Gold Line VDT

USER MANUAL
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1   GENERAL

1.1   Manual Scope

The software discussed in this manual controls GL-T8500 and GL-T8600 transmitters with the QT-1000 interface. The software resides in a PEROM that installs into the Gold Line exciter/PA control equipment, part number 265-0082-003.

1.2   Applicable Documents

This manual is incomplete without additional Gold Line manuals. Refer to *Table 1-1* for a listing of these manuals with their part number and a brief description.

Table 1-1 Applicable Documents

document	part number	description
GL-T8500/8600 system manual	9110.00163	describes fully racked-up 250/500-watt, 900-MHz Gold Line transmitter system with QT-1000 interface
DSP exciter user manual	9110.00172	describes exciter/PA control equipment for transmitter systems with interfaces
GL-T8500 power amplifier manual	9110.00160	describes 250-watt, 900-MHz Gold Line power amplifier equipment
GL-T8600 power amplifier manual	9110.00162	describes 500-watt, 900-MHz Gold Line power amplifier equipment
Gold Line VDT manual	9110.00164	this manual
Gold Line 50A/90A power supply manual	9110.00159	describes power supply equipment for 250W/500W Gold Line transmitter systems

1.3   Manual Sections

Table 1-2 lists the sections of this manual with a summary of their contents.

Table 1-2 Manual Sections

section	contents
1. general	introduction and purpose of manual
2. requirements	minimum features of VDT
3. description	introduction and principal characteristics of software
4. installation and setup	initial installation and activation of VDT
5. operation	operation of VDT screen and keyboard
6. menu tree	menu identification, keystrokes to display menus, in tree format
7. change TX settings	menus that permit forward power adjustment, low power alarm setting, frequencies setting, frequency password change, and entry password change/toggle
8. set up digital mode	menus that permit 2-level deviation setting, 2-level offset setting, 4-level deviation setting, 4-level offset setting, data polarity selection, filter risetime selection, and controller selection
9. set up analog mode	menus that permit audio input level adjustment, analog deviation setting, analog limiter setting, analog offset setting, analog response selection, and analog polarity selection
10. view TX status	menus that display voltage readings, channel frequencies, faults status, and all TX presets
11. calibrate fwd/ref power	menus that allow calibration of forward and reflected power
12. change mode	menu that allows selection between analog, 2-level, and 4-level modes
13. change channel	menu that allow selection between channels one through eight
14. run TX self tests	menus that allow: activation of LEDs, AGC, and alarm test; key/unkey of exciter only; reset of exciter

2   REQUIREMENTS

The software described in this manual requires a video display terminal (VDT) with a DEC VT100-type emulating program. The VDT requirements depend on the type of emulating program installed.

2.1   VDT Requirements

These requirements are for a VDT with a typical emulating program installed such as ProComm Plus®.

- **computer:** an IBM® PC, XT, AT, PS/2 or compatible computer.

- **memory:** at least 192K of available RAM.

- **operating system:** PC-DOS or MS-DOS, version 2.0 or later.

- **disc drive:** at least one floppy drive.

- **display:** VGA monitor and adapter, or compatible monitor and adapter.

- **serial port:** with DB-9 or DB-25 connection.

- **null modem cable:** with male DB-9 connector on transmitter end.

2.2   Emulating Program

These setup requirements are for all DEC VT100-type emulating programs.

- **baud rate:** 9600

- **parity:** none

- **data bits:** 8

- **stop bits:** 1

- **port:** serial port interface

3   DESCRIPTION

The software described in this manual allows interactive operation with GL-T8500 and GL-T8600 transmitters. Here is a brief list of the transmitter features that the software operates.

3.1   Status Display

The VDT displays principal transmitter status continuously or specific transmitter status selectively. Principal status is show in three information blocks at the top of most screens:

- The status block provides present information on 20 critical parameters of the transmitter, in addition to the fault or alarm condition.
- The currents block provides amperage measurements for the dc power input of each amplifier stage in the power amplifier.
- The powers block provides wattage measurements for forward and reflected RF power of most amplifier stages in the power amplifier.

The VDT can display more specific transmitter status if desired. Specific status includes regulated voltage readings, programmed channel frequencies, and four full-screen information displays:

- The present faults display lists every transmitter fault or alarm available at the present moment.
- The stored faults display lists the transmitter fault or alarm that was stored when the transmitter first left normal operating status.
- The readings at fault display lists the status, currents, and power blocks that were stored when the transmitter first left normal operating status.
- The presets display lists programmed transmitter parameters for all eight channels.

3.2   Remote Control

When the transmitter is in service and is responding to controller commands, the VDT can perform remote control functions:

- Adjust the transmitter's RF power out to any wattage within the transmitter's rated forward power.
- Adjust the transmitter's low power alarm to an RF power out wattage below which the transmitter provides an alert.
- Program frequencies into channels, if authorized with the frequency password. Frequency password can be changed.
- Change entry password, used to gain access to VDT. Enable and disable use of entry password.

3.2.1   Software Downloading

Note

C2000/I20 overwrites user changes when in remote mode.

3.3   Local Control

After the VDT has removed the transmitter from service, the VDT can still perform remote control functions, but now can perform local control functions:

- Key or unkey transmitter.

- Change between analog, 2-level, and 4-level digital modes.

- Change between eight channels.

- Calibrate total forward power (TFP) and total reflected power (TRP) using the appropriate external instruments.

- Perform four built-in-tests (BITs) to exciter equipment. Check keyup circuit, AGC reference circuit, front-panel LEDs, and digital alarm outputs.

- Reboot exciter.

3.3.1   Software Downloading

Note

I20 interface software upgrade overwrites local programming.

3.4   Setup

When the transmitter is initially installed and set up at the paging site, the VDT presets the analog or digital modes for operation:

- Set number of hertz that the signal deviates the RF carrier.

- Set number of hertz to offset the center of the RF carrier.

- Select inverted or non-inverted input signal polarity.

- Select a filter for the RF output signal.

- Set optimum audio input level (analog mode).

- Set maximum audio input level (analog mode).

4   INSTALLATION AND SETUP

This section requires user manuals for VDT hardware and emulating software. Before starting this section, verify that all hardware required to run the emulating program has been installed into the VDT.

4.1   VDT Connection

Connect the VDT to the exciter/PA control equipment using the proper interconnecting cable. The exciter female DE-9 connector is configured as a serial, DCE, EIA-232 port. The VDT (or computer) female DB-25 or male DE-9 input is configured as a serial, DTE, EIA-232 port. The typical serial input connector for the VDT is a female DB-25, and that of most computers is a male DE-9, but there is no guarantee of this.

4.1.1   VDT-to-Exciter Interconnect Cable

The DSP Exciter to VDT cable can be a straight through DE-9 to DE-9 cable, or a DE-9 to DB-25, EIA-232 adaptor cable, as shown in *Figure 4-1*. These cables may be purchased from a computer shop, adapted using standard EIA-232 parts, or fabricated. The exciter end of the cable is always a male DE-9 connector. The VDT end can be a male or female DE-9 or DB-25 connector, check your VDT for the correct connector type.

A 3-conductor cable can be used to fabricate either of the above mentioned cables, as only the TXD, RXD, and ground connections are needed. Connect the three conductors as shown in *Figure 4-1*.
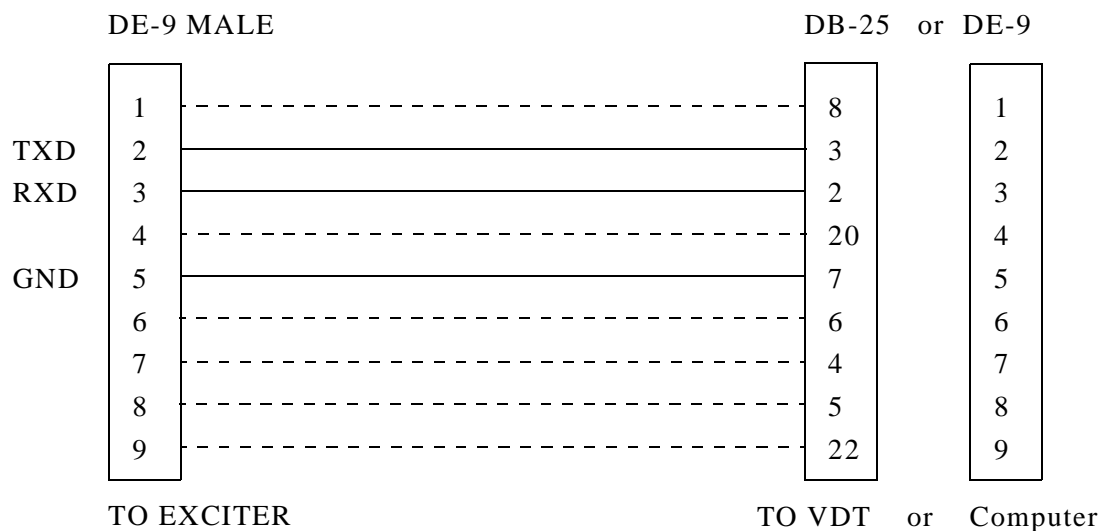
Note: The solid lines show the conductors necessary for the exciter and VDT (or computer)
to communicate. The dotted lines show the rest of the conductors in the standard cables.

Figure 4-1 DSP Exciter to VDT Cable

4.1.2   Connecting the VDT to the Transmitter

Connect the VDT to the transmitter using the proper cable(s). Plug the male DB-9 DCE connector into the jack marked VT-100 INTERFACE located on the front panel of the exciter/PA control. Plug the other end of the cable or the adapter into one of the VDT's serial ports. Note the designation of this port for VDT start-up.

4.2   Starting Up the VDT

Apply power to the VDT. If it has not yet been installed, install the emulating program and all software required to run it.

4.2.1   Presetting the Emulating Program

Select the comm port I/O line settings screen on the VDT. Change the current settings to those shown in *Table 4-1*. After you are done, save and exit the line settings screen.

Table 4-1 VT-100 Line Settings

parameter	setting
baud rate	9600
parity	none
data bits	8
stops bits	1
port	select desired port
A common abbreviation for the above settings is: 9600 8N1.	

4.2.2   Access VDT Communications

At this point, the VDT should display a screen containing the ENTRY LEVEL PASSWORD menu. From this menu, perform the following steps:

1. Type ABCD from VDT keyboard. As each letter is typed, an asterisk (*) appears on the screen under the phrase ENTER PRESENT PASSWORD.

4.2.3   Changing Passwords

When the VDT is connected to the transmitter the first time, a password must be entered in order to access VT-100 communications. Enter the default password "abcd" to access VT-100 communications. The VDT uses another password to access channel carrier frequency assignments. This password is also initially the default password "abcd". It is important to change these default passwords to secret passwords immediately after the VDT is connected the first time. By using two passwords, the frequency password may be maintained at a higher level of secrecy than the entry password. The entry password may be disabled if desired to permit immediate access to VT-100 communications. However, even if it is disabled, it is important to change the entry password to prevent unauthorized personnel from changing the default password.

4.3   Using the VT-100-Emulating Program

Most VT-100-emulating programs have additional features, some of which can be helpful when operating the program as a transmitter interface. The program may be capable of saving the active, or present settings for the RS-232 link with the transmitter. Some programs have a log function, which saves the keystrokes and displays from the current session. This feature is particularly useful for saving the transmitter parameters entered during a setup procedure. When used with a printer, the program may be able to dump the contents of the present screen display to the printer.

Caution

Some transmitter controllers may issue an alarm if a transmit command is sent with no resultant indication of transmitter forward power. This can be avoided by first placing the transmitter controller in a mode that does not allow it to issue alarms.

5   OPERATION

5.1   VT-100 Screen Displays

Most VT-100 screens have four display areas as shown below. Display area 1 contains `STATUS` information, such as transmitter parameters and conditions. Display area 2 contains the value of `CURRENTS` through selected active devices within the power amplifier. Display area 3 contains the value of forward or reflected `POWERS` for selected active devices within the power amplifier. Display area 4 contains the menu, which permits data input and selection of other menus. The VT-100 screens that do not have these four display areas are certain full-screen status displays. This section shows all four `STATUS`, `CURRENTS`, `POWERS`, and menu display areas, in addition to the full-screen status displays.

5.1.1   Display Area 1: STATUS

`STATUS` display area 1 contains two groups of two columns. The transmitter parameter is in the left column of each group, and its value or condition is in the right column of each group. The entire display area is repeated and continuously updated on all VT-100 screens except certain full-screen status displays. The `STATUS` display area is display-only and does not permit selections or data entry. The following text describes each parameter and condition displayed in the `STATUS` display area.

FWD PWR (Forward Power)

This display lists the transmitter's actual forward RF output power in watts. Sometimes described as total forward power, the value for this display is measured at the output of the PA's combiner board.

REF PWR (Reflected Power)

This display lists the transmitter's actual reflected RF power in watts. Sometimes described as total reflected power, the value for this display is measured at the isolator module on the rear of the PA.

EXC 26V (Exciter 26 Volts)

This display lists the exciter's actual 26-volt operating voltage. This voltage is measured at the power input of the exciter/PA control, and is normally supplied by the transmitter's 26-volt power supply.

AGC (Automatic Gain Control)

This display lists the `AGC` voltage, a dc voltage that controls the gain of the power amplifier. This voltage, generated by the PA metering board, is measured at the preamplifier (first stage) on the PA's driver board.

Note

Do not confuse AGC voltage generated in the PA with AGC reference voltage generated in the exciter/PA control. The PA's AGC voltage is produced by comparing AGC reference voltage against transmitter forward power.

V001 (Voltage-Controlled Oscillator 1)

This display lists the dc control voltage for VCO-1, in the exciter/PA control IF stage circuitry. The VCO1 control voltage, necessary for phase-locking the VCO-1 carrier to the 10-MHz reference signal, is generated by synthesizer-1.

V002 (Voltage-Controlled Oscillator 2)

This display lists the dc control voltage for VCO-2, in the exciter/PA control RF stage circuitry. The VCO2 control voltage, necessary for phase-locking the VCO-2 carrier to the 10-MHz reference signal, is generated by synthesizer-2.

