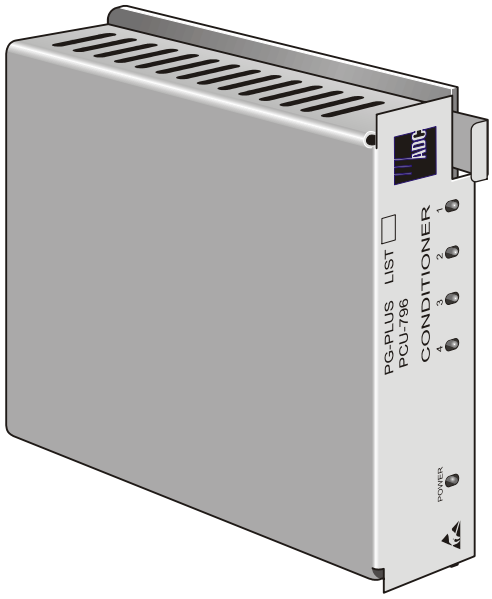
PG-PLUS

TECHNICAL PRACTICE



PGTC Conditioner Unit

Model	List	CLEI Code
PCU-796	1	S9TPLKNB~~

SECTION SCP-PCU796-010-04H

Revision History of This Practice

Revision	Release Date	Revisions Made
01	February 11, 1998	Initial Release
02	February 20, 2002	Release to rebrand document to comply with ADC standards
03	January 6, 2003	Updated Product Support Information
04	June 24, 2003	Updated Table 2 and Product Support Information

USING THIS PRACTICE

Three types of messages, identified by icons, appear in the text.

Notes indicate information about special circumstances.

Cautions indicate the possibility of equipment damage or the possibility of personal injury.

Electrostatic Discharge (ESD) susceptibility symbols indicate that a device or assembly is susceptible to damage from electrostatic discharge.You must wear an antistatic wrist strap connected to the appropriate ground connection prior to performing installation procedures. You must also observe normal ESD precautions when handling electronic equipment. Do not hold electronic plugs by their edges. Do not touch components or circuitry.

INSPECTING YOUR SHIPMENT

Upon receipt of the equipment:

- Unpack each container and visually inspect the contents for signs of damage. If the equipment has been damaged in transit, immediately report the extent of damage to the transportation company and to ADC. Order replacement equipment, if necessary.
- Check the packing list to ensure complete and accurate shipment of each listed item. If the shipment is short or irregular, contact ADC as described in "Returns" on page 9. If you must store the equipment for a prolonged period, store the equipment in its original container.

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PRODUCT OVERVIEW

This practice describes the PCU-796 List 1, a pair gain test controller (PGTC) Conditioner Unit (PCU), that provides control signals from the PGTC to I-MLT-2 during Mechanized Loop Testing (Integrated MLT) (see Figure 1).

THEORY OF OPERATION

To complete MLT testing on a PG-Plus® system, the PGTC must remain idle. The PG-Plus system can perform this function when tested by using Nonintegrated MLT-2 systems. However, the functionality between the MLT-2 and PGTC changes when the MLT function is integrated into the switch. The PCU-796 is required in this case to ensure that the test completes correctly.

The PCU-796 attaches to the Sleeve lead and the Trunk Ring lead of the PGTC equipment. In the case of I-MLT-2, the Sleeve lead of the PGTC is normally unconnected. The PCU-796 uses the signal on the Sleeve lead to drive a relay in the conditioner circuitry that applies -48 V office battery back to the Trunk Ring lead. This allows the I-MLT-2 to sense a normal termination of testing from the PGTC although it was never activated. Without the PCU-796, a **Channel Test Failure** message would appear at the conclusion of the MLT test.

