Table 1-2. Specifications for Model 6082A

FREQUENCY

Range: 100 kHz to 2112 MHz. (See Internal Modulation Oscillator for coverage from 0.1 Hz to 200 kHz.)
Frequency Bands: The carrier frequency band endpoints are shown below.

BAND DESIGNATION	APPROXIMATE CARRIER FREQUENCY BAND (MHz)	SPECIFIC CARRIER FREQUENCY BAND (MHz)
A	0.1 to 15	0.1 to 14.999,999
B	15 to 32	15 to 31.999,999
C	32 to 64	32 to 63.999,999
D	64 to 128	64 to 127.999,999
E	128 to 256	128 to 255.999,999
F	256 to 512	256 to 511.999,999
G	512 to 1056	512 to 1055.999,999
H	1056 to 2112	1056 to 2112

Resolution: 1 Hz
Display Resolution: 10 digits
Stability: Same as Internal Reference Oscillator

10 MHz INTERNAL REFERENCE OSCILLATOR

Type: Temperature Compensated Crystal Oscillator (TCXO)
Temperature Stability: Less than ±1 ppm p-p over the range 0 to +50°C
Typical Aging Rate: Less than ±1 ppm/yr
Reference Output: 10 MHz, >0 dBm for 50Ω load, available at the rear panel REF OUT connector.

PROVISION FOR EXTERNAL REFERENCE

The rear panel REF IN connector accepts an external source of 10 MHz ±10 ppm sine wave, 0.2 to 2.0V rms for a 50Ω load. One alternate external reference frequency setting of 1, 2, or 5 MHz is available at a time, through Special Function 761 or a remote command. The default alternate reference frequency is 5 MHz. See the Service Manual for setting internal DIP switches for use with a 1 or 2 MHz external reference.

AMPLITUDE

Range: +16 to -140 dBm for RF output frequency <1056 MHz.
+13 to -140 dBm for RF output frequency >1056 MHz.
Resolution: 0.1 dB (0.1% or 1 nV in volts). Annunciators for dB, dBm, V, mV, µV, dBf, dBµV, dBmV, and EMF
Display Resolution: 3 1/2 digits

Accuracy (+23 to ±5°C):

FREQUENCY (MHz)	AMPLITUDE IN dBm +16 to +13	+13 to -127	-127 to -140
0.1 to 0.4	±2 dB	±2 dB	±3 dB
0.4 to 1056	±1 dB	±1 dB	±3 dB
1056 to 2112	±1 dB	±1 dB	±3 dB

Table 1-2. Specifications for Model 6082A (cont.)

Accuracy (0 to 50°C):

FREQUENCY (MHz)	AMPLITUDE IN dBm +16 to +13	+13 to -127	-127 to -140
0.1 to 0.4	±2 dB	±2 dB	±3 dB
0.4 to 1056	±1.5 dB	±1.5 dB	±3 dB
1056 to 2112	±1.5 dB	±1.5 dB	±3 dB

Source SWR: <1.5:1 below +1 dBm
<2.0:1 above +1 dBm
Flatness (0 to 50°C): ±1.0 dB at +10 dBm
Intermodulation Distortion (Amplitude of +4 dBm, CW only):

FREQUENCY (MHz)	SPACING 1 kHz	25 kHz
0.1 to 128 MHz	-60 dBc	-75 dBc
128 to 512 MHz	-65 dBc	-75 dBc
512 to 2121 MHz	-65 dBc	-70 dBc

SPECTRAL PURITY (CW ONLY)

Spurious Signals: <-100 dBc for offsets greater than 10 kHz and RF output frequency <1056 MHz. <94 dBc for offsets greater than 10 kHz and RF output frequency >1056 MHz. Fixed-frequency spurious signals for RF output frequency <1056 MHz are <-100 dBc or <-140 dBm, whichever is greater. Fixed-frequency spurious signals for RF output frequency >1056 MHz are <-94 dBc or <-140 dBm, whichever is greater.

Harmonics: <-30 dBc for amplitudes less than +13 dBm at 1 to 2112 MHz.

Subharmonics: <-45 dBc for RF output frequencies from 1056 to 2112 MHz.

Power Line Spurious Signals (offsets less than 10 kHz): <-56 dBc for RF output frequencies <1056 MHz. <-50 dBc for RF output frequencies >1056 MHz.

Residual FM: (NOTE 1)

FREQUENCY BAND (MHz)	RESIDUAL FM 0.3 to 3 kHz	50 Hz to 15 kHz
0.1 to 15	0.2	0.4
15 to 32	0.2	0.4
32 to 64	0.2	0.4
64 to 128	0.2	0.4
128 to 256	0.4	0.5
256 to 512	0.7	1.0
512 to 1056	1.5	2.0
1056 to 2112	3.0	4.0

NOTE 1: *Allowable operating modes CW, AM, FM (peak dev. <1.5% of max in operating band), ØM (same comment as FM), Pulse.*

Table 1-2. Specifications for Model 6082A (cont.)

