# INSTRUCTION MANUAL

# MODEL 1200-88 Dual IF Amplifier



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First Edition, **August 2007** **Rev 0**

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## MODEL 1200-88 Dual IF Amplifier

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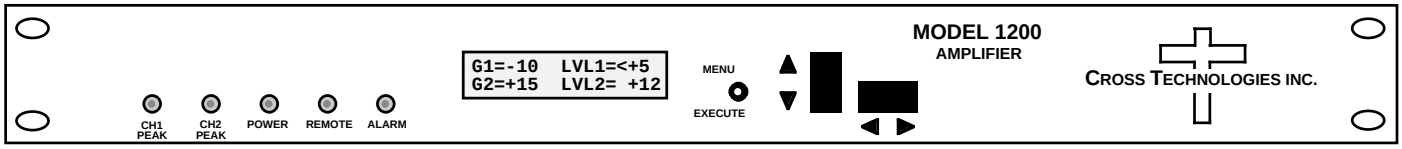
# MODEL 1200-88 Dual IF Amplifier

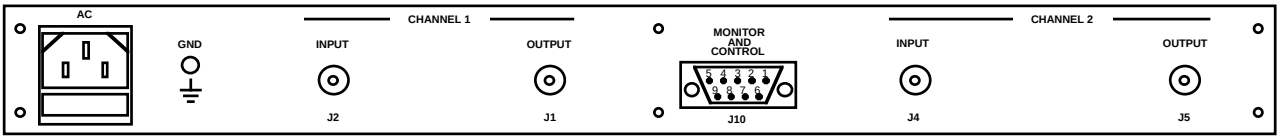
## 1.0 General

### 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). The gain settings appear on the LCD display, as well as an indication of the output level of each channel (when the level is between 5 and 15 dBm, ±1dB). Front panel LEDs light when DC power is applied (green), the output levels of either channel exceed +13 dBm (red), when the remote mode is selected (yellow), and when an alarm is detected (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 90-260 VAC switching power supply and is housed in a 1RU x 16" deep chassis.




**FRONT PANEL**




**REAR PANEL**

**FIGURE 1.1 Front and Rear Panels**

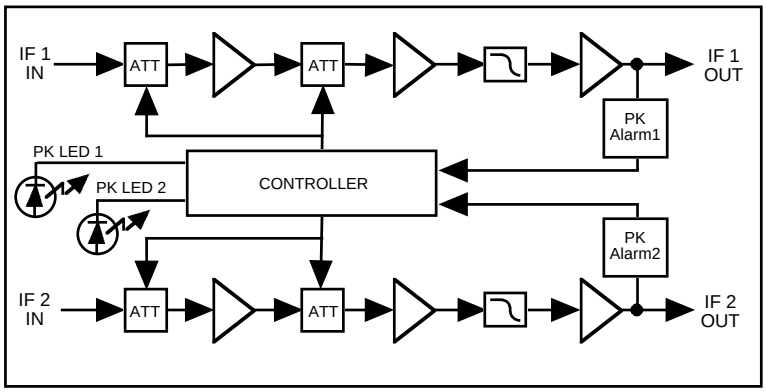



**FIGURE 1.2 Block Diagram**

### 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 |
| Frequency | 0.1 to 100 MHz |
| Output level | +10 dBm, max. |
| Output 1 dB compression | +15 dBm |

**Channel Characteristics**

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

**Controls, Indicators**

| | |
|---|---|
| Gain Selection | direct readout LCD; pushbutton switches or remote selection |
| Power | Green LED |
| Alarm | Red LED |
| Remote | Yellow LED; RS232C, 9600 baud (RS485, **option Q**) |
| Level Peak | Red LEDs light when output level exceeds +13 dBm |

**Other**

| | |
|---|---|
| IF Connector | BNC (female) |
| Alarm/Remote Connector | DB9 - NO or NC contact closure on Alarm |
| Size | 19 inch, 1RU standard chassis 1.75”high X 16.0” deep |
| Power | 90-260 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 1.3 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 {aaS0bbbcccddddeeeefg} 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.

