

## SECTION I GENERAL INFORMATION

### 1-1. INTRODUCTION.

1-2. The Operating and Service Manual contains information required to install, operate, test, adjust, and service the Hewlett-Packard Model 3325A Synthesizer/Function Generator. The Operating Information Supplement is a copy of the first three sections of the Operating and Service Manual. It also includes the Operational Verification procedures from Section IV, which may be used for incoming inspection. The supplement should be kept with the instrument for use by the operator. The part numbers of both the Operating and Service Manual and the Operating Information Supplement are shown on the title pages.

1-3. Also shown on the title page of this manual is a Microfiche part number. This number can be used to order 4 × 6 inch transparencies of the Operating and Service Manual. Each Microfiche contains up to 96 photo-duplicates of the manual pages. The Microfiche package includes the latest Manual Changes supplement as well as pertinent Service Notes.

1-4. Additional copies of the Operating and Service Manual, Operating Information Supplement, or Service Notes can be ordered through your nearest Hewlett-Packard Sales and Service Office. (A list of these offices is provided at the end of this manual.)

### 1-5. INSTRUMENT DESCRIPTION.

1-6. The Model 3325A Synthesizer/Function Generator produces the following signals at a minimum frequency of 1  $\mu$ Hz and maximum frequency of:

Sine wave	20 MHz
Square wave	10 MHz
Triangle	10 kHz
Positive slope ramp	10 kHz
Negative slope ramp	10 kHz

Frequency may be selected with up to eleven digits of resolution. Output amplitude is 1 mV to 10 V peak-to-peak. The output level may also be selected or displayed in V rms or in dBm (50 ohms). Any function may be dc offset up to  $\pm 4.5$  V, or the output may be dc only up to  $\pm 5$  V. An optional high voltage output produces up to 40 V p-p into  $\geq 500$  ohms load.

1-7. Frequency sweep of all functions is provided in linear or log sweep, at sweep times of 10 milliseconds to 99.99 seconds for linear sweep. Maximum time for log sweep is 99.99 seconds and minimum time is 2 seconds for single sweep and 0.1 second for continuous sweep. Single linear sweep may be up or down, while con-

tinuous sweep is up/down/up, etc., in the linear mode and up/up, etc., in log mode.

1-8. The Model 3325A is fully programmable through the rear panel Hewlett-Packard Interface Bus (HP-IB) connector. A device such as a programmable calculator is capable of remotely controlling the 3325A. Interface information is given in Section II of this manual, and programming information is in Section III.

### 1-9. SPECIFICATIONS.

1-10. Instrument specifications are listed in Table 1-1. These specifications are the performance standards or limits against which the instrument is tested. Any changes in specifications due to manufacturing, design or traceability to the U.S. National Bureau of Standards are included in Table 1-1 of this manual and/or the Manual Changes Supplement. Specifications listed in this manual supersede all previous specifications for the Model 3325A.

### 1-11. SUPPLEMENTAL OPERATING INFORMATION.

1-12. Table 1-2 contains information describing general operating characteristics of the 3325A. This information is supplemental operating information and is not to be considered as specifications.

### 1-13. REMOTE CONTROL.

1-14. Table 1-3 lists the HP-IB interface capabilities of the Model 3325A in conformity with IEEE Standard 488-1975, "Standard Digital Interface for Programmable Instrumentation". HP-IB response times are given in Table 1-4.

### 1-15. OPTIONS.

1-16. The following options extend the frequency stability and output amplitude capabilities of the Model 3325A:

Option 001	High Stability Frequency Reference
Option 002	High Voltage Output

The following options indicate the line voltage to which the instrument was set at the factory:

Option 100	Nominal 100 V ac
Option 120	Nominal 120 V ac
Option 220	Nominal 220 V ac
Option 240	Nominal 240 V ac

