Section II. EQUIPMENT DESCRIPTION

1-10. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES.

a. *Characteristics.*

- Sweep frequency or continuous wave operation over the full band
- Five front-panel or GPIB selectable sweep-frequency ranges: Full, F_1-F_2, M_1-M_2, ΔF CF, ΔF M1
- Fine-frequency adjustments (Frequency Vernier operation) providing up to ±12.7 MHz control in CW and ΔF sweep modes
- Three sweep triggering modes: Auto, Line, and External

b. *Capabilities and Features.*

- Eight frequency markers: M1 thru M8
- Three marker display modes: Video, RF, Intensity
- Alternately sweeps between two sets of front panel sweep parameters, such as Full and F1-F2
- Sweeps power over an up-to-15 dB range
- Retains front panel control settings in nonvolatile memory for up to 10 years. Whenever the instrument is turned on, it comes on line having the same control settings and values as when turned off last.

1-11. EQUIPMENT DATA.

a. *Weights and Dimensions.*

Weight	32 lb (14.5 kg)
Height	5.25 in. (133 mm)
Width	17 in. (432 mm)
Depth	18.75 in. (476 mm)

b. *Power Requirements.*

Voltage	115/230V ±20%
Frequency	48 to 400 Hz
Input Power	250 VA maximum
Fuses (2)	4 Amp SB, 115/230 Vac operation

c. *Environmental.*

Operating temperature range	0 to +55°C
Storage temperature range	−40 to +70°C
Relative humidity	95%±5% (10 to 30°C) 75% ±5% (30 to 40°C) 45% ±5% (40 to 50°C)
Operating altitude	0 to 10,000 ft
Storage altitude	0 to 40,000 ft

d. *Performance.*

Frequency range	10 MHz to 20 GHz
Frequency accuracy (25°C ±5°C)	
CW mode	±10 MHz
Frequency stability	
With temperature (MHz/°C)	±750 kHz, at ≤2 GHz output frequency ±0.02%, at >2 GHz output frequency
With 10 dB power level change	±200 kHz, at ≤2 GHz output frequency ±500 kHz, at >2 GHz output frequency
With 3:1 load SWR	±200 kHz, at ≤2 GHz output frequency ±300 kHz, at >2 GHz output frequency
Frequency resolution	
Normal	1 MHz
With Frequency Vernier mode selected	100 kHz
With Step Sweep (GPIB selectable function)	4096 programmable points
Sweep time	0.01 to 99 seconds
Output power (25°C ±5°C)	+13 dBm, at ≤2 GHz output frequency +10 dBm, at >2 to 18 GHz output frequency +7 dBm, at >18 GHz output frequency
Power level accuracy	±1.5 dB
Attenuator accuracy per step	±0.4 dB
Leveled power variation	±1.0 dB, at ≤2 GHz output frequency ±1.1 dB, at >2 GHz output frequency
Source SWR (50Ω)	1.5:1, at ≤2 GHz output frequency 2.1:1, at >2 GHz output frequency
Signal purity	
Harmonics	≤−25 dBc
Nonharmonics	≤−45 dBc
Residual FM (measured in a 30 Hz to 15 kHz bandwidth)	<5 kHz pk, at ≤4 GHz output frequency <7 kHz pk, at 4 to 6.5 GHz output frequency <15 kHz pk, at >6.5 GHz output frequency
Amplitude modulation (AM)	
Sensitivity	1 dB per volt
Frequency response (typical)	20 kHz, at ≤2 GHz output frequency 100 kHz, at >2 GHz output frequency
Frequency modulation (FM)	
Sensitivity	Selectable, −60 MHz per volt *or* −6 MHz per volt
Maximum deviation (modulation frequency), dc to 100 Hz	±75 MHz
Maximum deviation (modulation frequency), >100 Hz to 100 kHz	±7 MHz

Section III. TECHNICAL PRINCIPLES OF OPERATION

1-12. GENERAL FUNCTIONAL DESCRIPTION.

The SG-1206 is a microprocessor-based source of RF and microwave energy. It uses a down converter and three YIG-tuned oscillators to cover the frequency range of 10 MHz to 20 GHz. The SG-1206 is capable of outputting both broad (full range) and narrow band sweeps, along with discrete CW frequencies, across the entire range. It is fully controllable locally from the front panel or remotely (except for power on/off) via the IEEE-488 bus (GPIB). A functional description of the SG-1206 (fig. 1-2) is given below.

① The *User Interface and Instrument Control Function* accepts inputs from the front panel controls or GPIB. The function is distributed over three circuit card assemblys (CCAs), one of which houses an Intel 8085 Microprocessor integrated circuit (IC). This IC, along with its associated circuitry, provides digital control over sweep generator functions. Control lines go to the Markers, ALC, Freq Inst, and FM CCAs.

② The *Sweep Ramp, Markers, ALC, Freq Inst, and FM Function* is distributed over five CCAs.

- The *Sweep Ramp CCA* provides a ramping voltage to the Markers, ALC (Automatic Level Control), and Freq Inst (Frequency Instruction) CCAs. These CCAs use this ramp to control their own operations. The Sweep Ramp CCA also controls the sweep triggering circuits. These circuits provide for the three triggering modes that are described in Chapter 2.
- The *Markers CCA* provides markers at user-selectable frequencies. It also controls the marker-mode circuits that allow the user to select between Video, RF, and Intensity markers. Thirdly, it processes the power sweep signal that provides for sweeping the output power over a range of 0 to 15 dB.
- The *ALC CCA* controls the flatness of the power-level variations over the sweep range. That is, it ensures that the power level does not vary more than plus or minus 1 dB at any frequency within the selected range at the output of the sweeper. The ALC is a closed-loop system that receives feedback from a directional coupler and detector. In the INTERNAL leveling mode, the coupler and detector are located on the RF deck. In the EXTERNAL leveling mode, a coupler and a detector are connected outside the instrument. (In the POWER METER leveling mode, a voltage from a power meter replaces the output from a detector.) The coupler and detector sample the Sweep Generator output power and send a controlling current to the ALC Function, which controls the output power level via an RF modulator.
- The *Freq Inst CCA* provides overall control for the Freq (frequency) Generation Function. It controls the sweep and generates control voltages that ensure proper sequencing of the frequency bands from a lower to a higher frequency. This CCA also controls the manual tuning of the sweep (front panel MANUAL SWEEP function) and CW frequency settings.
- The *FM CCA* has two functions. Its main function is to control the frequency modulation current to the YIG-tuned oscillators, thereby, causing the output frequency to vary with an externally supplied FM control voltage signal. Its secondary function is to supply control voltages and currents to the 110 dB Step Attenuator located on the RF Deck.

