SONET Edition

Anritsu

MP1577A

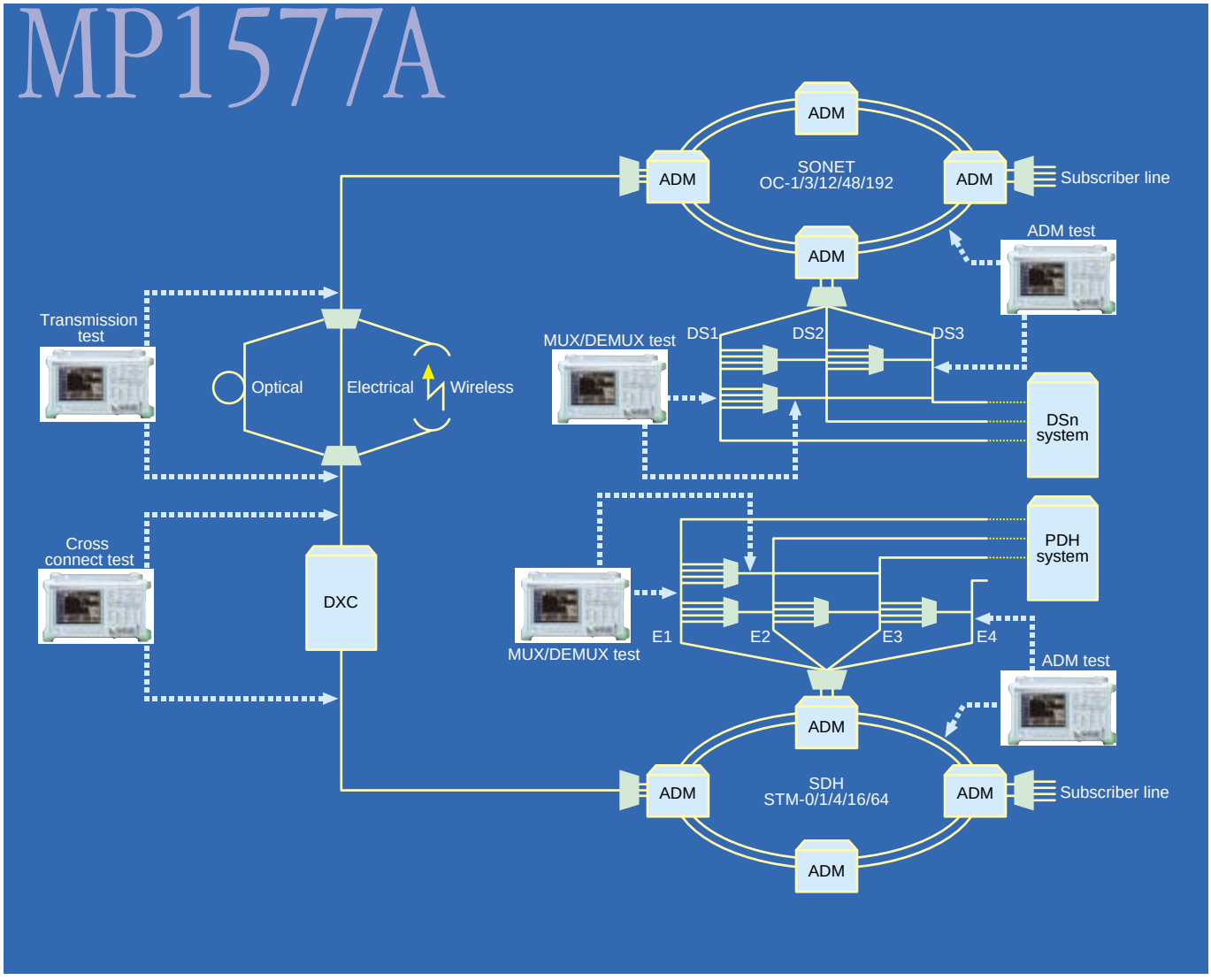
SONET/SDH/PDH/DSn Analyzer

1.5 Mbit/s to 10 Gbit/s

Comprehensive Testing of Core Networks from One Compact Portable Analyzer

Possible OC-192c/VC4-64c Measurements

The MP1577A analyzer is designed for construction and maintenance of SONET, SDH, PDH and DSn equipment and networks.
The MP1577A is scalable from 1.5 Mbit/s to 10 Gbit/s, and perform SONET/SDH/PDH/DSn tests such as concatenation mapping, tandem connection, APS switching time measurement.
The MP1577A has a built-in printer and a 3.5-inch floppy disk drive as standard output devices to print measurement results, and to save and read measurement data to and from the floppy disk (FD), which can also be read on an external PC. The user can also save screen data to the FD. The MP1577A has a "HELP" key function that explains operations, functions and connections.



Conforming to Bit Rates from 1.5 Mbit/s to 10 Gbit/s in a Single Unit

The MP1577A conforms to ITU-T Rec. G.703 (2, 8, 34, 139, 1.5, and 45 Mbit/s), G.703 and G.958 (52, 156, 622, 2,488, and 9,953 Mbit/s), and allows the user to select plug-in units for different applications, including SONET, SDH, PDH and DSn tests.

Concatenation Mapping

The MP1577A can perform SONET and SDH tests through the mapping routes from STS-3c to STS-192c and also core rooter interface tests.

Enhanced SONET and SDH Test Functions

The MP1577A can generate and detect Tandem Connection patterns (ITU-T Rec. G.707). Also, APS switching time testing (ITU-T Rec. G.707, G.783, and G.842), and Alarm detection are supported.

Enhanced Through-Modes

The MP1577A enables the user to select one of the three different types of through-modes that it offers: (1) Transparent, (2) Overhead Overwrite, and (3) Payload Overwrite.
The user can also insert various errors and alarms into the through signals.

Error Analysis (Error Performance)

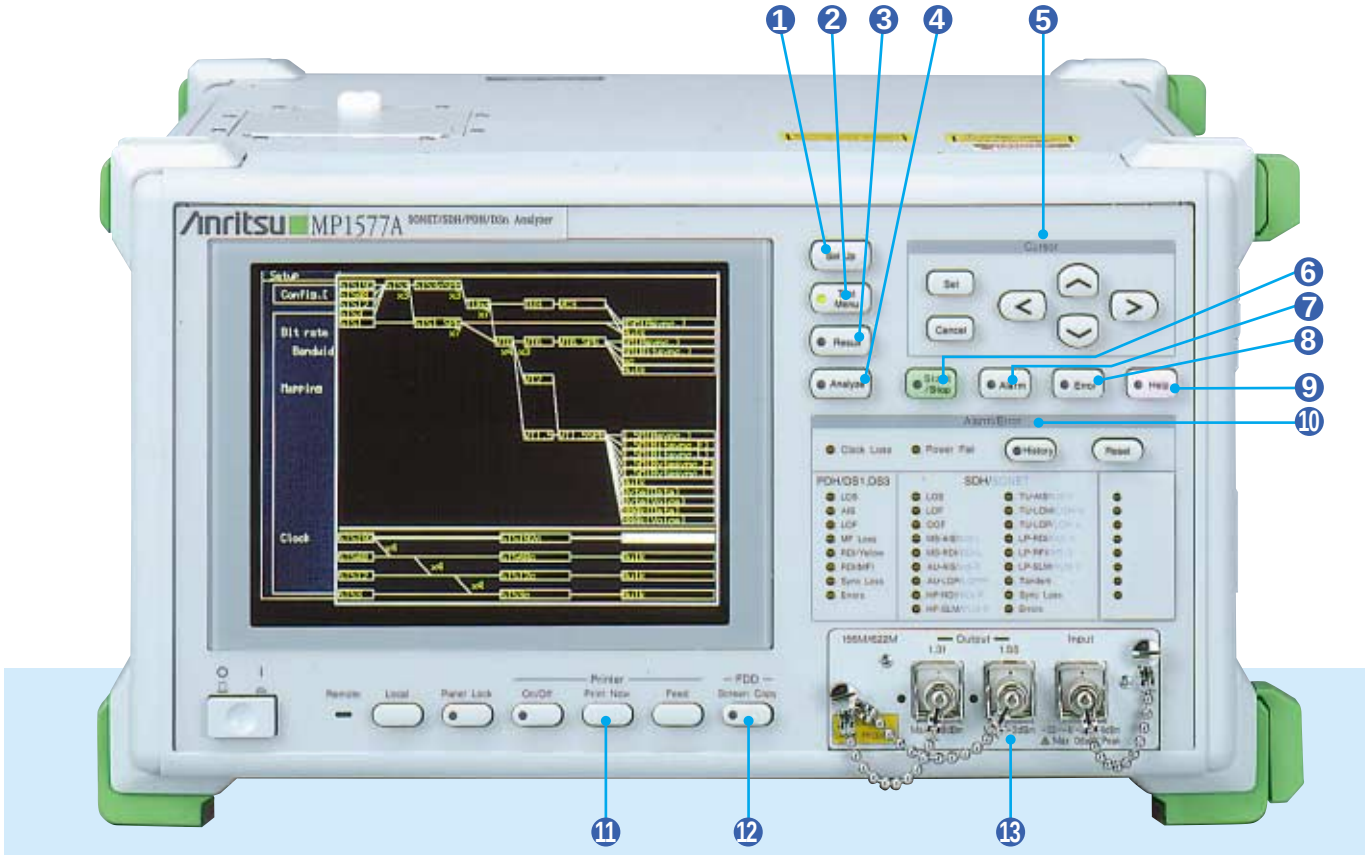
The MP1577A enables the user to perform error measurement conforming to ITU-T Rec. G.821, G.826, M.2100, M.2101, M.2110, and M.2120.

