

DIGITAL CLOCK DISTRIBUTOR

LOCAL PRIMARY REFERENCE

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-LPR (DCD-LPR) System. 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 with change bars.

- Revised Section 1, General
- Revised Figures 6 and 7.
- Revised Tables I and J.

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.)
- +1 408 428 7907 (U.S.A.)

Notes:

1. The following toll-free number is available in some countries to access Symmetricom’s Inside Sales or CTAC in the U.S.A.: +1 888 367 7966 (U.S.A.).
2. Where information is common to the TNC-E, ST2, and ST2E cards, these cards are collectively referred to as rubidium clock cards.
3. Where information is common to the TNC and ST3E cards, these cards are collectively referred to as quartz clock cards.

2. POWER TEST

2.01 This section assumes that the DCD-LPR Shelf has been physically and electrically installed per the Installation section of this manual.

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

2.02 Chart 1 contains the power test procedure.

Chart 1. Power Test

| STEP | PROCEDURE |
|------|--|
| | <p>Use this procedure to verify the power connections to the shelf. This procedure assumes power to the shelf under test has been connected per the Installation section of this manual.</p> <p>Test Equipment: Digital Multimeter, Fluke 77 or equivalent</p> <p>Note: The DCD-LPR Shelf does not load share the A and B battery feeds. The alternate source becomes active only if the active source fails.</p> |
| | <p>Caution: Do not perform this procedure on a DCD-LPR 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) which powers the DCD-LPR. |

Chart 1. Power Test (Cont'd)

| STEP | PROCEDURE |
|------|--|
| 3 | Disconnect the –48V A and –48V B power leads from the shelf power terminal blocks TB1 and TB5, on the rear of the DCD-LPR 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 (TB1) c. Battery A lead and frame (FRM) ground terminal on the power terminal block (TB1) d. Battery B lead and battery return (RTN) terminal on the power terminal block (TB5) e. Battery B lead and frame (FRM) ground terminal on the power terminal block (TB5) <p>Requirement: The multimeter indicates maximum 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 (TB1) c. Battery A lead and frame (FRM) ground terminal on the power terminal block (TB1) d. Battery B lead and battery return (RTN) terminal on the power terminal block (TB5) e. Battery B lead and frame (FRM) ground terminal on the power terminal block (TB5) <p>Requirement: The multimeter indicates infinite ohms (completely open circuit).</p> |
| 6 | Reconnect the A and B battery leads to the power terminal block (TB1 and TB5) –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 | <p>Use the multimeter to measure the voltage between the –48V A and RTN terminal sets on the power terminal block (TB1) on the backplane.</p> <p>Requirement: The multimeter indicates –42 V dc to –56 V dc.</p> |
| 9 | <p>Use the multimeter to measure the voltage between the –48V B and RTN terminal sets on the power terminal block (TB5), on the backplane.</p> <p>Requirement: The multimeter indicates –42 V dc to –56 V dc.</p> |
| 10 | This procedure is completed. Indicate completion of the Power Test on the Test Sign-off form. |

3. CARD TESTS

A. Pre-installation Considerations

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

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

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

Table A. DCD-LPR Cards

| CARD | NAME USED IN THIS SECTION | PART NUMBER |
|----------------------------|---------------------------|--------------|
| ANSI-STANDARD CARDS | | |
| GTI | GTI-17 | 090-42140-17 |
| GTI | GTI-15 | 090-42140-15 |
| GTI | GTI-13 | 090-42140-13 |
| GTI | GTI-11 | 090-42140-11 |
| LTI | LTI | 090-41140-01 |
| ITU-STANDARD CARDS | | |
| GTI | GTI-18 | 090-42140-18 |
| GTI | GTI-16 | 090-42140-16 |
| GTI | GTI-14 | 090-42140-14 |
| GTI | GTI-12 | 090-42140-12 |

Table A. DCD-LPR Cards (Cont'd)

| CARD | NAME USED IN THIS SECTION | PART NUMBER |
|---|---------------------------|--------------|
| ANSI-STANDARD AND UTI-STANDARD CARDS | | |
| LOU | LOU-1 | 090-42145-01 |
| LOU | LOU-2 | 090-42145-02 |
| Notes: 1. Where information is common to all GTI cards, these cards are collectively referred to as GTI cards. 2. Where information is common to both LOU cards, these cards are collectively referred to as LOU cards. | | |

3.02 For information on how to configure the GTI, MIS, MRC, and CI cards, refer to the DCD Manuals provided with your system.

3.03 If using a DCD-LPR with a DCD 500 Series Shelf containing an MIS card, the GTI and/or LTI cards may need to be entered into the database, and configured, using TL1 command. (For details on TL1 commands, refer to the TL1 User's Guide provided with the MIS card.)

B. Installation Procedures

3.04 Go to Chart 2 if installing an LOU card. Then go to Chart 3 if installing a GTI-11 or -12 card, Chart 4 if installing a GTI-13 or -14 card, or Chart 5 if installing a GTI-15, -16, -17, or -18 card. Then go to Chart 6 if installing an LTI card.

Chart 2. LOU Card Test

| STEP | PROCEDURE |
|------|--|
| | <p>Use this procedure to install either the LOU-1 or LOU-2 card, and verify operation. This procedure assumes power has been applied to the shelf per the Installation section of this manual.</p> <p>Note: There are no options to be set on either the LOU-1 or the LOU-2 card.</p> |
| 1 | <p>Insert the LOU card into the appropriate slot in the DCD-LPR Shelf (the top slot is “A,” the bottom is “B”). 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. Tighten the two thumb screws.</p> |
| | <p>Observe the lamps.</p> <p>Requirement: On the LOU-1: the OSC A lamp flashes green during warm-up, then lights solid green when warmed-up (up to 30 min). On the LOU-2: the OSC A and B lamps flash green during warm-up, then light solid green when warmed-up (up to 30 min).</p> |
| | <p>This procedure is completed. Indicate completion of the LOU Card Test on the Test Sign-off form on the last page of this section; proceed to the next chart.</p> |

Chart 3. GTI-11 and GTI-12 Card Test

| STEP | PROCEDURE |
|--|--|
| | <p>Use this procedure to install the GTI-11 or GTI-12 card (p/n 090-42140-11 or -12), 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. The GTI-11 and GTI-12 cards perform best with dual rubidium clock cards in the DCD Shelf. 2. If using a rubidium/quartz clock combination in the DCD Shelf, ensure that the following has been observed: <ul style="list-style-type: none"> • The rubidium clock card was installed, and its ACTIVE lamp lit, prior to the installation of the quartz clock card. Failure to allow the rubidium clock card to become active before installing the quartz clock card may prevent the GTI from attaining GTI LOCK. • The ST2/ST3 switch on the DCD Shelf is set to ST2. 3. Switch (SW2) settings on the GTI 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 recognizes a missing or invalid signal from the GTR and when a major or minor alarm is declared. The output signal conditioning settings include CCS/CAS, D4/ESF, and AIS/squelch. 4. When a major alarm is declared, E1 or DS1 outputs are squelched, or AIS is put out (depending on the SW2, section 3 setting on the GTI card). |
| 1 | Set the sections on SW2; use Figure 1 or Figure 2 and Table B through Table E to set switches and jumper straps per Installation Job Specifications. |
| <p>Note: Two GTI cards may be installed at the same time; if so, apply the steps in this chart to both cards.</p> | |
| | <p>Insert the GTI card(s) into the appropriate slot in the DCD-LPR 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. Tighten the two thumb screws.</p> |
| | <p>Observe the GTI card.</p> <p>Requirement: The GTI performs a lamp test, and displays various status messages, followed by: SEARCHING 0H where 0H = zero hours</p> |
| | <p>Observe the GTI card lamps.</p> <p>Requirement: The FAIL and OUTPUT lamps are OFF, and the INPUT lamp is lit red. The MAJOR and MINOR lamps on the DCD-LPR Shelf are OFF.</p> |
| | <p>While in SEARCHING 0H, check the lamp (labeled DS1) on the GTI module I/O A and/or I/O B, at the back of the DCD-LPR.</p> <p>Requirement: The lamp is lit green.</p> |

Chart 3. GTI-11 and GTI-12 Card Test (Cont'd)

| STEP | PROCEDURE |
|------|--|
| | <p>Measure the voltage between PWR+ and PWR-. The DCD-LPR Shelf backplane provides power to the GTR antenna unit via the GTI card. The GTI card in Slot A or B provides power at terminals TB3 (Slot A) or TB4 (Slot B), on the DCD-LPR Shelf (see Figure 3).</p> <p>Requirement: The voltage reads +31.0 V \pm2.0 V.</p> |
| | <p>Other messages may appear. After 15 min to 30 min (longer in sites with poor coverage), observe the display, and confirm that the following appears:</p> <p>Requirement: ACQUIRED 0H where 0H = zero hours</p> |
| | <p>Observe the lamps.</p> <p>Requirement: The lamp status does not change.</p> |
| | <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> |
| | <p>Observe the lamps.</p> <p>Requirement: The INPUT lamp is lit green, and both the OUTPUT and FAIL lamps are off. This may occur any time before GTR LOCK state.</p> |
| | <p>Typically, the tracking mode could last 2 h to 6 h, after which, observe the display, and confirm that the following is displayed:</p> <p>Requirement: GTR LOCK 0H where 0H = zero hours</p> |
| | <p>Observe the lamps.</p> <p>Requirement: The lamp status does not change.</p> |
| | <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 Minimum time between GTR LOCK and GTI LOCK is 30 m</p> <p>Note: After achieving GTI LOCK for more than 99 h (99H), the hours will not be displayed on the GTI-11, Software Rev. 2.03 and above.</p> |
| | <p>Observe the lamps.</p> <p>Requirement: The FAIL lamp is OFF, and the INPUT and OUTPUT lamps are lit green.</p> |

Chart 3. GTI-11 and GTI-12 Card Test (Cont'd)

| STEP | PROCEDURE |
|------|--|
| | <p>Note: After approximately 5 h, if GTI LOCK is still not displayed, check the DCD Shelf. If using a rubidium/quartz clock card combination in the DCD Shelf, ensure that the rubidium card's ACTIVE lamp is lit. If not, this could indicate that the rubidium clock card was not installed first, and allowed to become active before installing the quartz clock card; refer to the Maintenance section of the DCD Shelf manual, for instructions on how to re-install the rubidium card correctly.</p> |
| | <p>This procedure is completed. Indicate completion of the GTI-11 and GTI-12 Card Test on the Test Sign-off form on the last page of this section, then, if applicable, proceed to the next chart.</p> |

