

## 6 INITIAL TURNUP

### 6.1 SECTION INTRODUCTION

This section describes the procedures required to turn up the MDR-8000 Microwave Digital Radios after installation.

This provisioning part of the section describes provisioning options available with the MDR-8000 software application. Provisioning allows for the definition, editing, and storing of specific functions. The MDR-8000 provides the ability to provision equipment and facilities through a series of Windows™-based screens and messages. The Provisioning menu lists equipment and functions which may be provisioned. You should use only those provisioning screens that are applicable to your radio. Refer to the Users Guide section and applicable DS1/E1, DS3, or OC3 Initial Turnup section on the attached CD for more information.

### 6.2 RECOMMENDED SEQUENCE

Perform the following initial turnup procedures in sequence:

- 1 Install software on PC.

**Note**

*Software installed at the factory before delivery should not be overwritten by downloading to the radio controller at initial turnup. Refer to Maintenance section on the attached CD for procedure to upgrade existing software.*

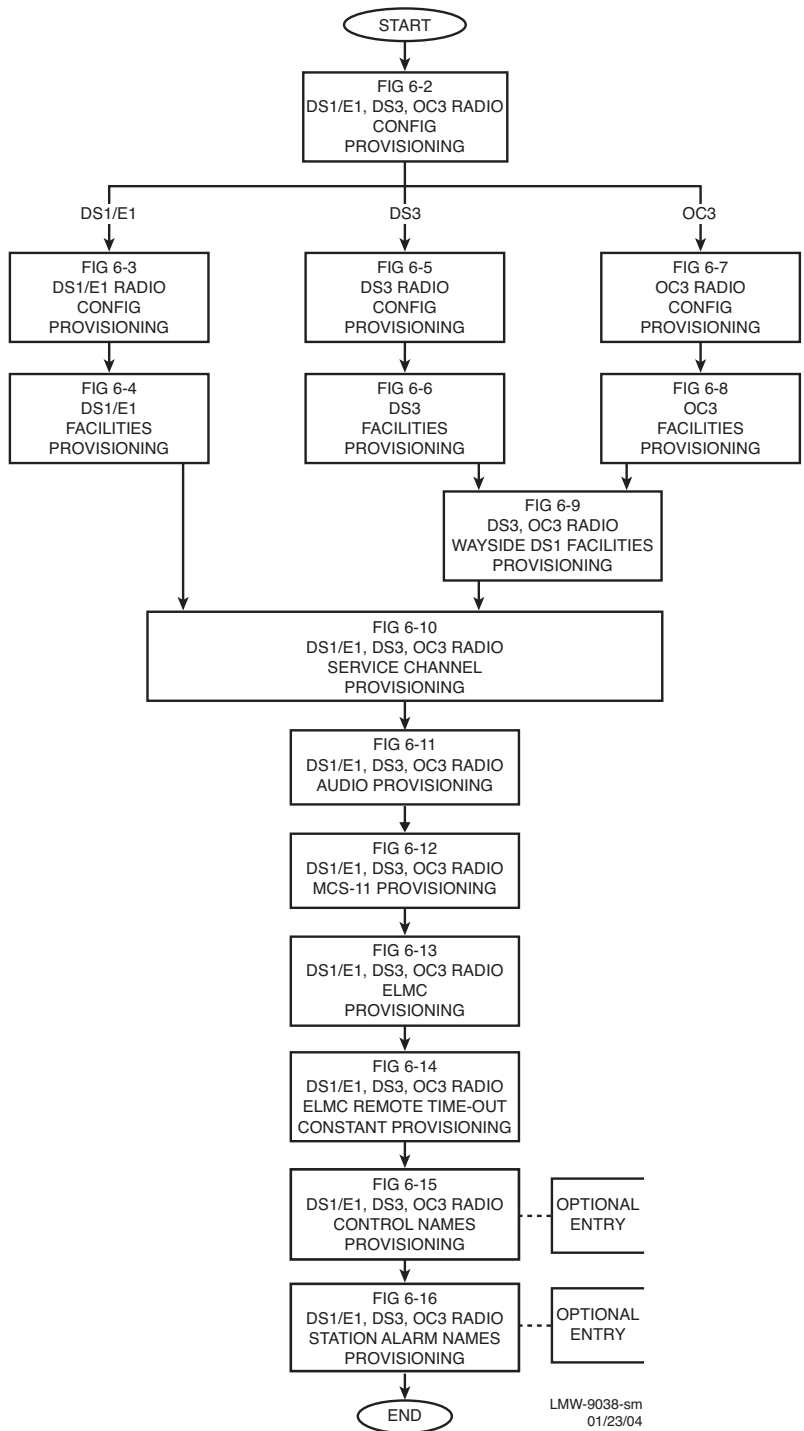
- 2 Establish communication between radio and USI computer.

**Note**

*Saving provisioning on disk provides a reference for any future provisioning changes.*

- 3 Provision radio. See Figure 6-1.

The radio has been properly aligned and tested at the factory before shipment eliminating the need for testing after initial turn-up. The only time testing and/or adjustment is required is after a maintenance action such as removal and replacement procedure and/or constant alarms requiring corrective maintenance action. The completed maintenance action procedure(s) will reference any required test procedure(s).



LMW-9038-sm  
01/23/04

**Figure 6-1 Provisioning Sequence**

### 6.3 PROVISIONING RADIO

#### Note

Screen shown is for DS1 Radio. DS3 and OC3 radio configuration provisioning is similar. Changes to provisioning do not have to be made in any particular order.

Open radio provisioning screens. On main screen, double click on tower icon. Status and alarm screen displays. Click on Provisioning. Check current provisioning and change as required.

The screenshot shows a provisioning interface with the following fields and callouts:

- SYSTEM ID:** ELMC; TEST1
- RADIO LINK ID:** Disable
- RADIO TYPE:** MDR-8000 DS1, 16 LINES, 128 TCM, 6-8 GHz
- RADIO CONFIG:** HS Tx/HS Rx, TERMINAL, ATPC Enabled, A&B PA Present
- SYSTEM ALARM:** Visual/Audible, Relays ON/NO, Station Alarm 13-16, RSL Alarm Enable
- RCV SWITCHING:** RSL-Sw Enable, Eye BER Disable
- OPTIONS:** Option Key: Stat/Prov/WaySide

Callout boxes provide detailed instructions for each field:

- DISPLAYS NUMBER OF LINES AVAILABLE AS DETERMINED BY CAPACITY KEY. CHANGING NUMBER OF LINES REQUIRES CHANGING CAPACITY KEY.** (Points to 16 LINES)
- BACKSPACE TO DELETE CURRENT ADDRESS AND ENTER 5-DIGIT REMOTE RACK ADDRESS. SEE FIGURE 6-11 FOR DETAILS.** (Points to ELMC; TEST1)
- ENABLE OR DISABLE AUTOMATIC POWER CONTROL (ATPC) FUNCTION. SELECT **ATPC Disable**, **ATPC Enabled**, OR **ATPC with Timeout** FROM DROP DOWN LIST. SEE SHEET 2 OF 3 FOR DETAILS.** (Points to ATPC Enabled)
- DISPLAYS RADIO TYPE. NOT PROVISIONABLE.** (Points to MDR-8000 DS1)
- SELECT **TERMINAL**, **REPEATER**, **RING TERMINAL** OR **RING REPEATER** FROM DROP DOWN LIST. SELECT **REPEATER** IF TRAFFIC AND SERVICE CHANNEL (FOUR RAILS OF X/Y DATA) ARE BEING TRANSPORTED BETWEEN J314 OF BOTH SHELVES.** (Points to TERMINAL)
- DISPLAYS MODULATION SCHEME. NOT PROVISIONABLE.** (Points to 128 TCM)
- SELECT **DISABLE** OR DOUBLE CLICK TO ENABLE (00 DISPLAYS). ENTER 2-DIGIT NUMBER BETWEEN 00 AND 99 AS IDENTIFICATION FOR RADIO RCV/XMT PAIR. USE FOR FREQUENCY COORDINATION IN CONGESTED AREAS THAT HAVE NEARBY TRANSMITTERS AT SAME FREQUENCY WITH SAME MODULATION. ID MUST BE SAME AT BOTH ENDS OF HOP. IF RCV ID DOES NOT MATCH ID RECEIVED FROM FAR-END XMTR, A USI ALARM AND RACK ALARM ARE GENERATED.** (Points to 6-8 GHz)
- SELECT **RSL-Sw Enable** TO ENABLE AUTOMATIC RECEIVER SWITCHING BASED ON RSL. WHEN ENABLED, RECEIVER SWITCHES IF: 1. ON-LINE RCV RSL IS BELOW RCV AGC THRESHOLD, AND 2. OFF-LINE RCV RSL IS ABOVE RCV AGC THRESHOLD. SELECT **RSL-Sw Disable** TO DISABLE AUTOMATIC RECEIVER SWITCHING.** (Points to RSL-Sw Enable)
- SELECT **Major/Minor** TO TRIGGER MAJOR ALARM ON ANY ALARM ON ON-LINE SIDE AND MINOR ALARM ON ANY ALARM ON OFF-LINE SIDE. SELECT **Visual/Audible** TO TRIGGER RACK ALARM ON ANY ALARM ON ON-LINE SIDE.** (Points to Visual/Audible)
- DISPLAYS ELMC OPTION KEY TYPE INSTALLED ON CONTROLLER. STAT (STATUS)/PROV (REMOTE PROVISIONING)/WAYSIDE (WITH WAYSIDE DS1 MONITORING). NOT PROVISIONABLE. CHANGING DISPLAY REQUIRES CHANGING OPTION KEY.** (Points to Option Key: Stat/Prov/WaySide)
- SELECT **Station Alarm 13-16** TO ENABLE STATION ALARM 13-16 INPUTS TO RELAY INTFC. WHEN EXTERNAL TBOS IS WIRED TO RADIO, SELECT **TBOS Display 1-8** TO ENABLE TBOS DRIVERS ON CONTROLLER AND SELECT A TBOS DISPLAY (1-8) TO VIEW.** (Points to Station Alarm 13-16)
- SELECT **A&B PA Present** IF SHELF IS EQUIPPED WITH A&B PAs, A OR B PA ONLY IF RACK IS EQUIPPED WITH ONLY ONE PA, OR **NO PA** IF SHELF IS NOT EQUIPPED WITH PA. UNEQUIPPED PA ALARMS ARE DISABLED.** (Points to A&B PA Present)
- SELECT APPROXIMATE ERROR RATE AT WHICH EYE CLOSURE ALARM ACTIVATES AND SWITCHING OCCURS: **EYE BER=1X10<sup>-5</sup>**, **1X10<sup>-6</sup>**, **1X10<sup>-7</sup>**, **1X10<sup>-8</sup>** OR SELECT **Eye BER Disable** TO ACTIVATE ALARMS AT APPROXIMATELY 1X10<sup>-6</sup> WITHOUT RECEIVERS SWITCHING.** (Points to Eye BER Disable)
- SELECT **Relays ON/NO** (NORMALLY OPEN-HIGH IMPEDANCE) OR **Relays ON/NC** (NORMALLY CLOSED-GROUND) ON ALARM FOR ALARM/STATUS OUTPUTS OR **Relays OFF**. REFER TO RELAY INTERFACE IN THEORY SECTION FOR DETAILS.** (Points to Relays ON/NO)

LMW-7084  
Sheet 1 of 2  
02/04/03

Figure 6-2 DS1/E1, DS3, OC3 Radio Configuration Provisioning (Sheet 1 of 4)

**Note**

Screen shown is for DS1 Radio. DS3 and OC3 radio configuration provisioning is similar. Changes to provisioning do not have to be made in any particular order.

