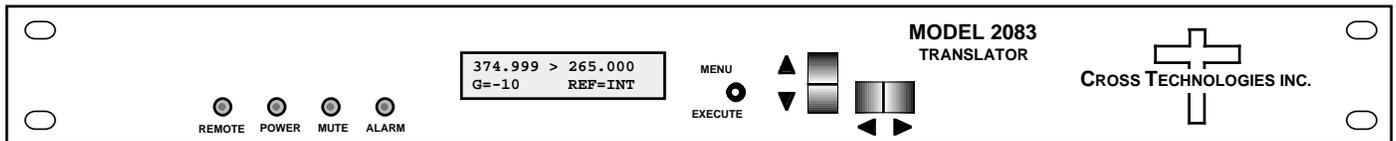


Instruction Manual

Model 2083-43

Agile UHF-to-UHF Translator

July 2012, Rev. 0



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INSTRUCTION MANUAL

MODEL 2083-43 Agile UHF-to-UHF Translator

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MODEL 2083-43 Agile UHF-to-UHF Translator

1.0 General

1.1 Equipment Description

The 2083-43 Frequency Translator converts any 50 MHz band in the 290-400 MHz range (Fc 315-375 MHz), in 1 kHz steps, to a fixed 265 ±25 MHz output with no spectrum inversion, low group delay, and flat frequency response. The UHF input signal is mixed with synthesized local oscillator (LO) signals, first to 1750 MHz and finally to the 265 ± 25 MHz output signal. Multifunction switches select the frequency translation, gain (0 to -10 dB, adjustable), and 10 MHz reference. These three settings appear on the LCD display. Front panel LEDs light when DC power is applied (green), a PLL alarm occurs (red), the signal is muted (yellow), or remote control is active (yellow). A 10 MHz input allows for connection of an external 10 MHz reference. The 10 MHz output contains the 10 MHz reference signal (be it internal or external). Connectors are BNC female for the UHF input and output and 10 MHz input and output. The 2083-43 has an internal ±0.01 ppm high stability reference and is housed in a 1 3/4" X 19" X 16" rack mount chassis.

