

DIGITAL CLOCK DISTRIBUTOR

LOCAL PRIMARY REFERENCE CE MARK COMPLIANT

TEST AND ACCEPTANCE

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1. GENERAL

1.01 This section provides test and acceptance procedures, and card installation procedures, for the Digital Clock Distributor Local Primary Reference CE Mark Compliant (DCD-LPR/C) System (DCD-LPR/C Shelf, p/n 090-44100-12). The test and acceptance procedures included in this document are recommended guidelines.

1.02 This section was reissued for the reasons listed below. Changes and additions are marked by change bars.

- Revised Section 1, General.
- Revised Figure 4.
- Revised Table G.

1.03 All product names, service marks, trademarks, and registered trademarks used in this document are the property of their respective owners.

1.04 When performing any of the procedures listed in this section, if problems are encountered, or if requirements listed in a step are not met, contact Symmetricom's Customer Assistance Center (CAC) at one of the following numbers:

- +44 (0) 1189 699 799 (U.K.)
- +1 888 367 7966 (U.S.A.)

2. POWER TEST

2.01 This section assumes that the DCD-LPR/C Shelf has been physically and electrically installed per the Installation section of this manual. Chart 1 contains the power test procedure.

Caution: *This test cannot be performed on a DCD-LPR/C Shelf that is supplying timing to network equipment. This test must be performed prior to using the DCD-LPR/C Shelf to time network equipment. Failure to observe this caution will result in service interruption.*

Chart 1. Power Test

STEP	PROCEDURE
	<p>Use this procedure for verifying the power connections to the shelf.</p> <p>Test Equipment: Digital Multimeter, Fluke 77 or equivalent</p> <p>Note: The DCD-LPR/C Shelf does not load share the A and B battery feeds. The alternate source becomes active only if the active source fails. This procedure assumes power to the shelf under test has been connected per the Installation section of this manual.</p>
	<p>Caution: Do not perform this procedure on a DCD-LPR/C Shelf which is supplying timing to network elements (in service). Failure to observe this caution will result in a service interruption.</p>
1	Ensure all plug-in cards are removed from the shelf under test.
2	Ensure all fuses are removed from the bay distribution fuse board (BDFB) that powers the DCD-LPR/C.
3	Disconnect the –48V A and –48V B power leads from the shelf power terminal blocks TB1 and TB2, on the backplane of the DCD-LPR/C Shelf (leave the battery [RTN] leads connected to the shelf).
4	<p>At the shelf end of the battery leads, use the multimeter to measure the voltage between the following:</p> <ul style="list-style-type: none"> a. Battery A lead and battery B lead b. Battery A lead and battery return (RTN) terminal on the power terminal block (TB2) c. Battery A lead and frame (FRM) ground terminal on the power terminal block (TB2) d. Battery B lead and battery return (RTN) terminal on the power terminal block (TB1) e. Battery B lead and frame (FRM) ground terminal on the power terminal block (TB1) <p>Requirement: The multimeter indicates less than 250 mV between any of the points listed above.</p>
5	<p>Set the multimeter for maximum resistance measurement, and measure the resistance between the following:</p> <ul style="list-style-type: none"> a. Battery A lead and battery B lead b. Battery A lead and battery return (RTN) terminal on the power terminal block (TB2) c. Battery A lead and frame (FRM) ground terminal on the power terminal block (TB2) d. Battery B lead and battery return (RTN) terminal on the power terminal block (TB1) e. Battery B lead and frame (FRM) ground terminal on the power terminal block (TB1) <p>Requirement: The multimeter indicates infinite resistance (completely open circuit).</p>

Chart 1. Power Test (Contd)

STEP	PROCEDURE
6	Reconnect the A and B battery leads to the power terminal block (TB1 and TB2) –48V A and –48V B terminal sets on the backplane.
7	In the BDFB, install the A and B battery fuses for the shelf under test. Use 3 A, or the next larger size, fuses.
8	Use the multimeter to measure the voltage between the –48V A and RTN terminal sets, on the power terminal block (TB2) on the backplane. Requirement: The multimeter indicates –42 V dc to –56 V dc.
9	Use the multimeter to measure the voltage between the –48V B and RTN terminal sets on the power terminal block (TB1), on the backplane. Requirement: The multimeter indicates –42 V dc to –56 V dc.
10	This procedure is completed. Indicate completion of the Power Test on the Test Sign-off form.