**Table 1-1. Specifications.**

FUNCTIONS AND FREQUENCIES	AMPLITUDE																																							
<p>Sine Wave:                      Signal Output (Front or Rear Panel):                      0.000 001 Hz to 20 999 999.999 Hz</p> <p>Auxiliary Output (Rear Panel):                      21 000 000.000 Hz to 60 999 999.999 Hz                      Underrange to 19 000 000.001 Hz</p> <p>Square Wave: 0.000 001 Hz to 10 999 999.999 Hz</p> <p>Triangle: 0.000 001 Hz to 10 999.999 999 Hz</p> <p>Positive and Negative Slope Ramp:                      0.000 001 Hz to 10 999.999 999 Hz</p>	<p>Resolution: 4 digits</p> <p>Accuracy (into 50 ohms), AC Functions only, no DC Offset:                      Sine Wave:</p> <table border="1"> <thead> <tr> <th>Frequency</th> <th>Peak-to-Peak Amplitude</th> <th>Specification</th> </tr> </thead> <tbody> <tr> <td>10 Hz to 10 kHz</td> <td>1 mV to 3 V 3 V to 10 V</td> <td>± 2% ± 1%</td> </tr> <tr> <td>10 kHz to 10 MHz</td> <td>1 mV to 3 V 3 V to 10 V</td> <td>± 5% ± 3%</td> </tr> <tr> <td>10 MHz to 20 MHz</td> <td>1 mV to 100 mV 100 mV to 3 V 3 V to 10 V</td> <td>± 8% ± 5% ± 3%</td> </tr> </tbody> </table> <p>Square Wave:</p> <table border="1"> <thead> <tr> <th>Frequency</th> <th>Peak-to-Peak Amplitude</th> <th>Specification</th> </tr> </thead> <tbody> <tr> <td>10 Hz to 10 kHz</td> <td>1 mV to 3 V 3 V to 10 V</td> <td>± 2% ± 1%</td> </tr> <tr> <td>10 kHz to 10 MHz</td> <td>1 mV to 3 V 3 V to 10 V</td> <td>± 5% ± 3%</td> </tr> </tbody> </table> <p>Triangle:</p> <table border="1"> <thead> <tr> <th>Frequency</th> <th>Peak-to-Peak Amplitude</th> <th>Specification</th> </tr> </thead> <tbody> <tr> <td>10 Hz to 2 kHz</td> <td>1 mV to 3 V 3 V to 10 V</td> <td>± 2% ± 1%</td> </tr> <tr> <td>2 kHz to 10 kHz</td> <td>1 mV to 10 V</td> <td>± 6%</td> </tr> </tbody> </table> <p>Ramps:</p> <table border="1"> <thead> <tr> <th>Frequency</th> <th>Peak-to-Peak Amplitude</th> <th>Specification</th> </tr> </thead> <tbody> <tr> <td>10 Hz to 2 kHz</td> <td>1 mV to 3 V 3 V to 10 V</td> <td>± 2% ± 1%</td> </tr> <tr> <td>2 kHz to 10 kHz</td> <td>1 mV to 10 V</td> <td>± 11%</td> </tr> </tbody> </table>	Frequency	Peak-to-Peak Amplitude	Specification	10 Hz to 10 kHz	1 mV to 3 V 3 V to 10 V	± 2% ± 1%	10 kHz to 10 MHz	1 mV to 3 V 3 V to 10 V	± 5% ± 3%	10 MHz to 20 MHz	1 mV to 100 mV 100 mV to 3 V 3 V to 10 V	± 8% ± 5% ± 3%	Frequency	Peak-to-Peak Amplitude	Specification	10 Hz to 10 kHz	1 mV to 3 V 3 V to 10 V	± 2% ± 1%	10 kHz to 10 MHz	1 mV to 3 V 3 V to 10 V	± 5% ± 3%	Frequency	Peak-to-Peak Amplitude	Specification	10 Hz to 2 kHz	1 mV to 3 V 3 V to 10 V	± 2% ± 1%	2 kHz to 10 kHz	1 mV to 10 V	± 6%	Frequency	Peak-to-Peak Amplitude	Specification	10 Hz to 2 kHz	1 mV to 3 V 3 V to 10 V	± 2% ± 1%	2 kHz to 10 kHz	1 mV to 10 V	± 11%
