

Table 1-1. Specifications

8556A/8552B/8552A	
FREQUENCY	
<p>Range: 20 Hz to 300 kHz — 8552B IF Section 100 Hz to 300 kHz — 8552A IF Section</p> <p>Tuning Dial Ranges of 0–30 kHz and 0–300 kHz.</p> <p>Scan Width: (On a 10 div. CRT horizontal axis.)</p> <p>Per Division: 10 calibrated scan widths from 20 Hz/div to 20 kHz/div in a 1, 2, 5 sequence.</p> <p>0–10f: 10 calibrated preset scans, from 200 Hz to 200 kHz in a 1, 2, 5 sequence. Analyzer scans from zero frequency to ten times the scan width per division setting.</p> <p>Zero: Analyzer is a fixed tuned receiver.</p> <p>Accuracy:</p> <p>Center Frequency: After 1 hour warmup, zero and 300 kHz adjustments, and with the Fine Tune centered, the dial indicates the display center frequency within the following specifications:</p> <p>With 8552B IF Section: 0–30 kHz Range: ± 500 Hz 0–300 kHz Range: ± 3 kHz</p> <p>With 8552A IF Section: 0–30 kHz Range: ± 1 kHz 0–300 kHz Range: ± 5 kHz</p> <p>Marker: RF markers every 20 kHz accurate to within $\pm 0.01\%$. Markers controlled by front panel on/off switch.</p> <p>Scan Width:</p> <p>With 8552B IF Section: Frequency error between any two points on the display is less than $\pm 3\%$ of the indicated frequency separation.</p> <p>With 8552A IF Section: Frequency error between any two points on the display is less than $\pm 5\%$ of the indicated frequency separation.</p>	<p>Stability:</p> <p>Residual FM:</p> <p>With 8552B IF Section: Sidebands >60 dB down 50 Hz or more from CW signal, scan time ≥ 1 sec/div, 10 Hz bandwidth.</p> <p>With 8552A IF Section: Less than 20 Hz peak-to-peak.</p> <p>Noise Sidebands: More than 90 dB below CW signal, 3 kHz away from signal, with a 100 Hz IF bandwidth.</p> <p>Frequency Drift: (After 1 hour warmup.)</p> <p>With 8552B IF Section: Less than 200 Hz/10 min.</p> <p>With 8552A IF Section: Less than 1 kHz /10 min.</p> <p>Resolution:</p> <p>Bandwidth Ranges: IF bandwidths of 10 Hz (50 Hz for 8552A) to 10 kHz are provided in a 1, 3, 10 sequence.</p> <p>Bandwidth Accuracy: Individual IF bandwidth 3 dB points calibrated to $\pm 20\%$ (10 kHz bandwidth $\pm 5\%$).</p> <p>Bandwidth Selectivity: 60 dB/3 dB IF bandwidth ratios.</p> <p>With 8552B IF Section: $<11:1$ for IF bandwidths from 10 Hz to 3 kHz; $<20:1$ for 10 kHz IF bandwidth. For 10 Hz bandwidth, 60 dB points are separated by less than 100 Hz.</p> <p>With 8552A IF Section: $<25:1$ for IF bandwidths from 50 Hz to 300 Hz; $<20:1$ for IF bandwidths from 1 kHz to 10 kHz.</p>

Table 1-1. Specifications (cont'd)

AMPLITUDE

Absolute Amplitude Calibration Range:

Log Modes:

dBV	0 dBV = 1 V rms
dBm-600Ω	0 dBm = 1 mW - 600Ω
dBm-50Ω	0 dBm = 1 mW - 50Ω

Input impedance is 1 MΩ. dBm ranges are referenced with input properly terminated externally.

Log Range: From -150 dBm/dBV to +10 dBm/dBV in 10 dB steps. Log reference level vernier, 0 to -12 dB continuously.

Log Display Range: 10 dB/div on a 70 dB display, or 2 dB/div on a 16 dB display (with 8552B only).

Linear Sensitivity: From 0.1 μV/div to 1V/div in a 1, 2, 10 sequence. Linear sensitivity vernier X1 to X0.25 continuously.

Dynamic Range:

Average Noise Level: Specified with a 600Ω or less source impedance and INPUT LEVEL at -60 dBm/dBV.

Mode	1 kHz IF Bandwidth	10 Hz IF Bandwidth
dBm-50 Ω	<122 dBm (180 nV)	<142 dBm (18 nV)
dBm-600Ω	<130 dBm (250 nV)	<150 dBm (25 nV)
dBV	<132 dBV (250 nV)	<152 dBV (25 nV)
Linear	<400 nV	<40 nV

Spurious Responses: Input signal level ≤ INPUT LEVEL Setting: out of band mixing responses,

harmonic and intermodulation distortion products are all more than 70 dB below the input signal level 5 kHz to 300 kHz; 60 dB 20 Hz to 5 kHz. Third order intermodulation products are more than 70 dB below the input signal level, 5 kHz to 300 kHz with signal separation >300 Hz.