**NOTES**

1. ATPC T/O IS A CMD PATH FUNCTION PERFORMED AT XMTR.
2. ATPC TRACKS RCVR WITH HIGHEST LEVEL.
3. LOW POWER ATPC IS 10dB DOWN FROM HIGH POWER.

SELECT **ATPC** OR **ATPC T/O** ENABLE AUTOMATIC XMT POWER CONTROL (ATPC) FUNCTION. WHEN PROVISIONED **ATPC** OR **ATPC T/O**, ONE RCVR OUT-OF-LOCK CAUSES HIGH POWER ATPC FOR 10 SECONDS EVERY ONE MINUTE. IF BOTH RCVRs ARE OUT-OF-LOCK, ATPC GOES TO HIGH POWER AND STAYS AT HIGH POWER UNTIL ONE RCVR (REVERTS TO ONE RCVR OUT-OF-LOCK MODE) OR BOTH RCVRs LOCK. WHEN PROVISIONED **ATPC T/O** (TIMEOUT), IF CMD PATH IS LOST, ATPC GOES TO HIGH POWER FOR FIVE MINUTES THEN GOES TO LOW POWER. THEN, EVERY HOUR, ATPC GOES HIGH FOR 10 SECONDS AND THEN GOES TO LOW POWER. THIS CONTINUES UNTIL THE CMD PATH IS RESTORED. SELECT **DISABLE** TO DISABLE ATPC FUNCTION.

SYSTEM ID:	ELMC: TEST1	RADIO LINK ID: Disable		
RADIO TYPE:	MDR-8000 DS1	16 LINES	128 TCM	6-8 GHz
RADIO CONFIG:	HS Tx/HS Rx	TERMINAL	ATPC Enabled	A&B PA Present
SYSTEM ALARM	Visual/Audible	RELAYS ON/NO	Station Alarm 13-1	RSL Alarm Enable
RCV SWITCHING:	Disable AGC	BER Disable		
OPTIONS:	Option Key: Stat/Prov/WaySide			

LMW-7085  
Sheet 2 of 2  
06/04/02

SELECT **RSL Alarm Enable** TO ENABLE ALARM ON USI ALARM AND STATUS SCREEN WHEN RSL DROPS BELOW THRESHOLD. SELECT **RSL Alarm Disable** TO INHIBIT ALARM.

Figure 6-2 DS1/E1, DS3, OC3 Radio Configuration Provisioning (Sheet 2 of 4)

**Note**

**MASTER RING CONFIGURATIONS** – Master rings are networks that consist entirely of a loop of synchronous repeaters. All nodes in the same ring direction use the same clock timing. Timing may be different for each direction. All service channel data is passed synchronously around the ring. The status of the ring is monitored using messages in the ELMC channel.

**SUBTENDING RING CONFIGURATIONS** – Subtending rings are networks that connect asynchronously to another ring at two locations (called primary and secondary connection points). The networks consist of a string of synchronous repeaters. All nodes in the same direction use the same clock timing. Timing may be different for each direction. All service channel data is passed synchronously within the subtending ring section and asynchronously to the main ring. Asynchronous connection must use LMC1 for the ELMC connection. Messages are sent on LMC1 by the subtending ring primary and secondary nodes to monitor for continuity of the synchronous connection.

SELECT **RING REPEATER MASTER** AT ANY ONE RADIO IN THE RING, TO ENABLE THE CONFIGURATION THAT IS USED TO BREAK THE LOOP OF A SYNCHRONOUS RING. IN THIS CONFIGURATION, THE RF SERVICE CHANNEL AND REPEATER SYNC ARE DISABLED (NORMALLY ENABLED), PREVENTING THE RING FROM CLOSING ON ITSELF. WHEN A RING FAILURE OCCURS, THE MASTER RECEIVES A RING FAIL MESSAGE FROM THE FAILED RADIO AND RESPONDS BY ENABLING THE RF SERVICE CHANNEL AND REPEATER SYNC TO CONNECT THE SERVICE CHANNELS. THE FAILURE IS WHAT NOW BREAKS THE SERVICE CHANNEL LOOP, PREVENTING THE RING FROM CLOSING ON ITSELF.

SYSTEM ID: ELMC: TEST1 RADIO LINK ID: Disable  
RADIO TYPE: MDR-8000 DS1 16 LINES 128 TCM 6-8 GHz  
RADIO CONFIG: HS Tx/HS Rx Ring Repeater Normal  
ATPC Enabled  
SYSTEM ALARM Visual/Audible  
RCV SWITCHING: RSL-SW Enable  
OPTIONS: Option Key: Stat/Prov/WaySide

LMW-9088  
09/08/03

- SELECT **RING REPEATER NORMAL** AT ALL RADIOS IN THE RING, EXCEPT THE ONE PROVISIONED **MASTER**, TO ENABLE THE CONFIGURATION THAT ENABLES RF SERVICE CHANNEL AND REPEATER SYNC, ALLOWING SERVICE CHANNEL DATA TO PASS THROUGH THE RF AND REPEATER PORTS. WHEN A FAILURE IS DETECTED ON THE RF OR REPEATER PORT, THE ASSOCIATED RADIO SENDS A RING FAIL MESSAGE TO THE MASTER.
- SELECT **RING REPEATER PRIMARY** WHEN THE RADIO IS IN THE MIDDLE OF A SUBTENDING RING AND IS THE PRIMARY SERVICE CHANNEL CONNECTION POINT TO ANOTHER RING. IN THIS CONFIGURATION, THE RF SERVICE CHANNEL AND REPEATER SYNC ARE ENABLED, ALLOWING SERVICE CHANNEL DATA TO PASS THROUGH THE RF AND REPEATER PORTS. WHEN A FAILURE OCCURS, THE RF SERVICE CHANNEL AND REPEATER SYNC ARE DISABLED.
- SELECT **RING REPEATER SECONDARY** WHEN THE RADIO IS IN THE MIDDLE OF A SUBTENDING RING AND IS THE SECONDARY SERVICE CHANNEL CONNECTION POINT TO ANOTHER RING. IN THIS CONFIGURATION, THE RF SERVICE CHANNEL AND REPEATER SYNC ARE DISABLED. WHEN A FAILURE OCCURS, THE RF SERVICE CHANNEL IS ENABLED.

**Figure 6-2 DS1/E1, DS3, OC3 Radio Configuration Provisioning (Sheet 3 of 4)**

→ **RING TERMINAL MASTER – NOT USED**

The screenshot shows a configuration interface with the following fields and values:

- SYSTEM ID:** [Empty]
- ELMC:** TEST1
- RADIO LINK ID:** Disable
- RADIO TYPE:** MDR-8000 OC3, OC-3, 128 QAM
- RADIO CONFIG:**
  - HS Tx: [Dropdown]
  - HS Rx: [Dropdown]
  - Ring Repeater: [Dropdown menu open showing: Normal, Terminal Repeater, Ring Terminal, Ring Repeater, Upgrade Enable]
  - ATPC Enabled: [Dropdown]
  - A&B PA Present: [Dropdown]
- SYSTEM ALARM:** Visual/Audible, RELAYS ON/NO [Dropdown]
- RCV SWITCHING:** Disable AGC, BER Disable [Dropdown]
- OPTIONS:** Option Key: Stat/Prov/WaySide

Arrows from the text below point to the 'Ring Repeater' dropdown menu and the 'Normal', 'Primary', and 'Secondary' options within it.

LMW-9089  
09/08/03

→ SELECT **RING TERMINAL NORMAL** AT FIRST RADIO IN AN INCOMPLETE RING, WHEN BUILDING OUT A NEW RING, AND PREVENT HAVING TO GO BACK AND REPROVISION EACH RADIO WHEN THE RING IS COMPLETE. AS EACH NEW HOP IS ADDED, PROVISION THE RADIOS ON EACH END AS **RING TERMINAL NORMAL** AND PROVISION ALL RADIOS IN BETWEEN AS **RING REPEATER NORMAL**. IN THE **RING TERMINAL NORMAL** CONFIGURATION, THE REPEATER CABLE IS NOT INSTALLED. SYNC ALARMS ARE INHIBITED. THE RF SERVICE CHANNEL IS ENABLED, ALLOWING SERVICE CHANNEL DATA TO PASS THROUGH THE RF PORT. WHEN THE RING IS COMPLETE, PROVISION ONE RADIO **RING REPEATER MASTER** AND ALL OTHER RADIOS AS **RING REPEATER NORMAL**.

SELECT **RING TERMINAL NORMAL** AT RADIOS AT ENDS OF STUBS OFF SUBTENDING RINGS.

→ SELECT **RING TERMINAL PRIMARY** WHEN THE RADIO IS THE PRIMARY CONNECTION POINT TO THE MAIN RING. IN THIS CONFIGURATION, THE REPEATER CABLE IS NOT INSTALLED. SYNC ALARMS ARE INHIBITED. THE RF SERVICE CHANNEL IS ENABLED, ALLOWING SERVICE CHANNEL DATA TO PASS THROUGH THE RF PORT. THE RF SERVICE CHANNEL IS DISABLED WHEN A FAILURE OCCURS.

→ SELECT **RING TERMINAL SECONDARY** WHEN THE RADIO IS THE SECOND CONNECTION POINT TO THE MAIN RING. IN THIS CONFIGURATION, THE REPEATER CABLE IS NOT INSTALLED. SYNC ALARMS ARE INHIBITED. THE RF SERVICE CHANNEL IS DISABLED. THE RF SERVICE CHANNEL IS ENABLED WHEN A FAILURE OCCURS ALLOWING SERVICE CHANNEL DATA TO PASS THROUGH THE RF PORT.

**Figure 6-2 DS1/E1, DS3, OC3 Radio Configuration Provisioning (Sheet 4 of 4)**

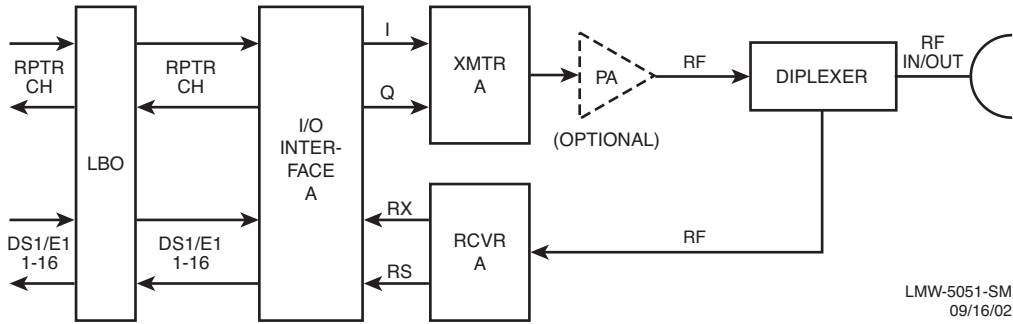
<b>SYSTEM ID:</b>	ELMC: TEST1	RADIO LINK ID:	Disable
<b>RADIO TYPE:</b>	MDR-8000 DS1	16 LINES	128 TCM
<b>RADIO CONFIG:</b>	HS Tx/HS Rx	TERMINAL	
	ATPC Enabled	A&B PA Present	
<b>SYSTEM ALARM</b>	Visual/Audible	RELAYS ON/NO	Station Alarm 13-16
<b>RCV SWITCHING:</b>	Disable AGC	BER Disable	
<b>OPTIONS:</b>	Option Key:	Stat/Prov/WaySide	