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<p><b>SIGNAL CHARACTERISTICS</b></p> <p>Sine Wave:                      Harmonic Distortion relative to the amplitude of the fundamental frequency at full output on each range</p> <table border="1"> <thead> <tr> <th>Fundamental Frequency</th> <th>No Harmonic Greater Than</th> </tr> </thead> <tbody> <tr> <td>10 Hz to 50 kHz</td> <td>- 65 dB</td> </tr> <tr> <td>50 kHz to 200 kHz</td> <td>- 60 dB</td> </tr> <tr> <td>200 kHz to 2 MHz</td> <td>- 40 dB</td> </tr> <tr> <td>2 MHz to 15 MHz</td> <td>- 30 dB</td> </tr> <tr> <td>15 MHz to 20 MHz</td> <td>- 25 dB</td> </tr> </tbody> </table> <p>Spurious: All non-harmonically related output signals (with no dc offset) will be more than 70 dB below the carrier (60 dB with dc offset) or less than -90 dBm, whichever is greater.</p> <p>Phase Noise: ≥ - 54 dB for a 30 kHz band centered on a 20 MHz carrier (excluding ± 1 Hz about the carrier)</p>	Fundamental Frequency	No Harmonic Greater Than	10 Hz to 50 kHz	- 65 dB	50 kHz to 200 kHz	- 60 dB	200 kHz to 2 MHz	- 40 dB	2 MHz to 15 MHz	- 30 dB	15 MHz to 20 MHz	- 25 dB																												
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<p>Square Wave:                      Rise/Fall Time: &lt; 20 nanoseconds, 10% to 90% at full output</p> <p>Symmetry: &lt; 0.02% of period + 3 nanoseconds</p> <p>Overshoot: &lt; 5% of p-p amplitude at full output</p>																																								
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<p>Ramps (Positive or Negative Slope):                      Linearity, 10% to 90%, best fit straight line: ± 0.05% of full output for each range, measured with a 20 MHz low pass filter.</p> <p>Retrace Time: &lt; 3 microseconds, 90% to 10%</p> <p>Ramp Period Variation: &lt; 1 µs</p>																																								
	<p>Accuracy of DC Offset (into 50 ohms):                      DC Only (No AC Function): ± 0.4% of full output for each range</p> <p>DC + AC, ≤ 1 MHz: ± 1.2%, Ramps ± 2.4%</p> <p>DC + AC, &gt; 1 MHz: ± 3%</p> <p><b>AMPLITUDE MODULATION (of Sine Function only)</b></p> <p>Modulation Envelope Distortion: - 30 dB to 80% modulation at 1 kHz, 0 V dc Offset</p> <p><b>PHASE OFFSET</b></p> <p>Range: ± 719.9° with respect to arbitrary starting phase, or assigned zero phase</p> <p>Resolution: 0.1°                      Stability: ± 1° phase/°C                      Increment Accuracy: ± 0.2°</p>																																							

