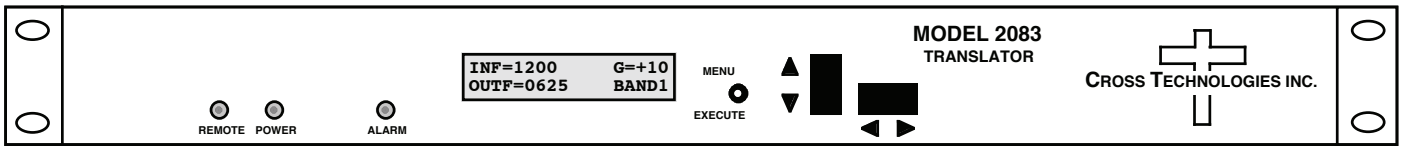
Instruction Manual

Model 2083-1622
L-Band Channel Translator

March 2010 - Rev. 0



When ordering parts from Cross Technologies, Inc., be sure to include the equipment model number, equipment serial number, and a description of the part.

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INSTRUCTION MANUAL

MODEL 2083-1622 Translator

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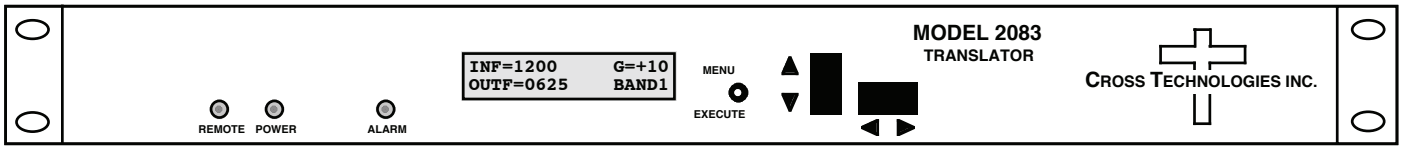
MODEL 2083-1622 L-Band Channel Translator

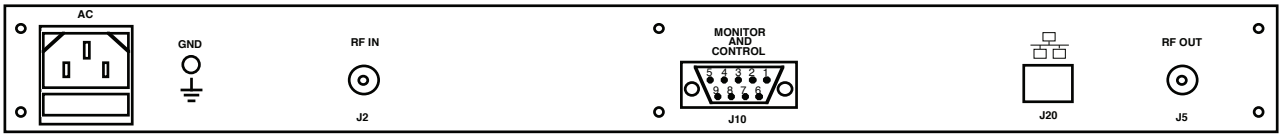
1.0 General

1.1 Equipment Description

2083-1622 L-Band Channel Translator - The 2083-1622 L-Band Channel Translator converts a 40 MHz channel in the 950-1650 MHz band to a 40 MHz channel in the 500-750 MHz or 1650-2150 MHz bands or switches (user selectable) the 950-1650 input band to the output with no spectrum inversion, low group delay and flat frequency response. The 950-1650 MHz input is mixed with synthesized local oscillator (LO) signals, first to 2400 MHz center frequency (±20 MHz) and finally to the 500-750 MHz or 1650-2150 MHz bands. A splitter on the input and a SPDT switch at the output allows switching the 950-1650 input to the output at a 0 to +20 Gain identical to where the translated channel gain is set at this time. Frequency translation or by-pass, and gain (0 to +20 dB, selectable in 1 dB steps) are selectable via either the multi-function push button switches or Remote M&C (RS232 or, optional, Ethernet). Settings appear on the LCD display. Front panel LEDs light when DC power is applied (green) or a PLL alarm occurs (red). Connectors are BNC female for RF input and output. The 2083-1622 Translator is housed in an 1 3/4" X 19" X 16" deep rack mount chassis.



