Table 2-1. Specifications (1 of 4)

Specifications	HP 8643A	HP 8644B
Frequency		
Range:	.252 - 1030 MHz .252 - 2060 MHz Opt. 002	.252 - 1030 MHz .252 - 2060 MHz Opt. 002
Resolution:	.01 Hz	.01 Hz
Accuracy (Std. Timebase): < 1 year of calibration	.375 x 10^{-6} times carrier in Hz	.375 x 10^{-6} times carrier in Hz
Internal Reference Oscillator	Standard High Stability	Option 001 High Stability with EFC
Aging:	±1.5 x 10^{-8}/day after 10 days	±3 x 10^{-10}/day after 10 days
Temperature:	±7 x 10^{-10}, 0 to 55°C	±6 x 10^{-10}, 0 to 55°C
Line Voltage:	±2 x 10^{-10}, (+5%, −10%)	±1 x 10^{-10}, ±10%
Output:	10 MHz, > 0.15 V_{rms} level into 50Ω	10 MHz, > 1 V_{rms} level into 50Ω
External Reference Input:	Accepts 10 MHz ±5 ppm and a level range of 0.5 V to 2 V_{rms} into 50Ω	
Electronic Frequency Control (EFC):	Option 001 only, ±0.01 ppm for ±1 Vdc at rear panel connector, voltage range 10 Vdc, input impedance 10 kΩ	
Spectral Purity		
SSB Phase Noise (dBc/Hz): (@ 20 kHz offset)		
Carrier (MHz)		
1030 - 2060	−124 (Opt. 002)	−130 (Opt. 002)
515 - 1030	−130	−136
257.5 - 515	−136	−142
128.5 - 257.5	−140	−145*
.25 - 128.5	−142	−145*
Nonharmonics	< −100 dBc, > 10 kHz offset, .252 - 1030 MHz < −94 dBc, > 10 kHz offset, 1030 - 2060 MHz	< −105 dBc, > 10 kHz offset, .252 - 1030 MHz < −100 dBc, > 10 kHz offset, 1030 - 2060 MHz
Harmonics	< −25 dBc, output ≤ +8 dBm	< −25 dBc, output ≤ +10 dBm
Subharmonics	None, .252 - 515 MHz < −52 dBc, 515 - 1030 MHz < −40 dBc, 1030 - 2060 MHz	None, .252 - 515 MHz < −52 dBc, 515 - 1030 MHz < −40 dBc, 1030 - 2060 MHz
Residual FM (Hz rms):		
Carrier (MHz) — 3 kHz BW / 15 kHz BW	< 4 / < 8	< 2 / < 4
1030 - 2060	< 2 / < 4	< 1 / < 2
515 - 1030	< 1.2 / < 2	< 0.5 / < 1
257.5 - 515	< 1 / < 1.2	< 0.5 / < 0.5
.25 - 257.5		
Residual AM: (.3 to 3 kHz Post Det. BW)	< 0.01% AM rms	< 0.01% AM rms
SSB AM Noise Floor (dBc/Hz): (offsets > 100 kHz) (typical)	< −157, 10 dBm, < 1030 MHz < −150, 10 dBm, < 2060 MHz	< −157, 10 dBm, < 1030 MHz < −150, 10 dBm, < 2060 MHz

* Note: The HP 8644B with Option 005 has a phase noise floor of −143 dBc.

Table 2–1. Specifications (2 of 4)

Specifications (cont.)	HP 8643A	HP 8644B
Output Level		
Range:	+13 to −137 dBm	+16 to −137 dBm +13 dBm, Opt. 002, Opt. 005
Resolution:	.01 dB	
Absolute Accuracy:	±1 dB, output ≥ −127 dBm ±3 dB, output < −127 dBm	
Reverse Power Protection	50 watts	
Amplitude Modulation		
Depth:	0 - 100%, output ≤+7 dBm	
Resolution:	.1%	
Bandwidth (3 dB):	dc to .100 kHz, 128 MHz < f_c < 1030 MHz dc to .75 kHz, f_c > 1030 MHz	
Accuracy (1 kHz rate):	±(7% of setting + 1%) up to 80% depth	
Distortion (30% depth, 1 kHz rate):	< 3%; < 4% Opt. 002	
Incidental Phase Modulation (30% depth, 1 kHz rate)	< 0.2 radians peak	
External Input Impedance	600Ω	
Frequency Modulation		
Maximum Peak Deviation:	2 MHz, 1030 - 2060 MHz 1 MHz, 515 - 1030 MHz 500 kHz, 257.5 - 515 MHz 250 kHz, 128.5 - 257.5 MHz 125 kHz, 64 - 128.5 MHz 62.5 kHz, 32 - 64 MHz Deviation halves per lower octave (> 16, > 8, > 4, > 1, > .5 MHz)	20 MHz/200 kHz[2], > 1030 MHz 10 MHz/100 kHz[3], > 515 MHz 5 MHz/50 kHz[2], >257.5 MHz 2.5 MHz/25 kHz[3], > 128.5 MHz 1.25 MHz/12.5 kHz[3], > 64 MHz 625 kHz/6.25 kHz[3], > 32 MHz Deviation halves per lower octave (> 16, > 8, > 4, > 1, > .5 MHz)
Resolution:	2.5% of setting	2.5% of setting
Bandwidth (3 dB):	dc to 100 kHz	dc to 100 kHz
Carrier Accuracy in FM:	±0.5% of setting	±0.5% of setting
Indicator Accuracy:	< 5%, < 30 kHz rates	< 6%[3], < 30 kHz rates
Indicator Accuracy:	< 10%, < 100 kHz rates	< 15%[3], < 100 kHz rates
Distortion:	< 5%, 20 Hz to 100 kHz rates	< 5%, < 1%[3] 20 Hz to 100 kHz
Incidental AM:	< 0.5%, deviation ≤ 20 kHz	< 0.5%, deviation ≤ 20 kHz
External Group Delay:	< 10 µs, ≤ 100 kHz rates	< 10 µs, ≤ 100 kHz rates
External Input Impedance	600Ω	600Ω