**Table 1-1. Specifications (Cont'd).**

<p><b>PHASE MODULATION</b></p> <p>Linearity (Sine Function): <math>\pm 0.5\%</math>, best fit straight line</p> <p><b>SYNC OUTPUT</b></p> <p>Output Levels into 50 ohms:                  Square wave with <math>V_{high} &gt; +1.2\text{ V}</math>, <math>V_{low} &lt; +0.2\text{ V}</math></p> <p><b>X DRIVE OUTPUT</b></p> <p>Amplitude: 0 to +10 V dc linear ramp proportional to sweep frequency (sweep up only)</p> <p>Linearity, 10% to 90%, best fit straight line:  <math>\pm 0.1\%</math> of final value.</p> <p><b>OPTION 001</b></p> <p><b>HIGH STABILITY FREQUENCY REFERENCE</b></p> <p>Accuracy: <math>\pm 5 \times 10^{-8}</math> (<math>0^\circ</math> to <math>50^\circ\text{C}</math>)</p> <p>Aging Rate: <math>\pm 5 \times 10^{-8}</math> per week  <math>\pm 1 \times 10^{-7}</math> per month</p> <p><b>OPTION 002</b></p> <p><b>HIGH VOLTAGE OUTPUT</b></p> <p>Frequency Range:                  Sine and Square Wave: 1 <math>\mu\text{Hz}</math> to 1 MHz                  Triangle and Ramps: 1 <math>\mu\text{Hz}</math> to 10 kHz</p>	<p>Amplitude:                  Range: 4 mV p-p to 40 V p-p (<math>\geq 500\ \Omega</math>, <math>&lt; 500\ \text{pF}</math> load) maximum output current, 40 mA p-p</p> <p>Accuracy (at 2 kHz): <math>\pm 2\%</math> of full output for each range</p> <p>Flatness: <math>\pm 10\%</math></p> <p>DC Offset:                  Range: 4 times the range of the standard instrument</p> <p>Accuracy: <math>\pm (1\% + 25\text{ mV})</math> of full output for each range</p> <p>Signal Characteristics:                  Sine Wave Harmonic Distortion (relative to the fundamental frequency at full output into <math>\geq 500\ \text{ohms}</math>, <math>&lt; 500\ \text{pF}</math>)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Fundamental Frequency</th> <th>No Harmonic Greater Than</th> </tr> </thead> <tbody> <tr> <td>10 Hz to 50 kHz</td> <td>- 65 dB</td> </tr> <tr> <td>50 kHz to 200 kHz</td> <td>- 60 dB</td> </tr> <tr> <td>200 kHz to 1 MHz</td> <td>- 40 dB</td> </tr> </tbody> </table> <p>Square Wave:                  Rise/Fall Time: <math>&lt; 100</math> nanoseconds, 10% to 90% at full output with <math>\geq 500\ \text{ohm}</math>, <math>&lt; 500\ \text{pF}</math> load</p> <p>Overshoot: <math>&lt; 10\%</math> of p-p amplitude with <math>\geq 500\ \text{ohm}</math>, <math>&lt; 500\ \text{pF}</math> load</p>	Fundamental Frequency	No Harmonic Greater Than	10 Hz to 50 kHz	- 65 dB	50 kHz to 200 kHz	- 60 dB	200 kHz to 1 MHz	- 40 dB
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**Table 1-2. Supplemental Information.**