FRONT PANEL



REAR PANEL

FIGURE 1.1 Front and Rear Panels

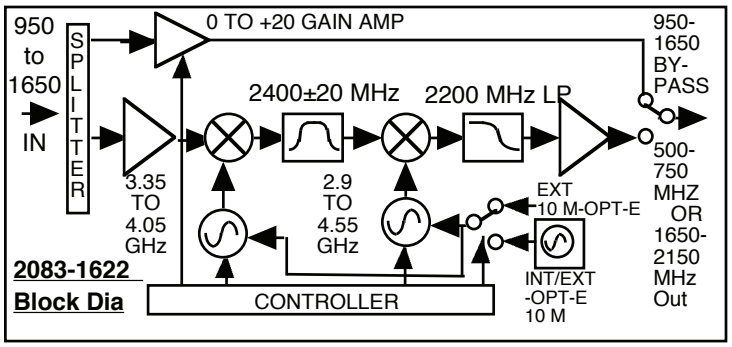


FIGURE 1.2 Block Diagram

1.2 Technical Characteristics

TABLE 1.0 2083-1622 Frequency Translator Specifications*

Input Characteristics

Input Impedance/RL	75 Ω /12 dB
Frequency,	950-1650 MHz
Input Level	-30 to -50 dBm
Input 1 dB compression	-20 dBm

Output Characteristics

Impedance/RL	75 Ω/12 dB
Output Level, Range	-20 to -40 dBm
Output 1 dB compression	-10 dBm
Frequency	a 40 MHz band in the 500-750 MHz or 1650-2150 MHz bands or input

Channel Characteristics

Gain	0 to +20 ± 1.5 dB, selectable in 1 dB steps
Frequency Response	± 1.5 dB, 500 MHz bandwidth; ± 1.0 dB, 40 MHz Band; <25 dBC, at ± 53 MHz
Spurious Response	<-40 dBC in band; <-40 dBC of the 950-1650 input band to the output
Group Delay, max	0.02 ns/MHz^2, parabolic, 0.04ns/MHz, linear, 1 ns ripple any 40 MHz BW
Frequency Sense	Non-inverting

Synthesizer Characteristics

Frequency Accuracy	± 1 ppm max over temp: (± 0.01 ppm is Option -H)
Frequency Step	1MHz (125 kHz is Option -X)
Reference	10 MHz Internal; Internal/External is Option -E

Phase Noise @ Freq	100 Hz	1kHz	10kHz	100kHz	1MHz
dBC/Hz	-65	-70	-80	-95	-110

Controls, Indicators

Frequency Translation	Pushbutton switches; setting on LCD display; Band or by-pass
Gain Selection	Pushbutton switches; setting shown on LCD display; Set to 0 to +20 dB
DC Power; PLL Alarm	Green LED; Red LED

Other

Connectors RF In & Out	BNC, female,75 ohm
Connector, Alarm	DB9 - NO or NC contact closure on Alarm
Size	19 inch standard chassis 1.75" high X 16.0" deep
Power	100-240 (±10%) VAC, 47-63 Hz, 30 watts max.

Options

-E	External 10 MHz reference In
- H	High Stability (± 0.01 ppm) internal referenct
- Q	High Stability (± 0.01 ppm) internal reference
-X	125 kHz frequency steps
-W8	Ethernet Interface
-W18	Ethernet Interface with SNMP
-R	Redundant Power Supplies
Connector options	See TABLE 2.2

*+10˚C to +40˚C; Specifications subject to change without notice

1.3 Monitor and Control Interface

A) Remote serial interface

Protocol: RS-232C, 9600 baud rate, no parity, 8 data bits, 1 start bit, and 1 stop bit.
(RS-232C, RS-422, or RS-485 - **option Q**)

Connector: Rear panel, DB-9 male

J10 Pinouts (RS-232C/422/485)	
Pin	Function
1	Rx-
2	Rx+ (RS-232C)
3	Tx+ (RS-232C)
4	Tx-
5	GND
6	Alarm Relay: Common
7	Alarm Relay: Normally Open
8	Not Used
9	Alarm Relay: Normally Closed

B) Status Requests - Table 1.1 lists the status requests for the 2083-1622 and briefly describes them.

