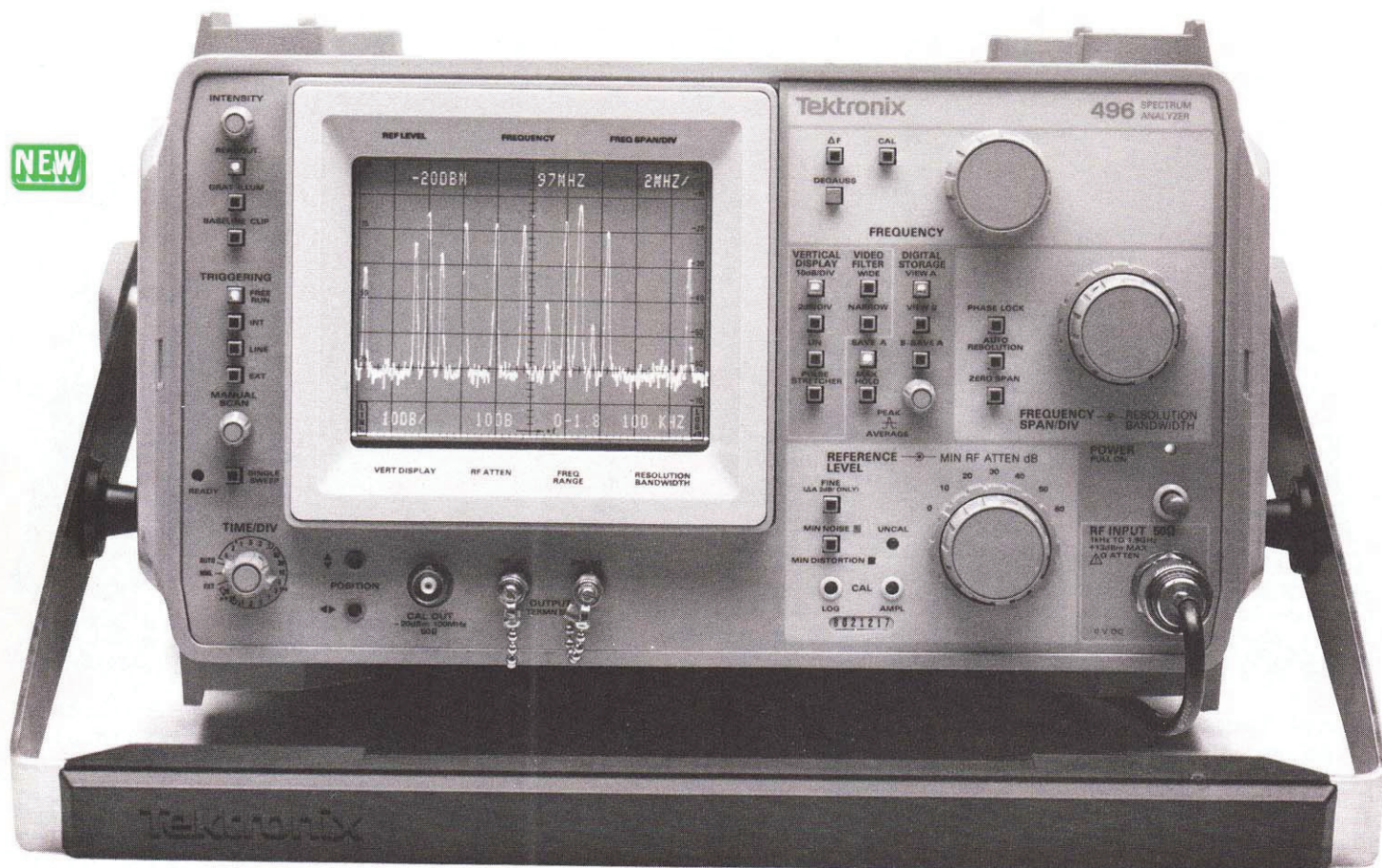


TEK 1 kHz TO 1800 MHz PORTABLE SPECTRUM ANALYZERS



The 496P complies with IEEE Standard 488-1978, and with Tektronix *Codes and Formats* Standard.

496 496P GPIB IEEE-488

Microprocessor Aided Controls

Automatic Modes

Portable Form Factor (Compact Size/Light Weight)

1 kHz to 1800 MHz Coverage

Amplitude Comparison in 0.25 dB Steps

1 kHz Frequency Resolution in ΔF Mode

CRT Readout of all Important Parameters

Fully Calibrated in Amplitude and Frequency

80 dB Dynamic Range

GPIB/Fully Programmable (496P)

Three-knob Operation

Environmentalized per MIL-T 28800B

Digital Storage and Signal Processing

The 496 provides high performance spectrum analysis and measurements in the 1 kHz to 1.8 GHz range. Its high stability and 80 dB dynamic range meet your demands for proof-of-performance measurements, on site or on the bench.