<p><b>MAIN SIGNAL OUTPUT</b></p> <p>50 <math>\Omega</math> Impedance</p> <p>BNC Connector, switchable to front or rear panel (not switchable with Option 002)</p> <p>May be floated a maximum of <math>\pm 42\text{ V}</math> peak (ac + dc) from chassis (earth) ground</p> <p>Amplitude Ranges:                  All AC Functions (with no dc offset):</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Range No.</th> <th>Attenuation Factor</th> <th>Amplitude (Peak-to-Peak)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1</td> <td>10.00 V to 3.000 V</td> </tr> <tr> <td>2</td> <td>3</td> <td>2.999 V to 1.000 V</td> </tr> <tr> <td>3</td> <td>10</td> <td>999.9 mV to 300.0 mV</td> </tr> </tbody> </table> <p>AC Function with DC Offset:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Range No.</th> <th>Attenuation Factor</th> <th>AC Function Amplitude (p-p)</th> <th>Maximum DC (+ or -)</th> <th>Min. DC (+ or -)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1</td> <td>9.998 V to 1.000 V</td> <td>1.000 mV to 4.500 V</td> <td>1.000 mV</td> </tr> <tr> <td>2</td> <td>3</td> <td>999.9 mV to 333.4 mV</td> <td>1.166 V to 1.499 V</td> <td>0.100 mV</td> </tr> <tr> <td>3</td> <td>10</td> <td>333.3 mV to 100.0 mV</td> <td>333.3 mV to 450.0 mV</td> <td>0.100 mV</td> </tr> <tr> <td>4</td> <td>30</td> <td>99.99 mV to 33.34 mV</td> <td>116.6 mV to 149.9 mV</td> <td>0.010 mV</td> </tr> <tr> <td>5</td> <td>100</td> <td>33.33 mV to 10.00 mV</td> <td>33.33 mV to 45.00 mV</td> <td>0.010 mV</td> </tr> <tr> <td>6</td> <td>300</td> <td>9.999 mV to 3.334 mV</td> <td>11.66 mV to 14.99 mV</td> <td>0.001 mV</td> </tr> <tr> <td>7</td> <td>1000</td> <td>3.333 mV to 1.000 mV</td> <td>3.333 mV to 4.500 mV</td> <td>0.001 mV</td> </tr> </tbody> </table>	Range No.	Attenuation Factor	Amplitude (Peak-to-Peak)	1	1	10.00 V to 3.000 V	2	3	2.999 V to 1.000 V	3	10	999.9 mV to 300.0 mV	Range No.	Attenuation Factor	AC Function Amplitude (p-p)	Maximum DC (+ or -)	Min. DC (+ or -)	1	1	9.998 V to 1.000 V	1.000 mV to 4.500 V	1.000 mV	2	3	999.9 mV to 333.4 mV	1.166 V to 1.499 V	0.100 mV	3	10	333.3 mV to 100.0 mV	333.3 mV to 450.0 mV	0.100 mV	4	30	99.99 mV to 33.34 mV	116.6 mV to 149.9 mV	0.010 mV	5	100	33.33 mV to 10.00 mV	33.33 mV to 45.00 mV	0.010 mV	6	300	9.999 mV to 3.334 mV	11.66 mV to 14.99 mV	0.001 mV	7	1000	3.333 mV to 1.000 mV	3.333 mV to 4.500 mV	0.001 mV	<table border="1" style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td>4</td> <td>30</td> <td>299.9 mV to 100.0 mV</td> </tr> <tr> <td>5</td> <td>100</td> <td>99.99 mV to 30.00 mV</td> </tr> <tr> <td>6</td> <td>300</td> <td>29.99 mV to 10.00 mV</td> </tr> <tr> <td>7</td> <td>1000</td> <td>9.999 mV to 3.000 mV</td> </tr> <tr> <td>8</td> <td>3000</td> <td>2.999 mV to 1.000 mV</td> </tr> </tbody> </table> <p>DC Offset Only:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Range No.</th> <th>Attenuation Factor</th> <th>Amplitude (Peak-to-Peak)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1</td> <td>5.000 V to 1.500 V</td> </tr> <tr> <td>2</td> <td>3</td> <td>1.499 V to 500.0 mV</td> </tr> <tr> <td>3</td> <td>10</td> <td>499.9 mV to 150.0 mV</td> </tr> <tr> <td>4</td> <td>30</td> <td>149.9 mV to 50.00 mV</td> </tr> <tr> <td>5</td> <td>100</td> <td>49.99 mV to 15.00 mV</td> </tr> <tr> <td>6</td> <td>300</td> <td>14.99 mV to 5.000 mV</td> </tr> <tr> <td>7</td> <td>1000</td> <td>4.999 mV to 1.500 mV</td> </tr> <tr> <td>8</td> <td>3000</td> <td>1.499 mV to 1.000 mV</td> </tr> </tbody> </table>	4	30	299.9 mV to 100.0 mV	5	100	99.99 mV to 30.00 mV	6	300	29.99 mV to 10.00 mV	7	1000	9.999 mV to 3.000 mV	8	3000	2.999 mV to 1.000 mV	Range No.	Attenuation Factor	Amplitude (Peak-to-Peak)	1	1	5.000 V to 1.500 V	2	3	1.499 V to 500.0 mV	3	10	499.9 mV to 150.0 mV	4	30	149.9 mV to 50.00 mV	5	100	49.99 mV to 15.00 mV	6	300	14.99 mV to 5.000 mV	7	1000	4.999 mV to 1.500 mV	8	3000	1.499 mV to 1.000 mV
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**Table 1-2. Supplemental Information (Cont'd).**