*** PLEASE NOTE: The two character {aa}(00-31) prefix, in the table below, should be used ONLY when RS-485, (OPTION-Q), is selected.**

TABLE 1.1 2083-1622 Status Requests		
Command	Syntax *	Description
Input Frequency	{aaSI}	Returns {aaSIxxxx} where:
		xxxx = current input frequency (MHz)
Output Frequency, Band 1	{aaS1}	Returns {aaS1xxxx} where:
		xxxx= current output frequency setting for band 1 (MHz)
Output Frequency, Band 2	{aaS2}	Returns {aaS2xxxx} where:
		xxxx= current output frequency setting for band 2 (MHz)
Band	{aaSB}	Returns {aaSBx} where:
		x = the currently selected band (1 or 2)
Gain	{aaSG}	Returns {aaSGxx} where:
		xx = current gain setting (0 to +20db)
Bypass	{aaSX}	Returns {aaSXy} where:
		y = current state of bypass switch (0=off; 1=on)
Alarm	{aaSA}	Returns {aaSAx} where:
		x = current state of summary alarm (0=no alarm; 1=alarm)
Unit ID	{aaSU}	Returns {aaSUxxxxxxxxxxxxxxxx} where:
		x..x = textual nomenclature to help indentify the unit
		(up to 16 characters in length)
IP Address (option W8, W18)	{aaSi}	Returns {aaSixxx.xxx.xxx.xxx} where:
		xxx.xxx.xxx.xxx. = current IP address setting of the unit

C) Commands

Table 1.2 lists the commands for the 2083-1622 and briefly describes them. After a command is sent the 2083 sends a return ">" indicating the command has been received and executed.

General Command Format - The general command format is {CND...}, where:

{ = start byte
C = 1 character, either C (command) or S (status)
N = 1 character command or status request
D = 1 character or more of data (depends on command)
} = stop byte

*** PLEASE NOTE: The two character {aa}(00-31) prefix, in the table below, should be used ONLY when RS-485, (OPTION-Q), is selected.**

Table 1.2 2083-1622 Commands		
Command	**Syntax***	**Description**
Input Frequency	{aaCIxxxx}	Sets the current input frequency (MHz) to the value xxxx.
		Range: 0950 - 1650
Output Frequency, Band 1	{aaC1xxxx}	Sets the current output frequency (MHz)
		for band 1 to the value xxxx.
		Range: 0500 - 0700
Output Frequency, Band 2	{aaC2xxxx}	Sets the current output frequency (MHz)
		for band 2 to the value xxxx.
		Range: 1650 - 2150
Band	{aaCBx}	Sets the currently selected output band to x (1 or 2)
Gain	{aaCGxx}	Sets the current gain to xx (0 to +20db).
Bypass	{aaCXy}	Sets the bypass switch off (y = 0) or on (y = 1).
Unit ID	{aaCUx..x}	Sets the unit's textual indetification to x..x.
		(up to 16 characters in length)

2.0 Installation

2.1 Mechanical

The 2083-1622 consists of one RF/Controller PCB housed in a 1 RU (1 3/4 inch high) by 16 inch deep chassis. A switching, ± 12, +24, +5 VDC power supply provides power for the assemblies. The 2083-1622 can be secured to a rack using the 4 holes on the front panel. Figure 2.0 shows how the 2083-1622 is assembled.

