PCS-719 Integrated DLC Installation and Turn-up Procedure

This document describes the procedures for installing and turning up PG-Flex*Plus*™ integrated systems in the PCS-719 Central Office Terminal (COT) Shelf. The PCS-719 can also be remotely located in a cabinet or other suitable enclosure.

PG-Flex*Plus* System

The PG-Flex*Plus* Integrated Digital Loop Carrier (IDLC) system supports four or six DS0s on a single copper pair or 24 DS0s on two copper pairs (Figure 1). Services include Plain Old Telephone Service (POTS – Loop Start/Ground Start [LS/GS] and Universal Voice Grade [UVG]), and Integrated Services Digital Network (ISDN). CLASS features, MLT testability, and network management are also supported.

Sixteen PLL-735 Dual Integrated Central Office Line Units (COLUs) or eight FLL-814 COLUs can be installed in the 23" COT Shelf.

High-bit-rate Digital Subscriber Line (HDSL) circuits transport these services between the COT Shelf and the Network Interface Devices (NIDs) or Remote Terminal (RT) Enclosures. NIDs and RTs are line-powered from the PLL-735s and FLL-814s.

Subscriber services are transported between the Class 5 switch and the COT Shelf over DSX-1 circuits supporting ES, ESF, and TR-08 formats. Equipment protection is provided through the COT Shelf backplane; the backplane terminates these circuits on both PMX-744 Multiplex Units.

The PMU-712 Management Unit provides shelf management, performance monitoring, alarm, and test interface functions.

Doublers can be used to extend the range of the 24 channel systems. Two additional copper pairs are required between the COT Shelf and RT Enclosure for each doubler installed.

Versions of the PG-Plus NIDs and PG-Flex RT Enclosures are environmentally hardened and can be mounted externally or internally at the subscriber location.

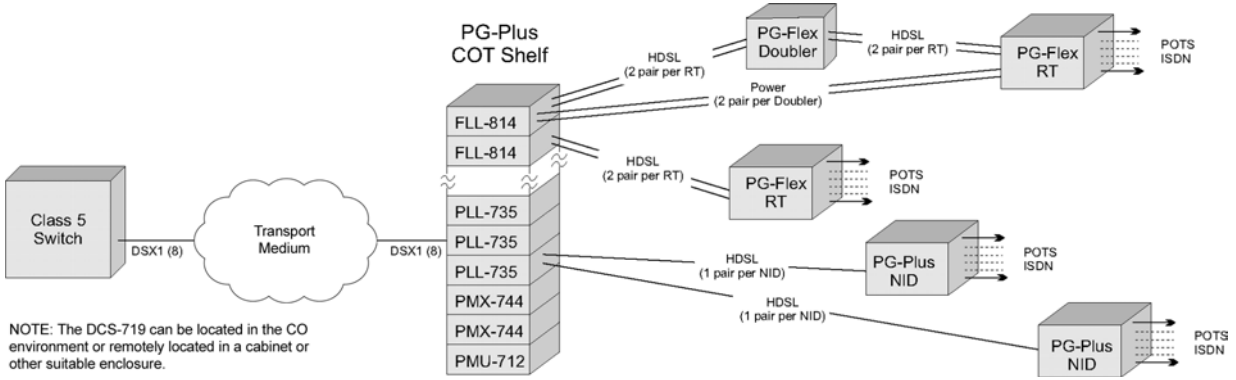

Figure 1. System Architecture

1 WIRE THE PCS-719 COT SHELF

Figure 2 provides a block diagram of the PCS-719 Shelf wiring required to support the IDLC system.

1.1 Frame Ground

Two frame ground termination points are provided on the COT Shelf. Both J22 and TB1 FGND are electrically equivalent.

Use locally approved methods to connect J22 or TB1 FGND to the common equipment ground wire running along the vertical member of the frame or to CO frame ground.

Use 12 AWG (minimum) wire for this connection.

1.2 CO Battery

The PCS-719 COT Shelf can be wired for single or redundant powering. The input current, shelf fuse recommendation, and heat dissipation are listed in Table 1. CO battery wiring for each COT Shelf goes directly to the equipment bay fuse panel (Figure 2).

Table 1 assumes the entire COT shelf is providing the services listed below and all POTS subscribers are off-hook.

Table 1. PCS-719 Shelf Fusing

Service	Doubler	ICOLU	NID or RTLU	Fuse[1] (Amps)
4 POTS	N/A	PLL-735	PRL-770	12.0
6 POTS	N/A	PLL-735	PRL-771	15.0
3 POTS/1 ISDN	N/A	PLL-735	PRL-772	12.0
2 ISDN	N/A	PLL-735	PRL-773	10.0
1 POTS/ 1 ISDN	N/A	PLL-735	PRL-774	10.0
6 UVG	N/A	PLL-735	PRL-779	15.0
24 POTS or 8 ISDN[2]	0	FLL-814	FRL-842	15.0
24 POTS or 8 ISDN[2]	1	FLL-814	FRL-842	15.0
24 POTS or 8 ISDN[2]	2	FLL-814	FRL-842	20.0
24 POTS or 8 ISDN[3]	0	FLL-814	FRL-842	10.0
24 POTS or 8 ISDN[3]	1	FLL-814	FRL-842	12.0
24 POTS or 8 ISDN[3]	2	FLL-814	FRL-842	15.0