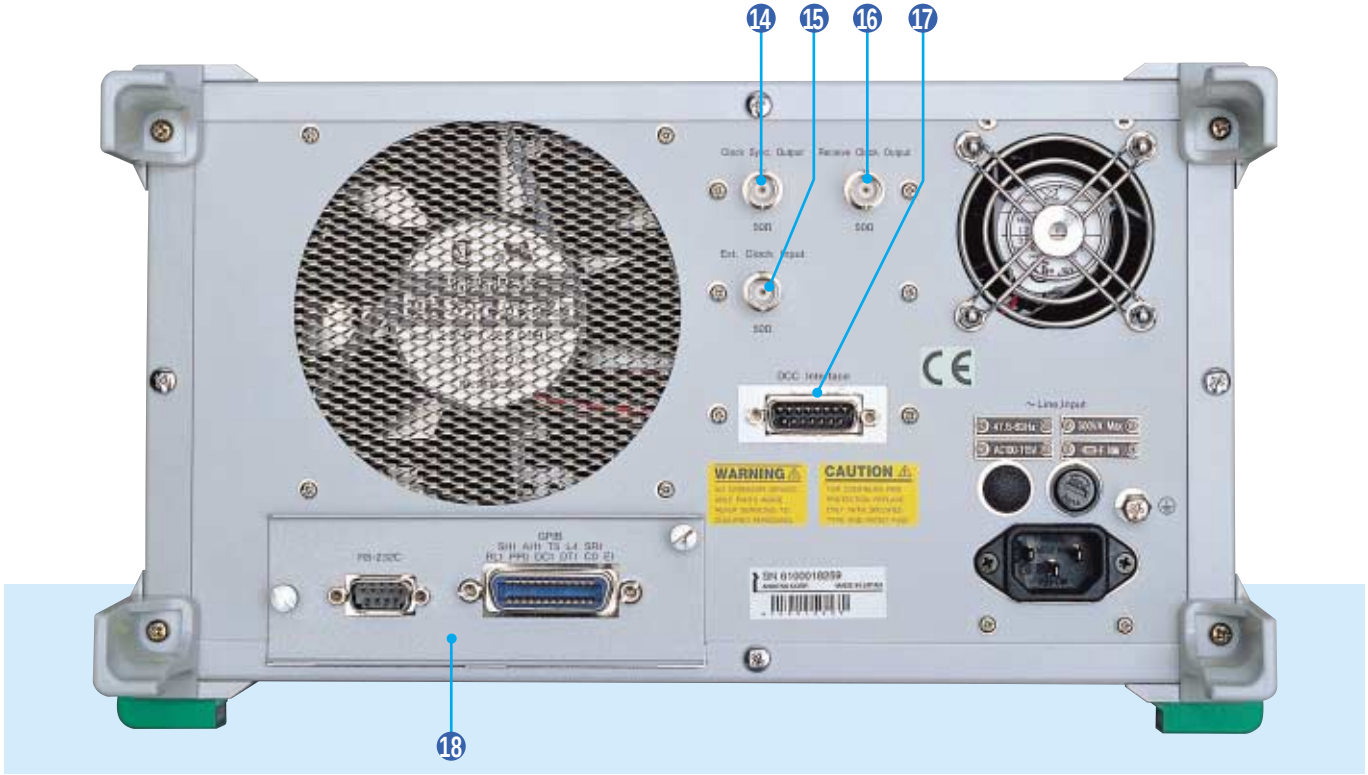
Frequency and Optical Power Measurements

The MP1577A can measure received frequencies and display measurement results in a graph. If an optical interface plug-in unit is installed, the MP1577A can measure the absolute and relative values of the optical power.

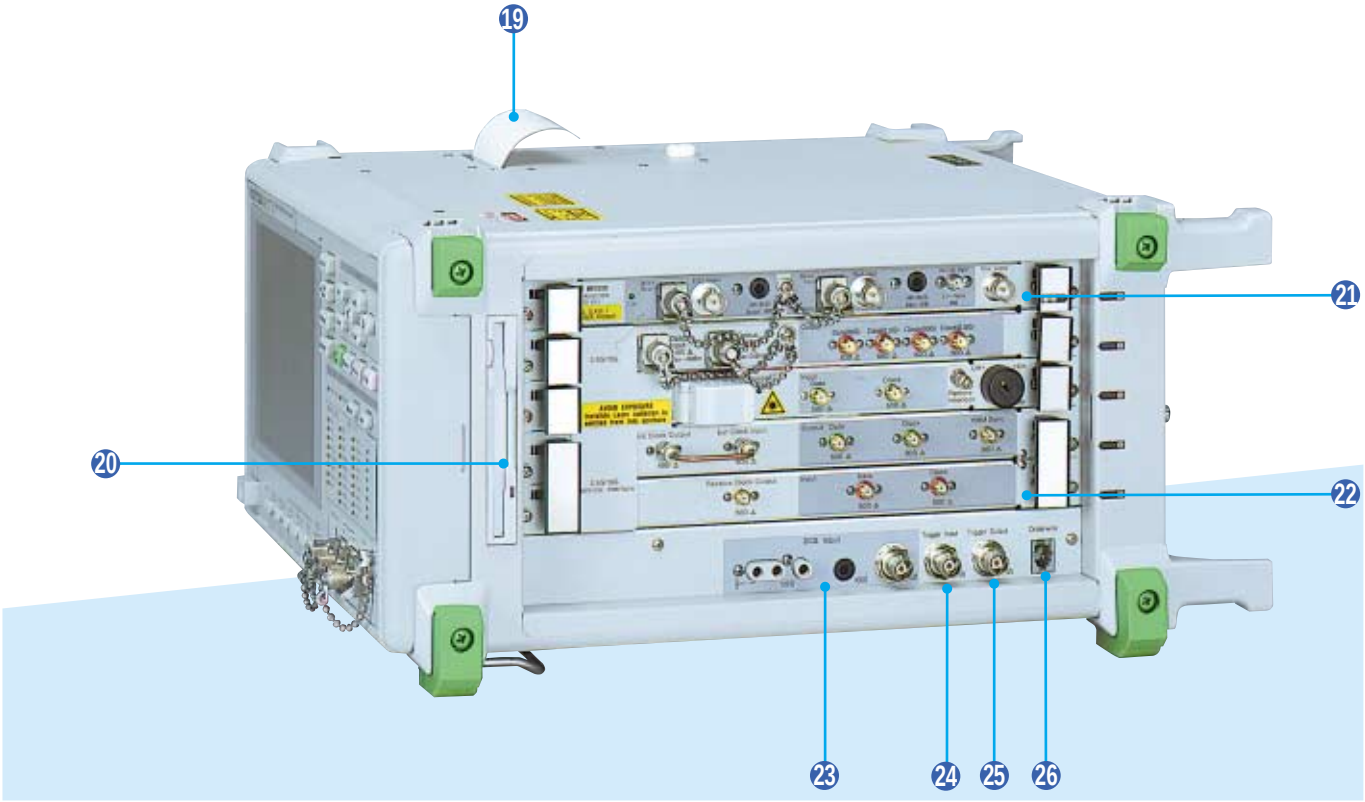
Supports SONET, SDH, Japan Mapping (Option) in One Frame

