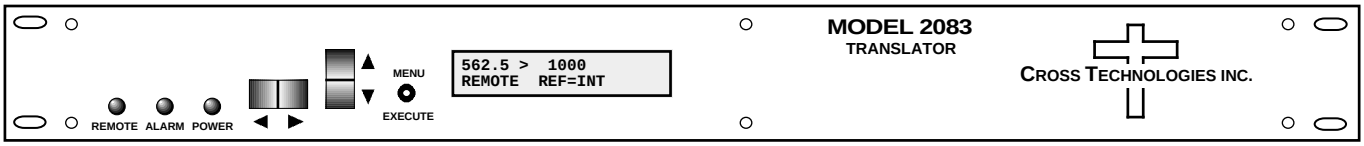
Instruction Manual

Model 2083-910

Block Translator

July 2012, 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 2083-910 Block Translator

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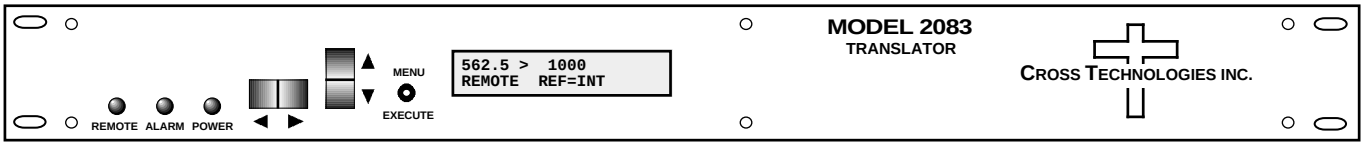
MODEL 2083-910 Block Translator

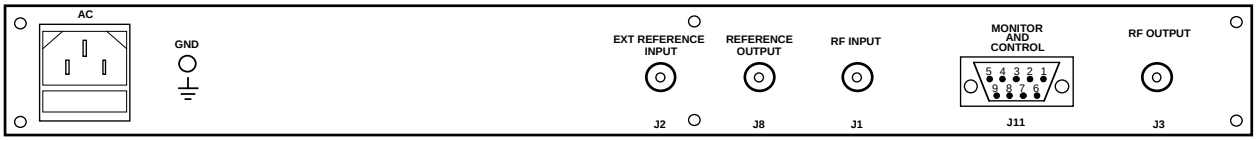
1.0 General

1.1 Equipment Description

2083-910 Block Translator - The 2083-910 Block Translator converts a 562.5 ± 150 MHz or 900 ± 240 MHz bandwidth block to 1000 ± 240 MHz block with no spectrum inversion, low group delay and flat frequency response. The 562.5 or 900 MHz block input is translated to the 1000 MHz block output using dual conversion. The gain is fixed at +10 dB. The selected input band appears on the LCD display and can be selected by the front panel multi-function switches or remotely by external TTL level signals via pins on the DB9 Monitor and Control Connector. Front panel LEDs provide indication of DC power (green), PLL alarm (red), and remote operation (yellow). Connectors are 50 ohm BNC female for RF input and output. The unit is powered by a 100-240 ±10% VAC, 47-63 HZ input power supply and housed in a 1 3/4" X 19" X 16" rack mount chassis.

