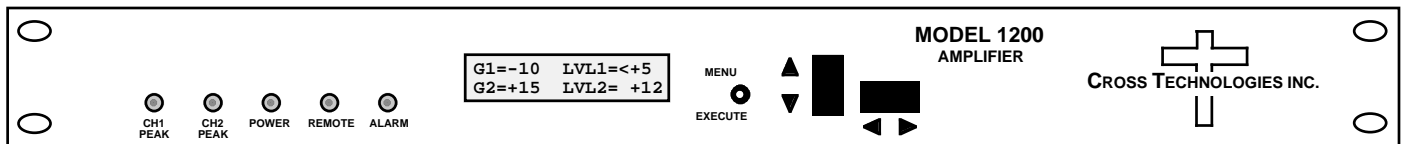


Instruction Manual

Model 1200-88 IF Amplifier

August 2010 Rev. A



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INSTRUCTION MANUAL

MODEL 1200-88 Dual IF Amplifier

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MODEL 1200-88 Dual IF Amplifier

1.0 General

1.1 Equipment Description

The 1200-88 IF Amplifier is a dual channel amplifier each providing manual gain control (MGC) for a 0.1 to 100 MHz IF signal for a -50 to 0 dBm input signal. The gain can be manually adjusted from -25 to +25 dB for up to a +10 dBm output. The 1200-88 has a band limiting lowpass filter. Multi-function push button switches select the gain of each channel (-25 to +25 dB, selectable in 1 dB steps) and the settings appear on the LCD display. Front panel LEDs light when DC power is applied (green) or the output level exceeds +13 dBm (red). Connectors are BNC female for IF input and output. A DB9 connector provides indication and remote control of gain via a 9600 baud, RS232C interface. The 1200-88 is powered by a 100-240 $\pm 10\%$ VAC switching power supply and is housed in a 1RU x 16" deep chassis.

