2510 Echo Canceller Resource Module

Contents

1.   Description

The Tellabs 2510 Echo Canceller Resource Module (ECRM) is a plug-in module that operates in the Nortel* DMS250* Spectrum Peripheral Module (SPM). The 2510 ECRM gives DMS250 operators the ability to integrate high-density, superior quality echo cancellation into the switch.

A single 2510 ECRM provides 320 DS0s of echo cancellation, each DS0 having a full-tap 48ms endpath capability.

To provide full echo canceller capacity to an SPM (2,016 DS0s), seven 2510 ECRMs are required. A larger number of 2510 ECRMs can be installed for redundancy or to provide back-to-back echo coverage.

Module Features

The 2510 ECRM offers the following features:
- H-register reset option for test purposes on a DS0 basis via an SPM message
- Selectable option to enable/disable residual echo suppression, provisionable on a DS0 basis
- Incorporates the Dynamic Signal Transfer™ (DST) patented Non-Linear Processor (NLP), which allows the natural background audio to pass through the echo canceller
- Non-volatile memory for storing configuration information, fault information, module information, etc.
- Self-test feature that operates ten times per hour on each idle channel

2. Applications

Module Environment

The 2510 ECRMs are connected by a set of Serial Links (S-Links) to the SPM Common Control Complex, which provides control and traffic switching functions, and redundant DS512 links to the DMS250 network. Each S-Link contains 256 timeslots, for a total of 768. The primary S-Link has 32 timeslots reserved for control signaling, leaving 736 timeslots for PCM traffic (768 total timeslots, minus 32 reserved by the primary S-Link for control signaling, which leaves 736). Each SPM slot can handle 368 channels (736 timeslots divided by two) for echo cancellation.

Test function control is provided via the Module Test and Maintenance (MTM) bus, which appears at each 2510 ECRM slot, and operates under CEM control.

Figure 2-1 provides an architectural view of 2510 ECRMs in the SPM.

Figure 2-1   2510 ECRMs in the SPM

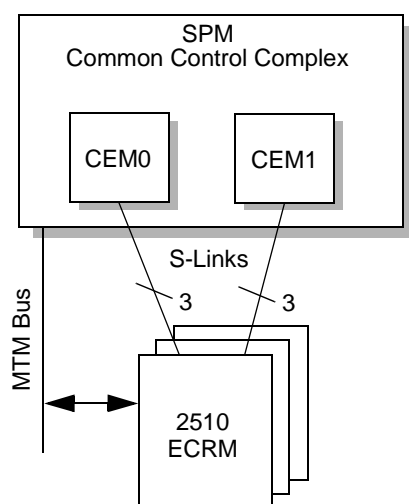### PCM Interface

The 2510 ECRM is a four-port device. R_{in} and S_{out} are connected to the far end. R_{out} and S_{in} are connected to the near end.

A single 2510 ECRM ECAN (echo canceller) resource is assigned to two DS0s on the S-Link(s). One DS0 contains the far end Rx and Tx signals, the other DS0 contains the near end Rx and Tx signals.

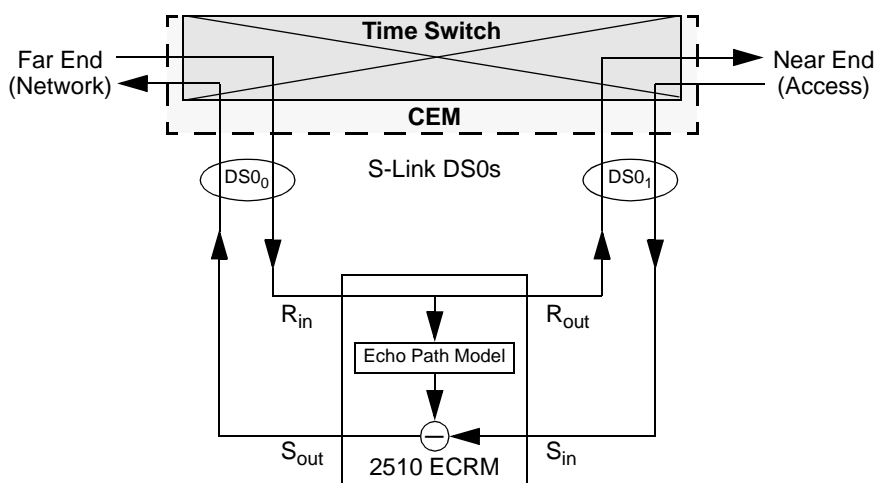Figure 2-2 illustrates this PCM interface.

Figure 2-2   PCM Interface

3.   Installation — Tellabs 2510 ECRM

Caution: **The 2510 ECRM is static sensitive and is therefore shipped in a protective package. When removing a module from its packaging, be sure to wear a grounded wrist strap to protect it from possible static discharge damage.**

Note: **Inspect the equipment upon its arrival to detect any possible shipping damage. If damage is found, immediately file a claim with the carrier. If the equipment has been in storage, reinspect it prior to installation.**

Power and Grounding

Each 2510 ECRM uses Point of Use Power Supplies (PUPS) to convert battery voltage to what is required on the module. The 2510 ECRM can power from either of the two battery feeds provided on the backplane. All modules are fused to protect the primary feeds. The fuse is not user-serviceable.

The module grounds to the shelf through an initial contact gasket at the back of the shelf prior to the engagement of signal or power pins.

Frame Ground

When inserted, the 2510 ECRM casing is automatically connected to Frame Ground.

