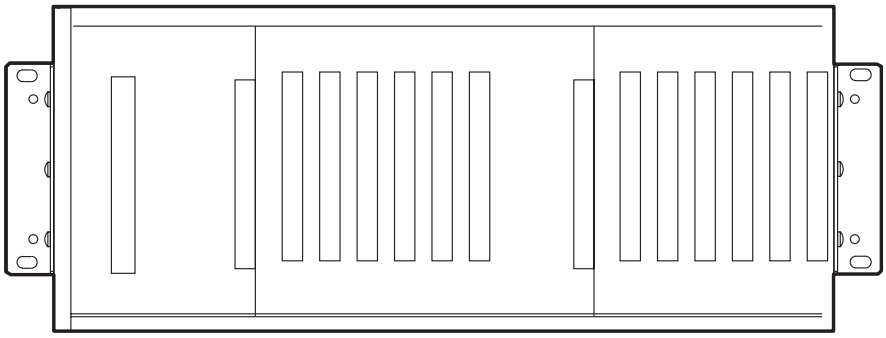
PG-FLEX 19" CENTRAL OFFICE TERMINAL SHELF

Model	List Number	Part Number	CLEI Code
FCS-718	2	150-1318-02	VAMCDC0ARA



PAIRGAIN TECHNOLOGIES, INC.
ENGINEERING PLANT SERIES TECHNICAL PRACTICE
SECTION 363-718-102-01

Revision History of this practice.
Revision 01—May 30, 1997
A) Initial Release.

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USING THIS TECHNICAL PRACTICE

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

A note informs you of special circumstances.

A caution indicates the possibility of equipment damage.

A warning indicates the possibility of personal injury.

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A. PRODUCT OVERVIEW

1. Description and Features

1.1 The PairGain® PG-Flex™ FCS-718 List 2 19-inch Central Office Terminal (COT) Shelf (Figure 1) supports:

- one Alarm Unit or PGTC Interface Unit that is common to both systems
- two PG-Flex subscriber carrier systems where each system comprises one Line Unit and from one to six Channel Units (for a shelf maximum of two Line Units and 12 Channel Units)

Additionally, the shelf provides termination points (on the rear of the shelf) for alarms, power, metallic bypass pairs, auxiliary power pairs when using a doubler, and subscriber circuits. The List 2 COT Shelf provides wire-wrap terminations for the subscriber circuits.

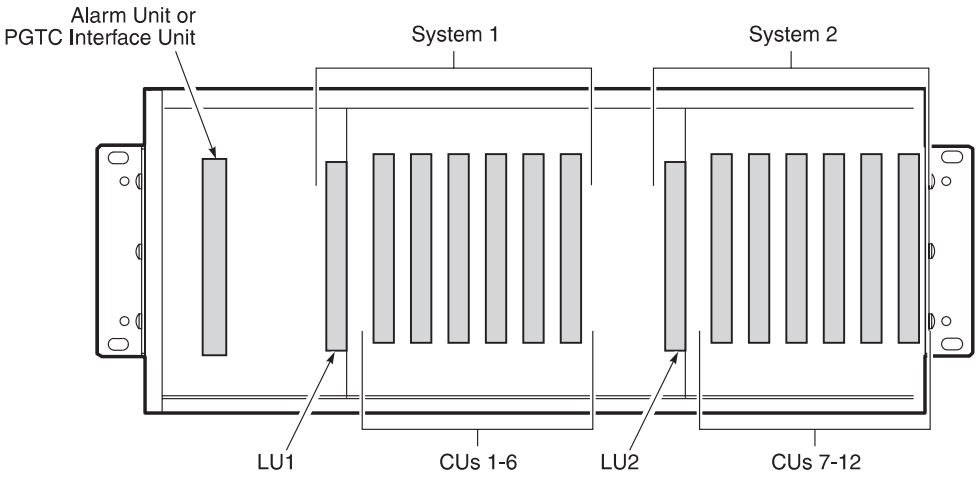

Figure 1. *FCS-718 COT Shelf (Card-side, Front View)*

Use the List 2 FCS-718 COT 19-inch Shelf only with a List 4x (or higher) FRE-765 Remote Terminal Enclosure.

1.2 Features of the PG-Flex FCS-718 COT Shelf are:

- universal mounting brackets for installing in a 19- or 23-inch equipment bay
- .045 in. wire-wrap connections for HDSL, alarm, metallic bypass pairs, and auxiliary power pairs (when using a doubler)
- screw terminal connections for frame ground and dual Central Office (CO) battery (BATT_A-, BATT_B-)
- DB-25 connector for Network Management Analysis (NMA) communications
- wire-wrap terminations for CO line connections
- 25-pair Amphenol connector for PGTC test interface

2. Specifications

Electrical Characteristics

Power ..... -48 Vdc CO battery

Environmental

Operating Temperature ..... -40° F to +150° F (-40° C to + 65° C)

Operating Humidity ..... 5% to 95% (non-condensing)

Operating Elevation ..... -200 feet to 13,000 feet (-60 m to 4,000 m)

Physical

Mounting ..... 19- or 23-inch equipment bay using universal mounting brackets

Height ..... 7.00 in. (17.8 cm)

Width ..... 17.25 in. (43.8 cm)

Depth ..... 11.75 in. (29.9 cm)

Weight ..... 11.00 lbs (5.0 kg)

B. FUNCTIONAL DESCRIPTION

3. Operational Capabilities

3.1 Each system (one Line Unit and from one to six Channel Units) can support up to either 24 or 32 subscriber channels. Each Channel Unit can provide four (4) or eight (8) channels, depending on the service offered. Services offered are:

- Plain Old Telephone Service (POTS)
- Integrated Services Digital Network (ISDN)

A label on the FCS-718 shelf indicates numbering for the Line and Channel Units. When the Line Units are a List 1 or 2, black numbers indicate sequential Channel Unit numbering 1 through 12. When the Line Units are List 3 or higher, blue numbers indicate Channel Unit numbering 1 through 6 for each system.

3.2 Tables 1 and 2 show how to utilize channels, dependent on the Channel Unit (4 or 8 channels) and the type of subscriber service (i.e., POTS or ISDN) selected.

Table 1. *Channel Unit Circuit Utilization*

Channel Unit	Channel Unit Service Configurations			
	4-Channel POTS	8-Channel POTS	4-Channel ISDN	4-Channel DDS
T/R 1	Ckt 1	Ckt 1	Ckt 1	Ckt 1 Tx
T/R 2	Ckt 2	Ckt 2	Ckt 2	Ckt 1 Rcv
T/R 3	Ckt 3	Ckt 3	Ckt 3	Ckt 2 Tx
T/R 4	Ckt 4	Ckt 4	Ckt 4	Ckt 2 Rcv
T/R 5	—	Ckt 5	—	Ckt 3 Tx
T/R 6	—	Ckt 6	—	Ckt 3 Rcv
T/R 7	—	Ckt 7	—	Ckt 4 Tx
T/R 8	—	Ckt 8	—	Ckt 4 Rcv

Table 2. *Systems 1 and 2 Circuit Assignments for COT Shelf*

System 1*							System 2*						
Line Unit	CU 1 (CU 1)	CU 2 (CU2)	CU 3 (CU 3)	CU 4 (CU 4)	CU 5 (CU 5)	CU 6 (CU 6)	Line Unit	CU 7 (CU 1)	CU 8 (CU 2)	CU 9 (CU 3)	CU 10 (CU 4)	CU 11 (CU 5)	CU 12 (CU 6)
1	Ckt 1	Ckt 1	Ckt 1	Ckt 1	Ckt 1	Ckt 1	2	Ckt 1	Ckt 1	Ckt 1	Ckt 1	Ckt 1	Ckt 1
	Ckt 2	Ckt 2	Ckt 2	Ckt 2	Ckt 2	Ckt 2		Ckt 2	Ckt 2	Ckt 2	Ckt 2	Ckt 2	Ckt 2
	Ckt 3	Ckt 3	Ckt 3	Ckt 3	Ckt 3	Ckt 3		Ckt 3	Ckt 3	Ckt 3	Ckt 3	Ckt 3	Ckt 3
	Ckt 4	Ckt 4	Ckt 4	Ckt 4	Ckt 4	Ckt 4		Ckt 4	Ckt 4	Ckt 4	Ckt 4	Ckt 4	Ckt 4
	Ckt 5	Ckt 5	Ckt 5	Ckt 5	Ckt 5	Ckt 5		Ckt 5	Ckt 5	Ckt 5	Ckt 5	Ckt 5	Ckt 5
	Ckt 6	Ckt 6	Ckt 6	Ckt 6	Ckt 6	Ckt 6		Ckt 6	Ckt 6	Ckt 6	Ckt 6	Ckt 6	Ckt 6
	Ckt 7	Ckt 7	Ckt 7	Ckt 7	Ckt 7	Ckt 7		Ckt 7	Ckt 7	Ckt 7	Ckt 7	Ckt 7	Ckt 7
	Ckt 8	Ckt 8	Ckt 8	Ckt 8	Ckt 8	Ckt 8		Ckt 8	Ckt 8	Ckt 8	Ckt 8	Ckt 8	Ckt 8

* CU numbers shown on top are for a List 1 or 2 Line Unit. CU numbers on the bottom in parentheses are for a List 3 or higher Line Unit. CU is a Channel Unit.