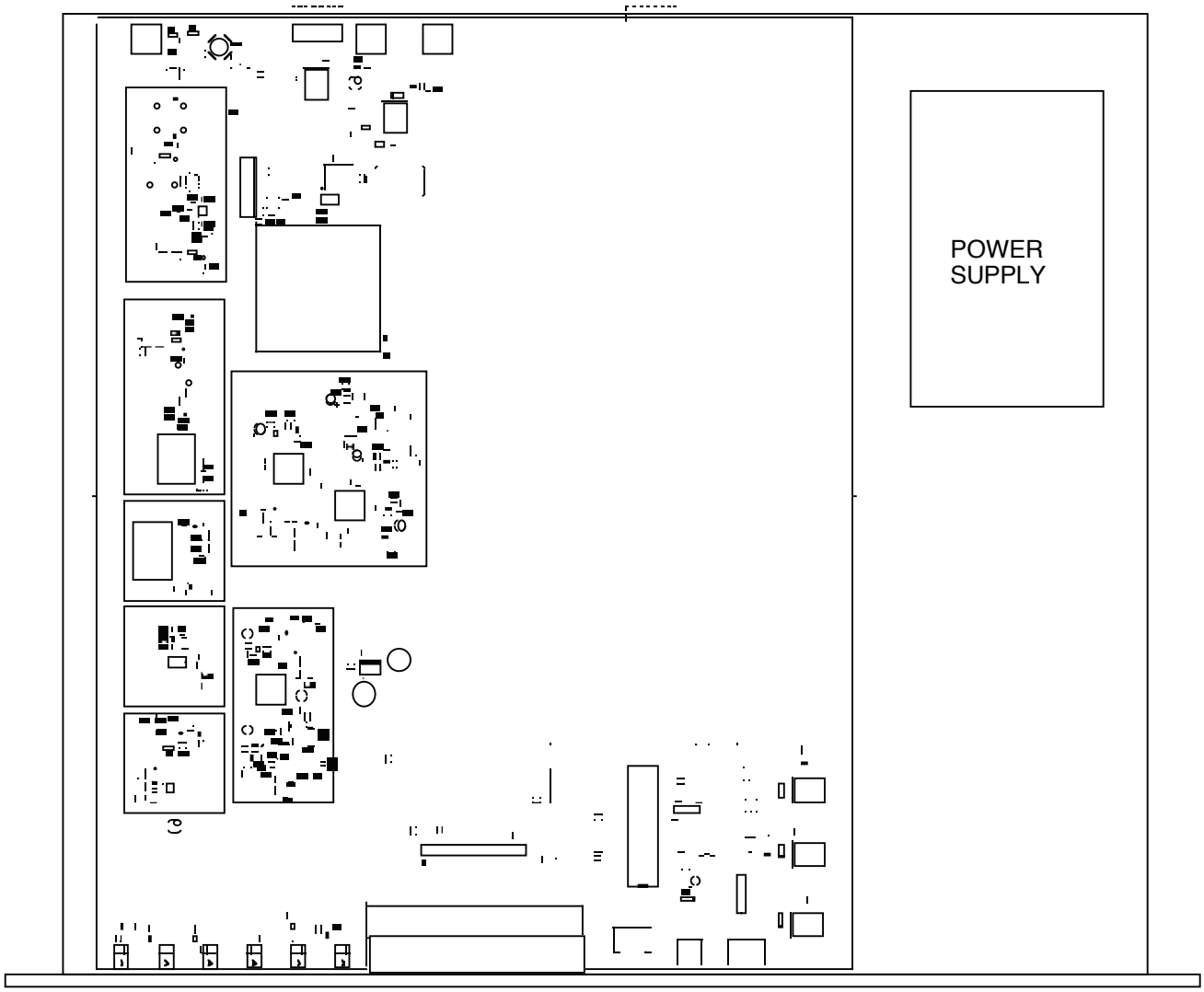


FIGURE 2.0 2083-1622 Mechanical Assembly

2.2 Rear Panel Input/Output Signals

Figure 2.1 shows the input and output connectors on the rear panel.

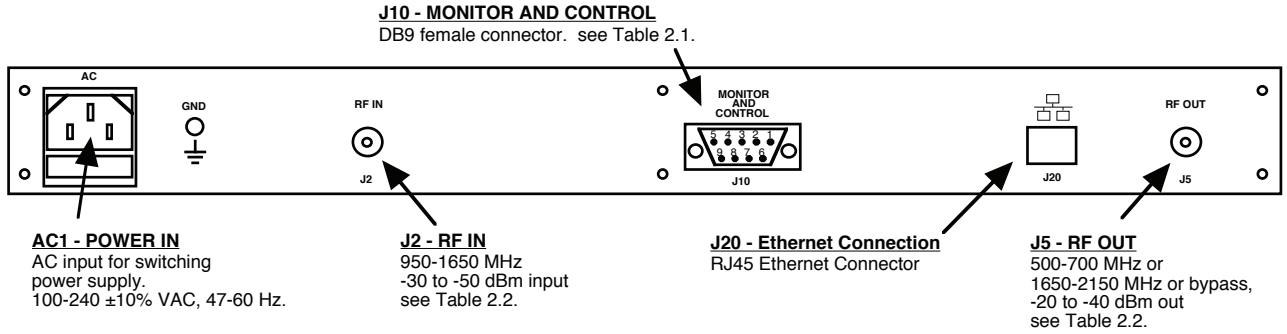


FIGURE 2.1 2083-1622 Rear Panel I/O's

TABLE 2.1 J10 Pinouts*	
Pin	Function
1	Rx-
2	Rx+ (RS-232C)
3	Tx+ (RS-232C)
4	Tx-
5	GND
6	Alarm Relay: Common
7	Alarm Relay: Normally Open
8	Not Used
9	Alarm Relay: Normally Closed