Table 2–1. Specifications (3 of 4)

Specifications (Cont.)	HP 8643A	HP 8644B
Pulse Modulation		
On/off ratio:	>50 dB(HP8643A ≤ 1030 MHz), >35 dB(HP8644B ≤ 1030 MHz), >80 dB for fc >1030MHz	
Rise/fall time, 10 – 90%:	<100 ns	
Repetition rate:	dc to 1 MHz	
Minimum width:(typical)	0.5 µs	
Video feedthrough/overshoot:(typical)	<15%	
Output level accuracy:	±2 dB	
External inputs/outputs:	Input level: On state: >3.0Vpk (600Ω input impedance) Off state; <0.8Vpk	
Internal Modulation Source		
Number of sources:	Two sources simultaneousiy available through summation, independently adjustable in frequency, phase, amplitude and waveform. Source One may also be internally modulated with AM, FM, phase modulation and pulse modulation to create a subcarrier waveform.	
Waveforms and rates:	Sine, white Gaussian noise; 0.1 Hz to 400 kHz Triangle, Sawtooth, Square; 0.1 Hz to 50 kHz	
Frequency accuracy:	Same as timebase	
Max output level (into 600Ω):	2 Vpk	
Output resolution:	2 mV pk	
Total harmonic distortion:	<0.2%,≤20 kHz rates	
Frequency Sweep		
Digital sweep:	Digitally stepped sweep over entire frequency range. Linear/log selection. .5 to 1000 sec sweeps .	
Markers/Z axis output:	Three markers available /Z axis ouput nominally +5 V/X axis output nominally 0 to 10V.	
Phase continuous sweep:	40 MHz of span available at maximum carrier frequency. 20 ms to 10 sec sweep times.	
Remote Programming		
Interface:	HP-IB (IEEE 488.2-1987).	
Control language:	Hewlett-Packard Systems Language (HP-SL). All functions controlled except power.	
IEEE-488 functions:	SH1, AH1, T6, TE0, L4, LE0, SR1, RL1, PP0, DC1, DT0, C0, E2.	
Avionics Option 009	Option 009 provides guaranteed specifications for testing VOR and ILS (Localizer, Glide Slope and Marker Beacon) receivers.	
VOR (108 to 118 MHz)	Bearing accuracy: 0.1°, Frequency accuracy: Same as timebase, AM accuracy (30%): ±5% of setting, AM distortion: 2%, FM accuracy (480 Hz dev.): ± 1.5 Hz	
ILS: localizer/glide slope (108 to 112 MHz/329.3 to 335 MHz)	DDM resolution: Localizer: 0.0002 Glide Slope: 0.0004 DDM accuracy: Localizer: ±0.0004 ±5% of DDM Glide Slope: ±0.0008 ±5% of DDM AM accuracy: ±5% of setting AM distortion: 2%	
Marker beacon (75 MHz):	AM accuracy (95%): ±5% of setting – 1% AM distortion: 5%	

Table 2–1. Specifications (4 of 4)

Specifications (Cont.)	HP 8643A	HP 8644B
2 GHz Counter Option 011		
Frequency range:	20 Hz to 2 GHz in three ranges	
Sensitivity:	40 mV_{rms} (-15 dBm into 50Ω)	
Maximum input:	2.25 V_{rms} (+20 dBm into 50Ω)	
Impedance:	50Ω, 10 MHz to 2 GHz; 1 MΩ shunted by <65 pf, <10 MHz	
Coupling:	ac	
Gate times:	0.1 s to 1 s in 0.1 s steps	
Measurement resolution:	Measured frequency (Hz) x 10^{-8}/gate time or 0.01 Hz if greater	
Measurement uncertainty:	(± timebase accuracy) plus (± measurement resolution)	

[3] When used in low noise mode three

General	
Power requirements:	±10% of 100V, 120V, 220V or 240V; 48 to 440 Hz; 500 VA except 48 to 100 Hz; 400 VA.
Operating temperature:	0 to 55°C
Leakage:	Conducted and radiated interference meets MIL STD 461B RE02 and FTZ 1046. Leakage is measured into a resonant dipole antenna one inch from the instrument's surface with output level <0 dBm (all inputs/outputs properly terminated, f_c <1 GHz). Leakage is typically <16 µV or <2 µV with Option 010, measured at the front panel. The older two-turn loop method of measurement is typically <1 µV or <0.1 µV for Option 010.
Acoustic noise:	Typically <5.5bels
Storage registers:	Ten full function and 40 frequency/amplitude registers.
Calibration/diagnostics:	Internal calibration and diagnostics funtions are available to the user. Built-in test capability locates circuit malfunctions to allow repair through module replacement.
Calibration interval:	Recommended two years (MTBC).
Weight:	HP8643A; 23 kg (50 lbs). HP8644B; 30 kg (67 lbs).
Dimensions:	177H X 426W X 601D mm (7 X 16.8 X 23.7 in.). Opt. 010 adds 35 mm (1.4 in.) to depth.

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