Table 1-1. 8555A/8552A/8552B Specifications

FREQUENCY SPECIFICATIONS

FREQUENCY RANGE

Tuning Range

With internal mixer: 0.01 - 18.00 GHz.

With external mixer: 12.4 - 40 GHz.

Selectable continuous coarse (by means of push-pull knob) and fine tuning determine display center frequency.

Harmonic Mixing Mode

Signal Identification: Signal identifier separates unknown input signal in center of CRT into two images 2 divisions apart with image on left slightly less in amplitude when the calibrated frequency scale is advanced to the appropriate band.

Scan Width

Full Scan: Inverted marker positioned by tuning control identifies the frequency that becomes the center frequency for scan width per division and zero scan modes. The width of the scan depends on mixing mode. Scan width = n x 2000 MHz, where n is the mixing mode; e.g., for n = 2, scan width is 4 GHz.

Per Division: 16 calibrated scan widths from 2 kHz/div to 200 MHz/div in a 2, 5, 10 sequence.

Manual Scan: (Available with 8552B only.) Scan determined by front panel control; continuously variable across CRT in either direction.

Zero Scan: Analyzer becomes fixed tuned receiver with frequency set by frequency and fine tune controls and selectable bandwidths by bandwidth control. Amplitude variations are displayed versus time on CRT.

FREQUENCY ACCURACY

Dial Accuracy: n x (±15 MHz) where n is the mixing mode.

Scan Accuracy: Frequency error between two points on the display is less than 10% of the indicated separation.

Stability:

Total Analyzer Residual FM (Fundamental Mixing)

Stabilized	Unstabilized
<100 Hz	<10 kHz
peak-to-peak	peak-to-peak

First LO residual FM typically 30 Hz.

Noise Sidebands: For fundamental mixing. More than 70 dB below CW signal, 50 kHz or more away from signal, with 1 kHz IF bandwidth and 100 Hz video filter.

RESOLUTION

Bandwidth Ranges: IF bandwidths of 0.10 to 300 kHz provided in a 1, 3 sequence.

Bandwidth Accuracy: Individual IF bandwidth 3 dB points calibrated to ±20%. (10 kHz bandwidth 15%).

Bandwidth Selectivity:

IF Bandwidth	60 dB/3 dB Bandwidth Ratio 8552A	8552B
10 kHz - 300 kHz	20:1	20:1
1 kHz - 3 kHz	20:1	11:1
0.1 kHz - 0.3 kHz	25:1	11:1

AMPLITUDE SPECIFICATIONS

ABSOLUTE CALIBRATION RANGE

Measurement Range

CAUTION

See "Input Specifications" for maximum levels to INPUT .01 - 18 GHz connector and to input mixer.

Log Reference Level: From -130 dBm to +10 dBm, in 10 dB steps. Log reference level vernier, 0 to -12 dB continuously.

Linear Sensitivity: From 0.1 μV/div to 100 mV/div in a 1,2 sequence. Linear sensitivity vernier 1 to 0.25 attenuation ratio continuously.

Sensitivity

Average Noise Level: Specified for 1 kHz bandwidth. Using lower bandwidths will improve average noise level; e.g., use of 100 Hz bandwidth will improve noise level in the 1.5 to 3.55 GHz frequency range from -117 dBm to -127 dBm max.

With INTERNAL Coaxial Mixer

Frequency Range (GHz)	Mixing Mode (n)	IF Freq. (MHz)	Average Noise Level (dBm max.)
0.01 - 2.05	1-	2050	-115
1.50 - 3.55	1-	550	-117
2.07 - 6.15	2-	2050	-108
2.60 - 4.65	1+	550	-117
4.11 - 6.15	1+	2050	-115
4.13 - 10.25	3-	2050	-103
6.17 - 10.25	2-	2050	-105
6.19 - 14.35	4-	2050	- 95
8.23 - 14.35	3+	2050	-100
10.29 - 18.00	4+	2050	- 90

With 11517A EXTERNAL Waveguide Mixer and Appropriate Waveguide Tapers

Frequency Range	Average Noise Level (Typ.)
12.4 - 18.0 GHz	-90 dBm
18.0 - 26.5 GHz	-85 dBm
26.5 - 40.0 GHz	-75 dBm

Table 1-1. 8555A/8552A/8552B Specifications (Continued)

Residual Responses: Referred to signal level at input mixer on fundamental mixing: <-90 dBm.

