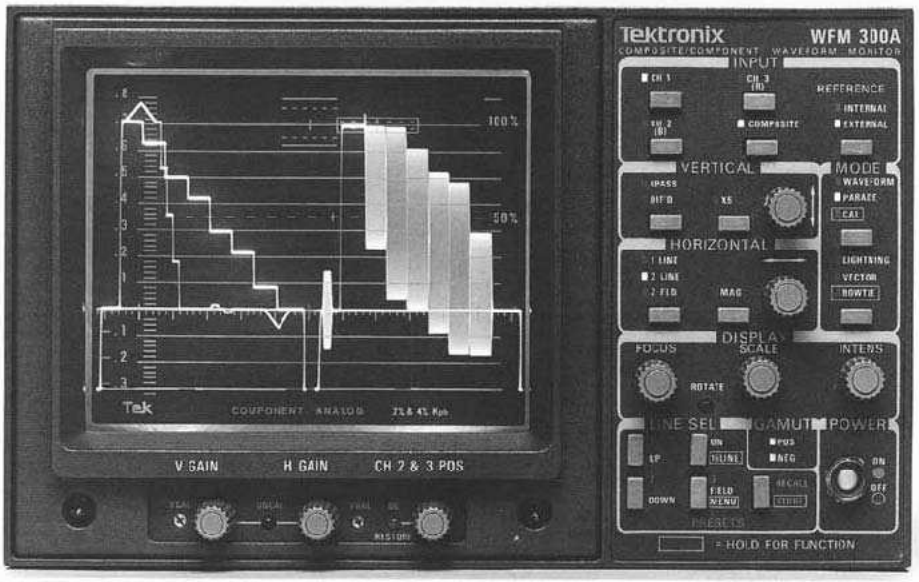
WFM300A Component/Composite Waveform Monitor

- Component and composite waveform display
- Menu selectable electronic graticules
- Lightning display for equipment setup and monitoring
- Bowtie display for system timing
- Menu selectable component format options
- Menu selected 625/50 or 525/60 configuration
- Separate GBR and composite picture monitor outputs
- Color gamut violation indication
- Front panel user recalls for fast operation
- UL, CSA, ANSI/ISA, IEC and FCC approved



Dual input display of composite and component Y-channel color bar signals.

The WFM300A is a comprehensive component television signal monitor with important features to monitor associated composite signals. It is designed specifically for signal evaluation and equipment alignment in production suites using RGB, Betacam, or MII component formats. In addition, composite (NTSC or PAL) waveforms existing in the facility may be monitored with the WFM300A and composite vectors displayed on a companion 1720 Series composite vectorscope.

The WFM300A provides a full set of component monitoring features. Its innovative and unique Lightning display allows accurate adjustment of component equipment to replay Betacam or MII format tapes without a requirement for special test signals. Off-tape color bars provide all necessary information to quickly set the playback recorder setup, video gain, chroma, and Y/C delay for accurate reproduction. All of these recorder adjustments are accomplished while viewing one convenient, easy-to-interpret display. Electronic graticules for the various component formats used throughout the world are selected from an on-screen menu.

The traditional parade display of the three component signals provides side-by-side comparison. In addition, any combination of the three signals can be overlaid for accurate comparison. A composite signal may also be compared to the component luminance signal. Three sweep rates (1 line, 2 lines, and 2 fields) are provided. Both horizontal and vertical magnification can be applied for detailed inspection of the signals being observed.

A component vector mode, useful for estimating color hue and saturation values, provides a familiar color bar vector display of color difference signals.

The Bowtie mode uses the Tektronix Bowtie timing test signal from component test signal generators, allowing precise timing of three wire component television systems. This utilizes a channel 1 minus channel 2 and 3 mode to provide a side-by-side differential comparison (1-2 and 1-3) of all three channels.

In addition to a luminance filter, which provides a smooth roll-off of chroma components in a composite signal, the WFM300A provides a differentiated step filter for measurement of luminance non-linearities in component signal channels.

Two separate picture monitor outputs are provided, one for the composite PAL or NTSC input signal, and one GBR set for the component input signal. All color difference format component input signals are transcoded to GBR using one of two plug-in resistor matrixes supplied with the WFM300A. The valid GBR gamut limit is monitored to ensure the operator is warned if a combination of signals will not be valid when later encoded into PAL or NTSC composite format. Front panel LEDs indicate whether positive or negative gamut limit has been exceeded, and the operator may enable a flashing on-screen indication of the offending area on the picture monitor.