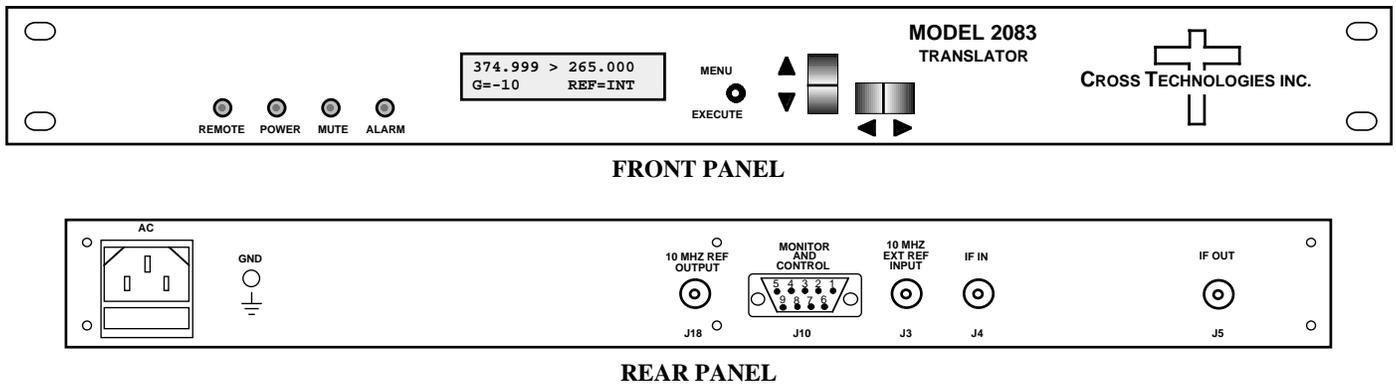


FIGURE 1.1 Model 2083-43 Front and Rear Panels

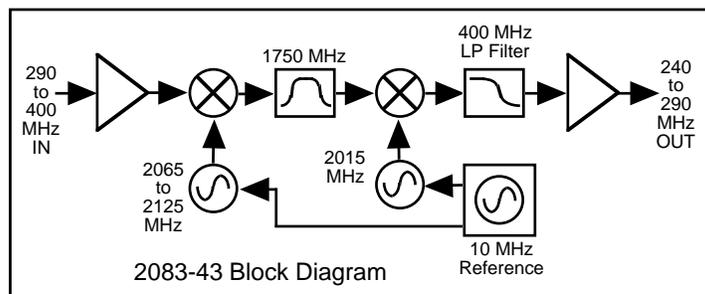


FIGURE 1.2 Model 2083-43 Translator Block Diagram

1.2 Technical Characteristics

TABLE 1.0 - 2083-43 Frequency Translator Specifications*					
Input Characteristics					
Input Impedance/RL	75Ω/12 dB				
Frequency	290-400 MHz (315-375, 50 MHz BW)				
Input Level	-20 to -10 dBm				
Input 1 dB Compression	0 dBm				
Output Characteristics					
Impedance/RL	75Ω/12 dB				
Frequency	265 ± 25 MHz				
Output Level	-10 to -30 dBm				
Channel Characteristics					
Gain	0 to -10 dB; Selectable in 1dB steps				
Spurious Response	<-40 dBC				
Bandwidth, response	±25 MHz, ±0.75 dB				
Frequency Response	Over 290-400 MHz input to 265 MHz output, ±1.5 dB				
Group Delay, ±25 MHz	0.015 ns/MHz ² parabolic; 0.05 ns/MHz linear; 2 ns ripple				
10MHz In/Out Level	3 dB ± 3 dB				
Frequency Sense	Non-inverting				
Synthesizer Characteristics					
Frequency Accuracy	±0.01 ppm internal reference				
Step Size	1 kHz, 315 to 375 MHz input center frequency to 265 MHz output center frequency, ±25 MHz bandwidth				
Phase Noise @ Frequency	100MHz	1kHz	10kHz	100kHz	1MHz
dBC/Hz	-75	-80	-85	-100	-110
10 MHz Level In/Mon.	3 dBm ± 3 dB				
Controls, Indicators					
Frequency Translation	On LCD display; push-button switches or remote selection				
Gain Selection	On LCD display; push-button switches or remote selection				
Power, Alarm; Mute	Green LED; Red LED, Yellow LED				
Remote	Yellow LED; RS232C, 9600 baud				
Other					
RF Connectors	BNC (female), 75Ω				
10MHz Connectors	BNC (female), 50Ω/75Ω				
Alarm Connector	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, 45 watts max.				
Available Options					
Q -	RS485 Remote Interface				
W8 -	Ethernet; with Web Browser (WB)				
W18 -	Ethernet; with Web Browser & SNMP				
W36 -	0 to 60 dB, 1 dB Step Attenuator				
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, DB9 female

J10 Pinouts (RS-232C)	
Pin	Function
1	Not Used
2	Rx+ (RS-232C)
3	Tx+ (RS-232C)
4	Not Used
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 2083-43 and briefly describes them.

TABLE 1.1 2083-43 Status Requests		
Command	Syntax	Description
Command Status	{S1}	Returns {S1bbbbbbccdef} where:
		• bbbbbbb = 345 MHz End Center Frequency (315.000-375.000)
		• cc = Gain (00 to -10)
		• d = Mute Status (0=Mute, 1=Unmute)
		• e = Alarm Status (0=No Alarm, 1= Alarm)
		• f = Reference Status (0=Internal, 1= External)

C) Commands Table 1.2 lists the commands for the 2083-43 and briefly describes them. After a command is sent the 2083-43 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-digit command or status character
- D = 1 character or more of data (depends on command)
- } = stop byte