Note 1: Assumes maximum capacity

Note 2: Subscriber drop set for LONG (≤ 960 Ω)

Note 3: Subscriber drop set for SHORT (≤ 830 Ω)

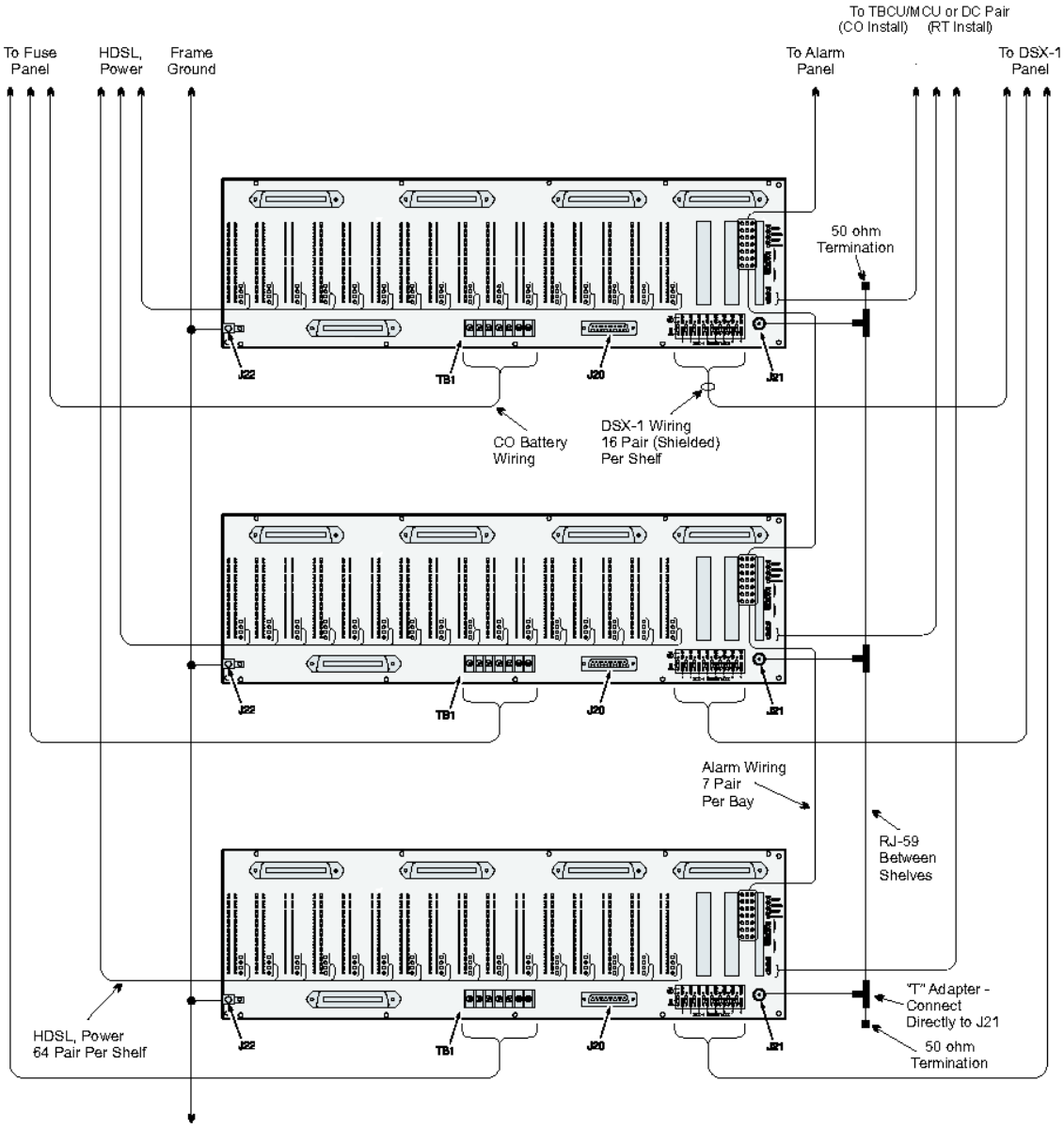

Figure 2. PCS-719 COT Shelf Integrated DLC Wiring Block Diagram

Follow local practice when wiring office battery to the COT shelf. It is recommended that crimp-on terminals be used on all wires connected to TB1.

1.2.1 Single Power Feed

1. Wire the COT shelf according to Figure 3.
2. Ensure the bridging clip is installed as shown in Figure 3 (factory provided).
3. After completing the wiring, continue with the Inter-Shelf LAN section on this page.

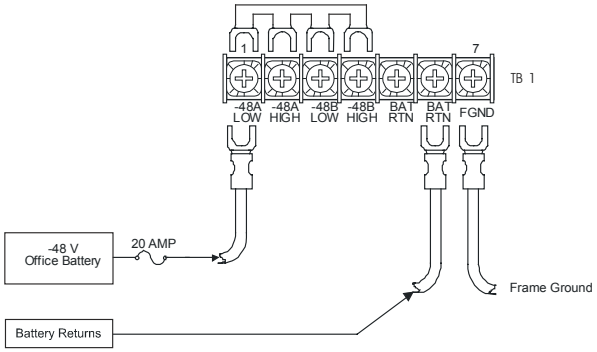

Figure 3. Single Source Power Wiring

The BAT RTN connections (terminations 5 and 6 on TB1) are commoned together on the COT Shelf backplane.

