

TAS 455
TAS 465

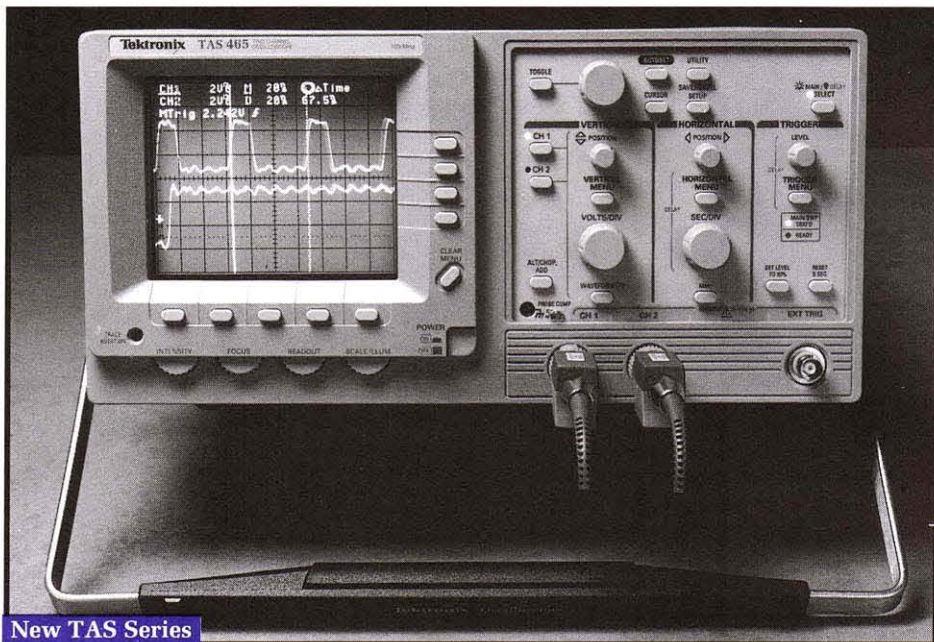
*New level of
power and
reliability to
general purpose
scopes.*

TAS 455
TAS 465

- Bandwidths of 60 MHz and 100 MHz
- Two input channels
- Auto Setup
- Store/Recall of four setups
- Video triggering
- Delayed Sweep
- Measurement Cursors
- Trigger Level Indicator
- Ground Reference Indicator

Analog Oscilloscopes

60 MHz to 100 MHz



New TAS Series

TAS 455/TAS 465

Tektronix' low-cost TAS series of scopes, by incorporating features from higher-end scopes, introduces a new level of power and reliability to general-purpose scopes. These instruments offer 2 input channels and bandwidths ranging from 60 MHz to 100 MHz.

STREAMLINED INTERFACE

Modeled after the successful TDS series of scopes, the TAS interface simplifies scope operation without limiting the instrument's capabilities.

You directly control important and frequently-used functions, such as horizontal and vertical position, with buttons and knobs. Secondary functions reside in menus displayed on the scope's screen. This arrangement eliminates the profusion of buttons found on most low-cost analog scopes.

For instance, to trigger most signals you simply press the "Set Level to 50%" button. The scope will set the trigger level to the midpoint of the signal. However, because varying signal levels frequently require trigger level to be adjusted, the TAS scopes have Auto Level to maintain a triggered signal.

ADVANCED FEATURES

With a comprehensive set of features, the TAS series bring leading-edge innovation to low-cost analog scopes.

Auto Setup function instantly delivers meaningful waveforms. When you press the AUTOSSET button, the scope automatically adjusts the horizontal, vertical, triggering and intensity controls so you see a stable signal.

Indispensable when trying to trigger and display unknown waveforms, the auto setup feature also helps inexperienced users quickly display useful waveforms.

Cursors with readouts in the display greatly ease the task of measuring waveforms. Complete with menus, the cursors can measure delta frequency, delta time, delta volts or absolute volts from the ground reference.

Save/Recall Setup feature will store up to four front-panel setups that you can recall at a later time. With this feature you can save complex setups and recall them within seconds.

Comprehensive Video Triggering simplifies triggering on complex video waveforms. With line, field 1 or 2, composite trigger selections and positive or negative sync, you can cleanly trigger on any NTSC, PAL or SECAM video signal.

The rugged P6109B probe is the result of years of customer research and design innovation. This passive probe has a slim, pen-like design with a patented one-piece molding made of rubber.

Besides being comfortable to handle, the probe's construction also protects its internal circuitry. Designed to withstand extreme mechanical abuse, the P6109B can endure rigorous handling while maintaining its superior measurement capabilities.

TD

Call Direct - Product available within 24 hours, (through TekDirect only). Call 1-800-426-2200. Also available through an Authorized Tektronix Distributor (listed on page 540).

