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Description

Signa Horizon products having GRAM 1 modules. If you have SGD miniGRAM's refer to the procedure for DC Offset Adjustment - MiniGRAM.

Before shimming, perform the GRAM DC Offset Adjustment on each axis of the GRAM. Failure to do so will cause errors in shimming.

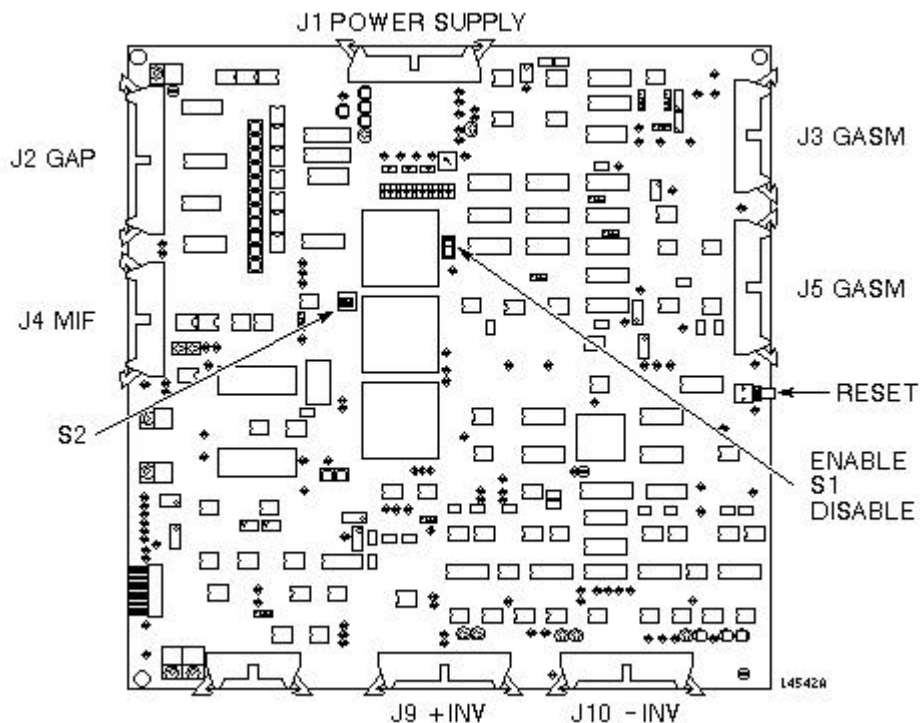
1- PRELIMINARY SET-UP

1. Remove the front cover of the GRAM Cabinet.
2. Remove the cover on each GRAM module for each axis being calibrated.

Note

Verify that all switches and jumpers on the GRAM Control Board and the Analog Tuning Board are set to the proper position. Failure to do so will cause adjustments to be inaccurate.

3. Verify the position of all jumpers and switches on the GRAM Control Board and the GRAM Power Supply Board for each axis.
 - a. See Table 1-1 and Illustration 1-1 for proper switch settings for the GRAM Control Board.



