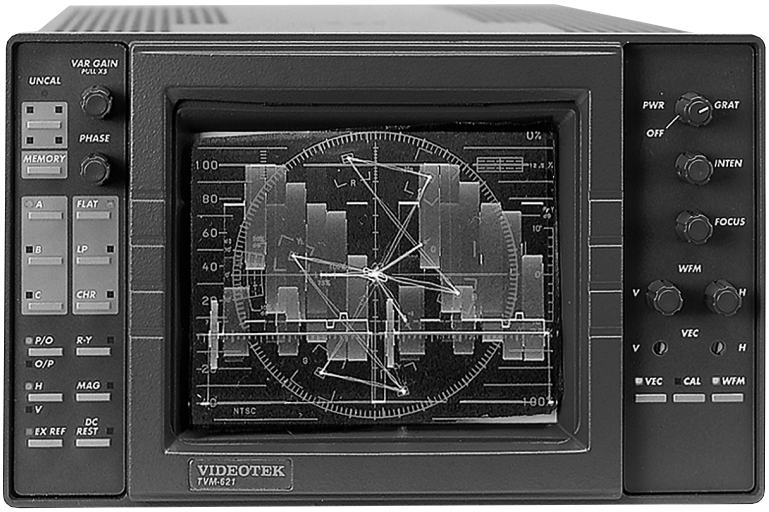
TVM-621
COMBINATION WAVEFORM MONITOR VECTORSCOPE

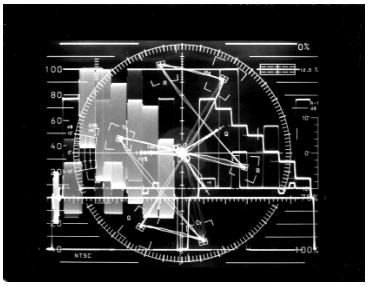


(Shown with optional SSC-1 case)

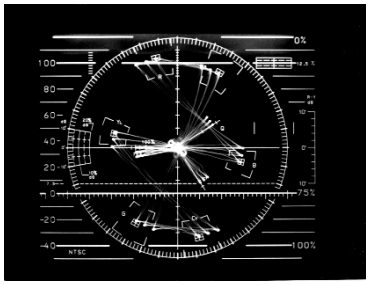
The TVM-621 is a full-featured half-rack width combination waveform monitor/ vectorscope which produces a variety of unique display modes. One, two or three video signals may be observed individually or in any combination of three inputs. Waveforms can be displayed in either simultaneous parade modes or overlayed for comparison of timing and amplitude characteristics. Any one input may be displayed with simultaneous Flat, Low Pass and Chroma filters. Vector displays can also be overlayed for simultaneous observation and comparison of the phase and amplitude of up to three signals. Four user-defined memories permit rapid recall of frequently used modes. Diagnostic testing of the front panel controls and LED's is built in. An R-Y mode (V-axis PAL) displays the demodulated chrominance with horizontal sweep. A graticule scale is provided to aid in measuring differential phase. This display can be viewed simultaneously in the parade mode with one or two additional filter waveforms.

FEATURES

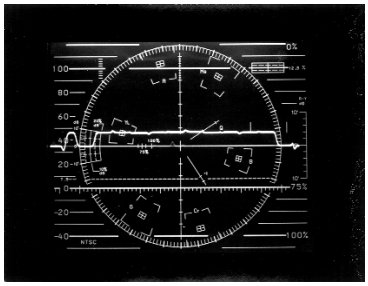
- ***INPUTS:*** *Three composite loop through. Any input plus external reference can be selected as reference.*
- ***DISPLAYS:*** *Waveform parade or overlay of three inputs and three filters. Vector overlay of three inputs. Combination of vectors overlayed and waveforms paraded and/or overlayed simultaneously. Up to 12 different functions/filters can be displayed simultaneously.*
- ***MEMORY:*** *Storage and recall of four user-defined front panel setups.*
- ***FREQUENCY RESPONSE:*** *Flat to 10 MHz .*
- ***GRATICULE:*** *Internally etched to eliminate parallax errors.*
- ***HIGH BRIGHTNESS CRT:*** *With non-glare contrast filter for enhanced visibility.*
- ***FILTERS:*** *Flat, Low Pass, Chroma*
- ***R-Y MODE:*** *Improved resolution of differential phase measurements (V-axis PAL).*
- ***DC RESTORATION:*** *Maintains display stability with varying APL.*
- ***STANDARDS AVAILABLE:*** *NTSC, PAL.*
- ***FORMATS:*** *Composite or Y/C (through YC-1 Option)*