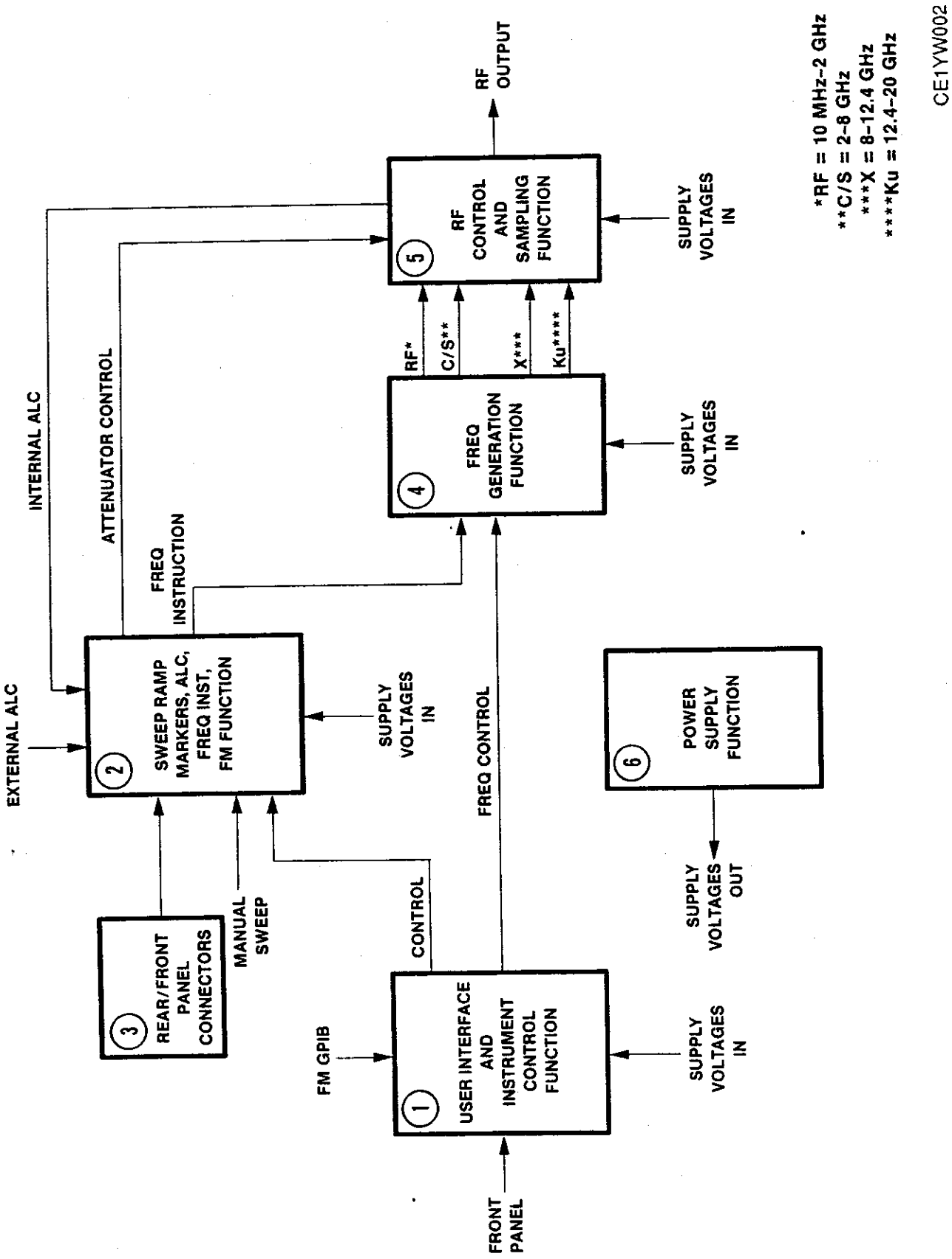


Figure 1-2. Sweep Generator SG-1206/U Overall Block Diagram.

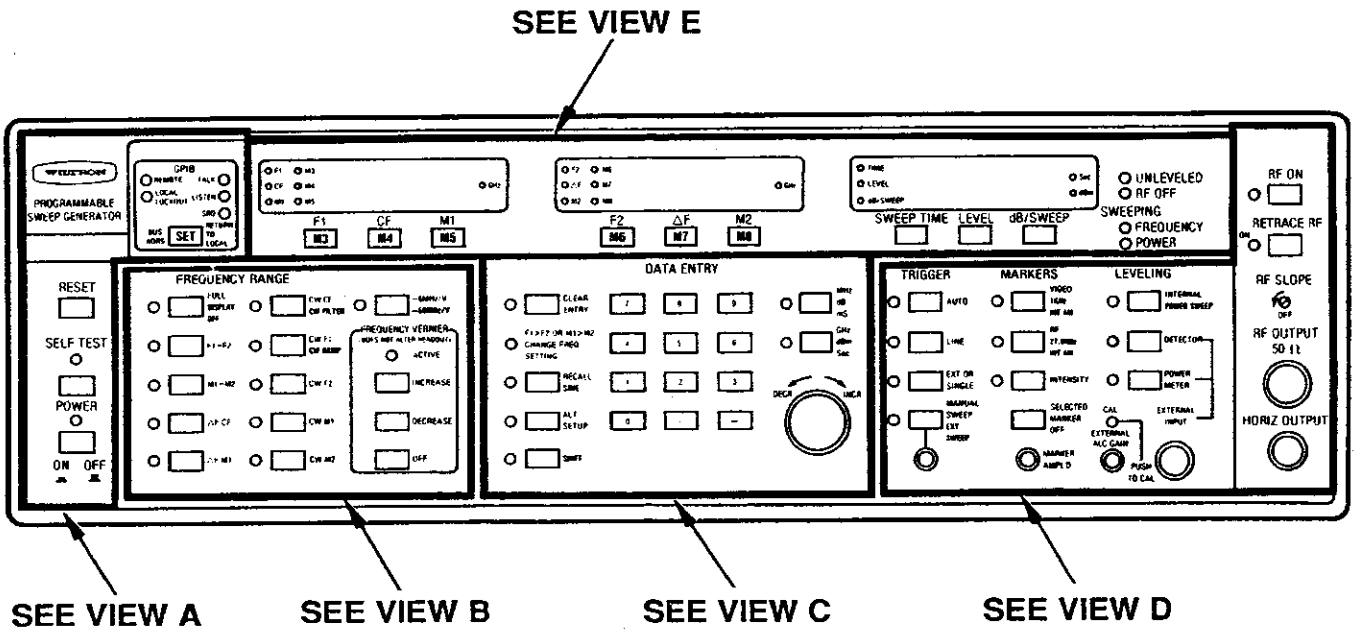
③ The *Rear/Front Panel Connectors* provide input/output interface between the sweep generator and other instruments. Front Panel connectors include RF Output (type N), External ALC Input (BNC), and Horizontal Output (BNC). Rear Panel connectors incude Pos Z Blanking Output, Neg Z Blanking Output, Marker Output, Penlift Output, External Trigger Input, FM Input, AM Input, Horizontal Output (parallel output with front panel connector), and Ext Sq Wave Input (BNC connectors), as well as AUX I/O and GPIB Interface (multipin connectors).

④ The *Freq Generation Function* consists of the three YIG-tuned oscillators, their associated driver CCAs, and the 10 MHz to 2 GHz down converter. Each YIG driver CCA in this function receives a control signal input from the Frequency Instruction CCA. Each YIG Driver CCA outputs a frequency-control-tuning current and bias voltage to its respective oscillator.

⑤ The *RF Control and Sampling Function* consists of three discrete elements:

- The first is an electronic switch for switching from a lower-frequency oscillator to a higher-frequency oscillator in a sequential sweep. This switch also contains an attenuator used by the ALC circuitry to provide leveling control of the output power.
- The second element is the directional coupler and detector previously described in the ALC CCA discussion.
- The third element is the 110 dB Attenuator used to reduce the output power level.

⑥ The *Power Supply Function* uses a switching power supply to provide dc voltages to all of the other instrument functions. It also contains diagnostic circuits that will shut the sweep generator down when the +5V power supply is out of tolerance.



