Table 3-3 TRP Composition (e/w FAN Type)

Equipment Name	Unit Name		TX Power	Freq. Domain	DC Power
TRP-L6G-101A	H2497A	TR UNIT	High	L	48 V
	H2497B		High	H	
	H2497C		STD	L	
	H2497D		STD	H	
	H2497J		High	L	24 V
	H2497K		High	H	
	H2497L		STD	L	
	H2497M		STD	H	
	H2326B	I/O BOARD	—	—	—
	Unit Name		**BAND WIDTH**	**System**	
	H2503A	BR CKT	Wide	1+0	
	H2503B			1+1, HS/HS (3 dB HYB)	
	H2503C			1+1, HS/HS (10 dB CPL)	
	H2503D			1+1, HS/SD	
	NWA-021550-001		Narrow	1+0 with EXP Port	
	NWA-021550-002			1+1, HS/HS (3 dB HYB) with EXP Port	
	NWA-021550-003			1+1, HS/HS (10 dB CPL) with EXP Port	
	NWA-021550-004			1+1, HS/SD with EXP Port	

Table 3-3 TRP Composition (e/w FAN Type)

Equipment Name	Unit Name		TX Power	Freq. Domain	DC Power	Freq. Plan
TRP-U6G-101A	NWA-017234-001	TR UNIT	High	L	48 V	CANADA
	NWA-017234-002			H		
	NWA-017234-003			L	24 V	
	NWA-017234-004			H		
	NWA-017234-005			L	48 V	FCC
	NWA-017234-006			H		
	NWA-017234-007			L	24 V	
	NWA-017234-008			H		
	NWA-017234-011		STD	L	48 V	CANADA
	NWA-017234-012			H		
	NWA-017234-013			L	24 V	
	NWA-017234-014			H		
	NWA-017234-015			L	48 V	FCC
	NWA-017234-016			H		
	NWA-017234-017			L	24 V	
	NWA-017234-018			H		
	H2326B	I/O BOARD	—	—	—	—

	Unit Name		BAND WIDTH	System
	NWA-023881-001	BR CKT	Wide	1+0
	NWA-023881-002			1+1, HS/HS (3 dB HYB)
	NWA-023881-003			1+1, HS/HS (10 dB CPL)
	NWA-023881-004			1+1, HS/SD
	NWA-021789-001		Narrow	1+0 with EXP Port
	NWA-021789-002			1+1, HS/HS (3 dB HYB) with EXP Port
	NWA-021789-003			1+1, HS/HS (10 dB CPL) with EXP Port
	NWA-021789-004			1+1, HS/SD with EXP Port

Table 3-3 TRP Composition (e/w FAN Type)

Equipment Name	Unit Name		TX Power	Freq. Domain	DC Power
TRP-10G-101A	NWA-017240-001	TR UNIT	High	L	48 V
	NWA-017240-002			H	
	NWA-017240-003			L	24 V
	NWA-017240-004			H	
	H2326B	I/O BOARD	—	—	—
	Unit Name		**BAND WIDTH**	**System**	
	NWA-023881-001	BR CKT	Wide	1+0	
	NWA-023881-002			1+1, HS/HS (3 dB HYB)	
	NWA-023881-003			1+1, HS/HS (10 dB CPL)	
	NWA-023881-004			1+1, HS/SD	

Table 3-3 TRP Composition (e/w FAN Type)

Equipment Name	Unit Name		TX Power	Freq. Domain	DC Power
TRP-11G-101A	NWA-017243-001	TR UNIT	High	L	48 V
	NWA-017243-002			H	
	NWA-017243-003			L	24 V
	NWA-017243-004			H	
	H2326B	I/O BOARD	—	—	—

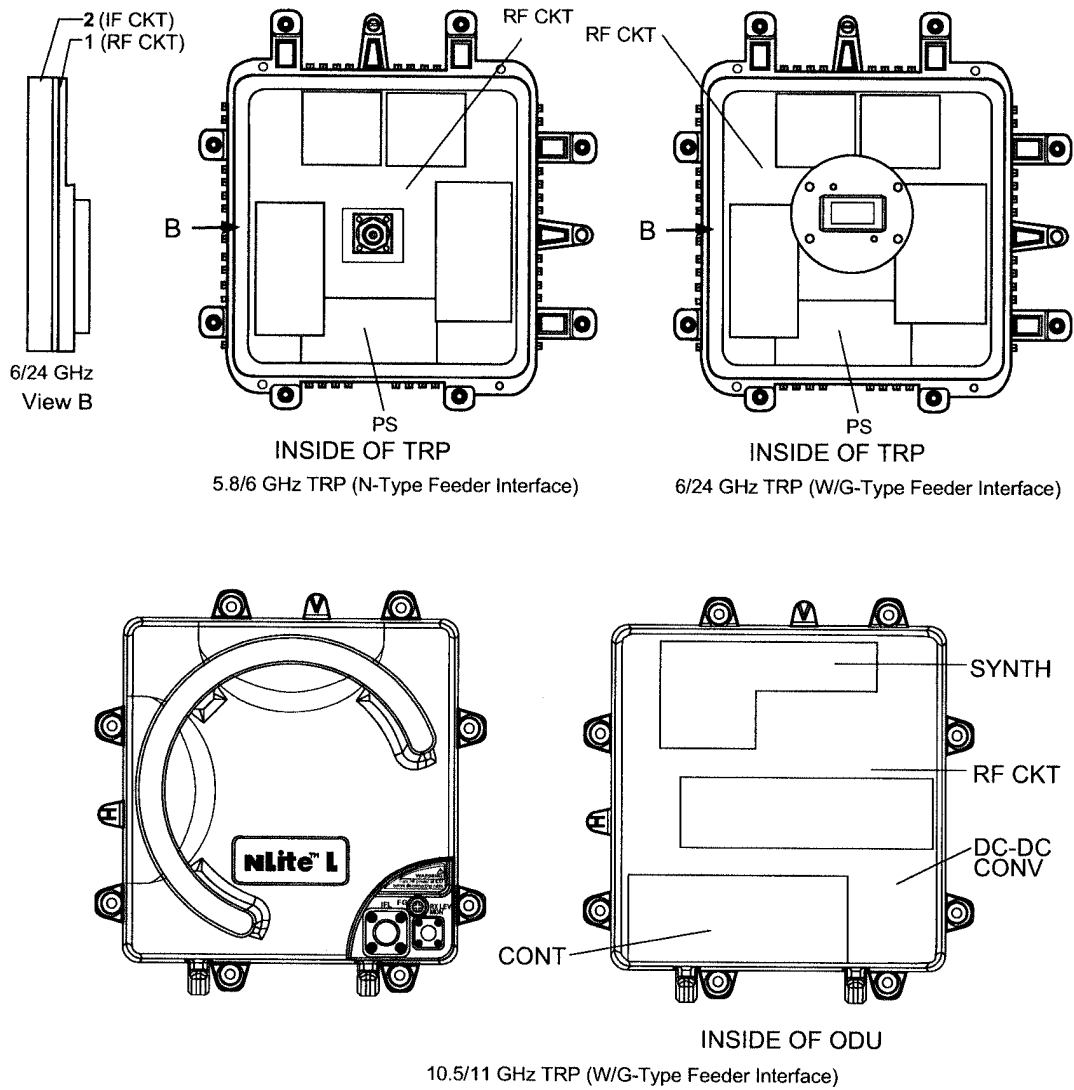|	Unit Name		BAND WIDTH	System
	NWA-017543-001	BR CKT	Wide (sub band)	1+0
	NWA-017543-002			1+1, HS/HS (3 dB HYB)
	NWA-017543-003			1+1, HS/HS (10 dB CPL)
	NWA-017543-004			1+1, HS/SD
	NWA-018299-001		Narrow	1+0
	NWA-018299-002			1+1, HS/HS (3 dB HYB)
	NWA-018299-003			1+1, HS/HS (10 dB CPL)
	NWA-018299-004			1+1, HS/SD
	NWA-020897-001		Narrow	1+0 with EXP Port
	NWA-020897-002			1+1, HS/HS (3 dB HYB) with EXP Port
	NWA-020897-003			1+1, HS/HS (10 dB CPL) with EXP Port
	NWA-020897-004			1+1, HS/SD with EXP Port
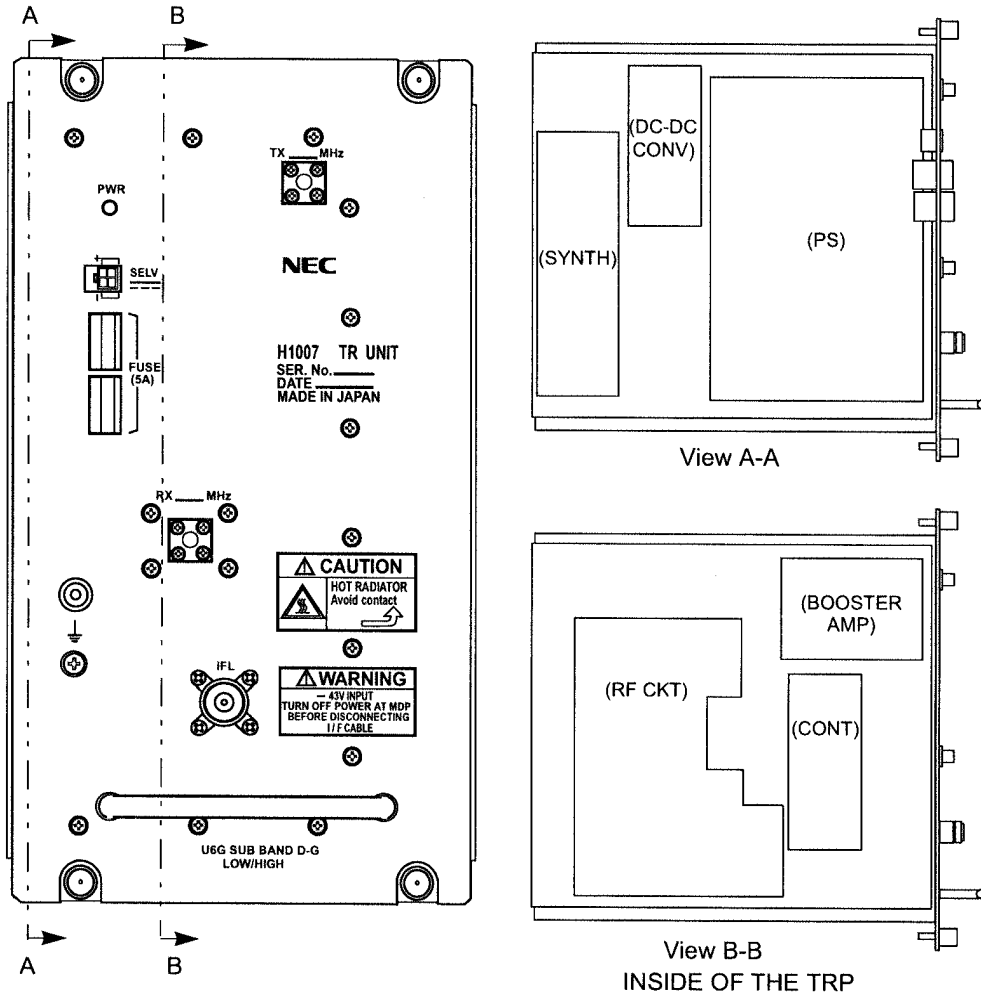
Fig. 3-5 TRP Component Module Arrangement (w/o FAN Type)

Table 3-3 TRP Composition (w/o FAN Type)

Equipment Name	Unit Name		SUB BAND	Freq. Domain	DC Power
TRP-U6G-3AA	H1007A	TR UNIT	A	L	48 V
			B		
			C		
	H1007B		D	L	
			E		
			F		
			G		
	H1007C		A	H	
			B		
			C		
	H1007D		D	H	
			E		
			F		
			G		
	H2326B	I/O BOARD	—	—	—

	Unit Name		BAND WIDTH	System
	H1009A	BR CKT	Wide	1+0
	H1009B			1+1, HS/HS (3 dB HYB)
	H1009C			1+1, HS/HS (10 dB CPL)
	H1009D			1+1, HS/SD

Table 3-3 TRP Composition (w/o FAN Type)

Equipment Name	Unit Name		SUB BAND	Freq. Domain	DC Power
TRP-11G-3AA	H1002A	TR UNIT	A	L	48 V
	H1002B		B	L	
	H1002C		C	L	
	H1002D		D	L	
	H1002E		A	H	
	H1002F		B	H	
	H1002G		C	H	
	H1002H		D	H	
	H2326B	I/O BOARD	—	—	—

	Unit Name		BAND WIDTH	System
	H1005A	BR CKT	Wide	1+0
	H1005B			1+1, HS/HS (3 dB HYB)
	H1005C			1+1, HS/HS (10 dB CPL)
	H1005D			1+1, HS/SD

2 (IF CKT)
1 (RF CKT)

6/24 GHz
View B

RF CKT
RF CKT

B →

PS
INSIDE OF TRP
5.8/6 GHz TRP (N-Type Feeder Interface)

RF CKT

B →

PS
INSIDE OF TRP
6/24 GHz TRP (W/G-Type Feeder Interface)

NLite™ L

SYNTH

RF CKT

DC-DC
CONV

CONT

INSIDE OF ODU
10.5/11 GHz TRP (W/G-Type Feeder Interface)

Note: Do not open the cover of the TRP usually. The Silica Gel Pack must be replaced and the air leakage test operation must be performed using the air leakage tester (NEC made, sold separately) when the cover is opened once.

Fig. 3-6 TRP Component Unit Arrangement (Split Type)

3.4 Functional Operation

The block diagram of the TRP is shown in Fig. 3-7. Functional operations of the TRP are described separately for the transmitter section and receiver section.

3.4.1 Transmitter Section

The alarm/control signal and DC component which compose the IF signal are applied from the MDP to the IFL jack. They are separated through the multiplexer (MPX) circuit in the RF CKT. The separated alarm/control signals are applied to the CONT module. The DC component is applied to the DC-DC CONV and regulated DC voltages are generated to be used in the TRP. The IF signal (340 MHz) is converted into the RF signal by mixing with a local signal generated at the SYNTH module. The RF signal is amplified and controlled by the ALC and ATPC function. Undesired components caused through the IF-RF conversion are eliminated through BPF, then, the RF signal is sent to the antenna through branching circuit.

Either TX power output of No.1 or No.2 is switched through the RF SW (all indoor type) or mute control in the Hot Standby system.

3.4.2 Receiver Section

The RF signal received from the antenna is fed to the RF CKT through the branching circuit. In the RF CKT, the RF signal is amplified to the required level by the RF amplifier and converted into the 140 MHz IF signal by mixing with a local signal generated by the SYNTH module. The 140 MHz IF signal is AGC controlled and fed to the MDP through the MPX circuit which combines the alarm/control signal.
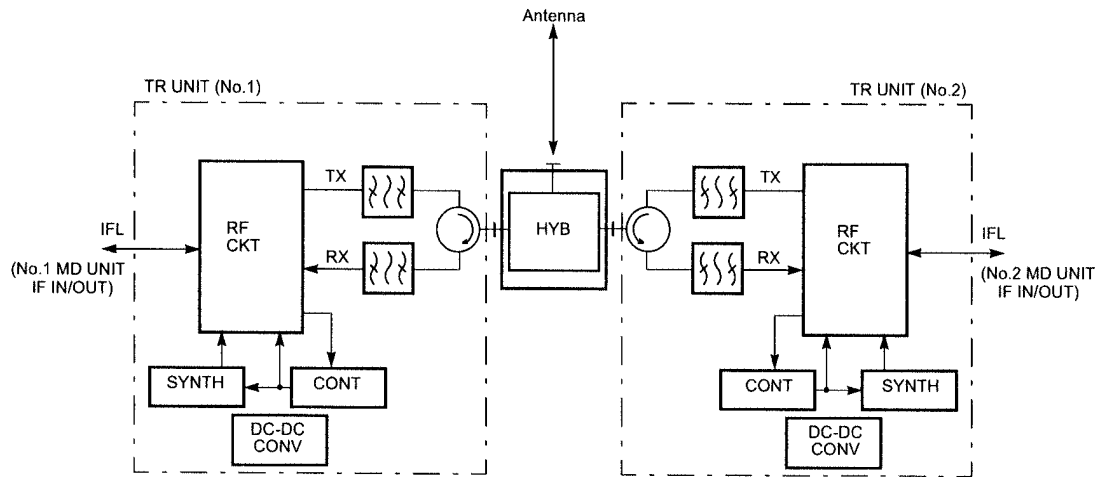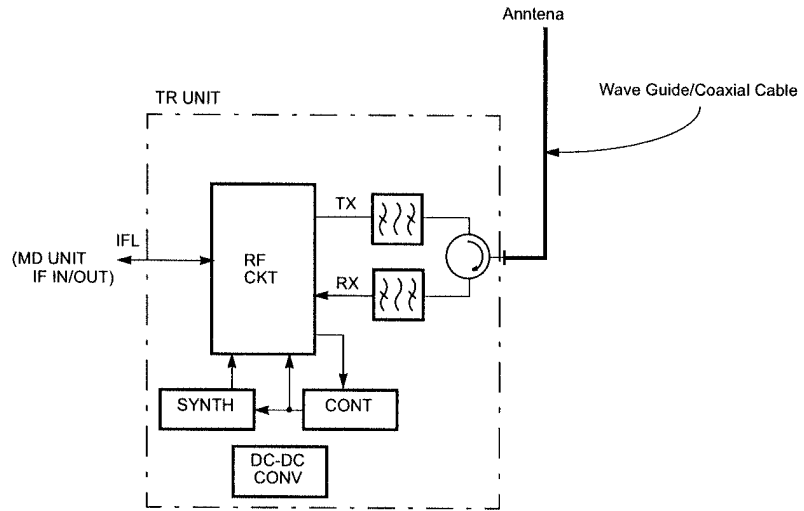
Note: * TR UNIT is mounted on the HYB or connected tto the HYB hrough feeder.
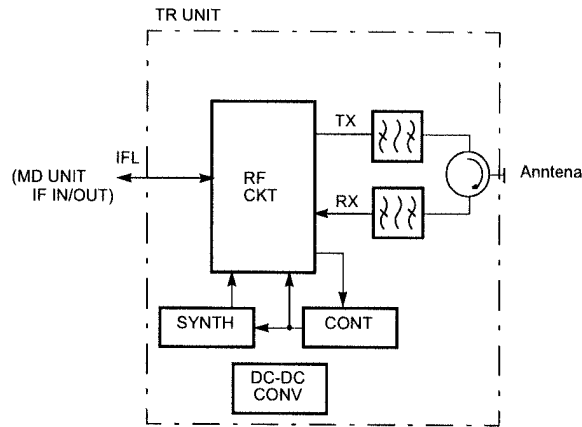
(a) TRP for HS/HS System
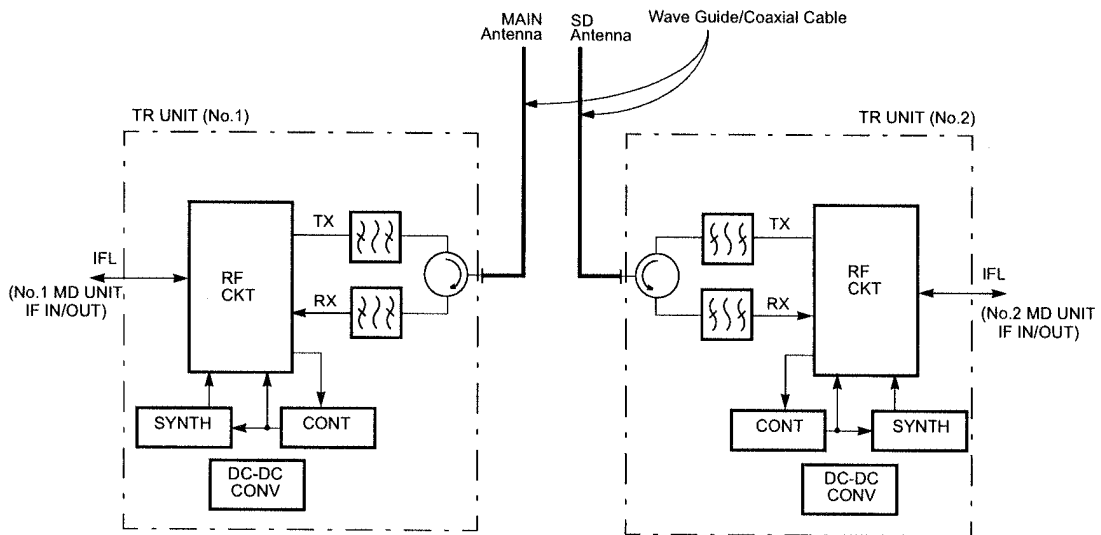
(b) TRP for HS/SD System