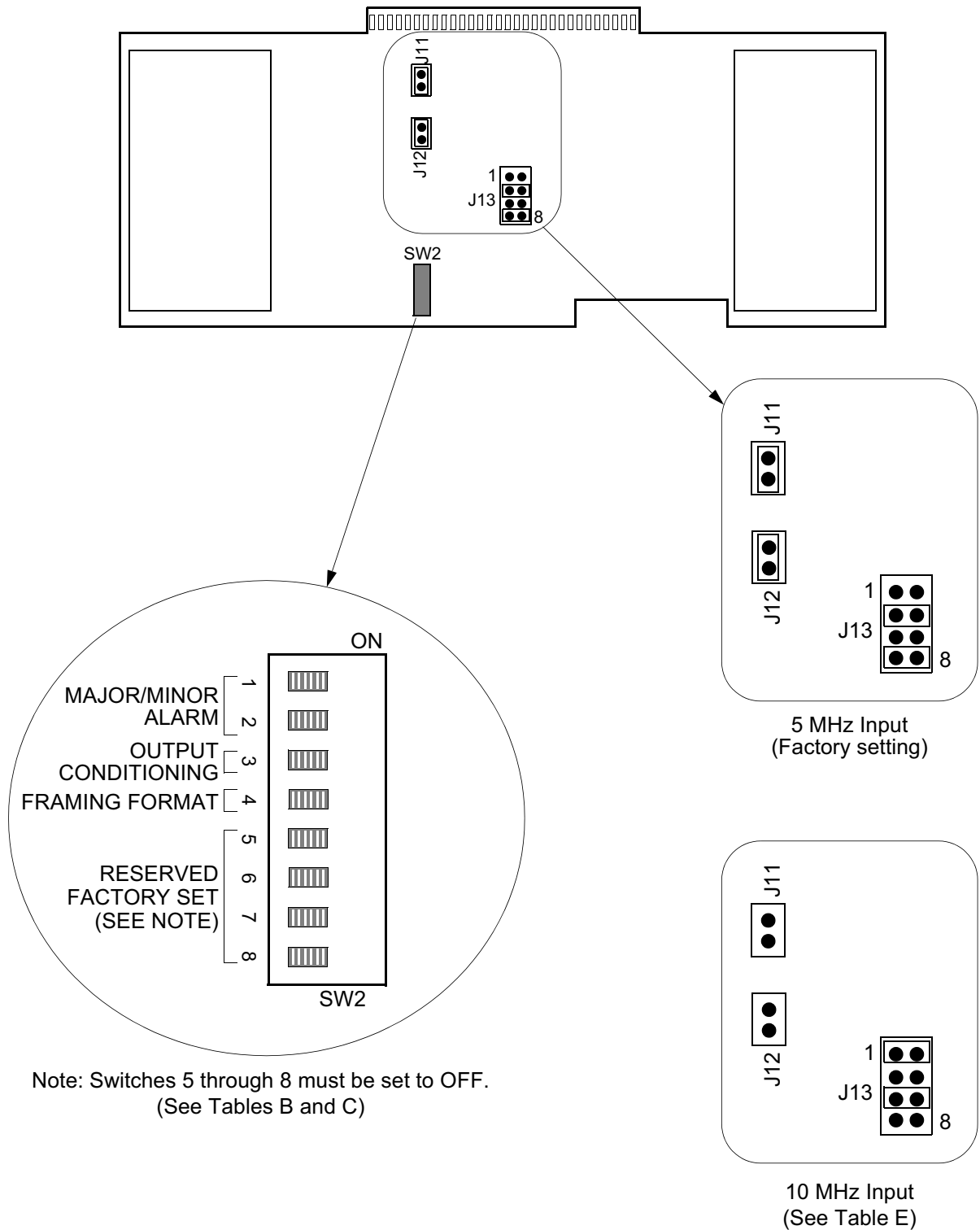
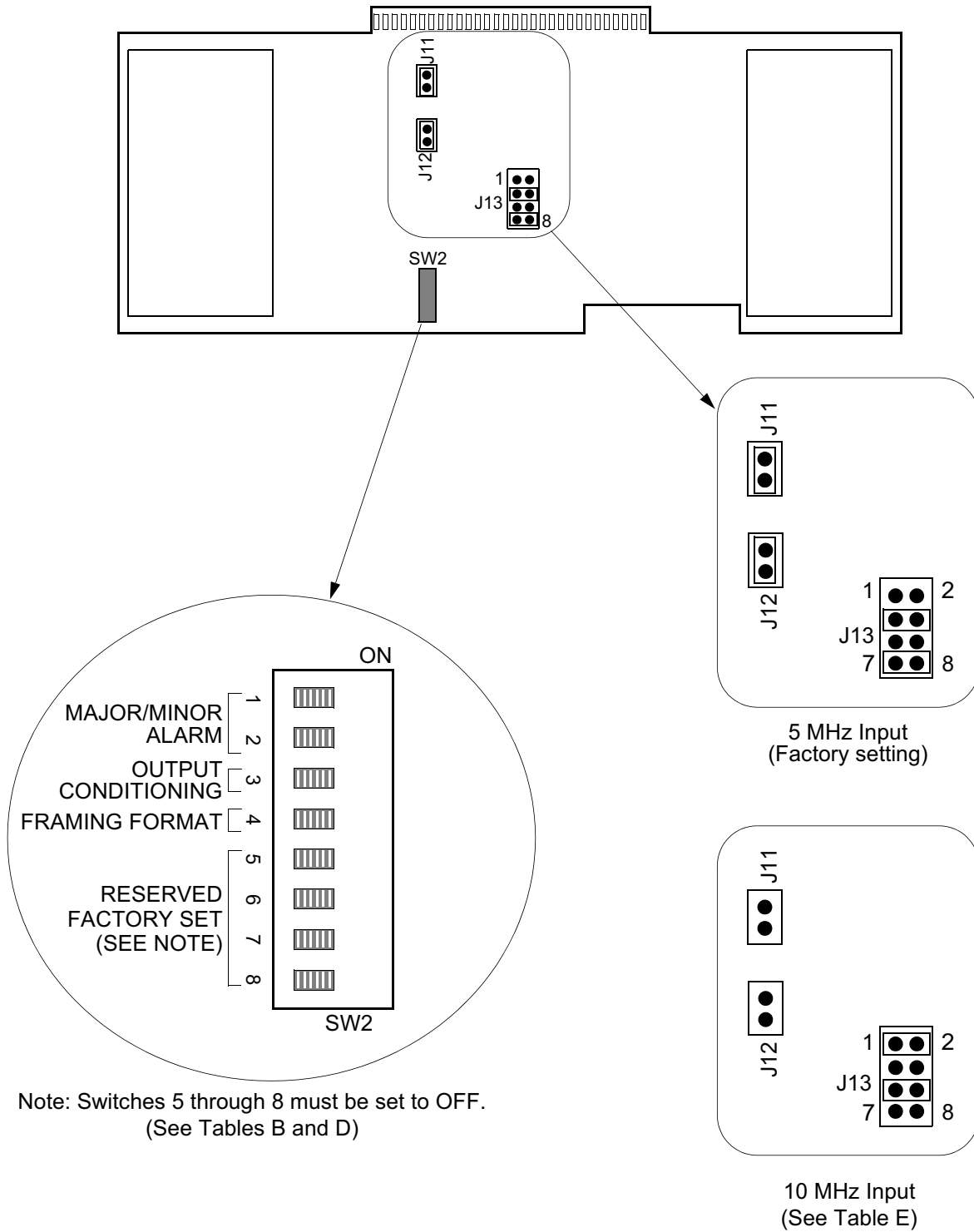


Figure 1. GTI-11 Card Switch and Jumper Settings



Note: Switches 5 through 8 must be set to OFF.
(See Tables B and D)

Figure 2. GTI-12 Card Switch and Jumper Settings

**Table B. GTI (-11, -12, -13, and -14) Card Switch Settings (Sections 1 and 2)
(for GPS INVALID and GPS LOS only)**

| SECTION 1 | SECTION 2 | ALARM DELAY TIME (Note 1) | | FACTORY SETTING |
|-----------|-----------|---------------------------|-------------|-----------------|
| | | MINOR ALARM | MAJOR ALARM | |
| OFF | OFF | 4 h | 24 h | X |
| ON | OFF | 3 h | 18 h | — |
| OFF | ON | 1 h | 6 h | — |
| ON | ON | 10 min | 1 h | — |

Notes:

- The minor alarm setting indicates the amount of time from when the GTI detects a GPS INVALID or GPS LOS alarm condition, and when a minor alarm is declared. The major alarm setting determines the total time allowable from when the GPS INVALID or GPS LOS was first detected, and when a major alarm is declared. For example, using the factory setting, 4 h after the GTI determines it is receiving an invalid signal from the GTR (GPS INVALID is displayed), a minor alarm is declared (GPS INVALID MN is displayed). If this condition continues for an additional 20 h (a total of 24 h without UTC traceable input), the GTI will declare a major alarm (GPS INVALID MJ is displayed).
- The factory setting is 4 h for minor and 24 h for major alarms; it is recommended that the following alarm delay times be as follows:
 - For GTI-11 and GTI-12 cards, use the factory setting of 4 h for minor alarms, and 24 h for major alarms.
 - For GTI-13 and GTI-14 cards set for quartz, set the alarm delay time to 1 h for minor alarms, and 6 h for major alarms.
 - For GTI-13 and GTI-14 cards set for rubidium, use the factory setting of 4 h for minor alarms, and 24 h for major alarms.

Table C. GTI-11 Card Switch Settings (Sections 3 through 8)

| SECTION | POSITION | MEANING | FACTORY SETTING |
|-------------|----------|--|-----------------|
| 3 | ON | Output is squelched when the GTI has a Major alarm | — |
| | OFF | Output is AIS when the GTI has a Major alarm | X |
| 4 | ON | ESF output framing format | — |
| | OFF | D4 output framing format | X |
| 5 through 8 | OFF | Reserved for factory use (must be set to OFF) | X |

Table D. GTI-12 Card Switch Settings (Sections 3 through 8)

| SECTION | POSITION | MEANING | FACTORY SETTING |
|-------------|----------|--|-----------------|
| 3 | ON | Output is squelched when the GTI has a Major alarm | — |
| | OFF | Output is AIS when the GTI has a Major alarm | X |
| 4 | ON | CCS output framing format | — |
| | OFF | CAS output framing format | X |
| 5 through 8 | OFF | Reserved for factory use (must be set to OFF) | X |

Table E. GTI Card Jumper Strapping

| JUMPER | PIN* | 5 MHz (FACTORY SETTING) | 10 MHz | DCD-LPR INPUT(S) AFFECTED |
|--------|---------|-------------------------------|-------------------------|------------------------------|
| J11 | 1 and 2 | Strapped | Not strapped (see Note) | OSC A IN |
| J12 | 1 and 2 | Strapped | Not strapped (see Note) | OSC B IN |
| J13 | 1 and 2 | Not strapped | Strapped | OSC A IN |
| | 3 and 4 | Strapped | Not strapped (see Note) | OSC A IN |
| | 5 and 6 | Not strapped | Strapped | OSC B IN |
| | 7 and 8 | Strapped | Not strapped (see Note) | OSC B IN |

* Indicates the pin number on the jumper illustrated in Figure 1.