TABLE 2.2 Input/Output Connector Options		
Option	Input	Output
STD	BNC, 75Ω	BNC, 75Ω
D	BNC, 50Ω	BNC, 50Ω
F	F-type, 75Ω	F-type, 75Ω

***Remote Serial Interface**

Interface: DB-9 Male
Protocol: RS-232C (RS-232C/422/485, **option Q**), 9600 baud rate, no parity, 8 data bits, 1 start bit, 1 stop bit.

2.3 Front Panel Controls and Indicators

Figure 2.2 shows the front panel controls and indicators.

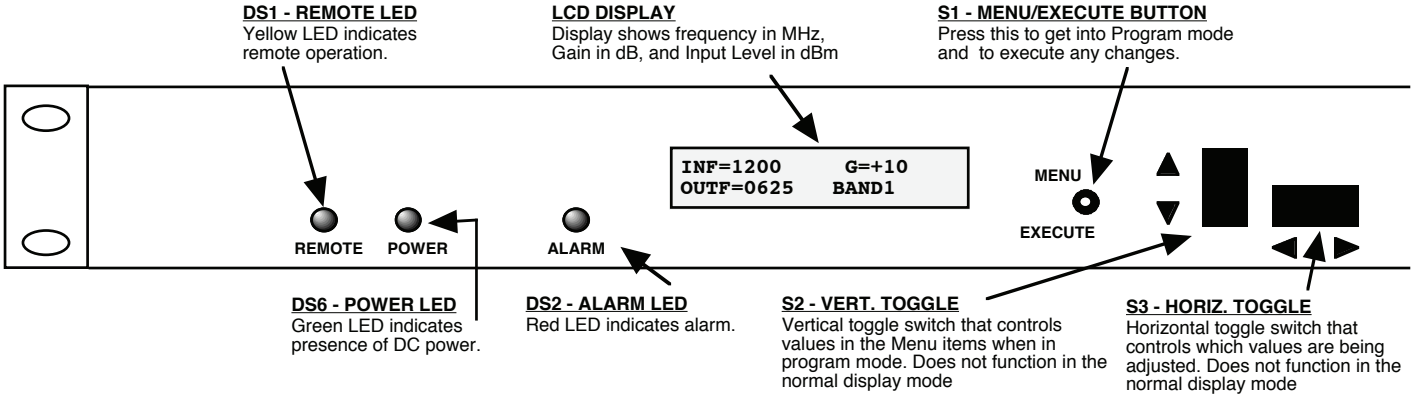


FIGURE 2.2 2083-1622 Front Panel Controls and Indicators

2.4 Installation / Operation

2.4.1 Installing and Operating the 2083-1622, Frequency Translator Section

1. Connect a -30 dBm to -50 dBm signal to IN, J4 (Figure 2.1)
2. Connect the OUT, J5, to the external equipment
3. Connect 100-240 ±10% VAC, 47 - 63 Hz to AC connector on the back panel.
4. Set the desired output frequency band (See Section 2.5 Menu Settings).
5. Set the gain for 0 to +20 dB. Make sure the output stays within -20 to -40 dBm with the gain selected and the input level provided.
6. Be sure DS6 (green, DC Power) is on and DS2 (red, Alarm) is off (Figure 2.2).
7. AC Fuse - The fuse is a 5 mm X 20 mm, 2 amp slow blow (Type T) and is inserted in the far slot in the drawer below the AC input as shown in Figure 2.3. There is a spare fuse in the near slot.
   If a fuse continues to open, the power supply is most likely defective.

