

TEKTRONIX®

067-0690-00

CALIBRATION FIXTURE

HIGH RESOLUTION TEST GENERATOR

INSTRUCTION MANUAL

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Fig. 1-1. 067-0690-00 High Resolution Test Generator.

SECTION 1

INTRODUCTION AND OPERATION

The Tektronix 067-0690-00 High Resolution Test Generator (Fig. 1-1) provides a variety of signals useful in investigating performance of video processing equipment, such as the Tektronix Hard Copy Units and the 4503 Scan Converter. The generator fits into a Tektronix TM 500-Series Power Module, and occupies two compartments.

Outputs of composite video of three amplitudes and of composite sync are continuously available from the front panel BNC connectors. The content of the composite video waveform may be varied by the front panel push switches.

The line rate, affecting all output signals, may be set internally to a variety of scanning frequencies; or the generator may be "gen locked" to an external source of composite sync or composite video applied to the front-panel BNC loop-through connectors. In this mode, the generator will lock onto the driving scan frequency and synchronize its output signals accordingly.

PREPARATION FOR USE

Introduction

The 067-0690-00 is calibrated for a 525 lines per frame, 60 fields per second output. For internal generation of other scanning rates, refer to the Servicing Information section of this manual.

The generator is designed to operate in any 2-wide compartment of a TM 500-Series Power Module. Refer to the Power Module Instruction Manual for line voltage requirements and Power Module operating instructions.

Installation and Removal

NOTE

It is recommended that the Power Module be turned off before inserting or removing the 067-0690-00. Arcing at the connector terminals can reduce connector life. However, no other internal damage will result if the supply is inserted into a live Power Module.

1. Install the 067-0690-00 in the Power Module by aligning its upper and lower grooves with the Power Module rails. Insert gently until the generator's front panel is flush with the front of the Power Module.
2. Remove the 067-0690-00 from the Power Module by pulling the white release latch at the lower left of the front panel, and sliding the unit straight out.

Turn-On Procedure

1. Check that the 067-0690-00 is fully inserted into the Power Module.
2. Pull the PWR switch on the front panel of the Power Module and observe the lighting of the POWER indicator light on the generator front panel.

FRONT PANEL CONNECTORS

Introduction

Refer to the front panel illustration (Fig. 1-2). The 067-0690-00 provides continuous output signals at the four BNC connectors arranged in a column in the middle of the front panel.

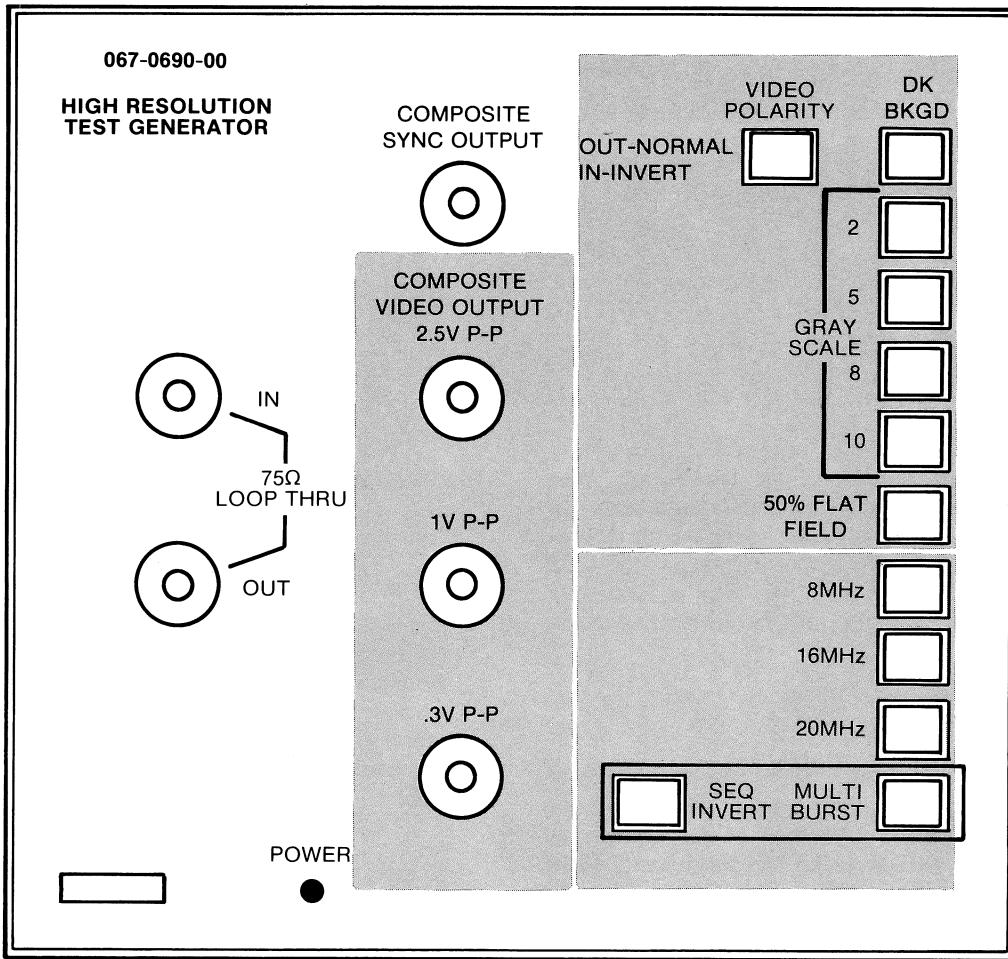


Fig. 1-2. 067-0690-00 Front Panel.

Two connectors on the left of the panel provide a $75\ \Omega$ LOOPTHRU by which the scan rate of generator signals may be determined by an external source of composite sync or composite video information ("gen lock" mode).

75 Ω LOOPTHRU (IN and OUT)

These two BNC connectors allow the user to drive the generator in synchronism with external signals. With no signal applied to IN, the generator operates at a line rate determined by the internal crystal oscillator.

By applying a composite sync or composite video signal of suitable level to the IN connector, the 067-0690-00 enters "gen lock" operation, and its output waveforms are synchronized with the driving signal. The OUT connector enables the user to place the 067-0690-00 in a $75\ \Omega$ video signal path without disturbing it (Fig. 1-3).

COMPOSITE SYNC OUTPUT

This BNC connector, at the top of the output connector column in the middle of the front panel, provides a 4 volt peak-to-peak composite sync signal to a $75\ \Omega$ termination. The composite sync signal agrees with EIA Standard RS-170 and is depicted in Fig. 1-4. The horizontal scanning period (H) is determined by the generator's internal crystal oscillator, or by the horizontal period of an external signal during gen lock operation. The vertical scanning period (V) of the composite sync signal is determined by H and the setting of internal controls described in the Servicing Information section of this manual. In gen lock operation, H and V are determined by the H and V of the driving signal.

The Composite Sync signal is not affected by the generator front panel controls.

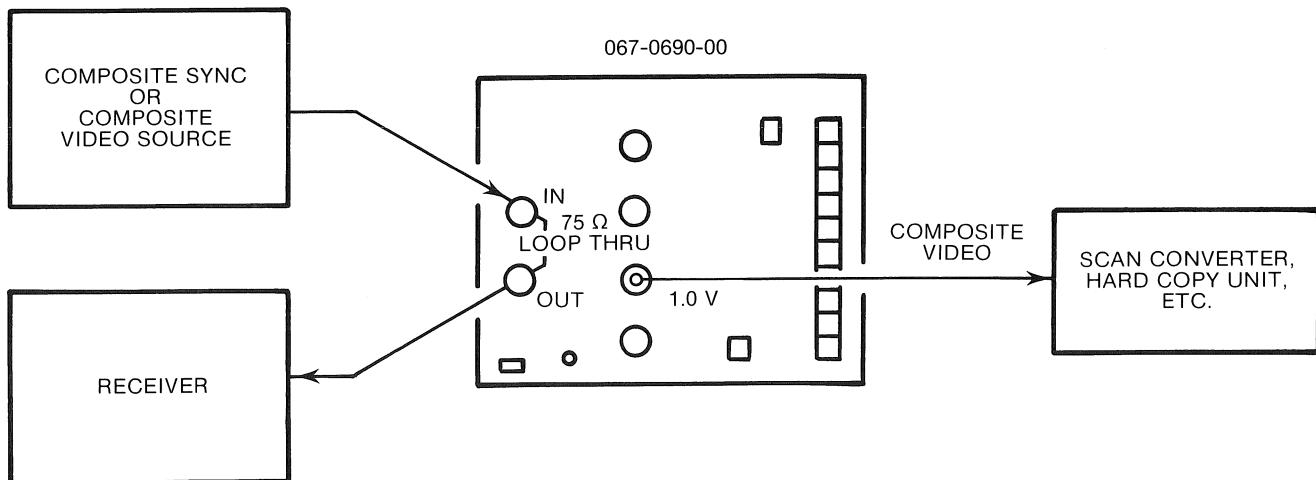


Fig. 1-3. Gen Lock Configuration.

COMPOSITE VIDEO OUTPUT (2.5 V, 1.0 V, 0.3 V)

The three BNC Connectors directly below COMPOSITE SYNC OUTPUT provide three levels (2.5 V, 1.0 V, and 0.3 V) of peak-to-peak composite video signal. The three levels allow for testing of automatic gain control circuitry in instruments such as the TEKTRONIX Hard Copy Unit.

The composite video signal is obtained directly from the generator's composite sync signal by adding the product of blanking and video envelope signals to it (Fig. 1-5). The parameters H and V are therefore exactly those of the composite sync signal previously described.

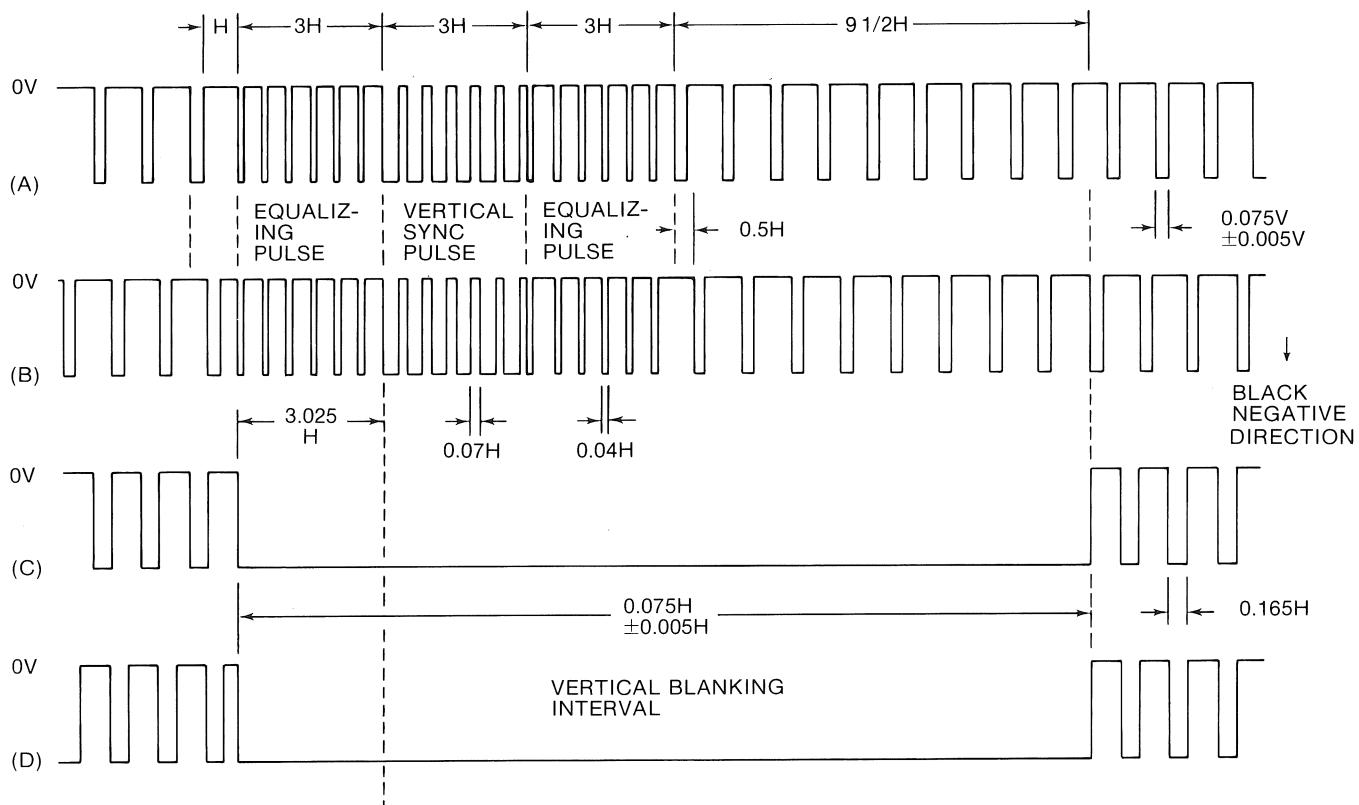


Fig. 1-4. Composite sync waveforms. (A) Even Field & (B) Odd Field. Blanking waveforms (C) Even Field & (D) Odd Field. Derived from EIA Standard RS-170. Amplitude at the composite sync output connector is $4 \text{ V} \pm 0.2 \text{ V}$ negative-going into a 75Ω termination.

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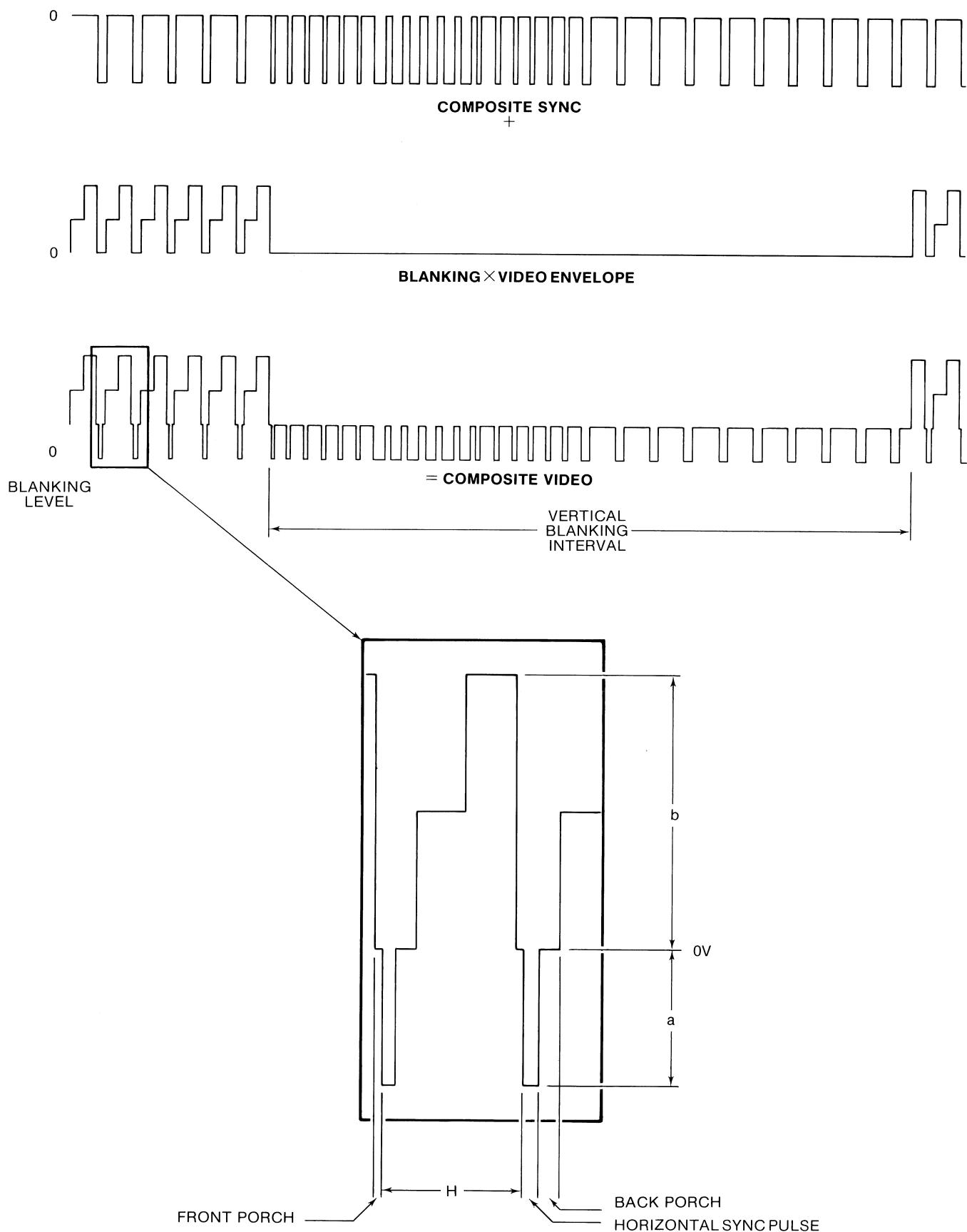


Fig. 1-5. 067-0690-00 Composite Video Signal. The example shows a 2 step gray scale video envelope. Refer to the Specifications page of Section 1 for details.

The content of the video envelope is determined by the generator's front panel switches, as described in the following text.

FRONT PANEL SWITCHES

Introduction

The 067-0690-00 front panel push-button switches (Fig. 1-2) allow the user to select a variety of video envelopes for the generator's composite video signal. The available video envelopes, and hence available test patterns, fall into two categories: Grayscale and Continuous Frequency.

