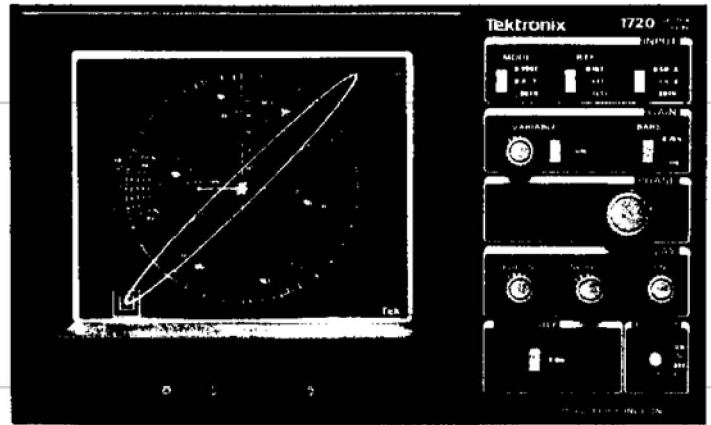


1720 Vectorscope — Vector and Stereo Audio Dual Display Mode.



1730 Waveform Monitor — Simultaneous Channel A and B Display.

1720 Series Vectorscopes

1730 Series Waveform Monitors

Performance and economy
Complete line select
Simultaneous channel A & B display
Dual filter display
One-button front panel recall
Differential phase and gain measurement
Stereo audio phase measurement
RGB/YRGB display capability
Vector center dot clamping
Parallax-free internal graticules
Portable dc power and battery available
Remote control capability
Available in NTSC, PAL, dual
NTSC/PAL, and PAL-M standards

The Tektronix 1730 Series Waveform Monitors and 1720 Series Vectorscopes provide television signal monitoring for both NTSC and PAL applications. These versatile instruments are light weight, half-rack width, and have bright CRTs for comprehensive video signal monitoring. Both instruments exceed normal monitoring capabilities. Their unique features make them even more powerful when operated in tandem. Each monitor has its own advanced feature set and the proven 1700 Series family performance to provide more monitor for the money. These monitors do the job faster, better and easier at a low price.

Complete Line Select

The 1730 Series Waveform Monitor has full frame line select, with alpha-numeric readout that can be tracked by the 1720 Series Vectorscope when in Auxiliary mode. Any one or two lines of the entire frame can be selected and displayed, or the same line(s) in

both fields can be viewed at one time. An intensified zone in the two-field sweep and on the picture monitor output signal indicates the location of the line selection. In addition, any successive 15 lines can be overlaid for camera and VTR adjustments.

Simultaneous Channel A and B Display

These instruments have state-of-the-art microprocessor front panel control. They are operator-friendly and provide features in half-rack waveform monitors or vectorscopes. Both the 1730 Series Waveform Monitor and the 1720 Series Vectorscope have dual channel display capability, allowing both input channels to be displayed on the CRT simultaneously.

Dual Filter Display

The 1730 (NTSC) and the 1731 (PAL) Waveform Monitors include dual filter display, which provides low pass and flat information in the same display. The 2-Field and 2-Line Display Modes have the Low Pass Filter applied to the left half of the trace. In the 1-Line Mode, the two signals are overlaid. These filter modes can also be used independently. All versions of the 1730 Series have chroma filters centered around the subcarrier frequency.

One-Button Front Panel Recall

Once the front panel has been set up in a frequently used mode, the configuration can be stored for later, one-button recall. In addition, when the 1720 is used in tandem with the 1730, it will respond to this Store/Recall operation. Up to four operator-selected front panel configurations can be stored from the front panel. Four other front panel configurations are factory-programmed settings and are accessible from the Remote Control interface.

Differential Phase and Gain Measurements

The 1720 Series Vectorscope graticule has scales for measuring Differential Phase and Gain. The Differential Phase scale has markings at 2° intervals. The Differential Gain scale has markings at 5% intervals. For even greater precision, the 1720 and 1730 Series

can be coupled for differential phase measurements using the field or line sweep on the 1730 Series Waveform Monitor. The Waveform Monitor Chroma filter can be used for differential gain measurements.

Stereo Audio Phase Measurements

Balanced inputs for the X Y mode are available on the 1720 Series Vectorscope through a separate input connector. This mode is particularly useful for evaluation of stereo audio with the special X Y graticule scale for both amplitude and phase measurements. X Y measurements can be displayed individually or in combination with a vector display. This input can also be used for other applications where X Y monitoring is useful.

