G 2 Payload	00000010
B/G 3 Payload	00000011	Fill Cells	Idle

Mainframe Features

Stored Settings

TRANSMIT Display ATM Services (Option USK)

Signal	140 Mb/s, Internal	Clock Sync	Internal
Line Code	CMI	Termination	75 ΩUnbal
Frequency Offset	Off	Trail Trace	Test
Cell Stream	Distribution	F/G Bandwidth	326,037 c/s
Type	Constant	B/G 1 to 9 Bandwidth	0
B/G Type	Constant	Fill	-
F/G GFC	0	F/G VPI	0
F/G VCI	32	F/G PTI	000
F/G CLP	0	F/G Payload	Test Cell
B/G GFC	All 0	B/G VPI	1, 2, 3, 4, 5 6, 7, 8, 9
B/G VCI	All 32	B/G PTI	All 000
B/G CLP	All 0	Header Fill Cells	Idle
B/G Payload Type	All User Byte	B/G 1 Payload	00000001
B/G 2 Payload	00000010	B/G 3 Payload	00000011
B/G 4 Payload	00000100	B/G 5 Payload	00000101
B/G 6 Payload	00000110	B/G 7 Payload	00000111
B/G 8 Payload	00001000	B/G 9 Payload	00001001

RECEIVE Display PDH (Option UKK)

Signal	140 Mb/s	Test Mode	Out of Service
Code	CMI	Pattern	2^23-1
Termination	75 Ω Unbal		

Mainframe Features
Stored Settings

RECEIVE Display SPDH (Option UKJ)

Settings	Main	Signal	140 Mb/s
Termination	75 Ω Unbal	Line Code	CMI
Gain	20 dB	Equalizer	Off
Payload Type	Unframed	Pattern	2 ²³ -1
PRBS Polarity	INV	Test Signal	34 Mb/s
34M Payload	Unframed	8M Payload	Unframed
2M Payload	Unframed	34 Mb	1
8 Mb	1	2 Mb	1
64 kb	1		

RECEIVE Display SDH (Options US1, A1T)

Signal	STM-1	Payload	140 Mb/s
Payload Pattern	2 ²³ -1	TUG3	1
TUG2	1	TU	1

RECEIVE Display ATM (Option UKN)

Signal	140 Mb/s	Termination	75 Ω Unbal
Code	CMI	Interface	UNI
Test Cell	VC	GFC	X
VPI	0	VCI	32
PTI	0XX	CLP	X
Cell Payload	Test Cell	Peak Cell Rate	100
CDV Tolerance	Disabled		

Mainframe Features

Stored Settings

RECEIVE Display ATM (Option UKZ)

Signal	DS3	Termination	75 W Unbal
Line Code	B3ZS	Level	Terminate
Convergence Sub-layer	Direct	Cell Scrambling	On
Measurement Mode	Out of Service	Interface	UNI
Test Cell	VC	GFC	X
VPI	0	VCI	32
PTI	0XX	CLP	X
Cell Payload	Test Cell	Peak Cell Rate	100
CDV Tolerance	Disabled		

RECEIVE Display ATM Services (Option USK)

Signal	140 Mb/s	Termination	75 Ω Unbal
Code	CMI	Level	Terminate
Measurement Mode	Out-Of-Service	Interface	UNI
Test Cell	VC	GFC	X
VPI	0	VCI	32
PTI	0XX	CLP	X
Cell Payload	Test Cell	Peak Cell Rate	100
CDV Tolerance	Disabled	Adaptation Layer	Null
OAM Analysis	Disabled		

Mainframe Features

Stored Settings

RECEIVE Display Binary Interfaces (Option UH3)

RESULTS Display

Results	Trouble Scan	Short Term Period	1 Second
Test Timing	Manual	Single Test Duration	1 Hour
Storage	OFF	SDH Results	Short Term, RS B1 BIP
PDH Results	Short Term		

OTHER Display

Stored Setting Lock	On	Stored Setting Number	0
Printer	Internal	Printing	Off
Print Period	OFF	Print Error Seconds	OFF
Print Mode	Normal	Print Speed	9600 Baud
Clock Mode	Run	Keyboard lock	OFF
Beep On Error	OFF	Analysis Display Mode	G.821
Suspend Test on LOS	OFF	Self Test	All Tests
Settings Control	Independent		

Mainframe Features

Stored Settings

Storing and Recalling Instrument Configurations (Example)

The use of the STORED SETTINGS function is illustrated by carrying out the following tasks:

- Select the settings used in the payload mapping measurement.
- TITLE the settings as payload mapping
- SAVE the settings as Stored Setting Number [1]
- RECALL the factory default settings from Stored Setting Number [0]
- RECALL the payload mapping settings from Stored Setting Number [1]

Mainframe Features

Stored Settings

Select Settings to be Stored

1. Set up the **OTHER SETTINGS CONTROL** display as shown opposite.

FUNCTION	[SETTINGS CONTROL]
TRANSMITTER AND RECEIVER	INDEPENDENT
STATUS:	
INDEPENDENT	COUPLED
	MULTIPLE WINDOW

2. Set up the **TRANSMIT** display as shown opposite.

TRANSMITTER OUTPUT	[PDH]
PDH	TEST FUNCTION
SIGNAL	[140 Mb/s]
CLOCK SYNC	INTERNAL
FREQUENCY OFFSET	[OFF]
CODE	CM1
PATTERN	[2 ²³ -1]
TERMINATION	75Ω UNBAL
STATUS:	
	MULTIPLE WINDOW

3. Set up the **RECEIVE** display as shown opposite.

RECEIVER INPUT	[SDH]
SDH	TEST OVERHEAD FUNCTION MONITOR
SIGNAL	[STM-1 OPT]
PAYLOAD	[140 Mb/s]
PAYLOAD TYPE	UNFRAMED
PATTERN	[2 ²³ -1 PRBS]
PRBS POLARITY	[INV] CCITT
STATUS:	
SDH	ATM
	MULTIPLE WINDOW

Mainframe Features

Stored Settings

4. Select INTERNAL printer and set up the **OTHER LOGGING** display, as shown opposite.

FUNCTION	[LOGGING]
LOGGING SETUP	[CONTROL]
LOGGING	[ON]
LOGGING PERIOD	[1 HOUR]
RESULTS LOGGED WHEN	[SELECTED]
CONTENT	[ALWAYS]
	[PER & ANAL]
LOG ERROR SECONDS	[PER & CUMUL]
LOG AT END OF TEST	[ON]
	[ALL RESULTS]
LOG ON DEMAND	RESULTS

STATUS: ERROR RESULTS ANALYSIS PER & ANALYSIS MULTIPLE WINDOW

5. Set up the **RESULTS** display as shown opposite.

RESULTS [PDH]	[ERROR ANALYSIS]
G_021 BIT ANALYSIS	
EL	AND ES
ES	2
EFS	2
SES	2
UNAV	2
DEG MIN	2
CODE ES	
ELAPSED TIME	

STATUS: CUMUL-RTIVE SHORT TERM ERROR ANALYSIS ALARM SECONDS FREQ-UCY MULTIPLE WINDOW

6. Set up the **RESULTS TIMING CONTROL** display as shown opposite.

RESULTS [TIMING CONTROL]
SHORT TERM PERIOD [1 SECOND]
TEST TIMING [SINGLE] [24 HOURS]
STORAGE [1 MIN RESOL'N]

STATUS: OFF 1 SEC RESOL'N 1 MIN RESOL'N 15 MIN RESOL'N 1 HR RESOL'N MULTIPLE WINDOW

Mainframe Features

Stored Settings

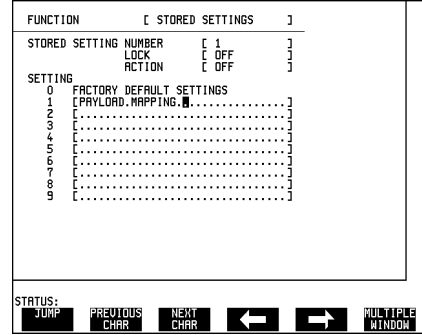
Title the Settings

1. Select the STORED SETTINGS function on the **OTHER** display.

To Title settings LOCK [OFF] must be selected.

2. The easiest method of titling is to use the pop-up menu available with **SET**.

3. Alternatively use **JUMP** ; **NEXT CHAR** ; **PREVIOUS CHAR** ; **→** and **←** to title the settings as shown opposite.

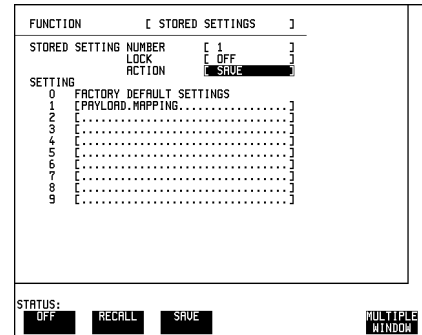


Save the Settings

1. Set up the display as shown opposite.

Press **SAVE** to save the settings.

The payload mapping settings are now stored in STORED SETTING NUMBER [1].

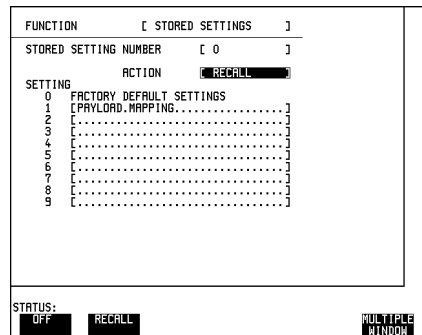


Recall Default Settings

1. Set up the display as shown opposite.

Press **RECALL** to recall the settings in STORED SETTING NUMBER [0].

To verify that the instrument has adopted the factory default settings, view the **TRANSMIT** ; **RECEIVE** ; **RESULTS** and **OTHER** displays.



Mainframe Features

Stored Settings

Recall Previously Stored Settings (Payload Mapping)

1. Set up the display as shown opposite and press **RECALL** to recall the settings in STORED SETTING NUMBER [1]

To verify that the instrument has adopted the payload mapping settings, view the **TRANSMIT**; **RECEIVE** and **RESULTS** displays

Settings can be recalled when LOCK [ON] is selected but to save settings or title settings LOCK [OFF] must be selected.

FUNCTION		[STORED SETTINGS]	
STORED SETTING NUMBER	[1]	LOCK	[OFF]
		ACTION	[RECALL]
SETTING			
0	FACTORY DEFAULT SETTINGS		
1	PAYLOAD MAPPING.....		
2	.....	
3	.....	
4	.....	
5	.....	
6	.....	
7	.....	
8	.....	
9	.....	
STATUS:			
OFF	RECALL	SAVE	MULTIPLE WINDOW

Mainframe Features

Disk Drive

Disk Drive

The disk drive is accessed on the **OTHER** display and allows the following:

- Save/recall of instrument configurations to/from floppy disk drive
- Save/recall of stored measurement graphics to/from floppy disk drive. This extends internal event based storage from 20,000 events to 320,000 events.
- Direction of logging output to floppy disk drive file path name.
- Save SMG stored results in a CSV (comma separated variable) PC compatible format for importing to PC spreadsheets etc.
- Copying of stored measurement graphics files from internal instrument storage to floppy disk drive.
- Copying of instrument configuration files from/to internal instrument storage to/from floppy disk drive.
- Disk management - Deleting files or directories, Renaming of files, Formatting of floppy disks, Labeling of floppy disks.
- The upgrading of instrument firmware from the floppy disk drive.

Directory Structure

It is recommended that different directories are created for the different applications as this will speed up the transfer of data between the instrument and disk e.g.

A:\GRAPHICS

A:\LOGGING

A:\CONFIG

In addition as the number of files in a directory increases the file name pop-up access becomes gradually slower.

Portability of Disks

When transporting disks between different HP 37717C's some problems may occur if the instruments have a different firmware revision and/or a different option mix.

Mainframe Features

Disk Drive

To Format a Disk

Only 1.44M, MS-DOS compatible disks can be used in the HP 37717C. Any other format or capacity will result in a Disk access error being displayed.

Select **OTHER** **FLOPPY DISK** and set up the display as shown opposite.

Insert the disk to be formatted into the Disk drive.

Select **OK** to Format the disk.

A warning that this operation will erase all data is displayed and asks do you wish to continue. If YES is selected the disk will be formatted. If NO is selected the operation is aborted.

FUNCTION	[FLOPPY DISK]
DISK OPERATION	[DISK] [FORMAT]
Insert Disk Select OK to perform operation	[OFF]
A:\ LABEL:	FREE: Bytes
STATUS: [OFF] [OK]	
MULTIPLE WINDOW	

NOTE

Disks can be formatted in an IBM compatible PC (1.44M, MS-DOS only) but it is recommended that the disk is formatted in the HP 37717C as this will ensure full compatibility with the Floppy Disk power fail recovery included in the HP 37717C.

To Label a Disk

Select **OTHER** **FLOPPY DISK** and set up the display as shown opposite.

Insert the disk to be labeled into the Disk drive.

Enter the label name. The Label can contain up to 11 alphanumeric characters (including spaces).

Select **OK** to Label the disk.

The label will be displayed at the bottom of the display.

FUNCTION	[FLOPPY DISK]
DISK OPERATION	[DISK] [LABEL] [MY DISK]
Select OK to perform operation	[OFF]
A:\ LABEL: MY DISK	FREE: Bytes
STATUS: [OFF] [OK]	
MULTIPLE WINDOW	

Mainframe Features

Disk Drive

File and Directory Management

File and directory names can be entered in one of 2 ways:

1. Pop-Up "File List" and "File Name" menus

Press **SET** to obtain the following display:





```
Stored Measurement Graphics Files - R:
GRAPHICS *.SMG
NEW.. (Press SET to enter new file name)
..          \  0 JUL-04-1996 09:51:58
PDH1.SMG    13564 JUL-04-1996 10:00:56
PDH3.SMG    13564 JUL-04-1996 10:15:24
MERS001.SMG 13466 JUL-19-1996 08:07:54
MERS002.SMG 13466 JUL-19-1996 08:09:40
SDH1.SMG    13466 JUL-19-1996 08:12:50
SDH2.SMG    13466 JUL-19-1996 08:13:36
SDH3.SMG    13466 JUL-19-1996 08:14:00
MERS003.SMG 13466 JUL-19-1996 08:14:54
MERS004.SMG 13466 JUL-19-1996 08:15:20
SDH4.SMG    13466 JUL-19-1996 08:15:44
NEXT PAGE ->
```

Move the highlighted cursor up and down the display using **↑** and **↓**.

- **Title Bar** - File types displayed and current directory. (cannot be highlighted).
- **.** \ - Current Directory.
- **..** \ - Parent directory. Move highlighted cursor to this line and press **SET** to move to parent directory.
- **PDH1.SMG** - File (with named extension) in current directory. Move highlighted cursor to this line and press **SET** to select the file. The display will return to the FLOPPY DISK display and the selected file name will appear in the FILE NAME field.
- **NEXT** - Move highlighted cursor to this line and press **SET** to access the next page of file names.
- **PREV** - Move highlighted cursor to this line and press **SET** to access the previous page of file names.
- **NEW..** - Allows entry of new file name using pop-up keypad. Press **SET** to obtain the pop-up keypad display.

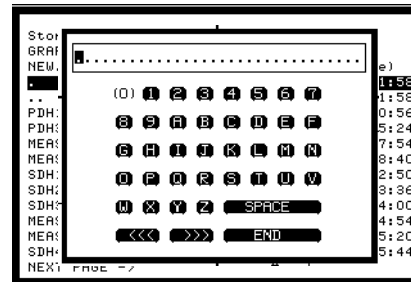
Mainframe Features

Disk Drive

Use   to move across the rows and   to move up and down the columns.

Select the character required and press **SET**. Repeat until the filename is entered.

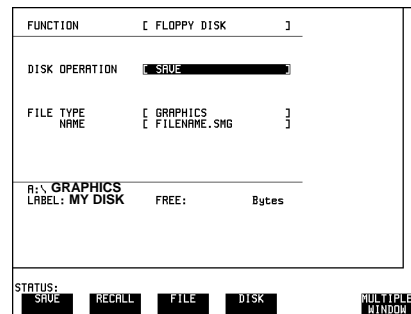
Select END and press **SET** to return to the file manager display, and then press **CANCEL** to return to the SAVE display.



The filename entered via the keypad appears on the SAVE display.

The file extension .SMG has been added automatically.

The Directory name and the disk Label appear at the bottom of the display.




Mainframe Features Disk Drive

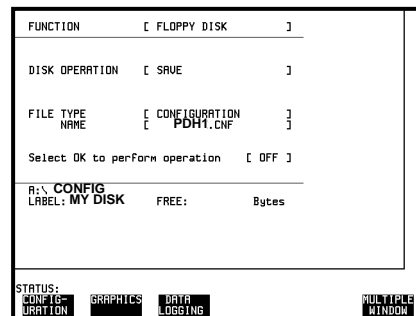
2. By SOFTKEY entry

Use the **PREVIOUS CHAR**
NEXT CHAR   softkeys.

This provides a quick method if the new filename is similar to the filename currently displayed e.g.

Filename displayed PDH1 and new filename required is PDH2 - use  to move the cursor to the 1 and press **NEXT CHAR**

This method is limited to entering file names, or a directory name when Creating a directory. However it cannot be used to navigate through the directory structure.



Adding Descriptors to .CNF and .SMG Files

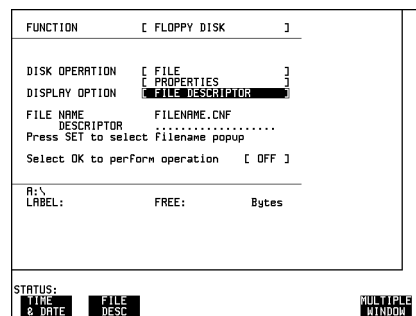
Descriptors can be added to .CNF and .SMG files.

Set up the display as shown opposite.

Move the highlighted cursor to the FILE NAME DESCRIPTOR field.

Enter the file descriptor using one of the methods described in *File and Directory Management*.

The "File List" pop-up will show the descriptor instead of the TIME and DATE information as long as FILE DESCRIPTOR is selected. This slows down the updating of the display.



Mainframe Features

Disk Drive

To Save Current Instrument Configuration to Disk

Select **OTHER** **FLOPPY DISK** and set up the display as shown opposite.

The filename extension is fixed as .CNF.
The file name can contain up to 8 alphanumeric characters and can be entered as described in *File and Directory Management*

Select **OK** to save the current configuration to disk.

If you have entered a filename which already exists, a warning "File exists - are you sure" you wish to continue is displayed. If YES is selected the configuration will be saved. To cancel, change OK to OFF.

The screenshot shows a terminal window with the following text:

```
FUNCTION [ FLOPPY DISK ]
DISK OPERATION [ SAVE ]
FILE TYPE [ CONFIGURATION ]
NAME [ FILENAME.CNF ]
Select OK to perform operation [ OFF ]
A:\ LABEL: FREE: Bytes
STATUS: OFF OK MULTIPLE WINDOW
```

To Save Graphics Results to Disk

Select **RESULTS** and set up the display as shown opposite.

Select the Graph Storage resolution required.

Two methods of naming the file which will be created when **RUN/STOP** is pressed are available:

1. A filename, in the form meas001.smg, is created automatically without any operator input.
2. The user can input a filename of his choice, which will override the automatic filename, but this must be input before **RUN/STOP** is pressed,

If the user entered file name already exists, SMG results will be saved to an Autogenerated file name. This prevents existing files from being overwritten each time the **RUN/STOP** is pressed.

The screenshot shows a terminal window with the following text:

```
RESULTS [TIMING CONTROL]
SHORT TERM PERIOD [ 1 SECOND ]
TEST TIMING [ MANUAL ]
GRAPH STORAGE [ 15 MIN RESOL'N ]
DISK
STATUS: INTERNAL DISK MULTIPLE WINDOW
```

Mainframe Features

Disk Drive

Select **OTHER FLOPPY DISK** and set up the display as shown opposite.

The filename extension is fixed as .SMG.
The file name can contain up to 8 alphanumeric characters and can be entered as described in *File and Directory Management*

FUNCTION	[FLOPPY DISK]
DISK OPERATION	[SAVE]
FILE TYPE	[GRAPHICS]
NAME	[FILENAME.SMG]
A:\ LABEL: FREE: Bytes	
STATUS: CONFIGURATION GRAPHICS DATA LOGGING MULTIPLE WINDOW	

To Save Data Logging to Disk

Select **OTHER LOGGING** and set up the display as shown opposite.

The **OTHER LOGGING CONTROL** display should be set as required.

FUNCTION	[LOGGING]
LOGGING SETUP	[DEVICE]
LOGGING PORT	[DISK]
REMOTE CONTROL PORT	[HP1B]
STATUS: DEVICE CONTROL MULTIPLE WINDOW	

Select **OTHER FLOPPY DISK** and set up the display as shown opposite.

The filename extension is fixed as .PRN.
The file name can contain up to 8 alphanumeric characters and can be entered as described in *File and Directory Management*

Select APPEND TO FILE - data logging is appended to the named file on disk in the available free space.

FUNCTION	[FLOPPY DISK]
DISK OPERATION	[SAVE]
FILE TYPE	[DATA LOGGING]
NAME	[FILENAME.PRN]
	[APPEND TO FILE]
A:\ LABEL: FREE: Bytes	
STATUS: OVERWRITE APPEND TO FILE MULTIPLE WINDOW	

or OVERWRITE - data logging overwrites the contents of the named file.

Once the named file has been opened the data logging is appended to the file as each logging output occurs during the measurement.

Mainframe Features
Disk Drive

To Recall Configurations from Disk to Instrument

Select **OTHER** **FLOPPY DISK** and set up the display as shown opposite.

The filename extension is fixed as .CNF.
 The file name can contain up to 8 alphanumeric characters and can be entered as described in *File and Directory Management*

Select **OK** to recall the configuration from disk to instrument.

FUNCTION	[FLOPPY DISK]
DISK OPERATION	[SAVE]
FILE TYPE NAME	[CONFIGURATION] [FILENAME.CNF]
Select OK to perform operation [OFF]	
A:\ LABEL:	FREE: Bytes
STATUS: OFF [OK] MULTIPLE WINDOW	

To Recall Graphics Results from Disk to Instrument

Select **OTHER** **FLOPPY DISK** and set up the display as shown opposite.

The filename extension is fixed as .SMG.
 The file name can contain up to 8 alphanumeric characters and can be entered as described in *File and Directory Management*

Select **OK** to recall the graphics results from disk to instrument.

FUNCTION	[FLOPPY DISK]
DISK OPERATION	[RECALL]
FILE TYPE NAME	[GRAPHICS] [FILENAME.SMG]
Select OK to perform operation [OFF]	
A:\ LABEL:	FREE: Bytes
STATUS: OFF [OK] MULTIPLE WINDOW	

To display the recalled graphics results select DISK on the Store Status page of the **GRAPH** display and press **GRAPH RESULTS**.

STORE	START DATE	START TIME	TEST DURATION	STORE USE
DISK	1-JAN-1993	23:16	06h 04m 05s	Nil
-8	1-JAN-1993	23:16	06h 04m 05s	Nil
-7	1-JAN-1993	23:16	06h 04m 05s	<1%
-6	1-JAN-1993	23:16	06h 04m 05s	Nil
-5	1-JAN-1993	23:16	06h 04m 05s	Nil
-4	1-JAN-1993	23:16	06h 04m 05s	Nil
-3	1-JAN-1993	23:16	06h 04m 05s	<1%
-2	1-JAN-1993	23:16	06h 04m 05s	Nil
-1	1-JAN-1993	23:16	06h 04m 05s	Nil
LAST	1-JAN-1993	23:16	06h 04m 05s	Nil
STORAGE		1 SEC	TOTAL USED	<1%
RESOLUTION		COMPRESSED	RAM FREE	99%
		19998 EVENTS		

Mainframe Features
Disk Drive

To Copy Configuration from Instrument Store to Disk

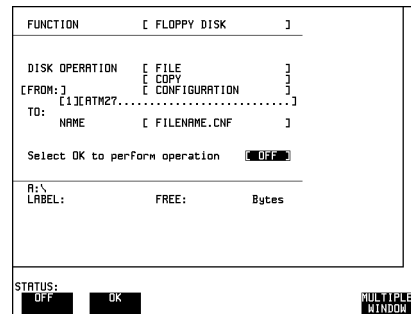
Select **OTHER FLOPPY DISK** and set up the display as shown opposite.

Enter the Store Number (1 to 4). The description which was displayed on the **OTHER STORED SETTINGS** display appears. If required the description can be modified using **JUMP NEXT CHAR PREVIOUS CHAR** **← →** softkeys.

The filename extension is fixed as .CNF. The file name can contain up to 8 alphanumeric characters and can be entered as described in *File and Directory Management*

Select **OK** to copy the configuration from instrument to disk.

If you have entered a filename which already exists, a warning "File exists - are you sure" you wish to continue is displayed. If YES is selected the configuration will be copied. To cancel, change OK to OFF.



To Copy Configuration from Disk to Instrument Store

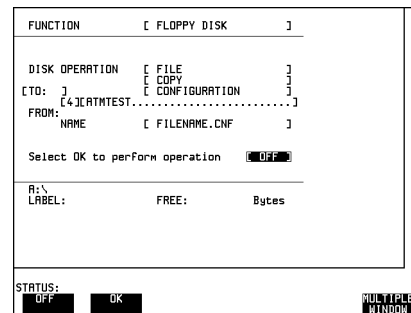
Select **OTHER DISK** and set up the display as shown opposite.

Enter the Store Number (1 to 4) and if required enter a description using **JUMP PREVIOUS CHAR NEXT CHAR** **← →** softkeys.

The filename extension is fixed as .CNF. The file name can contain up to 8 alphanumeric characters and can be entered as described in *File and Directory Management*

Select **OK** to copy the configuration from the disk to instrument store.

An "Are you sure?" you wish to go ahead with this operation choice is provided to decrease the possibility of accidentally overwriting existing instrument stores.



Mainframe Features

Disk Drive

To Copy Graphics from Instrument Store to Disk

Select **OTHER** **FLOPPY DISK** and set up the display as shown opposite.

Enter the Store Number (0 to -9).

The filename extension is fixed as .SMG.

The file name can contain up to 8 alphanumeric characters and can be entered as described in *File and Directory Management*

Select the required format. CSV is Comma Separated Variable and is compatible with spreadsheets.

Select **OK** to copy the graphics results from instrument store to disk.

If you have entered a filename which already exists, a warning "File exists - are you sure" you wish to continue is displayed. If YES is selected the graphics data will be copied. To cancel, change OK to OFF.

FUNCTION	[FLOPPY DISK]
DISK OPERATION	[FILE]
	[COPY]
FROM: STORE	[GRAPHICS]
	[-9]
TO: NAME	[FILENAME.SMG]
FORMAT	[NORMAL]
Select OK to perform operation [OFF]	
A:\ LABEL:	FREE: Bytes
STATUS: OFF [OK] MULTIPLE WINDOW	

To Delete a File

Select **OTHER** **FLOPPY DISK** and set up the display as shown opposite.

The file name **with extension** can contain up to 12 alphanumeric characters and can be entered in 2 ways:

1. Use the **PREVIOUS CHAR** **NEXT CHAR** **←** **→** softkeys.
2. Use **SET** and the method described in *File and Directory Management*

Select **OK** to delete the file from disk.

An "Are you sure?" you wish to go ahead with this operation choice is provided to reduce the possibility of deleting the wrong file.

FUNCTION	[FLOPPY DISK]
DISK OPERATION	[FILE]
	[DELETE]
	[DELETE FILE]
NAME	[FILENAME.EXT]
Select OK to perform operation [OFF]	
A:\ LABEL:	FREE: Bytes
STATUS: OFF [OK] MULTIPLE WINDOW	

Mainframe Features

Disk Drive

To Delete a Directory

Select **OTHER** **FLOPPY DISK** and set up the display as shown opposite.

A Directory cannot be deleted unless all files within the directory have been deleted.

Select **OK** to delete the current directory (listed on the display) from disk.

An "Are you sure?" you wish to go ahead with this operation choice is provided to reduce the possibility of accidentally deleting the wrong directory.

FUNCTION	[FLOPPY DISK]
DISK OPERATION	[FILE] [DELETE] [DELETE DIRECTORY]
Select OK to perform operation <input type="checkbox"/> OFF	
A:\ LABEL:	FREE: Bytes
STATUS: <input type="checkbox"/> OFF <input type="checkbox"/> OK MULTIPLE WINDOW	

To Rename a File

Select **OTHER** **FLOPPY DISK** and set up the display as shown opposite.

The FROM file name **with extension** can contain up to 12 alphanumeric characters and can be entered as described in *File and Directory Management*.

The To Directory can be selected as described in *File and Directory Management*.

The TO file contains up to 8 alphanumeric characters. (the extension is fixed - determined by the FROM file name extension)

Select **OK** to rename the file.

If you have entered a TO filename which already exists, a warning "File exists - are you sure" you wish to continue is displayed. If YES is selected the file will be renamed. To cancel, change OK to OFF.

FUNCTION	[FLOPPY DISK]
DISK OPERATION	[FILE] [RENAME] [FILENAME.CNF]
FROM: NAME	[FILENAME.CNF]
TO: DIRECTORY NAME	A:\ [FILENAME.CNF]
Select OK to perform operation <input type="checkbox"/> OFF	
A:\ LABEL:	FREE: Bytes
STATUS: <input type="checkbox"/> OFF <input type="checkbox"/> OK MULTIPLE WINDOW	

Mainframe Features

Disk Drive

To Create a Directory

Select **OTHER FLOPPY DISK** and set up the display as shown opposite.

The directory name can contain up to 8 alphanumeric characters and can be entered in 2 ways:

1. Use the **PREVIOUS CHAR** **NEXT CHAR** **←** **→** softkeys.
2. Use **SET** and the method described in *File and Directory Management*

Select **OK** to create the directory.

The screenshot shows a mainframe menu for disk operations. At the top, 'FUNCTION' is set to 'FLOPPY DISK'. Below it, 'DISK OPERATION' is set to 'CREATE DIRECTORY'. The 'NAME' field contains 'ATM'. A prompt 'Select OK to perform operation' is followed by a 'OFF' button. Below this, the current directory path is shown as 'A:\ CONFIG' with 'LABEL:' and 'FREE: Bytes' fields. At the bottom, there is a 'STATUS: OFF' indicator, an 'OK' button, and a 'MULTIPLE WINDOW' label.

This will create a sub directory of the directory displayed at the bottom of the display. In this example will create A:\CONFIG\ATM.

Printing from Disk

When you wish to print logging results from the Disk remove the Disk from the HP 37717C and insert in a Personal Computer (PC).

To Print from DOS Prompt

`copy /b a:\<filename> <printer name>`

To Print from Windows

Select the required file from Filemanager.

Select **FILE - COPY FILE TO**

<printer name>

Mainframe Features

Coupling Transmit and Receive Settings

Coupling Transmit and Receive Settings

When generating and measuring at the same interface level it is useful to have the transmit and receive settings coupled together. Any settings change made on the transmit display will automatically occur on the receive display. Any settings change made on the receive display will automatically occur on the transmit display.

This function is available on the **OTHER SETTINGS CONTROL** display.