A Grayscale video envelope is a staircase waveform, comprising a number of steps selected by the upper group of front panel switches. When viewed on a monitor, the GRAYSCALE composite video signal results in a bar pattern on the screen, ranging in intensity from black through white (see Fig. 1-6 for an 8 step GRAYSCALE). This signal allows the user to test the range of contrast available on the video monitor.

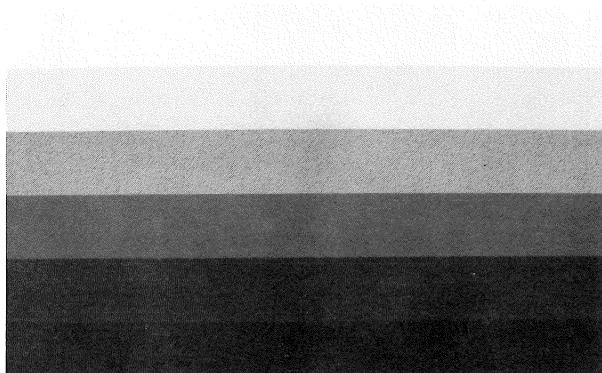


Fig. 1-6. 8 Step Gray Scale Test Pattern. The Video Polarity switch is in.

The VIDEO POLARITY control selects whether the increase in intensity occurs toward the top, or towards the bottom of the pattern (OUT-NORMAL or IN-INVERT).

The lower group of front panel switches select a CONTINUOUS FREQUENCY video envelope, resulting in a test pattern of vertical stripes. The frequency of the modulating sinusoid is selected by the switches labeled 8, 16, and 20 MHz pattern). Multiburst operation allows the modulating sinusoid to step through five discrete frequencies during a vertical period. The resulting pattern is sixteen horizontal bars on the screen, each horizontal bar containing vertical stripes.

Grayscale Functions

Refer to Fig. 1-7 for waveform specifications.

DK BKGD (Dark Background) — This switch selects the minimum video level, resulting in a dark screen.

GRAY SCALE 2 — This switch provides a white and a black horizontal bar of equal height.

GRAY SCALE 5 — This switch provides five horizontal bars of equal height ranging in intensity from black through white.

GRAY SCALE 8 — This switch provides eight horizontal bars of equal height (Fig. 1-6), ranging in intensity from black through white.

GRAY SCALE 10 — This switch provides ten horizontal bars of equal height, ranging in intensity from black through white.

VIDEO POLARITY — Pressing this switch once inverts the order of the grayscale bar pattern selected. The switch locks in the IN position until pushed a second time. The second push restores the original order of grayscale bars.

50% FLAT FIELD — Pressing this switch causes a constant 50% intensity field on the screen, unaffected by the VIDEO POLARITY switch.

Sinusoidal Functions

Refer to Fig. 1-8 for waveform specifications.

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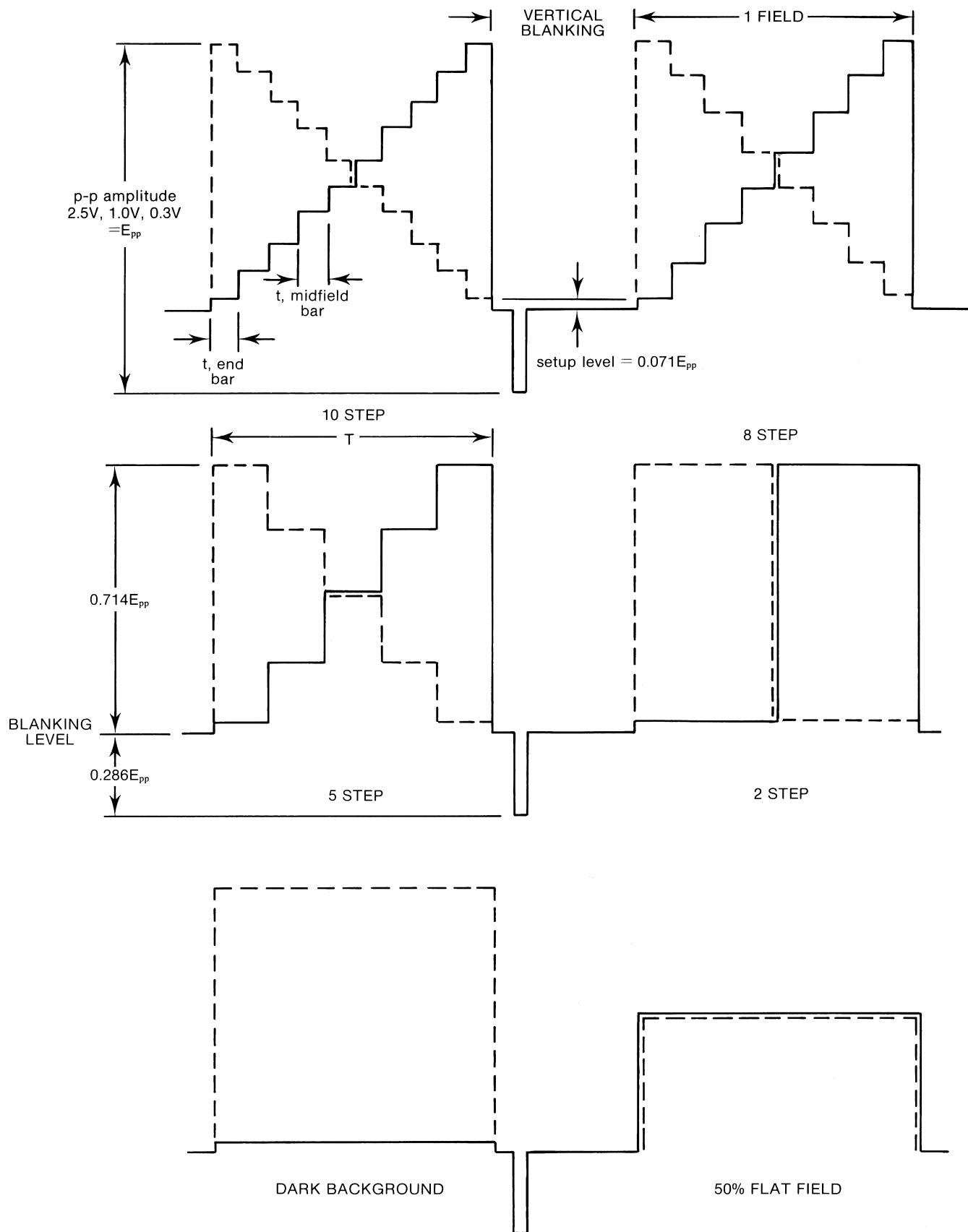


Fig. 1-7. Gray Scale Waveforms. (A) Dark Background (B) 2 step (C) 5 step (D) 8 step (E) 10 step (F) Flat Field. Dotted line represents waveform with Video Polarity Switch in.

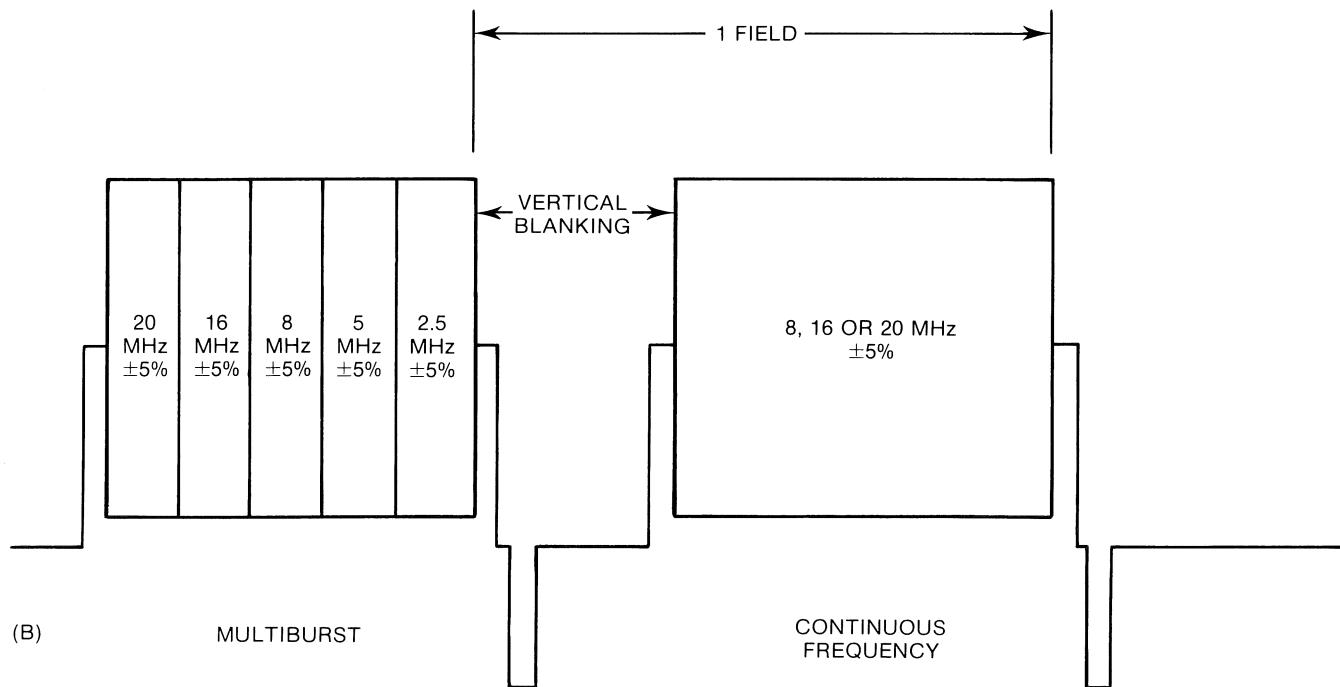
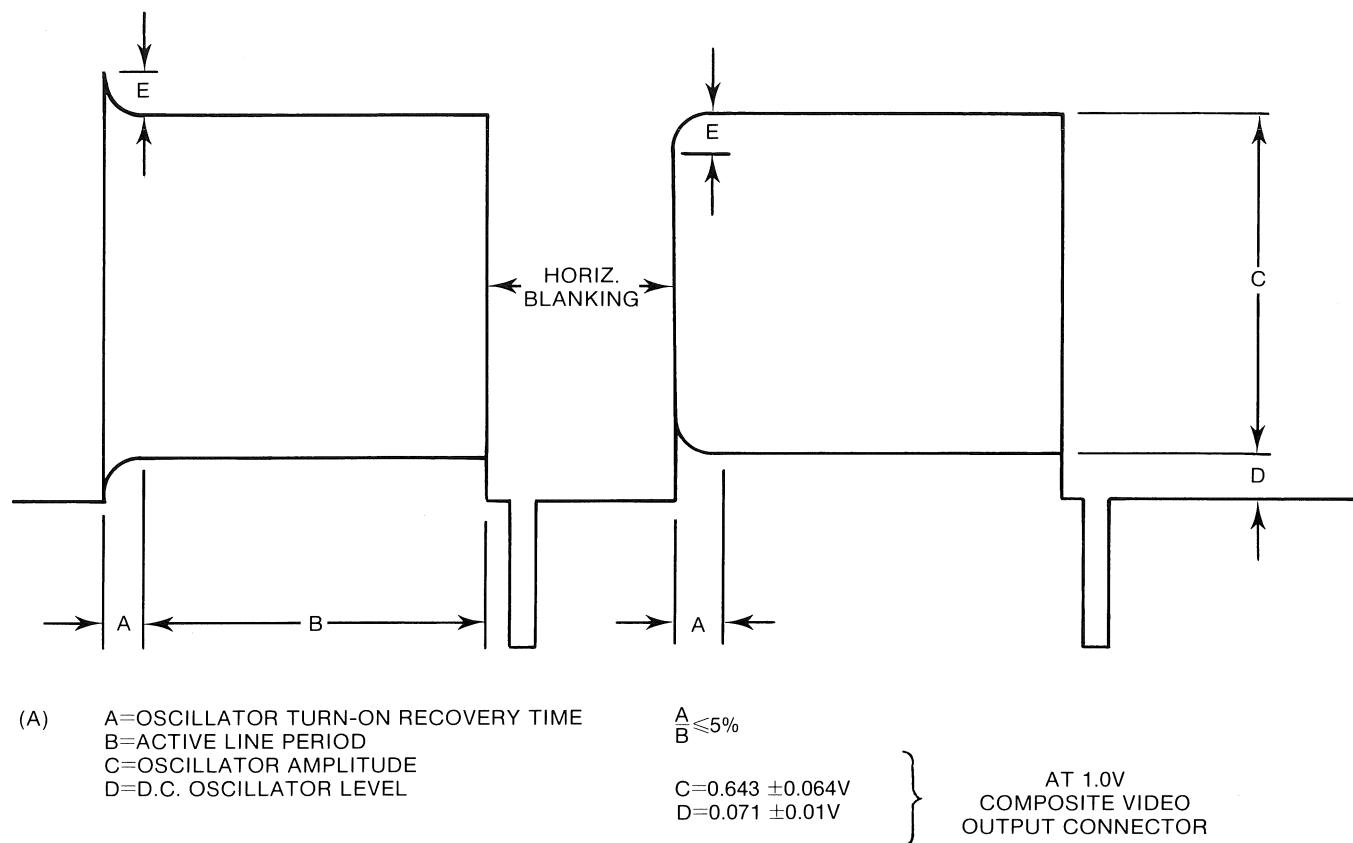


Fig. 1-8. Multiburst and Continuous Frequency Waveforms. Multiburst transient characteristics are shown in (A). Multiburst and Continuous Frequency Video envelopes are shown in (B).

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8 MHz — This switch causes a 8 MHz sinusoidal modulation of the video envelope, and results in a vertical stripe pattern on the screen (Fig. 1-9).

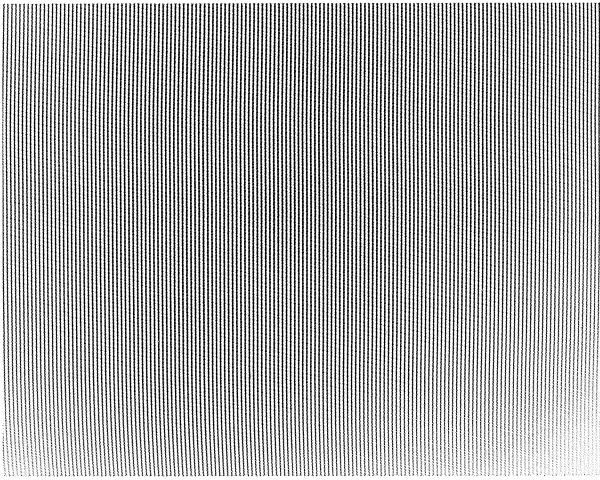


Fig. 1-9. 8 MHz Continuous Frequency Test Pattern.

16 MHz — This switch causes a 16 MHz sinusoidal modulation of the video envelope, and results in a vertical stripe pattern with one half the spacing observed during 8 MHz modulation.

20 MHz — This switch causes a 20 MHz sinusoidal modulation of the video envelope, and results in a vertical stripe pattern with spacing less than observed during 16 MHz modulation.

MULTIBURST — This switch causes a stepping of modulation frequency through 2.5, 5, 8, 16, and 20 MHz values repetitively during the vertical scan (Fig. 1-10).

SEQ INVERT — This switch, in conjunction with multiburst, allows inversion of the multiburst sequencing. Pressing the switch once inverts the order of modulating frequencies, and pressing twice restores the original sequence.

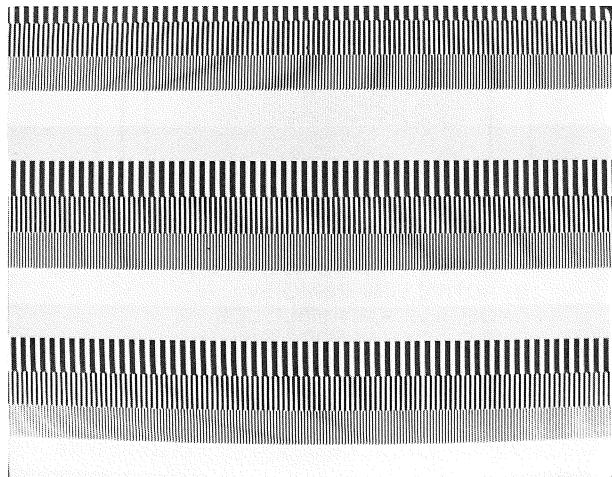


Fig. 1-10. Multiburst Test Pattern; (A) with Seq Invert button out and (B) with Seq Invert button in.

SPECIFICATIONS

Power Connections

The 067-0690-00 utilizes the +33, -33 and +11 volt DC unregulated power supplies of the TM 500-Type Power Module in which it is housed.

Characteristic	Performance Requirement
Line Voltage Required	104 — 126 VAC.
Generator Power Supplies	+15 volt reference $\pm 1\%$, 5 mV ripple. +5 volt $\pm 1\%$, 5 mV ripple. -15 volt $\pm 15\%$, 5 mV ripple.
Generator Power Consumption	20 Watts.

Composite Sync Signal

The specifications on the composite sync signal (Table 1-1) are for three commonly used line and field rates. HR refers to high resolution scanning, with 675 to 1235 lines per frame. Refer to Fig. 1-4.