SSB Phase Noise: (NOTE 1)

CARRIER FREQUENCY BAND (MHz)	OFFSET FREQUENCY 1 kHz (dBc/Hz)	20 kHz (dBc/Hz)	100 kHz (dBc/Hz)
0.1 to 15	-112	-137	-137
15 to 32	-124	-144	-144
32 to 64	-118	-143	-144
64 to 128	-112	-143	-144
128 to 256	-106	-140	-143
256 to 512	-100	-136	-142
512 to 1056	-94	-131	-138
1056 to 2112	-88	-125	-132

Residual AM (50 Hz to 15 kHz Band): < .01% (-80 dBc)

AMPLITUDE MODULATION

Depth Range: 0% to 99.9% for RF output level <+7 dBm
AM Resolution: 0.1%
AM Display: 3 digits
AM Accuracy: ±(2% + 4% of setting) for rate = 1 kHz and depth <90%
AM Distortion (Rate = 1 kHz) (NOTE 2): <1.5% THD to 30% AM
<3% THD to 70% AM
<5% THD to 90% AM

AM 3-dB Bandwidth (NOTE 2): AC-coupled AM, 20 Hz to 50 kHz
DC-coupled AM, dc to 50 kHz

Incidental ØM: <0.20 radian at 1 kHz rate and 30% AM

FREQUENCY MODULATION (NOTE 3)

FM Display Ranges and Resolution: 0 to 999 Hz Dev, 1 Hz Resolution
1 to 9.99 kHz Dev, 10 Hz Resolution
10 to 99.9 kHz Dev, 100 Hz Resolution
100 to 999 kHz Dev, 1 kHz Resolution
1 to 8.00 MHz Dev, 10 kHz Resolution

NOTE 2: *AM specifications apply where (RF output frequency - mod frequency) is greater than 150 kHz.*
NOTE 3: *FM specifications apply where: (RF output frequency - deviation) >150 kHz and RF output frequency - mod rate) >150 kHz.*

Table 1-2. Specifications for Model 6082A (cont.)

Maximum Deviation:

FREQUENCY BAND (MHz)	MAXIMUM DEVIATION			
	DC-COUPLED FM	AC-COUPLED FM (the smaller of)		
		ABSOLUTE MAXIMUM	RATE LIMITED MAXIMUM	
			DEV ≥ 1/64 MAX	DEV < 1/64 MAX
0.01 to 15	500 kHz	500 kHz	fmod x 5000	fmod x 78
15 to 32	125 kHz	125 kHz	fmod x 1250	fmod x 19
32 to 64	250 kHz	250 kHz	fmod x 2500	fmod x 39
64 to 128	500 kHz	500 kHz	fmod x 5000	fmod x 78
128 to 256	1 MHz	1 MHz	fmod x 10000	fmod x 156
256 to 512	2 MHz	2 MHz	fmod x 20000	fmod x 312
512 to 1056	4 MHz	4 MHz	fmod x 40000	fmod x 625
1056 to 2112	8 MHz	8 MHz	fmod x 80000	fmod x 1250

FM Distortion:

Standard Mode: <2% for 0.5 to 1.0 times maximum deviation; <1% for <0.5 times maximum deviation. Applies for rates of 50 Hz to 50 kHz.

Low-Distortion Mode (Special Function 731): <0.15% for <= 3.5 kHz peak deviation and rates 0.3 to 3 kHz.

FM Accuracy: ±(5% of setting + 10 Hz) for rates of 50 Hz to 50 kHz

FM 3-dB Bandwidth:

DEVIATION	COUPLING	
	INTERNAL AC	EXTERNAL AC (DC)
0% to 25% Maximum	20 Hz to 175 kHz	20 Hz (dc) to 175 kHz
25% to 100% Maximum	20 Hz to 100 kHz	20 Hz (dc) to 100 kHz

Incidental AM: <1% depth for peak deviation <100 kHz at 1 kHz rate and carrier frequency >0.5 MHz

DC-Coupled FM Center Frequency Error, at 1 GHz, after dcFM internal cal, and without any FM range changes: <(.1% of dev + 500 Hz)

Low-Rate External AC-Coupled FM (Special Function 711):

FREQUENCY BAND (MHz)	MAX DEV, IN kHz (AT 10 Hz RATE)	
	SINE WAVE	SQUARE WAVE
0.01 to 15	80	40
15 to 32	20	10
32 to 64	40	20
64 to 128	80	40
128 to 256	160	80
256 to 512	320	160
512 to 1056	640	320
1056 to 2112	1280	640

Table 1-2. Specifications for Model 6082A (cont.)