FUNCTION	[SETTINGS CONTROL]
TRANSMITTER AND RECEIVER	<input checked="" type="checkbox"/> COUPLED
RECEIVER COUPLED TO TRANSMITTER	

STATUS: INDEPENDENT COUPLED MULTIPLE WINDOW

Suspending a Test on Signal Loss

To suspended tests on signal loss, set **OTHER MISCELLANEOUS** SUSPEND TEST ON SIGNAL LOSS to ON.

FUNCTION	[MISCELLANEOUS]
KEYBOARD LOCK	[OFF]
BEEP ON RECEIVED ERROR	[OFF]
SUSPEND TEST ON SIGNAL LOSS	<input checked="" type="checkbox"/> ON
GRAPH STORAGE RESOLUTION	[COMPRESS]
NOTE: storing graph results with full resolution will reduce storage capacity by 50%	

STATUS: OFF ON MULTIPLE WINDOW

Mainframe Features

Time & Date

Time & Date

When making Bit error measurements and recording results it is desirable to have certain events timed chronologically for example, Alarms; Error Seconds.

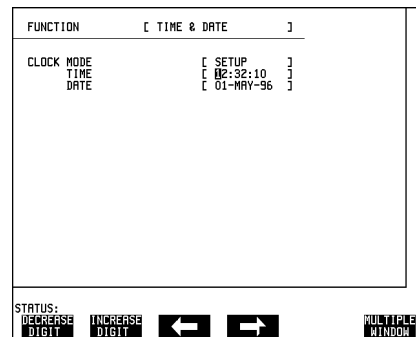
The capability to set the Time and Date is provided on the **OTHER** display under the TIME & DATE function.

Setting Time and Date

1. Set up the **OTHER** display as shown opposite.

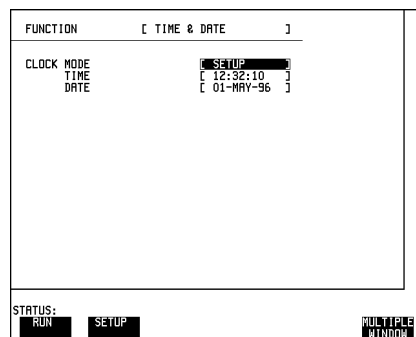
The time and date is most easily set using the pop-up menu displayed with **SET**.

. The alternative method is to use **↑**;
↓; **←**; **→**; **INCREASE DIGIT**
and **DECREASE DIGIT**.



2. Using **↑** and **↓** move the highlighted bar to [SETUP] as shown opposite.

Select **RUN** to complete the setting of Time and Date.







Mainframe Features

Keyboard Lock

Keyboard Lock

It is often desirable to protect the measurement settings from interference, during a test. This facility is provided in the HP 37717C on the **OTHER** **MISCELLANEOUS** display.

The following keys are not affected by Keyboard Lock:

- Display keys **TRANSMIT**; **RECEIVE**; **RESULTS**; **GRAPH**; **OTHER**
- cursor keys    and 
- **SHOW HISTORY**
- **PAPER FEED**

The following display functions are not affected by Keyboard Lock:

- RESULTS type on the **RESULTS** display
- KEYBOARD LOCK on the **OTHER** display

Lock/Unlock the Keyboard

1. Set up the **OTHER** display as shown opposite.

To Lock the keyboard select [ON].

To Unlock the keyboard select [OFF].

FUNCTION	[MISCELLANEOUS]
KEYBOARD LOCK	[ON]
BEEP ON RECEIVED ERROR	[OFF]
SUSPEND TEST ON SIGNAL LOSS	[OFF]
GRAPH STORAGE RESOLUTION	[COMPRESS]
NOTE: storing graph results with Full resolution will reduce storage capacity by 50%.	
STATUS:	
OFF	ON
	MULTIPLE WINDOW

Mainframe Features
Beep On Received Error

Beep On Received Error

It is sometimes desirable to have an audible indication of an error particularly when the display on the test set is hidden from view. This function is provided in the HP 37717C on the **OTHER** **MISCELLANEOUS** display.

Enable/Disable Beep On Error

1. Set up the **OTHER** display as shown opposite.

FUNCTION	[MISCELLANEOUS]
KEYBOARD LOCK	[OFF]
BEEP ON RECEIVED ERROR	[ON]
SUSPEND TEST ON SIGNAL LOSS	[OFF]
GRAPH STORAGE RESOLUTION	[COMPRESS]
NOTE: storing graph results with full resolution will reduce storage capacity by 50%	

STATUS:
OFF ON MULTIPLE WINDOW

Analysis Control (Option UKK[USB] only)

The HP 37717C allows a choice of Analysis results when testing and this choice is selected under ANALYSIS DISPLAY MODE.

This function is provided on the **OTHER** **MISCELLANEOUS** display.

1. Set up the **OTHER** display as shown opposite.

Select the analysis results required either G.821 or M.2100.

If Option UKJ[USA] is fitted the choice is made on the **RESULTS** display.

FUNCTION	[MISCELLANEOUS]
KEYBOARD LOCK	[OFF]
BEEP ON RECEIVED ERROR	[OFF]
SUSPEND TEST ON SIGNAL LOSS	[OFF]
UPDH ANALYSIS DISPLAY MODE	[G.821]
GRAPH STORAGE RESOLUTION	[COMPRESS]
NOTE: storing graph results with full resolution will reduce storage capacity by 50%	

STATUS:
G.821 M.2100 MULTIPLE WINDOW

Mainframe Features

Self Test

Self Test

Before using the HP 37717C to make measurements it may be desirable to run Self Test to ascertain the integrity of the HP 37717C. These tests take approximately 15 minutes to complete.

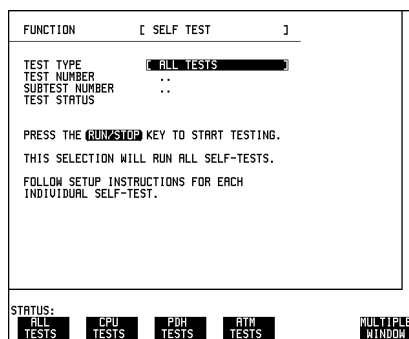
1. Set up the **OTHER** display as shown opposite using **OTHER**, **MORE** and **SELF TEST**

2. PDH Loopbacks:

Connect 75 Ω Signal In to 75 Ω Signal Out.

Connect 120 Ω Signal In to 120 Ω Signal Out.

If Option UKJ is fitted connect MUX port to DEMUX port.



3. SDH Loopbacks:

Connect the STM-1 IN port to the STM-1 OUT port.

4. Optical Interface Loopbacks:

Connect the IN port to the OUT Port.

NOTE

If Option URU, STM-1/STM-4 Optical Interface, is fitted connect an Optical attenuator, set to 10 dB, between the IN and OUT Ports.

NOTE

If Option USN or UKT, Dual Wavelength Optical Interface, is fitted connect the **1310 nm** OUT port to the IN port. Do not connect the **1550 nm** OUT port to the IN port.

NOTE

If any or all of these connections are not made the HP 37717C will FAIL Self Test.

Mainframe Features

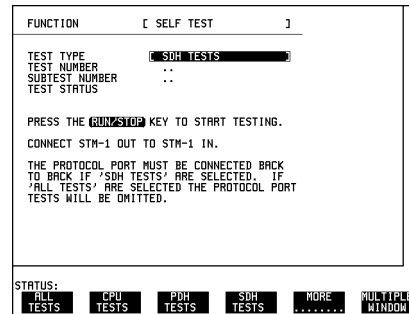
Self Test

6. Press **RUN/STOP** to activate the Self Test. TEST STATUS [RUNNING] will be displayed. The information pertaining to TEST TYPE, TEST NUMBER and SUBTEST NUMBER will change as the Self Test progresses

If the HP 37717C is functioning correctly, after approximately 15 minutes, TEST STATUS [PASSED] is displayed.

If TEST STATUS [FAIL nnn] is displayed the HP 37717C should be returned to a service office for repair.

FAIL Error Numbers are listed and defined in Appendix C.



Additional Tests

Line Jitter Tests

NOTE

If Options A1M, A1N or A1P, SDH Line Jitter, are fitted the full set of jitter tests are not included under ALL TESTS.

To fully test SDH Line Jitter:

1. Select JITTER TESTS
2. Connect STM-1 OUT from the SDH module to STM-1E IN on the RX Jitter module.
3. For Options A1N and A1P only connect STM-1/STM-4 OUT on the Optical Module to STM-1/STM-4 IN on the RX Jitter module.
4. RUN the JITTER TESTS.

1550 nm Dual Wavelength Tests

NOTE

If Option USN or UKT, Dual Wavelength Optical Interface, is fitted the 1550 nm tests are not included under ALL TESTS.

To complete the 1550 nm tests:

1. Select STM-1/STM-4 OPTICS TESTS

Mainframe Features

Self Test

2. Connect STM-1/STM-4 1550 nm OUT to STM-1/STM-4 1550 nm IN via an Optical Attenuator set to 10 dB.
3. RUN the STM-1/STM-4 OPTICS TESTS.

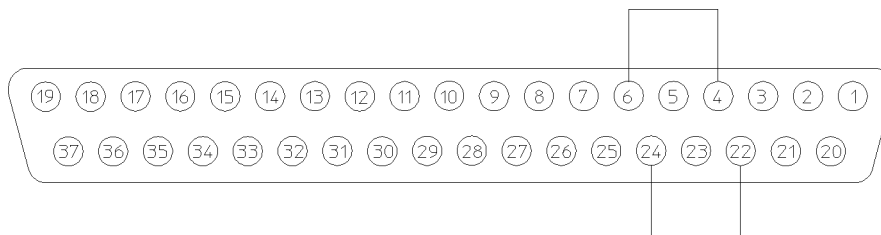
Datacom Tests

NOTE

If Option A1T[A1U], SDH Module, is fitted the Datacomm RS449 port is not tested under ALL TESTS

To test the Datacomm port:

1. Select SDH TESTS
2. Make the following connections on the Datacomm port.



Self Test Datacomm port loopback connections

3. RUN the SDH TESTS.

Mainframe Features
Self Test

Appendix A - Logging Messages

Appendix A - Logging Messages

Logging Devices

Logging Devices

The Disc Drive is a standard feature included in all instruments. Graphics results cannot be logged to the Disc drive.

If Remote Control Option A3B or A3D, is fitted the following types of External printer can be used for results logging:

- HP-IB HP 550C DeskJet printer
- RS-232-C HP 550C DeskJet printer
- An alternative suppliers RS-232-C printer

The alternative suppliers RS-232-C printer can be 40 column width or 80 column width. If a 40 column width printer is used Graphics results cannot be logged.

Results Logging

Header and results are logged to the selected device when:

- **PRINT NOW** is pressed.
- If LOGGING [ON] is selected on the **OTHER LOGGING** display and a measurement is started by pressing **RUN/STOP**

```
=====
                        Hewlett Packard HP37717 C
                        Instrument Configuration
=====
RECEIVER :
  Bit Rate      : 8 Mb/s           Pattern      : 2^15-1
  Code          : HDB3             Interface    : 75ohm Unbal
  Tx Clk Offset : Off
MEASUREMENT STARTED 24 Nov 93 07:25:17      Print Period 5 Minutes
=====
```

Logging Header

Appendix A - Logging Messages

Results Logging

If **PRINT NOW** is pressed the cumulative results are logged. If a measurement is in progress the current results are logged. If a measurement is not in progress the cumulative results for the last measurement are logged.

During the Measurement Period

If LOG ERROR SECOND [ON] is selected on the **OTHER** LOGGING display all occurrences of an Error Second will be logged:

- Bit
- Code (PDH / DSn)
- Frame (PDH / DSn)
- CRC (PDH / DSn)
- REBE (PDH)
- P-Parity (DS3)
- CP-Parity (DS3)
- FEBE (PDH / DSn / PLCP Convergence Layer)
- A1A2 FRAME (SDH / SONET Option A1T[A1U] only)
- RS B1 BIP (SDH / SONET)
- MS B2 BIP (SDH / SONET)
- MS FEBE (SDH / SONET Option A1T[A1U] only)
- Path B3 BIP (SDH / SONET)
- Path FEBE (SDH / SONET)
- Path IEC (SDH / SONET Option A1T[A1U] only)
- TU Path BIP (SDH / SONET)
- TU Path FEBE (SDH / SONET)
- Jitter Hit (PDH Jitter)
- BIP 8 (B1) (PLCP Convergence Layer)
- EM BIP (ATM Physical Layer)
- FEBE (ATM Physical Layer)
- Corrected HEC (ATM)
- Non Corrected HEC (ATM)

Appendix A - Logging Messages

Results Logging

- Cell Loss (ATM)
- Errored Cells (ATM)
- Misinserted Cells (ATM)

All Alarm occurrences will be logged both when set and cleared:

- Signal Loss
- AIS (PDH / DSn and ATM)
- Pattern Sync Loss (PDH / DSn and ATM)
- Loss Of Frame (SDH / SONET, PDH / DSn and ATM)
- Out Of Frame (SDH / SONET)
- Multiframe (PDH / DSn)
- Remote Loss (FERF) (PDH / DSn)
- Remote Multiframe Loss (PDH / DSn)
- Excess Zeros (DSn)
- Loss of Pointer (SDH / SONET)
- MS AIS / Line AIS (SDH / SONET)
- Path AIS / AIS-P (SDH / SONET)
- Pattern Loss (SDH / SONET)
- Clock Loss (SDH / SONET)
- MS FERG / Line FERG (SDH / SONET)
- Path FERG / RDI-P (SDH / SONET)
- K1K2 Change (SDH / SONET Option A1T[A1U] only)
- H4 Multiframe Loss (SDH / SONET)
- TU Loss of Pointer / VT Loss of Pointer (SDH / SONET)
- TU AIS / VT AIS (AIS-V) (SDH / SONET)
- TU Path FERG (SDH / SONET)
- Jitter Lock Loss (Option UHN[US9])
- Excess Jitter (Option UHN[US9])

Appendix A - Logging Messages

Results Logging

- Excess Wander (Option UHN[US9])
- Wander Ref Loss (Option UHN[US9])
- Wander Signal Loss (Option UHN[US9])
- PLCP Frame Loss (PLCP Convergence Layer)
- RAI (Yellow) (PLCP Convergence Layer)
- FERF (PDH / DS_n and ATM)
- Loss of Cell Sync (ATM)
- Selected Cell Not Received (ATM)
- Congestion Experienced (ATM)
- Test Cell Loss (ATM)
- VP AIS (ATM)
- VP FERF (ATM)
- VC AIS (ATM)
- VC FERF (ATM)
- VC Loss of Continuity (ATM)
- Performance Monitor OAM Loss (ATM)
- Test Cell Loss (ATM)

In addition the following events are logged:

- All Alarms Clear
- Power Failure
- Power Restored
- New Day
- Squelched
- Unsquelched
- Print Demanded - if **PRINT NOW** is pressed.
- Print Period - if selected on **OTHER LOGGING** display.
- Printing Enabled - if Printer enabled during a measurement.

Appendix A - Logging Messages

Results Logging

- Measurement Complete

ERROR SEC		Code	Bit
23:56:35		0	63604
ERROR SEC		Code	Bit
23:56:36		0	139264
ERROR SEC		Code	Bit
23:56:37		0	139264
ERROR SEC		Code	Bit
23:56:38		0	139264
ERROR SEC		Code	Bit
23:56:39		0	139264
ERROR SEC		Code	Bit
23:56:40		0	139264
ERROR SEC		Code	Bit
23:56:41		0	139264
ERROR SEC		Code	Bit
23:56:42		0	139264
ERROR SEC		Code	Bit
23:56:43		0	139264
ERROR SEC		Code	Bit
23:56:44		0	139264
23:56:45	SQUELCHED		
23:56:48	UNSQUELCHED		
23:56:54	AIS Alarm	SET	
23:56:54	Pattern Sync Loss	SET	
23:56:55	AIS Alarm	CLEAR	
23:56:55	Pattern Sync Loss	CLEAR	
ERROR SEC		Code	Bit
23:56:55		??05393	0
ERROR SEC		Code	Bit
23:56:56		0	276785
=====			
26-Nov-93 | NEW DAY			
=====			

Logging During Measurement

Appendix A - Logging Messages

Results Logging

At the End of the Measurement Period

A complete set of measurement results are logged.

```

MEASUREMENT COMPLETE : 26 Nov 93 00:01:59 Elapsed Time : 00d 00h 06m 11s
=====
                          Cumulative Results
=====
Error Results :
Error Count          CODE          BIT
Error Ratio         6.221E+07  2.882E+06
                   1.204E-03  5.578E-05

Frequency: 139263992 Hz      Offset:  -0.06 Hz      Offset:  -8 ppm

Analysis Results :
G.821 Analysis
                          CODE          BIT
ES                          1          24
%ES                          6.4690
%ES (Annex D)                6.469
EFS                          347
%EFS                          93.5310
SES                          1
%SES                          0.2695
DM                            2
%DM                          28.5714
UNAV                          0
%UNAV                        0.0000
=====

```

Logging At End of Measurement

Bar Graph Logging (External Printer Only)

To log the Bar Graphs select the required logging device (RS232 or HPIB) under LOGGING PORT on the **OTHER LOGGING** display. Select LOGGING [ON] on the **OTHER LOGGING** display. Display the Bar Graphs required on the Bar Graph display and press **PRINT**. The Error Summary, the Alarm Summary, the selected Bar Graphs and the Alarms Graph are logged.

```

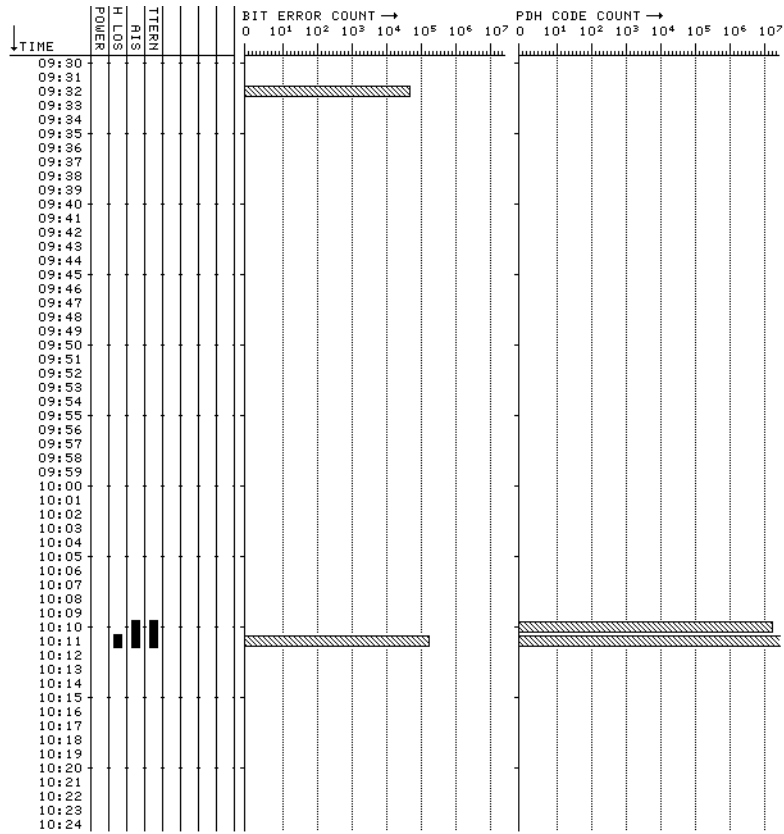
=====
                          Hewlett Packard HP37717 C
                          Graphical Text Results
MEASUREMENT STARTED : 09:25 26-NOV-1993
TEST DURATION       : 00d 01h 00m

Error Summary
Count      Ratio          Count      Ratio
BIT        1.406E+06  2.805E-06  CODE      1.559E+08  3.109E-04
Alarm Summary
Power Loss      0
LOS             1
AIS             5
PSL             5
=====

```

Appendix A - Logging Messages

Results Logging



Bar Graph Logging

Graphics Text Results Logging

To log the Alarm Summaries select the required logging device (RS232 or HPIB) under LOGGING PORT on the **OTHER LOGGING** display. Select LOGGING [ON] on the **OTHER LOGGING** display. Display the results required on the Text Results display and press **PRINT**. The Error Summary and Alarm Summary are logged.

Appendix A - Logging Messages

Results Logging

```
=====
                                Hewlett Packard HP37717 C
                                Graphical Text Results
MEASUREMENT STARTED : 13:10 23-NOV-1993
TEST DURATION       : 00d 01h 01m

Error Summary
Count      Ratio      CODE      Count      Ratio
BIT        157791    5.190E-06
Alarm Summary
Power Loss          3
LOS                 4
AIS                 0
PSL                 6
=====
```

Text Results Logging

Jitter Auto Tolerance Results Logging

To log the Jitter Auto tolerance plot select the required External logging device under LOGGING PORT on the **OTHER LOGGING** display. Select LOGGING [ON] on the **OTHER LOGGING** display. Select RESULTS **JITTER** ; **AUTO TOLER** on the **RESULTS** display and press **PRINT NOW**.

To log the results from which the Auto Tolerance plot is constructed enable the Internal printer and select **RESULTS JITTER** ; **AUTO TOLER** and press **PRINT NOW**

Appendix A - Logging Messages
Results Logging

5

Trouble Scan page 106

Alarm Scan (Options UKJ[USA], UKL[USC]) page 107

Short Term Results page 108

Cumulative Results page 111

PDH Error Analysis G.821, G.826, M2100, M2110, M2120 page 115

SDH Error Analysis (Option US1[US5], A1T[A1U]) page 126

Jitter Results (Options UHN[US9], A1M[A1Q], A1N[A1R], A1P[A1S]) page 143

Alarm Seconds page 144

Frequency Measurement page 147

Appendix B - Results Definitions

This Appendix contains definitions of the results available from all optional modules.

Appendix B - Results Definitions

Trouble Scan

Trouble Scan

All possible error sources and alarms are scanned simultaneously. If any error counts are not zero then these are displayed. Up to 4 non-zero error counts are displayed in priority order.

Table B-1 Error Count Priority

UPDH (Options UKK[USB])	SDH (Options US1[US5], A1T[A1U])	SPDH (Options UKJ[USA], UKL[USC])	ATM (Option UKN) + SDH	ATM (Option UKN) + SPDH	ATM Physical, and Cell Layer (Option UKZ)
CRC BIT CODE FRAME REBE	RS B1 BIP MS B2 BIP PATH B3 BIP VC3 PATH BIP TU2 BIP TU12 BIP A1A2 FRAME MS FEBE PATH FEBE PATH IEC VC3 PATH FEBE TU2 FEBE TU12 FEBE BIT	CRC BIT CODE FAS 140M FAS 34M FAS 8M FAS 2M REBE	RS B1 BIP (SDH only) MS B2 BIP (SDH only) PATH B3 BIP (SDH only) Non Corrected HEC Corrected HEC Lost Cells Misinserted Cells Path FEBE Bit Errored Cells	EM BIP Non Corrected HEC Corrected HEC Lost Cells Misinserted Cells EM FEBE Bit Errored Cells	FRAME CODE CP-Parity (DS3) P-Parity (DS3) CRC6 (DS1) PLCP-BIP8 (DS3) FEBE (DS3) PLCP-FRBE (DS3) PLCP Trailer Then as for ATM Option UKN

If any alarms are active "ALARMS ACTIVE" is displayed.

SHOW HISTORY and the alarm led's can be used to determine which alarms are active.

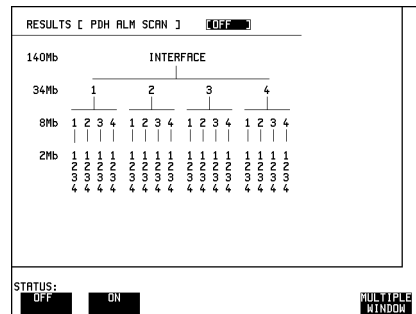
If no alarms are active and no non-zero error counts are detected then "NO TROUBLE" is displayed.

Appendix B - Results Definitions
Alarm Scan (Options UKJ[USA], UKL[USC])

Alarm Scan (Options UKJ[USA], UKL[USC])

Frame Loss, AIS and Remote Alarm at the interface rate and all lower levels of the hierarchy are displayed in graphical form as shown opposite.

The graphical display does not show which of the three possible alarms has occurred for each rate. However the alarmed rate can be selected and an analysis of the alarm state obtained.



Short Term Results

Short Term Results

Displays period results obtained during the measurement. The period is user-defined under SHORT TERM PERIOD on the **RESULTS** display. Many result parameters are presented in two forms: a count of error events (EC or COUNT) and a ratio of the number of errors to the total possible in the time period (ER or RATIO).

PDH Results (Options UKJ[USA], UKK[USB] and UKL[USC])

BIT	Bit by Bit comparison of the received data with the internal reference pattern.
CODE	Compares the received code with its correctly coded equivalent
FRAME (FAS)	Compares the received FAS word (or bit) with the correct value.
CRC 4	Compares the received CRC4 with the calculated CRC4 (2 Mb/s only).
REBE	Detects Bit 1 of the NFAS word in frames 13 and 15 being set to 0 (2 Mb/s only).
EMBIP	Resulting from the comparison of the recalculated BIP-8 with the received BIP-8. Each bit of the BIP in error constitutes a single error.
FEBE	Far End Block Errors indicated by the received FEBE bits.

PDH Results (Option UKZ)

As for the above PDH Options plus the following:

P-BIT PARITY	Compares the received P1, P2 bits with those calculated on the preceding received M-frame. 1 or 2 errors in the pair is counted as 1 parity error.
C-BIT PARITY	Compares the received CP-bit value (majority vote) with the P1, P2 value calculated on the preceding received M-frame.
CRC 6	Compares the received CRC6 with the calculated CRC6 (DS1 only). Any differences in the 6 bits count as 1 error.

SDH / SONET Results (Options US1[US5], A1T[A1U])

Error Count and Error Ratio results for the following error sources are available:

A1A2 FRAME	Compares the received Framing bytes with the known value.
-------------------	---

Appendix B - Results Definitions

Short Term Results

	(Option A1T[A1U] only)
RS B1 BIP	Compares the received B1 with the recalculated value.
MS B2 BIP	Compares the received B2 with the recalculated value.
MS FEBE	Calculated from the FEBE bits in the received M1 overhead byte. (Option A1T[A1U] only)
PATH B3 BIP	Compares the received B3 with the recalculated value.
PATH FEBE	Calculated from the FEBE bits in the received G1 overhead byte.
PATH IEC	Calculated from the PIEC bits in the received Z5 Path overhead byte. (Option A1T[A1U] only)

If a Payload of 34 Mb/s is selected, Error Count and Error Ratio results for the following additional error sources are also available:

TU PATH BIP	Compares the received VC3, B3 with the recalculated value.
TU PATH FEBE	Calculated from the FEBE bits in the received VC3, G1 overhead byte.

If a Payload of 2 Mb/s is selected, Error Count and Error Ratio results for the following additional error sources are also available:

TU PATH BIP	Compares the received V5, BIP-2 in the TU12 selected for test with the recalculated value.
TU PATH FEBE	Calculated from the FEBE bits in the V5 overhead byte of the TU12 selected for test.

PLCP Convergence Layer Results (Option UKZ)

BIP 8 (B1)	Compares the received B1 byte with the value calculated over the previous PLCP frame. Each bit error counts as a B1 error.
FEBE	Calculated from the FEBE bits in the G1 byte with values of 0 to 8.
Trailer Errors	Compares the trailer length with the C1 byte.

ATM Results (Options UKN and UKZ)

Error Count and Error Ratio results for the following error sources are available:

Corrected HEC	Errors in Cell Headers which have been corrected by the HEC algorithm.
Non Corrected HEC	Errors in Cell Headers which have not been corrected by the HEC algorithm.
Received Cells	Counts received cells which match the receiver cell filter.

Appendix B - Results Definitions

Short Term Results

Errored Cells	PRBS Cell containing one or more bit errors, or a Test Cell containing incorrect EDC's.
Bit	Bit by Bit comparison of the received data with the internal reference pattern.
Cell Loss	A discontinuity in the Test Cell sequence number indicating cells have been lost.
Misinserted Cells	Errors in the Test Cell sequence number implying a misinserted cell.

Cumulative Results

Cumulative Results

Provides a cumulative display of the results during the measurement period. Many result parameters are presented in two forms: a count of error events (EC or COUNT) and a ratio of the number of errors to the total possible in the time period (ER or RATIO).

PDH Results (Options UKJ[USA], UKK [USB]and UKL[USC])

BIT	Bit by Bit comparison of the received data with the internal reference pattern.
CODE	Compares the received code with its correctly coded equivalent
FRAME (FAS)	Compares the received FAS word (or bit) with the correct value.
CRC 4	Compares the received CRC4 with the calculated CRC4 (2 Mb/s only).
REBE	Detects Bit 1 of the NFAS word in frames 13 and 15 being set to 0 (2 Mb/s only).
EMBIP	Resulting from the comparison of the recalculated BIP-8 with the received BIP-8. Each bit of the BIP in error constitutes a single error.
FEBE	Far End Block Errors indicated by the received FEBE bits.

PDH Results (Option UKZ)

As for the above PDH Options plus the following:

P-BIT PARITY	Compares the received P1, P2 bits with those calculated on the preceding received M-frame. 1 or 2 errors in the pair is counted as 1 parity error.
C-BIT PARITY	Compares the received CP-bit value (majority vote) with the P1, P2 value calculated on the preceding received M-frame.
CRC 6	Compares the received CRC6 with the calculated CRC6 (DS1 only). Any differences in the 6 bits count as 1 error.

SDH Results (Option US1[US5], A1T[A1U])

Error Count and Error Ratio results for the following error sources are available:

Appendix B - Results Definitions

Cumulative Results

A1A2 FRAME	Compares the received Framing bytes with the known value. (Option A1T[A1U] only)
RS B1 BIP	Compares the received B1 with the recalculated value.
MS B2 BIP	Compares the received B2 with the recalculated value.
MS FEBE	Calculated from the FEBE bits in the received M1 overhead byte. (Option A1T[A1U] only)
PATH B3 BIP	Compares the received B3 with the recalculated value.
PATH FEBE	Calculated from the FEBE bits in the received G1 overhead byte.
PATH IEC	Calculated from the PIEC bits in the received Z5 Path overhead byte. (Option A1T[A1U] only)

If a Payload of 34 Mb/s is selected, Error Count and Error Ratio results for the following additional error sources are also available:

TU PATH BIP	Compares the received VC3, B3 with the recalculated value.
TU PATH FEBE	Calculated from the FEBE bits in the received VC3, G1 overhead byte.

If a Payload of 2 Mb/s is selected, Error Count and Error Ratio results for the following additional error sources are also available:

TU PATH BIP	Compares the received V5, BIP-2 in the TU12 selected for test with the recalculated value.
TU PATH FEBE	Calculated from the FEBE bits in the V5 overhead byte of the TU12 selected for test.

PLCP Convergence Layer Results (Option UKZ)

BIP 8 (B1)	Compares the received B1 byte with the value calculated over the previous PLCP frame. Each bit error counts as a B1 error.
FEBE	Calculated from the FEBE bits in the G1 byte with values of 0 to 8.
Trailer Errors	Compares the trailer length with the C1 byte.

ATM Results (Options UKN and UKZ)

Error Count and Error Ratio results for the following error sources are available:

Corrected HEC	Errors in Cell Headers which have been corrected by the HEC algorithm.
Non Corrected HEC	Errors in Cell Headers which have not been corrected by the HEC algorithm.

