

Table 1-1. Specifications and General Information.

FREQUENCY							
Range:							
Model 3336A:	75 ohm unbalanced 150 ohm balanced 600 ohm balanced	10 Hz to 20.999 999 999 MHz 10 kHz to 2.099 999 999 MHz 200 Hz to 109.999 999 kHz					
Model 3336B:	75 ohm unbalanced 124 ohm balanced 135 ohm balanced 600 ohm balanced	10 Hz to 20.999 999 999 MHz 10 kHz to 10.999 999 999 MHz 10 kHz to 2.099 999 999 MHz 200 Hz to 109.999 999 kHz					
Model 3336C:	50 ohm unbalanced 75 ohm unbalanced	10 Hz to 20.999 999 999 MHz 10 Hz to 20.999 999 999 MHz					
Resolution:							
1 μ Hz for frequencies < 100 kHz 1 MHz for frequencies \geq 100 kHz							
Accuracy: (instruments without Option 004)							
$\pm 5 \times 10^{-6}$ of programmed frequency							
Aging Rate: (instruments without Option 004)							
$\pm 5 \times 10^{-6}$ per year (20° to 30°C)							
Warm-Up Time:							
30 minutes							
AMPLITUDE							
Range:							
Model 3336A:	75 ohm output 150 ohm output 600 ohm output	-72.99 to +7.00 dBm -78.23 to +1.76 dBm -72.99 to +7.00 dBm					
Model 3336B:	75 ohm output 124 ohm output 135 ohm output 600 ohm output	-72.99 to +7.00 dBm -78.23 to +1.76 dBm -78.23 to +1.76 dBm -72.99 to +7.00 dBm					
Model 3336C:	50 ohm output 75 ohm output	-71.23 to +8.76 dBm -72.99 to +7.00 dBm					
Absolute Accuracy: specified at 10 kHz for the 50, 75 and 600 ohm outputs; specified at 50 kHz for the 124, 135 and 150 ohm outputs.							
$\pm .05$ dB, for the top 9.99 dB of amplitude range (20° to 30°C)							
+ .08 dB, for the top 9.99 dB of amplitude range (0° to 55°C)							
Flatness: referenced to amplitudes at 10 kHz for the 50, 75 and 600 ohm outputs; referenced to amplitudes at 50 kHz for the 124, 135 and 150 ohm outputs.							
Model 3336A	10 200 10K 50K 109K 2.09M 20.9M						
75 ohm output	± .1 dB (± .07 dB with Option 005)						
150 ohm output	± .12 dB						
600 ohm output	± .25 dB						
Model 3336B	10 200 10K 50K 109K 2.09M 10.9M 20.9M						
75 ohm output	± .1 dB (± .07 dB with Option 005)						
124 ohm output	± .15 dB ± .1 dB						
135 ohm output	± .12 dB						
600 ohm output	± .25 dB						
Model 3336C	10						20.9M
50 and 75 ohm outputs	± .1 dB (± .07 dB with Option 005)						

Table 1-1. Specifications and General Information (Cont'd).

Attenuator Accuracy: (Instruments without Option 005)

Attenuation	10Hz	1 MHz	10M	20.9M
10 to 19.99 dB	± .1 dB	± .15 dB	± .2 dB	
20 to 39.99 dB	± .15 dB	± .2 dB	± .25 dB	
40 to 79.99 dB	± .2 dB	± .25 dB	± .3 dB	

NOTE

Amplitude Accuracy is the sum of Absolute Accuracy and, as needed, Flatness and Attenuator Accuracy.

Warm-Up Time:

30 minutes

MAIN SIGNAL OUTPUTS

On Carrier Return Loss:

	10	10K	30K	2.09M	10.9M	20.9M
Model 3336A						
75 ohm output	> 30 dB					
150 ohm output		> 20 dB		> 30 dB		
Model 3336B						
75 ohm output	> 30 dB					
124 ohm output		> 20 dB		> 30 dB		
135 ohm output		> 20 dB		> 30 dB		
Model 3336C						
50 ohm output	> 30 dB				> 25 dB*	
75 ohm output	> 30 dB					

*Return Loss of 50 ohm output is > 30 dB to 20.9 MHz with Option 005.