TABLE 1.2 2083-43 Commands		
Command	Syntax	Description
Set Input Frequency	{C1xxxxxx}	where: <ul style="list-style-type: none"> • xxxxxx = Input Frequency (kHz) • Range: 315000 to 375000 in 1 kHz steps
Set Gain	{C3xx}	where: <ul style="list-style-type: none"> • xxx = 3 characters • Range: 0 to -10 (0 to -10 dB, in 1 dB steps) • Option W36 • Range 0 to -70 (0 to -70 in 1 dB steps)
Mute Output	{CAx}	where x =: <ul style="list-style-type: none"> • 0 to mute output • 1 to Unmute Output
External Reference	{CEx}	where x =: <ul style="list-style-type: none"> • 0 for Internal Reference • 1 for External Reference
Enable Remote	#	Just # sign
Disable Remote	{CRO}	{CR and zero}

1.4 Environmental Use Information

- A. **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.
- B. **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.
- C. **Mechanical loading** - Mounting of equipment in a rack should be such that a hazardous condition does not exist due to uneven weight distribution.
- D. **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.
- E. **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).
- F. **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 RE-INSTALLED** prior to Top Cover screw replacement. **FAILURE TO DO** this may cause **INGRESS** and/or **EGRESS** emission problems.

2.0 Installation

2.1 Mechanical - The 2083-43 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 2083-43 can be secured to a rack using the 4 holes on the front panel but must be supported by a bracket on the bottom. Figure 2.0 shows how the 2083-43 is assembled.