4. Backplane Connections

4.1 Section 4.2 provides connector pinouts located on the backplane for an Alarm or PGTC Interface Unit, Line Unit, and Channel Unit connectors.

Section 4.3 provides connectors and termination points located on the backplane for:

- CO battery and CO return (BATT_A-, BATT_B-, Battery Return)
- frame ground
- Local Area Network (LAN)
- data
- HDSL, test, composite clock, auxiliary power pairs, and external ACO switch wire-wrap posts
- alarm or PGTC test interface
- subscriber lines with .045 mm wire-wrap posts (P1, P2, P3, and P4)

4.2 Table 3 lists the FCS-718 List 2 connectors (Figure 1) and where each is described in this practice.

Table 3. *FCS-718 List 2 Card Connectors*

Connector/Fuse	Go to Table(s)	On page
Alarm Unit or PGTC Interface Unit	4	5
Line Unit Connectors (Systems 1 and 2)	5	6
Channel Unit Connectors (System 1)	6	7 thru 9
Channel Unit Connectors (System 2)	7	10 thru 12

Use the information in tables 4 through 7 for diagnostic and troubleshooting procedures under the direction of an authorized PairGain technical support representative. User terminations are not required on J1.

***Table 4**. Alarm Unit or PGTC Interface Unit Connector*

J1-C Pin	J1-C Signal	J1-B Pin	J1-B Signal	J1-A Pin	J1-A Signal
1	LAN	1	LGND (CDS)	1	LGND (CDS)
2	N/C	2	INHIBIT	2	N/C
3	PGTC_TIP1	3	SLEEVE1	3	TESTIN1-T
4	PGTC_RING1	4	SLEEVE2	4	TESTIN1-R
5	PGTC_TIP2	5	SLEEVE3	5	TESTIN2-T
6	PGTC_RING2	6	SLEEVE4	6	TESTIN2-R
7	PGTC_TIP3	7	OH1	7	TESTIN3-T
8	PGTC_RING3	8	OH2	8	TESTIN3-R
9	PGTC_TIP4	9	OH3	9	TESTOUT1_T
10	PGTC_RING4	10	OH4	10	TESTOUT1-R
11	(BURN-IN)	11	PROCEED1	11	TESTOUT2-T
12	LOCK1	12	PROCEED2	12	TESTOUT2-R
13	LOCK2	13	PROCEED3	13	TESTOUT3-T
14	LOCK3	14	PROCEED4	14	TESTOUT3-R
15	LOCK4	15	SEIZE	15	TESTOUT4-T
16	TMAJ	16	SEZBY	16	TESTOUT4-R
17	+5_1	17	TSTALM	17	+5
18	NMA_TX	18	NMA_RX	18	NMA_DTR
19	NMA_DSR	19	NMA_TCLK	19	NMA_RCLK
20	NMA_BUS_1	20	NMA_BUS_2	20	TESTIN4-T
21	NMA_BUS_3	21	NMA_BUS_4	21	TESTIN4-R
22	CC1TIP	22	CC1RING	22	EXT_ACO
23	CC2TIP	23	CC2RING	23	8KHZ_CC
24	SHELF_ID_NO	24	SHELF_ID_COM	24	SHELF_ID_NC
25	MAJ_AUD_NO	25	MAJ_AUD_COM	25	MAJ_AUD_NC
26	MAJ_VIS_NO	26	MAJ_VIS_COM	26	MAJ_VIS_NC
27	MIN_AUD_NO	27	MIN_AUD_COM	27	MIN_AUD_NC
28	MIN_VIS_NO	28	MIN_VIS_COM	28	MIN_VIS_NC
29	FUSEALARM	29	MAJORALARM	29	MINORALARM
30	BATT_B-	30	N/C	30	BATT_A-
31	BATTERY+	31	BATTERY+	31	BATTERY+
32	PROTGND	32	GND	32	GND

Table 5. *Line Unit Connector Pinouts*

System	Line Unit	Connector
1	1	J2
2	2	J10

Pin	Signal	Pin	Signal
1	PROTGND	2	PROTGND
3	N/C	4	N/C
5	HDSLTIP1EX	6	HDSLTIP2EX
7	HDSLRING1EX	8	HDSLRING2EX
9	N/C	10	N/C
11	BATTERY+	12	BATTERY+
13	-48	14	-48
15	BATTERY-_***n***	16	BATTERY-_***n***
17	8KHZ_CC	18	N/C (BURN-IN)
19	TSYNC	20	TSIG
21	TCLK	22	TSER
23	GND	24	RSYNC
25	RSIG	26	RCLK
27	RSER	28	GND
29	SDA	30	CSYNC
31	FUSEALARM	32	SCL
33	+5	34	+5
35	GND	36	GND
37	-5	38	-5
39	NMA_BUS2	40	GND (CID3)
41	GND (CID2)	42	CID1
43	MAJORALARM	44	MINORALARM
45	TESTIN-T	46	TESTIN-R
47	TESTOUT-T	48	TESTOUT-R
49	N/C	50	N/C
51	BYPASS-T	52	BYPASS-R
53	HDSL_TIP1	54	HDSL_TIP2
55	HDSL_RING1	56	HDSL_RING2
57	N/C	58	N/C
59	PROTGND	60	PROTGND

* Where ***n*** is A on system 1 and B on system 2.

Table 6. *Channel Unit Connectors for System 1*

System 1	Channel Unit 1	Connector J3		System 1	Channel Unit 2	Connector J4	
Pin	**Signal**	**Pin**	**Signal**	**Pin**	**Signal**	**Pin**	**Signal**
1	PROTGND	2	PROTGND	1	PROTGND	2	PROTGND
3	TIP05_1	4	RING05_1	3	TIP13_1	4	RING13_1
5	TIP06_1	6	RING06_1	5	TIP14_1	6	RING14_1
7	TIP07_1	8	RING07_1	7	TIP15_1	8	RING15_1
9	TIP08_1	10	RING08_1	9	TIP16_1	10	RING16_1
11	BATTERY+	12	BATTERY+	11	BATTERY+	12	BATTERY+
13	-48	14	-48	13	-48	14	-48
15	BATT_A-	16	BATT_A-	15	BATT_A-	16	BATT_A-
17	8KHZ_CC	18	N/C (BURN-IN)	17	8KHZ_CC	18	N/C (BURN-IN)
19	TSYNC	20	TSIG	19	TSYNC	20	TSIG
21	TCLK	22	TSER	21	TCLK	22	TSER
23	GND	24	RSYNC	23	GND	24	RSYNC
25	RSIG	26	RCLK	25	RSIG	26	RCLK
27	RSER	28	GND	27	RSER	28	GND
29	SDA	30	CSYNC	29	SDA	30	CSYNC
31	N/C	32	SCL	31	N/C	32	SCL
33	+5	34	+5	33	+5	34	+5
35	GND	36	GND	35	GND	36	GND
37	-5	38	-5	37	-5	38	-5
39	N/C	40	GND (CID3)	39	N/C	40	GND (CID3)
41	GND (CID2)	42	GND (CID1)	41	GND (CID2)	42	GND (CID1)
43	GND (CID0)	44	N/C	43	N/C (CID0)	44	N/C
45	TESTIN1-T	46	TESTIN1-R	45	TESTIN1-T	46	TESTIN1-R
47	GND	48	GND	47	GND	48	GND
49	TESTOUT1-T	50	TESTOUT1-R	49	TESTOUT1-T	50	TESTOUT1-R
51	TIP01_1	52	RING01_1	51	TIP09_1	52	RING09_1
53	TIP02_1	54	RING02_1	53	TIP10_1	54	RING10_1
55	TIP03_1	56	RING03_1	55	TIP11_1	56	RING11_1
57	TIP04_1	58	RING04_1	57	TIP12_1	58	RING12_1
59	PROTGND	60	PROTGND	59	PROTGND	60	PROTGND