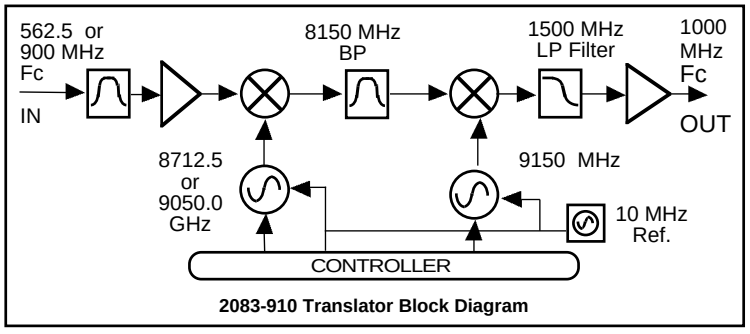


Front Panel - 2083-910



Rear Panel

FIGURE 1.1 2083-910 Front and Rear Panels



2083-910 Translator Block Diagram

FIGURE 1.2 2083-910 Block Diagram

1.2 Technical Characteristics

TABLE 1.0 2083-910 Block Translator Specifications**	
Input Characteristics	
Input Impedance/RL	50Ω / 12 dB
Frequency	562.5 ±150 MHz or 900 ±240 MHz Selectable
Input Composite Level	-10 to -60 dBm
Input, max. no damage	+15 dBm
Output Characteristics	
Impedance/RL	50Ω / 12 dB
Frequency	1000 ± 240 MHz
Output Composite Level	0 to -50 dBm
Output 1 dB Compression	+10 dBm
Channel Characteristics	
Gain	+10 dBm, ±2 dB
Frequency Response	±2.0 dB, 500 MHz bandwidth; ±0.5 dB, 40 MHz increment
Spurious, Inband	< -45 dBc in band, signal dependent or independent; 0.76 - 1.24 GHz out (See NOTE 1* Below)
Spurious, Out of Band	< -50 dBC, 0.2 - 0.75 and 1.25 - 2.0 GHz out (See NOTE 1* Below)
Spurious, Feed Through	< -50 dBC, 0.4 - 1.15 GHz feed through rejection (See NOTE 1* Below)
Group Delay, max.	0.015 ns/MHz^2; parabolic, 0.03ns/MHz, linear,1 ns ripple, any 40 MHz BW
Frequency Sense	Non-inverting
	*__NOTE 1__: decreases db for db below -40 dBm in; 20 dB worse at -60 dBm in
Synthesizer Characteristics	
Frequency Accuracy	±0.01 ppm
Reference	10 MHz Internal (External is Option -E)
Frequency Step	None, Fixed Translations

Phase Noise @ Frequency	100 MHz	1kHz	10kHz	100kHz	1MHz
dBC/Hz	-60	-70	-80	-90	-100

Controls, Indicators	
Frequency Translation	Direct readout LCD; manual or remote selection
Power, Alarm, Remote	Green LED; Red LED, Yellow LED
Remote	RS232C, 9600 Baud; TTL Selection for Band 1, Band 2
Other	
RF In/RF Out Connector	BNC (female), 50Ω
Alarm/Remote Connector	DB9 (female); No or NC contact closure on Alarm; TTL Selection for Band 1, Band 2
Size	19 inch Standard Chassis 1.75” high x 16.0” deep
Power	100-240 ±10% VAC, 47- 63 Hz, 30 watts max.
Available Options	
E -	External 10 MHz Reference Input and Output
M&C Interface	RS232 Standard
W8 -	Ethernet M&C Web Browser Interface
W18 -	Ethernet M&C Web Browser Interface & SNMP
Connector Options	See Table 2.2 (PG 9)
**+10˚C to +40˚C; Specifications subject to change without notice	**Cross Technologies, Inc., 2012**

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.

Connector: Rear panel, DB-9 male

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

B) <u>Status Requests</u> - Table 1.1 lists the status requests for the 2083-910 and briefly describes them.

TABLE 1.1 2083-910 Status Requests		
Command	**Syntax ***	**Description**
Input Band	{SB}	Returns {SBx} where:
		• x = 1 if input band 1 (562.5 MHz is selected)
		• x = 2 if input band 2 (900 MHz is selected)
Mode	{SM}	Returns {SMx} where:
		• x = 0 if TTL Mode
		• x = 1 if Remote Mode
		• x = 0 if Local Mode
Alarm Status	{SA}	Returns {SAxyz} where:
		• x = 1 if PLL-1 is alarmed, 0 if normal
		• y = 1 if PLL-2 is alarmed, 0 if normal
		• z = 1 if summary alarm, 0 if no alarm
Model Number & Rev.	{SV}	Returns {SV2083-910x.xx} or {SV2083-228x.xx} where:
		• x.xx is the unit's firmware version.
Option E:		
10 MHz Reference Mode	{SE}	Returns {SEx} where:
		• x = 0 if Internal Reference Mode is selected
		• x = 1 if External Reference Mode is selected
		• x = 2 if Auto Reference Mode is selected
10 MHz Reference Status	{SI}	Returns {SIx} where:
		• x = 0 if Internal Reference is active
		• x = 1 if External Reference is active

C) Commands

Table 1.2 lists the commands for the 2083-910 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

Table 1.2 2083-910 Commands

Command	Syntax*	Description
Set Input Band	{CBx}	where :
		• x = 1 to select input band 1 (562.5 MHz)
		• x = 2 to select input band 2 (900.0 MHz)
Set Remote On	#	Just # sign
Set Remote Off	{CR0}	
Option E:		
Set 10 MHz Reference Mode	{CEx}	where :
		• x = 0 to Select Internal Reference Mode
		• x = 1 to Select External Reference Mode
		• x = 2 to Select Auto Reference Mode

2.0 Installation

2.1 Mechanical

The 2083-910 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 2083-910 can be secured to a rack using the 4 holes on the front panel. Figure 2.0 shows how the 2083-910 is assembled.