Fig. 3-7 TRP, Block Diagram (1/2)

(c) TRP for 1+0 System

(d) TRP for 1+0 System
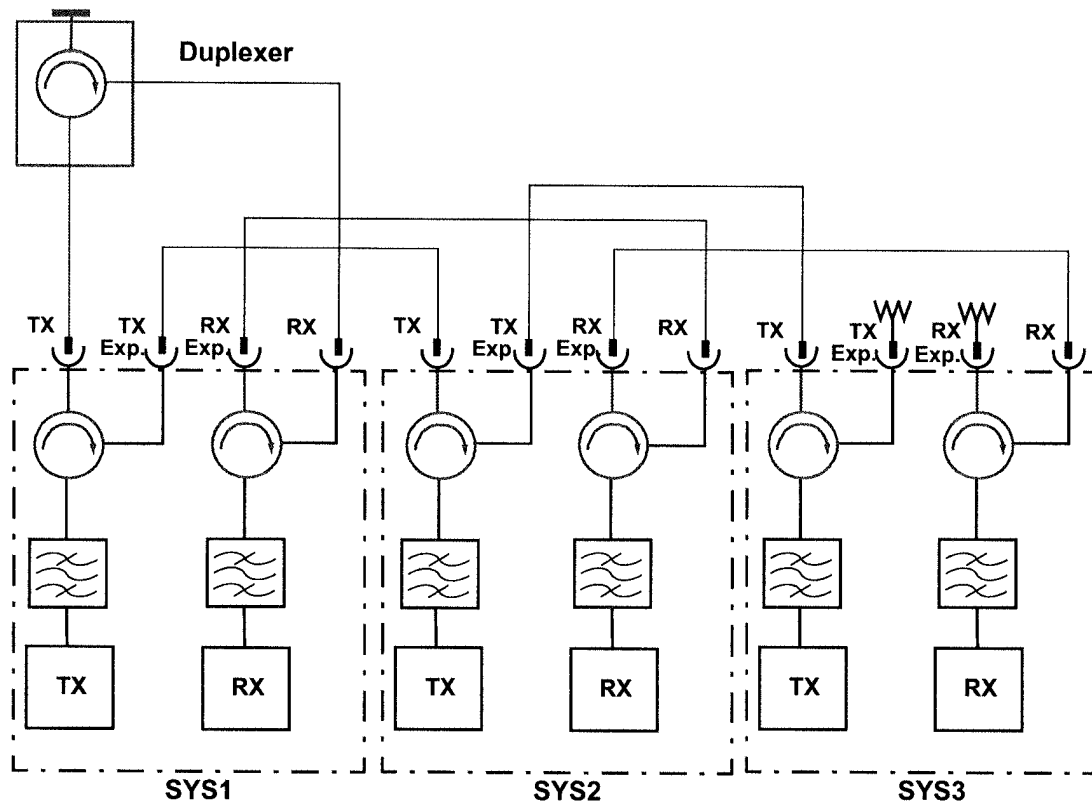
Fig. 3-7 TRP, Block Diagram (2/2)

Fig. 3-8 System Connection through the Narow Band BR CKT

APPENDIX

5.8/L6/U6/10.5/11/24 GHz 15/28/50 MB
PDH DIGITAL MICROWAVE RADIO SYSTEM
NLite L
(PDH 1+0/1+1 SYSTEM)

SECTION II OPERATION

CONTENTS

CONTENTS

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1. GENERAL

This section provides operating instructions for the 5.8/L6/U6/10.5/11/24 GHz 15/28/50 MB NLite L digital microwave radio system.

This part describes the interface terminals and jacks, controls, indicators, test jacks, equipment start-up, and equipment shut-down. Use of the LCT is required for local operation, control, monitoring and setup.

This manual is described for the firmware version of as follows.
SW UNIT: 2.4.4
MD UNIT: 1.30

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2. INTERFACE TERMINALS AND JACKS

The MDP has interface terminals and jacks to interconnect data signals, alarm, IF signals and line power with the associated equipment. These interface terminals and jacks are located on front of the equipment as shown in Fig. 2-1 and Fig. 2-2. The details of terminals and jacks for signal interface are described in Table 2-1.

> *Note: Use shielded cables which are connected to the D-Sub/RJ-45 connector to suppress interference from affecting the signal and to reduce electromagnetic radiation which may interfere with other signal cables.*

> *Note: Twist power cables (+)/(–) to suppress inductive interference signals.*

MDP-15MB5T-1A/MDP-28MB7T-1A
For 8/16 × DS1 System

* Not provided for 8 × DS1

MDP-50MB6T-2C
For 28 × DS1 System

* Not provided for 8 × DS1

Fig. 2-1 MDP, Interface Terminals and Jacks (1/6)

MDP-50MB6T-1A
For 1 × DS3 System

* Not provided for 8 × DS1

MDP-15MB5T-1B
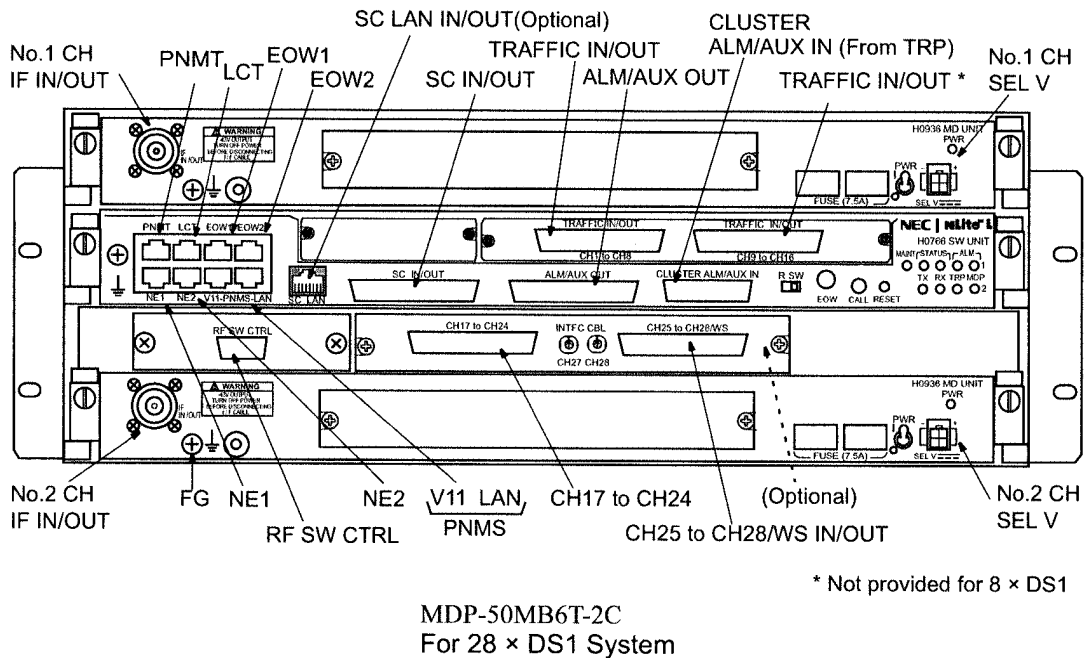For 8/16 × DS1 System
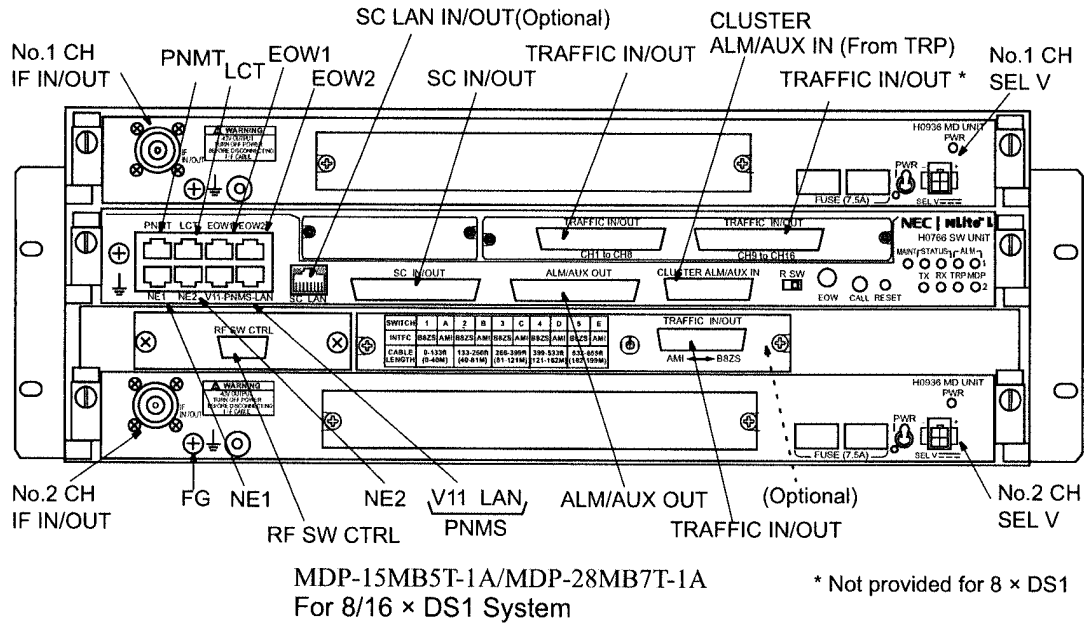
Fig. 2-1 MDP, Interface Terminals and Jacks (2/6)

MDP-50MB6T-2B
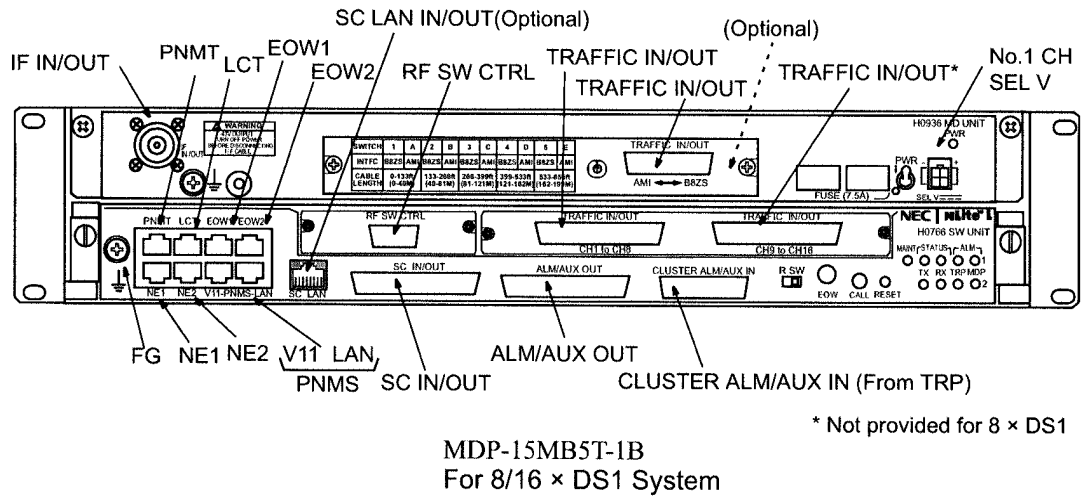For 28 × DS1 System

MDP-50MB6T-1B
For 1 × DS3 System

Fig. 2-1 MDP, Interface Terminals and Jacks (3/6)

2. INTERFACE TERMINALS AND JACKS

The MDP has interface terminals and jacks to interconnect data signals, alarm, IF signals and line power with the associated equipment. These interface terminals and jacks are located on front of the equipment as shown in Fig. 2-1 and Fig. 2-2. The details of terminals and jacks for signal interface are described in Table 2-1.

> *Note: Use shielded cables which are connected to the D-Sub/RJ-45 connector to suppress interference from affecting the signal and to reduce electromagnetic radiation which may interfere with other signal cables.*

> *Note: Twist power cables (+)/(−) to suppress inductive interference signals.*

MDP-15MB5T-1A/MDP-28MB7T-1A
For 8/16 × DS1 System

* Not provided for 8 × DS1

MDP-50MB6T-2C
For 28 × DS1 System

* Not provided for 8 × DS1

Fig. 2-1 MDP, Interface Terminals and Jacks (1/6)