The MP1577A allows the user to set up the measurement of SONET, SDH and 384k Japan mapping in one frame.
The user can set a signalling pattern (multi-frame pattern of 8 frames or 64 frames) for Japan mapping measurement.


Anritsu MP1577A
1
2
3
4
5
6
7
8
9
10
11
12
13


14
15
16
17
18
WARNING
CAUTION

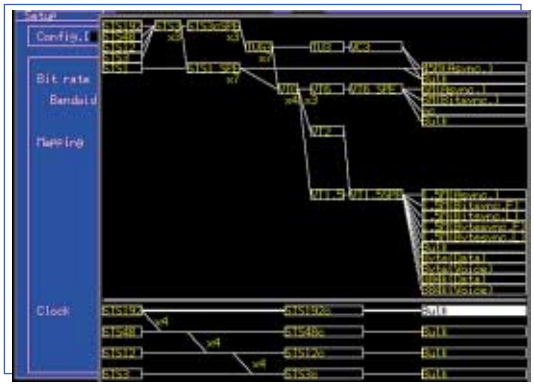
❶ **Setup:** Displays setup screen
❷ **Test Menu:** Displays main test menu screen
❸ **Result:** Displays main measurement results screen
❹ **Analyze:** Displays main analysis screen
❺ **Cursor**
Set: Sets data and opens windows for numeric, ASCII and character input
Cancel: Cancels data setting and closes windows for numeric, ASCII and character input
∧∨< >**:** Move cursor or window cursor on screen. At the numeric input window, the ∧and∨ keys increase and decrease the numeric value, respectively.
❻ **Start/Stop:** Starts and stops measurement
❼ **Alarm:** Inserts alarms (The alarm target and additional method/timing are selected at the Manual screen.)
❽ **Error:** Inserts errors (The error target and single/rate are selected at the Manual screen.)
❾ **Help:** Displays help screen
❿ **Alarm/Error:** Displays receiver alarms/errors, clock loss, and power fail measurement results
⓫ **Printer:** Prints screen at built-in or external printer
⓬ **Screen Copy:** Outputs screen in bitmap format to floppy disk
⓭ Slot for 156M/622M optical I/O
⓮ **Clock Sync Output:** Clock output synchronized with DSn or SONET send clock
⓯ **External Clock Input:** DSn or SONET external send clock input
⓰ **Receiver Clock Output:** Clock output synchronized with receiving data
⓱ **DCC Interface:** DCC clock output for send/receive, DCC data I/O connector
⓲ **External Interface:** Any of the RS-232C, GPIB, Ethernet interfaces can be selected as an option. In addition, an optional VGA output can be installed for connecting an external monitor.
⓳ Printer
⓴ Floppy disk drive
㉑ Slots for PDH/DSn units
㉒ 2.5G/10G electrical/optical I/O
㉓ **DCS Input:** Data/clock input for SONET output synchroniza-
㉔ tion
㉕ **Trigger Input:** Input for APS measurement and APS capture
Trigger Output: Output for error alarm detection,
㉖ send/receive frame or clock
Orderwire: Modular jack for connecting orderwire headset



SONET, SDH, DSn and PDH Measurement

Measurement at Bit Rates from 1.5 Mbit/s to 10 Gbit/s

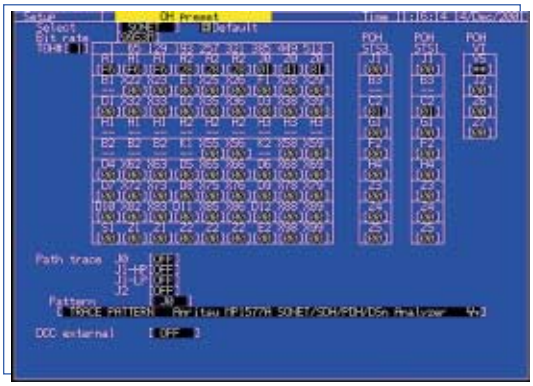
A mapping route to a bit rate of up to 10 Gbit/s can be set. The MP1577A mainly supports SONET, SDH, Japan mapping, PDH of the European system and DSn of the North American system for digital communications. For concatenation mapping, a route can be set from STS-3c up to STS-192c. Furthermore, the MP1577A supports a combination of channels.
For example, 64 channels of STS-3c, 16 channels of STS-12c, and four channels of STS-48c. (See figure 1 in page 14)



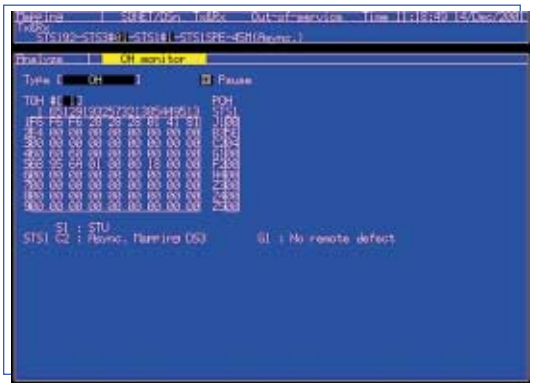
Mapping

Overhead Setting and Testing

The user can set the TOH, POH, all overheads and pass traces (J0, J1, J2). Moreover, monitors, such as TOH/POH (high order pass/low order pass), pointer and K1/K2 byte etc., are possible.



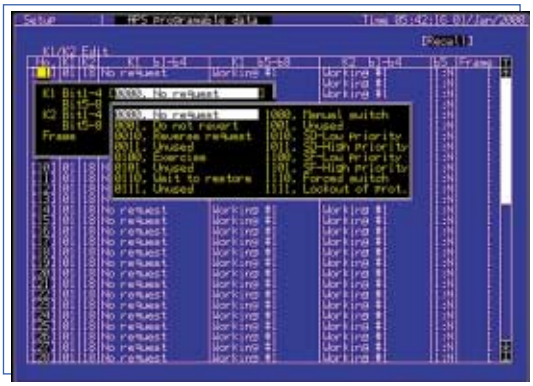
Overhead preset



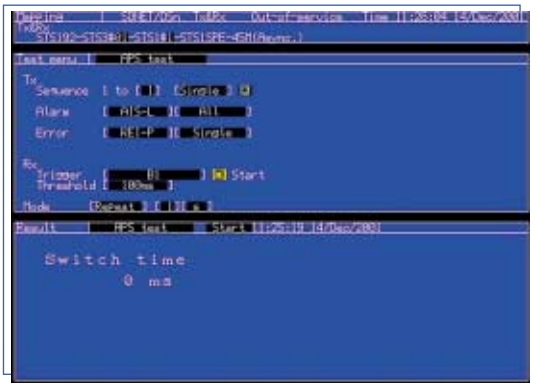
Overhead monitor

APS Function

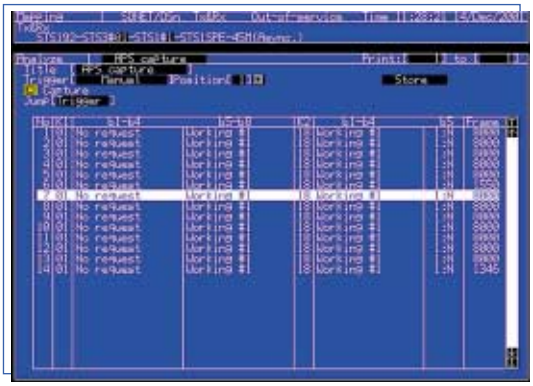
The user can test the automatic protection switch (APS) by measuring the equipment switching time accurately in milliseconds. The MP1577A also conforms to ITU-T Rec. G.783 and G.841.