3. CARD TESTS

Table A. DCD-LPR/C Cards

Warning: When handling cards, use local office procedures regarding electrostatic discharge (ESD), including the following:

- Use a grounded wrist strap on the DCD-LPR/C Shelf (connected to equipment frame ground) when handling cards.
- Store cards only in antistatic packaging provided by the factory.

3.01 For information on how to configure the MIS/C, MRC-T/C, MRC-EA/C, and CI/C cards, refer to the DCD Manual which comes with your system.

3.02 See Table A for a list of card names used in this section.

CARD	NAME USED IN THIS SECTION	PART NUMBER
GTI/C	GTI/C -12	090-44140-12
GTI/C	GTI/C -14	090-44140-14
GTI/C	GTI/C -16	090-44140-16
GTI/C	GTI/C -18	090-44140-18
LOU/C	LOU-1	090-44145-01
LOU/C	LOU-2	090-44145-02
Notes: 1. Where information is common to all GTI/C cards, these cards are collectively referred to as GTI/C cards. 2. Where information is common to both LOU/C cards, these cards are collectively referred to as LOU/C cards.		

3.03 Go to Chart 2 if installing an LOU/C card; go to Chart 3 if installing a GTI/C - 12 or -14 card; go to Chart 4 if installing a GTI/C - 16 or -18 card.

Chart 3. GTI/C -12 and GTI/C -14 Card Test

STEP	PROCEDURE
<p>Use this procedure to install the GTI/C card (p/n 090-44140-12 or -14) and verify operation. This procedure assumes power has been applied to the shelf, and the shelf is providing timing per the Installation section of this manual.</p>	
<p>Notes:</p> <ol style="list-style-type: none"> If using a TNC-E/C and TNC/C clock combination in the DCD Shelf, ensure that the following has been observed: <ul style="list-style-type: none"> The TNC-E/C was installed and its ACTIVE lamp lit prior to the installation of the TNC/C. Failure to allow the TNC-E/C to become active before installing the TNC/C may prevent the GTI from attaining GTI LOCK. The TNCE/TNC switch on the DCD Shelf is set to TNCE. Switch (SW2) settings on the GTI/C card are used to configure its alarm delay time and output signal conditioning. The alarm delay switch setting applies only to GPS INVALID and GPS LOS alarms. This switch setting selects the amount of time between when the GTI/C recognizes a missing or invalid signal from the GTR and when a major or minor alarm is declared. The output signal conditioning settings include CAS/CCS and AIS/squelch; on the 090-44140-14 GTI/C card, switches are also provided to set the reference type (rubidium or quartz). Using the factory settings (the card is configured for operation with rubidium oscillators), 4 h after the GTI/C determines it is receiving an invalid signal from the GTR (i.e., not traceable to UTC), a minor alarm is declared. If this condition continues for an additional 20 h (a total of 24 h without UTC traceable input), the GTI/C will declare a major alarm, and squelch E1 outputs, or send AIS (depending on SW2 setting). If only one GTI/C card is to be installed, and the other card slot is to be empty, a blank plug-in card (090-44198-01) must be installed in the empty slot to ensure the shelf is CE Mark compliant. 	
1	<p>Set switches on SW2 (on the GTI/C card[s]); use Figure 1 or Figure 2 and Table B through Table E to set switches and jumper straps per Installation Job Specifications.</p>
<p>Note: Two GTI/C cards may be installed at the same time; if so, apply the steps in this chart to both cards.</p>	
2	<p>Insert the GTI/C card(s) into the appropriate slot in the DCD-LPR/C Shelf (the top slot is “A,” the bottom is “B”); see Figure 3. Using the locking levers, carefully align the card with the connector on the shelf backplane, and press it firmly into place, securing the locking levers into position.</p>
3	<p>Observe the GTI/C card.</p> <p>Requirement: The GTI/C performs a lamp test, and displays various status messages, followed by:</p> <p style="padding-left: 40px;">SEARCHING 0H where 0H = zero hours</p>
4	<p>Observe the GTI/C card lamps.</p> <p>Requirement: The FAIL, OUTPUT, and INPUT lamps are all OFF.</p>
5	<p>While in SEARCHING 0H, check the lamp (labeled DS1 and DS2) on the DCD-LPR/C backplane.</p> <p>Requirement: The lamp is lit green.</p>

Chart 3. GTI/C -12 and GTI/C -14 Card Test (Contd)