1.2.2 Redundant Power Feed

1. Wire the COT shelf according to Figure 4.
2. Remove the section of the bridging clip between the second and third lugs as shown in Figure 4.
3. After completing the wiring, continue with the Inter-Shelf LAN section on this page.

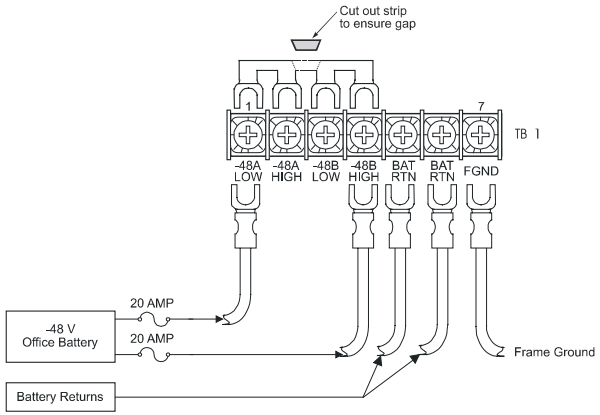

Figure 4. Redundant Source Power Wiring

1.3 Inter-Shelf LAN

The COT Shelf can be managed through a single network connection when the PMU-712 Management Unit is installed.

1. Attach a BNC "T" adapter directly to J21 on each shelf (Figure 5).
2. Connect each shelf with an RG-58 cable (Figure 2 on page 2).
3. Terminate the unused connection on the far end of each BNC "T" adapter with a 50 Ω termination resistor (Figure 2 on page 2).

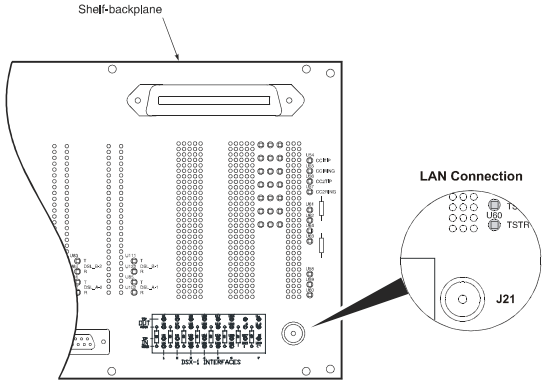

Figure 5. LAN Termination

1.4 Alarms

Terminate the alarm leads from the CO alarm system to the shelf. Refer to Table 2 for Alarm Terminations.

Each alarm operates a Form C relay with normally open (NO), normally closed (NC) and common (COM) connections. When an alarm is not active, there is continuity between the NC and COM connections. When an alarm is active, there is no continuity between the NO and COM connections.

The NO and COM alarm relay connections can be multipled between COT shelves in the same equipment bay.

Table 2. Alarm Terminations

Alarm	Function
SYSTEM	There is a critical, major, or minor alarm active on the COT shelf. Connect this relay to the equipment bay alarm indicator.
CRIT VISUAL	There is a critical alarm active on the COT shelf. Connect this relay to the critical alarm visual indicator of the CO alarm system.
CRIT AUDIBLE	There is a critical alarm active on the COT shelf. Connect this relay to the critical alarm audible indicator of the CO alarm system.
MAJ VISUAL	There is a major alarm active on the COT shelf. Connect this relay to the major alarm visual indicator of the CO alarm system.
MAJ AUDIBLE	There is a major alarm active on the COT shelf. Connect this relay to the major alarm audible indicator of the CO alarm system.
MIN VISUAL	There is a minor alarm active on the COT shelf. Connect this relay to the minor alarm visual indicator of the CO alarm system.
MIN AUDIBLE	There is a minor alarm active on the COT shelf. Connect this relay to the minor alarm audible indicator of the CO alarm system.

Audible alarms can be silenced using the ACO button.

Refer to Figure 6 for the location of the alarm wire-wrap posts and Figure 2 on Page 2 for inter-shelf wiring of these alarms.

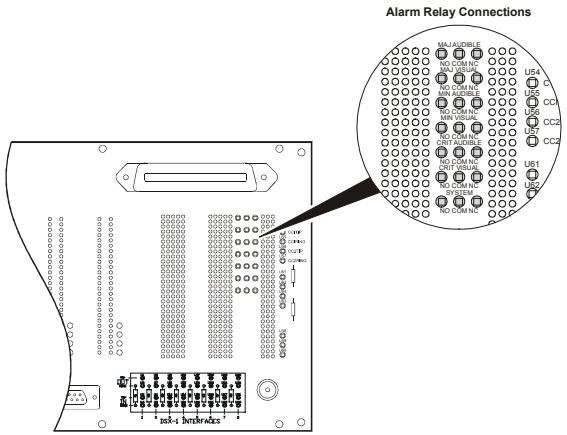

Figure 6. Alarm Terminations

1.5 ACO

The Alarm Cutoff (ACO) function silences active audible alarms; visual alarms remain present as long as an alarm is active. Alarm cutoff can be achieved by pressing the ACO button on the front panel of the PMU-712 or by connecting the EXT ACO pin on the shelf to ground (Figure 7) through a normally open momentary push button switch. The EXT ACO lead can be multiplied to other shelves. You can also silence audible alarms via the Maintenance screens.