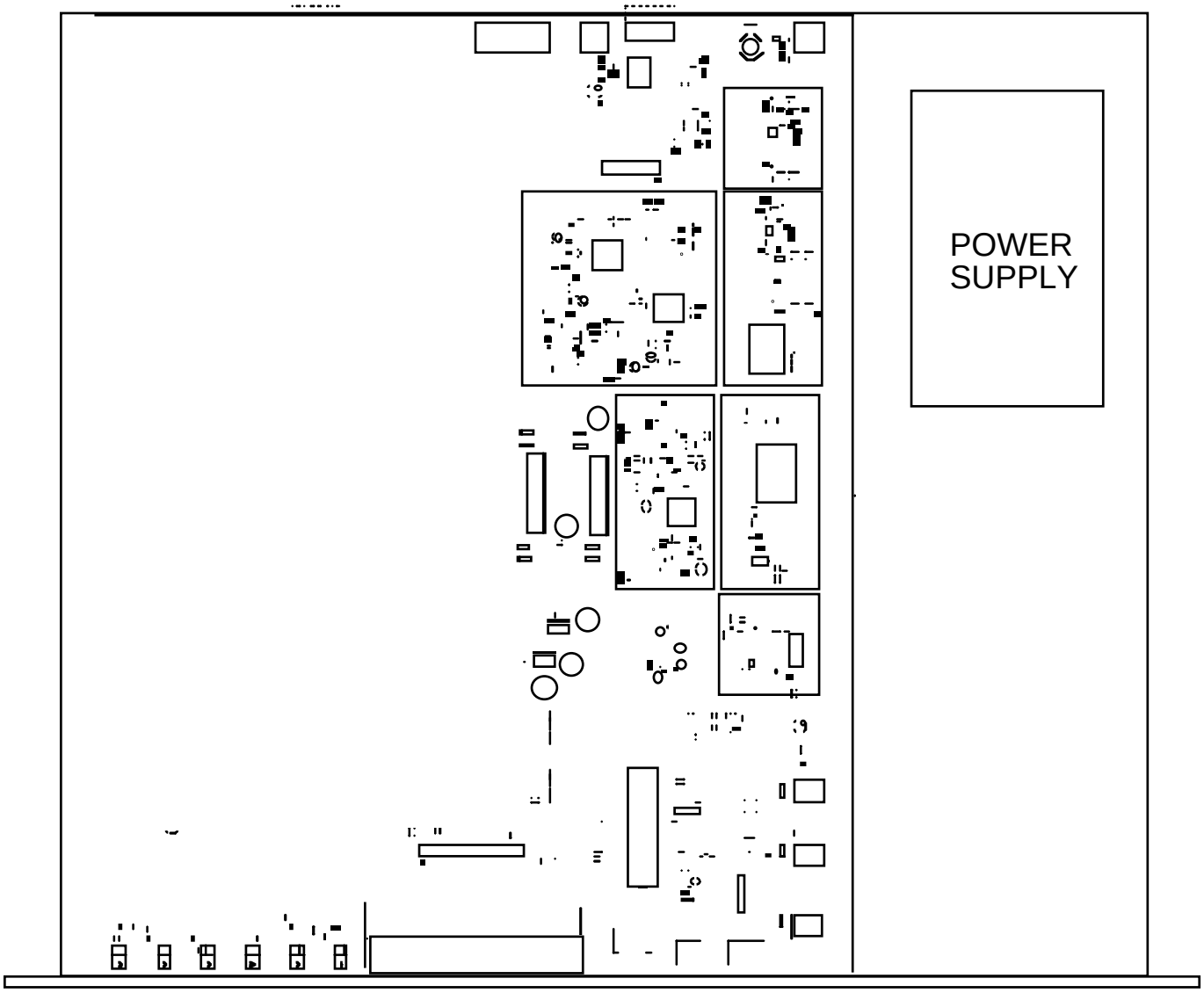


FIGURE 2.0 2083-910 Mechanical Assembly

2.2 Rear Panel Input/Output Signals

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

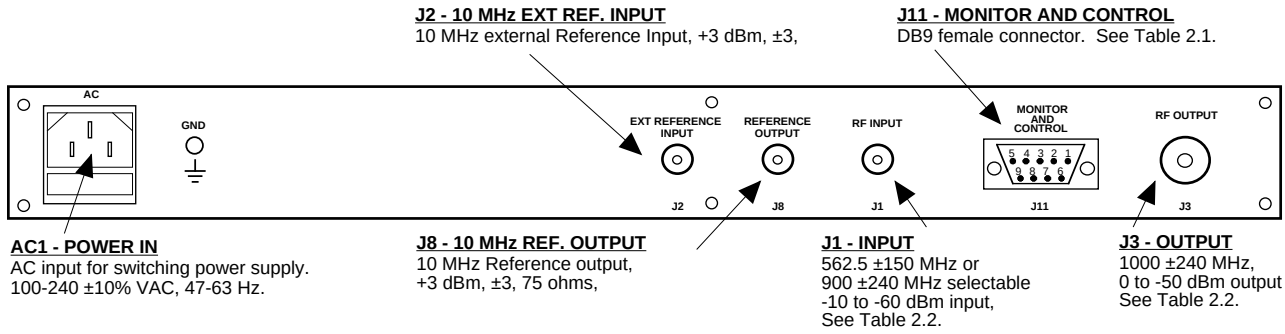


FIGURE 2.1 2083-910 Rear Panel I/O's

TABLE 2.1 J10 Pinouts*

Pin	Function
1	TTL Select Band 1
2	Rx+ (RS-232C)
3	Tx+ (RS-232C)
4	TTL Select Band 2
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
B	75Ω BNC (RF In)	75Ω BNC (RF Out)

***Remote Serial Interface**

Interface: DB-9 Male Protocol: 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.

