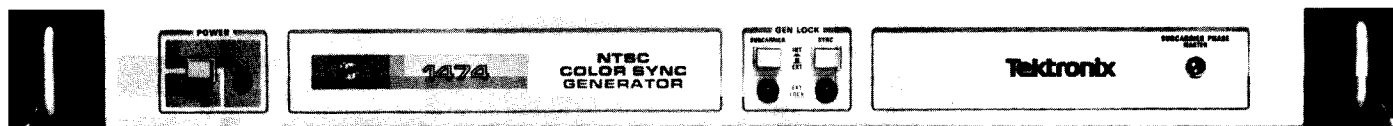
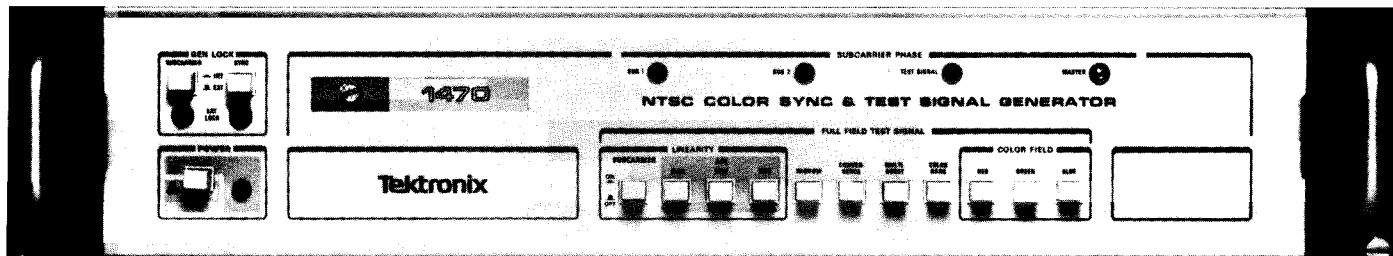


1470 SERIES NTSC GENERATORS



1474 NTSC Color Sync Generator



1470 NTSC Color Sync and Test Signal Generator

1470 and 1474 Features

Full color sync generator with gen-lock

Locks to most helical scan VTRs

Simple to operate

Compact and economical

Sync and timing signals

- Comp sync
- Comp blanking
- Vertical drive
- Horizontal drive
- Burst gate
- Subcarrier
- Black burst

1470 Only Features

Test signals:

- Black burst
- Color bars
- Staircase signals
- Window
- Convergence pattern
- Multiburst
- Red field
- Green field
- Blue field

Simplified timing via multiple subcarrier phasing controls

The 1470 Sync and Test Signal Generator is a compact, full color, gen-lock sync generator providing a full selection of high quality test signals.

The 1474 is identical in performance to the 1470 with the exception of test signals which, in the interest of economy, are not included. Both products have color gen-lock compatible with composite video from all normal sources including most helical scan video tape recorders.

The 1470 and 1474 have rack heights of 3.5 and 1.75 in. respectively. Both are shipped ready to install into a 19 in. rack.

1470/1474 SYNC PULSE GENERATORS

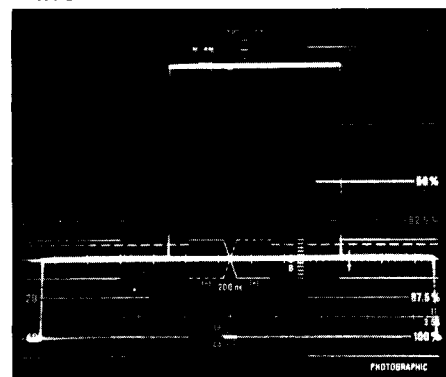
The synchronizing functions of the 1470 and 1474, like those of other Tektronix Generators, are of high quality. These generators can operate as master-sync generators or as units fully or partially timed from external sources. Color gen-lock capable of locking to most helical scan VTRs is a standard feature.

Front-panel pushbutton selection of external synchronization is provided. In external mode, the 1470 and 1474 automatically lock on composite video (1 V), composite sync (-4V), or reference subcarrier (2 V). Two front-panel lights show subcarrier and/or sync external lock. Lights out indicate a switch to internal standard.