Display Range

Log: 70 dB, 10 dB/div with 8552B 2 dB/div log expand on a 16 dB.display.

Linear: From 0.1 mV to 100 mV/div in a 1, 2 sequence on an 8-division display.

Display Uncalibrated Light: Panel light warns operator of uncalibrated amplitude display if the IF or video bandwidth selected is too narrow for combination of scan width and scan time selected.

Input Attenuator Range: 0 - 50 dB in 10 dB steps.

ABSOLUTE CALIBRATION ACCURACY

The overall absolute calibration accuracy of the spectrum analyzer in a particular application is a function of the measurement technique. The following elements also affect absolute calibration accuracy:

Frequency Response: With 10 dB input attenuator setting.

Frequency Range (GHz)	Mixing Mode (n)	IF Freq. (MHz)	Frequency Response (dB max.)
0.01 - 2.05	1-	2050	±1.0
1.50 - 3.55	1-	550	±1.0
2.07 - 6.15	2-	2050	±1.25
2.60 - 4.65	1+	550	±1.0
4.11 - 6.15	1+	2050	±1.0
4.13 - 10.25	3-	2050	±1.5
6.17 - 10.25	2+	2050	±1.5
6.19 - 14.35	4-	2050	±2.0
8.23 - 14.35	3+	2050	±2.0
10.29 - 18.00	4+	2050	±2.0

IF gain variation with different bandwidth settings: (at 20°C).
Log: ±0.5 dB.
Linear: ± 5.8%.

Amplitude Display: Log ±0.25 dB/dB but not more than ±1.5 dB over the full 70 dB display range.
Linear: ±2.8% of full 8-division deflection.

Input RF Attenuator: Frequency response typically ±0.6 dB from 10 MHz to 18 GHz.

Log Reference Level: Accurate to ±0.2 dB (±2.3% Linear Sensitivity).

Log Reference Level Vernier: Accurate to ±0.1 dB (1.2%) in 0, -6, and -12 dB positions; otherwise, ±0.25 dB (±2.8%).

Calibrator Output: Amplitude -30 dBm, ±0.3 dB. Frequency 30 MHz, ±0.3 MHz (8552A), ±3 kHz (8552B).

INPUT SPECIFICATIONS

Input Impedance: 50Ω nominal (0.01 - 18 GHz).

Reflection Coefficient: ≤0.130 (1.30 SWR) for input RF attenuator settings ≥10 dB.

Maximum Input Level:

CAUTION

DO NOT EXCEED THE FOLLOWING MAXIMUM INPUT LEVELS:

Maximum Input Levels	POWER[1]		VOLTS[2]		
	dBm	Watts	DC	Rms	Peak
Input 0.01 - 18 GHz Connector	+33	2	±20	10	14.14
Incident on Input Mixer	+10	10mW	+20	0.707	1.0

[1] The INPUT ATTENUATION control must be in the 30 dB or greater position when applying +33 dBm or input mixer will be damaged. The power levels listed apply for peak or average power.

[2] Do not exceed ± 20 volts dc. Apply only dc voltages with rise times less than 10^6 volts per second. Do not change INPUT ATTENUATION levels when dc voltages are applied to RF INPUT Connector.

RF Input Connector: Type N female.

External Mixer Input Connector: BNC female; LO power transfer to external mixer through connector as well as 2.05 GHz IF signal return to spectrum analyzer. LO power typically 0 dBm.

SCAN TIME SPECIFICATIONS

Scan Time: 16 internal scan rates from 0.1 ms/div to 10 sec/div in a 1, 2, 5 sequence.

Scan Time Accuracy: 0.1 ms/div to 20 ms/div, ±10%, 50 ms/div to 10 sec/div, ±20%.

GENERAL SPECIFICATIONS

Power Requirements: 115 or 230 volts ± 10%, 50 - 60 Hz, normally less than 225 watts (varies with plug-in units used).

Dimensions: Model 140T or 141T Display Section, 9-1/16 in. H (incl. feet) x 16-3/4 in. W x 18-3/8 in. D (229 x 425 x 467 mm). Model 143S Display Section, 21 in. H (incl. feet) x 16-3/4 in. W x 18-3/8 in. D (533 x 425 x 467 mm).