TEMP (Temperature)

This display lists the temperature in degrees centigrade measured at the heat sink on the back of the PA.

CTRL VER (Control Version)

This display lists the version number for the MCU software that is presently installed in the exciter/PA control. It is the version of software installed in the programmable and erasable read-only memory (PEROM) for the MCU.

DSP VER (DSP Version)

This display lists the version number for the DSP software that is presently installed in the exciter/PA control. It is the version of software installed in the programmable and erasable read-only memory (PEROM) for the DSP.

P/N (Part Number)

This display lists the part number of U3, the PEROM for the MCU. The present version of software for the MCU, designated by the CTRL VER display, is installed in U3.

DEVIATION

This display lists signal deviation values and other relative status items. The operation of the deviation display is dependent on the transmitter operating mode presently selected: digital FSK or analog.

Digital FSK Mode

- When no input data is present, the DEVIATION display lists NO DATA.

- When input data is present, the DEVIATION display lists the programmed deviation value for the channel and digital level currently selected. This value is the difference, in Hz, between f_0 and the highest FSK frequency, and between f_0 and the lowest FSK frequency. See OFFSET for a description of f_0.

Analog Mode

- When in analog mode and no input signal is present above 100 Hz, the DEVIATION display lists 0 Hz

- When in analog mode and an input signal is present above the programmed limiting value, causing the transmitter to impose deviation limiting, the DEVIATION display lists LIMIT.

- When in analog mode and an input signal is present above 100 Hz and below the programmed limiting value, the DEVIATION display lists the actual deviation value. This value is the number of Hz between f_0 and the highest modulated frequency, and between f_0 and the lowest modulated frequency. See OFFSET for a description of f_0.

OFFSET

This display lists the programmed offset value for the mode currently selected, and, when in the digital FSK mode, for the channel currently selected. This offset of the channel frequency is needed in order to reduce overlap area nulls when simulcasting. Offset value is the number of Hz added to or subtracted from the channel frequency to create the center frequency (digital FSK mode) or carrier frequency (analog mode), also known as f_0.

MODE

This display lists the presently selected operating mode and, when in analog mode, also lists the audio response.

- If 2-LEVEL is listed, two-level FSK mode is selected.

- If 4-LEVEL is listed, four-level FSK mode is selected.

- If ANLG-FLAT is listed, analog mode and audio response for flat is selected.

- If ANLG-PRE is listed, analog mode and audio response for preemphasis is selected.

CHANNEL

This display lists the number (1 through 8) of the transmitter channel that is currently selected.

FREQ (Frequency)

This display lists the programmed channel frequency, in MHz, for the channel currently selected.

DATA POL or ANLG POL

This display lists the programmed input signal polarity state for the presently selected mode. The title of this display item is DATA POL if 2-level or 4-level FSK modes are presently selected; the title is ANLG POL if analog mode is presently selected. NON-INV is listed to indicate the programmed input signal polarity state is noninverted. INV is listed to indicate the programmed input signal polarity state is inverted. The result of input signal polarity inversion is dependent on the mode presently selected.

DATA POL (Polarity)

- When in 2-level FSK mode and NON-INV is listed_, data "1" generates a frequency above f_0 and data "0" generates a frequency below f_0.

- When in 2-level FSK mode and INV is listed, data "1" generates frequency below f_0 and data "0" generates a frequency above f_0.

- When in 4-level FSK mode and NON-INV is listed, data "10" and data "11" generate frequencies above f_0. Data "01" and data "00" generate frequencies below f_0.

- When in 4-level FSK mode and INV is listed, data "10" and data "11" generate frequencies below f_0. Data "01" and data "00" generate frequencies above f_0. Note that data is rearranged, not just inverted (3-4/2-1 to 2-1/4-3).

ANLG POL (analog polarity)

- When in analog mode and NON-INV is listed, a positive voltage into audio (+) causes a positive deviation from f_0 and a negative voltage into audio (+) causes a negative deviation from f_0.

- When in analog mode and INV is listed, a positive voltage into audio (+) causes a negative deviation from f_0 and a negative voltage into audio (+) causes a positive deviation from f_0.

CONTROL

This display lists the transmitter's presently selected control state. This state is listed either as LOCAL or REMOTE.

- REMOTE - this is the transmitter's normal operating mode. External control inputs such as channel, mode, and key commands are supplied by a device such as a transmitter controller and are obeyed by the transmitter. These commands are not possible through the VT-100 interface when in the remote control mode.

- LOCAL - this is the transmitter's maintenance mode. External control inputs such as channel, mode, and key commands are ignored by the transmitter. These commands, in addition to maintenance, setup, and self test functions, are possible through the VT-100 interface when in the local control mode.

KEY STATE

This display lists the transmitter's presently selected key input state. This state is listed as KEYED or UNKEYED. The logic for this condition is detected in the exciter/PA control. A keyed condition indicates an external key hardline activation (in the remote control mode) or a VT-100 VDT [K] key software selection (in the local control mode).

FILTER

This display lists the rise time, in microseconds, of the presently selected digital premodulation filter. This rise time is effective for the digital FSK modes only, although it is always displayed regardless of mode.

CHAN BW (Channel Bandwidth)

This display lists maximum bandwidth, in kHz, of all the transmitter channels. The bandwidth is determined by the filtering circuitry installed in the exciter/PA control.

FAULT or ALARM

This display is normally blank, unless a transmitter malfunction has occurred that can be detected by the transmitter's monitoring system. In the event that a transmitter malfunction is detected, FAULT or ALARM appears as inverted video. The display is reset after each key cycle, unless a serious malfunction prevents the transmitter from keying up. The seriousness of the malfunction is indicated as FAULT or ALARM.

ALARM

A less serious transmitter malfunction has occurred, requiring an operator alert but still permitting normal transmitter operation.

FAULT

A more serious transmitter malfunction has occurred, requiring an operator alert and causing the transmitter to shut down or reduce power, thus preventing further transmitter damage.

5.1.2   Display Area 2: CURRENTS

CURRENTS display area 2 contains three groups of two columns. The active devices within the PA are in the left column of each group, and their currents are in the right column of each group. The entire display area is repeated and continuously updated on all VT-100 screens except for certain full-screen status displays. The CURRENTS display area is display-only and does not permit selections or data entry. Table 5-1 lists each item in the left column of each group, and describes the measurement that determines its currents value in the right column of each group.

Table 5-1   Measurements for CURRENTS Display Area

item	measurement
PREAMP	current through preamplifier (first stage) on driver board
DRVR1	current through transistor on driver board that supplies RF to PA1 board
DRVR2	current through transistor on driver board that supplies RF to PA2 board
DRVR3	current through transistor on driver board that supplies RF to PA3 board
DRVR4	current through transistor on driver board that supplies RF to PA4 board
IPA	current through intermediate PA transistor (second stage) on driver board
PA1-A	current through transistor pair A on PA1 board
PA2-A	current through transistor pair A on PA2 board
PA3-A	current through transistor pair A on PA3 board

Table 5-1   Measurements for CURRENTS Display Area (continued)

item	measurement
PA4-A	current through transistor pair A on PA4 board
PA1-B	current through transistor pair B on PA1 board
PA2-B	current through transistor pair B on PA2 board
PA3-B	current through transistor pair B on PA3 board
PA4-B	current through transistor pair B on PA4 board

5.1.3   Display Area 3: POWERS

POWERS display area 3 contains three groups of two columns. The active devices within the PA and the direction of their measurements are in the left column of each group. The powers in watts are in the right column of each group. The entire display area is repeated and continuously updated on all VT-100 screens except for certain full-screen status displays. The POWERS display area is display-only and does not permit selections or data entry. Table 5-2 lists each item in the left column of each group, and describes the measurement that determines its powers value in the right column of each group.

Table 5-2 Measurements for POWERS Display Area

item	measurement
IPA FWD	forward power out of second stage on driver board
IPA REF	reflected power into second stage on driver board
PA1 FWD	forward power out of PA1 board
PA2 FWD	forward power out of PA2 board
PA3 FWD	forward power out of PA3 board
PA4 FWD	forward power out of PA4 board
PA1 REF	reflected power into PA1 board output
PA2 REF	reflected power into PA2 board output
PA3 REF	reflected power into PA3 board output
PA4 REF	reflected power into PA4 board output

5.1.4   Display Area 4:Menu

The remainder of this section describes the menu display area 4. Unlike the other three display areas, most menus permit data input and parameter selection. Each menu is described in five parts: access procedure, sample menu, menu function, menu operation, and active alpha function key list.

1. **Access Procedure** - an access procedure is included at the top of each page just below the menu title. The access procedure describes the keystrokes or other actions required to display this menu.

2. **Sample Menu** - a sample menu is outlined by a square. This sample shows the typical contents of display area 4 when the menu is selected.

3. **Menu Function** - a menu function describes the purpose of the menu.

4. **Menu Operation** - a menu operation describes how to use the menu.

5. **Active Alpha Function Keys** - an active alpha function key list is at the bottom of each page. This list contains the alphabetical keys, active when the menu is displayed, that have been assigned a predetermined software function. The predetermined software function of these alpha keys is described in the previous introductory Section 4.

5.2   Keyboard Operation

Depending upon the displayed menu, the keys most often used on the keyboard are the numeric keys, enter/return key, [ESC], and alphabetic function keys.

5.2.1   Numeric Keys

The numeric keys are used to select a menu or transmitter parameter, or to enter a value into a data input field. The numeric keys on the keypad function identically to those on the main keyboard if [NUM LOCK] is enabled.

If the menu contains a list of numbered options, a single press of a numeric key produces the menu or function desired. No further keystrokes are required if the number pressed was one of the options.

If the menu contains a data input field, more than one keystroke is usually required to produce the desired function. Pressing numeric keys causes the value to appear in this data input field, in the space underlined by the cursor. The backspace key is functional during this procedure. After typing a value into the data input field, a press of enter/return is required to activate the value.

5.2.2   Enter/Return Key

This key is labeled Enter, Return, or abbreviations thereof, depending upon the keyboard. This key performs the same enter function regardless of label, and so is called [ENTER]. The key is used to activate a value that has been typed into a data input field.

When a data input field first appears, it already contains the default value or the last value entered by previous keystrokes. A cursor located to the left of this value indicates where a typed numeral will appear. As the new value is typed into the data input field, the old value disappears and the cursor flows to the right of the new value. After [ENTER] is pressed, the cursor resets to the left to indicate the new value has become the operative value.

5.2.3 [Esc]

The [ESC], or escape key, is active when all except top-level menus are displayed. Pressing the escape key causes the previous menu to be displayed. The previous menu is the next-higher level, or one menu back. The escape key will not work if a Main Menu (remote or Local) is displayed.

5.2.4 Alphabetic Function Keys

Alphabetic function keys are a group of letters that, when pressed, cause a predetermined activity to occur. Only some keys are active when a particular menu is displayed. An active alphabetic function key list is provided for each menu. The following is a list of all the alphabetic function keys:

- M (display main menu)
- R (refresh main menu)
- K (key or unkey TX)
- A (select all channels)
- Y (yes, perform request)
- N (no, do not perform request)
- U (adjust value upwards)
- D (adjust value downwards)

M Key

Pressing the M (main menu) key causes a main menu to be displayed, if it is not already displayed. If the transmitter is in remote control, the M key displays the Remote Control Main Menu. If the transmitter is in local control, the M key displays the Local Control Main Menu.

R Key

Pressing the R (refresh) key causes a main menu to be displayed if it is not already displayed (the same as pressing the M key). The R key also causes the transmitter to update the status, currents, and powers values in the top half of the screen.

K Key

Pressing the K (key) key causes the transmitter to key, if unkeyed, or to unkey, if already keyed. The K key is active in local control only. When local control is entered, the K key is activated and the transmitter unkeys, if already keyed. When local control is exited, the K key is deactivated and the transmitter assumes the key state determined by the remote key input.

A Key

Pressing the A (all) key causes the channel-all menu to be displayed for the parameter presently selected. This key allows selection or change of a transmitter parameter for all channels simultaneously, without having to select each channel individually.

U and D Keys

Pressing the U (up) or D (down) key causes an incremental adjustment to the value for the parameter displayed. These keys permit numerous adjustments to a transmitter parameter value without having to enter the entire value many times.

Y and N Keys

Pressing the Y (yes) or N (no) key causes a positive or negative response to a question being asked by the displayed menu. These keys are used when selecting or changing an important transmitter parameter.

6   MENU TREE

Note

C2000/I20 overwrites user changes when in remote mode. I20 interface software upgrade overwrites local programming.