Module Configuration

The front of the 2510 ECRM is comprised of two latches; one at the top and one at the bottom of the unit. The top latch consists of a diffuser window through which two LED indicators, red and green, are visible (Figure 3-1).
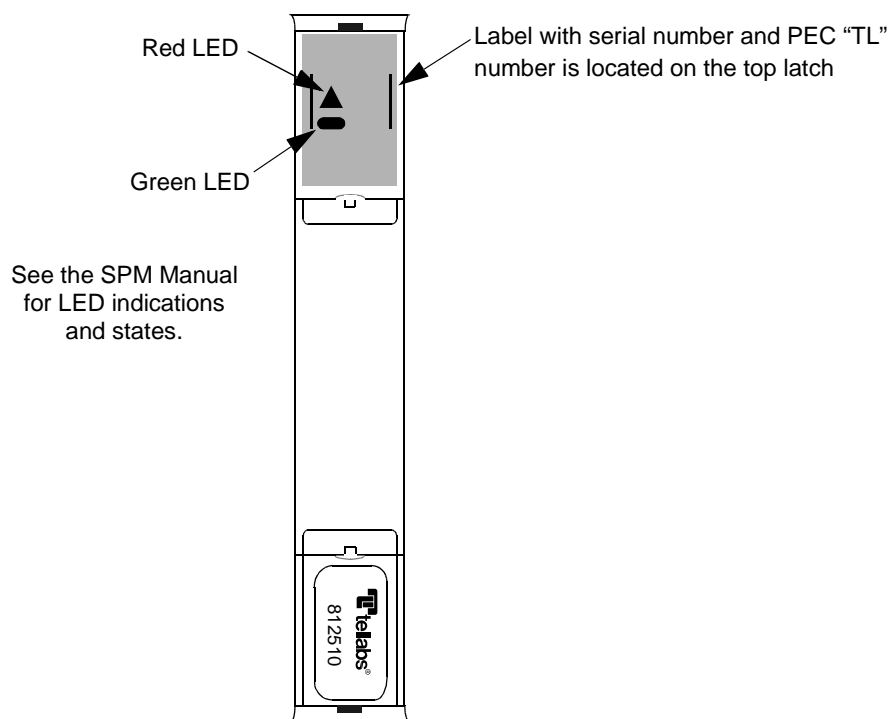
Red LED

Label with serial number and PEC "TL"
number is located on the top latch

Green LED

See the SPM Manual
for LED indications
and states.

tellabs®
812510

Figure 3-1   2510 ECRM — Front View

Power-Up Self-Test

During power-up self-test only, the 2510 ECRM controls the LEDs locally, using them to convey the progress and completion of the self-test. When the 2510 ECRM is initially inserted, both the red and green LEDs will light. After a short period of time, the red LED should extinguish, and just the green LED should be lit, indicating that power-up self-test was successful. If both LEDs stay lit, or if just the red LED is lit, contact Tellabs Technical Assistance (see Section 9.)

Once the power-up self-test is successfully completed and after the test results are indicated by the LEDs, LED control is then reverted to the Spectrum software.

All information to be conveyed via the LEDs is done entirely through the Spectrum software. The 2510 ECRM reports fault data to the Spectrum software, which is then responsible for interpreting the LED states and changing them accordingly.

4. REPLACING A TELLABS 2510 ECRM WITH ANOTHER TELLABS 2510 ECRM

Action

Figure 4-1 is a flowchart summary of the module replacement procedure. For a complete list of instructions, use the step-action procedure that follows the flowchart.

This flowchart summarizes the procedure.

Use the instructions in the procedure that follows this flowchart to perform the procedure.
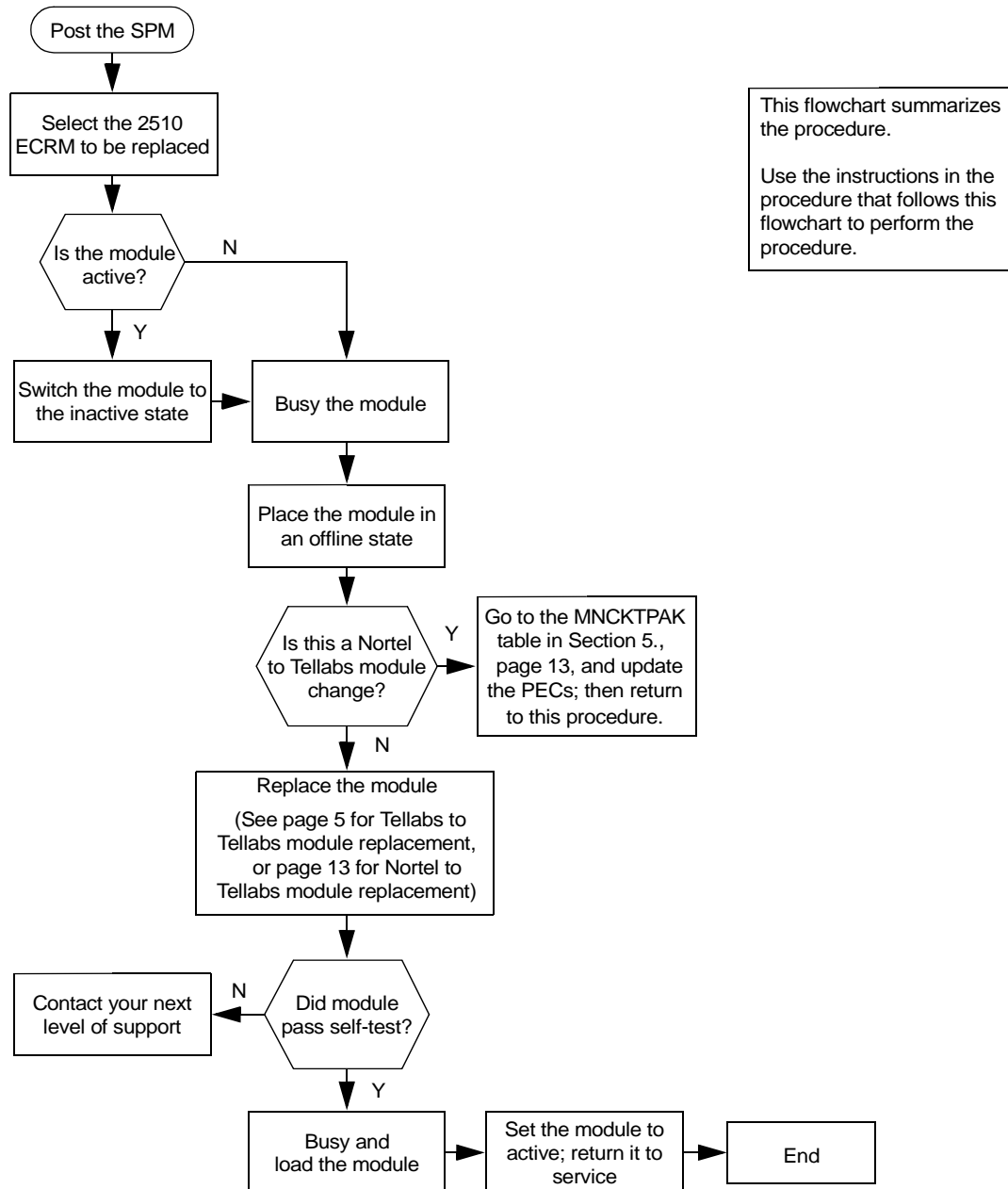
Figure 4-1 Module Replacement Procedure Summary Flowchart