CE1YW003

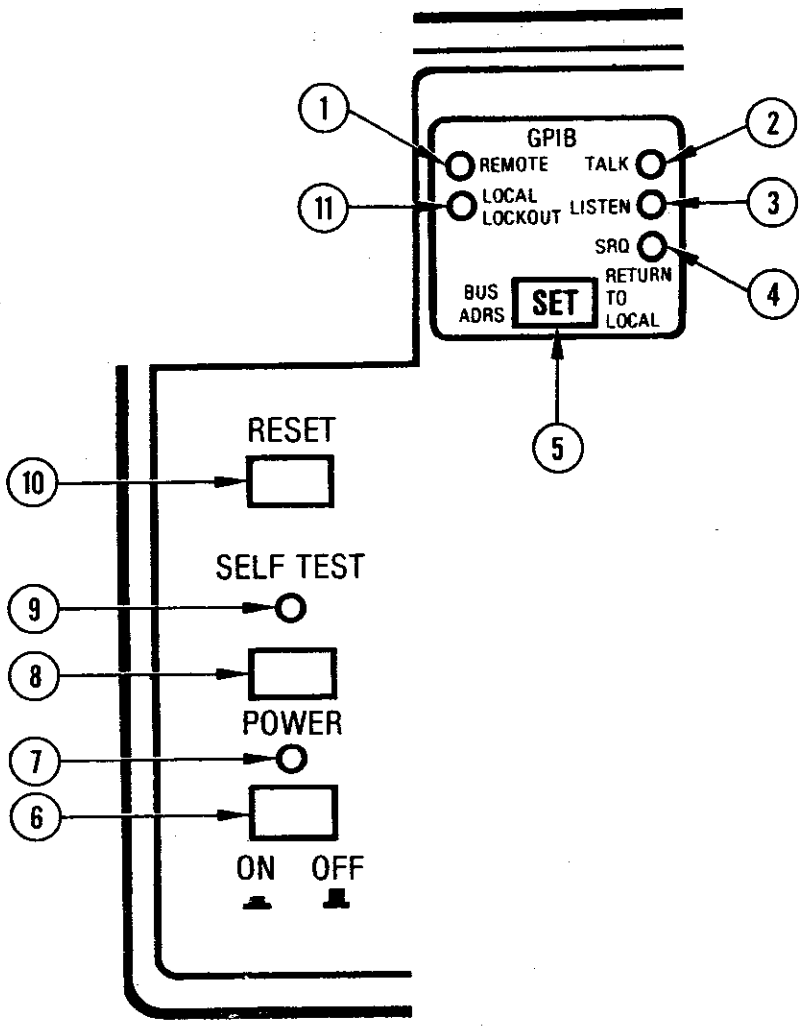
Figure 2-1. Operator's Controls, Indicators, and Connectors, front view.

CHAPTER 2
OPERATING INSTRUCTIONS

Section I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS, INDICATORS, AND CONNECTORS

2-1. INTRODUCTION.

This section describes all operator controls, indicators, and connectors on the SG-1206. Because of the many controls and indicators on the front panel, the front panel is divided into five portions (views A thru E). Figure 2-1 shows the front panel and identifies the different views, which are individually described on later pages. Figure 2-2 shows the rear panel and describes the connectors that it contains.

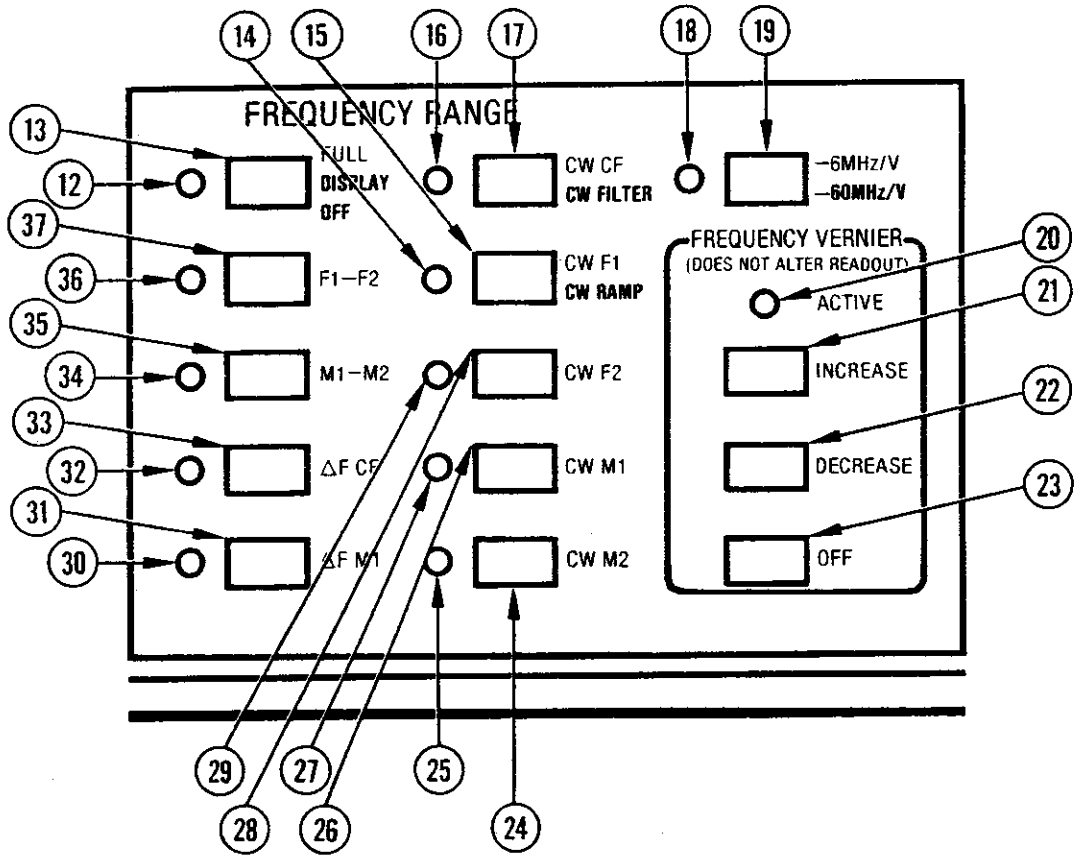


VIEW A

CE1YW004

Key	Control, Indicator, or Connector	Function
1	REMOTE Indicator	Indicates whether or not SG-1206 is under GPIB control. Lights when SG-1206 goes under GPIB control and remains lit until it is returned to local (front panel) control.
2	TALK Indicator	Indicates whether or not SG-1206 is sending information to controller. Indicator remains lit while SG-1206 is sending information.
3	LISTEN Indicator	Indicates whether or not SG-1206 is receiving information from controller. Indicator remains lit while SG-1206 is receiving information.

Key	Control, Indicator, or Connector	Function
4	SRQ Indicator	Indicates whether or not SG-1206 has sent a Service Request command to the controller. Indicator remains lit until SG-1206 receives a serial poll, or until controller resets SRQ function.
5A	BUS ADRS/ RETURN TO LOCAL Key	In local (front panel) mode, key causes bus address to be displayed on middle LED readout. In remote (GPIB) mode—providing a Local Lockout bus message is not programmed—pressing key causes Sweep Generator to return to local mode. If a Local Lockout bus message is programmed, the only way to return to local control is by sending the "Go to Local" bus message via the GPIB (Appendix E).
5B	**SET**	Provides for entering a new GPIB address. To use, press **SHIFT** key then this key and enter a new address number via keypad. Address number is displayed on right-most numeric display (99).
6	POWER Key	Turns ac power on and off. Press to use. **NOTE** Pressing this key to turn power on initiates a self test and causes the version number of the firmware (such as, 1.0) to appear on left-most numeric display (89).
7	POWER Indicator	Indicates whether or not SG-1206 is turned on. Indicator lights when POWER key is pressed to ON and remains on until POWER key is pressed to OFF.
8	SELF TEST Key	Initiates self testing of Sweep Generator circuits. Press to use.
9	SELF TEST Indicator	Indicates whether or not SG-1206 is in self test mode. Indicator lights when SELF TEST key is pressed and remains lit until self test is finished.
10	RESET Key	Presets front panel controls to default values. These values are shown for RESET key operation (para 2-6). Press to use.
11	LOCAL LOCKOUT Indicator	Lights when Sweep Generator receives a local lockout message. When LOCAL LOCKOUT indicator is lit, SG-1206 cannot be returned to local control via front panel.