STEP	PROCEDURE
6	<p>Measure the voltage between PWR+ and PWR-. The DCD-LPR/C Shelf backplane provides power to the GTR antenna unit via the GTI/C card. The GTI/C card in Slots A or B provides power at terminals TB3 (Slot A) or TB4 (Slot B), on the DCD-LPR/C Shelf (see Figure 3).</p> <p>Requirement: The voltage reads +31.0 V \pm2.0 V.</p>
7	<p>Other messages may appear. After 15 min to 30 min (longer in sites with poor satellite views), observe the display, and confirm that the following appears:</p> <p>Requirement: ACQUIRED 0H where 0H = zero hours</p>
8	<p>Observe the lamps.</p> <p>Requirement: The lamp status does not change.</p>
9	<p>The ACQUIRED 0H display may only appear for 1 s or 2 s before it changes to the next display state. Observe the display, and confirm that the following appears:</p> <p>Requirement: TRACKING 0H where 0H = zero hours</p>
10	<p>Observe the lamps.</p> <p>Requirement: The INPUT lamp is lit green, and both the OUTPUT and FAIL lamps are off.</p>
11	<p>Typically, the tracking mode could last 6 h to 9 h, after which, observe the display, and confirm that the following is displayed:</p> <p>Requirement: GTR LOCK 0H where 0H = zero hours</p>
12	<p>Observe the lamps.</p> <p>Requirement: The lamp status does not change.</p>
13	<p>After 2 h or 3 h of GTR LOCK, observe the display to verify the system has entered GTI LOCK.</p> <p>Requirement: GTI LOCK 0H where 0H = zero hours</p> <p>Note: For at least 100 h, the display will blank the hours.</p>
14	<p>Observe the lamps.</p> <p>Requirement: The FAIL lamp is OFF, and the INPUT and OUTPUT lamps are lit green.</p>
<p>Note: After approximately 5 h, if GTI LOCK is still not displayed, check the DCD Shelf. If using a TNC-E/C and TNC/C clock combination in the DCD Shelf, ensure that the TNC-E/C card's ACTIVE lamp is lit. If not, this could indicate that the TNC-E/C was not installed first, and allowed to become active, before installing the TNC/C; refer to the Maintenance section of this manual for instructions on how to re-install the TNC-E/C card correctly.</p>	
15	<p>This procedure is completed. Indicate completion of the GTI/C Card Test on the Test Sign-off form on the last page of this section, then, if applicable, proceed to the next chart.</p>

Chart 4. GTI/C -16 and GTI/C -18 Card Test

STEP	PROCEDURE
<p>Use this procedure to install the GTI/C -16 or -18 card (p/n 090-44140-16 or -18), and verify operation. This procedure assumes power has been applied to the shelf, and the shelf is providing timing per the Installation section of this manual.</p>	
<p>Notes:</p>	
<ol style="list-style-type: none"> 1. If using a TNC-E/C and TNC/C clock combination in the DCD Shelf, ensure that the following has been observed: <ul style="list-style-type: none"> • The TNC-E/C was installed and its ACTIVE lamp lit prior to the installation of the TNC/C. Failure to allow the TNC-E/C to become active before installing the TNC/C may prevent the GTI from attaining GTI LOCK. • The TNCE/TNC switch on the DCD Shelf is set to TNCE. 2. Switch (SW2) settings on the GTI/C card mother board are used to configure its alarm delay time and output signal conditioning. The alarm delay switch setting applies only to GPS INVALID and GPS LOS alarms. This switch setting selects the amount of time between when the GTI/C recognizes a missing or invalid signal from the GTR and when a major or minor alarm is declared. The output signal conditioning settings include CAS/CCS and AIS/squelch. The mother board also provides switches to set the reference type (rubidium or quartz). In addition, the GTI/C -16 and -18 cards contain a daughter board which provides a switch (SW1) to set baud rate, ASCII time stamp, and alarm integration time for TOD alarms. 3. Using the factory settings (the card is configured for operation with rubidium oscillators), 4 h after the GTI/C determines it is receiving an invalid signal from the GTR (i.e., not traceable to UTC), a minor alarm is declared. If this condition continues for an additional 20 h (a total of 24 h without UTC traceable input), the GTI/C will declare a major alarm, and squelch E1 outputs, or send AIS (depending on the SW2, section 3 setting on the mother board). 4. The Home Display is the UTC time; the STATUS button must be pressed (as appropriate) to display any of the alarm or status screens. For this reason, where instructions require you to confirm a display other than the UTC time, press the STATUS button (as appropriate) to display the alarm or status screen. 5. If only one GTI/C card is to be installed, and the other card slot is to be empty, a blank plug-in card (090-44198-01) must installed in the empty slot to ensure the shelf is CE Mark compliant. 	
1	Set switches on SW2 (on the GTI/C card mother board), and SW1 on the daughter board; use Figure 4, Table B, and Table F through Table I to set switches and jumper straps per Installation Job Specifications.
<p>Note: Two GTI/C cards may be installed at the same time; if so, apply the steps in this chart to both cards.</p>	
2	Insert the GTI/C card(s) into the appropriate slot in the DCD-LPR/C Shelf (the top slot is “A,” the bottom is “B”); see Figure 3. Using the locking levers, carefully align the card with the connector on the shelf backplane and press it firmly into place, securing the locking levers into position.
3	Observe the GTI/C card. Requirement: The GTI/C performs a lamp test and displays the UTC time.
4	Observe the GTI/C card lamps. Requirement: The FAIL, OUTPUT, and INPUT lamps are all OFF.
5	While in SEARCHING 0H, check the lamp (labeled DS1 and DS2) on the DCD-LPR/C backplane. Requirement: The lamp is lit green.