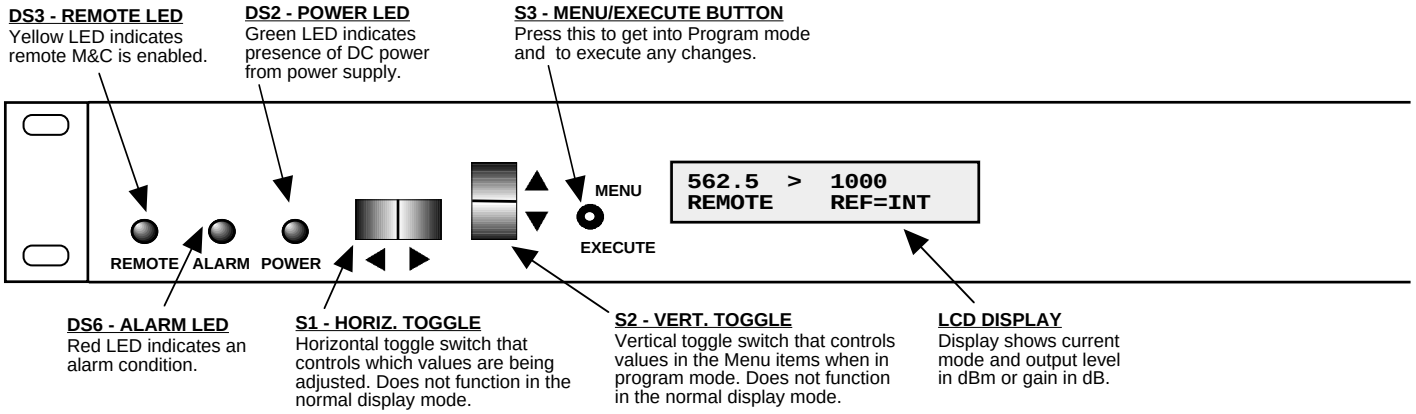


FIGURE 2.2 2083-910 Front Panel Controls and Indicators

2.4 Installation / Operation

2.4.1 Installing and Operating the 2083-910, Frequency Translator Section

1. Connect a -10 dBm to -60 dBm signal to RF IN, J1 (Figure 2.1)
2. Connect the RF OUT, J3, to the external equipment
3. Connect 100-240 ±10% VAC, 47 - 63 Hz to AC connector on the back panel.
4. Set the input band to the desired value.
5. Be sure DS6 (green, DC Power) is on and DS2 (red, Alarm) is off (Figure 2.2).
6. 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.