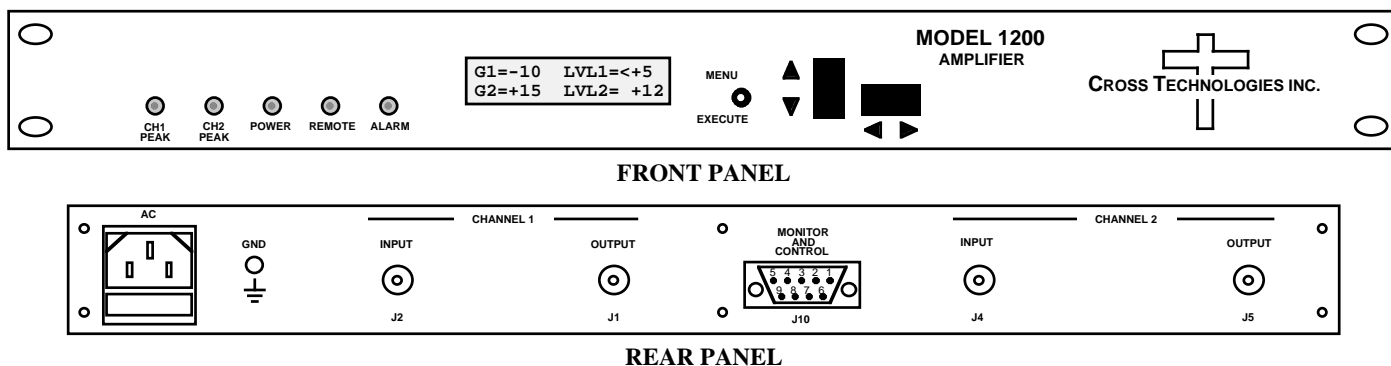


FIGURE 1.1 Front and Rear Panels

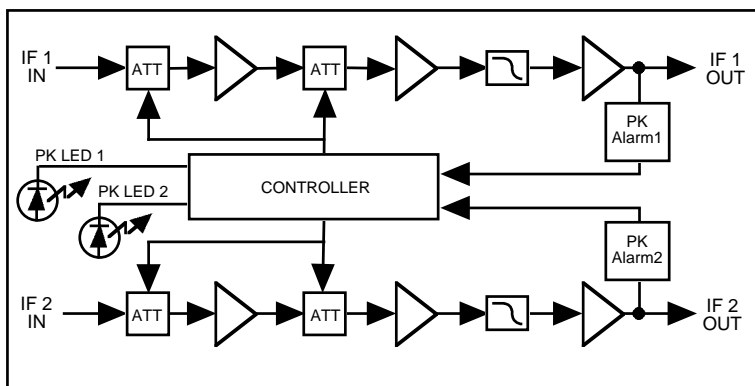


FIGURE 1.2 Block Diagram

1.2 Technical Characteristics

TABLE 1.0 1200-88 Dual IF Amp Specifications (each amp)*

Input Characteristics

Impedance	50Ω
Return Loss	18 dB
Frequency	0.1 to 100 MHz
Input Level	-50 to 0 dBm
Input 1 dB compression	+5 dBm @ min. gain

Output Characteristics

Impedance	50Ω
Return Loss	18 dB
Output level	+10 dBm, max.
Output 1 dB compression	+15 dBm

Channel Characteristics

Gain range (adjustable)	-25 to +25 dB (Front Panel Adjustable)
Frequency Response	±1.0 dB, 0.1-100 MHz; ±0.5 dB, any 20 MHz segment
Group Delay, max.	±2 ns, max. 0.1 to 100 MH

Controls, Indicators

Level Adjust	pushbutton switches or REMOTE; setting shown on LCD display; Set to -25 to +25 dB (+10 dBm max. out)
Level Peak	Red LED lights when output level exceeds +13 dBm
Power	Green LED
Remote	Yellow LED
Alarm	Red LED

Other

IF Connector	BNC (female)
Alarm/Remote Connector	DB9 - NO or NC contact closure on Alarm; M&C 9600 Baud, RS232C
Size	19 inch, 1RU standard chassis 1.75" high X 16.0" deep
Power	100-240 ±10% VAC, 47-63 Hz, 45 watts max.

Options

Q	RS-422/RS-485 Remote capability
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.

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 1200-88 and briefly describes them.

Table 1.1 1200-88 Status Requests		
Command	Syntax*	Description
Command Status	{aaS0}	Returns {aaS0bbbccdddeeeefg} where:
		• bbb = GAIN 1 (range -25 to +25 dB)
		• ccc = GAIN 2 (range -25 to +25 dB)
		• dddd = LEVEL 1 (range <+5, +5, +6,..., +14, +15, >+15)
		• eeee = LEVEL 2 (range <+5, +5, +6,..., +14, +15, >+15)
		• f = 0 if NO CH1 peak alarm
		= 1 if CH1 peak alarm
		• g = 0 if NO CH2 peak alarm
		= 1 if CH2 peak alarm

* PLEASE NOTE: The Address (aa) should only be used when RS-485 is selected.

C) Commands Table 1.2 lists the commands for the 1200-88 and briefly describes them. After a command is sent the 1200-88 sends a return “>” indicating the command has been received and executed.

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

- { = start byte
- aa = address (**RS-485 only - option Q**)
- C = 1 character, either C (command) or S (status)
- N = 1-digit command or status number, 1 through 9
- D = 1 character or more of data (depends on command)
- } = stop byte

Table 1.2 1200-88 Commands		
Command	Syntax*	Description
Set GAIN 1	{aaC1xxx}	where:
		• xxx = 3 characters
		• Range: -25 to +25
Set GAIN 2	{aaC2xxx}	where:
		• xxx = 3 characters
		• Range: -25 to +25
Enable Remote	#	Just # sign
Disable Remote	{aaCR0}	{CR and zero}

* PLEASE NOTE: The Address (aa) should only be used when RS-485 is selected.

2.0 Installation

2.1 Mechanical

The 1200-88 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 1200-88 can be secured to a rack using the 4 holes on the front panel. Figure 2.1 shows how the 1200-88 is assembled.