TABLE 1-1
Composite Sync Signal Specifications

Signal	Lines/Frame	525	625	HR
	Fields/Second	60	50	60
Line Sync	Pulse Duration	4.7 μ s $\pm 0.5 \mu$ s	4.7 μ s $\pm 0.5 \mu$ s	2.75 μ s $\pm 0.25 \mu$ s
	Rise and Falltime	≤ 300 ns	≤ 300 ns	≤ 300 ns
	Front Porch Duration	1.5 μ s $\pm 0.1 \mu$ s	1.5 μ s $\pm 0.1 \mu$ s	1 μ s $\pm 0.1 \mu$ s
	Line Period (H)	63.5 μ s $\pm 1\%$	64.0 μ s $\pm 1\%$	all periods $\pm 1\%$
Field Sync	Pulse Duration	3H	3H	3H
	Field Period (v)	16.667 ms $\pm 1\%$	20.000 ms $\pm 1\%$	16.667 ms $\pm 1\%$
Comp Sync Signal	Amplitude	4 V P-P ± 0.2 V into 75 Ω termination		
	Return Loss	≥ 30 dB, 50 Hz to 5 MHz		
	Rise and Falltime	≤ 190 ns		

Composite Video Signal

Refer to Fig. 1-5, and the previous Composite Sync Specifications. Additionally, the amplitude specifications in Table 1-2 apply for a and b of Fig. 1-5:

TABLE 1-2
Composite Video Signal Amplitude Specifications

COMPOSITE VIDEO OUTPUT LEVEL	2.5 V	1.0 V	0.3 V
a	1.785 ± 0.1 V	0.714 ± 0.1 V	0.214 ± 0.1 V
b	0.715 ± 0.1 V	0.286 ± 0.1 V	0.086 ± 0.1 V

Return Loss ≥ 30 dB 50 Hz to 5 MHz

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Gray Scale Specifications

Refer to Fig. 1-7 for depiction of the 067-0690-00 gray scale waveform. For grayscale 2, 5, 8, and 10 step functions and for the multiburst function, all bars of the test pattern must contain an equal number of lines ($\pm 5\%$) and consequently have equal duration ($\pm 5\%$). An exception to this is the 2 bars at the extreme top and bottom of the screen. These edge bars contain 5 fewer lines than a non-edge bar.

Characteristic	Performance Requirement	Specification
Composite Sync Input	Amplitude: 200 mV to 3.5 V. Loop through input Return Loss: ≥ 40 dB, 50 Hz to 5 MHz	Must conform to Fig. 1-4.
Temperature		
Operating	15°C to 35°C	0.1 Test Rate
Storage	-15°C to 75°C	0.1 Test Rate
Vibration	15 minutes each axis at 0.015", frequency varied from 10-50-10 cycle/second in 1 minute cycles with instrument secured to vibration platform. Three minutes each axis at any resonant point or at 50 cycles/second.	
Shock	30 g's, 1/2 sine, 11 ms duration, 2 guillotine-type shocks per axis.	
Dimensions	11.5" L X 5 5/16" W X 5" H.	
Weight	3 pounds.	
Accessories		Instruction manual (070-1724-00) Standard.

SECTION 2

SERVICING INFORMATION

INTRODUCTION

The 067-0690-00 High Resolution Test Generator contains three circuit boards: the Sync Generator board, the Logic And Output board, and the Oscillator And Grayscale board. Refer to Fig. 2-1 which depicts the mounting of these boards, and to Fig. 2-2 which shows locations of the various user options.

To obtain access to Sync Gen and Oscillator and Grayscale boards, remove the two sliding covers from the 067-0690-00. Access to the Logic and Output board requires that the Sync Generator board be lifted, after removing its 4 mounting screws and J111 connector. The power indicator lamp must be gently pried from its housing.

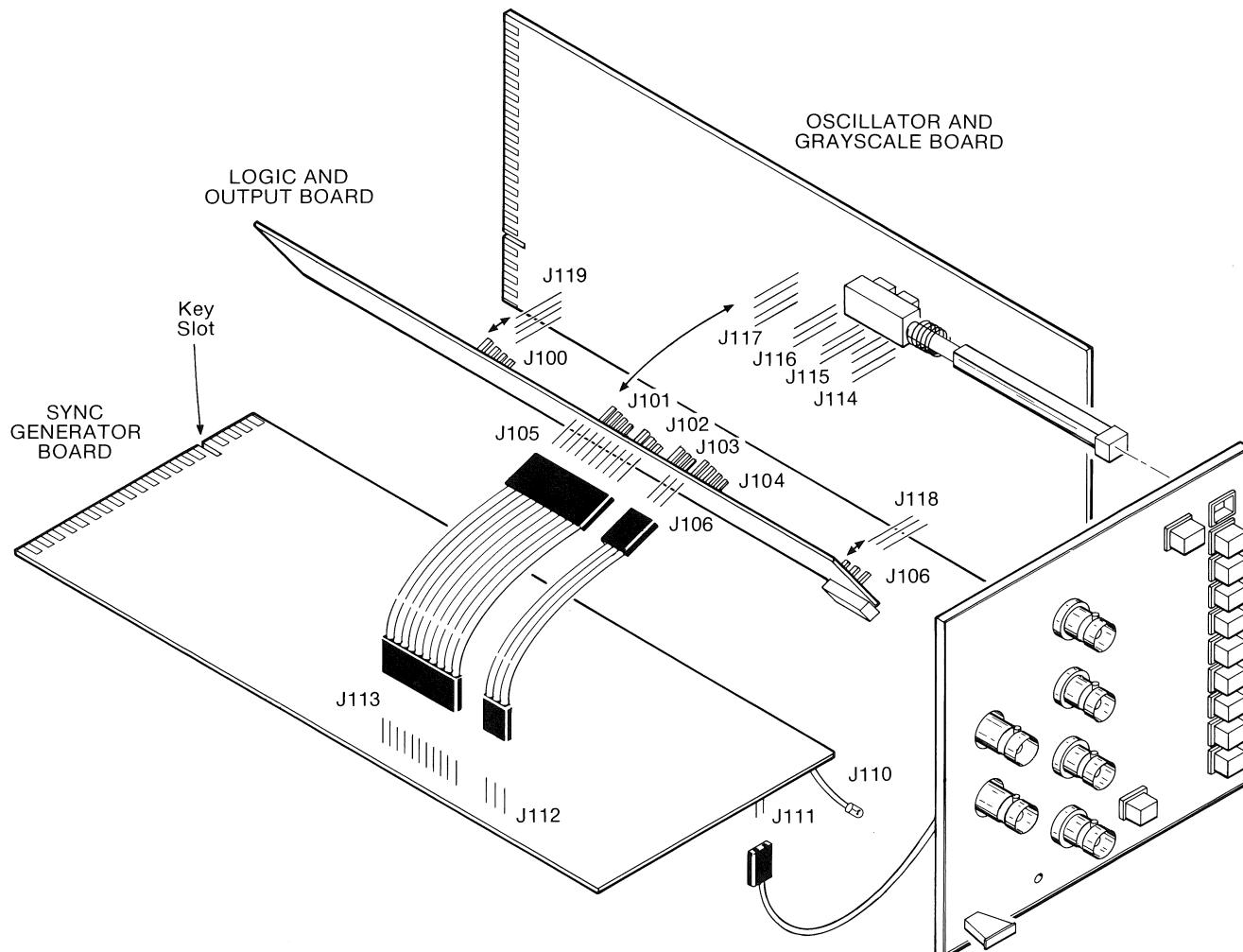
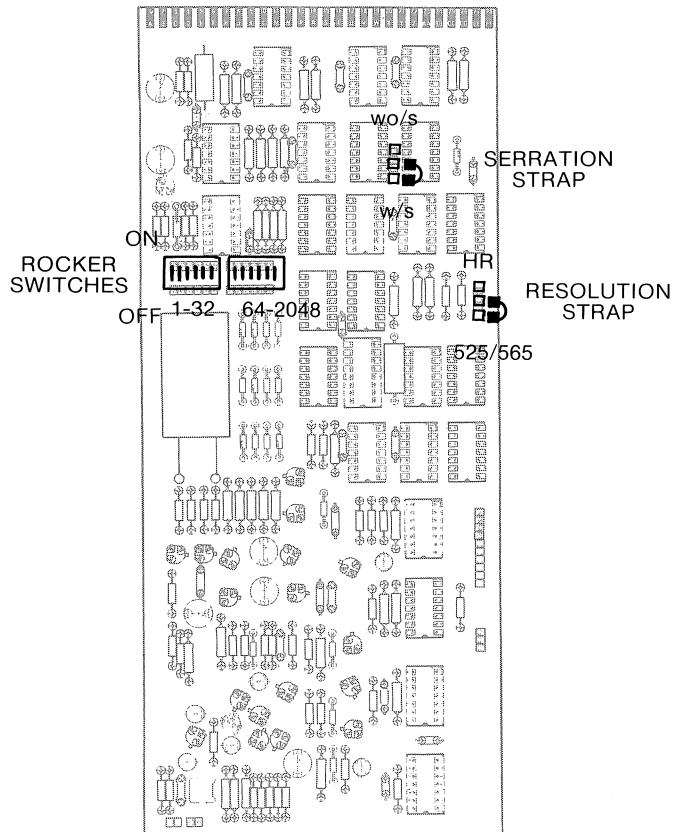
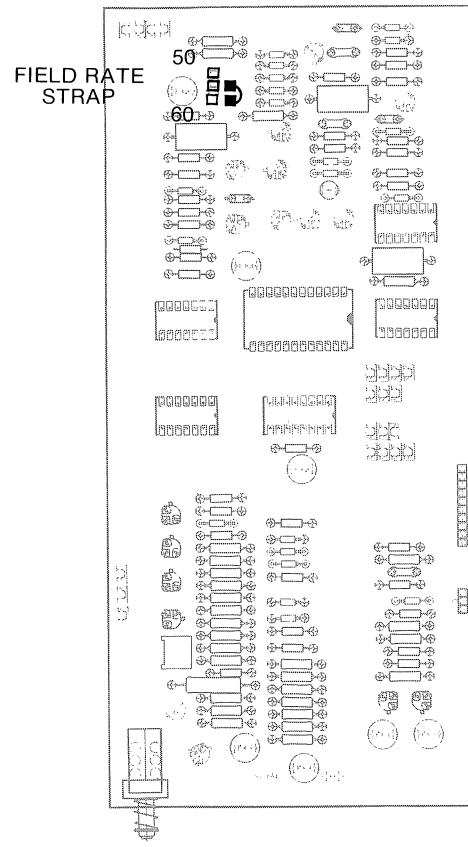


Fig. 2-1. Interconnection of the three 067-0690-00 Circuit Boards.



(A) Sync Generator Board



(B) Logic and Output Board

Fig. 2-2. Location of User Options on (A) Sync Generator Board and (B) Logic and Output Board.

USER OPTIONS

The 067-0690-00 contains three straps and twelve small rocker switches which should be set by the user with the following considerations:

RESOLUTION STRAP — 525/625 or HR (High Resolution).

This strap, located between U655 and U675 on the Sync Generator board, determines the generator blanking and sync pulse widths. This effect is independent of whether the generator is driven by its internal crystal oscillator, or by an external source (during gen lock operation). If the desired resolution is 525 or 625 lines/frame, set the strap in the 525/625 position. If the desired resolution is between 675 and 1235 lines/frame, set in the HR (high resolution) position.

SERRATION STRAP — WITH SERRATION (W/S) or WITHOUT SERRATION (W/O/S).

This strap, located between U485 and U585 on the Sync Generator board, affects the generator's gen lock operation. If the external signal used for driving the generator contains serration pulses, place the strap in the W/S position. If no serration pulses are present, place the strap in the WO/S position.

FIELD RATE STRAP — 50 or 60.

This strap, located near Q219 on the Logic and Output board, allows the user to select a particular field rate. During internal operation (with the gen lock signal absent), the generator produces a field rate determined by the crystal frequency and the setting of rocker switches as described in the following text.

During gen lock operation, the field rate generated is controlled by the field rate of the signal applied to the loop-thru connector. If this signal has a 60 field/second rate, set the strap to 60. If it has a 50 field/second rate, set this strap to 50.

ROCKER SWITCHES — 12 two position switches labeled 1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024, and 2048.

These switches, located near U175 and the generator crystal housing on the Sync Generator board, allow the user to select number of lines per frame of the generated video signal. For 525 lines/frame, the switches marked 512, 8, 4 and 1 ($512 + 8 + 4 + 1 = 525$) should be placed in the ON position.

During gen lock operation, the applied signal determines the generator's line/frame output. The rocker switches must be set to the applied signal's line/frame value.

During internal operation, the line/frame ratio is affected by the horizontal line rate, which is in turn determined by the frequency of the oscillator crystal (Y55). The crystal supplied with the generator produces a 525 line/frame signal, and the rocker switches should be placed in the 525 positions.

Should another line/frame value be desired, the crystal should be replaced with one of proper frequency:

$$\text{crystal frequency} = (\text{lines/frame}) \times (\text{fields/second})$$

As an example, suppose 1029 line per frame/60 fields per second output is desired. To find the crystal frequency, multiply and get 61.740 kHz.

CALIBRATION PROCEDURE

Introduction

The following calibration procedure allows the user to place the 067-0690-00 within the specification tolerances outlined in Section 1. The procedure is meant to be followed in a step-by-step manner, and it will normally not be necessary to repeat a step. Where such repetition is necessary (due to interaction of adjustments), it is noted in the text.

Equipment Required

The following Tektronix or equivalent equipment is required for the procedure:

7603 Oscilloscope with 7B53 Time Base and 7A13 Differential Amplifier

P6065 X10 Probe

75 Ω BNC Cable, Tektronix Part Number 012-0014-00

015-0149-00 Return Loss Bridge

DC 503 Frequency Counter with 2 P6011 probes.

DM 501 Multimeter

(2) 067-0645-01 Extender Cable

Sine Wave Generator, 50 Hz to 50 MHz

PG 501 or PG 502 Pulse Generator

Variable Transformer 50 watts or more, with an output voltage range of 104 to 126 Vac.

75 Ω BNC Terminator, Tektronix Part Number 011-0055-00

Tools Required

In addition to the above, the following tools are necessary:

Phillips screwdriver, 1/4 in.

Standard screwdriver, 1/8 in.

Non-ferrous adjustment tool, 1/16 in. hex tip.

(2) Integrated Circuit Clips.

1. Preliminary Procedures

a. With the Power Module power switch set to OFF (pushed in), connect the 067-0690-00 to the Power Module connectors by means of the two extender cables.

b. Remove the sliding protective covers from both sides of the generator. Place the variable transformer in series between ac supply and Power Module. Set to 115 V.

c. Turn the Power Module power switch to ON (pull).



Utmost care must be observed when probing the energized instrument. Carelessness may result in equipment damage.

2. Power Supplies

a. Refer to Fig. 2-3 where calibration points of the Oscillator and Grayscale board are noted. With the multimeter set to read in the +15 volt region, connect the measurement probe to U181 pin 3. Attach the ground probe to the generator chassis. Adjust R182 until the value measured falls within the range +14.85 to +15.15 volts. With the oscilloscope probe at the same test point, confirm that ripple is less than 5 mV. These specifications must remain intact as the line voltage is varied from 104 to 126 Vac.

b. Transfer the multimeter probe to U281 pin 3. Measure +4.95 to +5.05 volts. With the oscilloscope, confirm that ripple is under 5 mV. Confirm these tolerances with line voltage of 104 to 126 Vac.

c. Refer to Fig. 2-4, where calibration points of the Sync Generator board are noted. With the multimeter prepared to measure in the +5 volt range, place the probe on U185 pin 3. Measure +4.95 to +5.05 volts. Confirm ripple less than 5 mV., and that tolerances are maintained within the 104 to 126 Vac line voltage range.

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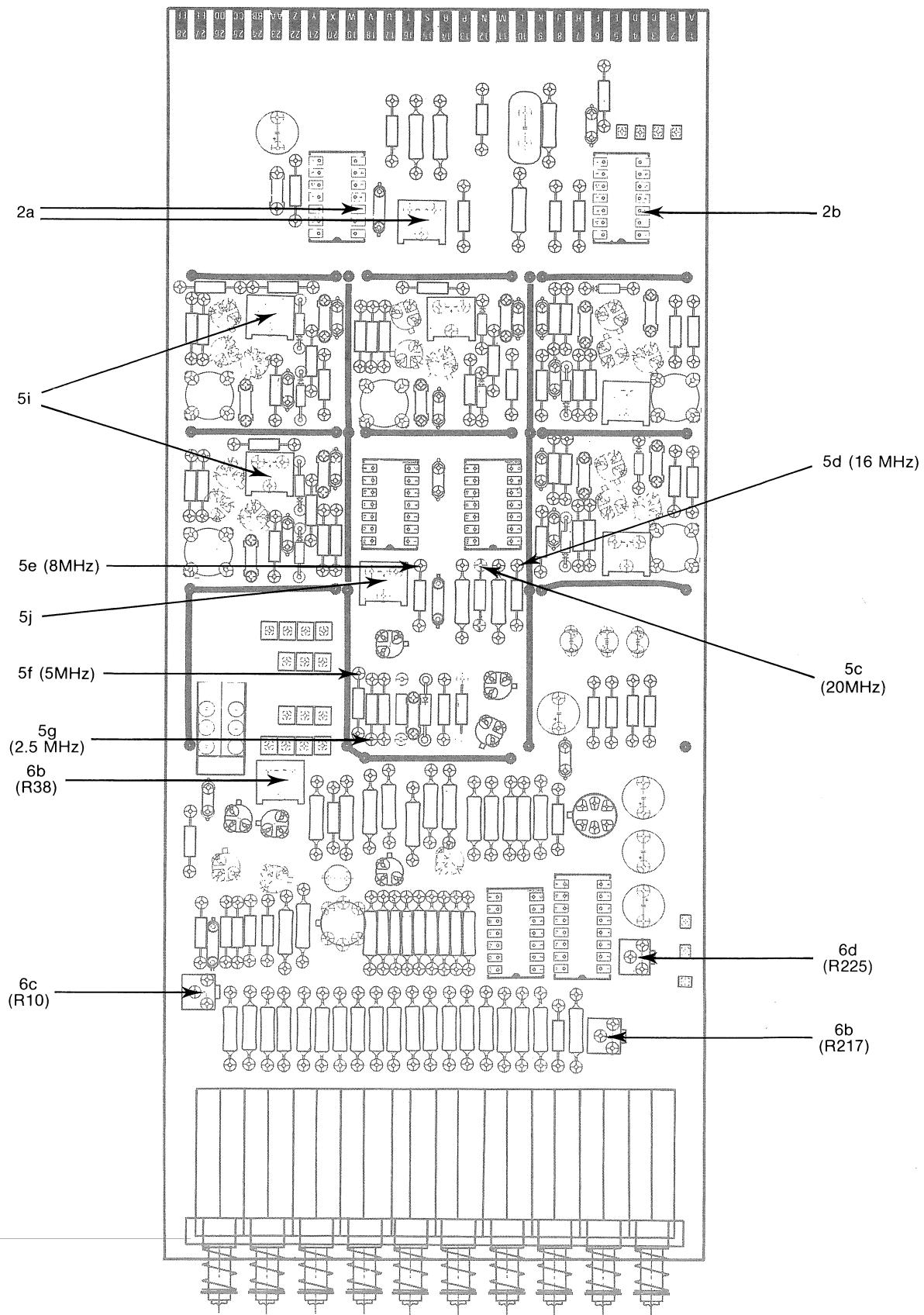


Fig. 2-3. The Oscillator and Gray Scale Board; Calibration and test points are indicated.

