

1.4 PERFORMANCE SPECIFICATIONS

1.4.1 Frequency Characteristics

FREQUENCY RANGE:	Specified by model number (e.g., Model 900/2-12 has a range of 2-12 GHz).
FREQUENCY RESOLUTION:	1 MHz (see note 1, page 1-8)
FREQUENCY ACCURACY/STABILITY:	same as time base
INTERNAL TIME BASE FREQUENCY/ACCURACY:	10 MHz, $\pm 1 \times 10^{-6}$
INTERNAL TIME BASE STABILITY:	$<1 \times 10^{-6}$ /year after 20 minute warm-up
EXTERNAL TIME BASE:	10 MHz, $\pm 1 \times 10^{-6}$ or better, 0.5 to 5 Vpp, overrides internal time base; BNC, rear panel.
TIME BASE OUTPUT:	Buffered 10 MHz, 2 Vpp into 50 ohms, derived from internal or external time base; BNC, rear panel.

1.4.2 Spectral Purity

HARMONICS, SUBHARMONICS:	<-55 dBc
SPURIOUS (nonharmonics):	<-55 dBc
POWER LINE/FAN RELATED:	<-38 dBc, offset <100 Hz <-45 dBc, offset 100-600 Hz <-55 dBc, offset >600 Hz

SINGLE SIDEBAND PHASE NOISE (dBc/Hz, CW MODE):

Band (GHz)	100 Hz offset	1 kHz offset	10 kHz offset	100 kHz offset
.05 - 2	-70	-72	-75	-97
2 - 8	-78	-80	-78	-102
8 - 12	-75	-77	-75	-100
12 - 18	-70	-74	-75	-95
18 - 26	-70	-70	-75	-95

1.4.3 Output Characteristics

MAX LEVELED OUTPUT:	$\geq +5$ dBm (units containing the 18-26 band, and all single band units) $\geq +3$ dBm (all other units)
OUTPUT LEVEL ACCURACY:	± 1 dBm to 18 GHz, ± 2 dBm from 18 to 26 GHz
ATTENUATION RANGE:	0 to 99 dB (units containing the 18-26 band) 0 to 119 dB (all other units)
ATTENUATION RESOLUTION:	0.1 dB
VERNIER LEVEL ADJUSTMENT RANGE:	20 dBm

SOURCE IMPEDANCE:	50 ohms, nominal
OUTPUT VSWR:	$\leq 2:1$
OUTPUT CONNECTOR:	Type SMA, front panel

1.4.4 Pulse Modulation Characteristics

WAVEFORM:	Pulse (variable duty cycle) or Square (50% duty cycle).
PULSE RATE:	1 kHz fixed, or variable (ranges 100 Hz to 5 kHz and 1 kHz to 50 kHz).
PULSE WIDTH:	1 μ sec fixed, or variable (0.1 to 10 μ sec)
ON/OFF RATIO:	>30 dB (all units containing the 18-26 band) >60 dB (all other units)
RISE/FALL TIMES:	<25 nanoseconds
OVERSHOOT/UNDERSHOOT/RINGING:	± 2 dB, max
SETTLING TIME (TO ± 1 dB):	≤ 100 nsec
EXTERNAL MODULATION:	10 Hz to 1 MHz rate; rising edge or falling edge triggering; TTL levels.
SYNC OUTPUT:	TTL level modulation waveform; BNC, front panel.

1.4.5 Amplitude Modulation (omitted for units which include the 18 to 26 GHz band)

FREQUENCY RESPONSE:	10 Hz to 5 kHz; 3 dB points referenced to 1 kHz.
MODULATION DEPTH:	0 to 82% (0 to 15 dB), min
INPUT REQUIRED:	Sine wave; 1 Vpp for 50% modulation at 1 kHz.
INPUT IMPEDANCE:	500 ohms, nominal, AC coupled
DISTORTION:	$\leq 10\%$, at 50% depth, at -2 dBm

1.4.6 Sweep Operation

SWEEP RANGE:	Same as frequency range.
SWEEP MODES:	Locked (phase lock loops enabled) and Unlocked (phase lock loops disabled).
SWEEP FUNCTIONS:	Automatic Recycle, Single Sweep, Single Step, Reset.
SWEEP INCREMENTS:	1 MHz, 10 MHz, 100 MHz (settable via the front panel); or any increment resolvable by the instrument (settable via the remote interface).
SWEEP TIME:	10 rates in 1-2-5 sequence; approx. 1 msec/step to 1 sec/step (unlocked sweep); approx. 10 msec/step to 10 sec/step (locked sweep).
SWEEP OUTPUT:	0 to +10V, proportional to progress through the defined sweep range; BNC, front panel.
SWEEP SYNC TRIGGER INPUT:	TTL low to initiate single sweep or single step; BNC, front panel.
PEN LIFT OUTPUT:	TTL low during retrace; BNC, rear panel.

1.4.7 General

REMOTE INTERFACE:	IEEE STD 488-1978; duplicates all front panel controls and readouts except power on/off and variable rate and width for pulse modulation.
OPERATING TEMPERATURE RANGE:	0 to +50°C
WARM-UP TIME:	20 minutes, max
ENVIRONMENTAL REQUIREMENTS:	Type tested to MIL-T-28800C, type III, Class 5, Style E.
POWER:	100/120/220/240 VAC \pm 10%, 50-400 Hz, approx. 250 W.
DIMENSIONS:	Width 16.75", Height 5.25", Depth 24", Weight 65 lbs, nominal.

NOTE 1 -- Frequency Resolution

An input is provided on the rear of the instrument marked 'PLL Ref In/5-6 MHz'. A signal applied at this input will override the internal 5 MHz reference to the phase lock loop that controls the reference YIG oscillator. Any shift in this frequency will cause a one-for-one shift in the RF output frequency (for example, an input of 5.1 MHz will add 100 kHz to the selected output frequency). Varying the input across a 5-6 MHz range permits selection of frequencies between 1 MHz increments. For most instruments, the effective range of this input is 4 to 15 MHz (inputs below 5 MHz subtract from the output frequency) and may be varied at a rate within the bandwidth of the phase lock loop (typically, 50 kHz). A low frequency synthesizer may be applied to this input in order to achieve greatly increased resolution. A swept frequency input may be used to produce a narrow-band swept RF output.

See Section 8 for information concerning Option 03 (1 kHz Resolution) and Option 16 (1 Hz Resolution).