Balance:

	300	10K	50K	2.09M	10.9M
Model 3336A					
150 ohm output		> 36 dB			
600 ohm output	> 38 dB				
Model 3336B					
124 ohm output		> 30 dB			
135 ohm output		> 36 dB			
600 ohm output	> 38 dB				

SPECTRAL PURITY

Integrated Phase Noise:

Model 3336A and 3336B
 > -64 dB, for a 3 kHz band, 2 kHz either side of a 20 MHz carrier.

Model 3336C
 > -54 dB, for a 30 kHz band, centered on a 20 MHz carrier, excluding 1 Hz about the carrier.

Phase Jitter

.3° peak to peak maximum, measured per Bell System Technical Reference PUB 41009, "Transmission Parameters Affecting Voiceband Data Transmission - Measuring Techniques May 1975" and per CCITT Orange Book, Volume IV.2 "Specifications of Measuring Equipment".

Table 1-1. Specifications and General Information (Cont'd).

Harmonic Distortion

No harmonically related signal will exceed these values with respect to the carrier:

10	30	50	10K	100K	1M	5M	20.9M	
-35dB	50dB		-60dB		-55dB	-50dB		Normal Leveling
			-50dB	-60dB	-55dB	50dB		Fast Leveling

Spurious: (dc to 200 MHz except where noted)

All non harmonically related signals from dc to 200 MHz will be more than 70 dB below the carrier or less than one of the following levels, whichever is greater.

Model 3336A	without Option 005	with Option 005
75 ohm output	-100 dBm	-115 dBm
150 ohm output	-100 dBm (to 10 MHz)	-100 dBm (to 10 MHz)
600 ohm output*	-100 dBm (to 10 MHz)	-100 dBm (to 10 MHz)
Model 3336B	without Option 005	with Option 005
75 ohm output	-100 dBm	-115 dBm
124 ohm output	-100 dBm	-115 dBm
135 ohm output	-100 dBm	-115 dBm
600 ohm output*	-100 dBm	-115 dBm
Model 3336C	without Option 005	with Option 005
50 ohm output	-100 dBm	-115 dBm
75 ohm output	-100 dBm	-115 dBm

*Line related signals from the 600 ohm outputs will be more than 70 dB below the carrier or -83 dBm whichever is greater.

Amplitude Blanking:

Maximum signal output during amplitude blanking: < 85 dBm

Impulse Level in adjacent channels caused by amplitude blanking: > 22 dBm 0

PHASE OFFSET

Range:

± 719.9° with respect to arbitrary starting phase or assigned zero phase.

Resolution: 0.1°

Increment Accuracy: ± 0.2°

Ambient Stability: ± 1 degree of phase per degree C.

FREQUENCY SWEEP

Sweep Flatness:

± .15 dB, Normal Leveling, 50 Hz to 1 MHz, .5s Sweep Time.

± .15 dB, Fast Leveling, 10 kHz to 20 MHz, .03s Sweep Time.

Sweep Time

Linear Sweep: .01 sec to 99.99 sec

Single Log Sweep: 2 sec to 99.99 sec

Continuous Log Sweep: .1 sec to 99.99 sec

Minimum Sweep Width

Log Sweep: 1 decade

Linear Sweep: Minimum Bandwidth (Hz) = .1(Hz/sec) x Sweep Time (sec)

Table 1-1. Specifications and General Information (Cont'd).

Phase Continuity:

Sweep is phase continuous over the full frequency range

AMPLITUDE MODULATION

Modulation Depth: 0 to 100 %

Modulation Frequency Range: 50 Hz to 50 kHz

Envelope Distortion: < -30 dBc to 80% modulation

Input Impedance: 20 K ohm

PHASE MODULATION

Range: 0 to $\pm 850^\circ$

Linearity: $\pm .5\%$ of peak to peak deviation from best fit straight line.