MAIN MENU

5 EXIT LOCAL CONTROL see other main menu items for description

6 CALIBRATE FWD/REF PWR see page 11-1

7 CHANGE MODE see page 12-1

8 CHANGE CHANNEL see page 13-1

9 TESTS/UPLOAD see page 14-1

7   CHANGE TX SETTINGS

Refer to following diagram for initial steps of Change Tx Settings procedure.

```
┌ ─ ─ ─ ─ ─ ─ ┐           ┌─────────────┐
│   MAIN      │           │   CHANGE    │
│   MENU      │           │   TX        │
│   (REMOTE   │───────────│   SETTINGS  │
│   OR LOCAL) │           │             │
└ ─ ─ ─ ─ ─ ─ ┘           └─────────────┘
```
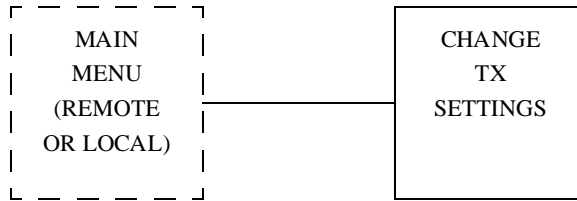
- Select option to **ADJ FWD PWR**
- Select option to **SET LOW PWR ALRM**
- Select option to **SET FREQUENCIES**
- Select option to **CHANGE FREQUENCY PASSWORD**
- Select option to **CHANGE/TOGGLE ENTRY PASSWORD**

7.1   ADJ FWD PWR

7.1.1   SELECT CHANNEL TO ADJ FWD PWR

Refer to the following diagram for initial steps of Select Channel to Adjust Forward Power Procedure.

```
┌ ─ ─ ─ ─ ─ ┐     ┌ ─ ─ ─ ─ ─ ┐     ┌ ─ ─ ─ ─ ─ ┐     ┌───────────┐
|   MAIN    |     |  CHANGE   |     |  ADJ FWD  |     |  SELECT   |
|   MENU    |     |    TX     |     |    PWR     |     |  CHANNEL  |
|  (REMOTE  |─────| SETTINGS  |─────|           |─────| TO ADJ FWD|
| OR LOCAL) |     |           |     |           |     |    PWR    |
└ ─ ─ ─ ─ ─ ┘     └ ─ ─ ─ ─ ─ ┘     └ ─ ─ ─ ─ ─ ┘     └───────────┘
```
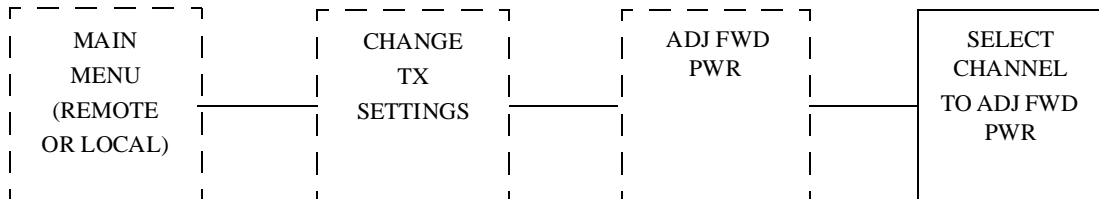
- To set one channel to a different forward power than other channels, press numeric key that corresponds to that channel. A menu to adjust forward power for one channel appears.

- To set forward power for all channels simultaneously, press A. A menu to adjust forward power for all channels appears. Refer to next paragraph for more information.

7.1.1.1   Adj Fwd Pwr For Channel

Refer to following diagram for initial steps of Adjust Forward Power For Channel Procedure.

```
┌ ─ ─ ─ ─ ┐   ┌ ─ ─ ─ ─ ┐   ┌ ─ ─ ─ ─ ┐   ┌ ─ ─ ─ ─ ┐   ┌────────┐
|  MAIN   |   | CHANGE  |   | ADJ FWD |   | SELECT  |   |ADJ FWD |
|  MENU   |   |   TX    |   |   PWR   |   | CHANNEL |   |PWR FOR |
| (REMOTE |───|SETTINGS |───|         |───|TO ADJ FWD|──|CHANNEL |
|OR LOCAL)|   |         |   |         |   |   PWR   |   |        |
└ ─ ─ ─ ─ ┘   └ ─ ─ ─ ─ ┘   └ ─ ─ ─ ─ ┘   └ ─ ─ ─ ─ ┘   └────────┘
```
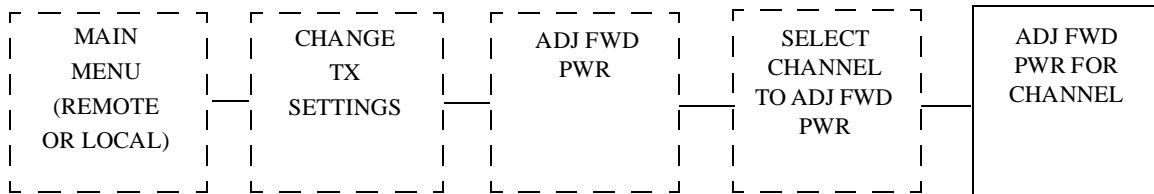
- For incremental adjustments, press U to increase or D to decrease forward power shown in shaded area. Forward power must remain between wattage limits stated on screen.

- For entry of a specific value, press numeric keys to input forward power into shaded area. Forward power must be whole number between wattage limits stated on screen. Press **Enter** to store value and reset cursor.

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7.2   Set Low Pwr Alrm

7.2.1   Select Channel To Set Low Pwr Alarm

Refer to following diagram for initial steps of Select Channel To Set Low Power Alarm Procedure.

```
┌──────────┐      ┌──────────┐      ┌──────────┐      ┌──────────┐
│  MAIN    │      │  CHANGE  │      │ SET LOW  │      │ SELECT   │
│  MENU    │      │   TX     │      │PWR ALARM │      │ CHANNEL  │
│ (REMOTE  │──────│ SETTINGS │──────│          │──────│TO SET LOW│
│ OR LOCAL)│      │          │      │          │      │PWR ALARM │
└──────────┘      └──────────┘      └──────────┘      └──────────┘
```
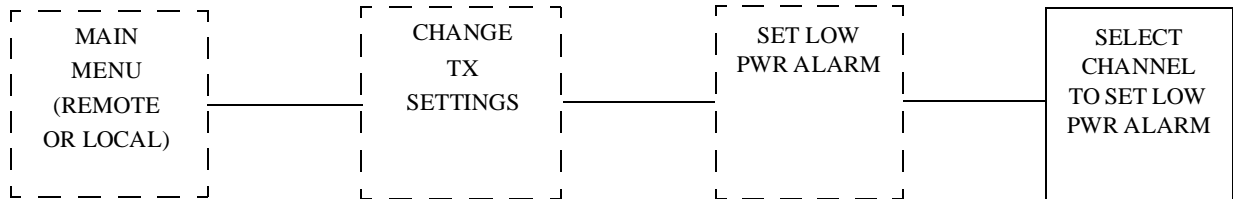
- To set one channel to a different low power alarm than other channels, press numeric key that corresponds to that channel. A menu to set low power alarm for one channel appears.

- To set low power alarm for all channels simultaneously, press A. A menu to set low power alarm for all channels appears. Refer to next paragraph for more information.

7.2.1.1   Set Low Pwr Alarm For Channel

Refer to following diagram for initial steps of Set Low Power Alarm For Channel Procedure.

```
┌──────────┐   ┌──────────┐   ┌──────────┐   ┌──────────┐   ┌──────────┐
│  MAIN    │   │  CHANGE  │   │ SET LOW  │   │ SELECT   │   │ SET LOW  │
│  MENU    │   │   TX     │   │PWR ALRM  │   │ CHANNEL  │   │  PWR     │
│ (REMOTE  │───│ SETTINGS │───│          │───│TO SET LOW│───│ALARM FOR │
│ OR LOCAL)│   │          │   │          │   │PWR ALARM │   │ CHANNEL  │
└──────────┘   └──────────┘   └──────────┘   └──────────┘   └──────────┘
```
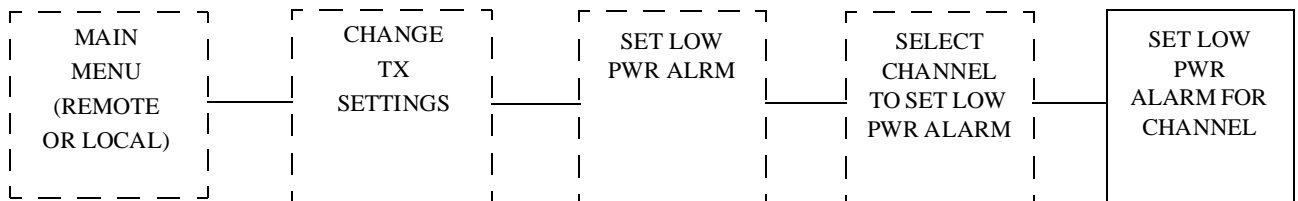
- Press numeric keys to input desired alarm level into shaded area. Alarm level must be a whole number between wattage limits stated on screen.

- Set deviation to maximum setting without causing channel interference.

- Press **Enter** to store deviation and reset cursor.

7.3 Set Frequencies

7.3.1 Enter Password To Set Frequencies

Refer to following diagram for initial steps of Enter Password To Set Frequencies procedure.
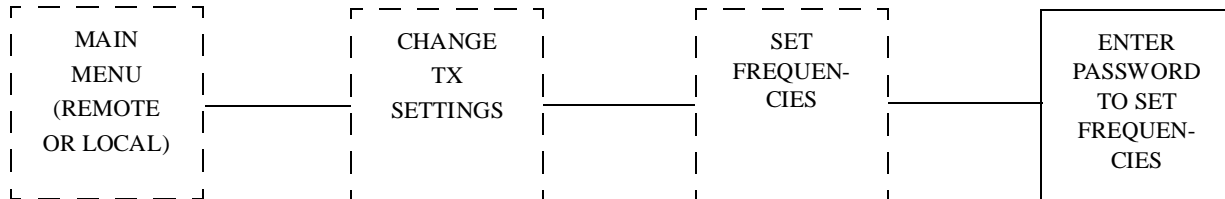
- Press keys corresponding to frequency password. Asterisk (*) appears in shaded area as each key is pressed.

- Press Enter. A screen to select channel to set frequencies appears if password is correct. Refer to next paragraph for more information.

7.3.1.1   Select Channel To Set Frequencies

Refer to following diagram for initial steps of Select Channel To Set Frequencies procedure.

- To set one channel to a different frequency than other channels, press numeric key that corresponds to that channel. A menu to set frequency for one channel appears.

- To set frequency for all channels simultaneously, press A. A menu to set frequencies for all channels appears.

7.3.1.1.1   Set Frequencies For Channel

Refer to following diagram for initial steps of Set Frequencies For Channel procedure.

```
┌──────────┐   ┌──────────┐   ┌──────────┐   ┌──────────┐   ┌──────────┐
│ CHANGE   │   │  SET     │   │ ENTER    │   │ SELECT   │   │  SET     │
│ TX       │───│ FREQUEN- │───│ PASSWORD │───│ CHANNEL  │───│ FREQUEN- │
│ SETTINGS │   │ CIES     │   │ TO SET   │   │ TO SET   │   │ CIES FOR │
│          │   │          │   │ FREQUEN- │   │ FREQUEN- │   │ CHANNEL  │
│          │   │          │   │ CIES     │   │ CIES     │   │          │
└──────────┘   └──────────┘   └──────────┘   └──────────┘   └──────────┘
```
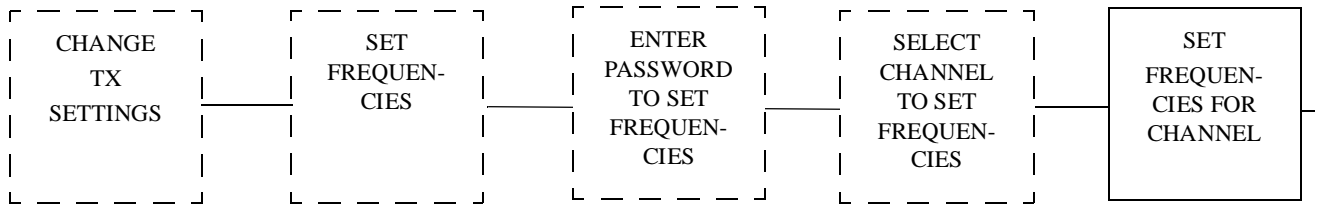
Note

Different frequency ranges appear for different bands. The ranges which are available to you, correspond to the available frequency range of the exciter, except in cases where the frequency band is subdivided (banded) so that frequencies selected must be within the range of resonant parts. For example, if your range is 920-960 MHz, you may legitimately select a new frequency around 925 MHz. The particular exciter, however, has resonant parts for, say, approximately 955 MHz and may not work at the programmed frequency because the VCO cannot lock unless you also install banded parts for the range which corresponds to the new frequency.

- Press numeric keys to input desired frequency into shaded area. Frequency must be within limits and proper multiple as stated on screen. Frequency must be within bandwidth of VCO/RF amplifier board. Press at least three whole digits and no more than eight digits total. A decimal may be pressed if desired.

- Press Enter to store frequency and reset cursor. A decimal is assumed between third and fourth digits if not pressed in previous step.

7.4 Change Frequency Password

Refer to following diagram for initial steps of Change Frequency Password procedure.

```
┌─ ─ ─ ─ ─ ─┐        ┌─ ─ ─ ─ ─ ─┐        ┌───────────┐
|   MAIN    |        |  CHANGE   |        |  CHANGE   |
|   MENU    |        |    TX     |        | FREQUENCY |
| (REMOTE   |────────| SETTINGS  |────────| PASSWORD  |
| OR LOCAL) |        |           |        |           |
└─ ─ ─ ─ ─ ─┘        └─ ─ ─ ─ ─ ─┘        └───────────┘
```

- Enter present password.

- If password is not correct, invalid password is displayed, go back to previous step.

- If password is correct, enter new password. Password is any combination of one to six alphanumeric keys on keyboard.

- Enter new password again.

- If password is not correct, invalid password is displayed, go back to previous step.

- If password is correct, password is saved.

7.5   Change/Toggle Entry Password

Refer to the following diagram for initial steps of Change/Toggle Entry Password procedure.

```
┌─ ─ ─ ─ ─ ─┐         ┌─ ─ ─ ─ ─ ─┐         ┌───────────┐
│   MAIN    │         │  CHANGE   │         │  CHANGE/  │
│   MENU    │         │    TX     │         │  TOGGLE   │
│ (REMOTE   ├─────────┤ SETTINGS  ├─────────┤  ENTRY    │
│ OR LOCAL) │         │           │         │ PASSWORD  │
└─ ─ ─ ─ ─ ─┘         └─ ─ ─ ─ ─ ─┘         └───────────┘
```
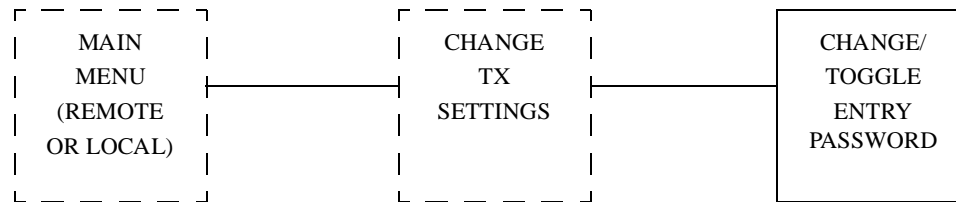
- Press option to enable entry password if disabled. Password status changes to **ENTRY PASSWORD IS CURRENTLY ENABLED**. Password is now required to gain access to VT-100 communications.