<p>High Voltage Output Option 002: Amplitude and Ranges: 4 times the standard instrument amplitudes</p> <p>Output Impedance: &lt; 2 Ω at DC to &lt; 10 Ω at 10 MHz</p> <p>Square Wave Settling Time: &lt; 1 μs to settle to within .05% of final value for frequencies of 10 Hz to 500 kHz, tested at full output with no load</p> <p><b>FREQUENCY SWEEP</b></p> <p>Sweep Time: Linear Sweep: 0.01 second to 99.99 seconds (single or continuous)</p> <p>Log Sweep: Single Sweep: 2 seconds to 99.99 seconds Continuous Sweep: 0.1 second to 99.99 seconds</p> <p>Maximum Sweep Width: 1 Hz to maximum frequency of the function selected</p> <p>Minimum Sweep Width (Linear):</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2">Function</th> <th colspan="2">Minimum Sweep Width</th> </tr> <tr> <th>Sweep Time 0.01 second</th> <th>Sweep Time 99.99 seconds</th> </tr> </thead> <tbody> <tr> <td>Sine</td> <td>0.1 mHz</td> <td>999.9 mHz</td> </tr> <tr> <td>Square</td> <td>0.05 mHz</td> <td>499.5 mHz</td> </tr> <tr> <td>Triangle</td> <td>0.005 mHz</td> <td>49.95 mHz</td> </tr> <tr> <td>Ramps</td> <td>0.01 mHz</td> <td>99.99 mHz</td> </tr> </tbody> </table> <p>Minimum Sweep Width (Log): 1 decade</p> <p>Phase Continuity: Sweep is phase continuous over the full frequency range</p> <p><b>WARMUP TIME</b></p> <p>Standard Instrument: 20 minutes to within specified accuracy</p> <p>Option 001 High Stability Frequency Reference: Reference will be within <math>\pm 1 \times 10^{-7}</math> of final value 15 minutes after turn-on at 25 °C for an off time of less than 24 hours</p> <p><b>AUXILIARY INPUTS (May be floated a maximum of ±42 V peak [ac + dc] from chassis [earth] ground)</b></p> <p>Reference: For phase-locking the 3325A to an external frequency reference of 10 MHz or a subharmonic of 10 MHz down to 1 MHz. Level must be 0 dBm to +20 dBm into 50 ohms. Rear panel BNC connector.</p> <p>Amplitude Modulation Input (Sine Function Only):</p> <p>Modulation depth at full output for each range: 0 to 100%</p> <p>Modulation frequency range: DC to 50 kHz (0 to 21 MHz carrier frequency)</p> <p>Sensitivity: 5 V peak for 100% modulation</p> <p>Input Impedance: 20 kΩ</p> <p>Connector: Rear panel BNC</p>	Function	Minimum Sweep Width		Sweep Time 0.01 second	Sweep Time 99.99 seconds	Sine	0.1 mHz	999.9 mHz	Square	0.05 mHz	499.5 mHz	Triangle	0.005 mHz	49.95 mHz	Ramps	0.01 mHz	99.99 mHz	<p>Phase Modulation: Modulation Frequency Range: DC to 5 kHz</p> <p>Modulation Depth (± 5 V maximum input):</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Function</th> <th>Depth (+ or -)</th> </tr> </thead> <tbody> <tr> <td>Sine</td> <td>850°</td> </tr> <tr> <td>Square</td> <td>425°</td> </tr> <tr> <td>Triangle</td> <td>42.5°</td> </tr> <tr> <td>Ramps</td> <td>85°</td> </tr> </tbody> </table> <p>Input Impedance: 20 kΩ</p> <p>Connector: Rear panel BNC</p> <p><b>AUXILIARY OUTPUTS (May be floated a maximum of ±42 V peak [ac + dc] from chassis [earth] ground)</b></p> <p>Auxiliary Frequency Output (ac coupled output):</p> <p>Frequency Range: 21 MHz to 60.999 999 999 MHz, with underrange coverage to 19.000 000 001 MHz</p> <p>Amplitude: 0 dBm</p> <p>Output Impedance: 50 ohms</p> <p>Connector: Rear panel BNC</p> <p>1 MHz Reference Output (for phase-locking other instruments to 3325A):</p> <p>Amplitude: 0 dBm</p> <p>Output Impedance: 50 ohms</p> <p>Connector: Rear panel BNC</p> <p>Marker Output (Linear sweep only):</p> <p>Levels: High to Low TTL compatible voltage transition at selected marker frequency, sweep up only</p> <p>Connector: Rear panel BNC</p> <p>X Drive Output (Sweep up only): Amplitude: 0 to +10 V linear ramp proportional to sweep frequency</p> <p>Connector: Rear panel BNC</p> <p>Z Blank Output: Levels (TTL compatible voltage levels):</p> <p>Linear Sweep: Single: Low at start of sweep, High at stop. Remains High until start of next sweep.</p> <p>Continuous: Low during sweep up, High during sweep down.</p> <p>Log Sweep: Single: Low at start of sweep, High at stop. Remains High until start of next sweep.</p> <p>Continuous: Low during sweep. Goes High momentarily at stop frequency.</p> <p>10 MHz Oven Reference Output, Option 001, for phase-</p>	Function	Depth (+ or -)	Sine	850°	Square	425°	Triangle	42.5°	Ramps	85°
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