MDP-50MB6T-1A
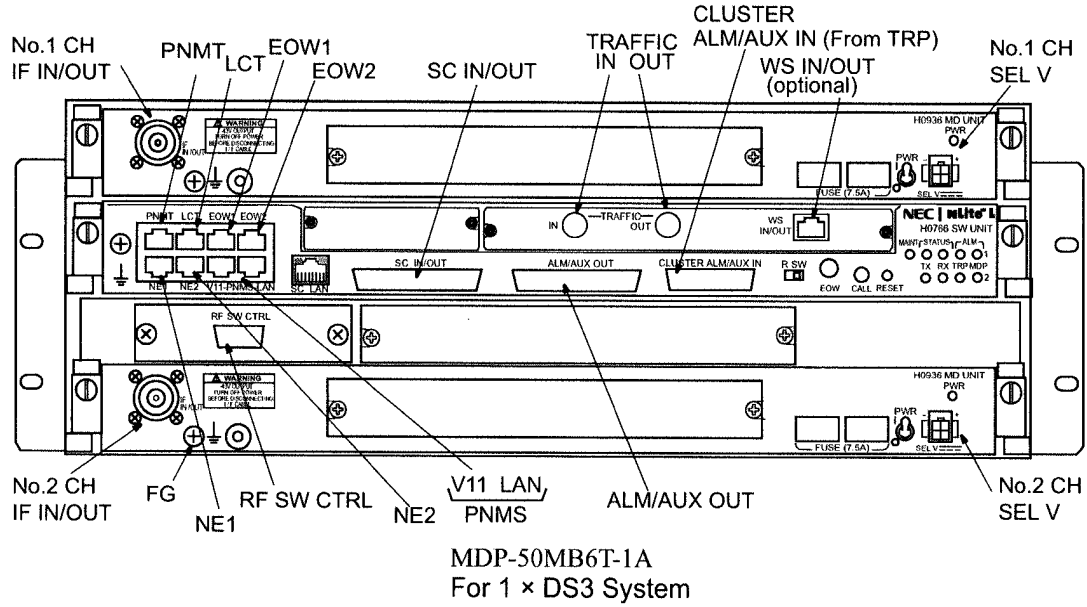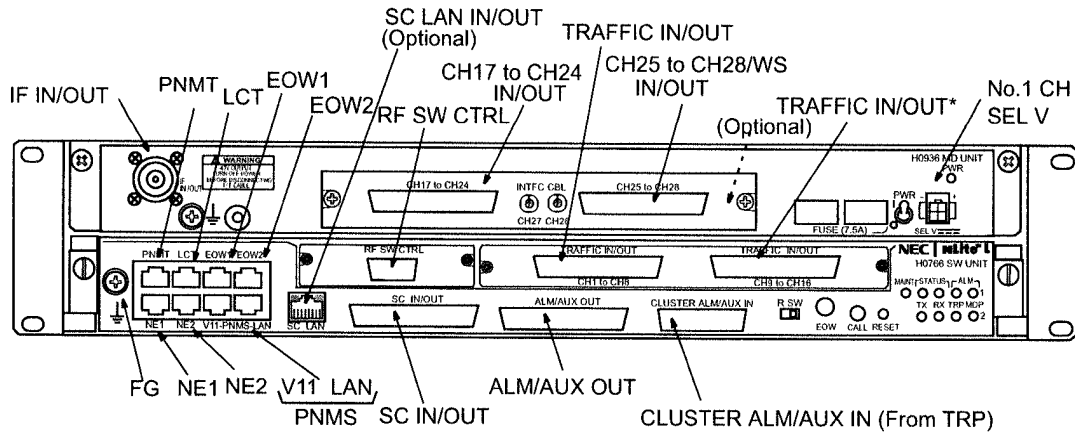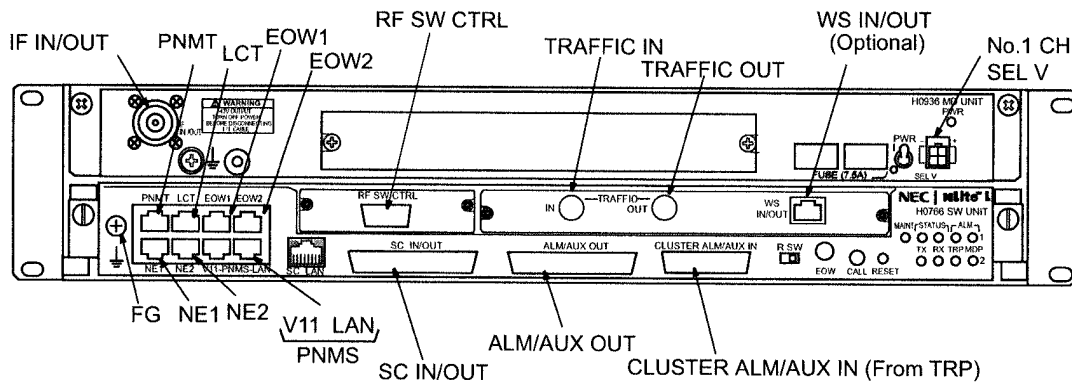For 1 × DS3 System

* Not provided for 8 × DS1

MDP-15MB5T-1B
For 8/16 × DS1 System

Fig. 2-1 MDP, Interface Terminals and Jacks (2/6)

MDP-50MB6T-1C
For 1 × DS3 e/w LAN System System

* Not provided for 8 × DS1

MDP-15MB5T-1D/MDP-28MB7T-1D
For 8/16 × DS1 e/w LAN System System

Fig. 2-1 MDP, Interface Terminals and Jacks (5/6)

MDP-50MB6T-2D
For 28 × DS1 System e/w LAN System
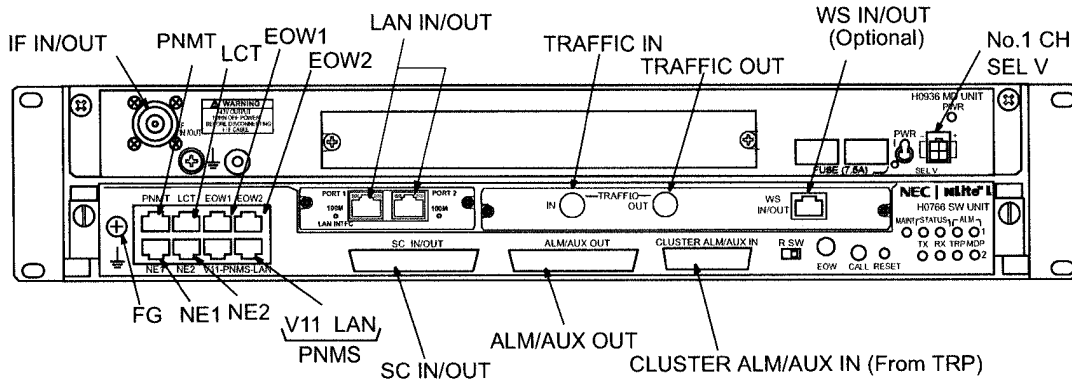
MDP-50MB6T-1D
For 1 × DS3 e/w LAN System System

Fig. 2-1 MDP, Interface Terminals and Jacks (6/6)
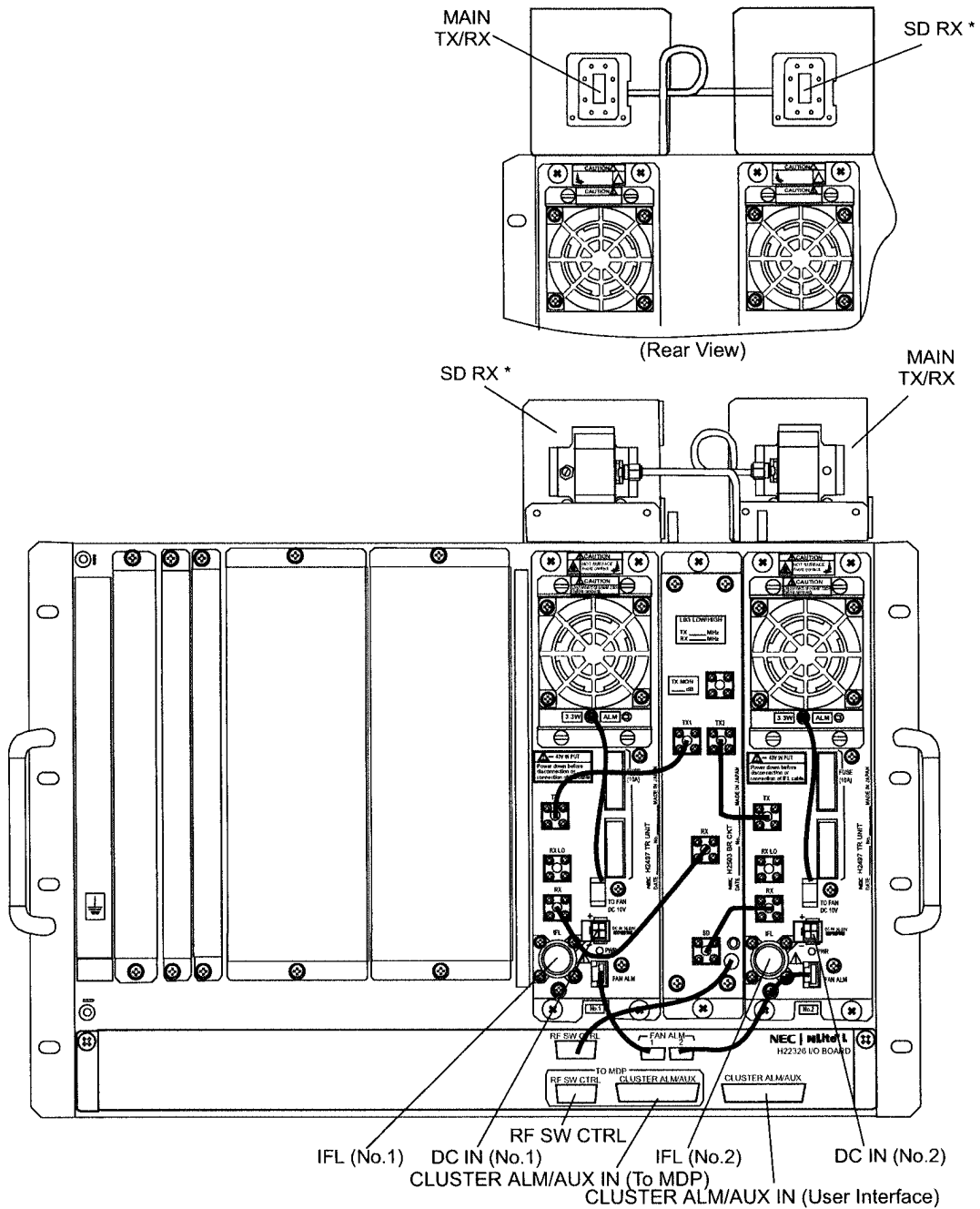
Notes: 1. *The TX/RX port orientation can be changed (see Section III).*

2. *SD RX Waveguide Frange is not provided in HS/HS system.*

TRP-L6/U6/10/11/24G-( ) All Indoor, 2 × TRP e/w FAN Type

Fig. 2-2 TRP, Interface Terminals and Jacks (1/5)
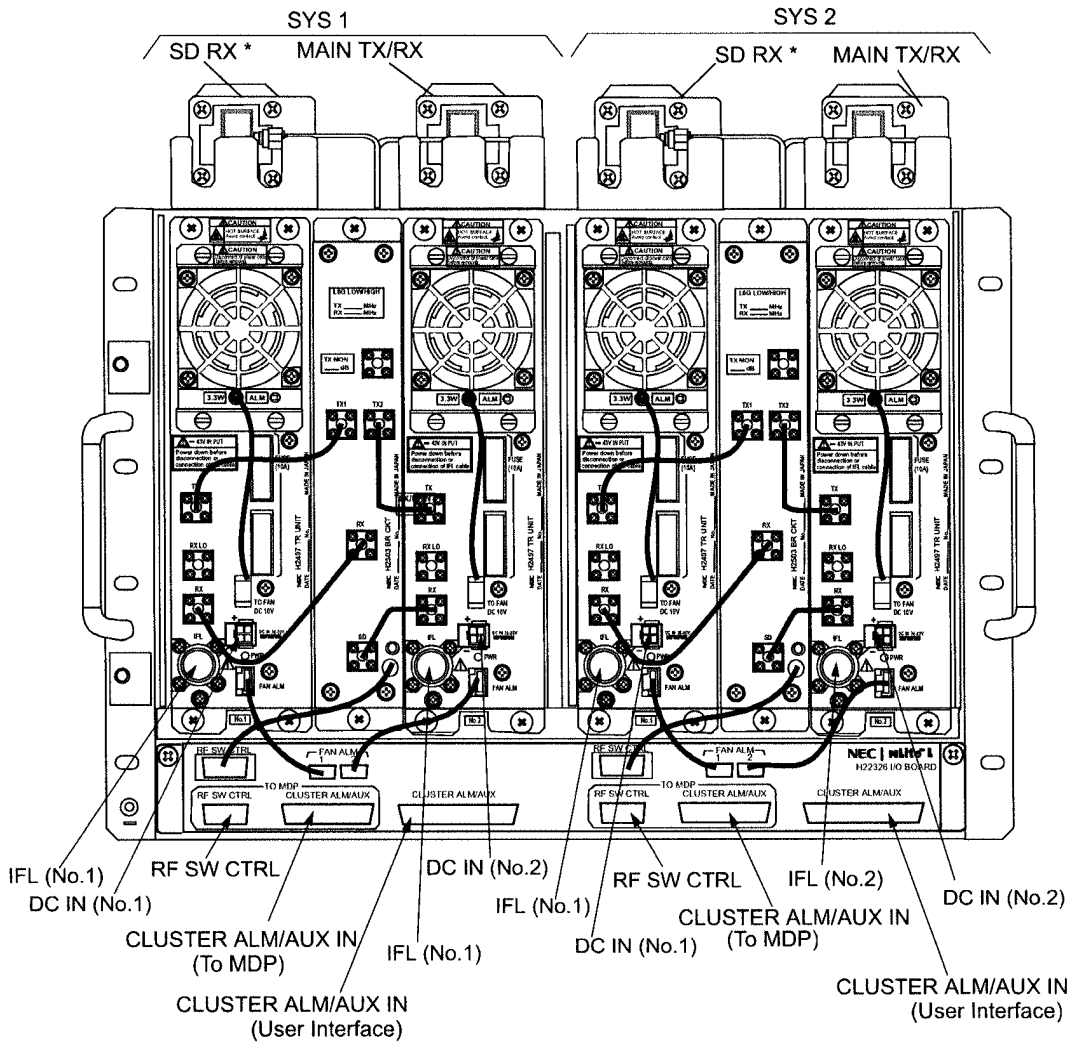
Notes: 1. SD RX Waveguide Flange is not provided in HS/HS system.
        2. The TX/RX port orientation can be changed (see Section III).

TRP-L6/U6/10/11/24G-( ) All Indoor, 4 × TRP e/w FAN Type

Fig. 2-2 TRP, Interface Terminals and Jacks (2/5)
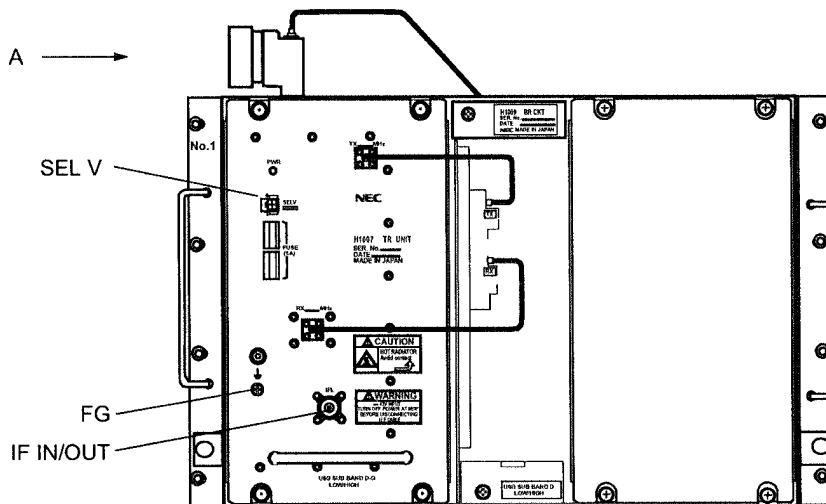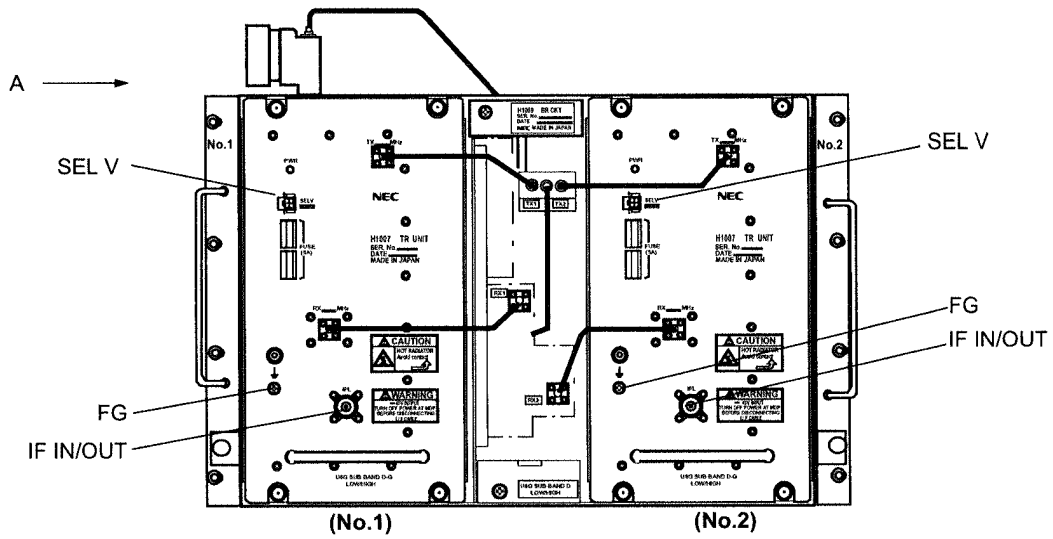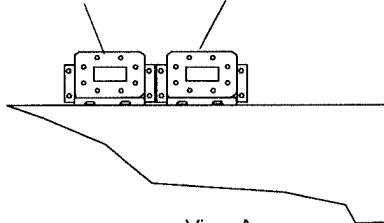
Note: Position of the TX/RX port varies depending on the waveguide orientation.