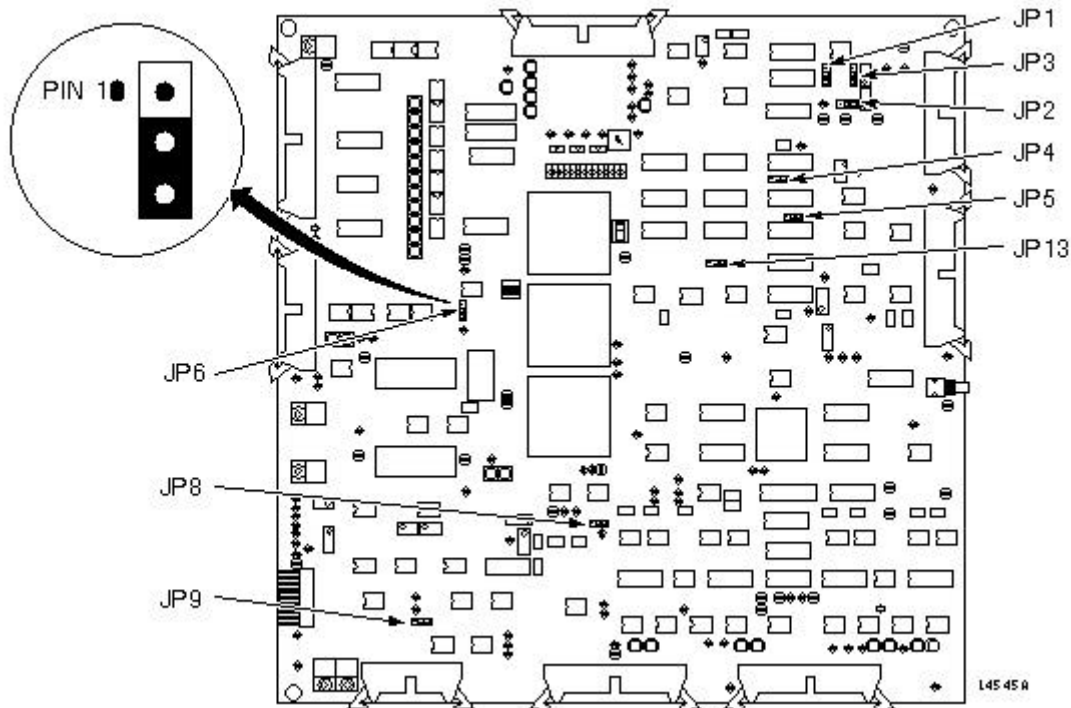
GRAM CONTROL BOARD
ILLUSTRATION 1-1

1- PRELIMINARY SET-UP (continued)

TABLE 1-1
GRAM CONTROL BOARD SWITCH SETTINGS

Number	Position	Setting	Name And Position Definition
S1	N/A	UP	GRAM Enabled: When S1 is down, the GRAM is disabled.
S2	1	Down	(RES) Reserved: unused
S2	2	Down	(HV) High Voltage Enable: Under software control
S2	3	Down	(FW) Free Wheel: Enables PWM mode under software control. Up is Freewheel mode, no PWM.
S2	4	Down	(MAN) Manual Ready: Manual Ready is controlled by GAP. Up is Troubleshooting; it forces the GRAM to Manual Ready. (S1 must also be up or enabled when MAN is Up.)

b. See Table 1-2 and Illustration 1-2 for proper jumper settings for the GRAM Control Board.



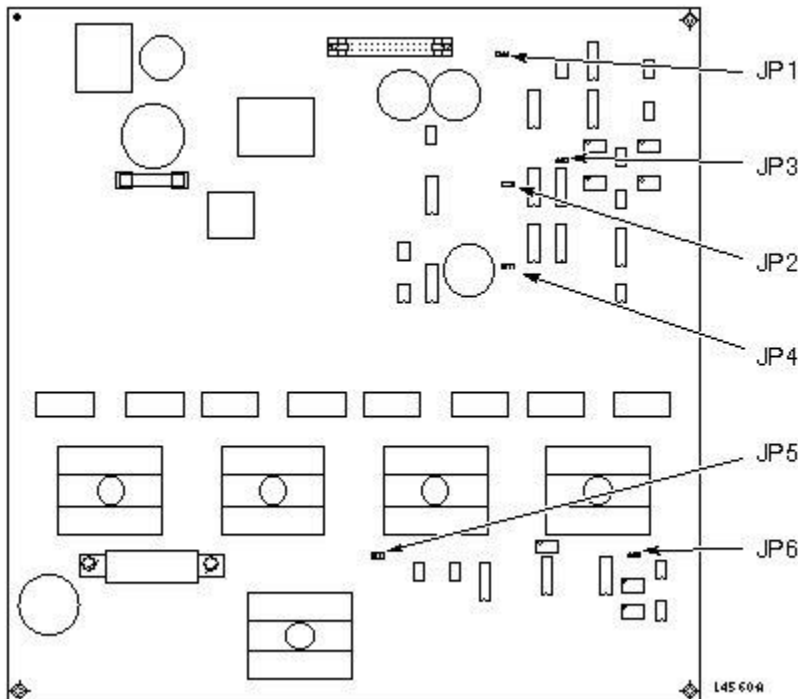
PROPER JUMPER SETTINGS FOR THE GRAM CONTROL BOARD
 ILLUSTRATION 1-2

1- PRELIMINARY SET-UP (continued)

TABLE 1-2
 PROPER JUMPER SETTINGS FOR THE GRAM CONTROL BOARD

Name	Position	Setting
JP1	2 & 3	
JP2	2 & 3	
JP3	2 & 3	
JP4	2 & 3	(V/D) Voltage or Digital to Analog Converter – DAC selected
JP5	2 & 3	(AN/DIG) Analog or Digital – Digital selected
JP6	2 & 3	(DIS/EN) Disable or Enable – Enable selected
JP8	2 & 3	(TST/NRM) Test or Normal – Normal selected
JP9	2 & 3	Sets up one current sensor. Located <u>under</u> the Tuning Board
JP13	2 & 3	(AN/DIG) Charge mode

c. See Table 1-3 and Illustration 1-3 for proper jumper settings for the GRAM Power Supply Board.