COMBINATION DISPLAY: Simultaneous waveform, with 1H each of Flat and Low Pass Filters, and vector displays of a single input.



TRIPLE VECTOR OVERLAY: SMPTE Bars on A, B and C inputs delayed by 6° and 12° to demonstrate phase error.



R-Y DISPLAY: 1H mode of Modulated Stairstep.

TVM-621 SPECIFICATIONS

VERTICAL DEFLECTION SYSTEM

FLAT:
Frequency response from 25 Hz to 10 MHz ±1% of 50 kHz response

LOW PASS:
40 dB attenuation at f_{SC} Low Pass response within 1% of FLAT response

CHROMA:
Response at 3.58 MHz NTSC (4.43 MHz PAL) does not vary between FLAT and CHROMA by more than 1%.
Attenuation at 2 x f_{SC} is 25 dB or greater

TRANSIENT RESPONSE:
Less than 1 unit of preshoot and/or overshoot at 1V full scale. FLAT mode using $\sin^2$ pulse bar signal

PULSE TO BAR RATIO:
0.99:1 to 1.01:1

TILT WITH FIELD RATE SQUARE WAVE OR VERTICAL WINDOW OR 25 µs PULSE SIGNAL:
1% or less

DEFLECTION FACTOR 1V FULL SCALE:
140 units ±1% with 1V input.(NTSC)
143 units ±1% with 1V input (PAL)

MAXIMUM ABSOLUTE INPUT LEVEL:
±3.5V (DC + peak AC)

INPUT IMPEDANCE:
100 kΩ, <25 pF (unterminated)

RETURN LOSS (75Ω)
Inputs A, B, C:
>50 dB, DC to 5 MHz

INPUT GAIN RANGE:
Input signals between 0.5V and 2.0V can be adjusted for 1V display (140 units NTSC, 143 units PAL)

HORIZONTAL DEFLECTION SYSTEM

FIELD RATE TIME BASE:
Equal to x1, x2, x3, of the field rate of applied video or external reference (User selected Parade modes)

LINE RATE TIME BASE:
Equal to x1, x2, x3 of the H line rate of applied video or external reference (User selected Parade modes)

SWEEP MAGNIFICATION:
x10

TIMING ACCURACY:
Mode:
1H, HMAG (0.5 µs/div) ±2%
2H, HMAG (1 µs/div) ±2% of 1H
3H, HMAG (1.5 µs/div) ±2% of 1H

LINEARITY:
2% or less over complete horizontal position range excluding first and last major divisions

DC RESTORATION

RESTORER CLAMP TIME:
Back Porch

BLANKING LEVEL SHIFT DUE TO PRESENCE OR ABSENCE OF BURST:
≤1 unit.

BLANKING LEVEL SHIFT WITH 10-90% APL CHANGE:
APL changes from 50% to either 10% or 90% will cause blanking level shift of 1 unit or less

CALIBRATOR

WAVEFORM MODE FREQUENCY:
100 kHz ±0.1 kHz. Synchronizes in H sweep modes providing reference for sweep and magnifier calibration

AMPLITUDE:
1.0V ±0.5%

VECTOR MODE:
Displays test circle for sweep linearity check and quadrature alignment

VIDEO OUTPUT

FREQUENCY RESPONSE:
DC to 5 MHz, ±2%

DIFFERENTIAL GAIN:
2% at 50% APL at 1V out into 75Ω

DIFFERENTIAL PHASE:
3° AT 50% APL at 1V out into 75Ω

DC LEVEL ON OUTPUT:
0 ±100 mV DC into 75Ω

OUTPUT IMPEDANCE:
75Ω, nominal

AMPLITUDE:
1V input is 1V ±3% into 75Ω

RETURN LOSS:
>40 dB, DC to 5 MHZ

SYNCHRONIZATION REQUIREMENTS

INTERNAL REFERENCE:
Composite video or blackburst with sync and burst amplitudes 286 mV NTSC, 300 mV PAL ±6 dB

