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Instruction Manual

Tektronix

TSG-100
NTSC Television Generator

070-6881-00

Please check for change information at the rear of this manual.

First Edition: April 1988
Last Revised: September 1994

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SAFETY SUMMARY

The general safety information in this part of the summary is for both operating and servicing personnel. Specific warnings and cautions will be found throughout the manual where they apply, but may not appear in this summary.

TERMS

In This Manual

CAUTION statements identify conditions or practices that could result in damage to the equipment or other property.

WARNING statements identify conditions or practices that could result in personal injury or loss of life.

As Marked on Equipment

CAUTION indicates a personal injury hazard not immediately accessible as one reads the marking, or a hazard to property, including the equipment itself.

DANGER indicates a personal injury hazard immediately accessible as one reads the marking.

SYMBOLS

In This Manual



This symbol indicates where applicable cautionary or other information is to be found.

As Marked on Equipment



DANGER — High voltage.



Protective ground (earth) terminal.



ATTENTION — refer to manual.

Power Source

This product is intended to operate from a power module connected to a power source that will not apply more than 250 volts rms between the supply conductors or between either supply conductor and ground. A protective ground connection by way of the grounding conductor in the power cord is essential for safe operation.

Ground the Product

This product is grounded through the grounding conductor of the power module power cord. To avoid electrical shock, plug the power cord into a properly wired receptacle before connecting to the product input or output terminals. A protective ground connection by way of the grounding conductor in the power module power cord is essential for safe operation.

Danger Arising From Loss of Ground

Upon loss of the protective-ground connection, all accessible conductive parts (including knobs and controls that may appear to be insulating) can render an electric shock.

Use the Proper Fuse

To avoid fire hazard, use only the fuse of correct type, voltage rating, and current rating as specified in the parts list for your product.

Refer fuse replacement to qualified service personnel.

Do Not Operate in Explosive Atmospheres

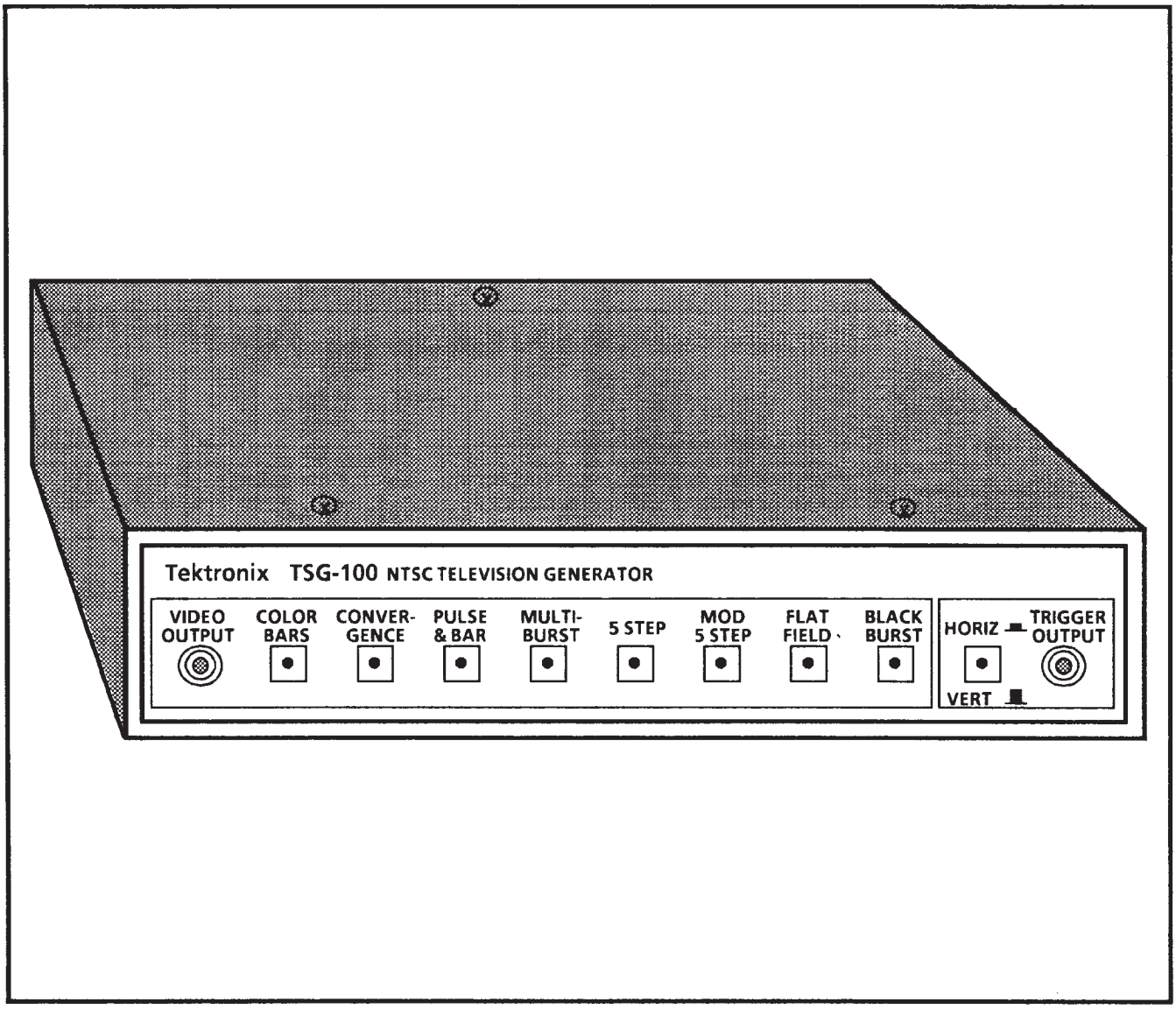
To avoid explosion, do not operate this product in an explosive atmosphere unless it has been specifically certified for such operation.

Do Not Operate Without Covers

To avoid personal injury, do not remove the product covers or panels. Do not operate the product without the covers and panels properly installed.

Do Not Service Alone

Do not perform internal service or adjustment of this product unless another person capable of rendering first aid and resuscitation is present.


Tektronix TSG-100 NTSC TELEVISION GENERATOR
VIDEO OUTPUT
COLOR BARS
CONVER- GENCE
PULSE & BAR
MULTI- BURST
5 STEP
MOD 5 STEP
FLAT FIELD
BLACK BURST
HORIZ
TRIGGER OUTPUT
VERT

TSG–100

SECTION 1
INTRODUCTION

The TSG–100 digitally generates a set of eight NTSC television test signals at baseband. To allow easy display of these signals on an oscilloscope, the TSG-100 also provides a trigger output that is switchable between horizontal and vertical rate trigger pulses.

In addition, it provides a 1 kHz audio tone at 8 dBu for setting amplitude levels of audio equipment and for checking continuity. For field operations, it is capable of running on a 12 V battery.

The test signal complement is:

- SMPTE Bars
- Convergence Pattern
- Pulse and Bar
- Multiburst
- 100% Luminance 5-step
- 100% Modulated 5-step
- 100 IRE Flat Field
- Black Burst

SECTION 2

CONTROLS, INDICATORS, AND CONNECTORS

Front-Panel Controls

Signal selection — Eight front-panel switches select the eight test signals. Details of these signals are given in the Specifications section of this manual. The signals, from left to right, are:

1. SMPTE Bars
2. Convergence
3. Pulse & Bar
4. Multiburst
5. 5-Step Staircase
6. Modulated 5-Step
7. Flat Field
8. Black Burst

Trigger pulse selection — The trigger switch selects between horizontal and vertical trigger pulses for oscilloscope display of the selected test signal.

The horizontal trigger signal is a horizontal rate square wave. The positive trigger edge occurs at the beginning of the line and the negative in the middle of the line. This allows you to look at either the beginning of the line or the middle, depending on whether you set the scope trigger level to positive or negative.

The vertical trigger is a two-field square wave. The positive edge occurs on odd fields and the negative on even fields. This allows you to look at either odd fields with the scope trigger on the positive slope or even fields with the trigger on the negative slope.

Front-Panel Indicators

The LEDs at the center of each test signal button indicate which signal has been selected.

Front-Panel Connectors

The front panel has two connectors: the Test Signal output BNC and H/V Trigger BNC.

Rear-Panel Controls

Both ac and dc power are turned on and off with the rear-panel power switch. When the power cord is disconnected, the power switch controls the battery. When the cord is connected, the power switch controls ac line power. If both ac and dc are applied at the same time, the ac source drives the instrument.

Rear-Panel Connectors

The rear panel has a test signal output BNC and a 1 kHz audio output XLR connector. Also located on the rear panel are the 110 Vac power socket and the DC power input.

CAUTION

The DC Power Input Connector is wired to accept a Sony BP90 battery pack. THE CENTER PIN OF THIS CONNECTOR IS GROUNDED, as shown in Fig 2-1.

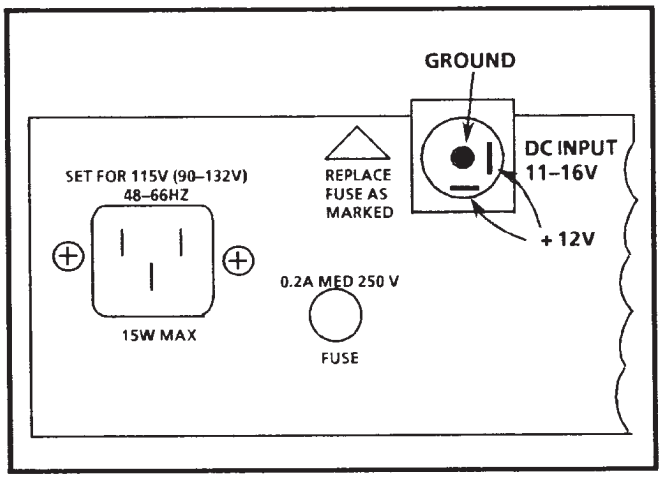


Fig. 2-1. DC Input Connector.

If the DC Input Voltage polarity is accidentally reversed, the DC power supply 2A fuse will blow. The allowable voltage variation is +11 Vdc to 16 Vdc. Typical power consumption in DC operation is 8 watts.

Audio Tone Level Adjustment

You can adjust the 1 kHz audio tone level over a range of 0 to 8 dBμ into 150Ω, 600Ω, or high impedance. Looking at the left side of the generator (as you face the front) you will see a hole as shown in Fig. 2-2. Through this hole you can locate the level adjustment pot.

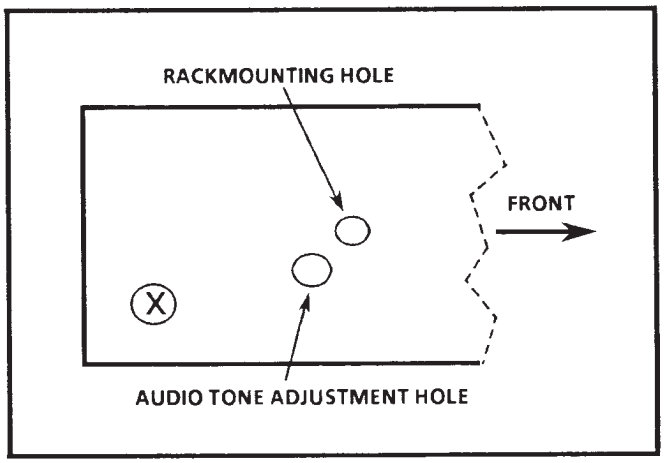


Fig. 2-2. Left side view of TSG–100.

SECTION 3
SPECIFICATIONS

The performance requirements listed here apply over an ambient temperature range of 0°C to +35°C after a warmup time of 30 minutes. The rated accuracies are valid when this instrument is calibrated at +25°C

Test equipment used in verifying performance requirements must be calibrated and working within the limits specified under Table 5-1 of this manual.

Table 3-1
Test Signal Generator — General Test Signal Characteristics

Characteristics	Performance Requirement	Supplemental Information
Luminance Amplitude Accuracy	±1% of 100 IRE.	
Chrominance-to-Luminance Gain	±2% of 100 IRE.	1% typical. Measured at white flag and 3.58 MHz of the Multiburst signal.
Chrominance-to-Luminance Delay	≤15 ns.	10 ns typical. Measured with the Pulse & Bar signal.
Blanking Level	0 Vdc ±50 mV.	
Luminance Rise Time	250 ns ±25 ns.	Except where specified otherwise.
Chrominance Rise Time	400 ns ±40 ns.	Except where specified otherwise.
Burst Amplitude	285.7 mV (40 IRE) ±2%.	
Burst Rise Time	400 ns ±40 ns.	
Sync Amplitude	285.7 mV ±1% of 100 IRE.	
Sync Rise Time	140 ns ±20 ns.	
Line Timing	See Figs. 3-1 through 3-8.	
Front Porch Duration	1.5 μs ±0.1 μs.	
Line Blanking Interval	10.9 μs ±0.2 μs for all test signals.	Measured at 20 IRE point of active video.
Breezeway Duration	600 ns ±100 ns.	
Line Sync Duration	4.7 μs ±100 ns.	50% amplitude point.
Vertical Serration Duration	4.7 μs ±100 ns.	50% amplitude point.
Equalizing Pulse Duration	2.35 μs ±100 ns.	50% amplitude point.
Burst		
Delay from Sync	5.308 μs ±35 ns.	19 cycles of subcarrier.
Burst Duration	2.51 μs ±0.1 μs.	9 cycles of subcarrier.
Output Impedance		75Ω.
Return Loss		≥36 dB to 4.2 MHz.
Signal-to-Noise Ratio	≥60 dB.	Signal passed through a continuous random noise 5 MHz low-pass filter.
Subcarrier Stability	3.579545 ±10 Hz over temp range of 5-35°.	Over temp range of 5-35°. Annual oscillator adjustment required.

Table 3-2
Test Signal Generator —Test Signals

Characteristics	Performance Requirement	Supplemental Information
COLOR BARS	SMPTE Bars.	
CONVERGENCE		
Amplitude	549.1 mV (76.9 IRE).	
Pattern		Crosshatch — 14 horizontal lines and 17 vertical lines per field.
Pulse HAD	225 ns ±25 ns.	
PULSE & BAR WITH WINDOW		
2T Pulse HAD	250 ns ±25 ns.	
White Bar Amplitude	100 IRE.	
Field Tilt	≤0.5%.	
Line Tilt	≤0.5%.	
Window Timing	Lines 72 to 202.	
2T Pulse Ringing	≤1.5% peak.	
MULTIBURST		
White Reference Bar Amplitude	500 mV (70 IRE).	
Packet Amplitudes	428.6 mV (60 IRE) p-p.	
Pedestal	285.7 mV (40 IRE).	
Burst Frequencies	500 kHz, 1.0 MHz, 2.0 MHz, 3.0 MHz, 3.58 MHz, and 4.2 MHz.	
Packet Rise Time		
500 kHz		140 ns typical (sine-squared shaped packets).
Other Packets		400 ns typical (sine-squared shaped packets).
100% 5-STEP STAIRCASE		
Amplitude	714.3 mV (100 IRE).	
Linearity Error	≤1%.	Relative step matching.

Table 3-2
Test Signal Generator — Test Signals (cont.)

Characteristics	Performance Requirement	Supplemental Information
100% MOD 5 STEP		
Luminannce Amplitude and Linearity	Same as Luminance Ramp.	
Chrominance Amplitude	285.7 mV (40 IRE).	
Diff Gain	1% maximum.	
Diff Phase	0.6° maximum.	
FLAT FIELD		
Amplitude	714.3 mV (100 IRE).	
BLACK BURST		
Amplitude	7.5 IRE.	

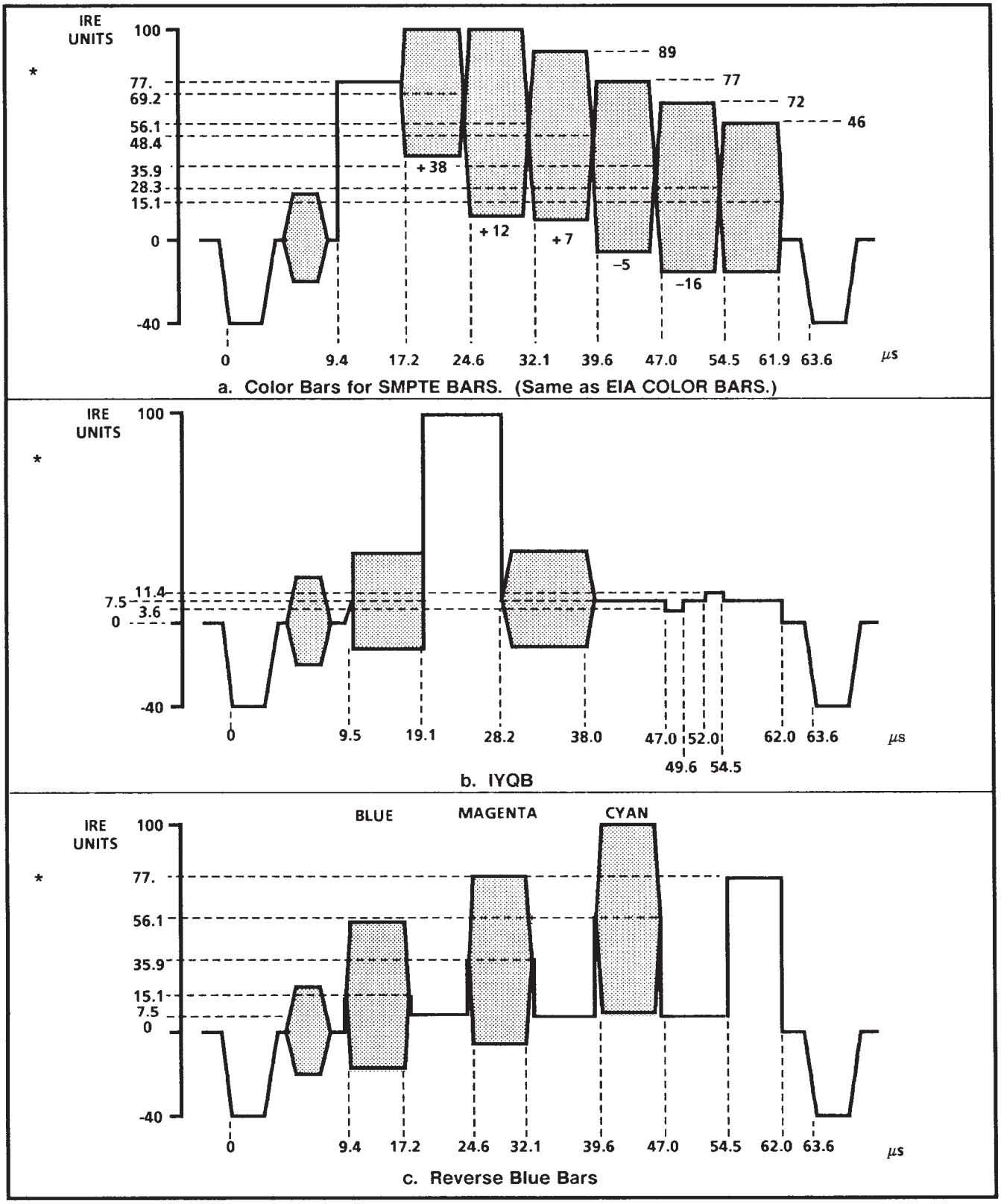


Fig. 3-1. Color Bar signal components.

* Where both chrominance and luminance transitions exist at the same time, only chrominance transition times are shown.

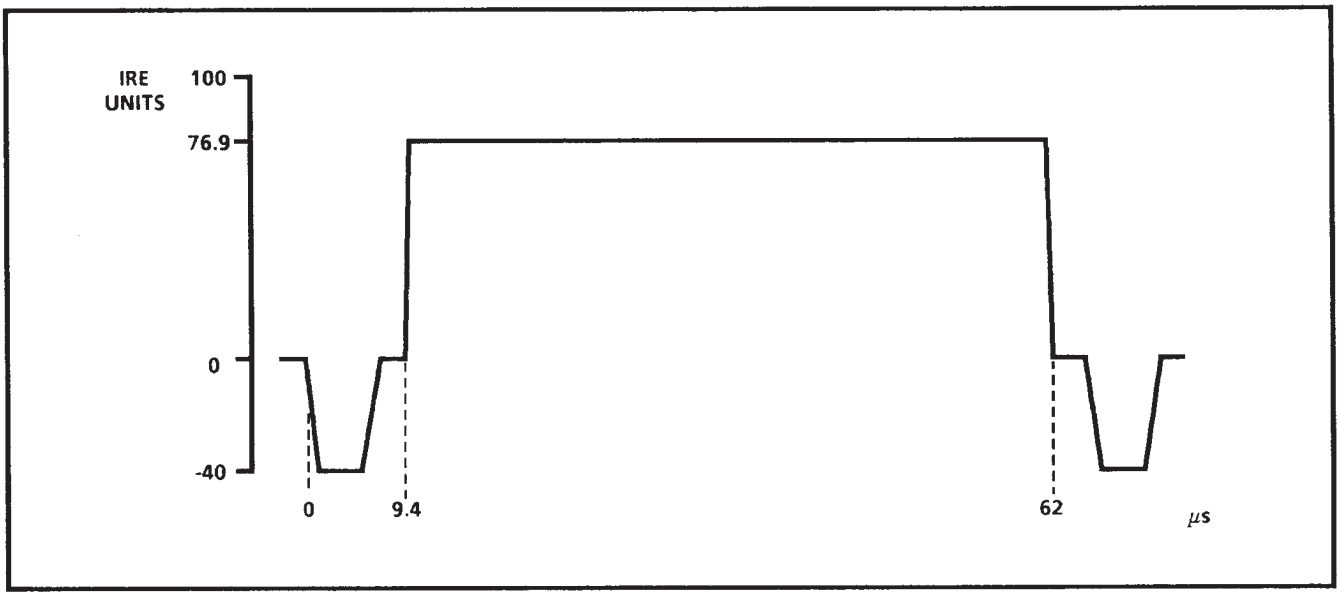


Fig. 3-2a. Horizontal Component of Convergence Test Signal.

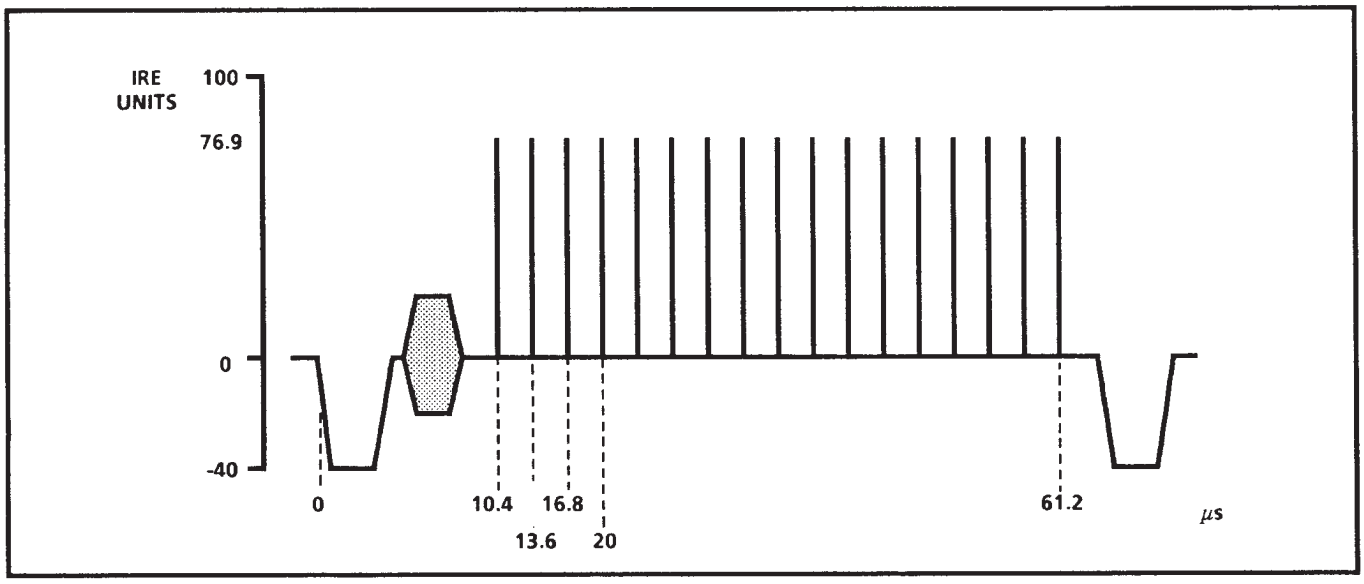


Fig. 3-2b. Vertical Component of Convergence Test Signal.