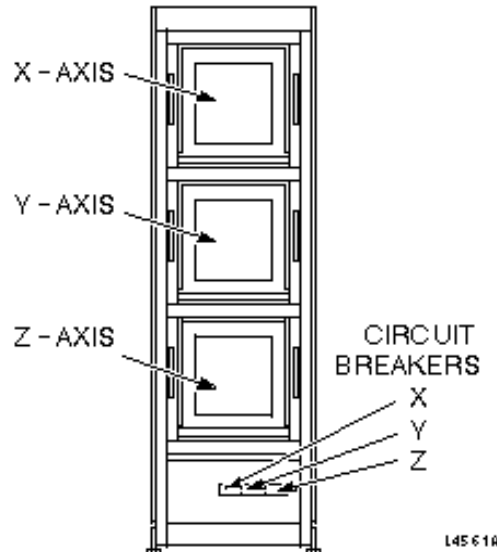
GRAM POWER SUPPLY BOARD JUMPER LOCATIONS
 ILLUSTRATION 1-3

1- PRELIMINARY SET-UP (continued)

TABLE 1-3
 GRAM POWER SUPPLY BOARD JUMPER SETTING

Name	Position Rev B	Position Rev C	Settings
JP1	2 & 3	2 & 3	Triangle enable
JP2	1 & 2	2 & 3	Connects LGND to AGND
JP3	1 & 2	2 & 3	High voltage enable
JP4	2 & 3	2 & 3	Under voltage enable
JP5	1 & 2	2 & 3	High voltage enable
JP6	1 & 2	2 & 3	NORM – Normal mode

- Turn power to the GRAM cabinet off using the circuit breakers located at the lower front of the GRAM cabinet for all three GRAM modules (see Illustration 1-4).



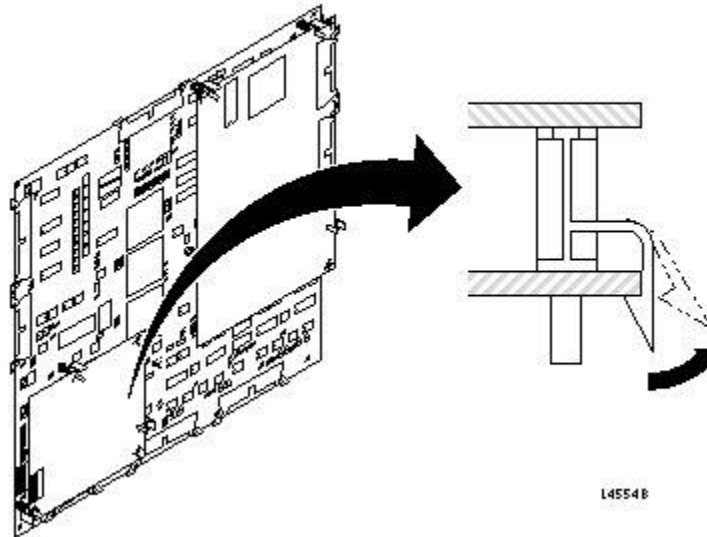
CIRCUIT BREAKER LOCATIONS
 ILLUSTRATION 1-4



Equipment damage possibility. Do not pull the circuit board off. The nylon standoffs are quite brittle and will break. Push the top of the standoff away from the circuit board one by one. If they do not push off of the circuit board at first, work on the other standoffs iteratively.

1- PRELIMINARY SET-UP (continued)

- Carefully push back the white nylon circuit board standoffs on the GRAM Analog Tuning board (see Illustration 1-5). Do not disconnect the GRAM Tuning Board at this time.