LMW-7100-SM  
09/16/02

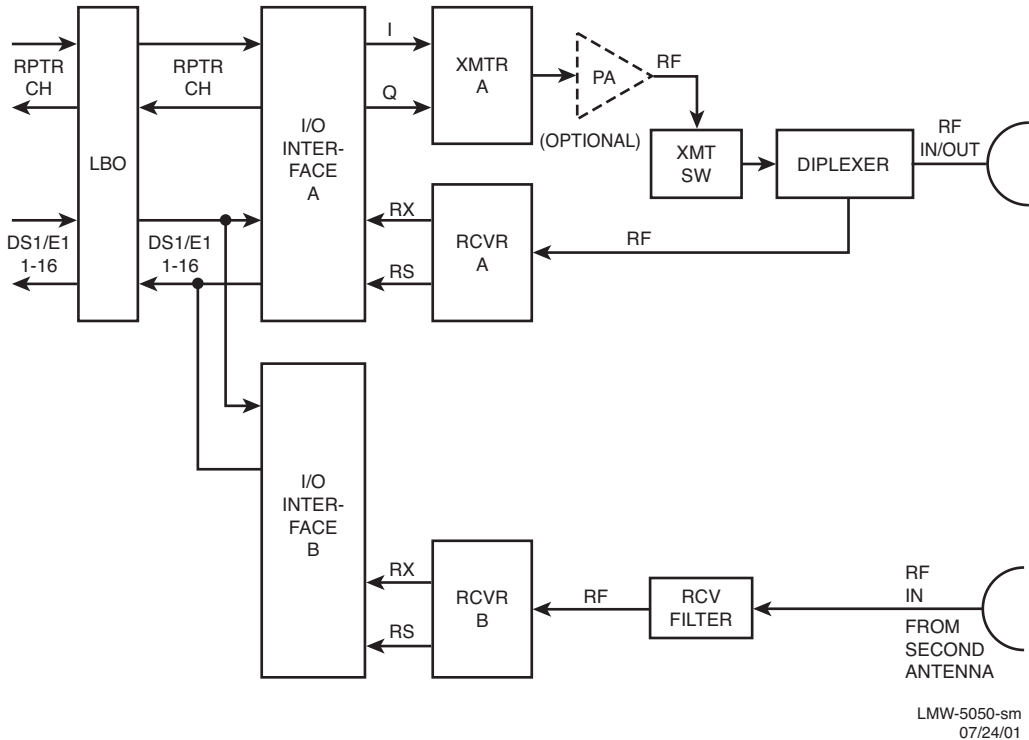
<p>SELECT ONE:</p> <ul style="list-style-type: none"> <li>* NS Tx/NS Rx</li> <li>NS Tx/HS Rx</li> <li>* NS Tx/SD Rx</li> <li>* HS Tx/HS Rx</li> <li>* HS Tx/SD Rx</li> <li>FD TxA/Rx A</li> <li>FD TxA/Rx B</li> </ul>
<p>NS = NON-STANDBY  HS = HOT-STANDBY  SD = SPACE DIVERSITY  FQ = FREQUENCY DIVERSITY</p>

\* ALTHOUGH THERE ARE A TOTAL OF 7 CONFIGURATIONS, ONLY 4 EXAMPLES ARE ILLUSTRATED.

**Figure 6-3 DS1/E1 Radio Configuration Provisioning**

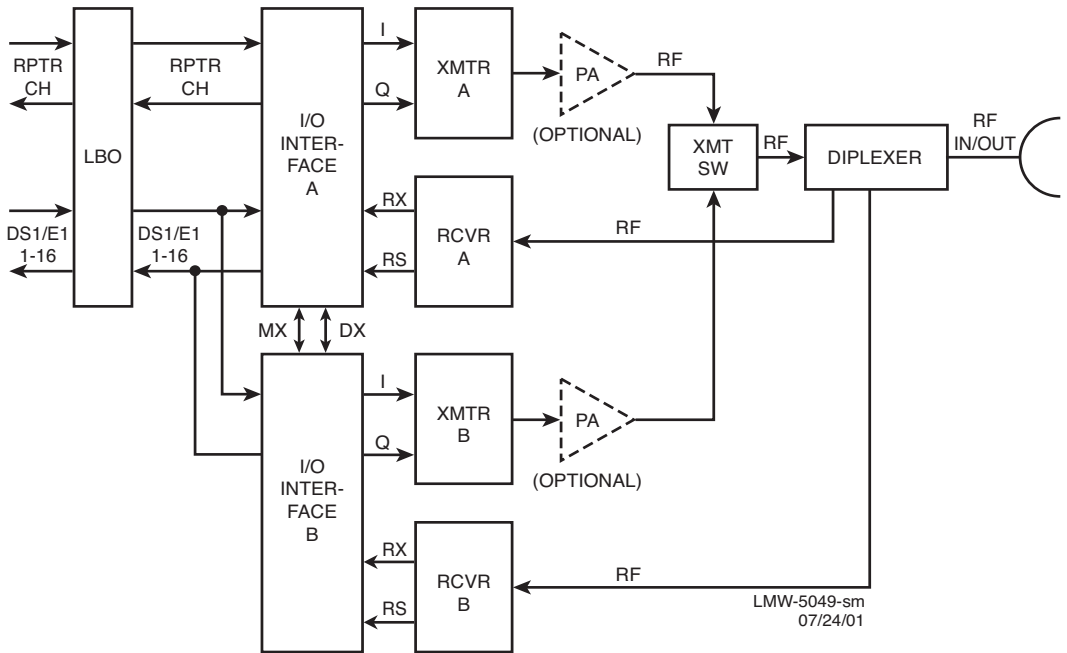


**DS1/E1 PROVISIONING EXAMPLE 1: NS Tx/NS Rx**

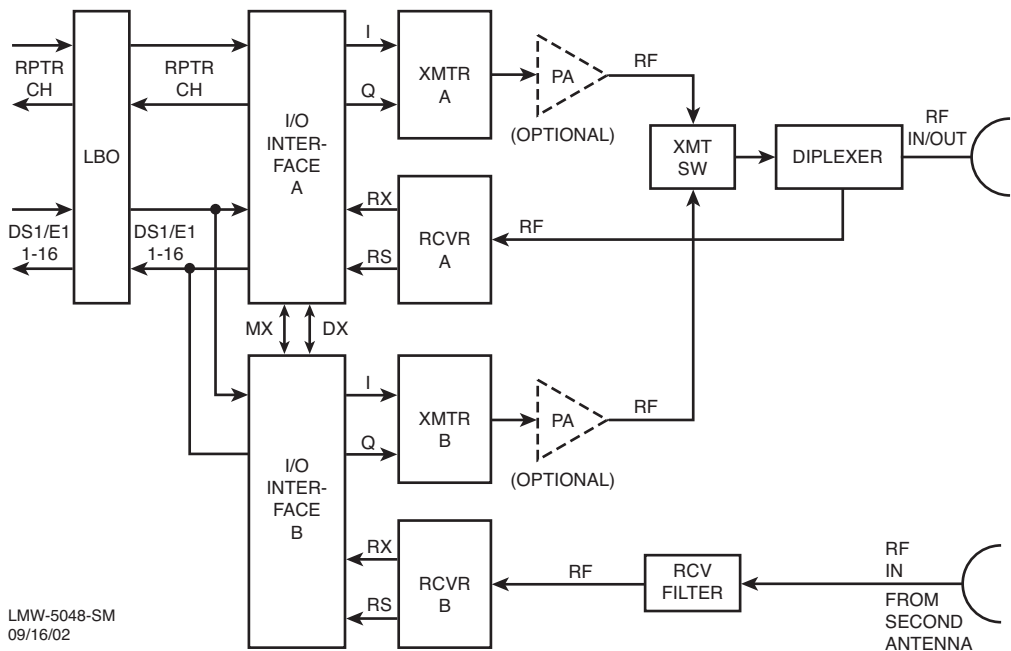


**DS1/E1 PROVISIONING EXAMPLE 2: NS Tx/SD Rx**





**DS1/E1 PROVISIONING EXAMPLE 3: HS Tx/HS Rx**



**DS1/E1 PROVISIONING EXAMPLE 4: HS Tx/SD Rx**

**Note**

If installation at both ends of a hop are complete except for connecting to customer inputs/outputs and it is desirable to have an alarm-free system, alarm reporting on the incomplete connections can be disabled temporarily through provisioning. You can communicate over the hop even if you do not have the radio connected to customer DS1 inputs; however, you will alarm unless you select **OFF** to disable **INSERT CHANNEL** (located on the **USI DS1 Facilities** screen) for all equipped lines. Disabling the **DS1 insert** function disables both the lines and alarm reporting for the lines. After all customer connections are complete, alarm reporting can be restored to normal. To restore alarm reporting to normal, set **INSERT CHANNEL** on **DS1 Facilities** screen to **ON**.

**Note**

The term "**LINE**" is used to describe an input/output signal at **DS1/E1** rate (1.544 MB/S 2.043 MB/S). The term "**CHANNEL**" is used to describe a multiplexed signal, at a higher rate than **DS1/E1**. The inserted channel is output of multiplexer circuit. The dropped channel is input to demultiplexer circuit. The multiplexer and demultiplexer circuits are located on **I/O interface module**.

SELECTING **ON** INSERTS LOCAL DATA AND TURNS ON ALARM REPORTING. SELECTING **NM** (NOT MONITORED), DEFAULT SETTING, INSERTS LOCAL AIS DATA BUT TURNS OFF ALARM REPORTING. SELECTING **OFF** TURNS OFF LOCAL DATA INSERT AND TURNS OFF ALARM REPORTING.

SELECT **ON** FOR ALL LINES IN USE AT A TERMINAL OR DROP-AND-INSERT REPEATER. SELECT **NM** FOR ALL LINES NOT USED AT A TERMINAL AND DROP-AND-INSERT REPEATER. SELECT **OFF** FOR ALL LINES AT A NON-STANDBY THROUGH REPEATER, OR SELECT **OFF** FOR LINES 1 THROUGH 4 AND **NM** FOR LINES 5 THROUGH 16 AT A PROTECTED REPEATER.

SELECT **ON** TO DROP ALL LINES OR **OFF** TO DISABLE ALL LINES AND ALARMS.

SELECT **ON** TO INSERT ALL LINES OR **OFF** TO DISABLE ALL LINES AND ALARMS.

FOR EACH LINE, SELECT **ON** TO DROP LINE OR **OFF** TO DISABLE LINE AND ALARMS.

SELECT **AMI** OR **B8ZS** CODING FOR ALL DSI LINES

LINES	1	2	3	4	5	6	7	8	Select: All
INSERT CHANNEL	ON ▾	ON ▾	OFF ▾	OFF ▾	OFF ▾	OFF ▾	OFF ▾	OFF ▾	▾
DROP CHANNEL	ON ▾	ON ▾	OFF ▾	OFF ▾	OFF ▾	OFF ▾	OFF ▾	OFF ▾	▾
LINE CODING	AMI ▾	AMI ▾	AMI ▾	AMI ▾	AMI ▾	AMI ▾	AMI ▾	AMI ▾	▾
AIS INHIBIT	OFF ▾	OFF ▾	OFF ▾	OFF ▾	OFF ▾	OFF ▾	OFF ▾	OFF ▾	▾

LINE	9	10	11	12	13	14	15	16	Select: All
INSERT CHANNEL	OFF ▾	OFF ▾	OFF ▾	OFF ▾	OFF ▾	OFF ▾	OFF ▾	OFF ▾	▾
DROP CHANNEL	OFF ▾	OFF ▾	OFF ▾	OFF ▾	OFF ▾	OFF ▾	OFF ▾	OFF ▾	▾
LINE CODING	AMI ▾	AMI ▾	AMI ▾	AMI ▾	AMI ▾	AMI ▾	AMI ▾	AMI ▾	▾
AIS INHIBIT	OFF ▾	OFF ▾	OFF ▾	OFF ▾	OFF ▾	OFF ▾	OFF ▾	OFF ▾	▾
AIS SIGNAL	ALL ONES ▾								▾

SELECT **ON** TO INHIBIT AIS INSERTION ON ALL LINES. SELECT **OFF** TO ENABLE AIS INSERTION ON ALL LINES.

