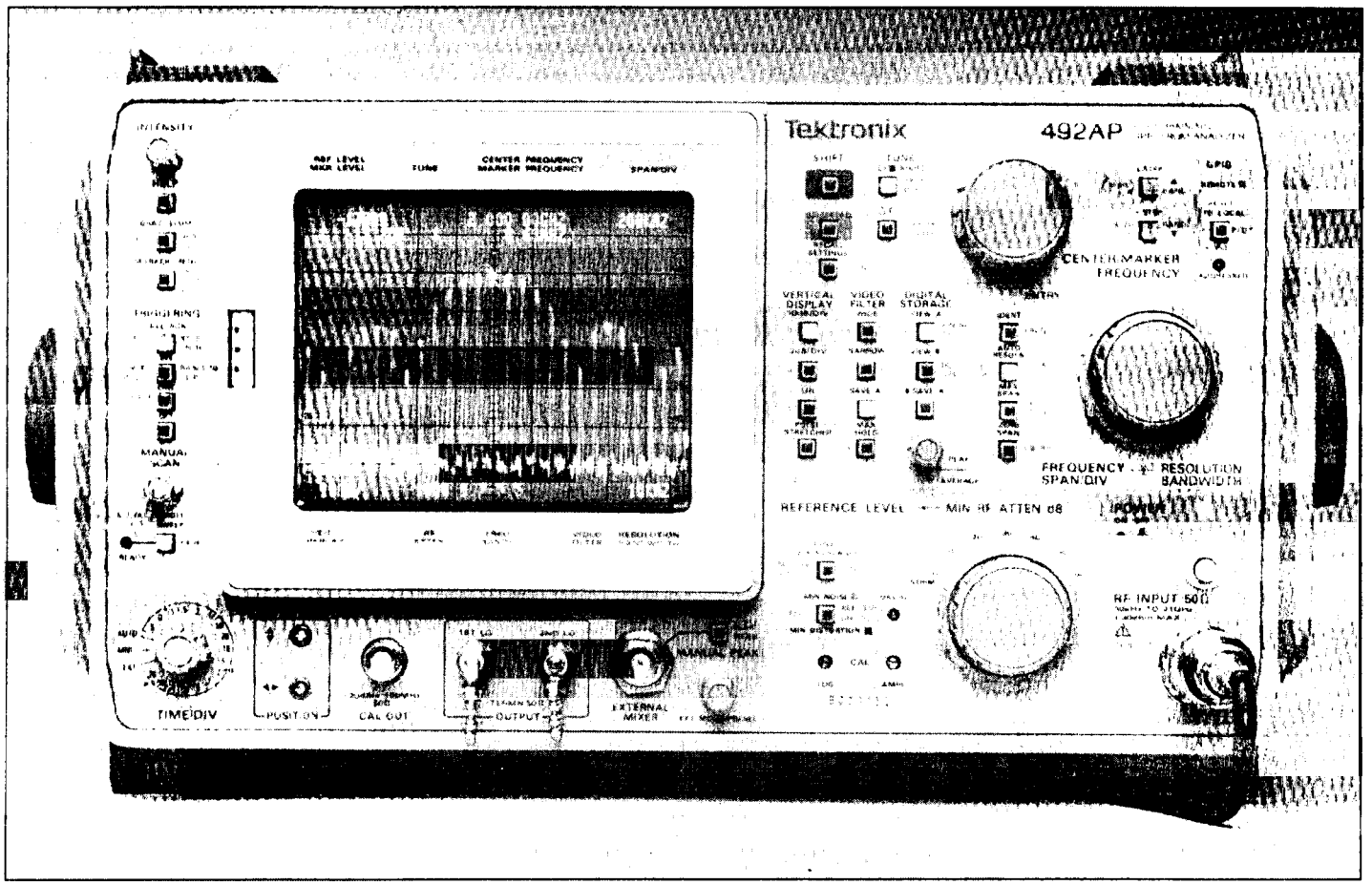
WITH ITS BUILT-IN MARKER INTELLIGENCE YOU CAN RELY ON THE 492A AS A DECISION-MAKING TOOL



492A/492AP

Spectrum Analyzers

GPIB IEEE-488

The 492AP complies with IEEE Standard 488-1978, and with Tektronix *Standard Codes and Formats.*