NYLON CIRCUIT BOARD STANDOFFS
ILLUSTRATION 1-5

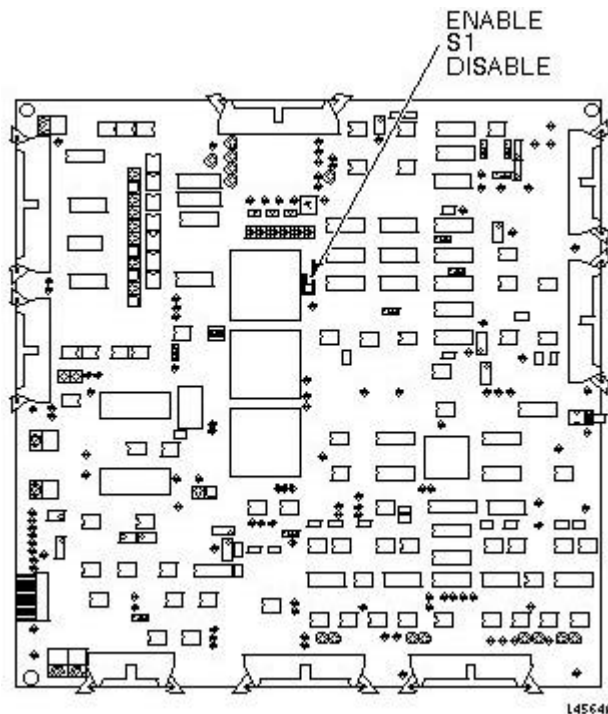
- Use the nylon standoffs as a circuit board holder by turning the GRAM Analog Tuning Board perpendicular to the GRAM Control Board. Push the Tuning Board in between the clip and the post of one nylon standoff. This should hold the GRAM Analog Tuning Board in place while you perform the other adjustments.
- If all three axes are to be calibrated, repeat steps 6 through 12 for each axis. If one or two axes are to be calibrated, perform steps 6 through 12 accordingly.
- Turn on power to the GRAM cabinet by using the circuit breakers located at the lower-front of the GRAM cabinet for all three GRAM modules.

2- GRAM DC OFFSET ADJUSTMENT

Note

GRAM DC Offset adjustment must be performed first, or the return signal may not show up due to a magnitude offset caused by a DC offset on the output of the GRAM.

1. At the GRAM Control Board, verify that switch S1 is in the up/enable position (see Illustration 2-1).



SWITCH S1
ILLUSTRATION 2-1

2. Landmark on the center line of the phantom.
3. At keypad on front magnet enclosure, press [**LANDMARK**] and [**Move to Scan**].
4. At operator work space, prepare system to scan using the scan parameters shown in the Protocol List under Signa Help, or for alternate proprietary procedure, use the following.
 - A. Click on [**New Pt**], and enter
Id: **geservice**
Name: **grafidy**
Weight (Lb): **111**
Set Patient Protocols to **Service**.
 - B. Depending on your Release,
8.0: Click on **Other** to go to protocol list, then select **Grafidy**. Select series **1**.
8.1 or 8.2: In the Protocol field, type **o.5.1** (o=Other, 1=series number).
 - C. [**Save Series**], then [**Prepare to Scan**].

2- GRAM DC OFFSET ADJUSTMENT (continued)

5. Go to manual prescan. Record grad shim values for x, y, and z axes. If values are not set to 0, set them by moving the slide bar to 0 at this time.
6. Select **[Done]** to exit manual prescan. This is important so that the scanner is ready, but not scanning.

Note

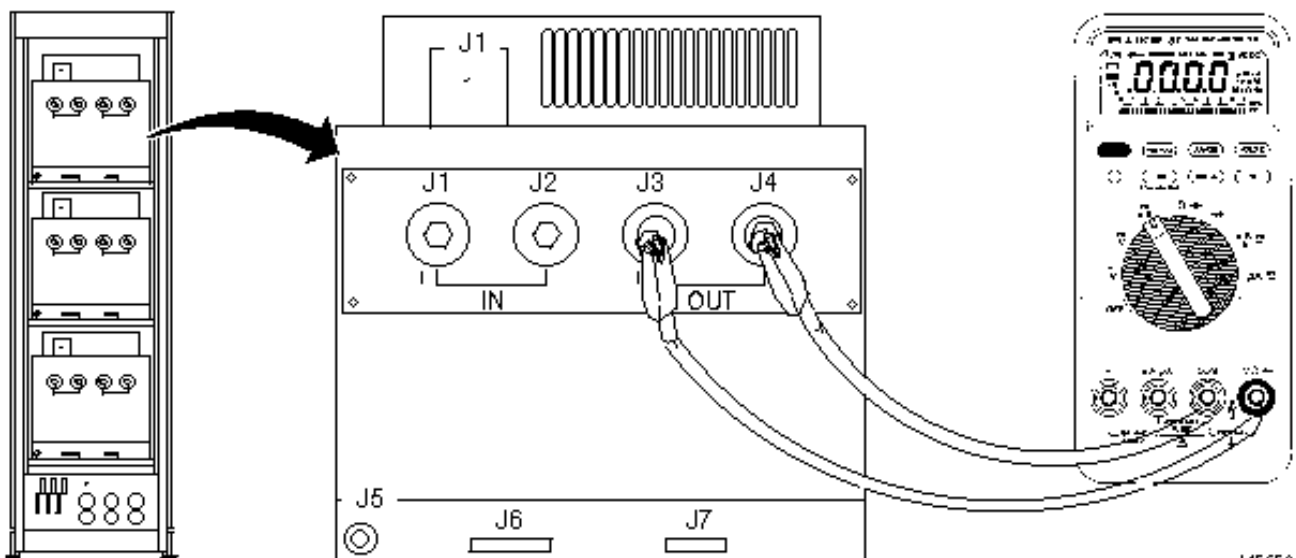
It is necessary to set the Grad Shim values to zero in order to ensure that there are no additional offsets in the circuit. This guarantees an accurate calibration.