Fig. 2-2 TRP, Interface Terminal and Jacks (3/5)

(N-type Interface)
(REAR VIEW)

(Antenna Mounting Type Interface)
(REAR VIEW)

(W/G Interface)
(REAR VIEW)
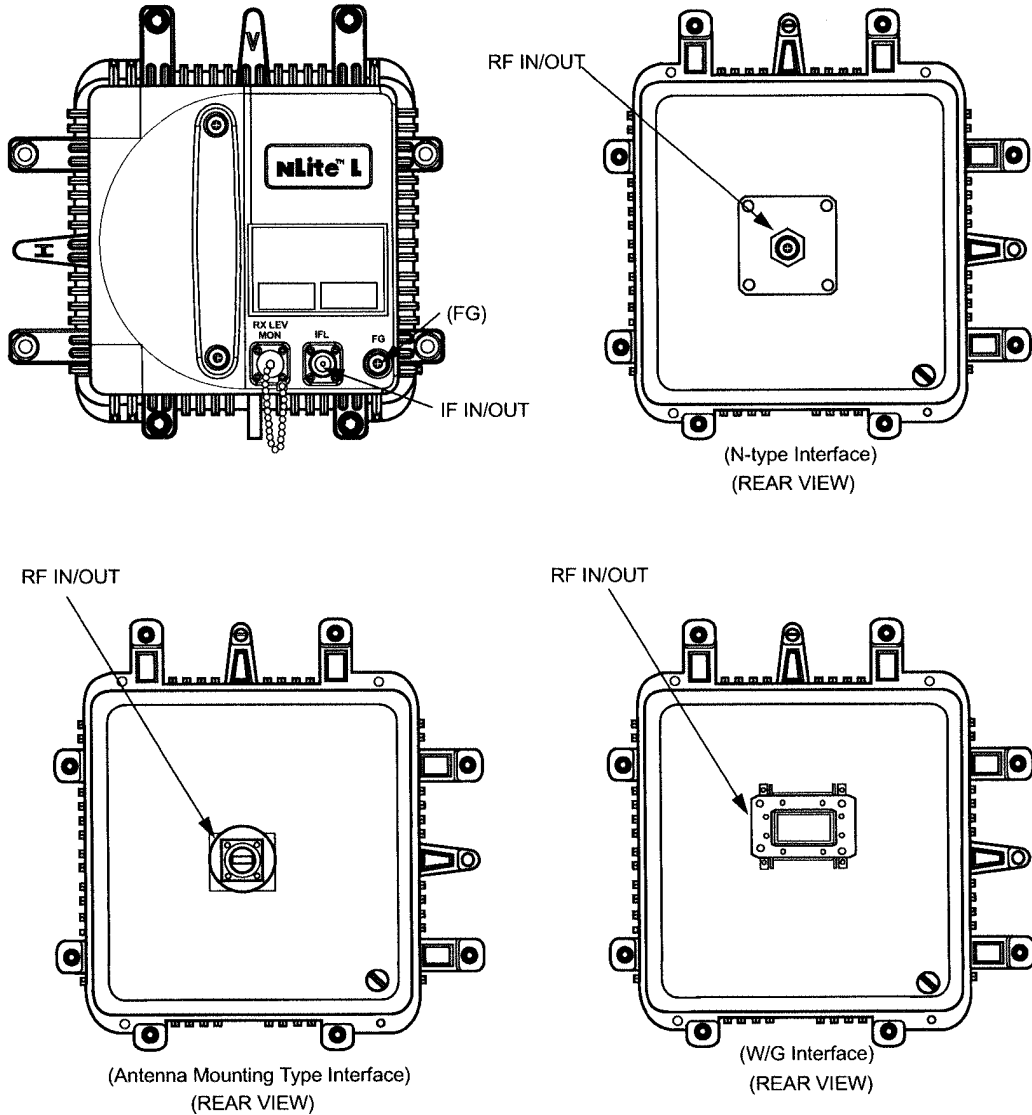
5.8/6/23 GHz BAND TRP

Fig. 2-3 TRP, Interface Terminal and Jacks (4/5)

FG

NLite™ L

IF IN/OUT   RX REV MON   RF IN/OUT

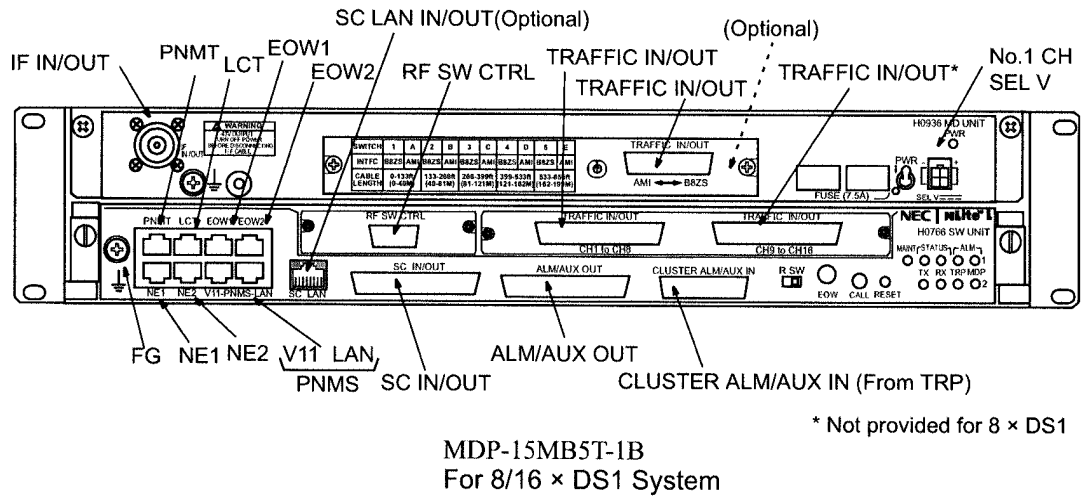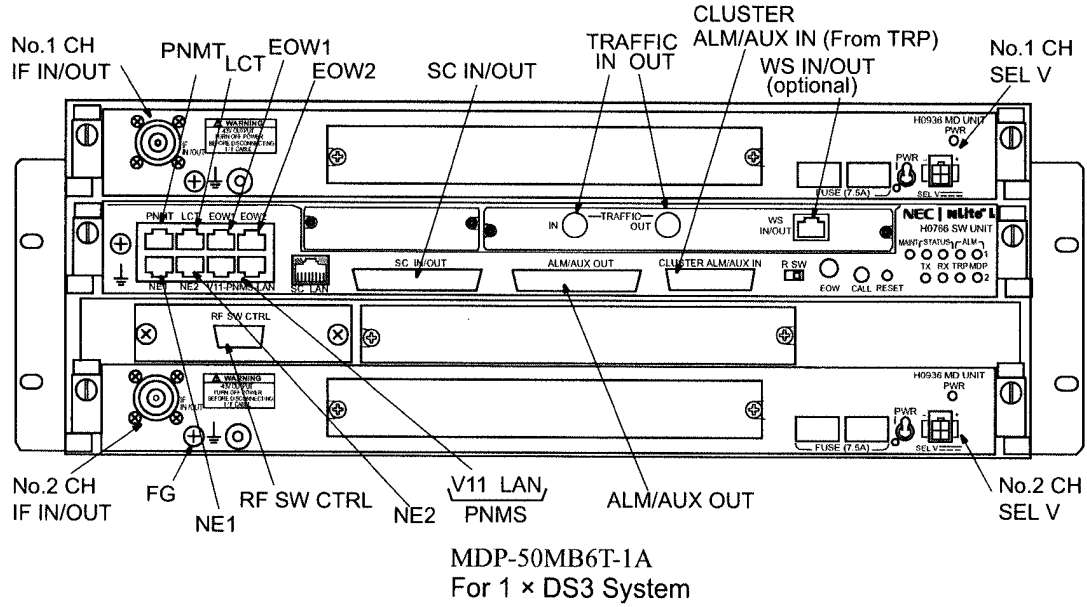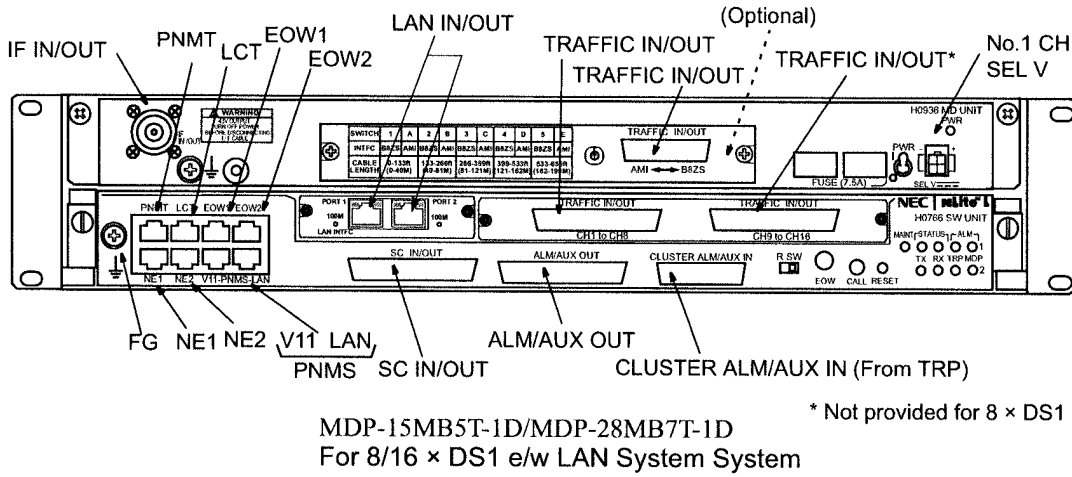(FRONT VIEW)   (REAR VIEW)
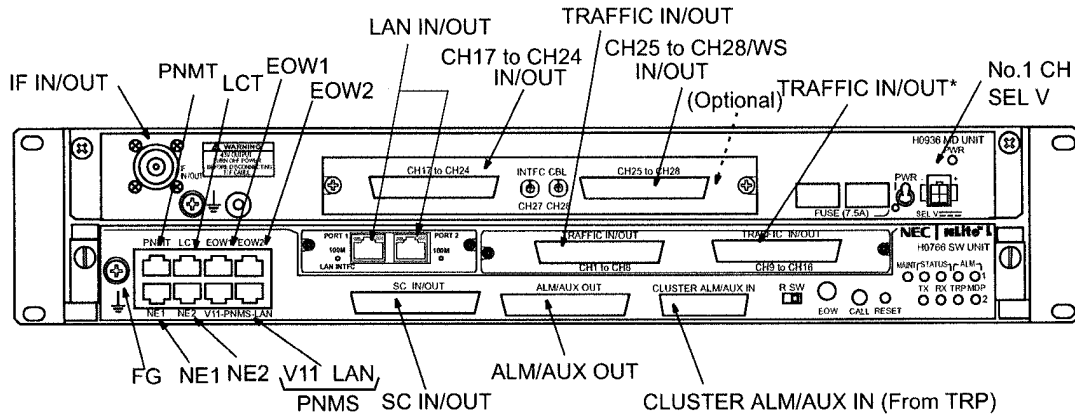
10.5/11 GHz BAND TRP
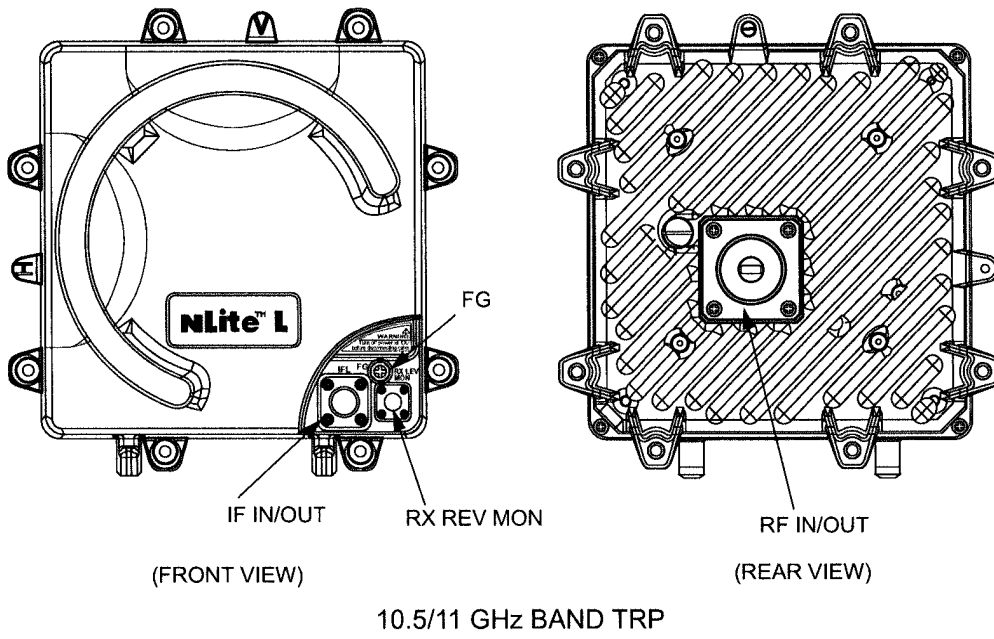
Fig. 2-3 TRP, Interface Terminal and Jacks (5/5)

Table 2-1 Interface Terminals and Jacks on the MDP (1/13)

Terminal	Description
TRAFFIC IN/OUT CH1-8 (1.5M INTFC) (D-sub Connector, 37 Pins)	DS1 data input/output from/to DTE (CH1 to CH8)
Pins 1 (+) and 2 (−)	CH8 data input
Pins 3 (+) and 4 (−)	CH7 data input
Pins 6 (+) and 7 (−)	CH6 data input
Pins 8 (+) and 9 (−)	CH5 data input
Pins 11 (+) and 12 (−)	CH4 data input
Pins 13 (+) and 14 (−)	CH3 data input
Pins 16 (+) and 17 (−)	CH2 data input
Pins 18 (+) and 19 (−)	CH1 data input
Pins 20 (+) and 21 (−)	CH8 data output
Pins 22 (+) and 23 (−)	CH7 data output
Pins 25 (+) and 26 (−)	CH6 data output
Pins 27 (+) and 28 (−)	CH5 data output
Pins 29 (+) and 30 (−)	CH4 data output
Pins 31 (+) and 32 (−)	CH3 data output
Pins 34 (+) and 35 (−)	CH2 data output
Pins 36 (+) and 37 (−)	CH1 data output
Pins 5,10,15,24 and 33	Ground

Table 2-1 Interface Terminals and Jacks on the MDP (2/13)

Terminal	Description
TRAFFIC IN/OUT CH9-16 (1.5M INTFC) (D-sub Connector, 37 Pins)	DS1 data input/output from/to DTE (CH 9 to CH 16) (for 16 x 1.5 MB system only)
Pins 1 (+) and 2 (−)	CH16 data input
Pins 3 (+) and 4 (−)	CH15 data input
Pins 6 (+) and 7 (−)	CH14 data input
Pins 8 (+) and 9 (−)	CH13 data input
Pins 11 (+) and 12 (−)	CH12 data input
Pins 13 (+) and 14 (−)	CH11 data input
Pins 16 (+) and 17 (−)	CH10 data input
Pins 18 (+) and 19 (−)	CH9 data input
Pins 20 (+) and 21 (−)	CH16 data output
Pins 22 (+) and 23 (−)	CH15 data output
Pins 25 (+) and 26 (−)	CH14 data output
Pins 27 (+) and 28 (−)	CH13 data output
Pins 29 (+) and 30 (−)	CH12 data output
Pins 31 (+) and 32 (−)	CH11 data output
Pins 34 (+) and 35 (−)	CH10 data output
Pins 36 (+) and 37 (−)	CH9 data output
Pins 5,10,15,24 and 33	Ground

Table 2-1 Interface Terminals and Jacks on the MDP (3/13)

Terminal	Description
CH17-CH24 (1.5M INTFC) (D-sub Connector, 37 Pins)	DS1 data input/output from/to DTE (CH17 to CH24) (for 28 x 1.5 MB system only)
Pins 1 (+) and 2 (–)	CH24 data input
Pins 3 (+) and 4 (–)	CH23 data input
Pins 6 (+) and 7 (–)	CH22 data input
Pins 8 (+) and 9 (–)	CH21 data input
Pins 11 (+) and 12 (–)	CH20 data input
Pins 13 (+) and 14 (–)	CH19 data input
Pins 16 (+) and 17 (–)	CH18 data input
Pins 18 (+) and 19 (–)	CH17 data input
Pins 20 (+) and 21 (–)	CH24 data output
Pins 22 (+) and 23 (–)	CH23 data output
Pins 25 (+) and 26 (–)	CH22 data output
Pins 27 (+) and 28 (–)	CH21 data output
Pins 29 (+) and 30 (–)	CH20 data output
Pins 31 (+) and 32 (–)	CH19 data output
Pins 34 (+) and 35 (–)	CH18 data output
Pins 36 (+) and 37 (–)	CH17 data output
Pins 5,10,15,24 and 33	Ground

Table 2-1 Interface Terminals and Jacks on the MDP (4/13)

Terminal	Description
CH25-CH28 (1.5M SUB INTFC) (D-sub Connector, 25 Pins)	DS1 data and WS input/output from/to DTE (CH25 to CH28) (for 28 x 1.5 MB system only)
Pin 1	No connected
Pins 2 (+) and 3 (–)	WS data input
Pins 5 (+) and 6 (–)	CH28 data input
Pins 7 (+) and 8 (–)	CH27 data input
Pins 10 (+) and 11 (–)	CH26 data input
Pins 12 (+) and 13 (–)	CH25 data input
Pin 1 4	No connected
Pins 15 (+) and 16 (–)	WS data output
Pins 18 (+) and 19 (–)	CH28 data output
Pins 20 (+) and 21 (–)	CH27 data output
Pins 22 (+) and 23 (–)	CH26 data output
Pins 24 (+) and 25 (–)	CH25 data output
Pins 4, 9, 25 and 17	Ground
TRAFFIC IN/OUT AMI/B8ZS (CODE CONV INTFC) (D-sub Connector, 25 Pins)	DS1 data input/output from/to DTE, from/to 1.5M INTFC (for 2CHs AMI/B8ZS input/output) (optional)
Pins 1 (+) and 2 (–)	CH2 data input from 1.5 M INTFC
Pins 4 (+) and 5 (–)	CH1 data input from 1.5 M INTFC
Pins 7 (+) and 8 (–)	CH2 data input
Pins 10 (+) and 11(–)	CH1 data input
Pins 14 (+) and 15 (–)	CH2 data output to 1.5 M INTFC
Pins 17 (+) and 18 (–)	CH1 data output to 1.5 M INTFC
Pins 20 (+) and 21 (–)	CH2 data output
Pins 23 (+) and 24 (–)	CH1 data output
Pin 13	No connected
Pins 3, 6, 9, 12, 16, 19, 22 and 25	Ground

Table 2-1 Interface Terminals and Jacks on the MDP (5/13)