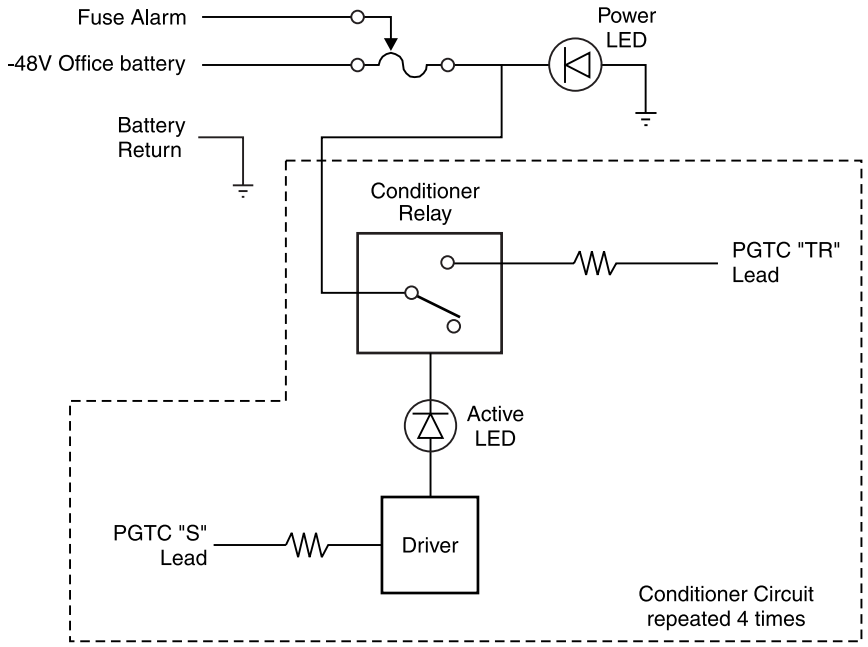

Figure 1. PGTC *Block Diagram*

The PCU-796 is not required in Central Offices (CO) that use Nonintegrated MLT-2 systems. Figure 2 shows the typical connections of Nonintegrated MLT-2. In this case, the Sleeve lead passes through the PGTC to the No Test Trunk in the switch. MLT interprets -48 V on the Ring lead as ***Test OK***. Because the PGTC remains inactive during PG-Plus testing, the -48 V is returned by the No Test Trunk when the MLT opens the Sleeve lead at the end of testing.