(continued on next page)

Table 6. *Channel Unit Connectors for System 1 (continued)*

System 1	Channel Unit 3	Connector J5		System 1	Channel Unit 4	Connector J6	
Pin	**Signal**	**Pin**	**Signal**	**Pin**	**Signal**	**Pin**	**Signal**
1	PROTGND	2	PROTGND	1	PROTGND	2	PROTGND
3	TIP21_1	4	RING21_1	3	TIP29_1	4	RING29_1
5	TIP22_1	6	RING22_1	5	TIP30_1	6	RING30_1
7	TIP23_1	8	RING23_1	7	TIP31_1	8	RING31_1
9	TIP24_1	10	RING24_1	9	TIP32_1	10	RING32_1
11	BATTERY+	12	BATTERY+	11	BATTERY+	12	BATTERY+
13	-48	14	-48	13	-48	14	-48
15	BATT_A-	16	BATT_A-	15	BATT_A-	16	BATT_A-
17	8KHZ_CC	18	N/C (BURN-IN)	17	8KHZ_CC	18	N/C (BURN-IN)
19	TSYNC	20	TSIG	19	TSYNC	20	TSIG
21	TCLK	22	TSER	21	TCLK	22	TSER
23	GND	24	RSYNC	23	GND	24	RSYNC
25	RSIG	26	RCLK	25	RSIG	26	RCLK
27	RSER	28	GND	27	RSER	28	GND
29	SDA	30	CSYNC	29	SDA	30	CSYNC
31	N/C	32	SCL	31	N/C	32	SCL
33	+5	34	+5	33	+5	34	+5
35	GND	36	GND	35	GND	36	GND
37	-5	38	-5	37	-5	38	-5
39	N/C	40	GND (CID3)	39	N/C	40	GND (CID3)
41	GND (CID2)	42	N/C (CID1)	41	GND (CID2)	42	N/C (CID1)
43	GND (CID0)	44	N/C	43	N/C (CID0)	44	N/C
45	TESTIN1-T	46	TESTIN1-R	45	TESTIN1-T	46	TESTIN1-R
47	GND	48	GND	47	GND	48	GND
49	TESTOUT1-T	50	TESTOUT1-R	49	TESTOUT1-T	50	TESTOUT1-R
51	TIP17_1	52	RING17_1	51	TIP25_1	52	RING25_1
53	TIP18_1	54	RING18_1	53	TIP26_1	54	RING26_1
55	TIP19_1	56	RING19_1	55	TIP27_1	56	RING27_1
57	TIP20_1	58	RING20_1	57	TIP28_1	58	RING28_1
59	PROTGND	60	PROTGND	59	PROTGND	60	PROTGND

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Table 6. *Channel Unit Connectors for System 1 (continued)*

System 1	Channel Unit 5	Connector J7		System 1	Channel Unit 6	Connector J8	
Pin	**Signal**	**Pin**	**Signal**	**Pin**	**Signal**	**Pin**	**Signal**
1	PROTGND	2	PROTGND	1	PROTGND	2	PROTGND
3	TIP37_1	4	RING37_1	3	TIP45_1	4	RING45_1
5	TIP38_1	6	RING38_1	5	TIP46_1	6	RING46_1
7	TIP39_1	8	RING39_1	7	TIP47_1	8	RING47_1
9	TIP40_1	10	RING40_1	9	TIP48_1	10	RING48_1
11	BATTERY+	12	BATTERY+	11	BATTERY+	12	BATTERY+
13	-48	14	-48	13	-48	14	-48
15	BATT_A-	16	BATT_A-	15	BATT_A-	16	BATT_A-
17	8KHZ_CC	18	N/C (BURN-IN)	17	8KHZ_CC	18	N/C (BURN-IN)
19	TSYNC	20	TSIG	19	TSYNC	20	TSIG
21	TCLK	22	TSER	21	TCLK	22	TSER
23	GND	24	RSYNC	23	GND	24	RSYNC
25	RSIG	26	RCLK	25	RSIG	26	RCLK
27	RSER	28	GND	27	RSER	28	GND
29	SDA	30	CSYNC	29	SDA	30	CSYNC
31	N/C	32	SCL	31	N/C	32	SCL
33	+5	34	+5	33	+5	34	+5
35	GND	36	GND	35	GND	36	GND
37	-5	38	-5	37	-5	38	-5
39	N/C	40	GND (CID3)	39	N/C	40	GND (CID3)
41	N/C (CID2)	42	GND (CID1)	41	N/C (CID2)	42	GND (CID1)
43	GND (CID0)	44	N/C	43	N/C (CID0)	44	N/C
45	TESTIN1-T	46	TESTIN1-R	45	TESTIN1-T	46	TESTIN1-R
47	GND	48	GND	47	GND	48	GND
49	TESTOUT1-T	50	TESTOUT1-R	49	TESTOUT1-T	50	TESTOUT1-R
51	TIP33_1	52	RING33_1	51	TIP41_1	52	RING41_1
53	TIP34_1	54	RING34_1	53	TIP42_1	54	RING42_1
55	TIP35_1	56	RING35_1	55	TIP43_1	56	RING43_1
57	TIP36_1	58	RING36_1	57	TIP44_1	58	RING44_1
59	PROTGND	60	PROTGND	59	PROTGND	60	PROTGND

Table 7. *Channel Unit Connectors for System 2*

System 2 Channel Unit 7 (1)* Connector J11				System 2 Channel Unit 8 (2)* Connector J12			
Pin	**Signal**	**Pin**	**Signal**	**Pin**	**Signal**	**Pin**	**Signal**
1	PROTGND	2	PROTGND	1	PROTGND	2	PROTGND
3	TIP05_2	4	RING05_2	3	TIP13_2	4	RING13_2
5	TIP06_2	6	RING06_2	5	TIP14_2	6	RING14_2
7	TIP07_2	8	RING07_2	7	TIP15_2	8	RING15_2
9	TIP08_2	10	RING08_2	9	TIP16_2	10	RING16_2
11	BATTERY+	12	BATTERY+	11	BATTERY+	12	BATTERY+
13	-48_1	14	-48_1	13	-48_1	14	-48_1
15	BATT_B-	16	BATT_B-	15	BATT_B-	16	BATT_B-
17	8KHZ_CC	18	N/C (BURN-IN)	17	8KHZ_CC	18	N/C (BURN-IN)
19	TSYNC_1	20	TSIG_1	19	TSYNC_1	20	TSIG_1
21	TCLK_1	22	TSER_1	21	TCLK_1	22	TSER_1
23	GND	24	RSYNC_1	23	GND	24	RSYNC_1
25	RSIG_1	26	RCLK_1	25	RSIG_1	26	RCLK_1
27	RSER_1	28	GND	27	RSER_1	28	GND
29	SDA_1	30	CSYNC_1	29	SDA_1	30	CSYNC_1
31	N/C	32	SCL_1	31	N/C	32	SCL_1
33	+5_1	34	+5_1	33	+5_1	34	+5_1
35	GND	36	GND	35	GND	36	GND
37	-5_1	38	-5_1	37	-5_1	38	-5_1
39	N/C	40	N/C (CID3)	39	N/C	40	N/C (CID3)
41	GND (CID2)	42	GND (CID1)	41	GND (CID2)	42	GND (CID0)
43	GND (CID0)	44	N/C	43	N/C (CID0)	44	N/C
45	TESTIN2-T	46	TESTIN2-R	45	TESTIN2-T	46	TESTIN2-R
47	GND	48	GND	47	GND	48	GND
49	TESTOUT2-T	50	TESTOUT2-R	49	TESTOUT2-T	50	TESTOUT2-R
51	TIP01_2	52	RING01_2	51	TIP09_2	52	RING09_2
53	TIP02_2	54	RING02_2	53	TIP10_2	54	RING10_2
55	TIP03_2	56	RING03_2	55	TIP11_2	56	RING11_2
57	TIP04_2	58	RING04_2	57	TIP12_2	58	RING12_2
59	PROTGND	60	PROTGND	59	PROTGND	60	PROTGND