DANGER!!

FATAL ELECTRIC SHOCK HAZARD!! GRAM MODULES GENERATE FATAL ELECTRICAL CURRENTS. SCANNING OR PRESCANNING DURING THIS MEASUREMENT MAY CAUSE A FAILURE TO THE GRAM, AND EXPLOSION OF THE VOLTMETER. DO NOT SCAN OR PRESCAN DURING THIS MEASUREMENT AND ADJUSTMENT.

7. At the GRAM Control Board, prepare to perform the GRAM DC Current Offset Adjustment to null any offset currents to zero.
8. Using voltmeter leads with alligator clips, connect a voltmeter at the rear of the GRAM chassis across J3 (+OUT) and J4 (-OUT). See Illustration 2-2.

ALLIGATOR CLIPS CONNECTED THROUGH THE ACCESS HOLES TO THE STUBS ON THE OUTPUT TERMINALS OF THE GRAM MODULE.



145 65 0

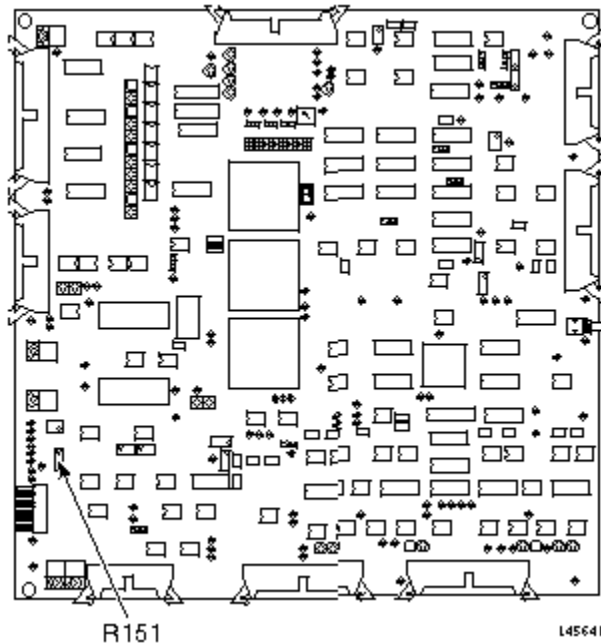
REAR VIEW WITH VOLTMETER ACROSS OUTPUT
ILLUSTRATION 2-2

2- GRAM DC OFFSET ADJUSTMENT (continued)

Note

Using longer leads for the voltmeter allows you to view the voltmeter as you perform the adjustment.

9. On the GRAM Control Board, locate and adjust the R151 (Offset Null) pot, so that the voltmeter reads $0\text{ Vdc} \pm 0.010\text{ Vdc}$. R151 is located under the GRAM Tuning Board (see Illustration 2-3).



R151 (OFFSET NULL) POT LOCATION
ILLUSTRATION 2-3

Note

GRAM DC Offset adjustment must be performed first, or the return signal may not show up due to a magnitude offset caused by a DC offset on the output of the GRAM.

10. If all three axes are to be calibrated, repeat steps 7 through 9 for each axis. If one or two axes are to be calibrated, repeat steps 7 through 9 accordingly.

REVISION HISTORY

REV	DATE	AUTHOR	PRIMARY REASONS FOR CHANGE
0	April 7, 1998	R. Hawthorne	Initial conversion from toolbook to Word.