The 496 offers state of the art performance and rugged portability. Resolution bandwidth can be varied from 1 MHz to 30 Hz over the entire frequency range. Automatic phase lock stabilization reduces incidental FM to 10 Hz p-p; phase noise sidebands are at least -75 dBc at 30 times the resolution offset. Frequency drift with phase lock is no greater than 330 Hz in ten minutes. And the 496 provides 1 kHz frequency resolution in ΔF mode.

Easy to use. Anywhere.

Simple 1,2,3 knob adjustment sets center frequency, frequency span and reference level. Power on sequence automatically normalizes operational settings and provides maximum input protection.

Digital storage eliminates time-consuming display adjustments. SAVE A, B MINUS SAVE A, MAX HOLD and AVERAGE modes let you compare, subtract, save maximum values or noise average (smooth) your spectral displays. Constant tuning rate lets you position the signal quickly and accurately at any frequency span.

Microprocessor-aided controls take care of the rest. Most-used functions are automatically controlled.

The 496 Goes Where You Go

Light weight and compact size combine to provide unmatched portability in a laboratory quality spectrum analyzer. With its single-handle carry, the 496 is easily moved around the design lab or systems test area, to the field, or wherever it may be needed.

It even fits under an airplane seat.

Automate your Spectrum Analysis with the 496P

The 496P is the fully programmable/GPIB compatible version of the 496 Spectrum Analyzer. Operation, features and benefits of the 496P are essentially the same as the 492P. See discussion on pages 123 and 124. 496 Spectrum Analyzer specifications also apply to the 496P.

Manual instruments can be converted to programmable instruments at a later time. Contact your Tektronix Sales Engineer for details.

496/496P CHARACTERISTICS

ELECTRICAL CHARACTERISTICS

The following characteristics and features apply to the 496/496P Spectrum Analyzer after a 30-minute warm up period unless otherwise noted.

FREQUENCY RELATED

Center Frequency Range — 1 kHz to 1800 MHz.

Frequency Accuracy — ± 5 MHz $\pm 20\%$ of span/div.

***Frequency Readout Resolution** — 1 MHz. 496P TUNE Command Accuracy (Span/div ≤ 50 kHz) — $\pm 7\%$ or ± 100 Hz, whichever is greater.

***Delta Frequency Readout Accuracy** (Span/div ≤ 50 kHz) — $\pm 5\%$ of the Delta Frequency Readout.

Residual FM (short term), Phase-lock ON — ≤ 10 Hz p-p over 20 ms.

Residual FM (short term), Phase-lock OFF — ≤ 1 kHz p-p over 20 ms.

Long Term Drift —

(At Constant Temperature and Fixed Center Frequency) — Phase Lock on 3.3 kHz or less in 10 Min.
Phase Lock off 33 kHz or less in 10 Min.

Resolution Bandwidth (–6 dB) — 30 Hz, then 100 Hz to 1 MHz in decade steps, plus an AUTO position. Resolution bandwidth is within 20% of selected bandwidth.

Resolution Shape Factor (60 dB/6 dB) — 7.5:1 or less. 15:1 or less for 30 Hz Resolution Bandwidth.

Noise Sidebands — At least 75 dBc at 30 times the Resolution Bandwidth offset from the Center Frequency (70 dBc for 100 Hz Resolution Bandwidth or less).

Frequency Span/div Range — From 50 Hz/div to 100 MHz/div in a 1-2-5 sequence.

Max Span — When selected, the entire effective frequency range is scanned and displayed.

Zero Span — When selected, the horizontal axis of the CRT is calibrated in time (instead of frequency). The span/div readout is changed to time/div.

Frequency Span/div Accuracy — Within 5% of the selected span/div over the center eight divisions of the ten-division CRT display.

* Δ F mode provides incremental frequency measurements to the nearest kHz plus direct center frequency readout to the nearest kHz between 1 kHz and 1500 kHz (Phase Locked).

AMPLITUDE RELATED

Reference Level Range (full screen, top of graticule) — -123 dBm to $+40$ dBm ($+40$ dBm includes maximum safe input of $+30$ dBm and 10 dB of IF gain reduction) for 10 dB/div and 2 dB/div LOG modes. 20 nV/div to 2 V/div (1 W maximum safe input) in LIN mode.

Reference Level Steps — 10 dB, 1 dB, and 0.25 dB for differential (Δ) measurements in LOG mode. 1-2-5 sequence and 1 dB equivalent increments in LIN mode.

Reference Level Accuracy — Accuracy is a function of changes in rf Attenuation, Resolution Bandwidth, Display Mode and Reference Level. See amplitude accuracies of these functions. The rf attenuator steps 10 dB for reference level changes above -30 dBm (-20 dBm when Min Noise is active) unless Min rf Attenuation is greater than normal. The IF gain increases 10 dB for each 10 dB Reference Level change below -30 dBm (-20 dBm when Min Noise is active).

Display Dynamic Range — 80 dB at 10 dB/div, 16 dB at 2 dB/div, and 8 divisions in LIN mode.

