6060A Specifications

FREQUENCY

Range: .1-1050.00000 MHz
Resolution: 10Hz

Accuracy & Stability: Same as Reference Oscillator
Switching speed: See Supplemental Characteristics

REFERENCE OSCILLATOR

Internal

Standard: 10MHz Crystal oscillator. Aging Rate $\leq \pm 0.5$ ppm/mo.
Temperature effects: $< \pm$ 5 ppm 25°±25°C.
Reference output: 10MHz TTL.
Option 130: 10MHz High stability, crystal oscillator. (See options for specifications.)
Reference output: 10MHz TTL.

External

Standard or Opt. 130: 10MHz input. TTL Level. Input Impedance: TTL Compatible.
Option 131: 1, 2, 2.5, 5, 10MHz input. (See options for specifications.)
Reference Output: 10 MHz TTL Level.

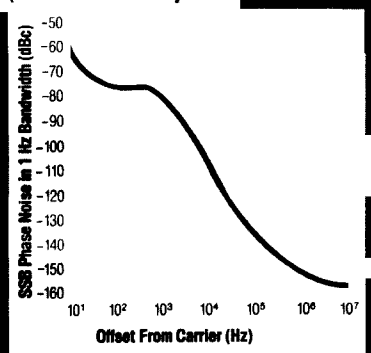
SPECTRAL PURITY

Spurious Signals ($\leq$ +13 dBm output levels)
Harmonics: <-30dBc
Non-Harmonic spurious: <-60dBc (greater than 10KHz away from the carrier in CW mode.)
Residual FM: (Hz rms)

Frequency Range	.3 to 3KHz BW	.05 to 15 KHz BW
.1-245 MHz	27	60
245-512 MHz	13	30
512-1050 MHz	27	60

Residual AM: <-60dBc in a .05-15KHz BW.

Typical SSB Phase Noise @ 500 MHz (with int. reference).



OUTPUT

Range: 1V to 32nV or +13dBm to −137 dBm (into 50 ohms, +13dBm pk on AM)
Resolution: 0.1dB
Absolute Level Accuracy: ±1.5dB for f_o =.4-1050 MHz, ± 2dB for f_o < .4 MHz and output ≥ -100 dBm, ±3dB for f_o < .4 MHz and output < -100 dBm.
Source SWR: <2.0, <1.5 below 1dBm and ≥.4 MHz.

Level Flatness: See Supplementary Characteristics
Reverse Power Protection: See Option −870.
Level Switching speed: See Supplemental Characteristics
Leakage: <1uv of generator's output signal**

AMPLITUDE MODULATION

AM Depth: 0 to 99% in 1% steps.
AM Accuracy: ±2% ±4% of setting (at internal rates, at depths ≤ 90% and peak amplitude ≤ + 13dBm)
AM Distortion: <1.5% THD, 0-30% AM, <3% THD, 31-70% AM, <5% THD, 71-90% AM, (at internal rates)

Incidental FM: $<0.3f_m$ (at internal rate and < 30% AM)
Rates:
Internal Rates: 400Hz and 1KHz (see Modulation Source for specifications.)
External BW: (3dB) .02 to 30 KHz.

FREQUENCY MODULATION

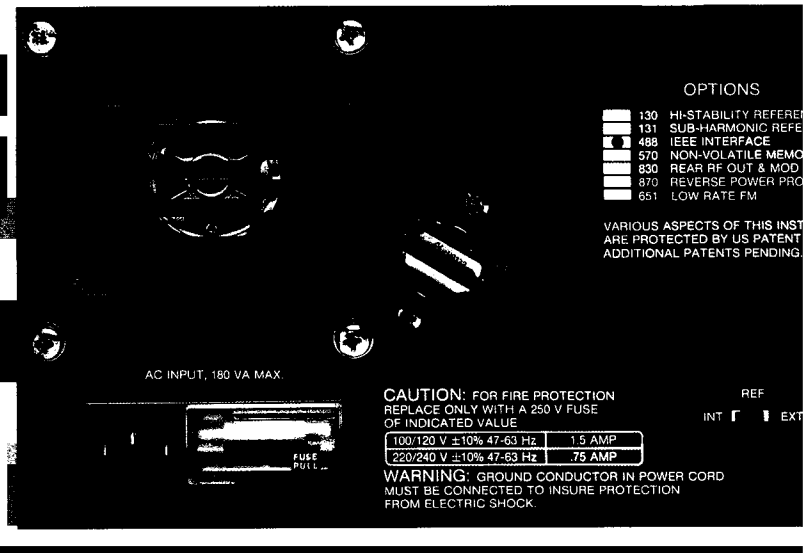
Maximum Deviation: f_o =carrier frequency in MHz f_m=modulation frequency in KH

Carrier Frequency	Max. Peak Deviation (The lessor of) (KHz)
<.4MHz	99.9KHz or 1000 $(f_o - .1)/3$
.4−245MHz	99.9KHz or $2f_m$ $(f_o + 800)$
>245MHz	99.9KHz or $2f_m f_o$

Example: If f_o=155MHz, f_m=400Hz the max dev. will be 99.9KHz since 2 x .4 x (155 + 800)KHz=764KHz>99.9KHz.