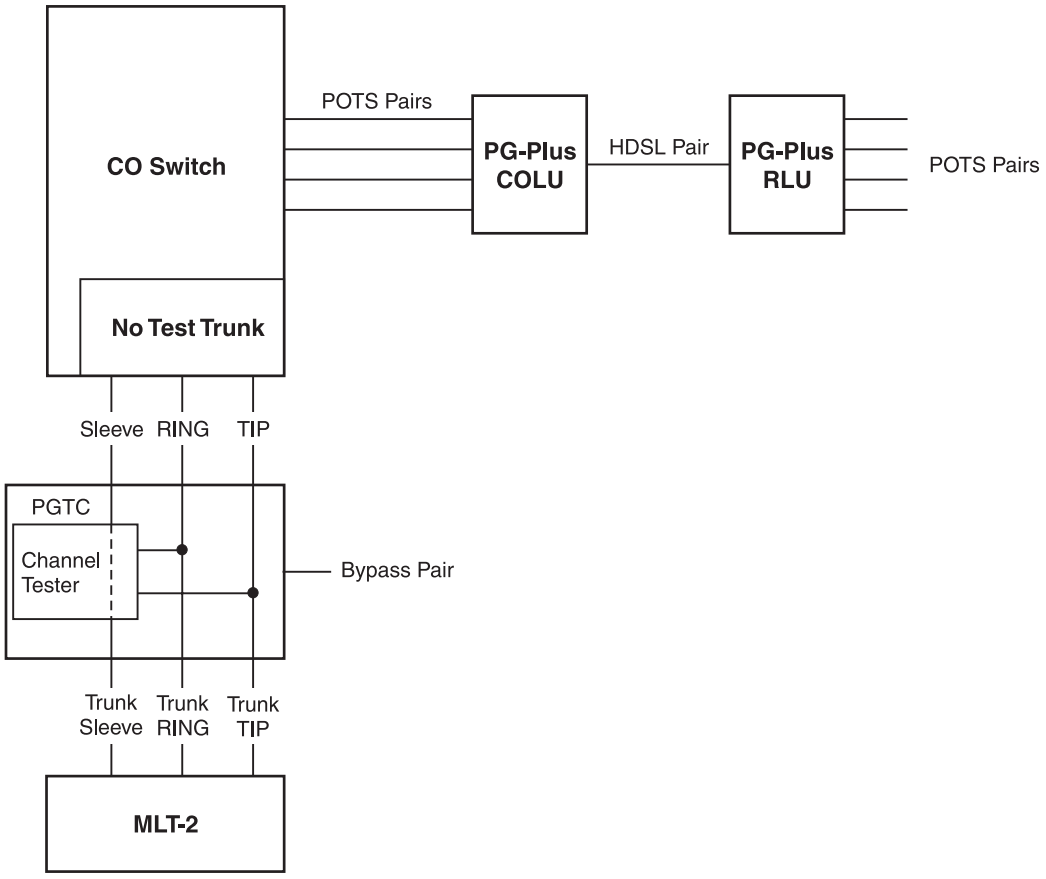

Figure 2. *Non-Integrated MLT-2*

The differences in the Integrated MLT-2 case are shown in Figure 3. Here the PCU-796 is necessary because a No Test Trunk is not present in this set-up. The PCU-796 monitors the unconnected Sleeve lead and responds with -48 V battery coupled through a resistor to the Trunk Ring lead when the MLT opens its Sleeve lead at the end of testing. The -48 V is interpreted as ***Test OK*** by the I-MLT-2 even though the PGTC was inactive. The PCU-796 does not interfere with other digital loop carrier (DLC) devices that activate the PGTC. When the PGTC is active, the opening of the Sleeve lead by I-MLT-2 at the end of test is not passed through the PGTC. Thus, the PCU-796 remains inactive and does not apply -48 V in this case.

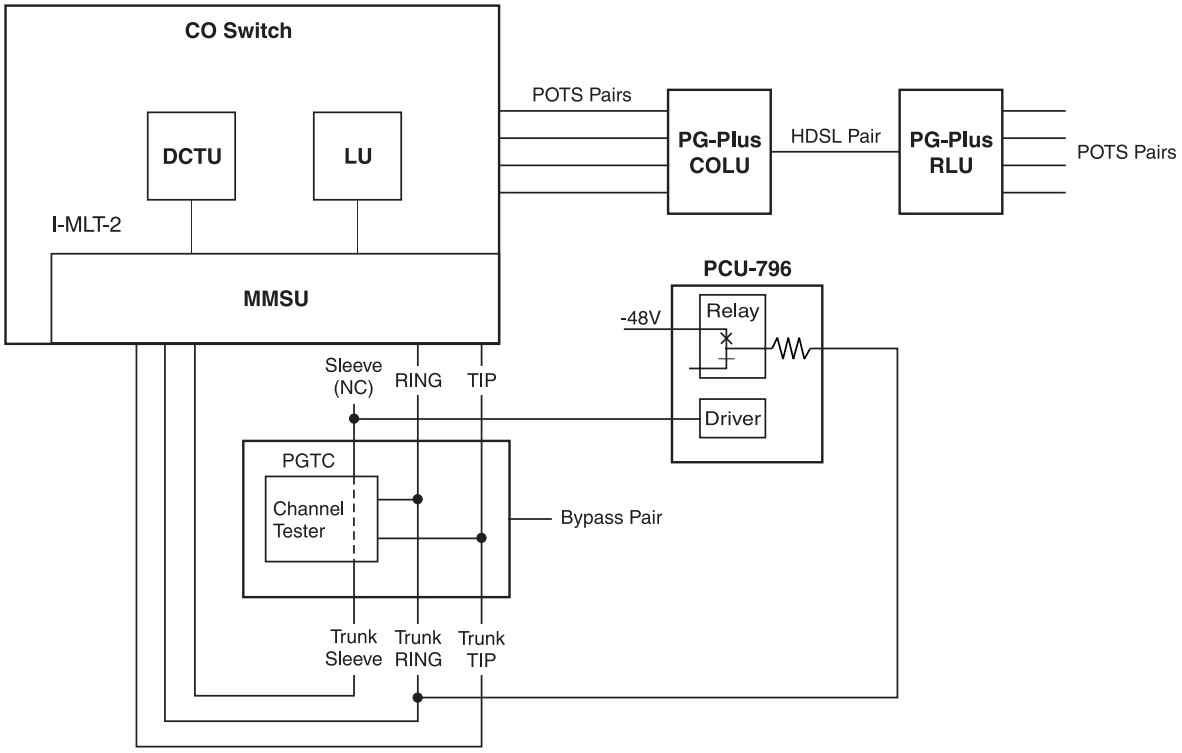

Figure 3. *Integrated MLT-2 Using PCU-796*

DESCRIPTION AND FEATURES

PGTC Conditioner Unit

The PCU-796 Conditioner Unit allows PG-Plus systems to correctly interface with a Pair Gain Test Controller when used in conjunction with an Integrated MLT-2. The PCU-796 is not required when MLT-2 is external to the switch. One PCU-796 is applied per PGTC (I-MLT-2 cases only), which then allows an unlimited number of PG-Plus systems to be deployed. The PCU-796 has no affect on other systems that also use the PGTC and I-MLT-2 connections.