Note: Retain unused jumpers at J11 and J12 (for possible future use), by slipping the jumper over one pin only.

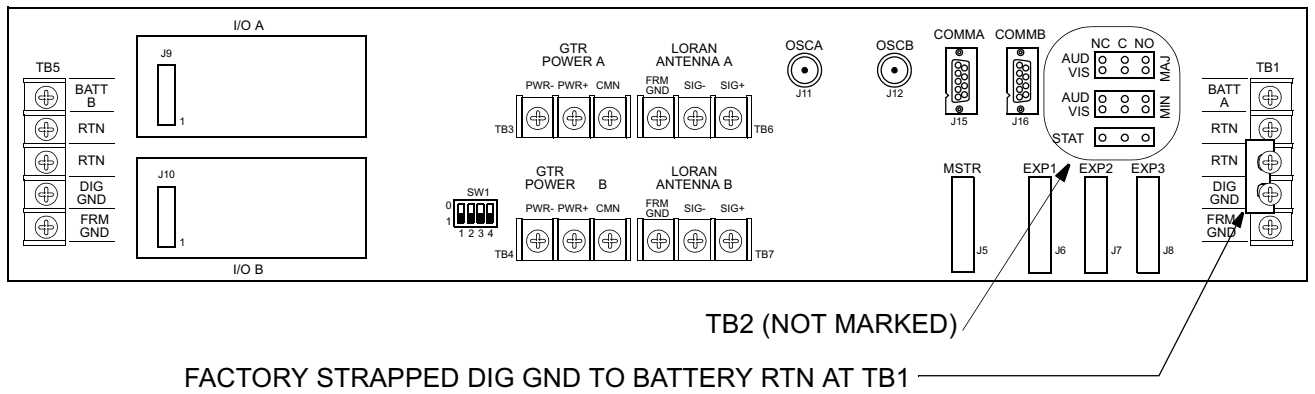
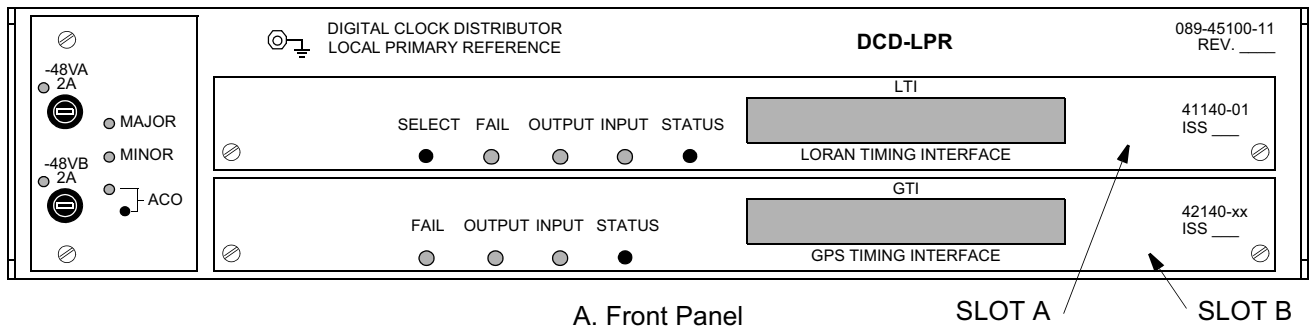


Figure 3. DCD-LPR Shelf (Front and Rear Views)

Chart 4. GTI-13 and GTI-14 Card Test

| STEP | PROCEDURE |
|------|--|
| | <p>Use this procedure to install the GTI-13 or GTI-14 card (p/n 090-42140-13 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"> 1. The GTI-13 and GTI-14 cards will work with dual rubidium or quartz clocks, or a rubidium/quartz mix by setting the option switch selection. 2. If using a rubidium/quartz clock combination in the DCD Shelf, ensure that the following has been observed: <ul style="list-style-type: none"> • The rubidium clock card was installed, and its ACTIVE lamp lit, prior to the installation of the quartz clock card. Failure to allow the rubidium clock card to become active before installing the quartz clock card may prevent the GTI from attaining GTI LOCK. • The ST2/ST3 switch on the DCD Shelf is set to ST2. 3. Switch (SW2) settings on the GTI 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 recognizes a missing or invalid signal from the GTR and when a major or minor alarm is declared. The output signal conditioning settings include CCS/CAS, D4/ESF, and AIS/squelch. The GTI card also provides switches to set the reference type (rubidium or quartz). 4. When a major alarm is declared, E1 or DS1 outputs are squelched, or AIS is put out (depending on the SW2, section 3 setting on the GTI card). |
| 1 | <p>Set the sections on SW2; use Figure 4 or Figure 5 and Table B, Table E, and Table F or Table G to set switches and jumper straps per Installation Job Specifications. See Table M for GTI card alarm integration times.</p> |
| | <p>Note: Two GTI cards may be installed at the same time; if so, apply the steps in this chart to both cards.</p> |
| | <p>Insert the GTI card(s) into the appropriate slot in the DCD-LPR 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. Tighten the two thumb screws.</p> <p>Requirement: The FAIL, OUTPUT, and INPUT lamps are all OFF.</p> |
| | <p>Observe the GTI card.</p> <p>Requirement: The GTI performs a lamp test, and displays various status messages, followed by: SEARCHING 0H where 0H = zero hours</p> |
| | <p>Observe the GTI card lamps.</p> <p>Requirement: The FAIL, OUTPUT, and INPUT lamps are all OFF. The MAJOR and MINOR lamps on the DCD-LPR Shelf are OFF.</p> |

Chart 4. GTI-13 and GTI-14 Card Test (Cont'd)

| STEP | PROCEDURE |
|------|---|
| | <p>While in SEARCHING 0H, check the lamp (labeled DS1) on the GTI module I/O A and/or I/O B, at the back of the DCD-LPR.</p> <p>Requirement: The lamp is lit green.</p> |
| | <p>Measure the voltage between PWR+ and PWR-. The DCD-LPR Shelf backplane provides power to the GTR antenna unit via the GTI card. The GTI card in Slots A or B provides power at terminals TB3 (Slot A) or TB4 (Slot B) on the DCD-LPR Shelf (see Figure 3).</p> <p>Requirement: The voltage reads +31.0 V \pm2.0 V.</p> |
| | <p>Other messages may appear. After 15 min to 30 min (longer in sites with poor coverage), observe the display, and confirm that the following appears:</p> <p>Requirement: ACQUIRED 0H where 0H = zero hours</p> |
| | <p>Observe the lamps.</p> <p>Requirement: The lamp status does not change.</p> |
| | <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> |
| | <p>Observe the lamps.</p> <p>Requirement: The INPUT lamp is lit green, and both the OUTPUT and FAIL lamps are off. This occurs any time before GTR LOCK state.</p> |
| | <p>Typically, the tracking mode could last 2 h to 6 h, after which, observe the display and confirm that the following is displayed:</p> <p>Requirement: GTR LOCK 0H where 0H = zero hours</p> |
| | <p>Observe the lamps.</p> <p>Requirement: The lamp status does not change.</p> |
| | <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 Minimum time between GTR LOCK and GTI LOCK is 30 m.</p> <p>Note: After achieving GTI LOCK for more than 99 h (99H), the hours will not be displayed.</p> |
| | <p>Observe the lamps.</p> <p>Requirement: The FAIL lamp is OFF, and the INPUT and OUTPUT lamps are lit green.</p> |

Chart 4. GTI-13 and GTI-14 Card Test (Cont'd)

| STEP | PROCEDURE |
|------|--|
| | <p>Note: After approximately 5 h, if GTI LOCK is still not displayed, check the DCD Shelf. If using a rubidium/quartz clock card combination in the DCD Shelf, ensure that the rubidium card's ACTIVE lamp is lit. If not, this could indicate that the rubidium clock card was not installed first, and allowed to become active before installing the quartz clock card; refer to the Maintenance section of the DCD Shelf manual, for instructions on how to re-install the rubidium card correctly.</p> |
| | <p>This procedure is completed. Indicate completion of the GTI-13 and GTI-14 Card Test on the Test Sign-off form on the last page of this section, then, if applicable, proceed to the next chart.</p> |