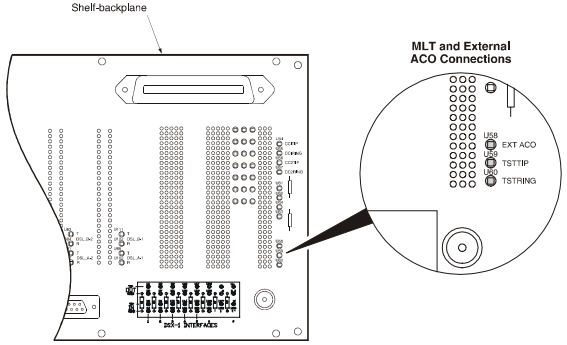

Figure 7. ACO and MLT Terminations

1.6 Subscriber Drop Testing

Test results on POTS subscriber drops can be displayed through a maintenance screen in the PMU-712 or as three-terminal resistive signatures on the TSTTIP and TSTRING terminations on the COT shelf backplane (Figure 7). Connect these terminations to the central office test system following local practice.

Table 3 shows the resistive signatures that are presented to the CO test system for various line conditions.

Table 3. DC Resistive Signatures

Test	Failure Condition	TR (kΩ)	TG, RG (kΩ)
RT Equipment Failure	RT detected, but no response from RT	17.8	90.9
Foreign Voltage on Drop	TG or RG > 10 V_{rms} TG or RG > 6 Vdc	27.8	90.9
All Tests OK	No failures detected	38.3	90.9
Ringer Test	REN > 5.0 or REN < 0.175	48.3	90.9
Resistive Fault on Drop	TG, RG, or TR ≤ 150 kΩ	58.0	90.9
Receiver Off-hook	Phone is off-hook	68.0	90.9
Hazardous Potential on Drop	TG or RG > 50 V_{rms} TG or RG > 135 Vdc	78.5	90.9
COTS-RT Facility Failure	RT not detected	≥ 1,000	90.9

The signatures for the PMU-712 List 2 are biased to –14 Vdc.

1.7 HDSL and Auxiliary Power

HDSL and auxiliary power connections are made to wire-wrap terminations on the shelf backplane (Figure 8).

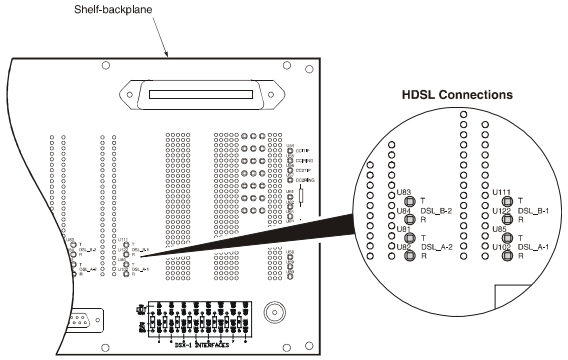

Figure 8. HDSL Terminations

Table 4 on Page 5 shows the HDSL distance. Table 5 on Page 5 shows the terminations for connecting the HDSL circuits and their appearances on the PLL-735 and FLL-814 CO line units.

Wire the HDSL subscriber circuits according to Table 5 on Page 5.

The wiring in Table 5 on Page 5 is different for the 4/6 channel PLL-735 and the 24 channel FLL-814.

For each doubler used in the 24 channel HDSL circuit, two additional power pairs are required between the COT Shelf and the RT Enclosure. Power pairs do not need to pass through the doubler housing.

Table 4. HDSL Distance

DSOs	Dblers	Pairs	26 AWG (kft)	24 AWG (kft)	22 AWG (kft)	19 AWG (kft)
4	N/A	1	15.0	21.7	31.2	49.7
6	N/A	1	12.5	18.0	25.2	37.8
24	0	2	9.0	12.3	16.1	22.8
24	1	4	18.0	24.6	32.2	45.6
24	2	6	27.0	36.9	48.3	68.4

