SECTION I
GENERAL INFORMATION

1-1. INTRODUCTION.

1-2. This section contains general information about the Model 3320C Level Generator. A general description plus information on specifications, accessories, and instrument identification is given.

1-3. SPECIFICATIONS.

1-4. Table 1-1 is a complete list of the 3320C critical specifications that are governed by tolerances. Table 1-3 contains general information that describes the operating characteristics of the 3320C.

1-5. Any change in specifications due to manufacturing, design, or traceability to the U.S. National Bureau of Standards will be covered by revised pages in this manual. The manual and manual change sheet supersedes all previous information concerning the specifications of the 3320C.

1-6. DESCRIPTION.

1-7. The 3320C Level Generator provides accurate and stable frequencies from 10 kHz to 16.9999 MHz and amplitudes from + 11.99 dBm to - 79.99 dBm. Three output amplitude impedances of 75 ohms, 124 ohms and 135 ohms are available. The frequency is derived from a precision single frequency source by an indirect synthesis technique. The amplitude is controlled by a thermopile circuit to ensure high stability and accuracy. The 124 ohm and 135 ohm outputs are transformer-coupled, balanced outputs. The 75 ohm output is an unbalanced output.

1-8. OPTION 001.

1-9. The 3320C Option 001 is a standard instrument with an oven controlled, 5 MHz, reference crystal oscillator. This option features increased frequency accuracy and stability (refer to Table 1-3 for specifications). A field installation kit is obtainable by ordering Accessory Kit, 11237A.

1-10. OPTION 002.

1-11. The 3320C Option 002, GPIB (General Purpose Interface Bus) Remote Control utilizes a seven line data bus, a three line transfer bus, and four additional control bus lines to manage the flow of information over the data bus and the transfer bus. Data information is transferred in an ASCII (American Standard Code for Information Interchange) code. For more information concerning this option, refer to Table 1-2 for specification, Section II for installation, Section III for operation.

1-12. ACCESSORIES SUPPLIED.

1-13. A Rack Mounting Kit 03320-84401) is supplied with each 3320C. A GPIB bus adapter (11235A) is supplied with each 3320C Option 002.

1-14. ACCESSORIES AVAILABLE.

1-15. Table 1-2 lists the accessories available for the 3320C.

1-16. INSTRUMENT AND MANUAL IDENTIFICATION.

1-17. This manual applies to instruments with the serial number prefix shown on the title page. If changes have been made in the instrument since this manual was printed, a "Manual Changes" supplement supplied with the manual will define these changes. Be sure to record these changes in your manual. Part numbers for the manual and the microfiche copy of the manual are also shown on the title page.

Table 1-1. Specifications.

Operating temperature: 20° C to 30° C (68° F to 86° F). **Frequency accuracy:** Vernier out: ± 0.001 % of setting. Vernier in: ± 600 Hz, 10 kHz to 12.5 MHz. ± 750 Hz, 12.5 MHz to 17 MHz. **Frequency stability:** Long term: ± 10 ppm of setting per year. Optional high stability crystal reference oven available (Option 001). Signal to phase noise (integrated): > 40 dB in 30 kHz band, excluding ± 1 Hz, centered on carrier.	**Harmonic Distortion:** > 50 dB for all harmonically related signals between 10 kHz and 17 MHz. > 40 dB for all harmonically related signals above 17 MHz. **Spurious:** > 50 dB for all spurious between 10 kHz and 17 MHz. > 40 dB for all spurious above 17 MHz. **Amplitude accuracy (absolute):** All impedances within their specified frequency ranges. ± 0.25 dBm from + 11.99 dBm to - 60.00 dBm. ± 0.4 dBm from - 60.00 dBm to - 79.99 dBm.

Table 1-2. Accessories Available.

-hp- Part No.	Description
11237A	Option 001, Field Installation Kit
11196A	Mobile cart, frame type
1117B	Mobile cart, enclosed type
11197A	Instrument clamp
11239B	GPIB Remote Control

Table 1-3. General Information.

Frequency range:
75 ohm output impedance: 10 kHz to 17 MHz.
124 ohm output impedance: 60 kHz to 3 MHz.
135 ohm output impedance: 10 kHz to 1 MHz.

Frequency resolution:
Vernier out: 10 kHz.
Vernier in: 20 Hz.

Internal frequency standard: 20 MHz ambient temperature crystal.

Phase locking (external frequency reference input): May be phase locked with an external signal which is within 200 mV rms and 2 V rms and which is any subharmonic of 20 MHz from 1 MHz through 10 MHz (e.g., 1 MHz, 2 MHz, 2.5 MHz, 5 MHz, 10 MHz). BNC female connector.

Amplitude range: + 11.99 dBm to - 79.99 dBm in steps of 0.01 dB, 0.1 dB, 1 dB or 10 dB.

Amplitude resolution: 0.01 dB.

Output impedance:
75 ohms unbalanced.
124 ohms and 135 ohms balanced.

Auxiliary outputs:
Tracking output: 20 MHz to 37 MHz offset signal. Tracks main output with 20 MHz offset. Rear panel female BNC, > 100 mV rms into 50 ohms.
Low level output: Same frequency as main output but remains between 50 mV rms and 158 mV rms into 50 ohms. Rear panel female BNC.
1 MHz output: Reference output. Rear panel female BNC, > 220 mV rms into 50 ohms.

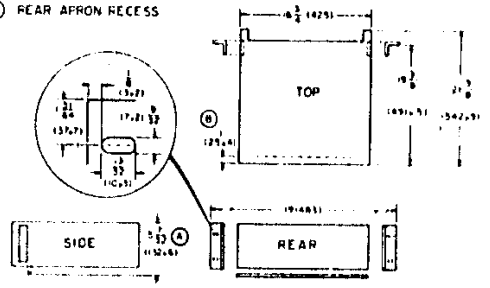
Power requirements: 115 V ± 10 % or 230 V ± 10 %, 48 Hz to 66 Hz, < 110 W (400 Hz operation on special basis).

Storage temperature: - 40° C to + 70° C (- 40° F to + 158° F).

Weight: 34 lb. (15.4 kg.).

Dimensions:

NOTES
DIMENSIONS IN INCHES AND (MILLIMETERS)
Ⓐ EIA RACK HEIGHT (INCLUDING FILLER STRIP)
FOR CABINET HEIGHT (INCLUDING FEET) ADD $\frac{5}{16}$ (8) TO EIA RACK HEIGHT
Ⓑ REAR APRON RECESS



Option 001:
5 MHz reference crystal oscillator in temperature stabilized oven.
Long term stability: ± 1 part in 10^8/day,
± 1 part in 10^7/month.
Frequency accuracy: ± 1 part in 10^7 of setting/month.
For field installation order accessory kit 11237A.

Option 002:
Allows bit-parallel word serial digital remote control of frequency and amplitude. A 3320C with this option will recognize an address and then accept instructions in a serial fashion. Instructions are in 7-bit parallel ASCII code.

This option requires 14 digital input lines for full control - seven data lines and seven data transfer and control lines.

Full digital isolation is standard.

Timing: max of 5 µs per word required to input program data.

Logic Level requirements: (Option 002)

State	Requirements
"LOW" (Logical "1")	0 V to 0.4 V (5 mA Max.) or contact closure to ground through < 80 ohms.
"HIGH" (Logical "0")	+ 2.4 V to + 5 V or removal of contact closure to ground.

For field installation, order accessory kit 11239B.