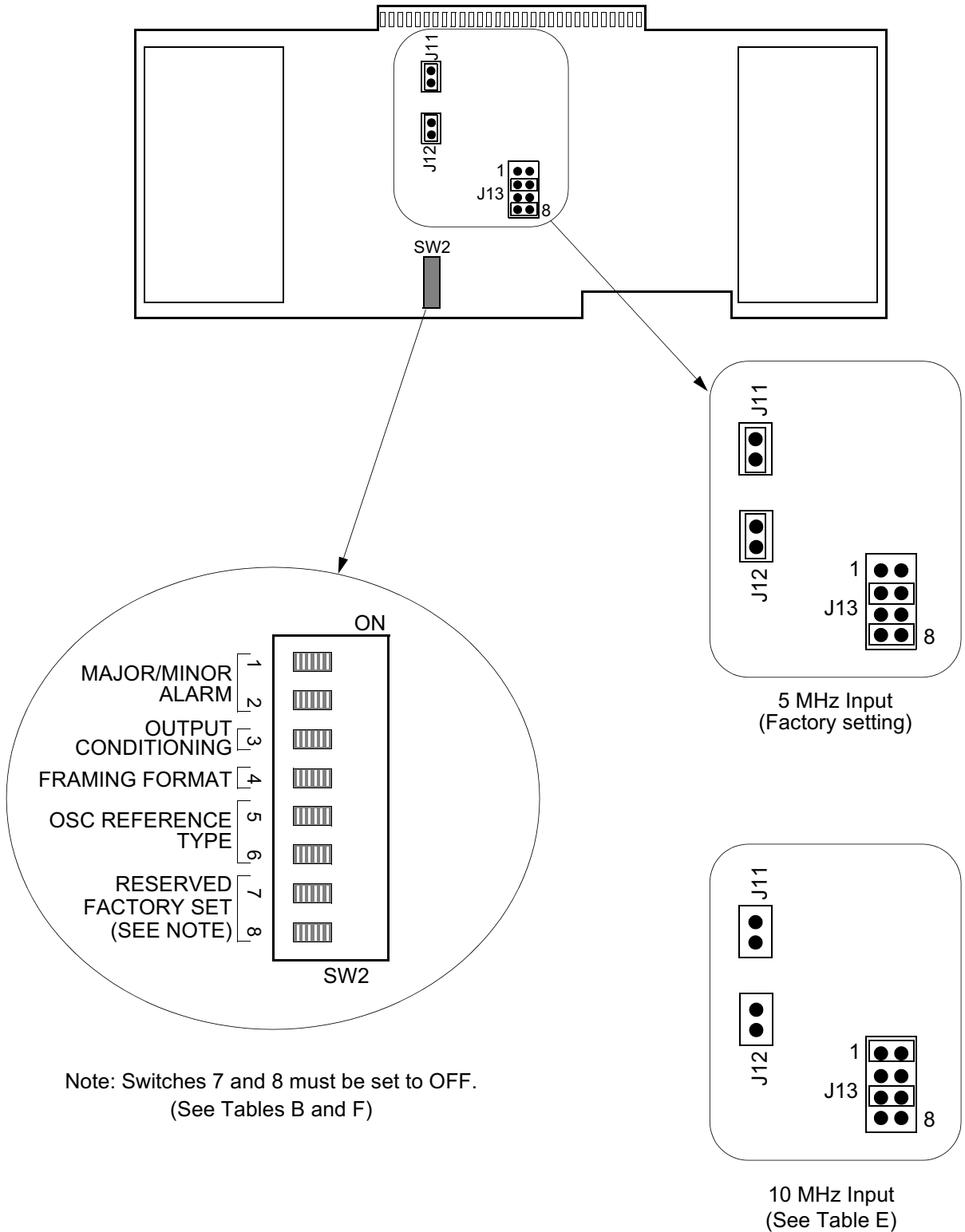


Figure 4. GTI-13 Card Switch and Jumper Settings

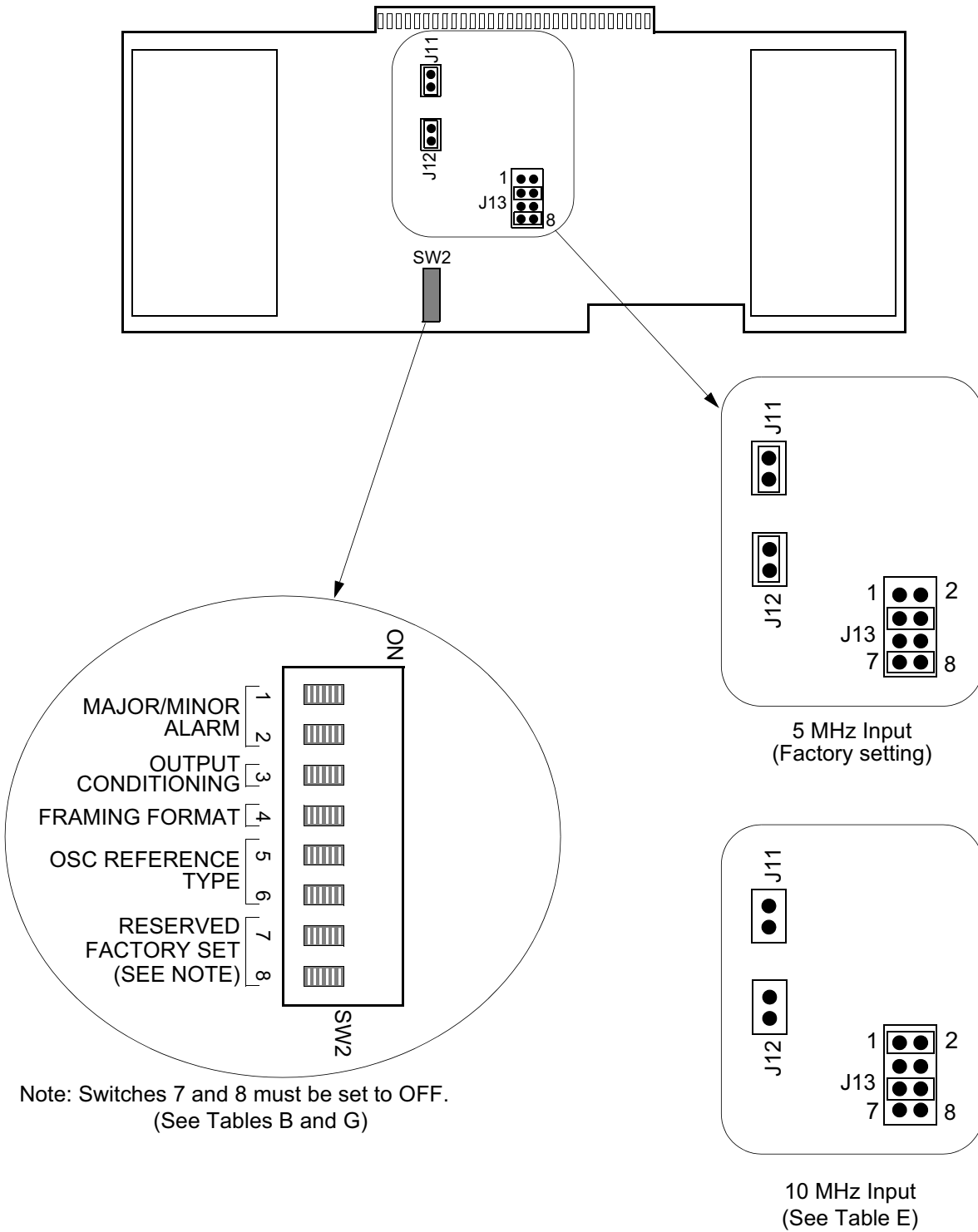


Figure 5. GTI-14 Card Switch and Jumper Settings

Table F. GTI-13 Card Switch Settings (Sections 3 through 8)

| SECTION | POSITION | MEANING | FACTORY SETTING |
|---------|----------|--|-----------------|
| 3 | ON | Output is squelched when the GTI has a Major alarm | — |
| | OFF | Output is AIS when the GTI has a Major alarm | X |
| 4 | ON | ESF output framing format | — |
| | OFF | D4 output framing format | X |
| 5 | OFF | Sets reference type for OSC A as rubidium | X |
| | ON | Sets reference type for OSC A as quartz | — |
| 6 | OFF | Sets reference type for OSC B as rubidium | X |
| | ON | Sets reference type for OSC B as quartz | — |
| 7 and 8 | OFF | Reserved for factory use (must be set to OFF) | X |

Notes:

1. If a rubidium and a quartz oscillator are installed in the same shelf, OSC A, section 5, must be set to OFF (rubidium).
2. If a LOU-1 or LOU-2 is used for a reference, both OSC A, section 5 and OSC B, section 6 must be set to ON (quartz).

Table G. GTI-14 Card Switch Settings (Sections 3 through 8)

| SECTION | POSITION | MEANING | FACTORY SETTING |
|---------|----------|--|-----------------|
| 3 | ON | Output is squelched when the GTI has a Major alarm | — |
| | OFF | Output is AIS when the GTI has a Major alarm | X |
| 4 | ON | CCS output framing format | — |
| | OFF | CAS output framing format | X |
| 5 | ON | Sets reference type for OSC A as quartz | — |
| | OFF | Sets reference type for OSC A as rubidium | X |
| 6 | ON | Sets reference type for OSC B as quartz | — |
| | OFF | Sets reference type for OSC B as rubidium | X |
| 7 and 8 | OFF | Reserved for factory use (must be set to OFF) | X |

Notes:

1. If a rubidium and a quartz oscillator are installed in the same DCD-500 Shelf, OSC A, section 5, must be set to OFF (rubidium).
2. If an LOU-1 or LOU-2 is used for a reference, both OSC A, section 5 and OSC B, section 6 must be set to ON (quartz).

Chart 5. GTI-15, GTI-16, GTI-17, and GTI-18 Card Test

| STEP | PROCEDURE |
|------|--|
| | <p>Use this procedure to install the GTI-15, -16, -17, or -18 card (p/n 090-42140-15, -16, -17, 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"> The GTI-15 through GTI-18 cards will work with dual rubidium or quartz clocks, or a rubidium/quartz mix by setting the option switch selections. If using a rubidium/quartz clock combination in the DCD Shelf, ensure that the following has been observed: <ul style="list-style-type: none"> The rubidium clock card was installed, and its ACTIVE lamp lit, prior to the installation of the quartz clock card. Failure to allow the rubidium clock card to become active before installing the quartz clock card may prevent the GTI from attaining GTI LOCK. The ST2/ST3 switch on the DCD Shelf is set to ST2. Switch (SW2) settings on the GTI 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 recognizes a missing or invalid signal from the GTR and when a major or minor alarm is declared. The output signal conditioning settings include CCS/CAS, D4/ESF, and AIS/squelch. The mother board also provides switches to set the reference type (rubidium or quartz). In addition, the GTI cards contain a daughter board which provides a switch (SW1) to set baud rate, ASCII time stamp, and alarm integration time for TOD alarms. When a major alarm is declared, E1 or DS1 outputs are squelched, or AIS is put out (depending on the SW2, section 3 setting on the mother board). 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. Switch SW2, section 4, must be set to ON for SSM to function. |
| 1 | Set the sections on SW2 (on the GTI card mother board), and SW1 on the daughter board; use Figure 6 or Figure 7 and Table H through Table L to set switches per Installation Job Specifications. See Table M for GTI card alarm integration times. |
| | Note: Two GTI cards may be installed at the same time; if so, apply the steps in this chart to both cards. |
| | Insert the GTI card(s) into the appropriate slot in the DCD-LPR 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. Tighten the two thumb screws. |
| | Observe the GTI card. Requirement: The GTI performs a lamp test, and displays the UTC time. |
| | Observe the GTI card lamps. Requirement: The FAIL, OUTPUT, and INPUT lamps are all OFF. The MAJOR and MINOR lamps on the DCD-LPR Shelf are OFF. |

Chart 5. GTI-15, GTI-16, GTI-17, and GTI-18 Card Test (Cont'd)

| STEP | PROCEDURE |
|------|---|
| | <p>While in SEARCHING 0H, check the lamp (labeled DS1) on the GTI module I/O A and/or I/O B, at the back of the DCD-LPR.</p> <p>Requirement: The lamp is lit green.</p> |
| | <p>Measure the voltage between PWR+ and PWR-. The DCD-LPR Shelf backplane provides power to the GTR antenna unit via the GTI card. The GTI card in Slots A or B provides power at terminals TB3 (Slot A) or TB4 (Slot B) on the DCD-LPR Shelf (see Figure 3).</p> <p>Requirement: The voltage reads +31.0 V \pm2.0 V.</p> |
| | <p>Other messages may appear. After 15 min to 30 min (longer in sites with poor coverage), observe the display, and confirm that the following appears:</p> <p>ACQUIRED 0H where 0H = zero hours</p> |
| | <p>Observe the lamps.</p> <p>Requirement: The lamp status does not change.</p> |
| | <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> |
| | <p>Observe the lamps.</p> <p>Requirement: The INPUT lamp is lit green, and both the OUTPUT and FAIL lamps are off. This occurs any time before GTR LOCK state.</p> |
| | <p>Typically, the tracking mode could last 2 h to 6 h, after which, observe the display, and confirm that the following is displayed:</p> <p>Requirement: GTR LOCK 0H where 0H = zero hours</p> |
| | <p>Observe the lamps.</p> <p>Requirement: The lamp status does not change.</p> |
| | <p>After 2 h or 3 h of GTR LOCK, observe the display to verify the system has entered GTI LOCK. This is indicated by the following display:</p> <p>Requirement: GTI LOCK 0H where 0H = zero hours</p> <p>Note: After achieving GTI LOCK for minimum 99 h (99H), the hours will not be displayed.</p> |