The WFM300A has full frame line select, with alphanumeric readout. Any one or two lines of the entire frame can be selected and displayed, or the same line(s) in both fields may be viewed at one time. In addition, any successive 15 lines can be overlaid. An intensified zone, in the two-field sweep and on the composite picture monitor output, indicates the location of the selected lines.

Operator interface has been given careful attention in the WFM300A. Component and composite inputs are clearly identified for easy signal selection. Regularly used controls, including three front panel user recalls, are readily available for immediate selection on the front panel. Less often used controls, such as electronic graticule selection for different component formats, selection of 525/60 or 625/50 line/field rates, 75%/100% color bar graticules, and gamut strobe enable/disable are accessed from on-screen menus. The internal CRT graticule supplied is calibrated in mV or IRE units appropriate to the PAL or NTSC composite format selected.

CHARACTERISTICS

VERTICAL DEFLECTION SYSTEM

Frequency Response

1 V Full Scale	50 kHz to 6 MHz within 2% of response at 50 kHz
X5 gain	50 kHz to 5MHz within 2% of response at 50 kHz
Diff'd step filter	≥-20 dB at 14 kHz and 2MHz
Luminance filter	>-25dB at 3.58 and 4.43 MHz

Transient Response

1 V Full Scale; Pulse-to-bar 0.99:1.00 to 1.01:1.00.

Ringing and Overshoot	≤2%
Tilt	≤1%

Variable Gain Range

1 V Full Scale; Input signals between 0.7 V and 2.0 V can be adjusted to 1.0 V display

Deflection Accuracy

1 V within 2% with 1 V input

DC RESTORATION

Attenuation of 50 Hz on Input Signal	≤20%
Blanking Level Shift with 10% to 90% APL Change	≤1%

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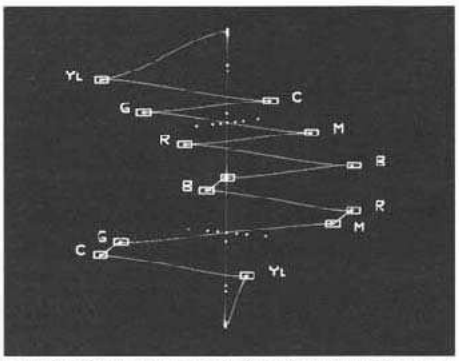
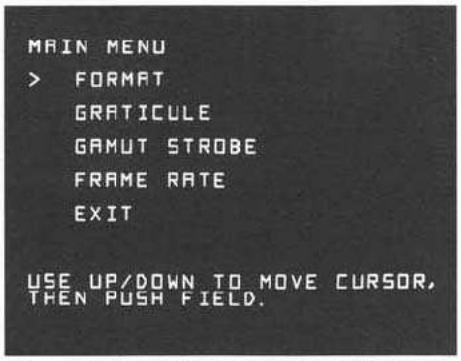


Lightning display allows monitoring of important component parameters using just color bars.



Instrument is configured to the desired application through on-screen menus.

INPUTS

Component Channels 1, 2, 3, and External Reference	Return Loss (75 Ω) at least 40 dB from 50 kHz to 6 MHz
Composite Channel	Return Loss (75 Ω) at least 30 dB from 50 kHz to 6 MHz
Cross Talk Between Channels	>46 dB isolation between channels
Loop-Through Isolation	>60 dB isolation between channels
Maximum Input Level for Normal Operation	Component channels 1, 2, 3, and Composite ±2V (dc + peak ac)
External Reference	+2 to -4 V peak ac (compatible with composite sync)

HORIZONTAL DEFLECTION SYSTEM

(Waveform and Parade Mode)	Sweep will occur in all sweep rate settings with or without a reference signal
Synchronization	Sweep will synchronize to sync amplitude of 0.3 V p-p ±6 dB
2 FLD Sweep Repetition Rate	Equal to frame rate of selected reference
2 FLD MAG (Magnification)	Approximately X20
1 LINE Sweep Repetition Rate	Equal to line rate of selected reference
2 LINE Sweep Repetition Rate	Equal to half line rate of selected reference
Timing Accuracy	
1 µs/div	within 2%
0.2 µs/div	within 2%
Linearity (1 µs/div and 0.2 µs/div)	Within 2 %
Parade Mode Sweep Repetition Rate	Field or line