SELECT **ON** OR **OFF**. WHEN SET TO **ON**, AIS INSERTION IS INHIBITED ON SELECTED DS1/E1.

SELECT **AMI** OR **B8ZS** CODING FOR EACH DS1 LINE. E1 LINE CODING IS ALWAYS HDB3.

FOR ALL DS1 LINES, SELECT RANGE THAT MATCHES ACTUAL DISTANCE TO CROSS-CONNECT **0-150 (TEO OFF)**, **150-330 (TEO ON)**, **330-480 (TEO OFF)** OR **480-660 (TEO ON)** FT. FOR E1, NO DISTANCE IS DISPLAYED.

SELECT **ALL 1s** OR **ALL 0s** AIS DATA FORMAT FOR ALL LINES.

DS1 LINE LENGTH 0-150 ▾

**Figure 6-4 DS1/E1 Facilities Provisioning**

SELECT AMI OR B8ZS CODING FOR WAYSIDE DS1 LINE.

SELECT ON TO DISABLE ALARM REPORTING FOR WAYSIDE DS1 LINE. SELECT OFF TO REPORT ALL ALARMS FOR LINE.

DS1 LINES	DS1 CARD A			DS1 CARD B			Select All
	1	2	3	1	2	3	
ALARM LOCK OUT	OFF	OFF	OFF	OFF	OFF	OFF	
DS1 LINE CODING	AMI	AMI	AMI	AMI	AMI	AMI	
AIS INHIBIT	OFF	OFF	OFF	OFF	OFF	OFF	
AIS INSERT	1	1	1	1	1	1	

LMW-3133C-sm  
01/29/01

SELECT 1 (ALL ONES) OR 0 (ALL ZEROES) FOR ALARM INDICATION SIGNAL (AIS) LINE CODE.

SELECT ON TO DISABLE AIS INSERTION ON WAYSIDE DS1 LINE WHEN LOSS OF UPSTREAM DS1 FRAME IS DETECTED. SELECT OFF TO INSERT AIS WHEN DS1 FRAME LOSS IS DETECTED.

**Figure 6-9 DS3, OC3 Radio Wayside DS1 Facilities Provisioning**

**Note**

There are five connectors on the backplane to interface the three service channels. Connectors on backplane interface three functions: Audio, RS232, and MCS. Each service channel is provisioned for a specific function. Audio and MCS can be put on any open service channel. RS232-1 Data can be put on Service Channel 1 and RS232- data can be put on Service Channel 2. RS232 data cannot be put on Service Channel 3.

SERVICE CHANNEL: 1: AUDIO-1 -16/+7 Norm 2: AUDIO-2 -16/+7 Norm 3: MCS

SELECT AUDIO-1 0/0 Norm, AUDIO-1 0/0 O/H, AUDIO-1 -16/+7 Norm, AUDIO-1 -16/+7 O/H, AUDIO-2 0/0 Norm, AUDIO-2 0/0 O/H, AUDIO 2 -16/+7 Norm, AUDIO-2 -16/+7 O/H, MCS OR RS232-1 FROM THE DROP DOWN LIST.

SELECT AUDIO-1 0/0 Norm, AUDIO-1 0/0 O/H, AUDIO-1 -16/+7 Norm, AUDIO-1 -16/+7 O/H, AUDIO-2 0/0 Norm, AUDIO-2 0/0 O/H, AUDIO 2 -16/+7 Norm, AUDIO-2 -16/+7 O/H, MCS OR RS232-2 FROM THE DROP DOWN LIST.

SELECT AUDIO-1 0/0 Norm, AUDIO-1 0/0 O/H, AUDIO-1 -16/+7 Norm, AUDIO-1 -16/+7 O/H, AUDIO-2 0/0 Norm, AUDIO-2 0/0 O/H, AUDIO 2 -16/+7 Norm, AUDIO-2 -16/+7 O/H, MCS OR RS232-2 FROM THE DROP DOWN LIST.

LMW-3017B-sm  
06/04/03

**Figure 6-10 DS1/E1, DS3, OC3 Radio Service Channel Provisioning (Sheet 1 of 2)**

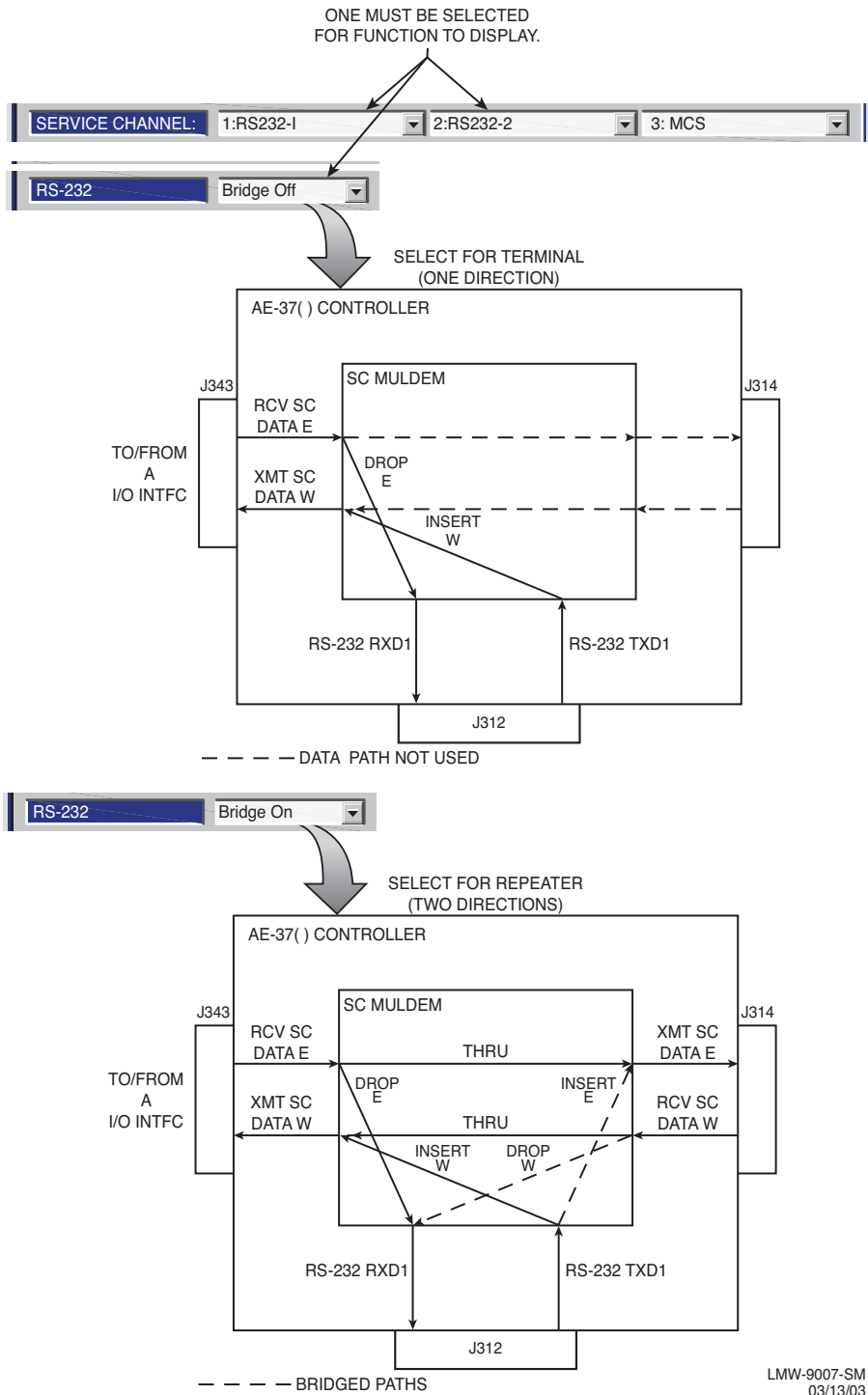


Figure 6-10 DS1/E1, DS3, OC3 Radio Service Channel Provisioning (Sheet 2 of 2)

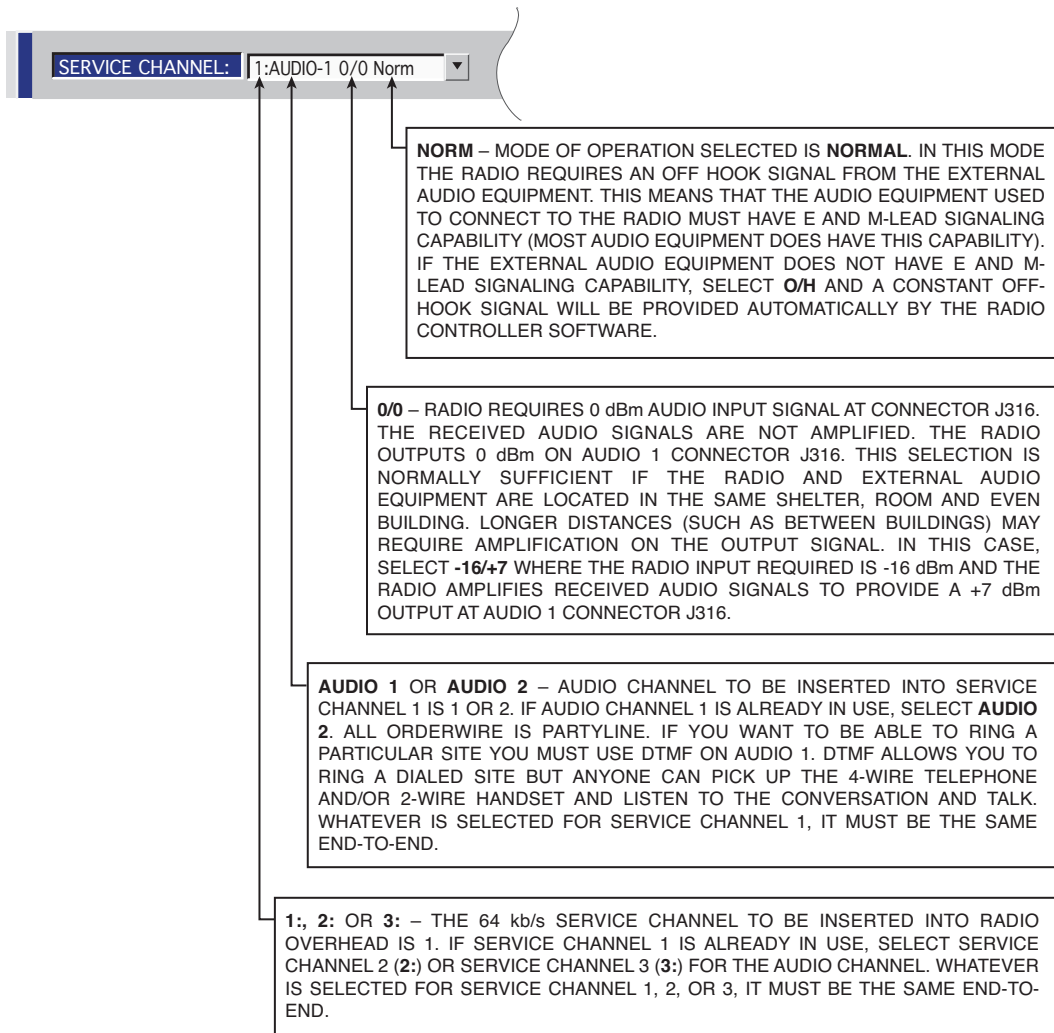
**Note**

The 2-wire handset is transported over Audio 1 only.

**Note**

Audio provisioning is required only if 4-wire audio equipment (external equipment not part of the radio) is supplied and the external audio equipment is connected to audio port 1 J316 or audio port 2 J317 on the radio backplane. These provisionable 4-wire audio functions should not be confused with the 2-wire audio handset. The handset is fully operational after it is connected to the TEL jack on the radio controller module, provided the radio is provisioned Audio 1.