Display Amplitude Accuracy — ± 1.0 dB/10 dB to a maximum cumulative error of ± 2.0 dB over the 80 dB window and ± 0.4 dB/2 dB to a maximum cumulative error of ± 1.0 dB over the 16 dB window. LIN mode is 5% of full scale.

Differential Amplitude — Delta A mode provides differential measurement in 0.25 dB increments.

Display Flatness — ± 1.5 dB, 1 kHz to 1800 MHz measured with ≥ 10 dB RF attenuation.

Sensitivity — Resolution Bandwidth Average Noise Level.

30 Hz	-127 dBm
100 Hz	-123 dBm
1 kHz	-115 dBm
10 kHz	-105 dBm
100 kHz	-95 dBm
1 MHz	-85 dBm

SPURIOUS RESPONSE

Residual (no input signal, referenced to mixer input) — -100 dBm or less.

Third-Order Intermodulation Distortion (Min Distortion mode) — At least -70 dBc below any two on-screen signals within any frequency span.

Harmonic Distortion (cw signal, Min Distortion mode) — At least -60 dBc for a full-screen signal.

L. O. Emissions (reference to input mixer) — -70 dBm maximum

INPUT SIGNAL CHARACTERISTICS

Rf Input — Type N female connector.

Input Impedance — 50Ω ; vswr 1.45 maximum with 10 dB or more rf attenuation.

Input Level (optimum level for linear operation) — -30 dBm referred to input mixer. Full screen not exceeded and MIN Distortion control setting.

1 dB Compression Point — -18 dBm, no rf attenuation.

Maximum Input Level

$+30$ dBm (1 W) continuous (rf attenuation at 0 dB). 75 W peak (20 dB or more R. F. Attenuation) for 1 μ s or less pulse width and 0.001 maximum duty factor. Dc must never be applied to R. F. input.

OUTPUT SIGNAL CHARACTERISTICS

Calibrator (Cal Out) — -20 dBm ± 0.3 dB at 100 MHz ± 1.7 kHz.

1st and 2nd LO — Provides access to the output of the respective local oscillators (1st LO $+7.5$ dBm minimum to a maximum of $+15$ dBm, 2nd LO -16 dBm minimum to a maximum of $+15$ dBm). These ports must be terminated in 50Ω at all times.

Vertical — Provides 0.5 V $\pm 5\%$ of signal per division of video above and below the centerline.

Horizontal Out — Provides 0.5 V either side of center. Full range -2.5 V to $+2.5$ V $\pm 10\%$.

Pen Lift — TTL compatible, nominal $+5$ V to lift pen.

IF Out — Output of the 10 MHz IF. Level is ≈ -16 dBm for a full screen signal at -30 dBm input reference level. Nominal impedance 50Ω .

496P Only: IEEE Std 488-1978 Port (GPIB) — In accordance with IEEE-488 Standard.

Probe Power — Provides operating voltages ($+5$ V, $+15$ V, -15 V, and Ground) for active probes.

GENERAL CHARACTERISTICS

Sweep Time — 20 μ s/div to 5 s/div in 1-2-5 sequence (20 μ s/div in Auto).

CRT Readout — Displays: Reference Level, Frequency, Frequency span/div, Vertical Display, rf Attenuation, and Resolution Bandwidth.

Input Voltage — 90 to 132 Vac or 180 to 250 Vac, 48 to 440 Hz.

Power — 210 W maximum, 3.2 A, at 115 V and 60 Hz.

ORDERING INFORMATION

496 Spectrum Analyzer \$22,950

496P Fully Programmable/GPIB Spectrum Analyzer \$26,950

496 to 496P Conversion — Conversions made by your Tektronix Service Center. Contact your Spectrum Analyzer Sales Engineer or Service Center for details.

Rackmount, Option 30 Add \$790

Rackmount with all inputs through rear panel, Option 31 Add \$840

Benchmount, Option 32 Add \$940

INTERNATIONAL POWER CORDS & PLUG OPTIONS

Option A1 Universal Euro 220 V/16A No Charge

Option A2 UK 240 V/13A No Charge

Option A3 Australian 240 V/10A No Charge

Option A4 North American 240 V/15A No Charge

PERIPHERAL PRODUCTS FOR (496P SPECTRUM ANALYZER)

4041 System Controller \$4995

4052 Graphic Computing System

Controller \$9900

4611 Hard Copy Unit \$4400

4631 Hard Copy Unit \$5575

4662 Interactive Digital Plotter \$4600

4924 Digital Cartridge Tape Drive \$2990

OPTIONAL ACCESSORIES

1405 TV Sideband Analyzer \$5000

TR 503 Tracking Generator \$6300

For more information on the TR 503 see page 132.

Hard Case (transit) (016-0658-00) \$625

Soft Case (016-0659-00) \$125

Polaroid Film Pack C-59AP \$1165

C-5C Camera \$500

Note: The 496 Spectrum Analyzer system is compatible with all TEKTRONIX C-50 Series Cameras.