The information required to begin the replacement is as follows:

• Product Engineering Code (PEC): TL812510
• Suffix: BA
• Card name: 2510 ECRM
• Shelf or frame name: NTLX51BA dual-shelf assembly, NTLX91BA DMS frame assembly
• To verify the PEC of the module being replaced, check the datafill in table MNCKTPAK.

REPLACING A TELLABS 2510 ECRM WITH ANOTHER TELLABS 2510 ECRM (CONTINUED)

Use the following procedure to remove and replace the 2510 ECRM in an SPM shelf.

At the MAP terminal:

1. Access the PM screen level of the MAP display by typing:
   >MAPCI;MTC;PM
   and pressing the Enter key.

2. Access the SPM screen by typing:
   >POST SPM spm_no
   and pressing the Enter key.

   where:
   spm_no   is the number of the SPM (0 to 63)

Figure 4-2 is an example of an SPM screen.

```
    CM      MS      IOD     Net      PM      CCS     Lns     Trks    Ext     APPL
    .       .       .       .        .       .       .       .       .       .

SPM                                 SysB    ManB    OffL    CBsy    ISTb    InSv
 0 Quit              PM               0       0       0       0       0       38
 2 Post_             SPM              0       0       0       0       0        1
 3 ListSet
 4 ListRes    SPM 11 INSV  Loc: Site HOST Floor 2 Row A  FrPos 0
 5 Trnsl
 6            Shlf0 SL A Stat  Shlf0 SL A Stat  Shlf1 SL A Stat  Shlf1 SL A Stat
 7            DSP 2  1 A Insv  CEM 1  8 I Insv  VSP 2  1 A Insv  --- =  8 = ====
 8            DSP 0  2 A Insv  OC3 0  9 A Insv  --- =  2 = ====  VSP 6  9 A Insv
 9            DSP 1  3 I Insv  OC3 1 10 I Insv  --- =  3 = ====  --- = 10 = ====
10            DSP 3  4 I Insv  --- = 11 = ====  --- =  4 = ====  --- = 11 = ====
11 Disp_      --- =  5 = ====  --- = 12 = ====  --- =  5 = ====  --- = 12 = ====
12 Next       --- =  6 = ====  VSP 4 13 A Insv  --- =  6 = ====  --- = 13 = ====
13 Select_    CEM 0  7 A Insv  VSP 5 14 A Insv  --- =  7 = ====  --- = 14 = ====
14 QueryPM    SPM:
15 ListAlm_
16
17
18
    14:12 >
```

Figure 4-2   Sample SPM Screen

3. Access the 2510 ECRM by typing:
   >SELECT VSP vsp_no
   and pressing the Enter key.

   where
   vsp_no   is the number of the 2510 ECRM (0 to 27)

Figure 4-3 is an example of a VSP screen:

```
CM       MS      IOD     Net      PM      CCS     Lns     Trks    Ext     APPL
 .        .       .       .        .       .       .       .       .       .

DSP                              SysB    ManB    OffL    CBsy    ISTb    InSv
 0 Quit              PM            0       0       0       0       0       38
 2                   SPM           0       0       0       0       0        1
 3 ListSet            VSP          0       0       0       0       0        4
 4 ListRes
 5                SPM 11    VSP 0  Act  InSv
 6 Tst
 7 Bsy            Loc : Row A FrPos 0 ShPos 42 ShId 1 Slot 2   Prot Grp : 1
 8 RTS            Default Load: VSPnnnn                        Prot Role: Working
 9 Offl           VSP:
10 LoadMod
11
12 Next
13 Select_
14 QueryMod
15 ListAlm
16 Prot
17
18

   14:12 >
```

Figure 4-3   Sample VSP Screen

4.   From the VSP screen, type:
     >PROT
     and press the Enter key.

Figure 4-4 is an example of a Protection screen:

```
CM       MS      IOD     Net      PM      CCS             Trks    Ext     APPL
 .        .       .       .        .       .       .       .       .       .

Protectn                         SysB    ManB    OffL    CBsy    ISTb    InSv
 0 Quit              PM            0       0       2       0       4       38
 2                   SPM           0       0       0       0       0        2
 3                    DSP          0       0       0       0       0        5
 4
 5                SPM   0   InSv
 6                Prot Grp: DSP_GRP 1    Mode: Non-revertive    Schema: m_for_n
 7 Force          Sh0 U R A Stat    Sh0 U R A Stat    Sh1 U R A Stat    Sh1 U R A Stat
 8 Manual         1 -- - - ----     8 -- - - ----     1 -- - - ----     8 -- - - ----
 9                2 -- - - ----     9 -- - - ----     2 -- - - ----     9  0 S I InSv
10                3 -- - - ----    10 -- - - ----     3 -- - - ----    10  1 W A InSv
11                4 -- - - ----    11 -- - - ----     4 -- - - ----    11  2 W A InSv
12                5 -- - - ----    12 -- - - ----     5 -- - - ----    12  3 W A InSv
13 Select_        6 -- - - ----    13 -- - - ----     6 -- - - ----    13  4 W A InSv
14                7 -- - - ----    14 -- - - ----     7 -- - - ----    14 -- - - ----
15 ListAlm
16
17
18

   13:56 >
```

Figure 4-4   Sample Protection Screen

5. At the Protection screen, determine if the 2510 ECRM being replaced is active (A) or inactive (I). If the module is active, place it in the inactive state, using these definitions:

from_unit_no   is the number (0 to 27) of the active unit (module to be replaced)
to_unit_no   is the number (0 to 27) of the inactive unit (spare)

Type the command:
>MANUAL from_unit_no to_unit_no
and press the Enter key.