Terminal	Description
LAN PORT1, 2 (Optional) (RJ45, 8 Pins)	LAN input/output
Pin 1	TXD+/RXD+
Pin 2	TXD–/RXD–
Pin 3	RXD+/TXD+
Pin 4	N.C
Pin 5	N.C
Pin 6	RXD–/TXD–
Pin 7	N.C
Pin 8	N.C
CLUSTER ALM/AUX IN (D-sub Connector, 25 Pins)	Alarm and transmission network surveillance auxiliary input/ output

Pins 1 (NO) and 14 (COM)	Cluster alarm 2 output
	  Normal state : Open
	  Control/Event state : Closed

Pins 2 (+) and 15 (–)	Cluster alarm 2 input *1, *4
	  Normal state : Open
	  Control/Event in : Closed

Pins 3, 16 (G)	Ground

Pins 4 (NO) and 17 (COM)	Cluster alarm 1 output
	  Normal state : Open
	  Control/Event state : Closed

Pins 5 (+) and 18 (–)	Cluster alarm 1 input *1, *4
	  Normal state : Open
	  Control/Event in : Closed

Pins 6, 19 (G)	Ground

Pins 7 (+), 20 (Ground) (e/w FAN Type only)	FAN ALM 11 alarm input (TR UNIT No.1 Front FAN ALM) *1,*2, *4
	  Normal state : Open
	  Control/Event in : Closed

Pins 8 (+), 21 (Ground) (e/w FAN Type only)	FAN ALM 12 alarm input (TR UNIT No.1 Rear FAN ALM) *1,*2, *4
	  Normal state : Open
	  Control/Event in : Closed

Table 2-1 Interface Terminals and Jacks on the MDP (6/13)

Terminal	Description
Pins 9 (+), 22 (Ground) (e/w FAN Type only)	FAN ALM 21 alarm input (TR UNIT No.2 Front FAN ALM) *1,*2, *4 Normal state : Open Control/Event in : Closed
Pins 10 (+), 23 (Ground) (e/w FAN Type only)	FAN ALM 22 alarm input (TR UNIT No.2 Rear FAN ALM) *1,*2, *4 Normal state : Open Control/Event in : Closed
Pins 11 (+), 24 (–)	HK2 alarm input *1, *4 Normal state : Open Control/Event in : Closed
Pins 12 (+), 25 (–)	HK1 alarm input *1, *4 Normal state : Open Control/Event in : Closed
Pin 13 (G)	Ground
ALM OUT (D-sub Connector, 37 Pins)	Alarm output

Pins 18 (COM), 36 (NC) and 37 (NO) — RL1	Maintenance alarm output *3
	
	                    Between Between
	               Pins 18 and 36 Pins 18 and 37
	Normal state : Closed Open
	Alarm state : Open Closed

Pins 35 (COM), 16 (NC) and 17 (NO) — RL2	Power supply alarm 1/Power supply alarm 2 output *3
	                    Between Between
	               Pins 35 and 16 Pins 35 and 17
	Normal state : Closed Open
	Alarm state : Open Closed

Pins 15 (COM), 33 (NC) and 34 (NO) — RL3	CPU alarm output *3
	                    Between Between
	               Pins 15 and 33 Pins 15 and 34
	Normal state : Closed Open
	Alarm state : Open Closed

Pins 13 (COM), 31 (NC) and 32 (NO) — RL4	TRP alarm 1/TRP alarm 2 output *2 or equipment alarm output
	                    Between Between
	               Pins 13 and 31 Pins 13 and 32
	Normal state : Closed Open
	Alarm/Event state : Open Closed

Table 2-1 Interface Terminals and Jacks on the MDP (7/13)

Terminal	Description

Pins 30 (COM), 11 (NC) and 12 (NO) — RL5	MDP alarm 1/MDP alarm 2 output *2 or equipment alarm output
	
	                          Between Between
	                      Pins 30 and 11 Pins 30 and 12
	Normal state : Closed Open
	Alarm/Event state : Open Closed

Pins 10 (COM), 28 (NC) and 29 (NO) — RL6	High BER alarm 1/High BER alarm 2 output *2 or equipment alarm output
	
	                          Between Between
	                      Pins 10 and 28 Pins 10 and 29
	Normal state : Closed Open
	Alarm/Event state : Open Closed

Pins 8 (COM), 26 (NC) and 27 (NO) — RL7	MAIN INTFC loss of signal alarm output *2 or equipment alarm output
	
	                          Between Between
	                      Pins 8 and 26 Pins 8 and 27
	Normal state : Closed Open
	Alarm/Event state : Open Closed

Pins 25 (COM), 6 (NC) and 7 (NO) — RL8 *5	HK4 alarm output *2 or equipment alarm output
	                          Between Between
	                      Pins 25 and 6 Pins 25 and 7
	Normal state : Closed Open
	Alarm/Event state : Open Closed

Pins 5 (COM), 23 (NC) and 24 (NO) — RL9 *5	HK3 alarm output *2 or equipment alarm output
	                          Between Between
	                      Pins 5 and 23 Pins 5 and 24
	Normal state : Closed Open
	Alarm/Event state : Open Closed

Pins 3 (COM), 21 (NC) and 22 (NO) — RL10 *5	HK2 alarm output *2 or equipment alarm output
	                          Between Between
	                      Pins 3 and 21 Pins 3 and 22
	Normal state : Closed Open
	Alarm/Event state : Open Closed

Pins 20 (COM), 1 (NC) and 2 (NO) — RL11 *5	HK1 alarm output *2 or equipment alarm output
	                          Between Between
	                      Pins 20 and 1 Pins 20 and 2
	Normal state : Closed Open
	Alarm/Event state : Open Closed

Pins 4, 9, 14 and 19	Ground

Table 2-1 Interface Terminals and Jacks on the MDP (8/13)

Terminal	Description
PNMT (Modular Connector)	Pasolink network management terminal (PNMT) data input/output (RS-232C)
Pin 1	PNMT DCD
Pin 2	PNMT TXD
Pin 3	PNMT RXD
Pin 4	PNMT DSR
Pin 5	Ground
Pin 6	PNMT DTR
Pin 7	PNMT CTS
Pin 8	PNMT RTS
LCT (Modular Connector)	Local craft terminal (LCT) data input/output (RS-232C)
Pin 2	LCT TXD
Pin 3	LCT RXD
Pin 5	Ground
Pin 7	LCT CTS
Pin 8	LCT RTS
EOW1 (Modular Connector)	Engineering orderwire (EOW)1 signal extension terminal for branching connection between MDPs (VF and CALL signal)
Pin 1	EXT EOW1 input (+)
Pin 2	EXT EOW1 input (–)
Pin 3	EXT CALL1 input
Pin 4	EXT EOW1 output (+)
Pin 5	EXT EOW1 output (–)
Pin 6	Ground
Pin 7	EXT CALL1 output
Pin 8	Ground

Table 2-1 Interface Terminals and Jacks on the MDP (9/13)

Terminal	Description
EOW2 (Modular Connector)	EOW2 signal extension terminal for branching connection between MDPs (VF and CALL signal)
Pin 1	EXT EOW2 output (+)
Pin 2	EXT EOW2 output (−)
Pin 3	EXT CALL2 output
Pin 4	EXT EOW2 input (+)
Pin 5	EXT EOW2 input (−)
Pin 6	Ground
Pin 7	EXT CALL2 input
Pin 8	Ground
NE1 (Modular Connector)	Pasolink network management system (PNMS) data input/ output for back-to-back connection between MDPs (RS-485)
Pin 1	TXD +/RXD+
Pin 2	TXD−/RXD−
Pin 3	RXD +/TXD +
Pin 4	CK +
Pin 5	CK −
Pin 6	RXD−/TXD−
Pin 7	Ground
Pin 8	Ground
NE2 (Modular Connector)	PNMS data input/output for back-to-back or branching connection between MDPs (RS-485)
Pin 1	TXD+/RXD+
Pin 2	TXD−/RXD−
Pin 3	RXD+/TXD+
Pin 4	N.C
Pin 5	N.C
Pin 6	RXD−/TXD−
Pin 7	Ground
Pin 8	Ground

Table 2-1 Interface Terminals and Jacks on the MDP (10/13)

Terminal	Description
PNMS V11 (Modular Connector)	PNMS data (V11) input/output
Pin 1	NMS TXD +
Pin 2	NMS TXD −
Pin 3	NMS RXD +
Pin 4	N.C
Pin 5	N.C
Pin 6	NMS RXD −
Pin 7	Ground
Pin 8	Ground
PNMS LAN (Modular Connector)	PNMS data (LAN) input/output
Pin 1	NMS TD +
Pin 2	NMS TD −
Pin 3	NMS RD +
Pin 4	N.C
Pin 5	N.C
Pin 6	NMS RD −
Pin 7	N.C
Pin 8	N.C

Table 2-1 Interface Terminals and Jacks on the MDP (11/13)

Terminal	Description
SC IN/OUT (D-sub Connector, 37 Pins)	Service channel data input/output (V11* : 2CH, RS-232C : 1CH)
Pin 1	OH3 RTS
Pin 2	OH3 DTR
Pin 4	OH3 TXD
Pin 21	OH3 CTS
Pin 23	OH3 RXD
Pins 6 (+) and 25 (−)	OH2 DFP
Pins 7 (+) and 26 (−)	OH2 DCK
Pins 8 (+) and 27 (−)	OH2 DDT
Pins 9 (+) and 28 (−)	OH2 IFP
Pins 10 (+) and 29 (−)	OH2 ICK
Pins 11 (+) and 30 (−)	OH2 IDT
Pins 13 (+) and 32 (−)	OH1 DFP
Pins 14 (+) and 33 (−)	OH1 DCK
Pins 15 (+) and 34 (−)	OH1 DDT
Pins 16 (+) and 35 (−)	OH1 IFP
Pins 17 (+) and 36 (−)	OH1 ICK
Pins 18 (+) and 37 (−)	OH1 IDT
Pins 5, 12, 19, 20, 22, 24 and 31	Ground Note:Either Co- or Contra-directional of V11 is selectable by LCT.
WS (optional) (RJ45 8 pins)	Wayside signal input/output For 120 ohms balanced interface
Pin 1	WS OUT (+)
Pin 2	WS OUT (−)
Pin 3	Ground
Pin 4	WS IN (+)
Pin 5	WS IN (−)
Pin 6	Ground
Pin 7	N.C
Pin 8	N.C

Table 2-1 Interface Terminals and Jacks on the MDP (12/13)
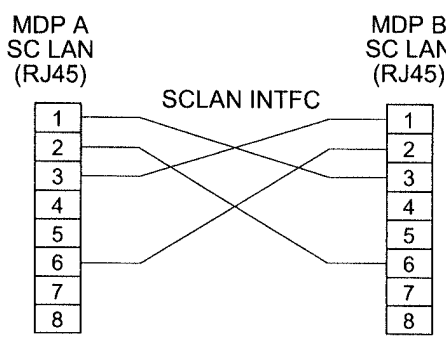
Terminal	Description
SC LAN (optional) * (RJ45 8 pins)	SC LAN signal input/output
Pin 1	SC LAN TX$^+$
Pin 2	SC LAN TX$^-$
Pin 3	SC LAN RX$^+$
Pin 4	N.C
Pin 5	N.C
Pin 6	SC LAN RX$^-$
Pin 7	N.C
Pin 8	Ground
	Note: It is available when the SC LAN INTFC is equipped. When the SC LAN signal is connected between two MDPs, perform wiring as follows.

Note *: Only applicable for MDP-15MB5T-1A/B, MDP-28MB7T-1A/B, MDP-50MB6T-1A/B.

Table 2-1 Interface Terminals and Jacks on the MDP (13/13)

Terminal	Description
IF IN/OUT (N-J Connector)	TX IF signal, DC power output to the TRP and RX IF signal input from the TRP *Caution: Do not connect other cables to this jack, because the –43 V DC power is superimposed on this jack.* *Caution: Do not connect/disconnect the IFL cable before turning off the power switch.* *Danger: Do not touch the jack core before turning off the power switch.*
FG	Frame ground
G	Wrist band ground
SELV *6 (Molex M5557-4R Connector, 4 Pins)	–36 V to –60 V DC/ +36 V to +60 V DC or –20 V to –60 V DC/ +20 V to +60 V DC power input
Pin 1	0 V (+48 V or +20 V to +60 V)
Pin 2	–48 V (0 V or –20 V to –60 V)

Notes: *1 *Photocoupler interface.*

2 These alarm items are assigned at the factory (default setting) and can be changed by the LCT as shown in Table 2-2 (Alarms may be selectively assigned to RL4 to RL11).

3 These ALM items are fixed at the factory (default setting) and can not be changed onsite.

4 Resistance of opened input terminal is more than 200 kilo ohms. Closed input terminal is less than 50 ohms.

5 The relay is rated at 0.2 A.

6 Wide range power supply voltage (–20 V to –60 V/ +20 V to +60 V) is applicable.

Table 2-2 Summarized External Alarms (Form-C)

ALARM ITEM	INTERFACE TERMINAL							
	ALM OUT							
	RL4	RL5	RL6	RL7	RL8	RL9	RL10	RL11
TRP ALM 1/2	√	O	O	O	O	O	O	O
MDP ALM 1/2	O	√	O	O	O	O	O	O
TX PWR ALM 1/2	O	O	O	O	O	O	O	O
TX IN ALM 1/2	O	O	O	O	O	O	O	O
RX LEV ALM 1/2	O	O	O	O	O	O	O	O
APC ALM 1/2	O	O	O	O	O	O	O	O
CABLE ALM 1/2	O	O	O	O	O	O	O	O
MOD ALM 1/2	O	O	O	O	O	O	O	O
DEM ALM 1/2	O	O	O	O	O	O	O	O
HIGH BER 1/2	O	O	√	O	O	O	O	O
LOW BER 1/2	O	O	O	O	O	O	O	O
LOF 1/2	O	O	O	O	O	O	O	O
Port 1/2 L/D	O	O	O	O	O	O	O	O
MAIN INTFC LOS ALM	O	O	O	√	O	O	O	O
HK1 OUT	—	—	—	—	—	—	—	√
HK2 OUT	—	—	—	—	—	—	√	—
HK3 OUT	—	—	—	—	—	√	—	—
HK4 OUT	—	—	—	—	√	—	—	—

Notes:1. √marks are set at factory. (default setting)
2. O marks can be set by the LCT. Each relay can be setup so that they will be assigned two or more alarm items output.
3. Alarms items can be assigned from RL8 to RL11 when the relays have not been designated for HK control.
4. The number after an alarm item shows a channel number.
5. While the CPU is initialized by depressing the RESET switch, alarm(s) is in normal condition. After initialization, the alarm information is properly provided through relay contacts.

Table 2-3 Interface Terminals and Jacks for TRP e/w FAN Type

Terminal/Jack	Description
IF IN/OUT (N-J Connector)	TX IF signal input and RX IF signal output *Warning: Do not connect/disconnect the coaxial cable while the MDP is powered on.*
CLUSTER ALM/AUX IN (D-sub Connector, 25 Pins) *1	Alarm and transmission network surveillance auxiliary input/ output

Pins 1 (NO) and 14 (COM)	Cluster alarm 2 output
	    Normal state : Open
	    Control/Event state : Closed

Pins 2 (+) and 15 (–)	Cluster alarm 2 input *2, *4
	    Normal state : Open
	    Control/Event in : Closed

Pins 3, 16 (G)	Ground

Pins 4 (NO) and 17 (COM)	Cluster alarm 1 output
	    Normal state : Open
	    Control/Event state : Closed

Pins 5 (+) and 18 (–)	Cluster alarm 1 input *2, *4
	    Normal state : Open
	    Control/Event in : Closed

Pins 6, 19 (G)	Ground

Pins 7 (+), 20 (Ground)	FAN ALM 11 alarm input (TR UNIT No.1 Front FAN ALM)
	*2, *3, *4
	    Normal state : Closed
	    Control/Event in : Open

Pins 8 (+), 21 (Ground)	FAN ALM 12 alarm input (TR UNIT No.1 Rear FAN ALM)
	*2, *3, *4
	    Normal state : Closed
	    Control/Event in : Open

Pins 9 (+), 22 (Ground)	FAN ALM 21 alarm input (TR UNIT No.2 Front FAN ALM)
	*2, *3, *4
	    Normal state : Closed
	    Control/Event in : Open

Table 2-3 Interface Terminals and Jacks for TRP e/w FAN Type (Cont'd)

Terminal/Jack	Description
Pins 10 (+), 23 (Ground)	FAN ALM 22 alarm input (TR UNIT No.2 Rear FAN ALM) *2, *3, *4 Normal state : Closed Control/Event in : Open
Pins 11 (+), 24 (−)	HK2 alarm input *2, *4 Normal state : Open Control/Event in : Closed
Pins 12 (+), 25 (−)	HK1 alarm input *2, *4 Normal state : Open Control/Event in : Closed
Pin 13 (G)	Ground
SEL V (Molex M5557-4R Connector, 4 Pins)	−36 V to −60 V DC (or +36 V to +60 V DC) power input
Pin 1	0 V (or +48 V)
Pin 2	−48 V (or 0 V)
	Note: Power for the TRP is supplied from the SEL V terminal and the IFL cable from the MDP. Therefore, both connections are necessary.
FG	Frame ground
MAIN TX/RX, SD RX Feeder Port (6 GHz : CPR-137F)	RF signal input/output from/to antenna.

Notes:*1 The CLUSTER ALM/AUX IN terminal is used for the user interface. The TO MDP CLUSTER ALM/AUX IN terminal must be connected to the CLUSTER ALM/AUX IN terminal on the MDP.

*2 Photocoupler interface.