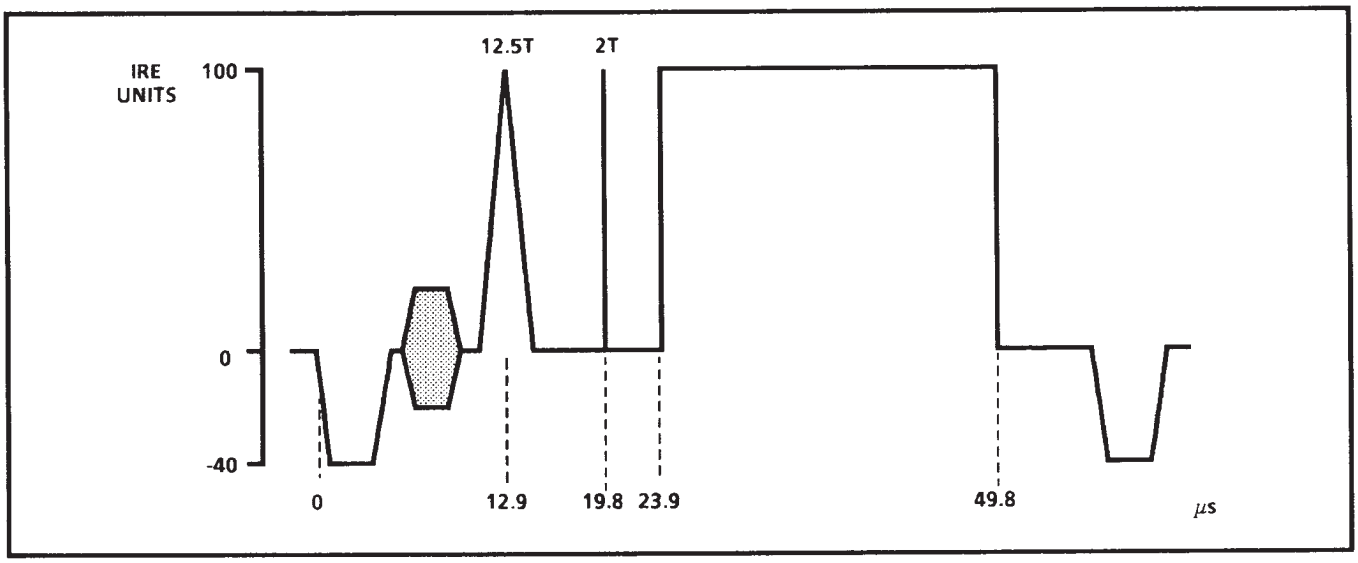


Fig. 3-3. Mod Pulse and Bar.

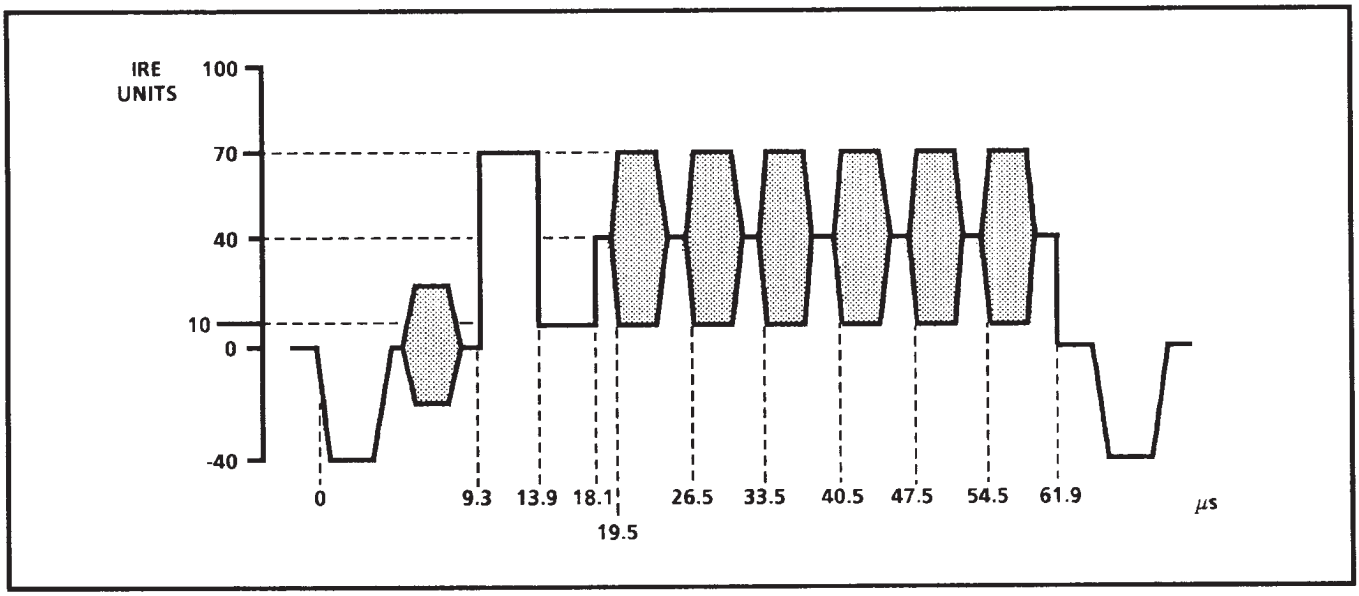


Fig. 3-4. Multiburst.

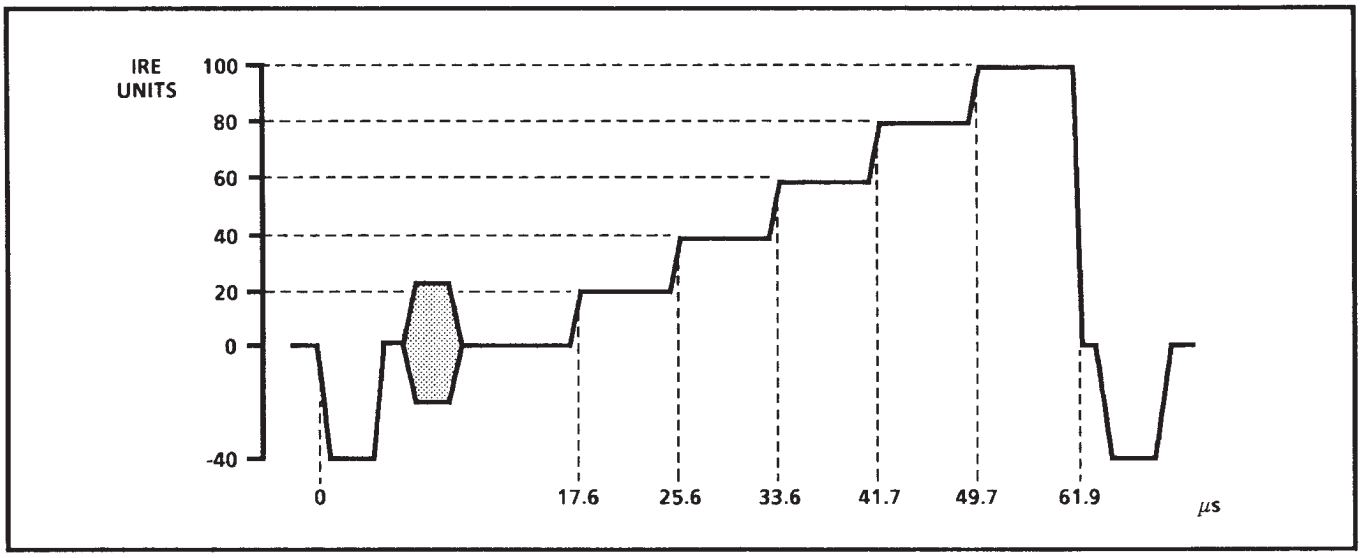


Fig. 3-5. 5-Step Staircase.

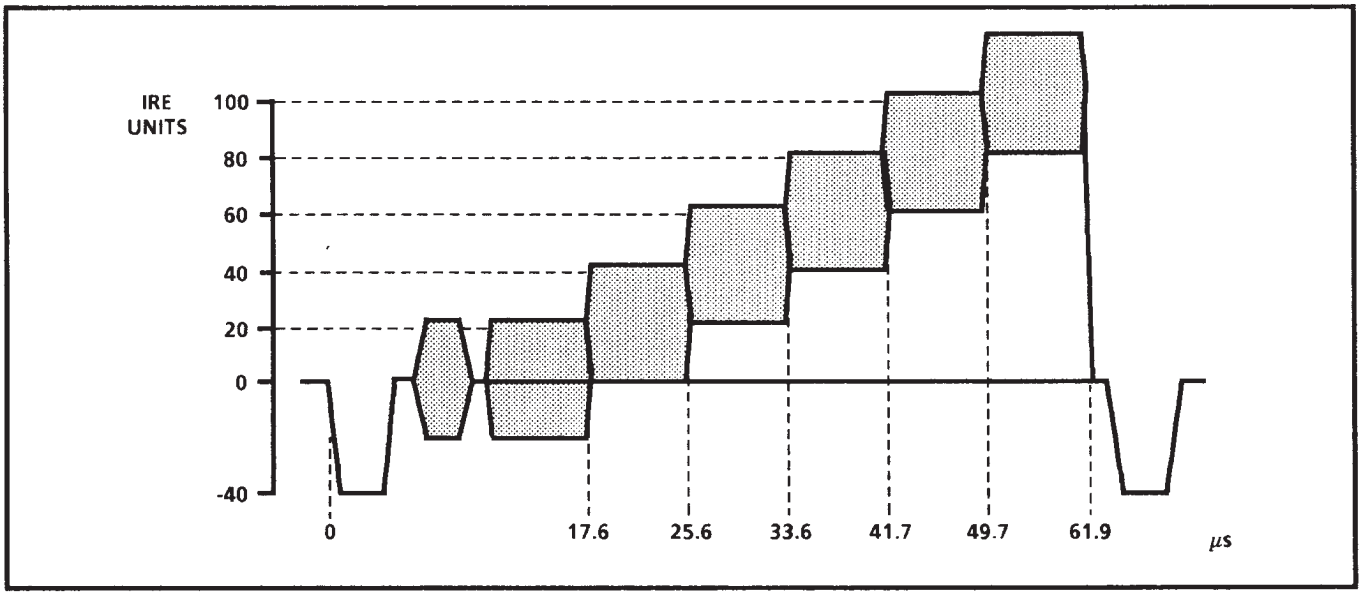


Fig. 3-6. Mod 5-Step Staircase.

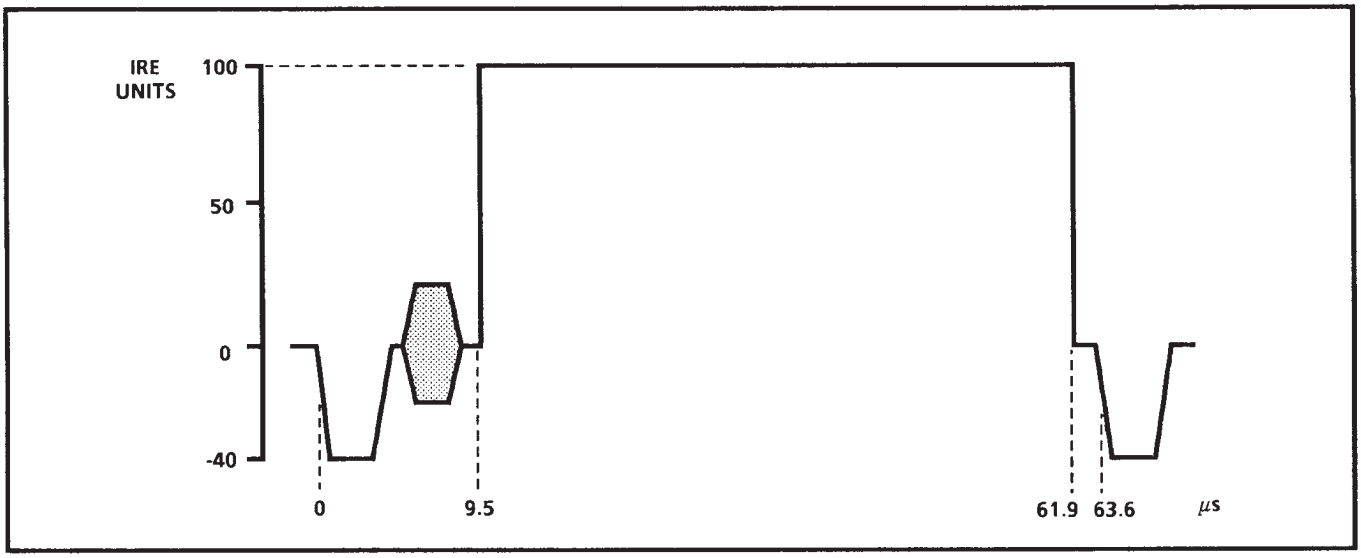


Fig. 3-7. 100 Flat Field.

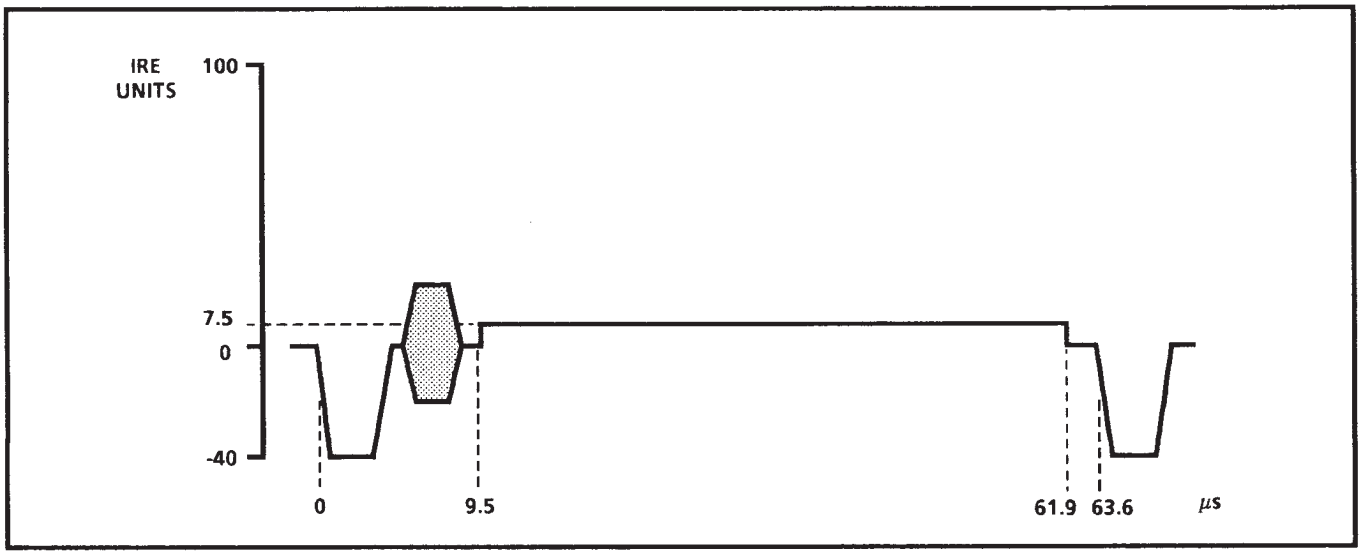


Fig. 3-8. Black Burst.

Table 3-3
Trigger Output

Characteristics	Performance Requirement	Supplemental Information
Amplitude		TTL levels.
Pulse Duration V Trigger H Trigger	 2-field square wave. H-rate square wave.	
Timing V Trigger H Trigger	 High for field 1 or 3, low for field 2 or 4. High for start of line, low for end of line.	 Transitions occur 1.5 lines before vertical interval. Positive transition occur just before H sync.

Table 3-4
Power Supply

Characteristics	Performance Requirement	Supplemental Information
Supply Accuracy +12 V +5 V –5.1 V –12 V		 12 V ±600 mV. 5 V ±250 mV. –5.2 V +300 mV –500 mV. –12 V ±600 mV.
Power Limit		18 watts.
Hum +12 V +5 V –5.2 V –12 V		**Typical** 10 mV. 10 mV. 20 mV. 10 mV.
Noise +12 V –12 V +5 V –5.1 V		 ≤50 mV (5 MHz bandwidth). ≤50 mV (5 MHz bandwidth). ≤50 mV (5 MHz bandwidth). ≤50 mV (5 MHz bandwidth).
Line Voltage Range 110 Vac	 90 – 132 Vac.	
Fuse Data 115 V Setting		 2A Med-Blow.
Power Consumption Typical		 10 watts.
Line Frequency		48 Hz to 62 Hz.

Table 3-5
Physical Characteristics

Characteristics	Information
Dimensions Rackmount Height Width Length	 1.71 inches. 8.1 inches. 12.0 inches.
Net Weight	3.25 lbs.
Shipping Weight	7 lbs. 1 oz.

Table 3-6
Environmental Characteristics

Characteristics	Information
Temperature Non-Operating Operating	 –40°C to +65°C. 0°C to +50°C.
Altitude Non-Operating Operating	 To 50,000 feet. To 15,000 feet.
Vibration (Operating)	15 minutes each axis at 0.025 inch, frequency varied from 10-55-10 c/s in 4-minute cycles with instrument secured to vibration platform. Ten minutes each axis at any resonant point or at 55 c/s.
Shock	50 g's, 1/2 sine, 11 ms duration, 3 guillotine-type shocks per side.
Transportion	Qualified under NTSC Test Procedure 1A, Category II (24-inch drop).

WARNING

The following servicing instructions are for use only by qualified personnel. To avoid injury, do not perform any servicing other than that stated in the operating instructions unless you are qualified to do so. Refer to all Safety Summaries before performing any service.

SECTION 4

PERFORMANCE CHECK AND CALIBRATION PROCEDURES

This section gives procedures for checking and calibrating your TSG–100.

These procedures are designed to be done in sequence. If you do not need to do a full procedure, start at the nearest convenient step that has a setup drawing.

Table 4-1 lists the equipment you will need. If you use alternate equipment, make sure it meets the specifications given in this table.

NOTE

After completing each step, immediately return jumpers to their original position.

Table 4-1
Recommended Test Equipment (Including Accessories)

Test Equipment	Minimum Specifications	Equipment Examples
Test Oscilloscope Mainframe	At least 50 MHz bandwidth with dual-trace plug-in and 10X probe.	TEKTRONIX 7603.
Test Oscilloscope Differential Comparator Plug-In	Minimum deflection factor 10 mV/div with 10X probe.	TEKTRONIX 7A13; plugs into 7603 mainframe.
Test Oscilloscope Dual-Trace Amplifier Plug-In	Minimum deflection factor 50 mV/div with 10X probe.	TEKTRONIX 7A26; plugs into 7603 mainframe.
Test Oscilloscope Dual Time Base Plug-In	Sweep rate 5 ns/div to 5 μs/div.	TEKTRONIX 7B53A; plugs into 7603 mainframe.
Spectrum Analyzer	Capable of measuring to at least 5 MHz.	TEKTRONIX 7L12; plugs into TEKTRONIX 7603 mainframe.
Low Pass Filter	5 MHz.	Tektronix Part No. 015-0213-00.
NTSC Waveform Monitor	For displaying and measuring field-rate and line-rate waveforms.	TEKTRONIX 1480 Mod W5F.
NTSC Vectorscope	For measuring differential phase and gain.	TEKTRONIX 520A.
NTSC Test Signal Generator	Provides the following test signals: black burst, flat field, staircase, pulse & bar, manual and continuous sweep, V drive, and subcarrier output. Provides variable subcarrier and sync amplitudes.	TEKTRONIX 1410/SPG2A (Opt AA)/TSP1/TSG3/TSG5/ TSG6.

Table 4-1 (cont.)
Recommended Test Equipment (Including Accessories)

Test Equipment	Minimum Specifications	Equipment Examples
Video Amplitude Calibration Fixture (VAC)	Provides a chopped voltage reference accurate to ±0.05% from 0 to 1 V in 0.1 mV increments. (Used with the TEKTRONIX 1480 MOD W5F Waveform Monitor.)	Tektronix Part No. 067-0916-00. Plugs into a TEKTRONIX TM 503 Power Mainframe.
Frequency Counter	For measuring subcarrier frequency. Accurate to within 2-1/2 Hz out of 5 MHz.	TEKTRONIX DC 501, Opt. 01; plugs into TM 503 Power Mainframe.
RG59/U Coaxial Cables (Qty 2)	Impedance, 75Ω; length, 42 inches. Equipped with bnc connectors.	Tektronix Part No. 012-0074-00.
End-Line Termination (Qty 3)	Impedance, 75Ω. Equipped with bnc connectors.	Tektronix Part No. 011-0102-00.
Feed-Through Termination (Qty 2)	Impedance, 75Ω. Equipped with bnc connectors.	Tektronix Part No. 011-0103-02.
Jumper-Type Termination	Impedance 75Ω. (Two-pin connector with a 75Ω, 1%, 1/8 W resistor installed.)	Tektronix Part No. 119-1158-00.
50Ω to 75Ω Minimum Loss Attenuator	Equipped with bnc connectors.	Tektronix Part No. 011-0057-00.
BNC Female-to-BNC Female Adapter	None.	Tektronix Part No. 103-0028-00.
50Ω Coaxial Cable	Length, 42 inches. Equipped with bnc connectors. For use with the spectrum analyzer and SG 503.	Tektronix Part No. 012-0057-01.
Distortion Analyzer	Must test to at least 0.01% THD and test power output over range of 0 to 8 dBm.	TEKTRONIX AA501.
Audio Connector-to-Triple Banana Cable	None.	ITT Pamona Electronics, Model 4953-J-36. Must be reconfigured to match the TSG–100 audio output. Pin 1: Shield, pin 2: +, pin 3: —.

aSix-foot length was used to interconnect the test equipment. If 42-inch length is preferred, the Tektronix Part No. is 012-0159-00.

PERFORMANCE CHECK PROCEDURE

TEST SIGNAL OUTPUT

1. Blanking Level

a. Connect test equipment as in Fig. 4-1.

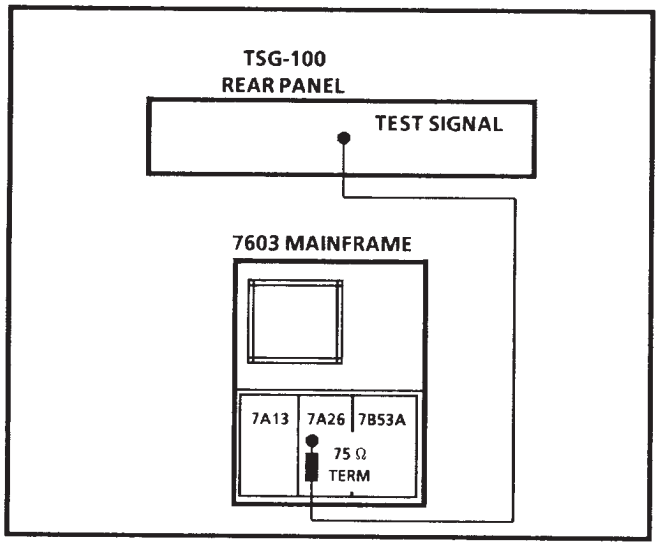


Fig. 4-1. Setup to Test TEST SIGNAL Output Blanking Level.

b. Select 5-Step from the TSG–100.

c. Set the oscilloscope to a ground reference.

d. CHECK — that the blanking level is 0 V ±50 mV.

2. Luminance Amplitude

a. Connect test equipment as in Fig. 4-2.

b. Select 5-Step from the TSG–100.

c. Set the 1480 to view the 5-Step at a horizontal rate in A–B mode, using a VAC (Voltage Amplitude Calibration Fixture) as the B input.