Chart 5. GTI-15, GTI-16, GTI-17, and GTI-18 Card Test (Cont'd)

| STEP | PROCEDURE |
|------|---|
| | <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 rubidium/quartz clock card combination in the DCD Shelf, ensure that the rubidium card's ACTIVE lamp is lit. If not, this could indicate that the rubidium clock card was not installed first, and allowed to become active, before installing the quartz clock card; refer to the Maintenance section of the DCD Shelf manual, for instructions on how to re-install the rubidium card correctly.</p> |
| | <p>If the DCD-LPR is not equipped with TOD, skip to Step . If it is, observe the PWR lamp on the RS-422-to-RS-232 converter.</p> <p>Requirement: The lamp is lit green.</p> |
| | <p>Connect a PC COM port to the DB25 RS-232 connector on the RS-422-to-RS-232 converter.</p> |
| | <p>Using a program, such as Hyperterminal, set for 9600, 8, N, 1.</p> |
| | <p>Observe the screen.</p> <p>Requirement: The time code is displayed once per second.</p> |
| | <p>This procedure is completed. Indicate completion of the GTI-15, GTI-16, GTI-17 or GTI-18 Card Test on the Test Sign-off form on the last page of this section, then, if applicable, proceed to the next chart.</p> |

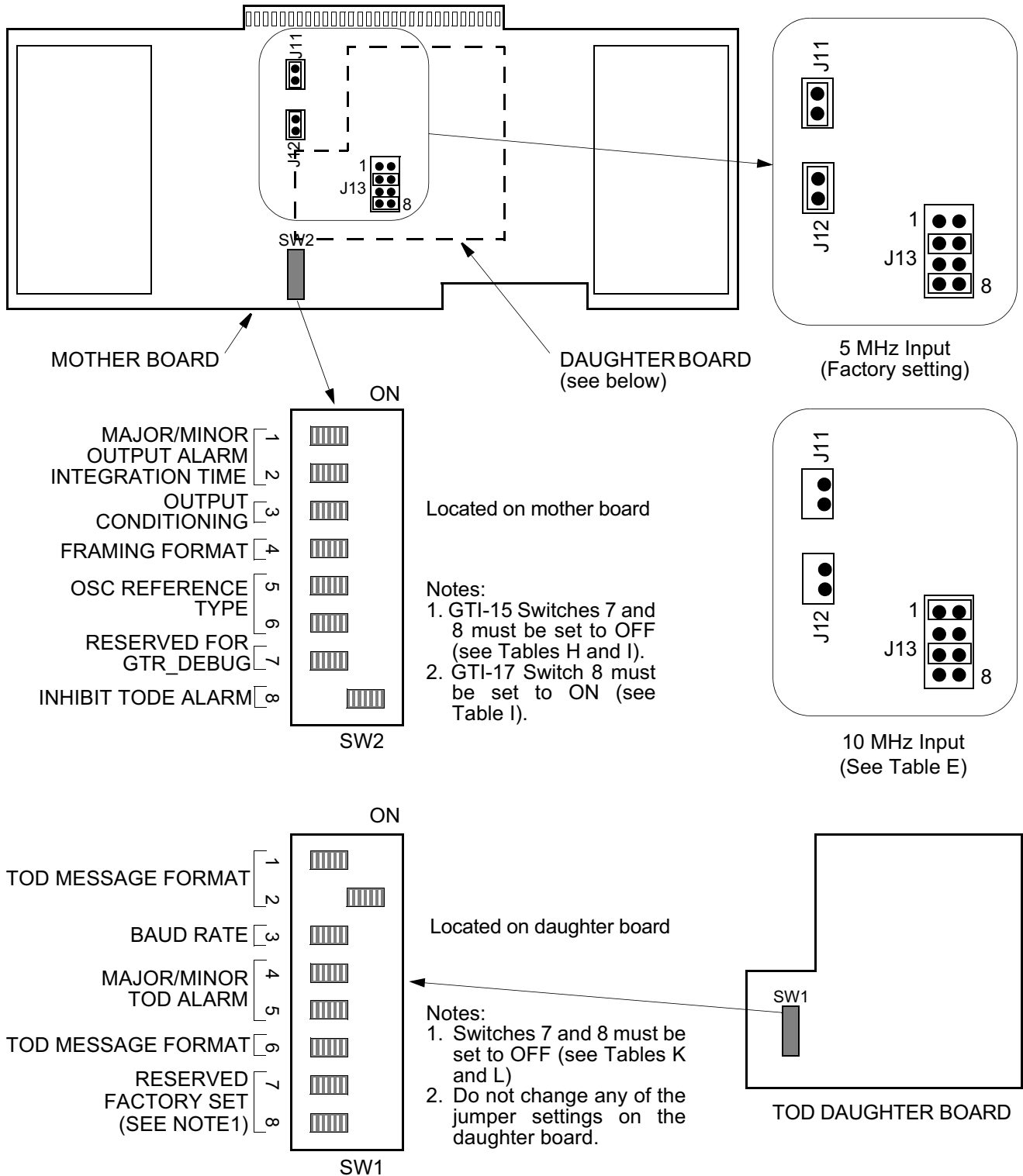


Figure 6. GTI -15 and GTI-17 Card Switches and Jumper Settings (Mother and Daughter Boards)

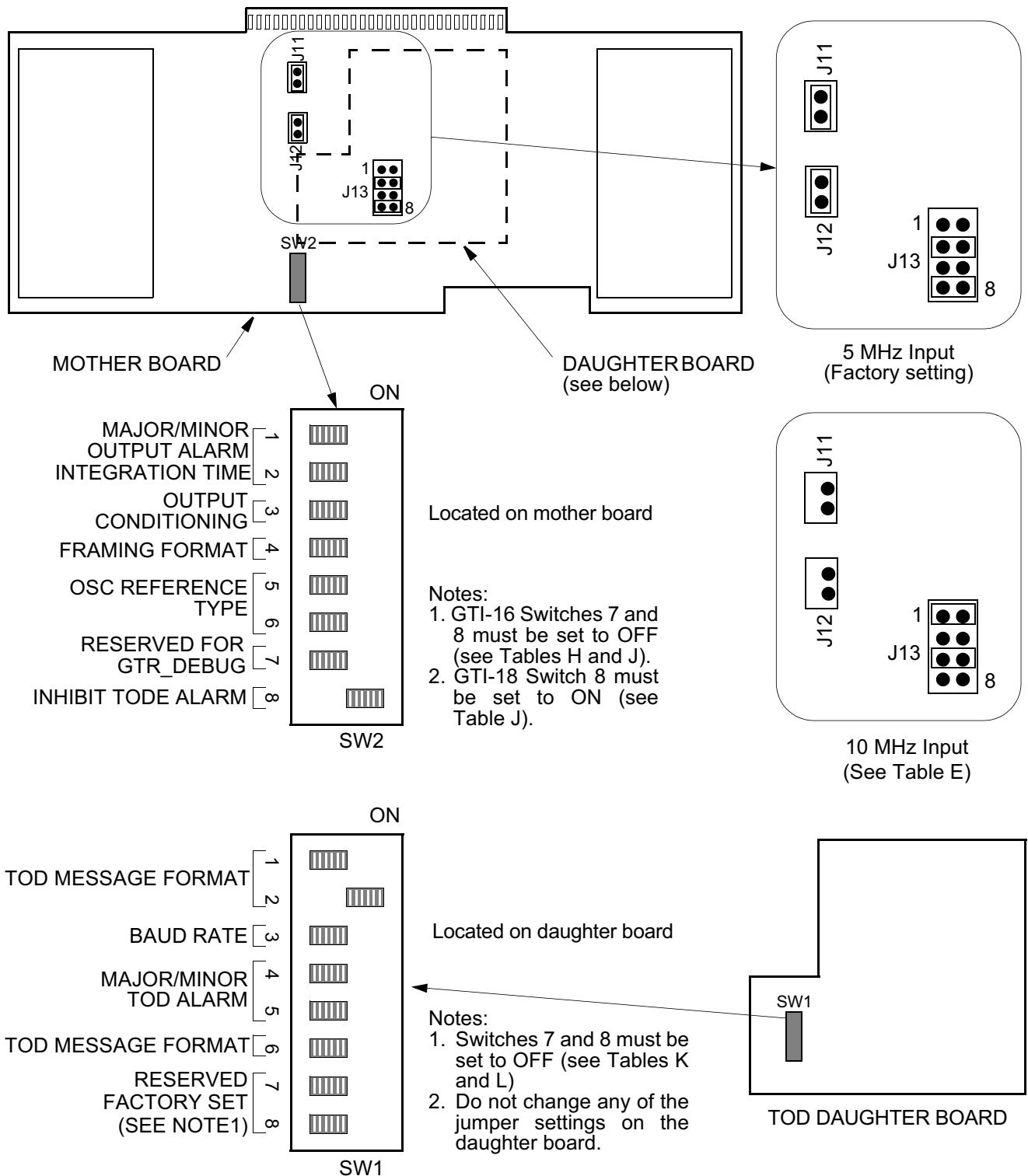


Figure 7. GTI-16 and GTI-18 Card Switches and Jumper Settings (Mother and Daughter Boards)

**Table H. GTI-15, GTI-16, GTI-17, and GTI-18 Card Switch Settings (Mother Board–Sections 1 and 2)
(for GPS INVALID and GPS LOS only)**

| SECTION | | ALARM DELAY TIME (Note 1) | | FACTORY SETTING |
|---------------------------|-----|---------------------------|-------------|-----------------|
| 1 | 2 | MINOR ALARM | MAJOR ALARM | |
| RUBIDIUM REFERENCE | | | | |
| OFF | OFF | 4 h | 24 h | X |
| ON | OFF | 8 h | 48 h | — |
| OFF | ON | x | 24 h | — |
| ON | ON | 1/2 h | 1 h | — |
| QUARTZ REFERENCE | | | | |
| OFF | OFF | 3/4 h | 6 h | X |
| ON | OFF | x | 6 h | — |
| OFF | ON | x | 1 h | — |
| ON | ON | 1/2 h | 1 h | — |

Notes:

- The minor alarm setting indicates the amount of time from when the GTI detects a GPS INVALID or GPS LOS alarm condition, and when a minor alarm is declared. The major alarm setting determines the total time allowable from when the GPS INVALID or GPS LOS was first detected, and when a major alarm is declared. For example, using the factory setting, 4 h after the GTI determines it is receiving an invalid signal from the GTR (GPS INVALID is displayed), a minor alarm is declared (GPS INVALID MN is displayed). If this condition continues for an additional 20 h (a total of 24 h without UTC traceable input), the GTI will declare a major alarm (GPS INVALID MJ is displayed).
- The factory setting is set for quartz, at 3/4 h for minor and 6 h for major alarms; it is recommended that the following alarm delay times be as follows:
 - For the factory-set quartz, use the factory-set alarm delay time of 3/4 h for minor alarms, and 6 h for major alarms.
 - If set for rubidium, use the factory setting of 4 h for minor alarms, and 24 h for major alarms.