- **Dot Markers Accurate in Frequency to 10^{-5}**
- **Frequency Range From 50 kHz to 325 GHz**
- **CW, Pulse, and Spurious Signal** Processing Modes
- **Occupied Bandwidth Function**
  - **— dBm, dBV, dBmV, and dBμV Alternate Reference Units**
  - **— Signal Tracking**
  - **— Noise Normalization**
- **Keypad Entry of Frequency, Span/Div, Reference Level and Vertical Scale Factors**
- **Environmentalized per MIL-T-28800C Type III, Class 3, Style C**

Convenience, Accuracy, Intelligence, and Value

The 492A and the fully programmable 492AP represent the benchmark for spectrum analyzers with built-in signal processing intelligence. These spectrum analyzers are designed to offer power to the experienced user, yet offer convenience to the novice, in field environments and in the lab. These lightweight, portable form factor spectrum analyzers deliver maximum utility and benefits at a reasonable cost.

Counter Center Frequency Accuracy, Near Zero Long-Term Drift, Superior Range and Resolution All in One Package

The 492A offers calibrated amplitude and frequency coverage from 50 kHz to 21 GHz in coax, and to 325 GHz using Tek's WM 490 Series high performance waveguide mixers.

Center frequency accuracy is excellent; typically 1 kHz at 100 MHz, 10 kHz at 10 GHz and 40 kHz at 40 GHz. Negligible long term frequency drift ensures measurement repeatability.

You get 100 Hz resolution bandwidth to 220 GHz and 1 kHz resolution to 325 GHz with high sensitivity and low phase noise—plus built-in preselection to 21 GHz (Option 01).

Menu-Selectable Signal Processing

Enables the analyzer to mark the peak of a main lobe and the peaks of side lobes at the push of a button—using the pulsed RF signal processing mode in conjunction with other marker functions like Peak Find, Right Next, and Left Next. The CW mode will mark only signals exhibiting CW characteristics with regard to span and resolution, ignoring all other signals. The spur mode will locate all signals that meet user-definable or automatic threshold criteria. Threshold criteria are available for all signal processing.

CHARACTERISTICS

The following characteristics apply after a 30-minute warm-up period unless otherwise noted.

FREQUENCY RELATED

Frequency Range—50 kHz to 21 GHz coaxial input; 50 kHz to 325 GHz external mixer input (amplitude specified from 18 GHz to 325 GHz with Tektronix WM 490 Series Waveguide Mixers).

Center and Marker Frequency Accuracy[*1]—Phase Locked: $\pm[20\%D + (F \times 10^{-8})]$ Hz. Bands 1 and 5-12 with span/div ≤200 kHz, and Bands 2-4 with span/div ≤100 kHz. Unlocked: $\pm[20\%D + (F \times 10^{-8}) + (15\ kHz)N]$ Hz.

Where: D = Span/div or Res BW, whichever is greater.
F = Center or Marker Frequency
N = Harmonic Mixing Number

Center Frequency Drift (After 1-Hour Warm-Up)—Bands 1 and 5-12 with span/div ≤200 kHz, and bands 2-4 with span/div ≤100 kHz. Phase locked: ≤50 Hz per minute of sweep time corrected at least every 30 seconds. Unlocked: ≤(5 kHz) N per minute of sweep time.

Frequency Readout Resolution—≤10% span/div to 1 kHz minimum (100 Hz in Delta Marker Mode).

Residual FM—Phase Locked: ≤(10 +2N) Hz peak-to-peak in 20 ms, Bands 1 and 5-12 with span/div ≤200 kHz, and Bands 2-4 with span/div ≤100 kHz. Unlocked: ≤(7 kHz) N peak-to-peak in 20 ms.

Resolution Filters—100 Hz to 1 MHz (6 dB bandwidth ±20%) in decade steps. Shape factor ≤7.5:1 (60 dB/6 dB).

Frequency Span/Div—0 Hz (ZERO SPAN pushbutton or keypad data entry); 200 Hz to 10 GHz (in a 1-2-5 sequence) via span/div knob; 200 Hz to 15 GHz (to two significant digits) via keypad or start stop data entry, or marker start stop; full band via MAX SPAN pushbutton (12 bands). Accuracy ±5% of selected span/div.

AMPLITUDE RELATED

See 490 Series Family Specifications on page 179 for additional Amplitude Related details.