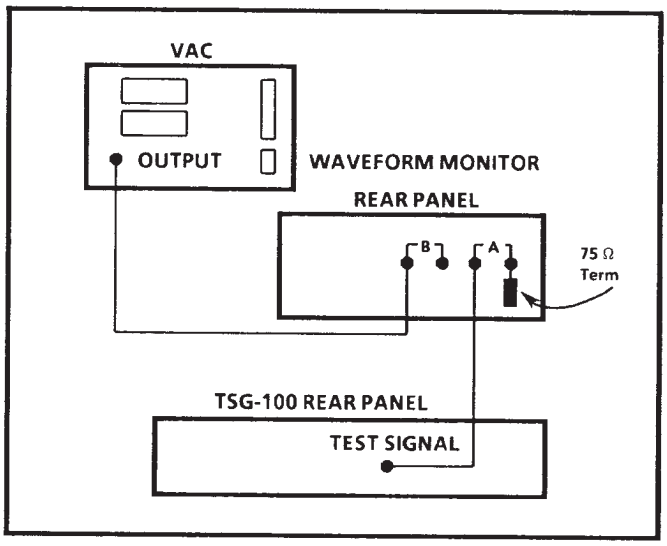


Fig. 4-2. Setup to Check TEST SIGNAL Output Luminance Amplitude.

d. With the VAC, match the top of the lower 5-Step waveform with the blanking level of the upper waveform.

e. CHECK — that the 5-Step amplitude is 714.3 mV ± 7.14 mV (1%).

3. 5-Step Staircase Linearity

a. With the 5-Step signal still selected, set the 1480 to view the 5-Step in differentiated form through the Channel A input at full scale.

c. CHECK — that the difference in relative amplitude of each differentiated step riser (spike) is ≤3.6 mV (0.5 IRE).

4. Check Line Tilt

a. Select Flat Field from the TSG–100.

b. CHECK — that the active line portion of the signal is 714.3 mV ±3.6 mV (0.5 IRE). Ignore the area immediately around the transitions.

5. Check Field Tilt

Same as Line Tilt test, except the waveform monitor should be set to display two fields.

6. Chrominance-Luminance Delay

a. Select Pulse & Bar from the TSG–100.

b. Set the 1480 to view the bottom of the 12.5T Modulated pulse.

c. CHECK — that the sine-wave-like envelope at the base of the 12.5T pulse is no more than 10.7 mV p-to-p (1.5 IRE), equivalent to 15 ns.

7. Ringing

a. With Pulse & Bar still selected, set the waveform monitor to display the 2T pulse at a horizontal rate.

b. CHECK — for a maximum of 10.7 mV (1.5 IRE) of ringing after the 2T pulse (7.1 mV is typical).

8. Chrominance-to-Luminance Gain

a. Select Multiburst from the TSG–100.

b. CHECK — that the white flag and 3.58 MHz burst packet have equal amplitude within ±4.3 mV peak (2% of 100 IRE). Less than 1% is typical.

9. Differential Phase and Gain

a. Connect test equipment as in Fig. 4-3.

b. Select Mod 5-Step from the TSG–100.

c. Set the vectorscope to measure differential phase of the Channel B input.

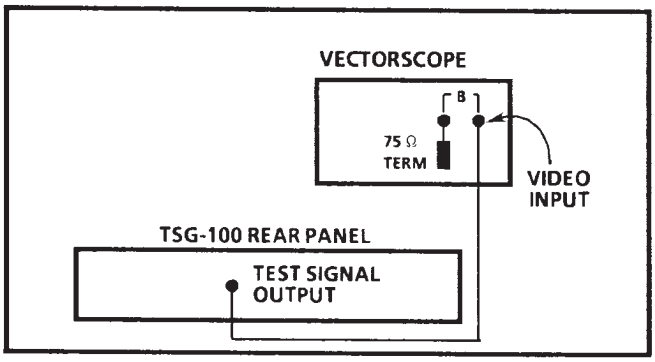


Fig. 4-3. Setup to Check TEST SIGNAL Output Differential Gain and Phase.

d. CHECK — for ≤0.6° differential phase on the Calibrated Phase Dial (0.3° typical).

e. Set the 520A to measure differential gain.

f. CHECK — that the Diff Gain of the Mod 5-Step is ≤1% from 0 IRE to 100 IRE (<0.5% typical).

SUBCARRIER FREQUENCY OSCILLATOR

10. Free-Running Frequency

NOTE

After initial shipment or long storage, allow a two-hour warm up to re-age the crystal. Thereafter, 30 minutes warm up is sufficient.

a. Connect the equipment as in Fig. 4-4.

b. Set the DC503 counter to count at a 4xsubcarrier rate.

c. CHECK — that the measured oscillator frequency is within 1 Hz of 14.31818 MHz.

H SYNC

11. Amplitude

a. Connect the TSG–100 as in Fig. 4-5.

b. Set the oscilloscope to display the TSG–100 Flat Field output at a line rate.

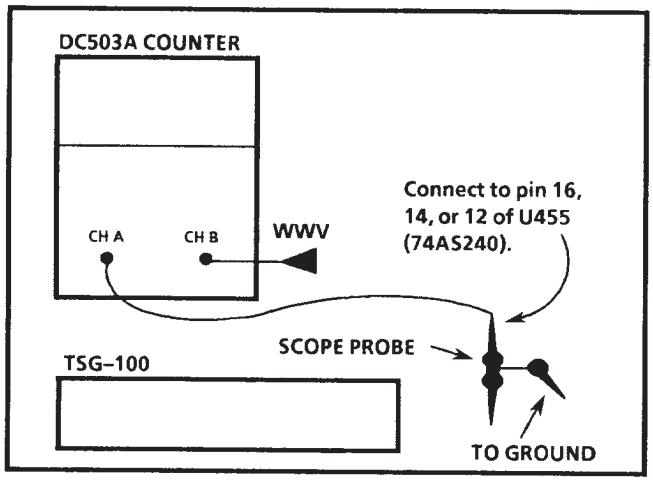


Fig. 4-4. Setup to Adjust Free-Running Oscillator Frequency.

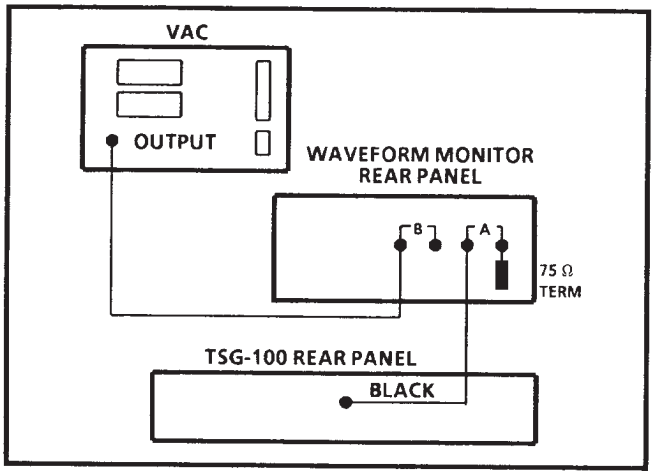


Fig. 4-5. Setup to Check H Sync.

c. CHECK — that the horizontal sync amplitude is 285.7 mV ±7.14 mV.

12. Rise and Fall Times

a. Set the oscilloscope to display sync transients.

b. CHECK — that the rise and fall times between 10% and 90% is 140 ns ±20 ns.

13. Timing

a. CHECK — that the horizontal sync duration is 4.7 μs ±0.1 μs.

b. Set the waveform monitor to display the vertical serrations and equalizing pulses.

c. CHECK — that the vertical serrations are 4.7 μs ±0.1 μs and that the equalizing pulses are 2.3 μs ±0.1 μs.

14. Horizontal Blanking

a. Set the waveform monitor to display horizontal blanking.

b. CHECK — that horizontal blanking is 10.9 μs ±0.1 μs wide from the 50% points.

AUDIO TONE (OPT 1) OUTPUT

15. Total Harmonic Distortion

a. Connect the equipment as in Fig. 4-6, and place a 150Ω or 600Ω resistor (to represent the impedance of your system) across the analyzer + and – terminals.

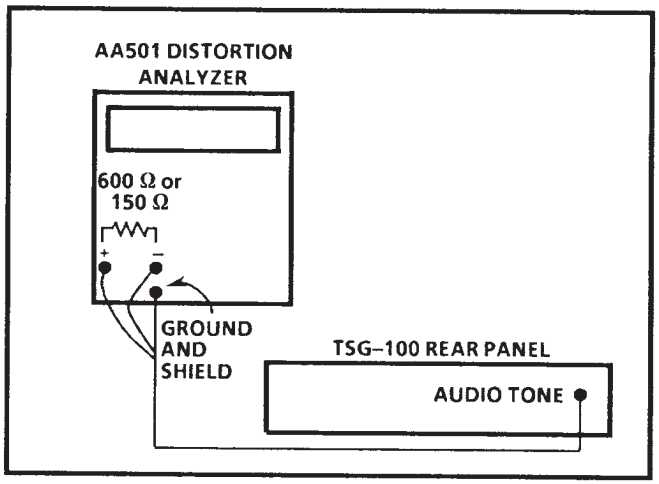


Fig. 4-6. Setup to Check THD of AUDIO TONE Output (Option 1 Board).

b. Set the distortion analyzer to measure THD (Total Harmonic Distortion).

c. CHECK — that the THD is no more than 0.5% (0.25% typical).

CALIBRATION PROCEDURES

OSCILLATOR FREQUENCY

NOTE

Set the oscillator frequency when the generator is cold.

1. Routine Oscillator Frequency Adjustment

a. Connect the equipment as in Fig. 4-7.

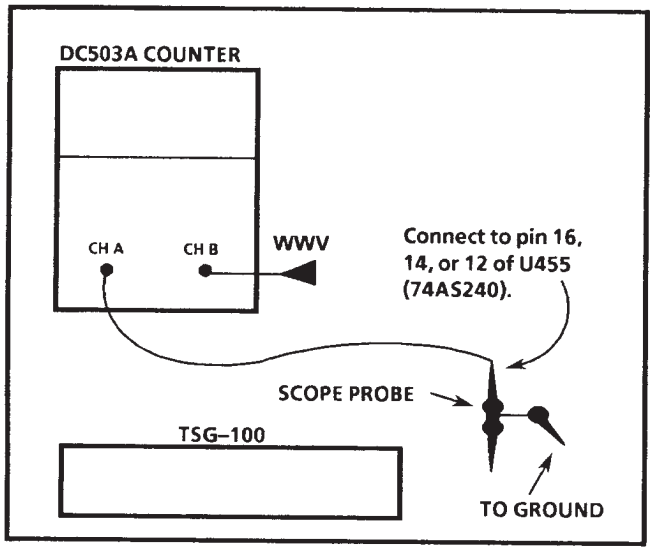


Fig. 4-7. Setup to Adjust Free-Running Oscillator Frequency.

b. Set the DC503A to count a frequency of 14.31819 MHz.

NOTE

Setting the oscillator 10 Hz high (at $4F_{SC}$) puts the chrominance subcarrier closest to 3.579545 MHz when the generator is operating at room temperature after 30 minutes warmup.

c. Remove round plastic cover from the top of the oscillator.

d. Fine-adjust the oscillator frequency to bring the SUBCARRIER output to within 1 Hz of 3.579545 MHz.

TEST SIGNAL OUTPUT

NOTE

Steps 2 and 3 are interactive.

2. Blanking Level Adjustment

a. Connect the equipment as in Fig. 4-8.

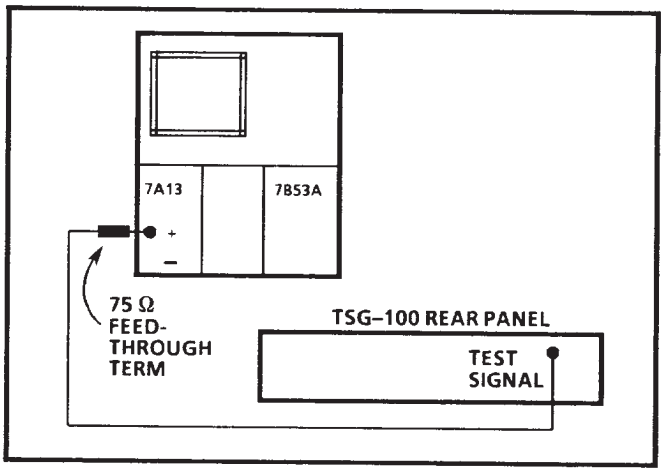


Fig. 4-8. Setup to Check Blanking Level of TEST SIGNAL Output.

b. Select 5-Step from the TSG–100.

c. Set the oscilloscope to display the blanking part of the 5-Step at a horizontal rate.

d. Set the oscilloscope trace to a ground reference, then adjust R821 on the Analog board for 0 volts ±50 mV blanking level.

3. Luminance Gain Adjustment

a. With 5-Step selected at the TSG–100, connect the equipment as in Fig. 4-9.

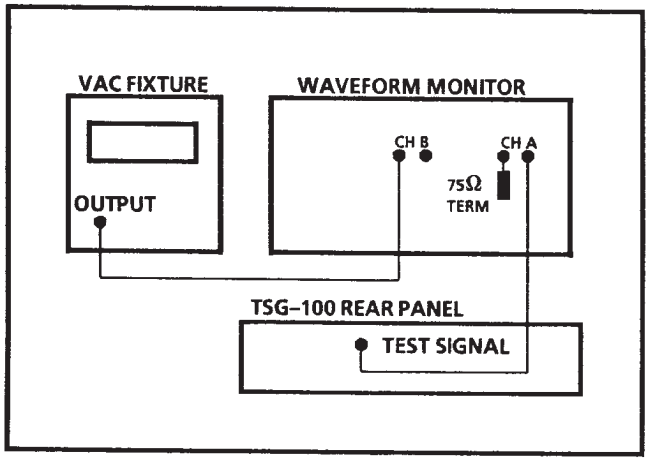


Fig. 4-9. Setup to adjust luminance gain.

b. Set the VAC to 714.3 mV and set the waveform monitor to view 5-Step at a horizontal rate in A–B mode.

c. Adjust R920 (Analog board) for 714.3 mV ±7.14 mV (1%) amplitude.

d. Repeat steps 2 and 3.

NOTE

The following four adjustments (4, 5, 6, and 7) should be done as a set. Repeat the adjustments in sequence until the best overall response is obtained.

4. Frequency Response

a. Select the Multiburst signal from the TSG-100 and remove the VAC input from the waveform monitor.

b. Set the waveform monitor to display Multiburst at a horizontal rate.

c. Adjust L636, L736, L625, L725, and L836 so that the displayed Multiburst is as flat as possible. (The 500 kHz and 3.58 MHz packets should match.)

5. Chrominance – to – Luminance Delay Adjustment

a. Select Pulse & Bar from the TSG–100.

b. Looking at the bottom of the modulated pulse waveform, adjust L736 and L636 for as flat as possible chrominance response.

NOTE

There is a trade-off between 2T pulse ringing and chrominance-luminance delay. Check both the 2T and 12.5T pulses as you adjust L736 and L636.

c. Check that the sine-wave-like envelope at the bottom of the 12.5T pulse is no more than 10.7 mV p-p (1.5 IRE).

d. Check for no more than 10.7 mV (1.5 IRE) peak ringing — below or above the signal baseline — after the 2T pulse.

6. Chrominance – to – Luminance Gain Adjustment

With Multiburst still selected, adjust C827 to make the 3.58 MHz packet amplitude match the 500 kHz packet.

8. Audio Tone Adjustment

a. Connect the equipment as in Fig. 4-10.

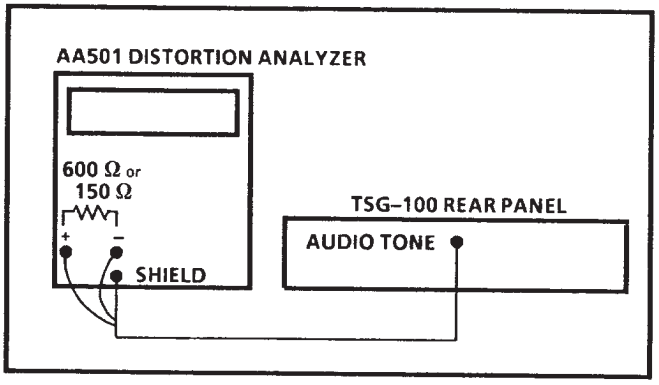


Fig. 4-10. Setup to Adjust Level of AUDIO Output of Option 1 Board.

AA501

Input Level Range	Auto range
dBm Switch	In
Level Switch	In
All Filter Switches	Out

b. Set the following controls:

c. Attach a load resistor (either 150Ω or 600Ω, to represent the load of your system) across the AA501 Audio Input pins.

d. Adjust R813 to obtain the desired dB output. (Factory setting is +8 dBm.)

SECTION 5
THEORY OF OPERATION

DIGITAL PROCESSING (SCHEMATIC 1)

Signal Timing

The Signal Timing section provides horizontal and vertical timing that enables the Signal Memory to address the signal data. The Horizontal Counter (U249-449) addresses the horizontal signal components in memory at a rate of 910 samples per horizontal line.

PAL U441 decodes this count into three signals: HCNTRCLR(L), VCNTREN(H), and VLATCHEN(H). HCNTRCLR(H) decodes the Horizontal Counter output to reset the Horizontal Counter every 910 counts. VCNTR EN(H) enables the Vertical Counter for one clock cycle twice a line. And VLATCHEN(H) enables the Vertical Counter latch (U225) twice a line.

Vertical Counter and Decoder

At a twice-a-line rate, the Vertical Counter counts from 0 to 2100. PROM U325 decodes this count to generate the four fields of vertical timing for the Address PROM in the Signal Memory. VC0-VC2 select the vertical components of the signal, CNV provides the convergence timing, and VTRIG is a two-field rate square wave for the vertical trigger output.

Signal Memory

Made up of the Segment Data PROM (U434) and Segment Address PROM (U240), the Signal Memory section stores the eight test signals. The Segment Data PROM stores signal data in 16-sample segments. The Segment Address PROM addresses these segments, and the Horizontal Counter addresses the samples that make up each segment with its H0-H2 outputs. From the Signal Memory, the signal data passes to the Output Processing section.

Front Panel Decoder (Signal Selection)

The eight test signals are selected by shorting together appropriate combinations of the Y1, Y2, and X1-X4 inputs to the Front Panel Decoder, U255. U255 polls these inputs to see which are shorted. It then generates the appropriate three-bit signal selection code (S0-S2) for the Address PROM (U240). If you want to control these three lines with an external source, you can do so by disabling U255 with J356 in the 2–3 position and attaching the control lines to the pins of J355.

Three-to-eight decoder U260 looks at the signal selection code from U255 and responds by pulling one of eight lines low to turn on the appropriate signal LED at the front panel.

System Clock

A temperature compensated crystal oscillator (Y550) puts out a TTL level 14.31818 MHz ($4F_{SC}$) clock signal to U455. U455 buffers the clock and feeds the buffered output back to three of the buffer's inputs to generate three duplicates of the clock, all having equal delay. These duplicate clocks drive the instrument (CLK1A, CLK1B, and CLK1C).

Trigger Gate

The trigger output switch (S182) selects between vertical rate and horizontal rate trigger signals. The H rate signal is simply the MSB (H9) of the H Counter. The vertical rate signal (VTRIG) is generated by decoder U325. The selected trigger signal is applied to the front panel via BNC J290.

ANALOG OUTPUT (SCHEMATIC 2)

Output Processing

Clocked by the $4F_{SC}$ rate by CLK1C, DAC U534 converts the eight-bit signal data into an analog signal, biased so that the sync tip sits at about –1.5 V. U640 provides a –1 V reference to pin 19 of U534. Current flows into this pin through current setting resistor R640.

This reference current establishes an internal reference for the current switch array in the DAC. The capacitors in parallel with the supply voltages are for noise decoupling. The feedback loop of the reference amplifier in the DAC (whose inputs are REF + and REF–) is internally closed at REF + . Compensation capacitor C541 makes this loop frequency stable.

Reconstruction Filter

The DAC passes the analog test signal to the filter via J625. This jumper allows the DAC output to be isolated from the analog output for testing. See the Jumper Table in Section 6. The front end of the filter provides group delay correction and the following stages provide reconstruction filtering.

The filter output can be measured at TP830. At this point its voltage is divided down so that its sync tip now sits at –.75 V.

Output Amplifier. The output amplifier is essentially a discrete op amp comprised of two differential amplifiers and an emitter follower. The first stage (Q833 and Q835) is an input buffer, the second (Q933 and Q935) is a gain stage, and the third is an output driver.

From the emitter of Q939, negative feedback goes to the base of Q835 through a voltage divider network. In this network, C830 is a loop compensation cap, R920 adjusts overall signal gain. R828 and R829 together form the voltage divider that sets the closed loop gain of the amplifier. R827, C828, and C827 form a filter that provides sinx/x correction by attenuating feedback in the upper portion of the signal spectrum. C827 adjusts sinx/x correction to obtain flat frequency response.

Audio Oscillator

U715A is configured as a Wien bridge oscillator, employing both positive and negative feedback. In the positive loop, R614, in parallel with C614, combines with R615 and C616 to form the Wein bridge filter network that selects the 1K audio frequency.

In the negative loop, R616, R617 combine with Q613 to form a resistive divider that keeps the oscillator gain to exactly 3. Parallel with this loop is a peak detecting circuit (U715B, CR715, CR714, R715, R716, and C618) that varies the applied voltage to Q613 to control oscillator gain.

If the output amplitude decreases, this controlling circuitry reduces the negative voltage to Q613, which decreases the effective resistance of Q613 and increases oscillator gain. Conversely, if the oscillator starts to increase, the peak detector increases negative voltage at Q613 to reduce the gain. Note that at pin 7 the voltage is essentially a sine wave with the positive peaks clipped off. But at C618, the waveform is averaged to form a slightly negative DC voltage.

Audio Output Driver

U815A and B form the output driver which provides a balanced output that can drive 150Ω, 600Ω, and high impedance loads over a range of 0 to 8 dBu. R813 provides the gain adjustment to obtain these levels. R918 and R917 provide op amp protection against shorts to ground.

POWER SUPPLY (SCHEMATIC 3)

Input

This power supply operates from either an 11-15 V battery input or 110 Vac.

The AC input goes through the line filter to the primary of a 60 Hz, 12 watt transformer set for 110 Vac operation. It is converted to a 20 V rms signal at the secondary. The parts associated with DS874 form a relaxation oscillator which blinks when power is applied to the instrument.

The secondary 20 V rms is rectified and converted to 28 Vdc by full bridge rectifier CR665 and C580.

The battery input passes through F760 and diode CR666, which prevents the rectified AC input and the DC input from interferring with one another if they are both connected. CR766 turns on if the battery voltage is plugged on backwards and blows the fuse.

Regulator and DC to DC Converter

The DC to DC Converter takes the unregulated DC from either the battery input or the rectified AC and converts it through T477 to four regulated DC outputs. The 5 V output is directly regulated by feedback to the Pulse Width Modulator. The –5 V and ±15 V outputs are line regulated through the +5 V output, but only indirectly load regulated through the +5 V. So, the ±15 V have linear regulators to do a better regulation and drop them to ±12 V.

The heart of the DC to DC Converter is T477, and it operates in the continuous flyback mode, which means that magnetic flux is continuously flowing in the inductor, never going to zero. Q490 switches the input unregulated DC voltage across the primary winding of this coil, causing current to flow in the primary and magnetic energy to build up in the core. When Q490 turns off, this energy is transferred to the secondaries and released into the load and charges the output filter capacitors. Never does current flow in both the primary and secondaries at the same time. The +5 V output is sensed and this is amplified and compared to a reference voltage inside of U290. Pin 1 is the voltage feedback pin, and pin 2 has the 5 V reference. Q490 is driven on by current from pin 8, U290, and Q370 helps bring the gate of Q490 to ground, turning it off faster than U290 could by itself.

R383, R382, and C380 form a slow start and duty cycle limiting circuit. The voltage at pin 4 sets the maximum duty cycle allowed at pin 8. For normal operation, this is at approximately 50% and the voltage at pin 4 is 1.5 V. On power up, the voltage at pin 4 will start out close to 5 V and gradually charge to 1.5 V so that the pulse out of pin 8 starts narrow at minimum duty cycle and gets larger as the output voltages come up.