VECTOR MODE

Vertical Bandwidth	900 kHz ±100 kHz
Horizontal to Vertical Bandwidth Matching	No eye opening at 500 kHz or 2 MHz
Vertical Gain Accuracy	±1%
Horizontal Gain Accuracy	±1%
Electronic Graticule Accuracy	±1%

BOWTIE MODE

Common Mode Rejection Ratio	>40 dB
Calibration	Calibrator accuracy within 1%

TRANSCODER

Accuracy	Within 1%
GBR Outputs	Impedance 75 Ω nominal Back porch clamped to 0.0 V
Gamut Limit	Preset threshold settings are nominally +735 mV and -35 mV within ±5 mV.

CRT DISPLAY

CRT Viewing Area	80 x 100 mm
Horizontal	12.5 div
Accelerating Potential	Nominally 13.75 kV
Trace Rotation Range	>±1° from horizontal

POWER SOURCE

Mains Voltage Ranges	110 V (88-132 V); 220 V (198-242 V)
Mains Frequency Range	48 Hz to 66 Hz
Power Consumption	35 Watts maximum

ENVIRONMENTAL

Temperature Nonoperating	-55°C to +75°C
Temperature Operating	0°C to +50°C
Altitude Nonoperating	to 50,000 feet
Altitude Operating	to 15,000 feet
Vibration Operating	15 minutes each axis at 0.15 inch, frequency varied from 10-55-10 Hz in 1-minute cycles with instrument secured to vibration platform. Ten minutes each axis at any resonant point or at 55 Hz if no resonant point is found.
Shock Nonoperating	30 g's, 1/2 sine, 11 ms duration, 3 shocks per surface (18 total)
Transportation	Qualified under NSTA Test Procedure 1A, Category II (24-inch drop)
Humidity	Meets Tektronix Standard 062-2847-00.

CERTIFICATION

Safety	UL-1244; ANSI/ISA S82; CSA Bulletin 556B; IEC 348
FCC EMI Compatibility	FCC Rules Part 15 Subpart J (Class A). VDE 0871.5 (Class B)

PHYSICAL CHARACTERISTICS

Dimensions	**mm**	**in**
Height	133	5.25
Width	214	8.424
Depth	464	18.125
Weight (approximate)	**kg**	**lb**
Net	4.0	9.0

ORDERING INFORMATION

The standard instrument is shipped without a case or handle. Please order the appropriate enclosure from the optional accessories list. The WFM300A is a UL recognized component and meets the requirements for listing when used in the appropriate enclosure.

WFM300A Component/Composite Waveform Monitor. 625/50 line/field rate. PAL mV CRT graticule

SMPTE/ EBU N10 (Betacam or MII as used in PAL countries) transcoder installed. Wired for 110 V power, with U.S. power cord. Select Option A1, A2, or A3 for 220 V/240 V ac mains operation.

Option 05 — Delete color shutter for white display of electronic graticules.

Option 10 — 525/60 line field rate. NTSC IRE CRT graticule. Betacam 60 Hz transcoder (Betacam as used in NTSC countries) installed. Wired for 110 V power, with U.S. power cord.

Option 14 — 525/60 line field rate. NTSC IRE CRT graticule. SMPTE/EBU N10 transcoder (MII as used in NTSC countries) installed. Wired for 110 V power, with U.S. power cord.

Option 74 — Substitute P4 (white) phosphor on CRT.

WFM300A Component/Composite Waveform Monitor

ORDERING INFORMATION (CONTINUED)

OPTIONS

Option A1 — Wired for 220 V power, with European power cord and two fuses.

Option A2 — Wired for 240 V power, with United Kingdom power cord and two fuses.

Option A3 — Wired for 240 V power, with Australian power cord and two fuses.

Option M2 — Remedial service

Option M8 — Calibration service

Transcoders for both Betacam and SMPTE/EBU N10 are supplied with all WFM300A instruments. Only one transcoder can be installed at a time. GBR operation is selectable from the front panel on all instrument/option combinations.

INCLUDED ACCESSORIES

Instruction manual; Power cable assembly; Spare fuse; Spare graticule lamps; Remote control mating connector.