To order, contact your local sales office (listed on the inside back cover) or call the National Marketing Center at 1-800-426-2200, Ext. 99.

Analog Oscilloscopes

60 MHz to 100 MHz

TAS 455

TAS 465

REMARKABLE RELIABILITY BASED ON A REMARKABLE TECHNOLOGY

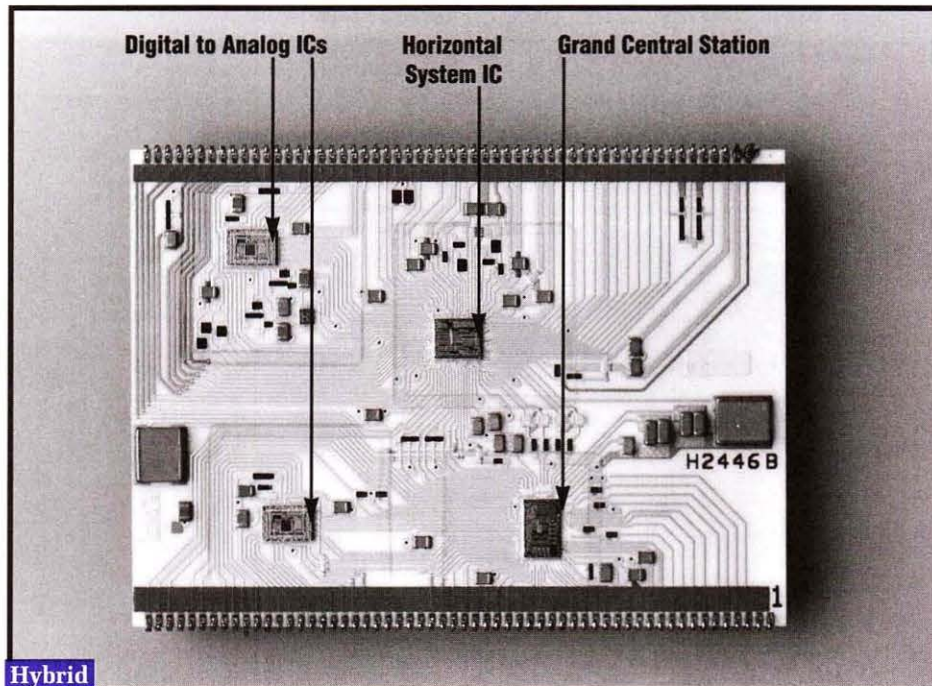
A sophisticated hybrid houses the entire acquisition system, including the vertical, horizontal and trigger functions, for each input channel. Because these hybrids dramatically reduce the scopes' parts count, the TAS 400 scopes set a new industry standard for reliability.

Furthermore, consolidating the acquisition system on the hybrid allows for extensive automatic calibration. Reducing time-to-calibrate and limiting manual calibration points translates into low maintenance costs.

ANALOG SIGNAL PROCESSING HYBRID

Two large scale (LSI) bipolar and two CMOS ICs on the hybrid house all of the vertical, horizontal and trigger functions. The first IC conditions the vertical signal controlling its position and scaling. Additionally, it embodies the channel switching and trigger coupling functions. The second IC performs the triggering and trigger logic functions. It also contains all of the horizontal functions of main and delayed sweeps, and the intensity switching and sequencing.

The two Digital to Analog ICs, developed by Tektronix specifically for the TAS 400 family, are 16 channel digital-to-analog converters (DACs). Greatly enhancing the scope's reliability, these two DAC farms replace 32 separate circuits. All the voltages for controlling trigger levels, position, offset, gain, intensity and general calibration flow from these two Digital to Analog ICs.



Hybrid

Containing the entire acquisition circuitry for each input channel, this hybrid dramatically increases these scopes' reliability.

Characteristics

VERTICAL SYSTEM

Frequency and Step TR Response –

Instrument	BW/Rise Time
TAS 455	60 MHz/≤ 5.8 ns
TAS 465	100 MHz/≤ 3.5 ns

Deflection Factor – 2 mV/div to 5 V/div, continuously variable between V/div settings.

Deflection Factor Basic Accuracy – ±2%.

Bandwidth Limit – 20 MHz.

Input Coupling – AC, DC, GND.

Max Input Voltage – 400 V (DC + peak AC); 800 Vp-p AC at ≤10 kHz.

Input R and C – 1 MΩ ±1% in parallel with 20 pF ±2.0 pF.

Channel Isolation – ≥50 dB at 10 MHz, ≥35 dB at 100 MHz.

Vertical Modes – CH 1, CH 2; ADD, INVERT, ALT, or CHOP.