>MAPCI;MTC;PM;POST SPM_no
>SELECT VSP_no (module to be replaced)

Example:
>LEAVE ALL
>TABLE MNCKTPAK
>POS SPM_no SHELF_no SLOT_no (POS SPM 0 0 12)

        SPM 0 0 12 VSP 2 1 WORKING (ECAN 320) $ (SYSB CR RPT) (MANB MJ RPT)

            (ISTB MN RPT) (PROTFAIL CR RPT) $

                TLC812510   01   TLB2510)

>CHA PEC
>PEC:TL812510
TUPLE TO BE CHANGED:

        SPM 0 0 12 VSP 2 1 WORKING (ECAN 320) $ (SYSB CR RPT) (MANB MJ RPT)

            (ISTB MN RPT) (PROTFAIL CR RPT) $

                TLC812510   01   DSP0012

ENTER Y TO CONFIRM, N TO REJECT, OR E TO EDIT
        >Y
TUPLE CHANGED
WRITTEN TO JOURNAL FILE AS JF NUMBER 201

**Note: Check the Tellabs card release number. If necessary, change the release num-
           ber by using the CHA release, enter the release number, enter >Y for confirma-
           tion.**

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6. Ensure the replacement module is inactive before setting it to manual busy. Take the 2510 ECRM to be replaced out of service by typing:
   >BSY

7. At the VSP screen, take the 2510 ECRM to be replaced offline by typing:
   >OFFL
   and pressing the Enter key.

If	Do
There is a PEC change	Update Table MNCKTPAK to match the replacement module

>LEAVE ALL
>MAPCI;MTC;PM
>POST SPM_no
>SELECT VSP_no

> **CAUTION**
> **Static electricity damage**
> While handling circuit cards or cables, wear a wrist strap
> connected to the wrist-strap grounding point on the frame
> to protect the cards against static electricity damage.

8. On the shelf, locate the 2510 ECRM to be removed. As shown in the figure below, unlock the SPM access door to the module. Open the SPM access door and slide it back into the retracted position.
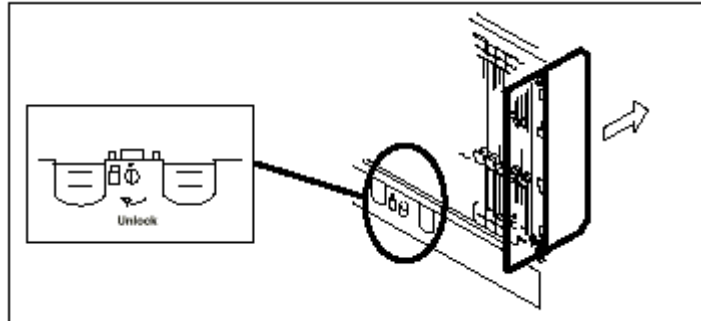
> **CAUTION**
> **Card lever breakage**
> Holding a card by the levers only may result in lever
> breakage. Once the card has been pulled half way out of
> the shelf, carefully grasp the card underneath for more
> secure support and continue to remove the card from the
> shelf. Avoid touching any wires or internal parts on the
> card.

9. As shown in the figure below, open the locking levers on the module to be replaced.
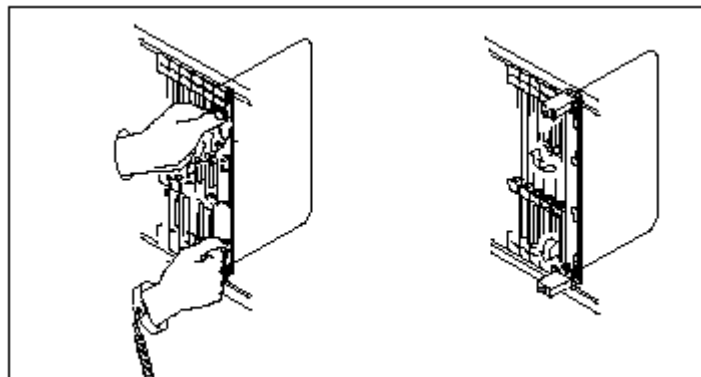
10. As shown in the figure below, while grasping the locking levers, gently pull the module toward you until it protrudes about 2 inches (5.1cm) from the equipment shelf.

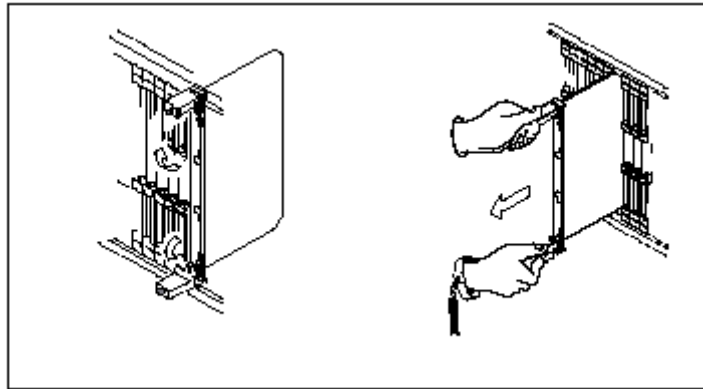11. As shown in the following figure, hold the module by the face plate with one hand while supporting the bottom edge with the other hand. Gently pull the module toward you until it clears the shelf.