VIEW B

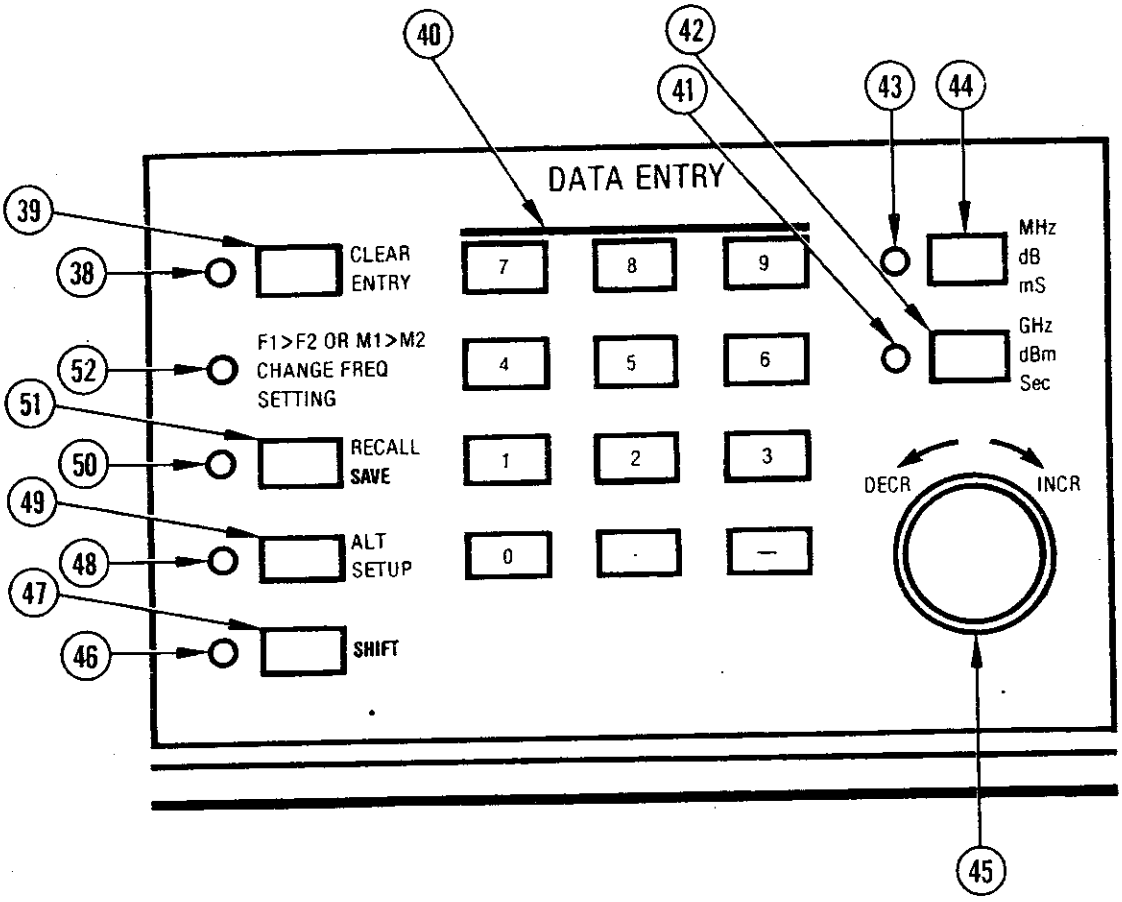
CE1YW005

Key	Control, Indicator, or Connector	Function
12A	FULL Indicator	Indicates whether or not FULL mode is active. Indicator lights when FULL key is pressed and remains lit while mode is active.
12B	**DISPLAY OFF** Indicator	When **SHIFT** key is pressed, indicator shows whether or not **DISPLAY OFF** mode is active. Indicator lights when **SHIFT** key plus **DISPLAY OFF** key is pressed and remains lit while mode is active.

Key	Control, Indicator, or Connector	Function
13A	FULL Key	Selects full-band, 10 MHz to 20 GHz, sweep. Press to use.
13B	**DISPLAY OFF** Key	Turns frequency LED displays off. To use, press **SHIFT** then this key. For security, all frequency related functions except **SAVE**, RECALL, and RESET are disabled.
14A	CW F1 Indicator	Indicates whether or not CW F1 mode is active. Indicator lights when CW F1 key is pressed and remains lit while mode is active.
14B	**CW RAMP** Indicator	When **SHIFT** key is pressed, indicator shows whether or not **CW RAMP** mode is active. Indicator lights when **SHIFT** key plus **CW RAMP** key is pressed and remains lit while mode is active.
15A	CW F1 Key	Selects CW F1 mode. Selection of this mode provides a non-sweeping, CW signal at the frequency set for the F1 parameter. Press to use.
15B	**CW RAMP** Key	Provides a 0-10V sweep ramp for all five CW modes at front and rear panel HORIZ OUTPUT connectors. To use: Press **SHIFT** then this key.
16A	CW CF Indicator	Indicates whether or not CW CF mode is active. Indicator lights when CW CF key is pressed and remains lit while mode is active.
16B	**CW FILTER** Indicator	When **SHIFT** key is pressed, indicator shows whether or not **CW FILTER** mode is active. Indicator lights when **SHIFT** key plus **CW FILTER** key is pressed and remains lit while mode is active.
17A	CW CF Key	Selects CW CF mode. Selection of this mode provides a non-sweeping, CW, signal at the frequency set for the CF parameter. Press to use.
17B	**CW FILTER** Key	Provides enable/disable, conditional-in/unconditional-out, control over CW filter located in YIG oscillator tuning circuit. When enabled, CW filter is switched-in for improved accuracy in CW and ≤50 MHz sweep modes. Conversely, when **CW FILTER** key is not activated (LED off), CW filter is unconditionally switched-out of YIG tuning circuit. To use, press **SHIFT**, then this key.
18A	−6 MHz/V Indicator	Indicates whether or not −6 MHz-per-volt FM mode is active. Indicator lights when −6 MHz/V key is pressed and remains lit while mode is active.
18B	**−60 MHz/V** Indicator	When **SHIFT** key is pressed indicator shows whether or not **−60 MHz/V** mode is active. Indicator lights when **SHIFT** key plus **−60 MHz/V** key is pressed and remains lit while mode is active.

Key	Control, Indicator, or Connector	Function
19A	−6 MHz/V Key	Allows output frequency to be either phase-locked or frequency-modulated at a deviation of 6 MHz per volt of input signal amplitude. To use, apply a modulating signal via rear panel EXT FM/Ø LOCK connector and press key to activate function.
19B	**−60 MHz/V** Key	Allows output frequency to be either phase locked or frequency modulated at a deviation of 60 MHz per volt of input signal amplitude. To use, press **SHIFT** then this key. Apply a modulating signal via rear panel EXT FM/Ø LOCK connector (130).
20	ACTIVE Indicator	Lights when FREQUENCY VERNIER function is active. Indicator lights when INCREASE or DECREASE key is pressed for any of the seven affected modes: CW CF, CW F1, CW F2, CW M1, CW M2, ΔF CF, and ΔF M1. Indicator remains lit until all affected modes have frequency-vernier correction turned off.
21	INCREASE Key	Increases frequency by a maximum of 12.7 MHz in 100 kHz increments for any of the following modes: CW CF, CW F1, CW F2, CW M1, CW M2, ΔF CF, and ΔF M1. Operation of this key does not affect displayed LED readout value. Once made, vernier corrections to frequency remain in place, even when SG-1206 is powered off. Press to use.
22	DECREASE Key	Decreases frequency by a maximum of 12.7 MHz in 100 kHz increments for any of the following modes: CW CF, CW F1, CW F2, CW M1, CW M2, ΔF CF, and ΔF M1. Operation of this key does not affect displayed LED readout value. Once made, vernier corrections to frequency remain in place, even when SG-1206 is powered off. Press to use.
23	OFF Key	Cancels vernier correction being applied to selected CW output or ΔF center frequency and turns ACTIVE indicator OFF in that mode.
24	CW M2 Key	Selects CW M2 mode. Selection of this mode provides a nonsweeping, CW, signal at the frequency set for the M2 parameter. Press to use.
25	CW M2 Indicator	Indicates whether or not CW M2 mode is active. Indicator lights when CW M2 key is pressed and remains lit while mode is active.
26	CW M1 Key	Selects CW M1 mode. Selection of this mode provides a nonsweeping, CW signal at the frequency set for the M1 parameter. Press to use.
27	CW M1 Indicator	Indicates whether or not CW M1 mode is active. Indicator lights when CW M1 key is pressed and remains lit while mode is active.
28	CW F2 Key	Selects CW F2 mode. Selection of this mode provides a nonsweeping, CW signal at the frequency set for the F2 parameter. Press to use.

