

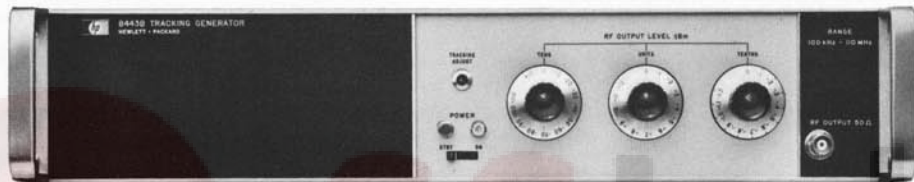
SIGNAL ANALYZERS



TRACKING GENERATOR/COUNTER
 New Measurement Capability for Spectrum Analyzers
 Models 8443A, 8443B



8443A



8443B

Features:

- Swept Transmission/Reflection Measurements**
 - 120 dB Dynamic Range/Return loss up to 40 dB
 - 0.1 dB Amplitude Resolution
 - 10 Hz Frequency Resolution
 - Sweep Widths from 200 Hz to 100 MHz
- Precision Frequency Measurements**
 - 10 Hz Resolution
 - 25 nV (-140 dBm) sensitivity
 - 20 Hz Selectivity
 - Movable Marker

Description

The 8443B Tracking Generator and 8443A Tracking Generator/Counter add a totally new dimension to the spectrum analyzer making it an extremely versatile, precision frequency domain measurement system.

8443B Tracking Generator

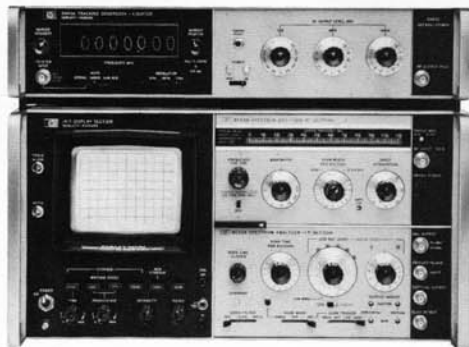
The 8443B is a swept signal source whose output frequency tracks the input frequency of the spectrum analyzer. With a swept source, the analyzer can make swept frequency response and return loss measurements on filters, amplifiers, antennas, etc. The combination of a tracking source and selective detector eliminates harmonic and spurious responses from the display allowing a measurement range of more than 120 dB. An additional result of the analyzer's selectivity is the ability to make swept frequency response measurements in the presence of high level signals or noise.

Because the tracking generator's output is derived by mixing a crystal oscillator with the spectrum analyzer's local oscillators, it shares the analyzer's excellent stability and flatness. These qualities allow quick and accurate characterization of high Q devices. In addition to exceptional stability and flatness, absolutely calibrated, continuously variable output make the 8443B useful as a precision signal generator.

8443A Tracking Generator/Counter

In the 8443A, frequency counter and variable marker capabilities are combined with the sweeper/signal generator capability of the 8443B. The Tracking Generator/Counter provides a marker which can be placed anywhere on the analyzer's display and measures the frequency of that point to seven digits. Making use of the spectrum analyzer's sensitivity and selectivity, the counter can measure the frequency of extremely low level signals even in close proximity to much larger signals. With the 8443A Tracking Generator/Counter, precision frequency measurement with 10 Hz resolution is brought to spectrum analysis and spectrum surveillance as well as swept frequency response measurements.

The frequency counter and variable marker section can be added to the 8443B Tracking Generator with an easy to install modification kit, the 11663A.



8443A With
 8553B / 8552A / 141T

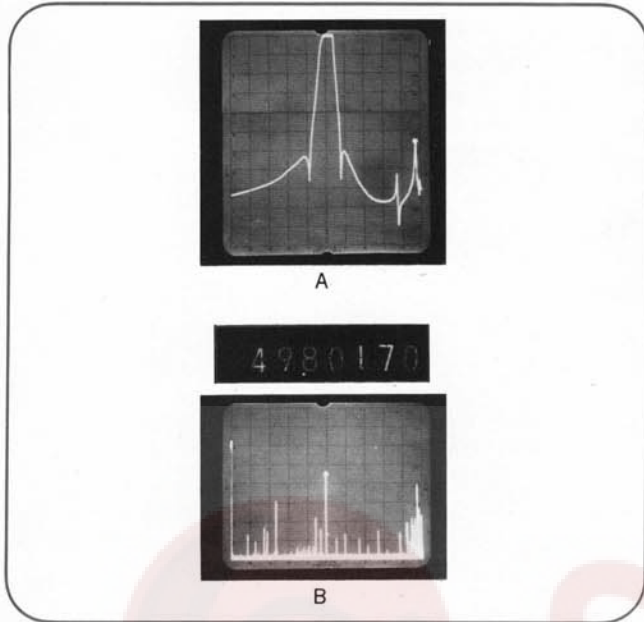


Figure 1. A frequency response measurement, shown in Photo A, reveals detail in the stop band 100 dB down. This is a 20 MHz crystal filter with a 60 dB bandwidth of 7.48 kHz (measured with the 8443A counter; the scan width is 5 kHz/division). The filter was to have greater than 60 dB rejection, however, a spurious mode at 20.0232 MHz is only 55 dB down. To show the entire response of the filter at one time, two CRT photographs were superimposed. Using this technique, frequency response could be displayed over a range greater than 120 dB. Photo B illustrates an application of precision frequency measurement. The display is the radiated spectrum from 0 to 100 MHz at Palo Alto, California. The marker was centered on the strong signal at about 50 MHz, and its frequency was accurately measured as 49.80170 MHz. The carriers for TV channels 2, 4, and 5 appear on the CRT as do the local FM stations. The precise frequency of any of these signals could be measured just as easily.

