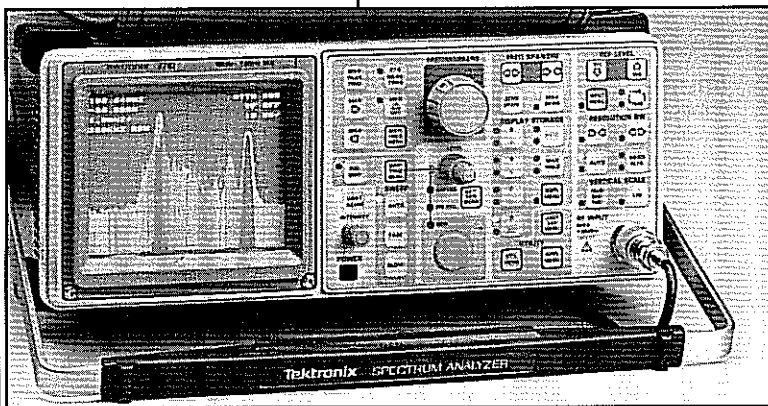


2710 ECONOMY PORTABLE SPECTRUM ANALYZER



BENEFITS

- High Confidence in Frequency Measurements
- Easily See Weak Signals
- Ease of Use Enhanced by Automated Calibration (Normalization), Dedicated Function Keys, Microprocessor Control, Pushbutton Measurements
- Short Waiting Time Before Making Measurements
- High Portability
- Enhanced Measurement Comparisons
- Measurement Convenience with Full Marker/Delta Marker Capability
- See Modulation-Related Phenomena and Low Level Beats

FEATURES

- 10 kHz to 1800 MHz Frequency Range
- 1×10^{-5} or Optional 5×10^{-7} Frequency Accuracy
- 1 Hz Frequency Resolution at Wide Span/Div Using Optional Internal Frequency Counter
- Up to -127 dBm Sensitivity, or -139 dBm Sensitivity Using Built-in Preamp
- 9.5 Kg (21 lb.) Weight, Compact Size
- Fast Warmup, High Stability
- Full Display Area Usable With 80 dB Display Dynamic Range
- Four-Trace Digital Storage
- Direct-Reading 50 ohm and 75 ohm Operation Modes
- True Analog Display
- Signal Identification and Qualitative Analysis with Aural and Optional Video Demod

CHARACTERISTICS

The following specifications and features apply after a 15-minute warmup period unless otherwise noted.

FREQUENCY RELATED

Frequency Range - 10 kHz to 1800 MHz.

Center Frequency Accuracy - $1 \times 10^{-5} \pm 5$ kHz; Option 01: $5 \times 10^{-7} \pm 700$ Hz.

Frequency Counter Accuracy (Opt. 02) - $1 \times 10^{-5} \pm 10$ Hz, 0°C to 50°C; $3 (10^{-5}) \pm 10$ Hz/year; Opt. 01: $5 \times 10^{-7} \pm 10$ Hz, 0°C to 50°C, at $2 \times 10^{-6} \pm 10$ Hz/year.

Dot Marker Frequency Accuracy - CF Accuracy plus 3% of span.

Frequency Counter Readout Resolution (Opt. 02) - 1 Hz.

Typical Long-Term Drift - 10 ppm/yr; Opt. 01: 2 ppm/yr.

Short-Term Drift - 20 kHz maximum drift between correction cycles. Typical short-term drift between correction cycles is within 5 kHz. Opt. 01: ≤ 400 Hz maximum drift between correction cycles.

Residual FM - ± 2 kHz p-p/20 μ sec; Opt. 01: ± 100 Hz p-p/20 μ sec at span/div ≤ 20 kHz/div; ± 2 kHz p-p/20 μ sec at span/div > 20 kHz/div.

Resolution Bandwidth - (-6 dB) 5 MHz, 300 kHz, 30 kHz, 3 kHz; Option 01: add 300 Hz.

Resolution Bandwidth Shape Factor - $\leq 7:1$

Noise Sidebands - $\rightarrow -70$ dBc at 30xRBW (Resolution Bandwidth).

Video Filter - Approx. 1/100 (Auto) of RBW. Manual Selection: 3 Hz to 300 kHz in 1-3 sequence.

Freq. Span/Div Range - 180 MHz to 10 kHz; Opt. 01: add 1,2,5 kHz/div. Selected in 1,2,5 sequence or 2 significant digits via menu. Max span, zero span keys.

Span Accuracy - $\pm 3\%$ measured over the center eight divisions.

AMPLITUDE RELATED

Flatness - ± 1.5 dB measured with 10 dB RF attenuation (preamp off).

Vertical Display Modes - 10, 5, 1 dB/div, Linear.

Measurement Range - -129 (preamp on) to +20 dBm; Option 01: -139 (preamp on) to +20 dBm.

Display Dynamic Range - 80 dB max.

Reference Level Range - LOG Mode: -70 to +20 dBm (-23 to +67 dBmV). LINEAR Mode: 8.8 μ V/div to 280 mV/div.