- Press option to disable entry password if enabled. Password status changes to **ENTRY PASSWORD IS CURRENTLY DISABLED**. Password is now no longer required to gain access to VT-100 communications.Press option to **CHANGE ENTRY PASSWORD**. Refer to next paragraph for more information.

7.5.1   Change Entry Password

Refer to following diagram for initial steps of Change Entry Password procedure
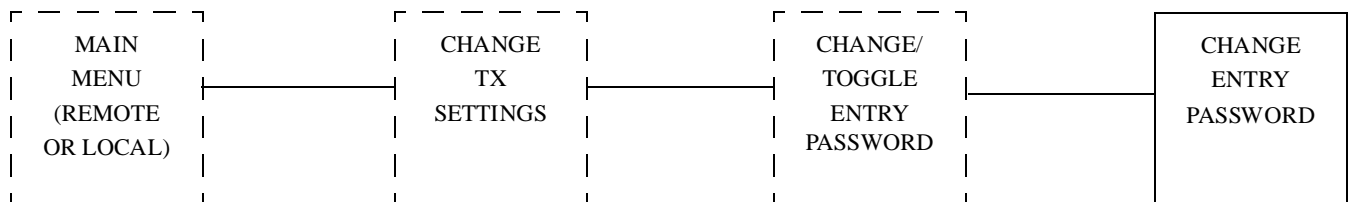
```
┌─ ─ ─ ─ ─ ─┐     ┌─ ─ ─ ─ ─ ─┐     ┌─ ─ ─ ─ ─ ─┐     ┌───────────┐
│   MAIN    │     │  CHANGE   │     │  CHANGE/  │     │  CHANGE   │
│   MENU    │     │    TX     │     │  TOGGLE   │     │   ENTRY   │
│ (REMOTE   ├─────┤ SETTINGS  ├─────┤  ENTRY    ├─────┤ PASSWORD  │
│ OR LOCAL) │     │           │     │ PASSWORD  │     │           │
└─ ─ ─ ─ ─ ─┘     └─ ─ ─ ─ ─ ─┘     └─ ─ ─ ─ ─ ─┘     └───────────┘
```

- Enter present password.

- If password is not correct, invalid password is displayed, go back to previous step.

- If password is correct, enter new password. Password is any combination of one to six alphanumeric keys on keyboard.

- Enter new password again.

- If password is not correct, invalid password is displayed, go back to previous step.

- If password is correct, password is saved.

8   DIGITAL MODE SETUP

Refer to following diagram for initial steps of Digital Mode Setup procedure.

```
+----------------+        +----------------+
| MAIN           |        | DIGITAL        |
| MENU           |        | MODE           |
| (REMOTE        |--------| SETUP          |
| OR LOCAL)      |        |                |
+----------------+        +----------------+
```
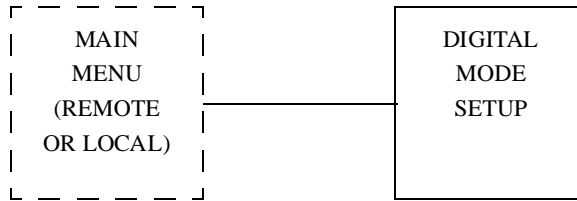
- Press option to **SET DEVIATION**

- Press option to **SET OFFSET**

- Press option to **SELECT DATA POLARITY**

- Press option to **SELECT FILTER RISETIME**

8.1   Set Deviation

Refer to following diagram for initial steps of Set Deviation procedure.

```
+----------------+     +----------------+     +----------------+
| MAIN           |     | DIGITAL        |     | SET            |
| MENU           |     | MODE           |     | DEVIATION      |
| (REMOTE        |-----| SETUP          |-----|                |
| OR LOCAL)      |     |                |     |                |
+----------------+     +----------------+     +----------------+
```
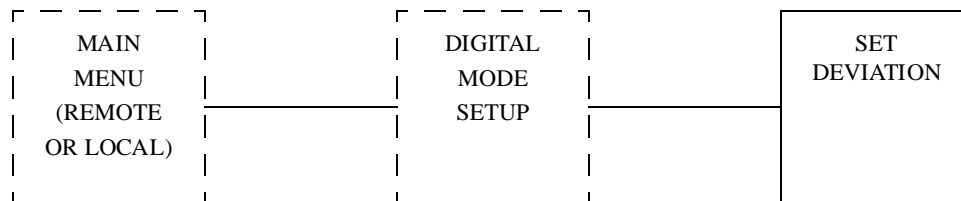
- To set one mode to a different deviation than other modes, press numeric key that corresponds to that mode. Up to four modes are adjustable (A,B,C, and D). A menu to select channel to set mode deviation appears.

8.1.1 Select Channel To Set Mode Deviation

Refer to following diagram for initial steps of Select Channel To Set Mode Deviation procedure.

```
┌ ─ ─ ─ ─ ─ ┐     ┌ ─ ─ ─ ─ ─ ┐     ┌ ─ ─ ─ ─ ─ ┐     ┌───────────┐
|   MAIN    |     |  DIGITAL  |     |    SET    |     |  SELECT   |
|   MENU    |     |   MODE    |     | DEVIATION |     |  CHANNEL  |
|  (REMOTE  |─────|   SETUP   |─────|           |─────|   TO SET  |
| OR LOCAL) |     |           |     |           |     |   MODE    |
|           |     |           |     |           |     | DEVIATION |
└ ─ ─ ─ ─ ─ ┘     └ ─ ─ ─ ─ ─ ┘     └ ─ ─ ─ ─ ─ ┘     └───────────┘
```
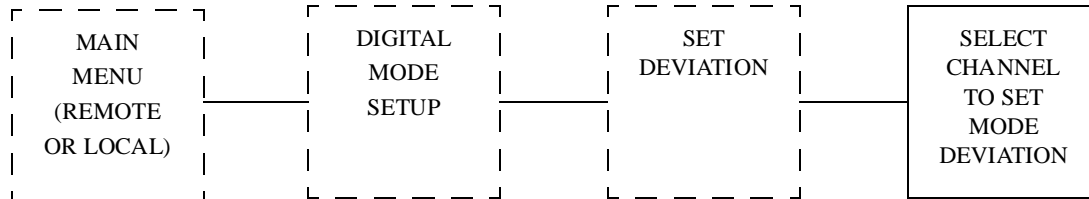
- To set one channel to a different mode deviation than other channels, press numeric key that corresponds to that channel. A menu to set mode deviation for one channel appears.

- To set mode deviation for all channels simultaneously, press A. A menu to set mode deviation for all channels appears.

8.1.1.1 Set Mode Deviation For Channel

Refer to following diagram for initial steps of Select Channel To Set Mode Deviation Procedure.

```
┌ ─ ─ ─ ─ ─ ┐     ┌ ─ ─ ─ ─ ─ ┐     ┌ ─ ─ ─ ─ ─ ┐     ┌───────────┐
|   MAIN    |     |  DIGITAL  |     |    SET    |     |  SELECT   |
|   MENU    |     |   MODE    |     | DEVIATION |     |  CHANNEL  |
|  (REMOTE  |─────|   SETUP   |─────|           |─────|   TO SET  |
| OR LOCAL) |     |           |     |           |     |   MODE    |
|           |     |           |     |           |     | DEVIATION |
└ ─ ─ ─ ─ ─ ┘     └ ─ ─ ─ ─ ─ ┘     └ ─ ─ ─ ─ ─ ┘     └───────────┘
```
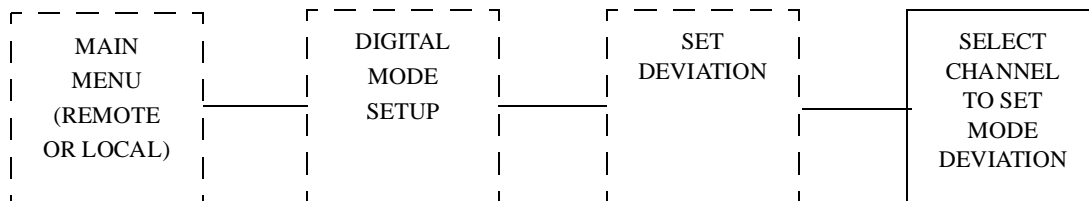
- Press numeric keys to input desired deviation into shaded area. Deviation must be whole number between frequency limits stated on screen.

- Set deviation to maximum setting without causing channel interference.

- Press Enter to store deviation and reset cursor.

8.2 Set Offset

Refer to the following diagram for initial steps of Set Offset procedure.

```
┌ ─ ─ ─ ─ ─ ┐      ┌ ─ ─ ─ ─ ─ ┐      ┌───────────┐
│   MAIN    │      │  DIGITAL  │      │ SET OFFSET │
│   MENU    │      │   MODE    │      │           │
│ (REMOTE   ├──────┤  SETUP    ├──────┤           │
│ OR LOCAL) │      │           │      │           │
└ ─ ─ ─ ─ ─ ┘      └ ─ ─ ─ ─ ─ ┘      └───────────┘
```
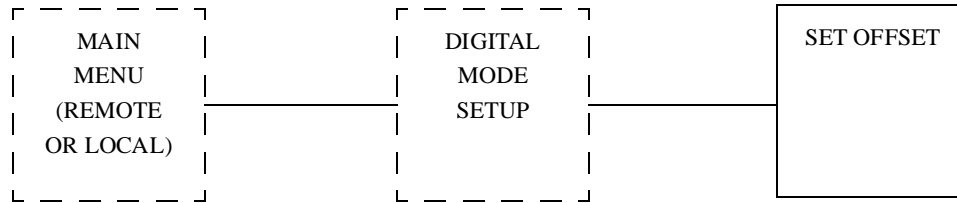
- To set one mode to a different offset than other modes, press numeric key that corresponds to that mode. A menu to select channel to set mode offset appears.

8.2.1 Select Channel To Set Mode Offset

Refer to following diagram for initial steps of Select Channel To Set Mode Offset Procedure.

```
┌ ─ ─ ─ ─ ─ ┐   ┌ ─ ─ ─ ─ ─ ┐   ┌ ─ ─ ─ ─ ─ ┐   ┌───────────┐
│   MAIN    │   │  DIGITAL  │   │ SET OFFSET │   │  SELECT   │
│   MENU    │   │   MODE    │   │           │   │  CHANNEL  │
│ (REMOTE   ├───┤  SETUP    ├───┤           ├───┤  TO SET   │
│ OR LOCAL) │   │           │   │           │   │   MODE    │
│           │   │           │   │           │   │  OFFSET   │
└ ─ ─ ─ ─ ─ ┘   └ ─ ─ ─ ─ ─ ┘   └ ─ ─ ─ ─ ─ ┘   └───────────┘
```
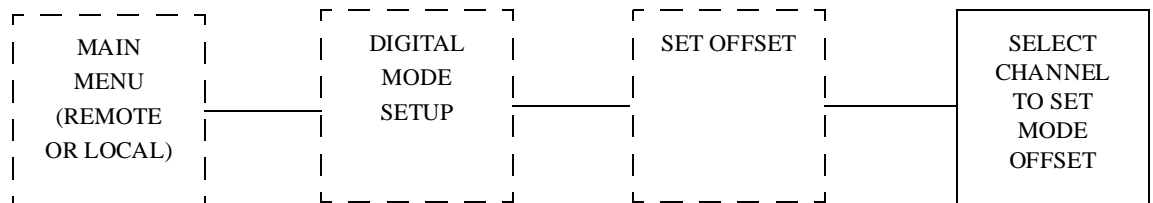
- To set one channel to a different mode offset than other channels, press numeric key that corresponds to that channel. A menu to set mode offset for one channel appears.

- To set mode offset for all channels simultaneously, press A. A menu to set mode offset for all channels appears.

8.2.1.1   Set Mode Offset For Channel

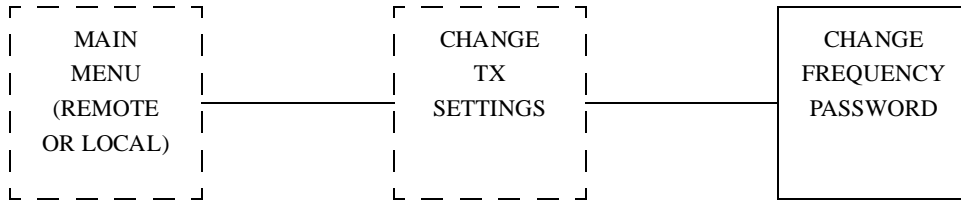Refer to following diagram for initial steps of Set Mode Offset For Channel Procedure.

| MAIN MENU (REMOTE OR LOCAL) | — | DIGITAL MODE SETUP | — | SET OFFSET | — | SELECT CHANNEL TO SET MODE OFFSET | — | SET MODE OFFSET FOR CHANNEL |

- Press minus (-) key if negative offset. If positive offset, plus (+) key may be pressed if desired.

- Press numeric keys to input desired offset into shaded area. Offset must be whole number between frequency limits stated in menu.

- Set offset to O if not simulcasting. If simulcasting, set one tx to 0, a second to +400, and a third tx to -400.

- Press Enter to store offset and reset cursor.

8.3   Select Data Polarity

Refer to following diagram for initial steps of Select Data Polarity procedure .

| MAIN MENU (REMOTE OR LOCAL) | — | DIGITAL MODE SETUP | — | SELECT DATA POLARITY |
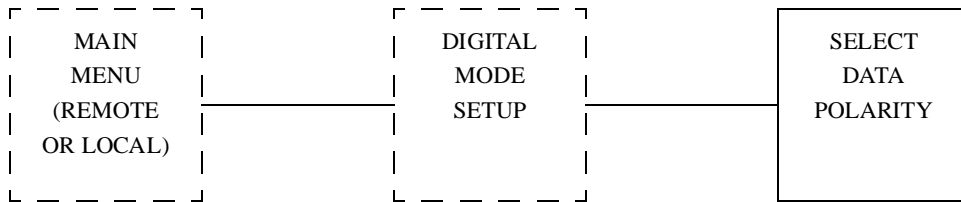
- Press 1 to invert data if noninverted. Polarity status changes to **DATA POLARITY IS CURRENTLY INVERTED**.