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Table 7. *Channel Unit Connectors for System 2 (continued)*

System 2 Channel Unit 9 (3)* Connector J13				System 2 Channel Unit 10 (4)* Connector J14			
Pin	**Signal**	**Pin**	**Signal**	**Pin**	**Signal**	**Pin**	**Signal**
1	PROTGND	2	PROTGND	1	PROTGND	2	PROTGND
3	TIP21_2	4	RING21_2	3	TIP29_2	4	RING29_2
5	TIP22_2	6	RING22_2	5	TIP30_2	6	RING30_2
7	TIP23_2	8	RING23_2	7	TIP31_2	8	RING31_2
9	TIP24_2	10	RING24_2	9	TIP32_2	10	RING32_2
11	BATTERY+	12	BATTERY+	11	BATTERY+	12	BATTERY+
13	-48_1	14	-48_1	13	-48_1	14	-48_1
15	BATT_B-	16	BATT_B-	15	BATT_B-	16	BATT_B-
17	8KHZ_CC	18	N/C (BURN-IN)	17	8KHZ_CC	18	N/C (BURN-IN)
19	TSYNC_1	20	TSIG_1	19	TSYNC_1	20	TSIG_1
21	TCLK_1	22	TSER_1	21	TCLK_1	22	TSER_1
23	GND	24	RSYNC_1	23	GND	24	RSYNC_1
25	RSIG_1	26	RCLK_1	25	RSIG_1	26	RCLK_1
27	RSER_1	28	GND	27	RSER_1	28	GND
29	SDA_1	30	CSYNC_1	29	SDA_1	30	CSYNC_1
31	N/C	32	SCL_1	31	N/C	32	SCL_1
33	+5_1	34	+5_1	33	+5_1	34	+5_1
35	GND	36	GND	35	GND	36	GND
37	-5_1	38	-5_1	37	-5_1	38	-5_1
39	N/C	40	N/C (CID3)	39	N/C	40	N/C (CID3)
41	GND (CID2)	42	N/C (CID1)	41	GND (CID2)	42	N/C (CID1)
43	GND (CID0)	44	N/C	43	N/C (CID0)	44	N/C
45	TESTIN2-T	46	TESTIN2-R	45	TESTIN2-T	46	TESTIN2-R
47	GND	48	GND	47	GND	48	GND
49	TESTOUT2-T	50	TESTOUT2-R	49	TESTOUT2-T	50	TESTOUT2-R
51	TIP17_2	52	RING17_2	51	TIP25_2	52	RING25_2
53	TIP18_2	54	RING18_2	53	TIP26_2	54	RING26_2
55	TIP19_2	56	RING19_2	55	TIP27_2	56	RING27_2
57	TIP20_2	58	RING20_2	57	TIP28_2	58	RING28_2
59	PROTGND	60	PROTGND	59	PROTGND	60	PROTGND

(continued on next page)

Table 7. *Channel Unit Connectors for System 2 (continued)*

System 2	Channel Unit 11 (5)*	Connector J15		System 2	Channel Unit 12 (6)*	Connector J16	
Pin	**Signal**	**Pin**	**Signal**	**Pin**	**Signal**	**Pin**	**Signal**
1	PROTGND	2	PROTGND	1	PROTGND	2	PROTGND
3	TIP37_2	4	RING37_2	3	TIP45_2	4	RING45_2
5	TIP38_2	6	RING38_2	5	TIP46_2	6	RING46_2
7	TIP39_2	8	RING39_2	7	TIP47_2	8	RING47_2
9	TIP40_2	10	RING40_2	9	TIP48_2	10	RING48_2
11	BATTERY+	12	BATTERY+	11	BATTERY+	12	BATTERY+
13	-48_1	14	-48_1	13	-48_1	14	-48_1
15	BATT_B-	16	BATT_B-	15	BATT_B-	16	BATT_B-
17	8KHZ_CC	18	N/C (BURN-IN)	17	8KHZ_CC	18	N/C (BURN-IN)
19	TSYNC_1	20	TSIG_1	19	TSYNC_1	20	TSIG_1
21	TCLK_1	22	TSER_1	21	TCLK_1	22	TSER_1
23	GND	24	RSYNC_1	23	GND	24	RSYNC_1
25	RSIG_1	26	RCLK_1	25	RSIG_1	26	RCLK_1
27	RSER_1	28	GND	27	RSER_1	28	GND
29	SDA_1	30	CSYNC_1	29	SDA_1	30	CSYNC_1
31	N/C	32	SCL_1	31	N/C	32	SCL_1
33	+5_1	34	+5_1	33	+5_1	34	+5_1
35	GND	36	GND	35	GND	36	GND
37	-5_1	38	-5_1	37	-5_1	38	-5_1
39	N/C	40	N/C (CID3)	39	N/C	40	N/C (CID3)
41	N/C (CID2)	42	GND (CID1)	41	N/C (CID2)	42	GND (CID1)
43	GND (CID0)	44	N/C	43	N/C (CID0)	44	N/C
45	TESTIN2-T	46	TESTIN2-R	45	TESTIN2-T	46	TESTIN2-R
47	GND	48	GND	47	GND	48	GND
49	TESTOUT2-T	50	TESTOUT2-R	49	TESTOUT2-T	50	TESTOUT2-R
51	TIP33_2	52	RING33_2	51	TIP41_2	52	RING41_2
53	TIP34_2	54	RING34_2	53	TIP42_2	54	RING42_2
55	TIP35_2	56	RING35_2	55	TIP43_2	56	RING43_2
57	TIP36_2	58	RING36_2	57	TIP44_2	58	RING44_2
59	PROTGND	60	PROTGND	59	PROTGND	60	PROTGND

* CU numbers 7 through 12 are for a List 1 or 2 LU. CU numbers shown in parentheses are for a List 3 or higher LU.

4.3 Table 8 lists the FCS-718 backplane connectors (Figure 2) and where each is described in this practice.

Table 8. *FCS-718 List 2 Backplane Connectors*

Connector/Fuse	Go to Table(s)	On page
CO Battery, CO Battery Return, and Frame Ground	9	14
LAN	10	14
Data	11	14
HDSL, Auxiliary Power Pairs, Bypass Pair, Channel Unit Test, Composite Clock, Frame Ground, External ACO	12	15
Alarm	13	16
System 1 Subscriber Wire-wrap Terminations	14	17
System 2 Subscriber Wire-wrap Terminations	15	18
PGTC	16	19

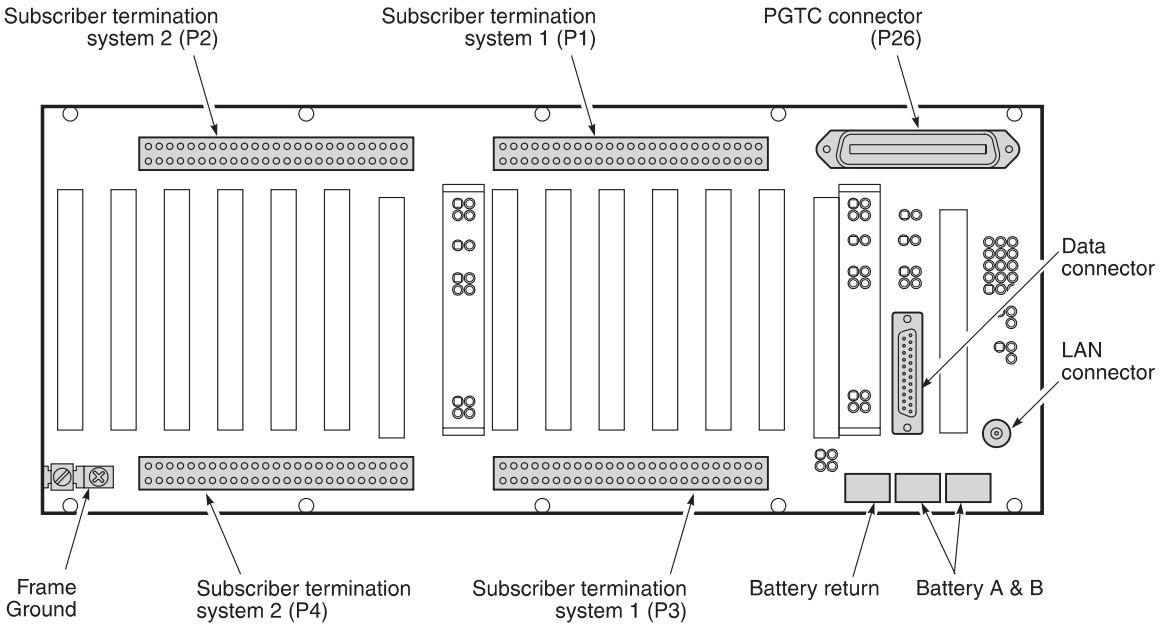

Figure 2. *COT Shelf Backplane*

CO BATTERY RETURN is separate from FRAME GROUND in PG-Flex.