Current Limit

Current is limited on the secondary voltages by sensing the amount of current flowing in the primary winding and shutting down the supply if it goes above a certain maximum amount (3.25 amps). The current sense resistor is R498. Current flowing here causes a voltage which is fed to pin 2, U397. This voltage is compared to the level at pin 3. If the level at pin 2 exceeds that on pin 3, then pin 1 goes low, triggering 555 timer U297. This timer has an output which goes high, feeds to pin 14, U290, and causes U290 to shut down for a few hundred milliseconds.

The high level also resets the soft start circuit through CR386, so that when the output of U297 goes low, U290 will do a soft start. If the soft start is not reset, then the supply will never start because it will try to start, but at a high current which immediately shuts it off again. If none of the time out circuitry is working, then the maximum output currents are set by limiting the duty cycle of the PWM by the voltage at pin 4.

Housekeeping Supplies

On first power up, C593 is charged to 11 V by current through R582. The base of Q589 is held at 12 V by zener diode VR588. Eleven volts is enough to start U290 and drive Q490. When the supply starts, then +15 V from the output is used to charge C593. Q589 is back biased and all power for operation of the primary circuits comes from the secondary +15 V.

SECTION 6
MAINTENANCE

JUMPER TABLE

Function	Jumper #	Description	Factory Set
External Signal Select	J356	Pins 1–2: Enables front-panel decoder for normal front-panel control. Pins 2–3: Disables front-panel decoder for external front-panel control (see J355).	Pins 1–2
	J355	Pins 1,2,3: When J356 is in the 2–3 position, the eight test signals can be selected via pins 1,2,3 of J355. The selection code is: S2 S1 S0 Signal 0 0 0 Black Burst 0 0 1 Flat Field 0 1 0 Mod 5-Step 0 1 1 5-Step 1 0 0 Multiburst 1 0 1 Pulse & Bar 1 1 0 Convergence 1 1 1 SMPTE Bars	——
For Future Use	J335	Pins 1–2: Standard position. Pins 2–3:	Pins 1–2
Address PROM Enable	J439	Pins 1–2: Disables address PROM. Pins 2–3: Enables address PROM.	Pins 2–3
DAC Test	J625	Pins 1–2: Passes DAC output to Output filter. Pins 2–3: Disconnects DAC output from Output filter for checking DAC output.	Pins 1–2
+12 V Test	J461	Jumper Inserted: Passes +12 V to circuits. Jumper Removed: Disconnects +12 V supply from all circuits.	——
–12 V Test	J462	Jumper Inserted: Passes –12 V to circuits. Jumper Removed: Disconnects –12 V supply from all circuits.	

JUMPER TABLE (cont.)

Function	Jumper #	Description	Factory Set
+5 V Test	J463	Jumper Inserted: Passes +5 V to circuits. Jumper Removed: Disconnects +5 V supply from all circuits.	
-5 V Test	J464	Jumper Inserted: Passes -5 V to circuits. Jumper Removed: Disconnects -5 V supply from all circuits.	
Power Supply Test	J380	Jumper Inserted: Normal operation. Jumper Removed: Disables power from the +15 V output to the Pulse Width Modulator.	
Power Supply Test	J485	Jumper Inserted: Normal operation. Jumper Removed: Disables power to T477 so that the Pulse Width Modulator can be checked independently of the output circuits and feedback.	

Removing the Main and Front Panel Circuit Boards

Front Panel Board

1. Remove the top cover by taking out the nine screws that attach it to the bottom pan.
2. Disconnect the front panel ribbon connector cable from the Main board.
3. Disconnect the short coaxial cable at J920 and then disconnect the long coaxial cable at J925.
4. Remove the two screws that hold the front panel to the bottom pan.
5. To remove the Front Panel board, remove the six screws that hold the Front Panel board in place.

Main Board

6. Do steps 1 through 4 above.
7. Remove the two screws that attach the mains socket (line filter) to the rear panel.
8. Disconnect the coaxial cable at J947.
9. Disconnect the DC input jack.
10. Remove the two audio tone XLR connector screws.
11. Remove the six screws that attach the Main board to the bottom pan.
12. Looking into the XLR connector from the rear panel, notice the small screw slot in the center of the connector.
13. Using a 80/1000" flat head screwdriver, turn this slot about 45° to the right, and then slide the Main board away from the rear panel.

Section 7
Replaceable Electrical Parts

This section contains a list of the components that are replaceable for the TSG-100. Use this list to identify and order replacement parts. There is a separate Replaceable Electrical Parts list for each instrument.

Parts Ordering Information

Replacement parts are available from or through your local Tektronix, Inc., Field Office or representative.

Changes to Tektronix instruments are sometimes made to accommodate improved components as they become available and to give you the benefit of the latest circuit improvements. Therefore, when ordering parts, it is important to include the following information in your order.

- Part number
- Instrument type or model number
- Instrument serial number
- Instrument modification number, if applicable

If a part you have ordered has been replaced with a new or improved part, your local Tektronix, Inc., Field Office or representative will contact you concerning any change in part number.

Change information, if any, is located at the rear of this manual.

Using the Replaceable Electrical Parts List

The tabular information in the Replaceable Electrical Parts list is arranged for quick retrieval. Understanding the structure and features of the list will help you find all of the information you need for ordering replaceable parts.

Cross Index–Mfr. Code Number to Manufacturer

The Mfg. Code Number to Manufacturer Cross Index for the electrical parts list is located immediately after this page. The cross index provides codes, names, and addresses of manufacturers of components listed in the electrical parts list.

Abbreviations

Abbreviations conform to American National Standards Institute (ANSI) standard Y1.1.

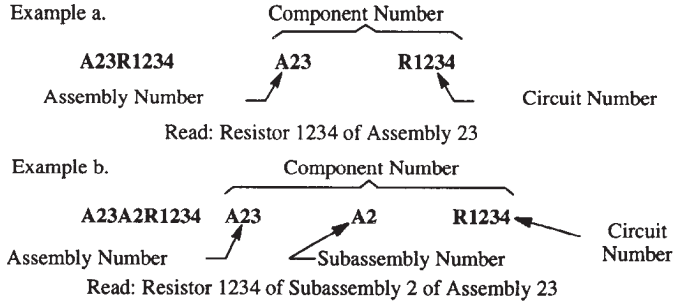
List of Assemblies

A list of assemblies can be found at the beginning of the electrical parts list. The assemblies are listed in numerical order. When the complete component number of a part is known, this list will identify the assembly in which the part is located.

Column Descriptions

Component No. (Column 1)

The component circuit number appears on the diagrams and circuit board illustrations, located in the diagrams section. Assembly numbers are also marked on each diagram and circuit board illustration, in the Diagram section and on the mechanical exploded views, in the mechanical parts list. The component number is obtained by adding the assembly number prefix to the circuit number.



The electrical parts list is arranged by assemblies in numerical sequence (A1, with its subassemblies and parts, precedes A2, with its subassemblies and parts).

Mechanical subparts to the circuit boards are listed in the electrical parts list. These mechanical subparts are listed with their associated electrical part (for example, fuse holder follows fuse).

Chassis-mounted parts and cable assemblies have no assembly number prefix and are located at the end of the electrical parts list.

Tektronix Part No. (Column 2)

Indicates part number to be used when ordering replacement part from Tektronix.

Serial/Assembly No. (Column 3 and 4)

Column three (3) indicates the serial or assembly number at which the part was first used. Column four (4) indicates the serial or assembly number at which the part was removed. No serial or assembly number entered indicates part is good for all serial numbers.

Name and Description (Column 5)

An item name is separated from the description by a colon (:). Because of space limitations, an item name may sometimes appear as incomplete. Use the U.S. Federal Catalog handbook H6-1 for further item name identification.

The mechanical subparts are shown as *ATTACHED PARTS* / *END ATTACHED PARTS* or *MOUNTING PARTS* / *END MOUNTING PARTS* in column five (5).

Mfr. Code (Column 6)

Indicates the code number of the actual manufacturer of the part. (Code to name and address cross reference can be found immediately after this page.)

Mfr. Part No. (Column 7)

Indicates actual manufacturer's part number.

Cross Index – Mfr. Code Number To Manufacturer

Mfr. Code.	Manufacturer	Address	City, State, Zip Code
TK0213	TOPTRON CORP		TOKYO JAPAN
TK0515	EVOX–RIFA INC	100 TRI–STATE INTERNATIONAL SUITE 290	LINCOLNSHIRE IL 60015
TK0891	MICONICS	1 FAIRCHILD AVE	PLAINVIEW NY 11803
TK1326	NORTHWEST FOURSLIDE INC	18224 SW 100TH CT	TUALATIN OR 97062
TK1547	MOORE ELECTRONICS INC (DIST)	19500 SW 90TH COURT PO BOX 1030	TUALATIN OR 97062
TK1727	PHILIPS NEDERLAND BV AFD ELONCO	POSTBUS 90050	5600 PB EINDHOVEN THE NETHERLANDS
TK1857	HIROSE ELECTRIC USA INC	2688 WESHILLS COURT	SIMI VALLEY, CA 93065–6235
TK2058	TDK CORPORATION OF AMERICA	1600 FEEHANVILLE DRIVE	MOUNT PROSPECT, IL 60056
TK2096	KELVIN ASSOCIATES	14724 VENTURA BLVD SUITE 1003	SHERMAN OAKS CA 91403–3501
TK2557	CGE ELECTRONICA	TEZOZOMOC No. 239 AZCAPOTZALZO	MEXICO D.F. MEXICO 02760
0FMA6	NEUTRIK USA INC	195–3 LEHIGH AVE	LAKEWOOD NJ 08701–4527
0GV52	SCHAFFNER EMC INC	9–B FADEM ROAD	SPRINGFIELD, NJ 07081
0H1N5	TOSHIBA MARCON ELECTRONICS AMERICA CORPORATION	998 FIRST EDGE DRIVE	VERNON HILLS IL 60061
0LUA3	PHILIPS COMPONENTS	100 PROVIDENCE PIKE	SLATERSVILLE, RI 02876
00779	AMP INC	2800 FULLING MILL PO BOX 3608	HARRISBURG PA 17105
01295	TEXAS INSTRUMENTS INC SEMICONDUCTOR GROUP	13500 N CENTRAL EXPY PO BOX 655303	DALLAS TX 75262–5303
04222	AVX/KYOCERA DIV OF AVX CORP	19TH AVE SOUTH P O BOX 867	MYRTLE BEACH SC 29577
04713	MOTOROLA INC SEMICONDUCTOR PRODUCTS SECTOR	5005 E MCDOWELL RD	PHOENIX AZ 85008–4229
07933	RAYTHEON CO SEMICONDUCTOR DIV HQ	350 ELLIS ST	MOUNTAIN VIEW CA 94042
11236	CTS CORPORATION RESISTOR NETWORKS DIVISION	406 PARR ROAD	BERNE IN 46711–9506
12954	MICROSEMI CORP – SCOTTSDALE	8700 E THOMAS RD P O BOX 1390	SCOTTSDALE AZ 85252
13409	SENSITRON SEMICONDUCTOR DIV OF RSM ELECTRON POWER INC	221 W INDUSTRY COURT	DEER PARK NY 11729–4605
14936	GENERAL INSTRUMENT CORP POWER SEMICONDUCTOR DIV	600 W JOHN ST	HICKSVILLE NY 11802–0709
17856	SILICONIX INC	2201 LAURELWOOD RD	SANTA CLARA CA 95054–1516
18796	MURATA ELECTRONICS NORTH AMERICA INC. STATE COLLEGE OPERATIONS	1900 W COLLEGE AVE	STATE COLLEGE PA 16801–2723
19701	PHILIPS COMPONENTS DISCRETE PRODUCTS DIV RESISTIVE PRODUCTS FACILITY AIRPORT ROAD	PO BOX 760	MINERAL WELLS TX 76067–0760
20462	PREM MAGNETICS INC	3519 N CHAPEL HILL	MCHENRY IL 60050–2504
22526	BERG ELECTRONICS INC (DUPONT)	857 OLD TRAIL RD	ETTERS PA 17319
24546	DALE ELECTRONICS A VISHAY INTERTECHNOLOGY INC CO	550 HIGH ST	BRADFORD PA 16701–3737

Mfr. Code.	Manufacturer	Address	City, State, Zip Code
26364	COMPONENTS CORP	6 KINSEY PLACE	DENVILLE NJ 07834–2611
27014	NATIONAL SEMICONDUCTOR CORP	2900 SEMICONDUCTOR DR	SANTA CLARA CA 95051–0606
31918	ITT SCHADOW INC	8081 WALLACE RD	EDEN PRAIRIE MN 55344–2224
32997	BOURNS INC TRIMPOT DIV	1200 COLUMBIA AVE	RIVERSIDE CA 92507–2114
34371	HARRIS CORP HARRIS SEMICONDUCTOR PRODUCTS GROUP	200 PALM BAY BLVD PO BOX 883	MELBOURNE FL 32919
50139	ALLEN–BRADLEY CO ELECTRONIC COMPONENTS	1414 ALLEN BRADLEY DR	EL PASO TX 79936
54937	DEYOUNG MANUFACTURING INC	12920 NE 125TH WAY	KIRKLAND WA 98034–7716
55680	NICHICON /AMERICA/ CORP	927 E STATE PKY	SCHAUMBURG IL 60195–4526
56845	DALE ELECTRONICS INC	2300 RIVERSIDE BLVD PO BOX 74	NORFOLK NE 68701–2242
57027	INTERNATIONAL RESISTIVE PRODUCTS INC	4222 S STAPLES	CORPUS CHRISTI TX 78411–2702
57668	ROHM CORPORATION	15375 BARRANCA PARKWAY SUITE B207	IRVINE CA 92718
59660	TUSONIX INC	7741 N BUSINESS PARK DR PO BOX 37144	TUCSON AZ 85740–7144
71400	BUSSMANN DIV OF COOPER INDUSTRIES INC	114 OLD STATE RD PO BOX 14460	ST LOUIS MO 63178
74970	JOHNSON E F CO	299 10TH AVE S W	WASECA MN 56093–2539
75498	MULTICOMP INC	3005 SW 154TH TERRACE #3	BEAVERTON OR 97006
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON OR 97077–0001
82567	DYNAMICS CORP OF AMERICA REEVES–HOFFMAN DIV	400 W NORTH ST	CARLISLE PA 17013–2248
9M860	ELECTRONIC SUB ASSEMBLY MFG CORP (ESAM)	930 SE M STREET PO BOX 376	GRANTS PASS OR 97526–3248
91637	DALE ELECTRONICS INC	2064 12TH AVE PO BOX 609	COLUMBUS NE 68601–3632

Replaceable Electrical Parts

Component Number	Tektronix Part Number	Serial / Assembly Number Effective	Discontinued	Name & Description	Mfr. Code	Mfr. Part Number
A1	671–0507–00	B010100	B010129	CIRCUIT BD ASSY:MAIN	80009	671050700
A1	671–0507–01	B010130	B010349	CIRCUIT BD ASSY:MAIN	80009	671050701
A1	671–0507–02	B010350	B020506	CIRCUIT BD ASSY:MAIN	80009	671050702
A1	671–0507–03	B020507	B020726	CIRCUIT BD ASSY:MAIN	80009	671050703
A1	672–1315–00	B020727	B022386	CIRCUIT BD ASSY:MAIN	80009	672131500
A1	672–1315–01	B022387		CIRCUIT BD ASSY:MAIN (STANDARD ONLY)	80009	672131501
A1	672–1316–00	B020727	B022047	CIRCUIT BD ASSY:MAIN	80009	672131600
A1	672–1316–01	B022048	B022386	CIRCUIT BD ASSY:MAIN	80009	672131601
A1	672–1316–02	B022387		CIRCUIT BD ASSY:MAIN (OPTION 01 ONLY)	80009	672131602
A2	671–0747–00			CIRCUIT BD ASSY:FRONT	80009	671074700
A1	671–0507–00	B010100	B010129	CIRCUIT BD ASSY:MAIN	80009	671050700
A1	671–0507–01	B010130	B010349	CIRCUIT BD ASSY:MAIN	80009	671050701
A1	671–0507–02	B010350	B020506	CIRCUIT BD ASSY:MAIN	80009	671050702
A1	671–0507–03	B020507	B020726	CIRCUIT BD ASSY:MAIN	80009	671050703
A1	672–1315–00	B020727	B022386	CIRCUIT BD ASSY:MAIN	80009	672131500
A1	672–1315–01	B022387		CIRCUIT BD ASSY:MAIN (STANDARD ONLY)	80009	672131501
A1	672–1316–00	B020727	B022047	CIRCUIT BD ASSY:MAIN	80009	672131600
A1	672–1316–01	B022048	B022386	CIRCUIT BD ASSY:MAIN	80009	672131601
A1	672–1316–02	B022387		CIRCUIT BD ASSY:MAIN (OPTION 01 ONLY)	80009	672131602
A1C276	290–0845–00			CAP,FXD,ELCTLT:330UF,+50–10%,25V	55680	UVX1H331MPA
A1C283	283–0204–00			CAP,FXD,CER DI:0.01UF,20%,50V	04222	SR155E103MAA
A1C290	283–0051–00			CAP,FXD,CER DI:0.0033UF,5%,100V	04222	SR211A332JAA
A1C292	283–0421–00			CAP,FXD,CER DI:0.1UF,+80–20%,50VDIP STYLE	04222	MD015C104MAB
A1C295	283–0204–00			CAP,FXD,CER DI:0.01UF,20%,50V	04222	SR155E103MAA
A1C296	283–0177–00			CAP,FXD,CER DI:1UF,+80–20%,25V	04222	SR303E105ZAA
A1C297	283–0421–00			CAP,FXD,CER DI:0.1UF,+80–20%,50VDIP STYLE	04222	MD015C104MAB
A1C318	283–0421–00			CAP,FXD,CER DI:0.1UF,+80–20%,50VDIP STYLE	04222	MD015C104MAB
A1C325	283–0421–00			CAP,FXD,CER DI:0.1UF,+80–20%,50VDIP STYLE	04222	MD015C104MAB
A1C331	283–0421–00			CAP,FXD,CER DI:0.1UF,+80–20%,50VDIP STYLE	04222	MD015C104MAB
A1C345	283–0421–00			CAP,FXD,CER DI:0.1UF,+80–20%,50VDIP STYLE	04222	MD015C104MAB
A1C349	283–0421–00			CAP,FXD,CER DI:0.1UF,+80–20%,50VDIP STYLE	04222	MD015C104MAB
A1C350	283–0211–00			CAP,FXD,CER DI:0.1UF,10%,200V	04222	SR302C104KAA
A1C360	283–0421–00			CAP,FXD,CER DI:0.1UF,+80–20%,50VDIP STYLE	04222	MD015C104MAB
A1C364	290–0804–00			CAP,FXD,ELCTLT:10UF,+50–20%,25V	0H1N5	CEUSM1E100
A1C365	290–0804–00			CAP,FXD,ELCTLT:10UF,+50–20%,25V	0H1N5	CEUSM1E100
A1C370	290–0845–00			CAP,FXD,ELCTLT:330UF,+50–10%,25V	55680	UVX1H331MPA
A1C380	290–0755–00			CAP,FXD,ELCTLT:100UF,+50%–20%,10WVDC	0H1N5	CEUSM1C101
A1C397	283–0067–00			CAP,FXD,CER DI:0.001UF,10%,200V	18796	DD09B10 Y5F 102
A1C415	283–0421–00			CAP,FXD,CER DI:0.1UF,+80–20%,50VDIP STYLE	04222	MD015C104MAB
A1C435	283–0421–00			CAP,FXD,CER DI:0.1UF,+80–20%,50VDIP STYLE	04222	MD015C104MAB
A1C449	283–0421–00			CAP,FXD,CER DI:0.1UF,+80–20%,50VDIP STYLE	04222	MD015C104MAB
A1C465	290–0755–00			CAP,FXD,ELCTLT:100UF,+50%–20%,10WVDC	0H1N5	CEUSM1C101
A1C466	290–1069–00			CAP,FXD,ALUM:1000UF,20%,6.3V,ESR=0.16 OHM (120HZ,20C),12.5 X 25MM	55680	UPL1E102MHH
A1C471	283–0095–00	671–0507–00	671–0507–00	CAP,FXD,CER DI:56PF,10%,200V	59660	855–536–COGO–56
A1C495	283–0095–00			CAP,FXD,CER DI:56PF,10%,200V	59660	855–536–COGO–56
A1C518	283–0421–00			CAP,FXD,CER DI:0.1UF,+80–20%,50VDIP STYLE	04222	MD015C104MAB
A1C525	283–0421–00			CAP,FXD,CER DI:0.1UF,+80–20%,50VDIP STYLE	04222	MD015C104MAB
A1C539	283–0204–00			CAP,FXD,CER DI:0.01UF,20%,50V	04222	SR155E103MAA
A1C540	283–0211–00			CAP,FXD,CER DI:0.1UF,10%,200V	04222	SR302C104KAA
A1C541	283–0211–00			CAP,FXD,CER DI:0.1UF,10%,200V	04222	SR302C104KAA