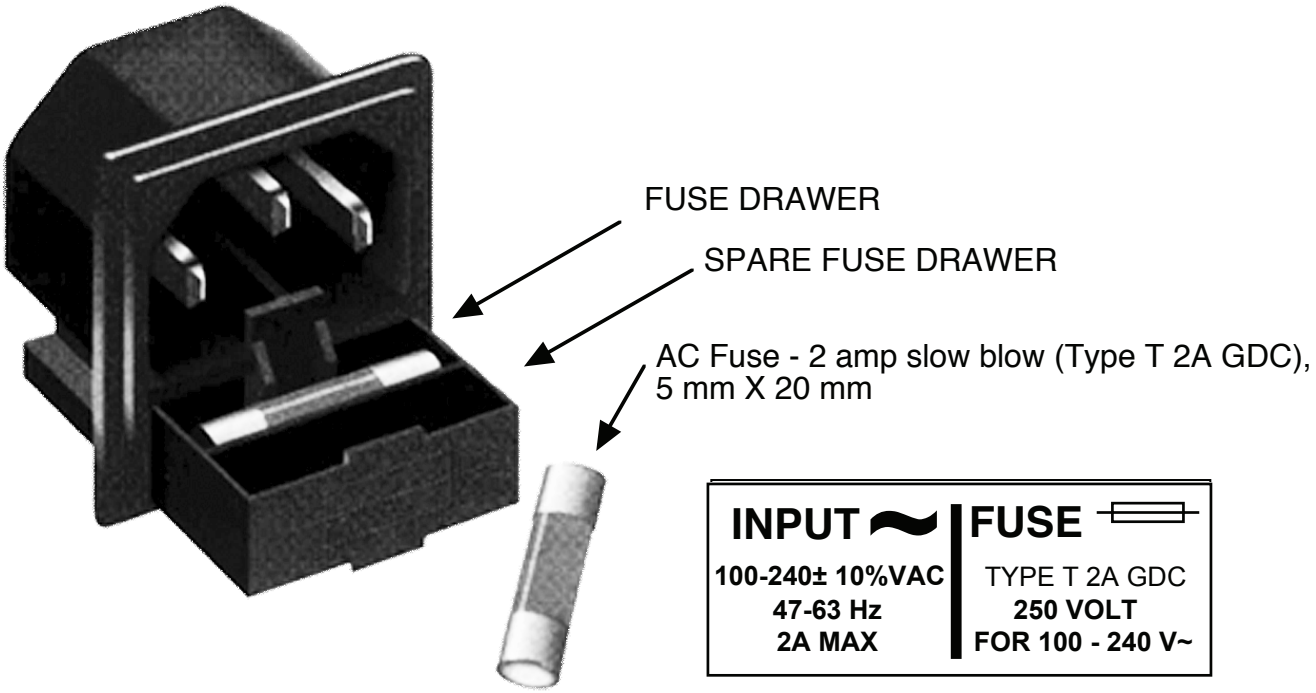


FIGURE 2.3 Fuse Location and Spare Fuse

2.5 Menu Settings

2.5.1 Functions

This section describes operation of the front panel controls. There are three operator switches, the LCD display and alarm indicator LEDs. All functions for the equipment are controlled by these components. The functions are (see Figure 2.4):

Power Up
Normal Display

Menu 1	Input Frequency (950-1650 MHz)
Menu 2	Output Band (Band 1 = 500-700 MHz) (Band 2 = 1650-2150 MHz)
Menu 3	Output Frequency
Menu 4	Gain (0 to +20 ±1.5 dB, 1 dB steps)
Menu 5	Bypass (ON or OFF)
Menu 6	Remote (ON or OFF)
Menu 7	Interface (RS232, Ethernet (option W8, W18), RS422, RS485 (option Q)
Menu 7a	Set RS485 address (option -Q)
Menu 8	Save Settings

Save Menu When "R" is selected in any above menu, or when the end is reached (after Menu 8)

Alarm indications appear on the LEDs (see Figure 2.2).

All program changes must start with the operation of the Menu/Execute switch and must also end with the operation of the Menu/Execute switch verified by the "Save Settings?" Menu. If this sequence is not followed, none of the changes will take effect. If programming is initiated and no operator action takes place for approximately 12 seconds (before the final press of the Menu/Execute switch) the display will revert to its previous status and you will need to start over.