Key	Control, Indicator, or Connector	Function
29	CW F2 Indicator	Indicates whether or not CW F2 mode is active. Indicator lights when CW F2 key is pressed and remains lit while mode is active.
30	ΔF M1 Indicator	Indicates whether or not ΔF M1 mode is active. Indicator lights when ΔF M1 key is pressed and remains lit while mode is active.
31	ΔF M1 Key	Selects a frequency sweep that is symmetrical about the M1 frequency. Width of this sweep can go from 0% to 100% of full frequency range. One of two similar sweep modes in which a selected sweep width (ΔF) provides equal excursions about a selected center frequency. Press to use.
32	ΔF CF Indicator	Indicates whether or not ΔF CF mode is active. Indicator lights when ΔF CF key is pressed and remains lit while mode is active.
33	ΔF CF Key	Selects a frequency sweep that is symmetrical about the CF frequency. Width of this sweep can go from 0% to 100% of full frequency range. One of two similar sweep modes in which a selected sweep width (ΔF) provides equal excursions about a selected center frequency. Press to use.
34	M1-M2 Indicator	Indicates whether or not M1-M2 sweep mode is active. Indicator lights when M1-M2 key is pressed and remains lit while mode is active.
35	M1-M2 Key	Selects a frequency sweep from marker M1 to marker M2. One of two similar sweep modes in which start and stop frequency can be individually set. Press to use.
36	F1-F2 Indicator	Indicates whether or not F1-F2 sweep mode is active. Indicator lights when F1-F2 key is pressed and remains lit while mode is active.
37	F1-F2 Key	Selects a frequency sweep from F1 to F2. One of two sweep modes in which start and stop frequency can be individually set. Press to use.



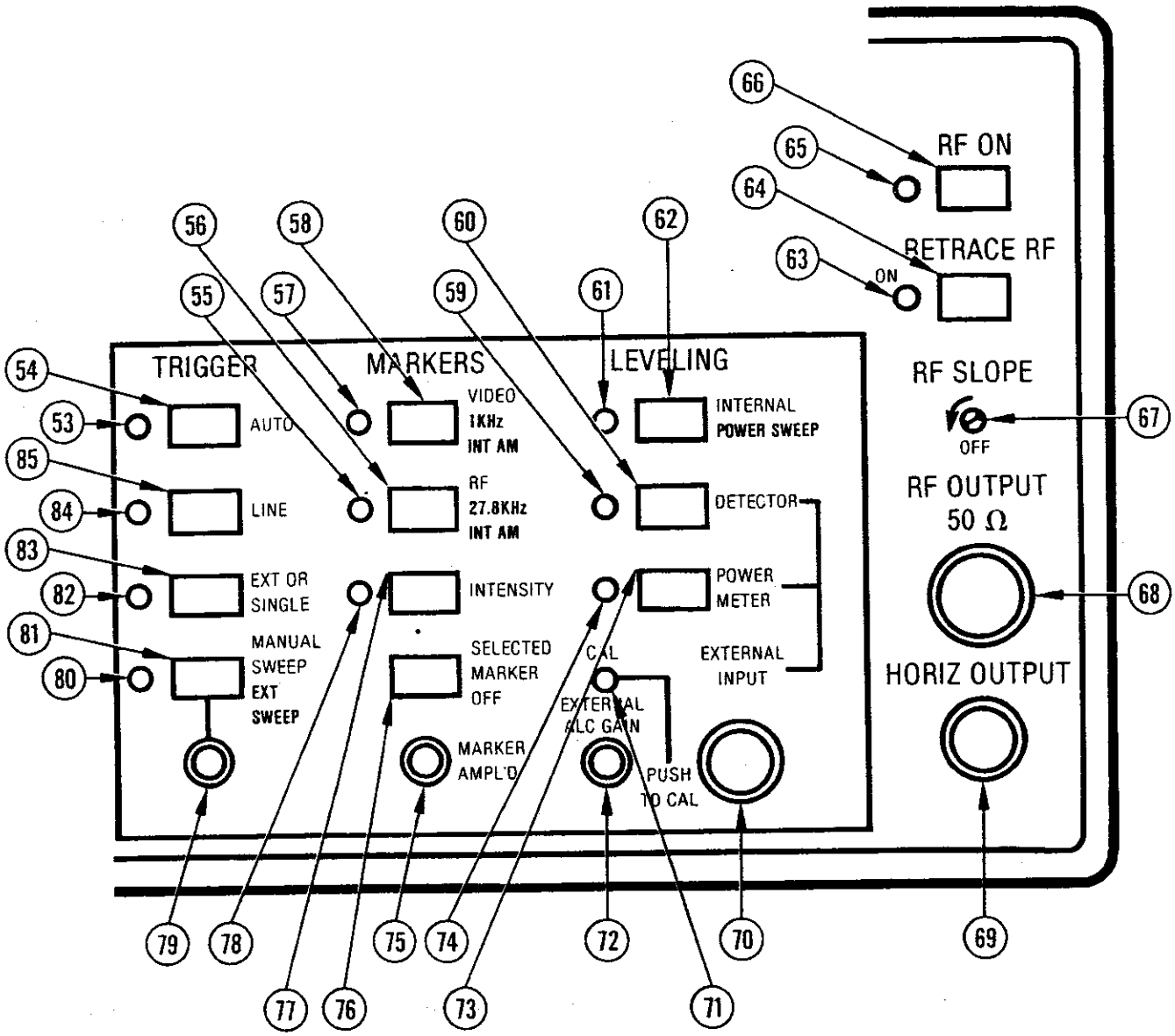
VIEW C

CE1YW006

Key	Control, Indicator, or Connector	Function
38	CLEAR ENTRY Indicator	Flashes when an illegal or incomplete (see below) data entry has been attempted. • *Illegal Entry:* Out-of-range frequency, sweep time, or output-power value entered via keypad. To clear, press associated CLEAR ENTRY key and re-enter data. • *Incomplete Entry:* Value entered on keypad but not terminated with GHz/dB/mS or MHz/dBm/Sec key. To clear, either press appropriate GHz/dB/mS or MHz/dBm/Sec key or press the CLEAR ENTRY key and re-enter data.
39	CLEAR ENTRY Key	Clears keypad of an illegal or incomplete data entry (described above) and allows parameter data to be re-entered.

Key	Control, Indicator, or Connector	Function
40	DATA ENTRY Keypad	Provides for entering numeric values for selected frequency, sweep time, power sweep, and power level parameters. • For frequency parameters, values can be entered in MHz or GHz. • For SWEEP TIME, values can be entered in seconds or milliseconds. • For power LEVEL, values can be entered in dB or dBm. • For dB/SWEEP, values can be entered in dB.
41	GHz/dBm/Sec Indicator	Flashes to indicate that data input via the keypad was not terminated with GHz/dBm/Sec or MHz/dB/mS key. Indicator begins flashing, along with CLEAR ENTRY indicator, when data is entered via keypad and a key other than GHz/dBm/Sec or MHz/dB/mS key is pressed.
42	GHz/dBm/Sec Key	Terminates data entry. That is, key marks the end of a parameter-input entry and assigns appropriate units (GHz, dBm, Sec) to entry. Press to use. • Frequency value is always displayed in GHz. • Sweep time value is always displayed in seconds. • Power level value is always displayed in dBm.
43	MHz/dB/mS Indicator	Flashes to indicate that data input via the keypad was not terminated with GHz/dBm/Sec or MHz/dB/mS key. Indicator begins flashing, along with CLEAR ENTRY indicator, when data is entered via keypad and a key other than GHz/dBm/Sec or MHz/dB/mS key is pressed.
44	MHz/dB/mS Key	Terminates data entry. That is, key marks the end of a parameter-input entry and assigns appropriate units (MHz, dB, mS) to entry. Press to use. • Frequency value is always displayed in GHz. • Sweep time value is always displayed in seconds. • Power level value is always displayed in dBm.
45	DECR/INCR Control	Increases or decreases a parameter's value. When turned slowly, parameter's value is increased or decreased by finest available resolution. Turning knob rapidly changes parameter's value in large steps. Clockwise rotation increases value; counterclockwise rotation decreases value. The finest resolution is shown below: • For frequency: 1 MHz • For power level and power sweep: 0.1 dB • For time: 1 ms, for sweeps 0.01 to 1.0 seconds 0.1 second, for sweeps 1.0 to 10 seconds 1 second, for sweeps 10 to 99 seconds