Table I. GTI-15 and GTI-17 Card Switch Settings (Mother Board –Sections 3 through 8)

| SECTION | POSITION | MEANING | FACTORY SETTING |
|-------------------|----------|--|-----------------|
| 3 | ON | Output is squelched when the GTI has a Major alarm | — |
| | OFF | Output is AIS when the GTI has a Major alarm | X |
| 4 | ON | ESF output framing format | — |
| | OFF | D4 output framing format | X |
| 5 | OFF | Sets reference type for OSC A as rubidium | X |
| | ON | Sets reference type for OSC A as quartz | — |
| 6 | OFF | Sets reference type for OSC B as rubidium | X |
| | ON | Sets reference type for OSC B as quartz | — |
| 7 | OFF | Reserved for factory use (must be set to OFF) | X |
| 8 (See Note 5) | OFF | GTI output conditioning enabled | X |
| | ON | GTI output conditioning disabled | — |
| 8 (See Note 6) | OFF | TODE event/alarm enabled | — |
| | ON | TODE event/alarm disabled | X |

Notes:

1. If a rubidium and a quartz oscillator are installed in the same shelf, OSC A, section 5, must be set to OFF (rubidium).
2. If an LOU-1 or LOU-2 is used for a reference, both OSC A, section 5 and OSC B, section 6 must be set to ON (quartz).
3. Section 4 must be set to ON for SSM to function.
4. Section 7 on GTI-17 card is reserved for GTR debug.
5. For GTI-15 card only.
6. On GTI-17 card, when switch setting position no. 8 is ON, no TODE-related events or alarms will be sent.

Table J. GTI-16 and GTI-18 Card Switch Settings (Mother Board –Sections 3 through 8)

| SECTION | POSITION | MEANING | FACTORY SETTING |
|-------------------|----------|--|-----------------|
| 3 | ON | Output is squelched when the GTI has a Major alarm | — |
| | OFF | Output is AIS when the GTI has a Major alarm | X |
| 4 | ON | CCS output framing format | — |
| | OFF | CAS output framing format | X |
| 5 | OFF | Sets reference type for OSC A as rubidium | X |
| | ON | Sets reference type for OSC A as quartz | — |
| 6 | OFF | Sets reference type for OSC B as rubidium | X |
| | ON | Sets reference type for OSC B as quartz | — |
| 7 | OFF | Reserved for factory use (must be set to OFF) | X |
| 8 (see Note 4) | OFF | GTI output conditioning enabled | X |
| | ON | GTI output conditioning disabled | — |
| 8 (see Note 5) | OFF | TODE event/alarm enabled | X |
| | ON | TODE event/alarm disabled | — |

Notes:

1. If a rubidium and a quartz oscillator are installed in the same shelf, OSC A, section 5 must be set to OFF (rubidium).
2. If an LOU-1 or LOU-2 is used for a reference, both OSC A, section 5 and OSC B, section 6 must be set to ON (quartz).
3. Section 7 on GTI-18 card is reserved for GTR debug.
4. For GTI-16 card only.
5. On GTI-18 card, when switch setting position no. 8 is ON, no TODE-related events or alarms will be sent.

**Table K. GTI -15, GTI-16, GTI-17, and GTI-18 Card Switch Settings
(TOD Daughter Board – Sections 1, 2, 3, 6, 7, 8)**

| SECTION | POSITION | MEANING | FACTORY SETTING |
|---------|------------|---|-----------------|
| 1/2/6 | OFF/OFF/ON | NTP Type 4 TOD format | — |
| | OFF/ON/OFF | ASCII timestamp (Cisco Systems router) | X |
| | ON/ON/OFF | LED remote display (not available at this time) | — |
| 3 | ON | 2400 baud | — |
| | OFF | 9600 baud | X |
| 7 and 8 | OFF | Reserved for factory use (must be set to OFF) | X |

**Table L. GTI -15, GTI-16, GTI-17, and GTI-18 Card Switch Settings
(Daughter Board – Sections 4 and 5) (for TOD alarms only)**

| SECTION | | ALARM DELAY TIME (Note) | | FACTORY SETTING |
|--------------------|-----|-------------------------|-------------|-----------------|
| 4 | 5 | MINOR ALARM | MAJOR ALARM | |
| RUBIDIUM REFERENCE | | | | |
| OFF | OFF | 4 h | 24 h | X |
| ON | OFF | 24 h | x | — |
| OFF | ON | x | x | — |
| ON | ON | Immediate | x | — |
| QUARTZ REFERENCE | | | | |
| OFF | OFF | 1/2 h | 2 h | X |
| ON | OFF | 2 h | x | — |
| OFF | ON | x | x | — |
| ON | ON | Immediate | x | — |

Note: The minor alarm setting indicates the amount of time from when the GTI detects a TOD alarm condition, and when a minor alarm is declared. The major alarm setting determines the total time allowable from when the TOD alarm was first detected, and when a major alarm is declared.

The TOD alarm codes are part of the ASCII serial time code. For a full description of the ASCII time code, see the DCD-LPR System Specifications table in the Functional Description section, in this manual.

Table M. GTI Card Alarm Integration Times

| INTEGRATION PARAMETER SETTING | GTI CARD TYPE | ALARM INTEGRATION TIME (SIGNAL DEFECT ONLY) | |
|-------------------------------------|---------------------------------------|--|------------------------|
| | | MINOR ALARM | MAJOR ALARM |
| 1 | GTI -13, -14, -15, -16, -17, & -18 | Rubidium ref: Immediate | Rubidium ref: 24 hours |
| | | Quartz ref: Immediate | Quartz ref: 24 hours |
| | | (Guide = Minor Alarm in 4 hours) | |
| 2 | GTI -13, -14, -15, -16, -17, & -18 | Rubidium ref: Immediate | Rubidium ref: 48 hours |
| | | Quartz ref: Immediate | Quartz ref: 48 hours |
| | | (Guide = Minor Alarm in 8 hours) | |
| 3 | GTI -13, -14, -15, -16, -17, & -18 | Rubidium ref: Immediate | Rubidium ref: 24 hours |
| | | Quartz ref: Immediate | Quartz ref: 24 hours |
| | | (Guide = No Minor Alarm) | |
| 4 | GTI -13, -14, -15, -16, -17, & -18 | Rubidium ref: Immediate | Rubidium ref: 1 hour |
| | | Quartz ref: Immediate | Quartz ref: 1 hour |
| | | (Guide = Minor Alarm in 0.5 hour) | |

Notes:

1. The GTI types are as follows:

| <u>type</u> | <u>part #</u> |
|-------------|-----------------------------|
| GTI -13 | 090-42140-13 |
| GTI -14 | 090-42140-14 & 090-44140-14 |
| GTI -15 | 090-42140-15 |
| GTI -16 | 090-42140-16 & 090-44140-16 |
| GTI -17 | 090-42140-17 |
| GTI -18 | 090-42140-18 & 090-44140-18 |

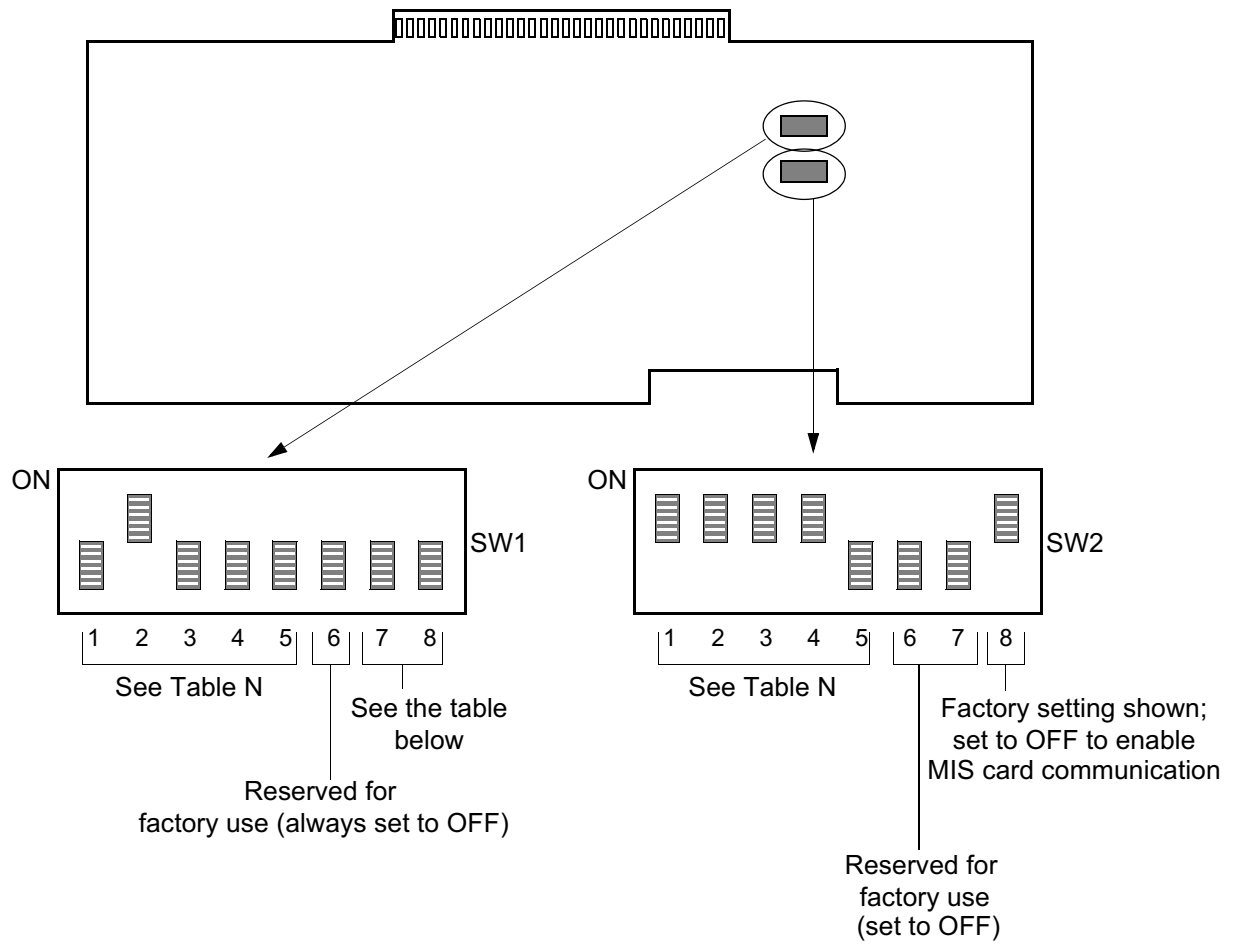
2. The times listed are from when a GPS INVALID condition occurs until a minor or major alarm is declared.