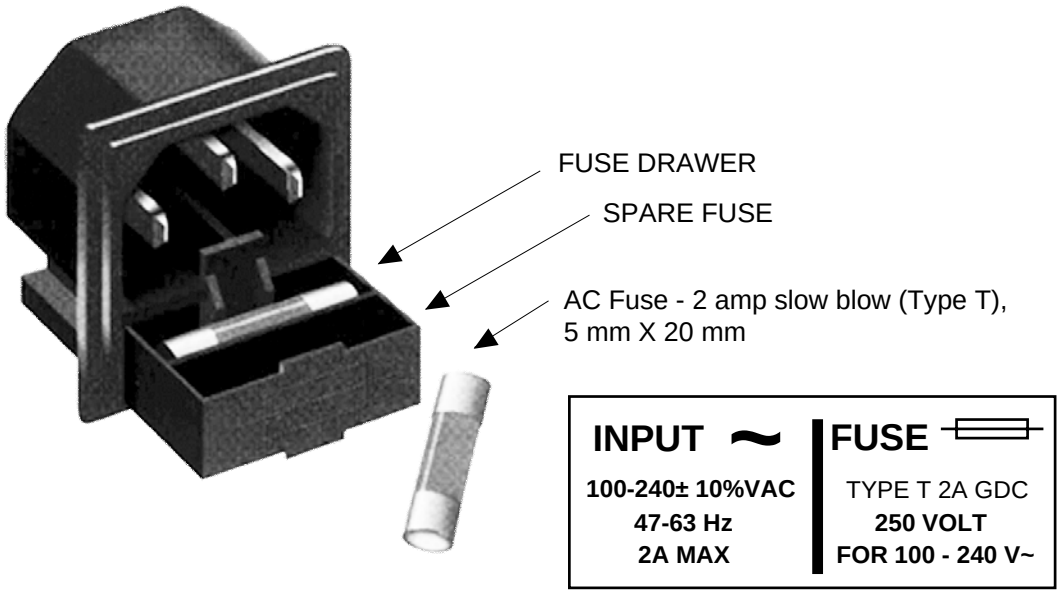


FIGURE 2.3 Fuse Location and Spare Fuse

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 Band
Menu 2 Set 10 MHz Reference Mode (Option E only)
Menu 3 Set Remote

Save Menu When "R" is selected from any above menu or at the end.

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 30 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.

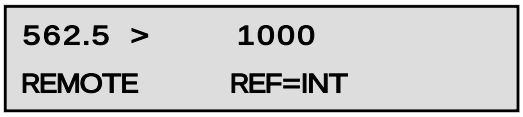
2.5.2. Power On Settings

NOTE: THE LAST OPERATING PARAMETERS OF A UNIT ARE 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 Model and Software version will be displayed.

3. The present frequency and mode of the translator 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 display cursor left or right.
3. Vertical Switch - This switch is mounted so its movement is vertical and has two functions:
   a. During 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 Alarm Indications

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

2.5.5 10 MHz Reference Mode Operation

Internal Mode: The unit uses its own built-in 10 MHz OCXO. The Internal Reference is present on the Reference Output Connector, J8. REF = INT appears on the front panel display.

External Mode: The unit uses a 10 MHz Reference that is connected to the External Reference Input, J2. REF = EXT appears on the front panel display. The External 10 MHz Reference level must be +3dBm, ±3dB. If the External 10 MHz signal does not meet the unit's specified parameters then the unit will not function properly. The External Reference is present on the Reference Output connector, J8.

Auto Mode: The unit defaults to the External 10 MHz Reference as long as the level meets the +3dBm, ±3dB specification. REF = AUTO - E appears on the front panel display where the -E indicates that the unit is using the External 10 MHz Reference. The External Reference is present on the Reference Output connector, J8.

If the external 10 MHz Reference signal level is less than -1dBm, the unit switches to Internal 10 MHz Reference. REF = AUTO -I appears on the front panel display where -I indicates that the unit is using the Internal 10 MHz Reference. The Internal 10 MHz Reference is present on the reference output connector, J8.