Table 5. PCS-719 HDSL and Power Circuit Assignments

Card Slot	HDSL Terms	PLL-735 Dual 4/6 Channel	FLL-814 24 Channel
LU 1	DSL_A-1 DSL_B-1	1 – HDSL (1A) 2 – HDSL (1B)	1 – PWR 1 1 – PWR 2
LU 2	DSL_A-2 DSL_B-2	3 – HDSL (2A) 4 – HDSL (2B)	1 – HDSL 1 1 – HDSL 2
LU 3	DSL_A-3 DSL_B-3	5 – HDSL (3A) 6 – HDSL (3B)	2 – PWR 1 2 – PWR 2
LU 4	DSL_A-4 DSL_B-4	7 – HDSL (4A) 8 – HDSL (4B)	2 – HDSL 1 2 – HDSL 2
LU 5	DSL_A-5 DSL_B-5	9 – HDSL (5A) 10 – HDSL (5B)	3 – PWR 1 3 – PWR 2
LU 6	DSL_A-6 DSL_B-6	11 – HDSL (6A) 12 – HDSL (6B)	3 – HDSL 1 3 – HDSL 2
LU 7	DSL_A-7 DSL_B-7	13 – HDSL (7A) 14 – HDSL (7B)	4 – PWR 1 4 – PWR 2
LU 8	DSL_A-8 DSL_B-8	15 – HDSL (8A) 16 – HDSL (8B)	4 – HDSL 1 4 – HDSL 2
LU 9	DSL_A-9 DSL_B-9	17 – HDSL (9A) 18 – HDSL (9B)	5 – PWR 1 5 – PWR 2
LU 10	DSL_A-10 DSL_B-10	19 – HDSL (10A) 20 – HDSL (10B)	5 – HDSL 1 5 – HDSL 2
LU 11	DSL_A-11 DSL_B-11	21 – HDSL (11A) 22 – HDSL (11B)	6 – PWR 1 6 – PWR 2
LU 12	DSL_A-12 DSL_B-12	23 – HDSL (12A) 24 – HDSL (12B)	6 – HDSL 1 6 – HDSL 2
LU 13	DSL_A-13 DSL_B-13	25 – HDSL (13A) 26 – HDSL (13B)	7 – PWR 1 7 – PWR 2
LU 14	DSL_A-14 DSL_B-14	27 – HDSL (14A) 28 – HDSL (14B)	7 – HDSL 1 7 – HDSL 2
LU 15	DSL_A-15 DSL_B-15	29 – HDSL (15A) 30 – HDSL (15B)	8 – PWR 1 8 – PWR 2
LU 16	DSL_A-16 DSL_B-16	31 – HDSL (16A) 32 – HDSL (16B)	8 – HDSL 1 8 – HDSL 2

1.8 DSX-1

Each DSX-1 circuit is connected to the COT shelf backplane (Figure 9). The input (side 1) of each DSX-1 circuit includes a 100 Ω termination resistor.

The IN termination is the DSX-1 signal from the central office (side 1). The OUT termination is the DSX-1 signal to the central office (side 2).

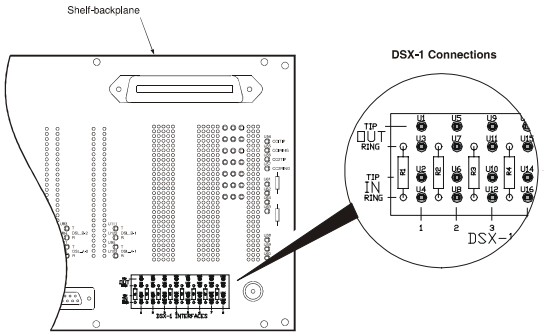

Figure 9. DSX-1 Terminations

Follow local practice to terminate the DS1 circuits to the COT shelf.

2 INSTALL AND PROVISION CARDS

This section describes the procedures for installing and provisioning the PMU-712 and PMX-744 units in the PCS-719 shelf.

2.1 Install the PMU-712

1. Install the PMU-712 (Figure 10) in the shelf slot labeled “COMMON”.
2. After installing the unit, the front panel LEDs cycle upwards in pairs, then go off. The PWR LED remains on.

Figure 10. Management Unit

Table 6 provides a description of the PMU-712 LEDs.

Table 6. PMU-712 LED Indicators

LED	Color	State	Description
PWR	Green	On	BAT A and BAT B present
		Flashing	BAT A or BAT B missing
		Off	Unit is not powered
EXTCLK	Green	On	Both clocks present
		Flashing	One clock present
		Off	No clock present
CRIT	Red	On	Critical alarm(s) active
		Off	No critical alarm(s) active
MAJ	Red	On	Major alarm(s) active
		Off	No major alarm(s) active
MN	Yellow	On	Minor alarm(s) active
		Off	No minor alarm(s) active
ACO	Yellow	On	ACO operated
		Off	ACO not operated
FAULT	Red	On	Fault in unit
		Off	No fault in unit
COM	Green	On	Multi-shelf management active
		Off	Multi-shelf management idle

Table 7 lists the LED indications for the PMU-712 diagnostic and maintenance modes.

Table 7. PMU-712 Diagnostic Indicators

Indicator	Description	Action
PWR LED On, all other LEDs Flashing	Unit is running in Boot Mode	Application software must be re-installed. Contact Technical Support for additional information.
PWR LED On, all other LEDs sequencing downward	Software download to unit	Wait for download to complete and unit to re-start

2.2 Install the PMX-744s

The following procedures assume the transmission circuits between the CO switch and the PCS-719 COT Shelf are configured correctly and fully operational (Table 10).

1. Install the first PMX-744 (Figure 11) in the shelf slot labeled “MUX1”.
2. After the PMX-744 is installed, the front panel LEDs turn on, then go off. The PWR LED remains on.
3. After approximately ten seconds, the DSX-1 LEDs indicate the status of the DSX-1 circuits and the ACTIVE LED remains on.

If the PMX-744 is not indicating the correct status of the DSX-1 circuits, then there may be a problem with the transmission circuits or with the PMX-744. Problems must be cleared before proceeding with the turn-up of the COT Shelf. Refer to Table 10 for line format and/or provision the cards per Section 2.3 on Page 7, as necessary.

4. Install the second PMX-744 (Figure 11) in the shelf slot labeled “MUX2”
5. After the PMX-744 is installed, the front panel LEDs turn on, then go off. The PWR LED remains on.
6. After approximately ten seconds, the DSX-1 LEDs indicate the status of the DSX-1 circuits.