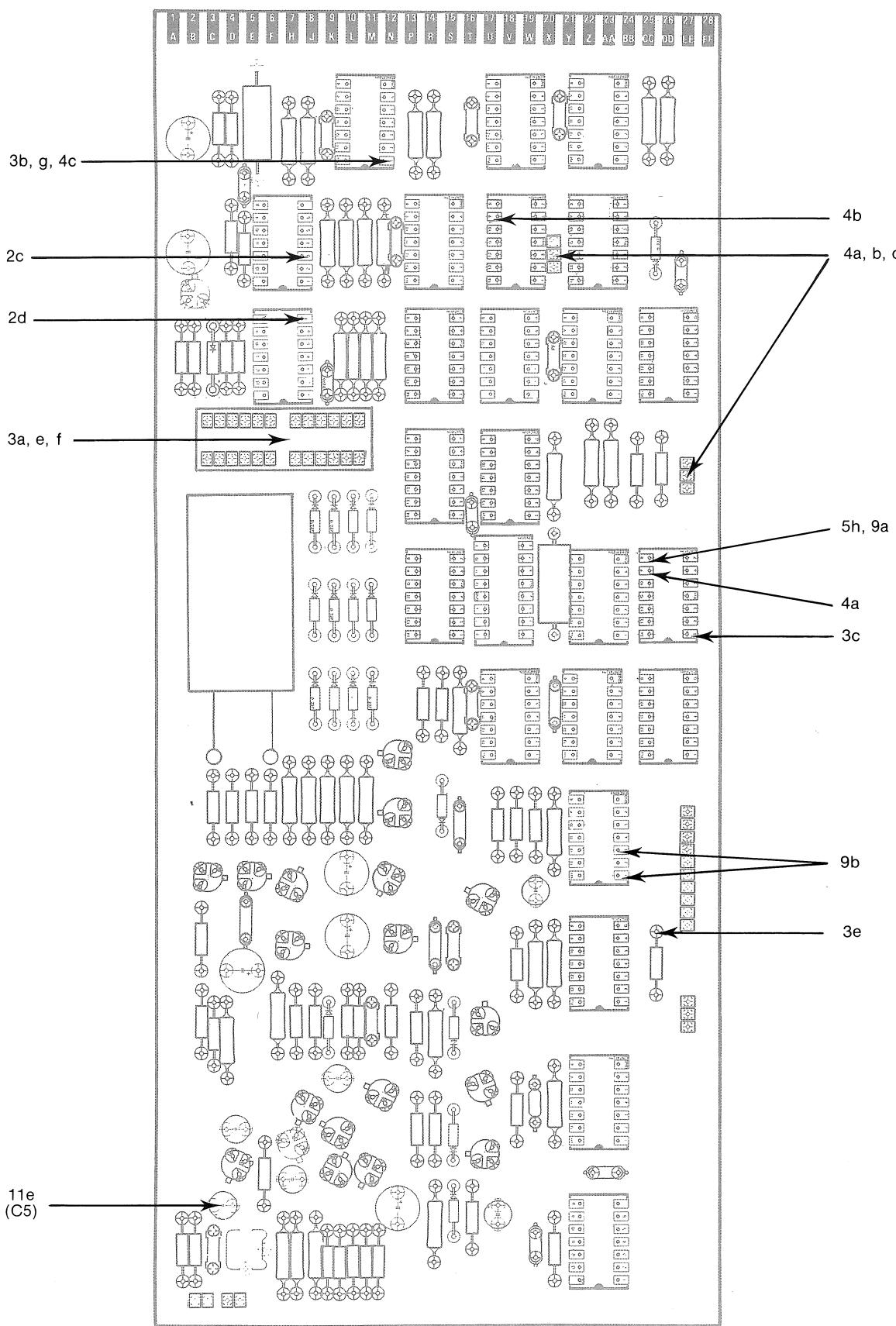


Fig. 2-4. The Sync Generator Board; Calibration and test points are indicated.

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d. With the multimeter prepared to read in the -15 volt region, place the probe on U175 pin 7. Measure -14.85 to -15.15 volts. Measure under 5 mV ripple. Confirm tolerances for a 104 to 126 Vac line voltage range.

f. Set the rocker switches to the proper setting for the crystal installed. For the example of 525 lines per frame and 30 frames per second, the appropriate crystal frequency is 31.500 kHz and the correct rocker switch settings are as follows:

Switch	Setting
1	ON
2	OFF
4	ON
8	ON
16	OFF
32	OFF
64	OFF
128	OFF
256	OFF
512	ON
1024	OFF
2048	OFF

3. Line, field and interlace

a. Refer to Fig. 2-4 for test and calibration points of the Sync Generator board. Set the rocker switches (SW165 and SW265) to the desired line per frame ratio, as outlined in the beginning of this section.

b. Set the DC 503 Function switch to Freq A with a gate time of 1 s. Turn the Display Time Control fully counterclockwise. Connect a probe from channel A to U295 pin 1. The display should contain a number equal to the horizontal rate of the generator $\pm 10\%$. For example, a 525 lines per frame with 30 frames per second selection results in a horizontal rate of $525 \times 30 = 15,750$ Hz. The 10% tolerance on this value would require a reading of 14,175 to 17,325 on the DC 503.

c. Connect a probe from channel B to U655 pin 1. Set the DC 503 Function switch to Ratio A/B, and the N/Clock Rate switch to 10^2 . The counter should now display a value exactly half of that observed during the previous step. For the example of 525 lines per frame, the reading should be 7,088 to 8,662 Hz.

d. Set the DC 503 Function switch to Period B. The counter will read in the range 16.500 to 16.733 if the generator is set for 60 Hz operation, and in the range 19.800 to 20.200 if set for 50 Hz operation.

e. Remove the DC 503 probes. Connect the channel A probe to the diode side of R625, a test point located in Fig. 2-4. Set the counter function switch to Freq A, gate of 1 s. Turn all of the rocker switches to the position marked OFF. Turn each switch, one at a time, to the ON position. The counter should read a value equal to the crystal frequency divided by the number associated with the particular switch. For example, the following values should be observed with a crystal of 31.500 kHz inserted:

Switch ON	DC 503 Display
1	31.500
2	15.750
4	7.875

and so forth.

g. Set the DC 503 Function switch to Period B and the N/Clock Rate switch to 10^4 . Connect the B channel probe to U295 pin 1, where pulses are generated for each horizontal blanking interval. The DC 503 display should be in the range indicated by the following, dependent upon the selected line per frame and field per second ratios.

Lines per Frame	Fields per Second	DC 503 Display
625	50	63.36 to 64.64
525	60	62.86 to 64.14
675	60	48.81 to 49.79
729	60	45.24 to 46.16
875	60	37.72 to 38.48
945	60	34.85 to 35.55
1032	60	32.18 to 32.82
1235	60	26.93 to 27.47

4. Blanking, Field and Line

a. Refer to Fig. 2-4. Place the Resolution Strap in the 525/625 position. Place the Serration strap in the W/S position. Connect the signal on U655 pin 9 to the oscilloscope by means of a X10 probe. With the oscilloscope sweep set at 0.2 ms per cm, verify a field blanking pulse with a duration of from 1167.7 μ s to 1333.3 μ s (Fig. 2-5).

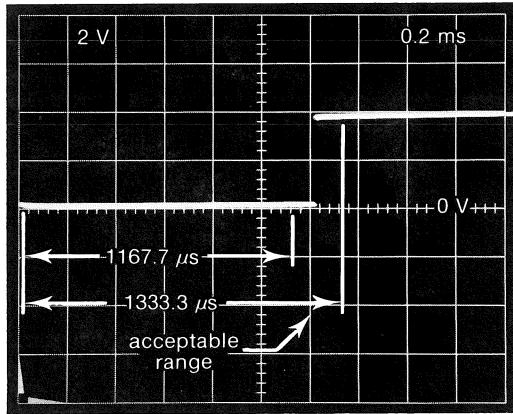


Fig. 2-5. The field (also called vertical) blanking pulse as seen at U655 pin 9. Its duration must be in the range 1167.7 to 1333.3 μ s.

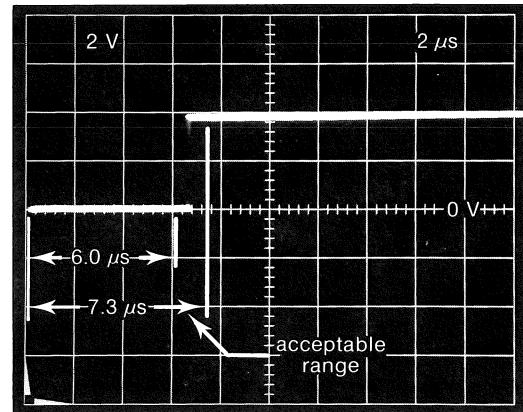


Fig. 2-7. The horizontal blanking pulse width is controlled by the resolution strap. With the strap in the HR position, a pulse of 6.0 to 7.3 μ s width should be observed.

b. Change the oscilloscope sweep to 2 ms per cm, and move the probe to U485 pin 9. Set the trigger control to negative level and negative slope. Move the Serration strap to the W/O/S position. Observe two pulses with a period of 16.67 ms (equal to the vertical interval, V), as shown in Fig. 2-6. Replace the Serration strap to the W/S position.

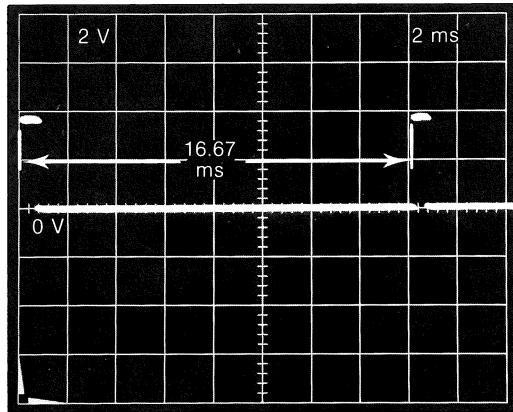


Fig. 2-6. The pulse at U485 pin 9 occurs during the time at which serrations appear in the vertical sync and equalizing pulses. The period between successive pulses is the inverse of the field rates; for 60 fields per second, this means 16.67 ms.

c. Connect the probe to U295 pin 1, and set the oscilloscope sweep to 2 μ s per cm. Observe a low-active horizontal blanking pulse with 10.6 to 11.4 μ s duration. Place the Resolution strap in the HR position, and observe a pulse with duration 6.0 to 7.3 μ s (Fig. 2-7). Return the strap to the 525/625 position.

5. Multiburst Frequencies

a. Refer to Fig. 2-4 for location of Oscillator and Grayscale board test points and calibration adjustments.

b. Press the MULTIBURST switch on the generator front panel.

c. Connect the probe from channel A of the DC 503 counter to the junction of R258 and R155, shown in the figure. Set the counter Function switch to Freq A, Gate Time 1 s. Press the channel A button marked AC COUPL. Remove Q255 from its socket. The counter should then read the oscillator frequency in MHz; this value should be adjusted to fall within the range 19 to 21 MHz by the rotation of the L259 tuning slug. Replace Q255.

d. Move the counter channel A probe to the junction of R277 and R159, shown in the figure. Remove Q266, and adjust L269 for a reading of 15.2 to 16.8 MHz on the counter. Replace Q266.

e. Move the counter probe to the junction of R152 and R173. Remove Q73. Adjust L61 for a reading of 7.6 to 8.4 MHz on the counter. Replace Q73.

f. Move the counter probe to the junction of R72 and R142. Remove Q56. Adjust L51 for a reading of 4.8 to 5.2 MHz on the counter. Replace Q56.

g. Move the counter probe to the junction of R58 and R141. Remove Q174. Adjust L161 for a reading of 2.4 to 2.6 MHz on the counter. Replace Q174. Remove the probe.

Servicing Information—067-0690-00

h. Connect the Composite Video Output 1 V P-P signal to the oscilloscope vertical input, terminating with a $75\ \Omega$ impedance. Drive the oscilloscope external trigger with the signal at U655 pin 8 (V BLNK located in Fig. 2-4). Set sweep to 2 ms per cm, and vertical deflection to 0.2 V per cm. Observe the composite video waveform on the screen (Fig. 2-8). Adjust R280, located on the Logic and Output board (Fig. 2-9) for a blanking level of 0.0 V to ground.

i. Referring again to Fig. 2-3, adjust the oscillator amplitudes by means of R255, R266, R74, R59 and R176; each amplitude should fall in the range 0.579 to 0.707 V.

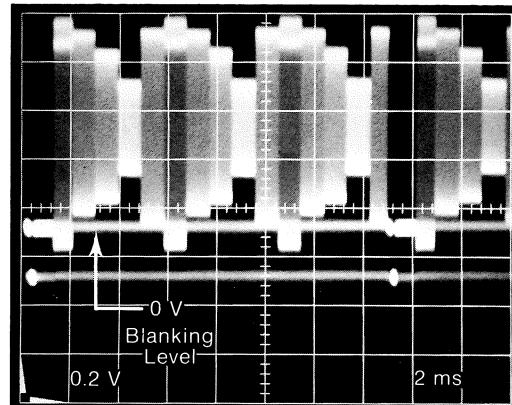


Fig. 2-8. The composite video waveform for the Multiburst function. Blanking level should be adjusted to 0.0 V with reference to ground.

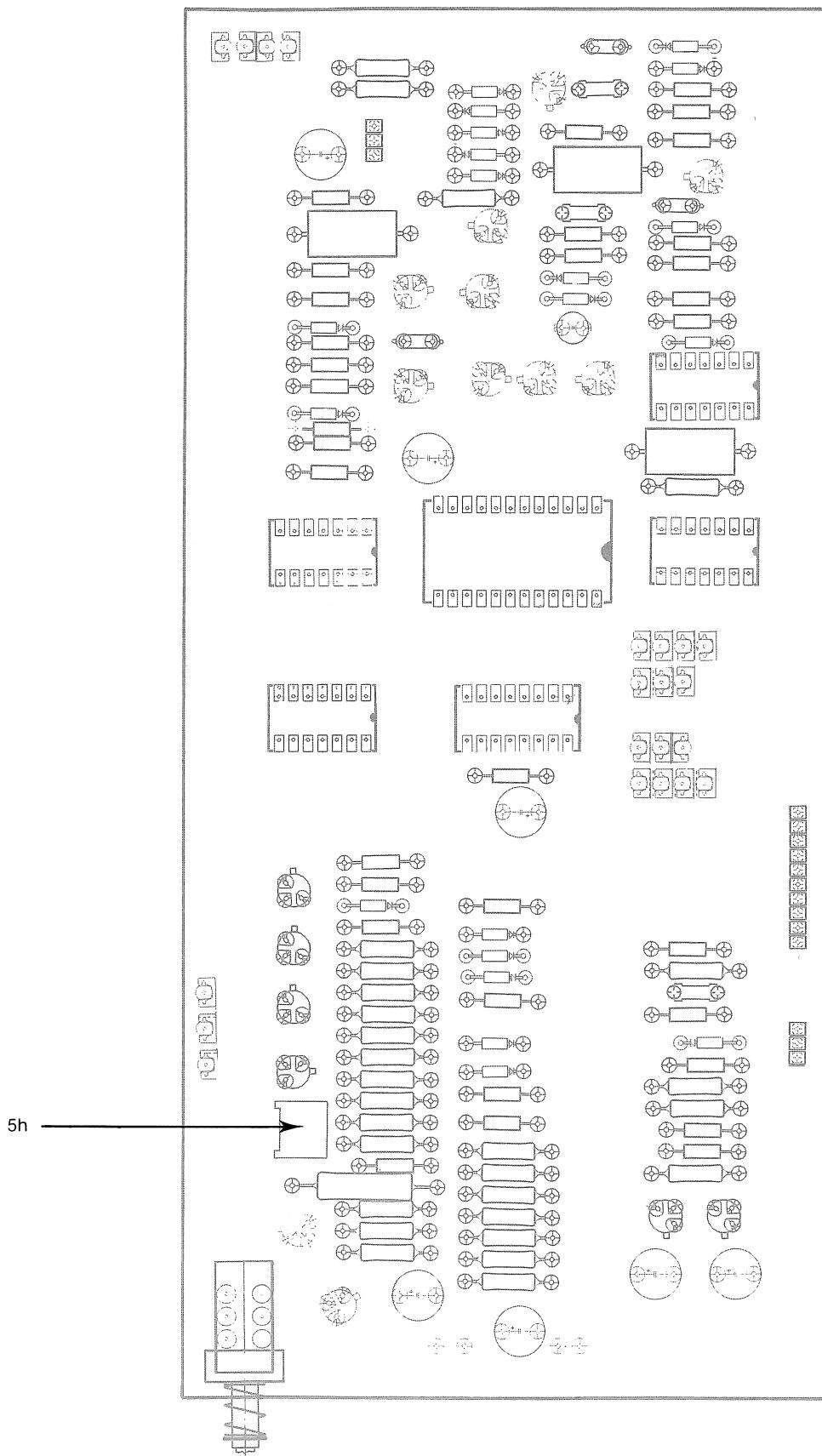


Fig. 2-9. The Logic and Output Board. Calibration point R280 is located.