RGB-YRGB

The Waveform Monitor can display RGB or YRGB. The RGB/YRGB staircase input is through a rear panel connector.

Vector Center Dot Clamping

These new Vectorscopes employ center dot clamping in Vector mode for easy detection of residual subcarrier on the signal. In addition, with no signal present, the center dot automatically dims prolonging the CRT life.

Parallax-Free Internal Graticules

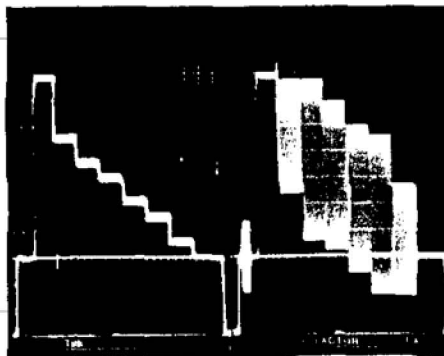
Both instruments utilize post-accelerated, mesh-type CRTs equipped with internal graticules to provide parallax-free displays. Variable, evenly-illuminated scales, along with molded bezels, make waveform photography a snap.

Portable DC Power

In addition to being ideal for camera control units and video tape recorders, these instruments can be equipped with cabinet and field upgrades allowing them to operate from a 12 Vdc source for portable operation. They can be used with the Tektronix BP1 battery pack or other 12 V supply. Coupling this dc operation with their light weight (about 9 pounds, including cabinet), low power consumption, and compact size make these instruments well suited for use on a portable production cart.



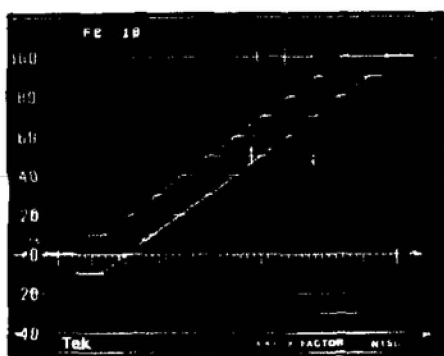
1730 NTSC Dual Filter Display



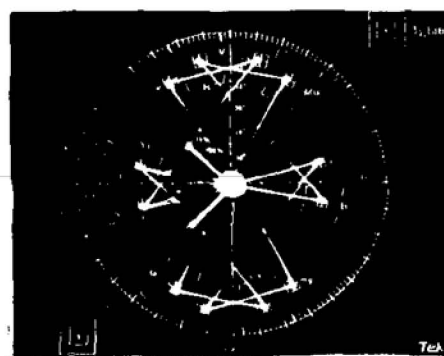
1731 PAL Dual Filter Display



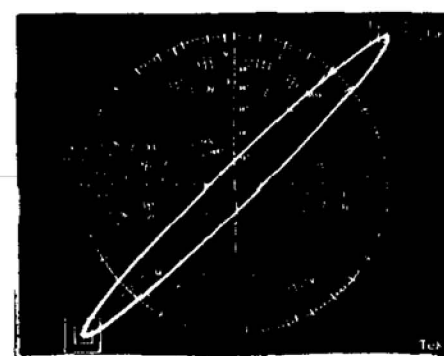
15 Line Display



Line Select Test Signal Display



1721 PAL Vector Display



1721 Stereo Audio with 10° Phase Error

Remote Control

Internal front panel presets, RGB/YRGB enable, 90/100 Hz sweep, and front panel recall/setup can be accessed through the Waveform Monitor Remote connector.

Available in NTSC and PAL

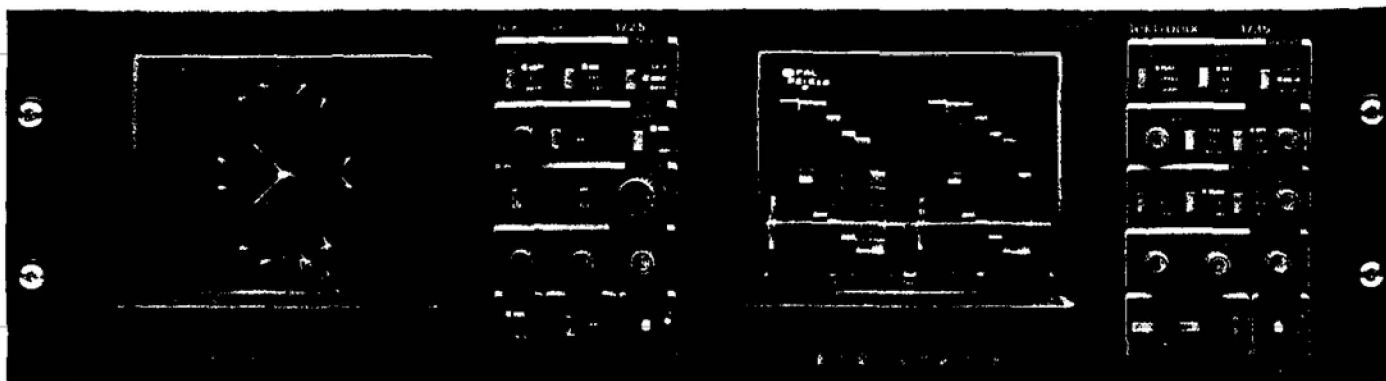
Both the 1730 Series and the 1720 Series are available in either NTSC or PAL versions. The 1721 Vectorscope and the 1731 Waveform Monitor are the PAL versions. The 1725 and 1735 Monitors provide PAL/NTSC Dual