Key	Control, Indicator, or Connector	Function
46	**SHIFT** Indicator	Indicates that **SHIFT** function is active. Lights when **SHIFT** key is pressed.
47	**SHIFT** Key	Provides additional functions for certain keys. (Shift functions are designated by blue lettering on panel itself and by boldface type in this manual.) • *To use:* Press **SHIFT** key then desired function or parameter key. Numeric displays and LED indicators will go out, except for currently active **SHIFT** functions. • *To abort once begun:* Press **SHIFT** key again. This returns displays and indicators to their unshifted (normal) indications—no parameters are changed.
48	ALT SETUP Indicator	Indicates whether or not ALT SETUP mode is active. Indicator lights when ALT SETUP key is pressed and remains lit while mode is active.
49	ALT SETUP Key	Causes present front panel setup—frequency sweep, power level, markers, etc.—to alternate with a setup stored in memory. Use keypad to enter number of stored setup, from 1 to 9. Press to use.
50A	RECALL Indicator	Indicates whether or not RECALL mode is active. Indicator lights when RECALL key is pressed and remains lit while mode is active.
50B	**SAVE** Indicator	When **SHIFT** key is pressed, indicator shows whether or not **SAVE** mode is active. Indicator lights when **SHIFT** key plus **SAVE** key is pressed and remains lit while mode is active.
51A	RECALL Key	Provides for recalling any of nine stored setups. Setup number is entered via keypad. Sequentially pressing RECALL key then 0 key recalls setup that was in use prior to starting Recall function. Press to use.
51B	**SAVE** Key	Provides for saving present front panel setup into any of nine memory locations. Setup number is entered via keypad. To use: Press **SHIFT** then this key. **NOTE** Sequentially pressing RECALL key then 0 key recalls values that were previously stored in that memory location. This allows operator to correct for erronous **SAVE** key entries.
52	F1>F2 OR M1>M2 CHANGE FREQ SETTING Indicator	Flashes when backward sweep is attempted. (Backward sweep is when respective value of F2 or M2 is less than that of F1 or M1.) Two LED readouts displaying frequency also flash. To clear: Either re-enter frequency values so that F1 or M1 is less than F2 or M2 or select a different frequency range.



VIEW D

CE1YW007

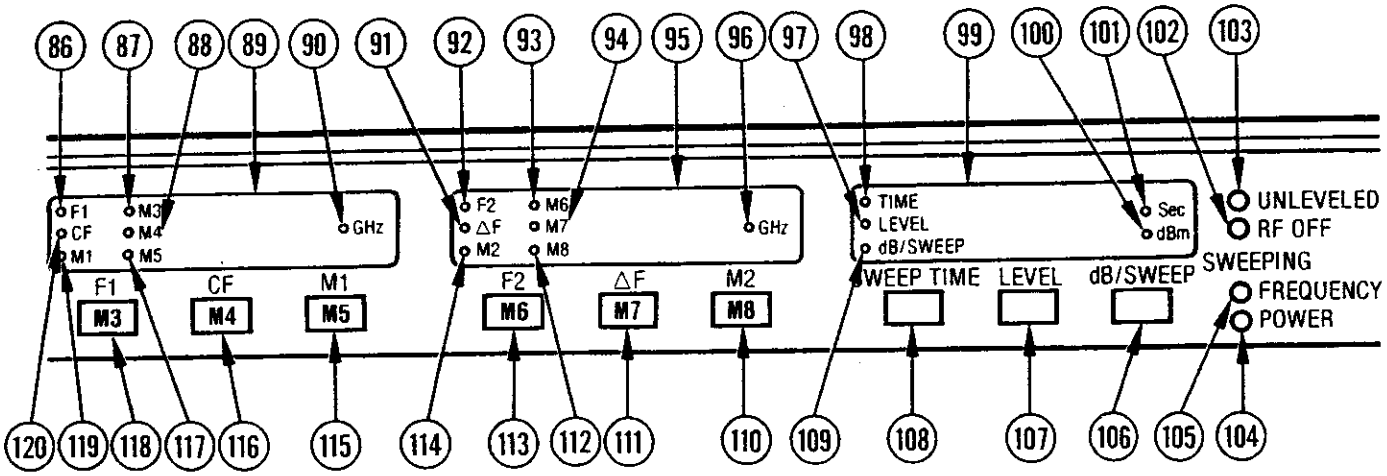
Key	Control, Indicator, or Connector	Function
53	AUTO Indicator	Indicates whether or not AUTO sweep is active. Indicator lights when AUTO key is pressed and remains lit while AUTO sweep is active.
54	AUTO Key	Selects frequency sweep to recur periodically with minimum delay (hold-off) time between one sweep and the next. Press to use.

Key	Control, Indicator, or Connector	Function
55A	RF Indicator	Indicates whether or not RF markers are on. Indicator lights when RF key is pressed and remains lit while RF markers are active.
55B	**27.8 kHz INT AM** Indicator	When **SHIFT** key is pressed indicator shows whether or not internal 27.8 kHz AM is being applied to the RF output. Indicator lights when **SHIFT** key plus **27.8 kHz INT AM** key is pressed.
56A	RF Key	Dips RF output at marker frequency (or frequencies). Dip of last-selected marker can be adjusted from 0 to approximately 10 dB using MARKER AMPL'D control. Dip of all other markers is adjustable from 0 to approximately 5 dB. Press to use.
56B	**27.8 kHz INT AM** Key	Provides 27.8 kHz square-wave modulation to output signal. To use: Press **SHIFT** key then this key. Press to use.
57A	VIDEO Indicator	Indicates whether or not VIDEO markers are active. Indicator lights when VIDEO key is pressed and remains lit while VIDEO markers are active.
57B	**1 kHz INT AM** Indicator	When **SHIFT** key is pressed indicator shows whether or not internal 1 kHz AM is being applied to the RF output. Indicator lights when **SHIFT** key plus **1 kHz INT AM** key is pressed.
58A	VIDEO Key	Provides positive-going video pulse at marker frequency (or frequencies). Amplitude of last-selected marker can be adjusted from 0 to +10 volts using MARKER AMPL'D control. Amplitude of all other markers can be adjusted from 0 to +5 volts. Press to use.
58B	**1 kHz INT AM** Key	Provides 1 kHz square-wave modulation to output signal. To use: Press **SHIFT** key then this key. Press to use.
59	DETECTOR Indicator	Indicates whether or not external DETECTOR leveling is active. Indicator lights when DETECTOR key is pressed and remains lit while external detector leveling is active.
60	DETECTOR Key	Provides for using external directional coupler and positive or negative detector to level output power. Press to use.
61A	INTERNAL Indicator	Indicates whether or not INTERNAL leveling is active. Indicator lights when INTERNAL key is pressed and remains lit while internal leveling is active.
61B	**POWER SWEEP** Indicator	When **SHIFT** key is pressed indicator shows whether or not **POWER SWEEP** mode is active. Indicator lights when **SHIFT** key plus **POWER SWEEP** key is pressed and remains lit while modulation is active.