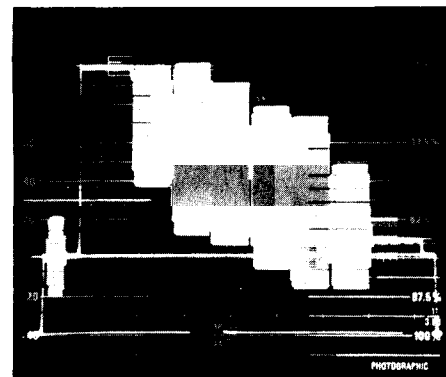
The GV3257A Changeover Unit is compatible with the 1470 and 1474.

All 1470 and 1474 generators include adjustments for varying the following timing signals:

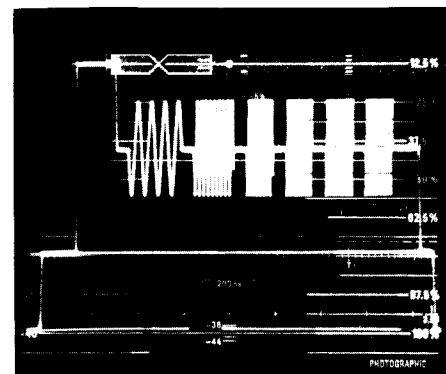
Window



Color Bars



Multiburst



1470 SERIES

Horizontal Blanking — Leading edge: 2.2 μ s to 0.6 μ s before the leading edge of sync. Trailing edge: 9.1 μ s to 10.7 μ s after the leading edge of sync.

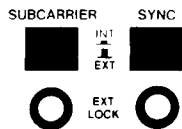
Horizontal Drive — Leading edge: 2.2 μ s to 0.6 μ s before the leading edge of sync.

Vertical Blanking — 20 or 21 lines.

Subcarrier Phase Controls — Composite test signals: subcarrier 1 and 2, blackburst: Independent adjustment range of $\approx 120^\circ$, and jumper arrangement giving a full 360° shift in 90° increments. Gen-lock (master): independent 360° front panel adjustment and 100° remote control, via a rear-panel BNC connector.

SYNC GENERATORS OUTPUTS (1470/1474)

GEN-LOCK



Composite Sync — Output level into 75 Ω : 4V ± 0.5 V. Rise and fall time: 140 ns nominal.

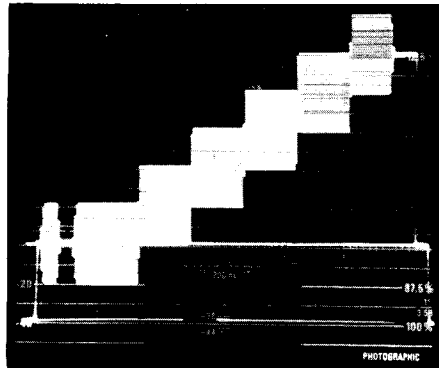
Composite Blanking — Output level into 75 Ω : 4V ± 0.5 V. Field blanking rise and fall time: 140 ns nominal.

Vertical Drive — Output level into 75 Ω : 4V ± 0.5 V. Rise and fall time: 140 ns nominal. Duration: 9 lines.

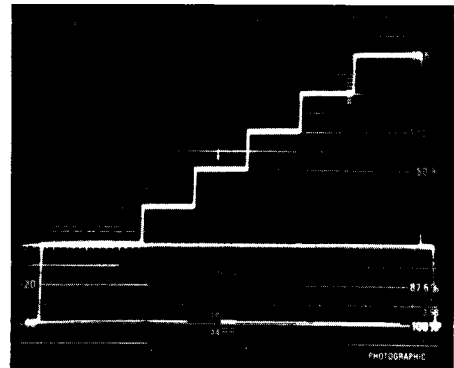
Horizontal Drive — Output level into 75 Ω : 4V ± 0.5 V. Rise and fall time: 140 ns nominal. Duration: 6.35 μ s.

Burst Gate — Output level into 75 Ω : 4V ± 0.5 V. Delay from line sync: 5.1 μ s ± 0.1 μ s. Rise and fall time: 140 ns nominal. Duration: 2.5 μ s ± 100 ns.