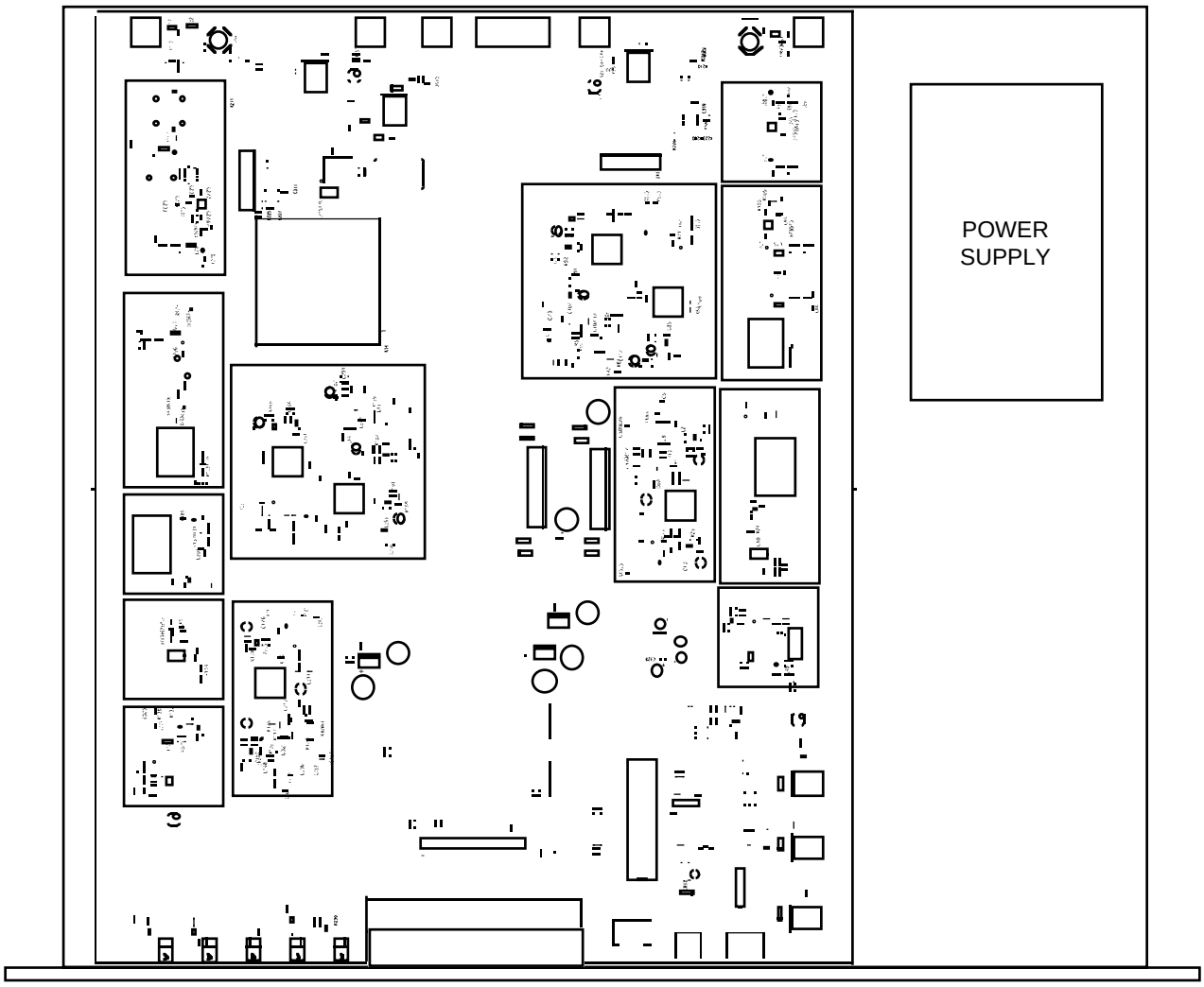



**FIGURE 2.1 Mechanical Assembly**

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

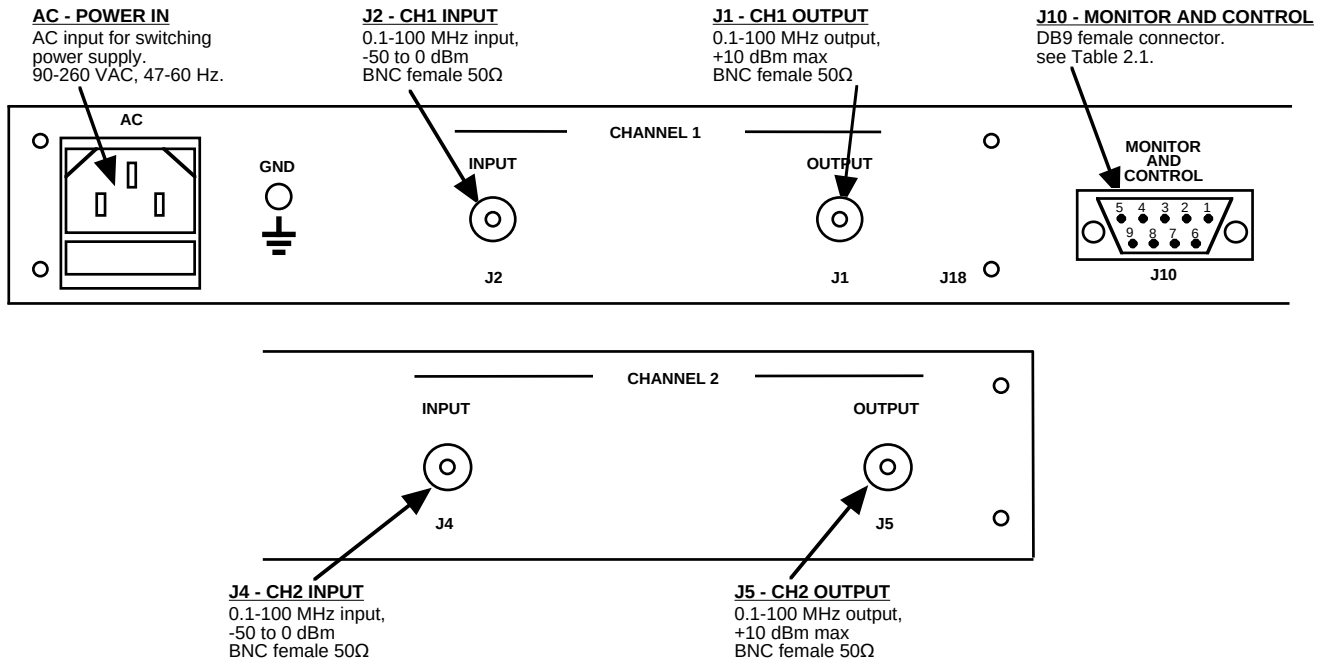



**FIGURE 2.2 Rear Panel I/Os**

| TABLE 2.1 | J10 Pinouts (RS-232C/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 |

| TABLE 2.2 Connector Options | |
|---|---|
| Option | IF |
| STD | BNC, 50Ω |
| -B | BNC, 75Ω |
| -F | Type-F, 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 2.3 shows the front panel controls and indicators.

