



DC-to-15 MHz
OSCILLOSCOPE

Type

422
R422

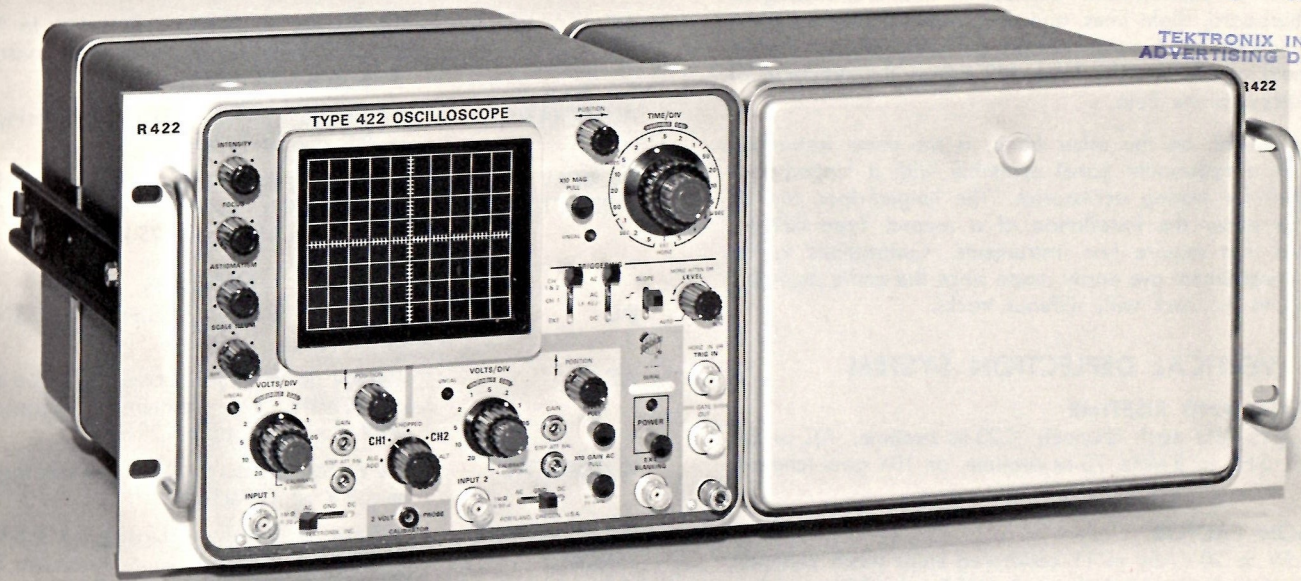
NEW

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MAR 8 - 1966

TEKTRONIX INC.
ADVERTISING DEPT.

1422



- SMALL SIZE—LIGHT WEIGHT
- DUAL TRACE
- SHARP, BRIGHT DISPLAYS
- DESIGNED FOR SEVERE ENVIRONMENTS
- AC, AC/DC OR BATTERY OPERATED
- VERSATILE PERFORMANCE

CHARACTERISTIC SUMMARY
VERTICAL

CALIBRATED DEFLECTION FACTOR—10 mV/div to 20 V/div.
RISETIME—23 ns.
BANDWIDTH—DC to 15 MHz.
INPUT RC—1 megohm paralleled by approximately 30 pF.
DELAY LINE—Approximately 150 ns.

HORIZONTAL

CALIBRATED SWEEP RANGE—0.5 μ s/div to 0.5 s/div.
SWEEP MAGNIFIER—10X, extends fastest sweep rate to 0.05 μ s/div.

TRIGGER REQUIREMENTS—

Internal: 0.2 divisions of deflection at 5 MHz. 1.0 division of deflection at 15 MHz.
External: 0.125 V up to 5 MHz, 0.6 V at 15 MHz.

CRT

DISPLAY AREA—8 x 10 divisions (0.8 cm/div).
ACCELERATING VOLTAGE—6 kV.
GRATICULE—Internal.