Attention: Modules can weigh up to 9 pounds (4kg).
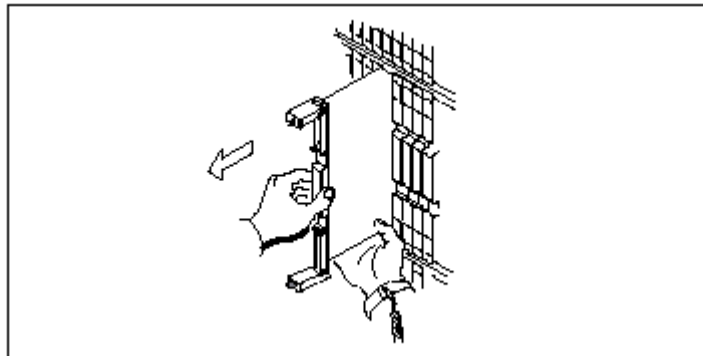
12. Place the module in an Electrostatic Discharge (ESD) protective container.

CAUTION
Equipment malfunction
Use a replacement card with the same PEC code; for example, a 65 for a 65 or a 66 for a 66.

CAUTION
Equipment damage due to empty slots
All slots not used on a powered shelf must be equipped with NTLX60BA filler modules. Filler modules maintain electromagnetic interference (EMI) integrity and they maintain shelf airflow patterns to ensure proper cooling.

13. Insert the replacement 2510 ECRM into the shelf. If a replacement module is not available, insert an NTLX60BA filler module in the slot until a replacement module is available.

14. Open the locking levers on the card.

15. As shown in the following figure, hold the module by the face plate with one hand while supporting the bottom edge with the other hand. Gently slide the module into the shelf.
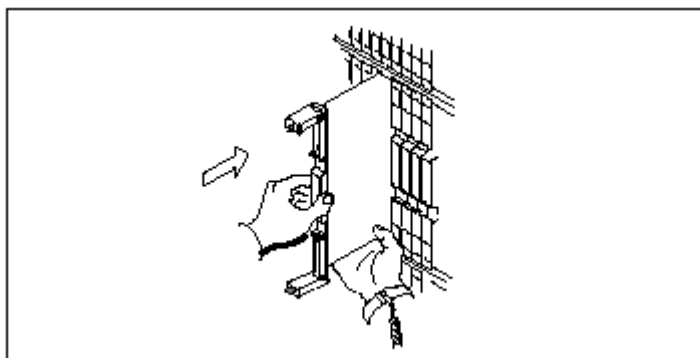
16. As shown in the following figure, using your fingers or thumbs, push on the upper and lower edges of the face plate to ensure that the module is fully seated in the shelf.
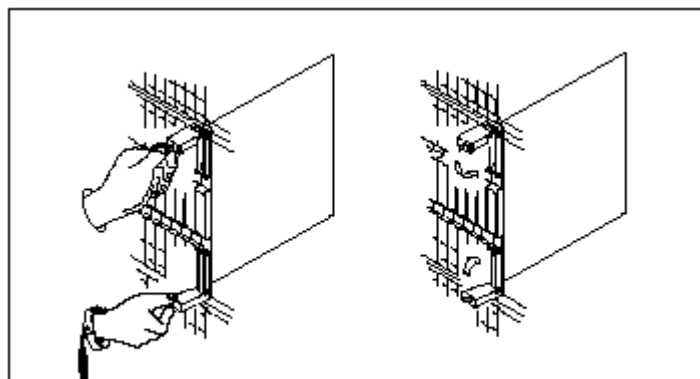
17. Close the locking levers to secure the module.

18. **Wait until the card performs a self-test (less than one minute).** The self-test is complete when the green LED remains on and the red LED remains off. If both LEDs stay on for an extended period of time, the replacement 2510 ECRM may be defective; remove the module and replace it with another replacement module of the same type. If both LEDs remain on with the second replacement module, contact your next level of support.

19. Close and lock the access door.

At the MAP terminal VSP screen:

20. Change the 2510 ECRM from the OffL state to the ManB state by typing:
    >BSY
    and pressing the Enter key.

21. Reset the firmware by typing:
    >RESETMOD FW
    and pressing the Enter key.

22. Load the module software by typing:
    >LOADMOD
    and pressing the Enter key.

Note: Module loading can take up to seven minutes to complete.

At the MAP terminal VSP screen:

23. Return the new 2510 ECRM to service by typing:
    >RTS
    and pressing the Enter key.

Note: The state change from ManB to Insv can take up to one minute to complete.

24. From the VSP screen, type:
    >PROT
    and press the Enter key.

25. Set the module to active by using these definitions:

    from_unit_no   is the number (0 to 27) of the active unit (spare)
    to_unit_no   is the number (0 to 27) of the inactive unit (newly replaced)

    Type the command:
    >MANUAL from_unit_no to_unit_no
    and press the Enter key.

26. If you need to replace another module, return to Step 3.

27. At this point, the 2510 ECRM replacement procedure is complete. Return to the CI level
    of the MAP screen by typing:
    >QUIT ALL
    and pressing the Enter key.

5. REPLACING A NORTEL MODULE WITH A TELLABS 2510 ECRM

The following explains the procedure to replace a Nortel module with a Tellabs 2510 ECRM.