APS program data



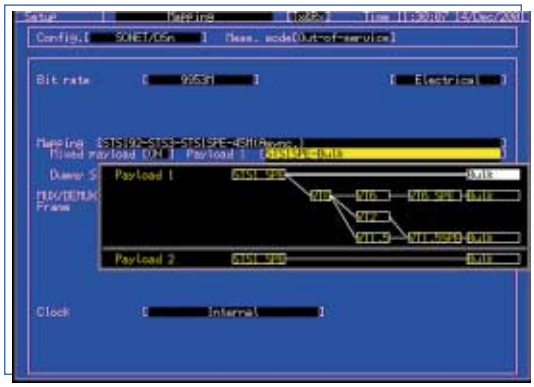
APS test sub-screen



APS capture

Mixed Payload

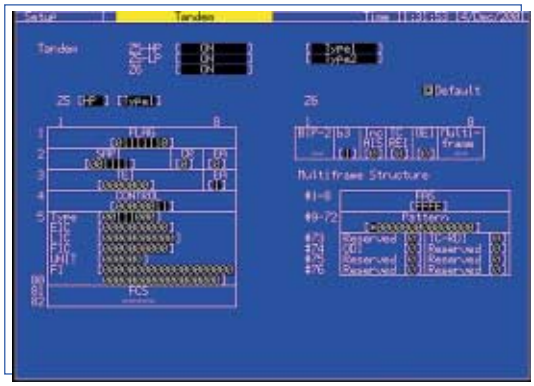
At mapping measurement in TUG3 and AU3, the user can set different mapping for three additional channels other than the target measurement channel.



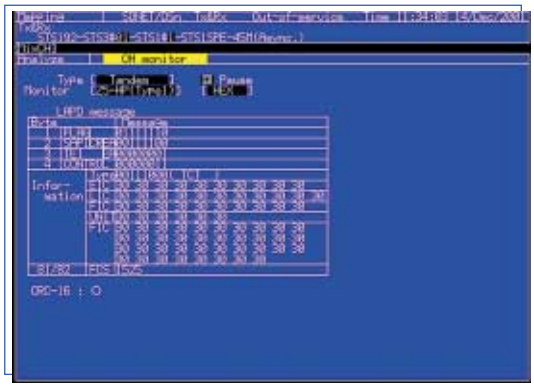
Mixed payload setting

Tandem Connection

The Z5 and Z6 bytes can be set and measured.



Tandem



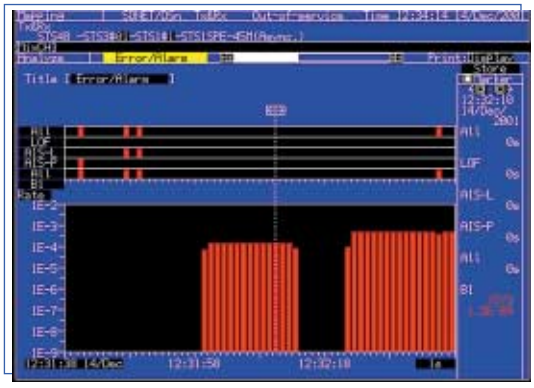
Overhead monitor (Tandem)

Various Analysis Functions

The internal optical power meter and frequency counter allows the user to measure optical power and frequency during error and alarm measurement. (Photo A)

Measured errors and alarms can be displayed as a graph with a time scale in 1 second, 1 minute, 15 minutes, or 60 minutes. (Photo B)

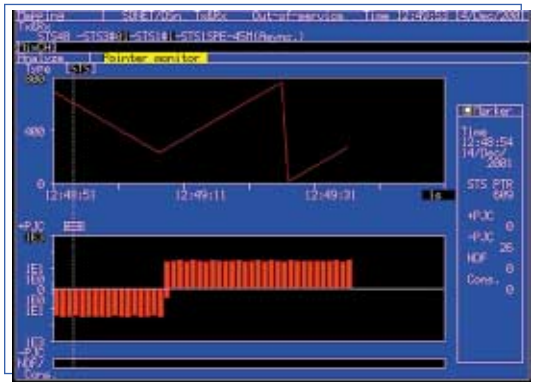
A: Optical power meter



B: Error/alarm

Pointer Value Monitoring

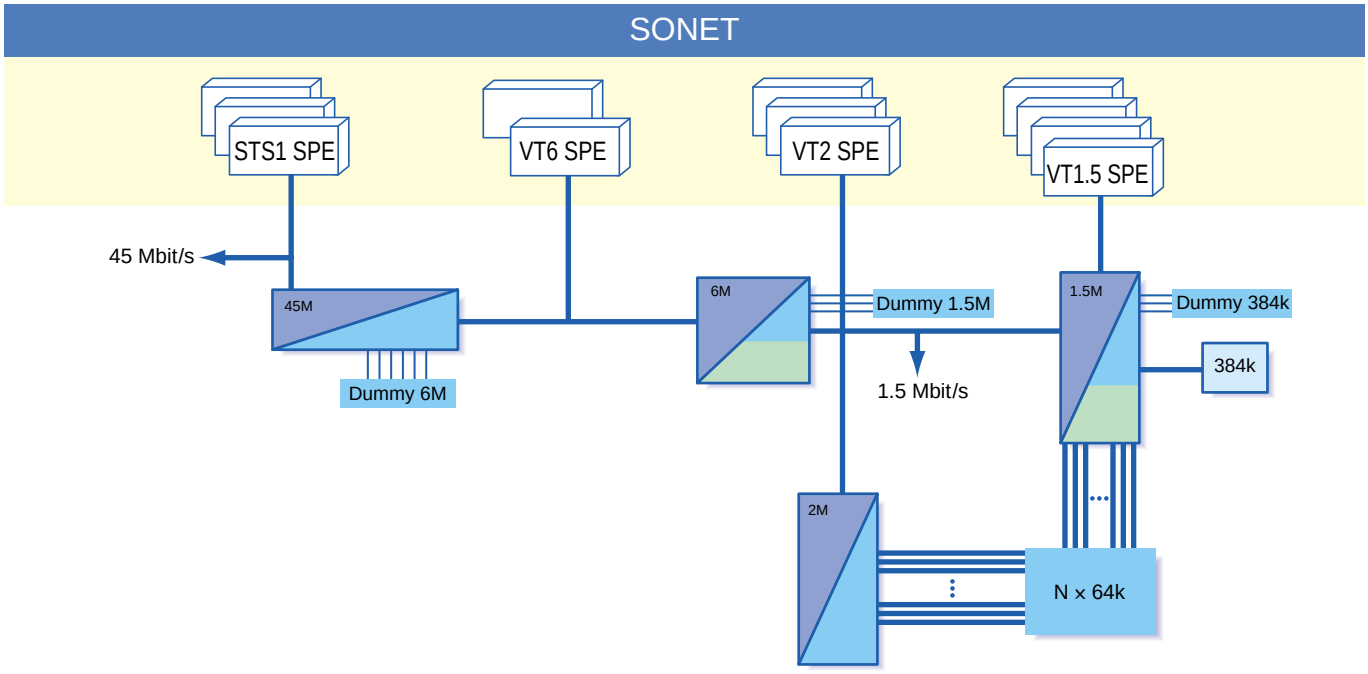
Changes in pointer value can be displayed as a graph with values updated in real time.