422 R422

The Type 422 is a portable dual-trace oscilloscope that combines small size and light weight with the ability to make precise laboratory measurements. It weighs under 22 pounds and occupies less than 0.6 cubic feet. To make it truly portable the Type 422 is ruggedly constructed to withstand shock, vibration, and extremes of environment. Because of this, it is finding its way on shipboard, flight lines, and even remote communication sites. No longer need measurements be compromised due to adverse field conditions; the Type 422 brings the precision of the laboratory to the field.

The Type R422, on the other hand, is the same instrument arranged in a rackmount panel assembly with a hinged-door compartment for storing accessories. The hinged-door can be removed to allow the installation of a second Type 422 for applications that require two instruments. Connections to the rear of the instrument are easily made since the entire assembly is mounted to the rack with slideout tracks.

VERTICAL DEFLECTION SYSTEM

BANDWIDTH AND RISE TIME

DC to ≥ 15 MHz each channel; ≤ 23 -ns risetime. AC or DC coupled. 5 Hz to 5 MHz, 70-ns risetime, on 10X gain (channel 2).

DEFLECTION FACTOR

10 mV/div to 20 V/div in 11 calibrated steps (each channel). Deflection factor extended to 1 mV/div in 10X position. 2.5:1 vernier allows continuous range (uncalibrated) between steps and extends range (uncalibrated) to 50 V/div. Warning light indicates uncalibrated setting. Accuracy is $\pm 3\%$ of indicated deflection; $\pm 7.5\%$ on 10X AC gain.

INPUT RC

1 megohm paralleled by approx 30 pF. Channel 1 and 2 time constants matched to $\pm 1\%$.

MAXIMUM INPUT VOLTAGE

300 V combined DC and peak AC.

OPERATING MODES

Channel 1 only; Channel 2 only; Channels 1 and 2 added algebraically; dual-trace chopped; dual-trace alternate. Chopping rate is 100 kHz. Channel 2 has polarity inversion. Common-mode rejection ratio is $\geq 100:1$ at 50 kHz with optimized gain setting.

DELAY LINE

Approx 150 ns.

HORIZONTAL DEFLECTION SYSTEM

SWEEP RANGE

$0.5 \mu\text{s}/\text{div}$ to $0.5 \text{ s}/\text{div}$, in 19 calibrated steps. Accuracy is $\pm 3\%$. 2.5:1 vernier gives variable and continuous sweep rates, uncalibrated, between steps. It also extends slowest sweep rates to $1.25 \text{ s}/\text{div}$, uncalibrated. Warning light indicates uncalibrated sweep settings. X10 magnifier extends all sweep speeds with fastest extended to $0.05 \mu\text{s}/\text{div}$; accuracy is $\pm 5\%$.

EXTERNAL HORIZONTAL INPUT

Deflection Factor: Variable between approx 1 V/div to approx 10 V/div and approx 10 V/div to approx 100 V/div with X10 Mag.

Bandwidth: DC to ≥ 500 kHz.

Input RC: Approx 300 k Ω paralleled by approx 35 pF.

TRIGGERING SYSTEM

MODE	TRIGGER SENSITIVITY INTERNAL
DC	0.2 div up to 5 MHz, increasing to 1 div at 15 MHz.
AC	0.2 div up to 5 MHz, increasing to 1 div at 15 MHz. Low frequency response 3-dB down at approx 25 Hz.
AUTOMATIC	0.8 div from 50 Hz to 4 MHz, increasing to 2.5 div at 15 MHz.
AC LOW FREQ REJECT	0.2 div up to 5 MHz, increasing to 1 div at 15 MHz. Low frequency response 3 dB down at approx 25 kHz.
	EXTERNAL
DC	125 mV up to 5 MHz, increasing to 0.6 V at 15 MHz.
AC	125 mV up to 5 MHz, increasing to 0.6 V at 15 MHz. Low frequency response 3 dB down at approx 25 Hz.
AUTOMATIC	0.6 V from 50 Hz to 7 MHz, increasing to 1.2 V at 15 MHz.
AC LOW FREQ REJECT	125 mV to 5 MHz increasing to 0.6 V at 15 MHz. Low frequency response 3 dB down at approximately 25 kHz.