Component Number	Tektronix Part Number	Serial / Assembly Number Effective	Discontinued	Name & Description	Mfr. Code	Mfr. Part Number
A1C542	283–0177–00			CAP,FXD,CER DI:1UF,+80–20%,25V	04222	SR303E105ZAA
A1C565	290–0755–00			CAP,FXD,ELCTLT:100UF,+50%–20%,10WVDC	0H1N5	CEUSM1C101
A1C569	290–0845–00			CAP,FXD,ELCTLT:330UF,+50–10%,25V	55680	UVX1H331MPA
A1C580	290–0838–00			CAP,FXD,ELCTLT:2200UF,+50–20%,35V	0H1N5	CE02W1V222F
A1C593	290–0804–00			CAP,FXD,ELCTLT:10UF,+50–20%,25V	0H1N5	CEUSM1E100
A1C614	283–0594–00			CAP,FXD,MICA DI:0.001UF,1%,100V	TK0891	RDM15FA102F03
A1C616	283–0594–00			CAP,FXD,MICA DI:0.001UF,1%,100V	TK0891	RDM15FA102F03
A1C618	290–0755–00			CAP,FXD,ELCTLT:100UF,+50%–20%,10WVDC	0H1N5	CEUSM1C101
A1C628	283–0631–00			CAP,FXD,MICA DI:95PF,1%,500V	TK0891	RDM15FD950F03
A1C630	283–0635–00			CAP,FXD,MICA DI:51PF,1%,500V	TK0891	RDM15ED510F03
A1C635	283–0633–00			CAP,FXD,MICA DI:77PF,1%,100V	TK0891	RDM15ED770F03
A1C636	283–0775–00			CAP,FXD,MICA DI:1764 PF,1%,500V	TK0891	RDM19FD17640F03
A1C638	283–0204–00			CAP,FXD,CER DI:0.01UF,20%,50V	04222	SR155E103MAA
A1C640	283–0211–00			CAP,FXD,CER DI:0.1UF,10%,200V	04222	SR302C104KAA
A1C644	283–0211–00			CAP,FXD,CER DI:0.1UF,10%,200V	04222	SR302C104KAA
A1C665	283–0211–00			CAP,FXD,CER DI:0.1UF,10%,200V	04222	SR302C104KAA
A1C711	283–0421–00			CAP,FXD,CER DI:0.1UF,+80–20%,50VDIP STYLE	04222	MD015C104MAB
A1C718	283–0421–00			CAP,FXD,CER DI:0.1UF,+80–20%,50VDIP STYLE	04222	MD015C104MAB
A1C725	283–0689–00			CAP,FXD,MICA DI:550PF,1%,300V	TK0891	RDM15FC551F03
A1C726	283–0646–00			CAP,FXD,MICA DI:170PF,1%,500V,.380H X .460L	TK0891	RDM15FD171F03
A1C728	283–0615–00			CAP,FXD,MICA DI:33PF,5%,500V	TK0891	RDM15ED330J03
A1C729	283–0674–00			CAP,FXD,MICA DI:85PF,1%,500V	TK0891	RDM15FD850F03
A1C730	283–0672–00			CAP,FXD,MICA DI:200PF,1%,500V	TK0891	RDM15FD201F03
A1C731	283–0687–00			CAP,FXD,MICA DI:560PF,2%,300V	TK0891	RDM15FC561G03
A1C765	283–0421–00			CAP,FXD,CER DI:0.1UF,+80–20%,50VDIP STYLE	04222	MD015C104MAB
A1C811	283–0421–00			CAP,FXD,CER DI:0.1UF,+80–20%,50VDIP STYLE	04222	MD015C104MAB
A1C817	283–0359–00	672–1315–01		CAP,FXD,CER DI:1000PF,10%,200V	04222	SR212A102KAA
A1C817	283–0359–00	672–1316–02		CAP,FXD,CER DI:1000PF,10%,200V	04222	SR212A102KAA
A1C818	283–0421–00			CAP,FXD,CER DI:0.1UF,+80–20%,50VDIP STYLE	04222	MD015C104MAB
A1C819	283–0177–00			CAP,FXD,CER DI:1UF,+80–20%,25V	04222	SR303E105ZAA
A1C820	290–0755–00			CAP,FXD,ELCTLT:100UF,+50%–20%,10WVDC	0H1N5	CEUSM1C101
A1C827	281–0153–00	671–0507–00	671–0507–00	CAP,VAR,AIR DI:1.7–10PF,150V	74970	187–0106–055
A1C827	281–0166–00	671–0507–01		CAP,VAR,AIR DI:1.9–15.7 PF,250V	74970	187–0109–055
A1C828	281–0811–00	671–0507–00	671–0507–00	CAP,FXD,CERAMIC:MLC;10PF,10%,200V,0.100 X 0.170	04222	SA102A100KAA
A1C828	281–0893–00	671–0507–01		CAP,FXD,CERAMIC:MLC;4.7PF,+/–0.5PF,100V,0.100 X 0.170	04222	SA102A4R7DAA
A1C830	281–0893–00			CAP,FXD,CERAMIC:MLC;4.7PF,+/–0.5PF,100V,0.100 X 0.170	04222	SA102A4R7DAA
A1C831	283–0647–00			CAP,FXD,MICA DI:70PF,1%,100V	TK0891	RDM15ED700F03
A1C835	283–0648–00			CAP,FXD,MICA DI:10PF,+/–0.5PF,500V	TK0891	RDM15CD100D03
A1C836	283–0421–00	671–0507–01		CAP,FXD,CER DI:0.1UF,+80–20%,50VDIP STYLE	04222	MD015C104MAB
A1C875	283–0211–00			CAP,FXD,CER DI:0.1UF,10%,200V	04222	SR302C104KAA
A1C885	285–1222–00			CAP,FXD,PLASTIC:0.068UF,20%,250V	TK0515	PME 271 M 568
A1C922	283–0421–00	671–0507–01		CAP,FXD,CER DI:0.1UF,+80–20%,50VDIP STYLE	04222	MD015C104MAB
A1C925	283–0648–00			CAP,FXD,MICA DI:10PF,+/–0.5PF,500V (NOM, SEL, 0 TO 27PF FOR RETURN LOSS)	TK0891	RDM15CD100D03
A1C928	283–0421–00			CAP,FXD,CER DI:0.1UF,+80–20%,50VDIP STYLE	04222	MD015C104MAB
A1C935	283–0648–00			CAP,FXD,MICA DI:10PF,+/–0.5PF,500V	TK0891	RDM15CD100D03
A1C947	283–0648–00			CAP,FXD,MICA DI:10PF,+/–0.5PF,500V (NOM, SEL, 0 T0 27PF FOR RETURN LOSS)	TK0891	RDM15CD100D03
A1C950	283–0421–00	670–0507–02		CAP,FXD,CER DI:0.1UF,+80–20%,50VDIP STYLE	04222	MD015C104MAB
A1F760	159–0021–00			FUSE,CARTRIDGE:3AG,2A,250V,FAST BLOW	71400	AGC–2
A1F970	159–0044–00			FUSE,CARTRIDGE:3AG,0.2A,250V,20SEC (FOR 90–132VAC OPERATION)	71400	MDL 2/10
A1F970	159–0048–00			FUSE,CARTRIDGE:3AG,0.1A,250V,27SEC (FOR 180–250VAC OPERATION)	71400	MDL 1/10
A1J270	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR,0.025SQ, 0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE	22526	48283–018
A1J290	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR,0.025SQ, 0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE	22526	48283–018

Component Number	Tektronix Part Number	Serial / Assembly Number Effective	Discontinued	Name & Description	Mfr. Code	Mfr. Part Number
A1J335	131–0608–00	671–0507–00	671–0507–03	CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR,0.025SQ, 0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE	22526	48283–018
A1J355	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR,0.025SQ, 0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE	22526	48283–018
A1J356	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR,0.025SQ, 0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE	22526	48283–018
A1J380	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR,0.025SQ, 0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE	22526	48283–018
A1J439	131–0608–00	671–0507–00	671–0507–03	CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR,0.025SQ, 0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE	22526	48283–018
A1J461	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR,0.025SQ, 0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE	22526	48283–018
A1J462	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR,0.025SQ, 0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE	22526	48283–018
A1J463	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR,0.025SQ, 0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE	22526	48283–018
A1J464	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR,0.025SQ, 0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE	22526	48283–018
A1J485	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR,0.025SQ, 0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE	22526	48283–018
A1J625	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR,0.025SQ, 0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE	22526	48283–018
A1J660	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR,0.025SQ, 0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE	22526	48283–018
A1J915	131–3987–00			CONN,CIRC:PCB,AUDIO,;MALE,RTANG,3 POS,1.22H X 1.024 W,CTR PLZ,LATCHING	0FMA6	NC3MD–H
A1J925	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR,0.025SQ, 0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE	22526	48283–018
A1J945	131–3378–00			CONN,RF JACK:BNC,;50 OHM,FEMALE,RTANG,PCB/REAR PNL,0.5–28 THD,0.625 H X 0.187 TAIL,W/O	00779	227677–1
A1L469	108–1263–00			INDUCTOR,FXD:POWER;10UH,10%,I<2.1A,RDC<0.043 OHM,Q>20,SRF>19MHZ,BOBBIN	TK2058	TSL0707–100K1R9
A1L565	108–1262–00			INDUCTOR,FXD:POWER;100UH,10%,I<0.75A,RDC<0.23 OHM,Q>15,SRF>5.4MHZ,BOBBIN CORE	TK2058	TSL0807–101KR75
A1L625	114–0366–00			COIL,RF:VARIABLE,2.40–2.70UH,Q MIN190 @ 2.6	54937	114–0366–00
A1L636	120–1180–00			TRANSFORMER,RF:VARIABLE	54937	500–3910
A1L670	108–1263–00			INDUCTOR,FXD:POWER;10UH,10%,I<2.1A,RDC<0.043 OHM,Q>20,SRF>19MHZ,BOBBIN	TK2058	TSL0707–100K1R9
A1L725	114–0367–00			COIL,RF:VARIABLE,2.70–3.30UHPOT CORE	54937	500–3895
A1L736	114–0415–00			COIL,RF:VARIABLE,775–925NHPOT CORE	54937	500–3901
A1L836	114–0369–00			COIL,RF:VARIABLE,2.19–2.53UHPOT CORE	54937	500–3896
A1P335	131–0993–02	671–0507–00	671–0507–03	BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P356	131–0993–02			BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P380	131–0993–02			BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P439	131–0993–02	671–0507–00	671–0507–03	BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P461	131–0993–02			BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P462	131–0993–02			BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P463	131–0993–02			BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P464	131–0993–02			BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P485	131–0993–02			BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P625	131–0993–02			BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1Q390	151–0188–00			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	04713	2N3906
A1Q490	151–1136–00			TRANSISTOR,PWR:MOS,N–CH;100V,14A,0.16 OHM	04713	MTP12N10E
A1Q589	151–0190–00			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	04713	2N3904
A1Q613	151–1025–00			TRANSISTOR,SIG:JFET,N–CH;6V,15MA,4.5MS,AMPL	17856	J304
A1Q833	151–0190–00			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	04713	2N3904
A1Q835	151–0190–00			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	04713	2N3904
A1Q933	151–0220–00			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,400MHZ,AMPL	27014	S036228.22
A1Q935	151–0220–00			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,400MHZ,AMPL	27014	S036228.22
A1Q939	151–0103–02			TRANSISTOR,SIG:BIPOLAR,NPN	04713	2N2219A

Component Number	Tektronix Part Number	Serial / Assembly Number Effective	Discontinued	Name & Description	Mfr. Code	Mfr. Part Number
A1R189	315–0102–00			RES,FXD,FILM:1K OHM,5%,0.25W	TK1727	SFR25 2322–181–
A1R275	315–0271–00			RES,FXD,FILM:270 OHM,5%,0.25W	TK1727	SFR25 2322–181–
A1R281	315–0103–00			RES,FXD,FILM:10K OHM,5%,0.25W	TK1727	SFR25 2322–181–
A1R282	315–0105–00			RES,FXD,FILM:1M OHM,5%,0.25W	TK1727	SFR25 2322–181–
A1R283	315–0472–00			RES,FXD,FILM:4.7K OHM,5%,0.25W	TK1727	SFR25 2322–181–
A1R290	315–0392–00			RES,FXD,FILM:3.9K OHM,5%,0.25W	TK1727	SFR25 2322–181–
A1R296	315–0564–00			RES,FXD,FILM:560K OHM,5%,0.25W	TK1727	SFR25 2322–181–
A1R297	315–0272–00			RES,FXD,FILM:2.7K OHM,5%,0.25W	TK1727	SFR25 2322–181–
A1R381	315–0472–00			RES,FXD,FILM:4.7K OHM,5%,0.25W	TK1727	SFR25 2322–181–
A1R382	315–0202–00			RES,FXD,FILM:2K OHM,5%,0.25W	TK1727	SFR25 2322–181–
A1R383	315–0752–00			RES,FXD,FILM:7.5K OHM,5%,0.25W	TK1727	SFR25 2322–181–
A1R387	322–3258–00			RES,FXD:METAL FILM;4.75K OHM,1%,0.2W,TC=100	56845	CCF50–2–G4751FT
A1R388	321–0142–00			RES,FXD,FILM:294 OHM,1%,0.125W,TC=T0	TK1727	MR25 2322–151–2
A1R389	315–0182–00			RES,FXD,FILM:1.8K OHM,5%,0.25W	TK1727	SFR25 2322–181–
A1R390	315–0100–00			RES,FXD,FILM:10 OHM,5%,0.25W,	TK1727	SFR25 2322–182–
A1R397	315–0201–00			RES,FXD,FILM:200 OHM,5%,0.25W,,MI	TK1727	SFR25 2322–181–
A1R490	315–0330–00			RES,FXD,FILM:33 OHM,5%,0.25W	TK1727	SFR25 2322–181–
A1R498	308–0643–00			RES,FXD,WW:0.10 OHM,3%,3W	TK2096	KM300 0.1 OHM +
A1R540	307–0637–00			RES NTWK,FXD,FI:5,2K OHM,2%,0.125W	11236	750–61–R2K
A1R541	322–3001–00			RES,FXD:METAL FILM;10 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10R00F
A1R542	317–0036–00			RES,FXD,CMPSN:3.6 OHM,5%,0.125W	50139	BB36G5
A1R543	317–0036–00			RES,FXD,CMPSN:3.6 OHM,5%,0.125W	50139	BB36G5
A1R561	308–0297–00			RES,FXD,WW:24.7 OHM,1%,3W	TK2096	KM300 24.7 OHM
A1R573	315–0330–00	671–0507–00	671–0507–00	RES,FXD,FILM:33 OHM,5%,0.25W	TK1727	SFR25 2322–181–
A1R582	315–0100–00			RES,FXD,FILM:10 OHM,5%,0.25W,	TK1727	SFR25 2322–182–
A1R583	315–0202–00			RES,FXD,FILM:2K OHM,5%,0.25W	TK1727	SFR25 2322–181–
A1R614	322–3404–00			RES,FXD,FILM:158K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF50–2F15802F
A1R615	322–3404–00			RES,FXD,FILM:158K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF50–2F15802F
A1R616	322–3277–00			RES,FXD,FILM:7.5K OHM,1%,0.2W,TC=T0,SMALL BODY	91637	CCF501G75000F
A1R617	322–3310–00			RES,FXD,FILM:16.5K OHM,1%,0.2W,TC=T0	91637	CCF501G16501F
A1R624	322–3056–00			RES,FXD,FILM:37.4 OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF50–2F37R40F
A1R625	322–3085–00			RES,FXD:METAL FILM;75 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G75R00F
A1R640	322–3213–00			RES,FXD,FILM:1.62K OHM,1%,0.2W,TC=T0	91637	CCF501G16200F
A1R641	322–3213–00			RES,FXD,FILM:1.62K OHM,1%,0.2W,TC=T0	91637	CCF501G16200F
A1R642	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A1R643	322–3126–00			RES,FXD,FILM:200 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G200ROF
A1R644	322–3226–00			RES,FXD:METAL FILM;2.21K OHM,1%,0.2W,TC=100	91637	CCF501G22100F
A1R714	321–0816–00			RES,FXD,FILM:5K OHM,1%,0.125W,TC=T0	19701	5033RD5K000F
A1R715	322–3318–00			RES,FXD:METAL FILM;20K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20001F
A1R716	322–3268–00			RES,FXD,FILM:6.04K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G60400F
A1R717	321–0613–00			RES,FXD,FILM:5.03K OHM,1%,0.125W,TC=T0MI	19701	5033RD5K030F
A1R725	322–3056–00			RES,FXD,FILM:37.4 OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF50–2F37R40F
A1R813	311–1935–00			RES,VAR,NONWW:TRMR,50K OHM,10%,0.5W LIN CERMET	32997	3299X–R27–503
A1R814	321–0613–00			RES,FXD,FILM:5.03K OHM,1%,0.125W,TC=T0MI	19701	5033RD5K030F
A1R815	322–3289–07			RES,FXD,FILM:10K OHM,0.1%,0.2W,TC=T9,T&R,SM BODY	91637	CCF501C10001B
A1R816	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A1R817	322–3289–07			RES,FXD,FILM:10K OHM,0.1%,0.2W,TC=T9,T&R,SM BODY	91637	CCF501C10001B
A1R818	322–3485–00	672–1315–01		RES,FXD,FILM:5.0K OHM,1%,0.2W,TC=TO,SMALL BODY	91637	CCF501G50000F
A1R818	322–3485–00	672–1316–02		RES,FXD,FILM:5.0K OHM,1%,0.2W,TC=TO,SMALL BODY	91637	CCF501G50000F
A1R821	311–0609–00			RES,VAR,NONWW:TRMR,2K OHM,0.5W	32997	3329H–L58–202
A1R825	322–3301–00			RES,FXD,FILM:13.3K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G13301F
A1R826	322–3217–00			RES,FXD,FILM:1.78K OHM,1%,0.2W,TC=T0	91637	CCF501G17800F
A1R827	322–3146–00			RES,FXD,FILM:324 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF50–2–G324ROF
A1R828	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A1R829	322–3218–00			RES,FXD:METAL FILM;1.82K OHM,1%,0.2W,TC=100	91637	CCF501G18200F
A1R834	322–3056–00			RES,FXD,FILM:37.4 OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF50–2F37R40F
A1R835	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A1R836	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F

Component Number	Tektronix Part Number	Serial / Assembly Number Effective	Discontinued	Name & Description	Mfr. Code	Mfr. Part Number
A1R837	322–3132–00			RES,FXD,FILM:232 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF50–2–G232ROF
A1R838	315–0150–00			RES,FXD,FILM:15 OHM,5%,0.25W	TK1727	SFR25 2322–181–
A1R870	315–0225–00			RES,FXD,FILM:2.2M OHM,5%,0.25W	TK1727	SFR25 2322–181–
A1R917	322–3039–00			RES,FXD,FILM:24.9 OHM,1%,0.2W,TC=T0,SMALL BODY	91637	CCF50–2–G24R90F
A1R918	322–3039–00			RES,FXD,FILM:24.9 OHM,1%,0.2W,TC=T0,SMALL BODY	91637	CCF50–2–G24R90F
A1R920	311–0634–00			RES,VAR,NONWW:TRMR,500 OHM,0.5W	32997	3329H–L58–501
A1R926	321–0085–07			RES,FXD,FILM:75 OHM,0.1%,0.125W,TC=T9MI	57668	CRB14 BZE 75 OH
A1R927	301–0111–00			RES,FXD,FILM:110 OHM,5%,0.50W	19701	5053CX110R0J
A1R928	315–0150–00			RES,FXD,FILM:15 OHM,5%,0.25W	TK1727	SFR25 2322–181–
A1R935	315–0150–00			RES,FXD,FILM:15 OHM,5%,0.25W	TK1727	SFR25 2322–181–
A1R936	321–0828–07			RES,FXD,FILM:2.4K OHM,0.1%,0.125W,TC=T9	57027	RC55–D–2K4–B–R
A1R937	321–0828–07			RES,FXD,FILM:2.4K OHM,0.1%,0.125W,TC=T9	57027	RC55–D–2K4–B–R
A1R938	321–0085–07			RES,FXD,FILM:75 OHM,0.1%,0.125W,TC=T9MI	57668	CRB14 BZE 75 OH
A1S182	260–1713–01			SWITCH,PUSH:1 BTN,2 POLE,CH2 INVERT	TK2557	2KAB01000001026
A1S960	260–1849–07			SWITCH,PUSH:DPST,4A,250VAC	31918	601955
A1T477	120–1785–00			TRANSFORMER:FLYBACK,+/– 5V 2A, +/– 15V0.2A	75498	128–7045–00
A1T785	120–1784–00			TRANSFORMER,PWR:STEPDOWN;DUAL PRI 115/230VAC 50–60HZ,DUAL SEC 20V/0.6A 40V/0.3A CT,SAF CONT	20462	SPW–306
A1U218	156–0464–02			IC,DIGITAL:LSTTL,GATES	01295	SN74LS20N
A1U225	156–0391–02			IC,DIGITAL:LSTTL,FLIP FLOP	01295	SN74LS174N
A1U231	156–2382–00			IC,DIGITAL:ASTTL,FLIP FLOP;OCTAL D–TYPE, 3–STATE	01295	SN74AS374N
A1U240	160–5325–00			MICROCKT,DGTL:NMOS,16384 X 8 OTP EPROM,PRGM (STANDARD ONLY)	80009	160532500
A1U240	160–6567–00	672–1316–00	672–1316–00	MICROCKT,DGTL:NMOS,16384 X 8 OTP EPROM,PRGM	80009	160656700
A1U240	160–6567–01	672–1316–01		MICROCKT,DGTL:NMOS,16384 X 8 OTP EPROM,27128A–3 (OPTION 01 ONLY)	80009	160656701
A1U249	156–2520–00			IC,DIGITAL:ASTTL,COUNTER;SYNCH 4–BIT BINARY	01295	SN74AS163N
A1U255	156–1215–01			IC,DIGITAL:CMOS,MUX/ENCODER	27014	MM74C923N
A1U260	156–0469–02			IC,DIGITAL:LSTTL,DEMUX/DECODER	01295	SN74LS138N
A1U270	156–1160–00			IC,LINEAR:BIPOLAR,VR;POSITIVE,12V,100MA,4%	27014	LM78L12ACH
A1U290	156–2395–00			IC,LINEAR:BIPOLAR,SW–REGULATOR CONTROLLER;PWM, SINGLE OUTPUT	04713	MC34060AP
A1U297	156–1408–00			IC,MISC:CMOS,TIMER;	34371	ICM7555IPA
A1U325	160–5411–00			MICROCKT,DGTL:NMOS,4096 X 8 EPROM,PRGMW/3 STATE OUT,2732A,DIP24 (STANDARD ONLY)	80009	160541100
A1U325	160–6568–00	672–1316–00		MICROCKT,DGTL:NMOS,4096 X 8 EPROM,PRGMW/3 STATE OUT,2732A,DIP24 (OPTION 01 ONLY)	80009	160656800
A1U349	156–2520–00			IC,DIGITAL:ASTTL,COUNTER;SYNCH 4–BIT BINARY	01295	SN74AS163N
A1U370	156–1207–00			IC,LINEAR:BIPOLAR,VR;NEGATIVE,–12V,500MA,3%	27014	LM320H–12
A1U397	156–1225–01			IC,LINEAR:BIPOLAR,COMPARATOR	01295	LM393P
A1U415	156–2520–00			IC,DIGITAL:ASTTL,COUNTER;SYNCH 4–BIT BINARY	01295	SN74AS163N
A1U434	160–5432–00			MICROCKT,DGTL:STTL,4096 X 8 PROM,PRGM (STANDARD ONLY)	80009	160543200
A1U434	160–6569–00	672–1316–00	672–1316–00	MICROCKT,DGTL:STTL,4096 X 8,PRGMW/3 STATE OUT PROM,27S43A,DIP24	80009	160656900
A1U434	160–6569–01	672–1316–01		MICROCKT,DGTL:STTL,4096 X 8,PRGM (OPTION 01 ONLY)	80009	160656901
A1U441	160–5324–00			MICROCKT,DGTL:QUAD,20 INP REG AND/OR,PRGM	80009	160532400
A1U449	156–2520–00			IC,DIGITAL:ASTTL,COUNTER;SYNCH 4–BIT BINARY	01295	SN74AS163N
A1U455	156–2482–00			IC,DIGITAL:ASTTL,BUFFER/DRIVER;INV OCTAL, DRIVER, 3–STATE	01295	SN74AS240(N/J)
A1U518	156–2520–00			IC,DIGITAL:ASTTL,COUNTER;SYNCH 4–BIT BINARY	01295	SN74AS163N
A1U525	156–2520–00			IC,DIGITAL:ASTTL,COUNTER;SYNCH 4–BIT BINARY	01295	SN74AS163N
A1U534	156–3548–00			IC,CONVERTER:BIPOLAR,D/A;12 BIT,20MHZ,4LSB, CURRENT OUT,LATCHED	07933	TDC1012N7C
A1U640	156–3019–00			IC,LINEAR:BIPOLAR,VOLTAGE REFERENCE;1.235V, 1.0%,150PPM,SHUNT,MICROPOWER	27014	LM385BZ–1.2