Appendix B - Results Definitions

ATM Results

Received Cells	Counts received cells which match the receiver cell filter.
Errored Cells	PRBS Cell containing one or more bit errors, or a Test Cell containing incorrect EDC's.
Bit	Bit by Bit comparison of the received data with the internal reference pattern.
Cell Loss	A discontinuity in the Test Cell sequence number indicating cells have been lost.
Misinserted Cells	Errors in the Test Cell sequence number implying a misinserted cell.

ATM Results

Received Cells	Counts received cells which match the receiver cell filter.
Cell Loss	A discontinuity in the Test Cell sequence number indicating cells have been lost.
Misinserted Cells	Errors in the Test Cell sequence number implying a misinserted cell.
Corrected HEC	Errors in Cell Headers which have been corrected by the HEC algorithm.
Non Corrected HEC	Errors in Cell Headers which have not been corrected by the HEC algorithm.
Errored Cells	PRBS Cell containing one or more bit errors, or a Test Cell containing incorrect EDC's.
Bit	Bit by Bit comparison of the received data with the internal reference pattern.
BEDC BIP-16	Block Error Detection Code . Results from a comparison of BIP-16 calculated over user cells and received BIP-16 contained in Performance Management OAM cell. Valid only if Receiver is set to Live Traffic and performance management OAM analysis on.
Max 1-Pt C D V	Maximum value of 1-point CDV over the gating period. Note that for a Constant Bit Rate distribution, Max 1-pt CDV equals peak-to peak 2-pt CDV.
Gated Mean Cell Transfer Delay	Mean cell transfer delay averaged over the gating period. Valid only if receiving the test cell.

Appendix B - Results Definitions

ATM Results

Max Cell

Transfer Delay Maximum cell transfer delay averaged over the gating period.
Valid only if receiving the test cell

Peak-to-Peak 2-pt

CDV Maximum cell transfer delay, minus minimum cell transfer delay over the gating period. Valid only if receiving the test cell

Non Conforming

Cells The number of cells exceeding the peak cell rate and the CDV threshold

Appendix B - Results Definitions

PDH Error Analysis G.821, G.826, M2100, M2110, M2120

PDH Error Analysis G.821, G.826, M2100, M2110, M2120

Analysis results are calculated for the following error sources:

Option UKK[USB]

Out of Service G.821 BIT (All Rates)

M2100 FRAME (All Rates)

In-Service G.821 FRAME (Not 704 kb/s),

G.821 CRC and REBE (2 Mb/s, CRC Framing only).

Option UKJ[USA] & UKL[USC]

G.821 BIT and FAS (All Rates), CRC and REBE (2 Mb/s, CRC Framing only).

G.826 (All Rates)

M2100 FRAME (All Rates)

M2110 BIS (Bring Into Service) All rates

M2120 Circuit Maintenance (All Rates)

G.821 Bit Errors

These result from a bit by bit comparison of the received pattern and the internal reference pattern.

Table B-2

PDH G.821 - Bit Analysis

Display	Definition
EC	Error Count - Cumulative Bit error count during the measurement period.
ES	Error Second - Cumulative count of seconds within available time that contain at least 1 Bit error. Percentage Error Seconds is also displayed - error seconds expressed as a percentage of the available time.
% Ann. D ES	Percentage Annex D Error Seconds - As% ES, only error second is normalised to 64 kb/s rate as per ITU-T G.821 Annex D.

Appendix B - Results Definitions

PDH Error Analysis G.821, G.826, M2100, M2110, M2120

Table B-2

PDH G.821 - Bit Analysis

Display	Definition
EFS	Error Free Seconds - Cumulative count of seconds within available time that contain zero errors. Percentage Error Free Seconds is also displayed - error free seconds expressed as a percentage of the available time.
SES	Severely Errored Seconds - Cumulative count of seconds within available time in which the Bit Error Ratio is > 1 in 10^{-3} . Percentage Severely Errored Seconds is also displayed - severely errored seconds expressed as a percentage of the available time.
UNAV	Unavailable Seconds - Cumulative count of unavailable seconds. A period of unavailability begins at the start of 10 or more consecutive seconds in which the Bit Error Ratio is > 1 in 10^{-3} , and ends at the start of 10 or more consecutive seconds in which the Bit Error Ratio is < 1 in 10^{-3} . Percentage Unavailable Seconds is also displayed - unavailable seconds expressed as a percentage of the total elapsed time.
DEG MIN	Degrade Minutes - Cumulative count of degraded minutes. Available seconds, excluding Severely Errored Seconds, are packaged into 1 minute blocks. The Bit Error Ratio for the packaged block is measured and if it exceeds 1 in 10^{-6} a Degraded Minute is registered. Percentage Degraded Minutes is also displayed -Degraded Minutes expressed as a percentage of the total number of packaged 1 minute blocks.
CODE ES	Code Errored Second - Cumulative count of seconds with available time that contain at least 1 Code error.

G.821 Frame (FAS) Errors

These result from a bit by bit comparison of the received FAS word with the correct value, once frame alignment has been achieved.

Table B-3

PDH G.821 - Frame (FAS) Analysis (Not 704 kb/s)

Display	Definition
EC	Error Count - Cumulative Frame error count during the measurement period.
ES	Error Second - Cumulative count of seconds within available time that contain at least 1 Frame error. Percentage Error Seconds is also displayed - error seconds expressed as a percentage of the available time.
% Ann. D ES	Percentage Annex D Error Seconds - As % ES, only error second is normalised to 64 kb/s rate as per ITU-T G.821 Annex D.
EFS	Error Free Seconds - Cumulative count of seconds within available time that contain zero errors. Percentage Error Free Seconds is also displayed - error free seconds expressed as a percentage of the available time.

Appendix B - Results Definitions

PDH Error Analysis G.821, G.826, M2100, M2110, M2120

Table B-3

PDH G.821 - Frame (FAS) Analysis (Not 704 kb/s)

Display	Definition
SES	Severely Errored Seconds - Cumulative count of seconds within available time in which the Bit Error Ratio is > 1 in 10^{-3} . Percentage Severely Errored Seconds is also displayed - severely errored seconds expressed as a percentage of the available time.
UNAV	Unavailable Seconds - Cumulative count of unavailable seconds. A period of unavailability begins at the start of 10 or more consecutive seconds in which the Bit Error Ratio is > 1 in 10^{-3} , and ends at the start of 10 or more consecutive seconds in which the Bit Error Ratio is < 1 in 10^{-3} . Percentage Unavailable Seconds is also displayed - unavailable seconds expressed as a percentage of the total elapsed time.
DEG MIN	Degraded Minutes - Cumulative count of degraded minutes. Available seconds, excluding Severely Errored Seconds, are packaged into 1 minute blocks. The Bit Error Ratio for the packaged block is measured and if it exceeds 1 in 10^{-6} a Degraded Minute is registered. Percentage Degraded Minutes is also displayed - degraded minutes expressed as a percentage of the total number of packaged 1 minute blocks.
CODE ES	Code Errored Second - Cumulative count of seconds with available time that contain at least 1 Code error.

G.821 CRC Errors

These result from a comparison of the received CRC4 with the calculated CRC4.

Table B-4

PDH G.821 - CRC Analysis (2 Mb/s, CRC Framing)

Display	Definition
EC	Error Count - Cumulative CRC error count during the measurement period.
ES	Error Second - Cumulative count of seconds within available time that contain at least 1 CRC error. Percentage Error Seconds is also displayed - error seconds expressed as a percentage of the available time.
% Ann. D ES	Percentage Annex D Error Seconds - As % ES, only error second is normalised to 64 kbs rate as per ITU-T G.821 Annex D.
EFS	Error Free Seconds - Cumulative count of seconds within available time that contain zero errors. Percentage Error Free Seconds is also displayed - error free seconds expressed as a percentage of the available time.
SES	Severely Errored Seconds - Cumulative count of seconds within available time in which the Bit Error Ratio is > 1 in 10^{-3} . Percentage Severely Errored Seconds is also displayed - severely errored seconds expressed as a percentage of the available time.

Appendix B - Results Definitions

PDH Error Analysis G.821, G.826, M2100, M2110, M2120

Table B-4

PDH G.821 - CRC Analysis (2 Mb/s, CRC Framing)

Display	Definition
UNAV	Unavailable Seconds - Cumulative count of unavailable seconds. A period of unavailability begins at the start of 10 or more consecutive seconds in which the Bit Error Ratio is > 1 in 10^{-3} , and ends at the start of 10 or more consecutive seconds in which the Bit Error Ratio is < 1 in 10^{-3} . Percentage Unavailable Seconds is also displayed - unavailable seconds expressed as a percentage of the total elapsed time.
DEG MIN	Degrade Minutes - Cumulative count of degraded minutes. Available seconds, excluding Severely Errored Seconds, are packaged into 1 minute blocks. The Bit Error Ratio for the packaged block is measured and if it exceeds 1 in 10^{-6} a Degraded Minute is registered. Percentage Degraded Minutes is also displayed - degraded minutes expressed as a percentage of the total number of packaged 1 minute blocks.
CODE ES	Code Errored Second - Cumulative count of seconds with available time that contain at least 1 Code error.

G.821 REBE Errors

These are calculated from bit 1 of the NFAS word in frames 13 and 15 of the received 2 Mb/s.

Table B-5

PDH G.821 - REBE Analysis (2 Mb/s, CRC Framing)

Display	Definition
EC	Error Count - Cumulative REBE error count during the measurement period.
ES	Error Second - Cumulative count of seconds within available time that contain at least 1 REBE error. Percentage Error Seconds is also displayed - error seconds expressed as a percentage of the available time.
% Ann. D ES	Percentage Annex D Error Seconds - As % ES, only error second is normalised to 64 kb/s rate as per ITU-T G.821 Annex D.
EFS	Error Free Seconds - Cumulative count of seconds within available time that contain zero errors. Percentage Error Free Seconds is also displayed - error free seconds expressed as a percentage of the available time.
SES	Severely Errored Seconds - Cumulative count of seconds within available time in which the Bit Error Ratio is > 1 in 10^{-3} . Percentage Severely Errored Seconds is also displayed - severely errored seconds expressed as a percentage of the available time.
UNAV	Unavailable Seconds - Cumulative count of unavailable seconds. A period of unavailability begins at the start of 10 or more consecutive seconds in which the Bit Error Ratio is > 1 in 10^{-3} , and ends at the start of 10 or more consecutive seconds in which the Bit Error Ratio is < 1 in 10^{-3} . Percentage Unavailable Seconds is also displayed - unavailable seconds expressed as a percentage of the total elapsed time.

Appendix B - Results Definitions

PDH Error Analysis G.821, G.826, M2100, M2110, M2120

Table B-5

PDH G.821 - REBE Analysis (2 Mb/s, CRC Framing)

Display	Definition
DEG MIN	Degraded Minutes - Cumulative count of degraded minutes. Available seconds excluding Severely Errored Seconds, are packaged into 1 minute blocks. The Bit Error Ratio for the packaged block is measured and if it exceeds 1 in 10^{-6} a Degraded Minute is registered. Percentage Degraded Minutes is also displayed - degraded minutes expressed as a percentage of the total number of packaged 1 minute blocks.
CODE ES	Code Errored Second - Cumulative count of seconds with available time that contain at least 1 Code error.

G.826 PDH Analysis

PDH G.826 Analysis results are only available on Option UKJ[USA] and UKL[USC].

Table B-6

PDH G.826 Analysis - 2 Mb/s CRC4 Framed (PCM30CRC, PCM31CRC)

Display	Definition
RX ES	Receive Error Second - Cumulative count of seconds within available time that contain at least 1 G.703 Code error or 1 CRC error.
TX ES	Transmit Error Second - Cumulative count of seconds within available time that contain at least 1 REBE error.
RX SES	Receive Severely errored Seconds - Cumulative count of 1 second periods within available time that contain at least 805 CRC errors or a DEFECT. Defects are LOS, LOF and AIS.
TX SES	Transmit Severely errored Seconds - Cumulative count of 1 second periods within available time that contain at least 805 REBE errors or RAI has occurred for 2 consecutive 100 ms periods. Near-end occurrences of LOS, LOF and AIS are not included in the cumulative result.
ESR	Error Second Ratio - The ratio of errored seconds to the total seconds of available time. A period of unavailability begins at the start of 10 or more consecutive Severely Errored Seconds, and ends at the start of 10 or more non Severely Errored Seconds.
SESR	Severely Errored Second Ratio - The ratio of severely errored seconds to the total seconds of available time.
UAS	Unavailable Seconds - Cumulative count of unavailable seconds. A period of unavailability begins at the start of 10 or more consecutive severely errored seconds and ends at the start of 10 or more consecutive non severely errored seconds.
EB	Errored Block count - An errored block is a CRC4 with one or more bits in error.
BBE	Background Block Error count - Cumulative count of errored blocks excluding those in severely errored seconds.

Appendix B - Results Definitions

PDH Error Analysis G.821, G.826, M2100, M2110, M2120

Table B-6

PDH G.826 Analysis - 2 Mb/s CRC4 Framed (PCM30CRC, PCM31CRC)

Display	Definition
BBER	Background Block Error Ratio - The ratio of errored blocks to total blocks. Total blocks excludes severely errored seconds and periods of unavailability.
PUAS	Path Unavailable Second count - Logical OR of the Near and Far end unavailable seconds.

Table B-7

PDH G.826 Analysis - 2 Mb/s Framed - Not CRC4

Display	Definition
RX ES	Receive Error Second - Cumulative count of seconds within available time that contain at least 1 G.703 Code error or 1 Frame error or 1 bit error.
TX ES	Transmit Error Second - Cumulative count of seconds within available time where RAI occurs for 2 consecutive 100 ms periods.
RX SES	Receive Severely errored Seconds - Cumulative count of 1 second periods within available time that contain at least 28 Frame errors or BER 1×10^{-3} , or a DEFECT. Defects are LOS, LOF, PSL and AIS.
TX SES	Transmit Severely errored Seconds - Cumulative count of 1 second periods within available time where RAI occurs for 2 consecutive 100 ms periods. Near-end occurrences of LOS, LOF and AIS are not included in the cumulative result.
ESR	Error Second Ratio - The ratio of errored seconds to the total seconds of available time. A period of unavailability begins at the start of 10 or more consecutive Severely Errored Seconds, and ends at the start of 10 or more non Severely Errored Seconds.
SESR	Severely Errored Second Ratio - The ratio of severely errored seconds to the total seconds of available time.
UAS	Unavailable Seconds - Cumulative count of unavailable seconds. A period of unavailability begins at the start of 10 or more consecutive severely errored seconds and ends at the start of 10 or more consecutive non severely errored seconds.

Table B-8

PDH G.826 Analysis - 2 Mb/s Unframed

Display	Definition
ES	Error Second - Cumulative count of seconds within available time that contain at least 1 G.703 Code error.
SES	Severely errored Seconds - Cumulative count of 1 second periods within available time that contain a DEFECT. Defects are LOS and AIS.

Appendix B - Results Definitions

PDH Error Analysis G.821, G.826, M2100, M2110, M2120

Table B-8

PDH G.826 Analysis - 2 Mb/s Unframed

Display	Definition
ESR	Error Second Ratio - The ratio of errored seconds to the total seconds of available time. A period of unavailability begins at the start of 10 or more consecutive Severely Errored Seconds, and ends at the start of 10 or more non Severely Errored Seconds.
SESR	Severely Errored Second Ratio - The ratio of severely errored seconds to the total seconds of available time.
UAS	Unavailable Seconds - Cumulative count of unavailable seconds. A period of unavailability begins at the start of 10 or more consecutive severely errored seconds and ends at the start of 10 or more consecutive non severely errored seconds.

Table B-9

PDH G.826 Analysis - 8 Mb/s Framed

Display	Definition
RX ES	Receive Error Second - Cumulative count of seconds within available time that contain at least 1 Frame error or 1 Bit error.
TX ES	Receive Error Second - Cumulative count of seconds within available time where RAI occurs for 2 consecutive 100 ms periods.
RX SES	Receive Severely errored Seconds - Cumulative count of 1 second periods within available time that contain at least 41 Frame errors or BER 1×10^{-3} or a DEFECT. Defects are LOS, LOF, AIS and PSL.
TX SES	Transmit Severely errored Seconds - Cumulative count of 1 second periods within available time where RAI occurs for 2 consecutive 100 ms periods. Near-end occurrences of LOS, LOF and AIS are not included in the cumulative result.
ESR	Error Second Ratio - The ratio of errored seconds to the total seconds of available time. A period of unavailability begins at the start of 10 or more consecutive Severely Errored Seconds, and ends at the start of 10 or more non Severely Errored Seconds.
SESR	Severely Errored Second Ratio - The ratio of severely errored seconds to the total seconds of available time.
UAS	Unavailable Seconds - Cumulative count of unavailable seconds. A period of unavailability begins at the start of 10 or more consecutive severely errored seconds and ends at the start of 10 or more consecutive non severely errored seconds.

Table B-10

PDH G.826 Analysis - 34 Mb/s Framed

Display	Definition
RX ES	Receive Error Second - Cumulative count of seconds within available time that contain at least 1 Frame error or 1 Bit error.

Appendix B - Results Definitions

PDH Error Analysis G.821, G.826, M2100, M2110, M2120

Table B-10

PDH G.826 Analysis - 34 Mb/s Framed

Display	Definition
TX ES	Receive Error Second - Cumulative count of seconds within available time where RAI occurs for 2 consecutive 100 ms periods.
RX SES	Receive Severely errored Seconds - Cumulative count of 1 second periods within available time that contain at least 52 Frame errors or a DEFECT. Defects are LOS, LOF, AIS and PSL.
TX SES	Transmit Severely errored Seconds - Cumulative count of 1 second periods within available time where RAI occurs for 2 consecutive 100 ms periods. Near-end occurrences of LOS, LOF and AIS are not included in the cumulative result.
ESR	Error Second Ratio - The ratio of errored seconds to the total seconds of available time. A period of unavailability begins at the start of 10 or more consecutive Severely Errored Seconds, and ends at the start of 10 or more non Severely Errored Seconds.
SESR	Severely Errored Second Ratio - The ratio of severely errored seconds to the total seconds of available time.
UAS	Unavailable Seconds - Cumulative count of unavailable seconds. A period of unavailability begins at the start of 10 or more consecutive severely errored seconds and ends at the start of 10 or more consecutive non severely errored seconds.

Table B-11

PDH G.826 Analysis - 140 Mb/s Framed

Display	Definition
RX ES	Receive Error Second - Cumulative count of seconds within available time that contain at least 1 Frame error.
TX ES	Receive Error Second - Cumulative count of seconds within available time where RAI occurs for 2 consecutive 100 ms periods.
RX SES	Receive Severely errored Seconds - Cumulative count of 1 second periods within available time that contain at least 69 Frame errors or a DEFECT. Defects are LOS, LOF, AIS.
TX SES	Transmit Severely errored Seconds - Cumulative count of 1 second periods within available time where RAI occurs for 2 consecutive 100 ms periods. Near-end occurrences of LOS, LOF and AIS are not included in the cumulative result.
ESR	Error Second Ratio - The ratio of errored seconds to the total seconds of available time. A period of unavailability begins at the start of 10 or more consecutive Severely Errored Seconds, and ends at the start of 10 or more non Severely Errored Seconds.
SESR	Severely Errored Second Ratio - The ratio of severely errored seconds to the total seconds of available time.
UAS	Unavailable Seconds - Cumulative count of unavailable seconds. A period of unavailability begins at the start of 10 or more consecutive severely errored seconds and ends at the start of 10 or more consecutive non severely errored seconds.

Appendix B - Results Definitions

PDH Error Analysis G.821, G.826, M2100, M2110, M2120

Table B-12

PDH G.826 Analysis - 8, 34 and 140 Mb/s Unframed

Display	Definition
ES	Error Second - Cumulative count of seconds within available time that contain at least 1 DEFECT. Defects are LOS and AIS.
SES	Severely errored Seconds - Cumulative count of 1 second periods within available time that contain a DEFECT. Defects are LOS and AIS.
ESR	Error Second Ratio - The ratio of errored seconds to the total seconds of available time. A period of unavailability begins at the start of 10 or more consecutive Severely Errored Seconds, and ends at the start of 10 or more non Severely Errored Seconds.
SESR	Severely Errored Second Ratio - The ratio of severely errored seconds to the total seconds of available time.
UAS	Unavailable Seconds - Cumulative count of unavailable seconds. A period of unavailability begins at the start of 10 or more consecutive severely errored seconds and ends at the start of 10 or more consecutive non severely errored seconds.

PDH M.2100 Frame Analysis

For Option UKK[USB], Analysis results based on ITU-T G.821 or M.2100 can be selected on the **OTHER** **MISCELLANEOUS** display under RESULTS DISPLAY MODE.

For Option UKJ[USA], UKL[USC] Analysis results based on ITU-T G.821 or M.2100 can be selected on the **RESULTS** [PDH] [ERROR ANALYSIS] display.

M.2100 Analysis is based on Frame errors.

Table B-13

PDH M.2100 - Frame (FAS) Analysis (Not 704 kb/s)

Display	Definition
RX ES	Receive Error Seconds - Cumulative count of seconds within available time that contain at least 1 FAS error. 2 Mb/s, CRC Framing - Cumulative count of seconds within available time that contain at least 1 CRC4 error.
TX ES	Transmit Error Seconds - 2 Mb/s, CRC Framing only. Cumulative count of seconds within available time that contain at least 1 REBE error.
RX SES	Receive Severely Errored Seconds - Cumulative count of seconds within available time in which the error ratio exceeds a threshold. The threshold changes according to the selected rate as follows: 140 Mb/s - ≥ 568 Frame Bit errors 34 Mb/s - ≥ 223 Frame Bit errors 8 Mb/s - ≥ 99 Frame Bit errors 2 Mb/s (Non CRC4) - ≥ 28 Frame Bit errors 2 Mb/s (CRC4) - ≥ 830 CRC4 errors
TX SES	Transmit Severely Errored Seconds - 2 Mb/s, CRC Framing only. Cumulative count of seconds within available time that contain ≥ 830 REBE errors.

Appendix B - Results Definitions

PDH Error Analysis G.821, G.826, M2100, M2110, M2120

Table B-13

PDH M.2100 - Frame (FAS) Analysis (Not 704 kb/s)

Display	Definition
UNAV	Unavailable Seconds - Cumulative count of unavailable second. A period of unavailability begins at the start of 10 or more consecutive Severely Errored Seconds, and ends at the start of 10 or more non Severely Errored Seconds.

Appendix B - Results Definitions

PDH Error Analysis G.821, G.826, M2100, M2110, M2120

PDH M.2110 BIS (Bring Into Service)

Provides a 2 Hour, 24 Hour and 7 Day PASS, FAIL, m-d;- indication for BIS testing as described in M.2110. The ES and SES results are compared to the S1 and S2 thresholds and indicate PASS, FAIL or m-d;- (uncertain). If m-d;- is displayed the next longest test will be carried out.

The S1 and S2 thresholds can be set in two different ways:

1. USER PROGRAM - S1 and S2 values are input by the user.
2. PATH ALLOCATION - The HP 37717C calculates the S1 and S2 values, from the user entered Path Allocation value, according to M.2110.

RESULTS [PDH]		[ERROR ANALYSIS]	
G.821	G.826	M.2100	M.2110
BIS LIMITS [USER PROGRAM]			
ES	S1	2-hr [7]	24-hr [147] [1210]
S2	S2	[22]	[198] ["]
SES	S1	[0]	[0] [" 30]
S2	S2	[2]	[8] ["]
BIS RESULTS-			
ELAPSED TIME			
STATUS:			
MULTIPLE WINDOW			

PDH M.2120 Circuit Maintenance

Provides a threshold report when any of the relevant thresholds are exceeded within a 15 Minute (TR1 ES & SES) or 24 Hour period (TR2 ES & SES).

The TR1 and TR2 thresholds can be set in two different ways:

1. USER PROGRAM - TR1 ES & SES and TR2 ES & SES values are input by the user.
2. PATH ALLOCATION - The HP 37717C calculates the TR1 and TR2 values, from the user entered Path Allocation and Maintenance Factor values, according to M.2120.

RESULTS [PDH]		[ERROR ANALYSIS]	
G.821	G.826	M.2100	M.2110
MAINT. THRESHOLD [USER PROGRAM]			
ES	TR1 (15-min)	TR2 (24-hr)	
SES	[120]	[130]	
THRESHOLD	[15]	[9]	
REPORTS	TR		
ELAPSED TIME			
STATUS:			
MULTIPLE WINDOW			

SDH Error Analysis (Option US1[US5], A1T[A1U])

SDH Error Analysis (Option US1[US5], A1T[A1U])

Analysis results are calculated for the following error sources:

RS B1 BIP; MS B2 BIP; Path B3 BIP and Path FEBE. If a Payload of 34 Mb/s or 2 Mb/s is selected additional error sources of TU Path BIP and TU Path FEBE are also available.

G.826 Analysis RS B1 BIP

These calculations are based on "Errored Blocks". A Block is a set of consecutive bits associated with the Path. Each bit belongs to one and only one block. If an STM-4 interface is selected an errored block is a BIP with one or more bits in error.

Table B-14

G.826 Analysis RS B1 BIP

Display	Definition
ES	Errored Seconds - Cumulative count of 1 second periods that contain at least 1 Errored Block.
EB	Errored Block count - cumulative count of errored blocks.
SES	Severely errored Seconds - Cumulative count of 1 second periods with \geq 2400 Errored Blocks, or containing a "defect". Defects are LOS and LOF.
UNAV	Unavailability - Cumulative count of unavailable seconds. A period of unavailability begins at the start of 10 or more consecutive severely errored seconds, and ends at the start of 10 or more consecutive non severely errored seconds.
ESR	Error Second Ratio - The ratio of errored seconds to the total seconds of available time. A period of unavailability begins at the start of 10 or more consecutive Severely Errored Seconds, and ends at the start of 10 or more non Severely Errored Seconds.
SESR	Severely Errored Second Ratio - The ratio of severely errored seconds to the total seconds of available time.
BBEC	Background Block error count - Cumulative count of errored blocks which occur outwith a severely errored second.
BBER	Background Block error Ratio - The ratio of errored blocks to total blocks. Total blocks excludes severely errored seconds and periods of unavailability.

Appendix B - Results Definitions

SDH Error Analysis (Option US1[US5], A1T[A1U])

G.826 Analysis MS B2 BIP

These calculations are based on "Errored Blocks". A Block is a set of consecutive bits associated with the Path. Each bit belongs to one and only one block. If an STM-4 interface is selected an errored block is a BIP with one or more bits in error.

Table B-15

G.826 Analysis MS B2 BIP

Display	Definition
ES	Errored Seconds - Cumulative count of 1 second periods that contain at least 1 Errored Block.
EB	Errored Block count - cumulative count of errored blocks.
SES	Severely errored Seconds - Cumulative count of 1 second periods with ≥ 2400 Errored Blocks, or containing a "defect". Defects are LOS, LOF and MS AIS.
UNAV	Unavailability - Cumulative count of unavailable seconds. A period of unavailability begins at the start of 10 or more consecutive severely errored seconds, and ends at the start of 10 or more consecutive non severely errored seconds.
ESR	Error Second Ratio - The ratio of errored seconds to the total seconds of available time. A period of unavailability begins at the start of 10 or more consecutive Severely Errored Seconds, and ends at the start of 10 or more non Severely Errored Seconds.
SESR	Severely Errored Second Ratio - The ratio of severely errored seconds to the total seconds of available time.
BBEC	Background Block error count - Cumulative count of errored blocks which occur outwith a severely errored second.
BBER	Background Block error Ratio - The ratio of errored blocks to total blocks. Total blocks excludes severely errored seconds and periods of unavailability.

Appendix B - Results Definitions

SDH Error Analysis (Option US1[US5], A1T[A1U])

G.826 Analysis MS FEBE (Option A1T[A1U] only)

These calculations are based on "Errored Blocks". A Block is a set of consecutive bits associated with the Path. Each bit belongs to one and only one block. If an STM-4 interface is selected an errored block is a FEBE with one or more bits in error.

Table B-16

G.826 Analysis MS FEBE

Display	Definition
ES	Errored Seconds - Cumulative count of 1 second periods that contain at least 1 Errored Block.
EB	Errored Block count - cumulative count of errored blocks.
SES	Severely errored Seconds - Cumulative count of 1 second periods with \geq 2400 Errored Blocks, or MS FERF.
UNAV	Unavailability - Cumulative count of unavailable seconds. A period of unavailability begins at the start of 10 or more consecutive severely errored seconds, and ends at the start of 10 or more consecutive non severely errored seconds.
ESR	Error Second Ratio - The ratio of errored seconds to the total seconds of available time. A period of unavailability begins at the start of 10 or more consecutive Severely Errored Seconds, and ends at the start of 10 or more non Severely Errored Seconds.
SESR	Severely Errored Second Ratio - The ratio of severely errored seconds to the total seconds of available time.
BBEC	Background Block error count - Cumulative count of errored blocks which occur outwith a severely errored second.
BBER	Background Block error Ratio - The ratio of errored blocks to total blocks. Total blocks excludes severely errored seconds and periods of unavailability.

NOTE

Near End Failures of LOS, LOF and MS AIS produce "dead time" in the MS FEBE measurement such that result accumulation is suspended.

Appendix B - Results Definitions

SDH Error Analysis (Option US1[US5], A1T[A1U])

G.826 Path B3 BIP Analysis

These calculations are based on "Errored Blocks". A Block is a set of consecutive bits associated with the Path. Each bit belongs to one and only one block.

Table B-17

G.826 Analysis Path B3 BIP

Display	Definition
ES	Errored Seconds - Cumulative count of 1 second periods that contain at least 1 Errored Block.
EB	Errored Block count - cumulative count of errored blocks.
SES	Severely errored Seconds - Cumulative count of 1 second periods with >= 2400 Errored Blocks, or containing a "defect". Defects are LOS, LOF, MSAIS, LOP and Path AIS.
UNAV	Unavailability - Cumulative count of unavailable seconds. A period of unavailability begins at the start of 10 or more consecutive severely errored seconds, and ends at the start of 10 or more consecutive non severely errored seconds.
ESR	Error Second Ratio - The ratio of errored seconds to the total seconds of available time. A period of unavailability begins at the start of 10 or more consecutive Severely Errored Seconds, and ends at the start of 10 or more non Severely Errored Seconds.
SESR	Severely Errored Second Ratio - The ratio of severely errored seconds to the total seconds of available time.
BBEC	Background Block error count - Cumulative count of errored blocks which occur outwith a severely errored second.
BBER	Background Block error Ratio - The ratio of errored blocks to total blocks. Total blocks excludes severely errored seconds and periods of unavailability.
PUAS	Path Unavailable Second count - Logical OR of the Near and Far end unavailable seconds.

Appendix B - Results Definitions

SDH Error Analysis (Option US1[US5], A1T[A1U])

G.826 Path FEBE Analysis

These calculations are based on "Errored Blocks". A Block is a set of consecutive bits associated with the Path. Each bit belongs to one and only one block.