Important! **Verify that the IMTs have been BSYd/BSY INBd.**

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1. The Tellabs ECRMs are assigned a new protection group during this installation, as follows:

(Enter)	**QUIT ALL**
(Enter)	**TABLE: MNPRTGRP**
(Enter)	**>lis all**

Example of switch response:

GRPKEY			GRPINFO
SPM 0	OC3_GRP 1		OC3_GRP NRVTV (NOSPARE MJ RPT)$
SPM 0	DSP_GRP 1		DSP_GRP NRVTV (NOSPARE MJ RPT)$
SPM 0	VSP_GRP 1		VSP_GRP NRVTV (NOSPARE MJ RPT)$
SPM 0	STS3L_GRP 1		STS3L_GRP 1PLUS1 NRVTV UNI_DIR
SPM 0	DLC_GRP 1		DLC_GRP NRVTV (NOSPARE MJ RPT)$
SPM 1	OC3_GRP 1		OC3_GRP NRVTV (NOSPARE MJ RPT)$
SPM 1	DSP_GRP 1		DSP_GRP NRVTV (NOSPARE MJ RPT)$
SPM 1	VSP_GRP 1		VSP_GRP NRVTV (NOSPARE MJ RPT)$
SPM 1	STS3L_GRP 1		STS3L_GRP 1PLUS1 NRVTV UNI_DIR

BOTTOM

(Enter)	**>ADD**
	GRPKEY:
(Enter)	**>SPM 0 VSP_GRP 2**
	SELECTOR:
(Enter)	**>VSP_GRP**
	SWCHMODE:
(Enter)	**>NRVTV**
	ALRMCTRL:
(Enter)	**>NOSPARE MJ RPT**

TUPLE TO BE ADDED:
SPM 0 VSP_GRP 2 VSP_GRP NRVTV (NOSPARE MJ RPT)$
ENTER Y TO CONFIRM, NO TO REJECT, OR E TO EDIT.

(Enter)	**>Y**

TUPLE ADDED
WRITTEN TO JOURNAL FILE AS JF NUMBER 1495

(Enter)	**>QUIT ALL**

---

2. Determine the SPM number and card location of the target VSPs. BSY CEM 1 of the target SPM; OFFL the VSPs to be replaced. Post the SPM containing the VSPs.

(Enter) **>MAPCI;MTC;PM;POST SPM 0**

Map screen example:

	CM	MS	IOD	Net	PM	CCS	Trks	Ext	APPL
	•	•	•	•	2 SPM	1 RS	11 CC	•	•
					C	*C*	*C*		

SPM			SysB	ManB	OffL	CBsy	ISTb	InSv	
0 Quit		PM	0	0	11	0	3	43	
2 Post_	SPM		0	0	0	0	0	2	

3 ListSet

4 ListRes   SPM 0 InSv Class: DMSCP

5 Trns1

6		Shlf0	SL	A	Stat	Shlf0	SL	A	Stat	Shlf1	SL	A	Stat	Shlf1	SL	A	Stat
7		- - - - -	1	-	- - - -	CEM1	8	I	InSv	DLC 0	1	A	InSv	- - - - -	8	-	- - - -
8		- - - - -	2	-	- - - -	OC3 0	9	A	InSv	- - - - -	2	-	- - - -	DSP 0	9	I	InSv
9		- - - - -	3	-	- - - -	OC3 1	10	I	InSv	- - - - -	3	-	- - - -	DSP 1	10	A	InSv
10		- - - - -	4	-	- - - -	VSP 3	11	A	InSv	- - - - -	4	-	- - - -	DSP 2	11	A	InSv
11 Disp_		- - - - -	5	-	- - - -	VSP 2	12	A	InSv	- - - - -	5	-	- - - -	DSP 3	12	A	InSv
12 Next		- - - - -	6	-	- - - -	VSP 1	13	A	InSv	- - - - -	6	-	- - - -	DSP 4	13	A	InSv
13 Select_		CEM 0	7	A	InSv	VSP 0	14	I	InSv	DLC 1	7	I	InSv	- - - - -	14	-	- - - -

14 QueryPM

15 ListAlm

16   SPM:

17 SPERFORM

18 Upgrade_

 GDICKINSO

Time 20:34 >

(Enter) **>SELECT CEM 1**

IF	DO
CEM 1 is ACTIVE	Switch Activity
CEM 1 is INACTIVE	BYS CEM 1

Example:
  SPM 0 CEM 1 Act *ISTb*
  Loc: Row B FrPos 6 ShPos 6 Shld 0 Slot 8 Class: DMSCP
  Default Load: CEM0012
  Clock:
  Input Ref: Internal Source: C Side 4 Current Mode: Sync
  CEM:

(Enter) **>PROT**
(Enter) **>MANUAL**
  Example switch response:
  A Switch of Activity may impact services on this node.
  Do you wish to continue?
  Please confirm ("YES, "Y", "NO", or "N"):

(Enter) **>Y**
  SPM 0 CEM 0 Manual: Request has been submitted.
  SPM 0 SwAct: Command completed. The node has switched activity.

(Enter)	**>SELECT CEM 1**
(Enter)	**>BSY**
(Enter)	**>QUIT ALL**

Select the Nortel VSPs to be replaced

(Enter)	**>MAPCI;MTC;PM;POST SPM 0**
(Enter)	**>SELECT VSP 0**
(Enter)	**>BSY**
(Enter)	**>OFFL**

(Enter)	**>SELECT VSP 1**
(Enter)	**>BSY FORCE**
(Enter)	**>OFFL**

(Enter)	**>SELECT VSP 2**
(Enter)	**>BSY FORCE**
(Enter)	**>OFFL**
(Enter)	**>QUIT ALL**

(Enter)	**>SELECT VSP 3**
(Enter)	**>BSY FORCE**
(Enter)	**>OFFL**

ADD TELLABS LOAD TO TABLE PMLOADS

(Enter)	**>TABLE PMLOADS**

(Enter)	**>ADD**
	LOADNAME:
(Enter)	**>TLB2510**
	ACTFILE:
(Enter)	**>TLB2510_010007**
	ACTVOL:
(Enter)	**>S00DPMLD**
	BKPFILE:
(Enter)	**>TLB2510_010007**
	BKPVOL:
(Enter)	**>S00DPMLD**
	UPDACT: N
(Enter)	**>N**

    TUPLE TO BE ADDED:
      TLB2510 TLB2510_010007 F02LPMLD TLB2510_010007 F02LPMLD N
      ENTER Y TO CONFIRM, N TO REJECT, OR E TO EDIT

(Enter)	**>Y**

(Enter)	**>QUIT ALL**

Go to TABLE MNCKTPAK and DELETE the VSPs just offlined (tuples containing NORTEL Datafill)

NOTE
PRINT OUT THE EXISTING DATAFILL FOR THE VSP TUPLES FOR FUTURE REFERENCE.