Component Number	Tektronix Part Number	Serial / Assembly Number Effective	Discontinued	Name & Description	Mfr. Code	Mfr. Part Number
A1U715	156–0158–07			IC,LINEAR:BIPOLAR,OP–AMP	01295	MC1458P
A1U815	156–1272–00			IC,LINEAR:BIPOLAR,OP–AMP;DUAL,HIGH OUTPUT DRIVE,LOW NOISE	01295	NE5532P
A1W335	176–0122–00	671–0507–04		WIRE,ELECTRICAL:22 AWG,BARE,12.0 L (STANDARD ONLY)	TK1326	ORDER BY DESC
A1W335	176–0122–00	672–1316–00		WIRE,ELECTRICAL:22 AWG,BARE,12.0 L (OPTION 01 ONLY)	TK1326	ORDER BY DESC
A1W439	176–0122–00	671–0507–04		WIRE,ELECTRICAL:22 AWG,BARE,12.0 L (STANDARD ONLY)	TK1326	ORDER BY DESC
A1W439	176–0122–00	672–1316–00		WIRE,ELECTRICAL:22 AWG,BARE,12.0 L (OPTION 01 ONLY)	TK1326	ORDER BY DESC
A1W565	131–0566–00	671–0507–01		BUS,CONDUCTOR:DUMMY RES,0.094 OD X 0.225L (STANDARD ONLY)	24546	OMA0207
A1W565	131–0566–00	672–1316–00		BUS,CONDUCTOR:DUMMY RES,0.094 OD X 0.225L (OPTION 01 ONLY)	24546	OMA0207
A1W765	131–0566–00	671–0507–00	671–0507–00	BUS,CONDUCTOR:DUMMY RES,0.094 OD X 0.225L	24546	OMA0207
A1Y550	119–3175–00			OSCILLATOR:14.31818MHZ	82567	03–022155–002
A1CR375	152–0400–00			DIODE,RECT:FAST RCVRY;400V,1A,200NS	0LUA3	1N4936
A1CR376	152–0400–00			DIODE,RECT:FAST RCVRY;400V,1A,200NS	0LUA3	1N4936
A1CR377	152–0400–00			DIODE,RECT:FAST RCVRY;400V,1A,200NS	0LUA3	1N4936
A1CR386	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A1CR389	152–0400–00			DIODE,RECT:FAST RCVRY;400V,1A,200NS	0LUA3	1N4936
A1CR573	152–0836–00			DIODE,RECT:SCHTKY;40V,1A,25A IFSM,600MVF AT 1A,1MA IR AT 40V,AXIAL LEAD	04713	1N5819
A1CR574	152–0836–00			DIODE,RECT:SCHTKY;40V,1A,25A IFSM,600MVF AT 1A,1MA IR AT 40V,AXIAL LEAD	04713	1N5819
A1CR665	152–0585–00			DIODE,RECT:BRIDGE,200V,1A,50A IFSM,1.0VFAT 1A	14936	W02G
A1CR666	152–0676–00			DIODE,RECT:400V,3A,125A IFSM,1VF AT3A	13409	SEN–R–247 (1N56
A1CR714	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A1CR715	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A1CR766	152–0066–00			DIODE,RECT:400V,1A,IFSM=30A,1.2VF,2US	0LUA3	1N5060
A1CR870	152–0400–00			DIODE,RECT:FAST RCVRY;400V,1A,200NS	0LUA3	1N4936
A1DS875	150–0035–00			LAMP,GLOW:NEON;90V,0.3MA,AID–T,WIRE LD	TK0213	JH005/3011JA
A1LF986	119–1946–00			FILTER,RFI:1A,250V,400HZ W/PC TERMINAL	0GV52	FN326–1/02–K–D–
A1TP113	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A1TP199	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A1TP360	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A1TP383	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A1TP598	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A1TP810	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A1TP830	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A1VR588	152–0520–00			DIODE,ZENER:12V,5%,1W	12954	DZ840631L
A2	671–0747–00			CIRCUIT BD ASSY:FRONT	80009	671074700
A2S126	260–2442–00			SWITCH,PUSH:SPST;MOM,NO,100 GRM FRC,COND RUBBER CONTACTS,GRN LED,W/KEYCAP	TK1857	HL20–LSG
A2S134	260–2442–00			SWITCH,PUSH:SPST;MOM,NO,100 GRM FRC,COND RUBBER CONTACTS,GRN LED,W/KEYCAP	TK1857	HL20–LSG
A2S140	260–2442–00			SWITCH,PUSH:SPST;MOM,NO,100 GRM FRC,COND RUBBER CONTACTS,GRN LED,W/KEYCAP	TK1857	HL20–LSG
A2S149	260–2442–00			SWITCH,PUSH:SPST;MOM,NO,100 GRM FRC,COND RUBBER CONTACTS,GRN LED,W/KEYCAP	TK1857	HL20–LSG

Component Number	Tektronix Part Number	Serial / Assembly Number Effective	Discontinued	Name & Description	Mfr. Code	Mfr. Part Number
A2S155	260–2442–00			SWITCH,PUSH:SPST;MOM,NO,100 GRM FRC,COND RUBBER CONTACTS,GRN LED,W/KEYCAP	TK1857	HL20–LSG
A2S162	260–2442–00			SWITCH,PUSH:SPST;MOM,NO,100 GRM FRC,COND RUBBER CONTACTS,GRN LED,W/KEYCAP	TK1857	HL20–LSG
A2S170	260–2442–00			SWITCH,PUSH:SPST;MOM,NO,100 GRM FRC,COND RUBBER CONTACTS,GRN LED,W/KEYCAP	TK1857	HL20–LSG
A2S176	260–2442–00			SWITCH,PUSH:SPST;MOM,NO,100 GRM FRC,COND RUBBER CONTACTS,GRN LED,W/KEYCAP	TK1857	HL20–LSG
A2W170	174–1282–00			CA ASSY,SP,ELEC:20,28 AWG,3.0 L,RIBBON	TK1547	TO BE ASSIGNED
W290	175–9861–00			CABLE ASSY,RF:75 OHM COAX,4.797 L,9–3	80009	175986100
W660	174–1281–00	B010100	B022960	CA ASSY,SP,ELEC:2,22 AWG,5.0 L	9M860	ORDER BY DESC
W660	174–1281–01	B022961		CABLE ASSY:CABLE ASSY,SP,ELEC,5.00 L	80009	174128101
W925	174–1280–00			CABLE ASSY,RF:75 OHM COAX,11.047 L	9M860	ORDER BY DESC

SECTION 8
DIAGRAMS/CIRCUIT BOARD ILLUSTRATIONS

Symbols

Graphic symbols and class designation letters are based on ANSI Standard Y32.2-1975.

Logic symbology is based on ANSI Y32.14-1973 in terms of positive logic. Logic symbols depict the logic function performed and may differ from the manufacturer's data.

The overline on a signal name indicates that the signal performs its intended function when it is in the low state.

Abbreviations are based on ANSI Y1.1-1972.

Other ANSI standards that are used in the preparation of diagrams by Tektronix, Inc. are:

Y14.15, 1966 — Drafting Practices.
Y14.2, 1973 — Line Conventions and Lettering.
Y10.5, 1968 — Letter Symbols for Quantities Used in Electrical Science and Electrical Engineering.

American National Standard Institute
1430 Broadway, New York, New York 10018

Component Values

Electrical components shown on the diagrams are in the following units unless noted otherwise:

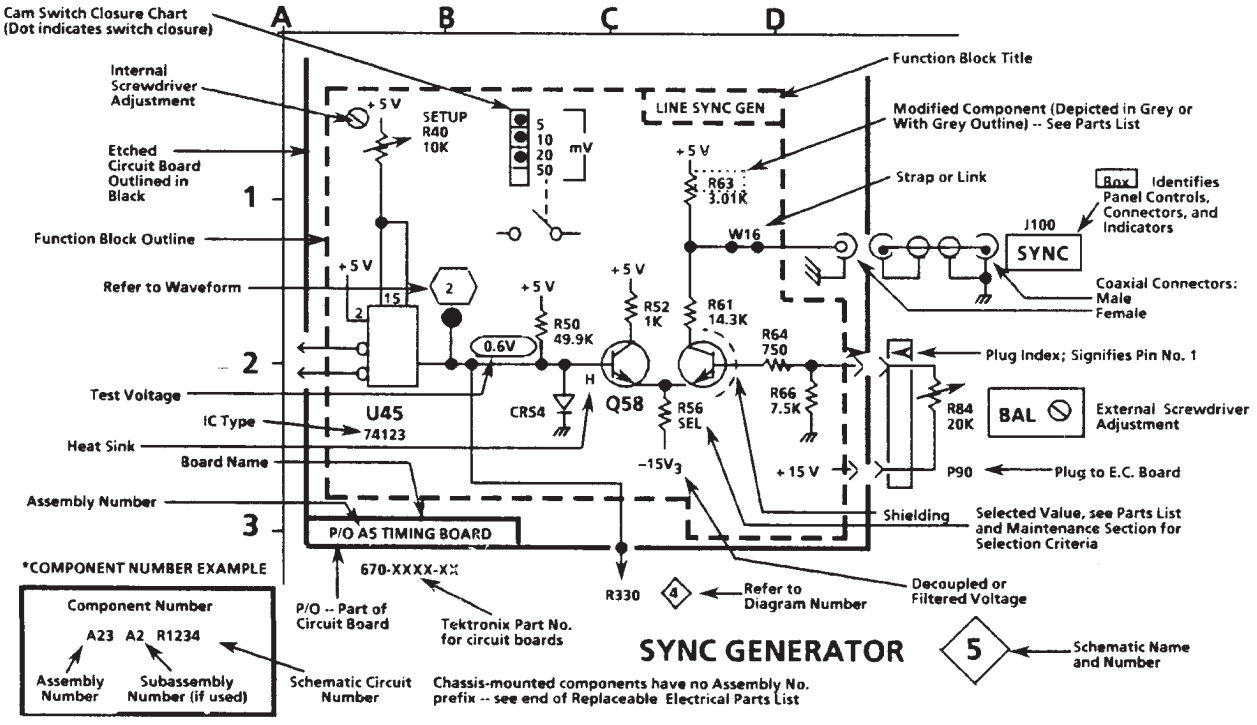
Capacitors = Values one or greater are in picofarads (pF). Values less than one are in microfarads (μF).
Resistors = Ohms (Ω).

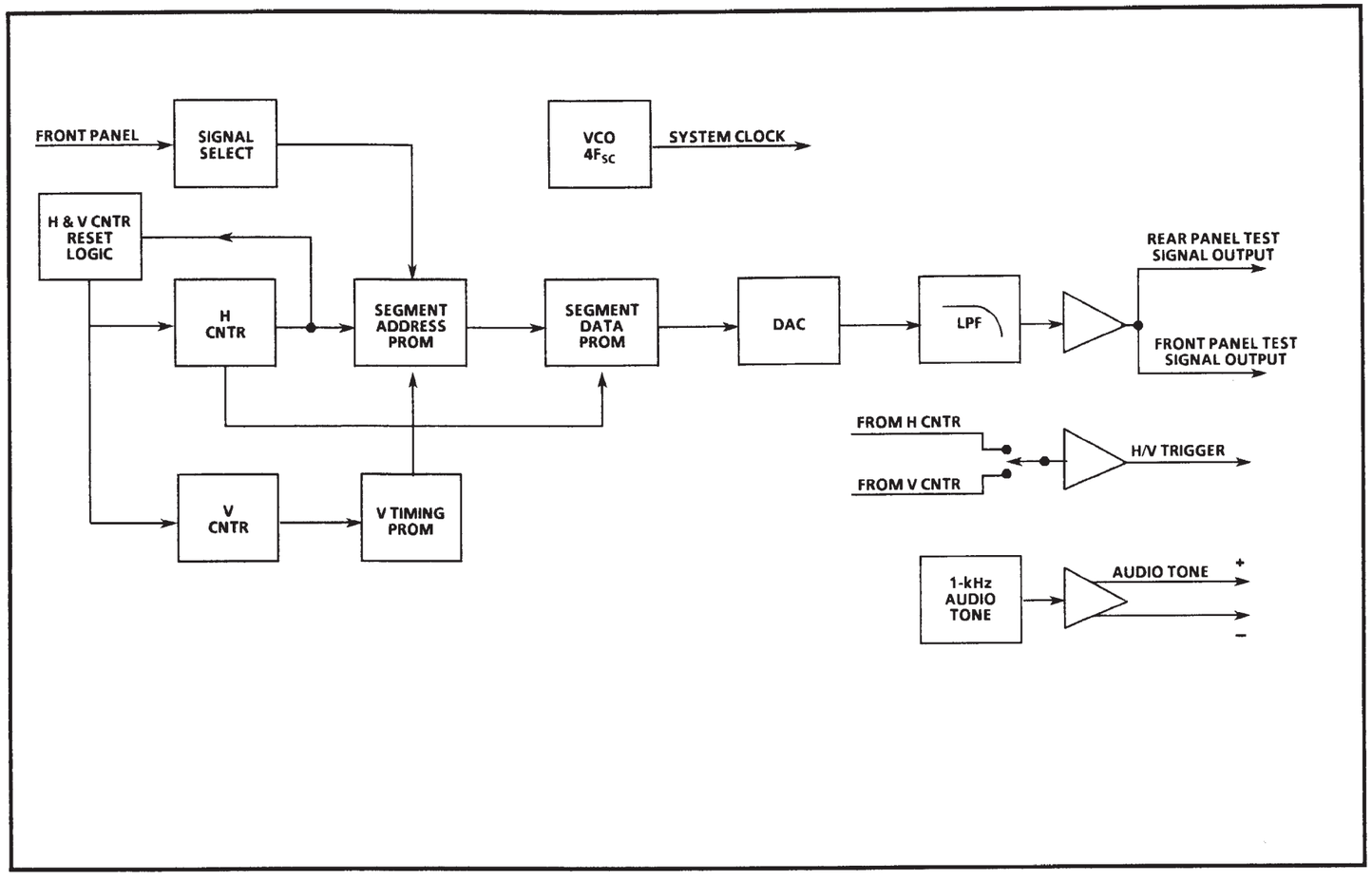
** *** **The following information and special symbols may appear in this manual** ** ***

Assembly Numbers and Grid Coordinates

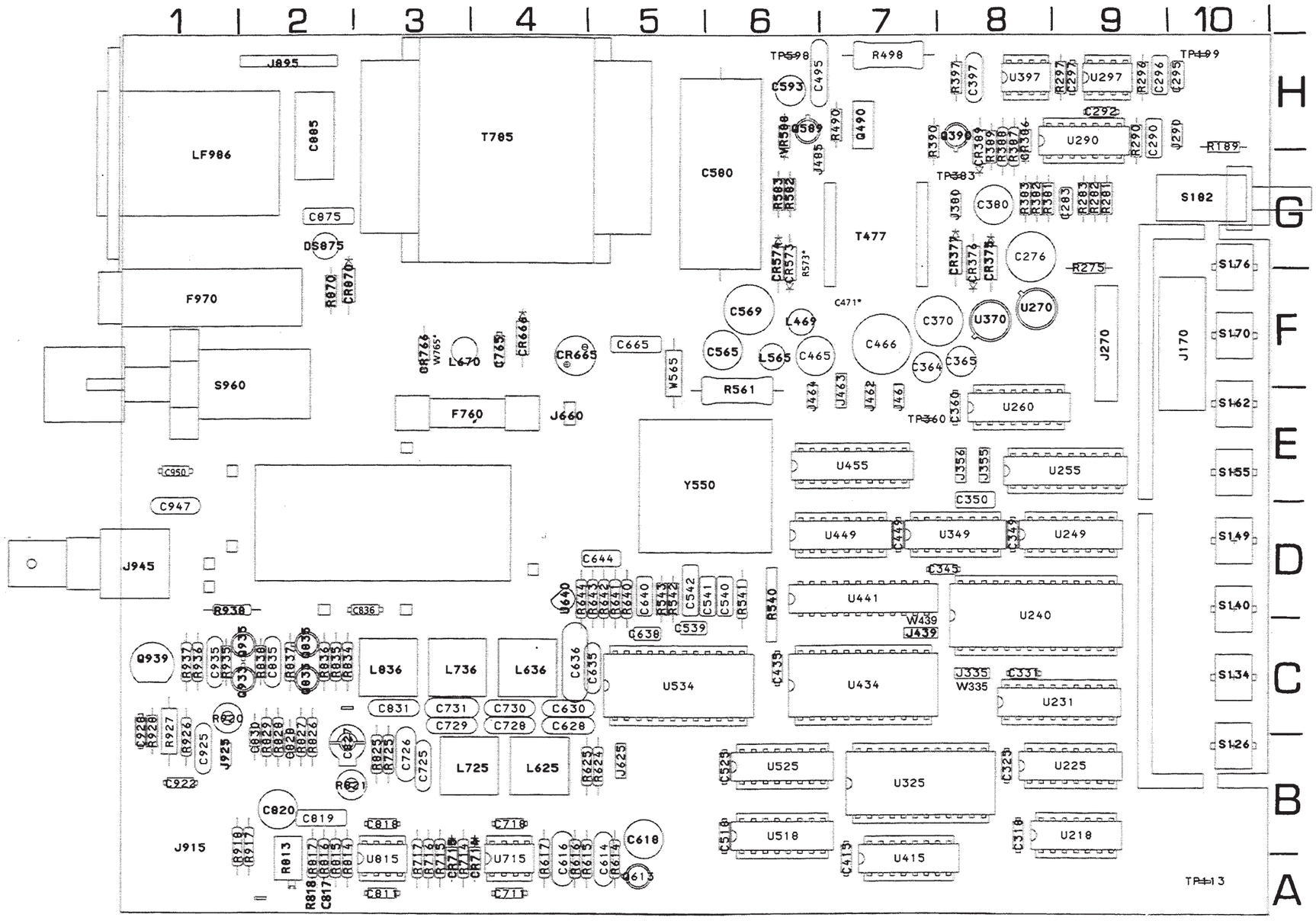
Each assembly in the instrument is assigned an assembly number (e.g., A20). The assembly number appears on the circuit board outline on the diagram, in the title for the circuit board component location illustration, and in the lookup table for the schematic diagram and corresponding component locator illustration. The Replaceable Electrical parts list is arranged by assemblies in numerical sequence; the components are listed by component number *(see following illustration for constructing a component number).

The schematic diagram and circuit board component location illustration have grids. A lookup table with the grid coordinates is provided for ease of locating the component. Only the components illustrated on the facing diagram are listed in the lookup table. When more than one schematic diagram is used to illustrate the circuitry on a circuit board, the circuit board illustration may only appear opposite the first diagram on which it was illustrated; the lookup table will list the diagram number of other diagrams that the circuitry of the circuit board appears on.





TSG–100 block diagram.



A1 Main Board and A2 Front Panel

SCHEMATIC DIAGRAM <1>

The schematic diagram has an alpha-numeric grid to assist in locating parts within that diagram.

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
ASSEMBLY A1			ASSEMBLY A2		
C350	D5	E8	S126A	H5	C10
			S126B	H4	C10
J170	G4	F10	S134A	H5	C10
J335*	F2	C8	S134B	H4	C10
J355	E4	E8	S140A	H5	D10
J356	D5	E8	S140B	H3	D10
J439*	F2	C7	S149A	H5	D10
			S149B	H3	D10
R189	F3	H10	S155A	H5	E10
R275	F4	G9	S155B	H3	E10
R540A	B1	D6	S162A	H5	E10
R540B	E4	D6	S162B	H3	E10
R540D	F3	D6	S170A	H4	F10
R540E	B3	D6	S170B	H2	F10
			S176A	H4	G10
S182	F3	G10	S176B	H2	G10
U218A	D4	B9			
U218B	F3	B9			
U225	D3	B9			
U231	F1	C9			
U240	E1	D8			
U249	C2	D9			
U255	E5	E9			
U260	F4	E8			
U325	D3	B7			
U349	C2	D8			
U415	C3	B7			
U434	G1	C7			
U441	D1	D7			
U449	C1	D7			
U455	B2	E7			
U518	C4	B6			
U525	C4	B6			
W335*	F2	C8			
W439*	E2	C7			
Y550	A2	E6			

*See Part List for Serial number ranges.

H COUNTER & DECODER

SYSTEM CLOCK

V COUNTER & DECODER

SIGNAL MEMORY

TRIGGER GATE

FRONT PANEL DECODER

FRONT PANEL

TRIGGER OUTPUT

BLACK BURST

FLAT FIELD

MOD 5 STEP

5 STEP

MULTIBURST

PULSE AND BAR

CONVERGENCE

COLOR BAR

H & V TRIGGER SWITCH

SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES

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PART OF A1 MAIN BOARD

A2 FRONT PANEL BOARD

SCHEMATIC DIAGRAM <2>

The schematic diagram has an alpha-numeric grid to assist in locating parts within that diagram.

ASSEMBLY A1

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C539	C4	D6	R541	C3	D6
C540	C3	D6	R542	C4	D5
C541	B4	D6	R543	C4	D5
C542	C3	D6	R614	C4	B5
C614	D4	B5	R615	D4	B5
C616	D4	B4	R616	D4	B4
C618	D5	B5	R617	D4	B4
C628	C2	C4	R624	C3	B5
C630	C2	C4	R625	C3	B5
C635	C2	C5	R640	B4	D5
C636	B2	C4	R641	B3	D5
C638	C4	C5	R642	B4	D5
C640	C3	D5	R643	B4	D5
C644	B4	D5	R644	B4	D5
C725	D2	B3	R714	D5	B4
C725	D2	B3	R715	D4	B3
C726	D2	B3	R716	E4	B3
C728	C2	C4	R717	F4	B3
C729	C2	C3	R725	D2	B3
C730	C2	C4	R813	F4	B2
C731	C2	C3	R814	E4	B3
C817 *	G4	A2	R815	F4	B2
C819	E4	B2	R816	F4	B2
C827	E3	C3	R817	E4	B2
C828	E3	C2	R818 *	F4	A2
C830	F2	C2	R821	E3	B3
C831	D2	C2	R825	E3	B3
C835	E2	C2	R826	E2	C2
C836*	E1	C3	R827	E3	C2
C922*	F2	B1	R828	F3	C2
C925	G2	C1	R829	F2	C2
C928	F2	C1	R834	D2	C3
C935	F2	C1	R835	E1	C2
C947	G3	E1	R836	E1	C2
			R837	E1	C2
CR714	E5	B4	R838	E2	C2
CR715	E4	B3			
			R917	F5	B2
J625	B2	B5	R918	G4	B2
J915	G4	B1	R926	G2	C1
J925	G3	B2	R927	F2	C1
J945	G3	D1	R928	F2	C1
			R930	F2	C2
L625	C2	B4			
L636	C2	C4	R935	F2	C2
L725	C2	B4	R936	F2	C1
L736	C2	C3	R937	E2	C1
L836	D2	C3	R938	F3	D2
Q613	D5	A5	TP830	D2	C3
Q833	E2	C2			
Q835	E2	C2	U534	B3	C5
Q933	F2	C2	U640	B4	D4
Q935	E2	C2	U715A	D4	B4
Q939	F2	C1	U715B	E5	B4
			U815A	F4	B3
			U815B	F4	B3

***See Parts list for serial number ranges.**

RECONSTRUCTION FILTER

C630 51
C628 95
C728 33
C729 85
C831 70
L825 2.3-2.6uH
L725 2.7-3.3uH
L836 2.19-2.53uH
L836
C730 200
C731 560
C725 550
C726 170
C636 1784
C635 77
L736 0.775-0.925uH
R725 37.4
TP830
R834 37.4

OUTPUT AMPLIFIER

+12V
R835 1.0K
C836 0.1
R836 1.0K
R837 232
R838 15
Q835
Q833
R935 15
C835 10
C935 10
+5V
R928 15
C928 0.1
Q930
R926 75.0
J925
P925
VIDEO OUTPUT FRONT PANEL
C925 10 (SEL)
R937 2.4K
R936 2.4K
-12V
C922 0.1
R927 110
-5V
Q833
Q835
R826 1.78K
C830 4.7pF
GAIN
R829 1.82K
R920 500
R827 324
R828 1.0K
C826 4.7
C827 1.8-15pF
SINX/X CORR
NC
DC OFFSET
R821 2K
R825 13.3K
R938 75.0
J945
VIDEO OUTPUT REAR PANEL
C947 10 (SEL)

U434 1 SIG[0..7] SIG[0..7]
SIG7 (MSB) SIG6 SIG5 SIG4 SIG3 SIG2 SIG1 SIG0
U534 TDC1012
D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12
OUT+ OUT-
R624 37.4
R625 75
+5V
R541 10
C540 0.1
U455-12 1 CLK1C
CONV FT
VCC AGND DGND VEEA VEED
REF+ REF-
COMP
R641 1.62K
C542 1.0
C640 0.1
C639 0.01
C638 0.01
C541 0.1
R640 1.62K
R543 3.6
R642 3.6
-5.2V
-5.2V
J625
P625
C644 0.1
R642 1.0K
R643 200
R644 2.21K
U640 LM385-1.2
-12V

+15V +15V
+12V +12V
+5VREF +5VREF
+5V +5V
GND
-5V -5V
-12V -12V

D/A CONVERTER

R614 158K
R615 158K
C616 1000
C614 1000
U715A 1458
R617 16.50K
R616 7.5K
Q613
C618 100uF
R715 20K
CR715
R714 5.00K
CR714
U715B 1458
R716 6.04K
C819 1.0uF

AUDIO OSCILLATOR

R818 5.0K
C817 1000pF
R813 50K
R817 10.0K
R814 5.03K
U815A 5532
R815 10.0K
R816 10K
R717 5.03K
U815B 5532
R818 24.9
R817 24.9
J915
AUDIO TONE OUTPUT REAR PANEL

OUTPUT DRIVER

** SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES

671-0507-00 - 08

PART OF A1 MAIN BOARD

SCHEMATIC DIAGRAM <3>

The schematic diagram has an alpha-numeric grid to assist in locating parts within that diagram.