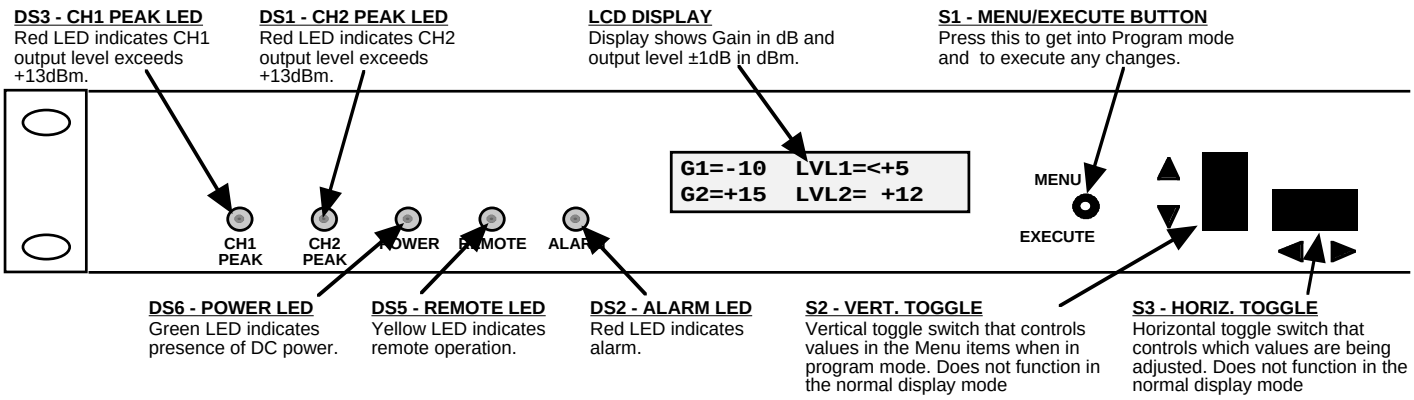



**FIGURE 2.3 Front Panel Controls and Indicators**

## 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 90- 260 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.

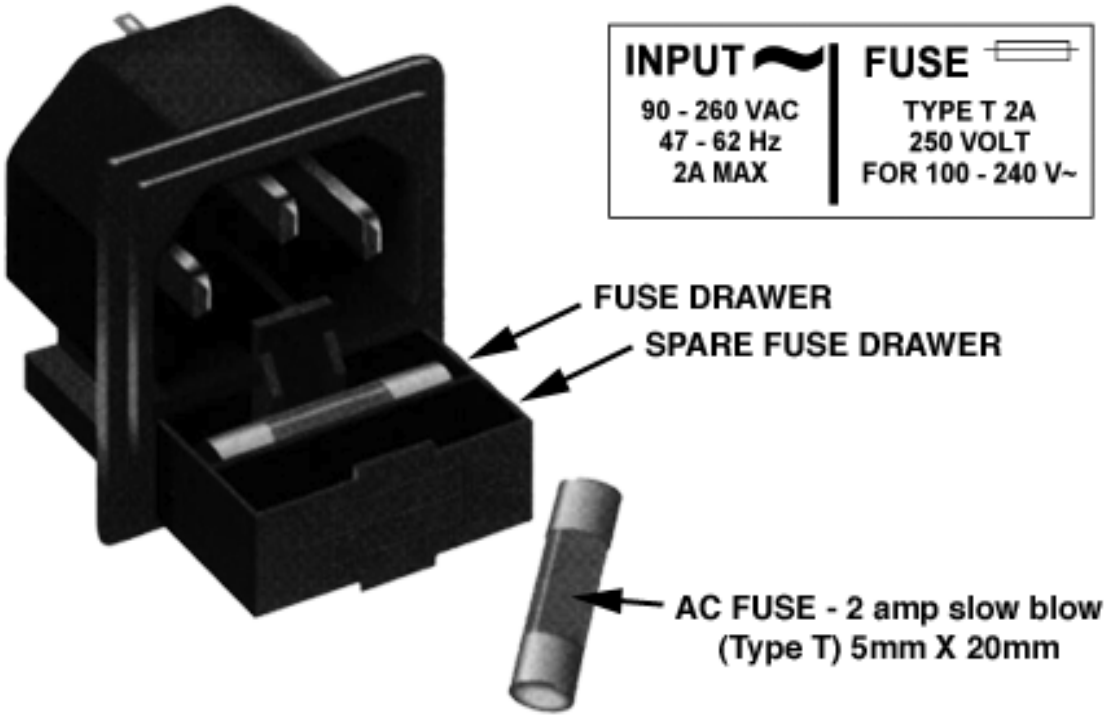



**FIGURE 2.4 Fuse Location and Spare Fuse**

## 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=-10          