Servicing Information—067-0690-00

- j. Adjust R151, located in Fig. 2-3, to cause the field amplitudes to fall within 0.06 to 0.08 V on the low end and 0.614 to 0.814 on the high end, relative to the 0.0 V blanking level (Fig. 2-10).

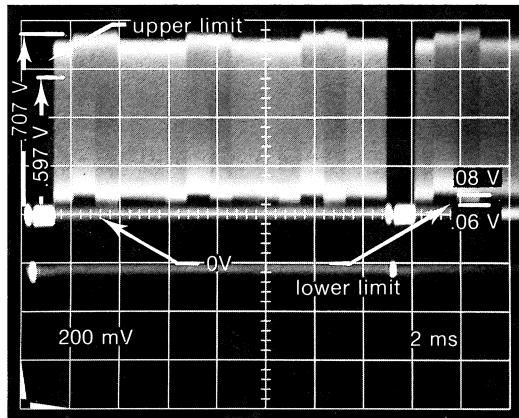


Fig. 2-10. The Multiburst Composite Video waveform following adjustment.

These levels, and the amplitudes specified in step 5i must remain within specification for Multiburst, 20 MHz, 16 MHz and 8 MHz functions. The SEQ INVERT button must have no effect. Each time a frequency is activated, it must have a duration of 1/15 of the total field time $\pm 5\%$. Distortion of the multiburst waveform must not exceed the limits set forth in Fig. 1-8.

6. Grayscale Balance, Level and Amplitude

a. Refer to Fig. 2-3 for location of the Oscillator and Grayscale board test and calibration points. The oscilloscope should be set up as in step 5h.

b. Switch the 067-0690-00 to 50% FLAT FIELD. Adjust R217 for no shift in background level while reversing VIDEO POLARITY. Push the 10 Grayscale button, and adjust R38 for an amplitude of 0.579 to 0.707 V from the black to the white step (Fig. 2-11).

c. Adjust R10 for minimum shift between fields when reversing the VIDEO POLARITY switch. That is, check that the white step (highest voltage plateau) is the same amplitude from the blanking level, whether it is the first or the last step in the ordering.

d. Adjust R225 for a white-step amplitude in the range 0.614 to 0.814 volts from blanking level; the black step amplitude at this setting should fall within the range 0.0671 to 0.0871 V. Some interaction may occur in these steps, and readjustment may be necessary.

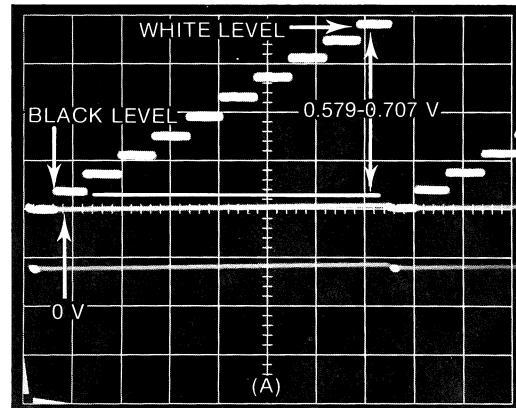


Fig. 2-11. Composite Video waveform for the 10 step gray scale function, with VIDEO POLARITY button (A) OUT-NORMAL and (B) IN-INVERT.

e. Switch the 067-0690-00 to 8, 5 and 2 Grayscale functions. Again, the composite video waveform must fall within the specifications outlined in steps 5b,c, and 3. The DK BKGD function may be considered a single step grayscale, and with VIDEO POLARITY in the OUT-NORMAL position a composite video level of from 0.0671 to 0.0871 V should be observed; with VIDEO POLARITY in the IN-INVERT position, the waveform composite video level must fall within the range 0.614 to 0.814 V. During the 50% FLAT FIELD function, a composite video waveform of approximately 1/2 the amplitude of the light background function should be observed. Light background refers to the combined DK BKGD and VIDEO POLARITY INVERT functions.

7. Grayscale Linearity and Timing

a. Cycle through the 2,5,8 and 10 Grayscale functions, with the oscilloscope still monitoring the 1.0 V p-p composite video waveform. At each function, perform the tests of steps 7b,c, and d.

b. The number of plateaus in the staircase, beginning with the black step at a nominal 0.71 V and ending with the white step at a nominal 0.71, must equal 2, 5, 8, or 10 as selected.

c. Each plateau in the staircase must be flat, with a tilt of less than 10 mV. Each step must be equally spaced from the steps immediately above and below it (Fig. 2-11b).

d. For the selected field rate (either 50 or 60 Hz) and grayscale function, consult the following table. The time range indicated represents the allowable range of step duration, or the step width of the observed waveform. The first and last staircase steps may exceed the lower limit by as much as 5H, where as before, H represents the line-scanning time and was established earlier in this procedure (step 3g).

Step Duration, ms		
Field Rate:	60	50
Grayscale Steps		
2	7.3—8.1	8.8—9.7
5	2.9—3.3	3.5—3.9
8	1.8—2.0	2.2—2.4
10	1.4—1.6	1.8—2.0

8. The Composite Video Waveform (See Fig. 1-7)

a. The rise and fall times on all the sync portions (that is, negative portions) of the COMPOSITE VIDEO must be less than 300 ns, regardless of line rate.

b. Change the oscilloscope BNC input line from the 067-0690-00 COMPOSITE VIDEO OUTPUT 1 V P-P connector to the COMPOSITE VIDEO OUTPUT 2.5 V P-P connector. As previously, the line should be terminated with $75\ \Omega$ at the oscilloscope input.

c. Verify a total peak-to-peak amplitude of from 2.3 to 2.7 V.

d. Verify a sync amplitude of from -0.679 to -0.751 volts, with respect to the blanking level.

e. Verify a setup level of from 0.152 to 0.202 volts with respect to the blanking level.

f. For all grayscale waveforms, the white step must have an amplitude in the range 1.52 to 2.02 volts relative to the blanking level.

g. The grayscale linearity and timing specifications of 6b, c, and d must be met.

h. Again change the oscilloscope input connection, this time to view the 067-0690-00 front panel connector marked COMPOSITE VIDEO OUTPUT .3 V P-P. The composite video waveform seen must have a peak-to-peak amplitude in the range 270 to 330 mV, relative to blanking.

i. Verify a sync amplitude of 83 to 91 mV, relative to blanking.

j. Verify a setup level of 19 to 23 mV, relative to blanking.

k. Verify a white-step level of 194 to 238 mV, for all grayscale functions. (This step is analogous to 8f.) Level relative to blanking.

l. The grayscale linearity and timing specifications of 6b, c, and d must be met.

10. Composite Sync Output

a. Transfer the $75\ \Omega$ oscilloscope input to the 067-0690-00 BNC output labelled COMPOSITE SYNC OUTPUT. Connect a probe from the oscilloscope external trigger to U655 pin 8 (see Fig. 2-4). Set the oscilloscope controls as follows:

Horizontal	2 ms per cm
Vertical	1 V per cm
Delay Time	50 μ s

Adjust the Delay Time Multiplier, and view the composite sync waveform. With the delay "window" centered on the vertical sync interval, a waveform similar to Fig. 2-12 should result. A more complete comparison can be made against Fig. 1-4. Amplitude must be -3.8 to -4.2 V referenced to ground. All rise and delay times must not exceed 190 ns.

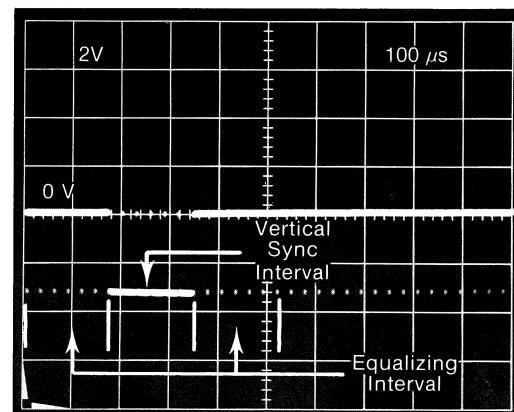


Fig. 2-12. The Composite Sync waveform, seen during the equalizing and vertical sync periods.

11. External Sync (Gen Lock Operation)

a. Connect the pulse generator to the 067-0690-00 EXTERNAL SYNC IN connector, using a $75\ \Omega$ line. Adjust pulse amplitude to approximately -4 V , pulse duration to approximately $3\ \mu\text{s}$. For step 10b, the pulse train period should be varied from $64.0\ \mu\text{s}$ to $27.2\ \mu\text{s}$.

b. Connect a probe from oscilloscope channel 1 to U535 pin 3, and a probe from channel 2 to U535 pin 1 (located in Fig. 2-4). Trigger on channel 1. The resulting horizontal sync pulse should be relatively stationary over the variation of pulse train period described in the previous step. Jitter should be no more than 50 ns at $525/60$ (referring to lines per frame and field rate) and no more than 20 ns at $1029/60$. These limits refer to the greatest horizontal variation allowed in the observed waveform which is visible on the oscilloscope.

12. Return Loss

a. Connect the 015-0149-00 to the oscilloscope input as described in the Return Loss Bridge manual, Tektronix Part Number 070-1024-00. Set both oscilloscope channels to dc if they are not already. The Bridge reference lead should be terminated with the $75\ \Omega$ device which accompanies the instrument. The "unknown" lead should be unterminated.

b. Apply the sinewave generator, set to 5 MHz , to the input of the Return Loss Bridge. Adjust the sine wave level until a 250 mV peak-to-peak amplitude is observed on the oscilloscope.

c. Connect the "unknown" lead of the 015-0149-00 to the 067-0690-00 front panel BNC connector labelled COMPOSITE VIDEO OUTPUT 1 V P-P. Select an arbitrary function of the 067-0690-00, e.g., 50% FLAT FIELD. Observe on the oscilloscope no more than 8 mV of 5 MHz sine wave superimposed on the composite video waveform.

d. Repeat the previous step, but transfer the "unknown" lead of the Bridge to the BNC connector labelled COMPOSITE SYNC OUTPUT.

e. Repeat step 11c, but transfer the Bridge "unknown" lead to the BNC connector labelled EXTERNAL SYNC IN. Apply a $75\ \Omega$ termination to the EXTERNAL SYNC OUT connector. Adjust C5 on the Sync Generator board (Fig. 2-4) until the peak-to-peak amplitude of the sine wave observed is no greater than 2.5 mV .

CONNECTOR DESIGNATIONS

On circuit boards, Pin 1 is marked with a small caret. Additional information on connectors is contained in Fig 2-1.

TABLE 2-1
Connector Information

CONNECTOR					SIGNAL
END 1	LOCATION*	END 2	LOCATION*	PIN	
J110	BOARD 1	PWR LAMP	F. PANEL	1 2	GND. +5 V
J111	BOARD 1	LOOPTHRU	F. PANEL	1 2	SHIELD COMP SYNC IN
J112	BOARD 1	J106	BOARD 2	1 2 3	-15 V GND. +15 V
J113	BOARD 1	J105	BOARD 2	1 2 3 4 5 6 7 8 9 10	HORIZONTAL BLANK VERTICAL SYNC COMPOSITE BLANK COMPOSITE BLANK COMPOSITE SYNC COMPOSITE SYNC HORIZONTAL SYNC HORIZONTAL DRIVE VERTICAL BLANK VERTICAL SYNC
J100	BOARD 2	J119	BOARD 3	1 2 3 4	-15 V +15 V +15 V GND.
J101	BOARD 2	J117	BOARD 3	1 2 3 4	16 MHz GATE 5 MHz GATE 2.5 MHz GATE 8 MHz GATE
J102	BOARD 2	J116	BOARD 3	1 2 3	HORIZONTAL DRIVE VERTICAL BLANK 20 MHz GATE
J103	BOARD 2	J115	BOARD 3	1 2 3	GRAY GEN TIMING 2 TIMING 1
J104	BOARD 2	J114	BOARD 3	1 2 3 4	ENABLE MULTIBURST VERTICAL SYNC DATA SELECT B DATA SELECT A
J107	BOARD 2	J118	BOARD 3	1 2 3	GND VIDEO GND

*BOARD 1 = SYNC GEN; BOARD 2 = LOGIC & OUTPUT; and BOARD 3 = OSC & GRAY SCALE.

TABLE 2-2
Power Supply Connector

PIN	DESIGNATION		PIN
A14—A28	NO CONNECTION		B14—B28
A13	25 Vac		B13
A12	+33.5 Vdc Filtered		B12
A11	Base of PNP Series Pass	Collector of PNP Series Pass	B11
A10	Emitter Lead of PNP Series Pass	Transformer Shield Lead	B10
A9	±33.5 V Common Return		B9
A8	−33.5 Vdc Filtered		B8
A7	Emitter of NPN Series Pass	Collector of NPN Series Pass	B7
A6	Base of NPN Series Pass	NO CONNECTION	B6
A5	17.5 Vac		B5
A4	+11.5 V Common Return		B4
A3	+11.5 V Common Return		B3
A2	+11.5 Vdc Filtered		B2
A1	25 Vac		B1

This table represents the view looking into the female connector of the Power Module. A connector key falls between the number 6 and 7 edge conductors.

SECTION 3

CIRCUIT DESCRIPTION

INTRODUCTION

The 067-0690-00 High Resolution Test Generator is composed of three circuit boards. Component Layouts and Schematic Diagrams are to be found on the pull-out pages in Section 5 of this manual. Sync Generator (Board 1) components (Fig. 5-2) comprise the Sync Generator (Fig. 5-3) and +5 V, -15 V power supplies (Fig. 5-8). Logic and Output (Board 2) components (Fig. 5-4) comprise the bar-generating portion of the Gray Scale Generator (Fig. 5-5) and Comp Video and Comp Sync output amplifiers (Fig. 5-8). Oscillator and Gray Scale (Board 3) components (Fig. 5-7) comprise the Multiburst Generator (Fig. 5-6), bar-timing and output portions of the Gray Scale Generator (Fig. 5-5) and +5 V, +15 V power supplies (Fig. 5-8).

DETAILED DESCRIPTION

Refer to Fig. 5-1, the 067-0690-00 Block Diagram. This figure shows the interrelation between the functions of the three circuit boards. Board 1 is schematically located at the top of the diagram, board 2 below it and board 3 at the bottom. All connector designations are shown except for the power supply interfacing with the TM 500 Series Power Module (refer to Power Supply Connector Designations in the Servicing Information section).

Sync Generator

Refer to Fig. 5-3, the Sync Generator Schematic Diagram. Assume that no signal is applied to the LOOPTHRU input; that is, the generator is running in the internal mode. Because no external signal is applied, no separated sync pulses will drive U505, an astable multivibrator. The resulting low Q output enables the generator's internal crystal oscillator. The oscillator rate is twice that of a horizontal line (the serration frequency). Counting and gating circuitry in the Sync Generator produces the complete range of synchronization, blanking and drive signals. The composite sync output is fed directly to the composite sync amplifier (Fig. 5-8) which outputs the signal to the front panel COMP SYNC connector.

Gen Lock Operation

Should an external source of composite information (be it a composite sync or composite video signal) be applied to the COMP SYNC IN connectors (Fig. 5-3), the video signal is clipped by the sync stripper circuitry. The remaining sync pulses drive U505, disabling the internal crystal oscillator and enabling the variable frequency, voltage controlled (VCO) oscillator. This oscillator then drives the sync generator circuitry at the external signal's characteristic serration rate. The output horizontal sync pulse train (H SYNC) is returned to the phase detector, where it is compared with the externally applied horizontal sync signal. The error signal from the phase detector locks the VCO to the driving frequency.

Vertical sync pulses for driving and sync gen signals are aligned by an error signal developed at U675, which causes a reset of the sync gen counters (U355, U365 and U375).

Bar Generation

The four gray-scale functions and the multiburst function of the 067-0690-00 require that the content of the composite video envelope be stepped through different states during a vertical sweep. The astable multivibrator (bar generator) comprising Q105 and Q119 on board 2 (Fig. 5-5) begins this function, and runs continuously at a rate determined by TIMING 1 and TIMING 2 time constants and the 50/60 field rate strap option. The timing constants are chosen by the gray scale and multiburst switch mounted on board 3. The two gray scale-step switch causes the multivibrator to oscillate at twice the field rate, the five gray scale-step switch causes oscillation at five times the field rate, and the eight and ten gray scale-step switches have analogous functions. The multiburst switch causes a 15 times field rate oscillation, allowing the 15 multiburst bars to be of equal width.