*3 These ALM items are fixed for TR UNIT FAN ALM at the factory (default setting) so do not change and connect wires from/to external can not be changed onsite.

*4 Resistance of opened input terminal is more than 200 kilo ohms. Closed input terminal is less than 50 ohms.

Table 2-4 Interface Terminals and Jacks for TRP w/o FAN Type

| Terminal/Jack	Description
IF IN/OUT (N-J Connector)	TX IF signal input and RX IF signal output *Warning: Do not connect/disconnect the coaxial cable while the MDP is powered on.*
SEL V (Molex M5557-4R Connector, 4 Pins)	–36 V to –60 V DC (or +36 V to +60 V DC) power input
Pin 1	0 V (or +48 V)
Pin 2	–48 V (or 0 V) *Note: Power for the TRP is supplied from the SEL V terminal and also I/F cable from the MDP, therefore, both connections are necessary.*
FG	Frame ground
RF IN/OUT (6 GHz : CPR-137F) (11 GHz : CPR-90F)	RF signal input/output from/to antenna. .

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3. CONTROLS, INDICATORS AND TEST JACKS

The controls, indicators and test jacks of the MDP and TRP are described in this chapter.

3.1 MDP

The controls, indicators and jacks of the MDP are shown in Fig. 3-1. Their functions are described as follows:
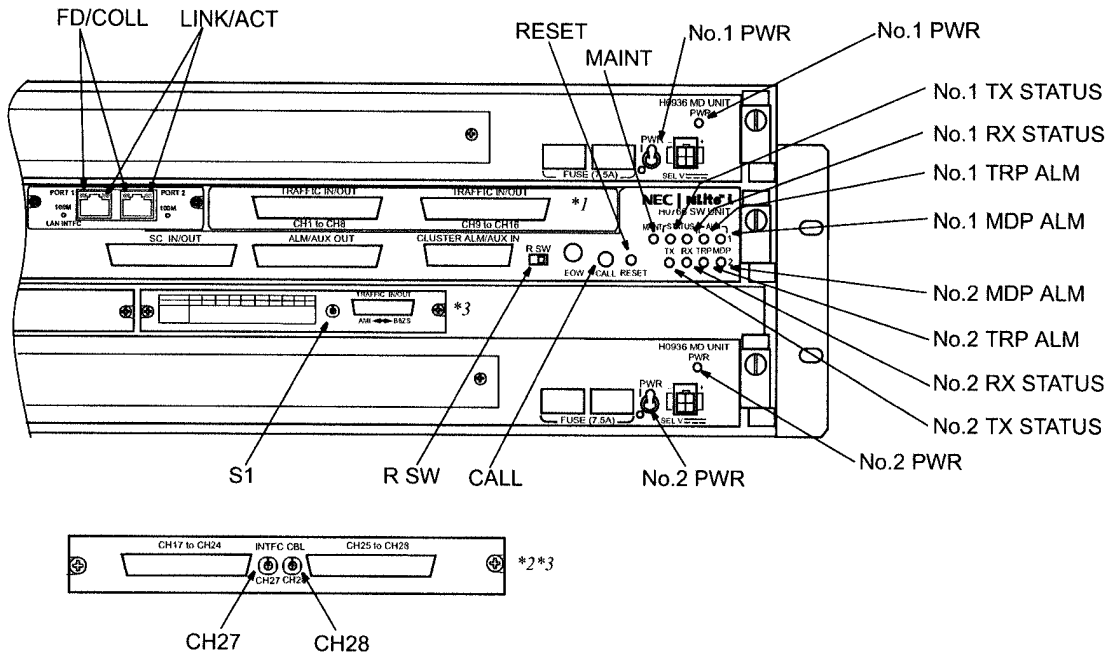
Notes: *1 CH1-16 IN/OUT interface for 16 x DS1 system is shown as an example.
      *2 CH17-28 IN/OUT sub interface is used only for 28 x DS1 system.
      *3 Optional.

Note: To prevent accidental IDU power switch lever movement, the power switch lever is locked. When set the power switch to on/off, it must be pulled out power switch lever knob to unlock the switch lever.

Note: The power switch provides the power on/off for the MDP and TR UNIT in common.

Fig. 3-1 MDP Controls, Indicators and Test Jacks

No.1 PWR indicator:

Lights when the PWR switch of No.1 CH is turned on.

No.2 PWR indicator:

Lights when the PWR switch of No.2 CH is turned on.

No.1 PWR switch:

Turns on or off the input DC power for No.1 CH.

No.2 PWR switch:

Turns on or off the input DC power for No.2 CH.

No.1 MDP ALM indicator:

Lights when:

- INTFC clock of TX side is lost — Main board
- INTFC signal/clock of RX side is lost — Main board
- Input data of main CH (CH1-16) is lost — Main board
- 1.5M INTFC module failure — 1.5M INTFC
- MOD IF output level down or TX DPU failure — No.1 MODEM
- Input IF signal is lost — No.1 MODEM
- Frame synchronization is lost — No.1 MODEM
- BER is worse than preset value — No.1 MODEM
- DC power failure — No.1 DC-DC CONV or external power supply (When No.2 MDP is provided.)
- LAN port Link down occurs. (For the LAN INTFC)

No.2 MDP ALM indicator (in 1+1 system) :

Lights when:

- Interface (INTFC) clock of TX side is lost — Main board
- INTFC signal/clock of RX side is lost — Main board
- Input data of main CH (CH1-16) is lost — Main board
- Main INTFC module failure — Main board
- MOD IF output level down or TX DPU failure — No.2 MODEM
- Input IF signal is lost — No.2 MODEM
- Frame synchronization is lost — No.2 MODEM
- BER is worse than preset value — No.2 MODEM

- DC power failure — No.2 DC-DC CONV (When No.1 MDP is provided.)
- LAN port Link down occurs. (For the LAN INTFC)

No.1 TRP ALM indicator:

Lights when:

- Transmit RF power of No.1 CH TRP decreases approx. −3 dB from normal
- Receiver input level of the No.1 CH TRP falls below squelch level
- APC loop of local oscillator in No.1 CH TRP is unlocked
- IF signal from the MDP at No.1 CH TRP is lost
- Communication between the No.1 CH TRP and No.1 CH MDP is lost

No.2 TRP ALM indicator (in 1+1 system) :

Lights when:

- Transmit RF power of No.2 CH TRP decreases approx. −3 dB from normal
- Receiver input level of No.2 CH TRP falls below squelch level
- APC loop of local oscillator in No.2 CH TRP is unlocked
- IF signal from the MDP at No.2 CH TRP is lost
- Communication between the No.2 CH TRP and No.2 CH MDP is lost

No.1 TX STATUS indicator :

Lights when the modulator and transmitter of No.1 CH is selected.

No.2 TX STATUS indicator :

Lights when the modulator and transmitter of No.2 CH is selected.

No.1 RX STATUS indicator :

Lights when the receiver and demodulator of No.1 CH is selected.

No.2 RX STATUS indicator :

Lights when the receiver and demodulator of No.2 CH is selected.

MAINT indicator

Lights when the equipment is set to maintenance mode by the LCT.

RESET switch:

    RESET switch initializes the CPU.

    Note: When the indication on the LCT is frozen or the CPU is abnormal, press the RESET switch.

CALL switch:

    Transmits the calling signal, to sound the buzzer at the opposite station.

EOW jack:

    Connects the headset to use EOW.

R SW switch:

    Slide the switch from the current position to the other position to use to the former program version after the MDP program is updated. Then press the RESET switch.

Caution: Contact with NEC before R SW operation. Equipment may not function correctly with improper operation.

S1 rotary switch:

    Adjusts output level of the CODE CONV according to the cable length.

LINK/ACT indicator (optional):

    Lights when line is linked. Blinks when data is sending and receiving.

FD/COLL indicator (optional):

    Lights when FULL DUPLEX mode or blinks when COLLISION ocurrs in HALF DUPLEX mode.

100M indicator (optional):

    Lights when data is linked in 100 MB.

CH27/CH28 rotary switch

Adjusts respective output level of CH27 and CH28 of the 1.5M SUB INTFC according to the cable length. When the Line Length selection is performed by using LCT, set the rotary switch to any 0, 6, 7, 8, 9 or F position.

Note: When the LCT is used for the Line Length setting, lump together four channels from CH25 to CH28 are performed.

CH27 and CH28 Line Length Selection		
SW Position	Cable Length	Signal Code
1	0 - 133ft (0 - 40m)	B8ZS
2	133 - 266ft (40 - 81m)	
3	266 - 399ft (81 - 121m)	
4	399 - 533ft (121 - 162m)	
5	533 - 655ft (162 - 199m)	
A	0 - 133ft (0 - 40m)	AMI
B	133 - 266ft (40 - 81m)	
C	266 - 399ft (81 - 121m)	
D	399 - 533ft (121 - 162m)	
E	533 - 655ft (162 - 199m)	

3.2 TRP

The controls, test jack of the TRP are shown in Fig. 3-2 (1/3) to Fig. 3-2 (3/3). Their functions are described as follows:

RX LEV MON terminal

TRP
5.8/6/24 GHz TRP

TRP
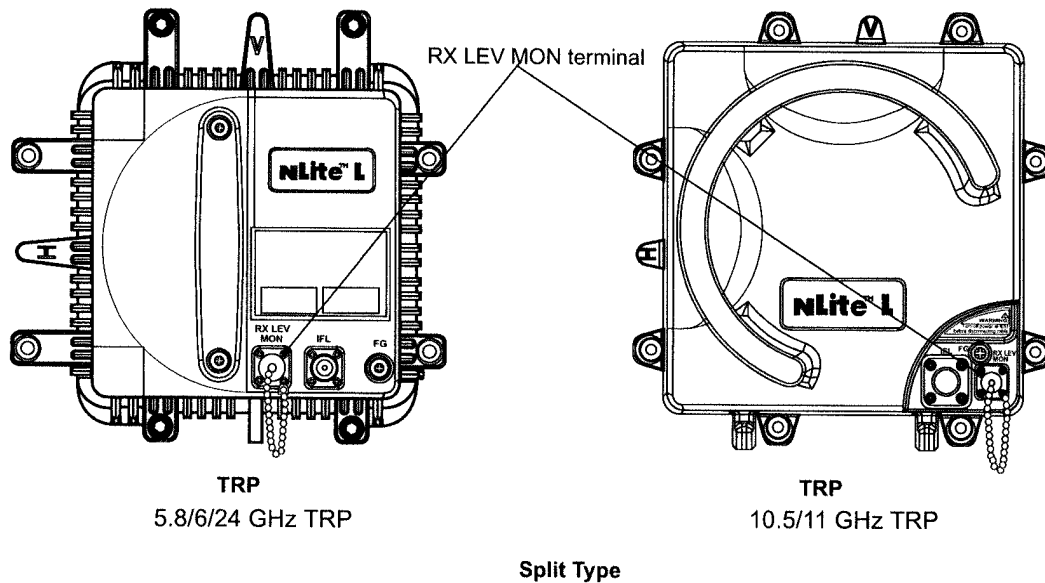10.5/11 GHz TRP

Split Type

Fig. 3-2 TRP UNIT, Test Jack (1/3)

RX LEV MON jack:

- Gives access to monitor the received level in voltage.

- Facilitate the transmission of EOW signal between MDPs and TRPs by connecting the OW/RX LEV Monitor and headset.

Note: In order to measure exact performance of AGC V, it is mandatory required to set Antenna Alignment Mode to ON as the AGC voltage indication is not guaranteed outside Antenna Alignment Mode.

- *The OW/RX LEV Monitor terinal must be capped for waterproof.*

- *It is necessary to set to Antenna Alignment Mode every time monitor the RX level with the OW/RX LEV MON unit.*

The X0818 OW/RX LEV Monitor (optional) is used for operation and maintenance is shown below. The operation range of the OW/RX LEV Monitor is 0 °C to +45 °C and its functions are described as follows:

METER:
>Indicates a DC voltage proportional to the receiving RF level.

OW indicator:
>Lights when the OW ON-OFF switch is set to ON. If the OW indicator is not lit even after setting the OW switch to ON, replace the battery (6F22(UB)/9V).

OW ON-OFF switch:
>Enables transmission of EOW signal between TRPs and MDPs by setting the switch to ON.
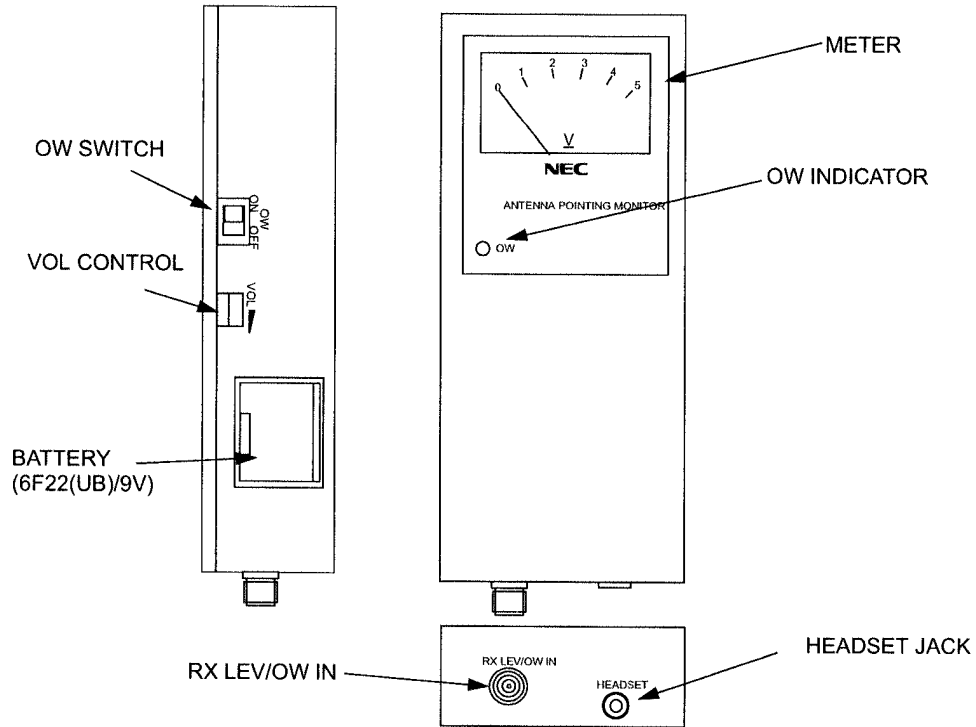
VOL control:
>Adjusts receive OW voice level.

RX LEV/OW IN jack:
>Provide a DC voltage for RX LEV monitoring and EOW signal from/ to the TRP.

HEADSET jack:
>Connects the orderwire headset to communicate between TRPs and MDPs.

OW SWITCH

VOL CONTROL

BATTERY
(6F22(UB)/9V)

METER

OW INDICATOR

V

NEC

ANTENNA POINTING MONITOR

○ OW

RX LEV/OW IN

RX LEV/OW IN

HEADSET

HEADSET JACK

Controls, Indicators and Test Jacks of OW/RX LEV Monitor

ALM Indicator

TX MON terminal
(optional)

PWR Indicator

TR UNIT   BR CKT
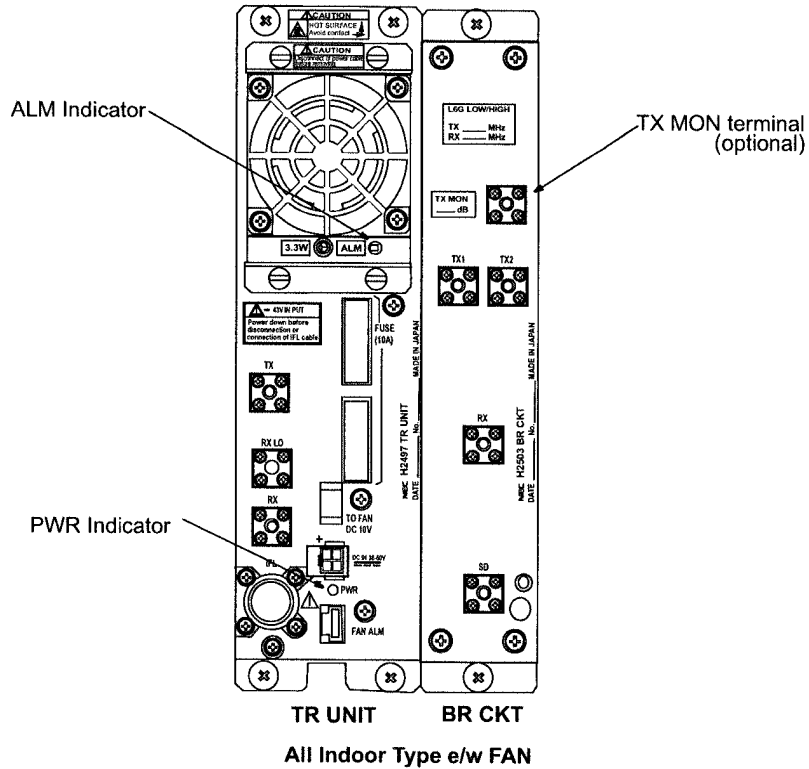
All Indoor Type e/w FAN

Fig. 3-2 TR UNIT Controls, Indicators and Test Jacks (2/3)

ALM indicator:

Lights when:

• Rotation rate of the fan is lower than preset value.

PWR indicator:

Lights when:

• DC power is supplied from DC IN to the TR UNIT.

TX MON (optional):

• Connecting the power meter, monitor TX power level *.