AC-Coupled Lower -3 dB Point – ≤10 Hz with a 1X probe. The AC-coupled lower frequency limits are reduced by a factor of 10 when 10X, passive probes are used.

Common Mode Rejection Ratio – ≥10:1.

HORIZONTAL SYSTEM

Main Sweep Time Base Range – 0.5 s/div to 20 ns/div (to 2 ns/div with X10 magnification).

Delayed Sweep Time Base Range – 5 ms/div to 20 ns/div (to 2 ns/div with X10 magnification).

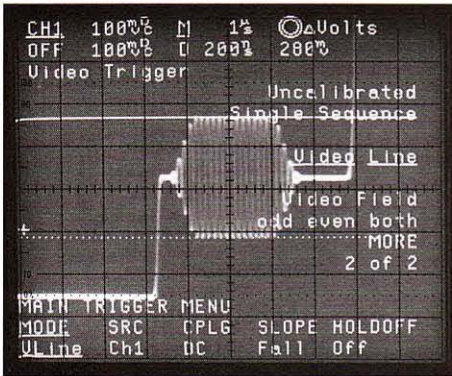
Time Base Accuracy – ±2%, ±3% magnified.

Delay Jitter – 25000 to 1 for sweep speeds <1 ms/div. 10,000 for all other sweep speeds.

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Analog Oscilloscopes

60 MHz to 100 MHz



TRIGGERING

Main Mode Selections – AUTO LEVEL, (with auto baseline), AUTO, NORM, TV LINE, TV FIELD (both, odd and even), SGL, SEQ.

Delayed Mode Selections – RUNS AFTER DELAY, TRIGGERS AFTER DELAY and TV LINE (from MAIN source).

A and B Trigger Coupling – DC, HF Reject, Noise Reject, LF Reject and AC for both Main and Delayed.

Lowest Frequency for Successful Operation of “Set Level to 50%” function – 50 Hz with 1 division internal, 100 mV external (1X) or 1 V external (10X).

Trigger Source – CH 1, CH 2, Ext, Line, ADD.

Holdoff Control Range – Increases Main sweep holdoff time by a factor of at least 10.

External Trigger Input Impedance – 1 M Ω \pm 2% in parallel with 20 pF \pm 2.0 pF.

Maximum Input Voltage – +400 V (DC + peak AC); 800 Vp-p AC at \leq 10 kHz.

Trigger Sensitivity – DC: 0.30 division from DC to 25 MHz, increasing linearly to 1 div at 150 MHz.

Noise Reject: 1.2 division from DC to 25 MHz, increasing linearly to 2.2 divisions at 150 MHz.

HF REJ: 0.30 div from DC to 10 kHz; attenuates signals above the upper -3 dB cutoff frequency of 50 kHz.

LF REJ: 0.30 div from 100 kHz to 25 MHz; increasing linearly to 1.0 division at 150 MHz; attenuates signals below the lower -3 dB cutoff frequency of 50 KHz.

AC: 0.30 division from 350 Hz to 25 MHz, increasing linearly to 1.0 division at 150 MHz; attenuates signals below the -3 dB cutoff frequency of 160 Hz.

X-Y OPERATION

Sensitivity Range – Same as Vertical Deflection System.

XY Accuracy – \pm 4%.

X-Axis Bandwidth – DC to at least 3 MHz.

Phase Difference Between X and Y – \pm 3 $^\circ$ DC to 150 kHz.

PROBE COMPENSATOR OUTPUT

Output Voltage – 5 V (base to top) into a 1 M Ω load.

Frequency – 1 kHz \pm 5%.

Typical Rise Time – \leq 500 ns.

Typical Aberrations – \leq 1% after the first 500 ns following the square wave transition.

NONVOLATILE SETUP MEMORY

Number of Nonvolatile Setups – 4.

Memories Retention Time – Internal batteries, installed at the time of manufacture have a life of \geq 10 years when operated and stored at an ambient temperature from 0 $^\circ$ C to +50 $^\circ$ C. Retention time is equal to the remaining life of the batteries.

Cursors

Cursor Functions – Δ Volts, absolute Volts, time and frequency.

Accuracy –

Cursor Type	Accuracy
Time	\pm (0.5% of reading + 2% of one horizontal division).
Frequency	Readouts calculated using SEC cursor difference
Volts	\pm (1% of reading + 2% of one vertical division + HF display errors + trace shift errors).
Δ Volts	\pm (1% of reading + 2% of one vertical division + HF display errors).

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POWER REQUIREMENTS

Line Voltage Ranges – 115 V: 90-132 VAC rms.
230 V: 180-250 VAC rms.

Line Frequency – 48 to 440 Hz.

Maximum Power Consumption – ≤ 85 Watts.