Pointer monitor

MUX/DEMUX Function (Option)

When the MUX/DEMUX option is added, the multiplexing structure including the frame alignment signal can be generated, and multiplexer/demultiplexer measurement can be performed.

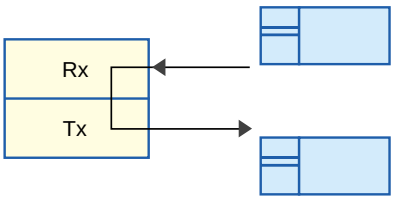


Through Modes

One of the three through modes can be selected: (1) Transparent, (2) Overhead Overwrite, and (3) Payload Overwrite.

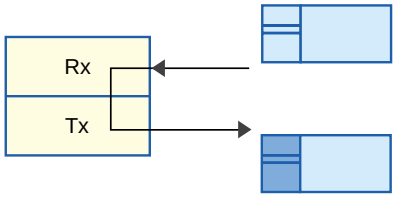
●Transparent

For in-service monitoring



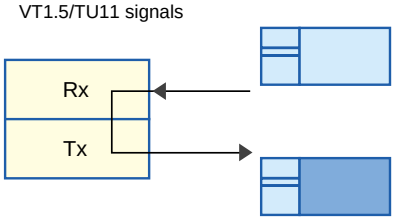
●Overhead Overwrite

Modification of TOH/POH byte. Addition of various errors/alarms.



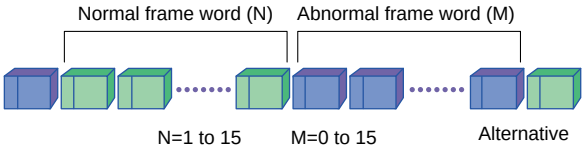
●Payload Overwrite

Insertion of internal STS-3SPE/VC4, VT6/TU2, VT2/TU12, VT1.5/TU11 signals



Enhanced Error/Alarm Simulation

The MP1577A can generate normal and abnormal frames alternately to test the frame synchronization function of terminal equipment. (This is an SONET FAS error addition function.)



Example of FAS error

Specifications

- **MP0121A 2/8/34/139/156M*1 Unit**

Bit rate	2.048, 8.448, 34.368, 139.264 Mbit/s
Level/waveform	Conforms to ITU-T G.703 (with 20 dB monitoring point)
Connectors	BNC (75 Ω, unbalanced), 3-pin Siemens (120 Ω, balanced) 2.048 Mbit/s: HDB3 (balanced/unbalanced) 8.448, 34.368 Mbit/s: HDB3 (unbalanced) 139.264 Mbit/s: CMI (unbalanced)
Clock	Internal (accuracy: ±7 ppm), external (ECL [AC] 50 Ω), received signal
Frame format	Unframed: 2, 8, 34, 139 Mbit/s Framed: 2 Mbit/s (with/without CRC-4 at channels 30/31, G.704), 8 Mbit/s (G.742), 34 Mbit/s (G.751), 139 Mbit/s (G.751), MUX/DEMUX (Option 06)
Test patterns	PRBS: $2^{11} - 1$, $2^{15} - 1$, $2^{20} - 1$, $2^{23} - 1$ (O.151) Invert: On/off Word: 16-bit programmable, all 0, all 1
Error addition	Bit (all, test pattern), code, E-bit Timing: Single, rate (1E–3, 1E–4, 1E–5, 1E–6, 1E–7) FAS: n in 16 (n: 1 to 4), all
Alarm addition	LOS, LOF, AIS, RDI, RDI (MF) Timing: All
Measurements	Mode: Single, repeat, manual In-service Errors: Frame, code, CRC-4, E-bit Alarms: Power-fail, LOS, AIS, LOF, MF loss, RDI, RDI (MF) Error performance: G.821 (inc. Annex D), M.2100, G.826 Out-of-service Errors: Frame, code, CRC-4, E-bit, bit Alarms: Power-fail, LOS, AIS, LOF, MF loss, RDI, RDI (MF), sync loss Error performance: G.821 (inc. Annex D), M.2100, G.826
LEDs	LOS, AIS, LOF, MF loss, RDI, RDI (MF), sync loss, errors
Monitor	Frame word
Trouble search	Auto search for errors/alarms in all measured channels
Delay measurement	0 to 1 s
Auxiliary interface	Clock sync output, frame sync output, error output

*1: Built-in 156M CMI (electrical) interface

Can not be used simultaneously with the MP0122A or MP0122B.

• MP0122A 1.5/45/52M*1 Unit, MP0122B 1.5/45/52/52M*2 (1.31) Unit

Bit rate	1.544, 44.736 Mbit/s
Level/waveform	1.544 Mbit/s: ANSI T1.102 (with 20 dB monitoring point), 0/655 ft 44.736 Mbit/s: ANSI T1.102 (with 20 dB monitoring point), 0/450/900 ft
Connectors	BNC (75 Ω, unbalanced), Bantam (100 Ω, balanced) 1.544 Mbit/s: AMI/B8ZS (balanced), 44.736 Mbit/s: B3ZS (unbalanced)
Clock	Internal (accuracy: ±7 ppm), external (ECL [AC] 50 Ω) received signal
Frame format	Unframed: 1.5, 45 Mbit/s Framed: 1.5 Mbit/s (D4, ESF, Japan ESF*3), 45 Mbit/s (M13, C-bit), MUX/DEMUX (Option 07)
Test patterns	PRBS: $2^{11}-1$, $2^{15}-1$, $2^{20}-1$ (zero suppress), $2^{20}-1$, $2^{23}-1$ (O.151) Invert: On/off Word: 16-bit program, all 0, all 1, 3 in 24 (1.5 Mbit/s)
Error addition	Bit (all, test pattern), code, parity, CRC-6, C-bit, REI Timing: Single, rate (1E–3, 1E–4, 1E–5, 1E–6, 1E–7) FAS (45 Mbit/s): n in 16 (n: 1 to 4), all
X-bit setting	00, 01, 10, 11
Alarm addition	LOS, LOF, AIS, RDI Timing: All
Measurements	Mode: Single, repeat, manual In-service Errors: FAS, code, parity, CRC-6, C-bit, REI Alarms: Power-fail, LOS, AIS, LOF, RDI Error performance: G.821 (inc. Annex D), G.826, M.2100 Out-of-service Errors: FAS, code, parity, CRC-6, C-bit, REI, bit Alarms: Power-fail, LOS, AIS, LOF, RDI, sync loss Error performance: G.821 (inc. Annex D), G.826, M.2100
LEDs	LOS, LOF, AIS, RDI, sync loss, errors
Trouble search	Auto search for errors/alarms in all measured channels
Delay measurement	0 to 1 s
Auxiliary interface	Clock sync output, frame sync output, error output

*1: Built-in 52M B3ZS (electrical) interface
*2: Built-in 52M B3ZS (electrical) and optical interfaces
*3: Mounted Option 09 (Japan mapping)

Can not be used simultaneously with the MP0121A or MP0122B.

• MP0122B 1.5/45/52/52M (1.31) Unit
Optical interface

Bit rate	51.84 Mbit/s (NRZ)
Transmit	Wavelength: 1310 nm Output level: –11.5 dBm ±3.5 dB Optical safety: IEC 825-1 Class 1, 21CFR1040.10 Class I Connector: FC-PC (SM-F)
Receive	Sensitivity 52M: –33 to –8 dBm (test pattern: PRBS $2^{23}-1$, BER 10^{-10}, +10˚ to +40˚C) Connector: FC-PC (SM-F) Power measurement Measurement range: –30 to 0 dBm (peak power) Accuracy: ≤±1 dB (–20 dBm) Linearity: ≤±1 dB (–30 to 0 dBm) Monitor input Level: 0.1 to 1.0 Vp-p (AC), Connector: SMA (50 Ω)

Can not be used simultaneously with the MP0121A or MP0122A.