Modulation Frequency Range: dc to 5 kHz

Input Sensitivity: ± 5 V peak for $\pm 850^\circ$ phase shift ($\approx 170^\circ/\text{volt}$)

Input Impedance: 20 K ohm

HP-IB CONTROL

Frequency Switching Time: (Time to settle to within 1 Hz of final value, exclusive of programming and processing time)

< 10 ms for 100 kHz step

< 25 ms for 1 MHz step

< 70 ms for 20 MHz step

Phase Switching Time: (to within 90° of phase lock, exclusive of programming and processing time)

< 15 ms

Amplitude Switching Time: (to within .1 dB of final value, exclusive of programming and processing time)

< 500 ms

AUXILIARY OUTPUTS**AUX 0 dBm:**

Frequency range is from 21 MHz to 60.999 999 999 MHz (under-range to 20.000 000 001 MHz). Amplitude is 0 dBm (50 ohm).

SYNC OUT:

Square wave with $V_{\text{high}} \geq 1.2$ V, $V_{\text{low}} \leq 0.2$ V into 50 ohms, to synchronize other instruments to the Main Signal Outputs. Level transition occurs at Main Signal Output zero crossing.

REF OUT:

0 dBm (50 ohm), 1 MHz signal for phase-locking additional instruments to the Model 3336.

10 MHz OVEN OUT:

Instruments with Option 004, only. 0 dBm (50 ohm), 10 MHz signal from a temperature stabilized, crystal oscillator for phase locking the Model 3336 or other instruments.

X DRIVE:

0 to $> +10$ Vdc linear ramp proportional to the sweep frequency. Linearity, $\pm 1\%$ of final value, 10% to 90%, best fit straight line.

Z BLANK:

Sweep related TTL compatible voltage levels. Low level is capable of sinking current from a positive voltage source.

Maximum Current = 200 mA

Maximum Voltage = ± 45 Vdc

Maximum Power Dissipation = 1 W

MARKER:

TTL compatible high to low level transition at the programmed Marker Frequency.

Table 1-1. Specifications and General Information (Cont'd).

AUXILIARY INPUTS

EXT REF IN:

For phase-locking the 3336A/B/C to an external frequency reference. Signal from 0 dBm to -20 dBm (50 ohm). Signal frequency must be within 1×10^{-6} of a sub-harmonic of 10 MHz from 1 MHz to 10 MHz.

AMPTD MOD:

Amplitude modulation input (see AMPLITUDE MODULATION specifications)

PHASE MOD:

Phase modulation input (see PHASE MODULATION specifications)

EXTERNAL LEVELING:

Input from an External Leveling voltage source to regulate the signal amplitude at a remote point. Input Sensitivity: $.25$ dB/volt

OPTION 004, HIGH STABILITY FREQUENCY REFERENCE

Aging Rate:

- = 5×10^{-8} per week after 72 hours continuous operation.
- = 1×10^{-7} per month after 15 days continuous operation

Ambient Stability:

$\pm 5 \times 10^{-8}$ maximum, 0° to 55°C

Warm-Up Time:

Reference frequency will be within 1×10^{-7} of the turn-off frequency, 20 minutes after turn-on, for an off time less than 24 hours.

OPTION 005, HIGH ACCURACY ATTENUATOR

Attenuation	10Hz	20 MHz
10 to 19.99 dB	= .035 dB	
20 to 39.99 dB	± .06 dB	
40 to 79.99 dB	± .1 dB	

GENERAL

Operating Environment:

- Temperature: 0° to 55°C
- Relative Humidity: 85%, 0° to 40°C
- Altitude: < 15,000 ft. (< 4600 meters)

Storage Environment:

- Temperature: -50° to $+65^{\circ}$ C
- Altitude: < 50,000 ft. (< 15,000 meters)

Power Requirements:

100/120, 220/240 V, +5%, -10%, 48 to 66 Hz, 60 VA (100 VA with all options), 10 VA standby.

Size: 132.8 mm (5 1/4 in) high x 425.5 mm (16 3/4) wide x 497.8 (19 5/8) deep

Weight: 10 kg (22 lbs.) net, 15.5 kg (34 lbs.) shipping