Residual Responses: (no signal present at input): with the INPUT LEVEL at -60 dBm/dBV and the input terminated with 600Ω or less, all line related residual responses from 0-500 Hz are below -120 dBm/dBV. All other residual responses are below -130 dBm/dBV.

Gain Compression: For input signal level 20 dB above INPUT LEVEL setting gain compression is less than 1 dB.

INPUT LEVEL Control: -10 to -60 dBm/dBV in 10 dB steps. Accuracy ±0.2 dB. Marking indicates maximum input levels for 70 dB spurious-free dynamic range.

Accuracy:	Log	Linear
Frequency Response:	±0.2 dB	±2.3%
Switching Between Bandwidths (at 20°C),		
100 Hz to 10 kHz:	±0.5 dB	±5.8%
20 Hz to 10 kHz:	±1.0 dB	±12%
10 Hz to 10 kHz:	±1.5 dB	±20%
Display:	±.25 dB/dB	±2.8% of full 8 div display
	but not more than ±1.5 dB	over 70 dB display range

TRACKING GENERATOR

Frequency Range: Tracks the analyzer tuning, 20 Hz to 300 kHz.

Amplitude Range: Continuously variable from 100 mV rms to greater than 3V rms into an open circuit.

Amplitude Accuracy: With TRACKING GEN LEVEL in CAL position, output level at 100 kHz is 100 mV ±0.3 dB into an open circuit.

Frequency Response: ±0.25 dB 50 Hz to 300 kHz.

Output Impedance: 600Ω.

Spectral Purity:

Residual FM:
 With 8552B IF Section: <1 Hz peak-to-peak.
 With 8552A IF Section: <20 Hz peak-to-peak.

Harmonic Signals: >40 dB down.

Spurious Outputs: >50 dB down.

Table 1-1. Specifications (cont'd)

INPUT

Input Impedance: 1 M Ω shunted by \approx 32 pF.

Maximum Input Level: 10V rms, \pm 200 Vdc.

Ground terminals of BNC input connectors are isolated from the analyzer chassis ground to minimize ground loop pickup at low frequencies.

Maximum Voltage, Isolated Ground to Chassis Ground: \pm 100 Vdc.

Isolated Ground to Chassis Ground Impedance: 100 k Ω shunted by approximately 0.3 μ f.

GENERAL

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: \pm 10%
50 ms/div to 10 sec/div: \pm 20%.

Power Requirements: 115 or 230 volts \pm 10%, 50 to 60 Hz, less than 225 watts.

Dimensions:

Model 140T or 141T Display Section: 9-1/5" high (including height of feet) x 16-3/4" wide x 18-3/8" deep (229 x 425 x 467 mm).

Model 143S Display Section: 21" high (including height of feet) x 16-3/4" wide x 18-3/8" deep (533 x 425 x 467 mm).

Weight:

Model 8556A LF Section: Net, 8 lb (3,7 kg).

Model 8552B IF Section: Net, 9 lb (4,1 kg).

Model 8552A IF Section: Net, 9 lb (4,1 kg).

Model 140T Normal Persistence Display Section: Net 37 lb (16,8 kg).

Model 141T Variable Persistence Display Section: Net, 40 lb (18 kg).

Model 143S Large Screen Display Section: Net 62 lb (28,1 kg).

Accessories Included:

Model 11660A Tracking Generator Shunt

Model 11048B 50 Ω Feed Thru Termination

Model 11095A 600 Ω Feed Thru Termination

Table 1-2. Supplemental Performance Characteristics

FREQUENCY CHARACTERISTICS

Range: With 300 kHz Center Frequency and 20 kHz/div Scan Width, analyzer will scan linearly to 400 kHz.

Center Frequency Control: Approximately 10 turns to cover full dial indicator in both 0–30 kHz and 0–300 kHz ranges.

Fine Tune: Single turn control, ± 50 Hz on 0–30 kHz range, ± 500 Hz on 0–300 kHz range.

Zero Adjust: ± 27 kHz range with 8552A, ± 12 kHz range with 8552B.

0–10f Scan Mode: With zero properly adjusted in PER DIVISION scan, 0 to 10f scan mode will scan from 0 (± 500 Hz or 0.2 div, whichever is greater) to ten times the scan width per division setting. Offset may be reduced to 0 readjusting frequency zero. Scan accuracy $\pm 5\%$.

Resolution: See Figure 1-3 for curves of typical 8556A/8552B/8552A Spectrum Analyzer resolution using different IF bandwidths.

Warmup Drift: (Typical – first hour's operation.)

With 8552B: 500 Hz
With 8552A: 15 kHz

Long Term Drift: (Typical – at fixed center frequency after one hour warmup.)

With 8552B: 70 Hz/10 min
With 8552A: 400 Hz/10 min

Temperature Drift: (Typical.)

With 8552B: 200 Hz/ $^{\circ}$ C
With 8552A: 2 kHz/ $^{\circ}$ C

AMPLITUDE CHARACTERISTICS

Dynamic Range: For operation from 5 kHz to 300 kHz with signal levels greater than INPUT LEVEL setting, see Figure 1-4 for typical distortion.