The most common audio provisioning is: **1:, 2:, or 3: AUDIO 1 0/0 Norm.**



LMW-9041-sm  
09/15/03

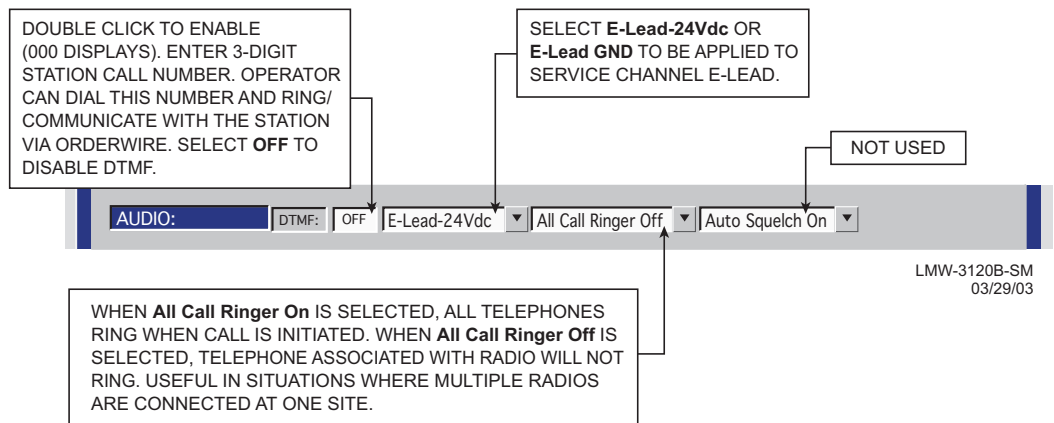
**Figure 6-11 DS1/E1, DS3, OC3 Radio Audio Provisioning (Sheet 1 of 2)**

**Note**

*DTMF allows you to dialup and ring other sites using the 2-wire handset. Only the ringing is detected. Communication over the handset is party-line. DTMF addressing is a local function not a network function, therefore if one or more radios are assigned the same DTMF address, they will all ring when that address is dialed.*

*To be able to use the DTMF function:*

- 1. Audio 1 must be selected for 2-wire handset operation.*
- 2. DTMF must be turned ON on the Audio provisioning screen.*
- 3. 2-wire handset must be connected to TEL jack on controller module.*
- 4. Radios must be provisioned with DTMF address.*



**Figure 6-11 DS1/E1, DS3, OC3 Radio Audio Provisioning (Sheet 2 of 2)**

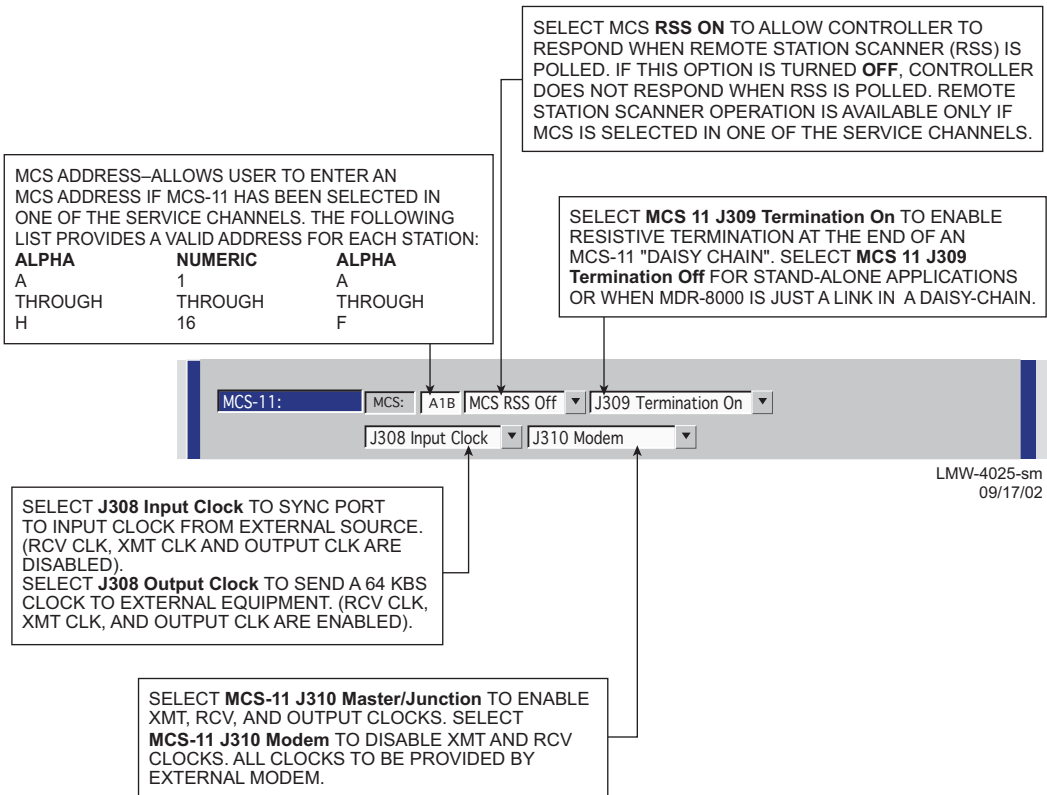
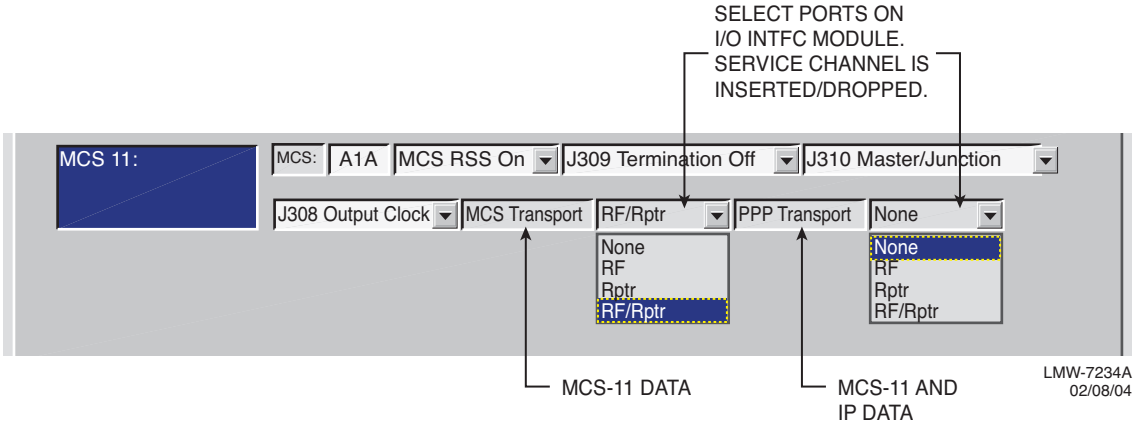


Figure 6-12 DS1/E1, DS3, OC3 Radio MCS-11 Provisioning

**Note**

*MCS-11 is enabled/disabled using the service channel 1-3 selections.  
MCS-11 must be enabled for MCS-11/PPP transport operation.*



**Note**

*Currently the only valid transport combinations (for terminal or repeater) are:*

**Note**

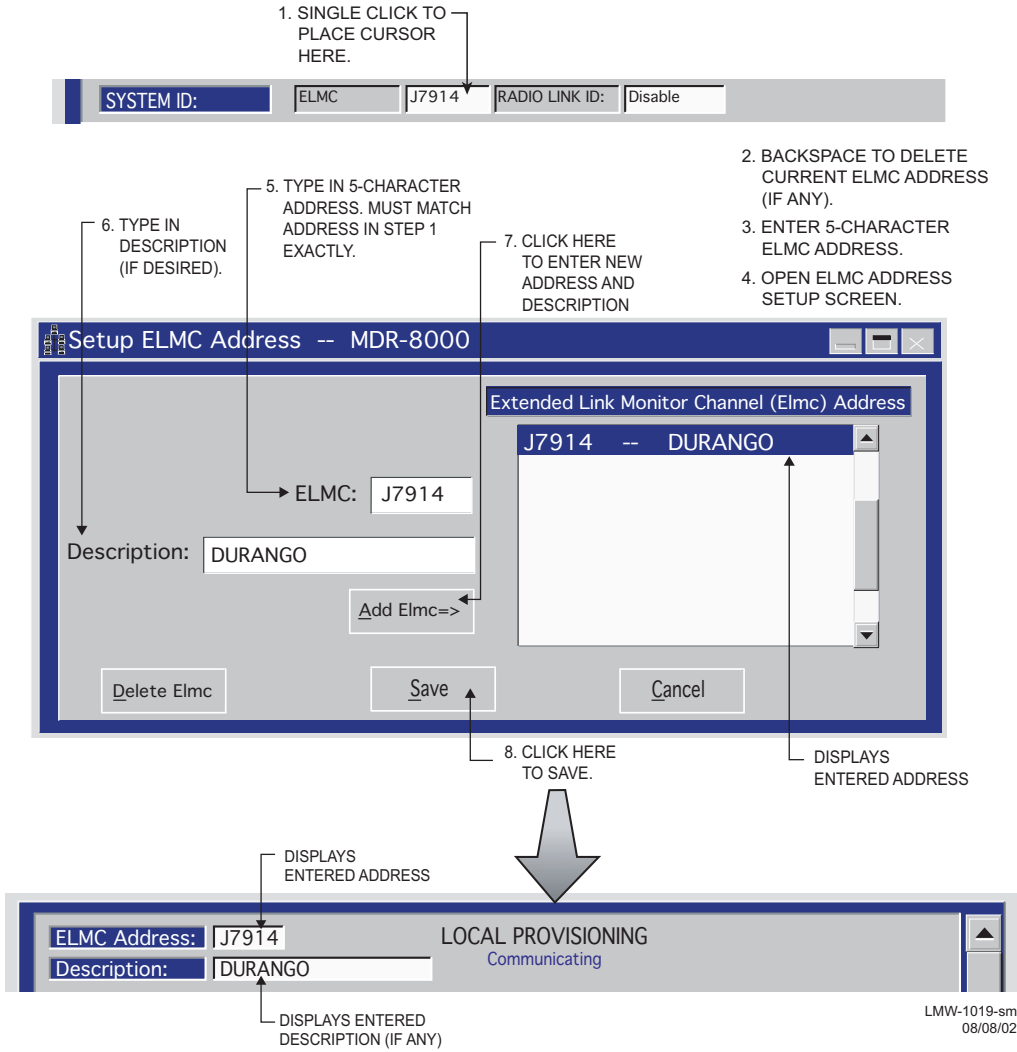
*For MCS-11 to operate properly, all radio controllers in a system interconnected by RF or RPTR must have the same MCS transport and PPP transport provisioning. Currently the only valid transport combinations (for terminal or repeater) are:*

<u>MCS TRANSPORT</u>	<u>PPP TRANSPORT</u>	<u>REMARKS</u>
RF/RPTR	NONE	TMN INTFC MODULE IS NOT INSTALLED. COMPATIBLE WITH OLDER (PRE-TMN) SOFTWARE. RECOMMENDED FOR SYSTEM UPGRADES ONLY.
RF/RPTR	RF/RPTR	MUST BE CHOSEN IF TMN INTERFACE MODULE IS INSTALLED. RECOMMENDED FOR ALL NEW SYSTEMS.