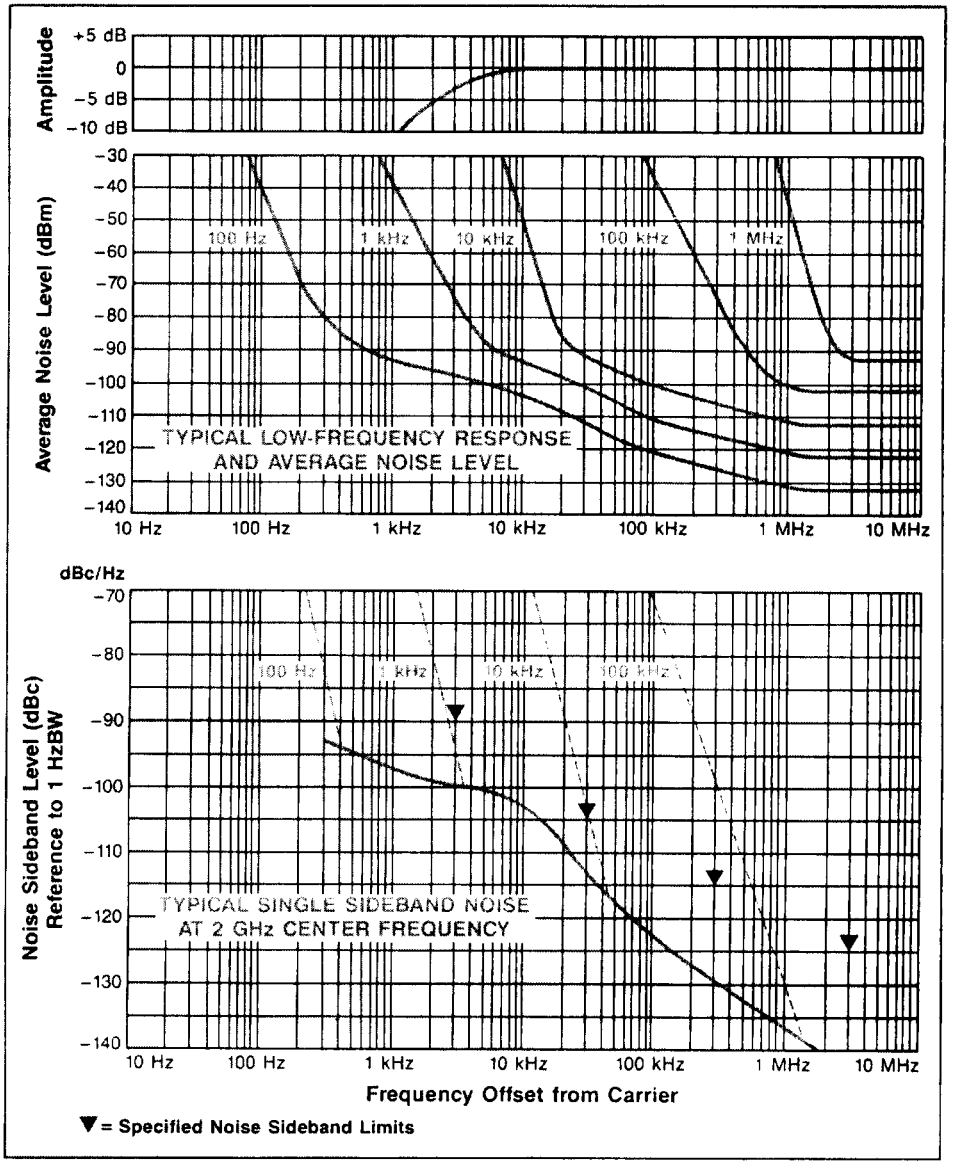
Display Dynamic Range—80 dB Log mode; 8 divisions Linear mode.

Noise Sidebands—At least −75 dBc at 30 times the resolution bandwidth offset from the center frequency.

Noise Sidebands

dBc/Hz	Offset from Carrier
≤ − 95	3 kHz
≤ − 105	30 kHz
≤ − 115	300 kHz

[*1] *Over the operating temperature extremes of −15 to +55°C, 1.5 × 10⁻⁵.*



SPURIOUS RESPONSES

Residual—≤ −100 dBm.

Harmonic Distortion—≤ −60 dBc for a −40 dBm input 50 kHz to 21 GHz in MIN Distortion mode. Not discernible above the noise (typically −100 dBc) for preselected bands (Option 01 only).