Chart 6. LTI Card Test

| STEP | PROCEDURE |
|------|---|
| | <p>Use this procedure to install the LTI card and verify operation. This procedure assumes power has been applied to the shelf per the Installation section of this manual.</p> <p>Notes:</p> <ol style="list-style-type: none"> The LTI card switches (SW1 and SW2, section 1 through 5) determine the Group Repetition Interval (GRI) of the LORAN-C radio transmitter(s) to be tracked. The LTI card can track up to 2 transmitter groups at one time. SW1 selects for group 1, SW2 selects for group 2. SW1 section 6 is reserved for factory use only, and must remain in the factory setting (OFF). SW1 sections 7 and 8 are used to set the framing format. SW2 sections 6 and 7 are for factory use only, and must remain in the factory settings (OFF). SW2 section 8 is used to communicate with the MIS card (in the OFF position); the factory setting is ON – set to OFF to enable MIS communication. Failure to set GRI 1 and GRI 2 switch settings will cause the LTI card to go to an auto select mode. This process samples all GRI transmitter groups to select the best GRI transmitter, and could take several hours. The LTI card accepts 5 MHz clock inputs from the DCD Shelf (rubidium only). |
| 1 | <p>Set switches SW1 and SW2; use Figure 8, Table N, and Table O to set switches per Installation Job Specifications. (The GRIs selected must have at least one transmitter station within 1000 miles of the LTI site.)</p> |
| | <p>Note: Two LTI cards may be installed at the same time; if so, apply the steps in this chart to both cards.</p> |
| | <p>Insert the LTI card(s) into the appropriate slot(s) in the DCD-LPR Shelf (the top slot is “A,” the bottom is “B”). Using the locking levers, carefully align the card with the connector on the shelf back-plane, and press it firmly into place, securing the locking levers into position. Tighten the two thumb screws.</p> |
| | <p>Upon power-up, observe the LTI card.</p> <p>Requirement: The INPUT and OUTPUT lamps flash green, then red, and then momentarily go off, and the LTI LCD display screen shows:</p> <p style="text-align: center;">GRI SEARCH 0H</p> |
| | <p>Observe the INPUT and OUTPUT lamps.</p> <p>Requirement: Less than 1 min later, both the INPUT and OUTPUT lamps light red; the display does not change. Approximately 1 min after that, the INPUT lamp goes off, then lights green, and the OUTPUT lamp status and the display remain the same. The MAJOR and MINOR lamps on the DCD-LPR Shelf are OFF.</p> |

Chart 6. LTI Card Test (Cont'd)

| STEP | PROCEDURE |
|------|--|
| | <p>Note: Step tests the voltage output from the LTI card; TB6 and TB7 on the DCD-LPR backplane provide power to the antenna. This test can be performed while the system is in GRI SEARCH mode.</p> |
| | <p>Measure the voltage between SIG+ and SIG- on TB6 and/or TB7 (depending on which slot the LTI is installed; if in Slot A, TB6, Slot B, TB7).</p> <p>Requirement: The voltage reads +12.0 V dc \pm2.0 V.</p> |
| | <p>Observe the display.</p> <p>Requirement: Within 3 h, in most cases, the screen may display various messages, and after the LTI has acquired lock to a LORAN-C transmitter, will display:</p> <p style="text-align: center;">LTI LOCK 0H</p> |
| | <p>Observe the lamps.</p> <p>Requirement: The INPUT and OUTPUT lamps are lit green.</p> |
| | <p>Refer to Figure 9 through Figure 11, for instructions on how to set GRIs and MJ/MN alarm thresholds via the LCD display panel. Refer to the Maintenance section of this manual for definitions of the various LTI card displays shown in the figures.</p> |
| | <p>This procedure is completed. Indicate completion of the LTI Card Test on the Test Sign-off form on the last page of this section.</p> |



Note: SW1 selects GRI 1; SW2 selects GRI 2

Figure 8. LTI Card Switch Settings

Table N. LTI Card Switch GRI Settings (SW1 and SW2)

| GRI CODE | SECTION 1 | SECTION 2 | SECTION 3 | SECTION 4 | SECTION 5 |
|----------|-----------|-----------|-----------|-----------|-----------|
| 2 | OFF | ON | OFF | OFF | OFF |
| 4 | OFF | OFF | ON | OFF | OFF |
| 7 | ON | ON | ON | OFF | OFF |
| 8 | OFF | OFF | OFF | ON | OFF |
| 9 | ON | OFF | OFF | ON | OFF |
| 10 | OFF | ON | OFF | ON | OFF |
| 12 | OFF | OFF | ON | ON | OFF |
| 13 | ON | OFF | ON | ON | OFF |
| 14 | OFF | ON | ON | ON | OFF |
| 15 | ON | ON | ON | ON | OFF |
| 16 | OFF | OFF | OFF | OFF | ON |
| 17 | ON | OFF | OFF | OFF | ON |
| 18 | OFF | ON | OFF | OFF | ON |
| 19 | ON | ON | OFF | OFF | ON |

Notes:

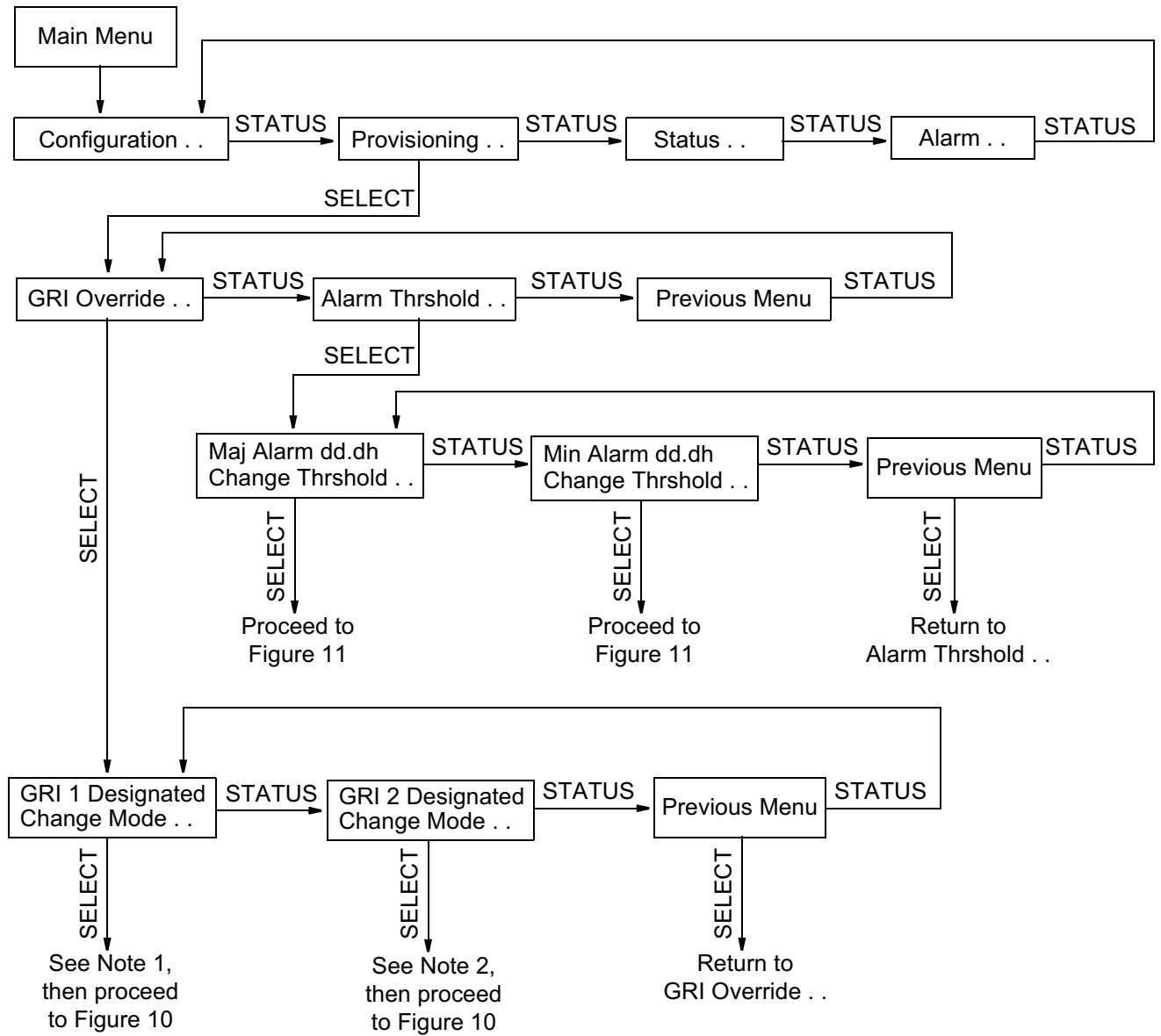
1. Refer to Table O for GRI code designations. For additional GRI codes, contact Symmetricom's CTAC.
2. SW1 and SW2 are shipped from the factory with the following settings:
SW1 = Section 2 is in the UP (ON) position; the remaining switches are in the DOWN (OFF) position.
SW2 = Sections 1, 2, 3, 4, and 8 are in the UP (ON) position; sections 5, 6, and 7 are in the DOWN (OFF) position.