Reference Level Steps - LOG Mode: 1 dB or 10 dB. LINEAR Mode: 1,2,5 sequence: 10 μ V/div to 280 mV/div.

Mixer Input Level - Automatically controlled by instrument for on-screen signals. Level selectable between -20 to -50 dBm.

Display Amplitude Accuracy - 10 dB/div: ± 1.0 dB/10 dB to max. cum. error of ± 2 dB over 80 dB range. 5 dB/div: ± 1.0 dB/5 dB to max. cum. error of ± 2.0 dB over 40 dB range. 1 dB/div: 1 dB max. error over 8 dB range. LINEAR Mode: $\pm 5\%$ of full scale.

RF Attenuation Range - 0 - 50 dB, 2 dB steps.

Maximum Sensitivity - -117 dBm at 3 kHz RBW. -129 dBm at 3 kHz RBW w/preamp. Opt. 01: -127 dBm at 300 Hz RBW, -139 at 300 Hz RBW w/preamp.

SPURIOUS RESPONSE(WITH PREAMP OFF)

Residual Spurious Response - ≤ -100 dBm referenced to input of 1st mixer.

3rd Order IM Distortion - ≤ -70 dBc, from any two on-screen signals within any frequency span at -20 dBm input level, 10 dB attenuation.

2nd Harmonic Distortion - ≥ -66 dBc with -30 dBm input and 0 dB attenuation.

INPUT RELATED

LO Emission - ≤ -70 dBm with 0 dB RF attenuation.

RF Input - Type N connector, 50 Ω

VSWR with 10 dB or more RF attenuation - 1.5:1 max.

Maximum Safe Input - +20 dBm (0.1 W) continuous peak with 0 dB RF attenuation; 100 V dc (initially applied with full attenuation).

1 dB Compression Point - ≥ -15 dBm with 0 dB RF attenuation.

SWEEP RELATED

Sweep Times - 1 μ sec to 2 sec/div in 1,2,5 seq. (7 decade range); AUTO SWEEP mode; MANUAL SWEEP select.

Sweep Time Accuracy - $\pm 10\%$ over the center 8 divisions.

Trigger - Free run, internal, external, line, TV field, TV line, single sweep, manual scan.

Trigger Amplitude - Internal: One division or more of signal. External: 1.0 V peak, minimum; DC coupled (15 Hz to 1 MHz).

OTHER INPUTS/OUTPUTS

External Trigger - BNC connector, 10 k Ω impedance, DC coupled 0.1 μ s minimum pulse width. 35 V max.

nal Video Input – DC coupled, 0-100 kHz, $\sqrt{}$ (200 mV/div) signal input for vertical deflection beam.

p Gate Out – TTL level signal that is HI while beam sweeps.

p Output – +1.3 to -1.3 V, negative going ramp, tional to the horizontal sweep. Source impedance $\geq 10 \Omega$, load impedance $\geq 10 \Omega$.

i Output – 0 to +1.6 V of video signal, propor- to vertical display amplitude. 0 V is top of screen. impedance.

ENVIRONMENTAL

perature – Operating: 0°C to +50°C (MIL-T C). Nonoperating: -55°C to +75°C.

idity – Nonoperating: Five cycles (120 hours) per -28800C, class 5.

tion – Meets MIL-T-28800C Method 514 dure X (modified).

k – Operating and Nonoperating: Three guillotine- shocks of 30 g, one-half sine, 11 ms duration each on along each major axis; total of 18 shocks.

ated and Conducted Emissions – Meets FCC 5, sub-part J, class A and VDE 0871, class B.

ated and Conducted Susceptibility – Meets MIL-STD 461B.

POWER CHARACTERISTICS

Power Requirements – 90 W MAX (1.2 A) at 115 V, Operates 48 Hz to 440 Hz, 90 to 250 V ac. Battery option available.

Weight – 9.5 kg (<21 lb.) nominal for basic configuration.

Dimensions (H, W, D) with feet, handle and front cover – 137x361x445 mm (5.4x14.2x17.5 inches).

MEASUREMENT CAPABILITIES

Markers – Single marker/delta markers; next right, next peaks; next lower, next higher peaks; (highest) peak marker to CF; select start/stop frequencies; mouse Δ markers.

olatile memory – Up to 18 displays and/or 8 panel setups may be saved. Lithium battery backup.

al Storage Display – Selectable acquisition modes: sensitive peak only, positive/negative peak. SAVE A, B, C active D trace; up to four traces on screen; MAX HOLD MIN HOLD A, B or C; B, C minus A; WATERFALL ay mode; ensemble averaging; (min., max., mean, max); digital storage off provides analog display.

amble Averaging – Provides weighted averaging of ay resulting in reduction of random noise and impulse ls without sweep speed changes.

ct Entry of Control Parameters – Frequency, /div, reference level, RBW, video filter, vert. scale, p rate.

urement Modes – Noise, Carrier-to-Noise, width (user definable "dB down" points).

Internal Freq. Counter (signal counter) – Opt. 02.