CKT GND and CO BATTERY RETURN are connected inside the PG-FLEX Line Unit but are not connected on the backplane.

Table 9. *Battery, CO Battery Ground, and Frame Ground*

Connector	Type	Function
TB1 -48V	Screw	Battery (-48 Vdc) for system 1
TB2 -48V	Screw	Battery (-48 Vdc) for system 2
TB3 GND	Screw	CO battery return
G1	Screw	Frame ground

Table 10. *LAN Connector*

Connector	Type	Function
J21	BNC	(Not currently used)

Table 11. *Data Connector*

Connector	Type	Function
J18	DB-25(F)	(Not currently used)

Table 12. *HDSL, Test, And Miscellaneous Terminations*

System	Connector	Type	Function
System ***n****	HDSL_***n***_T1 HDSL_***n***_R1	.045 in. Wire-wrap	Tip and Ring terminations for HDSL Pair #1 of System ***n*** to Remote Terminal ***n***. -130 Vdc is simplexed on this line for powering the Remote Terminal.
System ***n***	HDSL_***n***_T2 HDSL_***n***_R2	.045 in. Wire-wrap	Tip and Ring terminations for HDSL Pair #2 of System ***n*** to Remote Terminal ***n***. +130 Vdc is simplexed on this line for powering the Remote Terminal.
System ***n***	PWR_1_T1 PWR_1_R1	.045 in. Wire-wrap	System ***n*** auxiliary Power Pair #1. Used for auxiliary power to the RT when using a PG-Flex doubler unit.
System ***n***	PWR_2_T2 PWR_2_R2	.045 in. Wire-wrap	System ***n*** auxiliary Power Pair #2. Used for auxiliary power to the RT when using a PG-Flex doubler unit.
System ***n***	BYPASS_***n***_T BYPASS_***n***_R	.045 in. Wire-wrap	Termination (P10 for system 1 and P20 for system 2) for the metallic bypass pair into COT System ***n*** from RT ***n***.
System ***n***	TEST_***n***_T_IN TEST_***n***_R_IN	.045 in. Wire-wrap	Test connection looking into the CO switch (P13 for system 1 and P14 for system 2) for the selected subscriber for System ***n***. This connection must be set up through the PG-Flex RS-232 maintenance port.
System ***n***	TEST_***n***_T_OUT TEST_***n***_R_OUT	.045 in. Wire-wrap	Test connection looking into the COT channel unit (P13 for system 1 and P14 for system 2) for the selected subscriber for System ***n***. This connection must be set up through the PG-Flex RS-232 maintenance port. In some applications, this pair will be jumpered to the BYPASS pair from RT ***n***.
	CC1_TIP CC1_RING CC1_TERM	.045 in. Wire-wrap	Composite Clock #1 (P18). Used for synchronization to CO timing. When cascaded, terminate only on the last shelf in the cascade.
	CC2_TIP CC2_RING CC2_TERM	.045 in. Wire-wrap	Composite Clock #2 (P19). Used for synchronization to CO timing. When cascaded, terminate only on the last shelf in the cascade.
	FRAME_GND CKT GND	.045 in. Wire-wrap	Frame ground (G1). This is isolated from CO battery return in PG-Flex.
	EXT_ACO CKT_GND	.045 in. Wire-wrap	External Alarm Cutoff (P16). A momentary connection between EXT_ACO and circuit ground resets PG-Flex audible alarm relays.
	BATT RTN CKT GND	.045 in. Wire-wrap	CO battery return (TB3). This is isolated from frame ground in PG-Flex.
	SPARE	—	P99 are spare pins.

***** Where ***n*** is 1 on System 1 and 2 on System 2.

Table 13. *Alarm Termination*

Posts	Contact Post NO*	Contact Post COM*	Contact Post NC*	FUNCTION†
SHELF_ID	1	2	3	Shelf ID indicates a major or minor shelf alarm is active
MAJ_AUD	4	5	6	Indicates a major alarm. The alarm can be silenced using the ACO button. Connect this relay to the major alarm audible indicator of the CO alarm system.
MAJ_VIS	7	8	9	Indicates a major alarm. This alarm cannot be disabled. Connect this relay to the major alarm visual indicator of the CO alarm system.
MIN_AUD	10	11	12	Indicates a minor alarm. The alarm can be silenced using the ACO button. Connect this relay to the minor alarm audible indicator of the CO alarm system.
MIN_VIS	13	14	15	Indicates a minor alarm. This alarm cannot be disabled. Connect this relay to the minor alarm visual indicator of the CO alarm system.

* For the relay contacts, NO is normally opened, NC is normally closed, and COM is common.
† All relays provide form “C” contacts.

Table 14. *System 1 Subscriber Wire-Wrap Connections*

CU	Circuit	Conn P1 Tip	Conn P1 Ring	Tip	Ring	Conn P3 Tip	Conn P3 Ring	Circuit	CU
	1	26	1	WH/BL	BL/WH	26	1	1	
	2	27	2	WH/OR	OR/WH	27	2	2	
	3	28	3	WH/GN	GN/WH	28	3	3	
	4	29	4	WH/BN	BN/WH	29	4	4	
1	5	30	5	WH/SL	SL/WH	30	5	5	**4**
	6	31	6	RD/BL	BL/RD	31	6	6	
	7	32	7	RD/OR	OR/RD	32	7	7	
	8	33	8	RD/GN	GN/RD	33	8	8	
	1	34	9	RD/BN	BN/RD	34	9	1	
	2	35	10	RD/SL	SL/RD	35	10	2	
	3	36	11	BK/BL	BL/BK	36	11	3	
	4	37	12	BK/OR	OR/BK	37	12	4	
2	5	38	13	BK/GN	GN/BK	38	13	5	**5**
	6	39	14	BK/BN	BN/BK	39	14	6	
	7	40	15	BK/SL	SL/BK	40	15	7	
	8	41	16	YL/BL	BL/YL	41	16	8	
	1	42	17	YL/OR	OR/YL	42	17	1	
	2	43	18	YL/GN	GN/YL	43	18	2	
	3	44	19	YL/BN	BN/YL	44	19	3	
	4	45	20	YL/SL	SL/YL	45	20	4	
3	5	46	21	VI/BL	BL/VI	46	21	5	**6**
	6	47	22	VI/OR	OR/VI	47	22	6	
	7	48	23	VI/GN	GN/VI	48	23	7	
	8	49	24	VI/BN	BN/VI	49	24	8	

Shaded terminations are used only with 8 channel POTS and DDS CUs.