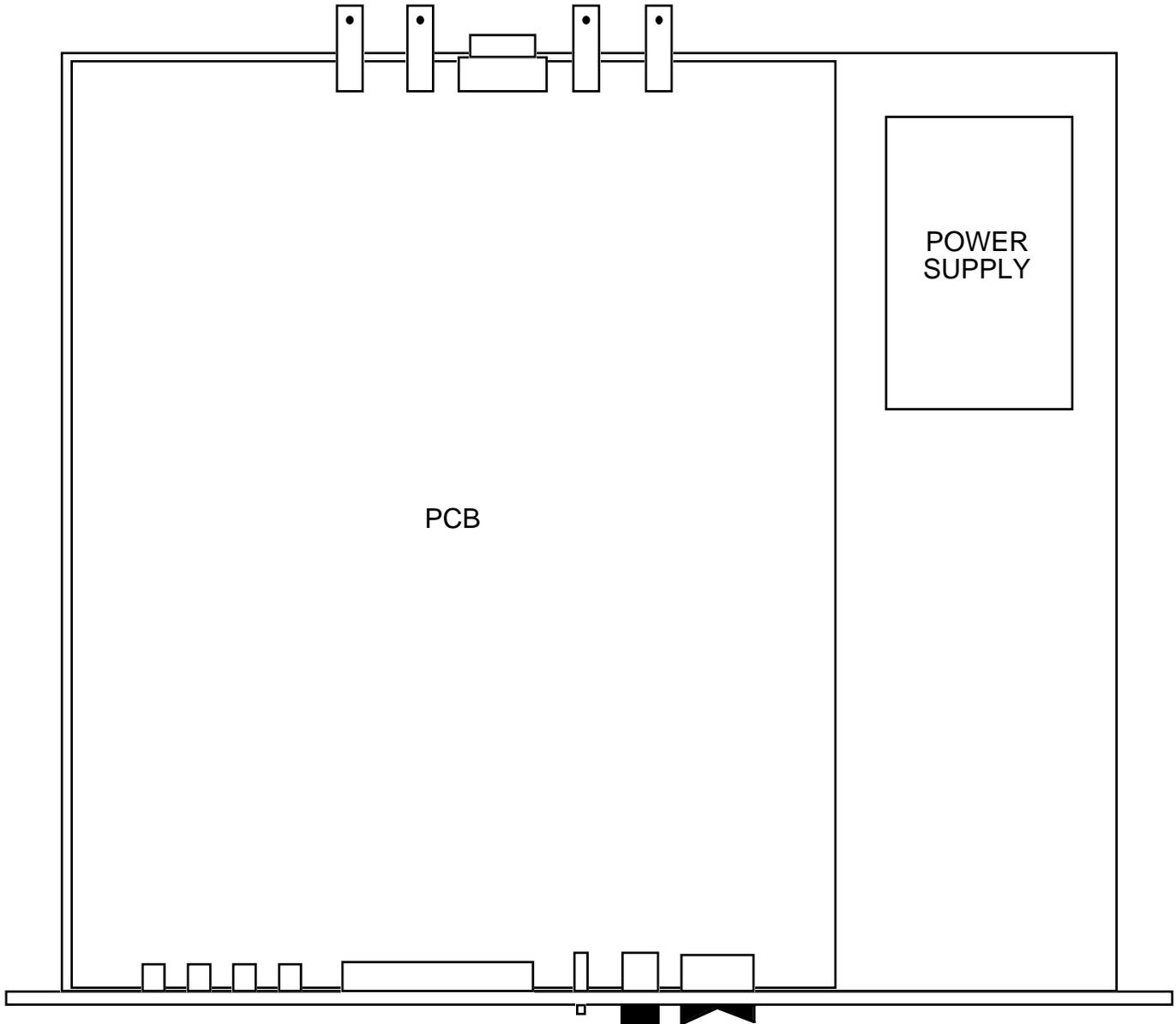


FIGURE 2.0 2083-43 Mechanical Assembly

2.2 Rear Panel Input/Output Signals - Figure 2.1 shows the input and output connectors on the rear panel.

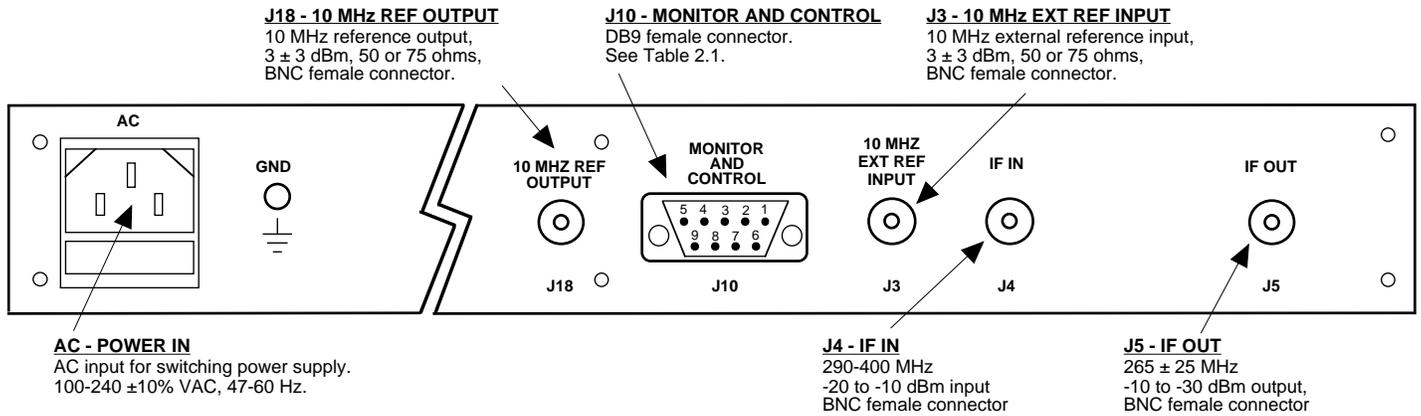


FIGURE 2.1 2083-43 Rear Panel I/O's

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

TABLE 2.2 Connectors/Impedance	
C	50Ω BNC (RF), 75Ω BNC (IF)
K	75Ω BNC (RF), 50Ω BNC (IF)
M	50Ω N-type (RF), 50Ω BNC (IF)
N	50Ω N-type (RF), 75Ω BNC (IF)
S	50Ω SMA (RF), 50Ω BNC (IF)
SS	50Ω SMA (RF), 50Ω SMA (IF)