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=-20          R
LEVEL1=<+5
```

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

```
GAIN 1=-20          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.

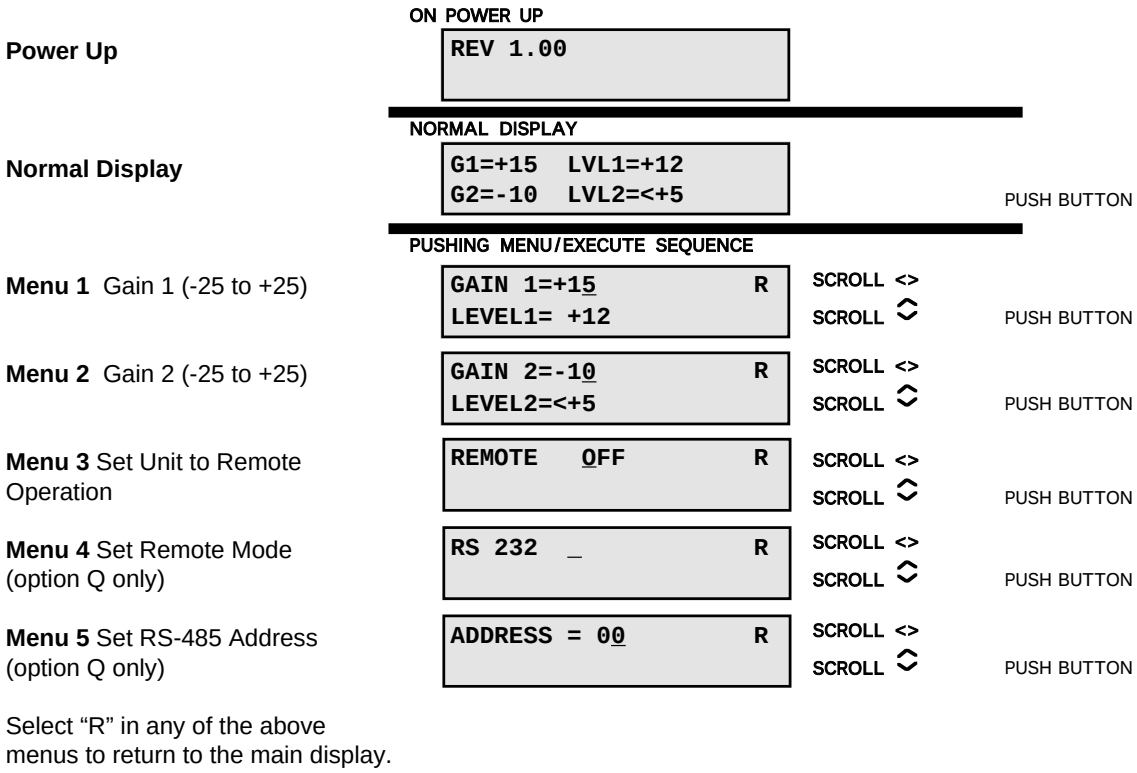



**FIGURE 2.5 Menu Display and Sequence**

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