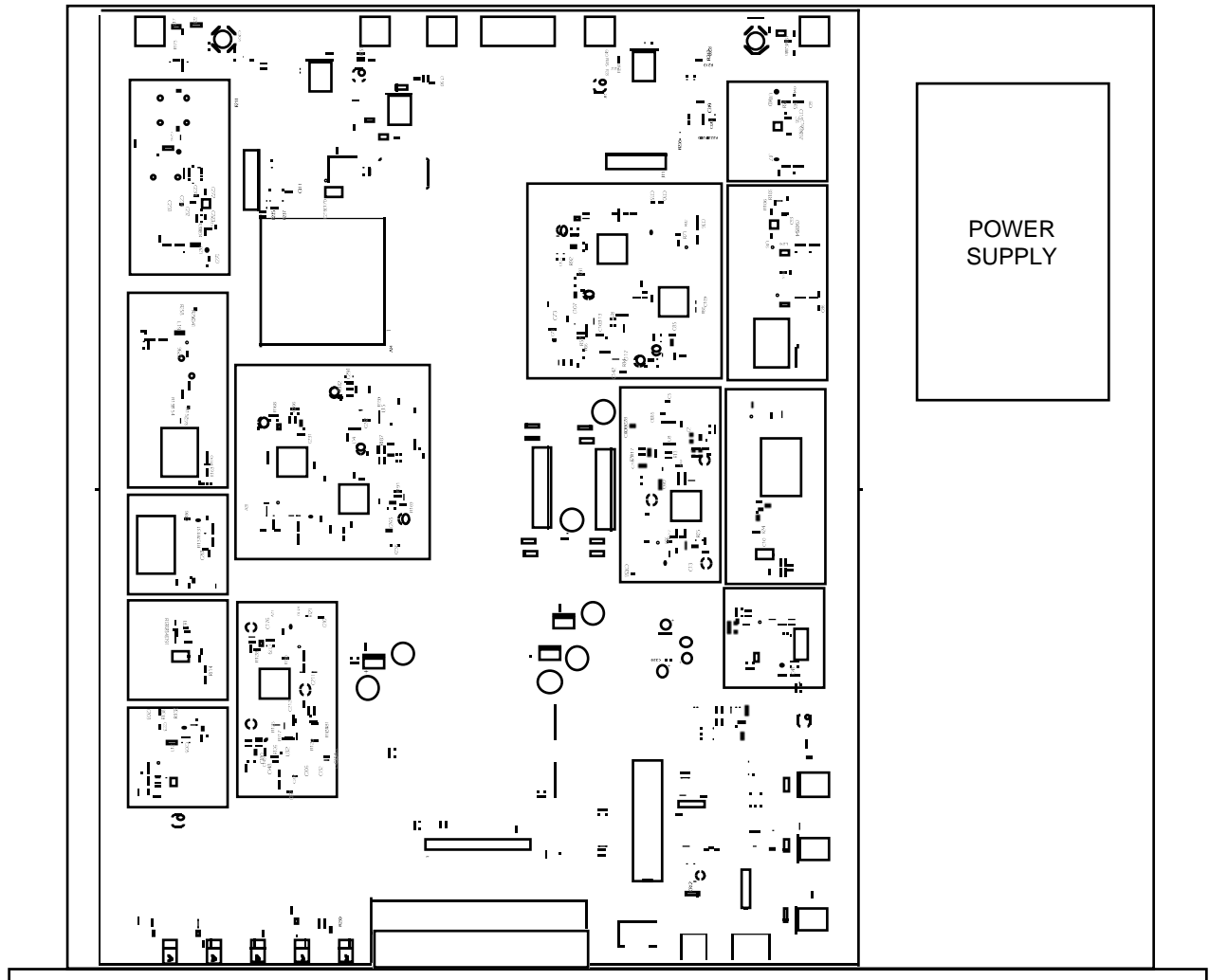


FIGURE 2.1 Mechanical Assembly

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

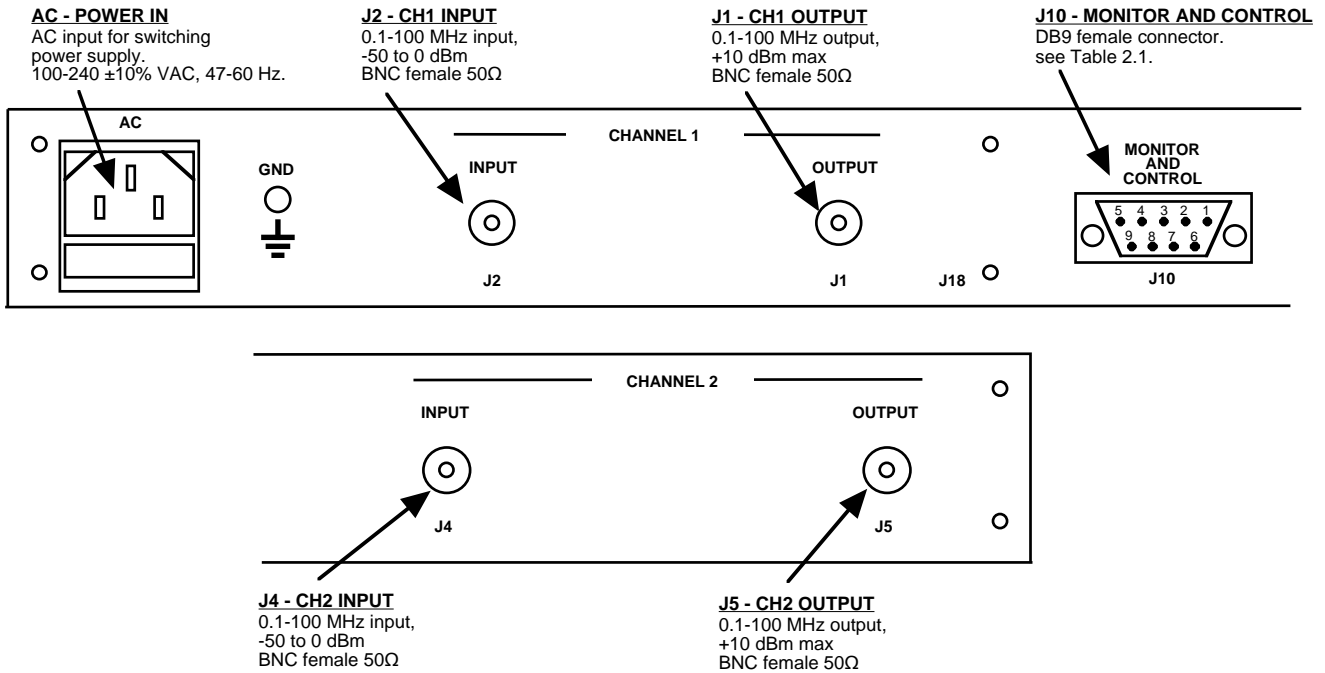


FIGURE 2.2 Rear Panel I/Os

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

Option	IF
STD	BNC, 50 Ω
-B	BNC, 75 Ω
-F	Type-F, 75 Ω

***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 2.3 shows the front panel controls and indicators.

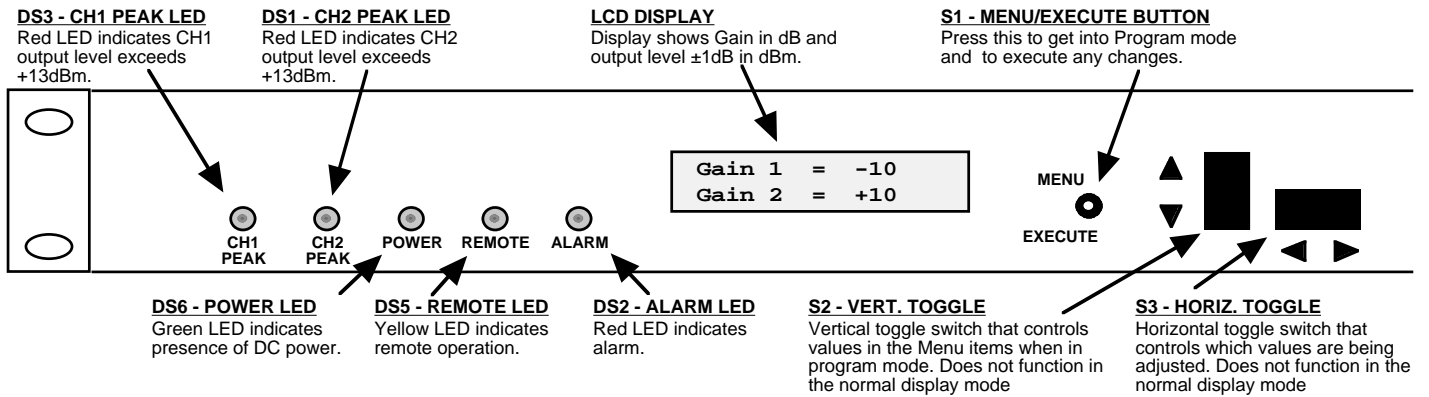


FIGURE 2.3 Front Panel Controls and Indicators

2.4 Operation

2.4.1 Installing and Operating the 1200-88 Dual IF Amplifier