ENVIRONMENTAL AND SAFETY

The TAS series scopes are designed to meet specific environmental conditions as described in MIL-T-28800E for Type III, Class 3, Style D equipment as specified below. Other environmental specifications are available.

Temperature – -10°C to +55°C (operating);
-51°C to +71°C (non-operating).

Humidity – Operating and non-operating, up to 95% RH at or below +55°C.

Altitude – 15,000 ft/4572 m (operating);
50,000 ft/15240 m (non-operating).

Random Vibration – 0.31 g rms (operating)
2.46 g rms (non-operating), from 5 to 500 Hz,
10 minutes each axis.

Electrostatic Discharge Susceptibility – Up to 8 kV with no change to control settings, or lower cost impairment of normal operation; up to 15 kV with no damage that prevents recovery of normal operation by the user.

Safety – UL 1244 Listed, CSA 556B certified, IEC 348.

Emissions – VFG 243; FCC Rules and Regulations, Part 15, Subpart J, Class A.

Cooling Method – Forced-air circulation with no air filter.

PHYSICAL CHARACTERISTICS

Dimensions	Cabinet		Rackmount ¹	
	mm	in.	mm	in.
Width (with handle)	362	14.25	483	19
Height (with feet pouch)	191	7.5	178	7
(without pouch)	165	6.5		
Depth (with front cover)	471	18.55	472	18.6
(handle extended)	564	22.20	517	20.35
	kg	lb	kg	lb
Weight Net with accessories and pouch	7.7	17	4.5	10
Domestic Shipping	13.6	30	15.4	33.9

¹ Weight of conversion kit only. The rear support kit adds 7.3 kg/16 lbs.

ORDERING INFORMATION

TAS 455

60 MHz Oscilloscope **TD \$1,540**

Includes: Two 10X Voltage Probes (P6109B); Instruction Manual (070-8523-00); Reference (070-8522-00); XYZ's of Oscilloscopes: Analog and Digital Concepts (070-8690-00).

Opt. 02 – Front Cover and Pouch **+\$60**

Opt. 3R – Rackmount Kit **+\$350**

Opt. 23 – 2 ea. P6129B Probes **+\$190**

Opt. 9C – Calibration Certification/Test Data **+\$125**

TAS 465

100 MHz Oscilloscope **TD \$2,195**

Includes: Two 10X Voltage Probes (P6109B); Instruction Manual (070-8523-00); Reference (070-8522-00); XYZ's of Oscilloscopes: Analog and Digital Concepts (070-8690-00).

Opt. 02 – Front Cover and Pouch **+\$60**

Opt. 3R – Rackmount Kit **+\$350**

Opt. 23 – 2 ea. P6129B Probes **+\$190**

Opt. 9C – Calibration Certification/Test Data **+\$125**

WARRANTY-PLUS SERVICE OPTIONS

Opt. M2 – Repair Protection

TAS 455 **+\$125**

TAS 465 **+\$150**

Opt. M8 – Calibration Service

TAS 455 **+\$125**

TAS 465 **+\$150**

INTERNATIONAL POWER PLUG OPTIONS

Opt. A1 – Universal Euro 220 V, 50 Hz **NC**

Opt. A2 – United Kingdom 240 V, 50 Hz **NC**

Opt. A3 – Australian 240 V, 50 Hz **NC**

Opt. A4 – North American 240 V, 60 Hz **NC**

Opt. A5 – Switzerland 220 V, 50 Hz **NC**

PROBES

Differential –

100 MHz, active differential, 6 ft. Order P6046 **\$2,195**

High Voltage –

100X, 120 MHz, 1500 V, 2.5 pF/10 MΩ, 9 ft. Order P6009 **\$265**

1000X, 75 MHz, 20 kV, 3.0 pF/100 MΩ, 10 ft. Order P6015A **\$895**

General Purpose –

1X, 15 MHz, 100 pF/1 MΩ, 2 m. Order P6101B **\$60**

10X, 100 MHz, 13.2 pF/10 MΩ, 2 m. Order P6109B **\$70**

1X-10X Switchable, 1X: 10 MHz, 100 pF/1 MΩ.

10X: 100 MHz, 18 pF/10 MΩ, 2 m. Order P6129B **\$95**

Logic –

20 MHz, 17 bit, word recognizer/trigger. Order P6408 **\$425**

Digital Timing Demodulator –

Order TVC501 **\$2,495**

Current –

935 Hz to 120 MHz, 3 A continuous peak. Order P6022 **\$595**

120 Hz to 60 MHz, 7.5 A continuous peak. Order P6021 **\$545**

DC to 50 MHz System, includes AM503A, A6302 20 A probe, TM502A Order AM503S **\$2,595**

CART – Order K212 **\$395**

CAMERA – Order C9 Opt. 06 **\$470**

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