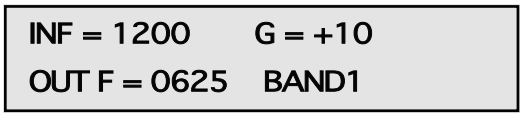
2.5.2. Power On Settings

NOTE: THE LAST STATUS OF A UNIT IS RETAINED EVEN WHEN POWER IS REMOVED. WHEN POWER IS RESTORED, THE UNIT WILL RETURN TO IT'S PREVIOUS SETTINGS.

When power is first applied, the LCD display goes through three steps.

1. The LCD goes black to show all segments are functioning.
2. The software version will be displayed.

3. The present frequency and gain of the upconverter is shown.



The unit is now operational and ready for any changes the operator may desire.

2.5.3 Control Switches

1. Menu/Execute - Any change to the programming of the unit must be initiated by pressing the Menu/Execute switch and completed by pressing the Menu/Execute switch.
2. Horizontal Switch - This switch is mounted so its movement is horizontal and moves the cursor left or right.
3. Vertical Switch - This switch is mounted so its movement is vertical and has two functions:
   a. During frequency , gain changes, the vertical movement will raise or lower the number in the direction of the arrows.
   b. For other functions such Remote on/off, the vertical switch will alternately turn the function on or off regardless of the direction operated.

2.5.4 Gain Changes

When you get to this menu note that the gain changes will be made as you make them but if you do not wish to save the changes you have made, scroll to **"R"** and push the menu/Execute switch and select **"NO"** in the **"SAVE SETTINGS?"** window or **do not press the Menu/Execute switch**; simply do nothing for approximately 12 seconds, and the system will return to the normal operating mode.

NOTE: CHANGES TAKE PLACE ON LEVEL AND GAIN IMMEDIATELY BUT DO NOT GET SAVED UNTIL YOU GO TO THE SAVE MENU AND INDICATE YOU WANT TO SAVE THE CHANGES.

Press the Up/Down switch to change the level in 1 dB steps and then push the Menu/Execute switch to get to the Gain setting:

G= +10 R

Pressing the Up/Down switch to change the gain in 1 or 10 dB steps and then push the Menu/Execute switch to get to the Gain setting:

G= +10 R

By using the horizontal rocker switch the cursor can be moved left or right.

G= +10 R

Pressing the Up/Down switch down will toggle the display digit selected until you have the desired gain.

NOTE: THE GAIN WILL BE CHANGED AS YOU ADJUST THE NUMBERS. HOWEVER, THE VALUE WILL NOT BE STORED UNTIL YOU INDICATE YES IN THE SAVE SETTINGS WINDOW. DO NOT SET A GAIN THAT WOULD EXCEED 0 dBm OR HAVE LESS THAN -30 dBm OUTPUT LEVEL. THE FIRMWARE PREVENTS YOU FROM THIS.

When the display indicates the value desired you can push the Menu/Execute switch to the next item OR you can scroll to "R", push the Menu/Execute switch to get to:

SAVE SETTINGS? Y N

Selecting **Y** will save the new settings. Selecting **N** will revert to the previous settings.

Figure 2.4 gives the menu items and how to make changes

2.5.5 Alarm Indications

An alarm condition for will occur if any local oscillator phase lock loop (PLL) comes out of lock.
The Mute LED will light if you select Mute and the Remote LED will light when you select the Remote mode.