Table 15. *System2 Subscriber Wire-wrap Connections*

CU*	Circuit	Conn P2 Tip	Conn P2 Ring	Tip	Ring	Conn P4 Tip	Conn P4 Ring	Circuit	CU*
	1	26	1	WH/BL	BL/WH	26	1	1	
	2	27	2	WH/OR	OR/WH	27	2	2	
	3	28	3	WH/GN	GN/WH	28	3	3	
7	4	29	4	WH/BN	BN/WH	29	4	4	**10**
(1)	5	30	5	WH/SL	SL/WH	30	5	5	**(4)**
	6	31	6	RD/BL	BL/RD	31	6	6	
	7	32	7	RD/OR	OR/RD	32	7	7	
	8	33	8	RD/GN	GN/RD	33	8	8	
	1	34	9	RD/BN	BN/RD	34	9	1	
	2	35	10	RD/SL	SL/RD	35	10	2	
	3	36	11	BK/BL	BL/BK	36	11	3	
8	4	37	12	BK/OR	OR/BK	37	12	4	**11**
(2)	5	38	13	BK/GN	GN/BK	38	13	5	**(5)**
	6	39	14	BK/BN	BN/BK	39	14	6	
	7	40	15	BK/SL	SL/BK	40	15	7	
	8	41	16	YL/BL	BL/YL	41	16	8	
	1	42	17	YL/OR	OR/YL	42	17	1	
	2	43	18	YL/GN	GN/YL	43	18	2	
	3	44	19	YL/BN	BN/YL	44	19	3	
9	4	45	20	YL/SL	SL/YL	45	20	4	**12**
(3)	5	46	21	VI/BL	BL/VI	46	21	5	**(6)**
	6	47	22	VI/OR	OR/VI	47	22	6	
	7	48	23	VI/GN	GN/VI	48	23	7	
	8	49	24	VI/BN	BN/VI	49	24	8	

* The CU numbers in parentheses are for a List 3 or higher LU. The numbers not in parentheses are for a List 1 or 2 LU.

Shaded terminations are used only with 8 channel POTS and DDS CUs.

Table 16. *PGTC Connector P12 Pinouts*

Pin	Signal	Pin	Signal
1	PGTC_RING1	26	PGTC_TIP1
2	PGTC_RING2	27	PGTC_TIP2
3	PGTC_RING3	28	PGTC_TIP3
4	PGTC_RING4	29	PGTC_TIP4
5	SLEEVE2	30	SLEEVE1
6	SLEEVE4	31	SLEEVE3
7	OH2	32	OH1
8	OH4	33	OH3
9	PROCEED2	34	PROCEED1
10	PROCEED4	35	PROCEED3
11	LOCK2	36	LOCK1
12	LOCK4	37	LOCK3
13	N/C	38	N/C
14	N/C	39	N/C
15	N/C	40	N/C
16	N/C	41	N/C
17	TMAJ	42	TSTALM
18	N/C	43	N/C
19	N/C	44	N/C
20	N/C	21	N/C
21	N/C	46	N/C
22	SEZBY	47	SEIZE
23	N/C	48	N/C
24	N/C	49	N/C
25	N/C	50	N/C

C. INSTALLATION AND TEST

5. Unpacking

5.1 Upon receipt of the equipment:

1 Unpack each container and visually inspect it for signs of damage. If the equipment has been damaged in transit, immediately report the extent of damage to the transportation company and to PairGain. Order replacement equipment if necessary.

2 Check the contents against the packing list to ensure complete and accurate shipment. If the shipment is short or irregular, contact PairGain as described in Section 12. If you must store the equipment for a prolonged period, store the equipment in its original container.

6. Pre-Provisioning—HDSL Lines

6.1 The HDSL transmission scheme uses two pairs between the COT and the Remote Terminal (RT). The wire pairs should have identical electrical make-ups. Keep exposure to crosstalk and the differences in total wire length, wire gauge, bridge taps to a minimum. Pair isolation (Tip-ring, Tip-ground, and Ring-ground) must be ≥ 100 kohms.

6.2 The wire pairs from the COT to the RT must meet the following design guidelines:

- nonloaded cable only
- multi-gauge restricted to two gauge changes, except for stubbing or fusing
- total bridge taps can not exceed 2.5 kft. No single bridge tap may exceed 2.0 kft

6.3 The distance limitation for HDSL transmission is based on a maximum signal attenuation of 35 dB. Since signal attenuation decreases as cable size increases, the larger the gauge (i.e., 19 AWG vs. 26 AWG), the greater the distance between the COT and the RT. Tables 17 and 18 identify these distances (at a cable temperature of 68°F).

Table 17. *12/24 Channel HDSL Transmission Distance*

Gauge	Loop Length	Resistance
19 AWG 0.9 mm	22.8 kft 7.0 km	367 Ω
22 AWG 0.6 mm	16.1 kft 4.9 km	521 Ω
24 AWG 0.5 mm	12.3 kft 3.7 km	638 Ω
26 AWG 0.4 mm	9.0 kft 2.7 km	750 Ω

Table 18. *16/32 Channel HDSL Transmission Distance*

Gauge	Loop Length	Resistance
19 AWG 0.9 mm	19.4 kft 5.9 km	312 Ω
22 AWG 0.6 mm	13.7 kft 4.2 km	444 Ω
24 AWG 0.5 mm	10.7 kft 3.3 km	554 Ω
26 AWG 0.4 mm	8.1 kft 2.5 km	672 Ω

7. Mounting

7.1 The COT shelf mounts in a standard 19- or 23-inch CO equipment bay. Use rack adapters when installing onto a 23-inch frame or remove the two mounting brackets and reverse them. The shelf has a mounting height requirement of 7 inches.

1 Align the shelf (Figure 3) universal mounting brackets with the four vertical mounting holes.

2 Install the mounting screws.

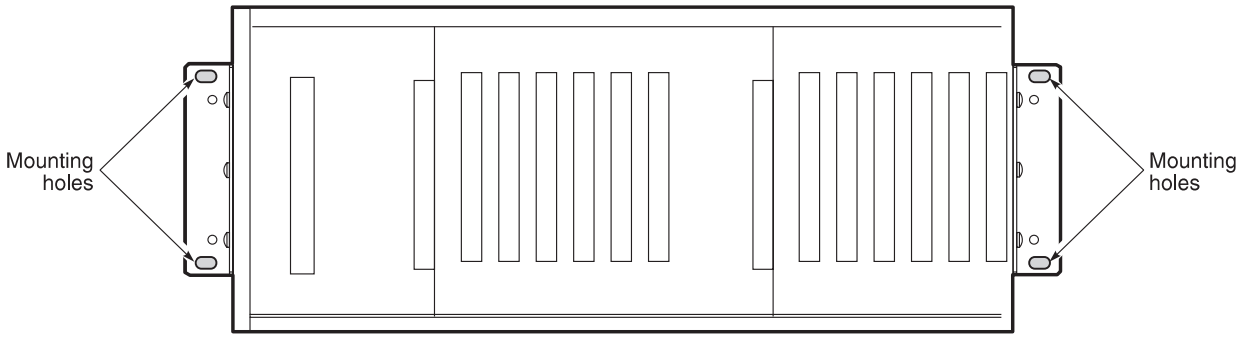

Figure 3. *Mounting the FCS-718 COT Shelf*

8. Wiring

8.1 Sections 8.2 through 8.9 describe how to connect the FCS-718. Section 8.10 verifies the installation. All wiring to the COT shelf is performed on the backplane (Figure 2) at the back side of the shelf.

Follow the provisions of the National Electric Code (current edition) for wiring external to the product(s).

8.2 Frame Ground and Battery. Connect the frame ground and battery:

1 Remove the clear Plexiglas™ from the backplane.

2 Remove the fuse in the equipment bay fuse panel for the circuit where the PG-Flex CO battery wire will be terminated.

Follow local grounding practices to ensure a good frame ground connection to PG-Flex. This frame grounding is required for secondary voltage protection of the PG-Flex equipment.

3 Connect the frame ground (Figure 4):

a Connect one end of the frame ground wire to the grounding lug G1 (Frame Ground).

b Connect the other end of the frame ground wire to the CO ground termination point.

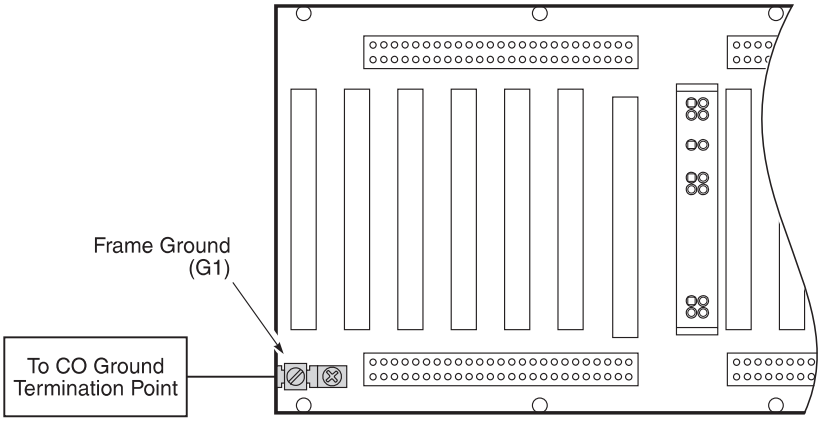

Figure 4. *Connecting the Frame Ground*

Use 12 AWG or larger wire to ensure good power connections to PG-Flex.