Table B-18

G.826 Analysis Path FEBE

Display	Definition
ES	Errored Seconds - Cumulative count of 1 second periods that contain at least 1 Errored Block.
EB	Errored Block count - cumulative count of errored blocks.
SES	Severely errored Seconds - Cumulative count of 1 second periods with \geq 2400 Errored Blocks, or Path FERF.
UNAV	Unavailability - Cumulative count of unavailable seconds. A period of unavailability begins at the start of 10 or more consecutive severely errored seconds, and ends at the start of 10 or more consecutive non severely errored seconds.
ESR	Error Second Ratio - The ratio of errored seconds to the total seconds of available time. A period of unavailability begins at the start of 10 or more consecutive Severely Errored Seconds, and ends at the start of 10 or more non Severely Errored Seconds.
SESR	Severely Errored Second Ratio - The ratio of severely errored seconds to the total seconds of available time.
BBEC	Background Block error count - Cumulative count of errored blocks which occur outwith a severely errored second.
BBER	Background Block error Ratio - The ratio of errored blocks to total blocks. Total blocks excludes severely errored seconds and periods of unavailability.
PUAS	Path Unavailable Second count - Logical OR of the Near and Far end unavailable seconds.

NOTE

Near End Failures of LOS, LOF, MS AIS, LOP and Path AIS produce "dead time" in the Path FEBE measurement such that result accumulation is suspended.

Appendix B - Results Definitions

SDH Error Analysis (Option US1[US5], A1T[A1U])

G.826 Path IEC Analysis (Option A1T[A1U] only)

These calculations are based on "Errored Blocks". A Block is a set of consecutive bits associated with the Path. Each bit belongs to one and only one block.

Table B-19

G.826 Analysis Path IEC

Display	Definition
ES	Errored Seconds - Cumulative count of 1 second periods that contain at least 1 Errored Block.
EB	Errored Block count - cumulative count of errored blocks.
SES	Severely errored Seconds - Cumulative count of 1 second periods with >= 2400 Errored Blocks, or containing a "defect". Defects are LOS, LOF, MS AIS, LOP, Path AIS and Path FERF.
UNAV	Unavailability - Cumulative count of unavailable seconds. A period of unavailability begins at the start of 10 or more consecutive severely errored seconds, and ends at the start of 10 or more consecutive non severely errored seconds.
ESR	Error Second Ratio - The ratio of errored seconds to the total seconds of available time. A period of unavailability begins at the start of 10 or more consecutive Severely Errored Seconds, and ends at the start of 10 or more non Severely Errored Seconds.
SESR	Severely Errored Second Ratio - The ratio of severely errored seconds to the total seconds of available time.
BBEC	Background Block error count - Cumulative count of errored blocks which occur outwith a severely errored second.
BBER	Background Block error Ratio - The ratio of errored blocks to total blocks.Total blocks excludes severely errored seconds and periods of unavailability.
PUAS	Path Unavailable Second count - Logical OR of the Near and Far end unavailable seconds.

NOTE

Near End Failures of LOS, LOF, MS AIS, LOP and Path AIS produce "dead time" in the Path IEC measurement such that result accumulation is suspended.

Appendix B - Results Definitions

SDH Error Analysis (Option US1[US5], A1T[A1U])

G.826 TU Path BIP Analysis - 34 Mb/s Payload

These calculations are based on "Errored Blocks". A Block is a set of consecutive bits associated with the Path. Each bit belongs to one and only one block.

Table B-20

G.826 Analysis TU Path BIP - 34 Mb/s Payload

Display	Definition
ES	Errored Seconds - Cumulative count of 1 second periods that contain at least 1 Errored Block.
EB	Errored Block count - cumulative count of errored blocks.
SES	Severely errored Seconds - Cumulative count of 1 second periods with \geq 2400 Errored Blocks, or containing a "defect". Defects are LOS, LOF, MS AIS, LOP, Path AIS, H4 LOM, TU3 Path AIS and TU3 LOP.
UNAV	Unavailability - Cumulative count of unavailable seconds. A period of unavailability begins at the start of 10 or more consecutive severely errored seconds, and ends at the start of 10 or more consecutive non severely errored seconds.
ESR	Error Second Ratio - The ratio of errored seconds to the total seconds of available time. A period of unavailability begins at the start of 10 or more consecutive Severely Errored Seconds, and ends at the start of 10 or more non Severely Errored Seconds.
SESR	Severely Errored Second Ratio - The ratio of severely errored seconds to the total seconds of available time.
BBEC	Background Block error count - Cumulative count of errored blocks which occur outwith a severely errored second.
BBER	Background Block error Ratio - The ratio of errored blocks to total blocks. Total blocks excludes severely errored seconds and periods of unavailability.
PUAS	Path Unavailable Second count - Logical OR of the Near and Far end unavailable seconds.

Appendix B - Results Definitions

SDH Error Analysis (Option US1[US5], A1T[A1U])

G.826 TU Path BIP Analysis - 2 Mb/s Payload

These calculations are based on "Errored Blocks". A Block is a set of consecutive bits associated with the Path. Each bit belongs to one and only one block.

Table B-21

G.826 Analysis TU Path BIP - 2 Mb/s Payload

Display	Definition
ES	Errored Seconds - Cumulative count of 1 second periods that contain at least 1 Errored Block.
EB	Errored Block count - cumulative count of errored blocks.
SES	Severely errored Seconds - Cumulative count of 1 second periods with ≥ 600 Errored Blocks, or containing a "defect". Defects are LOS, LOF, MS AIS, LOP, Path AIS, H4 LOM, TU Path AIS and TU LOP.
UNAV	Unavailability - Cumulative count of unavailable seconds. A period of unavailability begins at the start of 10 or more consecutive severely errored seconds, and ends at the start of 10 or more consecutive non severely errored seconds.
ESR	Error Second Ratio - The ratio of errored seconds to the total seconds of available time. A period of unavailability begins at the start of 10 or more consecutive Severely Errored Seconds, and ends at the start of 10 or more non Severely Errored Seconds.
SESR	Severely Errored Second Ratio - The ratio of severely errored seconds to the total seconds of available time.
BBEC	Background Block error count - Cumulative count of errored blocks which occur outwith a severely errored second.
BBER	Background Block error Ratio - The ratio of errored blocks to total blocks. Total blocks excludes severely errored seconds and periods of unavailability.
PUAS	Path Unavailable Second count - Logical OR of the Near and Far end unavailable seconds.

Appendix B - Results Definitions

SDH Error Analysis (Option US1[US5], A1T[A1U])

G.826 TU Path FEBE Analysis - 34 Mb/s Payload

These calculations are based on "Errored Blocks". A Block is a set of consecutive bits associated with the Path. Each bit belongs to one and only one block.

Table B-22

G.826 Analysis TU Path FEBE, 34 Mb/s Payload

Display	Definition
ES	Errored Seconds - Cumulative count of 1 second periods that contain at least 1 Errored Block.
EB	Errored Block count - cumulative count of errored blocks.
SES	Severely errored Seconds - Cumulative count of 1 second periods with >= 2400 Errored Blocks, or TU3 Path FERF.
UNAV	Unavailability - Cumulative count of unavailable seconds. A period of unavailability begins at the start of 10 or more consecutive severely errored seconds, and ends at the start of 10 or more consecutive non severely errored seconds.
ESR	Error Second Ratio - The ratio of errored seconds to the total seconds of available time. A period of unavailability begins at the start of 10 or more consecutive Severely Errored Seconds, and ends at the start of 10 or more non Severely Errored Seconds.
SESR	Severely Errored Second Ratio - The ratio of severely errored seconds to the total seconds of available time.
BBEC	Background Block error count - Cumulative count of errored blocks which occur outwith a severely errored second.
BBER	Background Block error Ratio - The ratio of errored blocks to total blocks.Total blocks excludes severely errored seconds and periods of unavailability.
PUAS	Path Unavailable Second count - Logical OR of the Near and Far end unavailable seconds.

NOTE

Near End Failures of LOS, LOF, MS AIS, LOP, Path AIS, H4 LOM, TU LOP and TU Path AIS produce "dead time" in the TU Path FEBE measurement such that result accumulation is suspended.

Appendix B - Results Definitions

SDH Error Analysis (Option US1[US5], A1T[A1U])

G.826 TU Path FEBE Analysis - 2 Mb/s Payload

These calculations are based on "Errored Blocks". A Block is a set of consecutive bits associated with the Path. Each bit belongs to one and only one block.

Table B-23

G.826 Analysis TU Path FEBE - 2 Mb/s Payload

Display	Definition
ES	Errored Seconds - Cumulative count of 1 second periods that contain at least 1 Errored Block.
EB	Errored Block count - cumulative count of errored blocks.
SES	Severely errored Seconds - Cumulative count of 1 second periods with >= 600 Errored Blocks, or TU Path FERF and TU LOP.
UNAV	Unavailability - Cumulative count of unavailable seconds. A period of unavailability begins at the start of 10 or more consecutive severely errored seconds, and ends at the start of 10 or more consecutive non severely errored seconds.
ESR	Error Second Ratio - The ratio of errored seconds to the total seconds of available time. A period of unavailability begins at the start of 10 or more consecutive Severely Errored Seconds, and ends at the start of 10 or more non Severely Errored Seconds.
SESR	Severely Errored Second Ratio - The ratio of severely errored seconds to the total seconds of available time.
BBEC	Background Block error count - Cumulative count of errored blocks which occur outwith a severely errored second.
BBER	Background Block error Ratio - The ratio of errored blocks to total blocks.Total blocks excludes severely errored seconds and periods of unavailability.
PUAS	Path Unavailable Second count - Logical OR of the Near and Far end unavailable seconds.

NOTE

Near End Failures of LOS, LOF, MS AIS, LOP, Path AIS, H4 LOM, TU LOP and TU Path AIS produce "dead time" in the TU Path FEBE measurement such that result accumulation is suspended.

Physical Layer Error Analysis (Options US1[US5], A1T[A1U], UKZ)

G.826 EM BIP(34 Mb/s with ATM Payload) Analysis

These calculations are based on "Errored Blocks". A Block is a set of consecutive bits associated with the Path. Each bit belongs to one and only one block.

Table B-24

G.826 Analysis EM BIP (34 Mb/s with ATM Payload)

Display	Definition
ES	Errored Seconds - Cumulative count of 1 second periods that contain at least 1 Errored Block.
EB	Errored Block count - cumulative count of errored blocks.
SES	Severely errored Seconds - Cumulative count of 1 second periods with > 30% Errored Blocks, or containing a "defect". Defects are LOS, LOF, AIS.
UNAV	Unavailability - Cumulative count of unavailable seconds. A period of unavailability begins at the start of 10 or more consecutive severely errored seconds, and ends at the start of 10 or more consecutive non severely errored seconds.
ESR	Error Second Ratio - The ratio of errored seconds to the total seconds of available time. A period of unavailability begins at the start of 10 or more consecutive Severely Errored Seconds, and ends at the start of 10 or more non Severely Errored Seconds.
SESR	Severely Errored Second Ratio - The ratio of severely errored seconds to the total seconds of available time.
BBEC	Background Block error count - Cumulative count of errored blocks which occur outwith a severely errored second.
BBER	Background Block error Ratio - The ratio of errored blocks to total blocks.Total blocks excludes severely errored seconds and periods of unavailability.
PUAS	Path Unavailable Second count - Logical OR of the Near and Far end unavailable seconds.

Appendix B - Results Definitions

Physical Layer Error Analysis (Options US1[US5], A1T[A1U], UKZ)

G.826 FEBE (34 Mb/s with ATM Payload) Analysis

These calculations are based on "Errored Blocks". A Block is a set of consecutive bits associated with the Path. Each bit belongs to one and only one block.

Table B-25

G.826 Analysis FEBE (34 Mb/s with ATM Payload)

Display	Definition
ES	Errored Seconds - Cumulative count of 1 second periods that contain at least 1 Errored Block.
EB	Errored Block count - cumulative count of errored blocks.
SES	Severely errored Seconds - Cumulative count of 1 second periods with > 30% Errored Blocks, or containing a "defect". Defects are LOS, LOF, AIS, FERF.
UNAV	Unavailability - Cumulative count of unavailable seconds. A period of unavailability begins at the start of 10 or more consecutive severely errored seconds, and ends at the start of 10 or more consecutive non severely errored seconds.
ESR	Error Second Ratio - The ratio of errored seconds to the total seconds of available time. A period of unavailability begins at the start of 10 or more consecutive Severely Errored Seconds, and ends at the start of 10 or more non Severely Errored Seconds.
SESR	Severely Errored Second Ratio - The ratio of severely errored seconds to the total seconds of available time.
BBEC	Background Block error count - Cumulative count of errored blocks which occur outwith a severely errored second.
BBER	Background Block error Ratio - The ratio of errored blocks to total blocks. Total blocks excludes severely errored seconds and periods of unavailability.
PUAS	Path Unavailable Second count - Logical OR of the Near and Far end unavailable seconds.

Appendix B - Results Definitions

Physical Layer Error Analysis (Options US1[US5], A1T[A1U], UKZ)

G.826 ATM C BIT Parity (DS3 with ATM Payload) Analysis

These calculations are based on "Errored Blocks". A Block is a set of consecutive bits associated with the Path. Each bit belongs to one and only one block.

Table B-26

G.826 Analysis C BIT Parity (DS3 with ATM Payload)

Display	Definition
ES	Errored Seconds - Cumulative count of 1 second periods that contain at least 1 Errored Block.
EB	Errored Block count - cumulative count of errored blocks.
SES	Severely errored Seconds - Cumulative count of 1 second periods with > 30% Errored Blocks, or containing a "defect". Defects are LOS / Signal Loss, LOF / Frame Loss, AIS.
UNAV	Unavailability - Cumulative count of unavailable seconds. A period of unavailability begins at the start of 10 or more consecutive severely errored seconds, and ends at the start of 10 or more consecutive non severely errored seconds.
ESR	Error Second Ratio - The ratio of errored seconds to the total seconds of available time. A period of unavailability begins at the start of 10 or more consecutive Severely Errored Seconds, and ends at the start of 10 or more non Severely Errored Seconds.
SESR	Severely Errored Second Ratio - The ratio of severely errored seconds to the total seconds of available time.
BBEC	Background Block error count - Cumulative count of errored blocks which occur outwith a severely errored second.
BBER	Background Block error Ratio - The ratio of errored blocks to total blocks. Total blocks excludes severely errored seconds and periods of unavailability.
PUAS	Path Unavailable Second count - Logical OR of the Near and Far end unavailable seconds.

Appendix B - Results Definitions

Physical Layer Error Analysis (Options US1[US5], A1T[A1U], UKZ)

G.826 FEBE (DS3 with ATM Payload) Analysis

These calculations are based on "Errored Blocks". A Block is a set of consecutive bits associated with the Path. Each bit belongs to one and only one block.

Table B-27

G.826 Analysis FEBE (DS3 with ATM Payload)

Display	Definition
ES	Errored Seconds - Cumulative count of 1 second periods that contain at least 1 Errored Block.
EB	Errored Block count - cumulative count of errored blocks.
SES	Severely errored Seconds - Cumulative count of 1 second periods with > 30% Errored Blocks, or containing a "defect". Defects are LOS / Signal Loss, LOF / Frame Loss, AIS.
UNAV	Unavailability - Cumulative count of unavailable seconds. A period of unavailability begins at the start of 10 or more consecutive severely errored seconds, and ends at the start of 10 or more consecutive non severely errored seconds.
ESR	Error Second Ratio - The ratio of errored seconds to the total seconds of available time. A period of unavailability begins at the start of 10 or more consecutive Severely Errored Seconds, and ends at the start of 10 or more non Severely Errored Seconds.
SESR	Severely Errored Second Ratio - The ratio of severely errored seconds to the total seconds of available time.
BBEC	Background Block error count - Cumulative count of errored blocks which occur outwith a severely errored second.
BBER	Background Block error Ratio - The ratio of errored blocks to total blocks.Total blocks excludes severely errored seconds and periods of unavailability.
PUAS	Path Unavailable Second count - Logical OR of the Near and Far end unavailable seconds.

Appendix B - Results Definitions

Physical Layer Error Analysis (Options US1[US5], A1T[A1U], UKZ)

G.826 CRC 6 (DS1 with ATM Payload) Analysis

These calculations are based on "Errored Blocks". A Block is a set of consecutive bits associated with the Path. Each bit belongs to one and only one block.

Table B-28

G.826 Analysis CRC 6 (DS1 with ATM Payload)

Display	Definition
ES	Errored Seconds - Cumulative count of 1 second periods that contain at least 1 Errored Block.
EB	Errored Block count - cumulative count of errored blocks.
SES	Severely errored Seconds - Cumulative count of 1 second periods with > 30% Errored Blocks, or containing a "defect". Defects are LOS / Signal Loss, LOF / Frame Loss, AIS.
UNAV	Unavailability - Cumulative count of unavailable seconds. A period of unavailability begins at the start of 10 or more consecutive severely errored seconds, and ends at the start of 10 or more consecutive non severely errored seconds.
ESR	Error Second Ratio - The ratio of errored seconds to the total seconds of available time. A period of unavailability begins at the start of 10 or more consecutive Severely Errored Seconds, and ends at the start of 10 or more non Severely Errored Seconds.
SESR	Severely Errored Second Ratio - The ratio of severely errored seconds to the total seconds of available time.
BBEC	Background Block error count - Cumulative count of errored blocks which occur outwith a severely errored second.
BBER	Background Block error Ratio - The ratio of errored blocks to total blocks.Total blocks excludes severely errored seconds and periods of unavailability.
PUAS	Path Unavailable Second count - Logical OR of the Near and Far end unavailable seconds.

Appendix B - Results Definitions

Physical Layer Error Analysis (Options US1[US5], A1T[A1U], UKZ)

G.826 CRC 4 (2 Mb/s with ATM Payload) Analysis

These calculations are based on "Errored Blocks". A Block is a set of consecutive bits associated with the Path. Each bit belongs to one and only one block.

Table B-29

G.826 Analysis CRC 4 (2 Mb/s with ATM Payload)

Display	Definition
ES	Errored Seconds - Cumulative count of 1 second periods that contain at least 1 Errored Block.
EB	Errored Block count - cumulative count of errored blocks.
SES	Severely errored Seconds - Cumulative count of 1 second periods with > 30% Errored Blocks, or containing a "defect". Defects are LOS, LOF, AIS, FERF.
UNAV	Unavailability - Cumulative count of unavailable seconds. A period of unavailability begins at the start of 10 or more consecutive severely errored seconds, and ends at the start of 10 or more consecutive non severely errored seconds.
ESR	Error Second Ratio - The ratio of errored seconds to the total seconds of available time. A period of unavailability begins at the start of 10 or more consecutive Severely Errored Seconds, and ends at the start of 10 or more non Severely Errored Seconds.
SESR	Severely Errored Second Ratio - The ratio of severely errored seconds to the total seconds of available time.
BBEC	Background Block error count - Cumulative count of errored blocks which occur outwith a severely errored second.
BBER	Background Block error Ratio - The ratio of errored blocks to total blocks. Total blocks excludes severely errored seconds and periods of unavailability.
PUAS	Path Unavailable Second count - Logical OR of the Near and Far end unavailable seconds.

Appendix B - Results Definitions

Physical Layer Error Analysis (Options US1[US5], A1T[A1U], UKZ)

G.826 REBE (2 Mb/s with ATM Payload) Analysis

These calculations are based on "Errored Blocks". A Block is a set of consecutive bits associated with the Path. Each bit belongs to one and only one block.

Table B-30

G.826 Analysis REBE (2 Mb/s with ATM Payload)

Display	Definition
ES	Errored Seconds - Cumulative count of 1 second periods that contain at least 1 Errored Block.
EB	Errored Block count - cumulative count of errored blocks.
SES	Severely errored Seconds - Cumulative count of 1 second periods with > 30% Errored Blocks, or containing a "defect". Defects are LOS, LOF, AIS, FERF.
UNAV	Unavailability - Cumulative count of unavailable seconds. A period of unavailability begins at the start of 10 or more consecutive severely errored seconds, and ends at the start of 10 or more consecutive non severely errored seconds.
ESR	Error Second Ratio - The ratio of errored seconds to the total seconds of available time. A period of unavailability begins at the start of 10 or more consecutive Severely Errored Seconds, and ends at the start of 10 or more non Severely Errored Seconds.
SESR	Severely Errored Second Ratio - The ratio of severely errored seconds to the total seconds of available time.
BBEC	Background Block error count - Cumulative count of errored blocks which occur outwith a severely errored second.
BBER	Background Block error Ratio - The ratio of errored blocks to total blocks. Total blocks excludes severely errored seconds and periods of unavailability.
PUAS	Path Unavailable Second count - Logical OR of the Near and Far end unavailable seconds.

Appendix B - Results Definitions

Jitter Results (Options UHN[US9], A1M[A1Q], A1N[A1R], A1P[A1S])

Jitter Results (Options UHN[US9], A1M[A1Q], A1N[A1R], A1P[A1S])

Jitter Hits and Jitter Amplitude results are provided. In addition Wander results are provided at 2 Mb/s for Option UHN[US9].

Table B-31

Jitter Results (Options UHN[US9], A1M[A1Q], A1N[A1R], A1P[A1S])

Result	Options	Description
+ve PEAK	UHN[US9]	Highest value of positive Jitter during measurement period.
-ve PEAK	UHN[US9]	Highest value of negative Jitter during measurement period.
PEAK-PEAK	UHN[US9]	Highest value of pk_pk Jitter during measurement period.

Table B-32

Wander Results (Option UHN[US9])

Result	Options	Description
+ve PEAK	UHN[US9]	Cumulative amount of positive Wander during measurement period.
-ve PEAK	UHN[US9]	Cumulative amount of negative Wander during measurement period.
PEAK-PEAK	UHN[US9]	Cumulative amount of pk_pk Wander during measurement period.
PEAK-PEAK (15 MIN)	UHN[US9]	Cumulative amount of pk_pk Wander during 15 Minute period.
PEAK-PEAK (24 HOURS)	UHN[US9]	Cumulative amount of pk_pk Wander during 24 Hour period.
TIME INTERVAL ERROR	UHN[US9]	Cumulative
ESTIMATED BIT SLIPS	UHN[US9]	Cumulative count of Bit Slips during measurement Period.
ESTIMATED FRAME SLIPS	UHN[US9]	Cumulative count of Frame Slips during measurement Period.

Appendix B - Results Definitions

Alarm Seconds

Alarm Seconds

PDH Alarm Seconds

Table B-33

PDH Alarm Seconds

Alarm	Options	Description
Power Loss	UKJ[USA], UKK[USB], UKL[USC]	All rates
Loss of Signal	UKJ[USA], UKK[USB], UKL[USC]	All rates
AIS	UKJ[USA], UKK[USB], UKL[USC]	All rates
Pattern Loss	UKJ[USA], UKK[USB], UKL[USC]	All rates
LOF 140M	UKJ[USA], UKL[USC]	140 Mb/s Frame Loss
LOF 34M	UKJ[USA], UKL[USC]	34 Mb/s Frame Loss
LOF 8M	UKJ[USA], UKL[USC]	8 Mb/s Frame Loss
LOF 2M	UKJ[USA], UKL[USC]	2 Mb/s Frame Loss
Frame Loss	UKK[USB]	2 Mb/s In Service Only
Remote Alarm	UKJ[USA], UKK[USB], UKL[USC]	Not 704 kb/s
Multiframe Loss	UKJ[USA], UKK[USB], UKL[USC]	2 Mb/s, CAS or CRC Framing
Remote M'Frame Alarm	UKJ[USA], UKK[USB], UKL[USC]	2 Mb/s, CAS Framing Only

Appendix B - Results Definitions

Alarm Seconds

SDH Alarm Seconds (Options US1[US5], A1T[A1U])

Table B-34

SDH Alarm Seconds

Alarm	Payload	STM-1	STM-4
Power Loss	Yes	Yes	Yes
Loss of Signal (LOS)	Yes	Yes	Yes
Loss of Frame (LOF)	Yes	Yes	Yes
Out of Frame (OOF)	Yes	Yes	Yes
Loss of Pointer (LOP)	Yes	Yes	No
MS AIS	Yes	Yes	Yes
K1K2 Change (A1T[A1U] only)	Yes	Yes	Yes
Path AIS	Yes	Yes	No
MS FERF	Yes	Yes	Yes
Path FERF	Yes	Yes	No
H4 Multiframe Loss	Not 140 Mb/s	No	No
TU LOP	Not 140 Mb/s	No	No
TU Path AIS	Not 140 Mb/s	No	No
TU Path FERF	Not 140 Mb/s	No	No

ATM Alarm Seconds (Options UKN and UKZ)

Table B-35

ATM Alarm Seconds (Options UKN and UKZ)

Alarm	SDH / SONET	PDH / DS _n	Description
Power Loss	Yes	Yes	All rates
Loss of Signal	Yes	Yes	All rates
LOF	Yes	Yes	Loss of Frame
AIS	No	Yes	PDH / DS _n , Physical Layer. AIS
FERF / Remote Alarm	No	Yes	PDH / DS _n , Physical Layer FERF

Appendix B - Results Definitions

Alarm Seconds

Table B-35

ATM Alarm Seconds (Options UKN and UKZ)

Alarm	SDH / SONET	PDH / DSn	Description
PLCP Frame Loss	No	Yes	PLCP ATM Convergence Layer Frame Loss
PLCP RAI (Yellow) Alarm	No	Yes	PLCP ATM Convergence Layer Remote Alarm Indication
Link Signal Status	No	Yes	PLCP ATM Convergence Layer Link Signal Status
Pattern Loss	Yes	Yes	Pattern Sync Loss
Loss of Cell Sync	Yes	Yes	Cell Sync Loss
Sel Cell Not RX	Yes	Yes	Selected Cell Not Received
Test Cell Loss	Yes	Yes	Test Cell Loss
Congestion EXP	Yes	Yes	Congestion experienced
VP AIS	Yes	No	Virtual Path AIS
VP FERF	Yes	No	Virtual Path FERF
VP LOC	Yes	No	Virtual Path LOC
VC AIS	Yes	No	Virtual Channel AIS
VC FERF	Yes	No	Virtual Channel FERF
VC LOC	Yes	No	Virtual Channel LOC
PM OAM loss			Loss of performance management OAM

Frequency Measurement

Frequency Measurement

Frequency measurement is available at standard PDH and SDH rates.

The measured frequency is displayed in Hz with 1 Hz resolution.

Offset from the standard rate is displayed in Hz and ppm (parts per million).

Appendix B - Results Definitions
Frequency Measurement

Appendix C - Self Test Fail Numbers

Appendix C - Self Test Fail Numbers

When self test is run fail numbers may be displayed. The fail numbers and a description are listed below.

Table C-1 Processor Self Test

No.	Description	No.	Description
1020	SRAM Error	1021	SRAM Error
1022	SRAM Error	1023	SRAM Error
1024	SRAM Address Error	1040	RS232 DCD
1041	RS232 R1	1042	RS232 DSR
1043	RS232 CTS	1044	RS232 Rx too many bytes
1045	RS232 Tx time out	1046	RS232 Rx too few bytes
1047	RS232 Tx/Rx Data t	1052	HP-IB Driver Chip
1060	Real Time Clock Set Incorrectly	1061	Real Time Clock Not Ticking correctly
1070	Parallel Port No Send Data	1080	Internal Printer
1081	Keyboard Processor Internal RAM	1082	Keyboard Processor External RAM
1083	Keyboard Processor ROM	1084	Front Panel No Response
1085	Front Panel Bad Command	1086	Front Panel Invalid Error Returned
1087	Front Panel CPU or UART	1088	Cannot Detect Front Panel Printer
1090	VRAM Data Error	1100	No Disk in Drive
1101	Disk Full	1102	Disk Write Fail
1103	Disk Read Fail	1104	Disk Verify Read/Write Fail
1110	LAN Failed Power-On Test	1111	LAN Returned Invalid Error Number
1112	LAN Hardware Not Found	1113	Lan Fitted No Test Result
1120	Front Panel No Response	1121	Front Panel Bad Command
1122	Front Panel Returned Invalid Error Number	1123	Dual Port SRAM Data Error
1124	Dual Port SRAM Address Error	1130	Front Panel No Response
1131	Front Panel Bad Command	1132	Front Panel Returned Invalid Error Number
1133	Front Panel FEPRAM Sum-check Error	1140	Front Panel No Response
1141	Front Panel Bad Command	1142	Front Panel Returned Invalid Error Number
1143	Front Panel SRAM Data Error	1144	Front Panel SRAM Address Error
1145	Front Panel Address Range Invalid	1150	Front Panel No Response
1151	Front Panel Bad Command	1152	Front Panel Returned Invalid Error Number
1153	Front Panel VRAM Data Error	1154	Front Panel Stored Fonts Corrupted

Appendix C - Self Test Fail Numbers

Table C-1 Processor Self Test

No.	Description	No.	Description
1155	Front Panel Address Range Invalid	1156	Front Panel VGA Controller Error
1160	Front Panel No Response	1161	Front Panel Bad Command
1162	Front Panel Returned Invalid Error Number	1163	Front Panel UART Tx/Rx Error Internal
1164	Front Panel Internal Loopback not Reset	1166	Front Panel UART Tx/Rx Error External

Table C-2 PDH Tests, Option UKK (75Ω Unbal Back to Back)

No.	Description	No.	Description
2010	140 Mb/s, PRBS - Signal Loss	2011	140 Mb/s, PRBS - Pattern loss
2014	140 Mb/s, PRBS - Errors	2020	34 Mb/s, PRBS - Signal Loss
2021	34 Mb/s, PRBS - Pattern loss	2024	34 Mb/s, PRBS - Errors
2030	8 Mb/s, PRBS - Signal Loss	2031	8 Mb/s, PRBS - Pattern loss
2034	8 Mb/s, PRBS - Errors	2040	2 Mb/s, HDB3, PRBS - Signal Loss
2041	2 Mb/s, HDB3, PRBS - Pattern loss	2044	2 Mb/s, HDB3, PRBS - Errors
2050	2 Mb/s, AMI, PRBS - Signal Loss	2051	2 Mb/s, AMI, PRBS - Pattern loss
2054	2 Mb/s, AMI, PRBS - Errors	2060	704 kb/s, HDB3, PRBS - Signal Loss
2061	704 kb/s, HDB3, PRBS - Pattern loss	2064	704 kb/s, HDB3, PRBS - Errors
2070	704 kb/s, AMI, PRBS - Signal Loss	2071	704 kb/s, AMI, PRBS - Pattern loss
2074	704 kb/s, AMI, PRBS - Errors	2080	140 Mb/s, WORD - Signal Loss
2081	140 Mb/s, WORD - Pattern loss	2084	140 Mb/s, WORD - Errors
2090	140 Mb/s, AIS WORD - Signal Loss	2091	140 Mb/s, AIS WORD - Pattern Loss
2094	140 Mb/s, AIS WORD - Errors	2100	704 kb/s, AMI, WORD - Signal Loss
2101	704 kb/s, AMI, WORD - Pattern Loss	2104	704 kb/s, AMI, WORD - Errors

Appendix C - Self Test Fail Numbers

Table C-3 PDH Tests, Option UKK (120Ω Bal Back to Back)

No.	Description	No.	Description
2110	2 Mb/s, HDB3, PRBS - Signal Loss	2111	2 Mb/s, HDB3, PRBS - Pattern Loss
2114	2 Mb/s, HDB3, PRBS - Errors	2120	704 kb/s, AMI, WORD - Signal Loss
2121	704 kb/s, AMI, WORD - Pattern Loss	2124	704 kb/s, AMI, WORD - Errors