Note: The directional coupler provides 40 dB attenuation. Accurate values of coupling loss is indicated on the BR CKT front panel. TX power (dBm) = Power meter indication (dBm) + Coupling loss (dB)
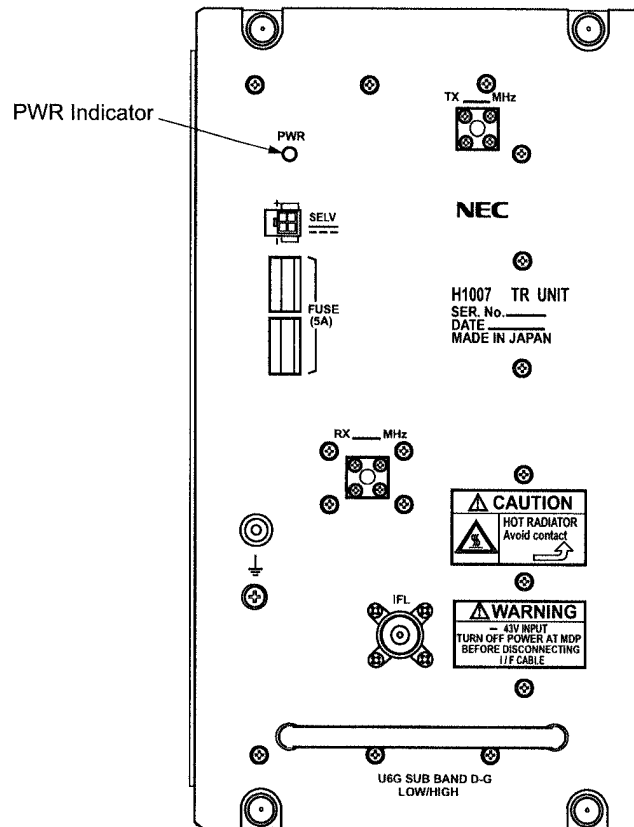
Fig. 3-2 TR UNIT Controls, Indicators and Test Jacks (3/3)

PWR indicator:

Lights when:

- DC power is supplied from DC IN to the TR UNIT.

4. EQUIPMENT START-UP AND SHUT-DOWN

Procedures for equipment start-up and shut-down are described below.

Warning: After turning ON the equipment, wait at least 1 minute before turning it OFF again. Repeatedly turning the power ON and OFF within a short interval may cause the NLite L to fail.

4.1 Start-up

The start-up procedure for the equipment is described in Chart 4-1.

Chart 4-1 Start-up

This procedure describes how to turn the power on/off after the initial lineup is completed and the configuration of frequency and transmit output level are also completed.

Caution: Do not apply to the equipment a voltage that varies sharply.

Caution: Do not apply to the equipment a voltage that varies sharply. The equipment may operate wrongly.

Caution: Do not remove/connect the IFL cable with the MDP power ON. Turn the MDP power OFF before connecting/ disconnecting the IFL cable or equipment may be damaged.

Apparatus:
  No required

Step	Procedure

Notes:1.   *The TRP power is supplied from the MDP through the IFL cable.*

     2.   *Supply the power to the SELV terminal on the MDP and TRP of the All Indoor Type before turn on the PWR switch on the MDP.*

     3.   *Power turn on procedures for No.1 and No.2 are identical.*

  1   Check that the IFL cable between the MD UNIT and the TR UNIT is firmly connected,

tep	Procedure (cont'd)
2	Check that every modules are properly installed on to the MDP shelf,
3	Turn on the PWR switch on the MDP (see Fig. 4-1),
4	Confirm that the PWR indicator on the MD UNIT lights.

No.1 PWR switch   No.1 PWR indicator

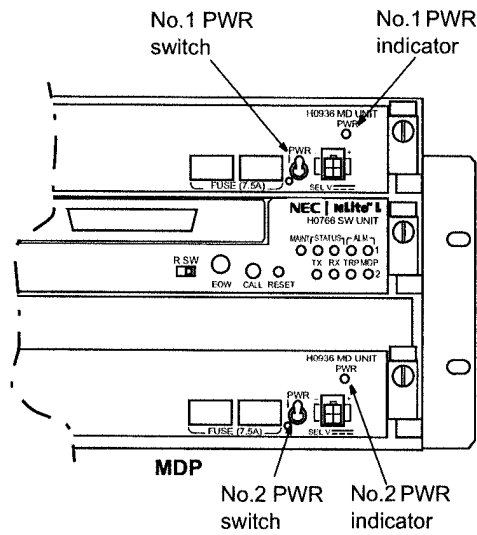No.2 PWR switch   No.2 PWR indicator

MDP

Fig. 4-1 Power Switch and Indicator Location

4.2 Shut-down

The shut-down procedure for the equipment is shown in Chart 4-2.

	Chart 4-2 Shut-down
Step	**Procedure**
1	Turn off the PWR switch on the front panel of the MD UNIT (see Fig. 4-1).
2	Confirm that the PWR indicator on the MD UNIT goes off.

5. SETTING, CONTROL AND MONITORING WITH LCT

This chapter outlines the local craft terminal (LCT) operation, system configuration setting/monitoring, and provisioning setting.

The operation for maintenance, alarm/status monitoring and performance monitoring are referred to the Section IV Maintenance.

5.1 General

The LCT operator must have the security system privilege to access/control systems. The system privilege menu item are listed as follows.

Login Level Menu	Administrator	User
Login	Admin	User
Password	12345678	(no use)
Alarm /Status	O	O
Performance Monitor		
• Display Metering/BER	O	O
• Display Performance Monitor	O	O
• Display Threshold Data	O	O
• Set Threshold Data	O	—
• RSL Monitor	O	—
Provisioning Data		
• Display Current Data	O	O
• Set Provisioning Data	O	—
System Configuration		
• Display Radio Equipment Configuration	O	O
• Setup Radio Equipment Configuration	O	—
Inventory Data		
• Display Inventory Data	O	O
Relay/House Keeping		
• Display Current State	O	O
• Relay Configuration	O	—
• Output Control	O	—
Maintenance		
• MAINT Mode	O	—
• Control	O	—
• Reset CPU	O	—
• Set Calendar	O	—
• Password Setting	O	—
• Program Download	O	—
Logout	O	O

Note: O ; possible, —; impossible

The password can be changed when "Admin" level is logged in. For procedures to change the password, refer to Chapter 5 in Section IV Maintenance.

Note: Do not forget the changed password. If you forget a password, report to NEC.

Equipment setting in provisioning data can not be changed in "User" level.

5.2 LCT Menu Items

General of menu tree for the 1+0/1+1 system is shown below.

Main Menu No.	LCT Menu					Login Level	
						Administrator	User
0	Logout					O	O
1	Alarm/Status					O	O
2	Performance Monitor	Display Metering/ BER				O	O
		Display Performance Monitor	15 min Register			O	O
			1 day Register			O	O
		Display Threshold Data				O	O
		Set Threshold Data	15 min Register			O	—
			1 day Register			O	—
		Display RSL Monitor				O	—
3	Provisioning Data	Display Current Data				O	O
		Set Provisioning Data	Main/LAN Signal Configuration	LAN (Main/WS/SC) function		O	—
				Main Interface		O	—
			BER Threshold	High BER		O	—
				Low BER		O	—
			Wayside Interface	Usage		O	—
				Line Length		O	—
			SC Assignment	RS232C		O	—
				V11-1		O	—
				V11-2		O	—
			MTPC TX PWR	No. 1		O	—
				No. 2		O	—
			ATPC Range	No. 1		O	—
				No. 2		O	—
			RX Threshold	No. 1		O	—
				No. 2		O	—
			Additional ATT	No. 1		O	—
				No. 2		O	—
			TRP ALM Mode			O	—
			TXSW/RXSW Priority			O	—
			Channel Usage Error			O	—
			AIS Activation Condition			O	—
			AIS Activation Delay Time			O	—
			AIS Generated Report	Main INTFC	Select CH	Report	O	—
						Not Report	O	—
				Wayside INTFC	*1	Report	O	—
						Not Report	O	—

Main Menu No.	LCT Menu						Login Level	
							Administrator	User
3			AIS Received Report	Main INTFC	Select CH	Report	O	—
						Not Report	O	—
				Wayside NTFC	*1	Report	O	—
						Not Report	O	—
4	System Configuration	Display Radio Equipment Configuration					O	O
		Setup Radio Equipment Configuration					O	—
5	Inventory Data	Display Inventory Data					O	O
6	Relay/ House keeping	Display Current State					O	O
		Relay Configuration					O	—
		Output Control					O	—
7	Maintenance	MAINT Mode	On				O	—
			Off				O	—
		Control	Current Status	—			O	—
			ATPC Manual Control	No. 1	Manual (Value [dB])		O	—
					Auto		O	—
				No. 2	Manual (Value [dB])		O	—
					Auto		O	—
			TXSW Manual Control	No. 1			O	—
				No. 2			O	—
				AUTO			O	—
			TX Mute	No. 1	On		O	—
					Off		O	—
				No. 2	On		O	—
					Off		O	—
			RXSW Manual Control	No. 1			O	—
				No. 2			O	—
				AUTO			O	—
			CW	No. 1	On		O	—
					Off		O	—
				No. 2	On		O	—
					Off		O	—
			IF Loopback	No. 1	On		O	—
					Off		O	—
				No. 2	On		O	—
					Off		O	—
			Main Signal Loopback (Near End)	CH	On		O	—
					Off		O	—
				ALL CH Off			O	—

Main Menu No.	LCT Menu					Login Level	
						Administrator	User
7	Maintenance	Control	Main Signal Loopback (Far End)	CH	On	O	—
					Off	O	—
				ALL CH Off		O	—
			LAN Device Reset *2	Port1		O	—
				Port2		O	—
			Linearizer Control *3	No. 1	Auto	O	—
					Reset	O	—
				No. 2	Auto	O	—
					Reset	O	—
			Antenna Alignment Mode	No. 1	On	O	—
					Off	O	—
				No. 2	On	O	—
					Off	O	—
		Reset CPU	MDP / Main Board			O	—
			MDP / MODEM			O	—
			TRP			O	—
		Set Calendar				O	—
		Password Setting				O	—
		Program Download	MDP / CTRL			O	—
			MDP / MODEM			O	—
			TRP			O	—

Notes: No. 1 or No. 2 in the table signifies CH number in the 1+1 system. In the 1+0 system, CH number is not displayed.

O; possible, —; impossible

*1;   Select CH number when 1+1 wayside system is applied. CH number is fixed to No.1 when 1+0 wayside system is applied.

*2;   This control is only available for the LAN INTFC is used.

*3;   Normally, the "Auto" mode is selected in default value and will be applied without change.

5.3 LCT Connection

Fig. 5-1 RS-232C Cable Pin Assignment

Fig. 5-2 LCT Setup

Table 5-1　Initial Setting Items

	Item	Remarks
1.	System Configuration	Chart 5-1 in this Section
2.	Date and Time Setting	Chart 5-2 in this Section
3.	Provisioning Setting	Chart 5-3 in this Section
4.	Relay/House Keeping Setting	Chart 5-4 in this Section

The communication/serial port settings of the personal computer used as local craft terminal (LCT) is listed below.

- Bits per second:　　19200
- Data bits:　　　　　8
- Parity:　　　　　　None
- Stop bits:　　　　　1
- Flow control:　　　　Hardware
- Emulation:　　　　　VT100 Video Terminal
- Transmission:　　　　Add CR at end of line : No
  (ASCII Sending)*　　(Send line ends with line feeds:No)*
  　　　　　　　　　Local echo : No
  　　　　　　　　　(Echo typed characters locally : No)*

- Receiving:　　　　　CR: No
  (ASCII Receiving)*　(Append line feeds to incoming line ends : No)*
  　　　　　　　　　Return on the right edge: Yes
  　　　　　　　　　(Wrap lines that exceed terminal width : Yes)*
  　　　　　　　　　Force incoming data to 7-bit ASCII: No

* Windows HyperTerminal settings.

Microsoft and Windows are either registered trademark of Microsoft Corporation in the United States and other countries.

These display screens are shown in Fig. 5-3.

Notes:1. For operating the LCT properly, do not use the arrow keys "→, ↑, etc." (as generates the ESC code).

*　　2. The operation check by HyperTerminal attached to Windows is performed by Windows 2000.*

The cable connector pin assignments are shown in Fig. 5-1. The length of the RS-232C cable between the personal computer and MDP should be less than 15 m.
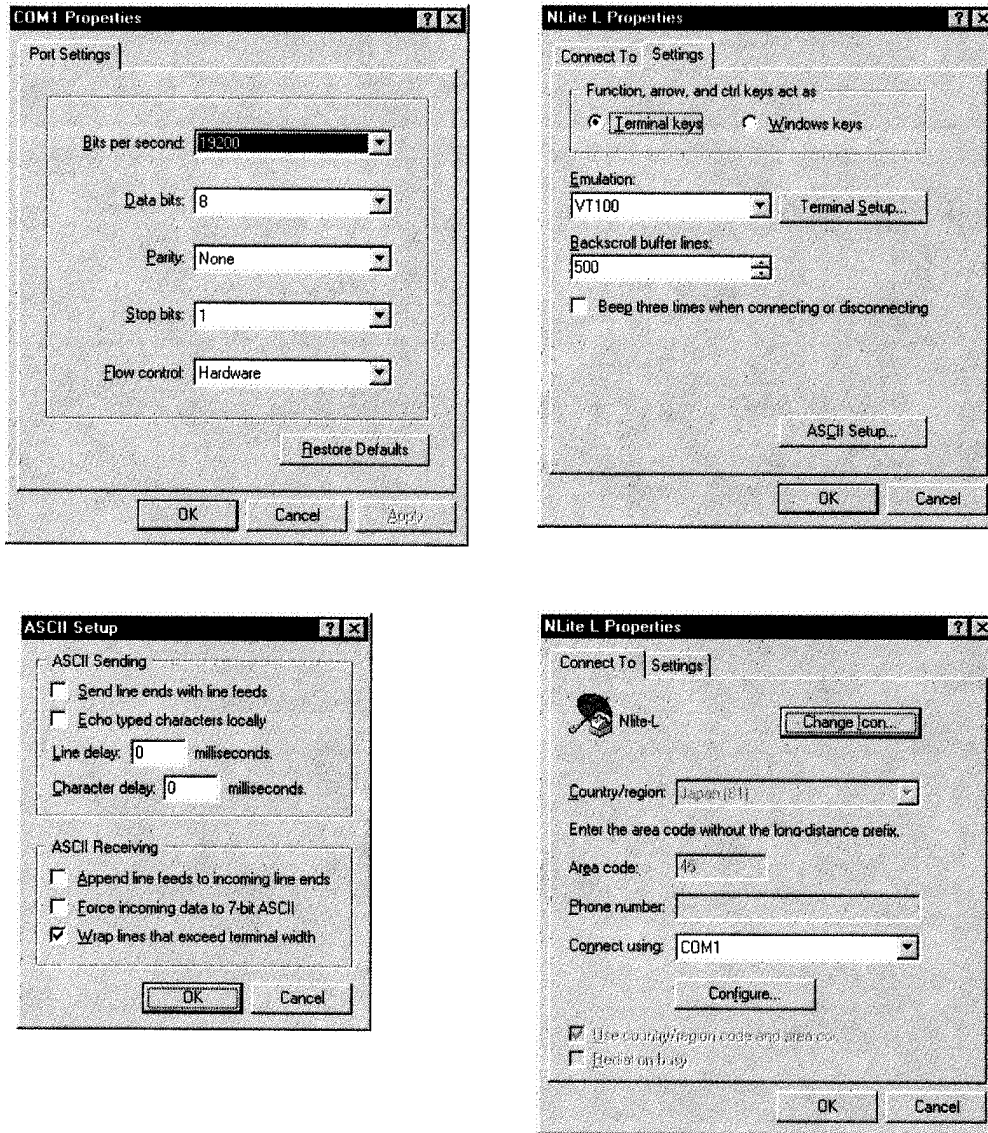
Note: Please refer to the above screenshots as an example for the HyperTerminal Setting.

Fig. 5-3 Display Screens

5.4 LCT System Configuration Setting

Chart 5-1 System Configuration

This chart describes the procedure for setting the system configuration.
The items to be set are as follows:
- Equipment Configuration
- Main Interface
- RF Frequency
- TX Power Control
- Frame ID

Setting of the system configuration should be performed in following order.

Step	Procedure
1	Referring to Fig. 3-5, connect the RS-232C cable between the LCT and the MDP,
2	Open the Terminal software (e.g; HyperTerminal),
3	Enter Login name "Admin" and press the "Enter" key,
4	Enter password "12345678" and press the "Enter" key,

Note: The factory default setting is "12345678". For procedures to change the password, refer to the Appendix in Maintenance section.

```
Login   : Admin
Password : ********

--- NEC PDH RADIO  VER. X.XX.XX ---
0. Logout
1. Alarm / Status
2. Performance Monitor
3. Provisioning Data
4. System Configuration
5. Inventory Data
6. Relay / House Keeping
7. Maintenance
Enter Selection :
```

Chart 5-1 System Configuration (Cont'd)

Step	Procedure

---

5   Press the "4" key for setting the System Configuration and press the "Enter" key,

Following is an explanation of each item under the System Configuration menu.

- Display Radio Equipment Configuration
  Selects to display radio equipment configuration.

- Setup Radio Equipment Configuration
  Selects to set radio equipment configuration.