4 Connect the CO battery (Figure 5):

a Connect a wire for the CO battery to TB1 BATT A (-48 Vdc) screw terminal.

b Connect a wire for the CO battery to TB2 BATT B (-48 Vdc) screw terminal.

c Connect the wire for the CO battery return to TB3 (BATT RTN) screw terminal.

d Connect the CO battery return wire from TB3 on the COT Shelf to the CO battery ground termination point.

e Connect the CO battery wires from TB1 BATT A (-48 Vdc) and TB2 BATT B (-48 Vdc) on the COT Shelf to the equipment bay fuse panel termination points that were selected for this system.

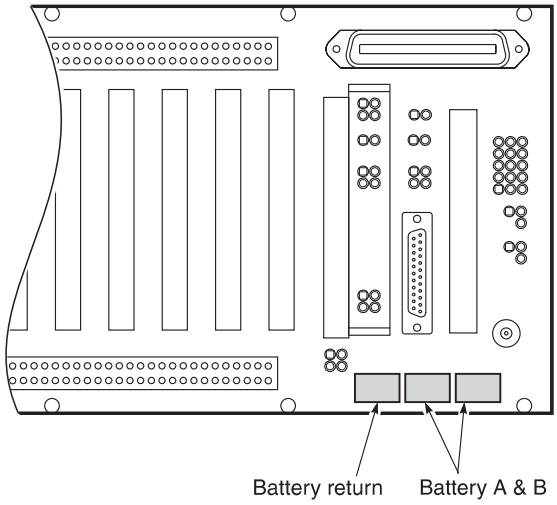

Figure 5. *Connecting the CO Battery*

8.3 HDSL Lines. Connect the HDSL lines (Figure 6):

1 For System 1 installation:

a Connect the HDSL Pair #1 on System 1 onto wire-wrap pins HDSL_T1 (Tip1) and HDSL_R1 (Ring1) on the COT shelf.

b Connect the HDSL Pair #2 on System 1 onto wire-wrap pins HDSL_T2 (Tip2) and HDSL_R2 (Ring2) on the COT shelf.

2 For System 2 installation:

a Connect HDSL Pair #1 on System 2 onto wire-wrap pins HDSL_T1 (Tip1) and HDSL_R1 (Ring1) on the COT shelf.

b Connect HDSL Pair #2 on System 2 onto wire-wrap pins HDSL_T2 (Tip2) and HDSL_R2 (Ring2) on the COT shelf.

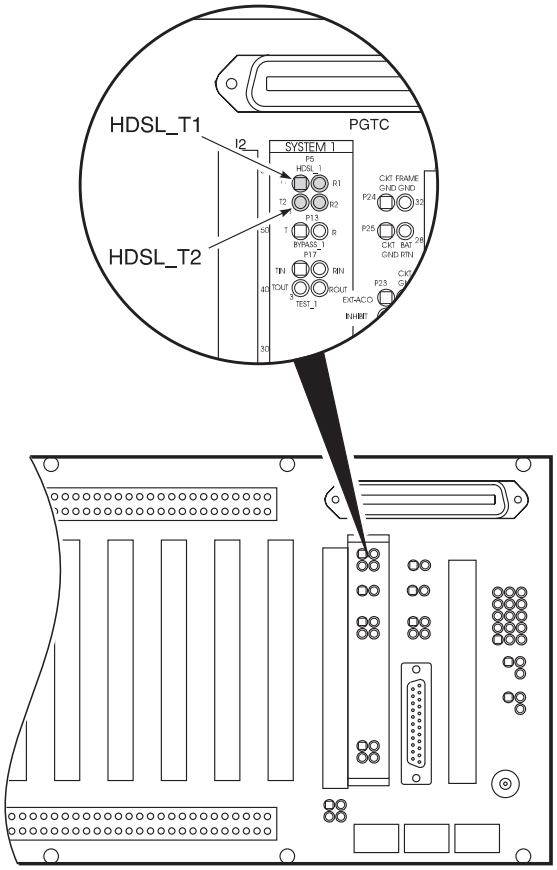

Figure 6. *Connecting the HDSL Lines*

8.4 Bypass Pairs. If subscriber drop testing is required, connect the metallic bypass pairs (Figure 7):

Do not connect metallic bypass pairs between PG-Flex systems or to other DLC systems.

1. For System 1 installation, connect the metallic bypass pair from the main distribution frame (MDF) to wire wrap posts BYPASS_T and BYPASS_R on the COT shelf.
2. For System 2 installation, connect the metallic bypass pair from the MDF to wire wrap posts BYPASS_T and BYPASS_R on the COT shelf.

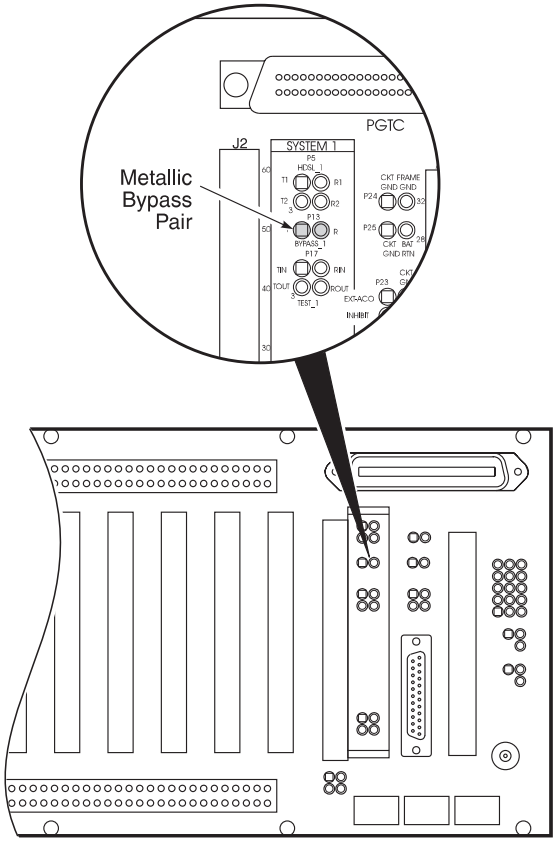

Figure 7. *Connecting the Metallic Bypass Pair*

8.5 Composite Clock. When required for digital services, connect the composite clock (Figure 8). You can cascade the composite clock to other PG-Flex shelves.

1 Connect the composite clock leads from the primary master clock source in the CO to CC1_TIP and CC1_RING termination pins on the backplane.

2 Connect the composite clock leads from the secondary master clock source in the CO to CC2_TIP and CC2_RING termination pins on the backplane.

3 When cascading the composite clock to other PG-Flex shelves, terminate pins CC1 TERM to CC1 TIP and from CC2 TERM to CC2 TIP only on the last shelf in the cascade.

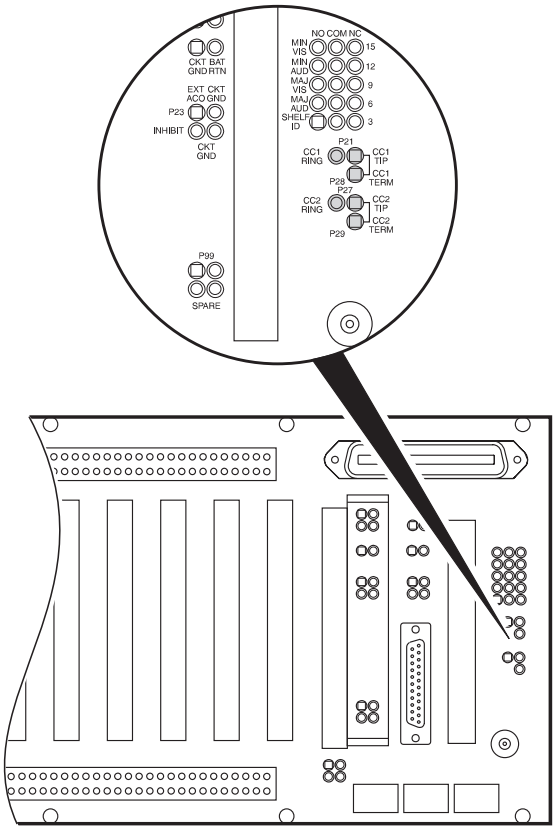

Figure 8. *Connecting the Composite Clock and Alarms*

8.6 Alarms. If external audible and visual alarm indicators are required, connect the audible and visual alarm leads from the CO alarm panel to the COT according to Figure 8 and Table 13, and local practice.