Table C-4 PDH Tests, Option UKK (Offset, Frequency Measurement)

No.	Description	No.	Description
2130	704 kHz, 0 ppm - Signal Loss	2133	704 kHz, 0 ppm - Frequency Low
2134	704 kHz, 0 ppm - Frequency High	2140	2 MHz, 0 ppm - Signal Loss
2143	2 MHz, 0 ppm - Frequency Low	2144	2 MHz, 0 ppm - Frequency High
2150	8 MHz, 0 ppm - Signal Loss	2153	8 MHz, 0 ppm - Frequency Low
2154	8 MHz, 0 ppm - Frequency High	2160	8 MHz, -100 ppm - Signal Loss
2163	8 MHz, -100 ppm - Frequency Low	2164	8 MHz, -100 ppm - Frequency High
2170	8 Mb/s, +100 ppm - Signal Loss	2173	8 MHz, +100 ppm - Frequency Low
2174	8 Mb/s, +100 ppm - Frequency High	2180	34 MHz, 0 ppm - Signal Loss
2183	34 MHz, 0 ppm - Frequency Low	2184	34 MHz, 0 ppm - Frequency High
2190	34 MHz, -100 ppm - Signal Loss	2193	34 MHz, -100 ppm - Frequency Low
2194	34 MHz, -100 ppm - Frequency High	2200	34 MHz, +100 ppm - Signal Loss
2203	34 MHz, +100 ppm - Frequency Low	2204	34 MHz, +100 ppm - Frequency High
2210	140 MHz, 0 ppm - Signal Loss	2213	140 MHz, 0 ppm - Frequency Low
2214	140 MHz, 0 ppm - Frequency High	2220	140 MHz, -100 ppm - Signal Loss
2223	140 MHz, -100 ppm - Frequency Low	2224	140 MHz, -100 ppm - Frequency High
2230	140 MHz, +100 ppm - Signal Loss	2233	140 MHz, +100 ppm - Frequency Low
2234	140 MHz, +100 ppm - Frequency High		

Appendix C - Self Test Fail Numbers

Table C-5 PDH Tests, Option UKK (Error Add/Error Count)

No.	Description	No.	Description
2243	140 Mb/s, No Error - Count Low	2244	140 Mb/s, No Error - Count High
2253	140 Mb/s, 5 Errors - Count Low	2254	140 Mb/s, 5 Errors - Count High
2263	140 Mb/s, Error All - Count Low	2264	140 Mb/s, Error All - Count High

Table C-6 PDH Tests, Option UKK (Clock Recovery)

No.	Description	No.	Description
2273	704 kb/s - Result Low	2274	704 kb/s - Result High
2283	2 Mb/s - Result Low	2284	2 Mb/s - Result High
2293	8 Mb/s - Result Low	2294	8 Mb/s - Result High
2303	34 Mb/s - Result Low	2304	34 Mb/s - Result High
2313	140 Mb/s - Result Low	2314	140 Mb/s - Result High

Table C-7 PDH Tests, Option UKK (FAS Word)

No.	Description	No.	Description
2320	FAS register write error	2330	FAS 2 Mb/s - Signal Loss
2335	FAS 2 Mb/s - Not Locked	2340	FAS 8 Mb/s - Signal Loss
2341	FAS Word 8 Mb/s - Not Locked	2344	FAS Word 8 Mb/s - Errors
2345	Non FAS Word 8 Mb/s - Locked	2350	FAS Word 34 Mb/s - Signal Loss
2351	FAS Word 34 Mb/s - Not Locked	2354	FAS Word 34 Mb/s - Errors
2355	Non FAS Word 34 Mb/s - Locked	2360	FAS Word 140 Mb/s - Signal Loss
2361	FAS Word 140 Mb/s - Not Locked	2364	FAS Word 140 Mb/s - Errors
2365	Non FAS Word 140 Mb/s - Locked		

Appendix C - Self Test Fail Numbers

Table C-8 PDH Tests, Option UKK & UH3 (Binary Interface)

No.	Description	No.	Description
2370	140 Mb/s, PRBS23- Error Add On	2380	140 Mb/s, PRBS23- Error Add Off
2390	34 Mb/s, PRBS23- Error Add On	2400	34 Mb/s, PRBS23- Error Add Off
2410	8 Mb/s, PRBS15 - Error Add On	2420	8 Mb/s, PRBS15 - Error Add Off
2430	2 Mb/s, PRBS15 - Error Add On	2440	2 Mb/s, PRBS15 - Error Add Off
2450	704 kb/s, PRBS15 - Error Add On	2460	704 kb/s, PRBS15 - Error Add Off
2470	140 Mb/s, 110001001110110 - Error Add Off	2480	704 kb/s,000000000000001 - Error Add Off
2490	34 Mb/s, 111111100000100 - Error Add Off		

Table C-9 SPDH Tests, Option UKJ (Line Code 75Ω Unbal Back to Back)

No.	Description	No.	Description
3010	140 Mb/s, PRBS - Signal Loss	3011	140 Mb/s, PRBS - Pattern loss
3014	140 Mb/s, PRBS - Errors	3020	140 Mb/s, AIS WORD - Signal Loss
3021	140 Mb/s, AIS WORD - Pattern loss	3024	140 Mb/s, AIS WORD - Errors
3030	140 Mb/s, WORD - Signal Loss	3031	140 Mb/s, WORD - Pattern loss
3034	140 Mb/s, WORD - Errors	3040	34 Mb/s, PRBS - Signal Loss
3041	34 Mb/s, PRBS - Pattern loss	3044	34 Mb/s, PRBS - Errors
3050	8 Mb/s, PRBS - Signal Loss	3051	8 Mb/s, PRBS - Pattern loss
3054	8 Mb/s, PRBS - Errors	3060	2 Mb/s, HDB3, PRBS - Signal Loss
3061	2 Mb/s, HDB3, PRBS - Pattern loss	3064	2 Mb/s, HDB3, PRBS - Errors
3070	2 Mb/s, AMI, PRBS - Signal Loss	3071	2 Mb/s, AMI, PRBS - Pattern loss
3074	2 Mb/s, AMI, PRBS - Errors		

Table C-10 SPDH Tests, Option UKJ (Line Code 120Ω Bal Back to Back)

No.	Description	No.	Description
3080	2 Mb/s, HDB3, PRBS - Signal Loss	3081	2 Mb/s, HDB3, PRBS - Pattern Loss

Appendix C - Self Test Fail Numbers

Table C-10 SPDH Tests, Option UKJ (Line Code 120Ω Bal Back to Back)

No.	Description	No.	Description
3084	2 Mb/s, HDB3, PRBS - Errors	3090	2 Mb/s, AMI, PRBS - Signal Loss
3091	2 Mb/s, AMI, PRBS - Pattern Loss	3094	2 Mb/s, AMI, PRBS - Errors

Table C-11 SPDH Tests, Option UKJ (Offset, Frequency Measurement)

No.	Description	No.	Description
3100	140 MHz, 0 ppm - Signal Loss	3102	140 MHz, 0 ppm - VXCO not settled
3103	140 MHz, 0 ppm - Frequency Low	3104	140 MHz, 0 ppm - Frequency High
3110	140 MHz, +100 ppm - Signal Loss	3112	140 MHz, +100 ppm - VXCO not settled
3113	140 MHz, +100 ppm - Frequency Low	3114	140 MHz, +100 ppm - Frequency High
3120	140 MHz, -100 ppm - Signal Loss	3122	140 MHz, -100 ppm - VXCO not settled
3123	140 MHz, -100 ppm - Frequency Low	3124	140 MHz, -100 ppm - Frequency High
3130	34 MHz, 0 ppm - Signal Loss	3132	34 MHz, 0 ppm - VXCO not settled
3133	34 MHz, 0 ppm - Frequency Low	3134	34 MHz, 0 ppm - Frequency High
3140	34 MHz, +100 ppm - Signal Loss	3142	34 MHz, +100 ppm - VXCO not settled
3143	34 MHz, +100 ppm - Frequency Low	3144	34 MHz, +100 ppm - Frequency High
3150	34 MHz, -100 ppm - Signal Loss	3152	34 MHz, -100 ppm - VXCO not settled
3153	34 MHz, -100 ppm - Frequency Low	3154	34 MHz, -100 ppm - Frequency High
3160	8 MHz, 0 ppm - Signal Loss	3162	8 MHz, 0 ppm - VXCO not settled
3163	8 MHz, 0 ppm - Frequency Low	3164	8 MHz, 0 ppm - Frequency High
3170	8 MHz, +100 ppm - Signal Loss	3172	8 MHz, +100 ppm - VXCO not settled
3173	8 MHz, +100 ppm - Frequency Low	3174	8 MHz, +100 ppm - Frequency High
3180	8 MHz, -100 ppm - Signal Loss	3182	8 MHz, -100 ppm - VXCO not settled
3183	8 MHz, -100 ppm - Frequency Low	3184	8 MHz, -100 ppm - Frequency High
3190	2 MHz, 0 ppm - Signal Loss	3192	2 MHz, 0 ppm - VXCO not settled
3193	2 MHz, 0 ppm - Frequency Low	3194	2 MHz, 0 ppm - Frequency High
3200	2 MHz, +100 ppm - Signal Loss	3202	2 MHz, +100 ppm - VXCO not settled
3203	2 MHz, +100 ppm - Frequency Low	3204	2 MHz, +100 ppm - Frequency High
3210	2 MHz, -100 ppm - Signal Loss	3212	2 MHz, -100 ppm - VXCO not settled
3213	2 MHz, -100 ppm - Frequency Low	3214	2 MHz, -100 ppm - Frequency High

Appendix C - Self Test Fail Numbers

Table C-12 **SPDH Tests, Option UKJ (34 Mb/s, Error Add/Error Count)**

No.	Description	No.	Description
3223	Framed, Code, No Error - Count Low	3224	Framed, Code, No Error - Count High
3226	Framed, Code, No Error - Invalid result	3233	Framed, Code, 1 Error - Count Low
3234	Framed, Code, 1 Error - Count High	3236	Framed, Code, No Error - Invalid result
3243	Framed, Code, 1 in 10 ³ - Count Low	3244	Framed, Code, 1 in 10 ³ - Count High
3246	Framed, Code, 1 in 10 ³ - Invalid result	3253	Framed, Frame, No Error - Count Low
3254	Framed, Frame, No Error - Count High	3256	Framed, Frame, No Error - Invalid result
3263	Framed, Code, 1 Error - Count Low	3264	Framed, Code, 1 Error - Count High
3266	Framed, Code, 1 Error - Invalid result	3273	Framed, Code, 1 in 10 ³ - Count Low
3274	Framed, Code, 1 in 10 ³ - Count High	3276	Framed, Code, 1 in 10 ³ - Invalid result
3283	Framed, Bit, No Error - Count Low	3284	Framed, Bit, No Error - Count High
3286	Framed, Bit, No Error - Invalid result	3293	Framed, Frame, 1 Error - Count Low
3294	Framed, Bit, 1 Error - Count High	3296	Framed, Bit, 1 Error - Invalid result
3303	Framed, Bit, 1 in 10 ³ Error - Count Low	3304	Framed, Bit, 1 in 10 ³ Error - Count High
3306	Framed, Bit, 1 in 10 ³ - Error - Invalid result	3313	Structured, Frame, No Error - Count Low
3314	Structured, Frame, No Error - Count High	3316	Structured, Frame, No Error - Invalid result
3323	Structured, Frame, 1 Error - Count Low	3324	Structured, Frame, 1 Error - Count High
3326	Structured, Frame, 1 Error - Invalid result	3333	Structured, Frame, 1 in 10 ³ Error - Count Low
3334	Structured, Frame, 1 in 10 ³ Error - Count High	3336	Structured, Frame, 1 in 10 ³ Error- Invalid result
3343	Structured, Bit, No Error - Count Low	3344	Structured, Bit, No Error - Count High
3346	Structured, Bit, No Error - Invalid result	3353	Structured, Frame, 1 Error - Count Low
3354	Structured, Bit, 1 Error - Count High	3356	Structured, Bit, 1 Error - Invalid result
3363	Structured, Bit, 1 in 10 ³ Error - Count Low	3364	Structured, Bit, 1 in 10 ³ Error - Count High
3366	Structured, Bit, 1 in 10 ³ - Error - Invalid result		

Appendix C - Self Test Fail Numbers

Table C-13 SPDH Tests, Option UKJ (Framing/Unframed)

No.	Description	No.	Description
3377	140 Mb/s Unframed - Frame Loss	3387	140 Mb/s Framed - Frame Loss
3397	2 Mb/s Unframed - Frame Loss	3407	2Mb/s, PCM30 - Frame Loss
3408	2Mb/s, PCM30 - MultiFrame Loss	3417	2Mb/s, PCM31 - Frame Loss
3427	2Mb/s, PCM30CRC - Frame Loss	3428	2Mb/s, PCM30CRC - MultiFrame Loss
3437	2Mb/s, PCM31CRC - Frame Loss	3447	2 Mb/s, Drop - Frame Loss

Table C-14 SPDH Tests, Option UKJ (Structured Payloads)

No.	Description	No.	Description
3451	140 Mb/s ; 34 Mb/s - Pattern Loss	3454	140 Mb/s ; 34 Mb/s - Errors
3461	140 Mb/s ; 8 Mb/s - Pattern Loss	3464	140 Mb/s ; 8 Mb/s - Errors
3471	140 Mb/s ; 2 Mb/s - Pattern Loss	3474	140 Mb/s ; 2 Mb/s - Errors
3481	140 Mb/s ; 64 kb/s - Pattern Loss	3484	140 Mb/s ; 64 kb/s - Errors
3491	140 Mb/s ; N X 64 kb/s (odd channels) - Pattern Loss	3494	140 Mb/s ; N X 64 kb/s (odd channels)- Errors
3501	140 Mb/s ; N X 64 kb/s (even channels) - Pattern Loss	3504	140 Mb/s ; N X 64 kb/s (even channels)- Errors
3511	34 Mb/s ; 8 Mb/s - Pattern Loss	3514	34 Mb/s ; 8 Mb/s - Errors
3521	34 Mb/s ; 2 Mb/s - Pattern Loss	3524	34 Mb/s ; 2 Mb/s - Errors
3531	8 Mb/s ; 2 Mb/s - Pattern Loss	3534	8 Mb/s ; 2 Mb/s - Errors

Table C-15 SPDH Tests, Option UKJ (Patterns)

No.	Description	No.	Description
3541	140 Mb/s, Inverted PRBS9 - Pattern Loss	3544	140 Mb/s, Inverted PRBS9 - Errors
3551	140 Mb/s, PRBS11 - Pattern Loss	3554	140 Mb/s, PRBS11 - Errors
3561	140 Mb/s, Inverted PRBS15 - Pattern Loss	3564	140 Mb/s, Inverted PRBS15 - Errors

Appendix C - Self Test Fail Numbers

Table C-15 **SPDH Tests, Option UKJ (Patterns)**

No.	Description	No.	Description
3571	140 Mb/s, PRBS23 - Pattern Loss	3574	140 Mb/s, PRBS23 - Errors
3581	140 Mb/s, WORD - Pattern Loss	3584	140 Mb/s, WORD - Errors
3591	2 Mb/s, PRBS9 - Pattern Loss	3594	2 Mb/s, PRBS9 - Errors
3601	2 Mb/s, Inverted PRBS11 - Pattern Loss	3604	2 Mb/s, Inverted PRBS11 - Errors
3611	2 Mb/s, PRBS15 - Pattern Loss	3614	2 Mb/s, PRBS15 - Errors
3621	2 Mb/s, Inverted PRBS23 - Pattern Loss	3624	2 Mb/s, Inverted PRBS23 - Errors
3631	2 Mb/s, WORD - Pattern Loss	3634	2 Mb/s, WORD - Errors

Table C-16 **SPDH Tests, Option UKJ (Drop/Insert)**

No.	Description	No.	Description
3640	Insert Port Loss of Signal	3641	Insert Port Excess Frequency Offset
3642	Drop Port Excess Frequency Offset		

Table C-17 **SPDH Tests, Option UKJ (Round Trip Delay)**

No.	Description	No.	Description
3651	140 Mb/s, 1 μ s - Pattern Loss	3653	140 Mb/s, 1 μ s - Result Low
3654	140 Mb/s, 1 μ s - Result High	3661	140 Mb/s, 2s - Pattern Loss
3663	140 Mb/s, 2s - Result Low	3664	140 Mb/s, 2s - Result High
3671	34 Mb/s, 1 μ s - Pattern Loss	3673	34 Mb/s, 1 μ s - Result Low
3674	34 Mb/s, 1 μ s - Result High	3681	34 Mb/s, 2s - Pattern Loss
3683	34 Mb/s, 2s - Result Low	3684	34 Mb/s, 2s - Result High
3691	8 Mb/s, 1 μ s - Pattern Loss	3693	8 Mb/s, 1 μ s - Result Low
3694	8 Mb/s, 1 μ s - Result High	3701	8 Mb/s, 2s - Pattern Loss
3703	8 Mb/s, 2s - Result Low	3704	8 Mb/s, 2s - Result High
3711	2 Mb/s, 1 μ s - Pattern Loss	3713	2 Mb/s, 1 μ s - Result Low

Appendix C - Self Test Fail Numbers

Table C-17 **SPDH Tests, Option UKJ (Round Trip Delay)**

No.	Description	No.	Description
3714	2 Mb/s, 1 μ s - Result High	3721	2 Mb/s, 2s - Pattern Loss
3723	2 Mb/s, 2s - Result Low	3724	2 Mb/s, 2s - Result High

Table C-18 **PDH Tests, Options UKJ & UH3 (Binary Interface)**

No.	Description	No.	Description
3730	140 Mb/s, PRBS23- Error Add On	3740	140 Mb/s, PRBS23- Error Add Off
3750	34 Mb/s, PRBS23- Error Add On	3760	34 Mb/s, PRBS23- Error Add Off
3770	8 Mb/s, PRBS15 - Error Add On	3780	8 Mb/s, PRBS15 - Error Add Off
3790	2 Mb/s, PRBS15 - Error Add On	3800	2 Mb/s, PRBS15 - Error Add Off
3810	140 Mb/s, 110001001110110 - Error Add Off	3820	34 Mb/s, 111111100000100 - Error Add Off

Table C-19 **SDH Tests Option A1T (STM-1)**

No.	Description	No.	Description
721	Sync Loss	724	Bit Errors
731	Monitor, False Sync	741	Rx loss of Signal

Table C-20 **SDH Tests Option A1T (STM-1 Frequency Offset)**

No.	Description	No.	Description
751	STM-1 - Signal Loss	753	STM-1, 0 ppm - Frequency Low
754	STM-1, 0 ppm - Frequency High	761	STM-1, +100 ppm - Signal Loss
763	STM-1, +100 ppm - Offset Low	764	STM-1, +100 ppm - Offset High
771	STM-1, -100 ppm - Signal Loss	773	STM-1, -100 ppm - Offset Low

Appendix C - Self Test Fail Numbers

Table C-20 SDH Tests Option A1T (STM-1 Frequency Offset)

No.	Description	No.	Description
774	STM-1 -100 ppm - Offset High	781	Clock Ref, Clock Loss
791	Clock Ref, false lock		

Table C-21 SDH Tests Option A1T (STM-1, Overhead)

No.	Description	No.	Description
7101	Overhead processor failed	7102	Path Overhead fail
7104	section Overhead fail	7111	VC4 J1 fail
7121	B1 Error Add, Sync Loss	7123	B1 Errors, Result Low
7124	B1 Errors, Result High	7131	B2 Error Add, Sync Loss
7133	B2 Errors, Result Low	7134	B2 Errors, Result High
7141	B3 Error Add, Sync Loss	7143	B3 Errors, Result Low
7144	B3 Errors, Result High	7151	MS FEBE Error Add, Sync Loss
7153	MS FEBE Errors, Result Low	7154	MS FEBE Errors, Result High
7161	PIEC Error Add, Sync Loss	7163	PIEC Errors, Result Low
7164	PIEC Errors, Result High		
7171	Error Add Off - Loss of Frame	7172	Error Add 1 in 4 - Loss of Frame
7173	Error Add 2 in 4 - Loss of Frame	7174	Error Add 3 in 4 - Loss of Frame
7175	Error Add 4 in 4 - Frame Sync	7176	Error Add 3 in 4 - Frame Sync
7177	Error Add 2 in 4 - Loss of Frame	7178	Error Add 1 in 4 - Loss of Frame
7179	Error Add Off - Loss of Frame		

Table C-22 SDH Tests Option A1T (140 Mb/s Payload)

No.	Description	No.	Description
7181	Bit Errors - Sync Loss	7183	Bit Errors - Result Low
7184	Bit Errors - Result High	7191	Error Add 1E3, Offset +100 ppm - Sync Loss
7193	Error Add 1E3, Offset +100 ppm - Result Low	7194	Error Add 1E3, Offset +100 ppm - Result High

Appendix C - Self Test Fail Numbers

Table C-22 SDH Tests Option A1T (140 Mb/s Payload)

7201	Error Add 1E3, Offset -100 ppm - Sync Loss	7203	Error Add 1E3, Offset -100 ppm - Result Low
7204	Error Add 1E3, Offset -100 ppm - Result High		

Table C-23 SDH Tests Option A1T (TU3 Payload)

No.	Description	No.	Description
7211	VC3 J1 Fail	7221	VC3 B3 Single Error - Sync Loss
7223	VC3 B3 Single Error - Result Low	7224	VC3 B3 Single Error - Result High
7231	VC3 FEBE Single Error - Sync Loss	7233	VC3 FEBE Single Error - Result Low
7234	VC3 FEBE Single Error - Result High	7241	Payload Bit Single Error - Sync Loss
7243	Payload Bit Single Error - Result Low	7244	Payload Bit Single Error - Result High
7251	Background Pattern - RX False Sync	7261	Background Pattern - TUG 1 Pattern Loss
7262	Background Pattern - TUG 3 Pattern Loss		

Table C-24 SDH Tests Option A1T (TU12 Payload Overhead)

No.	Description	No.	Description
7271	Async - A1,A2 Sync Loss	7284	Async - B1 Errors
7294	Async - B2 errors	7304	Async - B3 Errors
7314	Async - FEBE Errors	7324	Async - V5 BIP2 Errors
7334	Async - V5 FEBE Errors	7341	Floating Byte - A1,A2 Sync Loss
7354	Floating Byte - B1 Errors	7364	Floating Byte - B2 Errors
7374	Floating Byte - B3 Errors	7384	Floating Byte - FEBE Errors
7394	Floating Byte - V5 BIP2 Errors	7404	Floating Byte - V5 FEBE Errors
7411	Async V5 BIP2 Add - Sync Loss	7413	Async V5 BIP2 Add - Result Low
7414	Async V5 BIP2 Add - Result High	7421	Async V5 FEBE Add - Sync Loss
7423	Async V5 FEBE Add - Result Low	7424	Async V5 FEBE Add - Result High
7431	Async Payload Bit Add - Sync Loss	7433	Async Payload Bit Add - Result Low

Appendix C - Self Test Fail Numbers

Table C-24 SDH Tests Option A1T (TU12 Payload Overhead)

7434	Async Payload Bit Add - Result High	7441	Floating Byte Payload Bit Add - Sync Loss
7433	Floating Byte Payload Bit Add - Result Low	7434	Floating Byte Payload Bit Add - Result High

Table C-25 SDH Tests Option A1T (Payload Pattern)

No.	Description	No.	Description
7451	140 Mb/s, PRBS23 - Sync Loss	7453	140 Mb/s, PRBS23 - Result Low
7454	140 Mb/s, PRBS23 - Result High	7461	TU3, PRBS15 - Sync Loss
7463	TU3, PRBS15 - Result Low	7464	TU3, PRBS15 - Result High
7471	TU12, WORD - Sync Loss	7473	TU12, WORD - Result Low
7474	TU12, WORD - Result High	7481	TU2, PRBS9 - Sync Loss
7483	TU2, PRBS9 - Result Low	7484	TU2, PRBS9 - Result High
7491	Background PRBS9 - False Pattern Sync TUG1	7501	Background PRBS9 - False Pattern Sync TUG2

Table C-26 SDH Tests Option A1T (TU12 Payload Bit Error Add)

No.	Description	No.	Description
7511	Sync Loss	7513	Result Low
7514	Result High		

Table C-27 SDH Tests Option A1T (Freq Offset/Pointer Movements)

No.	Description	No.	Description
7521	140 Mb/s, A1,A2 - Sync Loss	7531	140 Mb/s, H1,H2 - Loss of Pointer
7544	140 Mb/s, B1 - Errors	7554	140 Mb/s, B2 - Errors
7564	140 Mb/s, B2 - Errors	7573	140 Mb/s, +100 ppm - Implied VC Offset Low

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Table C-27 SDH Tests Option A1T (Freq Offset/Pointer Movements)

7574	140 Mb/s, +100 ppm - Implied VC Offset High	7583	140 Mb/s, -100 ppm - Implied VC Offset Low
7584	140 Mb/s, -100 ppm - Implied VC Offset High	7591	TU3, A1,A2 - Sync Loss
7601	TU3, H1,H2 - Loss of Pointer	7614	TU3, B1 - Errors
7624	TU3, B2 - Errors	7634	TU3, B3 - Errors
7644	TU3, TU BIP - Errors	7653	TU3, +100 ppm - Implied VC Offset Low
7654	TU3, +100 ppm - Implied VC Offset High	7663	TU3, -100 ppm - Implied VC Offset Low
7664	TU3, -100 ppm - Implied VC Offset High	7671	TU12, A1,A2 - Sync Loss
7681	TU12, H1,H2 - Loss of Pointer	7694	TU12, B1 - Errors
7704	TU12, B2 - Errors	7714	TU12, B3 - Errors
7724	TU12, TU BIP - Errors	7733	TU12, +100 ppm - Implied VC Offset Low
7734	TU12, +100 ppm - Implied VC Offset High	7743	TU12, -100 ppm - Implied VC Offset Low
7744	TU12, -100 ppm - Implied VC Offset High		

Table C-28 SDH Tests Option A1T (Thru Mode and DCC)

No.	Description	No.	Description
7751	Thru Mode - H4 Frame Sync Loss	7761	RS DCC Loopback Fail
7771	MS DCC Loopback Fail		

Table C-29 SDH Tests Option US1 (STM-1)

No.	Description	No.	Description
821	Signal Loss	831	Sync Loss
834	Bit Errors		

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Table C-30 SDH Tests Option US1 (STM-1, Frequency Offset)

No.	Description	No.	Description
841	STM-1 - Signal Loss	843	STM-1, 0 ppm - Frequency Low
844	STM-1, 0 ppm - Frequency High	851	STM-1, +100 ppm - Signal Loss
853	STM-1, +100 ppm - Offset Low	854	STM-1, +100 ppm - Offset High
861	STM-1, -100 ppm - Signal Loss	863	STM-1, -100 ppm - Offset Low
864	STM-1 -100 ppm - Offset High		

Table C-31 SDH Tests Option US1 (STM-1, 140 Mb/s Payload/Overhead)

No.	Description	No.	Description
871	A1,A2 Sync Loss	884	B1 BIP Errors
894	B2 BIP Errors	8104	Path B3 BIP Errors
8114	Path FEBE Errors	8121	VC-4 J1 Byte Error
8131	B1 Errored - Sync Loss	8133	B1 Errors - Count Low
8134	B1 Errors - Count High	8141	B2 Errored - Sync Loss
8143	B2 Errors - Count Low	8144	B2 Errors - Count High
8151	B3 Errored - Sync Loss	8153	B3 Errors - Count Low
8161	Payload Errored - Sync Loss	8163	Payload Errored - Bit Errors Low
8164	Payload Errored - Bit Errors High		

Table C-32 SDH Tests Option US1 (STM-1, 34 Mb/s Payload/Overhead)

No.	Description	No.	Description
8171	A1,A2 Sync Loss	8184	B1 BIP Errors
8194	B2 BIP Errors	8204	VC-3 B3 BIP Errors
8214	VC-3 FEBE Errors	8221	VC-3 J1 Byte Error
8231	VC3 FEBE Errored - Sync Loss	8233	VC-3 FEBE - Error Rate Low

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Table C-32 SDH Tests Option US1 (STM-1, 34 Mb/s Payload/Overhead)

No.	Description	No.	Description
8234	VC-3 FEBE - Error Rate High	8241	Payload Errored - Sync loss
8243	Payload Errored - Error Rate Low	8244	Payload Errored - Error Rate High

Table C-33 SDH Tests Option US1 (STM-1, 2 Mb/s Payload/Overhead)

No.	Description	No.	Description
8251	A1,A2 Sync Loss	8264	B1 BIP Errors
8274	B2 BIP Errors	8284	B3 BIP Errors
8294	Path FEBE Errors	8304	V5 BIP-2 Errors
8314	V5 FEBE Errors	8321	V5 BIP-2 Errored - Sync Loss
8323	V5 BIP-2 - Error Rate Low	8324	V5 BIP-2 - Error Rate High
8331	V5 FEBE Errored - Sync Loss	8333	V5 FEBE - Error Rate Low
8334	V5 FEBE - Error Rate High	8341	Payload Errored - Sync Loss
8343	Payload Errored - Error Rate Low	8344	Payload Errored - Error Rate High

Table C-34 SDH Tests Option US1 (Payload/Background Patterns)

No.	Description	No.	Description
8351	140 Mb/s PRBS $2^{23}-1$ - Sync Loss	8354	140 Mb/s PRBS $2^{23}-1$ - Bit Errors
8361	34 Mb/s PRBS $2^{23}-1$ - Sync Loss	8364	34 Mb/s PRBS $2^{23}-1$ - Bit Errors
8371	2 Mb/s PRBS $2^{23}-1$ - Sync Loss	8374	2 Mb/s PRBS $2^{23}-1$ - Bit Errors
8381	2 Mb/s PRBS $2^{15}-1$ - Sync Loss	8384	2 Mb/s PRBS $2^{15}-1$ - Bit Errors
8391	34 Mb/s PRBS $2^{15}-1$ - Sync Loss	8394	34 Mb/s PRBS $2^{15}-1$ - Bit Errors
8401	140 Mb/s PRBS $2^{15}-1$ - Sync Loss	8404	140 Mb/s PRBS $2^{15}-1$ - Bit Errors
8411	2 Mb/s All Ones - Sync Loss	8414	2 Mb/s All Ones - Bit Errors
8421	34 Mb/s All Zeros - Sync Loss	8424	34 Mb/s All Zeros - Bit Errors
8431	140 Mb/s All Ones - Sync Loss	8434	140 Mb/s All Ones - Bit Errors

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Table C-34 SDH Tests Option US1 (Payload/Background Patterns)

No.	Description	No.	Description
8441	140 Mb/s 1010 - Sync Loss	8444	140 Mb/s 1010 - Bit Errors
8451	140 Mb/s 16 bit WORD - Sync Loss	8454	140 Mb/s 16 bit WORD - Bit Errors
8461	34 Mb/s 16 bit WORD - Sync Loss	8464	34 Mb/s 16 bit WORD - Bit Errors
8471	2 Mb/s 16 bit WORD - Sync Loss	8474	2 Mb/s 16 bit WORD - Bit Errors
8481	2 Mb/s Background - Sync Loss	8491	2 Mb/s Background - No Sync Loss

Table C-35 SDH Tests Option US1 (Alarm Detect)