Internal Preamplifier – Preamp may be switched in/out of circuit (degrades flatness below 10 MHz and above 600 MHz, provides approx. 12 dB sensitivity improvement) with zero RF attenuation.

Alternate Reference Level Units – dBm, dBmV, dBV, dBm, dB μ W, dB μ V/m.

User-definable Power-on Status – Instrument powers up to user-definable state or supplied default settings.

Constant Rate Tuning – Same on-screen tuning sensitivity regardless of span/div selection.

Center Measure – Signal nearest CF (from any screen location) is centered with frequency and peak amplitude automatically read out (not a marker mode). The centered signal will be counted if the Opt. 02 Frequency Counter is installed.

Signal Track – Drifting signal is kept at display center with correct frequency and peak amplitude displayed.

Graticule Illumination – Contrast enhancement for CRT photography.

Centronics Interface – Opt. 09. Will support Epson FX Series Printers and compatibles and Tek HC100 Printer/Plotter.

Rackmount Option – Opt. 30. Converts unit to a rack mounted installation. Five-inch rack height, 19-inch rack width.

Portable-to-Rack Adapter – Opt. 34. Provides rackmounting of instrument in standard enclosure with handle. Offers immediate instrument portability when needed. Seven-inch rack height, 19-inch rack width.

AM/FM Detectors – Built-in amplifier, speaker and headphone jack for aural demodulation.

Video Monitor Mode – Opt. 10. Allows direct viewing of television picture on analyzer screen. Functions in NTSC, PAL and SECAM systems. Includes selectable horizontal line trigger.

2704 INVERTER/2705 BATTERY PACK

The 2704 Inverter and 2705 Battery Pack can provide a minimum of one hour continuous operation for the 2710 in locations where ac power is not available. These units mount directly on the 2710 to form a portable package.

They can also be used for other remote applications requiring 115V, 60 Hz power. Maximum continuous output power is 125 watts.

Several 2705s can be used to provide an uninterruptible power source for the 2710 or other equipment. The 2704 includes a battery charger, and provides an auxiliary 18 volt output. The 2704 also accepts 12 volt input from other sources, such as car batteries. These units are described in more detail in Tektronix Specification/Ordering Information Sheet 26W-7061.

TYPICAL APPLICATIONS

- Cable Television
- VTR/VCR Maintenance
- Television and Audio Broadcasting
- Broadband Local Area Networks
- Education
- Manufacturing Test
- EMI/RFI
- Land Mobile/Two-Way Communication
- Avionics
- Cellular Radio

ORDERING INFORMATION

2710 Spectrum Analyzer. \$8,250
Includes: Power cord (U.S. 115 V/60 Hz) (161-0104-00); Operator's manual (070-6022-02); Front cover (200-2520-00); and 75/50 Ω min-loss pad (131-4199-00).

OPTIONS

Opt. 01 – 300 Hz resolution bandwidth/phaselock stabilization/5 x 10⁻⁷ \pm 700 Hz frequency accuracy +\$1,200
Opt. 02 – Internal frequency counter with selectable 1 kHz/1 Hz readout resolution +\$600
Opt. 06 – 1106 Battery Pack, 1107 Inverter, Battery operation, nicad +\$2,720
Opt. 07 – 2704 Inverter and 2705 Battery Pack, gell cell lead acid +\$1,290
Includes: Power cord (U.S. 115 V, 60 Hz), Operator's Manual, 2710 Mounting Plate.
Opt. 09 – Centronics Interface +\$450
Opt. 10 – Video monitor mode +\$620
Opt. 14 – Adds 1 kHz, 10 kHz, 100 kHz and 1 MHz RBW filters +\$570
Opt. 15 – Tek 1405 TV Sideband Analyzer Interface +\$250
Opt. 30 – Rackmount for 19-inch rack width, 5-inch height +\$150
Opt. 33 – Travel Line Package +\$95
Includes: Accessory pouch; carrying strap; smoke-gray CRT filter; vinyl rain cover
Opt. 34 – Portable to Rack mount adaptor for 19-inch rack width, 7 inch height +\$425

INTERNATIONAL POWER PLUG OPTIONS

Opt. A1 - A5 – Available NC
See page 488 for description.

WARRANTY-PLUS SERVICE PLANS

Opt. M1 – Available +\$710
Opt. M2 – Available +\$1,190
Opt. M3 – Available +\$1,430

OPTIONAL ACCESSORIES

2704 – Inverter \$995
Includes: Power cord (U.S. 115 V, 60 Hz), Operator's Manual, 2710 Mounting Plate.
2705 – Battery Pack \$295
Front Panel Cover – 200-2520-00 \$6.00
Accessory Pouch – Mounts on top. Order 016-0677-02 \$45
Viewing Hoods – (Collapsible) Order 016-0592-00 \$15 (Binocular) Order 016-0566-00 \$21 (Polarized) Order 016-0180-00 \$60
Carrying Strap – 346-0199-00 \$19.25
Shipping Case – 016-0792-02 \$375