OPTIONAL ACCESSORIES

1700F00 — Plain cabinet (painted silver grey)

1700F02 — Portable cabinet (including handle, feet, and front cover)

1700F05 — Side-by-side rack adapter

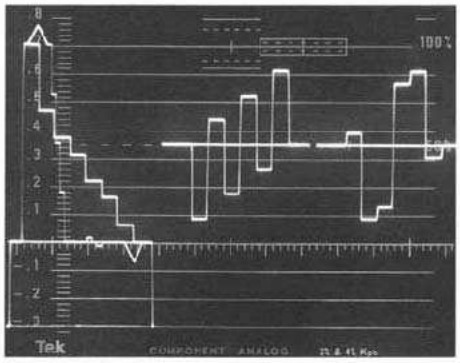
1700F06 — Blank half-rack width panel

1700F07 — Utility drawer

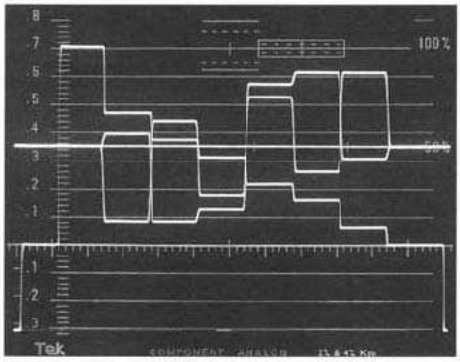
C9 Option 20 — Camera

016-0475-00 — Viewing hood

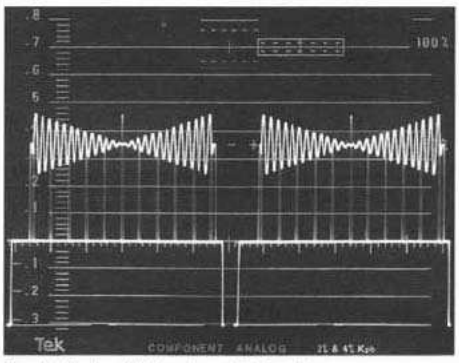
200-3897-01 — Snap-on front cover



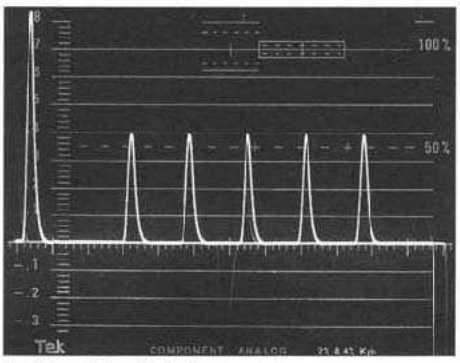
Component Parade display.



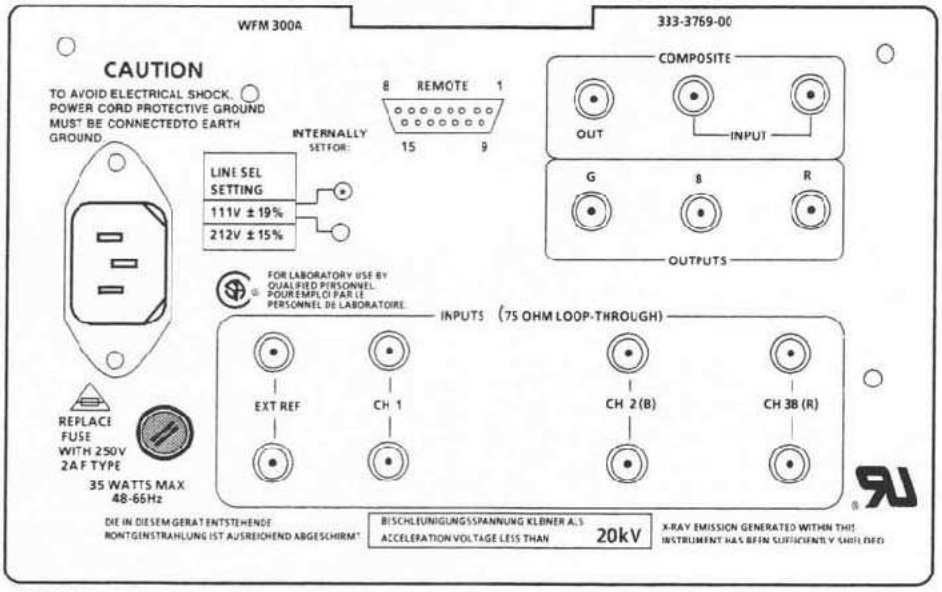
Component Overlay display.



Bowtie display of Inter-channel Timing Error.



Luminance Linearity display.



WFM300A Rear Panel