PCU-796 List 1

The PCU-796 mounts in a single-width 400-type mechanics enclosure such as the Pair Gain HUS-340 HiGain Universal Shelf. A single PCU-796 has four separate conditioner circuits to handle all the ports on a single PGTC. When used in a HUS-340 shelf, up to three PCU-796 units can be accommodated.

The PCU-796 is a non-service affecting device. It is wired in parallel with the existing Sleeve and Ring connections between the PGTC and the I-MLT-2. Failure or removal of the PCU-796 does not result in any loss of traffic or service degradation. At most, a **Channel Test Failure** message would appear if the PCU-796 were removed while a PG-Plus system is under MLT test.

The PCU-796 has no options or provisionable settings and is in service when plugged into a suitable COT Shelf. The PCU-796 has one field replaceable fuse (F1) of the GMT variety for mechanical and electrical fuse alarm indication. The major features of the PCU-796 are:

- Conditions four PGTC connections per board
- Fits any standard 400-type mechanics enclosure
- Provides Fuse Alarm contact
- Does not affect other PGTC/MLT users
- Non-service affecting

Specifications

Function	Four individual PGTC conditioner circuits.
	Used in I-MLT-2 applications with PG-Plus
Material	Glass-epoxy circuit board
Finish	Wet-film solder mask
Dimensions	
Width	5.6 in. (14.2 cm.)
Length	5.6 in. (14.2 cm.)
Height	1.4 in. (3.6 cm.)
Weight	0.6 lbs. (0.3 kg.)
Mounting	Single width 400-type mechanics enclosure
Connectors	56 pin gold edge fingers
Power Requirements	
Input Voltage	Nominal: 48 Vdc
	Minimum: 42 Vdc
	Maximum: 56 Vdc
Input Current (All Ports Active)	Typical: 30 mA at 48 Vdc
	Maximum: 36 mA at 56 Vdc
Input Current (No Ports Active)	Maximum: 7 mA at 56V
Power Consumption (All Ports Active)	Typical: 1.44 W at 48 Vdc
	Maximum: 2.0 W at 56 Vdc
Power Consumption (No Ports Active)	Maximum: 0.40 W at 56 Vdc
Environment	
Operating Temperature	32°F to 150° F (0° C to 65°C)
Operating Humidity	5% to 95% noncondensing

LED DESCRIPTIONS

Figure 4 shows the PCU-796 front edge indicators. One green POWER LED and four yellow CONDITIONER LEDs are present. The POWER LED is green when the -48 V office battery and battery return are present at the card edge pins. If fuse F1 blows, the POWER LED goes off and -48 V office battery is applied to the Fuse Alarm pin on the card edge connector.

The yellow CONDITIONER LEDs go on when one or more of the conditioner circuits sense current flow on the PGTC sleeve lead output (see Table 1).