MISCELLANEOUS

FRONT-PANEL OUTPUTS

Amplitude Calibrator: approx 1-kHz squarewave, negative-going. Provides 0.2 V, internally, $\pm 0.7\%$, and 2 V, $\pm 2.7\%$, at Probe Cal jack on front panel.

Gate Signal: Rectangular pulse, negative-going; 0.5 V minimum, duration same as sweep. Approx 600-ohm source resistance.

TEKTRONIX CRT

Rectangular, 4-inch, with 0.8-cm divisions; 8 x 10-div display area. Illuminated internal graticule. 6-kV accelerating potential. External blanking, DC-coupled. Phosphor is P31.

MECHANICAL

TYPE 422 NET WEIGHT: AC model—20.5 lbs; AC-DC model—23 lbs, (29 lbs, 12 oz with batteries). Shipping weight: (Including accessories, manuals, and packaging) AC model—28 lbs; AC-DC model—28 lbs, 6 oz, without batteries. Overall height, including feet: 7". Overall width, including handle: 10". Length, including rear feet and front-panel knobs: 14". (To front of panel cover: 16".) To front edge of carrying handle, in forward position: 18". (With AC/DC Power Supply, add 3" to length measurements.)

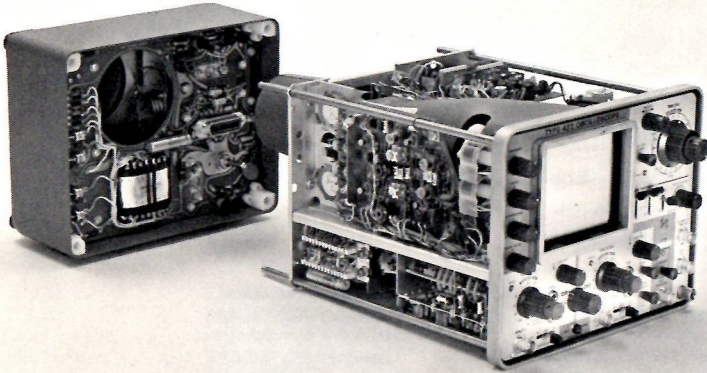
Type R422 NET WEIGHT: 18 lbs; Shipping Weight: (including accessories, manuals, and packaging) 50 1/2 lbs. Overall height: 7". Overall width: 19". Overall depth including rear feet and front panel knobs: 14".

ENVIRONMENTAL FEATURES—AC MODEL

Temperature: Operating: -15°C to $+55^{\circ}\text{C}$.
Non-operating: -55°C to $+75^{\circ}\text{C}$.

Altitude: Operating: 15,000 ft, maximum.
Non-operating: 50,000 ft, maximum.

AC POWERED INSTRUMENTS



- Humidity:** Non-operating: Meets electrical performance specification after exposure to five cycles (120 hrs) of MIL-STD-202B, Method 106A (omit freezing and vibration, and allow a 24-hour post-test drying period at room ambient conditions of 25, $\pm 5^\circ$ C and 20 to 80% relative humidity).
- Vibration:** Operating: 0.025" peak to peak displacement (4 g's for 15 minutes along each of 3 axes at 55 Hz) 10-55-10 Hz.
- Shock:** Operating: 30 g's, $\frac{1}{2}$ sine, 11-ms duration, 12 shocks total.
Non-operating: 60 g's, $\frac{1}{2}$ sine, 11-ms duration, 6 shocks total.
- RFI:** Meets interference requirements of MIL-I-6181D and MIL-I-16910A, Power line conducted: 150 kHz—25 MHz. Radiated (with mesh filter installed): 14 kHz—1000 MHz.
- Transportation:** National Safe Transit. 1 hour at approx 1 g vibration. 30 inch drops on one corner, all edges radiating from that corner, and all flat surfaces (total of 10 drops).