1. Connect -50 dBm to 0 dBm signals to CH1 IF In, J2, and CH2 IF In, J4 (Figure 2.2)
2. Connect the IF OUTPUTS, J1 and J5, to the external equipment.
3. Connect 100-240 \pm 10% VAC, 47 - 63 Hz to AC on the back panel.
4. Set the gain for -25 to +25 dB on each channel for a maximum output level of +10 dBm for each channel. (See Section 2.5 Menu Settings).
5. Be sure DS6 (green, DC Power) is on and DS2 (red, Alarm) is off (Figure 2.3).
6. To insure that CH1 and CH2 amplifiers are not being overloaded check that CH1 PEAK and CH2 PEAK LEDs, DS3 and DS1, are off (Figure 2.3).
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 2.4. There is a spare fuse in the near slot. If a fuse continues to open, the power supply is most likely defective.

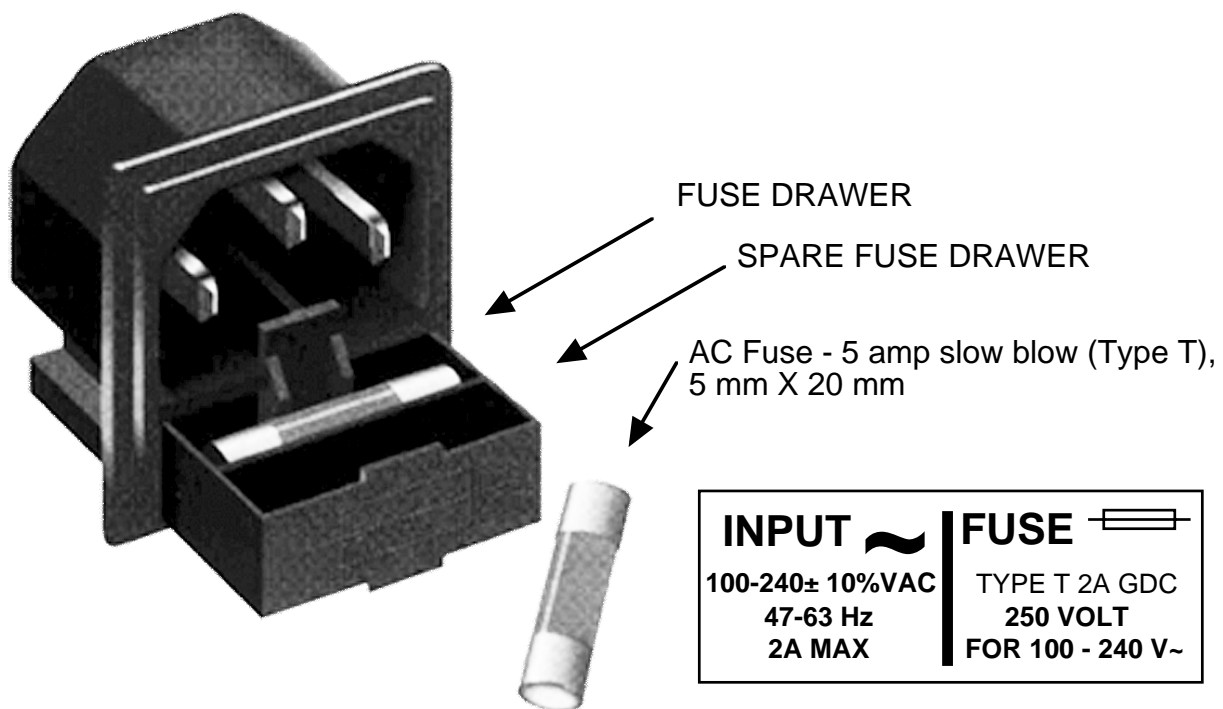


FIGURE 2.4 Fuse Location and Spare Fuse

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 2.5):

Power Up

Normal Display

Menu 1 Gain 1 (-25 to +25)

Menu 2 Gain 2 (-25 to +25)

Menu 3 Set Unit to Remote Operation (NOTE: the local controls still function when in REMOTE)

Menu 4 Set Remote Mode (**option Q**)

Menu 5 Set RS-485 Address (**option Q**)

Alarm indications appear on the LEDs (see figure 2.3).