Weight:
Model 8555A RF Section: Net 14 lb 15 oz (6,8 kg).
Model 8552A IF Section: Net 9 lb (4,1 kg).
Model 8552B IF Section: Net 9 lb (4,1 kg).
Model 140T Display Section: Net 37 lb (16,8 kg).
Model 141T Display Section: Net 40 lb (18 kg).
Model 143S Display Section: Net 62 lb (28,1 kg).

Table 1-2. Supplemental Performance Characteristics

SUPPLEMENTAL PERFORMANCE CHARACTERISTICS

AMPLITUDE CHARACTERISTICS

For typical sensitivity and frequency response versus input frequency, see Figure 1-4.

Spurious Responses Due to Second Harmonic Distortion: With -40 dBm incident on input mixer.

Frequency Range	2nd Harmonic Distortion
0.1 - 6.2 GHz	<-63 dB
6.2 - 10.3 GHz	<-69 dB
10.3 - 14.4 GHz	<-54 dB
14.4 - 18.5 GHz	<-51 dB

Spurious Responses Due to Third Order Intermodulation Distortion: <-70 dB with -30 dBm incident on input mixer and signal separation >1 MHz.

Video Filter: Post-detection filter used to average displayed noise. With 8552A nominal bandwidths: 10 kHz and 100 Hz. With 8552B nominal bandwidths: 10 kHz, 100 Hz, and 10 Hz.

Gain Compression: For internal mixer gain compression <1 dB for -10 dBm peak or average signal level to input mixer. 11517A external mixer (12.4 - 40 GHz) gain compression, <1 dB for -15 dBm peak or average signal level to input mixer.

FREQUENCY CHARACTERISTICS

RESOLUTION

See Figure 1-5 for curves of typical 8555A/8552A and 8555A/8552A spectrum analyzer resolution for different bandwidths.

FREQUENCY DRIFT

Long Term Drift: (At fixed center frequency, after 2-hour warm-up).

Stabilized: ±3.0 kHz/10 min.

Unstabilized: ±25 kHz/10 min.

Stabilization Range: First LO can be automatically stabilized to internal crystal reference for scan widths of 100 kHz/div or less.

OUTPUT CHARACTERISTICS

First LO Output: +10 dBm; 50 ohms; 2.05 - 4.10 GHz.

Second LO Output: +10 dBm; 50 ohms; 1500 MHz.

Third LO Output: +5 dBm; 50 ohms (rear panel); 500 MHz.

Pen Lift Output: 0 to 14 volts (0 volts during scan cycle). Output available in Int and single scan modes and Auto, Line, and Video scan trigger.

Vertical Output: 100 mV per major division on CRT display; output impedance <100 ohms.

SCAN CHARACTERISTICS

Scan Mode:

Int: Analyzer repetitively scanned by internally generated ramp; synchronization selected by scan trigger.

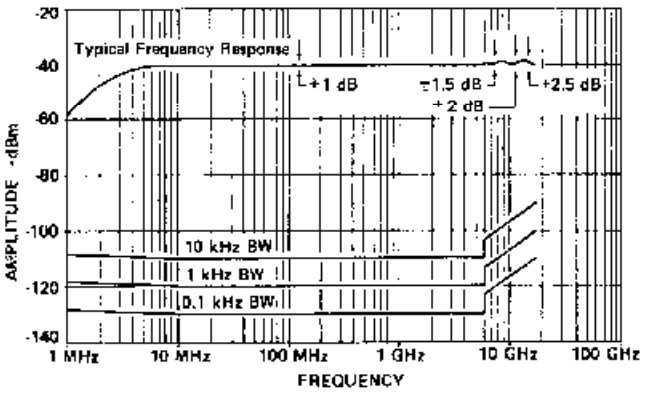

Figure 1-4. Typical Spectrum Analyzer Sensitivity and Frequency Response

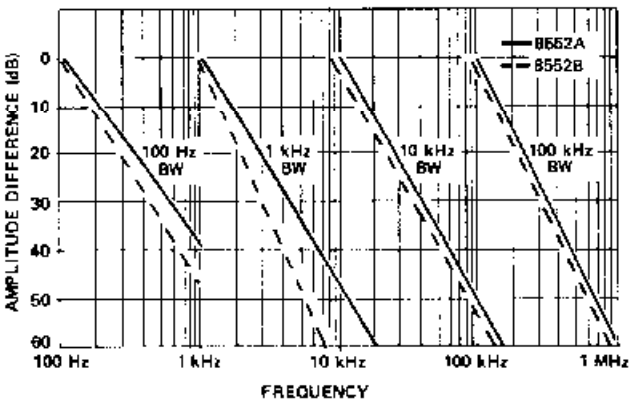

Figure 1-5. Typical Spectrum Analyzer Resolution (Fundamental Mixing)