The bar generator is synchronized to H SYNC and V BLNK of board 1, and its output is provided to both the gray scale counter (Fig. 5-5) and multiburst generator (Fig. 5-6).

Circuit Description—067-0690-00

Gray Scale

Refer to Fig. 5-5. The signal GRAY GEN from the bar generator clocks counter U226, which is only disabled by the multiburst switch. The outputs from this counter drive a digital-to-analog (d to a) converter that provides a staircase waveform to the divider network composed of R12, R13, R16, and R18. The front panel switches then adjust the staircase to the appropriate normalized level, which is then applied to one input of a differential amplifier.

A clamp is provided by V SYNC, which stabilizes the amplifier between fields. The second input to the differential amplifier is held at a reference voltage, with the result that both positive and negative going normalized staircase waveforms are made available to VIDEO POLARITY switch S45. The latter switch selects the appropriate positive-going or negative-going staircase, and the closed state of one of the gray scale switches relays this signal to the composite video output amplifier.

The dark background and flat-field selections cause a departure from normal gray scale functions. Both dark background and flat-field switches ground the staircase input, and both outputs of the differential amplifier are determined by the reference voltage. Normally, this reference is ground, and in the case of dark background selection, this ensures a low-level constant dark background signal relayed to the composite video output amplifier.

The flat field switch applies a positive reference voltage to the differential amplifier, adjusted by R217 to ensure that both amplifier outputs are at an equal and intermediate (in terms of resulting intensity voltage level).

Frequency Gate Generator

Referring again to Fig. 5-5, the GRAY GEN signal from the bar generator is applied to the frequency gate generator. The latter's outputs are gates enabling the five Colpitts oscillators of board 3. If a sinusoid of 8 MHz, 16 MHz or 20 MHz is selected by a front panel switch, the appropriate gate for the selected oscillator is held high for the duration of the vertical scan. Selection of multiburst enables the frequency gate generator to step through the five frequency gates at a 16 step per field repetition rate. The respective frequency gates are relayed to board 3.

Multiburst Generator

Refer to Fig. 5-6. The multiburst generator is composed of five Colpitts oscillators gated by the outputs of the frequency gate generator previously described, and H DRIVE, which allows the appropriate oscillator to be keyed slightly prior to the removal of the horizontal blanking pulse. This preparatory time allows the keyed oscillator to reach steady-state characteristics. The outputs of the oscillators are summed and relayed through a closed 8 MHz, 16 MHz, 20 MHz or multiburst selection switch to the composite video output amplifier.

Composite Video Output Amplifier

The selected video envelope, either gray scale sinusoid or multiburst is combined with composite sync at the composite video output amplifier on board 2 (Fig. 5-8). The resulting composite video signal passes through a voltage divider, and the 2.5 V, 1.0 V, and 0.3 V signals are made available to the three front panel output connectors.

Power Supplies

Boards 1 and 3 contain the 067-0690-00 power supply regulators (Fig. 5-8). Board 1 accepts +11.5 V and -33.5 V unregulated voltages from the Power Module, and supplies +5 V regulated to board 1, and -15 V regulated to boards 1, 2, and 3. Board 3 accepts +11.5 V and +33.5 V unregulated from the Power Module and supplies +5 V regulated to boards 2 and 3 and +15 V to boards 1, 2, and 3.

The +15 V supply is variable by means of R182 on board 3, and is used as a reference for the remaining non-adjustable supplies (+5 V and -15 V on board 1 and +5 V on board 3).

ELECTRICAL REPLACEABLE PARTS LIST

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 developed in our engineering department. It is therefore important, when ordering parts, to include the following information in your order: Part number, instrument type or number, serial number, and 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.

SPECIAL NOTES AND SYMBOLS

X000	Part first added at this serial number
00X	Part removed after this serial number

ITEM NAME

In the Parts List, an Item Name is separated from the description by a colon (:). Because of space limitations, an Item Name may sometimes appear as incomplete. For further Item Name identification, the U.S. Federal Cataloging Handbook H6-1 can be utilized where possible.

ABBREVIATIONS

ACTR	ACTUATOR	PLSTC	PLASTIC
ASSY	ASSEMBLY	QTZ	QUARTZ
CAP	CAPACITOR	RECP	RECEPTACLE
CER	CERAMIC	RES	RESISTOR
CKT	CIRCUIT	RF	RADIO FREQUENCY
COMP	COMPOSITION	SEL	SELECTED
CONN	CONNECTOR	SEMICOND	SEMICONDUCTOR
ELCLTL	ELECTROLYTIC	SENS	SENSITIVE
ELEC	ELECTRICAL	SEP	SEPARATELY
FXD	FIXED	VAR	VARIABLE
INCAND	INCANDESCENT	WW	WIREWOUND
LED	LIGHT EMITTING DIODE	XFMR	TRANSFORMER
NONWIR	NON WIREWOUND	XTAL	CRYSTAL

CROSS INDEX MFR. CODE NUMBER TO MANUFACTURER

MFR.CODE	MANUFACTURER	ADDRESS	CITY,STATE,ZIP
00779	AMP, Inc.	P. O. Box 3608	Harrisburg, PA 17105
00853	Sangamo Electric Co., S. Carolina Div.	P. O. Box 128	Pickens, SC 29671
01121	Allen-Bradley Co.	1201 2nd St. South	Milwaukee, WI 53204
01295	Texas Instruments, Inc., Components Group	P. O. Box 5012	Dallas, TX 75222
03508	General Electric Co., Semi-Conductor Products Dept.	Electronics Park	Syracuse, NY 13201
04713	Motorola, Inc., Semiconductor Products Div.	5005 E. McDowell Rd.	Phoenix, AZ 85008
07263	Fairchild Semiconductor, A Div. of Fairchild Camera and Instrument Corp.	464 Ellis St.	Mountain View, CA 94040
07910	Teledyne Semiconductor	12515 Chadron Ave.	Hawthorne, CA 90250
08806	General Electric Co., Miniature Lamp Products Dept.	Nela PK.	Cleveland, OH 44112
12040	National Semiconductor Corp.	Commerce Drive	Danbury, CT 06810
13571	Electronic Research Co.	10005 W. 75th	Overland Park, KS 66204
21845	Solitron Devices, Inc., Transistor Div.	1177 Blue Heron Blvd.	Riviera Beach, FL 33404
24931	Specialty Connector Co., Inc.	3560 Madison Ave.	Indianapolis, IN 46227
27014	National Semi-Conductor Corp.	2900 San Ysidro Way	Santa Clara, CA 95051
34553	Amperex Electronic Corp., Component Div.	35 Hoffman Ave.	Happauge, NY 11787
56289	Sprague Electric Co.		North Adams, MA 01247
71590	Centralab Electronics, Div. of Globe-Union, Inc.	5757 N. Green Bay Ave.	Milwaukee, WI 53201
72136	Electro Motive Mfg. Co., Inc., The	South Park and John Streets	Willimantic, CT 06226
72982	Erie Technological Products, Inc.	644 W. 12th St.	Erie, PA 16512
73138	Beckman Instruments, Inc., Helipot Div.	2500 Harbor Blvd.	Fullerton, CA 92634
75042	TRW Electronic Components, IRC Fixed Resistors, Philadelphia Division	401 N. Broad St.	Philadelphia, PA 19108
80009	Tektronix, Inc.	P. O. Box 500	Beaverton, OR 97005
80294	Bourns, Inc., Instrument Div.	6135 Magnolia Ave.	Riverside, CA 92506
80740	Beckman Instruments, Inc.	2500 Harbor Blvd.	Fullerton, CA 92634
84411	TRW Electronic Components, TRW Capacitors	112 W. First St.	Ogallala, NB 69153
90201	Mallory Capacitor Co., Div. of P. R. Mallory Co., Inc.	3029 E. Washington St.	Indianapolis, IN 46206
91637	Dale Electronics, Inc.	P. O. Box 609	Columbus, NB 68601

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	DScont	Name & Description	Mfr Code	Mfr Part Number
A1	670-3257-00			CKT BOARD ASSY:SYNC GENERATOR	80009	670-3257-00
A2	670-2997-00			CKT BOARD ASSY:OSCILLATOR AND GRAY SCALE	80009	670-2997-00
A3	670-3067-00			CKT BOARD ASSY:LOGIC AND OUTPUT	80009	670-3067-00
A1	670-3257-00			CKT BOARD ASSY:SYNC GENERATOR	80009	670-3257-00
C4	281-0625-00			CAP.,FXD,CER DI:35PF,5%,500V	72982	308-000C0G0350J
C5	281-0185-00			CAP.,VAR,PLSTC:2 TO 18PF,250V	34553	2222-809-09003
C6	290-0523-00			CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0025HA1
C12	290-0523-00			CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0025HA1
C26	290-0529-00			CAP.,FXD,ELCTLT:47UF,20%,20V	56289	196D476X0020LA3
C27	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-547E103Z
C83	290-0529-00			CAP.,FXD,ELCTLT:47UF,20%,20V	56289	196D476X0020LA3
C89	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
C93	290-0529-00			CAP.,FXD,ELCTLT:47UF,20%,20V	56289	196D476X0020LA3
C111	290-0523-00			CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0025HA1
C209	290-0529-00			CAP.,FXD,ELCTLT:47UF,20%,20V	56289	196D476X0020LA3
C218	290-0524-00			CAP.,FXD,ELCTLT:4.7UF,20%,10V	90201	TDC475M010EL
C224	281-0523-00			CAP.,FXD,CER DI:100PF,/-20PF,350V	72982	301-000U2M0101M
C228	290-0529-00			CAP.,FXD,ELCTLT:47UF,20%,20V	56289	196D476X0020LA3
C229	290-0529-00			CAP.,FXD,ELCTLT:47UF,20%,20V	56289	196D476X0020LA3
C274	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
C289	281-0546-00			CAP.,FXD,CER DI:330PF,10%,500V	72982	301-000X5P0331K
C295	281-0623-00			CAP.,FXD,CER DI:650PF,5%,500V	72982	301-000Y5D0651J
C325	283-0051-00			CAP.,FXD,CER DI:0.0033UF,5%,100V	72982	8131N145CGG332J
C326	281-0623-00			CAP.,FXD,CER DI:650PF,5%,500V	72982	301-000Y5D0651J
C339	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-547E103Z
C405	290-0523-00			CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0025HA1
C409	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	72982	8131N039651105Z
C415	283-0142-00			CAP.,FXD,CER DI:0.0027UF,5%,200V	72982	875-551B272J
C429	290-0535-00			CAP.,FXD,ELCTLT:33UF,20%,10V	56289	196D336X0010KA1
C449	283-0626-00			CAP.,FXD,MICA D:1800PF,5%,500V	00853	D19E182J0500
C461	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	72982	8131N039651105Z
C495	283-0625-00			CAP.,FXD,MICA D:220PF,1%,500V	72136	DM10F221F
C510	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	72982	8131N039651105Z
C545	283-0664-00			CAP.,FXD,MICA D:2800PF,5%,500V	00853	D19E282J0
C555	285-0835-00			CAP.,FXD,PLSTC:0.22UF,2%,100V	84411	TEK35-224-9-1
C575	281-0638-00			CAP.,FXD,CER DI:240PF,5%,500V	72982	301-000Z5D0241J
C595	283-0596-00			CAP.,FXD,MICA D:528PF,1%,300V	00853	D153F5280F0
C681	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	72982	8131N039651105Z
CR125	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	CD8220
CR143	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	CD8220
CR145	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	CD8220
CR147	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	CD8220
CR149	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	CD8220
CR153	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	CD8220
CR155	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	CD8220
CR157	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	CD8220
CR159	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	CD8220
CR163	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	CD8220
CR165	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	CD8220
CR167	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	CD8220
CR169	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	CD8220
CR305	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	CD8220
CR317	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	CD8220
CR323	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	CD8220
CR333	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	CD8220
CR685	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	CD8220

Electrical Parts List—067-0690-00

Gkt No.	Tektronix Part No.	Serial/Model No.	Mfr
		Eff	Code
		Dscont	Mfr Part Number
Q11	151-0190-00	TRANSISTOR:SILICON,NPN	04713 2N3904
Q27	151-0190-00	TRANSISTOR:SILICON,NPN	04713 2N3904
Q28	151-0190-00	TRANSISTOR:SILICON,NPN	04713 2N3904
Q80	151-0188-00	TRANSISTOR:SILICON,PNP	04713 2N3906
Q112	151-0190-00	TRANSISTOR:SILICON,NPN	04713 2N3904
Q114	151-0190-00	TRANSISTOR:SILICON,NPN	04713 2N3904
Q125	151-0190-00	TRANSISTOR:SILICON,NPN	04713 2N3904
Q127	151-0190-00	TRANSISTOR:SILICON,NPN	04713 2N3904
Q215	151-0188-00	TRANSISTOR:SILICON,PNP	04713 2N3906
Q216	151-0188-00	TRANSISTOR:SILICON,PNP	04713 2N3906
Q217	151-0190-00	TRANSISTOR:SILICON,NPN	04713 2N3904
Q219	151-0190-00	TRANSISTOR:SILICON,NPN	04713 2N3904
Q228	151-0190-00	TRANSISTOR:SILICON,NPN	04713 2N3904
Q229	151-0281-00	TRANSISTOR:SILICON,NPN	03508 X16P4039
Q238	151-0188-00	TRANSISTOR:SILICON,PNP	04713 2N3906
Q239	151-0188-00	TRANSISTOR:SILICON,PNP	04713 2N3906
Q415	151-0188-00	TRANSISTOR:SILICON,PNP	04713 2N3906
Q419	151-0190-00	TRANSISTOR:SILICON,NPN	04713 2N3904
Q421	151-0190-00	TRANSISTOR:SILICON,NPN	04713 2N3904
Q424	151-0190-00	TRANSISTOR:SILICON,NPN	04713 2N3904
R2	315-0821-00	RES.,FXD,COMP:820 OHM,5%,0.25W	01121 CB8215
R3	315-0102-00	RES.,FXD,COMP:1K OHM,5%,0.25W	01121 CB1025
R15	315-0153-00	RES.,FXD,COMP:15K OHM,5%,0.25W	01121 CB1535
R16	315-0100-00	RES.,FXD,COMP:10 OHM,5%,0.25W	01121 CB1005
R17	315-0203-00	RES.,FXD,COMP:20K OHM,5%,0.25W	01121 CB2035
R18	321-0308-00	RES.,FXD,FILM:15.8K OHM,1%,0.125W	75042 CEAT0-1582F
R25	315-0104-00	RES.,FXD,COMP:100K OHM,5%,0.25W	01121 CB1045
R32	315-0104-00	RES.,FXD,COMP:100K OHM,5%,0.25W	01121 CB1045
R35	315-0103-00	RES.,FXD,COMP:10K OHM,5%,0.25W	01121 CB1035
R37	315-0103-00	RES.,FXD,COMP:10K OHM,5%,0.25W	01121 CB1035
R72	315-0153-00	RES.,FXD,COMP:15K OHM,5%,0.25W	01121 CB1535
R73	315-0471-00	RES.,FXD,COMP:470 OHM,5%,0.25W	01121 CB4715
R75	308-0420-00	RES.,FXD,WW:1.8 OHM,3%,1.5W	91637 RS1A1R00H10PPM
R76	315-0151-00	RES.,FXD,COMP:150 OHM,5%,0.25W	01121 CB1515
R85	315-0562-00	RES.,FXD,COMP:5.6K OHM,5%,0.25W	01121 CB5625
R86	315-0332-00	RES.,FXD,COMP:3.3K OHM,5%,0.25W	01121 CB3325
R94	315-0202-00	RES.,FXD,COMP:2K OHM,5%,0.25W	01121 CB2025
R95	315-0270-00	RES.,FXD,COMP:27 OHM,5%,0.25W	01121 CB2705
R97	308-0764-00	RES.,FXD,WW:2.7 OHM,5%,2W	75042 BWF2R70F
R103	321-0316-00	RES.,FXD,FILM:19.1K OHM,1%,0.125KW	75042 CEAT0-1912F
R104	321-0280-00	RES.,FXD,FILM:8.06K OHM,1%,0.125W	75042 CEAT0-8061F
R105	321-0289-00	RES.,FXD,FILM:10K OHM,1%,0.125W	75042 CEAT0-1002F
R121	321-0197-00	RES.,FXD,FILM:1.1K OHM,1%,0.125W	75042 CEAT0-1101F
R122	315-0752-00	RES.,FXD,COMP:7.5K OHM,5%,0.25W	01121 CB7525
R123	315-0104-00	RES.,FXD,COMP:100K OHM,5%,0.25W	01121 CB1045
R131	315-0302-00	RES.,FXD,COMP:3K OHM,5%,0.25W	01121 CB3025
R133	321-0289-00	RES.,FXD,FILM:10K OHM,1%,0.125W	75042 CEAT0-1002F
R135	321-0289-00	RES.,FXD,FILM:10K OHM,1%,0.125W	75042 CEAT0-1002F
R195	321-0289-07	RES.,FXD,FILM:10K OHM,0.1%,0.125W	75042 CEAT9-1002B
R197	321-0816-07	RES.,FXD,FILM:5K OHM,0.1%,0.125W	75042 CEAT9-5001B
R203	315-0302-00	RES.,FXD,COMP:3K OHM,5%,0.25W	01121 CB3025
R204	315-0103-00	RES.,FXD,COMP:10K OHM,5%,0.25W	01121 CB1035
R205	315-0103-00	RES.,FXD,COMP:10K OHM,5%,0.25W	01121 CB1035
R206	315-0151-00	RES.,FXD,COMP:150 OHM,5%,0.25W	01121 CB1515
R207	315-0100-00	RES.,FXD,COMP:10 OHM,5%,0.25W	01121 CB1005
R222	315-0512-00	RES.,FXD,COMP:5.1K OHM,5%,0.25W	01121 CB5125
R223	315-0512-00	RES.,FXD,COMP:5.1K OHM,5%,0.25W	01121 CB5125
R226	315-0242-00	RES.,FXD,COMP:2.4K OHM,5%,0.25W	01121 CB2425
R233	321-0277-00	RES.,FXD,FILM:7.5K OHM,1%,0.125W	75042 CEAT0-7501F
R235	321-0277-00	RES.,FXD,FILM:7.5K OHM,1%,0.125W	75042 CEAT0-7501F