No.	Description	No.	Description
8511	STM-1 Out of Frame	8512	STM-1 Frame Loss
8521	STM-1 Frame Move - No OOF History	8522	STM-1 Frame Move - LOF History
8531	STM-1 Out of Frame	8532	STM-1 Frame Loss
8541	STM-1 MS AIS - Sync Loss	8553	STM-1 MS AIS - No Alarm
8564	STM-1 MS AIS - Alarm Not Canceled	8571	STM-1 MS FERF - Sync Loss
8583	STM-1 MS FERF - No Alarm	8594	STM-1 MS FERF - Alarm Not Canceled
8601	STM-1 Path AIS - Sync Loss	8613	STM-1 Path AIS - No Alarm
8624	STM-1 Path AIS - Alarm Not Canceled	8661	STM-1 TU3 Path AIS - Sync Loss
8673	STM-1 TU3 Path AIS - No Alarm	8684	STM-1 TU3 Path AIS - Alarm Not Canceled
8691	STM-1 TU3 Path FERF - Sync Loss	8703	STM-1 TU3 Path FERF - No Alarm
8714	STM-1 TU3 Path FERF - Alarm Not Canceled	8721	STM-1 TU12 Path AIS - Sync Loss
8733	STM-1 TU12 Path AIS - No Alarm	8744	STM-1 TU12 Path AIS - Alarm Not Canceled
8751	STM-1 TU12 Path FERF - Sync Loss	8763	STM-1 TU12 Path FERF - No Alarm
8774	STM-1 TU12 Path FERF - Alarm Not Canceled	8781	STM-1 Internal Ref - Clock Loss
8791	STM-1 Internal Ref - No Clock Loss	8801	STM-1 VC3 Path B3 - Sync Loss
8803	STM-1 VC-3 B3 - Error Rate Low	8804	STM-1 VC-3 B3 - Error Rate High

Table C-36 SDH Tests (Round Trip Delay)

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8911	STM-1, 140 Mb/s, 1 μ s - Pattern Loss	8913	STM-1, 140 Mb/s, 1 μ s - Result Low
8914	STM-1, 140 Mb/s, 1 μ s - Result High	8921	STM-1, 140 Mb/s, 2s - Pattern Loss
8923	STM-1, 140 Mb/s, 2s - Result Low	8924	STM-1, 140 Mb/s, 2s - Result High
8931	STM-1, 34 Mb/s, 1 μ s - Pattern Loss	8933	STM-1, 34 Mb/s, 1 μ s - Result Low
8934	STM-1, 34 Mb/s, 1 μ s - Result High	8941	STM-1, 34 Mb/s, 2s - Pattern Loss
8943	STM-1, 34 Mb/s, 2s - Result Low	8944	STM-1, 34 Mb/s, 2s - Result High
8951	STM-1, 2 Mb/s, 1 μ s - Pattern Loss	8953	STM-1, 2 Mb/s, 1 μ s - Result Low
8954	STM-1, 2 Mb/s, 1 μ s - Result High	8961	STM-1, 2 Mb/s, 2s - Pattern Loss
8963	STM-1, 2 Mb/s, 2s - Result Low	8964	STM-1, 2 Mb/s, 2s - Result High

Table C-37 Optical Tests Option UH1 (STM-1)

No.	Description	No.	Description
911	Signal Loss	921	Alarms Present
931	Pattern Sync Loss	934	Bit Errors
941	Error Add - Pattern Sync Loss	943	Error Add - Bit Error Rate Low
944	Error Add - Bit Error Rate High	951	TX OFF - No Signal Loss

Table C-38 Optical Tests Options UH2, URU (STM-1)

No.	Description	No.	Description
9101	STM-1 - Signal Loss	9111	STM-1 - Alarms Present
9121	STM-1 - Pattern Sync Loss	9124	STM-1 - Bit Errors
9131	STM-1, Error Add - Pattern Sync Loss	9133	STM-1, Error Add - Bit Error Rate Low
9134	STM-1, Error Add - Bit Error Rate High	9141	STM-1 TX OFF - No Signal Loss
9151	STM-1 #1 - Signal Loss	9161	STM-1 #1 - Alarms Present
9171	STM-1 #1 - Pattern Sync Loss	9174	STM-1 #1 - Bit Errors
9181	STM-1 #1, Error Add - Pattern Sync Loss	9183	STM-1 #1, Error Add - Error Rate Low

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Table C-38 Optical Tests Options UH2, URU (STM-1)

No.	Description	No.	Description
9184	STM-1 #1, Error Add - Error Rate High	9191	STM-1 #1, TX OFF - No Signal Loss
9201	STM-1 #2 - Signal Loss	9211	STM-1 #2 - Alarms Present
9221	STM-1 #2 - Pattern Sync Loss	9224	STM-1 #2 - Bit Errors
9231	STM-1 #2, Error Add - Pattern Sync Loss	9233	STM-1 #2, Error Add - Error Rate Low
9234	STM-1 #2, Error Add - Error Rate High	9241	STM-1 #2, TX OFF - No Signal Loss
9251	STM-1 #3 - Signal Loss	9261	STM-1 #3 - Alarms Present
9271	STM-1 #3 - Pattern Sync Loss	9274	STM-1 #3 - Bit Errors
9281	STM-1 #3, Error Add - Pattern Sync Loss	9283	STM-1 #3, Error Add - Error Rate Low
9284	STM-1 #3, Error Add - Error Rate High	9291	STM-1 #3, TX OFF - No Signal Loss
9301	STM-1 #4 - Signal Loss	9311	STM-1 #4 - Alarms Present
9321	STM-1 #4 - Pattern Sync Loss	9324	STM-1 #4 - Bit Errors
9331	STM-1 #4, Error Add - Pattern Sync Loss	9333	STM-1 #4, Error Add - Error Rate Low
9334	STM-1 #4, Error Add - Error Rate High	9341	STM-1 #4, TX OFF - No Signal Loss
9351	Frame or Pointer Sync Loss	9364	RS B1 BIP Errors
9374	MS B2 BIP Errors		

Table C-39 Error Add Tests Options UKT, USN

No.	Description	No.	Description
1011	1310 nm STM-1 Pattern Sync Loss	1012	1310 nm STM-1 Signal Loss
1015	1550 nm STM-1 Pattern Sync Loss	1016	1550 nm STM-1 Signal Loss
1022	1310 nm STM-1 - Alarms Present	1026	1550 nm STM-1 - Alarms Present
1031	1310 nm STM-1, Error Add - Pattern Sync Loss	1033	1310 nm STM-1, Error Add - Bit Error Rate Low
1034	1310 nm STM-1, Error Add - Bit Error Rate High	1035	1550 nm STM-1, Error Add - Pattern Sync Loss
1037	1550 nm STM-1, Error Add - Bit Error Rate Low	1038	1550 nm STM-1, Error Add - Bit Error Rate High
1041	1310 nm TX OFF - No Alarms	1042	1310 nm TX OFF - No Signal Loss
1045	1550 nm TX OFF - No Alarms	1046	1550 nm TX OFF - No Signal Loss
1051	1310 nm STM-1 - Failed Frame Sync	1055	1550 nm STM-1 - Failed Frame Sync
1061	1310 nm STM-1 - Frame Alarm (LOF or OOF)	1065	1550 nm STM-1 - Frame Alarm (LOF or OOF)

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Table C-39 Error Add Tests Options UKT, USN

No.	Description	No.	Description
1071	1310 nm STM-1 #1 - Alarms Present	1072	1310 nm STM-1 #1 - Signal Loss
1075	1550 nm STM-1 #1 - Alarms Present	1076	1550 nm STM-1 #1 - Signal Loss
1081	1310 nm STM-1 #1, Error Add - Pattern Sync Loss	1083	1310 nm STM-1 #1, Error Add - Bit Error Rate Low
1084	1310 nm STM-1 #1, Error Add - Bit Error Rate High	1085	1550 nm STM-1 #1, Error Add - Pattern Sync Loss
1087	1550 nm STM-1 #1, Error Add - Bit Error Rate Low	1088	1550 nm STM-1 #1, Error Add - Bit Error Rate High
1091	1310 nm STM-1 #1 - TX OFF - No Alarms	1092	1310 nm STM-1 # - TX OFF - No Signal Loss
1095	1550 nm STM-1 #1 - TX OFF - No Alarms	1096	1550 nm STM-1 #1 - TX OFF - No Signal Loss
10101	1310 nm STM-1 #2 - Alarms Present	10102	1310 nm STM-1 #2 - Signal Loss
10111	1310 nm STM-1 #2, Error Add - Pattern Sync Loss	10113	1310 nm STM-1 #2, Error Add - Bit Error Rate Low
10114	1310 nm STM-1 #2, Error Add - Bit Error Rate High	10121	1310 nm STM-1 #2 - TX OFF - No Alarms
10122	1310 nm STM-1 #2 - TX OFF - No Signal Loss	10131	1310 nm STM-1 #3 - Alarms Present
10132	1310 nm STM-1 #3 - Signal Loss	10141	1310 nm STM-1 #3, Error Add - Pattern Sync Loss
10143	1310 nm STM-1 #3, Error Add - Bit Error Rate Low	10144	1310 nm STM-1 #3, Error Add - Bit ErrorRate High
10151	1310 nm STM-1 #3 - TX OFF - No Alarms	10152	1310 nm STM-1 #3 - TX OFF - No Signal Loss
10161	1310 nm STM-1 #4 - Alarms Present	10162	1310 nm STM-1 #4 - Signal Loss
10171	1310 nm STM-1 #4, Error Add - Pattern Sync Loss	10173	1310 nm STM-1 #4, Error Add - Bit Error Rate Low
10174	1310 nm STM-1 #4, Error Add - Bit Error Rate High	10181	1310 nm STM-1 #4 - TX OFF - No Alarms
10182	1310 nm STM-1 #4 - TX OFF - No Signal Loss	10191	1310 nm STM-4 - Failed Frame Sync
10192	1310 nm STM-4 - B1 Errors	10195	1550 nm STM-4 - Failed Frame Sync
10196	1550 nm STM-4 - B1 Errors	10202	1310 nm STM-4 - B2 Errors
10206	1550 nm STM-4 - B2 Errors	10211	1310 nm STM-4, B2 Error Add - Pattern Sync Loss
10213	1310 nm STM-4, B2 Error Add - Bit Error Rate Low	10214	1310 nm STM-4, B2 Error Add - Bit ErrorRate High

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Table C-40 Clock Recovery Tests Options UKT, USN

No.	Description	No.	Description
10221	STM-4, STM-1 #1 LOF, OOF or LOP	10222	STM-4, STM-1 #1 Signal Loss
10225	STM-4, STM-1 #1 LOF, OOF or LOP	10226	STM-4, STM-1 #1 Signal Loss
10231	STM-4 Clock Recovery LOF, OOF or LOP	10235	STM-4 Clock Recovery LOF, OOF or LOP
10241	STM-4 Clock Recovery LOF, OOF or LOP	10245	STM-4 Clock Recovery LOF, OOF or LOP
10251	STM-4 Clock Recovery LOF, OOF or LOP	10255	STM-4 Clock Recovery LOF, OOF or LOP

Table C-41 Overhead Tests Options UKT, USN

No.	Description	No.	Description
10261	STM-4 Overhead Pattern 1 - Fail to Sync	10262	STM-4 Overhead Pattern 1 - Pattern Error
10271	STM-4 Overhead Pattern 1 - Fail to Sync	10272	STM-4 Overhead Pattern 1 - Pattern Error
10281	STM-1 Overhead Pattern 1, Columns 1,4,7 - Fail to Sync	10282	STM-1 Overhead Pattern 1, Columns1,4,7 - Pattern Error
10291	STM-1 Overhead Pattern 1, Columns 2,5,8 - Fail to Sync	10292	STM-1 Overhead Pattern 1, Columns2,5,8 - Pattern Error
10301	STM-1 Overhead Pattern 1, Columns 3,6,9 - Fail to Sync	10302	STM-1 Overhead Pattern 1, Columns3,6,9 - Pattern Error
10311	STM-1 Overhead Pattern 2, Columns 1,4,7 - Fail to Sync	10312	STM-1 Overhead Pattern 2, Columns1,4,7 - Pattern Error
10321	STM-1 Overhead Pattern 2, Columns 2,5,8 - Fail to Sync	10322	STM-1 Overhead Pattern 2, Columns2,5,8 - Pattern Error
10331	STM-1 Overhead Pattern 2, Columns 3,6,9 - Fail to Sync	10332	STM-1 Overhead Pattern 2, Columns3,6,9 - Pattern Error
10341	STM-1 #1 Overhead Pattern 1, Columns 1,4,7 - Fail to Sync	10342	STM-1 #1 Overhead Pattern 1,Columns 1,4,7 - Pattern Error
10351	STM-1 #1 Overhead Pattern 1, Columns 2,5,8 - Fail to Sync	10352	STM-1 #1 Overhead Pattern 1,Columns 2,5,8 - Pattern Error

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Table C-41 Overhead Tests Options UKT, USN

No.	Description	No.	Description
10361	STM-1 #1 Overhead Pattern 1, Columns 3,6,9 - Fail to Sync	10362	STM-1 #1 Overhead Pattern 1,Columns 3,6,9 - Pattern Error
10371	STM-1 #2 Overhead Pattern 1, Columns 1,4,7 - Fail to Sync	10372	STM-1 #2 Overhead Pattern 1,Columns 1,4,7 - Pattern Error
10381	STM-1 #2 Overhead Pattern 1, Columns 2,5,8 - Fail to Sync	10382	STM-1 #2 Overhead Pattern 1,Columns 2,5,8 - Pattern Error
10391	STM-1 #2 Overhead Pattern 1, Columns 3,6,9 - Fail to Sync	10392	STM-1 #2 Overhead Pattern 1,Columns 3,6,9 - Pattern Error
10401	STM-1 #3 Overhead Pattern 1, Columns 1,4,7 - Fail to Sync	10402	STM-1 #3 Overhead Pattern 1,Columns 1,4,7 - Pattern Error
10411	STM-1 #3 Overhead Pattern 1, Columns 2,5,8 - Fail to Sync	10412	STM-1 #3 Overhead Pattern 1,Columns 2,5,8 - Pattern Error
10421	STM-1 #3 Overhead Pattern 1, Columns 3,6,9 - Fail to Sync	10422	STM-1 #3 Overhead Pattern 1,Columns 3,6,9 - Pattern Error
10431	STM-1 #4 Overhead Pattern 1, Columns 1,4,7 - Fail to Sync	10432	STM-1 #4 Overhead Pattern 1,Columns 1,4,7 - Pattern Error
10441	STM-1 #4 Overhead Pattern 1, Columns 2,5,8 - Fail to Sync	10442	STM-1 #4 Overhead Pattern 1,Columns 2,5,8 - Pattern Error
10451	STM-1 #4 Overhead Pattern 1, Columns 3,6,9 - Fail to Sync	10452	STM-1 #4 Overhead Pattern 1,Columns 3,6,9 - Pattern Error
10461	STM-1 #1 Overhead Pattern 2, Columns 1,4,7 - Fail to Sync	10462	STM-1 #1 Overhead Pattern 2,Columns 1,4,7 - Pattern Error
10471	STM-1 #1 Overhead Pattern 2, Columns 2,5,8 - Fail to Sync	10472	STM-1 #1 Overhead Pattern 2,Columns 2,5,8 - Pattern Error
10481	STM-1 #1 Overhead Pattern 2, Columns 3,6,9 - Fail to Sync	10482	STM-1 #1 Overhead Pattern 2,Columns 3,6,9 - Pattern Error
10491	STM-1 #2 Overhead Pattern 2, Columns 1,4,7 - Fail to Sync	10492	STM-1 #2 Overhead Pattern 2,Columns 1,4,7 - Pattern Error
10501	STM-1 #2 Overhead Pattern 2, Columns 2,5,8 - Fail to Sync	10502	STM-1 #2 Overhead Pattern 2,Columns 2,5,8 - Pattern Error
10511	STM-1 #2 Overhead Pattern 2, Columns 3,6,9 - Fail to Sync	10512	STM-1 #2 Overhead Pattern 2,Columns 3,6,9 - Pattern Error
10521	STM-1 #3 Overhead Pattern 2, Columns 1,4,7 - Fail to Sync	10522	STM-1 #3 Overhead Pattern 2,Columns 1,4,7 - Pattern Error

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Table C-41 Overhead Tests Options UKT, USN

No.	Description	No.	Description
10531	STM-1 #3 Overhead Pattern 2, Columns 2,5,8 - Fail to Sync	10532	STM-1 #3 Overhead Pattern 2, Columns 2,5,8 - Pattern Error
10541	STM-1 #3 Overhead Pattern 2, Columns 3,6,9 - Fail to Sync	10542	STM-1 #3 Overhead Pattern 2, Columns 3,6,9 - Pattern Error
10551	STM-1 #4 Overhead Pattern 2, Columns 1,4,7 - Fail to Sync	10552	STM-1 #4 Overhead Pattern 2, Columns 1,4,7 - Pattern Error
10561	STM-1 #4 Overhead Pattern 2, Columns 2,5,8 - Fail to Sync	10562	STM-1 #4 Overhead Pattern 2, Columns 2,5,8 - Pattern Error
10571	STM-1 #4 Overhead Pattern 2, Columns 3,6,9 - Fail to Sync	10572	STM-1 #4 Overhead Pattern 2, Columns 3,6,9 - Pattern Error

Table C-42 STM-4 Alarms Options UKT, USN

No.	Description	No.	Description
10591	1310 nm, No Frame Errors - OOF Alarm Test Fail	10592	1310 nm, No Frame Errors - LOF Alarm Test Fail
10601	1310 nm, 3 in 4 Frame Errors - OOF Alarm Test Fail	10602	1310 nm, 3 in 4 Frame Errors - LOF Alarm Test Fail
10611	1310 nm, No Alarms - Pattern Sync Loss	10622	1310 nm, MS AIS Alarm - Alarm Not Detected
10632	1310 nm, No Alarms - MS AIS Alarm	10641	1310 nm, No Alarms - Pattern Sync Loss
10652	1310 nm, MS FERF Alarm - Alarm Not Detected	10662	1310 nm, No Alarms - MS FERF Alarm

Table C-43 Binary Interface Options 0YH with UKT or USN

No.	Description	No.	Description
10701	STM-1 Binary - Signal Loss	10702	STM-1 Binary - Pattern Sync Loss
10711	STM-1 Binary, Error Add - Alarms Detected	10721	STM-1 Binary, Error Add - Pattern Sync Loss
10723	STM-1 Binary, Error Add - Bit Error Rate Low	10724	STM-1 Binary, Error Add - Bit Error Rate High
10731	STM-1 Binary, TX OFF - No Alarms	10732	STM-1 Binary, TX OFF - No Signal Loss
10751	STM-4 Binary, Error Add - No Alarms	10752	STM-4 Binary, Error Add - No Signal Loss
10761	STM-4 Binary, Error Add - Pattern Sync Loss	10763	STM-4 Binary, Error Add - Bit Error Rate Low

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Table C-43 Binary Interface Options 0YH with UKT or USN

No.	Description	No.	Description
10764	STM-4 Binary, Error Add - Bit Error Rate High	10771	STM-4 Binary, TX OFF - No Alarms
10772	STM-4 Binary, TX OFF - No Signal Loss	10781	STM-4 Binary - Frame Sync Loss
10782	STM-4 Binary - B1 Errors	10792	STM-4 Binary - B2 Errors

Table C-44 Optical Power Measurement Options UKT, USN

No.	Description	No.	Description
10801	1310 nm STM-1 - Alarm Sync	10803	1310 nm STM-1 - Result Low
10804	1310 nm STM-1 - Result High	10805	1550 nm STM-1 - Alarm Sync
10807	1550 nm STM-1 - Result Low	10808	1550 nm STM-1 - Result High
10811	1310 nm STM-4 - Alarm Sync	10813	1310 nm STM-4 - Result Low
10814	1310 nm STM-4 - Result High	10815	1550 nm STM-4 - Alarm Sync
10817	1550 nm STM-4 - Result Low	10818	1550 nm STM-4 - Result High

Table C-45 Frequency Measurement Options UKT, USN

No.	Description	No.	Description
10821	1310 nm STM-1 - Loss Of Signal	10823	1310 nm STM-1 - Result Low
10824	1310 nm STM-1 - Result High	10825	1550 nm STM-1 - Loss Of Signal
10827	1550 nm STM-1 - Result Low	10828	1550 nm STM-1 - Result High
10831	1310 nm STM-4 - Loss Of Signal	10833	1310 nm STM-4 - Result Low
10834	1310 nm STM-4 - Result High	10835	1550 nm STM-4 - Loss Of Signal
10837	1550 nm STM-4 - Result Low	10838	1550 nm STM-4 - Result High

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Table C-46 ATM Bandwidth, Back to Back Tests (Opt UKN)

No.	Description	No.	Description
12153	F/G, 80,000 c/s - Result Low	12154	F/G, 80,000 c/s - Result High
12156	F/G, 80,000 c/s - Result Invalid	12163	F/G, 40,000 c/s - Result Low
12164	F/G, 40,000 c/s - Result High	12166	F/G, 40,000 c/s - Result Invalid
12173	F/G, 100 c/s - Result Low	12174	F/G, 100 c/s - Result High
12176	F/G, 100 c/s - Result Invalid	12183	F/G 24,000 c/s - Result Low
12184	F/G 24,000 c/s - Result High	12186	F/G 24,000 c/s - Result Invalid
12193	B/G 1 70% - Result Low	12194	B/G 1 70% - Result High
12196	B/G 1 70% - Result Invalid	12203	B/G 1, 25 % - Result Low
12204	B/G 1, 25 % - Result High	12206	B/G 1, 25 % - Result Invalid
12213	B/G 2, 45 % - Result Low	12214	B/G 2, 45 % - Result High
12216	B/G 2, 45 % - Result Invalid	12223	B/G 2, 20 % - Result Low
12224	B/G 2, 20 % - Result High	12226	B/G 2, 20 % - Result Invalid
12233	B/G 3, 25 % - Result Low	12234	B/G 3, 25 % - Result High
12236	B/G 3, 25 % - Result Invalid	12243	B/G 3, 15 % - Result Low
12244	B/G 3, 15 % - Result High	12246	B/G 3, 15 % - Result Invalid
12253	Fill 10 % - Result Low	12254	Fill 10 % - Result High
12256	Fill 10 % - Result Invalid		

Table C-47 ATM Distribution, Back to Back Tests (Opt UKN)

No.	Description	No.	Description
12263	Periodic, SCNR Off - Result Low	12264	Periodic, SCNR Off - Result High
12265	Periodic, SCNR Off - SCNR alarm	12266	Periodic, SCNR Off - Result Invalid
12273	Burst, SCNR On - Result Low	12274	Burst, SCNR On - Result High
12275	Burst, SCNR On - No SCNR alarm	12276	Burst, SCNR On - Result Invalid
12283	Periodic + Burst, SCNR Off - Result Low	12284	Periodic + Burst, SCNR Off - Result High
12285	Periodic + Burst, SCNR Off - SCNR alarm	12286	Periodic + Burst, SCNR Off - Result Invalid

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Table C-48 ATM Error Add, Back to Back Tests (Opt UKN)

No.	Description	No.	Description
12293	2 Mb/s CRC4, Error Add Off - Result Low	12294	2 Mb/s CRC4, Error Add Off - Result High
12296	2 Mb/s CRC4, Error Add Off - Result Invalid	12297	2 Mb/s CRC4, Error Add Single - Result Low
12298	2 Mb/s CRC4, Error Add Single - Result High	12299	2 Mb/s CRC4, Error Add Single - Result Invalid
12303	2 Mb/s REBE, Error Add Off - Result Low	12304	2 Mb/s REBE, Error Add Off - Result High
12306	2 Mb/s REBE, Error Add Off - Result Invalid	12307	2 Mb/s REBE, Error Add Single - Result Low
12308	2 Mb/s REBE, Error Add Single - Result High	12309	REBE, Error Add Single - Result Invalid
12313	34 Mb/s EM BIP, Error Add Off - Result Low	12314	34 Mb/s EM BIP, Error Add Off - Result High
12316	34 Mb/s EM BIP, Error Add Off - Result Invalid	12317	34 Mb/s EM BIP, Error Add Single - Result Low
12318	34 Mb/s EM BIP, Error Add Single - Result High	12319	34 Mb/s EM BIP, Error Add Single - Result Invalid
12323	140 Mb/s EM BIP, Error Add Off - Result Low	12324	140 Mb/s EM BIP, Error Add Off - Result High
12326	140 Mb/s EM BIP, Error Add Off - Result Invalid	12327	140 Mb/s EM BIP, Error Add Single - Result Low
12328	140 Mb/s EM BIP, Error Add Single - Result High	12329	140 Mb/s EMBIP, Error Add Single - Result Invalid
12333	34 Mb/s FEBE, Error Add Off - Result Low	12334	34 Mb/s FEBE, Error Add Off - Result High
12336	34 Mb/s FEBE, Error Add Off - Result Invalid	12337	34 Mb/s FEBE, Error Add On - Result Low
12338	34 Mb/s FEBE, Error Add On - Result High	12339	34 Mb/s FEBE, Error Add On - Result Invalid
12343	140 Mb/s FEBE, Error Add Off - Result Low	12344	140 Mb/s FEBE, Error Add Off - Result High
12346	140 Mb/s FEBE, Error Add Off - Result Invalid	12347	140 Mb/s FEBE, Error Add On - Result Low
12348	140 Mb/s FEBE, Error Add On - Result High	12349	140 Mb/s FEBE, Error Add On - Result Invalid
12353	SHEC, Error Add Off - Result Low	12354	SHEC, Error Add Off - Result High
12356	SHEC, Error Add Off - Result Invalid	12357	SHEC, Error Add Single - Result Low
12358	SHEC, Error Add Single - Result High	12359	SHEC, Error Add Single - Result Invalid
12363	SHEC, Error Add Single - DHEC Result Low	12364	SHEC, Error Add Single - DHEC Result High
12366	Single HEC, Error Add Single - DHEC Result Invalid	12367	Single HEC, Error Add 1 in 10 ³ - Result Low
12368	Single HEC, Error Add 1 in 10 ³ - Result High	12369	Single HEC, Error Add 1 in 10 ³ - Result Invalid
12373	SHEC, Error Add Burst - Result Low	12374	SHEC, Error Add Burst - Result High
12376	SHEC, Error Add Burst - Result Invalid	12377	SHEC, Error Add Burst - DHEC Result Low
12378	SHEC, Error Add Burst - DHEC Result High	12379	SHEC, Error Add Burst - DHEC Result Invalid
12383	Double HEC, Error Add Off - Result Low	12384	Double HEC, Error Add Off - Result High

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Table C-48 ATM Error Add, Back to Back Tests (Opt UKN)

No.	Description	No.	Description
12386	Double HEC, Error Add Off - Result Invalid	12387	Double HEC, Error Add Single - Result Low
12388	Double HEC, Error Add Single - Result High	12389	Double HEC, Error Add Single - Result Invalid
12393	Double HEC, Error Add Single - SHEC Result Low	12394	Double HEC, Error Add Single - SHEC Result High
12396	Double HEC, Error Add Single - SHEC Result Invalid	12397	Double HEC, Error Add 1 in 10 ³ - Result Low
12398	Double HEC, Error Add 1 in 10 ³ - Result High	12399	Double HEC, Error Add 1 in 10 ³ - Result Invalid
12403	Double HEC, Error Burst - SHEC Result Low	12404	Double HEC, Burst - SHEC Result High
12406	Double HEC, Burst - SHEC Result Invalid	12407	Double HEC, Burst - DHEC Result Low
12408	Double HEC, Burst - DHEC Result High	12409	Double HEC, Burst - DHEC Result Invalid
12413	Bit, Error Add Off - Result Low	12414	Bit, Error Add Off - Result High
12416	Bit, Error Add Off - Result Invalid	12417	Bit, Error Add Single - Result Low
12418	Bit, Error Add Single - Result High	12419	Bit, Error Add Single - Result Invalid
12423	Bit, Error Add Single - Err. Cell Result Low	12424	Bit, Error Add Single - Err. Cell Result High
12426	Bit, Error Add Single - Err. Cell Result Invalid	12427	Bit, Error Add 1 in 10 ³ - Result Low
12428	Bit, Error Add 1 in 10 ³ - Result High	12429	Bit, Error Add 1 in 10 ³ - Result Invalid

Table C-49 ATM Headers, Back to Back Tests (Opt UKN)

No.	Description	No.	Description
12433	F/G GFC=10 - Result Low	12434	F/G GFC=10 - Result High
12436	F/G GFC=10 - Result Invalid	12443	F/G VPI=85 - Result Low
12444	F/G VPI=85 - Result High	12446	F/G VPI=85 - Result Invalid
15453	F/G VPI=2730 - Result Low	12454	F/G VPI=2730 - Result High
12456	F/G VPI=2730 - Result Invalid	12463	F/G VCI=21845 - Result Low
12464	F/G VCI=21845 - Result High	12466	F/G VCI=21845 - Result Invalid
12473	F/G PTI=000 - Result Low	12474	F/G PTI=000 - Result High
12476	F/G PTI=000 - Result Invalid	12483	F/G PTI=010 - Result Low
12484	F/G PTI=010 - Result High	12486	F/G PTI=010 - Result Invalid
12493	F/G CLP=0 - Result Low	12494	F/G CLP=0 - Result High

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Table C-49 ATM Headers, Back to Back Tests (Opt UKN)

No.	Description	No.	Description
12496	F/G CLP=0 - Result Invalid	12503	F/G CLP=1 - Result Low
12504	F/G CLP=1 - Result High	12506	F/G CLP=1 - Result Invalid
12513	RX GFC=X - Result Low	12514	RX GFC=X - Result High
12516	RX GFC=X - Result Invalid	12523	RX GFC=2 - Result Low
12524	RX GFC=2 - Result High	12526	RX GFC=2 - Result Invalid
12533	RX VPI=X - Result Low	12534	RX VPI=X - Result High
12536	RX VPI=X - Result Invalid	12543	RX VPI=0 - Result Low
12544	RX VPI=0 - Result High	12546	RX VPI=0 - Result Invalid
12553	RX VPI=85 - Result Low	12554	RX VPI=85 - Result High
12556	RX VPI=85 - Result Invalid	12563	RX VCI=X - Result Low
12564	RX VCI=X - Result High	12566	RX VCI=X - Result Invalid
12573	RX VCI=33 - Result Low	12574	RX VCI=33 - Result High
12576	RX VCI=33 - Result Invalid	12583	RX PTI=XXX - Result Low
12584	RX PTI=XXX - Result High	12586	RX PTI=XXX - Result Invalid
12593	RX PTI=0XX - Result Low	12594	RX PTI=0XX - Result High
12596	RX PTI=0XX - Result Invalid	12603	RX PTI=X1X - Result Low
12604	RX PTI=X1X - Result High	12606	RX PTI=X1X - Result Invalid
12613	RX PTI=XX0 - Result Low	12614	RX PTI=XX0 - Result High
12616	RX PTI=XX0 - Result Invalid	15623	RX CLP=X - Result Low
12624	RX CLP=X - Result High	12626	RX CLP=X - Result Invalid
12633	RX CLP=0 - Result Low	12634	RX CLP=0 - Result High
12636	RX CLP=0 - Result Invalid	12643	RX CLP=1 - Result Low
12644	RX CLP=1 - Result High	12646	RX CLP=1 - Result Invalid