2.5.6 Input Band Select Operation

The 2083-910 is a block frequency translator that converts one of two possible input frequency bands to 1000 MHz +/- 240 MHz. The two possible input frequency bands are:

Band 1 : 562.5 MHz (+/- 150 MHz)

Band 2 : 900 MHz (+/- 240 MHz)

There are 3 possible methods of selecting the input band. The method used is referred to as the "mode" of selection. The current selection mode is displayed on the bottom line of the front panel LCD display.

NOTE: IF TTL Mode is “active” (i.e., if *either* Pin is 'pulled low' as described below) the other two Input Band Selection modes (Remote M&C and Local) are ***disabled***. Both TTL mode inputs must be “inactive” (i.e., *neither* Pin is 'pulled low') for either of the other two Modes to be enabled.

TTL Mode:
Two TTL compatible inputs are provided on the rear panel DB9 connector (J11) to select the desired input band. Pin 1 of J11 selects Band 1 and pin 4 selects Band 2. Both TTL inputs are internally pulled up to +5V through 10K ohm resistors. Selection of either band is accomplished by pulling the respective pin low. If both pins are low then Band 1 will be selected. If neither pin is pulled low then the input band is selected via a Remote M&C command or Locally via the front panel.

Remote M&C Mode:
If a remote M&C command is sent to set the input band then the unit will select that band *if there are no active TTL inputs*. TTL inputs are considered active if either pin is pulled low.

Local Mode:
If a local front panel command is issued to select the input band then the unit will select that band *if there are no active TTL inputs*. TTL inputs are considered active if either pin is pulled low.

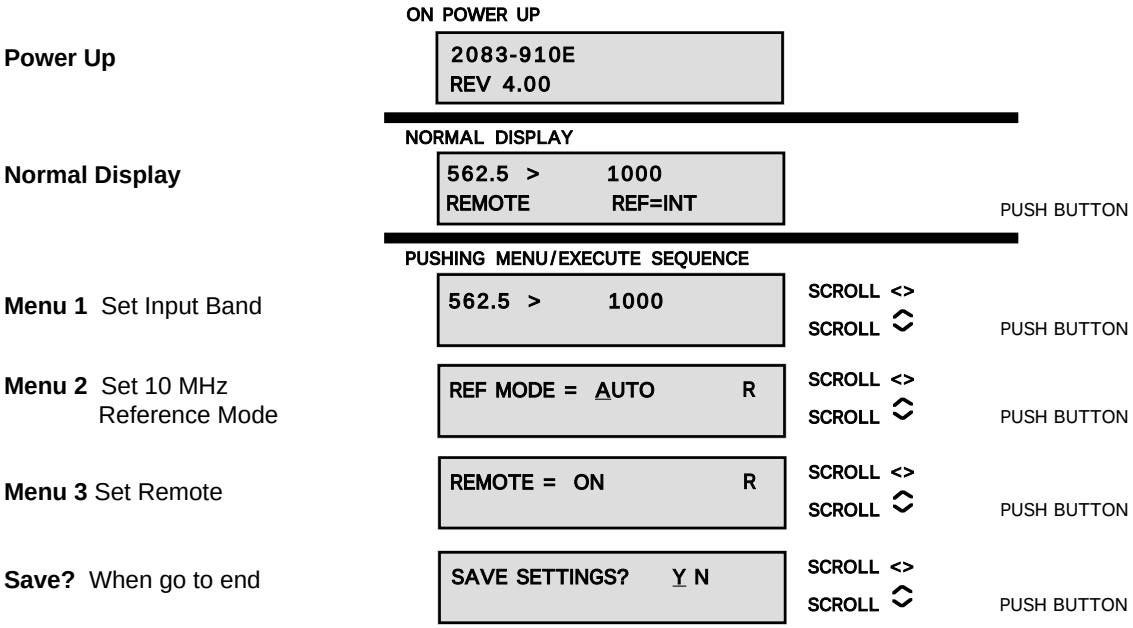


FIGURE 2.4 Menu Display and Sequences

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.

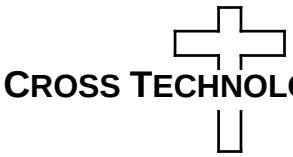
C. **Elevated Operating Ambient Temperature -** If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack may be greater than room ambient temperature. Therefore, consideration should be given to Tmra.

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 units 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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