EXTERNAL REFERENCE WAVEFORM MODE:
Sync amplitude between 143 mV and 4V will synchronize sweeps

VECTOR DISPLAY:
Composite video or blackburst with sync and burst amplitudes
286 mV NTSC, 300 mV PAL ±6 dB

VECTOR MODE

PHASE CONTROL RANGE:
360° minimum 400° typical
(Vector and R-Y modes)

VECTOR ACCURACY: ≤1°

DIFFERENTIAL GAIN: ≤1%

DIFFERENTIAL PHASE: ≤1°

VARIABLE GAIN RANGE:
12 dB minimum, +6 dB to -6 dB typical with 1V input

GAIN STABILITY:
Less then 2% from 0°C to 50°C, AC mains varied ±5% from center of range

SUBCARRIER REGENERATOR

(Phase locked to subcarrier on burst signal of designated reference)

NOMINAL FREQUENCY:
(3.579545MHz - NTSC)
(4.433619MHz - PAL)

PULL IN RANGE:
Within 50 Hz of nominal f_{SC}

PHASE SHIFT WITH BURST AMPLITUDE CHANGE:
≤0.5° per dB change in burst amplitude for 6 dB change from nominal burst amplitude

PHASE SHIFT WITH REFERENCE SWITCHED BETWEEN INTERNAL AND EXTERNAL REFERENCES:
≤0.5°

PHASE SHIFT WITH INPUT CHANNEL CHANGE:
≤0.5°

PHASE SHIFT WITH VARIABLE GAIN:
≤0.5° per dB as gain is varied ±6 dB from nominal

MULTIPLE DISPLAY MODE MEASUREMENT ACCURACY

WAVEFORM OVERLAYS (X10 MAG):
±100 ns - Relative
±1 unit - Relative

VECTOR OVERLAYS:
±1° - Relative
±1 unit Relative

MICROPROCESSOR CONTROL SYSTEM

MICROPROCESSOR:
Low power, 65C02 @ 4 MHz

MEMORY:
1 year typical (self-charging battery)

DIAGNOSTICS:
Built in front panel test mode

ENVIRONMENTAL

OPERATING: 0°C to 50°C

STORAGE: -40°C to 65°C

HUMIDITY: 0 - 90% (non-condensing)

ALTITUDE:
Operating: to 10,000 ft. (3,050m)
Non-operating: to 50,000 ft. (15,240m)

MECHANICAL

CRT
Display Size: 8 x 10 cm

DIMENSIONS:
Height: 5.25" (13.34 cm)
Width: 8.5" (21.59 cm)
Depth: 17.75" (45.09 cm)

WEIGHT: 13.5 lb (6.1 kg)

POWER REQUIREMENTS

POWER INPUT:
95 - 132 VAC or 195 - 264 VAC @ 50/60 Hz, nominal (Externally selectable)

POWER CONSUMPTION:
75 VA

ACCESSORIES

STANDARD:
Non-glare contrast filter, Operator's Manual and 75Ω video terminator

OPTIONS (see page 50)

SSC-1: Single standard case

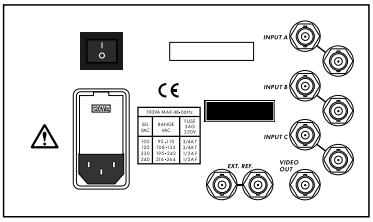
PTC-1: Portable case with extendable sun hood and 20° folding stand

DRC-1: Double Rackmount Case

BLK-1: Blank panel for left or right side of DRC-1

DAT-3: Half rack tray for DRC-1 to mount any two Videotek modular stand-alone switchers, distribution amplifiers, sync generators, or test signal generators.

YC-1: Adapter for Y/C input *(see page 71)*



TVM-621 REAR PANEL