***Remote Serial Interface**

Interface: DB9 Male

Protocol: RS-232C, 9600 baud rate, no parity, 8 data bits, 1 start bit, 1 stop bit

2.3 Front Panel Controls and Indicators - The following are the front panel controls and indicators.

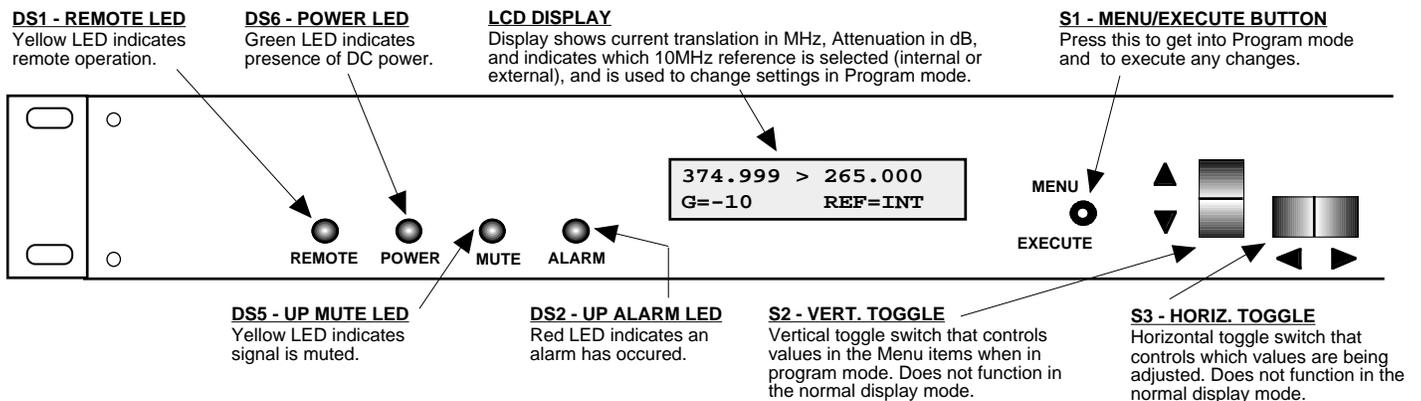


FIGURE 2.2 2083-43 Front Panel Controls and Indicators

2.4 Installation / Operation

2.4.1 Installing and Operating the 2083-43 Frequency Translator

1. Connect a -20 dBm to -10 dBm signal to IF IN, J4 (Figure 2.1).
2. Connect the IF OUT, J5, to the external equipment.
3. Connect 100-240 \pm 10% VAC, 47 - 63 Hz to AC connector on the back panel.
4. Set the 345 MHz end frequency (IF IN) (See Section 2.5 Menu Settings).
5. Set the Gain for 0 to -10 dB (See Section 2.5 Menu Settings).
6. Be sure DS6 (green, 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.