**Figure 6-13 MCS Transport/PPP Transport Provisioning**



**PROVISION ANY ONE OR ALL RADIOS AT A SITE, LOCALLY, USING FOLLOWING PROCEDURE:**

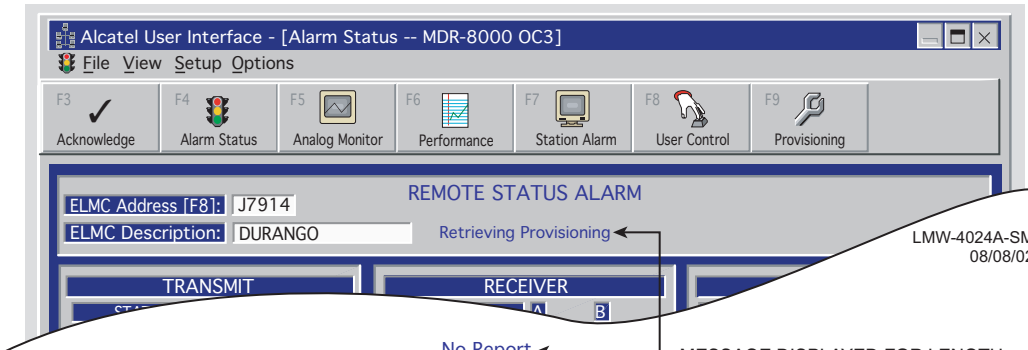
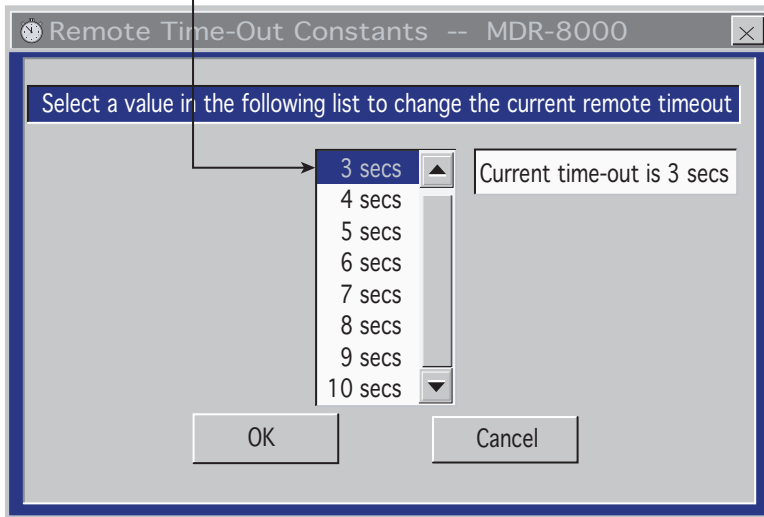


**Note**

*Each network element controller with ELMC must first be locally provisioned with a unique ELMC or remote address. The ELMC address is not related to MCS-11. Any name can be entered as long as the name is a 5-character, alphanumeric word. The address is case sensitive. Space, dash, slash, asterisk, and underscored characters are not allowed. If small numbers are used as addresses, then it is necessary to fill higher order digits with zeros. For example, if the address is the value 1, then the address must be entered as 00001. No address, or the same address used on multiple network elements, prevents ELMC access to that/those network elements. The remote address can only be provisioned and changed locally. Service-affecting functions, including operation mode, radio configuration, and remote address, cannot be provisioned or changed remotely.*

**Figure 6-14 DS1/E1, DS3, OC3 Radio ELMC Provisioning**

SELECT TIME LOCALLY FOR ELMC RESPONSE TO A REQUEST FOR STATUS BEFORE TRYING AGAIN. SELECT SHORTER TIME (5 SECS) FOR SHORTER SYSTEMS (10 HOPS OR LESS). SELECT LONGER TIME (10 SECS) FOR SYSTEMS WITH 10 HOPS OR MORE.



LMW-4024A-SM  
08/08/02

**Note**

*If the time-out value selected is too short, there may not be enough time for the remote controller to respond before the requesting controller times out, resulting in a constant No Report. ELMC response time delay is a function of controller circuitry and is not linear. Always start with longer time-out, then reduce time to an acceptable value.*

No Report

MESSAGE DISPLAYED FOR LENGTH OF TIME SELECTED DURING TIME LOCAL RADIO IS ATTEMPTING TO COMMUNICATE WITH REMOTE ADDRESS VIA ELMC.

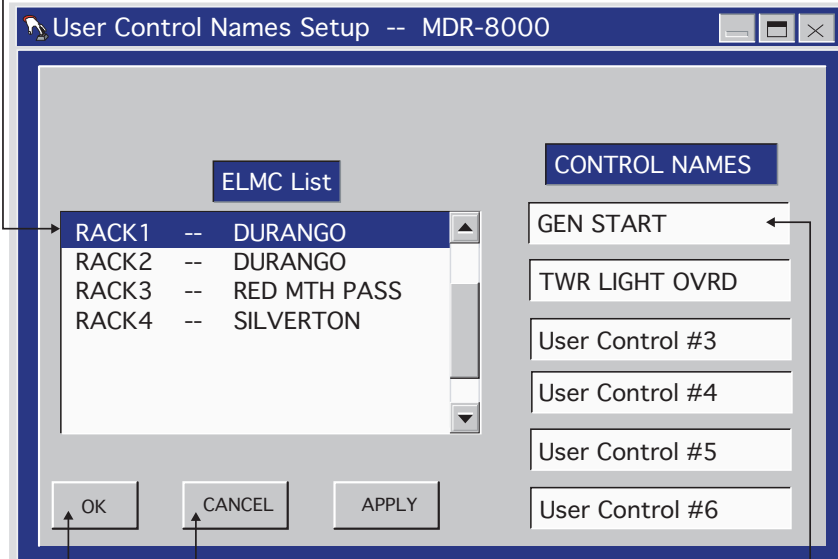
MESSAGE DISPLAYED FOR LENGTH OF TIME SELECTED IF THERE IS NO RESPONSE TO REQUEST FOR STATUS/CONTROL/PROVISIONING.

**Figure 6-15 DS1/E1, DS3, OC3 Radio ELMC Remote Time-Out Constant Provisioning**

**NOTE: DEFAULT CONTROL NAMES ARE USER CONTROL 1-6**

1. OPEN USER CONTROL NAMES SETUP SCREEN

2. SELECT RADIO



CLICK HERE TO SAVE

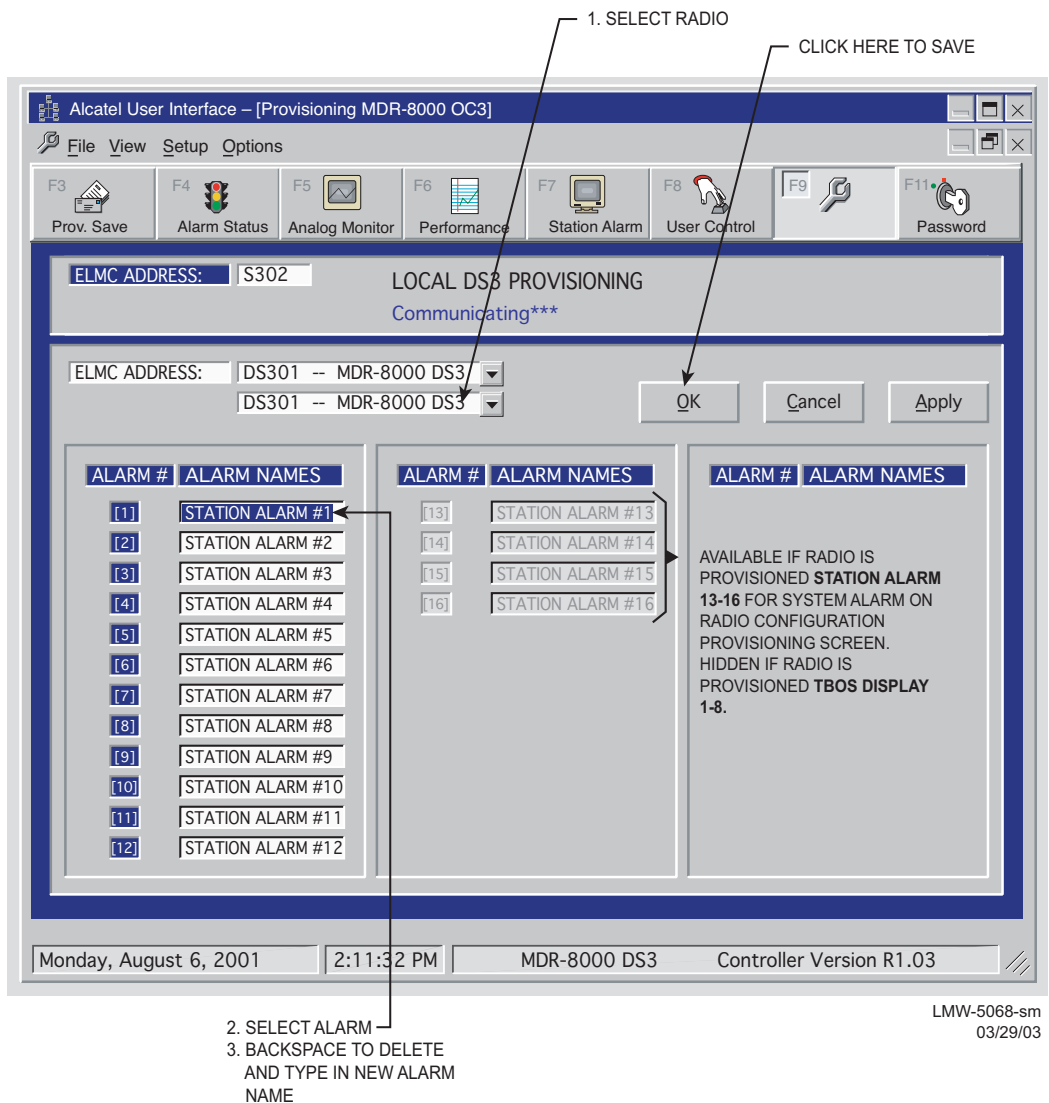
CLICK HERE TO CANCEL TRANSACTIONS BEFORE SAVE

3. SELECT CONTROL POINT

4. BACKSPACE TO DELETE AND TYPE IN NEW CONTROL NAME

LMW-1021-SM  
02/04/03

**Figure 6-16 DS1/E1, DS3, OC3 Radio Control Names Provisioning**



**Figure 6-17 DS1/E1, DS3, OC3 Radio Alarm Names Provisioning**

**Note**

*DS3 screen is shown. DS1/E1 and OC3 alarm names provisioning is similar.*

## Chart 12 Over-The-Hop XMTR Output Power and RCVR RSL

### PURPOSE

Use this procedure to check XMTR output power and RCVR receive signal level (RSL) end-to-end in both directions over the hop. Refer to the Maintenance Section for any alarms or corrective maintenance.

### TOOLS REQUIRED

BER Test Set/Communications Analyzer

Power Meter

Fiber Optic Test Cables (2)

Test Lead and Tool Kit

---

STEP	PROCEDURE
------	-----------

---



***Exposure to energy radiated at microwave frequencies can cause eye injury and eventual blindness. Do not operate the system with a waveguide port unterminated.***



***This is an out-of-service procedure.***

- 1 Perform procedure shown on Figure E-19.
- 2 STOP. This procedure is complete.