Accuracy:

Log Reference Level: INPUT LEVEL and LOG REF LEVEL controls provide continuous log reference levels from +10 dBm/dBV to –80 dBm/dBV (may be decreased to –92 dBm/dBV by using 12 dB Log Reference Level Vernier).

Input Level: Provides 50 dB control of input preamplification and attenuation to prevent input overload. INPUT LEVEL markings of –60 dBm/dBV to –10 dBm/dBV indicate maximum input level for a minimum of 70 dB spurious-

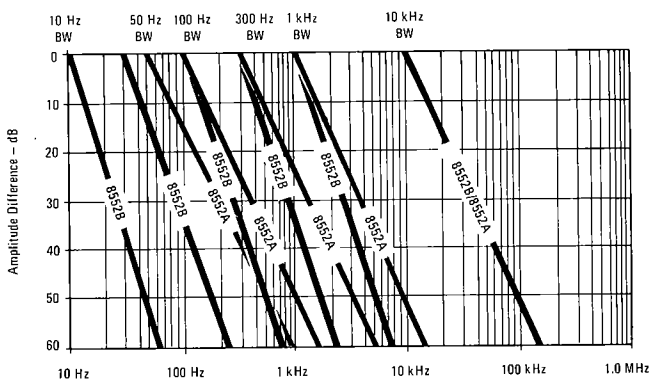
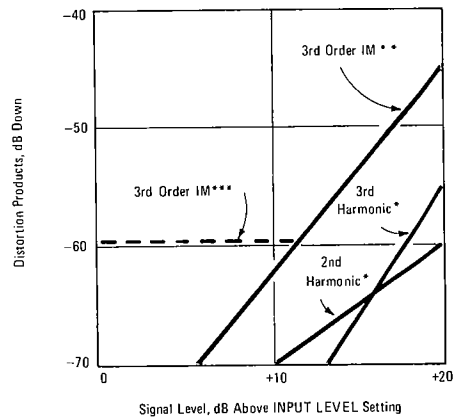


Figure 1-3. Typical Spectrum Analyzer Resolution



- * Single input signal, 300 Hz to 300 kHz. Second and third harmonic distortion products typically 10 dB higher below 30 Hz.
- ** Two input signals, 5 kHz to 300 kHz with > 300 Hz signal separation.
- *** Two input signals, frequency below 5 kHz with < 300 Hz signal separation.

Figure 1-4. Typical Spectrum Analyzer Distortion Products

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

AMPLITUDE CHARACTERISTICS (cont'd)

free dynamic range. Accuracy ± 0.2 dB (2.3%). Input may be overloaded up to 20 dB with the analyzer still providing useful measurement capability. See Figure 1-4.

Log Reference Level Control: Provides 90 dB of IF gain control in 10 dB steps to cover log and linear ranges. Accurate to ± 0.2 dB ($\pm 2.3\%$).

Log Reference Level Vernier: Provides continuous 12 dB range. Accurate to ± 0.1 dB ($\pm 1.2\%$) in 0, -6, -12 dB positions; otherwise ± 0.25 dB ($\pm 2.8\%$).

Log Reference Level, switching between 10 dB/div and 2 dB/div log scales (8552B only):

Accuracy: ± 0.6 dB
Temperature Stability: ± 0.07 dB/ $^{\circ}$ C.

Amplitude Stability: ± 0.07 dB/ $^{\circ}$ C in log, ± 0.6 %/ $^{\circ}$ C in linear.

Display Uncalibrated Light: Warns if a combination of control settings (IF or video bandwidth, scan time or scan width) degrades absolute calibration for CW signals. Typically accurate to ± 1 position in scan width or scan time setting.

Video Filter: Averages displayed noise; bandwidth of 10 kHz, 100 Hz and (8552B only) 10 Hz. Bandwidth accuracy $\pm 20\%$.

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 face-plate reduces glare.

Graticule: 8 x 10 division (approximately 7,1 x 8,9 cm) parallax-free internal graticule; five subdivisions per major division on horizontal and vertical axes.

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 face-plate reduces glare. (Normal persistence of P7 phosphor approximately 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 P31 phosphor. (Persistence approximately 0.1 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.

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

GENERAL CHARACTERISTICS

Scan Mode:

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

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

Ext: Scan determined by 0 to +8 volt external signal; scan input impedance more than 10 k Ω .

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 more than 2 volt (20 volt max.) trigger signal (polarity selected by internally located switch in Model 8552 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).

Auxiliary Outputs:

Vertical Output: Approximately 0 to -0.8V for 8 division deflection on CRT display; approximately 100 Ω output impedance.

Scan Output: Approximately -5 to +5V for 10 div CRT deflection, 5k Ω output impedance.

Pen Lift Output: 0 to 14V (0V, pen down). Output available in Int and Single Scan modes and Auto, Line, and Video Scan Trigger.

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.

EMI: Conducted and radiated interference is within requirements of MIL-I-16910C and MIL-I-6181D and methods CE03 and RE02 of MIL-STD-461 (except 35 to 40 kHz) when 8556A and 8552B are combined in a 140T or 141T Display Section.

Temperature Range: Operating, 0°C to +55°C, storage, -40°C to +75°C.