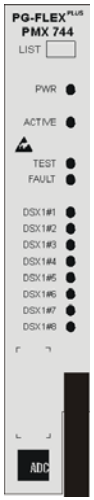

Figure 11. PMX-744

Table 8 lists the LED indications for the PMX-744.

Table 8. PMX-744 LED Indicators

LED	Color	State	Description
PWR	Green	On	BAT A and/or BAT B present
		Flashing	BAT A or BAT B missing
		Off	Unit is not powered/Processor dead
ACTIVE	Green	On	Carrying traffic
		Off	Standby
TEST	Yellow	On	DS1(s) is in loopback
		Off	No DS1(s) loopbacks
FAULT	Red	On	Active alarm fault or complete hardware failure in system
		Off	No fault in unit
DSX-1-# (# = 1-8)	Green	On	Good DS1 signal present
		Flashing	Loss of Frame (LOF) detected
		Off	No DS1 signal present

Table 9 lists the LED indications for the PMX-744 diagnostic and maintenance modes.

Table 9. PMX-744 Diagnostic Indicators

Indicator	Description	Action
PWR LED On, all other LEDs Flashing	PMX-744 is running in Boot Mode	Application software must be re-installed. Contact Technical Support for additional information.
PWR LED On, all other LEDs sequencing downward	Software download to PMX-744	Wait for download to complete and PMX-744 to re-start
Fault LED On, all other LEDs off	Complete hardware failure	Replace PMX-744

When the PMX-744 is installed, the multiplexer unit is automatically configured with the DS1 default values shown in Table 10.

Table 10. PMX-744 DS1 Default Options

Option	List 1A	List 2
Cross Connect Mode	192-CH	192-CH
Primary Timing Source	DS1-1	DS1-1
Secondary Timing Source	DS1-1	DS1-1
PMX Protection Switching	Enabled	Enabled
DS1 Frame Format	ESF	TR-08
DS1 Line Code	B8ZS	AMI

2.3 Provision the PMU-712 and PMX-744

Equipment Needed:
VT-100 emulator terminal (PC/Laptop
running Windows Hyperterminal or PROCOMM, etc.)
DB-9 straight cable
PMU-712
PMX-744
ESD Wrist Strap

Step	Action	Verification
1	Set your terminal to: **8 data bits** **1 stop bit** **no parity** **VT-100 emulation**	
2	Connect DB-9 cable between RS-232 port on front panel of PMU-712 and PC/Laptop serial port.	
3	Press the **Spacebar** several times to activate the auto baud feature of the PMU-712	
	If the Login Password screen displays, skip step 3 and go directly to step 4.	
4	Type `chg-dialog;` and press **Enter** at the TL1 prompt (“<”) to change from TL1 mode to Screens mode.	After several seconds, the Login Password screen displays.
	Type `chg-mode::screens`; instead of `chg-dialog`; before pressing **Enter** to permanently change from TL1 mode to screen interface mode.	
5	Enter the *Password*, then press **Enter**.	Main Menu appears.
	The factory-default password is `password#1`. If the password has been changed and the new password is not known, contact ADC Technical Support while at the terminal. Technical Support will provide a temporary password based on the Access Key number displayed on the Logon screen.	

6	Choose *SELECT* from the menu bar and choose active MUX (**MUX 1** or **MUX 2**).	
a)	Select **CONFIG**, then choose *System Options* and press **Enter**.	
b)	Use the arrows to select the **DS1 Frame Format** and **DS1 Line Code** fields, and set the appropriate values per your engineering specifications.	
c)	Select *ACCEPT SYSTEM OPTION CHANGES* and press **Enter**.	
d)	Press **ESC**.	Menu bar appears.
7	Select *MAIN* from the menu bar and press **Enter**.	Shelf Summary screen appears.
a)	Select *Shelf Summary* and press **Enter**.	The screen should indicate that both PMX-744s are installed and all other slots are not equipped.
	If any alarms are present in the system, they must be identified and cleared before proceeding with the turn-up of the COT Shelf.	
b)	Press **ESC**.	Menu bar appears.
8	Select *CONFIG* from the menu bar and press **Enter** to set the system date and time.	
a)	Select **Date and Time** and press **Enter**.	
b)	Enter the *current date and time*, then select *ACCEPT DATE AND TIME* and press **Enter**.	

9	Select *CONFIG* from the menu bar and press **Enter** to set the system ID.	
a)	Select **Shelf Options** and press **Enter**.	
b)	Use the tab key to select the **Shelf ID** field, then type the *system ID*.	
c)	Select *ACCEPT SHELF OPTIONS* and press **Enter**.	
d)	Press **ESC**.	Menu bar appears.
10	Select *ALARMS* from the menu bar and press **Enter** to clear the alarm history.	
a)	Select *ALARM HISTORY* and press **Enter.**	
b)	Type **Y** at the *CLEAR ALARM HISTORY* prompt.	
c)	Press **ESC**.	Menu bar appears.

2.4 Install the PLL-735 and FLL-814 Line Units

The following procedures assume the transmission circuits between the CO switch and the COT Shelf are configured correctly and are fully operational, and the PMX-744s are functioning normally.