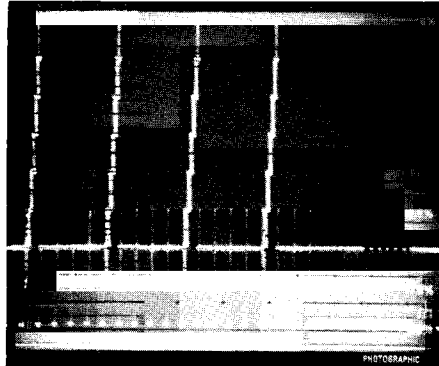
Subcarrier — Output level into 75 Ω : 2V. Frequency: 3.579545 MHz ± 10 Hz.



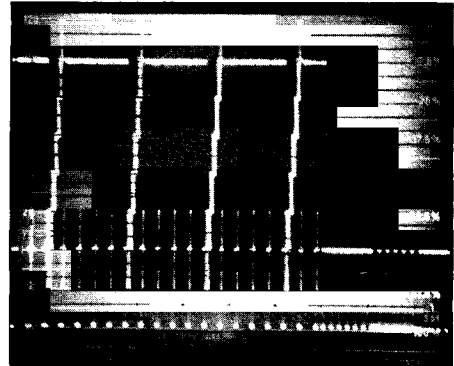
5-step modulated linearity test signal for differential gain and phase measurements.



5-step linearity test signal without modulation for gray-scale evaluating, gray-scale tracking.



The staircase linearity test signal is useful in measuring non-linear distortions. Note four lines at 0 IRE alternated with a staircase for tests at a low APL.



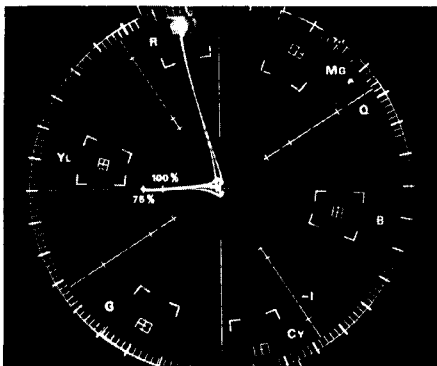
Four lines at 100 IRE alternated with a staircase line for tests at high APL.

Black Burst — Sync amplitude into 75 Ω : 40 IRE. Burst amplitude: 40 IRE (286 mV p-p). Burst frequency: 3.579545 MHz ± 10 Hz.

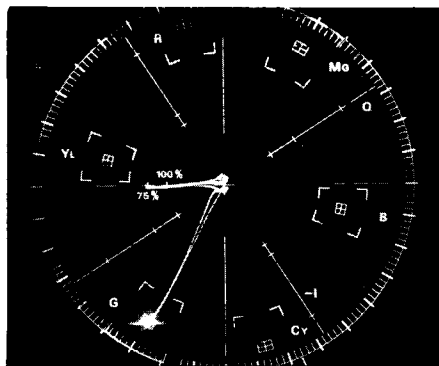
Gen-lock Signal Loop Input — Composite video input range: 0.5V to 1V when loop-through connectors are externally terminated into 75 Ω . Comp sync 1 to 4V, ref subcarrier 1.5 to 2V p-p.

1470 TEST SIGNAL FUNCTIONS

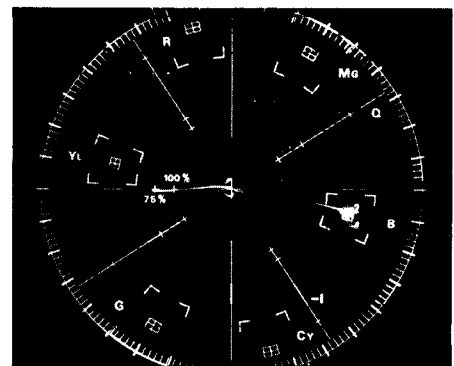
To simplify your test signal selection and speed testing operations, the 1470 has push button selection of test signals. All test signal push buttons, except the color field selectors, are self-cancelling.