## MDR-8000 HOP

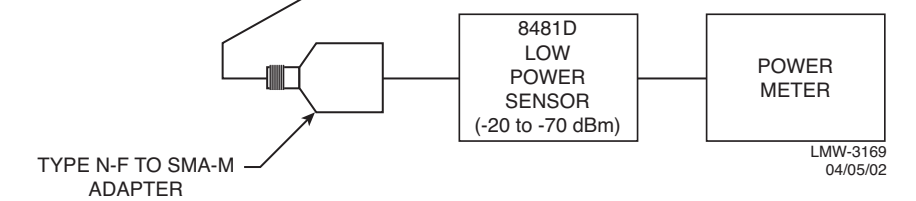
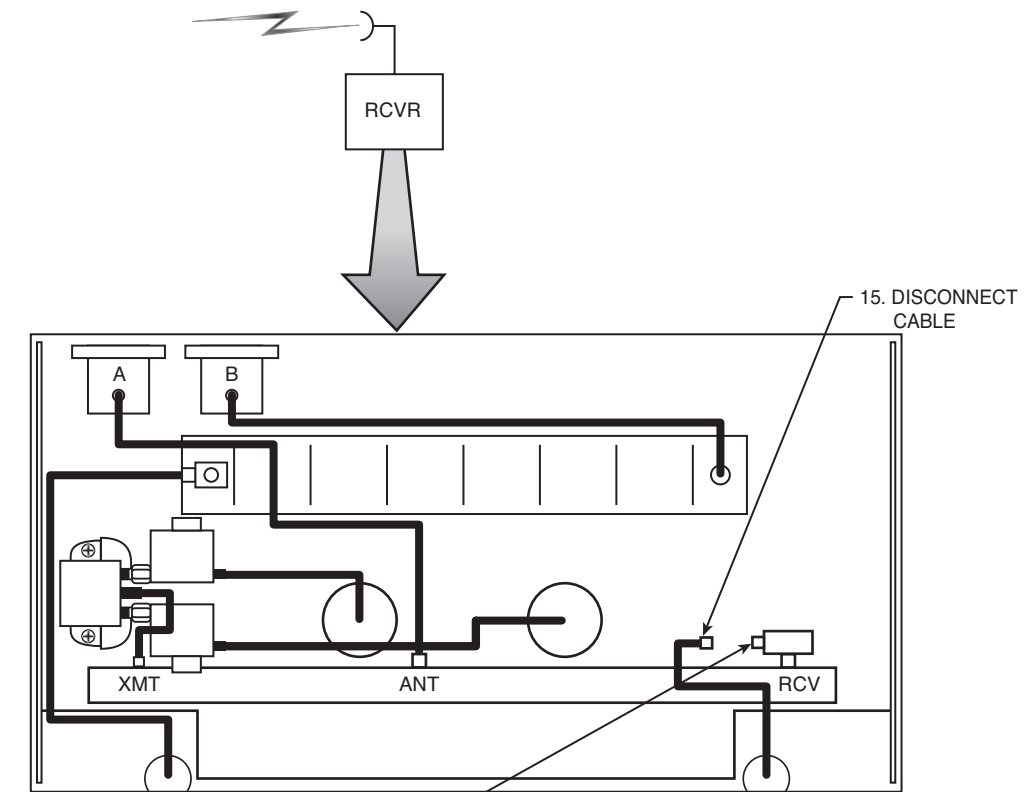
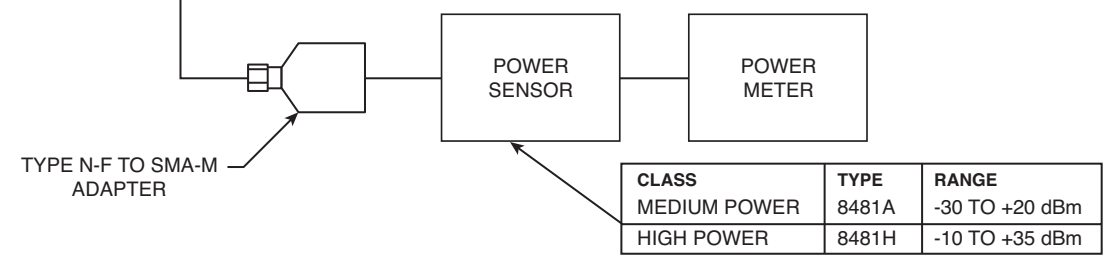
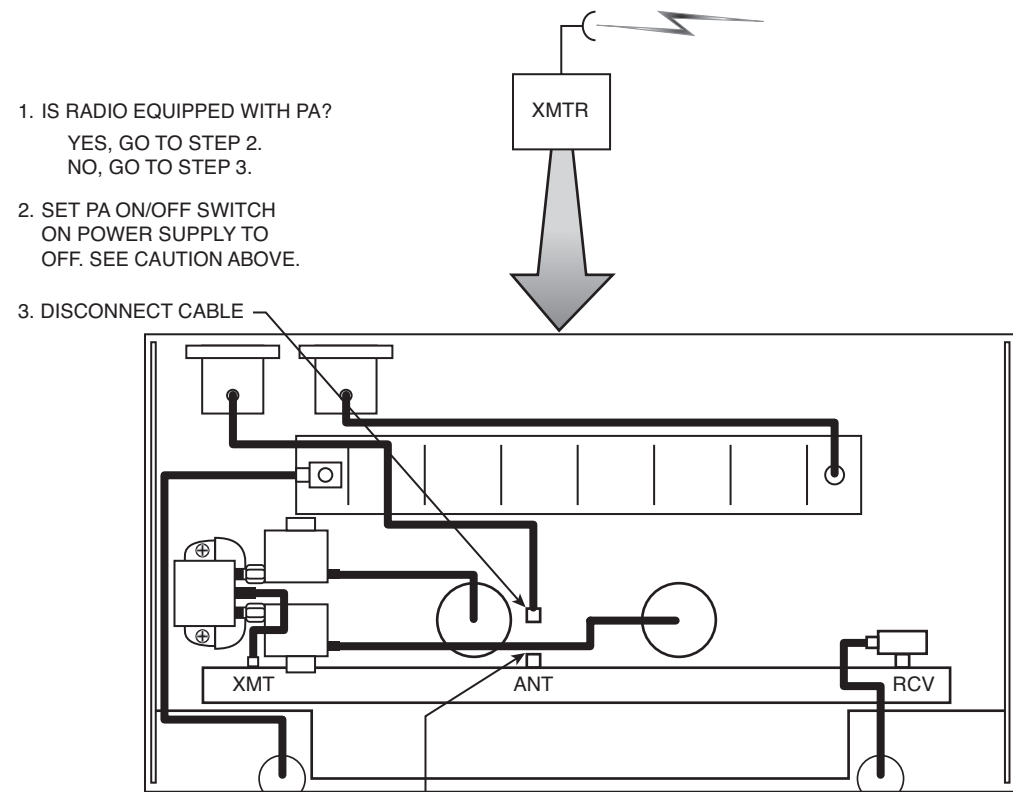
**CAUTION**  
Possibility of Service Interruption

*To prevent radiating into the compartment, power to the PA must be removed before connecting or disconnecting the power meter.*

**Note**

*If radio is provisioned ATPC Enabled, on control screen, select ATPC High Pwr Lock to lock XmTR output at high power.*

**MDR-8000 SHELF (REAR VIEW)**



1. IS RADIO EQUIPPED WITH PA?  
YES, GO TO STEP 2.  
NO, GO TO STEP 3.
2. SET PA ON/OFF SWITCH ON POWER SUPPLY TO OFF. SEE CAUTION ABOVE.
3. DISCONNECT CABLE

4. CONNECT PWR METER TO ANT CONNECTOR ON DIPLEXER
5. IS RADIO EQUIPPED WITH PA?  
YES, GO TO STEP 6.  
NO, GO TO STEP 7.
6. SET PA ON/OFF SWITCH ON POWER SUPPLY TO ON
7. MEASURE XMT OUTPUT PWR ON PWR METER

8. RECORD XMT OUTPUT PWR ON FIELD TEST DATA SHEET
9. IS RADIO EQUIPPED WITH PA?  
YES, GO TO STEP 10.  
NO, GO TO STEP 11.
10. SET PA ON/OFF SWITCH ON POWER SUPPLY TO OFF. SEE CAUTION 2.
11. DISCONNECT TEST EQUIPMENT

12. RECONNECT CABLE TO ANT SMA CONNECTOR ON DIPLEXER
13. IS RADIO EQUIPPED WITH PA?  
YES, GO TO STEP 14.  
NO, GO TO STEP 15.
14. SET PA ON/OFF SWITCH ON POWER SUPPLY TO ON.

16. CONNECT PWR METER SENSOR TO ISOLATOR
17. MEASURE RSL ON PWR METER. CALCULATE RSL AT ANTENNA PORT ON DIPLEXER, BASED ON MEASURED RSL AT RCV ISOLATOR OUTPUT:

RSL = MEASURED RSL + INSERTION LOSS OF RCV ISOLATOR (0.2 dB NOMINAL) + INSERTION LOSS OF DIPLEXER FILTER/RCV FILTER (MARKED ON LABEL ON FILTER)

EXAMPLE:  
MEASURED RSL AT OUTPUT OF ISOLATOR = -37 dBm  
LABEL ON DIPLEXER FILTER/RCV FILTER SHOWS INSERTION LOSS = 2 dB  
RSL AT ANTENNA INPUT = -37 dBm + 2 dB + 0.2 dB = -34.8 dBm

18. RECORD RSL ON FIELD TEST DATA SHEET AT END OF THIS SECTION
19. DISCONNECT TEST EQUIPMENT
20. RECONNECT CABLE TO ISOLATOR
21. REPEAT STEPS 15-20 FOR THE B-SIDE RSL
22. REPEAT STEPS 1-21 FOR OPPOSITE DIRECTION OVER HOP

**Figure E-19 XMT Output Power and RSL Test**





## Chart 14 Over-The-Hop DS1/E1 BER Threshold Test

### PURPOSE

Use this procedure to check RCVR threshold end-to-end in both directions over the hop.

### TOOLS REQUIRED

BER Test Set/Communications Analyzer

Variable Attenuator

Test Lead and Tool Kit

---

### STEP

### PROCEDURE

---



***Exposure to energy radiated at microwave frequencies can cause eye injury and eventual blindness. Do not operate the system with a waveguide port unterminated.***