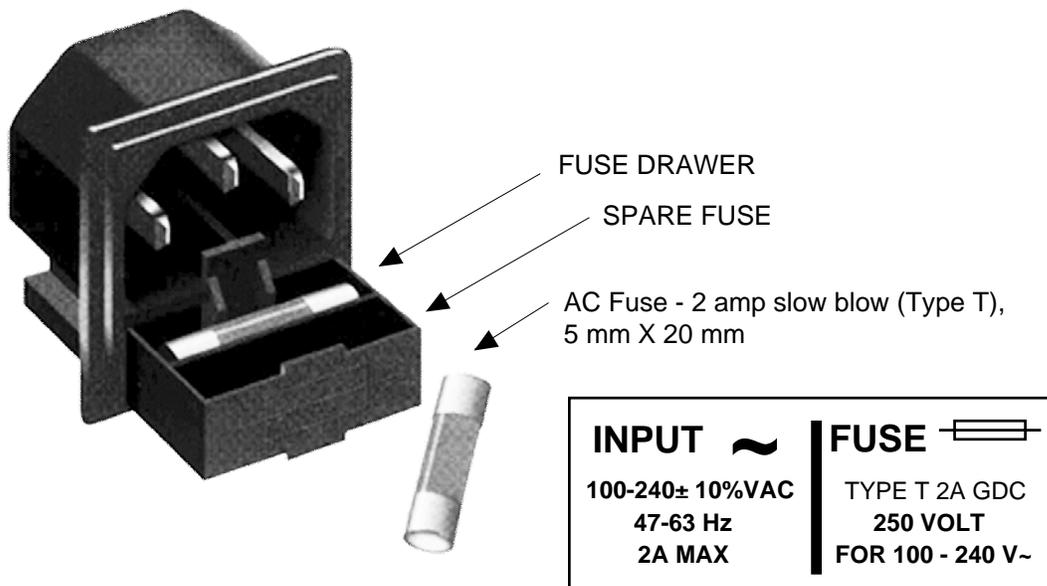


FIGURE 2.3 Fuse Location and Spare Fuse

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 1 345 MHz end center frequency (315.000 to 375.000 in 1 kHz steps)

Menu 2 Gain in dB (0 to -10)

Menu 3 Mute

Menu 4 Set Unit to Remote Operation (Note: the local controls still function when in REMOTE)

Menu 5 Select External 10 MHz Reference

Save Menu When go to 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 status of a unit is retained even when power is removed. When power is restored, the unit will return to its previous settings.

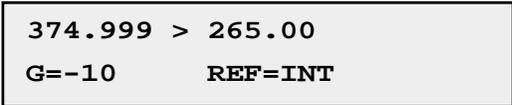
When power is first applied, the LCD display goes through three steps.

1. The LCD goes black to show all segments are functioning.
2. The model number with options is displayed on the top line.
The firmware version is displayed on the bottom line.



2083-43W36
4.02

3. The present frequency translation, attenuation, and INT/EXT Reference is shown.



374.999 > 265.00
G=-10 REF=INT

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 attenuation changes, the vertical movement will raise or lower the number selected.
 - b. For other functions such as Mute On/Off, the vertical switch will alternately turn the function on or off.

2.5.4 345 MHz End Center Frequency Changes

The 345 MHz end can have the center frequency adjusted from 315 to 375 MHz.

At any time during the modification process, if you have made a mistake and do not wish to save the changes you have made, **do not press the MENU/EXECUTE switch**; simply do nothing for approximately 30 seconds, and the system will return to the normal operating mode or scroll to “R” and push the MENU/EXECUTE switch and select “NO” in the “SAVE SETTINGS?” window. To change the Frequency Translation:

345 MHZ END CENTER FREQUENCY CHANGES :

To change the 290 MHz end frequency, push the Menu/Execute switch until you get to:

```
IF IN = 315 MHz      R
```

Press the Up/Down switch to change the frequency in 1 or 10 MHz steps.

```
IF IN = 325 MHz      R
```

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

```
IF IN = 325 MHz      R
```

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

NOTE: CHANGES DO NOT TAKE PLACE ON FREQUENCY UNTIL YOU GO TO THE SAVE MENU AND INDICATE YOU WANT TO SAVE THE CHANGES. THE CARRIER IS MUTED WHEN FREQUENCY IS CHANGED.

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.

Pushing the Menu/Execute switch then takes you to:

```
374.999 > 265  
G=-10      REF=INT
```

2.5.6 Gain Changes

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

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 30 seconds, and the system will return to the normal operating mode.