LO Emissions—≤ −10 dBm. Option 01: ≤ −70 dBm.

Third Order Intermodulation Distortion—≤ −70 dBc for CW signal (MIN Distortion Mode) Any two on-screen signals within any frequency span (50 kHz to 21 GHz): ≤ −100 dBc for signals spaced ≥100 MHz for preselected bands (Option 01 only).

INPUT SIGNAL

RF Input—Type "N" female 50 Ω nominal impedance.

VSWR

Frequency	10 dB Attenuation	(Typical) 0 dB Attenuation
50 kHz to 2.5 GHz	1.3:1 Max; 1.2:1 Typical	1.9:1
2.5 to 6.0 GHz	1.7:1 Max; 1.5:1 Typical	1.9:1
6.0 to 18 GHz	2.3:1 Max; 1.9:1 Typical	2.3:1
18 to 21 GHz	3.5:1 Max, 2.7:1 Typical	3.0:1

Measured at −3 MHz of preselector peak for Option 01.

SENSITIVITY AND FREQUENCY RESPONSE

Band and Frequency Range	Harmonic Number	Sensitivity (dBm) at Minimum Resolution	Frequency Response (dB)*3
1 (50 kHz-4.2 GHz)*1	1	−125	±1.5
2 (1.7-5.5 GHz)*1	1	−125	±1.5
3 (3.0-7.1 GHz)*1	1	−125	±1.5
4 (5.4-12 GHz)*1	3	−110	±2.5
5 (15-21 GHz)*1	3	−105	±3.5
6 (18-27 GHz)	6	−108	±2.0
7 (26-40 GHz)	10	−103	±2.0
8 (33-60 GHz)	10	−103	±2.0
9 (50-90 GHz)*2	15	−105 at 50 GHz; −95 at 90 GHz	±3.0
10 (75-140 GHz)*2	23	−100 at 75 GHz; −85 at 140 GHz	±3.0
11 (110-220 GHz)*2	37	−90 at 100 GHz; −75 at 220 GHz	±3.0
12 (170-325 GHz)*2	56	−70 at 170 GHz; −55 at 325 GHz	±3.0

*1 *Band 1 is limited to 50 kHz to 1.8 GHz for preselected (Option 01) units. The preselector degrades minimum sensitivity by 5 dB (6 dB in BAND 3) and degrades frequency response by ±1.0 dB to 18 GHz; ±1.5 dB to 21 GHz.*

*2 *Frequency response for any 5 GHz band. Response is within ±6 dB referenced to 100 MHz.*

*3 *Measured with 10 dB RF Attenuation and peaking optimized (when applicable). Frequency response is within ±4.5 dB from 50 kHz to 18 GHz referenced to 100 MHz (±4.5 dB for Option 01).*

Maximum Safe Input— +30 dBm CW with ≥20 dB attenuation; +13 dBm CW with 0 dB attenuation; 0 V dc. Option 01 preselector: +30 dBm (1 W) CW, 75 W peak, 1 μs Pulse width, 0.001 duty; 0 dB attenuation. Do not apply dc.

1 dB Gain Compression— ≥ −18 dBm in MIN Distortion Mode.

OUTPUT SIGNAL

Calibrator (Cal Out)— −20 dBm ±0.3 dB at 100 MHz ±1.0 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 +20 dBm; 2nd LO −22 dBm minimum to maximum of 0 dBm). These ports must be terminated in 50 Ω at all times.

CHARACTERISTICS

50/75 Ω OPTION 07
75 Ω INPUT RELATED

Provides 75 Ω input and dBmV calibration in addition to the normal 50 Ω input and dBm calibration. The 100 kHz resolution filter is replaced by 300 kHz to optimize the instrument for broadcast and CATV uses.

Center Frequency Range—1 to 1000 MHz.

Frequency Response—±2.0 dB from 5 to 1000 MHz; Typical response for the 1 to 5 MHz frequency range is <3 dB down from the 5 MHz response.

Reference Level Range— −68 to +79 dBmV (+89 dBmV is achievable in MIN NOISE mode and +99 dBmV in Reduced Gain mode).

Input Impedance—75 Ω; VSWR 1.35:1 (17 dB RL) maximum, 5 to 800 MHz; VSWR 1.6:1 (13 dB RL) maximum, 800 to 1000 MHz; BNC female.