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.

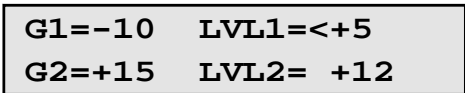
When power is first applied, the LCD display goes through three steps.

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



REV 1.00

3. The present gain of the Dual IF Amp is shown.



G1=-10 LVL1=<+5
G2=+15 LVL2= +12

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 gain changes, the vertical movement will raise or lower the number in the direction of the arrows.
 - b. For other functions such as Remote Mode, the vertical switch will cycle through the different options.

2.5.4 Gain Changes

When you get to this menu note that the gain changes will be made as you make them, and they will be saved immediately. Press the Menu/Execute button until you get to the desired gain setting:

GAIN 1=-<u>1</u>0	R
LEVEL1=<+5	

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:

GAIN 1=-<u>2</u>0	R
LEVEL1=<+5	

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

GAIN 1=-2<u>0</u>	R
LEVEL1=<+5	

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

NOTE: THE GAIN WILL BE CHANGED AND SAVED AS YOU ADJUST THE NUMBERS.

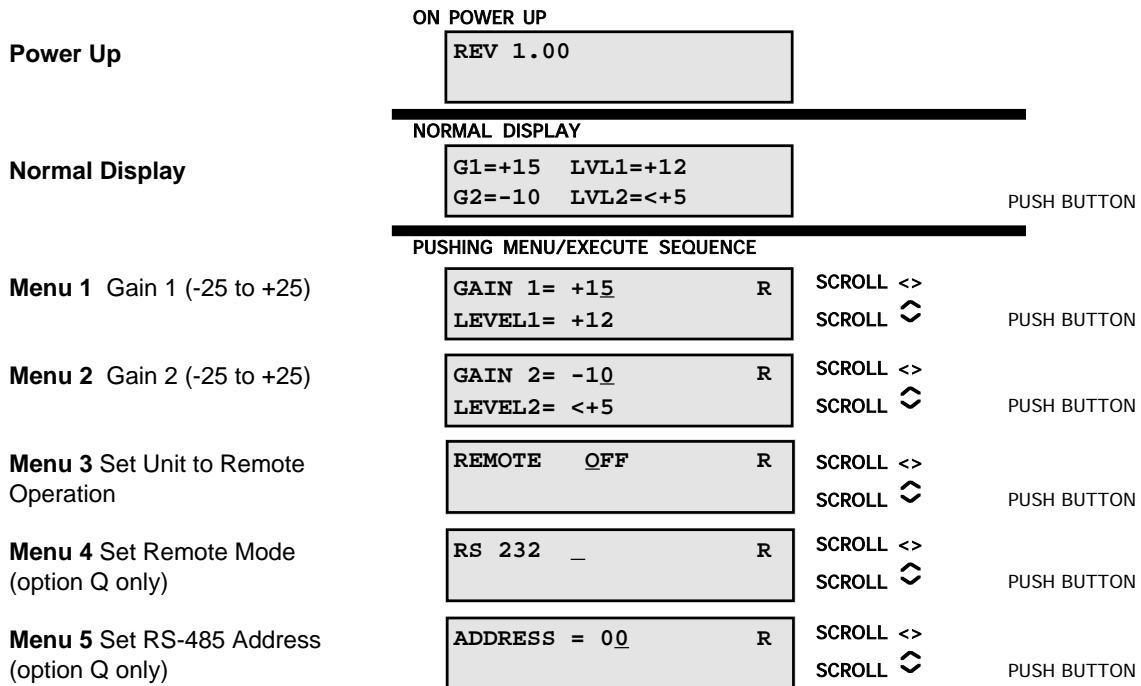
When the display indicates the value desired you can push the Menu/Execute switch to the next item OR you can scroll to "R", push the Menu/Execute switch to get back to the main display:

G1=-20	LVL1=<+5
G2=+15	LVL2= +12

Figure 2.5 gives the menu items and how to make changes.

2.5.5 Alarm Indications

An alarm condition will occur if the +12 VDC voltage that powers the amplifiers is lost. The CH1 and CH2 peak indicators will light when an output level of greater than +13 dBm is detected. The Remote LED will light when the Remote mode is selected.



Select "R" in any of the above menus to return to the main display.

FIGURE 2.5 Menu Display and Sequence

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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