Ckt No.	Tektronix Part No.	Serial/Model No.	Mfr Code	Mfr Part Number
		Eff	Descont	Name & Description
R237	321-0311-00			RES., FXD, FILM: 16.9K OHM, 1%, 0.125W
R275	321-0816-07			RES., FXD, FILM: 5K OHM, 0.1%, 0.125W
R276	321-0603-07			RES., FXD, FILM: 15K OHM, 0.1%, 0.125W
R277	321-0816-07			RES., FXD, FILM: 5K OHM, 0.1%, 0.125W
R278	321-0816-07			RES., FXD, FILM: 5K OHM, 0.1%, 0.125W
R285	321-0329-00			RES., FXD, FILM: 26.1K OHM, 1%, 0.125W
R286	321-0350-00			RES., FXD, FILM: 43.2K OHM, 1%, 0.125W
R287	321-0335-00			RES., FXD, FILM: 30.1K OHM, 1%, 0.125W
R289	321-0344-00			RES., FXD, FILM: 37.4K OHM, 1%, 0.125W
R305	321-0303-00			RES., FXD, FILM: 14K OHM, 1%, 0.125W
R309	315-0104-00			RES., FXD, COMP: 100K OHM, 5%, 0.25W
R315	315-0102-00			RES., FXD, COMP: 1K OHM, 5%, 0.25W
R317	315-0103-00			RES., FXD, COMP: 10K OHM, 5%, 0.25W
R321	315-0203-00			RES., FXD, COMP: 20K OHM, 5%, 0.25W
R322	321-0350-00			RES., FXD, FILM: 43.2K OHM, 1%, 0.125W
R347	315-0100-00			RES., FXD, COMP: 10 OHM, 5%, 0.25W
R348	315-0512-00			RES., FXD, COMP: 5.1K OHM, 5%, 0.25W
R349	321-0311-00			RES., FXD, FILM: 16.9K OHM, 1%, 0.125W
R395	321-0286-00			RES., FXD, FILM: 9.31K OHM, 1%, 0.125W
R397	321-0323-00			RES., FXD, FILM: 22.6K OHM, 1%, 0.125W
R409	315-0203-00			RES., FXD, COMP: 20K OHM, 5%, 0.25W
R415	315-0103-00			RES., FXD, COMP: 10K OHM, 5%, 0.25W
R419	321-0337-00			RES., FXD, FILM: 31.6K OHM, 1%, 0.125W
R425	315-0103-00			RES., FXD, COMP: 10K OHM, 5%, 0.25W
R428	321-0316-00			RES., FXD, FILM: 19.1K OHM, 1%, 0.125W
R429	321-0289-00			RES., FXD, FILM: 10K OHM, 1%, 0.125W
R436	315-0362-00			RES., FXD, COMP: 3.6K OHM, 5%, 0.25W
R437	315-0100-00			RES., FXD, COMP: 10 OHM, 5%, 0.25W
R438	315-0103-00			RES., FXD, COMP: 10K OHM, 5%, 0.25W
R439	321-0289-00			RES., FXD, FILM: 10K OHM, 1%, 0.125W
R561	311-0635-00			RES., VAR, NONWIR: 1K OHM, 10%, 0.50W
R565	321-0281-00			RES., FXD, FILM: 8.25K OHM, 1%, 0.125W
R566	321-0319-00			RES., FXD, FILM: 20.5K OHM, 1%, 0.125W
R567	321-0309-00			RES., FXD, FILM: 16.2K OHM, 1%, 0.125W
R625	315-0102-00			RES., FXD, COMP: 1K OHM, 5%, 0.25W
R665	315-0512-00			RES., FXD, COMP: 5.1K OHM, 5%, 0.25W
R667	315-0272-00			RES., FXD, COMP: 2.7K OHM, 5%, 0.25W
R695	321-0304-00			RES., FXD, FILM: 14.3K OHM, 1%, 0.125W
R697	321-0288-00			RES., FXD, FILM: 9.76K OHM, 1%, 0.125W
S165	260-1589-00			SWITCH, ROCKER: 0.10A, 5V
S265	260-1589-00			SWITCH, ROCKER: 0.10A, 5V
U175	156-0071-00			MICROCIRCUIT, LI: VOLTAGE REGULATOR
U185	156-0071-00			MICROCIRCUIT, LI: VOLTAGE REGULATOR
U295	156-0072-00			MICROCIRCUIT, DI: MONOSTABLE MV, TTL
U355	156-0032-00			MICROCIRCUIT, DI: 4-BIT BINARY COUNTER
U365	156-0032-00			MICROCIRCUIT, DI: 4-BIT BINARY COUNTER
U375	156-0032-00			MICROCIRCUIT, DI: 4-BIT BINARY COUNTER
U385	156-0072-00			MICROCIRCUIT, DI: MONOSTABLE MV, TTL
U445	156-0072-00			MICROCIRCUIT, DI: MONOSTABLE MV, TTL
U455	156-0042-00			MICROCIRCUIT, DI: J-K M/S FLIP-FLOP
U465	156-0030-00			MICROCIRCUIT, DI: QUAD 2-INPUT POS NAND GATE
U475	156-0047-00			MICROCIRCUIT, DI: 3-INPUT NAND GATE
U485	156-0039-00			MICROCIRCUIT, DI: DUAL J-K FLIP FLOP
U495	156-0072-00			MICROCIRCUIT, DI: MONOSTABLE MV, TTL
U505	156-0143-00			MICROCIRCUIT, DI: RETRIGGERABLE MONOSTABLE/MV
U515	156-0072-00			MICROCIRCUIT, DI: MONOSTABLE MV, TTL
U525	156-0043-00			MICROCIRCUIT DI: 2-INPUT NOR GATE
U535	156-0124-00			MICROCIRCUIT, DI: SGL FREQ/PHASE DETECTOR
U545	156-0072-00			MICROCIRCUIT, DI: MONOSTABLE MV, TTL

Electrical Parts List—067-0690-00

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Serial/Model No. Dscont	Name & Description	Mfr Code	Mfr Part Number
U555	156-0072-00			MICROCIRCUIT,DI:MONOSTABLE MV,TTL	12040	DM71421N
U575	156-0072-00			MICROCIRCUIT,DI:MONOSTABLE MV,TTL	12040	DM71421N
U585	156-0039-00			MICROCIRCUIT,DI:DUAL J-K FLIP FLOP	04713	MC7473P
U595	156-0072-00			MICROCIRCUIT,DI:MONOSTABLE MV,TTL	12040	DM71421N
U645	156-0058-00			MICROCIRCUIT,DI:HEX INVERTER	04713	MC7404P
U655	156-0039-00			MICROCIRCUIT,DI:DUAL J-K FLIP FLOP	04713	MC7473P
U675	156-0030-00			MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND GATE	01295	SN7400N
VR75	152-0127-00			SEMICOND DEVICE:ZENER,0.4W,7.5V,5%	04713	1N755A
Y55	158-0064-00			XTAL UNIT,QTZ:61.740 KHZ,0.02%	13571	OBD
A2	670-2997-00			CKT BOARD ASSY:OSCILLATOR AND GRAY SCALE	80009	670-2997-00
C22	283-0167-00			CAP.,FXD,CER DI:0.1UF,10%,100V	72982	8131N147W5R104K
C31	290-0559-00			CAP.,FXD,ELCTLT:22UF,20%,35V	56289	196D226X0035MA1
C41	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	72982	8131N039651105Z
C51	283-0620-00			CAP.,FXD,MICA D:470PF,1%,300V	00853	D153F471F0
C52	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	72982	8131N039651105Z
C59	283-0729-00			CAP.,FXD,MICA D:2500PF,5%,500V	72136	OBD
C61	283-0167-00			CAP.,FXD,CER DI:0.1UF,10%,100V	72982	8131N147W5R104K
C62	283-0603-00			CAP.,FXD,MICA D:113PF,2%,300V	00853	D153F1130G0
C65	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	72982	8131N039651105Z
C78	283-0687-00			CAP.,FXD,MICA D:560PF,2%,300V	72136	DM15E561G0300
C79	283-0167-00			CAP.,FXD,CER DI:0.1UF,10%,100V	72982	8131N147W5R104K
C81	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-547E103Z
C88	290-0529-00			CAP.,FXD,ELCTLT:47UF,20%,20V	56289	196D476X0020LA3
C143	281-0504-00			CAP.,FXD,CER DI:10PF,/-1PF,500V	72982	301-000C0G0100F
C152	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-547E103Z
C153	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
C154	281-0500-00			CAP.,FXD,CER DI:2.2PF,+-0.5PF,500V	72982	301-000C0J0229D
C162	283-0628-00			CAP.,FXD,MICA D:450PF,1%,300V	00853	D155F411F0
C165	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	72982	8131N039651105Z
C178	283-0626-00			CAP.,FXD,MICA D:180PF,5%,500V	00853	D19E182J0500
C179	283-0167-00			CAP.,FXD,CER DI:0.1UF,10%,100V	72982	8131N147W5R104K
C181	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-547E103Z
C188	290-0533-00			CAP.,FXD,ELCTLT:330UF,20%,,6V	56289	196D337X006MA3
C229	290-0529-00			CAP.,FXD,ELCTLT:47UF,20%,20V	56289	196D476X0020LA3
C231	290-0529-00			CAP.,FXD,ELCTLT:47UF,20%,20V	56289	196D476X0020LA3
C235	290-0529-00			CAP.,FXD,ELCTLT:47UF,20%,20V	56289	196D476X0020LA3
C241	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	72982	8131N039651105Z
C242	290-0529-00			CAP.,FXD,ELCTLT:47UF,20%,20V	56289	196D476X0020LA3
C243	290-0536-00			CAP.,FXD,ELCTLT:10UF,20%,25V	90201	TDC106M025FL
C246	290-0536-00			CAP.,FXD,ELCTLT:10UF,20%,25V	90201	TDC106M025FL
C248	290-0536-00			CAP.,FXD,ELCTLT:10UF,20%,25V	90201	TDC106M025FL
C252	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	72982	8131N039651105Z
C255	283-0629-00			CAP.,FXD,MICA D:62PF,1%,500V	00853	D105E620F0
C257	283-0167-00			CAP.,FXD,CER DI:0.1UF,10%,100V	72982	8131N147W5R104K
C259	283-0604-00			CAP.,FXD,MICA D:304PF,2%,300V	00853	D153F304G0
C262	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	72982	8131N039651105Z
C271	283-0167-00			CAP.,FXD,CER DI:0.1UF,10%,100V	72982	8131N147W5R104K
C274	283-0260-00			CAP.,FXD,CER DI:5.6PF,5%,200V	72982	8118500C0G569J
C277	283-0599-00			CAP.,FXD,MICA D:98PF,5%,500V	00853	D10E980J0500
C296	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
CR52	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	CD8220
CR59	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	CD8220
CR66	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	CD8220
CR76	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	CD8220
CR152	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	CD8220

Ckt No.	Tektronix Part No.	Serial/Model No.	Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
CR167	152-0141-02				SEMICOND DEVICE:SILICON,30V,150MA	07910	CD8220
CR176	152-0141-02				SEMICOND DEVICE:SILICON,30V,150MA	07910	CD8220
CR251	152-0141-02				SEMICOND DEVICE:SILICON,30V,150MA	07910	CD8220
CR259	152-0141-02				SEMICOND DEVICE:SILICON,30V,150MA	07910	CD8220
CR263	152-0141-02				SEMICOND DEVICE:SILICON,30V,150MA	07910	CD8220
CR275	152-0141-02				SEMICOND DEVICE:SILICON,30V,150MA	07910	CD8220
L51	114-0257-00				COIL,RF:6-11UH,CORE 276-0096-00	80009	114-0257-00
L61	114-0257-00				COIL,RF:6-11UH,CORE 276-0096-00	80009	114-0257-00
L161	114-0246-00				COIL,RF:0.7-1.1UH,CORE 276-0096-00	80009	114-0246-00
L259	114-0246-00				COIL,RF:0.7-1.1UH,CORE 276-0096-00	80009	114-0246-00
L269	114-0246-00				COIL,RF:0.7-1.1UH,CORE 276-0096-00	80009	114-0246-00
Q25	151-0188-00				TRANSISTOR:SILICON,PNP	04713	2N3906
Q26	151-0190-02				TRANSISTOR:SILICON,NPN	04713	2N3904
Q32	151-0190-02				TRANSISTOR:SILICON,NPN	04713	2N3904
Q33	151-0190-02				TRANSISTOR:SILICON,NPN	04713	2N3904
Q55	151-1025-00				TRANSISTOR:SILICON,JFE,N-CHANNEL	01295	SBA8129
Q56	151-0221-00				TRANSISTOR:SILICON,PNP	07263	S24849
Q57	151-0190-02				TRANSISTOR:SILICON,NPN	04713	2N3904
Q72	151-1036-00				TRANSISTOR:SILICON,JFE,N-CHANNEL,DUAL	21845	FD1551
Q73	151-0221-00				TRANSISTOR:SILICON,PNP	07263	S24849
Q74	151-0190-02				TRANSISTOR:SILICON,NPN	04713	2N3904
Q121	151-0232-00				TRANSISTOR:SILICON,NPN,DUAL	12040	NS7348
Q136	151-0190-02				TRANSISTOR:SILICON,NPN	04713	2N3904
Q138	151-0188-00				TRANSISTOR:SILICON,PNP	04713	2N3906
Q146	151-0190-02				TRANSISTOR:SILICON,NPN	04713	2N3904
Q148	151-0190-02				TRANSISTOR:SILICON,NPN	04713	2N3904
Q149	151-0302-00				TRANSISTOR:SILICON,NPN	04713	2N2222A
Q173	151-1025-00				TRANSISTOR:SILICON,JFE,N-CHANNEL	01295	SBA8129
Q174	151-0221-00				TRANSISTOR:SILICON,PNP	07263	S24849
Q175	151-0190-02				TRANSISTOR:SILICON,NPN	04713	2N3904
Q235	151-1036-00				TRANSISTOR:SILICON,JFE,N-CHANNEL,DUAL	21845	FD1551
Q255	151-0221-00				TRANSISTOR:SILICON,PNP	07263	S24849
Q257	151-0190-02				TRANSISTOR:SILICON,NPN	04713	2N3904
Q259	151-1025-00				TRANSISTOR:SILICON,JFE,N-CHANNEL	01295	SBA8129
Q266	151-0221-00				TRANSISTOR:SILICON,PNP	07263	S24849
Q268	151-1036-00				TRANSISTOR:SILICON,JFE,N-CHANNEL,DUAL	21845	FD1551
Q276	151-0190-02				TRANSISTOR:SILICON,NPN	04713	2N3904
R10	311-1263-00				RES.,VAR,NONWIR:1K OHM,10%,0.50W	73138	62PT-347-0
R11	321-0319-00				RES.,FxD,Film:20.5K OHM,1%,0.125W	75042	CEATO-2052F
R12	321-0154-00				RES.,FxD,Film:392 OHM,1%,0.125W	75042	CEATO-3920F
R13	321-0319-00				RES.,FxD,Film:20.5K OHM,1%,0.125W	75042	CEATO-2052F
R14	321-0072-00				RES.,FxD,Film:54.9 OHM,1%,0.125W	75042	CEATO-54R90F
R15	321-0280-00				RES.,FxD,Film:8.06K OHM,1%,0.125W	75042	CEATO-8061F
R16	321-0021-00				RES.,FxD,Film:16.2 OHM,1%,0.125W	01121	CC-16R2-F
R17	321-0260-00				RES.,FxD,Film:4.99K OHM,1%,0.125W	75042	CEATO-4991F
R18	321-0073-00				RES.,FxD,Film:56.2 OHM,1%,0.125W	75042	CEATO-56R20F
R21	315-0153-00				RES.,FxD,COMP:15K OHM,5%,0.25W	01121	CB1535
R22	315-0470-00				RES.,FxD,COMP:47 OHM,5%,0.25W	01121	CB4705
R23	315-0512-00				RES.,FxD,COMP:5.1K OHM,5%,0.25W	01121	CB5125
R24	315-0222-00				RES.,FxD,COMP:2.2K OHM,5%,0.25W	01121	CB2225
R25	315-0103-00				RES.,FxD,COMP:10K OHM,5%,0.25W	01121	CB1035
R26	321-0208-00				RES.,FxD,Film:1.43K OHM,1%,0.125W	75042	CEATO-1431F
R27	321-0143-00				RES.,FxD,Film:301 OHM,1%,0.125W	75042	CEATO-3010F
R31	315-0101-00				RES.,FxD,COMP:100 OHM,5%,0.25W	01121	CB1015
R38	311-1225-00				RES.,VAR,NONWIR:1K OHM,20%,0.50W	80294	3389F-P31-102
R39	321-0134-00				RES.,FxD,Film:243 OHM,1%,0.125W	75042	CEATO-2430F
R40	315-0102-00				RES.,FxD,COMP:1K OHM,5%,0.25W	01121	CB1025
R51	315-0512-00				RES.,FxD,COMP:5.1K OHM,5%,0.25W	01121	CB5125