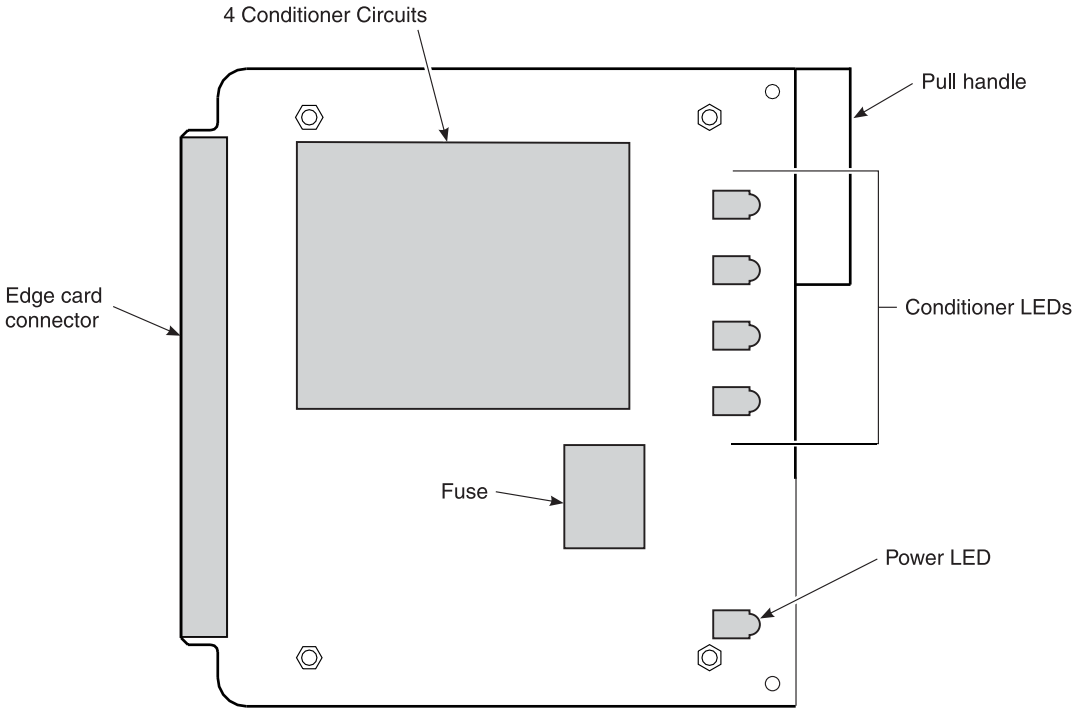

Figure 4. PCU-796 *Unit*

Table 1. *LED Indicators on Front Edge of the PCU-796*

Indicator	Condition	Description
POWER	ON	PCU-796 is powered on.
	OFF	PCU-796 is not receiving power.
CONDITIONER #1	ON	Conditioner circuit #1 is inactive.
	OFF	Conditioner circuit #1 is active.
CONDITIONER #2	ON	Conditioner circuit #2 is inactive.
	OFF	Conditioner circuit #2 is active.
CONDITIONER #3	ON	Conditioner circuit #3 is inactive.
	OFF	Conditioner circuit #3 is active.
CONDITIONER #4	ON	Conditioner circuit #4 is inactive.
	OFF	Conditioner circuit #4 is active.

CARD-EDGE CONNECTOR

The PCU-796 connector has 56 gold-edge fingers that mate to a standard 400-type connector. Table 2 lists the PCU-796 card-edge connector pinouts. Although all the Trunk Tip connections are not used, they are shown for wiring convenience. Wire the trunk Tip #*n* (where *n* equals the Tip or Ring number), trunk Ring #*n*, and sleeve #*n* leads to the corresponding leads on the PCU-796 shelf.

Table 2. *Edge Connector Pinouts*

Edge Pin	Signal Name	Edge Pin	Signal Name
1	Frame Ground	2	Trunk Tip #1 (TT1)
3		4	Trunk Ring #1 (TR1)
5		6	Sleeve #1 (S1)
7		8	
9		10	
11		12	Trunk Tip #2 (TT2)
13		14	Trunk Ring #2 (TR2)
15		16	Sleeve #2 (S2)
17	Battery Return	18	
19		20	
21		22	
23		24	
25	Alarm	26	
27		28	
29		30	
31		32	
33		34	
35	-48V Battery	36	
37		38	
39		40	
41		42	Trunk Tip #3 (TT3)
43		44	Trunk Ring #3 (TR3)
45		46	Sleeve #3 (S3)
47		48	
49		50	
51		52	Trunk Tip #4 (TT4)
53		54	Trunk Ring #4 (TR4)
55		56	Sleeve #4 (S4)

INSTALLATION

To install the PCU-796, slide the PCU-796 into the card guides of the slot that is wired for PGTC conditioning, then press on the metal insertion handle until the unit seats fully into its connector. Figure 5 shows installation into a HUS-340 shelf.