To change the translator attenuation, push the Menu/Execute switch until you get to the Gain setting:

```
GAIN = 00          R
```

Press the Up/Down switch to change the attenuation in 1 or 10 dB steps.

```
GAIN = 10          R
```

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

```
GAIN = 10          R
```

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

NOTE: THE ATTENUATION WILL CHANGE AS IT IS ADJUSTED, HOWEVER, THE VALUE WILL NOT BE STORED UNTIL YOU INDICATE YES IN THE SAVE SETTINGS WINDOW.

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.

```
374.999 > 265  
G=-10      REF=INT
```

Figure 2.4 gives the menu items and how to make changes.

2.5.7 Alarm Indications

An alarm condition 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.

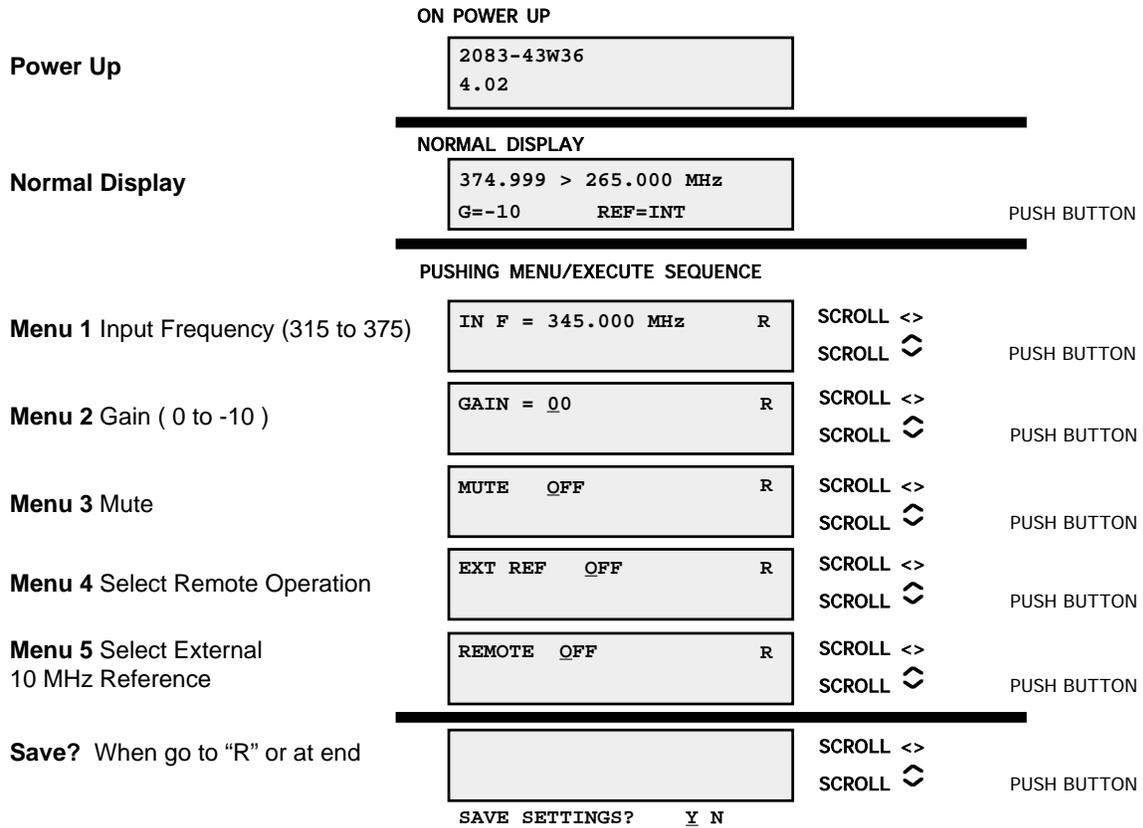


FIGURE 2.4 Menu Display and Sequences



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