Table C-50 ATM Payloads, Back to Back Tests (Opt UKN)

No.	Description	No.	Description
12654	34 Mb/s Cross Cell PRBS15 - Pattern Errors	12664	34 Mb/s Cross Cell PRBS23 - Pattern Errors
12674	34 Mb/s Single Cell PRBS9 - Pattern Errors	12684	140 Mb/s User Word 00000000 - Pattern Errors

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Table C-50 ATM Payloads, Back to Back Tests (Opt UKN)

No.	Description	No.	Description
12694	140 Mb/s User Word 11111111 - Pattern Errors	12704	2 Mb/s User Word 01010101 - Pattern Errors
12714	2 Mb/s Test Cell - Pattern Errors		

Table C-51 ATM Test Cell, Back to Back Tests (Opt UKN)

No.	Description	No.	Description
12723	Single HEC Inject - Result Low	12724	Single HEC Inject - Result High
12726	Single HEC Inject - Result Invalid	12733	Double HEC Inject - Result Low
12734	Double HEC Inject - Result High	12736	Double HEC Inject - Result Invalid
12743	3 X 100 ms Double HEC Inject - Result Low	12744	3 X 100 ms Double HEC Inject - Result High
12746	3 X 100 ms Double HEC Inject - Result Invalid	12753	Misinserted Cell (a) - Result Low
12754	Misinserted Cell (a) - Result High	12756	Misinserted Cell (a) - Result Invalid
12757	Misinserted Cell (a) - Errored Cell Count Low	12758	Misinserted Cell (a) - Errored Cell Count High
12759	Misinserted Cell (a) - Errored Cell Count - Invalid	12763	Misinserted Cell (b) - Result Low
12764	Misinserted Cell (b) - Result High	12766	Misinserted Cell (b) - Result Invalid
12767	Misinserted Cell (b) - Errored Cell Count Low	12768	Misinserted Cell (b) - Errored Cell Count High
1212769	Misinserted Cell (b) - Errored Cell Count Invalid	12773	Misinserted Cell (c) - Result Low
12774	Misinserted Cell (c) - Result High	12776	Misinserted Cell (c) - Result Invalid
12777	Misinserted Cell (c) - Errored Cell Count Low	12778	Misinserted Cell (c) - Errored Cell Count High
12779	Misinserted Cell (c) - Errored Cell Count Invalid	12783	Mean Cell Transfer Delay -Normal Result Low
12784	Mean Cell Transfer Delay - Normal Result High	12786	Mean Cell Transfer Delay -Normal Result Invalid
12787	Mean Cell Transfer Delay - Test Result Low	12788	Mean Cell Transfer Delay - Test Result High
12789	Mean Cell Transfer Delay - Test Result Invalid	12793	Gated Mean Cell Transfer Delay -Normal Result Low
12794	Gated Mean Cell Transfer Delay - Normal Result High	12796	Gated Mean Cell Transfer Delay -Normal Result Invalid
12797	Gated Mean Cell Transfer Delay - Test Result Low	12798	Gated Mean Cell Transfer Delay- Test Result High
12799	Gated Mean Cell Transfer Delay - Test Result Invalid	12803	Maximum Cell Transfer Delay -Normal Result Low

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Table C-51 ATM Test Cell, Back to Back Tests (Opt UKN)

No.	Description	No.	Description
12804	Maximum Cell Transfer Delay - Normal Result High	12806	Maximum Cell Transfer Delay -Normal Result Invalid
12807	Maximum Cell Transfer Delay - Test Result Low	12808	Maximum Cell Transfer Delay - Test Result High
12809	Maximum Cell Transfer Delay - Test Result Invalid	12813	Pk_Pk Cell Delay Variation -Normal Result Low
12814	Pk_Pk Cell Delay Variation- Normal Result High	12816	Pk_Pk Cell Delay Variation -Normal Result Invalid
12817	Pk_Pk Cell Delay Variation - Test Result Low	12818	Pk_Pk Cell Delay Variation - Test Result High
12819	Pk_Pk Cell Delay Variation - Test Result Invalid	12823	Bit Error Add Off - Errored Cell Count Low
12824	Bit Error Add Off - Errored Cell Count High	12826	Bit Error Add Off - Errored Cell Count Invalid
12833	Bit Error Add Single - Errored Cell Count Low	12834	Bit Error Add Single - Errored Cell Count High
12836	Bit Error Add Single - Errored Cell Count Invalid	12843	Bit Error Add 1 in 10 ³ - Errored Cell Count Low
12844	Bit Error Add 1 in 10 ³ - Errored Cell Count High	12846	Bit Error Add Off - Errored Cell Count Invalid
12853	Cell Delay Variation tolerance (a) - Non Conforming Cell Count Low	12854	Cell Delay Variation tolerance (a) - Non Conforming Cell Count High
12856	Cell Delay Variation tolerance (a) - Non Conforming Cell Count Invalid	12863	Cell Delay Variation tolerance (b) - Non Conforming Cell Count Low
12864	Cell Delay Variation tolerance (b) - Non Conforming Cell Count High	12866	Cell Delay Variation tolerance (b) - Non Conforming Cell Count Invalid
12867	Cell Delay Variation tolerance (c) - Non Conforming Cell Count Low	12868	Cell Delay Variation tolerance (c) - Non Conforming Cell Count High
12869	Cell Delay Variation tolerance (c) - Non Conforming Cell Count Invalid	12873	TX CellRate=20,000 - Maximum 1 Pt CDV Result Low
12874	TX Cell Rate=20,000 - Maximum 1 Pt CDV Result High	12876	TX Cell Rate=20,000 - Maximum 1 Pt CDV Result Invalid
12883	TX Cell Rate=20,000 - Maximum 1 Pt CDV Result Low	12884	TX Cell Rate=20,000 - Maximum 1 Pt CDV Result High
12886	TX Cell Rate=20,000 - Maximum 1 Pt CDV Result Invalid		

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Table C-52 ATM Trail Trace, Back to Back Tests (Opt UKN)

No.	Description	No.	Description
12896	34 Mb/s TEST String Incorrect	12897	140 Mb/s TEST String Incorrect
12898	34 Mb/s USER String Incorrect	12899	140 Mb/s USER String Incorrect

Table C-53 Performance Management OAM, Back to Back Tests (Opt UKN)

No.	Description	No.	Description
12906	F4 Segment Loss of POAM - Error Not Detected	12907	F4 Segment NO Loss of POAM - Error Detected
12916	F4 End to End Loss of POAM - Error Not Detected	12917	F4 End to End NO Loss of POAM - Error Detected
12926	F5 Segment Loss of POAM - Error Not Detected	12927	F5 Segment NO Loss of POAM - Error Detected
12936	F5 End to End Loss of POAM - Error Not Detected	12937	F5 End to End NO Loss of POAM - Error Detected
12943	F4 Segment Error Add Off - BEDC Result Low	12944	F4 Segment Error Add Off - BEDC Result High
12946	F4 Segment Error Add Off - BEDC Result Invalid	12947	F4 Segment Bit Error Add Single- BEDC Result Low
12948	F4 Segment Bit Error Add Single - BEDC Result High	12949	F4 Segment Bit Error Add Single- BEDC Result Invalid
12953	F4 End to End Error Add Off - BEDC Result Low	12954	F4 End to End Error Add Off - BEDC Result High
12956	F4 End to End Error Add Off - BEDC Result Invalid	12957	F4 End to End Bit Error Add Single- BEDC Result Low
12958	F4 End to End Bit Error Add Single - BEDC Result High	12959	F4 End to End Bit Error Add Single- BEDC Result Invalid
12963	F5 Segment Error Add Off - BEDC Result Low	12964	F5 Segment Error Add Off - BEDC Result High
12966	F5 Segment Error Add Off - BEDC Result Invalid	12967	F5 Segment Bit Error Add Single- BEDC Result Low
12968	F5 Segment Bit Error Add Single - BEDC Result High	12969	F5 Segment Bit Error Add Single- BEDC Result Invalid
12973	F5 End to End Error Add Off - BEDC Result Low	12974	F5 End to End Error Add Off - BEDC Result High
12976	F5 End to End Error Add Off - BEDC Result Invalid	12977	F5 End to End Bit Error Add Single- BEDC Result Low
12978	F5 End to End Bit Error Add Single - BEDC Result High	12979	F5 End to End Bit Error Add Single- BEDC Result Invalid
12983	Double Header Error Add - Cell Loss Result Low	12984	Double Header Error Add - Cell Loss Result High
12986	Double Header Error Add - Cell Loss Result Invalid	12987	Double Header Error Add - BEDC Result Low
12988	Double Header Error Add - BEDC Result High	12989	Double Header Error Add - BEDC Result Invalid
12993	B/G Header = FG Header - Cell Misinsertion Result Low	12994	B/G Header = FG Header- Cell Misinsertion Result High

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Table C-53 Performance Management OAM, Back to Back Tests (Opt UKN)

No.	Description	No.	Description
12996	B/G Header = FG Header - Cell Misinsertion Result Invalid	12997	B/G Header = FG Header -BEDC Result Low
12998	B/G Header = FG Header - BEDC Result High	12999	B/G Header = FG Header - BEDC Result Invalid

Table C-54 Back to Back Unbalanced 75 ohms (Opt UKZ)

No..	Description	No.	Description
11010	34 Mb/s - Loss Of Signal	11011	34 Mb/s - Loss Of Frame
11012	34 Mb/s - LOCS or SCNR	11013	34 Mb/s - Pattern Sync Loss
11014	34 Mb/s - PRBS Errors	11020	2 Mb/s - HDB3 Loss Of Signal
11021	2 Mb/s - HDB3 Loss Of Frame	11022	2 Mb/s - HDB3 LOCS or SCNR
11023	2 Mb/s - HDB3 Pattern Sync Loss	11024	2 Mb/s - HDB3 PRBS Errors
11025	2 Mb/s - AMI Loss Of Signal	11026	2 Mb/s - AMI Loss Of Frame
11027	2 Mb/s - AMI LOCS or SCNR	11028	2 Mb/s - AMI Pattern Sync Loss
11029	2 Mb/s - AMI PRBS Errors	11030	DS3 - B3ZS Loss Of Signal
11031	DS3 - B3ZS Loss Of Frame	11032	DS3 - B3ZS LOCS or SCNR
11033	DS3 - B3ZS Pattern Sync Loss	11034	DS3 - B3ZS PRBS Errors
11040	DS3 PLCP - B3ZS Loss Of Signal	11041	DS3 PLCP - B3ZS Loss Of Frame
11042	DS3 PLCP - B3ZS LOCS or SCNR	11043	DS3 PLCP - B3ZS Pattern Sync Loss
11044	DS3 PLCP - B3ZS PRBS Errors	-----	-----

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Table C-55 Back to Back Balanced 100 / 120 ohms (Opt UKZ)

No.	Description	No.	Description
11050	ATM 2Mb/s HDB3 Loss Of Signal	11051	ATM 2Mb/s, HDB3 Loss Of Frame
11052	ATM 2Mb/s, HDB3 LOCS or SCNR	11053	ATM 2Mb/s, HDB3 Pattern Sync Loss
11054	ATM 2Mb/s, HDB3 PRBS Errors	11055	ATM 2Mb/s, AMI Loss Of Signal
11056	ATM 2Mb/s, AMI Loss Of Frame	11057	ATM 2Mb/s, AMI LOCS or SCNR
11058	ATM 2Mb/s, AMI Pattern Sync Loss	11059	ATM 2Mb/s, AMI PRBS Errors
11060	ATM DS1, B8ZS Loss Of Signal	11061	ATM DS1, B8ZS Loss Of Frame
11062	ATM DS1, B8ZS LOCS or SCNR	11063	ATM DS1, B8ZS Pattern Sync Loss
11064	ATM DS1, B8ZS PRBS Errors	----	----

Table C-56 Offset, Frequency Measurement (Opt UKZ)

No.	Description	No.	Description
11071	34 Mb/s, 0 ppm Loss Of Signal	11072	34 Mb/s, 0 ppm VCXO Not Settled
11073	34 Mb/s, 0 ppm Frequency error	11074	34 Mb/s, +100 ppm Loss Of Signal
11075	34 Mb/s, +100 ppm VCXO Not Settled	11076	34 Mb/s, +100 ppm Frequency error
11077	34 Mb/s, -100 ppm Loss Of Signal	11078	34 Mb/s, -100 ppm VCXO Not Settled
11079	34 Mb/s, -100 ppm Frequency error	11081	2 Mb/s, 0 ppm Loss Of Signal
11082	2 Mb/s, 0 ppm VCXO Not Settled	11083	2 Mb/s, 0 ppm Frequency error
11084	2 Mb/s, +100 ppm Loss Of Signal	11085	2 Mb/s, +100 ppm VCXO Not Settled
11086	2 Mb/s, +100 ppm Frequency error	11087	2 Mb/s, -100 ppm Loss Of Signal
11088	2 Mb/s, -100 ppm VCXO Not Settled	11089	2 Mb/s, -100 ppm Frequency error
11091	DS3, 0 ppm Loss Of Signal	11092	DS3, 0 ppm VCXO Not Settled
11093	DS3, 0 ppm Frequency error	11094	DS3, +100 ppm Loss Of Signal
11095	DS3, +100 ppm VCXO Not Settled	11096	DS3, +100 ppm Frequency error
11097	DS3, -100 ppm Loss Of Signal	11098	DS3, -100 ppm VCXO Not Settled
11099	DS3, -100 ppm Frequency error	11101	DS1, 0 ppm Loss Of Signal
11102	DS1, 0 ppm VCXO Not Settled	11103	DS1, 0 ppm Frequency error

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Table C-56 Offset, Frequency Measurement (Opt UKZ)

No.	Description	No.	Description
11104	DS1, +100 ppm Loss Of Signal	11105	DS1, +100 ppm VCXO Not Settled
11106	DS1, +100 ppm Frequency error	11107	DS1, -100 ppm Loss Of Signal
11108	DS1, -100 ppm VCXO Not Settled	11109	DS1, -100 ppm Frequency error

Table C-57 Physical Layer Error Add (Opt UKZ)

No.	Description	No.	Description
11111	34 Mb/s EM-BIP, Error Add Off - Result Invalid	11112	34 Mb/s EM-BIP, Error Add Off - Result low
11113	34 Mb/s EM-BIP, Error Add Off - Result high	11114	34 Mb/s EM-BIP, Error Add Single - Result Invalid
11115	34 Mb/s EM-BIP, Error Add Single - Result low	11116	34 Mb/s EM-BIP, Error Add Single - Result high
11117	34 Mb/s EM-BIP, Error Add 1 in 10 ⁴ - Result Invalid	11118	34 Mb/s EM-BIP, Error Add 1 in 10 ⁴ - Result low
11119	34 Mb/s EM-BIP, Error Add 1 in 10 ⁴ - Result high	11121	34 Mb/s FEBE, Error Add Off - Result Invalid
11122	34 Mb/s FEBE, Error Add Off - Result low	11123	34 Mb/s FEBE, Error Add Off - Result high
11127	34 Mb/s FEBE, Error Add On - Result Invalid	11128	34 Mb/s FEBE, Error Add On - Result low
11129	34 Mb/s FEBE, Error Add On - Result high	11131	2 Mb/s CRC4, Error Add Off - Result Invalid
11132	2 Mb/s CRC4, Error Add Off - Result low	11133	2 Mb/s CRC4, Error Add Off - Result high
11134	2 Mb/s CRC4, Error Add Single - Result Invalid	11135	2 Mb/s CRC4, Error Add Single - Result low
11136	2 Mb/s CRC4, Error Add Single - Result high	11137	2 Mb/s CRC4, Error Add 1 in 10 ³ - Result Invalid
11138	2 Mb/s CRC4, Error Add 1 in 10 ³ - Result low	11139	2 Mb/s CRC4, Error Add 1 in 10 ³ - Result high
11141	2 Mb/s REBE, Error Add Off - Result Invalid	11142	2 Mb/s REBE, Error Add Off - Result low
11143	2 Mb/s REBE, Error Add Off - Result high	11144	2 Mb/s REBE, Error Add Single - Result Invalid
11145	2 Mb/s REBE, Error Add Single - Result low	11146	2 Mb/s REBE, Error Add Single - Result high
11147	2 Mb/s REBE, Error Add 1 in 10 ³ - Result Invalid	11148	2 Mb/s REBE, Error Add 1 in 10 ³ - Result low
11149	2 Mb/s REBE, Error Add 1 in 10 ³ - Result high	11151	DS3 CODE, Error Add Off - Result Invalid
11152	DS3 CODE, Error Add Off - Result low	11153	DS3 CODE, Error Add Off - Result high
11154	DS3 CODE, Error Add Single - Result Invalid	11155	DS3 CODE, Error Add Single - Result low
11156	DS3 CODE, Error Add Single - Result high	11157	DS3 CODE, Error Add 1 in 10 ⁴ - Result Invalid

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Table C-57 Physical Layer Error Add (Opt UKZ)

No.	Description	No.	Description
11158	DS3 CODE, Error Add 1 in 10 ⁴ - Result low	11159	DS3 CODE, Error Add 1 in 10 ⁴ - Result high
11167	DS3 CODE, Error Add 1.0E-7 Result Invalid	11168	DS3 CODE, Error Add 1.0E-7 Result low
11169	DS3 CODE, Error Add 1.0E-7 Result high	11171	DS3 FAS, Error Add Off - Result Invalid
11172	DS3 FAS, Error Add Off - Result low	11173	DS3 FAS, Error Add Off - Result high
11174	DS3 FAS, Error Add Single - Result Invalid	11175	DS3 FAS, Error Add Single - Result low
11176	DS3 FAS, Error Add Single - Result high	11177	DS3 FAS, Error Add 1 in 10 ³ - Result Invalid
11178	DS3 FAS, Error Add 1 in 10 ³ - Result low	11179	DS3 FAS, Error Add 1 in 10 ³ - Result high
11181	DS3 MFAS, Error Add Off - Result Invalid	11182	DS3 MFAS, Error Add Off - Result low
11183	DS3 MFAS, Error Add Off - Result high	11184	DS3 MFAS, Error Add Single - Result Invalid
11185	DS3 MFAS, Error Add Single - Result low	11186	DS3 MFAS, Error Add Single - Result high
11187	DS3 MFAS, Error Add 1 in 10 ³ - Result Invalid	11188	DS3 MFAS, Error Add 1 in 10 ³ - Result low
11189	DS3 MFAS, Error Add 1 in 10 ³ - Result high	11191	DS3 P-Bit, Error Add Off - Result Invalid
11192	DS3 P-Bit, Error Add Off - Result low	11193	DS3 P-Bit, Error Add Off - Result high
11194	DS3 P-Bit, Error Add Single - Result Invalid	11195	DS3 P-Bit, Error Add Single - Result low
11196	DS3 P-Bit, Error Add Single - Result high	11197	DS3 P-Bit, Error Add 1 in 10 ⁴ - Result Invalid
11198	DS3 P-Bit, Error Add 1 in 10 ⁴ - Result low	11199	DS3 P-Bit, Error Add 1 in 10 ⁴ - Result high
11201	DS3 C-Bit, Error Add Off - Result Invalid	11202	DS3 C-Bit, Error Add Off - Result low
11203	DS3 C-Bit, Error Add Off - Result high	11204	DS3 C-Bit, Error Add Single - Result Invalid
11205	DS3 C-Bit, Error Add Single - Result low	11206	DS3 C-Bit, Error Add Single - Result high
11207	DS3 C-Bit, Error Add 1 in 10 ⁴ - Result Invalid	11208	DS3 C-Bit, Error Add 1 in 10 ⁴ - Result low
11209	DS3 C-Bit, Error Add 1 in 10 ⁴ - Result high	11211	DS3 FEBE, Error Add Off - Result Invalid
11212	DS3 FEBE, Error Add Off - Result low	11213	DS3 FEBE, Error Add Off - Result high
11214	DS3 FEBE, Error Add Single - Result Invalid	11215	DS3 FEBE, Error Add Single - Result low
11216	DS3 FEBE, Error Add Single - Result high	11217	DS3 FEBE, Error Add 1 in 10 ⁴ - Result Invalid
11218	DS3 FEBE, Error Add 1 in 10 ⁴ - Result low	11219	DS3 FEBE, Error Add 1 in 10 ⁴ - Result high
11221	DS3 PLCP FAS, Error Add Off - Result Invalid	11222	DS3 PLCP FAS, Error Add Off - Result low
11223	DS3 PLCP FAS, Error Add Off - Result high	11224	DS3 PLCP FAS, Error Add Single - Result Invalid
11225	DS3 PLCP FAS, Error Add Single - Result low	11226	DS3 PLCP FAS, Error Add Single - Result high
11227	DS3 PLCP FAS, Error Add 1 in 10 ³ - Result Invalid	11228	DS3 PLCP FAS, Error Add 1 in 10 ³ - Result low
11229	DS3 PLCP FAS, Error Add 1 in 10 ³ - Result high	11231	DS3 PLCP BIP, Error Add Off - Result Invalid

Appendix C - Self Test Fail Numbers

Table C-57 Physical Layer Error Add (Opt UKZ)

No.	Description	No.	Description
11232	DS3 PLCP BIP, Error Add Off - Result low	11233	DS3 PLCP BIP, Error Add Off - Result high
11234	DS3 PLCP BIP, Error Add Single - Result Invalid	11235	DS3 PLCP BIP, Error Add Single - Result low
11236	DS3 PLCP BIP, Error Add Single - Result high	11237	DS3 PLCP BIP, Error Add 1 in 10 ⁴ - Result Invalid
11238	DS3 PLCP BIP, Error Add 1 in 10 ⁴ - Result low	11239	DS3 PLCP BIP, Error Add 1 in 10 ⁴ - Result high
11241	DS3 PLCP FEBE, Error Add Off - Result Invalid	11242	DS3 PLCP FEBE, Error Add Off - Result low
11243	DS3 PLCP FEBE, Error Add Off - Result high	11244	DS3 PLCP FEBE, Error Add Single - Result Invalid
11245	DS3 PLCP FEBE, Error Add Single - Result low	11246	DS3 PLCP FEBE, Error Add Single - Result high
11247	DS3 PLCP FEBE, Error Add 1 in 10 ⁴ - Result Invalid	11248	DS3 PLCP FEBE, Error Add 1 in 10 ⁴ - Result low
11249	DS3 PLCP FEBE, Error Add 1 in 10 ⁴ - Result high	11251	DS3 PLCP C1, Error Add Off - Result Invalid
11252	DS3 PLCP C1, Error Add Off - Result low	11253	DS3 PLCP C1, Error Add Off - Result high
11254	DS3 PLCP C1, Error Add Single - Result Invalid	11255	DS3 PLCP C1, Error Add Single - Result low
11256	DS3 PLCP C1, Error Add Single - Result high	11261	DS1 CODE, Error Add Off - Result Invalid
11262	DS1 CODE, Error Add Off - Result low	11263	DS1 CODE, Error Add Off - Result high
11264	DS1 CODE, Error Add Single - Result Invalid	11265	DS1 CODE, Error Add Single - Result low
11266	DS1 CODE, Error Add Single - Result high	11267	DS1 CODE, Error Add 1 in 10 ³ - Result Invalid
11268	DS1 CODE, Error Add 1 in 10 ³ - Result low	11269	DS1 CODE, Error Add 1 in 10 ³ - Result high
11271	DS1 FAS, Error Add Off - Result Invalid	11272	DS1 FAS, Error Add Off - Result low
11273	DS1 FAS, Error Add Off - Result high	11274	DS1 FAS, Error Add Single - Result Invalid
11275	DS1 FAS, Error Add Single - Result low	11276	DS1 FAS, Error Add Single - Result high
11277	DS1 FAS, Error Add 1 in 10 ³ - Result Invalid	11278	DS1 FAS, Error Add 1 in 10 ³ - Result low
11279	DS1 FAS, Error Add 1 in 10 ³ - Result high	11281	DS1 CRC6, Error Add Off - Result Invalid
11282	DS1 CRC6, Error Add Off - Result low	11283	DS1 CRC6, Error Add Off - Result high
11284	DS1 CRC6, Error Add Single - Result Invalid	11285	DS1 CRC6, Error Add Single - Result low
11286	DS1 CRC6, Error Add Single - Result high	11287	DS1 CRC6, Error Add 1 in 10 ³ - Result Invalid
11288	DS1 CRC6, Error Add 1 in 10 ³ - Result low	11289	DS1 CRC6, Error Add 1 in 10 ³ - Result high

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Table C-58 Physical Layer Alarms (Opt UKZ)

No.	Description	No.	Description
11292	34 Mb/s LOS not detected	11293	34 Mb/s LOS detected
11294	34 Mb/s LOF not detected	11295	34 Mb/s LOF detected
11296	34 Mb/s AIS not detected	11297	34 Mb/s AIS detected
11298	34 Mb/s RAI not detected	11299	34 Mb/s RAI detected
11302	2 Mb/s LOS not detected	11303	2 Mb/s LOS detected
11304	2 Mb/s LOF not detected	11305	2 Mb/s LOF detected
11306	2 Mb/s AIS not detected	11307	2 Mb/s AIS detected
11308	2 Mb/s RAI not detected	11309	2 Mb/s RAI detected
11312	DS3 LOS not detected	11313	DS3 LOS detected
11314	DS3 LOF not detected	11315	DS3 LOF detected
11316	DS3 AIS not detected	11317	DS3 AIS detected
11318	DS3 RAI not detected	11319	DS3 RAI detected
11322	DS1 LOS not detected	11323	DS1 LOS detected
11324	DS1 LOF not detected	11325	DS1 LOF detected
11326	DS1 AIS not detected	11327	DS1 AIS detected
11328	DS1 RAI not detected	11329	DS1 RAI detected
11332	DS3 PLCP LOF not detected	11333	DS3 PLCP LOF detected
11334	DS3 PLCP RAI not detected	11335	DS3 PLCP RAI detected
11341	DS3 Idle Alarm not detected	11342	DS3 Idle Alarm detected
11343	DS3 LOMF not detected	11344	DS3 LOMF detected
11345	DS3 Excess Zeros not detected	11346	DS3 Excess Zeros detected
11348	DS1 Excess Zeros not detected	11349	DS1 Excess Zeros detected

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Table C-59 DS3 PLCP LSS (Opt UKZ)

No.	Description	No.	Description
11352	DS3 PLCP LSS, Code 000 not detected	11353	DS3 PLCP LSS, Code 001 not detected
11354	DS3 PLCP LSS, Code 010 not detected	11355	DS3 PLCP LSS, Code 011 not detected
11356	DS3 PLCP LSS, Code 100 not detected	11357	DS3 PLCP LSS, Code 101 not detected
11358	DS3 PLCP LSS, Code 110 not detected	11359	DS3 PLCP LSS, Code 111 not detected

Table C-60 ATM Alarms (Opt UKZ)

No.	Description	No.	Description
11360	34 Mb/s Loss Of Signal	11361	34 Mb/s Pattern Loss not detected
11362	34 Mb/s Pattern Loss detected	11369	34 Mb/s Loss Of Frame
11370	DS3 Loss Of Signal	11371	DS3 Cell Sync Loss not detected
11372	DS3 Cell Sync Loss detected	11373	DS3 Selected Cell Not Received not detected
11374	DS3 Selected Cell Not Received detected	11375	DS3 Congestion Experienced not detected
11376	DS3 Congestion Experienced detected	11379	DS3 Loss Of Frame
11380	DS3 PLCP Loss Of Signal	11381	DS3 PLCP VP-AIS not detected
11382	DS3 PLCP VP-AIS detected	11383	DS3 PLCP VP-FERF not detected
11384	DS3 PLCP VP-FERF detected	11385	DS3 PLCP VP-LOC not detected
11386	DS3 PLCP VP-LOC detected	11388	DS3 PLCP PLCP Loss Of Frame
11389	DS3 PLCP Loss Of Frame	11390	DS1 Loss Of Signal
11391	DS1 VC-AIS not detected	11392	DS1 VC-AIS detected
11393	DS1 VC-FERF not detected	11394	DS1 VC-FERF detected
11399	DS1 ATM Alarms - Loss Of Frame	11400	2 Mb/s Loss Of Signal
11401	2 Mb/s VC-LOC not detected	11402	2 Mb/s VC-LOC detected
11403	2 Mb/s Test Cell Loss not detected	11404	2 Mb/s Test Cell Loss detected
11409	2 Mb/s Loss Of Frame	-----	-----

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Table C-61 ATM Cell Scrambler (Opt UKZ)

No.	Description	No.	Description
11411	Scramblers On-Off - Pattern Loss not detected	11412	Scramblers Off-Off - Pattern Loss detected
11413	Scramblers Off-On - Pattern Loss not detected	11414	Scramblers On-On - Pattern Loss detected
11415	Scramblers Off-Off - Test Cell Loss not detected	11416	Scramblers On-Off - Test Cell Loss detected
11417	Scramblers Off-On - Test Cell Loss not detected	11418	Scramblers On-On - Test Cell Loss detected

Table C-62 ATM Bandwidth (Opt UKZ)

No.	Description	No.	Description
11422	F/G, 80,000 c/s - Result Invalid	11423	F/G, 80,000 c/s - Result Low
11424	F/G, 80,000 c/s - Result High	11427	F/G, 40,000 c/s - Result Invalid
11428	F/G, 40,000 c/s - Result Low	11429	F/G, 40,000 c/s - Result High
11432	F/G, 100 c/s - Result Invalid	11433	F/G, 100 c/s - Result Low
11434	F/G, 100 c/s - Result High	11437	F/G, 24,000 c/s - Result Invalid
11438	F/G, 24,000 c/s - Result Low	11439	F/G, 24,000 c/s - Result High
11442	B/G 1, 70% - Result Invalid	11443	B/G 1, 70% - Result Low
11444	B/G 1, 70% - Result High	11447	B/G 1, 25% - Result Invalid
11448	B/G 1, 25% - Result Low	11449	B/G 1, 25% - Result High
11452	B/G 2, 45% - Result Invalid	11453	B/G 2, 45% - Result Low
11454	B/G 2, 45% - Result High	11457	B/G 2, 20% - Result Invalid
11458	B/G 2, 20% - Result Low	11459	B/G 2, 20% - Result High
11462	B/G 3, 25% - Result Invalid	11463	B/G 3, 25% - Result Low
11464	B/G 3, 25% - Result High	11467	B/G 3, 15% - Result Invalid
11468	B/G 3, 15% - Result Low	11469	B/G 3, 15% - Result High
11472	Fill 10% - Result Invalid	11473	Fill 10% - Result Low
11474	Fill 10% - Result High	----	----

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Table C-63 **ATM Distribution (Opt UKZ)**

No.	Description	No.	Description
11486	Periodic 2,000 c/s - Result Invalid	11483	Periodic 2,000 c/s - Result Low
11484	Periodic 2,000 c/s - Result High	11496	Burst 2,000 c/s - Result Invalid
11493	Burst 2,000 c/s - Result Low	11494	Burst 2,000 c/s - Result High
11506	Periodic + Burst - Result Invalid	11503	Periodic + Burst - Result Low
11504	Periodic + Burst - Result High	-----	-----