Chart 4. GTI/C -16 and GTI/C -18 Card Test (Contd)

STEP	PROCEDURE
6	<p>Measure the voltage between PWR+ and PWR-. The DCD-LPR/C Shelf backplane provides power to the GTR antenna unit via the GTI/C card. The GTI/C card in Slots A or B provides power at terminals TB3 (Slot A) or TB4 (Slot B) on the DCD-LPR/C Shelf (see Figure 3).</p> <p>Requirement: The voltage reads +31.0 V \pm2.0 V.</p>
7	<p>Other messages may appear. After 15 min to 30 min (longer in sites with poor satellite views), observe the display, and confirm that the following appears:</p> <p>Requirement: ACQUIRED 0H where 0H = zero hours</p>
8	<p>Observe the lamps.</p> <p>Requirement: The lamp status does not change.</p>
9	<p>The ACQUIRED 0H display may only appear for 1 s or 2 s before it changes to the next display state. Observe the display, and confirm that the following appears:</p> <p>Requirement: TRACKING 0H where 0H = zero hours</p>
10	<p>Observe the lamps.</p> <p>Requirement: The INPUT lamp is lit green, and both the OUTPUT and FAIL lamps are off.</p>
11	<p>Typically, the tracking mode could last 6 h to 9 h, after which, observe the display, and confirm that the following is displayed:</p> <p>Requirement: GTR LOCK 0H where 0H = zero hours</p>
12	<p>Observe the lamps.</p> <p>Requirement: The lamp status does not change.</p>
13	<p>After 2 h or 3 h of GTR LOCK, observe the display to verify the system has entered GTI LOCK.</p> <p>Requirement: GTI LOCK 0H where 0H = zero hours</p> <p>Note: For at least 100 h, the display will blank the hours.</p>
14	<p>Observe the lamps.</p> <p>Requirement: The FAIL lamp is OFF, and the INPUT and OUTPUT lamps are lit green.</p>
<p>Note: After approximately 5 h, if GTI LOCK is still not displayed, check the DCD Shelf. If using a TNC-E/C and TNC/C clock combination in the DCD Shelf, ensure that the TNC-E/C card's ACTIVE lamp is lit. If not, this could indicate that the TNC-E/C was not installed first, and allowed to become active, before installing the TNC/C; refer to the Maintenance section of the DCD-521/C manual for instructions on how to re-install the TNC-E/C card correctly.</p>	
15	<p>If the DCD-LPR/C is not equipped with TOD, skip to Step 19. If it is, observe the PWR lamp on the RS-422-to-RS-232 converter.</p> <p>Requirement: The lamp is lit green.</p>
16	<p>Connect a PC COM port to the DB25 RS-232 connector on the RS-422-to-RS-232 converter.</p>
17	<p>Using a program, such as Hyperterminal, set for 9600, 8, N, 1.</p>

Chart 4. GTI/C -16 and GTI/C -18 Card Test (Contd)

STEP	PROCEDURE
18	Observe the screen. <i>Requirement:</i> The time code is displayed once per second.
19	This procedure is completed. Indicate completion of the GTI/C -16 and GTI/C -18 Card Test on the Test Sign-off form on the last page of this section, then, if applicable, proceed to the next chart.



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