Droop: <30% on a 5 Hz square wave
3-dB Bandwidth: 0.5 Hz to 100 kHz (typical)
Maximum DC Input: ±10 mV
Incidental AM: <1% AM at 1 kHz rate and <10 kHz deviation

PHASE MODULATION (NOTE 4)
Display Ranges: 0 to .999 radians
1 to 9.99 radians
10 to 99.9 radians
100 to 800 radians
Display Resolution: 3 digits
Maximum Deviation:

FREQUENCY BAND (MHz)	MAXIMUM DEVIATION (RADIANS)
0.1 to 15	50
15 to 32	12.5
32 to 64	25
64 to 128	50
128 to 256	100
256 to 512	200
512 to 1056	400
1056 to 2112	800

High-Rate Phase Modulation Maximum Deviation (Special Function 721):

FREQUENCY BAND (MHz)	MAXIMUM DEVIATION (RADIANS)
0.1 to 15	5
15 to 32	1.25
32 to 64	2.5
64 to 128	5
128 to 256	10
256 to 512	20
512 to 1056	40
1056 to 2112	80

Accuracy: ±(5% of setting + 0.1 radian) at 1-kHz rate
Distortion (NOTE 5): <2% THD from maximum deviation to 1/2 max deviation, and <1% THD at 1/2 maximum deviation or less at 1-kHz rate.
3-dB Bandwidth: AC-coupled phase modulation, 20 Hz to 15 kHz
DC-coupled phase modulation, dc to 15 kHz

NOTE 4: *Phase modulation specifications are valid where (RF frequency - mod frequency) >150 kHz.*
NOTE 5: *Valid for rates from 50 Hz to 50 kHz in high-bandwidth mode. Does not include effects of residual phase noise.*

Table 1-2. Specifications for Model 6082A (cont.)

High-Rate Phase Modulation 3-dB Bandwidth (Special Function 721):
AC-coupled phase modulation, 20 Hz to 100 kHz
DC-coupled phase modulation, dc to 100 kHz
Incidental AM (valid for f > 500 kHz): <1% AM at 1-kHz rate for peak deviation <10 radians.

PULSE MODULATION (For RF Output Frequencies >10 MHz)
On/Off Ratio: 80 dB minimum
Rise and Fall Times: <15 ns, 10% to 90%
Level Error: For pulse widths >50 ns, the power in the pulse is within ±0.7 dB of the measured CW level.
Duty Cycle (External Modulation): 0 to 100%
Repetition Rate (External Modulation): DC to 10 MHz
Internal Modulation: Internal rates and widths
External Modulation: The pulse input is TTL compatible, terminated in 50Ω with internal active pull-up. It can be modeled as 1.2V in series with 50Ω at the pulse mod input connector. The instrument senses input terminal voltage and turns the RF OUTPUT off when the terminal voltage drops below 1±0.1V. The maximum allowable input is ±10V.

PULSE MODULATION (For RF Output Frequencies <10 MHz)
Rise and Fall Times: <2 times the period of the RF output frequency
Level Error: For pulse widths >10 times the period of the RF output frequency, the power in the pulse is within ±0.7 dB of the measured CW level.
Other pulse specifications are the same as for the >10 MHz frequency range.

NONVOLATILE INSTRUMENT STATE MEMORY
50 instrument states are retained for typically 2 years, even with ac line power disconnected.

REVERSE-POWER PROTECTION
Protection Level: Up to 25 watts from a 50Ω source; up to 25V dc. RF OUTPUT is ac coupled. Protection is provided when the signal generator is turned off.
Trip/Reset: A flashing RF OFF annunciator indicates a tripped condition. Pressing RF ON/OFF button resets the signal generator.

IEEE-488 REMOTE CONTROL
Extent of Remote Control: All controls except the POWER, REF/INT EXT, and CAL/COMP switches are remotely programmable via the IEEE-488 Interface (Std. 488.2-1987). All status including the option complement are available remotely.
Interface Functions Supported: SH1, AH1, T5, TE0, L3, LE0, SR1, RL1, PP0, DC1, DT1, C0, and E2.

INTERNAL MODULATION SOURCE (Sine Wave)
Rates: 0.1 Hz to 200 kHz, key-selectable 400/1000 Hz
Display Ranges: 00.1 to 99.9 Hz
100 to 999 Hz
1.00 to 9.99 kHz
10.0 to 99.9 kHz
100 to 200 kHz
Frequency Resolution: 0.1 Hz or 3 digits
Frequency Accuracy: Same as reference oscillator ±7 millihertz

Table 1-2. Specifications for Model 6082A (cont.)