- Press 2 to non-invert data if inverted. Polarity status changes to **DATA POLARITY IS CURRENTLY NON-INVERTED**.

- Set to non-inverted unless data is inverted by a receiver or controller.

8.4   Select Filter Risetime

8.4.1   Select Channel To Set Filter Risetime

Refer to the following diagram for initial steps of Select Channel To Set Filter Risetime procedure.

```
┌──────────┐     ┌──────────┐     ┌──────────┐     ┌──────────┐
│  MAIN    │     │ DIGITAL  │     │  SELECT  │     │  SELECT  │
│  MENU    │     │  MODE    │     │  FILTER  │     │ CHANNEL  │
│ (REMOTE  │─────│  SETUP   │─────│ RISETIME │─────│ TO SET   │
│ OR LOCAL)│     │          │     │          │     │  FILTER  │
│          │     │          │     │          │     │ RISETIME │
└──────────┘     └──────────┘     └──────────┘     └──────────┘
```
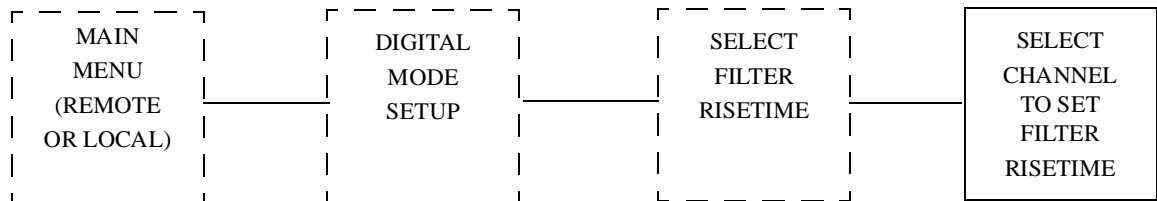
- To set one channel to a different filter risetime than other channels, press numeric key that corresponds to that channel. A menu to select filter risetime for one channel appears.

- To set filter risetime for all channels simultaneously, press A. A menu to set filter risetime for all channels appears.

8.4.1.1   Select Filter Risetime for Channel

Refer to the following diagram for initial steps of Select Filter Risetime For Channel procedure.

```
┌────────┐   ┌────────┐   ┌────────┐   ┌────────┐   ┌────────┐
│  MAIN  │   │ DIGITAL│   │ SELECT │   │ SELECT │   │ SELECT │
│  MENU  │   │  MODE  │   │ FILTER │   │CHANNEL │   │ FILTER │
│(REMOTE │───│ SETUP  │───│RISETIME│───│ TO SET │───│RISETIME│
│OR LOCAL)│  │        │   │        │   │ FILTER │   │  FOR   │
│        │   │        │   │        │   │RISETIME│   │CHANNEL │
└────────┘   └────────┘   └────────┘   └────────┘   └────────┘
```

- Press 1 to select standard rise time. Premodulation filter selection status changes to **FILTER RISETIME IS CURRENTLY 88uS.**

- Press 2 to select narrowband rise time. Premodulation filter selection status changes to **FILTER RISETIME IS CURRENTLY 150uS.**

- Set to standard 88uS unless this is a retrofit to a system that already uses 150uS bessel.

9   ANALOG MODE SETUP

Refer to following diagram for initial steps of Analog Mode Setup procedure

.

```
┌ ─ ─ ─ ─ ─ ─ ┐              ┌──────────┐
│  MAIN       │              │  ANALOG  │
│  MENU       │              │  MODE    │
│  (REMOTE    ├──────────────┤  SETUP   │
│  OR LOCAL)  │              │          │
└ ─ ─ ─ ─ ─ ─ ┘              └──────────┘
```
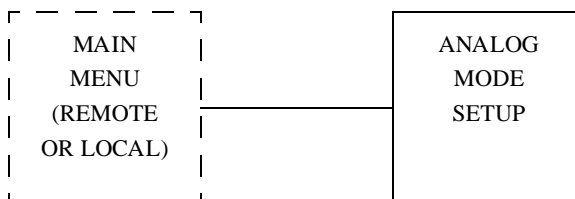
- Press option to **ADJUST AUDIO INPUT LEVEL** (must enter analog mode and local control to initiate this command).Press Y for yes to enter analog mode and local control. Press N for no to do not enter analog mode and local control. Press M to display main menu. Press R to refresh main menu. Press K when in local control to key or unkey TX.

- Press option to **SET ANALOG DEVIATION** (must enter analog mode and local control to initiate this command).

- Press option to **SET ANALOG LIMITER**.

- Press option to **SET ANALOG OFFSET**.

- Press option to **SELECT AUDIO RESPONSE**.

- Press option to **SELECT AUDIO POLARITY**.

9.1   Adjust Audio Input Level

1. Remove exciter/PA control far enough to gain access to AUDIO INPUT ADJUST control through top cover.

2. Input standard-level (1000-Hz) audio tone from transmitter controller.

3. Refer to following diagram for next steps of **ADJUST AUDIO INPUT LEVEL** Procedure.

.

```
┌ ─ ─ ─ ─ ─ ┐        ┌ ─ ─ ─ ─ ┐        ┌──────────┐
│  MAIN     │        │ ANALOG  │        │  ADJUST  │
│  MENU     │        │ MODE    │        │  AUDIO   │
│  (REMOTE  ├────────┤ SETUP   ├────────┤  INPUT   │
│  OR LOCAL)│        │         │        │  LEVEL*  │
└ ─ ─ ─ ─ ─ ┘        └ ─ ─ ─ ─ ┘        └──────────┘
```
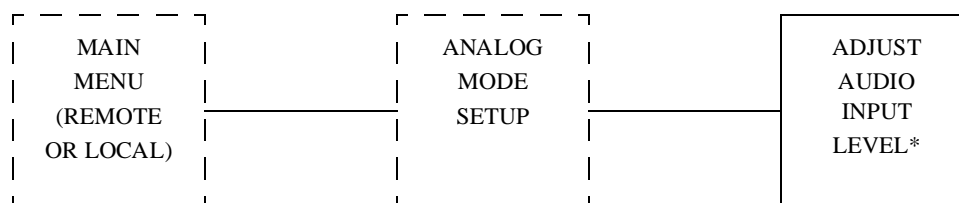
4. Set to appropriate (normal) level by rotating audio input adjust clockwise if message at bottom of menu says low. Set to normal level by rotating audio input adjust counter-clockwise if message at bottom of menu says high.

5. Remove audio input and replace exciter/PA control.

6. Return transmitter to service.

Procedure is complete.

9.2 Set Analog Deviation

Perform audio input level adjustment procedure referenced on previous page.

```
┌ ─ ─ ─ ─ ─ ┐        ┌ ─ ─ ─ ─ ─ ┐        ┌───────────┐
│   MAIN    │        │  ANALOG   │        │    SET    │    * (Must be in
│   MENU    │        │   MODE    │        │  ANALOG   │    analog mode
│  (REMOTE  │────────│   SETUP   │────────│ DEVIATION*│    and local
│ OR LOCAL) │        │           │        │           │    control)
└ ─ ─ ─ ─ ─ ┘        └ ─ ─ ─ ─ ─ ┘        └───────────┘
```
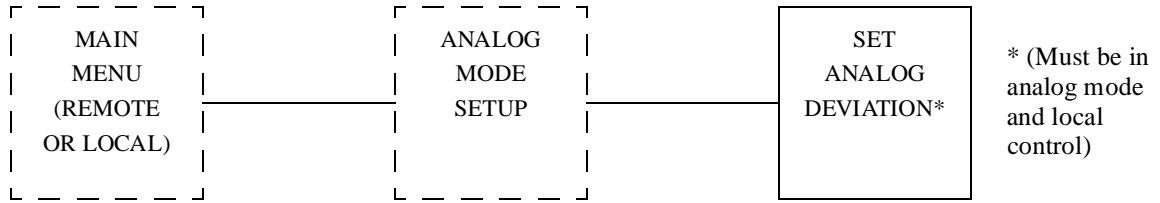
- Input standard (1000-Hz) level audio tone to exciter/PA control from transmitter controller or other source.

- Press numeric keys to input desired deviation into shaded area. Deviation must be whole number between frequency limits stated on screen.

- Set to 3500 Hz.

- Press `Enter` to store value and reset cursor.

- Press `Reset` on transmitter controller to remove audio tone from exciter/PA control.

9.3 Set Analog Limiter Value

Refer to following diagram for initial steps of Set Analog Limiter Value procedure.

```
┌ ─ ─ ─ ─ ─ ┐        ┌ ─ ─ ─ ─ ─ ┐        ┌───────────┐
│   MAIN    │        │  ANALOG   │        │    SET    │
│   MENU    │        │   MODE    │        │  ANALOG   │
│  (REMOTE  │────────│   SETUP   │────────│  LIMITER  │
│ OR LOCAL) │        │           │        │   VALUE   │
└ ─ ─ ─ ─ ─ ┘        └ ─ ─ ─ ─ ─ ┘        └───────────┘
```
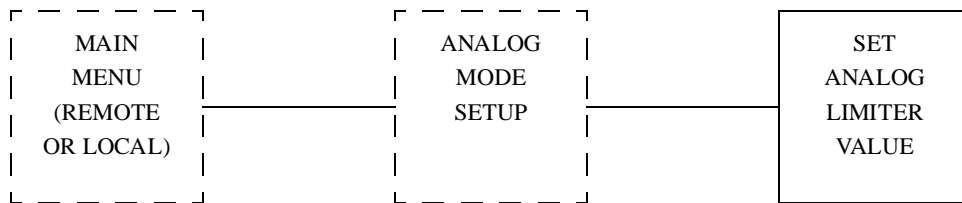
- Press numeric keys to input analog limiter level into shaded area. Limiter level must be whole number between frequency limits stated in menu.

- Set to 4800 Hz.

- Press `Enter` to store limiter level and reset cursor.

9.4 Set Analog Offset

Refer to following diagram for initial steps of Set Analog Offset Procedure.
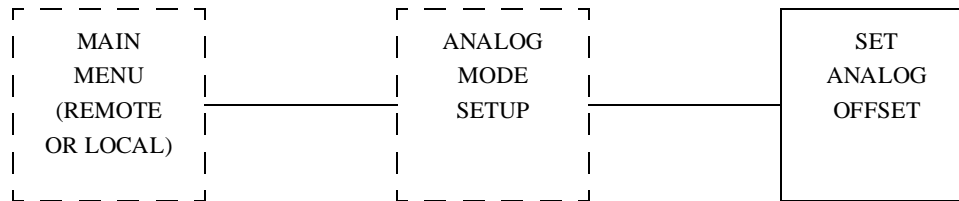
```
+-----------+      +-----------+      +-----------+
| MAIN      |      | ANALOG    |      |   SET     |
| MENU      |------| MODE      |------| ANALOG    |
| (REMOTE   |      | SETUP     |      | OFFSET    |
| OR LOCAL) |      |           |      |           |
+-----------+      +-----------+      +-----------+
```

- Press minus (-) key if negative offset. If positive offset, plus (+) key may be pressed if desired.

- Press numeric keys to input desired offset into shaded area. Offset must be whole number between frequency limits stated on screen.

- Set to 0 if not simulcasting. If simulcasting, set as follows. Two transmitters: set tx1 to 0; set tx2 to between +2 and +8 Hz. Three transmitters: set tx1 to 0; set tx2 to between +2 and +4; set tx3 to between -2 and -4 Hz. Note: Never set more than 8 Hz total spread in offset between transmitters of same simulcast area.

- Press Enter to store offset and reset cursor.

9.5 Select Audio Response

Refer to following diagram for initial steps of Select Audio Response procedure.

```
+-----------+      +-----------+      +-----------+
| MAIN      |      | ANALOG    |      | SELECT    |
| MENU      |------| MODE      |------| AUDIO     |
| (REMOTE   |      | SETUP     |      | RESPONSE  |
| OR LOCAL) |      |           |      |           |
+-----------+      +-----------+      +-----------+
```
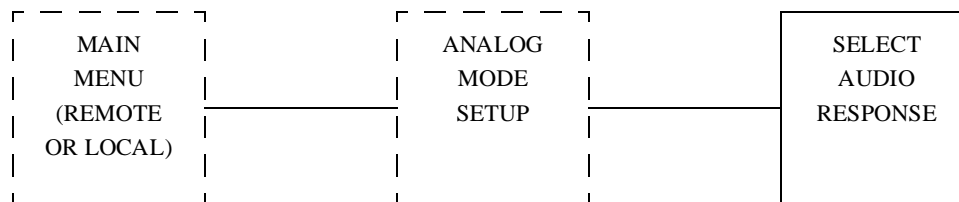
- Press option to disable audio preemphasis if enabled. Audio response status changes to **AUDIO RESPONSE IS CURRENTLY FLAT**.

- Press option to enable audio preemphasis if disabled. Audio response status changes to **AUDIO RESPONSE IS CURRENTLY PRE-EMPH**.

- Set to flat for most sites. Set to preemphasis if paging receivers correspondingly deemphasize received signal.