● **52/156/622/2488/9953M**

Bit rate	51.84, 155.52, 622.08, 2488.32, 9953.28 Mbit/s
Level/waveform	52M (electrical: B3ZS)*1: ANSI T1.102, 0/450 ft 52M (optical): As per MP0122B unit optical interface specifications 156M (electrical: CMI)*2: ITU-T G.703 156M (optical): As per 156M/622M optical I/O specifications 622M (optical): As per 156M/622M optical I/O specifications 2488M (electrical/optical): As per 2.5G/10G electrical optical I/O specifications 9953M (electrical/optical): As per 2.5G/10G electrical optical I/O specifications
Clock	Internal (accuracy: ±3.5 ppm), Lock (2 MHz, 1.5 MHz, 64 kHz + 8 kHz, 2 Mbit/s, 1.5 Mbit/s), External (ECL [AC] 50 Ω, 9953M: 1.02 to 0.58 Vp-p, 50 Ω), received signal
Frame	SONET/SDH
Mapping	See Fig. 1
Through	Tranceparent, overhead overwrite, payload overwrite
Test patterns	PRBS: $2^{11}-1$, $2^{15}-1$, $2^{20}-1$ (zero suppress, MP0122A/B installed), $2^{20}-1$, $2^{23}-1$, $2^{31}-1$ (only concatenation mapping 16c/64c, conform to O.151) Invert: On/off Word: 16-bit programmable, all 0, all 1
Error addition	Bit all (all, test pattern), FAS, B1, B2, B3, BIP-2, REI-L, REI-P, REI-V Timing: Single, single (burst) bit (1 to 64000), rate (1E–3, 1E–4, 1E–5, 1E–6, 1E–7, 1E–8, 1E–9) User program AE-B [A: 1.0 to 9.9 (step: 0.1), B: 2 to 10] Alternative: Error frame (0 to 8000), normal frame (1 to 8000)
Alarm addition	LOS, LOF, AIS-L, RDI-L, AIS-P, LOP-P, PLM-P, HP-TIM, RDI-P, UNEQ-P, AIS-V, LOP-V, LOM-V, PLM-V, LP-TIM, RDI-V, UNEQ-V, RFI-V Timing: Single, single (burst) frame Alternative: alarm frame (0 to 8000), normal frame (1 to 8000), all
Measurements	Mode: Single, repeat, manual In-service/Out-of-service Errors: B1, B2, B3, BIP-2, REI-L, REI-P, REI-V Alarms: Power-fail, LOS, LOF, OOF, AIS-L, RDI-L, AIS-P, LOP-P, PLM-P, HP-TIM, RDI-P, UNEQ-P, AIS-V, LOP-V, LOM-V, PLM-V, LP-TIM, RDI-V, UNEQ-V, RFI-V Error performance: G.826, M2101, M2110, M2120 Preset: Alarm measurement condition
LEDs	LOS, LOF, OOF, AIS-L, RDI-L, AIS-P, LOP-P, RDI-P, PLM-P, AIS-V, LOM-V, LOP-V, RDI-V, RFI-V, PLM-V Tandem, sync. loss, errors
Tandem connection	Z5 byte (Type 1, Type 2), Z6 byte Errors: Z6 BIP-2, TC-REI, OEI, IEC Alarms: VC-AIS, ISF, FAS, HP-Incoming-AIS, HP-TC-RDI, HP-ODI, LP-Incoming-AIS, LP-TC-RDI, LP-ODI
Justification	STS pointer, VT pointer, C, C1/C2 Measurement: NDF, +PJC, –PJC, Cons, C, C1/C2
Monitor	TOH, POH, K1/K2, pointer, path trace (TIM alarms detectable), Tandem, payload
Dummy channel setting	Payload: Dummy, copy, mixed payload Setting: POH, pathtrace, Tandem
Simultaneous measurement	VT6SPE, VT2SPE, VT1.5SPE
Trouble search	Auto search for errors/alarms in all measured channels
Delay	Measurement period: 0.5, 1, 2, 5, 10 s Measurement range: 0 to 999 µs, 1.0 to 999.9 ms, 1.0 to 10.0 s, time out Display accuracy: ±5 µs (0.5, 1 s), ±50 µs (2, 5, 10 s)
APS (K1/K2)	Switching time measurement Measurement range: 1 to 2000 ms, >2000 ms Trigger Internal: B1, B2, B3, BIP-2, REI-L, REI-P, REI-V, AIS-L, AIS-P, LOP-P, RDI-P, AIS-V, LOM-V, LOP-V, RDI-V, RFI-V, Bit External: Measures trigger input signal (active high) Threshold: Specify non-error alarm between 1 ms, 10 ms, 100 ms Sequence generation: 2 to 64 word, repeat (8000 frame) Sequence capture: 2 to 64 word, repeat (8000 frame)
Frequency measurement	Range: ±100 ppm, Accuracy: ±3.5 ppm
Japan mapping (option 09)	VT1.5SPE Signaling (8-multiframe, 64-multiframe setting)
Payload offset	±100 ppm/0.1 ppm step
Auxiliary interface	Clock sync output, trigger input, trigger output, DCC interface (V.11), orderwire, receive clock output

*1: Mounted MP0122A/B
*2: Mounted MP0121A

● **General**

Printer	Internal, external
Internal memory	Measurement settings memory: 10, graphics memory: 15
Others	FDD, RS-232C (Option 01)*1, GPIB (Option 02)*1, Ethernet (Option 03)*1, video output (Option 04)*1, buzzer, clock, help, screen copy
EMC	EN55011: 1991, Group 1, Class A EN50082-1: 1992 Harmonic current emissions: EN61000-3-2 (1995)
Safety	EN61010-1: 1993 (Installation Category Ⅱ, Pollution Degree Ⅱ)
Dimensions and mass	320 (W) x 177 (H) x 350 (D) mm, 15 kg approx.
Power	100 to 240 Vac, 47.5 to 63 Hz, ≤500 VA
Temperature	0˚ to +40˚C

*1: The video output, RS-232C, GPIB and Ethernet options cannot all be used simultaneously.
Only the video output + RS-232C, or video output + GPIB, or RS-232C + GPIB board, or Ethernet board combinations support simultaneous use, so change the board combinations according to the purpose.