(Enter)   **>TABLE MNCKTPAK**

(Enter)   **>POS SPM 0 0 14**

  Example:
        SPM 1 0 14 VSP 0 1 SPARE (SYSB CR RPT) (MANB MJ RPT) (ISTB MN RPT)
         (PROTFAIL CR RPT)$ NTLX66BA   01   DSP0012

(Enter)   **>DEL**

Repeat >POS & >DEL above for all VSPs to be changed

<u>NOTE</u>
The VSP tuples cannot be CHAnged to update the
PEC. The tuples MUST be deleted and re-added.

Add the tuples back into TABLE MNCKTPAK with the new Tellabs PEC and Load Name.
********BE AWARE THAT VSP 0 IS TO BE ADDED AS -- SPARE.********

(Enter)   **>TABLE MNCKTPAK**
(Enter)   **>ADD**
               CPKKEY:
(Enter)   **>SPM 0 0 14**
               CPKTYPE:
(Enter)   **>VSP**
               UNITNO:
(Enter)   **><#>**
               VSPGRPID:
(Enter)   **>2**
               WRKSPR:
(Enter)   **>WORKING**
               RSRINFO:
(Enter)   **>ECAN 320**
               RSRINFO:
(Enter)   **>$**
               ALRMCTRL:
(Enter)   **>SYSB CR RPT**

NOTE
When entering the information in WRKSPR - VSP 0 is
datafilled as SPARE. VSPs 1 2 & 3 are to be datafilled
as WORKING.

NOTE
**** RSRINFO for the Tellabs ECRM is datafilled as 320 ****
**** for WORKING VSPs. The RSRINFO will not be   ****
**** datafilled for VSP 0. This is automatically filled as ****
**** needed by the DMS250.   ****

	ALRMCTRL:
(Enter)	**>MANB MJ RPT**
	ALRMCTRL:
(Enter)	**>ISTB MN RPT**
	ALRMCTRL:
(Enter)	**>PROTFAIL CR RPT**
	PEC:
(Enter)	**>TL812510**
	RELEASE:
(Enter)	**>01**
	LOAD:
(Enter)	**>TLB2510**
	ENTER Y TO CONFIRM, N TO REJECT, OR E TO EDIT.
(Enter)	**>Y**
(Enter)	**>QUIT ALL**

NOTE:
It is required to BSY and reload CEM 1 of the SPM you are currently working with before continuing. This will reset the CEM to recognize the Tellabs ECRMs.

(Enter)	**>MAPCI;MTC;PM;POST SPM 0**

(Enter)	**>SELECT CEM 1**

NOTE: CHECK THAT CEM 1 IS IN THE MANB STATE

(Enter)	**>RESETMOD FW**	(This will take approximately 1-2 minutes)
(Enter)	**>LOADMOD**	(LOADMOD will take approximately 10-15 minutes)

During loading of CEM 1, change out cards in the respective SPM shelf slots and then return to this procedure.

(Enter)	**>RTS**	(RTS will take approximately 5 minutes)
(Enter)	**>PROT**	
(Enter)	**>MANUAL**	(CEM 1 should now be ACTIVE)

YOU ARE NOW READY TO LOAD AND RTS THE VSPs

(Enter)	**>SELECT VSP 1**
(Enter)	**>BSY**
(Enter)	**>RESETMOD FW**
(Enter)	**>LOADMOD**
(Enter)	**>RTS**

<div style="border: 1px solid black;">

<u>NOTE:</u>
AT THIS TIME RTS THE IMTs PREVIOUSLY BYSd/INBd AND PERFORM TEST CALLS.
REVIEW TEST CALLS AND MAKE THE DECISION TO CONTINUE OR ABORT

</div>

IF	DO
TEST CALLS ARE ACCEPTABLE	CONTINUE WITH FOLLOWING STEPS
TEST CALLS ARE NOT ACCEPTABLE	REFER TO ABORT PROCEDURE — **PAGE 19**

Repeat SELECT, BSY, RESETMOD FW, LOADMOD AND RTS
for VSPs 0 2 3

RTS the associated IMTs

(Enter)   **>SELECT CEM 0**

(Enter)   **>BSY**
(Enter)   **>RESETMOD FW**
(Enter)   **>LOADMOD**
(Enter)   **>RTS**
(Enter)   **>PROT**
(Enter)   **>MANUAL**
(Enter)   **>Y**

(Enter)   **>QUIT ALL**

<u>END OF INSTALLATION PROCEDURE</u>

ABORT PROCEDURE

1) BSY the associated IMTs

2) SELECT VSP 1 Tellabs ECRM

3) BYS / OFFL the Tellabs VSP 1

4) DELETE the Tellabs VSP 1 in TABLE MNCKTPAK

5) Replace the Tellabs ECRM with the Nortel ECRM

6) ADD the Nortel ECRM to TABLE MNCKTPAK

NOTE
As instructed on page 16 of this procedure, use the printout of the existing datafill for the VSP tuples printed to ADD the datafill for the Nortel ECRMs.

---

7) SELECT CEM 0 – If active, go to the PROT screen and switch activity

8) BSY the INACTIVE CEM 0

9) RESETMOD FW, LOADMOD and RTS CEM 0

10) Switch activity to CEM 1

11) BSY VSP <#>

12) RESETMOD FW VSP <#>

13) RTS VSP <#>

14) Repeat steps 11, 12, and 13 until all VSPs are INSV

15) RTS the associated IMTs

16) Verify Call Processing

17) SELECT CEM 1 – If active, go to the PROT screen and switch activity

18) BSY the INACTIVE CEM 1

19) RESETMOD FW, LOADMOD, and RTS CEM 1

20) Switch activity to CEM 0

21) Verify Call Processing

22) RTS ALL IMTs

23) Verify traffic to ECANs

24) Switch activity of CEMs

25) Re-verify Call Processing

26) Switch activity of VSPs to verify activity switching is functional

27) Monitor

28) Clean up

---

6. Operation and Autonomous Fault Reporting

Operation

The maintenance function is performed by cooperating entities in the CEM and 2510 ECRM. CEM-based 2510 ECRM maintenance software interacts with Integrated Device Maintenance. This interaction allows for the exchange of information concerning the 2510 ECRM state and specific faults, and allows Device Maintenance to request that the 2510 ECRM perform certain maintenance actions.