9.6 Select Audio Polarity

Refer to following diagram for initial steps of Select Audio Polarity procedure.

```
┌ ─ ─ ─ ─ ─ ┐        ┌ ─ ─ ─ ─ ─ ┐        ┌───────────┐
│   MAIN    │        │  ANALOG   │        │  SELECT   │
│   MENU    │        │   MODE    │        │   AUDIO   │
│ (REMOTE   ├────────┤  SETUP    ├────────┤ POLARITY  │
│ OR LOCAL) │        │           │        │           │
│           │        │           │        │           │
└ ─ ─ ─ ─ ─ ┘        └ ─ ─ ─ ─ ─ ┘        └───────────┘
```
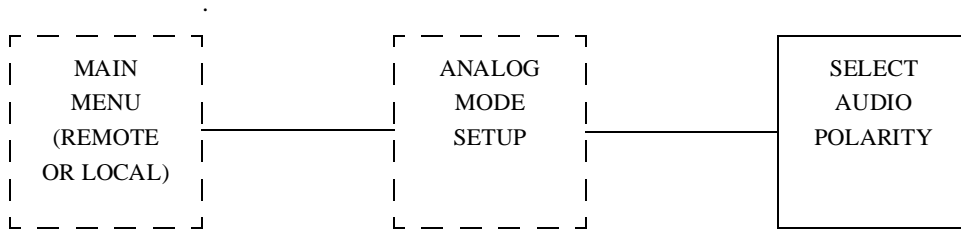
- Press option to invert audio if noninverted. Polarity status changes to **AUDIO POLARITY IS CURRENTLY INVERTED**.

- Press option to non-invert audio if inverted. Polarity status changes to **AUDIO POLARITY IS CURRENTLY NON-INVERTED**.

- Set to non-inverted unless audio is inverted by a receiver or controller.

10   VIEW TX STATUS

Refer to following diagram for initial steps of View Transmitter Status procedure.

```
┌ ─ ─ ─ ─ ─ ─ ┐          ┌─────────────┐
│   MAIN      │          │   VIEW      │
│   MENU      │          │   TX        │
│  (REMOTE    │──────────│   STATUS    │
│   OR LOCAL) │          │             │
└ ─ ─ ─ ─ ─ ─ ┘          └─────────────┘
```
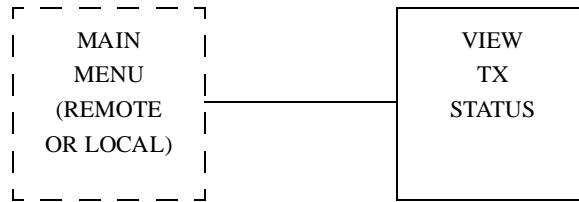
- Press option to VIEW VOLTAGE READINGS

- Press option to VIEW CHANNEL FREQS

- Press option to VIEW FAULTS SELECTION

- Press option to VIEW ALL TX PRESETS

10.1 View Voltage Readings

Refer to following diagram for intitial steps of View Voltage Readings Procedure.

```
┌ ─ ─ ─ ─ ─ ┐       ┌ ─ ─ ─ ─ ─ ┐       ┌───────────┐
   MAIN                 VIEW                  VIEW
   MENU                  TX                 VOLTAGE
  (REMOTE              STATUS              READINGS
  OR LOCAL)
└ ─ ─ ─ ─ ─ ┘       └ ─ ─ ─ ─ ─ ┘       └───────────┘
```
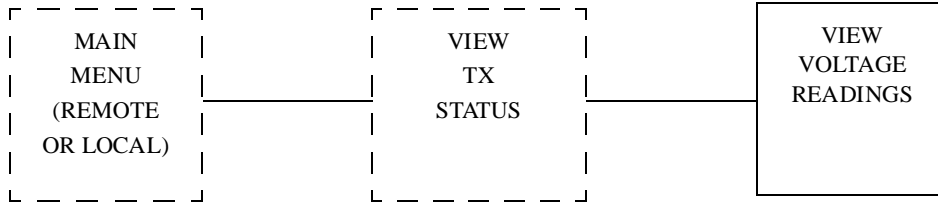
- The screen displays two groups of two columns. Location of each voltage measurement (either power amplifier or exciter/PA control) and its expected value are in left column of each group. Actual value is in right column of each group, adjacent to its expected value. Each voltage is measured at output of its respective regulating device.

10.2 View Channel Freqs

Refer to following diagram for initial steps of View Channel Frequencies procedure.

```
┌ ─ ─ ─ ─ ─ ┐       ┌ ─ ─ ─ ─ ─ ┐       ┌───────────┐
   MAIN                 VIEW                  VIEW
   MENU                  TX                 CHANNEL
  (REMOTE              STATUS               FREQS
  OR LOCAL)
└ ─ ─ ─ ─ ─ ┘       └ ─ ─ ─ ─ ─ ┘       └───────────┘
```
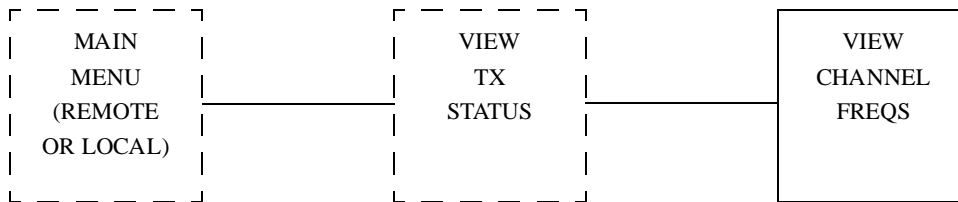
- This screen displays two groups of two columns. Each channel number (`FREQUENCY 1` through `FREQUENCY 16`) is in left column of each group. Programmed frequency is in right column of each group, adjacent to its channel number.

10.3 View Faults Selection

Refer to following diagram for initial steps of View Faults Selection Procedure.

```
┌ ─ ─ ─ ─ ─ ─ ┐        ┌ ─ ─ ─ ─ ─ ─ ┐        ┌─────────────┐
   MAIN                    VIEW                     VIEW
│  MENU       │        │  TX         │        │  FAULTS     │
   (REMOTE                 STATUS                   SELECTION
│  OR LOCAL)  │        │             │        │             │
└ ─ ─ ─ ─ ─ ─ ┘        └ ─ ─ ─ ─ ─ ─ ┘        └─────────────┘
```
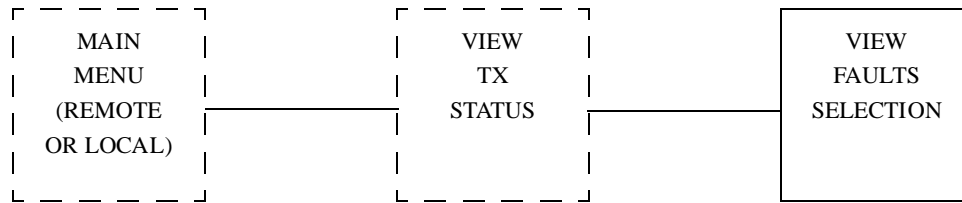
- Press option to VIEW PRESENT FAULTS.
- Press option to VIEW STORED FAULTS.
- Press option to VIEW STORED FAULT READINGS.
- Press option to VIEW/RESET DSP FAULTS.

10.3.1 View Present Faults

Refer to following diagram for initial steps of View Present Faults full-screen display procedure
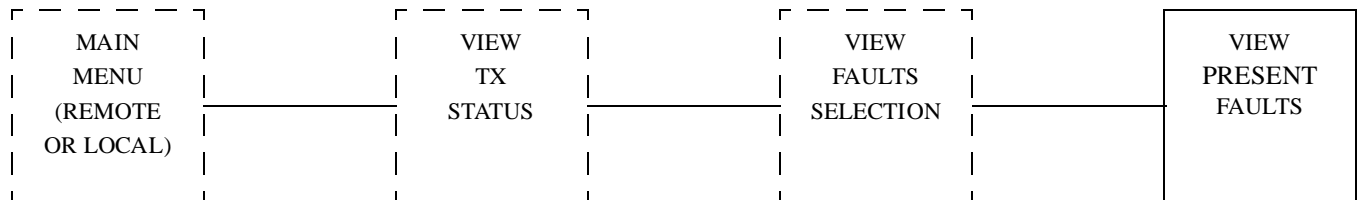
```
┌ ─ ─ ─ ─ ─ ┐     ┌ ─ ─ ─ ─ ─ ┐     ┌ ─ ─ ─ ─ ─ ┐     ┌───────────┐
   MAIN              VIEW              VIEW              VIEW
│  MENU     │     │  TX       │     │  FAULTS   │     │  PRESENT  │
   (REMOTE           STATUS            SELECTION         FAULTS
│  OR LOCAL)│     │           │     │           │     │           │
└ ─ ─ ─ ─ ─ ┘     └ ─ ─ ─ ─ ─ ┘     └ ─ ─ ─ ─ ─ ┘     └───────────┘
```

- This full screen displays four groups of two columns. Location/function of each item is in left column of each group. **FAULT/ALARM/OK** or **HI/LO** status is in right column of each group, adjacent to its location/function. Refer to Section 7 for a detailed description of all faults screens.

10.3.2 View Stored Faults

Refer to following diagram for initial steps of View Stored Faults full-screen display.
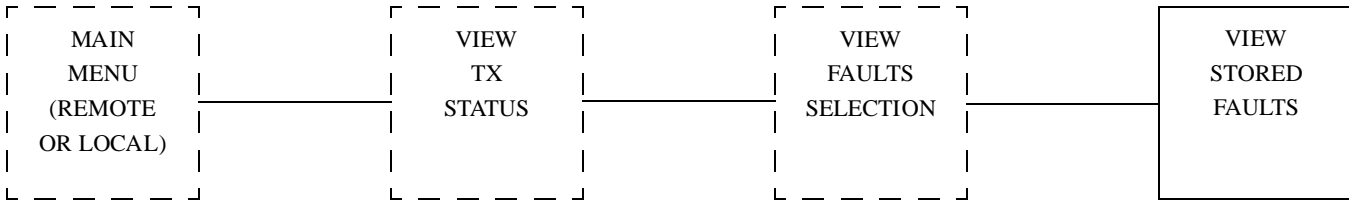
```
┌ ─ ─ ─ ─ ─ ┐        ┌ ─ ─ ─ ─ ─ ┐        ┌ ─ ─ ─ ─ ─ ┐        ┌───────────┐
|   MAIN    |        |   VIEW    |        |   VIEW    |        |   VIEW    |
|   MENU    |        |   TX      |        |   FAULTS  |        |   STORED  |
| (REMOTE   |────────|   STATUS  |────────| SELECTION |────────|   FAULTS  |
| OR LOCAL) |        |           |        |           |        |           |
└ ─ ─ ─ ─ ─ ┘        └ ─ ─ ─ ─ ─ ┘        └ ─ ─ ─ ─ ─ ┘        └───────────┘
```

- This full screen displays four groups of two columns. Location/function of each item is in left column of each group. **FAULT/ALARM/OK** or **HI/LO** status is in right column of each group, adjacent to its location/function. Refer to Section 7 for a detailed description of all fault screens.

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Table 10-1 TX Faults Legend Display Description

display legend	normal state	alarm state	fault state
PA1 BOARD OK	PA1 board is fully operational.		
PA1 BOARD ALARM		PA1 board should be replaced soon.	
PA1 BOARD FAULT			PA1 board must be replaced immediately.
PA1-A OK CURR	Current through A pair of transistors on PA1 board is within window: (PA1 FWD ÷ PA SUPPLY VOLTAGE) ±2.5A.		
PA1-A LO CURR		Current through A pair of transistors on PA1 board is below window or below 2.0A.	
PA1-A HI CURR		Current through A pair of transistors on PA1 board is above window and below 9A.	Current through A pair of transistors on PA1 board is above 9A.
PA1-B CURR OK	Current through B pair of transistors on PA1 board is within window: (PA1 FWD ÷ PA SUPPLY VOLTAGE) ±2.5A.		
PA1-B CURR LO		Current through B pair of transistors on PA1 board is below window or below 2.0A.	
PA1-B CURR HI		Current through B pair of transistors on PA1 board is above window and below 9A.	Current through B pair of transistors on PA1 board is above 9A.
PA1 FWD OK PWR	Forward power of PA1 board is within window: [(FWD PWR + 25%) ÷ NO. of PA BOARDS] + 33%/-50%.		
PA1 FWD LO PWR		Forward power of PA1 board is below window.	
PA1 FWD HI PWR		Forward power of PA1 board is above window.	
PA1 REF OK PWR	Reflected power of PA1 board is below 15 W		

Table 10-1 TX Faults Legend Display Description (continued)

display legend		normal state	alarm state	fault state
PA1 REF PWR	HI			Reflected power of PA1 is above 15 W.
PA2 BOARD	OK	PA2 board is fully operational.		
PA2 BOARD	ALARM		PA2 board should be replaced soon.	
PA2 BOARD	FAULT			PA2 board must be replaced immediately.
PA2-A CURR	OK	Current through A pair of transistors on PA2 board is within window: (PA2 fwd ÷ PA supply voltage) ±2.5 A.		
PA2-A CURR	LO		Current through A pair of transistors on PA2 board is below window or below 2.0 A.	
PA2-A CURR	HI		Current through A pair of transistors on PA2 board is above window and below 9 A.	Current through A pair of transistors on PA2 board is above 9 A.
PA2-B CURR	OK	Current through B pair of transistors on PA2 board is within window: (PA2 FWD ÷ PA SUPPLY VOLTAGE) ±2.5 A.		
PA2-B CURR	LO		Current through B pair of transistors on PA2 board is below window or below 2.0A.	
PA2-B CURR	HI		Current through B pair of transistors on PA2 board is above window and below 9 A.	Current through B pair of transistors on PA2 board is above 9 A.
PA2 FWD PWR	OK	Forward power of PA2 board is within window: [(FWD PWR + 25%) ÷ NO. OF PA BOARDS] + 33%/-50%.		
PA2 FWD PWR	LO		Forward power of PA2 board is below window.	
PA2 FWD PWR	HI		Forward power of PA2 board is above window.	
PA2 REF PWR	OK	Reflected power of PA2 board is below 15 W.		