Table 11 describes the LED indicator status on the front of the PLL-735 (Figure 12). Refer to Table 13 on Page 9 for fault isolation and troubleshooting procedures.

Figure 12. PLL-735

Table 11. PLL-735 LED Indicators

LED	Color	State	Description
PWR	Green	On	Power is normal – HDSL in sync
		Flashing	HDSL not in sync
		Off	Unit is not powered
SYNC	Green	On	HDSL in sync to NID
		Flashing	HDSL attempting to sync with NID
		Off	No NID detected
MARGIN	Yellow	On	CO margin below preset threshold
		Flashing	RT margin is below preset threshold
		Off	CO and RT margins are above preset threshold
TEST	Yellow	On	Subscriber drop test in progress
		Off	No drop test in progress
FAULT	Red	On	PLL-735 detected a fault
		Flashing	PLL-735 has an active alarm
		Off	PLL-735 has no fault

Table 12 describes the LED indicator status on the front of the FLL-814 (Figure 13). Refer to Table 14 on Page 9 for fault isolation and troubleshooting.

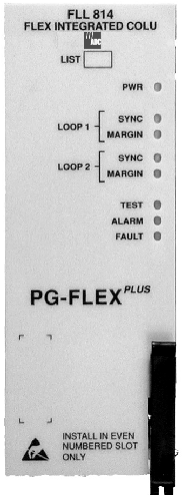

Figure 13. FLL-814

Table 12. FLL-814 LED Indicators

LED	Color	State	Description
PWR	Green	On	FLL-814 power supply is normal
		Flashing	FLL-814 is attempting to power-up the RT Line Unit or Doubler Unit
		Off	FLL-814 is not receiving power or internal fault
LOOP 1 or LOOP 2 SYNC	Green	On	Loop 1 or 2 is in sync between the FLL-814 and RT Line Unit or Doubler Unit
		Flashing	Loop 1 or 2 margin is attempting to sync with the RT Line Unit or Doubler Unit
		Off	Active RT Line Unit or Doubler Unit is not detected
LOOP 1 or LOOP 2 MARGIN	Yellow	On	Loop 1 or 2 margin at the FLL-814 is equal to or below the provisioned threshold level
		Flashing	Loop 1or 2 margin at the RT Line Unit or Doubler Unit is equal to or below the provisioned threshold level
		Off	Loop 1or 2 margin at the FLL-814 and RT Line Unit and Doubler Unit is above the provisioned threshold level
TEST	Yellow	On	Subscriber drop test in progress
		Off	No drop test in progress
ALARM	Red	On	FLL-814 has an active alarm
		Flashing	RT Line Unit alarm exists
		Off	FLL-814 has no alarms
FAULT	Red	On	FLL-814 detects a fault
		Off	FLL-814 has no fault

3 System Fault Isolation and Troubleshooting

This section provides information on system fault isolation and troubleshooting based on front panel LED indicators.

If you need additional assistance, contact Technical Support on page 11.

3.1 PLL-735 Fault Isolation and Troubleshooting

Table 13 provides fault isolation and troubleshooting procedures for the PLL-735.

Table 13. PLL-735 Fault Isolation and Troubleshooting

Indicator	Probable Cause	Solution
All LEDs Off	No input power PLL-735 power fuse blown PLL-735 processor stopped	Verify fuses on bay fuse panel. Check input power on the shelf battery terminations. Remove and re-insert the PLL-735. From the Main Menu (Main Submenu – Overall Status), verify that no alarms exist. If you cannot view the Main Menu, replace the PLL-735. Replace the PLL-735.
PWR LED Flashing	HDSL loop open or HDSL ground fault detector activated	Check HDSL loop continuity and length. PLL-735 power supply or NID fault. Replace the PLL-735. Replace the NID.
FAULT LED On	PLL-735 fault detected	Remove and re-insert the PLL-735. Replace the PLL-735.
FAULT LED Flashing	PLL-735 has detected an alarm condition	From the Main Menu (Main Submenu – Overall Status), verify what alarms exist. From the Main Menu (Alarms Submenu), clear the alarm(s).
MARGIN LED On MARGIN LED Flashing	HDSL distance limit exceeded HDSL loop fault PLL-735 fault	From the Main Menu (Main Submenu – Overall Status), verify that no alarms exist. If you cannot view the Main Menu, replace the PLL-735. Check engineering records for distance between the PLL-735 and NID. From the Main Menu, (Performance Submenu – HDSL-A or HDSL-B Summary), check HDSL loss to ensure maximum attenuation has not been exceeded. Replace the PLL-735. Replace the NID.
SYNC LED Off	HDSL loop has lost sync with NID HDSL distance limit exceeded HDSL loop fault PLL-735 or NID fault	From the Main Menu (Main Submenu – Overall Status), verify that no alarms exist. If you cannot view the Main Menu, replace the PLL-735. Check engineering records for distance between the PLL-735 and NID. From the Main Menu, (Performance Submenu – HDSL-A or HDSL-B Summary), check HDSL loss to ensure maximum attenuation has not been exceeded. Replace the PLL-735. Replace the NID.

3.2 FLL-814 Fault Isolation and Troubleshooting

Table 14 provides fault isolation and troubleshooting procedures for the FLL-814.