Accuracy: ±7% for f_m=.3 to 20KHz (.3 to 1 KHz for f_o < .4 MHz) and deviation >100Hz.
Distortion: <1% THD for f_m=.3 to 20KHz (.3 to 1 KHz for f_o <.4MHz) and deviation >100Hz.
Incidental AM: <1% AM at 1KHz rate and the maximum deviation or 50KHz whichever is less.

Internal Rates: 400Hz and 1KHz (see Modulation Source for specifications.)
External BW: (3dB) .02-100KHz
External low rate ACFM (opt-651): (See Option for specification.)



*** Measured with 2 turn loop, 1 inch in diameter, held 1 inch away from any surface into 50 ohm receiver.*

MODULATION SOURCE

Internal: 400Hz or 1KHz, ±3% for 20-30°C; add ±0.1%°C outside this range.

External: 1 volt peak causes indicated modulation index.

Input impedance: 600 ohms nominal (560 ohm nominal when EXT AM and EXT FM enabled simultaneously.)

EXT HI/EXT LO indicators: See Supplemental Characteristics.

GENERAL

Operating Temperature: 0°C to 50°C

Storage Temperature: −40°C to +75°C

Humidity (operating): 0-95% up to 30°C, 0-75% 30°C to 40°C, 0-45% 40°C to 50°C.

Altitude (operating): ≤10,000 ft.

Power: 100, 120, 220, 240 VAC ±10% 47-63Hz, (for 400Hz consult the factory) <180VA. (<15VA standby with opt. 130.)

Weight: <35 lbs.

Size: 13.3 cm high, 43.2 cm wide, 50.8 cm deep (5.25 in high, 17 in wide, 20 in deep).

EMI: Meets MIL-STD 461B RE02, CE03; FCC Part 15 (j), class A; CISPR 11.

OPTIONS

Option 130: High stability crystal oscillator

Aging Rate: <±5 x 10^{-10}/day after 21-day warmup (oven remains on with instrument plugged in.)

Temp. Effects: <±2 x 10^{-10}/°C

Option 131: Subharmonic Reference

Input Freq: 1, 2, 2.5, 5, 10MHz

Input Level: .3 to 4V peak-to-peak, sine or squarewave.

Input Impedance: 50 ohm, nominal

Output: 10MHz, TTL

Option 488: IEEE-488 compatible interface option

Interface: IEEE-488-1978

Functions Controlled: All front panel controls except line power switch.

Data Output: Instrument status, stored memory contents, instrument settled, instrument ID, option complement, uncal/reject entry status.

Indicators: Remote, Addressed, SRQ

Interface Functions: SH1, AH1, T5, TE0, L3, LE0, SR1, RL1, PP0, DC1, DT1, C0, E2

Option 570: Non-volatile Memory 50 location. Operational features same as standard features. Data is stored typically 2 years with power off.

Option 651: Low Rate ACFM

Maximum Deviation: 9.99KHz or 1000(f_0−.1)/30 whichever is less.

Droop: 15% typical on 7Hz Squarewave

Maximum DC Input: ±10mv

Option 830: Rear Only RF output and modulation input. Type N RF output connector on rear panel.

Option 870: Reverse Power Protection

Protection Level: Up to 50 watts of RF power from a 50 ohm source over .1 to 1050MHz. Will withstand up to 50VDC.

Trip/Reset: Flashing RF OFF annunciator indicates a tripped condition. Pushing RF ON/OFF button will reset device. Protection is not provided when instrument is off.

SUPPLEMENTAL CHARACTERISTICS

The following characteristics are provided to assist in the application of the instrument and describe the TYPICAL performance that can be expected.

Frequency:

Switching speed: <100ms to be within 100Hz of final value.

Modulation:

External Modulation Annunciators: EXT HI/EXT LO indicate when 1V peak, ±2% is applied at MOD IN connector .02 to 100KHz BW.

Amplitude:

Level Flatness: ±0.5 dB

Overrange: Useable up to approximately +15dBm, display up to +19dBm

Underrange: Useable down to −147.4dBm

Switching Speed: <100ms to be within 0.1dB of final value.

REAR PANEL CONNECTORS AND CONTROLS

Standard:

10MHz IN/OUT: Connector to input external 10MHz reference frequency, or to monitor internal 10MHz reference

REF INT/EXT: Control to enable 10MHz IN/OUT connector to output internal 10MHz reference (INT) or to receive an external reference (EXT)

Option:

REF IN: part of −131 subharmonic reference option

MOD IN: present only if −830 is installed

RF OUT: present only if −830 is installed

IEEE-488 Connector: present only if −488 is installed

ORDERING INFORMATION

Model	
6060A	0.1 to 1050MHz Synthesized Signal Generator
Options	
−130	High Stability Reference
−131	Sub Harmonic External Reference Input
−488	IEEE-488 Compatible Interface
−651	Low Rate ACFM
−570	Non-volatile Memory, 50 Locations
−830	Rear Only RF Output and Modulation Input
−870	Reverse Power Protection