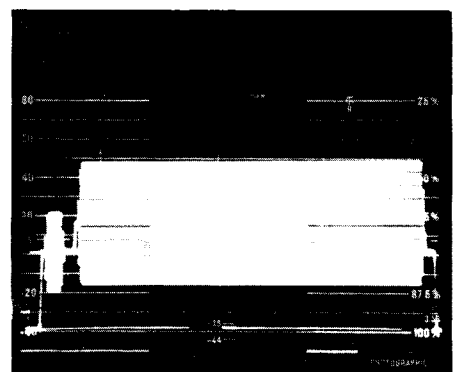
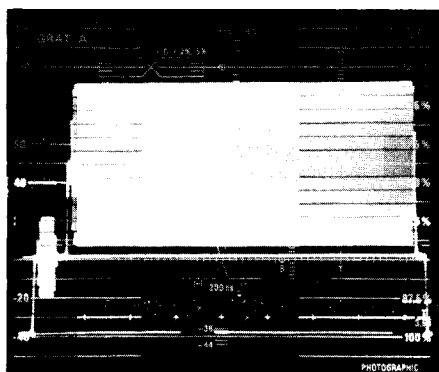
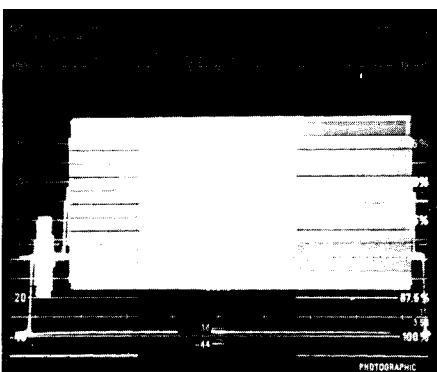
Red Field

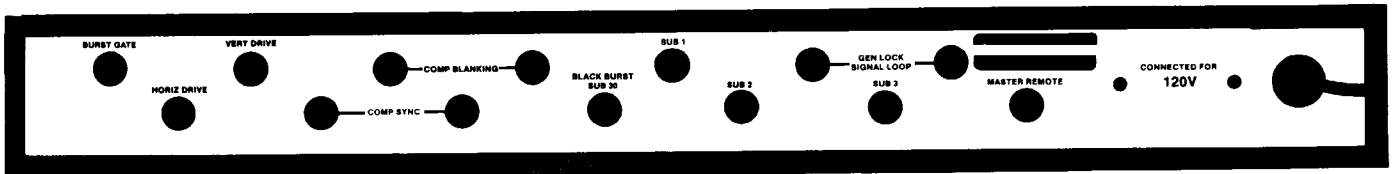


Green Field

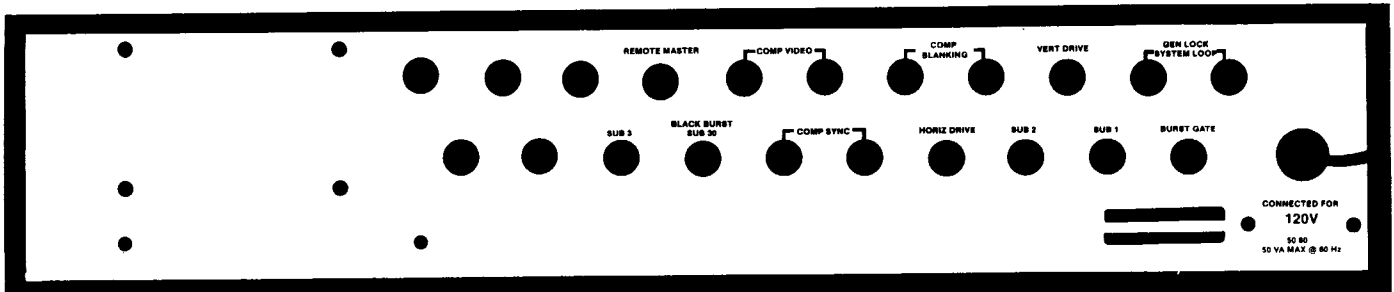


Blue Field





1474 Rear Panel



1470 Rear Panel

Each test signal provides essentially aberration-free transitions and accurate flat levels. Specifications for the test signals are under Characteristics later in this section.