Table C-64 **ATM Error Add (Opt UKZ)**

No.	Description	No.	Description
11516	Single HEC, Error Add Off - Result Invalid	11513	Single HEC, Error Add Off - Result Low
11514	Single HEC, Error Add Off - Result High	11519	Single HEC, Error Add Single - Result Invalid
11517	Single HEC, Error Add Single - Result Low	11518	Single HEC, Error Add Single - Result High
11526	Single HEC, Error Add Single (Inv HEC) - Result Invalid	11523	Single HEC, Error Add Single (Inv HEC) - Result Low
11524	Single HEC, Error Add Single (Inv HEC) - Result High	11529	Single HEC, Error Add 1 in 10 ³ - Result Invalid
11527	Single HEC, Error Add 1 in 10 ³ - Result Low	11528	Single HEC, Error Add 1 in 10 ³ - Result High
11536	Single HEC, Error Add Burst (Cor HEC) - Result Invalid	11533	Single HEC, Error Add Burst (Cor HEC) - Result Low
11534	Single HEC, Error Add Burst (Cor HEC) - Result High	11539	Single HEC, Error Add Burst (Inv HEC) - Result Invalid
11537	Single HEC, Error Add Burst (Inv HEC) - Result Low	11538	Single HEC, Error Add Burst (Inv HEC) - Result High
11546	Double HEC, Error Add Off Result - Invalid	11543	Double HEC, Error Add Off Result - Low
11544	Double HEC, Error Add Off Result - High	11549	Double HEC, Error Add Single - Result Invalid
11547	Double HEC, Error Add Single - Result Low	11548	Double HEC, Error Add Single - Result High
11556	Double HEC, Error Add Single (Cor HEC) - Result Invalid	11553	Double HEC, Error Add Single (Cor HEC) - Result Low
11554	Double HEC, Error Add Single (Cor HEC) - Result High	11559	Double HEC, Error Add 1 in 10 ³ Result - Invalid
11557	Double HEC, Error Add 1 in 10 ³ Result - Low	11558	Double HEC, Error Add 1 in 10 ³ Result - High
11566	Double HEC, Error Add Burst (Cor HEC) - Result Invalid	11563	Double HEC, Error Add Burst (Cor HEC) - Result Low
11564	Double HEC, Error Add Burst (Cor HEC) - Result High	11569	Double HEC, Error Add Burst (Inv HEC) - Result Invalid
11567	Double HEC, Error Add Burst (Inv HEC) - Result Low	11568	Double HEC, Error Add Burst (Inv HEC) - Result High

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Table C-64 ATM Error Add (Opt UKZ)

No.	Description	No.	Description
11576	Bit Error Add Off - Result Invalid	11573	Bit Error Add Off - Result Low
11574	Bit Error Add Off - Result High	11579	Bit Error Add Single - Result Invalid
11577	Bit Error Add Single - Result Low	11578	Bit Error Add Single - Result High
11586	Bit Error Add Single (Err Cell Cnt) - Result Invalid	11583	Bit Error Add Single (Err Cell Cnt) - Result Low
11584	Bit Error Add Single (Err Cell Cnt) - Result High	11589	Bit Error Add 1 in 10 ³ - Result Invalid
11587	Bit Error Add 1 in 10 ³ - Result Low	11588	Bit Error Add 1 in 10 ³ - Result High

Table C-65 ATM Headers (Opt UKZ)

No.	Description	No.	Description
11596	F/G GFC=10 - Result Invalid	11593	F/G GFC=10 - Result Low
11594	F/G GFC=10 - Result High	11606	F/G VPI=85 - Result Invalid
11603	F/G VPI=85 - Result Low	11604	F/G VPI=85 - Result High
11616	F/G VPI=2730 - Result Invalid	11613	F/G VPI=2730 - Result Low
11614	F/G VPI=2730 - Result High	11626	F/G VCI=21845 - Result Invalid
11623	F/G VCI=21845 - Result Low	11624	F/G VCI=21845 - Result High
11636	F/G PTI=000 - Result Invalid	11633	F/G PTI=000 - Result Low
11634	F/G PTI=000 - Result High	11646	F/G PTI=010 - Result Invalid
11643	F/G PTI=010 - Result Low	11644	F/G PTI=010 - Result High
11656	F/G CLP=0 - Result Invalid	11653	F/G CLP=0 - Result Low
11654	F/G CLP=0 - Result High	11666	F/G CLP=1 - Result Invalid
11663	F/G CLP=1 - Result Low	11664	F/G CLP=1 - Result High
11676	RX GFC=X - Result Invalid	11673	RX GFC=X - Result Low
11674	RX GFC=X - Result High	11686	RX GFC=2 - Result Invalid
11683	RX GFC=2 - Result Low	11684	RX GFC=2 - Result High
11696	RX VPI=X - Result Invalid	11693	RX VPI=X - Result Low
11694	RX VPI=X - Result High	11706	RX VPI=0 - Result Invalid
11703	RX VPI=0 - Result Low	11704	RX VPI=0 - Result High
11716	RX VPI=85 - Result Invalid	11713	RX VPI=85 - Result Low

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Table C-65 ATM Headers (Opt UKZ)

No.	Description	No.	Description
11714	RX VPI=85 - Result High	11726	RX VCI=X - Result Invalid
11723	RX VCI=X - Result Low	11724	RX VCI=X - Result High
11736	RX VCI=33 - Result Invalid	11733	RX VCI=33 - Result Low
11734	RX VCI=33 - Result High	11746	RX PTI=XXX - Result Invalid
11743	RX PTI=XXX - Result Low	11744	RX PTI=XXX - Result High
11756	RX PTI=0XX - Result Invalid	11753	RX PTI=0XX - Result Low
11754	RX PTI=0XX - Result High	11766	RX PTI=X1X - Result Invalid
11763	RX PTI=X1X - Result Low	11764	RX PTI=X1X - Result High
11776	RX PTI=XX0 - Result Invalid	11773	RX PTI=XX0 - Result Low
11774	RX PTI=XX0 - Result High	11786	RX CLP=X - Result Invalid
11783	RX CLP=X - Result Low	11784	RX CLP=X - Result High
11796	RX CLP=0 - Result Invalid	11793	RX CLP=0 - Result Low
11794	RX CLP=0 - Result High	11806	RX CLP=1 - Result Invalid
11803	RX CLP=1 - Result Low	11804	RX CLP=1 - Result High

Table C-66 ATM Payloads (Opt UKZ)

No.	Description	No.	Description
11811	34Mb/s, Cross Cell PRBS15 - Pattern Errors	11812	34Mb/s, Cross Cell PRBS23 - Pattern Errors
11813	DS3, Single Cell PRBS9 - Pattern Errors	11814	DS3 PLCP, User Word 00000000 - Pattern Errors
11815	DS1, User Word 11111111 - Pattern Errors	11816	2Mb/s, User Word 01010101 - Pattern Errors
11817	2Mb/s, Test Cell - Pattern Errors	-----	-----

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Table C-67 Test Cell (Opt UKZ)

No.	Description	No.	Description
11821	Single Header Error Add - Result Invalid	11822	Single Header Error Add - Result Low
11823	Single Header Error Add - Result High	11824	Double Header Error Add - Result Invalid
11825	Double Header Error Add - Result Low	11826	Double Header Error Add - Result High
11827	3 x 100 ms Double Header Error Add - Result Invalid	11828	3 x 100 ms Double Header Error Add - Result Low
11829	3 x 100 ms Double Header Error Add - Result High	11836	Mis-inserted Cell (a) - Misinserted Cell Count Invalid
11833	Mis-inserted Cell (a) - Misinserted Cell Count Low	11834	Mis-inserted Cell (a) - Misinserted Cell Count High
11839	Mis-inserted Cell (a) - Errored Cell Count Invalid	11837	Mis-inserted Cell (a) - Errored Cell Count Low
11838	Mis-inserted Cell (a) - Errored Cell Count High	11846	Mis-inserted Cell (b) - Misinserted Cell Count Invalid
11843	Mis-inserted Cell (b) - Misinserted Cell Count Low	11844	Mis-inserted Cell (b) - Misinserted Cell Count High
11849	Mis-inserted Cell (b) - Errored Cell Count Invalid	11847	Mis-inserted Cell (b) - Errored Cell Count Low
11848	Mis-inserted Cell (b) - Errored Cell Count High	11856	Mis-inserted Cell (c) - Misinserted Cell Count Invalid
11853	Mis-inserted Cell (c) - Misinserted Cell Count Low	11854	Mis-inserted Cell (c) - Misinserted Cell Count High
11859	Mis-inserted Cell (c) - Errored Cell Count - Invalid	11857	Mis-inserted Cell (c) - Errored Cell Count - Low
11858	Mis-inserted Cell (c) - Errored Cell Count - High	11866	Gated Mean Cell Transfer delay (0) - Result Invalid
11863	Gated Mean Cell Transfer delay (0) - Result Low	11864	Gated Mean Cell Transfer delay (0) - Result High
11869	Gated Mean Cell Transfer delay (307) - Result Invalid	11867	Gated Mean Cell Transfer delay (307) - Result Low
11868	Gated Mean Cell Transfer delay (307) - Result High	11876	Max Cell Transfer delay (0) - Result Invalid
11873	Max Cell Transfer delay (0) - Result Low	11874	Max Cell Transfer delay (0) - Result High
11879	Max Cell Transfer delay (307) - Result Invalid	11877	Max Cell Transfer delay (307) - Result Low
11878	Max Cell Transfer delay (307) - Result High	11886	Pk-to-Pk Cell Transfer delay (0) - Result Invalid
11883	Pk-to-Pk Cell Transfer delay (0) - Result Low	11884	Pk-to-Pk Cell Transfer delay (0) - Result High
11889	Pk-to-Pk Cell Transfer delay (625) - Result Invalid	11887	Pk-to-Pk Cell Transfer delay (625) - Result Low
11888	Pk-to-Pk Cell Transfer delay (625) - Result High	11891	Bit Error Add Off - Errored Cell Count Invalid
11892	Bit Error Add Off - Errored Cell Count Low	11893	Bit Error Add Off - Errored Cell Count High
11894	Bit Error Add Single - Errored Cell Count Invalid	11895	Bit Error Add Single - Errored Cell Count Low
11896	Bit Error Add Single - Errored Cell Count High	11897	Bit Error Add 1 in 10 ³ - Errored Cell Count Invalid

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Table C-67 Test Cell (Opt UKZ)

No.	Description	No.	Description
11898	Bit Error Add 1 in 10 ³ - Errored Cell Count Low	11899	Bit Error Add 1 in 10 ³ - Errored Cell Count High
11901	Cell Delay Variation tolerance (a) - Non Conforming Cell Count Invalid	11902	Cell Delay Variation tolerance (a) - Non Conforming Cell Count Low
11903	Cell Delay Variation tolerance (a) - Non Conforming Cell Count High	11904	Cell Delay Variation tolerance (b) - Non Conforming Cell Count Invalid
11905	Cell Delay Variation tolerance (b) - Non Conforming Cell Count Low	11906	Cell Delay Variation tolerance (b) - Non Conforming Cell Count High
11907	Cell Delay Variation tolerance (c) - Non Conforming Cell Count Invalid	11908	Cell Delay Variation tolerance (c) - Non Conforming Cell Count Low
11909	Cell Delay Variation tolerance (c) - Non Conforming Cell Count High	11911	TX Cell Rate = 20,000 - Max 1 Pt CDV Result Invalid
11912	TX Cell Rate = 20,000 - Max 1 Pt CDV Result Low	11913	TX Cell Rate = 20,000 - Max 1 Pt CDV Result High
11914	TX Cell Rate = 60,000 - Max 1 Pt CDV Result Invalid	11915	TX Cell Rate = 60,000 - Max 1 Pt CDV Result Low
11916	TX Cell Rate = 60,000 - Max 1 Pt CDV Result High	-----	-----

Table C-68 DS3 FEAC and 34M Trail Trace (Opt UKZ)

No.	Description	No.	Description
11922	DS3 FEAC - Idle not received	11923	DS3 FEAC - Burst < threshold detected
11924	DS3 FEAC - Burst >= threshold not detected	11925	DS3 FEAC - Continuous code not detected
11928	34Mb/s Trail Trace - TEST String incorrect	11929	34Mb/s Trail Trace - USER String incorrect

Table C-69 Performance Management OAM (Opt UKZ)

No.	Description	No.	Description
11931	F4 Segment Loss of POAM - Error Not Detected	11932	F4 Segment Loss of POAM - Error Detected
11933	F4 End-to-End Loss of POAM - Error Not Detected	11934	F4 End-to-End Loss of POAM - Error Detected
11935	F5 Segment Loss of POAM - Error Not Detected	11936	F5 Segment Loss of POAM - Error Detected
11937	F5 End-to-End Loss of POAM - Error Not Detected	11938	F5 End-to-End Loss of POAM - Error Detected

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Table C-69 Performance Management OAM (Opt UKZ)

No.	Description	No.	Description
11946	F4 Segment Error Add Off - BEDC Result Invalid	11943	F4 Segment Error Add Off - BEDC Result Low
11944	F4 Segment Error Add Off - BEDC Result High	11949	F4 Segment Bit Error Add Single - BEDC Result Invalid
11947	F4 Segment Bit Error Add Single - BEDC Result Low	11948	F4 Segment Bit Error Add Single - BEDC Result High
11956	F4 End to End Error Add Off - BEDC Result Invalid	11953	F4 End to End Error Add Off - BEDC Result Low
11954	F4 End to End Error Add Off - BEDC Result High	11959	F4 End to End Bit Error Add Single - BEDC Result Invalid
11957	F4 End to End Bit Error Add Single - BEDC Result Low	11958	F4 End to End Bit Error Add Single - BEDC Result High
11966	F5 Segment Error Add Off - BEDC Result Invalid	11963	F5 Segment Error Add Off - BEDC Result Low
11964	F5 Segment Error Add Off - BEDC Result High	11969	F5 Segment Bit Error Add Single - BEDC Result Invalid
11967	F5 Segment Bit Error Add Single - BEDC Result Low	11968	F5 Segment Bit Error Add Single - BEDC Result High
11976	F5 End to End Error Add Off - BEDC Result Invalid	11973	F5 End to End Error Add Off - BEDC Result Low
11974	F5 End to End Error Add Off - BEDC Result High	11979	F5 End to End Bit Error Add Single - BEDC Result Invalid
11977	F5 End to End Bit Error Add Single - BEDC Result Low	11978	F5 End to End Bit Error Add Single - BEDC Result High
11986	Double HEC Error Add - Cell Loss Result Invalid	11983	Double HEC Error Add - Cell Loss Result Low
11984	Double HEC Error Add - Cell Loss Result High	11989	Double HEC Error Add - BEDC Result Invalid
11987	Double HEC Error Add - BEDC Result Low	11988	Double HEC Error Add - BEDC Result High
11996	B/G Header = F/G Header - Cell Misinsertion Result Invalid	11993	B/G Header = F/G Header - Cell Misinsertion Result Low
11994	B/G Header = F/G Header - Cell Misinsertion Result High	11999	B/G Header = F/G Header - BEDC Result Invalid
11997	B/G Header = F/G Header - BEDC Result Low	11998	B/G Header = F/G Header - BEDC Result High

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Table C-70 JITTER Generator Tests (Opt UHK)

No.	Description	No.	Description
1411	140 Mb/s PDH, 2 kHz - Errors	1419	140 Mb/s PDH, 2 kHz - VCO not Settling
1421	140 Mb/s PDH, 5 kHz - Errors	1431	34 Mb/s PDH, 2 kHz - Errors
1439	34 Mb/s PDH, 2 kHz - VCO not Settling	1441	34 Mb/s PDH, 5 kHz - Errors
1452	34 Mb/s PDH, 100 kHz - No Errors	1461	8 Mb/s PDH, 2 kHz - Errors
1469	8 Mb/s PDH, 2 kHz - VCO not Settling	1471	8 Mb/s PDH, 5 kHz - Errors
1482	8 Mb/s PDH, 50 kHz - No Errors	1491	2 Mb/s PDH, 2 kHz - Errors
1499	2 Mb/s PDH, 2 kHz - VCO not Settling	14102	2 Mb/s PDH, 5 kHz - No Errors
14111	140 Mb/s SDH, 2 kHz - Errors	14121	140 Mb/s SDH, 5 kHz - Errors

Table C-71 JITTER Receiver Tests (Opt UHN)

No.	Description	No.	Description
14133	Intrinsic Jitter 140 Mb/s, PRBS - Result Low	14134	Intrinsic Jitter 140 Mb/s, PRBS - Result High
14138	Intrinsic Jitter 140 Mb/s, PRBS - Jitter Unlock	14139	Intrinsic Jitter 140 Mb/s - VCO not Settling
14143	Intrinsic Jitter 140 Mb/s, All 0's - Result Low	14144	Intrinsic Jitter 140 Mb/s, All 0's - Result High
14148	Intrinsic Jitter 140 Mb/s, All 0's - Jitter Unlock	14153	Intrinsic Jitter 140 Mb/s, 1000 - Result Low
14154	Intrinsic Jitter 140 Mb/s, 1000 - Result High	14158	Intrinsic Jitter 140 Mb/s, 1000 - Jitter Unlock
14163	Intrinsic Jitter 140 Mb/s, All 1's - Result Low	14164	Intrinsic Jitter 140 Mb/s, All 1's - Result High
14168	Intrinsic Jitter 140 Mb/s, All 1's - Jitter Unlock	14173	Intrinsic Jitter 34 Mb/s, PRBS - Result Low
14174	Intrinsic Jitter 34 Mb/s, PRBS - Result High	14178	Intrinsic Jitter 140 Mb/s, PRBS - Jitter Unlock
14179	Intrinsic Jitter 34 Mb/s - VCO not Settling	14183	Intrinsic Jitter 34 Mb/s, All 0's - Result Low
14184	Intrinsic Jitter 34 Mb/s, All 0's - Result High	14188	Intrinsic Jitter 34 Mb/s, All 0's - Jitter Unlock
14193	Intrinsic Jitter 34 Mb/s, 1000 - Result Low	14194	Intrinsic Jitter 34 Mb/s, 1000 - Result High
14198	Intrinsic Jitter 34 Mb/s, 1000 - Jitter Unlock	14203	Intrinsic Jitter 34 Mb/s, All 1's - Result Low
14204	Intrinsic Jitter 34 Mb/s, All 1's - Result High	14208	Intrinsic Jitter 34 Mb/s, All 1's - Jitter Unlock
14213	Intrinsic Jitter 8 Mb/s, PRBS - Result Low	14214	Intrinsic Jitter 8 Mb/s, PRBS - Result High
14218	Intrinsic Jitter 8 Mb/s, PRBS - Jitter Unlock	14219	Intrinsic Jitter 8 Mb/s - VCO not Settling
14223	Intrinsic Jitter 8 Mb/s, All 0's - Result Low	14224	Intrinsic Jitter 8 Mb/s, All 0's - Result High

Appendix C - Self Test Fail Numbers

Table C-71 JITTER Receiver Tests (Opt UHN)

No.	Description	No.	Description
14228	Intrinsic Jitter 8 Mb/s, All 0's - Jitter Unlock	14233	Intrinsic Jitter 8 Mb/s,0001 - Result Low
14234	Intrinsic Jitter 8 Mb/s, 1000 - Result High	14238	Intrinsic Jitter 8 Mb/s,1000 - Jitter Unlock
14243	Intrinsic Jitter 8 Mb/s, All 1's - Result Low	14244	Intrinsic Jitter8 Mb/s, All 1's - Result High
14248	Intrinsic Jitter 8 Mb/s, All 1's - Jitter Unlock	14253	Intrinsic Jitter 2 Mb/s,PRBS - Result Low
14254	Intrinsic Jitter 2 Mb/s, PRBS - Result High	14258	Intrinsic Jitter 2 Mb/s,PRBS - Jitter Unlock
14259	Intrinsic Jitter 8 Mb/s, - VCO not Settling	14263	Intrinsic Jitter 2 Mb/s,All 0's - Result Low
14264	Intrinsic Jitter 2 Mb/s, All 0's - Result High	14268	Intrinsic Jitter 2 Mb/s,All 0's - Jitter Unlock
14273	Intrinsic Jitter 2 Mb/s, 1000 - Result Low	14274	Intrinsic Jitter2 Mb/s, 1000 - Result High
14278	Intrinsic Jitter 2 Mb/s, 1000 - Jitter Unlock	14283	Intrinsic Jitter 2 Mb/s,All 1's - Result Low
14284	Intrinsic Jitter 2 Mb/s, All 1's - Result High	14288	Intrinsic Jitter 2 Mb/s,All 1's - Jitter Unlock

Table C-72 JITTER Back to Back Tests (Opt UHK and UHN)

No.	Description	No.	Description
14293	140 Mb/s, 0 UI, 10 Hz - Result Low	14294	140 Mb/s, 0 UI, 10 Hz - Result High
14298	140 Mb/s, 0 UI, 10 Hz - Jitter Unlock	14299	140 Mb/s - VCO not Settling
14303	140 Mb/s, 10 UI, 100 Hz - Result Low	14304	140 Mb/s, 10 UI, 100 Hz - Result High
14308	140 Mb/s, 10 UI, 100 Hz - Jitter Unlock	14313	140 Mb/s, 1 UI, 10 kHz - Result Low
14314	140 Mb/s, 1 UI, 10 kHz - Result High	14318	140 Mb/s, 1 UI, 10 kHz - Jitter Unlock
14323	140 Mb/s, 0.6 UI, 3 MHz - Result Low	14324	140 Mb/s, 0.6 UI, 3 MHz - Result High
14328	140 Mb/s, 0.6 UI, 3 MHz - Jitter Unlock	14333	34 Mb/s, 0 UI, 10 Hz - Result Low
14334	34 Mb/s, 0 UI, 10 Hz - Result High	14338	34 Mb/s, 0 UI, 10 Hz - Jitter Unlock
14339	34 Mb/s - VCO not Settling	14343	34 Mb/s, 10 UI, 100 Hz - Result Low
14344	34 Mb/s, 10 UI, 100 Hz - Result High	14348	34 Mb/s, 10 UI, 100 Hz - Jitter Unlock
14353	34 Mb/s, 1 UI, 200 kHz - Result Low	14354	34 Mb/s, 1 UI, 200 kHz - Result High
14358	34 Mb/s, 1 UI, 200 kHz - Jitter Unlock	14363	34 Mb/s, 0.6 UI, 500 kHz - Result Low
14364	34 Mb/s, 0.6 UI, 500 kHz - Result High	14368	34 Mb/s, 0.6 UI, 500 kHz - Jitter Unlock
14373	8 Mb/s, 0 UI, 10 Hz - Result Low	14374	8 Mb/s, 0 UI, 10 Hz - Result High
14378	8 Mb/s, 0 UI, 10 Hz - Jitter Unlock	14379	8 Mb/s - VCO not Settling
14383	8 Mb/s, 10 UI, 100 Hz - Result Low	14384	8 Mb/s, 10 UI, 100 Hz - Result High

Appendix C - Self Test Fail Numbers

Table C-72 JITTER Back to Back Tests (Opt UHK and UHN)

No.	Description	No.	Description
14388	8 Mb/s, 10 UI, 100 Hz - Jitter Unlock	14393	8 Mb/s, 1 UI, 100 kHz - Result Low
14394	8 Mb/s, 1 UI, 100 kHz - Result High	14398	8 Mb/s, 1 UI, 100 kHz - Jitter Unlock
14403	8 Mb/s, 0.6 UI, 300 kHz - Result Low	14404	8 Mb/s, 0.6 UI, 300 kHz - Result High
14408	8 Mb/s, 0.6 UI, 300 kHz - Jitter Unlock	14413	2 Mb/s, 0 UI, 10 Hz - Result Low
14414	2 Mb/s, 0 UI, 10 Hz - Result High	14418	2 Mb/s, 0 UI, 10 Hz - Jitter Unlock
14419	2 Mb/s - VCO not Settling	14423	2 Mb/s, 10 UI, 100 Hz - Result Low
14424	2 Mb/s, 10 UI, 100 Hz - Result High	14428	2 Mb/s, 10 UI, 100 Hz - Jitter Unlock
14433	2 Mb/s, 1 UI, 25 kHz - Result Low	14434	2 Mb/s, 1 UI, 25 kHz - Result High
14438	2 Mb/s, 1 UI, 25 kHz - Jitter Unlock	14443	2 Mb/s, 0.6 UI, 80 kHz - Result Low
14444	2 Mb/s, 0.6 UI, 80 kHz - Result High	14448	2 Mb/s, 0.6 UI, 80 kHz - Jitter Unlock

Table C-73 STM-1 Electrical JITTER Receiver Tests (Opt A1M)

No.	Description	No.	Description
14493	Intrinsic Jitter, Range 1_6, PRBS - Result Low	14494	Intrinsic Jitter, Range 1_6, PRBS - Result High
14496	Intrinsic Jitter Range 1_6, PRBS - Loss of Signal	14498	Intrinsic Jitter Range 1_6, PRBS - Jitter Unlock
14499	Intrinsic Jitter Range 1_6, PRBS - VCO not Settling	14503	Intrinsic Jitter Range 1_6, All 0's - Result Low
14504	Intrinsic Jitter, Range 1_6, All 0's - Result High	14506	Intrinsic Jitter, Range 1_6, All 0's - Loss of Signal
14508	Intrinsic Jitter, Range 1_6, All 0's - Jitter Unlock	14513	Intrinsic Jitter Range 1_6, All 1's - Result Low
14514	Intrinsic Jitter, Range 1_6, All 1's - Result High	14516	Intrinsic Jitter, Range 1_6, All 1's - Loss of Signal
14518	Intrinsic Jitter, Range 1_6, All 1's - Jitter Unlock	14523	Intrinsic Jitter Range 16, PRBS - Result Low
14524	Intrinsic Jitter, Range 16, PRBS - Result High	14526	Intrinsic Jitter, Range 16, PRBS - Loss of Signal
14528	Intrinsic Jitter, Range 16, PRBS - Jitter Unlock	14533	Intrinsic Jitter Range 16, All 0's - Result Low
14534	Intrinsic Jitter, Range 16, All 0's - Result High	14536	Intrinsic Jitter, Range 16, All 0's - Loss of Signal
14538	Intrinsic Jitter, Range 16, All 0's - Jitter Unlock	14543	Intrinsic Jitter Range 16, All 1's - Result Low
14544	Intrinsic Jitter, Range 16, All 1's - Result High	14546	Intrinsic Jitter, Range 16, All 1's - Loss of Signal
14548	Intrinsic Jitter, Range 16, All 1's - Jitter Unlock	14553	Jitter Off - Result Low
14554	Jitter Off - Result High	14556	Jitter Off - Loss of Signal
14558	Jitter Off - Jitter Unlock	14563	Jitter 5 UI, 100 Hz - Result Low

Appendix C - Self Test Fail Numbers

Table C-73 STM-1 Electrical JITTER Receiver Tests (Opt A1M)

No.	Description	No.	Description
14564	Jitter 5 UI, 100 Hz - Result High	14566	Jitter 5 UI, 100 Hz - Loss of Signal
14568	Jitter 5 UI, 100 Hz - Jitter Unlock	14573	Jitter 5 UI, 1 kHz - Result Low
14574	Jitter 5 UI, 1 kHz - Result High	14576	Jitter 5 UI, 1 kHz - Loss of Signal
14578	Jitter 5 UI, 1 kHz - Jitter Unlock	14583	Jitter 1 UI, 10 kHz - Result Low
14584	Jitter 1 UI, 10 kHz - Result High	14586	Jitter 1 UI, 10 kHz - Loss of Signal
14588	Jitter 1 UI, 10 kHz - Jitter Unlock	14593	Jitter 1 UI, 100 kHz - Result Low
14594	Jitter 1 UI, 100 kHz - Result High	14596	Jitter 1 UI, 100 kHz - Loss of Signal
14598	Jitter 1 UI, 100 kHz - Jitter Unlock	14603	Jitter 0.5 UI, 1 MHz - Result Low
14604	Jitter 0.5 UI, 1 MHz - Result High	14606	Jitter 0.5 UI, 1 MHz - Loss of Signal
14608	Jitter 0.5 UI, 1 MHz - Jitter Unlock	14613	Jitter Hits 1 UI - Result Low
14614	Jitter Hits 1 UI - Result High	14616	Jitter Hits 1 UI - Loss of Signal
14618	Jitter Hits 1 UI - Jitter Unlock		

Table C-74 JITTER Back to Back Tests (Opt A3K)

No.	Description	No.	Description
14881	2 Mb/s, 80 UI, 100 Hz - Errors	14889	2 Mb/s, 80 UI, 100 Hz - VCXO not Settling
14893	2 Mb/s, 13 UI, 100 Hz - Result Low	14894	2 Mb/s, 13 UI, 100 Hz - Result High
14898	2 Mb/s, 13 UI, 100 Hz - Jitter Unlock	14899	2 Mb/s, 13 UI, 100 Hz - VCXO not Settling
14902	2 Mb/s, 20 UI, 100 Hz - Overrange not Detected	14908	2 Mb/s, 20 UI, 100 Hz - Jitter Unlock
14909	2 Mb/s, 20 UI, 100 Hz - VCXO not Settling	14911	140 Mb/s, 50 UI, 100 Hz - Errors
14923	STM-1E, 13 UI, 100 Hz - Result Low	14924	STM-1E, 13 UI, 100 Hz - Result High
14928	STM-1E, 13 UI, 100 Hz - Jitter Unlock	14929	STM-1E, 13 UI, 100 Hz - VCXO not Settling
14933	STM-1O, 13 UI, 100 Hz - Result Low	14934	STM-1O, 13 UI, 100 Hz - Result High
14938	STM-1O, 13 UI, 100 Hz - Jitter Unlock	14939	STM-1O, 13 UI, 100 Hz - VCXO not Settling
14943	STM-4, 12 UI, 100 Hz - Result Low	14944	STM-4, 12 UI, 100 Hz - Result High
14948	STM-4, 12 UI, 100 Hz - Jitter Unlock	14949	STM-4, 12 UI, 100 Hz - VCXO not Settling

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Learning Products Map

:All of the learning products which apply to the HP 37717C Communications Performance Analyzer are shown below:

The HP 37717C Mainframe Operating Manual- 37717-90221

General operating information irrespective of option.

The HP 37717C PDH / DS_n Operating Manual - 37717-90222

Information about the PDH / DS_n modules, how to select the features available and measurement examples.

The HP 37717C SDH / SONET Operating Manual - 37717-90223

Information about the SDH / SONET modules, how to select the features available and measurement examples. This book also contains a table of ANSI / ETSI equivalent terms.

The HP 37717C Jitter Operating Manual - 37717-90224

Information about the Jitter modules, how to select the features available and measurement examples.

The HP 37717C ATM Operating Manual - 37717-90225

Information about the ATM modules, how to select the features available and measurement examples. This book also contains tutorial information on some ATM measurements, Information on pre-stored sequences and a glossary of ATM terms.

Remote Control Manual - 37717-90227:

Provides remote control information for instruments fitted with the RS232 and HP-IB remote control option modules.

Calibration Manual - 37717-90228:

Provides specifications and methods of testing that the instrument meets its specifications.

About This Edition

This is the 1st edition of the 37717-90221 manual. It documents the product as of August 1996. Edition dates are as follows:

1st Edition, August 1996

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In This Book

This book provides general information about the HP 37717C Communications Performance Analyzer. This Mainframe Manual contains operating information which applies irrespective of option. In addition to the general information, this manual contains information on measurement results and error codes.