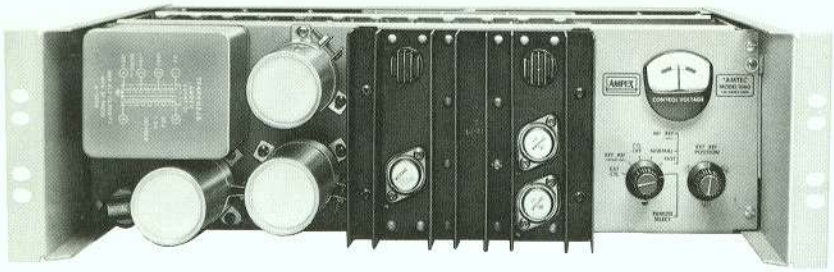
AMPEX

Amtec*
Time Element Compensator



For eliminating distortions in picture geometry, and for greatly extending the utility of your videotape recorder

Description

The Amtec Time Element Compensator provides line-by-line compensation for timing errors in the composite video signal. In this way, the Amtec System eliminates picture geometric distortions from all causes: skewing, scalloping, quadrature, essing and waterfall. Additionally, the Amtec System extends the tolerance for error in video head alignment and effects instant correction at splice points—even when the two tapes are from recorders of differing head alignments. When a videotape recorder is equipped with the Intersync* Television Signal Synchronizer, the Amtec System will provide a rock-steady picture lock with the external sync. When certain trick effects are desired, provision is made for altering the geometry of the picture. The entire equipment, complete with power supply, is contained in a single chassis requiring only 5¼" of rack space. The unit may be installed in less than two hours; slide-out design permits easy access to circuit cards, yet the mounting arrangement is rugged enough for mobile applications.

Features

525/625 operation standard · 405/525/625 operation optional · External bypass relay eliminated · No fixed delay line · Greatly improved video response · All solid state construction, for low power consumption, high reliability · Only two operating controls · Slide-out chassis mounting and plug-in circuit cards for easy maintenance · Circuit card extender provided · Built-in power supply

Operating Controls

Only two controls appear on the front panel; all other adjustments are pre-set and rarely need adjustment.

Function Selector—This six position control selects one of the following modes:

EXTERNAL CONTROL: A special test position, and where an external waveform may be applied to modulate the variable delay line for special effects.

EXTERNAL REFERENCE: Selects station sync as correction reference when the Intersync System is used. Provides for simultaneous geometric correction and time base stabilization.

CONTROL OFF: At this point the Amtec operates as a unity gain amplifier only.

NORMAL: Normal geometric correction.

FAST: An emergency position when video contains an abnormal amount of hum or similar deformity.

REMOTE SELECT: Provides selection of operating modes remotely when used on VR-1200 and VR-2000.

Phasing Control—A variable control used when the Function Select Switch is in the "External Reference" position. It adjusts timing of the system output signal to coincide with the external reference.

Theory of Operation

AMTEC accomplishes line-by-line compensation of timing errors in the composite video signal by sampling the timing accuracy of the signal once each horizontal interval, with respect to a stable timing reference. An internal AFC controlled oscillator is used as the refer-

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ence signal when the unit is operated in the NORMAL or FAST modes, and external station sync is used when operated in the INTER-SYNC mode. The instantaneous time difference between the sampled and reference signals is converted to a proportional voltage which controls the delay time of a voltage controlled delay line in the video signal path. The unit is inserted between the demodulator and the processing amplifier of the videotape recorder. It has unity gain with high performance characteristics necessary to pass color or monochrome video unaltered, except for time-base correction.

Specifications

Environmental

Operating temperature: 0 to 50°C

Power Requirements

Power input: 117 volts, 50 or 60 cps, 50 watts maximum

Input Impedances

Video: 75 ohms ±2% unbalanced
External reference sync: High impedance, bridging
External control: 10,000 ohms (approx.), bridging

Output Impedances

Video: 75 ohms ±2% unbalanced
Horizontal trigger: 75 ohms ±2% unbalanced
Error waveform monitor: High impedance

Input Signal Levels

Standard video: 1.0 volt peak-to-peak, composite sync negative
External reference sync: 2.5 to 8.0 volts peak-to-peak, negative
External control: 1.8 volts peak-to-peak produces 1.0 microsecond ±5% peak-to-peak change of delay

Output Signal Levels

Standard video: 1.0 volt peak-to-peak, composite sync negative
Horizontal trigger: 2.0 microseconds wide, negative pulse, 4.0 volts peak-to-peak into 75 ohms load
Error waveform monitor: 1.0 volt peak-to-peak (equivalent to 1.0 microsecond ±5% peak-to-peak error)

Video Performance at Mid-Delay

Video gain: Fixed at unity ±5%, output terminated in 75 ohms
High frequency response: Flat ±0.25 db to 6 mc, relative to 100 kc
Frequency response variation: 0.5 db maximum at 3.58 mc, and/or 4.43 mc through a 1.0 microsecond delay range
Low frequency tilt: 2% maximum on 50 cps square wave with composite sync and blanking
Transient response: K factor is ½% maximum with 0.2 μsec. H.A.D. sine-squared pulse
Differential gain: 1% maximum at 3.58/4.43 mc, independent of duty cycle
Differential phase: 0.5° maximum at 3.58/4.43 mc, independent of duty cycle
Signal delay: 3.0 μsec, ±5%

Time Base Compensation Performance

Total range of correction: 1.0 μsec minimum for any combination of geometric and jitter errors
Remaining repetitive geometric timing error: .02 μsec peak-to-peak, or less, with 0.5 μsec peak-to-peak input error containing no false sync timing or differential velocity error
Equivalent positional noise: 0.006 μsec rms maximum, with E-E simulated 40 db signal-to-noise ratio and input sync pulse rise time of 0.25 μsec, or less
Remaining low frequency picture jitter and short term timing drift with Inter-Sync: 0.01 μsec peak-to-peak, maximum
Total remaining timing error with Inter-Sync (including all error components) as referred to external sync source: ±0.03 μsec, or less

Physical

Height: 5¼ inches (13 cm)
Width: 19 inches (48 cm)
Depth: 17⅛ inches (43 cm) less mounting brackets
Weight: 35 pounds

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