Key	Control, Indicator, or Connector	Function
62A	INTERNAL Key	Toggles Internal Leveling function on and off. This function uses internally mounted directional detector to sample the output power for leveling purposes. Press to use.
62B	**POWER SWEEP** Key	Sweeps output power over 0-15 dB (maximum) range. To use: Press **SHIFT** key then this key. Press to use.
63	RETRACE RF Indicator	Indicates whether or not RETRACE RF function is active. Indicator lights when RETRACE RF key is pressed and remains lit while mode is active.
64	RETRACE RF Key	Turns RF output on and off during sweep retrace. Key is interlocked with RF ON key so that it cannot be turned on unless RF ON key is also on.
65	RF ON Indicator	Indicates whether or not RF output is turned on. Indicator lights when RF key is pressed and remains lit while RF output is turned on.
66	RF ON Key	Turns RF output on and off. Press to use.
67	RF SLOPE Control	Adjusts slope of detected, leveled-RF output signal. Turn clockwise to adjust output-signal slope. This control is used to compensate for linear-with-frequency attenuation characteristics of RF transmission lines. Fully counterclockwise is off.
68	RF OUTPUT Connector	Provides RF output from 50Ω source. To prevent RF losses due to impedance mismatch, use 50Ω impedance mating connector and cable.
69	HORIZ OUTPUT Connector	Provides 0 to +10V ramp coincident with frequency sweep.
70	EXTERNAL INPUT Connector	Provides for applying external-leveling-input signal.
71	CAL Indicator	Lights when EXTERNAL ALC GAIN control is pushed in and has been adjusted for optimum ALC operation. Press to use.
72	EXTERNAL ALC GAIN Control	Control has two positions: normal and pushed in. In either position, it adjusts gain of signal applied to EXTERNAL INPUT connector. When pushed in, it works with CAL indicator (71) to show when level of input signal is optimum for ALC operation. Press to use. **NOTE** Do not rotate knob after gain has been adjusted for optimum operation. To do so invalidates setting.

Key	Control, Indicator, or Connector	Function
73	POWER METER Key	Provides for leveling output power using external power meter. SG-1206 is compatible with power meters that have ±1V FS (full-scale) analog output. Press to use.
74	POWER METER Indicator	Indicates whether or not POWER METER leveling is active. Indicator lights when POWER METER key is pressed and remains lit while power meter leveling is active.
75	MARKER AMPL'D Control	Adjusts amplitude of VIDEO and RF markers. Rotate clockwise to increase marker aplitude and counterclockwise to decrease marker amplitude.
76	SELECTED MARKER OFF Key	Causes selected marker to disappear from externally connected oscilloscope display. Press to use.
77	INTENSITY Key	Causes intensity dot to occur at marker frequency (or frequencies) for sweep times of less than 1.0 seconds. Press to use. **NOTE** Intensity marker is created by causing sweep to dwell at marker frequency(ies). Therefore, to view using oscilloscope requires no connection to CRT Z-axis input. Marker intensity is not affected by MARKER AMPL'D control. Marker is not viewable on a display that is digitally refreshed.
78	INTENSITY Indicator	Indicates whether or not INTENSITY markers are active. Indicator lights when INTENSITY key is pressed and remains lit while INTENSITY markers are active.
79	MANUAL SWEEP Control	Tunes sweep manually over selected range, when MANUAL SWEEP key is pressed on. Rotate control clockwise to increase frequency.
80A	MANUAL SWEEP Indicator	Indicates whether or not MANUAL SWEEP mode is active. Indicator lights when MANUAL SWEEP key is pressed and remains lit while mode is active.
80B	**EXT SWEEP** Indicator	When **SHIFT** key is pressed, indicator shows whether or not **EXT SWEEP** mode is active. Indicator lights when **SHIFT** key plus **EXT SWEEP** key is pressed and remains lit while mode is active.
81A	MANUAL SWEEP Key	Provides for manually sweeping output signal using associated control (79). Press to use.
81B	**EXT SWEEP** Key	Provides for sweeping output frequency using an external sweep ramp supplied via rear panel EXT SWEEP connector. To use: Press **SHIFT** key then this key. Pressing any other TRIGGER key will deactivate **EXT SWEEP** function.
82	EXT OR SINGLE Indicator	Indicates whether or not EXT OR SINGLE mode is active. Indicator lights when EXT OR SINGLE key is pressed and remains lit while mode is active.

Key	Control, Indicator, or Connector	Function
83	EXT OR SINGLE Key	Provides for triggering a frequency sweep in either of two ways: • By using an external pulse supplied via rear panel SWEEP TRIGGER INPUT connector (126). • By pressing this key a second time. • To trigger a single sweep using this key: Press key once to select mode and a second time to trigger sweep. Pressing key a third time while sweep is in progress aborts sweep and resets it to start point.
84	LINE Indicator	Indicates whether or not LINE mode is active. Indicator lights when LINE key is pressed and remains lit while mode is active.
85	LINE Key	Provides for triggering sweep at a multiple or submultiple of line frequency. Press to use.



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Key	Control, Indicator, or Connector	Function
86	F1 Indicator	Indicates whether or not F1 parameter is active. Lights when F1 key is pressed and remains lit while F1 parameter is active.
87	M3 Indicator	Indicates whether or not M3 parameter is active. Lights when M3 key is pressed and remains lit while M3 parameter is active.
88	M4 Indicator	Indicates whether or not M4 parameter is active. Lights when M4 key is pressed and remains lit while M4 parameter is active.
89	LED Frequency Display	Displays frequency of selected F1, CF, M1, M3, M4, or M5 parameter.
90	GHz Indicator	Indicates that displayed frequency numerals are in GHz.
91	ΔF Indicator	Indicates whether or not ΔF parameter is active. Lights when ΔF key is pressed and remains lit while ΔF parameter is active.
92	F2 Indicator	Indicates whether or not F2 parameter is active. Lights when F2 key is pressed and remains lit while F2 parameter is active.
93	M6 Indicator	Indicates whether or not M6 parameter is active. Lights when M6 key is pressed and remains lit while M6 parameter is active.
94	M7 Indicator	Indicates whether or not M7 parameter is active. Lights when M7 key is pressed and remains lit while M7 parameter is active.

Key	Control, Indicator, or Connector	Function
95	LED Frequency Display	Displays frequency of selected F2, ΔF, M2, M6, M7, or M8 parameter.
96	GHz Indicator	Indicates that displayed frequency numerals are in GHz.
97	LEVEL Indicator	Indicates whether or not LEVEL parameter is active. Lights when LEVEL key is pressed and remains lit while LEVEL parameter is active.
98	TIME Indicator	Indicates whether or not SWEEP TIME parameter is active. Lights when SWEEP TIME key is pressed and remains lit while SWEEP TIME parameter is active.
99	LED Level/Time Display	Displays value of selected LEVEL, SWEEP TIME, or dB SWEEP parameter.
100	dBm Indicator	Indicates that displayed frequency numerals are in dBm.
101	Sec Indicator	Indicates that displayed frequency numerals are in seconds.
102	RF OFF Indicator	Indicates whether or not RF output power is off. Indicator lights when RF ON key is pressed and remains on until key is pressed to turn the RF power on.
103	UNLEVELED Indicator	Indicates whether or not RF output power is leveled. Indicator lights when output power goes unleveled. Indicator also lights when INTERNAL key is toggled to turn leveling off.
104	SWEEPING, POWER Indicator	Indicates whether or not output power is sweeping. Indicator lights during forward portion of a power sweep. It is out during the retrace sweep.
105	SWEEPING, FREQUENCY Indicator	Indicates whether or not output frequency is sweeping. Lights during forward portion of a frequency sweep. It is out during retrace sweep.
106	dB/SWEEP Key	Selects power sweep parameter and opens it for data entry. Press to use.
107	LEVEL Key	Selects level parameter and opens it for data entry. Press to use.
108	SWEEP TIME Key	Selects sweep time parameter and opens it for data entry. Press to use.
109	dB/SWEEP Indicator	Indicates whether or not dB/SWEEP parameter is open. Indicator lights when dB/SWEEP key is pressed and remains lit until a different parameter is selected.
110A	M2 Key	Selects M2 parameter, opens it for data entry, and activates marker if any MARKERS key mode is selected. Press to use.
110B	**M8** Key	Selects **M8** parameter, opens it for data entry, and activates marker if any MARKERS key mode is selected. To use: Press **SHIFT** key then this key.