6   Press the "1" key for setting the Display Radio Equipment Configuration and press the "Enter" key,

```
Enter Selection : 4

--- System Configuration ---
  1. Display Radio Equipment Configuration
  2. Setup Radio Equipment Configuration
Enter Selection : 1

--- Display Radio Equipment Configuration ---
System Configuration      : 1+1(Hot Standby)
TX Switch Type            : Mute
TX Frequency              : XXXXX.XXX[MHz]
RX Frequency              : XXXXX.XXX[MHz]
TX Power Control          : ATPC
Frame ID                  : 1
Main Interface            : 8*1.5M
Modulation                : 32QAM

--- System Configuration ---
  1. Display Radio Equipment Configuration
  2. Setup Radio Equipment Configuration
```

Notes: Modulation squema is related to the Main INTFC and is fixed as shown below.

$$8*1.5M \; : \quad 32 \, QAM$$
$$16*1.5M \; : \; 128 \, QAM$$
$$28*1.5M \; : \; 64 \, QAM$$
$$1*45M \; : \; 64 \, QAM$$

Chart 5-1 System Configuration (Cont'd)

Step	Procedure

7   Press the "2" key for setting the Setup Radio Equipment
        Configuration and press the "Enter" key,

```
--- Equipment Configuration ---
1. 1+0   (Expandable)
2. 1+1   (Hot Standby)
Current Setting : 1
Enter Selection ([RET]=No Change) : 1
```

8   Press the "1" key for 1+0 system or "2" key for 1+1 Hot
        Standby system and press the "Enter" key,

        When 1+1 Hot Standby system is selected, the "TX Switch
        Type" is displayed, press corresponding key and press the
        "Enter" key,

```
--- TX Switch Type ---
1. RF SW
2. Mute
Current Setting : 2
Enter Selection ([RET]=No Change) :
```

Note: Select necessarily "2. Mute" for the TRPs which are ODU type.

Then, "RF Frequency" is displayed,

```
--- RF Frequency ---
  Current  TX Frequency = XXXXX.XXX[MHz]
  Current  RX Frequency = XXXXX.XXX[MHz]
  Start    TX Frequency = XXXXX.XXX[MHz]
  Stop     TX Frequency = XXXXX.XXX[MHz]
  Shift       Frequency = XXXXX.XXX[MHz]
Enter TX Frequency ([RET] = No Change) :
```

It is necessary to set frequencies of the TRPs. When the
transmitting frequency is set, the receiving frequency is
automatically set. The actual transmit frequency setting that
is entered should be within the TX frequency band of the
TRP. The "Start", "Stop" and "Shift" frequencies are
displayed on the LCT.

Chart 5-1 System Configuration (Cont'd)

Step	Procedure

```
--- RF Frequency ---
   New RX Frequency = XXXXX.XXX[MHz]
   Start RX Frequency = XXXXX.XXX[MHz]
   Stop RX  Frequency = XXXXX.XXX[MHz]
Enter RX Frequency ([RET] = No Change) :
```

9   Enter transmit frequency and press the "Enter" key,

```
TX Frequency =  XXXXX.XXX[MHz]
RX Frequency=  XXXXX.XXX[MHz]
Are You Sure ? (Y/N)  :  Y
```

Note: The receive frequency is automatically decided by entered transmit frequency.

When the 6/24 GHz TRP for split type or Indoor type e/w FAN is used, RX frequency setting is assignable no concerned with the TX frequency values.

10   When prompted "Are You Sure? (Y/N)", press the "Y" and press the "Enter" key,

```
--- TX Power Control ---
1. MTPC
2. ATPC
Current Setting : 1
Enter Selection ([RET] = No Change) :
```

An operation mode of transmission power control is selected from the following two modes.

ATPC : Automatic Transmission Power Control

MTPC : Manual Transmission Power Control

Note: Set the MTPC mode during antenna orientation. Set to the ATPC mode after antenna orientation has been completed.

Chart 5-1 System Configuration (Cont'd)

Step   Procedure

---

11   After setting, press the "Enter" key for setting the Frame ID,

```
--- Frame ID ---
Current Setting : 1
Enter ID No. (1-32) ([RET] = No Change) :
```

The Frame ID provides to discriminate the data channel. The ID should be matched with the opposite station. If different ID is set, communications cannot be established, therefore, confirm the ID used opposite station before reset the ID. The number of IDs which can be set up from/to 32; ID1 through ID32.

12   After setting the Frame ID, press the "Enter" key. When prompted "Are You Sure? (Y/N)", press the "Y" and press the "Enter" key,

13   After setting the System Configuration, proceed to Chart 5-2 for time setting.

Chart 5-2 Date and Time Setting

This chart describes the procedure for setting date and time. When the MDP is turned off for an extended period (i.e. approx. 1 week), the equipment time setting could have been cleared. In such case, verify and re-enter the time setting after turning on the MDP.

Step   **Procedure**

---

1   Press the "ESC" key to go back to the following Main menu,

```
--- NEC PDH RADIO  VER. X.XX.XX ---
0. Logout
1. Alarm / Status
2. Performance Monitor
3. Provisioning Data
4. System Configuration
5. Inventory Data
6. Relay / House Keeping
7. Maintenance
Enter Selection :
```

2   Press the "7" key for Maintenance and press the "Enter" key,

```
Enter Selection : 7

--- Maintenance ---
1. MAINT Mode (OFF)
2. Control
3. Reset CPU
4. Set Calendar
5. Password Setting
6. Program Download
Enter Selection : 4

--- Set Calendar ---
Enter Year    : 2007
Enter Month  : 10
Enter Day     : 28
Enter Hour    : 18
Enter Min     : 20
Enter Sec     : 40

Are You Sure ? (Y/N) :  Y

Success !!
```

3   Press the "4" key for setting the Set Calendar and press the "Enter" key,

4   Set all calendar items according to display of the LCT,

Chart 5-2 Date and Time Setting (Cont'd)

Step	Procedure
5	When prompted "Are You Sure? (Y/N)", press the "Y" and press the "Enter" key,
6	After setting the time, proceed to Chart 5-3 for the Provisioning setting.

5.5 Provisioning Setting

Chart 5-3 Display Provisioning Data

This chart describes the procedure for setting the provisioning data.

Step	Procedure

---

1   Press the "ESC" key to go back to the following menu,

```
--- NEC PDH RADIO  VER. X.XX.XX ---
0. Logout
1. Alarm / Status
2. Performance Monitor
3. Provisioning Data
4. System Configuration
5. Inventory Data
6. Relay / House Keeping
7. Maintenance
Enter Selection : 3
```

2   Press the "3" key for Provisioning Data and press the "Enter" key,

```
--- Provisioning Data ---
1. Display Current Data
2. Set Provisioning Data
Enter Selection : 1
```

Following is an explanation of each item of Provisioning item.

- Display Current Data
  Selects to display current provisioning data.

- Set Provisioning Data
  Selects to set provisioning data.

3   Press the "1" key to display provisioning current data,

Chart 5-3 Display Provisioning Data (Cont'd)

Step	Procedure

```
--- Provisioning Data ---
 1.Display Current Data
 2.Set Provisioning Data
Enter Selection : 1

--- Display Current Data ---
--- Main INTFC ---
Channel Usage              (CH01-08): ########........ *1
                           (CH09-16): *--**--*
Bipolar Code               (CH01-04): -
                           (CH05-08): -
                           (CH09-12): AMI
                           (CH13-16): B8ZS
Line Length                (CH01-04): -
                           (CH05-08): -
                           (CH09-12): 133-266ft ( 40- 81m)
                           (CH13-16): 266-399ft ( 81-121m)

Next Data ? (Y/N) :  y

--- Main INTFC ---
AIS Generated Report       (CH01-08): ########  ........ *2
                           (CH09-16): *--**--*
AIS Received Report        (CH01-08): ########
                           (CH09-16): *--**--*

Next Data ? (Y/N) :  y

---- LAN INTFC ---........ *3
Port Switching                         : Enable ....... *4
Port Assignment                        : Main Shared ........ *5
Port1+2 Throughput                     : 1.5Mbps(CH01)...... *6
Port1+2 1.5M Frameing format           : UF (Unframed)...... *7
Port1 Setting                          : Auto Negotiation(Auto MDI/MDIX)
Port1 Collision Report                 : Enable...... *8
Port1 Flow Control                     : Enable...... *9
Port1 Link Down Control                : Enable...... *4, *10

Port2 Setting                          : Auto Negotiation(Auto MDI/MDIX)
Port2 Collision Report                 : Enable
Port2 Flow Control                     : Enable
Port2 Link Down Control                : Enable......*4, *10, *11

Next Data ? (Y/N) :  y
```

Chart 5-3 Display Provisioning Data (Cont'd)

Step	Procedure

Notes: *1. "*" indicates CH is used, "-" indicates CH is not used, "#" indicates assigned to LAN . CH numbers are not displayed for the 1*45MB system.

2. "" indicates to Report, "-" indicates is not to Report, "#" indicates assigned to LAN .

*3. Displayed when the LAN function for 8*1.5MB, 16*1.5MB, 28*1.5MB or 1*45MB system is set to "Main LAN". For the details of LAN interface, refer to attached "Application and Setting of the 10/100BASE-T(X)" in Section IV Maintenance.

*4. Displayed when the LAN function is set to SC Shared, WS Shared and Main Shared.

*5. Indicates NA/Main/SC/WS/Main shared/SC Shared or WS shared which is corresponding to the assigned channel for Port1 / Port2. When Port Assignement is either SC Shared, WS Shared or Main Shared, only one item is indicated.

*6. Throughput:

The throughput is displayed according to the predefined "Main / LAN Signal Configuration".

*7. The Port1/2 Frame Mode is displayed only when the Port1/2 throughput is 1.5Mbps or 1.5Mbps (WS). When the Port Assigment is Main Shared as well as 1.5Mbps, Port2 Frame Mode is not displayed in WS Shared, and then "Port1 Frame Mode" is displayed as "Port1+2 Frame Mode".

*8. Collision Report:

In HALF-Duplex mode, it is selected that is reported or not reported about collision conditions at each port. (default value is Not Report)

*9. Flow Control:

Enable: Effective flow control (default value is Enable).
Disable: Non-effective flow control.

*10. Link Down Control:

Setting of the Link Down Control mode is effective or no effective. (See Link Loss Forwarding description in the Section II Operation) (default value is Disabled).

*11 Link Down Control

Not displayed when Port setting is "Enable".

Chart 5-3 Display Provisioning Data (Cont'd)

Step	Procedure

		EXTERNAL EQUIPMENT						
SETTING POSITION **LAN PORT** **SETTING POSITION**		Auto Negotiation	10BASE-T/Half Duplex	10BASE-T/Full Duplex	100BASE-TX/Half Duplex	100BASE-TX/Full Duplex	10BASE-T/Half Duplex(FIX)	100BASE-TX/Half Duplex(FIX)
Auto Negotiation (Auto MDI/MDI-X)		√	—	—	—	—	√	√
10BASE-T/Half Duplex (MDI/MDI-X*)		—	√	—	—	—	—	—
10BASE-T/Full Duplex (MDI/MDI-X*)		—	—	√	—	—	—	—
100BASE-TX/Half Duplex (MDI/MDI-X*)		—	—	—	√	—	—	—
100BASE-TX/Full Duplex (MDI/MDI-X*)		—	—	—	—	√	—	—

√ : A setup is possible.

MDI/MDI-X is selected according to the cable type or terminal type to be used (straight or cross type).

Chart 5-3 Display Provisioning Data (Cont'd)

Step	Procedure

```
---- Wayside INTFC---
Usage                     : 1.5MB (AMI)
Line Length               : 0 - 133ft (0 - 40m)
AIS Generated Report      : Report
AIS Received Report       : Report
Next Data ? (Y/N) :  y

---- SC Assignment ---
RS232C Setting            : Not Used
V11-1 Setting             : DSC1
V11-1 Direction Type      : Contra-directional
V11-2 Setting             : DSC2
V11-2 Direction Type      : Contra-directional
Next Data ? (Y/N) :  y

--- MDP ---
High BER                  : 3E-4
Low BER                   : 3E-7
AIS Activation Condition  : LOF or High BER
AIS Activation Delay Time : Include
MTPC TX PWR               : -15dB      -15dB      *1
ATPC Maximum PWR          :   0dB        0dB    ⎫ *2
ATPC Minimum PWR          : -23dB      -23dB    ⎭
RX Threshold              : -55dBm     -55dB
Additional ATT            :   0dB        0dB
TRP ALM Mode              : HOLD
TXSW Priority             : Non-priority
RXSW Priority             : Priority No.1

--- Provisioning Data ---
 1.Display Current Data
 2.Set Provisioning Data
Enter Selection :
```

*1. *Indicates when the MTPC is selected in system configuration.*
*2. *Indicates when the ATPC is selected in system configuration.*

Chart 5-4 Set Provisioning Data

Step	Procedure

---

1   Press the "2" key and press the "Enter" key,

```
--- Provisioning Data ---
1. Display Current Data
2. Set Provisioning Data
Enter Selection : 2

--- Set Provisioning Data ---
1.  Main / LAN Signal configuration
2.  BER Threshold
3.  Wayside Interface....... *1
4.  SC Assignment
5.  MTPC TX PWR........ *2
6.  ATPC Range     ........ *3
8.  RX Threshold
9.  Additional ATT
10. TRP ALM Mode
11. TX SW Priority  ........ *4
12. RX SW Priority ........ *4
13. Channel Usage Error
16. AIS Activation Condition
17. AIS Activation Delay Time
18. AIS Generated Report
19. AIS Received Report
Enter Selection :
```

Notes: Setting items displayed on the LCT depend on setting condition of "System Configuration".

　　*1. Displays when the 28 × 1.5 MB or 1 × 45 MB is selected in system configuration.

　　*2. Displays when the MTPC is selected in system configuration.

　　*3. Displays when the ATPC is selected in system configuration.

　　*4. Displays when equipment configuration is 1+1 system.

Chart 5-4 Set Provisioning Data (Cont'd)

Step	Procedure

<u>For 8/16/28 × 1.5 MB system</u>

2   Press the "1" key for the Main/LAN Signal configuration menu and press the "Enter" key. Then select the channel number to be set,

```
--- LAN (Main / WS / SC) function ---
1. Used
2. Not Used
Current Setting : 1
Enter Selection ([RET]=No Change) : 2
```

3   Press the "1" key and press the "Enter" key when LAN is not provided,

```
--- Main Interface Setting ---
--- CH01 Usage ---
1. Used
2. Not Used
Current Setting : 1
Enter Selection ([RET] = No Change) :
```

The main channel signal to be used is selected from the following items.

Used :   When the 1.5 Mbps signal is applied, select the "Used" in corresponding channel.

Not Used : When the 1.5 Mbps signal is not applied, select the "Not Used" in corresponding channel.

```
--- Main Interface Setting ---
--- CH02 Usage ---
1. Used
2. Not Used
Current Setting : 1
Enter Selection ([RET] = No Change) :
```

4   After setting, press the "Enter" key for continue other channels,

```
--- CH01-04 Bipolar Code Select ---
1. AMI
2. B8ZS
Current Setting : 1
Enter Selection ([RET] = No Change) :
```

Set AMI or B8ZS and line length for each 4 CH block.

Chart 5-4 Set Provisioning Data (Cont'd)

Step	Procedure

5   Press the "1" or "2" key and press the "Enter" key,

```
--- CH01-04 Line Length Select ---
1.    0 -  133ft (   0 -  40m )
2.  133 -  266ft (  40 -  81m )
3.  266 -  399ft (  81 - 121m)
4.  399 -  533ft ( 121 - 162m)
5.  533 -  655ft ( 162 - 199m)
Current Setting : 1
Enter Selection ([RET] = No Change) :
```

When the Line Length selection is performed for the CH25 to CH28 in 28 × 1.5 MB system, set the rotary switch CH27 or CH28 on the 1.5M SUB INTFC to any 0, 6, 7, 8, 9 or F position.

Note: For respective CH27 and CH28, the Line Length selection can be performed using rotary switch on the 1.5M SUB INTFC, too. For the details of the rotary switch, refer to 3 CONTROLS, INDICATORS AND TEST JACKS in this Section II.

6   Enter item number for corresponding Line Lengh and press the "Enter" key,

Set AMI or B8ZS and line length for each 4 CH block.

7   After setting, press the "Enter" key to go back to the menu shown in step 1,

8   Press the "1" key and press the "Enter" key,
Note: Applies only for MAIN LAN system.

```
--- LAN (Main / WS / SC) function ---
1. Used
2. Not Used
Current Setting : 2
Enter Selection ([RET]=No Change) : 1
```

9   Press the "1" key and press the "Enter" key when LAN is provided,

---

Chart 5-4 Set Provisioning Data (Cont'd)

Step	Procedure

```
-- LAN Interface Setting --
--- Port1/Port2 Assignment ---
  1. SC      /  NA
  2. WS      /  NA........ *1
  3. Main    /  NA.
  4. SC      /  SC
  5. SC      /  WS........ *1
  6. Main    /  SC.
  7. Main    /  WS........ *1
  8. Main    /  Main.
  9. SC Shared
 10. WS Shared....... *1
 11. Main Shared

Enter Selection :  1
```

Note: *1; displayed only when optional WS is provided.*

When the SC is assigned in Port1/Port2 for LAN, the LAN port is shared as following

10   Enter item number for assignment of LAN Port and press the "Enter" key,

LAN port assignement for SC/WS/Main signal is displayed for Port1 / Port2 or Shared (i.e. Port1+Port2).

When Port1 is assigned to SC/NA, SC/WS or Port1+Port2 to SC Shared, the throughput for SC signal is selectable from either 64kbps or 128kbps.

When Port1 is assigned to WS, throughput for WS signal in Port1 is fixed in 1.5Mbps.

```
--- Port1 Throughput ---
 1.  64kbps
 2.  128kbps
Current Setting : 2
Enter Selection ([RET]=No Change) : 1
```

When Port1 is assigned to 1.5Mbps Main signal, throughput for Main signal is selectable at Main/NA, Main/SC, Main/WS and Main/Main according to Main signal interface.