8.7 Subscriber Lines. Connect the subscriber lines to the wire-wrap terminations (Figure 9):

1 Wire-wrap CO switch subscriber line circuits to P1 and P3 termination points for system 1. Use Table 14.

2 Wire-wrap CO switch subscriber line circuits to P2 and P4 termination points for system 2. Use Table 15.

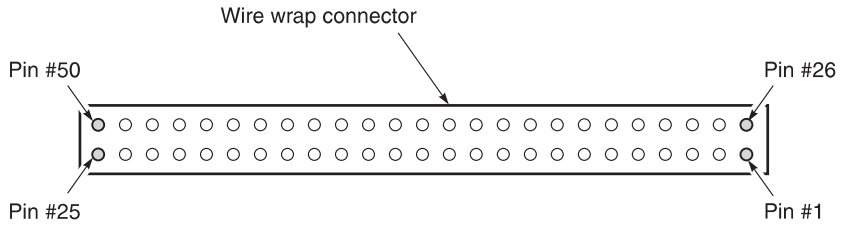

***Figure 9**. Installing the Subscriber Lines*

8.8 Auxiliary Power Pairs. When PG-Flex is used with a doubler, wire auxiliary power pairs to the COT shelf (Figure 10) as follows:

1 Wire-wrap power pair #1 to PWR_OUT T1 (Tip1) and PWR_OUT R1 (Ring1) for system 1.

2 Wire-wrap power pair #2 to PWR_OUT T2 (Tip2) and PWR_OUT R2 (Ring2) for system 1.

3 Repeat steps 1 and 2 for system 2 when used with a doubler.

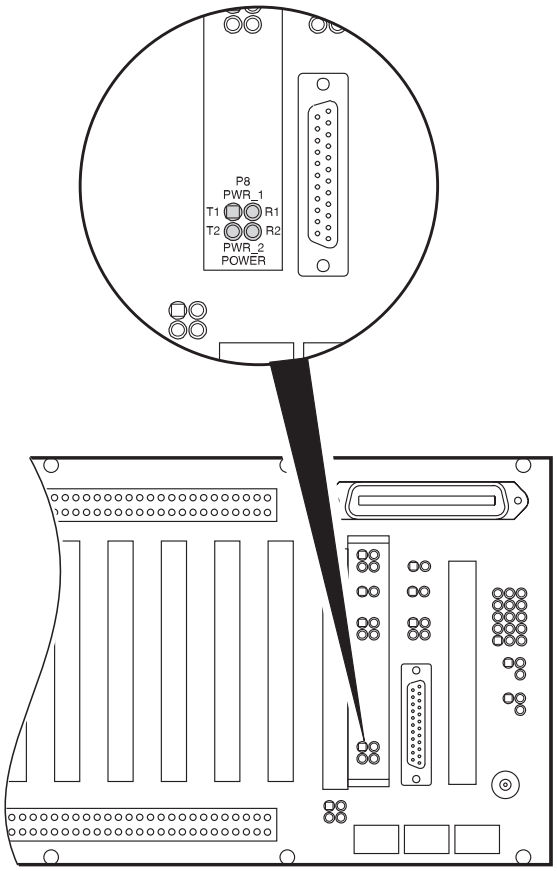

***Figure 10.** Wiring the Auxiliary Power Pairs*

8.9 **Fuse.** Insert a 3 amp fuse in the equipment bay fuse panel for each circuit (two) where the PG-Flex CO battery wire is terminated.

8.10 **Cabling Verification.** Verify the following:

The following verifications should be done before any cards are inserted in the COT shelf.

1 Verify a minimum of -42 Vdc and a maximum of -56 Vdc between:

a TB1 BATT A (–48 Vdc) and TB3 (BATT RTN) screw terminals on the COT shelf.

b TB2 BATT B (–48 Vdc) and TB3 (BATT RTN) screw terminals on the COT shelf.

2 Verify the following for the HDSL lines:

If the HDSL lines are not connected properly, the COT will not communicate with the RT.

a Visually verify the HDSL lines are terminated properly and with the correct polarity.

b Verify that the HDSL lines are "dry."

c Verify 0 Vdc between the Tip and Ring, Tip and Ground, and Ring and Ground of each of the HDSL circuits terminated on the shelf.

d Verify > 100 kohm resistance between the Tip and Ring, Tip and Ground, and Ring and Ground of each of the HDSL circuits terminated on the shelf.

3 Replace the clear Plexiglas cover on the rear of the COT shelf.

9. Turn-Up and Testing

9.1 Refer to the COT or RT Line Unit Technical Practices for complete COT and RT turn up and testing procedures.

10. Troubleshooting

10.1 Refer to the COT or RT Line Unit Technical Practices for complete COT and RT troubleshooting procedures.

11. Technical Support

11.1 PairGain Technical Assistance is available 24-hours-a-day, 7-days-a-week by contacting PairGain Customer Service at:

Telephone:	**(800) 638-0031 or (714) 832-9922**
Fax:	**(714) 832-9924**

11.2 During normal business hours (8:00 AM to 5:00 PM, Pacific Time, Monday-Friday, excluding holidays), technical assistance calls are normally answered directly by a Customer Service Engineer. At other times, a request for technical assistance is handled by an on-duty Customer Service Engineer through a callback process. This process normally results in a callback within 30 minutes of initiating the request.

11.3 In addition, PairGain maintains a computer bulletin board system for obtaining current information on PairGain products, product troubleshooting tips and aids, accessing helpful utilities, and for posting requests or questions. This system is available 24-hours-a-day by calling (714) 730-3299. Transmission speeds up to 28.8 kbps are supported with a character format of 8-N-1.

D. WARRANTY AND CERTIFICATION

12. Warranty

12.1 PairGain Technologies warrants this product to be free of defects and to be fully functional for a period of 5 years from the date of original shipment, given proper customer installation and regular maintenance. PairGain will repair or replace any unit without cost during this period if the unit is found to be defective for any reason other than abuse or improper use or installation.

12.2 This module should not be field repaired. If it fails, replace it with another unit and return the faulty unit to PairGain for repair. Any modifications of the unit by anyone other than an authorized PairGain representative will void the warranty.

12.3 If a unit needs repair, call PairGain for a Return Material Authorization (RMA) number and return the defective unit, freight prepaid, along with a brief description of the problem, to:

PairGain Technologies, Inc.
14402 Franklin Avenue
Tustin, CA 92780-7013
Attn: Customer Repair Facility.
(800) 638-0031

12.4 PairGain will continue to repair faulty modules beyond the warranty program at a nominal charge. Contact your PairGain sales representative for details and pricing.

13. Certification

13.1 **FCC Compliance.** The FCS-718 List 2COT Shelf has been tested and found to comply with the limits for Class A digital devices 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.

13.2 Refer to the installation section of the appropriate instruction manual for the unit you are installing to obtain information on:

- cabling
- proper connections
- grounding
- line powering

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

E. ABBREVIATIONS

14. Abbreviations

COT	Central Office Terminal
CU	Channel Unit
DLC	Digital Loop Carrier
HDSL	High bit-rate Digital Subscriber Line
ISDN	Integrated Services Digital Network
LAN	Local Area Network
LU	Line Unit
MDF	Main Distribution Frame
NMA	Network Management Analysis
POTS	Plain Old Telephone Service
RT	Remote Terminal

Corporate Office
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ISO 9001
DNV
DNV Certification, Inc.
Certificated Firm

PAIRGAIN
THE COPPEROPTICS COMPANY