Standard Monitoring. See the 1725/1735 data which follows for additional information on these dual standard instruments. PAL-M instruments are available as a modified product.

Detailed specifications for the entire 1720/1730 Series follow the 1725/1735 information.

1725 Vectorscope

1735 Waveform Monitor



1725/1735 monitoring a PAL signal

The Tektronix 1725 Vectorscope and 1735 Waveform Monitor provide dual-standard (PAL and NTSC) television signal monitoring capabilities. These instruments are ideally suited for standards conversion, telecine, international common-carrier and mobile satellite vehicle applications.

Built on the solid foundation of the Tektronix 1700 series monitors, the 1725 and 1735 automatically track the standard of the input signal. Vector graticule positions and box sizes are correct for selected standard. Both instruments indicate standard selection on-screen. When operated in tandem, the 1735 Waveform Monitor controls similar front panel selections on the 1725 Vectorscope.

The 1725 Vectorscope has a unique automatic vector display positioning feature. Simply pressing the front panel Auto button positions the vector display such that burst is properly aligned with the appropriate graticule reference mark. This facilitates the instrument's ability to correctly position burst when switching between standards.

D-2 format 90/100 Hz servo waveform monitoring is also possible with the 1735. Moving an internal jumper allows the 90/100 Hz external trigger to be input through the rear panel remote connector.

For component/PAL/NTSC applications, the 1725 Vectorscope and WFM300A Option 10 or 14 Component/Composite Waveform Monitor provide a comprehensive signal monitoring solution.

CHARACTERISTICS

1730, 1731, and 1735 WAVEFORM MONITOR

Signal input (video and external reference) — Return loss: > 40 dB, 50 kHz to 6 MHz, power on or off. Maximum input: ± 5 Vdc + peak ac. Loop-through isolation: > 80 dB at F_{sc} . Channel isolation: > 50 dB at F_{sc} . Impedance: > 15 k Ω .

Vertical deflection — Deflection factor: Within 1% of 1 V. Gain range: Input signals between 0.8 V and 2 V can be adjusted to a 1 V display; (160 mV and 400 mV for X5 gain). Position range: 1 V signal can be placed at blanking level regardless of gain range.

Frequency response — Flat: 50 kHz to 6 MHz within 2% (X1), within 5% (X5). Low pass: 40 dB attenuation at F_{sc} . Low pass response within 1% of flat response. Chroma: Nominal bandwidth 1 MHz. 2X F_{sc} attenuation > 20 dB. Chroma response within 1% of flat response.

Transient response — Preshoot: < 1%. Overshoot: < 2%. Ringing: < 2%. Tilt: < 1%. Pulse-to-bar ratio: 0.99:1 to 1.01:1. Differential gain: < 1%.

DC restoration — Clamp time: Back porch. Frequency response: Attenuation of 60 Hz on input signal, slow mode: < 20%; fast mode: > 90%. Blanking level shift: A 10% to 90% APL change will cause < 1% of blanking level shift. Presence or absence of color burst will cause < 1% of blanking level shift.

PIX MONITOR OUTPUT — Frequency response: 50 kHz to 6 MHz within 3%. Differential gain: < 1%. Differential phase: < 1%. DC level on output: < 0.5 V into 75 ohms load. Intensification (brightup): 180 mV dc offset on select lines. Output impedance: 75 ohms nominal. Return loss: > 30 dB, 50 kHz to 6 MHz. Input to output (PIX MON) gain ratio luminance: 1:1 $\pm 5\%$ at 15 kHz.

Calibrator — Frequency: 100 kHz ± 0.1 kHz. Timing accuracy: 10 μ s, ± 0.01 μ s. Amplitude: 1 V, $\pm 1\%$.