Maximum Input Level—With 0 dB Attenuation: +78 dBmV, 100 V maximum (dc + ac peak).

Calibrator (Cal Out)— +20 dBmV ±0.5 dB; 75 Ω impedance nominal.

Sensitivity (Equivalent Input Noise)— 5 to 1000 MHz—75 Ω Input

Sensitivity (dBmV)	Resolution Bandwidth
−74	100 Hz
−66	1 kHz
−56	10 kHz
−41	300 kHz
−36	1 MHz
50 Ω RF Input	
−90 (dBm)	300 kHz

ORDERING INFORMATION

492A Spectrum Analyzer $29,040
Includes: 50 Ω coax cable, N-to-N connector, 6 ft (012-0114-00); 50 Ω coax cable, BNC-to-BNC connector, 18 in. (012-0076-00); service manual Vol. 1 (070-5565-00); service manual Vol. 2 (070-5566-00); operator's manual (070-5562-00); N male-to-BNC female adaptor (103-0045-00); 2 Fast-Blo 4A fuses (159-0017-00); power cord (161-0104-00); power cord clamp (343-0170-00); CRT light filters (amber 378-0115-01, gray 378-0115-02); CRT mesh filter (378-0887-01).

492AP Programmable Spectrum Analyzer $30,500
Includes: Same as 492A plus programmer's manual (070-5564-00).

OPTIONS

Option 01—Adds preselection. +$3,995
Option 07—75 Ω input. +$750
Includes: BNC male-to-female adaptor connector (013-0126-00); 42 inch, BNC-to-BNC connector, 75 Ω coax cable (012-0074-00).
Option 21—18 to 40 GHz High Performance Waveguide Mixer Set. +$2,650
Includes: Diplexer assembly (015-0385-00); TNC-to-SMA adaptor (015-0388-00); SMA-to-SMA cable (012-0649-00).
Option 22—18 to 60 GHz High Performance Waveguide Mixer Set. +$4,460
Includes: Same as Option 21.
Option 39—Replaces Lithium with Silver batteries. +$50
Option 41—Digital Radio Enhancement. +$450
Option 42—110 MHz, >5 MHz bandwidth, IF Output. +$750
Option 45—MATE/CHIL language interface (492AP only). +$4,975
Option 52*1—North American 220 V configuration with standard power cord.

INTERNATIONAL POWER PLUG OPTIONS

Option A1—Universal Euro 220 V, 50 Hz.
Option A2—UK 240 V, 50 Hz.
Option A3—Australian 240 V, 50 Hz.
Option A4—North American 240 V, 60 Hz.
Option A5—Switzerland 220 V, 50 Hz.

WARRANTY PLUS SERVICE PLANS

See Service section.
Option M1—2 Calibrations.
(492A) +$1,995
(492AP) +$2,025
Option M2—2 Years Service.
(492A) +$3,380
(492AP) +$3,510
Option M3—2 Years Service and 4 Calibrations.
(492A) +$3,995
(492AP) +$4,045

OPTIONAL ACCESSORIES

Operators Handbook—(492/492P) Order 070-5563-00. $40
Microwave Comb Generator—TM 500 Series compatible. Order 067-0885-00. $1,815
TR 503 Tracking Generator—For more information see page 201. $7,080
1405 TV Sideband Adaptor—525/60 Markers. See page 201. $5,780
Portable to Rack Adaptor—Order 016-0844-00. $650
GPIB Cable—Order 012-0630-01. $95
External Waveguide Mixers—492A/492AP
(18 to 26.5 GHz) Order WM 490K. $1,310
(26.5 to 40 GHz) Order WM 490A $1,310
(33 to 50 GHz) Order WM 490Q. $1,520
(40 to 60 GHz) Order WM 490U. $1,805
(50 to 75 GHz) Order WM 490V. $2,045
(60 to 90 GHz) Order WM 490E. $2,125
(75 to 110 GHz) Order WM 490W. $2,280
(90 to 140 GHz) Order WM 490F. $2,415
(110 to 170 GHz) Order WM 490D. $3,110
(140 to 220 GHz) Order WM 490G. $3,490
Tapered Transition—(Used with WM 490G) 220 to 325 GHz. Order 119-4728-00. $1,200

*1 *To order, contact your local Tektronix Sales Office.*