ENVIRONMENTAL FEATURES—AC/DC MODEL, with batteries

- Same as AC MODEL, except,
- Temperature:** Operating: -15° C to $+40^\circ$ C
Non-operating: -40° C to $+60^\circ$ C
- Humidity:** With batteries, derate temperature from $+65^\circ$ C to $+60^\circ$ C.

POWER REQUIREMENTS

AC Model: 115 V or 230 V $\pm 10\%$, 45 to 440 Hz.
Requires approx 40 watts.

AC/DC Model: AC mode: 115 V or 230 V $\pm 20\%$ 45-440 Hz except derate linearly to $+10\%$ from 50 Hz to 45 Hz.
DC mode: 11.5 V—35 V, approx 23 watts (CONSTANT POWER—2 A max, 650 mA min). Accepts 24 V battery pack.

TYPE 422 OSCILLOSCOPE \$1400

Each instrument includes: 2—P6006 probe (010-0127-00); 1—adapter, BNC to binding post (103-0033-00); 1—ring, ornamental (354-0248-00); 1—filter, light graticule, smoke gray (378-0549-00); 1—plate, protector, clear, CRT (386-0118-00); 1—mesh filter (installed) (378-0571-00); 1—AC power supply (016-0072-00); 1—adapter, 3 to 2-wire (103-0013-00); 1—power cord, 117 V, 3-conductor, right-angle, female w/straight male plug (161-0024-00); 2—instruction manual for Type 422 (070-0434-00).

TYPE R422 OSCILLOSCOPE (mounted on left side) . . \$1475

Each instrument includes: 2—P6006 probe (010-0127-00); 1—adapter, BNC to binding post (103-0033-00); 1—ring, ornamental (354-0248-00); 1—filter, light graticule, smoke gray (378-0549-00); 1—plate, protector, clear, CRT (386-0118-00); 1—mesh filter (installed) (378-0571-00); 1—AC power supply (016-0072-00); 1—adapter, 3 to 2-wire (103-0013-00); 1—power cord, 117 V, 3-conductor, right-angle, female w/straight male plug (161-0024-00); 2—instruction manual for Type 422 (070-0434-00).

TYPE R422 OSCILLOSCOPE (mounted on right side)

(Includes accessories listed above)

Type R422 MOD 150E \$1475

TYPE 422 OSCILLOSCOPE WITHOUT CABINET for rack-mount conversion. (Includes accessories listed above.)

Type 422 MOD 146B \$1375

TWO TYPE 422's MOUNTED IN A RACK-MOUNT PANEL.

(Includes 2 sets of accessories listed under Type 422 above.)

Type R422 MOD 150B \$2850

DC POWERED INSTRUMENTS

TYPE 422 WITH AC/DC BATTERY POWER SUPPLY, less batteries. (Includes accessories listed under Type 422 above.)

Type 422 MOD 125B \$1750

BATTERY PACK for Type 422 MOD 125B. Provides 24 volts; rechargeable internally from AC line. Powers the Type 422 Oscilloscope for approximately 4 hours. Shipping weight 9 lbs, 15 oz.

Order Part Number 016-0066-00 \$125

CONVERSION KITS

Power Supply AC/DC Battery, less batteries.

Shipping weight 10 lbs, 4 oz.

Each supply includes: 1—adapter, 3-wire to 2-wire (103-0013-00); 1—power cord, 3-wire AC w/female connector and male plug (161-0015-01); 1—power cord, 3-wire DC w/female connector (161-0016-01); 2—instruction manual (070-0471-00).

Order Part Number 016-0073-00 \$600

Portable to Rack-mount conversion kit.

This mounting kit includes hardware and instructions to convert existing Type 422 Oscilloscopes for rack-mount installation.

Order Part Number 040-0419-00 \$75

Rack-mount to Portable conversion kit.

This kit includes the cabinet and necessary hardware to convert existing Type R422 Oscilloscopes for portable operation.

Order Part Number 040-0421-00 \$40



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