Horizontal deflection system — Sweep: Sweep will occur with or without input signal. 1-Line repetition rate: Equal to applied line rate, magnification equals 0.2 μ s/div. 2-Line repetition rate: Equal to half applied line rate, magnification equals 1 μ s/div. 2-Field repetition rate: Equal to applied frame rate, magnification equals approximately X25. Timing accuracy: 1 μ s/div. within 2%. 0.2 μ s/div. within 3%. Linearity: Within 2%. Differential linearity: Within 2%. Sweep magnification registration: Magnification occurs about the center of the screen. Position range: Any portion of a synchronized video sweep can be positioned on screen in all sweep modes.

Synchronization — Internal: Composite video or black burst with sync ± 6 dB of nominal. External: Sync amplitude of 143 mV to 4 V. Remote sync: 2.0 to 5.0 V square wave or 4.0 V comp sync (sync polarity can be internally inverted). RGB/YRGB: Repetition rate: Field rate and line rate with magnification of X25 and X10, respectively. Sweep length: 3-Step (RGB) — 3.4 to 4.1 divs.; 4-Step (YRGB) — 2.5 to 3.1 divs.

1720, 1721, and 1725 VECTORSCOPE

Signal input (video and external reference) — Return loss: > 40 dB, 50 kHz to 6 MHz, power on or off. Maximum input: ± 5 Vdc + peak ac. Loop-through isolation: > 70 dB at F_{sc} . Channel isolation: > 70 dB at F_{sc} . Impedance: > 15 kohms.

Chrominance bandwidth — Upper: -3 dB point, F_{sc} + 500 kHz, ± 100 kHz. Lower: -3 dB point, F_{sc} - 500 kHz, ± 100 kHz. Vector phase accuracy: Within 1.25°. Vector gain accuracy: Within 2.5%, typical. Quadrature phasing: Within 0.5° typical.

Subcarrier regenerator — Pull-in range: F_{sc} ± 50 Hz. Pull in time: Within 1 second. Phase shift with subcarrier frequency change: $2^\circ \pm 50$ Hz. Phase shift with burst amplitude change: < 2° with ± 6 dB change from nominal. Phase shift with input channel change: < 0.5° . Phase change with variable gain control: $\pm 1^\circ$. Phase control range: 360° continuous rotation. Burst jitter: < 0.5° . Display differential phase and gain: $\pm 1^\circ$ and $\pm 1\%$. Center dot clamp stability: < 0.4 mm spot movement.

Synchronization — Internal: Composite video with sync ± 6 dB of nominal. External reference: Composite video or CW subcarrier.

X Y mode — Input: Differential, dc coupled. Input amplitude: 2 to 9 V p-p, adjustable full scale deflection 0 dBm to +12 dBm for 600-Ohm system, factory set to 0 dBm. Maximum input: ± 15 V peak signal + dc. Frequency response: Dc to 500 kHz (dc to 100 kHz high-gain mode). X and Y phase match: Less than a trace width separation at 20 kHz.

1720, 1721, 1725, 1730, 1731, and 1735

Specifications — CRT viewing area: 80 x 100 mm. Trace rotation: 8° range, typical. Graticule: Internal scale with variable illumination.

Power source — Mains voltage ranges: 115 V, 90-132 V, 230 V, 200-250 V. Mains frequency range: 48 Hz to 66 Hz. Power consumption: 25 watts (85 BTU/HR) maximum. Battery operation: 12 Vdc (when 1700F10 is field installed).

ENVIRONMENTAL

Temperature nonoperating — -55°C to $+75^\circ\text{C}$.

Temperature operating — 0°C to $+50^\circ\text{C}$.

Altitude nonoperating — To 18,000 M (50,000 feet).

Altitude operating — To 5,500 M (15,000 feet).

Shock — Nonoperating: 30 g's, $\frac{1}{2}$ sine, 11 ms duration, 3 shocks per surface (18 total).

Transportation — Qualified under NATA Test Procedure 1A, Category II (30-inch drop).

Humidity — Meets Tektronix Standard 062-2847-00.

CERTIFICATION

Safety — UL-1244. Factory Mutual-3820. CSA Bulletin 556B. IEC 348.

EMI compatibility — FCC Rules, Part 15, Subpart J, Class A, VDE 0871.5 (Class B).

PHYSICAL CHARACTERISTICS

Dimensions	mm	in
Height	133.4	5.25
Width	215.9	8.5
Depth	460.4	18.125
Weight (approximate)	kg	lb
Net	3.8	8.5