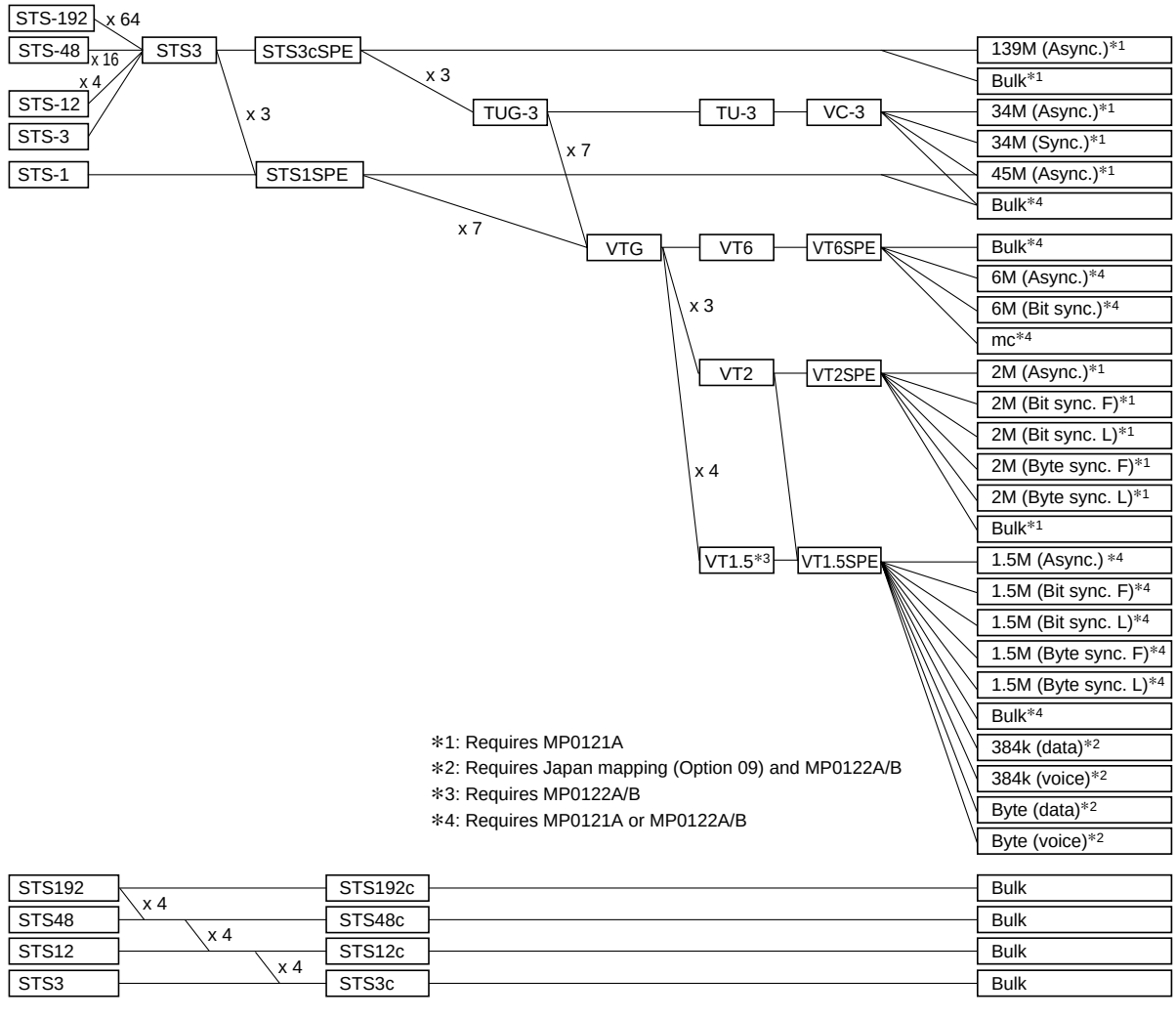


Fig. 1 Mapping structure

• 156M/622M optical I/O

Bit rate	155.52, 622.08 Mbit/s (NRZ)
Transmit	Wavelength: 1310/1550 nm Output level 1.31 µm: –11.5 dBm ±3.5 dB, 1.55 µm: –5 dBm ±2 dB Optical safety: IEC825-1 Class 1, 21CFR1040.10 Class I Connector: FC-PC (SM-F)
Receive	Sensitivity 156M: –33 to –8 dBm (test pattern: PRBS 2^{23} – 1, BER 10^{-10}, +10˚ to +40˚C) 622M: –28 to –8 dBm (test pattern: PRBS 2^{23} – 1, BER 10^{-10}, +10˚ to +40˚C) Connector: FC-PC (SM-F) Power measurement Measurement range: –30 to 0 dBm (peak power) Accuracy: ≤±1 dB (–20 dBm) Linearity: ≤±1 dB (–30 to 0 dBm)

• 2.5G/10G optical output (Option 20)

Bit rate	9953.28, 2488.32 Mbit/s
Transmit	Wavelength 10G: 1550 nm band 2.5G: 1310/1550 nm band Output level: –4 dBm ±3 dB Optical safety: IEC825-1 Class 3A, 21CFR1040.10 Class IIIb Connector: FC-PC (SMF)
Electrical input	Data input H: 0 to –0.2 V, L: –0.85 to –1.4 V Clock input H: 0 to –0.2 V, L: –0.85 to –1.3 V Connector: SMA 50 Ω

• 2.5G/10G optical input

Bit rate	9953.28, 2488.32 Mbit/s
Receive	Wavelength: Option 20 (10G: 1550 nm, 2.5G: 1310/1550 nm) Option 21 (10G: 1310 nm, 2.5G: 1310 nm) Sensitivity 10G: –13 to –3 dBm (BER 10^{-12}, NRZ, mark ratio: 1/2, PRBS: 2^{31} –1) 2.5G: –29 to –10 dBm (BER 10^{-11}, NRZ, mark ratio: 1/2, PRBS: 2^{23} –1) Connector: FC-PC (SMF) Power measurement Range: –16 to 0 dBm (10G, average power), –30 to –10 dBm (2.5G, average power) Accuracy: ≤±2 dB (10G, –10 dBm), ≤±2 dB (2.5G, –20 dBm) Linearity: ≤±2 dB (10G, –16 to 0 dBm), ≤±2 dB (2.5G, –30 to –10 dBm)
Electrical output	Data output: 0.65 to 1.4 Vp-p Clock output: 0.65 to 1.3 Vp-p Connector: SMA 50 Ω

• 2.5G/10G optical output (Option 21)

Bit rate	9953.28 Mbit/s, 2488.32 Mbit/s
Transmit	Wavelength: 1290 to 1330 nm Output level: +3 dBm ±2 dB Optical Safety: IEC825-1 (Class 3A), 21CFR1040.10 (Class IIIb) Connector: FC-PC (SM-F)
Electrical input	Data input H: 0 to –0.2 V, L: –0.85 to –1.4 V Clock input H: 0 to –0.2 V, L: –0.85 to –1.3 V Connector: SMA (50 Ω)

• 2.5G/10G electrical I/O

Bit rate	9953.28, 2488.32 Mbit/s (NRZ)
Transmit	Level Data H: 0 to –0.2 V, Data L: –0.85 to –1.4 V Clock H: 0 to –0.2 V, Clock L: –0.85 to –1.3 V Connector (Data, Clock): SMA (50 Ω)
Receive	Level Data: 0.65 to 1.4 Vp-p, Clock: 0.65 to 1.3 Vp-p Connector (Data, Clock): SMA (50 Ω)
Auxiliary interface	External clock input, Internal clock output, Receive clock output,156M sync. output

Typical Configuration

MP1577A (with Option 20) + MP0121A

MP1577A (with Option 21) + MP0122B

Note:

The MP0121A or MP0122A/B can be inserted to slot 1.

The modules in slots 2 to 5 are fixed and can not exchanged.

Ordering Information

Please specify the model/order number and quantity when ordering.