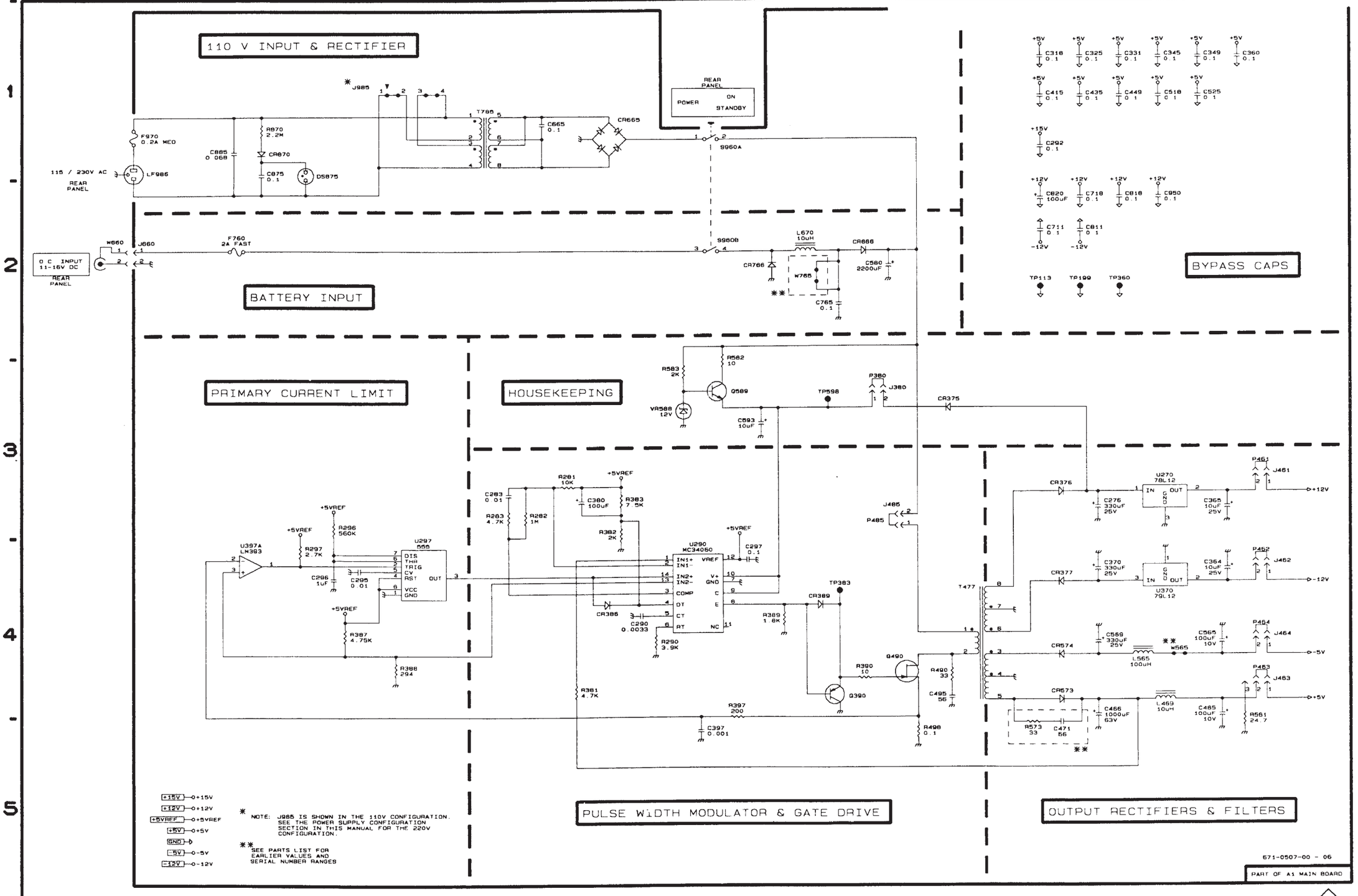
ASSEMBLY A1

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C276	G3	G8
C283	C3	G9
C290	D4	H9
C292	G1	H9
C295	C4	H10
C296	B4	H10
C297	E4	H9
C318	G1	B8
C325	G1	B8
C331	G1	C8
C345	G1	D8
C349	G1	D8
C360	G2	E8
C364	H4	F8
C365	H3	F8
C370	G4	F8
C380	D3	G8
C397	E4	H8
C415	G1	B7
C435	G1	C6
C449	G1	D7
C465	H4	F7
C466	G4	F7
C471*	G5	F7
C495	F4	H7
C518	G1	B6
C525	G2	B6
C565	H4	F6
C569	G4	F6
C580	F2	G6
C593	E3	H6
C665	D1	F5
C711	G2	A4
C718	G2	B4
C765	E2	F4
C811	G2	A3
C818	G2	B3
C820	G2	B2
C875	B2	G2
C885	B1	H2
C950*	G2	E1

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
CR375	F3	G8
CR376	G3	G8
CR377	G4	G8
CR386	D4	H8
CR389	E4	H8
CR573	G4	G6
CR574	G4	G6
CR665	D1	F4
CR666	E2	F4
CR766	E2	F3
CR870	B1	F2
DS875	B2	G2
F760	B2	E4
F970	A1	F1
J270	G4	F9
J290	H2	H10
J380	F3	G8
J461	H3	F7
J462	H4	F7
J463	H4	F7
J464	H4	F7
J485	F3	H7
J660	A2	E4
J895	C1	H2
L469	G4	F6
L565	G4	F6
L670	E2	F4
LF986	A1	H1
Q390	E4	H8
Q490	F4	H7
Q589	E3	H6
R281	D3	G9
R282	D3	G9
R283	C3	G9
R290	D4	H9
R296	B3	H9
R297	B3	H9
R381	D4	G9

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
R382	D3	G8
R383	D3	G8
R387	C4	H8
R388	C4	H8
R389	E4	H8
R390	F4	H8
R397	E4	H8
R490	F4	H7
R498	F4	H7
R561	H4	F6
R573*	F5	G6
R582	E3	G6
R583	D3	G6
R870	B1	F2
S960A	E1	F1
S960B	C2	F1
T477	F4	G7
T785	B4	H4
TP113	G2	A10
TP199	G2	H10
TP360	G2	E7
TP383	E4	G8
TP598	E3	H6
U270	G3	F8
U290	D4	H9
U297	C4	H9
U370	G4	F8
U397A	B4	H8
VR588	D3	H6
W565*	H4	F6
W765*	E2	F4

***See Parts List for serial number ranges.**


110 V INPUT & RECTIFIER
BATTERY INPUT
PRIMARY CURRENT LIMIT
HOUSEKEEPING
PULSE WIDTH MODULATOR & GATE DRIVE
OUTPUT RECTIFIERS & FILTERS
BYPASS CAPS
REAR PANEL
POWER ON STANDBY
115 / 230V AC
D.C. INPUT 11-16V DC
F970 0.2A MED
F760 2A FAST
LF986
DS875
T785
T477
U397A LM393
U297 555
U290 MC34060
U270 78L12
U370 79L12
Q390
Q490
VR588 12V
CR665
CR666
CR670
CR686
CR766
CR386
CR389
CR376
CR377
CR574
CR573
CR375
L670 10uH
L565 100uH
L469 10uH
W765
W565
TP598
TP383
TP113
TP199
TP360
J485
P485
J460
P460
J461
P461
J462
P462
J463
P463
J464
P464
J380
P380
+5V
+12V
-5V
-12V
+15V
+5VREF
GND
NOTE: J985 IS SHOWN IN THE 110V CONFIGURATION. SEE THE POWER SUPPLY CONFIGURATION SECTION IN THIS MANUAL FOR THE 220V CONFIGURATION.
SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES
671-0507-00 - 06
PART OF A1 MAIN BOARD

Section 9
Replaceable Mechanical Parts

This section contains a list of the components that are replaceable for the TSG-100. Use this list to identify and order replacement parts. There is a separate Replaceable Mechanical Parts list for each instrument.

Parts Ordering Information

Replacement parts are available from or through your local Tektronix, Inc., Field Office or representative.

Changes to Tektronix instruments are sometimes made to accommodate improved components as they become available and to give you the benefit of the latest circuit improvements. Therefore, when ordering parts, it is important to include the following information in your order.

- Part number
- Instrument type or model number
- Instrument serial number
- Instrument modification number, if applicable

If a part you have ordered has been replaced with a new or improved part, your local Tektronix, Inc., Field Office or representative will contact you concerning any change in part number.

Change information, if any, is located at the rear of this manual.

Using the Replaceable Mechanical Parts List

The tabular information in the Replaceable Mechanical Parts list is arranged for quick retrieval. Understanding the structure and features of the list will help you find all of the information you need for ordering replaceable parts.

Cross Index–Mfr. Code Number to Manufacturer

The Mfg. Code Number to Manufacturer Cross Index for the mechanical parts list is located immediately after this page. The cross index provides codes, names, and addresses of manufacturers of components listed in the mechanical parts list.

Abbreviations

Abbreviations conform to American National Standards Institute (ANSI) standard Y1.1.

Chassis Parts

Chassis-mounted parts and cable assemblies are located at the end of the Replaceable Electrical Parts list.

Column Descriptions

Figure & Index No. (Column 1)

Items in this section are referenced by figure and index numbers to the illustrations.

Tektronix Part No. (Column 2)

Indicates part number to be used when ordering replacement part from Tektronix.

Serial No. (Column 3 and 4)

Column three (3) indicates the serial number at which the part was first used. Column four (4) indicates the serial number at which the part was removed. No serial number entered indicates part is good for all serial numbers.

Qty (Column 5)

This indicates the quantity of mechanical parts used.

Name and Description (Column 6)

An item name is separated from the description by a colon (:). Because of space limitations, an item name may sometimes appear as incomplete. Use the U.S. Federal Catalog handbook H6-1 for further item name identification.

Following is an example of the indentation system used to indicate relationship.

```
1  2  3  4  5        Name & Description
Assembly and/or Component
Mounting parts for Assembly and/or Component
*MOUNTING PARTS*/*END MOUNTING PARTS*
    Detail Part of Assembly and/or Component
    Mounting parts for Detail Part
    *MOUNTING PARTS*/*END MOUNTING PARTS*
        Parts of Detail Part
        Mounting parts for Parts of Detail Part
        *MOUNTING PARTS*/*END MOUNTING PARTS*
```

Mounting Parts always appear in the same indentation as the Item it mounts, while the detail parts are indented to the right. Indented items are part of and included with, the next higher indentation. **Mounting parts must be purchased separately, unless otherwise specified.**

Mfr. Code (Column 7)

Indicates the code number of the actual manufacturer of the part. (Code to name and address cross reference can be found immediately after this page.)

Mfr. Part Number (Column 8)

Indicates actual manufacturer's part number.

Cross Index – Mfr. Code Number To Manufacturer

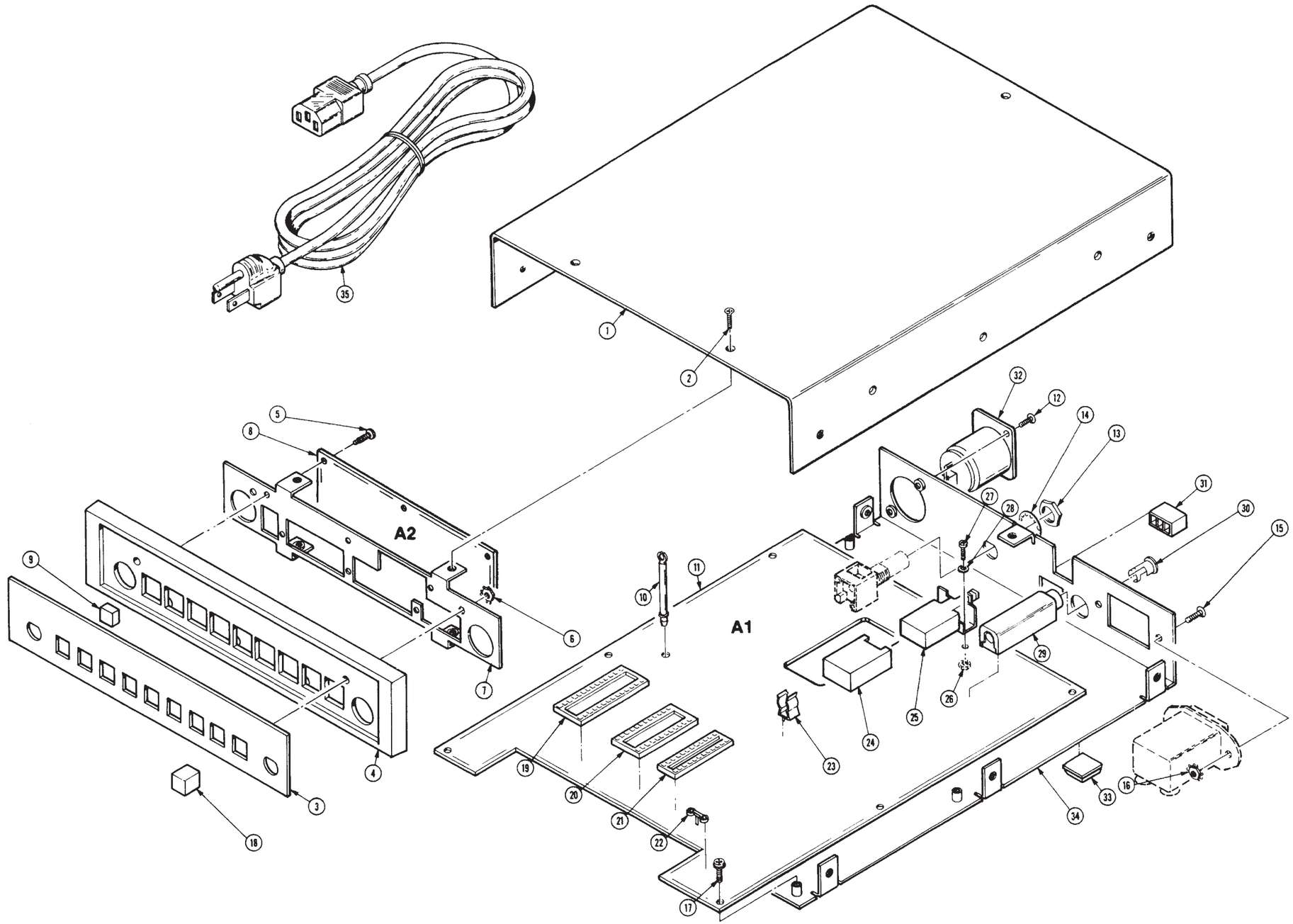
Mfr. Code	Manufacturer	Address	City, State, Zip Code
S3109	FELLER	72 Veronica Ave Unit 4	Summerset NJ 08873
TK0435	LEWIS SCREW CO	4300 S RACINE AVE	CHICAGO IL 60609–3320
TK1151	QUALITY PLASTIC INC	2101 CRESTVIEW DR PO BOX 740	NEWBERG OR 97132–9518
TK1857	HIROSE ELECTRIC USA INC	2688 WESHILLS COURT	SIMI VALLEY, CA 93065–6235
TK1935	ACCRA–FAB INC	11007 NE 37TH CIRCLE	VANCOUVER WA 98682
TK2548	XEROX BUSINESS SERVICES DIV OF XEROX CORPORATION	14181 SW MILLIKAN WAY	BEAVERTON OR 97077
TK2562	MOLDING SPECIALITIES INC	3000 LEWIS & CLARK HWY	VANCOUVER, WA 98661–2999
0JR05	TRIQUEST CORP	3000 LEWIS AND CLARK HWY	VANCOUVER WA 98661–2999
0KBZ5	MORELLIS Q & D PLASTICS	1812 16TH AVE	FOREST GROVE OR 97116
0KB01	STAUFFER SUPPLY	810 SE SHERMAN	PORTLAND OR 97214
00779	AMP INC	2800 FULLING MILL PO BOX 3608	HARRISBURG PA 17105
07416	NELSON NAME PLATE CO	3191 CASITAS	LOS ANGELES CA 90039–2410
09922	BURNDY CORP	1 RICHARDS AVE	NORWALK CT 06856
5Y400	TRIAX METAL PRODUCTS INC DIV OF BEAVERTON PARTS MFG CO	1800 NW 216TH AVE	HILLSBORO OR 97124–6629
52152	MINNESOTA MINING AND MFG CO INDUSTRIAL TAPE DIV	3M CENTER	ST PAUL MN 55144–0001
61857	SAN–0 INDUSTRIAL CORP	91–3 COLIN DRIVE	HOLBROOK NY 11741
61935	SCHURTER INC	1016 CLEGG COURT	PETALUMA CA 94952–1152
73743	FISCHER SPECIAL MFG CO	111 INDUSTRIAL RD	COLD SPRING KY 41076–9749
78189	ILLINOIS TOOL WORKS INC SHAKEPROOF DIV	ST CHARLES ROAD	ELGIN IL 60120
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON OR 97077–0001
83486	ELCO INDUSTRIES INC	1101 SAMUELSON RD	ROCKFORD IL 61101

Replaceable Mechanical Parts

Fig. & Index No.	Tektronix Part No.	Serial Number Effective	Dscont	Qty	12345	Name & Description	Mfr. Code	Mfr. Part No.
1–1	200–3593–00			1		COVER,TOP:TSG100 *MOUNTING PARTS*	5Y400	ORDER BY DESC
–2	211–0119–00			12		SCREW,MACHINE:4–40 X 0.25,FLH,100 DEG,STL *END MOUNTING PARTS*	TK0435	ORDER BY DESC
–3	333–3602–00			1		PANEL,FRONT:TSG100 (STANDARD ONLY)	07416	333–3602–00
	333–3770–00	B020727		1		PANEL,FRONT:TSG100 OPT 01 (OPTION 01 ONLY)	07416	333–3770–00
–4	426–2262–00			1		FRAME,FRONT:TSG100 *MOUNTING PARTS*	TK1151	ORDER BY DESC
–5	213–0088–00	B010100	B010315	6		SCREW,TPG,TF:4–24 X 0.25,TYPE B,PNH,STL CDPL	TK0435	ORDER BY DESC
	213–0912–00	B010316		6		SCREW,TPG,TF:4–20 X 0.25 L,PAN HEAD STL CDPL,POZ	83486	ORDER BY DESC
–6	210–0586–00			2		NUT,PL,ASSEM WA:4–40 X 0.25,STL CD PL *END MOUNTING PARTS*	TK0435	ORDER BY DESC
–7	337–3514–00			1		SHIELD,ELEC:ALUMINUM	TK1935	337–3514–00
–8	————			1		CKT BOARD ASSY:FRONT PANEL (SEE A2 REPL)		
–9	366–0671–00			8		PUSH BUTTON:W/LENS,HL20–1101	TK1857	HL20–1101
–10	343–1412–00			1		CLAMP,CABLE:TSG100	80009	343141200
–11	————			1		CKT BOARD ASSY:MAIN (SEE A1 REPL) *MOUNTING PARTS*		
–12	211–0101–00			2		SCREW,MACHINE:4–40 X 0.25,FLH,100 DEG,STL	TK0435	ORDER BY DESC
–13	220–0497–00			1		NUT,PLAIN,HEX:0.5–28 X 0.562 HEX,BRS CD PL	73743	ORDER BY DESC
–14	210–1039–00			1		WASHER,LOCK:0.521 ID,INT,0.025 THK,SST	0KB01	1224–02–00–0541
–15	211–0025–00			2		SCREW,MACHINE:4–40 X 0.375,FLH,100 DEG,STL	TK0435	ORDER BY DESC
–16	210–0586–00			2		NUT,PL,ASSEM WA:4–40 X 0.25,STL CD PL	TK0435	ORDER BY DESC
–17	211–0661–00			7		SCR,ASSEM WSHR:4–40 X 0.25,PNH,STL,CD PL,POZ,MACH *END MOUNTING PARTS*	TK0435	ORDER BY DESC
						CKT BOARD ASSY INCLUDES:		
–18	366–0686–00			1		PUSH BUTTON:0.375 SQ,TV GRAY,PLASTIC	0KBZ5	ORDER BY DESC
–19	136–0755–00			1		SOCKET,DIP:PCB;FEMALE,STR,2 X 14,28 POS,0.1 X 0.6 CTR, 0.175 H X0.130 TAIL,BECU,TIN,ACCOM 0.008–0.0015 X 0.014–0.022	09922	DILB28P–108
–20	136–0751–00			3		SOCKET,DIP:PCB,;STR,2 X 12,24 POS,0.1 X 0.6CTR,0.175 H X 0.13 TAIL,BECU,TIN,ACCOM 0.008–0.015 X 0.014–0.022 LEADS	09922	DILB24P108
–21	136–0925–00			1		SOCKET,DIP::PCB,;24 POS,2 X 12,0.1 X 0.3 CTR,0.196 H X 0.130 TAIL,BECU,TIN,ACCOM 0.008–0.015THRU 0.014 X 0.022 LEADS	00779	2–641932–3
–22	361–0385–00			2		SPACER,PB SW:0.164 L,GREEN POLYCARBONATE	TK2562	361–0385–00
–23	344–0329–00			2		CLIP,ELECTRICAL:PCB,;FEMALE,STR,ACCOM 5 X 20MM FUSE,5.9MM H X 3.2MM TAIL,5MM PTH SP,1.3MM DIA PTH,BRONZE TIN PLATED	61857	H–0011–2
–24	200–2735–00			1		COVER,POWER SW:BLACK,POLYCARBONATE	0JR05	ORDER BY DESC
–25	————			1		SWITCH,PUSH: (SEE S960 REPL) *MOUNTING PARTS*		
–26	210–0405–00			2		NUT,PLAIN,HEX:2–56 X 0.188,BRS CD PL	73743	12157–50
–27	211–0022–00			2		SCREW,MACHINE:2–56 X 0.188,PNH,STL	TK0435	ORDER BY DESC
–28	210–0001–00			2		WASHER,LOCK:#2 INTL,0.013 THK,STL *END MOUNTING PARTS*	78189	1202–00–00–0541
–29	204–0906–00			1		BODY,FUSEHOLDER:3AG & 5 X 20MM FUSES	61935	TYPE FAU 031.35
–30	200–2264–00			1		CAP,FUSEHOLDER:3AG FUSES	61935	FEK 031 1666
–31	366–1160–00			1		PUSH BUTTON:CHARCOAL,0.523 X 0.253 X 0.43	80009	366116000
–32	————			1		CONN,RCPT,ELEC: (SEE J915 REPL)		

Fig. & Index No.	Tektronix Part No.	Serial Number Effective	Dscont	Qty	12345	Name & Description	Mfr. Code	Mfr. Part No.
–33	348–0844–00			4		PAD,CUSHIONING:0.05 SQ X 0.23 H,POLYURETHANE W/PRESSURE SENS ADHESIVE	52152	SJ–5018–GRAY
–34	200–3594–00	B010100	B022960	1		COVER,BOTTOM:TSG100	80009	200359400
	200–3594–01	B022961		1		COVER,BOTTOM:ALUMINUM,TSG100	80009	200359401
						STANDARD ACCESSORIES		
–35	161–0066–00			1		CA ASSY,PWR:3,18 AWG,250V/10A,98 INCH,STR,IEC320, RCPT X NEMA 5–15P,US,SAFTEY CONTROLLED	S3109	161–0066–00
	070–6881–00			1		MANUAL,TECH:INSTR,TSG100	TK2548	PER TEK P/N

FIG.1 EXPLODED



TSG100

APPENDIX A
TSG-100 OPTION 01

This appendix documents Option 01 for the TSG-100. Option 01 changes the entire test signal complement produced by the instrument to provide a transmission test signal set. This involves a different front panel (to show the appropriate signal names), and changes to the PROMs which store the test signal data.

The TSG–100 Option 01 deletes the standard signal set and replaces it with transmission test signals, including the NTC7 signals. The different signal names are the only visual distinction on the front panel between the standard and the Option 01 (see Fig. A-1), although there is an Option 1 sticker on the rear panel. The remainder of the instrument stays the same, including trigger output, audio tone, and battery operation.

This section will deal with the changes to the other sections in this manual, to change the information for the TSG–100 Option 01.