Key	Control, Indicator, or Connector	Function
111A	ΔF Key	Selects ΔF parameter and opens it for data entry. Press to use.
111B	**M7** Key	Selects **M7** parameter, opens it for data entry, and activates marker if any MARKERS key mode is selected. To use: Press **SHIFT** key then this key.
112	M8 Indicator	Indicates whether or not **M8** parameter is open. Indicator lights when **SHIFT** plus **M8** key is pressed and remains lit until a different parameter is selected.
113A	F2 Key	Selects F2 parameter and opens it for data entry. Press to use.
113B	**M6** Key	Selects **M6** parameter, opens it for data entry, and activates marker if any MARKERS key mode is selected. To use: Press **SHIFT** key then this key.
114	M2 Indicator	Indicates whether or not M2 parameter is open. Indicator lights when M2 key is pressed and remains lit until a different parameter is selected.
115A	M1 Key	Selects M1 parameter, opens it for data entry, and activates marker if any MARKERS key mode is selected. Press to use.
115B	**M5 Key**	Selects **M5** parameter, opens it for data entry, and activates marker if any MARKERS key mode is selected. To use: Press **SHIFT** key then this key.
116A	CF Key	Selects CF parameter and opens it for data entry. Press to use.
116B	**M4 Key**	Selects **M4** parameter, opens it for data entry, and activates marker if any MARKERS key mode is selected. To use: Press **SHIFT** key then this key.
117	M5 Indicator	Indicates whether or not **M5** parameter is open. Indicator lights when **SHIFT** plus **M5** key is pressed and remains lit until a different parameter is selected.
118A	F1 Key	Selects F1 parameter and opens it for data entry. Press to use.
118B	**M3 Key**	Selects **M3** parameter, opens it for data entry, and activates marker if any MARKERS key mode is selected. To use: Press **SHIFT** key then this key.
119	M1 Indicator	Indicates whether or not M1 parameter is open. Indicator lights when M1 key is pressed and remains lit until a different parameter is selected.
120	CF Indicator	Indicates whether or not CF parameter is open. Indicator lights when CF key is pressed and remains lit until a different parameter is selected.

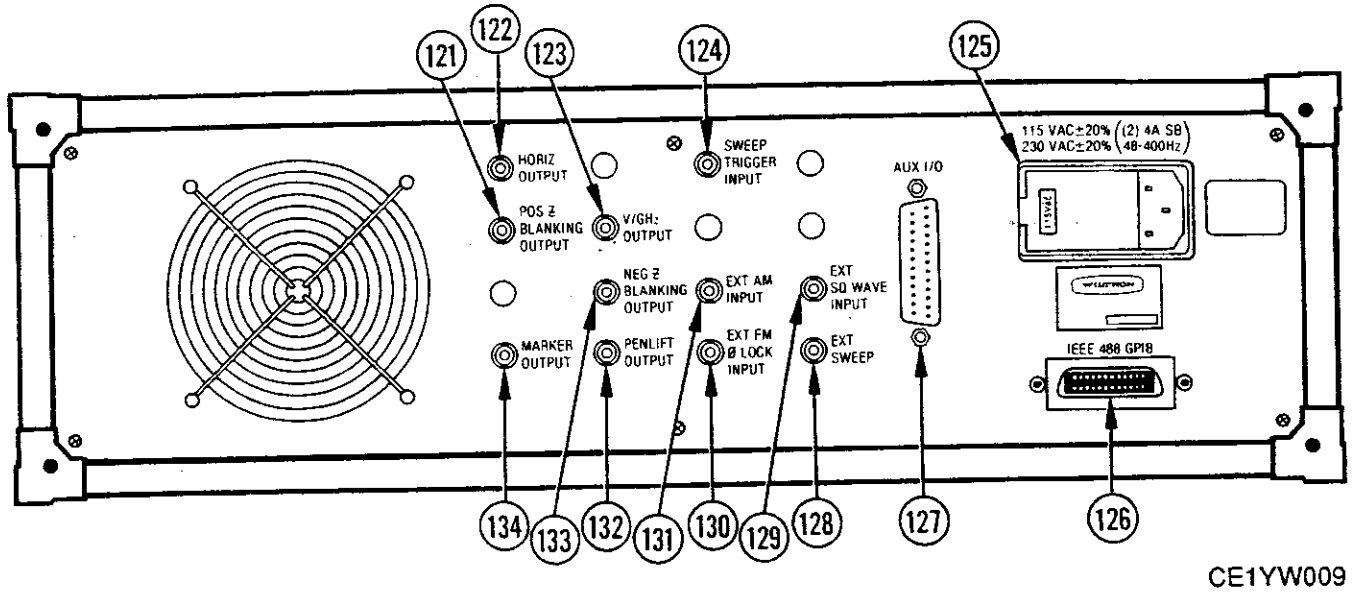

Figure 2-2. Operator's Controls, Indicators, and Connectors.

Key	Control, Indicator, or Connector	Function
121	POS Z BLANKING OUTPUT Connector	Provides direct-coupled, +5.0 V rectangular pulse during sweep retrace and bandswitch points.
122	HORIZ OUTPUT Connector	Provides 0 to +10V ramp coincident with low- to high-frequency sweep.
123	V/GHz OUTPUT Connector	Provides voltage equal to 1V per GHz of output frequency.
124	SWEEP TRIGGER INPUT Connector	Provides for externally triggering sweep when TRIGGER-EXT OR SINGLE key is engaged. Trigger occurs on closure-to-ground. Input pulse should be a clock pulse with following characteristics: Amplitude: 4 to 25 Vpk Fall Time: <5 µs Pulse Width: >1 µs Polarity: Low true
125	Line Voltage Module	Provides for supplying 115 Vac or 230 Vac line voltage to SG-1206.
126	IEEE-488 (GPIB) Interface Bus Connector	Provides input/output connections to IEEE-488 Bus. (The IEEE-488 bus is also known as General Purpose Interface Bus (GPIB).
127	AUX I/O Connector	Only used to provide interface between SG-1206 and Wiltron Models 560A, 561, or 562 Scalar Network Analyzer.
128	EXT SWEEP Connector	Allows external 0 to +10 V ramp to be used to sweep output frequency. EXTERNAL SWEEP key must be activated.
129	EXT SQ WAVE INPUT Connector	Provides for external square-wave input. Square wave can have a frequency of up to 50 kHz and an amplitude of +10 V.

Key	Control, Indicator, or Connector	Function
130	EXT FM Ø LOCK INPUT Connector	Provides for external FM and/or phase-lock input signal. For phase locking, front panel −6MHz/V key must be selected. Input impedance is 2 kΩ.
131	EXT AM INPUT Connector	Provides for AM input. The frequency of the modulating signal can go from dc to 50 kHz. Input impedance is 10 kΩ.
132	PENLIFT OUTPUT Connector	Provides isolated, normally-open (NO) relay contacts for lifting recorder pen during sweep retrace. Internal jumper provides for normally-closed (NC) relay-contact operation.
133	NEG Z BLANKING OUTPUT Connector	Provides direct-coupled, −5.0 V rectangular pulse coincident in time with RF blanking.
134	MARKER OUTPUT Connector	Provides video-marker output when MARKERS VIDEO key is engaged. All markers that have been selected and assigned a frequency, except the one selected last, are adjustable from 0 to +5 volts using MARKER AMPL'D control (75). The last-selected marker is adjustable from 0 to +10 volts.

Section II. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

2-2. GENERAL.

To be sure that the equipment is always ready for a mission, do the scheduled preventive maintenance checks and services (PMCS). When doing any PMCS or routine checks, keep in mind the WARNINGS and CAUTIONS about electrical shock and bodily harm.

2-3. PMCS PROCEDURES.

a. Tools, Materials, and Equipment Required for Preventive Maintenance. No tools or equipment are required for operator preventive maintenance. Cleaning materials required are listed in Appendix D, items 1 thru 3.

b. PMCS for the SG-1206 is limited to routine checks such as those shown below.

- cleaning,
- dusting,
- wiping,
- checking for frayed cables,
- storing items not in use,
- covering unused receptacles,
- checking for loose nuts, bolts, and screws.

c. Perform these routine checks anytime they must be done.