Model/Order No.	Name		Remarks
	Main frame		
MP1577A*[1,*2]	SONET/SDH/PDH/DSn Analyzer		Requires Option 20 or Option 21
	Standard accessories		
	AC power cord:	1 pc	
Z0169	Printer paper (5 rolls/pack):	1 pack	
F0079	Fuse, 10 A:	2 pcs	
B0329G	Front cover:	1 pc	
Z0486	Side cover:	1 pc	
J0907Q	Remote interlock cord:	1 pc	For 2.5G/10G optical output
J0908	Remote interlock terminator:	1 pc	For 2.5G/10G optical output
E0008A	Optical output control key:	1 pc	For 2.5G/10G optical output
J0747B	Fixed optical attenuator (10 dB):	1 pc	For 2.5G/10G optical input
J0635A	Optical fiber cable (FC · PC-FC · PC) 1 m:	1 pc	
W2002AE	MP1577A operation manual (Vol. 1 Basic operation for SDH):	1 copy	
W2003AE	MP1577A operation manual (Vol. 1 Basic operation for SONET):	1 copy	
W2004AE	MP1577A operation manual (Vol. 2 Remote control):	1 copy	
J1002A	Semi-rigid cable:	1 set	For 2.5G/10G optical output (2 pcs/set)
J1002B	Semi-rigid cable:	1 set	For 2.5G/10G optical input (2 pcs/set)
J1002C	Semi-rigid cable:	1 set	For 2.5G/10G electrical I/O (3 pcs/set)
	Plug-in units		
MP0121A	2/8/34/139/156M Unit		
MP0122A	1.5/45/52M Unit		
MP0122B*[1]	1.5/45/52/52M (1.31) Unit		
	Options		
MP1577A-01*[3]	RS-232C		
MP1577A-02*[3]	GPIB		
MP1577A-03*[3]	Ethernet		
MP1577A-04*[3]	VGA output		
MP1577A-06	MUX/DEMUX (2/8/34/139 Mb/s)		For MP0121A
MP1577A-07	MUX/DEMUX (1.5/45 Mb/s)		For MP0122A/B
MP1577A-09	Japan mapping		Requires MP0122A or MP0122B
MP1577A-20*[4]	10G (1.55 µm)/2.5G (1.31/1.55 µm) Transmission		
MP1577A-21*[4]	10G (1.31 µm)/2.5G (1.31 µm) Transmission		
MP1577A-37	FC connector		Replaceable, with protective caps, 6 sets
MP1577A-38	ST connector		Replaceable, with protective caps, 6 sets
MP1577A-39	DIN connector		Replaceable, with protective caps, 6 sets
MP1577A-40	SC connector		Replaceable, with protective caps, 6 sets
MP1577A-43	HMS-10/A connector		Replaceable, with protective caps, 6 sets
MP1577A-90	Extended three years warranty service		
MP0121A-90	Extended three years warranty service		
MP0122A-90	Extended three years warranty service		
MP0122B-90	Extended three years warranty service		
MP0122B-37	FC connector		Replaceable, with protective caps, 2 sets
MP0122B-38	ST connector		Replaceable, with protective caps, 2 sets
MP0122B-39	DIN connector		Replaceable, with protective caps, 2 sets
MP0122B-40	SC connector		Replaceable, with protective caps, 2 sets
MP0122B-43	HMS-10/A connector		Replaceable, with protective caps, 2 sets
	Application equipment		
J0796A	ST connector		Replaceable, with protective caps, 1 set
J0796B	DIN connector		Replaceable, with protective caps, 1 set
J0796C	SC connector		Replaceable, with protective caps, 1 set
J0796D	HMS-10/A connector		Replaceable, with protective caps, 1 set
J0796E	FC connector		Replaceable, with protective caps, 1 set
J0162A	Balanced cable, 1 m		Siemens 3P/Siemens 3P
J0162B	Balanced cable, 2 m		Siemens 3P/Siemens 3P
J0845A	Balanced cable, 6 ft		BANTAM 3P/ BANTAM 3P
J0775B	Coaxial cable (BNC-P620 · 3C-2WS · BNC-P620), 0.5 m (75 Ω)		
J0775D	Coaxial cable (BNC-P620 · 3C-2WS · BNC-P620), 2 m (75 Ω)		
J0776D	Coaxial cable (BNC-P-3W · 3D-2W · BNC-P-3W), 2 m (50 Ω)		
J0635A	Optical fiber cable, 1 m		SM, FC-SPC connector both ends
J0635B	Optical fiber cable, 2 m		SM, FC-SPC connector both ends
J0635C	Optical fiber cable, 3 m		SM, FC-SPC connector both ends
J0747A	Fixed optical attenuator (5 dB)		

Model/Order No.	Name	Remarks
J0747B	Fixed optical attenuator (10 dB)	
J0747C	Fixed optical attenuator (15 dB)	
J0747D	Fixed optical attenuator (20 dB)	
J0322B	Coaxial cable (11SMA · SUCOFLEX104 · 11SMA), 1 m	
J0008	GPIB cable, 2 m	
B0448	Soft case	
B0336C	Carrying case	
B0454C	Blank panel (for slot 1)	
MA1314A	I-214/3-pole CF adapter	
MP35A	Matching Transformer	75 Ω (unbalance)/120 Ω (balance)
J0698	High impedance pad	Attenuator: 20 dB
J0697	T-pad	BNC-TA619

⋆1: Specify one of FC, ST, DIN, SC or HMS-10/A. If the connector is not specified, an FC connector will be supplied as standard.
⋆2: Specify Option 20 or Option 21 when ordering.
⋆3: The video output, RS-232C, GPIB and Ethernet options cannot all be used simultaneously. Only the video output + RS-232C, video output + GPIB or video out put + Ethernet board combinations support simultaneous use, so change the board combinations according to the purpose.
⋆4: The Option 20 and Option 21 can not be installed simultaneously.

Carrying case

Soft case

Anritsu

Specifications are subject to change without notice.

ANRITSU CORPORATION
MEASUREMENT SOLUTIONS
5-10-27, Minamiazabu, Minato-ku, Tokyo 106-8570, Japan
Phone: +81-3-3446-1111
Telex: J34372
Fax: +81-3-3442-0235

● **U.S.A.**
ANRITSU COMPANY
North American Region Headquarters
1155 East Collins Blvd., Richardson, Tx 75081, U.S.A.
Toll Free: 1-800-ANRITSU (267-4878)
Phone: +1-972-644-1777
Fax: +1-972-671-1877

● **Canada**
ANRITSU ELECTRONICS LTD.
Unit 102, 215 Stafford Road West
Nepean, Ontario K2H 9C1, Canada
Phone: +1-613-828-4090
Fax: +1-613-828-5400

● **Brasil**
ANRITSU ELETRÔNICA LTDA.
Praia de Botafogo 440, Sala 2401 CEP 22250-040,
Rio de Janeiro, RJ, Brasil
Phone: +55-21-5276922
Fax: +55-21-537-1456

● **U.K.**
ANRITSU LTD.
200 Capability Green, Luton, Bedfordshire LU1 3LU, U.K.
Phone: +44-1582-433200
Fax: +44-1582-731303

● **Germany**
ANRITSU GmbH
Grafenberger Allee 54-56, 40237 Düsseldorf, Germany
Phone: +49-211-96855-0
Fax: +49-211-96855-55

● **France**
ANRITSU S.A.
9, Avenue du Québec Z.A. de Courtabœuf 91951 Les Ulis Cedex, France
Phone: +33-1-60-92-15-50
Fax: +33-1-64-46-10-65

● **Italy**
ANRITSU S.p.A.
Via Elio Vittorini, 129, 00144 Roma EUR, Italy
Phone: +39-06-509-9711
Fax: +39-06-502-24-25

● **Sweden**
ANRITSU AB
Botvid Center, Fittja Backe 1-3 145 84 Stockholm, Sweden
Phone: +46-853470700
Fax: +46-853470730

● **Spain**
ANRITSU ELECTRÓNICA, S.A.
Europa Empresarial Edificio Londres, Planta 1, Oficina 6 C/ Playa de Liencres, 2 28230 Las Rozas. Madrid, Spain
Phone: +34-91-6404460
Fax: +34-91-6404461

● **Singapore**
ANRITSU PTE LTD.
10, Hoe Chiang Road #07-01/02, Keppel Towers, Singapore 089315
Phone: +65-282-2400
Fax: +65-282-2533

● **Hong Kong**
ANRITSU COMPANY LTD.
Suite 719, 7/F., Chinachem Golden Plaza, 77 Mody Road, Tsimshatsui East, Kowloon, Hong Kong, China
Phone: +852-2301-4980
Fax: +852-2301-3545

● **Korea**
ANRITSU CORPORATION
14F Hyun Juk Bldg. 832-41, Yeoksam-dong, Kangnam-ku, Seoul, Korea
Phone: +82-2-553-6603
Fax: +82-2-553-6604～5

● **Australia**
ANRITSU PTY LTD.
Unit 3/170 Forster Road Mt. Waverley, Victoria, 3149, Australia
Phone: +61-3-9558-8177
Fax: +61-3-9558-8255

● **Taiwan**
ANRITSU COMPANY INC.
6F, 96, Sec. 3, Chien Kou North Rd. Taipei, Taiwan
Phone: +886-2-2515-6050
Fax: +886-2-2509-5519

Catalog No. MP1577A(SONET)-E-A-1-(1.00) Printed in Japan 2002-2 20W/AGKD