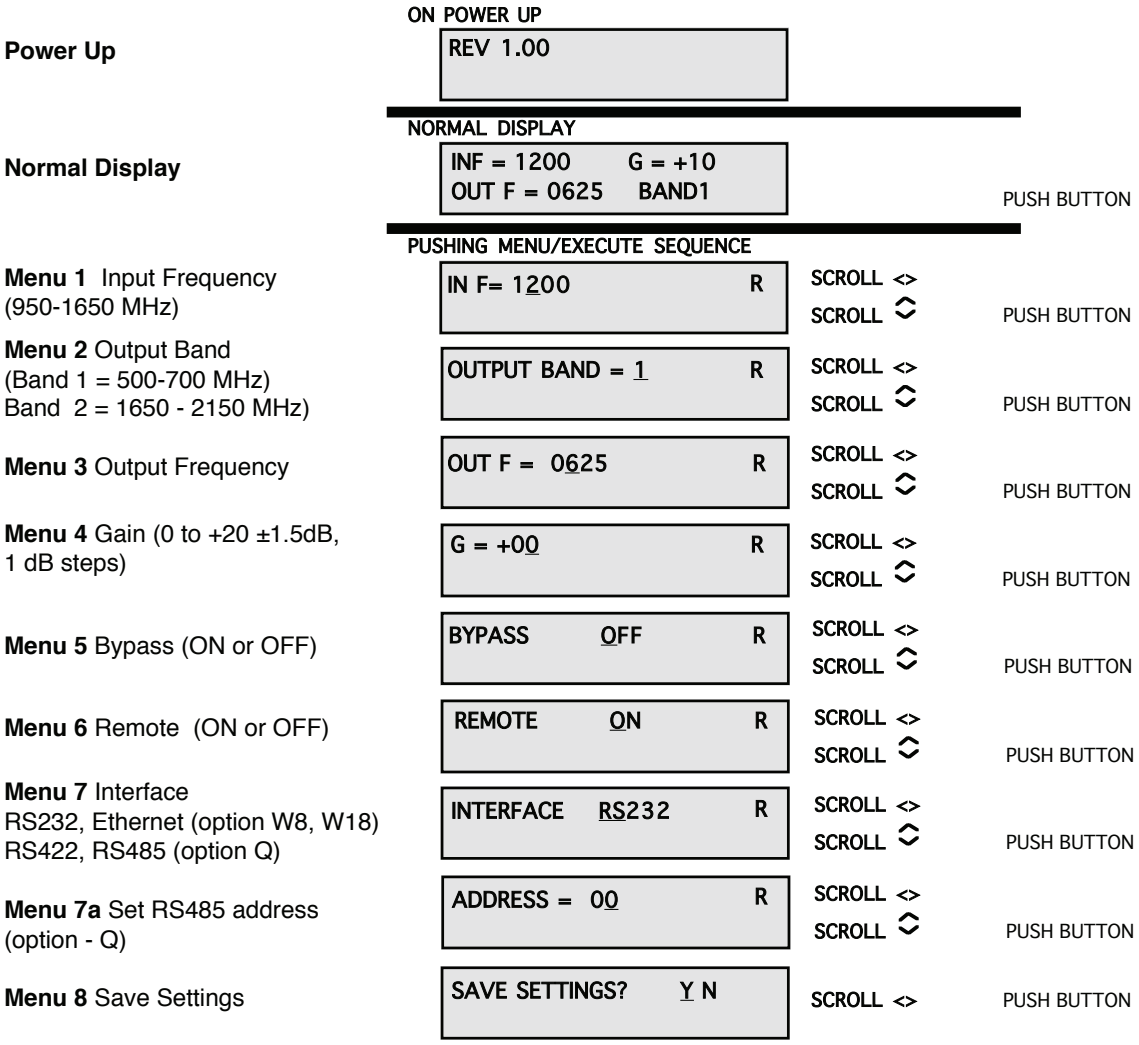


FIGURE 2.4 Menu Display and Sequences

3.0 Environmental Use Information

A. **Rack-Mounting** - To mount this equipment in a rack, please refer to the installation instructions located in the user manual furnished by the manufacturer of your equipment rack.

B. Mechanical loading - Mounting of equipment in a rack should be such that a hazardous condition does not exist due to uneven weight distribution.

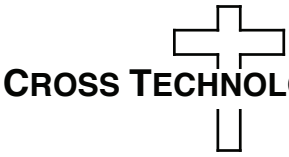
C. **Elevated operating ambient temperature** - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack may be greater than room ambient temperature. Therefore, consideration should be given to Tmra.

D. Reduced air flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised. Additional space between unit may be required.

E. Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits could have on over current protection and supply wiring. Appropriate consideration of equipment name plate rating should be used, when addressing this concern.

F. Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connection to the Branch (use of power strips).

G. Top Cover - There are no serviceable parts inside the product so, the Top Cover should not be removed. If the Top Cover is removed the ground strap and associated screw MUST BE REINSTALLED prior to Top Cover screw replacement. FAILURE TO DO this may cause INGRESS and/or EGRESS emission problems.



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