8443 Tracking Generator/Counter Specifications

Tracking Generator (8443A and 8443B)

- Frequency Range:** 100 kHz to 110 MHz.
- Sweep Width:** 18 selectable, calibrated sweep widths from 200 Hz to 100 MHz in a 2, 5, 10 sequence; controlled by spectrum analyzer.
- Spectral Purity:**
 - Residual FM:** Determined by spectrum analyzer IF Section.
 - 8552A:** Less than 20 Hz peak to peak.
 - 8552B:** FM sidebands > 60 dB down 50 Hz or more from CW signal; typically less than 1 Hz peak to peak.
- Amplitude Range:** < -120 dBm to +10 dBm in 10 and 1 dB steps with a continuous 1.2 dB vernier.
- Amplitude Accuracy:**
 - Frequency Response (flatness):** ±0.5 dB.
 - Output Attenuators:**
 - 10 dB steps: ±0.2 dB.
 - 1 dB steps: ±0.1 dB.
 - Calibration:** 0 dBm at 30 MHz: ±0.3 dB.
- Output Impedance:** 50 Ω, ac coupled, reflection coefficient ≤ 0.09 (1.2 SWR) output < 0 dBm.

Counter (8443A only)

- Display:** 7 digits with 1 digit over-range. Reads to ±10 Hz increments.
- Resolution (gate time):** 1 kHz (1 ms), 100 Hz (10 ms), 10 Hz (100 ms).
- Accuracy:** ±1 count ± time base accuracy.
- Time Base Aging Rate:** < 3 x 10⁻⁹/day after warm-up.
- Time Base Temperature Drift:** < 3 x 10⁻⁸ variation, 0-55°C.
- External Inputs:**
 - Counter:** 10 kHz to 120 MHz, 50 Ω, -10 dBm min.
 - Time Base:** 1 MHz, 50 Ω, 1 V rms min.
- Auxiliary Outputs:**
 - Time Base:** 1 MHz, 1 V rms nominal.
 - Digital Frequency Output:** 8, 4, 2, 1 code: "1" positive.
- Modes:**
 - Marker:** Counter reads frequency of marker location on Spectrum Analyzer display. Marker position is manually variable or can be automatically switched to the center of the display.
 - Scan Hold:** Scan starts at left edge of display and stops at marker. Counter measures frequency continually. Scan hold mode allows manual scan.
 - External:** Counter measured frequency of signal at external counter input up to 120 MHz.

General (8443A and 8443B)

- Temperature Range:** Operation, 0 to 55°C; storage, -40°C to 75°C.
- Power:** 115 V and 230 V, 48 to 440 Hz. 8443A, 75 watts; 8443B, 45 watts.
- Dimensions:** Length, 18 3/8 in. (466,7 mm). Width, 16 3/4 in. (425,4 mm). Height, 3 7/8 in. (98,4 mm), including height of feet.
- Net Weight:** 8443A, 29 lb. (13,1 kg). 8443B, 24 lb., 12 oz. (11,2 kg).
- Shipping Weight:** 8443A, 35 lb. (15,9 kg). 8443B, 30 lb. (13,7 kg).
- Price:** 8443A, \$3,500.00
8443B \$1,975.00
Mod. Kit No. 11663A adds counter/marker to 8443B, \$1,525.00.

Modifications Required (8443A and 8443B)

The 8443A and 8443B are fully compatible with all 8553B RF Sections, 8552B or new 8552A IF Sections and 141T or 140T Display Sections. It is not compatible with the 143S Large Screen Display Section; however, special 143S Display Sections can be ordered.

Older spectrum analyzers may require modification kits for the RF, the IF, and the display section. The kits may be ordered separately from the service center or as options to the 8443 from the factory. The prices are the same in either case.

The sections that need to be modified are: all 8553L RF Sections, any 8552A IF Section with Serial Numbers 945-01889 and below, and all 140S or 141S displays. Kits are not available for the 143S Display Section.

Section	Modification Kits	
	With 8443A or 8443B from factory	From service center
8552A (S/N ≤ 945-01889)	Option 101, add \$70.00	Mod. Kit 08552-6060 \$70.00
8553L	Option 102, add \$90.00	Mod. Kit 08553-6065 \$90.00
141S/140S	Option 103, add \$40.00	Mod. Kit 00140-69504 \$40.00
All Three Kits	Option 100, add \$200.00	-