Table 10-1 TX Faults Legend Display Description (continued)

display legend		normal state	alarm state	fault state
PA2 REF PWR	HI			Reflected power of PA2 board is above 15 W.
DRVR1 CURR	OK	Current through No. 1 driver transistor on driver board is between 1.5 A and 4.5 A.		
DRVR1 CURR	LO		Current through No. 1 driver transistor on driver board is below 1.5 A.	
DRVR1 CURR	HI			Current through No. 1 driver transistor on driver board is above 4.5 A.
DRVR2 CURR	OK	Current through No. 2 driver transistor on driver board is between 1.5 A and 4.5 A.		
DRVR2 CURR	LO		Current through No. 2 driver transistor on driver board is below 1.5 A.	
DRVR2 CURR	HI			Current through No. 2 driver transistor on driver board is above 4.5 A.
IPA BOARD	OK	Driver board is fully operational.		
IPA BOARD	ALARM		Driver board should be replaced soon.	
IPA BOARD	FAULT			Driver board must be replaced immediately.
PREAMP CURR	OK	Current through first stage on driver board is between 1 A and 4 A.		
PREAMP CURR	LO		Current through first stage on driver board is below 1 A.	
PREAMP CURR	HI			Current through first stage on driver board is above 4 A.
IPA CURR	OK	Current through second stage on driver board is between 0.7 A and 2.5 A.		
IPA CURR	LO		Current through second stage on driver board is below 0.7 A.	
IPA CURR	HI			Current through second stage on driver board is above 2.5 A.

Table 10-1 TX Faults Legend Display Description (continued)

display legend		normal state	alarm state	fault state
IPA FWD PWR	OK	Forward power of second stage on driver board is between 7 W and 35 W.		
IPA FWD PWR	LO		Forward power of second stage on driver board is below 7 W.	
IPA FWD PWR	HI			Forward power of second stage on driver board is above 35 W.
IPA REF PWR	OK	Reflected power of second stage on driver board is below 10 W.		
IPA REF PWR	HI			Reflected power of second stage on driver board is above 10 W.
TOT FWD PWR	OK	Forward power of combiner board is below 300 W and above low- power alarm setting.		
TOT FWD PWR	LO		Forward power of combiner board is below low power alarm setting and above 100 W.	Forward power of combiner board is below 100W.
TOT FWD PWR	HI			Forward power of combiner board is being limited to 300 W.
TOT REF PWR	OK	Reflected power at isolator is below 25 W.		
TOT REF PWR	HI			Reflected power at isolator is above 25 W.
EXC OUT-PUT	OK	Power amplifier's modulated RF input signal is above 1 Vrms or 200 mW		
EXC OUT-PUT	LO			Power amplifier's modulated RF input signal is below 1 Vrms or 200 mW
ISOLATOR	OK	Isolator module is fully operational.		
ISOLATOR	FAULT			Isolator module must be replaced immediately.
COMBINER	OK	Combiner board is fully operational.		

Table 10-1 TX Faults Legend Display Description (continued)

display legend		normal state	alarm state	fault state
COMBINER	FAULT			Combiner board must be replaced immediately.
PA 26V	OK	Power amplifier's 26 Vdc power input is between 22 V and 29 V.		
PA 26V	LO		Power amplifier's 26 Vdc power input is below 22 V.	
PA 26V	HI		Power amplifier's 26 Vdc power input is above 29 V.	
PA 13V	OK	Power amplifier's 13.5 Vdc power input is between 11 V and 15 V.		
PA 13V	LO		Power amplifier's 13.5 Vdc power input is below 11 V.	
PA 13V	HI		Power amplifier's 13.5 Vdc power input is above 15 V.	
PA 5V	OK	Power amplifier's internal 5 Vdc supply is between 4 V and 6 V.		
PA 5V	LO		Power amplifier's internal 5 Vdc supply is below 4 V.	
PA 5V	HI		Power amplifier's internal 5 Vdc supply is above 6 V.	
EXC 26V	OK	Exciter's 26 Vdc power input is between 22 V and 29 V.		
EXC 26V	LO		Exciter's 26 Vdc power input is below 22 V.	
EXC 26V	HI		Exciter's 26 Vdc power input is above 29 V.	
EXC 13.5V	OK	Exciter's internal 13.5 Vdc supply is between 11 V and 15 V.		
EXC 13.5V	LO		Exciter's internal 13.5 Vdc supply is below 11 V.	
EXC 13.5V	HI		Exciter's internal 13.5 Vdc supply is above 15 V.	
EXC 5V	OK	Exciter's internal 5 Vdc supply is between 4 V and 6 V.		

Table 10-1 TX Faults Legend Display Description (continued)

display legend		normal state	alarm state	fault state
EXC 5V	LO		Exciter's internal 5 Vdc supply is below 4 V.	
EXC 5V	HI		Exciter's internal 5 Vdc supply is above 6 V.	
TEMP	OK	Power amplifier's heat sink temperature below 85°C.		
TEMP	HI			Power amplifier's heatsink temperature above 85°C.
100KHZ LEVEL	OK	DSP's modulated 1st IF signal output is above 1 Vrms.		
100KHZ LEVEL	LO			DSP's modulated 1st IF signal output is below 1 Vrms.
10MHZ LEVEL	OK	10 MHz reference signal is above 1 Vrms.		
10MHZ LEVEL	LO			10 MHz reference signal is below 1 Vrms.
OSC WARM	OK	10 MHz oscillator is at operating temperature.		
OSC WARM	FAULT		10 MHz oscillator is below operating temperature in local control.	10 MHz oscillator is below operating temperature in remote control.
SYNTH1 LCK	OK	No. 1 stage VCO-1 carrier signal is phase locked.		
SYNTH1 LCK	FAULT			No. 1 stage VCO-1 carrier signal is not phase-locked.
SYNTH2 LCK	OK	No. 2 stage VCO-2 carrier signal is phase-locked.		
SYNTH2 LCK	FAULT			No. 2 stage VCO-2 carrier signal is not phase-locked.
SCI COMM	OK	Serial data link with VT-100 VDT has no overrun, framing, or lockup errors.		
SCI COMM	FAULT		Serial data link with VT-100 VDT has overrun, framing, or lockup error.	
SPI COMM	OK	Serial data link to synth-1 and synth-2 has no lockup error.		

Table 10-1 TX Faults Legend Display Description (continued)

display legend		normal state	alarm state	fault state
SPI COMM	FAULT			Serial data link to synth-1 and synth-2 has lockup error.
DSP COMM	OK	DSP responds to status requests.		
DSP COMM	FAULT			DSP unresponsive to status requests.
RAM	OK	No read/write errors by MCU's internal RAM.		
RAM	FAULT			Data read from MCU's internal RAM not same as written.
EEPROM	OK	No read/write errors by MCU's internal ROM.		
EEPROM	FAULT			Data read from MCU's internal ROM not same as written.
ROM	OK	No checksum errors by MCU's external ROM.		
ROM	FAULT			Calculated checksum from MCU's external ROM does not equal known checksum.
FWD CALIB	OK	Forward power has been calibrated.		
FWD CALIB	FAULT			Forward power has not been calibrated.
REF CALIB	OK	Reflected power has been calibrated.		
REF CALIB	FAULT			Reflected power has not been calibrated.
DSP ROM	OK	No checksum errors by DSP's external ROM.		
DSP ROM	FAULT			Calculated checksum from DSP's external ROM does not equal known checksum.

10.3.3 View Stored Fault Readings

10.3.3.1 View Readings At Fault

Refer to following diagram for initial steps of View Readings At Fault procedure.

```
┌──────────┐   ┌──────────┐   ┌──────────┐   ┌──────────┐   ┌──────────┐
│  MAIN    │   │  VIEW    │   │  VIEW    │   │  VIEW    │   │  VIEW    │
│  MENU    │   │  TX      │   │  FAULTS  │   │  STORED  │   │ READINGS │
│ (REMOTE  │───│  STATUS  │───│SELECTION │───│  FAULT   │───│ AT FAULT │
│ OR LOCAL)│   │          │   │          │   │ READINGS │   │          │
└──────────┘   └──────────┘   └──────────┘   └──────────┘   └──────────┘
```
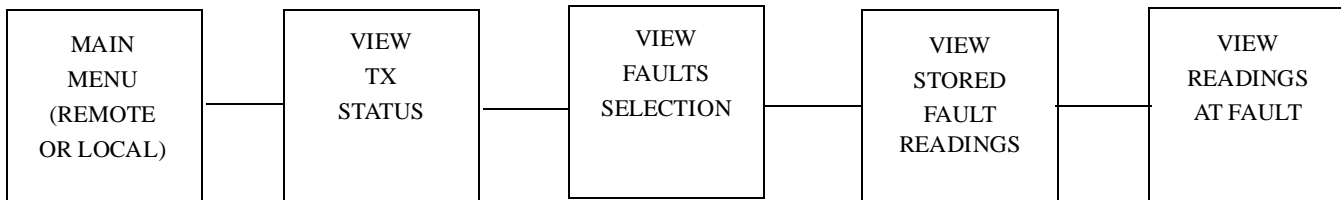
- This full screen displays fault readings in display areas. Instead of being continuously updated, STATUS, CURRENTS, and POWERS readings indicate saved values when first fault or alarm occurred during most recent key cycle. If no fault or alarm occurred, menu displays phrase THERE ARE NO TX FAULTS and fault readings are zero. Refer to Section 7 for a detailed description of all faults screens.

10.3.4 View/Reset DSP Faults

```
┌──────────┐   ┌──────────┐   ┌──────────┐   ┌──────────┐
│  MAIN    │   │  VIEW    │   │  VIEW    │   │VIEW/RESET│
│  MENU    │   │  TX      │   │  FAULTS  │   │DSP FAULTS│
│ (REMOTE  │───│  STATUS  │───│SELECTION │───│          │
│ OR LOCAL)│   │          │   │          │   │          │
└──────────┘   └──────────┘   └──────────┘   └──────────┘
```
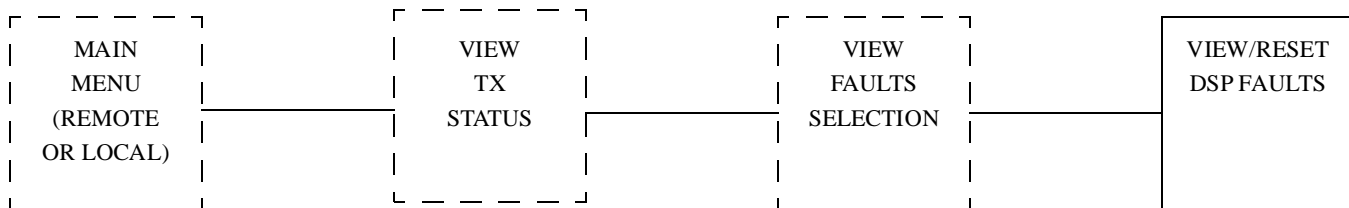
- Screen displays current number of DSP faults. Select option to reset DSP faults.

10.4 View All Tx Presets

Refer to following diagram for initial steps of View All Transmitter Presets full-screen displays procedure.

```
┌ ─ ─ ─ ─ ─ ─┐          ┌ ─ ─ ─ ─ ─┐          ┌──────────┐
│   MAIN     │          │   VIEW   │          │  VIEW    │
│   MENU     │          │   TX     │          │  ALL     │
│ (REMOTE    ├──────────┤  STATUS  ├──────────┤  TX      │
│ OR LOCAL)  │          │          │          │  PRESETS │
└ ─ ─ ─ ─ ─ ─┘          └ ─ ─ ─ ─ ─┘          └──────────┘
```
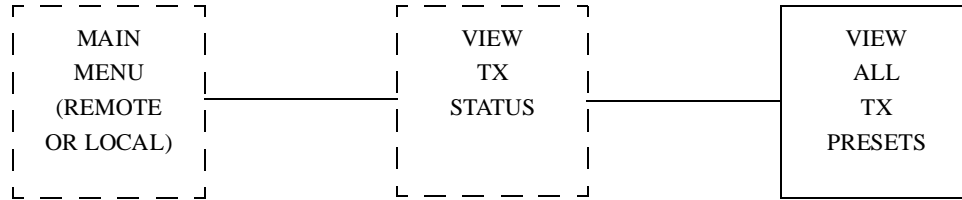
- Full screen displays presently selected transmitter parameters: frequency for each channel; mode deviation for each channel; mode offset for each channel; forward power for each channel; low power alarm for each channel; filter for each channel; analog deviation; analog limiter; analog polarity; digital polarity; audio response; and mode.

11   CALIBRATE FWD/REF PWR

Refer to following diagram for initial steps of Calibrate Forward/Reflected Power Procedure.

```
┌ ─ ─ ─ ─ ─ ─ ┐              ┌──────────────┐
│    MAIN     │              │  CALIBRATE   │
│    MENU     │              │   FWD/REF    │
│   LOCAL*    │──────────────│    PWR       │
│             │              │              │
└ ─ ─ ─ ─ ─ ─ ┘              └──────────────┘
```
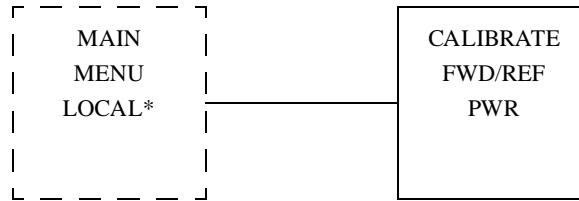
- Press option to CALIBRATE FWD PWR.

- Press option to CALIBRATE REF PWR.

11.1 CALIBRATE FWD PWR

Note

Output is at cabinet-mounted connector on 36 inch cabinet. On other cabinets, output is at isolator output.

Refer to following diagram for initial steps of Calibrate Forward Power procedure..

```
+-------------+        +-------------+      +-------------+
|    MAIN     |        |  CALIBRATE  |      |  CALIBRATE  |
|    MENU     |--------|   FWD/REF   |------|   FWD PWR   |
|   LOCAL*    |        |     PWR     |      |             |
+-------------+        +-------------+      +-------------+
```
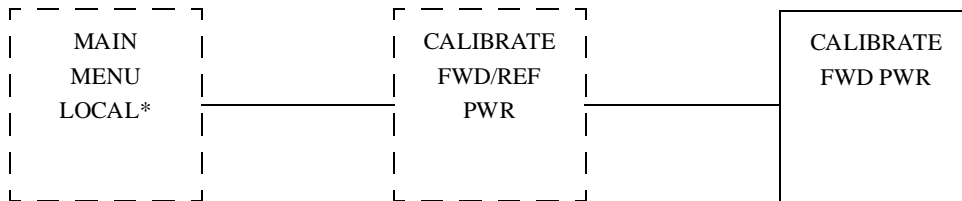
- Press K to unkey transmitter if transmitter is keyed.