COLOR BARS



The 1470 provides a full-field color bars signal. Color bars are useful for color monitor adjustments, VTR tape lead in, and system checks.

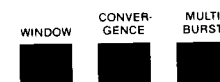
NTSC Color Bars — Full field: 75% amplitude, 100 IRE white reference, 7.5% setup. Luminance signal accuracy: within 2%. Chrominance signal absolute amplitudes: within 3% (all subcarrier frequency components).

COLOR FIELDS



Red, green, and blue color field signals are provided for checking purity on color monitors/receivers that do not have individual gun on/off controls. These signals may also be used to provide a color background source. The red, green and blue selectors may be used simultaneously to provide yellow, cyan, magenta, and white full field signals.

WINDOW, CONVERGENCE, MULTIBURST



Test Signals available include:

Window signal suitable for measuring both line time and field time distortion.

Convergence test signals for checking color monitor convergence and linearity, and camera scanning linearity. (Not shown)

Multiburst signal for checking system frequency response.

Window Amplitude — 100 IRE, ± 2 IRE. Duration: 25.8 μs, ± 3%. Starts at line 66 in each field and ends at 218 in each field. Rise time: 150 ns nominal.

Crosshatch Pattern or Dots — Setup: 7.5 IRE ± 1 IRE. Peak level: 77 IRE ± 2 IRE. Rise and fall time: 150 ns nominal.

Multiburst — White reference amplitude: 100 IRE ± 2% IRE. Multiburst amplitude: 50 IRE ± 2% IRE. Average level: 55 IRE ± 1 IRE. Multiburst frequencies: 0.5 MHz, 1.5 MHz, 2.0 MHz, 3.0 MHz, 3.58 MHz, 4.2 MHz.

STAIRCASE



LINEARITY (STAIRCASE)

Staircase signal with selection of high, medium, or low APL. Staircase subcarrier may be switched on or off from the front panel.

Staircase Luminance Component — 5 step amplitude (each step): 20 IRE ± 1 IRE (143 mV). Staircase amplitude: 100 IRE ± 2 IRE (714 mV). Aberrations: within 2% of step amplitude. Step rise time: 150 ns nominal.

Staircase Subcarrier Chrominance Component — Amplitude: 40 IRE ± 1 IRE (286 mV p-p). Phase: 180°. Differential phase: ± 0.3°. Differential gain: ≤ 0.5%. Subcarrier envelope rise time: 400 ns nominal.

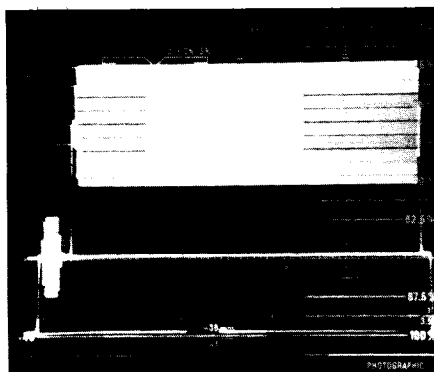
1470 Test Signal Generator Outputs Composite Video — Return loss: ≥ 30 dB to 5 MHz. Output level into 75 Ω: 1 V. Sync: 40 IRE, ± 1 IRE (286 mV nominal amplitude). Peak video level: ± 100 IRE, ± 2 IRE (714 mV nominal amplitude). Blanking dc level: 0 V, ± 50 mV.

OTHER CHARACTERISTICS

1470 Power Requirements — 115V or 240V line voltage, High-Low Ranges. Selection switches for line voltages and ranges are accessible internally. Factory-set to 120V. 120V Range — High, 108V to 132V; Low, 95V to 110V. 240 Range — High, 216V to 250V; Low, 198V to 242V. Line Frequency: 50-60 Hz. Power max: 50W. 1474 Power Requirements — 115V: 90-130V. 240V: 198V to 250V. Power: max 40W.



Yellow Field



ORDERING INFORMATION

1470 Color Sync and Test Signal Generator

#3025 00

Option 01, Sync Generator without Gen-lock

1474 Color Sync Generator

Option 01, Sync Generator without Gen-lock

Rack Mounting — The 1470 and 1474 are shipped ready to install.

GV3257A Automatic Change Over Unit