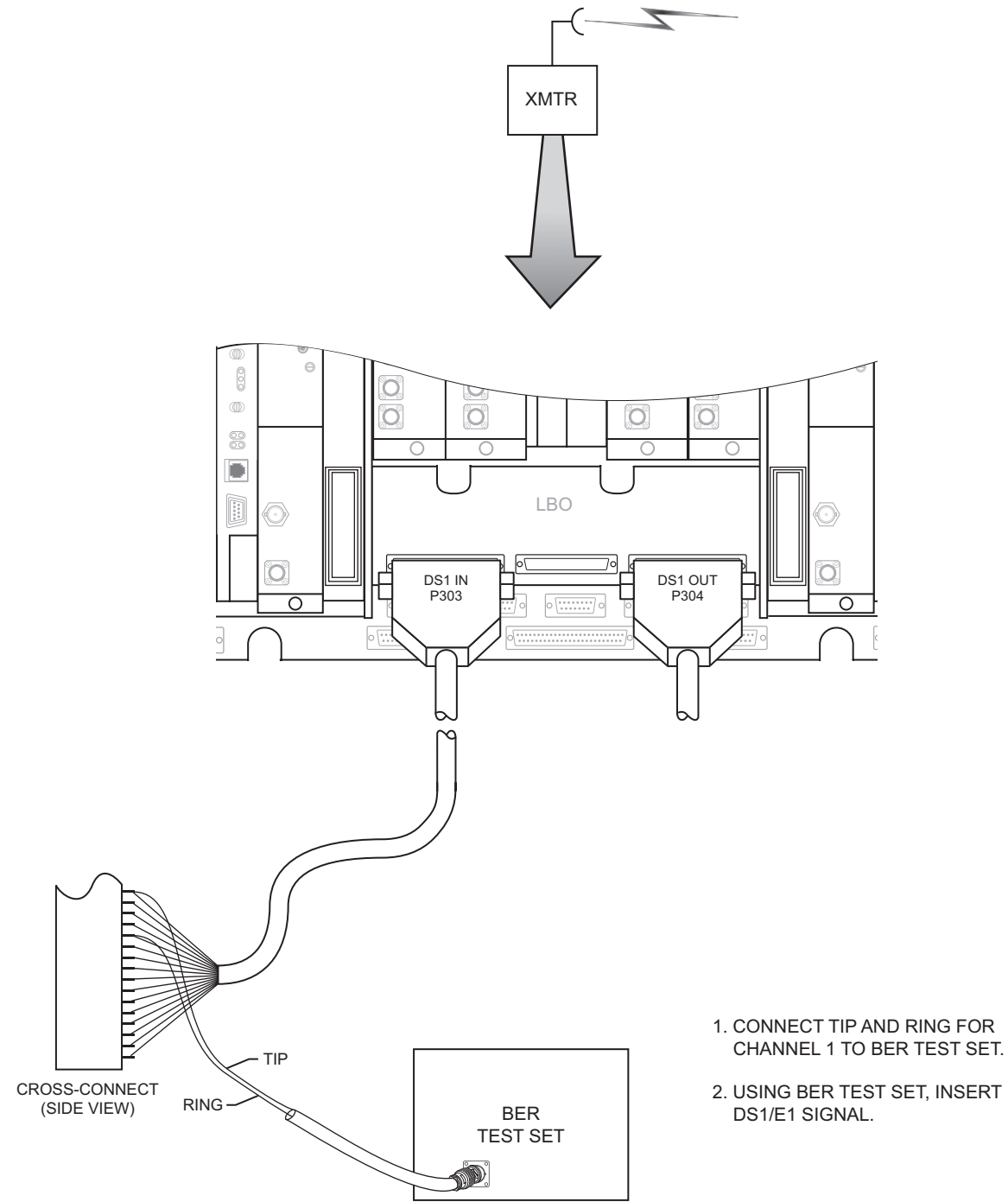


***This is an out-of-service procedure when on a nonstandby (unprotected) system. On a hot-standby or frequency diversity system, switch traffic on the channel under test to protect.***

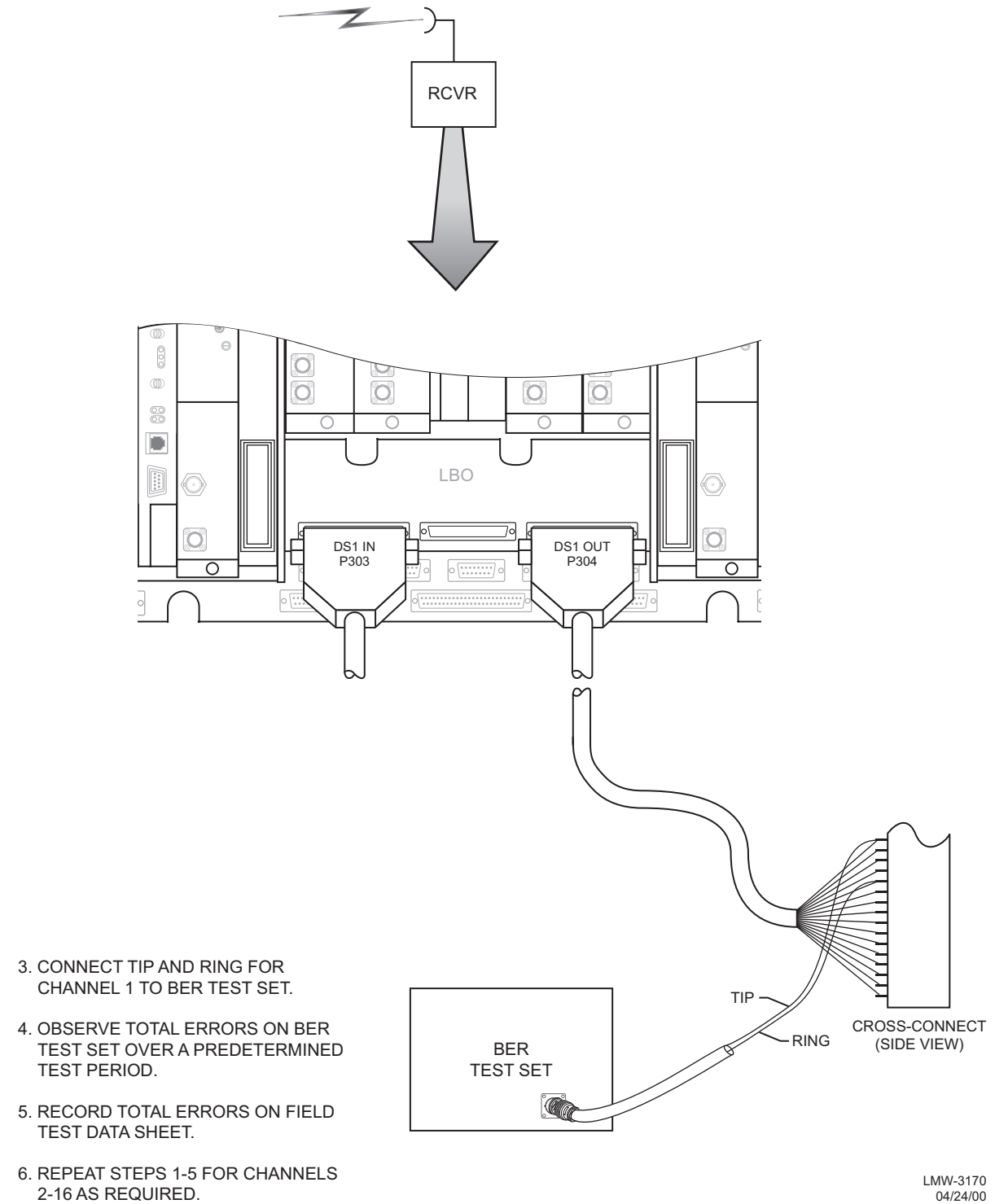
- 1 Perform procedure shown on Figure E-21.
- 2 STOP. Procedure is complete.



# MDR-8000 HOP



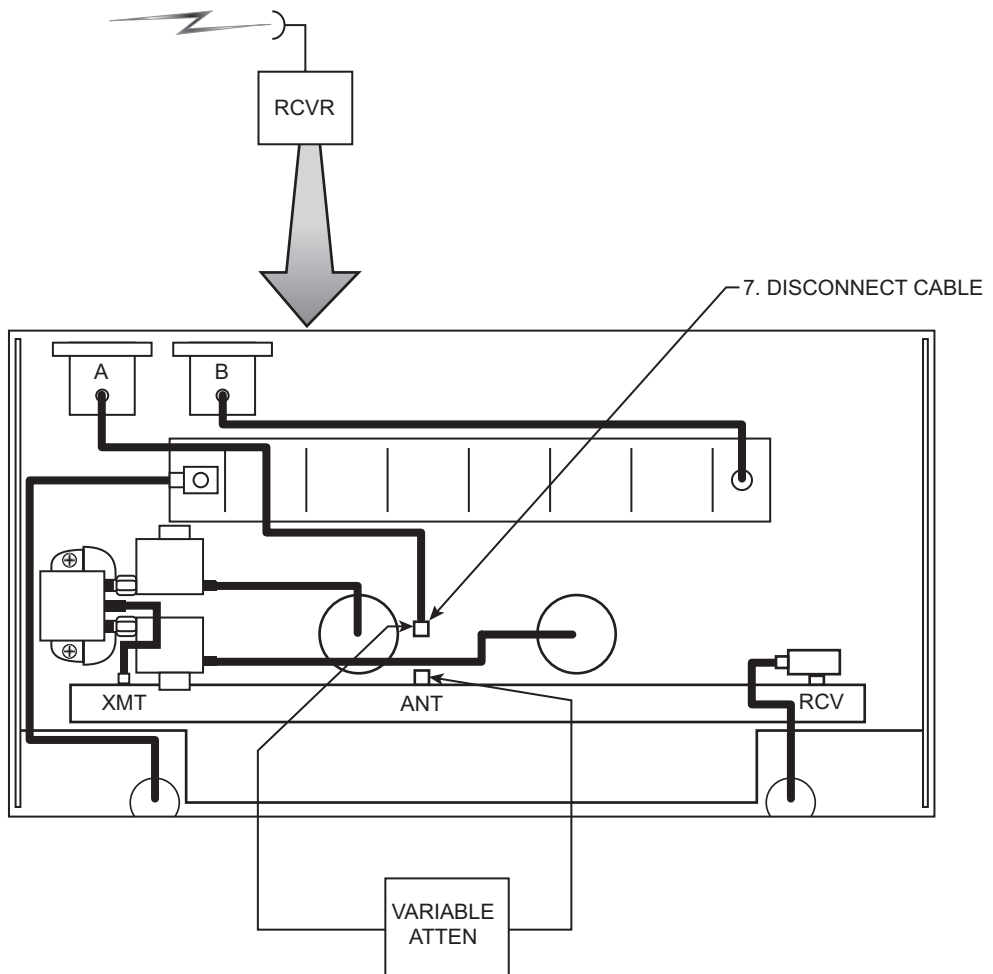
PAIR	J303/J304 PIN NUMBER	WIRE COLOR	FUNCTION
1	1	WHITE/BLUE	CHAN 1 TIP
	20	BLUE/WHITE	CHAN 1 RING
2	2	WHITE/ORANGE	CHAN 2 TIP
	21	ORANGE/WHITE	CHAN 2 RING
3	3	WHITE/GREEN	CHAN 3 TIP
	22	GREEN/WHITE	CHAN 3 RING
4	4	WHITE/BROWN	CHAN 4 TIP
	23	BROWN/WHITE	CHAN 4 RING
5	5	WHITE/SLATE	CHAN 5 TIP
	24	SLATE/WHITE	CHAN 5 RING
6	6	RED/BLUE	CHAN 6 TIP
	25	BLUE/RED	CHAN 6 RING
7	7	RED/ORANGE	CHAN 7 TIP
	26	ORANGE/RED	CHAN 7 RING
8	8	RED/GREEN	CHAN 8 TIP
	27	GREEN/RED	CHAN 8 RING
9	9	RED/BROWN	CHAN 9 TIP
	28	BROWN/RED	CHAN 9 RING
10	10	RED/SLATE	CHAN 10 TIP
	29	SLATE/RED	CHAN 10 RING
11	11	BLACK/BLUE	CHAN 11 TIP
	30	BLUE/BLACK	CHAN 11 RING
12	12	BLACK/ORANGE	CHAN 12 TIP
	31	ORANGE/BLACK	CHAN 12 RING
13	13	BLACK/GREEN	CHAN 13 TIP
	32	GREEN/BLACK	CHAN 13 RING
14	14	BLACK/BROWN	CHAN 14 TIP
	33	BROWN/BLACK	CHAN 14 RING
15	15	BLACK/SLATE	CHAN 15 TIP
	34	SLATE/BLACK	CHAN 15 RING
16	16	YELLOW/BLUE	CHAN 16 TIP
	35	BLUE/YELLOW	CHAN 16 RING



LMW-3170  
04/24/00

Figure E-21 DS1/E1 BER Threshold Test (Sheet 1 of 2)





- |  |  |
|--|--|
| <p>8. CONNECT VARIABLE ATTENUATOR BETWEEN CABLE AND ANT CONNECTOR ON DIPLEXER.</p> <p>9. WHILE OBSERVING BER TEST SET, CONNECTED TO DS1 OUT J304, INCREASE ATTENUATION UNTIL A BER OF <math>10E-6</math> IS DISPLAYED.</p> | <p>10. ADD VARIABLE ATTENUATOR SETTING TO RECORDED RSL TO OBTAIN RCV THRESHOLD AND RECORD.</p> <p>11. REPEAT STEPS 1 THROUGH 10 FOR OPPOSITE DIRECTION OVER HOP.</p> <p>12. DISCONNECT TEST EQUIPMENT.</p> |
|--|--|

LMW-3173  
04/05/02

**Figure E-21 DS1/E1 BER Threshold Test (Sheet 2 of 2)**