The functionality provided by the 2510 ECRM-based component includes:

- ECRM State Management — maintains the 2510 ECRM state and executes state transitions, performing local functions needed for successful transition without requiring that the CEM have knowledge of these local functions.
- Diagnostic Framework — provides a mechanism to initiate diagnostics from the CEM without knowing the details of what the tests are.
- Fault Reporting — reports faults up to the CEM.
- Module Identification Memory (MIM) — a utility into which 2510 ECRM configuration and fault information, as well as module identification, is written.

Autonomous Fault Reporting

Beyond those faults detected through a diagnostic triggered by a test request from CEM resident Device Maintenance, fault reports can be autonomously sent from the 2510 ECRM to Device Maintenance. Upon receipt of the report, Device Maintenance reacts on the severity of the fault reported.

Device Maintenance categorizes faults into two categories:

- Non-critical fault — indicates a failure, but does not prevent the 2510 ECRM from continuing to provide service.
- Critical fault — indicates a failure that prevents the 2510 ECRM from providing service.

The 2510 ECRM determines what constitutes a non-critical or a critical fault. Furthermore, a critical fault results in the entire 2510 ECRM being removed from service. A non-critical fault only results in the circuit pack being flagged with a trouble condition and, if it is in service, is kept in service.

The 2510 ECRM is responsible for the following fault reporting requirements:

- All faults reported must fall into either the non-critical or critical category.
- Fault reports must be sent to Device Maintenance on both the active and inactive CEM.
- No faults are to be reported to Device Maintenance while the 2510 ECRM is in the **unavail** state (see the SPM Manual for further information about the **unavail** state).
- All reported faults are to be written into the 2510 ECRM Information Memory.
- **Critical faults must be reported as soon as they are detected.**

Loopback

Signal loopbacks represent an essential maintenance function for testing and recording the general health of serial transmission links. The 2510 ECRM supports one channel loopback on every primary and secondary S-Link. Loopback control is S-Link associated (see Figure 6-1).
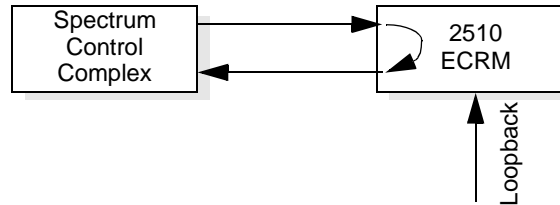

Figure 6-1   S-Link Loopbacks

Maintenance Loopback Message

Device Maintenance uses a Maintenance Loopback Message between itself and the 2510 ECRM, to ensure that 2510 ECRM maintenance is still present and available. This is equivalent to a "ping" in some network protocols.

When a 2510 ECRM receives a Maintenance Loopback Message it responds back with a Maintenance Loopback Message.

7.   Specifications

Cancellation Circuits

Echo Return Loss Enhancement (ERLE)	• At least 33dB (with NLP disabled)
Minimum Echo Return Loss (ERL)	• Auto adaptive from 0 to 6dB, minimum
Maximum Endpath Delay	• 48ms

Electrical

Power Dissipation	• Less than 30 watts
Input Voltage Range	• –40 to –60VDC

Physical

Dimensions	• Height: approximately 12.4 inches (315mm)
	• Width: approximately 1.2 inches (31mm)
	• Depth: approximately 15.7 inches (400mm)
Weight	• Less than 10 pounds (4.5kg)

Environmental

Operating Temperature	• +32° to +113° F (0° to +45° C); relative humidity 10 to 85 percent, non-condensing
	• Short term: +32° to +122° F (0° to +50° C); relative humidity 5 to 95 percent (short term is defined as not less than 72 hours and not more than 15 days per year)

Standards

Safety and Electrostatic Discharge (ESD)	• When used with the Nortel Spectrum system, the 2510 ECRM complies with Nortel Spectrum safety and ESD specifications.

8. Acronyms

The following is a list of acronyms that are used throughout this technical manual.

CEM	Common Equipment Module
DMS	Digital Multiplex Switch
ECAN	Echo Canceller
ECRM	Echo Canceller Resource Module
EMI	Electromagnetic Interference
ERL	Echo Return Loss
ERLE	Echo Return Loss Enhancement
ESD	Electrostatic Discharge
LED	Light Emitting Diode
MIM	Module Identification Memory
ms	Milliseconds
MTM	Module Test and Maintenance
NLP	Non Linear Processor
PCM	Pulse Code Modulation
PEC	Product Engineering Code
PUPS	Point of Use Power Supplies
S-Link	Serial Link
SPM	Spectrum Peripheral Module
VSP	Voice Signal Processor

9. Technical Assistance, Repair and Return

Technical Assistance

For technical assistance, please contact Tellabs Technical Assistance as follows, or contact us at our website at www.tellabs.com.

Location	Telephone	FAX
Canada — Tellabs Communications, Canada Ltd., Mississauga, Ontario	1.905.858.2058	1.905.858.0418
Mexico — Tellabs de Mexico	1.525.241.9800	1.525.241.9801
United States — Tellabs Operations, Inc.	630.679.7600 or 888.223.4933	630.679.7551

Repair and Return

If equipment needs repair, contact Tellabs' Product Services Department at the 800 number listed above with the equipment's model and issue numbers and warranty date code. You will be issued a Material Return Authorization (MRA) number and instructions on how and where to return the equipment.

Repair service includes an attempt to remove any permanent markings made by customers on Tellabs equipment. If equipment must be marked, it should be done with nonpermanent materials and in a manner consistent with the correct handling of electrostatically sensitive devices.

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