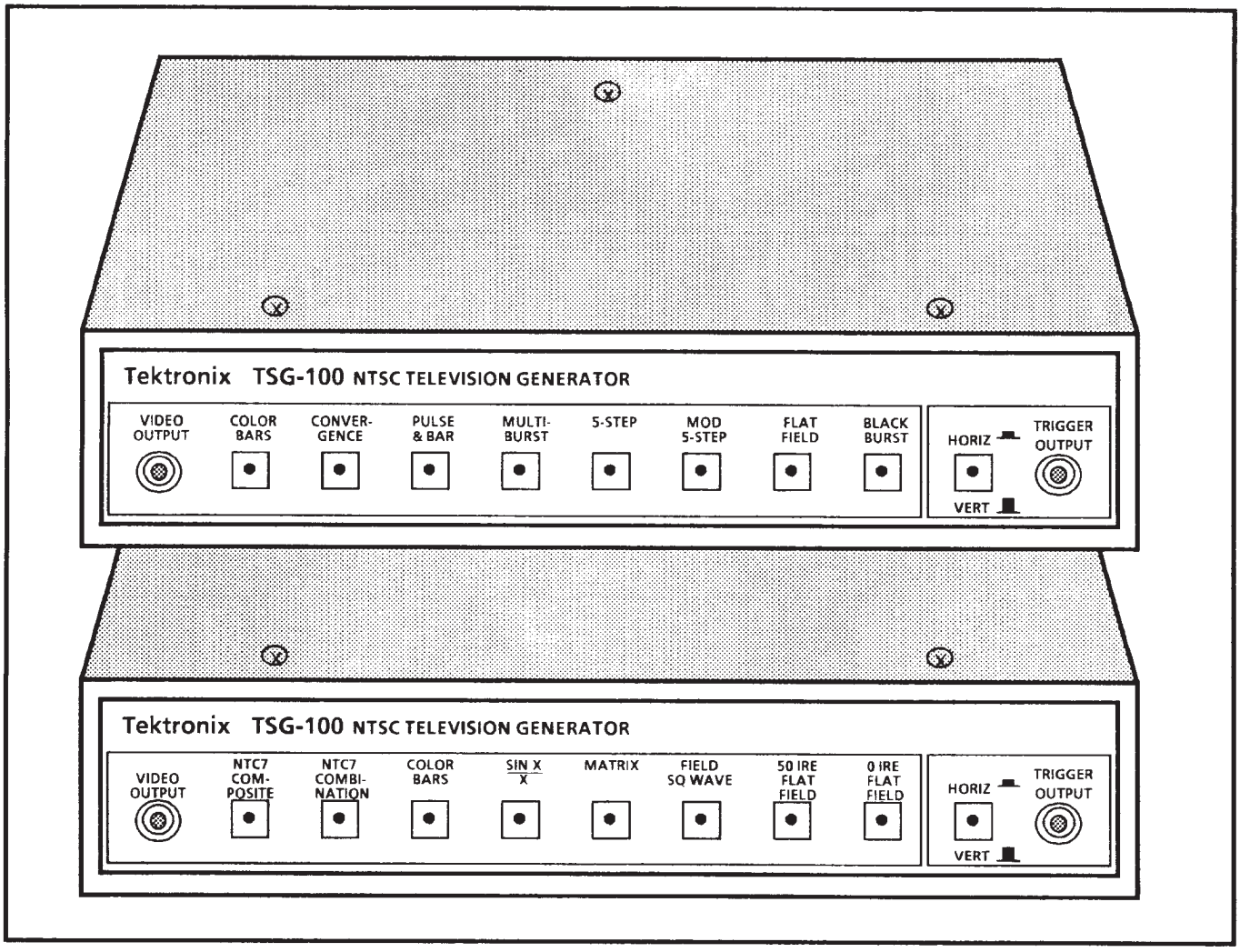


Fig. A-1. TSG–100 (top), TSG–100 Option 01 (bottom).

SECTION 1 - INTRODUCTION
SECTION 2 - CONTROLS, INDICATORS, AND CONNECTORS

The only change to these two sections is the new test signal complement, which is:

- NTC7 Composite
- NTC7 Combination
- Color Bars
- SIN X/X
- Matrix
- Field Square Wave
- 50 IRE Flat Field
- 0 IRE Flat Field

SECTION 3 SPECIFICATIONS

Option 01 changes all of the test signals, so the test signals called out in Table 3-1 for Chrominance-to-Luminance Gain and Chrominance-to-Luminance Delay change, as shown in Table A-1, and all of the information in Table 3-2 is replaced by Table A-2.

Table A-1
Test Signal Generator — Opt. 01 Test Signal Characteristics Changes

Characteristics	Performance Requirement	Supplemental Information
Chrominance-to-Luminance Gain	±2% of 100 IRE.	1% typical. Measured with NTC7 Composite.
Chrominance-to-Luminance Delay	≤15 ns.	10 ns typical. Measured with with NTC7 Composite.

Table A-2
Test Signal Generator — Opt. 01 Test Signals

Characteristics	Performance Requirement	Supplemental Information
NTC7 Composite		See Fig. A-2.
Bar		
Amplitude	100 IRE (714.3 mV).	
Risetime	125 ns ±12.5 ns.	
2T Pulse		
Amplitude	100 IRE (714.3 mV).	
HAD	250 ns ±25 ns.	
Ringing	≤1.5% peak.	
Modulated 12.5T Pulse		
Amplitude	100 IRE (714.3 mV).	
HAD	1.53 μs ±150 ns.	
Modulated Phase	60.8°	
Modulated 5-Step Staircase		
Amplitude	90 IRE (642.9 mV).	
Linearity Error	≤1%.	Relative step matching.
Chrominance Amplitude	40 IRE (285.7 mV).	
Diff Gain	1% Max.	
Diff Phase	0.6° Max	

Table A-2 (Cont.)
Test Signal Generator — Opt. 01 Test Signals

Characteristics	Performance Requirement	Supplemental Information
NTC7 Combination		See Fig. A-3.
Multiburst		
White Reference Bar		
Amplitude	100 IRE (714.3 mV).	
Packet Amplitude	50 IRE p-p (357.2 mV).	
Pedestal	50 IRE (357.2 mV).	
Burst Frequencies	500 kHz, 1 MHz, 2 MHz, 3 MHz, 3.58 MHz, 4.2 MHz.	
Packet Risetime		
500 kHz		140 ns typical (Sin^2 shaped packets).
Others		400 ns typical (Sin^2 shaped packets).
Modulated Pedestal		
Pedestal Amplitude	50 IRE (357.2 mV).	
Chrominance Amplitude	20 IRE (142.9 mV).	
	40 IRE (285.7 mV).	
	80 IRE (571.4 mV).	
Phase	90°	
Risetime	400 ns ±40 ns.	
Color Bars	Full Field color bars	75% Amplitude, 7.5% setup with a 100 IRE White Flag. See Fig. A-4.
SIN $X/_X$		See Fig. A-5.
Spectrum		–3 dB at 4.75 MHz.
Matrix		See Fig. A-6.
Field Square Wave		See Fig. A-7.
Field Timing		
Lines (White)		Lines 70 to 213.
Lines at Blanking		All remaining active lines.
Field Tilt	≤0.5%	
Line Tilt	≤0.5%	
Amplitude	100 IRE (714.3 mV).	
50 IRE Flat Field		See Fig. A-7.
Amplitude	50 IRE (357.2 mV).	
0 IRE Flat Field		See Fig. A-8.
Amplitude	0 IRE (0 mV).	No Burst.

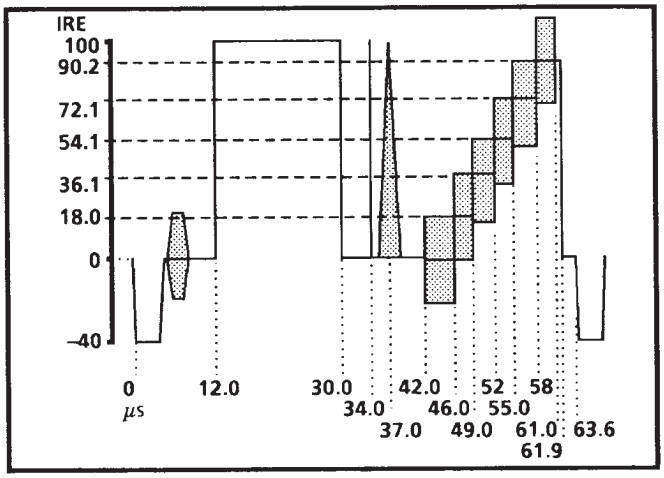


Fig. A-2. Option 01 NTC7 Composite.

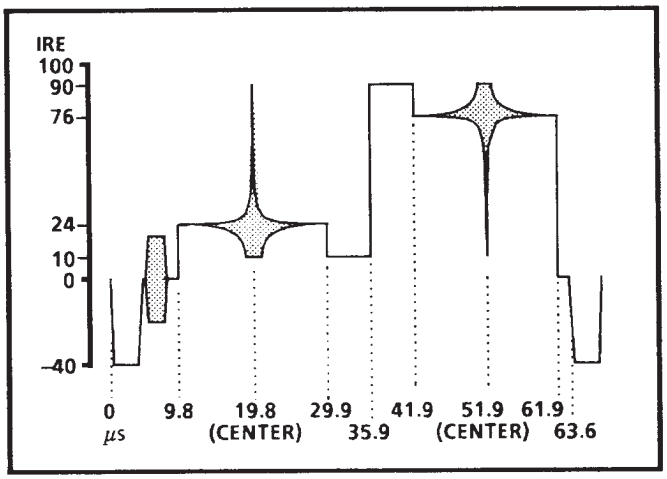


Fig. A-5. Option 01 $\frac{\text{SIN X}}{X}$.

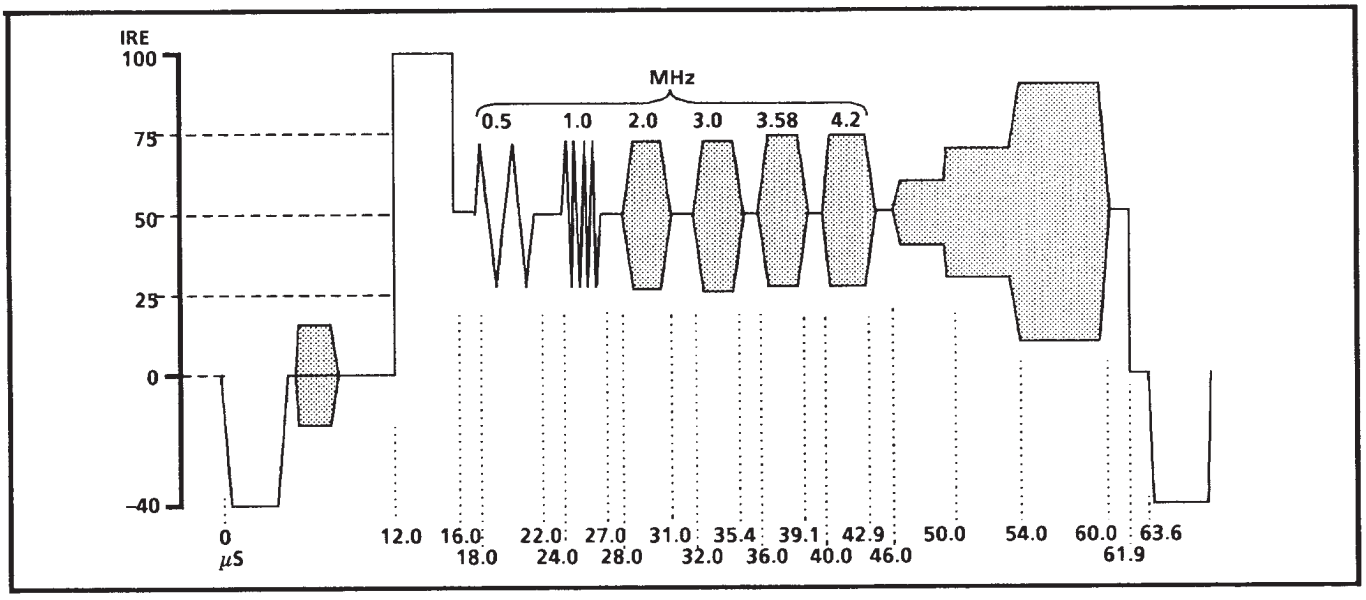


Fig. A-3. Option 01 NTC7 Combination.

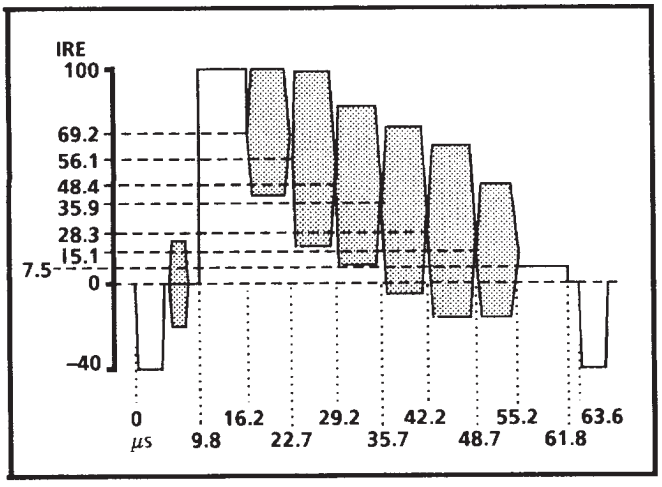


Fig. A-4. Option 01 Color Bars.

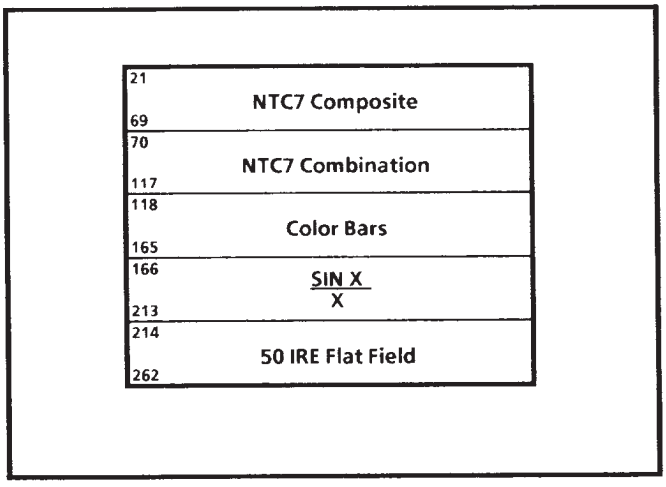


Fig. A-6. Option 01 Matrix.

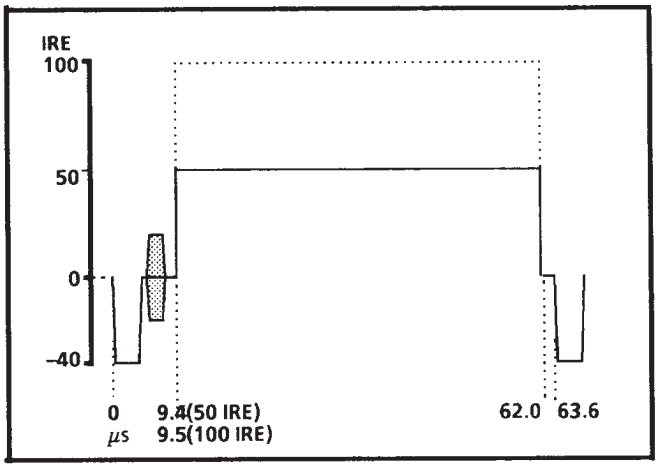


Fig. A-7. Option 01 Field Square Wave and 50 IRE Flat Field.

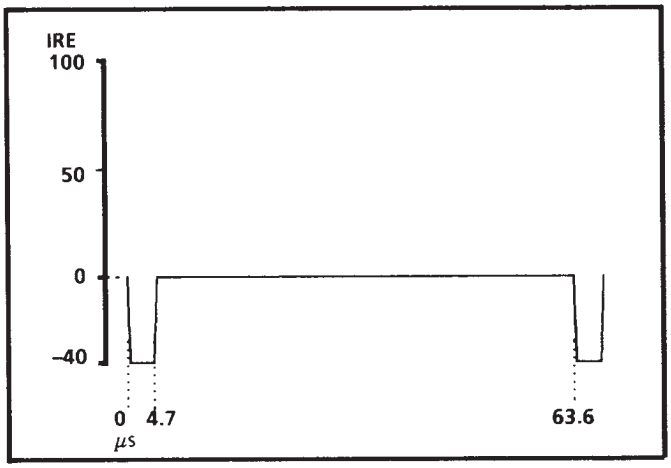


Fig. A-8. Option 01 0 IRE Flat Field.

SECTION 4 PERFORMANCE CHECK AND CALIBRATION PROCEDURES

PERFORMANCE CHECK PROCEDURE CHANGES

Change the following portions (changes shown in italics) of the performance check procedure for the TSG-100 Option 01: Steps or parts of steps not mentioned are not changed.

1. b. Select *NTC7 Composite* from the TSG-100 *Option 01.*

2. b. Select *NTC7 Composite* from the TSG-100 *Option 01.*

c. Set the 1480 to view the *Bar portion of the waveform* at a horizontal rate in A–B mode, using a VAC (Voltage Amplitude Calibration Fixture) as the B input.

d. With the VAC, match the top of the *lower waveform's Bar* with the blanking level of the upper waveform.

e. CHECK – that the *Bar* amplitude is 714.3 mV ±7.14 mV (1%).

3. Staircase Linearity

a. With the *NTC7 Composite* signal still selected, set the 1480 to view the 5-step portion of the waveform in differentiated form through the Channel A input.

b. Use the 1480 Variable Volts Full Scale control to obtain a full scale (100 IRE) display of the differentiated steps.

c. CHECK – that the difference in relative amplitude of each differentiated step riser (spike) is *≤7.14 mV (1 IRE).*

4. a. Select *Field Square Wave* from the TSG-100 *Option 01.*

6. a. Select *NTC7 Composite* from the TSG-100 *Option 01.*

7. a. With *NTC7 Composite* still selected, set the waveform monitor to display the 2T pulse at a horizontal rate.

8. Chrominance-to-Luminance Gain

a. Select *NTC7 Composite* from the TSG-100 *Option 01.*

b. CHECK – that the Bar and Modulated 12.5T Pulse have equal amplitude within ±4.3 mV peak (2% of 100 IRE). Less than 1% is typical.

9. b. Select *NTC7 Composite* from the TSG-100 *Option 01.*

11. b. Set the oscilloscope to display the TSG-100 *Option 01 50 IRE Flat Field* output at a line rate.

CALIBRATION PROCEDURE CHANGES OPTION 01

Change the following portions (changes shown in italics) of the Calibration procedures for the TSG-100 Option 01. Steps or parts of steps not mentioned are not changed.

2. b. Select *NTC7 Composite* from the TSG-100 *Option 01.*

3. a. With *NTC7 Composite* selected at the TSG-100, connect the equipment as in Fig. 4-9.

b. Set the VAC to 714.3 mV and set the Waveform Monitor to view the *Bar* at a horizontal rate.

4. a. Select the *NTC7 Combination* signal from the TSG-100 *Option 01.*

5. a. Select *NTC7 Composite* from the TSG-100 *Option 01.*

6. a. With *NTC7 Composite* still selected, adjust C827 to make the *top of the Modulated 12.5T Pulse* match the *top of the 100 IRE Bar.*

SECTION 6 – MAINTENANCE

The only change to Section 6 for the TSG-100 Option 01 is the list of signal names in the External Signal Select row of the Jumper Table. Table A-3 shows the new signal names associated with the various selection codes.

Table A-3
Jumper Table Changes

Function	Jumper #	Description	Factory Set
External Signal Select	J356	Pins 1–2: Enables front-panel decoder for normal front-panel control. Pins 2–3: Disables front-panel decoder for external front-panel control (see J355).	
	J355	Pins 1,2,3: When J356 is in the 2–3 position, the eight test signals can be selected via *ground closure of P355–1, 2, and 3.* The selection code is: S2 S1 S0 SIGNAL 0 0 0 *0 IRE Flat Field* 0 0 1 *50 IRE Flat Field* 0 1 0 *Field Square Wave* 0 1 1 *Matrix* 1 0 0 *SIN X/X* 1 0 1 *Color Bars* 1 1 0 *NTC7 Combination* 1 1 1 *NTC7 Composite*	

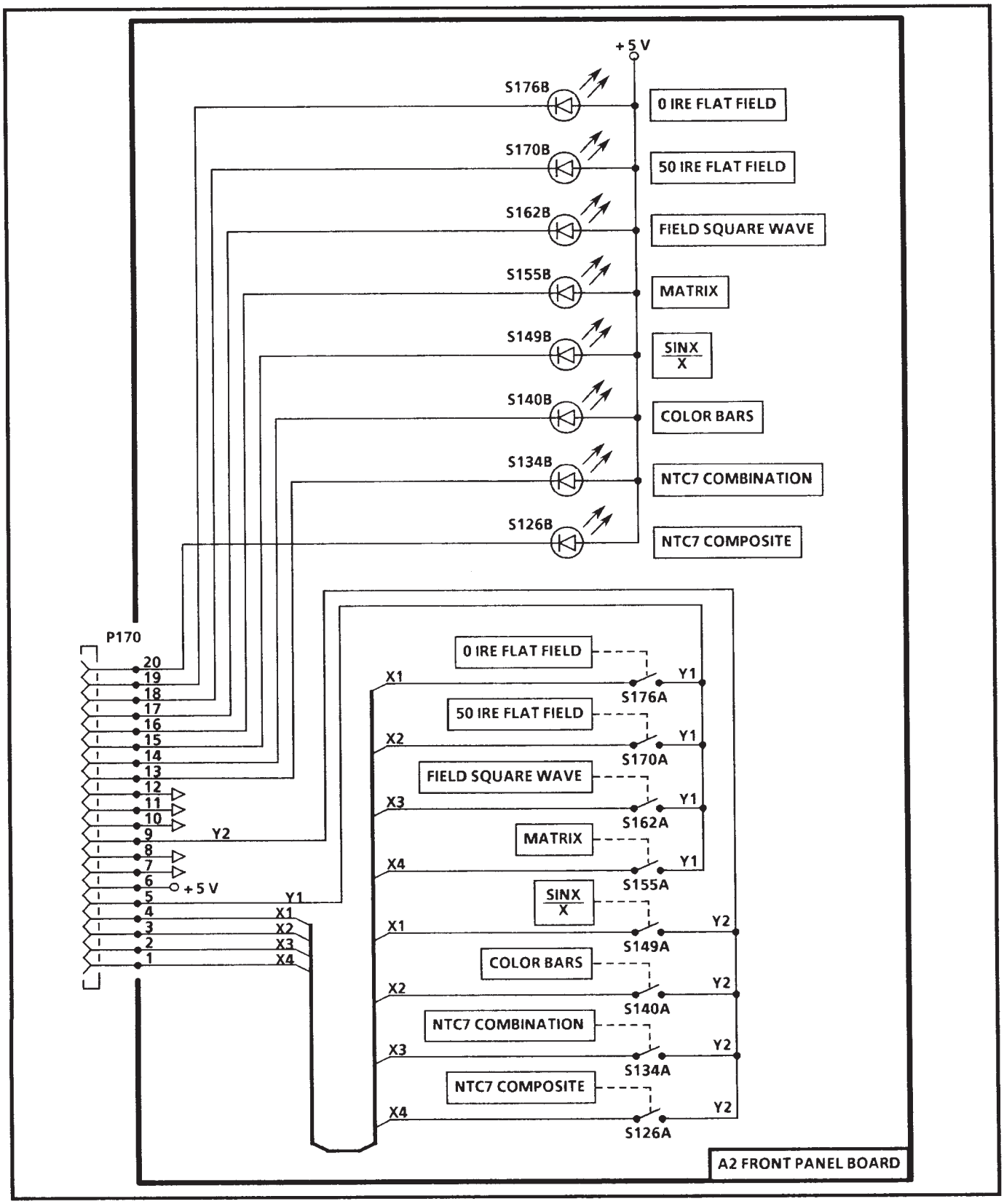


Fig. A-9. Part of Schematic 1 DIGITAL GENERATION & FRONT PANEL, showing changed signal names for Option 01.

Manual Change Information

Tektronix products are constantly under development for increased performance or lower cost to the customer. Often, changes are incorporated into a product as soon as they are shown to meet the highest quality standards.

This aggressive policy of product improvement can result in changes that are not reflected in the appropriate sections of the manual. Information regarding such changes will appear on the following pages. If no change notices are inserted after this page, the manual is correct as printed.

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