Table 14. FLL-814 Troubleshooting and Fault Isolation

LED	Probable Cause	Solution
No LEDs On	No input power FLL-814 power fuse blown FLL-814 processor stopped	Check input power at COT Shelf backplane with FLL-814 removed. If power is not present at COT Shelf backplane, replace FLL-814. If power is not present at COT Shelf backplane, replace the fuse in the backplane.
PWR LED Off	No input power On-board fuse is blown on FLL-814	Check input power at COT Shelf backplane with FLL-814 removed. If power is not present at COT Shelf backplane, replace FLL-814. If power is not present at COT Shelf backplane, replace the fuse in the backplane.
FAULT LED On	Fault detected on FLL-814	Replace the FLL-814.
ALARM LED On	Alarm exists on FLL-814	From the Main Menu (Performance Submenu), determine the cause of the alarm. Correct the condition, if possible. If you cannot view the Main Menu, a communication error exists. Remove and re-insert the FLL-814. If communication error still exists, replace the FLL-814.

LED	Probable Cause	Solution
ALARM LED Flashing	An existing alarm exists on the RT Line Unit	From the Main Menu (Performance Submenu), determine the cause of the alarm. Correct the condition, if possible. If you cannot view the Main Menu, a communication error exists. Remove and re-insert the FLL-814. If communication error still exists, replace the FLL-814.
MARGIN LED On	Distance limitation	From the Main Menu (Performance Submenu), verify that no alarms exist.
	Fault in HDSL line	If Initial installation: Check engineering records for the distance between the COT Shelf and the RT. From the Main Menu (Performance Submenu – HDSL Summary), view the HDSL loss.
	Faulty FLL-814	If existing installation: From the Main Menu (Performance Submenu – HDSL Summary), view the HDSL loss to ensure that a maximum allowable loss has not been exceeded. Replace the FLL-814 and/or the RT Line Unit.
SYNC LED Off	HDSL line has lost sync	If Initial installation: Check engineering records for the distance between the COT Shelf and the RT.
	Distance limitation may have been exceeded	
	Faulty FLL-814	If existing installation: From the Main Menu (Performance Submenu – HDSL Summary), view the HDSL loss to ensure that a maximum allowable loss has not been exceeded.

3.3 Subscriber Fault Isolation

Table 15 provides fault isolation procedures for the System. Problems are listed in decreasing order of probability; the most likely action to the resolve the problem listed first. If is assumed that the system has successfully powered up, the HDSL circuits are synchronized end-to-end, there are no ES, UAS, or margin errors occurring, and no Fault LEDs are illuminated on the units installed in the COT Shelf or RT Enclosure.

Table 15. Subscriber Fault Isolation

Indication	Probable Cause	Solution
All subscriber circuits cannot draw dial tone Telephones are not ringing ISDN circuits are not synchronizing	Incorrect provisioning of the PMX-744(s) and/or PLL-735 or FLL-814	PMX-744: Verify system options are set correctly. FLL-814: Verify timeslots are correctly assigned and enabled for all mapped circuits.
	Problem with DS1 signals	Verify the presence and integrity of the DS1 signals terminated on the COT Shelf.
	Undetected hardware problem	Replace the following units with known good units in the following order: - PLL-735/FLL-814 - NID/RT Line Units - PMX-744(s) - RT Channel Units
One or more subscriber circuits on a NID or single RT Channel Unit cannot draw dial tone Telephones are not ringing ISDN circuits are not synchronizing (24 channel system only)	Undetected hardware problem	Replace the following units with known good units in the following order: - RT Channel Unit on which the failures are occurring - RT Line Unit - All RT Channel Units of the same type on which the failures are occurring

4 LIMITED WARRANTY

Product warranty is determined by your service agreement. Refer to the ADC Warranty/Software Handbook for additional information, or contact your sales representative or Customer Service for details.

5 FCC CLASS A COMPLIANCE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

6 MODIFICATIONS

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by ADC voids the user's warranty.

All wiring external to the product(s) should follow the provisions of the current edition of the National Electrical Code.

7 TECHNICAL SUPPORT

Technical assistance is available 24 hours a day, 7 days a week by contacting the ADC Technical Assistance Center (TAC) at:

Telephone:	800.366.3891 (toll-free in the U.S. and Canada)
E-mail:	wsd_support@adc.com
Knowledge Base:	http://adc.com/Knowledge_Base/index.jsp
Web:	www.adc.com

8 REVISION HISTORY

Rev	Date	Changes
01	12/1/2002	Initial release.

PCS-719 Integrated DLC Installation and Turn-up Procedure

Section SCP-PCS719-111-01P
Issued December 1, 2002

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This document applies to the following products:

Model	CLEI	Description
PCS-719 List 1A	S9MTCB0A~~	23" COT Shelf
PMU-712 List 2	S9C3CCDA~~	Management Unit
PMX-744 List 1A	VAPHCC0C~~	8 DS1 Multiplex Unit
PMX-744 List 2	VAPHCCCD~~	
PLL-735 List 2	S9L1AREA~~	4/6 Channel Integrated CO Line Unit
PLL-735 List 3	S9L1ARFB~~	
FLL-814 List 1A	VACHD7NG~~	24 Channel Integrated CO Line Unit
FLL-814 List 2	VACJKPFE~~	

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