Output Level Range: 0 to 4V pk into 600Ω
Output Level Resolution: 1 mV pk or 3 digits, whichever is greater.
Distortion: <0.15% THD for output levels >0.2V pk and modulation frequency <20 kHz.
Output Level Accuracy: ±(4% + 15 mV) for modulation frequency <100 kHz.
Output Impedance: 600Ω ±2%
Other Waveforms Available by Special Function:

- Square Wave (Special Function 752)
- Triangle Wave (Special Function 751)
- Pulse (Special Functions 758,759), width 100 ns to 1/Fmod in 100 ns or 3-digit increments, whichever is greater. Rate and width are coherent with signal generator time base.

EXTERNAL MODULATION

1V pk provides indicated modulation index. Nominal input impedance is 600Ω. Maximum level is ±5V pk.

MODULATION MODES

Any combination of AM, PULSE, and FM or ØM, internal or external, may be used.

DIGITAL FREQUENCY SWEEP

Sweep Modes: Auto, single, or manual
Adjustable Parameters: Sweep symmetry, sweep speed, sweep width, and sweep increment.
Sweep Speed: Minimum 40 ms/increment selectable as (minimum + dwell time) where dwell time can be 0, 20, 50, 100, 200, or 500 ms, or 1, 2, 5, or 10s at each increment.

DIGITAL AMPLITUDE SWEEP

Sweep Type: Linear (volts) or logarithmic (dB)
Sweep Modes: Auto, single, or manual.
Adjustable Parameters: Sweep symmetry, sweep speed, sweep width, and sweep increment.
Sweep Speed: Minimum 30 ms/increment selectable as (minimum + dwell time) where dwell time can be 0, 20, 50, 100, 200, or 500 ms, or 1, 2, 5, or 10s at each increment.

SWEEP OUTPUT (AUX Connector Pin 5)

0 to +10V±10%, up to 4096 points in a stepped ramp, load >2 kΩ.

PEN LIFT OUTPUT (AUX Connector Pin 4)

TTL level, high during sweep retrace, load >2 kΩ.

GENERAL SPECIFICATIONS

Temperature: Operating, 0 to +50°C (+32 to +122°F).
Nonoperating, -40 to +75°C (-40 to +167°F).
Operating Humidity Range: 95% to +30°C, 75% to +40°C, and 45% to +50°C.
Operating Altitude: Up to 10,000 ft.
Vibration: Nonoperating, 5 to 15 Hz at 0.06 in, 15 to 25 Hz at 0.04 in, and 25 to 55 Hz at 0.02 in, double amplitude (DA).
Shock: Nonoperating, bench handling per MIL T 28800C Class 5, Style E.
Electromagnetic Compatibility: The radiated emissions induce <0.5 µV (at RF carrier frequency) into a 1-inch diameter, 2-turn loop, 1-inch from any surface as measured into a 50Ω receiver.

Table 1-2. Specifications for Model 6082A (cont.)

Complies with Standards:

- CE03 of MIL-STD-461B (Power and interconnecting leads), 0.015 to 50 MHz.
- RE02 of MIL-STD-461B (14 kHz to 10 GHz).
- FCC Part 15, Class B.
- VDE 0871B
- CISPR 22

Size:	Width	Height	Depth
	43 cm	13.3 cm	59.7 cm
	17 in	5.25 in	23.5 in

Power Requirements: 100, 120, 220, or 240V, each ±10%; 48-63 Hz; 200 VA, <15 VA in standby, with any options installed.

Weight: 30 kg (65 lbs).

OPTION -130 HIGH-STABILITY REFERENCE

Aging Rate: $<\pm 5 \times 10^{-10}$/day, after 21 days continuous operation.

Temperature Stability: $<\pm 2 \times 10^{-10}$/°C. (Oven remains powered in standby.)

OPTION -132 MEDIUM-STABILITY REFERENCE

Aging Rate: $<\pm 1 \times 10^{-7}$/month after 5 days continuous operation.

Temperature Stability: $<\pm 1 \times 10^{-7}$ (0 to +50°C)

OPTION -830 REAR PANEL CONNECTORS

Moves connectors for MODULATION INPUT, MOD output, and RF OUTPUT to the rear panel. The front panel connector locations are covered with plugs.

SUPPLEMENTAL CHARACTERISTICS

The following characteristics are provided to assist in signal generator applications, and to describe some other aspects of typical performance.

Frequency Switching Speed: <100 ms to settle within 100 Hz

Amplitude Switching Speed: <100 ms to settle within 0.1 dB

Pulse Modulation Delay: 80 ns typical