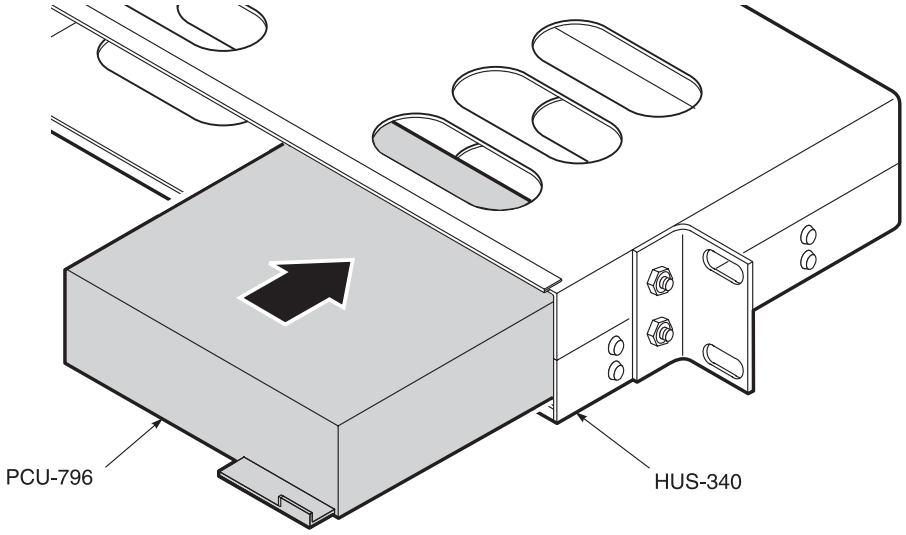

Figure 5. *Installing the PCU-796 into an HUS-340 Shelf*

The POWER LED is on when the PCU-796 is seated correctly and the shelf is powered.

Installation is now complete.

PCU-796 STATES

Active State

The CONDITIONER LED is off when the PCU-796 no longer senses current flow and is applying -48 V to the Trunk Ring lead.

Inactive State

The four CONDITIONER LEDs are lighted when the PCU-796 is monitoring the shelf current and is not applying -48 V to the Trunk Ring lead. Each conditioner circuit is an independent circuit.

Servicing

The GMT type fuse can be replaced in the field. There are no other field serviceable parts.

PRODUCT SUPPORT

TECHNICAL SUPPORT

Technical Assistance is available 24 hours a day, 7 days a week by the contacting Customer Service Engineering group at:

Telephone:	800.366.3891 The 800 telephone support line is toll-free in the U.S. and Canada.
Email:	wsd_support@adc.com
Knowledge Base:	http://adc.com/Knowledge_Base/index.jsp
Web:	www.adc.com

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.

RETURNS

To return equipment to ADC:

1. Locate the number of the purchase order under which the equipment was purchased. To obtain a return authorization number, you need to provide the original purchase order number to ADC's Return Material Authorization (RMA) Department.
2. Call or write ADC's RMA Department to ask for an RMA number and any additional instructions. Use the telephone number, fax number or email address listed below:
   - Telephone: 800.366.3891
   - Email Address: rma@ADC.com
3. Include the following information, in writing, along with the equipment you are returning:
   - Company name and address.
   - Contact name and telephone number.
   - The shipping address to which ADC should return the repaired equipment.
   - The original purchase order number.
   - A description of the equipment that includes the model and part number of each unit being returned, as well as the number of units that you are returning.
   - The reason for the return. For example:
     - The equipment needs an ECO/ECN upgrade.
     - The equipment is defective.

If the equipment is defective, please tell us what you observed just before the equipment malfunctioned. Be as detailed in your description as possible.

If there is another reason for returning the equipment, please let us know so we can determine how best to help you.

4 Pack the equipment in a shipping carton.

5 Write ADC's address and the RMA Number you received from the RMA Department clearly on the outside of the carton.

All shipments are to be returned prepaid. ADC will not accept any collect shipments.

FCC CLASS B COMPLIANCE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

* Reorient or relocate the receiving antenna.
* Increase the separation between the equipment and receiver.
* Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
* Consult the dealer or an experienced radio/TV technician for help.

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.

ACRONYMS

CO	Central Office
DLC	Digital Loop Carrier
HUS	HiGain Universal Shelf
ISDN	Integrated Services Digital Network
LED	Light Emitting Diode
MLT	Mechanized loop Testing
PCU	Pair Gain Conditioner Unit
PGTC	Pair Gain Test Controller
RMA	Return Materials Authorization

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