- Connect wattmeter and dummy load to transmitter RF output.

- Press K on VDT keyboard to key transmitter.

- Press and hold U on VDT keyboard until wattmeter reads correct wattage if wattmeter reads below that wattage.

- Press and hold D on VDT keyboard until wattmeter reads correct wattage if wattmeter reads above that wattage.

- Press Enter on VDT keyboard when the wattmeter reads correct wattage.

- Press N on VDT keyboard if wattmeter does not read correct wattage. Go to step 5.

- Press Y on VDT keyboard if wattmeter does read correct wattage.

Caution

Wattmeter must read exactly correct wattage to ensure proper metering.

- Menu displays **TX CALIBRATED**. Press K on VDT keyboard to unkey transmitter.

- Disconnect wattmeter and dummy load; return transmitter to service.

Procedure is complete.

11.2 Calibrate Ref Pwr

Note

Output is at cabinet-mounted connector on 36 inch cabinet. On other cabinets, output is at isolator output. Before continuing, forward power calibration must have been completed.

Refer to following diagram for initial steps of Calibrate Reflected Power procedure.

```
┌─────────────┐      ┌─────────────┐      ┌─────────────┐
│    MAIN     │      │  CALIBRATE  │      │  CALIBRATE  │
│    MENU     │──────│   FWD/REF   │──────│   REF PWR   │
│   LOCAL*    │      │     PWR     │      │             │
└─────────────┘      └─────────────┘      └─────────────┘
```
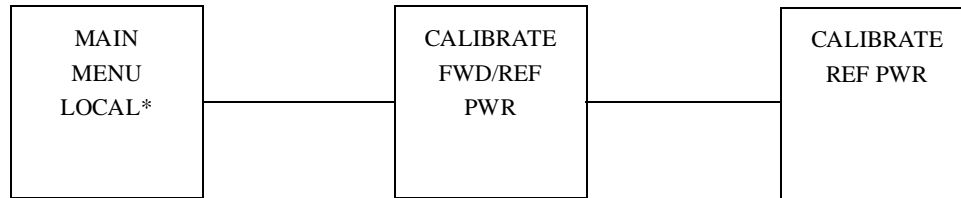
- Press Enter to continue.
- Disconnect PA RF output from load at a convenient point.
- Press Enter to continue.
- Automatic reflected power calibration has just occurred.
- Press Enter to continue.
- This procedure is finished.

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12 CHANGE MODE

Refer to following diagram for initial steps of Change Mode procedure

.

```
┌ ─ ─ ─ ─ ─ ┐          ┌──────────┐
│           │          │          │
│  MAIN     │          │ CHANGE   │
│  MENU     │──────────│ MODE     │
│  LOCAL*   │          │          │
│           │          │          │
│           │          └──────────┘
└ ─ ─ ─ ─ ─ ┘
```

- Press option to select analog mode if not already selected. Transmitter operating mode selection status changes to **MODE IS CURRENTLY ANALOG**.
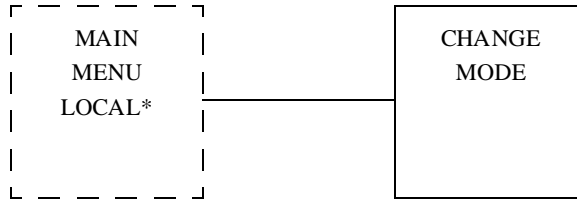
- Press option to select digital mode A if not already selected. Transmitter operating mode selection status changes to **MODE IS CURRENTLY MODE A**.

- Press option to select digital mode B if not already selected. Transmitter operating mode selection status changes to **MODE IS CURRENTLY MODE B**.

- Press option to select digital mode C if not already selected. Transmitter operating mode selection status changes to **MODE IS CURRENTLY MODE C.**

- Press option to select digital mode D if not already selected. Transmitter operating mode selection status changes to **MODE IS CURRENTLY MODE D.**
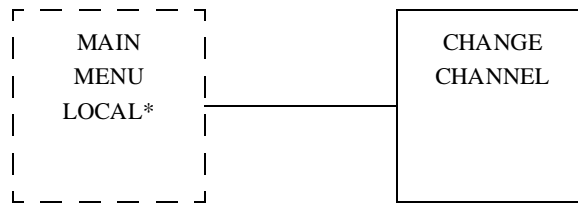
13 CHANGE CHANNEL

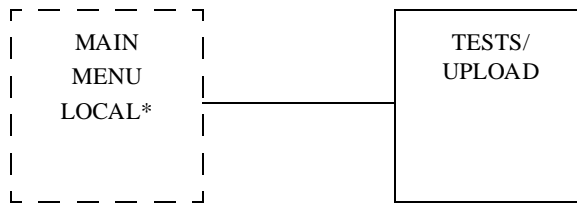Refer to following diagram for initial steps of Change Channel procedure.

```
┌ ─ ─ ─ ─ ─ ┐            ┌──────────────┐
│  MAIN     │            │   CHANGE     │
│  MENU     │            │   CHANNEL    │
│  LOCAL*   │────────────│              │
│           │            │              │
└ ─ ─ ─ ─ ─ ┘            └──────────────┘
```

- Press option to change channel and status indication to channel one.
- Press option to change channel and status indication to channel two.
- Press option to change channel and status indication to channel three.
- Press option to change channel and status indication to channel four.
- Press option to change channel and status indication to channel five.
- Press option to change channel and status indication to channel six.
- Press option to change channel and status indication to channel seven.
- Press option to change channel and status indication to channel eight.
- Press option to change channel and status indication to channel nine.
- Press option to change channel and status indication to channel ten.
- Press option to change channel and status indication to channel eleven.
- Press option to change channel and status indication to channel twelve.
- Press option to change channel and status indication to channel thirteen.
- Press option to change channel and status indication to channel fourteen.
- Press option to change channel and status indication to channel fifteen.
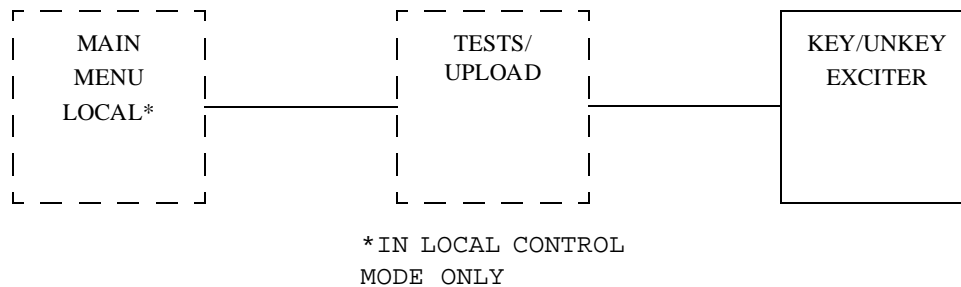- Press option to change channel and status indication to channel sixteen.

14 TESTS/UPLOAD

Refer to following diagram for initial steps of Tests/Upload procedure.

```
┌ ─ ─ ─ ─ ─ ┐           ┌───────────┐
│   MAIN    │           │  TESTS/   │
│   MENU    │───────────│  UPLOAD   │
│  LOCAL*   │           │           │
│           │           │           │
└ ─ ─ ─ ─ ─ ┘           └───────────┘
```

- Press option to **KEY/UNKEY EXCITER**

- Press option to initiate exciter front-panel LEDs test and display menu: **LEDS TEST**

- N/A

- Press option to **RESET EXCITER**

- Press option to initiate alarms test to see if alarms are reported correctly: **TEST ALARMS**

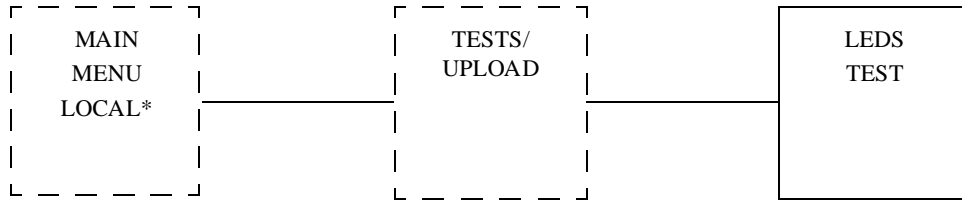- Press option to **UPDATE FIRMWARE**

14.1 Key/Unkey Exciter

Refer to following diagram for initial steps of Key/Unkey Exciter procedure.

```
┌ ─ ─ ─ ─ ─ ┐       ┌ ─ ─ ─ ─ ─ ┐       ┌───────────┐
│   MAIN    │       │  TESTS/   │       │ KEY/UNKEY │
│   MENU    │───────│  UPLOAD   │───────│  EXCITER  │
│  LOCAL*   │       │           │       │           │
│           │       │           │       │           │
└ ─ ─ ─ ─ ─ ┘       └ ─ ─ ─ ─ ─ ┘       └───────────┘

          *IN LOCAL CONTROL
          MODE ONLY
```

- Press option to key exciter internal keyline if transmitter is unkeyed. Exciter key state changes to **KEYED**. **KEY** LED on exciter front panel is illuminated. Any exciter keyline outputs or key reports are activated.

- Press option to unkey exciter internal keyline if exciter is keyed and AGC reference voltage is low (PA unkeyed). Exciter key state changes to UNKEYED. KEY LED on exciter front panel is extinguished. Any exciter keyline outputs or key reports are deactivated.

14.2 LEDs Test

Refer to following diagram for initial steps of LEDs Test procedure.

```
┌ ─ ─ ─ ─ ─ ─ ┐      ┌ ─ ─ ─ ─ ─ ─ ┐      ┌─────────────┐
│    MAIN     │      │   TESTS/    │      │    LEDS     │
│    MENU     │──────│   UPLOAD    │──────│    TEST     │
│   LOCAL*    │      │             │      │             │
└ ─ ─ ─ ─ ─ ─ ┘      └ ─ ─ ─ ─ ─ ─ ┘      └─────────────┘
```

- Observe that front-panel LEDs on exciter light as follows:
  All tested LEDs: light green except VSWR which lights red.
  FAULT/ALARM: lights red; flashes green; flashes red; returns to green.
  REMOTE LOCAL: toggles orange/green; returns to green.
  KEY: flashes green; returns to green.
  RF OUT/RF LOW: toggles orange/green; toggles orange/red; returns to green.
  VSWR: flashes red; returns to red.
  DIGITAL/ANALOG: toggles orange/green.

- All tested LEDs: return to original pretest color. Ignore DC POWER and MODULA-TION/LIMITING LEDs which are not tested during this procedure.

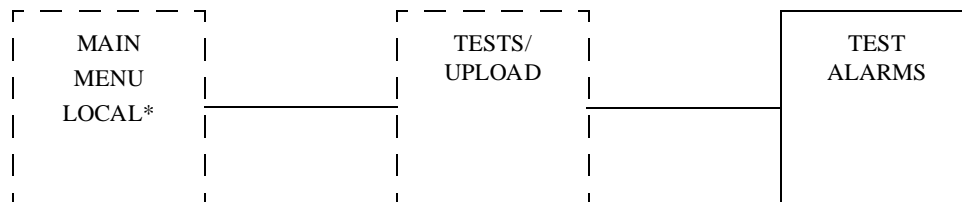- Return transmitter to service

Test is complete.

14.3 N/A

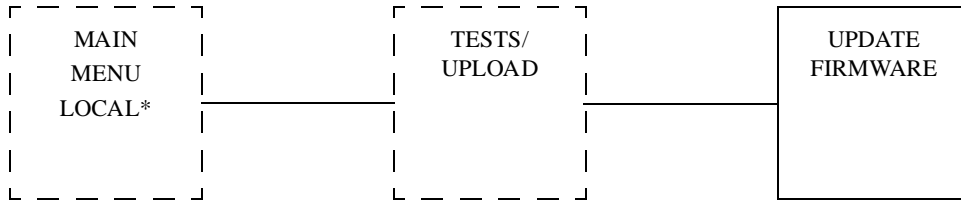## 14.4 Reset Exciter

Select to reset exciter.

14.5 Test Alarms

Refer to following diagram for initial steps of Test Alarms procedure.

```
┌ ─ ─ ─ ─ ─ ─ ┐       ┌ ─ ─ ─ ─ ─ ─ ┐       ┌─────────────┐
│    MAIN     │       │   TESTS/    │       │    TEST     │
│    MENU     │───────│   UPLOAD    │───────│   ALARMS    │
│   LOCAL*    │       │             │       │             │
└ ─ ─ ─ ─ ─ ─ ┘       └ ─ ─ ─ ─ ─ ─ ┘       └─────────────┘
```

- Press option to toggle **RF IN** fault on/off.
- Press option to toggle **PA DC LOW** fault on/off.
- Press option to toggle **PA SHTDWN** fault on/off.
- Press option to toggle **ISOLATOR** fault on/off
- N/A
- Press option to toggle **PA FLT** fault on/off.
- Press option to toggle **MOD IND** fault on/off.
- Press option to toggle **TEMP FLT** fault on/off

14.6 Update Firmware

Refer to following diagram for initial steps of Update Firmware Procedure.

```
+---------+        +---------+        +-----------+
| MAIN    |        | TESTS/  |        | UPDATE    |
| MENU    |--------| UPLOAD  |--------| FIRMWARE  |
| LOCAL*  |        |         |        |           |
+---------+        +---------+        +-----------+
```

Press enter to continue firmware ugrade.

- Place firmware update diskette in drive A or B.

- Press ALT-F5 to continue firmware update.

- Use filename. Example: a:\upload.asx.