Table O. LORAN-C Stations

| LTI GRI CODE | GRI | CHAIN | STATION | LOCATION |
|--------------|-------------|---------------------|-----------------------|---|
| 2 | 59300 μs | Canadian East Coast | M X Y Z | Caribou, Maine USA Nantucket, Massachusetts, USA Cape Race, Newfoundland, Canada Fox Harbor, Labrador, Canada |
| 4 | 59900 μs | Canadian West Coast | M X Y Z | Williams Lake, British Columbia, Canada Shoal Cove, Alaska, USA George, Washington, USA Port Hardy, British Columbia, Canada |
| 7 | 79600 μs | Gulf of Alaska | M X Y Z | Tok, Alaska, USA Narrow Cape, Kodiak Island, Alaska, USA Shoal Cove, Alaska, USA Port Clarence, Alaska, USA |
| 8 | 79700 μs | Norwegian Sea | M W X Y Z | Ejde, Faeroe Island, Denmark Bo, Norway Sylt, Germany Sandur, Iceland Jan Mayen, Norway |
| 9 | 79800 μs | Southeast USA | M W X Y Z | Malone, Florida, USA Grangeville, Louisiana, USA Raymondville, Texas, USA Jupiter, Florida, USA Carolina Beach, North Carolina, USA |
| 10 | 79900 μs | Mediterranean Sea | M X Y Z | Sellia Marina, Italy Lampedusa, Italy Kargabarun, Turkey Estartit, Spain |
| 12 | 82900 μs | North Central USA | M W X Y | Havre, Montana, USA Baudette, Minnesota, USA Gillette, Wyoming, USA Williams Lake, British Columbia, Canada |

Table O. LORAN-C Stations (Cont'd)

| LTI GRI CODE | GRI | CHAIN | STATION | LOCATION |
|--------------|-------------|----------------------|----------------------------|---|
| 13 | 89700 μs | Great Lakes | M W X Y Z | Dana, Indiana, USA Malone, Florida, USA Seneca, New York, USA Baudette, Minnesota, USA Boise City, Oklahoma, USA |
| 14 | 96100 μs | South Central USA | M V W X Y Z | Boise City, Oklahoma, USA Gillette, Wyoming, USA Searchlight, Nevada, USA Las Crusas, New Mexico, USA Raymondville, Texas, USA Grangeville, Louisiana, USA |
| 15 | 99400 μs | West Coast USA | M W X Y | Fallon, Nevada, USA George, Washington, USA Middletown, California, USA Searchlight, Nevada, USA |
| 16 | 99600 μs | Northeast USA | M W X Y Z | Seneca, New York, USA Caribou, Maine, USA Nantucket, Massachusetts, USA Carolina Beach, North Carolina, USA Dana, Indiana, USA |
| 17 | 99700 μs | Northwest Pacific | M W X Y Z | Iwo Jima, Japan Marcus Island, Japan Hokkaido, Japan Gesashi, Okinawa, Japan Barrigada, Guam |
| 18 | 99800 μs | Icelandic | M W X | Sandur, Iceland Angissoq, Greenland Ejde, Faeroe Island, Denmark |
| 19 | 99900 μs | North Pacific | M X Y Z | Saint Paul, Pribilof Island, Alaska, USA Attu, Alaska, USA Point Clarence, Alaska, USA Narrow Cape, Kodiak Island, Alaska, USA |



Notes:

1. Selecting GRI1 Designated Change Mode . . . overrides the LTI SW1 switch settings for GRI 1.
2. Selecting GRI 2 Designated Change Mode . . . overrides the LTI SW2 switch settings for GRI 2.

Figure 9. LTI Provisioning Menus

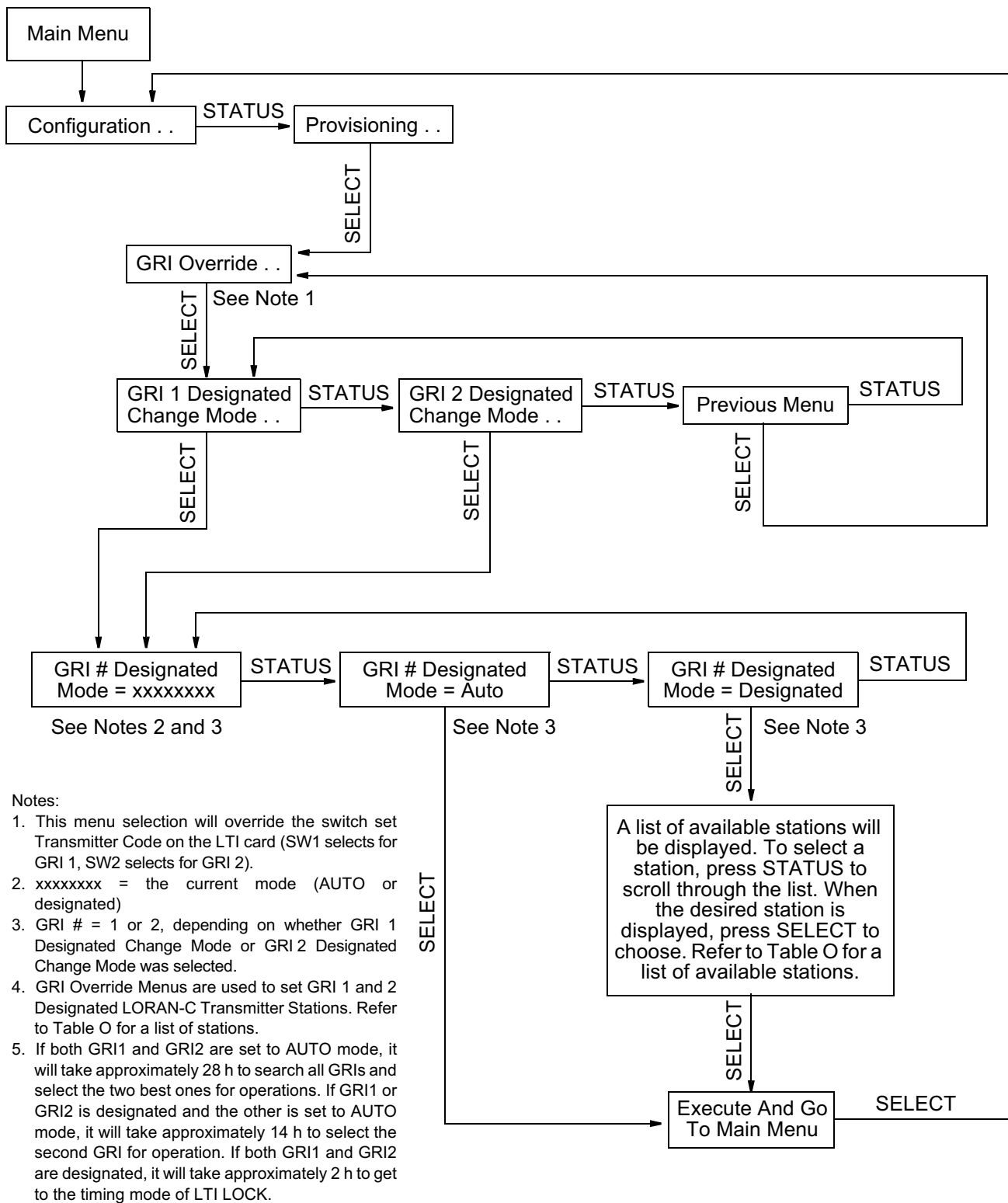
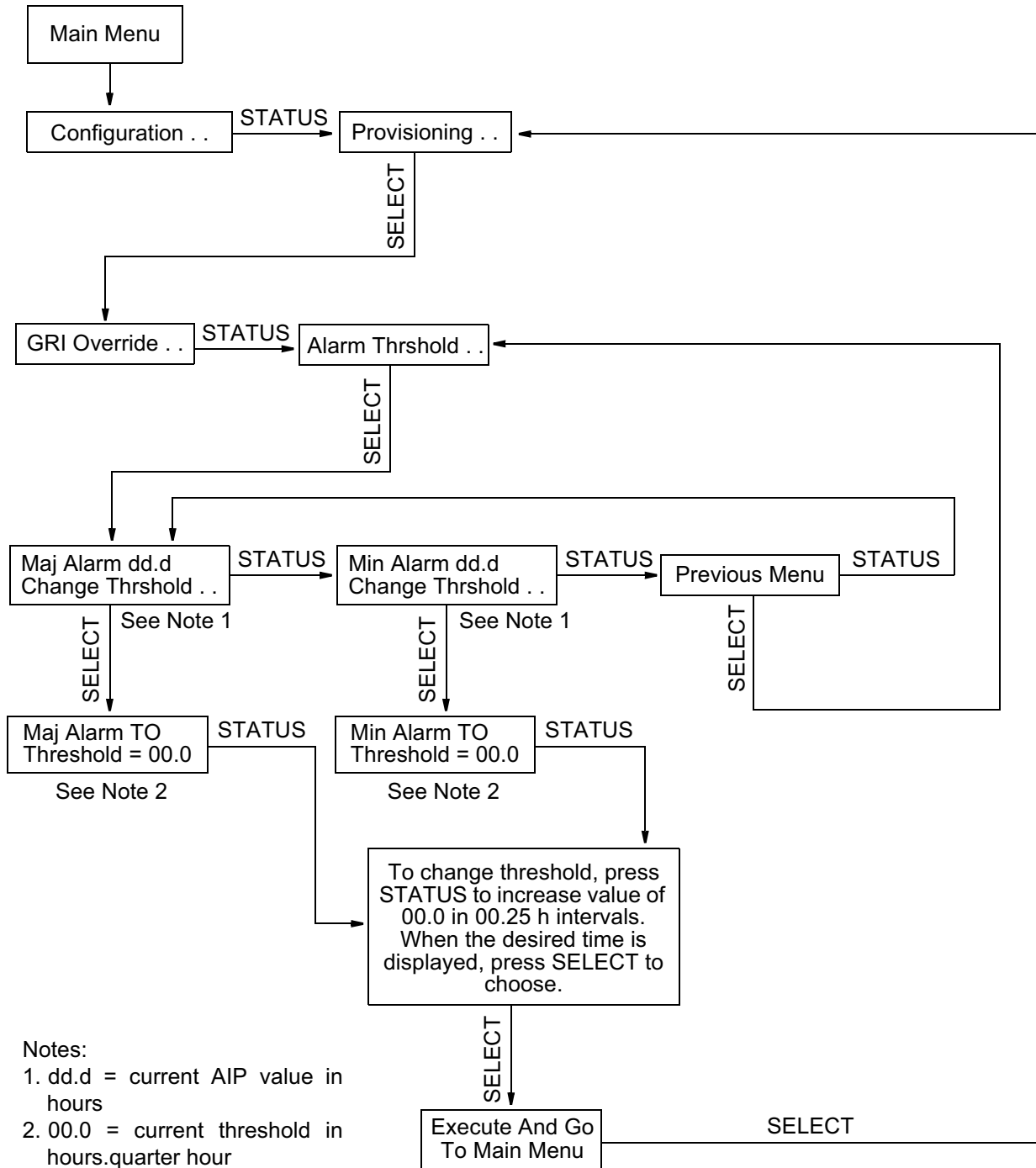


Figure 10. LTI GRI Override Menus



Alarm Threshold Menus are used to set Major and Minor alarm threshold alarm intervention period (AIP) values. Values are in hours, and range from 0 h to 24 h in 1/4 h intervals.

Figure 11. LTI Alarm Threshold Menus

Table P. Test Sign-off

| CHART # | TEST | COMPLETED |
|--|--|-----------|
| <p>Place a check mark or initials beside each individual test after the test is completed. When all tests have been completed, sign and date at the bottom.</p> <p>Note: The test and acceptance procedures listed in this document are recommended guidelines. The Test Sign-off form is for customer use only. When completed, file locally per company practice.</p> | | |
| | Power Test | |
| 2 | LOU Card Test | |
| 3 | GTI-11 and GTI-12 Card Test | |
| 4 | GTI-13 and GTI-14 Card Test | |
| 5 | GTI-15, GTI-16, GTI-17, and GTI-18 Card Test | |
| 6 | LTI Card Test | |
| <p>DCD-LPR Test and Acceptance completed by: _____</p> <p>Date: _____</p> <p>Comments:</p> | | |

4. INDEX**A**

Alarm integration times, GTI card 13, 19
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