Table 1-2. Supplemental Performance Characteristics (cont'd)

SUPPLEMENTAL PERFORMANCE CHARACTERISTICS (Continued)

Single: Single scan with reset actuated by front panel pushbutton.

Ext: Scan determined by 0 to +8 volt external signal; scan input impedance >10 kΩ.

Blanking: -1.5V external blanking signal required.

Manual: Scan determined by front panel control; continuously variable across CRT in either direction (8552B only).

Scan Trigger: For Internal Scan Mode, select between:

Auto: Scan free runs.

Line: Scan synchronized with power line frequency.

Ext: Scan synchronized with >2 volt (20 volt max.) trigger signal (polarity selected by internally located switch in IF Section).

Video: Scan internally synchronized to envelope of RF input signal (signal amplitude of 1.5 major divisions peak-to-peak required on display section CRT).

DISPLAY CHARACTERISTICS

Variable Persistence/Storage (Model 141T):

Plug-ins: Accepts Model 8550-series Spectrum Analyzer plug-ins and Model 1400-series time domain plug-ins.

Cathode-ray Tube:

Type: Post-accelerator storage tube, 9000 volt accelerating potential; aluminized P31 phosphor; etched safety glass faceplate reduces glare.

Functions Used with Time Domain Plug-ins Only: Intensity modulation, calibrator, beam finder.

Special Order: Chassis slides and adapter kit: Fixed slides, order HP Part Number 1490-0714; pivot slides, order HP Part Number 1490-0718; slide adapter kit for mounting slides on scope, order HP Part Number 1490-0721.

Persistence:

Normal: Natural persistence of P31 phosphor (approximately 0.1 second).

Variable:

Normal Writing Rate Mode: Continuously variable from less than 0.2 second to more than one minute (typically to two or three minutes).

Maximum Writing Rate Mode: Typically from 0.2 second to 15 seconds.

Erase: Manual; erasure takes approximately 350 ms; CRT ready to record immediately after erasure.

Storage Time: Normal writing rate; more than 2 hours at reduced brightness (typically 4 hours). More than one minute at maximum brightness. Fast writing speed; more than 15 minutes (typically 30 minutes) at reduced brightness or more than 15 seconds at maximum brightness.

Functions Used with Time Domain Plug-ins Only: Intensity modulation, calibrator, beam finder.

Normal Persistence (Model 140T):

Plug-ins: Same as 141T.

Cathode-ray Tube:

Type: Post-accelerator, 7300 volt potential medium-short persistence P7 phosphor; tinted and etched safety glass faceplate reduces glare. (Normal persistence of P7 phosphor approximately 0.3 sec).

Graticule: 8 x 10 division (approximately 7,6 x 9,5 cm) parallax-free internal graticule; five subdivisions per major division on horizontal and vertical axes.

Functions Used with Time Domain Plug-ins Only: Same as 141T.

Normal Persistence Large Screen Display (Model 143S):

Plug-ins: Same as 141T.

Cathode-ray Tube:

Type: Post-accelerator, 20 kV accelerating potential, aluminized P7 phosphor. (Persistence approximately 0.3 sec.)

Graticule: 8 x 10 divisions (approximately 8 x 10 inch) parallax-free internal graticule, five subdivisions per major division on horizontal and vertical axes.

Functions Used with Time Domain Plug-ins Only: Same as 141T.

GENERAL CHARACTERISTICS

CRT BASELINE CLIPPER: Front panel control adjusts blanking of CRT trace baseline to allow more detailed analysis of low-repetition-rate signals and improved photographic records to be made.

Temperature Range: Operating, 0° to +40°C; storage, -40° to +75°C.