Electrical Parts List—067-0690-00

Ckt No.	Tektronix Part No.	Serial/Model No.	Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R53	315-0202-00				RES., FXD, COMP: 2K OHM, 5%, 0.25W	01121	CB2025
R54	315-0511-00				RES., FXD, COMP: 510 OHM, 5%, 0.25W	01121	CB5115
R56	315-0100-00				RES., FXD, COMP: 10 OHM, 5%, 0.25W	01121	CB1005
R59	311-1232-00				RES., VAR, NONWIR: 50K OHM, 20%, 0.50W	80294	3389F-P31-503
R57	315-0202-00				RES., FXD, COMP: 2K OHM, 5%, 0.25W	01121	CB2025
R58	315-0912-00				RES., FXD, COMP: 9.1K OHM, 5%, 0.25W	01121	CB9125
R61	315-0152-00				RES., FXD, COMP: 1.5K OHM, 5%, 0.25W	01121	CB1525
R64	315-0512-00				RES., FXD, COMP: 5.1K OHM, 5%, 0.25W	01121	CB5125
R67	315-0202-00				RES., FXD, COMP: 2K OHM, 5%, 0.25W	01121	CB2025
R68	315-0511-00				RES., FXD, COMP: 510 OHM, 5%, 0.25W	01121	CB5115
R71	315-0100-00				RES., FXD, COMP: 10 OHM, 5%, 0.25W	01121	CB1005
R72	315-0912-00				RES., FXD, COMP: 9.1K OHM, 5%, 0.25W	01121	CB9125
R73	315-0202-00				RES., FXD, COMP: 2K OHM, 5%, 0.25W	01121	CB2025
R74	311-1232-00				RES., VAR, NONWIR: 50K OHM, 20%, 0.50W	80294	3389F-P31-503
R75	315-0152-00				RES., FXD, COMP: 1.5K OHM, 5%, 0.25W	01121	CB1525
R82	315-0152-00				RES., FXD, COMP: 1.5K OHM, 5%, 0.25W	01121	CB1525
R111	321-0251-00				RES., FXD, FILM: 4.02K OHM, 1%, 0.125W	75042	CEATO-4021F
R112	321-0280-00				RES., FXD, FILM: 8.06K OHM, 1%, 0.125W	75042	CEATO-8061F
R113	321-0260-00				RES., FXD, FILM: 4.99K OHM, 1%, 0.125W	75042	CEATO-4991F
R114	321-0251-00				RES., FXD, FILM: 4.02K OHM, 1%, 0.125W	75042	CEATO-4021F
R115	321-0234-00				RES., FXD, FILM: 2.67K OHM, 1%, 0.125W	75042	CEATO-2671F
R116	321-0234-00				RES., FXD, FILM: 2.67K OHM, 1%, 0.125W	75042	CEATO-2671F
R117	321-0227-00				RES., FXD, FILM: 2.26K OHM, 1%, 0.125W	75042	CEATO-2261F
R119	321-0143-00				RES., FXD, FILM: 301 OHM, 1%, 0.125W	75042	CEATO-3010F
R122	321-0171-00				RES., FXD, FILM: 590 OHM, 1%, 0.125W	75042	CEATO-5900F
R123	321-0231-00				RES., FXD, FILM: 2.49K OHM, 1%, 0.125W	75042	CEATO-2491F
R124	321-0122-00				RES., FXD, FILM: 182 OHM, 1%, 0.125W	75042	CEATO-1820F
R125	321-0122-00				RES., FXD, FILM: 182 OHM, 1%, 0.125W	75042	CEATO-1820F
R126	321-0184-00				RES., FXD, FILM: 806 OHM, 1%, 0.125W	75042	CEATO-8060F
R127	321-0184-00				RES., FXD, FILM: 806 OHM, 1%, 0.125W	75042	CEATO-8060F
R128	321-0210-00				RES., FXD, FILM: 1.5K OHM, 1%, 0.125W	75042	CEATO-1501F
R129	321-0210-00				RES., FXD, FILM: 1.5K OHM, 1%, 0.125W	75042	CEATO-1501F
R130	321-0171-00				RES., FXD, FILM: 590 OHM, 1%, 0.125W	75042	CEATO-5900F
R131	321-0193-00				RES., FXD, FILM: 1K OHM, 1%, 0.125W	75042	CEATO-1001F
R132	321-0280-00				RES., FXD, FILM: 8.06K OHM, 1%, 0.125W	75042	CEATO-8061F
R133	321-0280-00				RES., FXD, FILM: 8.06K OHM, 1%, 0.125W	75042	CEATO-8061F
R135	321-0193-00				RES., FXD, FILM: 1K OHM, 1%, 0.125W	75042	CEATO-1001F
R136	321-0193-00				RES., FXD, FILM: 1K OHM, 1%, 0.125W	75042	CEATO-1001F
R137	321-0177-00				RES., FXD, FILM: 681 OHM, 1%, 0.125W	75042	CEATO-6810F
R138	321-0222-00				RES., FXD, FILM: 2K OHM, 1%, 0.125W	75042	CEATO-2001F
R139	321-0222-00				RES., FXD, FILM: 2K OHM, 1%, 0.125W	75042	CEATO-2001F
R140	315-0511-00				RES., FXD, COMP: 510 OHM, 5%, 0.25W	01121	CB5115
R141	315-0103-00				RES., FXD, COMP: 10K OHM, 5%, 0.25W	01121	CB1035
R142	315-0103-00				RES., FXD, COMP: 10K OHM, 5%, 0.25W	01121	CB1035
R143	315-0152-00				RES., FXD, COMP: 1.5K OHM, 5%, 0.25W	01121	CB1525
R144	315-0751-00				RES., FXD, COMP: 750 OHM, 5%, 0.25W	01121	CB7515
R145	315-0432-00				RES., FXD, COMP: 4.3K OHM, 5%, 0.25W	01121	CB4325
R151	311-1224-00				RES., VAR, NONWIR: 500 OHM, 20%, 0.50W	80294	3389F-P31-501
R152	315-0103-00				RES., FXD, COMP: 10K OHM, 5%, 0.25W	01121	CB1035
R154	321-0233-00				RES., FXD, FILM: 2.61K OHM, 1%, 0.125W	75042	CEATO-2611F
R155	315-0103-00				RES., FXD, COMP: 10K OHM, 5%, 0.25W	01121	CB1035
R157	321-0264-00				RES., FXD, FILM: 5.49K OHM, 1%, 0.125W	75042	CEATO-5491F
R159	315-0103-00				RES., FXD, COMP: 10K OHM, 5%, 0.25W	01121	CB1035
R164	315-0512-00				RES., FXD, COMP: 5.1K OHM, 5%, 0.25W	01121	CB5125
R168	315-0511-00				RES., FXD, COMP: 510 OHM, 5%, 0.25W	01121	CB5115
R171	315-0100-00				RES., FXD, COMP: 10 OHM, 5%, 0.25W	01121	CB1005
R172	315-0202-00				RES., FXD, COMP: 2K OHM, 5%, 0.25W	01121	CB2025
R173	315-0912-00				RES., FXD, COMP: 9.1K OHM, 5%, 0.25W	01121	CB9125
R175	315-0152-00				RES., FXD, COMP: 1.5K OHM, 5%, 0.25W	01121	CB1525
R176	311-1232-00				RES., VAR, NONWIR: 50K OHM, 20%, 0.50W	80294	3389F-P31-503

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Descont	Name & Description	Mfr Code	Mfr Part Number
R177	315-0202-00			RES., FXD, COMP: 2K OHM, 5%, 0.25W	01121	CB2025
R182	311-1225-00			RES., VAR, NONWIR: 1K OHM, 20%, 0.50W	80294	3389F-P31-102
R183	315-0153-00			RES., FXD, COMP: 15K OHM, 5%, 0.25W	01121	CB1535
R184	321-0276-00			RES., FXD, FILM: 7.32K OHM, 1%, 0.125W	75042	CEAT0-7321F
R185	321-0272-00			RES., FXD, FILM: 6.65K OHM, 1%, 0.125W	75042	CEAT0-6651F
R186	307-0114-00			RES., FXD, COMP: 6.2 OHM, 5%, 0.25W	01121	CB62G5
R187	315-0151-00			RES., FXD, COMP: 150 OHM, 5%, 0.25W	01121	CB1515
R188	321-0816-07			RES., FXD, FILM: 5K OHM, 0.1%, 0.125W	75042	CEAT0-5001B
R211	321-0171-00			RES., FXD, FILM: 590 OHM, 1%, 0.125W	75042	CEAT0-5900F
R213	321-0231-00			RES., FXD, FILM: 2.49K OHM, 1%, 0.125W	75042	CEAT0-2491F
R215	315-0512-00			RES., FXD, COMP: 5.1K OHM, 5%, 0.25W	01121	CB5125
R216	321-0319-00			RES., FXD, FILM: 20.5K OHM, 1%, 0.125W	75042	CEAT0-2052F
R217	311-1268-00			RES., VAR, NONWIR: 10K OHM, 10%, 0.50W	73138	62PT-351-0
R225	311-1258-00			RES., VAR, NONWIR: 50 OHM, 10%, 0.50W	73138	62PT-342-0
R230	321-0251-00			RES., FXD, FILM: 4.02K OHM, 1%, 0.125W	75042	CEAT0-4021F
R231	321-0240-00			RES., FXD, FILM: 3.09K OHM, 1%, 0.125W	75042	CEAT0-3091F
R323	321-0251-00			RES., FXD, FILM: 4.02K OHM, 1%, 0.125W	75042	CEAT0-4021F
R234	307-0106-00			RES., FXD, COMP: 4.7 OHM, 5%, 0.25W	01121	CB47G5
R243	315-0101-00			RES., FXD, COMP: 100 OHM, 5%, 0.25W	01121	CB1015
R244	307-0106-00			RES., FXD, COMP: 4.7 OHM, 5%, 0.25W	01121	CB47G5
R245	307-0106-00			RES., FXD, COMP: 4.7 OHM, 5%, 0.25W	01121	CB47G5
R248	307-0106-00			RES., FXD, COMP: 4.7 OHM, 5%, 0.25W	01121	CB47G5
R251	315-0202-00			RES., FXD, COMP: 2K OHM, 5%, 0.25W	01121	CB2025
R253	315-0511-00			RES., FXD, COMP: 510 OHM, 5%, 0.25W	01121	CB5115
R254	315-0512-00			RES., FXD, COMP: 5.1K OHM, 5%, 0.25W	01121	CB5125
R255	311-1232-00			RES., VAR, NONWIR: 50K OHM, 20%, 0.50W	80294	3389F-P31-503
R256	315-0152-00			RES., FXD, COMP: 1.5K OHM, 5%, 0.25W	01121	CB1525
R257	315-0202-00			RES., FXD, COMP: 2K OHM, 5%, 0.25W	01121	CB2025
R258	315-0912-00			RES., FXD, COMP: 9.1K OHM, 5%, 0.25W	01121	CB9125
R260	315-0100-00			RES., FXD, COMP: 10 OHM, 5%, 0.25W	01121	CB1005
R261	315-0202-00			RES., FXD, COMP: 2K OHM, 5%, 0.25W	01121	CB2025
R264	315-0511-00			RES., FXD, COMP: 510 OHM, 5%, 0.25W	01121	CB5115
R265	315-0512-00			RES., FXD, COMP: 5.1K OHM, 5%, 0.25W	01121	CB5125
R266	311-1232-00			RES., VAR, NONWIR: 50K OHM, 20%, 0.50W	80294	3389F-P31-503
R272	315-0152-00			RES., FXD, COMP: 1.5K OHM, 5%, 0.25W	01121	CB1525
R273	315-0202-00			RES., FXD, COMP: 2K OHM, 5%, 0.25W	01121	CB2025
R277	315-0912-00			RES., FXD, COMP: 9.1K OHM, 5%, 0.25W	01121	CB9125
R279	315-0100-00			RES., FXD, COMP: 10 OHM, 5%, 0.25W	01121	CB1005
R281	315-0222-00			RES., FXD, COMP: 2.2K OHM, 5%, 0.25W	01121	CB2225
R282	321-0289-07			RES., FXD, FILM: 10K OHM, 0.1%, 0.125W	75042	CEAT0-1002B
R283	315-0562-00			RES., FXD, COMP: 5.6K OHM, 5%, 0.25W	01121	CB5625
R284	307-0108-00			RES., FXD, COMP: 6.8 OHM, 5%, 0.25W	80009	307-0108-00
R297	315-0270-00			RES., FXD, COMP: 27 OHM, 5%, 0.25W	01121	CB2705
S1						
S2	260-1621-00			SWITCH, PUSH: MODE	71590	16520-001
S3						
S4	260-1208-00			SWITCH, PUSH: DPDT	71590	2KAB010000-359
S101						
S102						
S103	260-1621-00			SWITCH, PUSH: MODE	71590	16520-001
S201						
S202						
S203						
U151	156-0129-00			MICROCIRCUIT, DI: QUAD 2-INPUT GATE	01295	SN7408N
U155	156-0129-00			MICROCIRCUIT, DI: QUAD 2-INPUT GATE	01295	SN7408N
U181	156-0071-00			MICROCIRCUIT, LI: VOLTAGE REGULATOR	07263	U6E7723393
U225	156-0092-00			MICROCIRCUIT, DI: HEX. INVERTER	01295	SN7405N
U226	156-0117-00			MICROCIRCUIT, DI: 4-BIT BINARY COUNTER, TTL	01295	SN7416LN
U281	156-0071-00			MICROCIRCUIT, LI: BOLTAGE REGULATOR	07263	U6E7723393
VR143	152-0149-00			SEMICOND DEVICE: ZENER, 0.4W, 10V, 5%	04713	1N961B

Electrical Parts List—067-0690-00

Ckt No.	Tektronix Part No.	Serial/Model No.	Mfr Code	Mfr Part Number
		Eff	Code	
		Dscont		
A3	670-3067-00		80009	670-3067-00
C12	283-0177-00	CAP., FXD, CER DI: 1UF, +80-20%, 25V	72982	8131N039651105Z
C29	285-0835-00	CAP., FXD, PLSTC: 0.22UF, 2%, 100V	84411	TEK35-224-9-1
C68	281-0629-00	CAP., FXD, CER DI: 33PF, 5%, 600V	72982	308-000COG0330G
C95	290-0529-00	CAP., FXD, ELCTLT: 47UF, 20%, 20V	56289	196D476X0020LA3
C96	290-0529-00	CAP., FXD, ELCTLT: 47UF, 20%, 20V	56289	196D476X0020LA3
C104	283-0000-00	CAP., FXD, CER DI: 0.001UF, +100-0%, 500V	72982	831-516E102P
C105	281-0523-00	CAP., FXD, CER DI: 100PF, +/-20PF, 350V	72982	301-000U2M0101M
C109	285-0835-00	CAP., FXD, PLSTC: 0.22UF, 2%, 100V	84411	TEK35-224-9-1
C112	281-0523-00	CAP., FXD, CER DI: 100PF, +/-20PF, 350V	72982	301-000U2M0101M
C119	290-0535-00	CAP., FXD, ELCTLT: 33UF, 20%, 10V	56289	196D336X0010KAL
C151	290-0529-00	CAP., FXD, ELCTLT: 47UF, 20%, 20V	56289	196D476X0020LA3
C195	290-0529-00	CAP., FXD, ELCTLT: 47UF, 20%, 20V	56289	196D476X0020LA3
C209	290-0529-00	CAP., FXD, ELCTLT: 47UF, 20%, 20V	56289	196D476X0020LA3
C213	285-0835-00	CAP., FXD, PLSTC: 0.22UF, 2%, 100V	84411	TEK35-224-9-1
C221	283-0000-00	CAP., FXD, CER DI: 0.001UF, +100-0%, 500V	72982	831-516E102P
C228	290-0529-00	CAP., FXD, ELCTLT: 47UF, 20%, 20V	56289	196D476X0020LA3
C291	290-0529-00	CAP., FXD, ELCTLT: 47UF, 20%, 20V	56289	196D476X0020LA3
CR4	152-0141-02	SEMICOND DEVICE: SILICON, 30V, 150MA	07910	CD8220
CR5	152-0141-02	SEMICOND DEVICE: SILICON, 30V, 150MA	07910	CD8220
CR13	152-0141-02	SEMICOND DEVICE: SILICON, 30V, 150MA	07910	CD8220
CR21	152-0141-02	SEMICOND DEVICE: SILICON, 30V, 150MA	07910	CD8220
CR75	152-0141-02	SEMICOND DEVICE: SILICON, 30V, 150MA	07910	CD8220
CR104	152-0141-02	SEMICOND DEVICE: SILICON, 30V, 150MA	07910	CD8220
CR105	152-0141-02	SEMICOND DEVICE: SILICON, 30V, 150MA	07910	CD8220
CR106	152-0141-02	SEMICOND DEVICE: SILICON, 30V, 150MA	07910	CD8220
CR107	152-0141-02	SEMICOND DEVICE: SILICON, 30V, 150MA	07910	CD8220
CR108	152-0141-02	SEMICOND DEVICE: SILICON, 30V, 150MA	07910	CD8220
CR115	152-0141-02	SEMICOND DEVICE: SILICON, 30V, 150MA	07910	CD8220
CR117	152-0141-02	SEMICOND DEVICE: SILICON, 30V, 150MA	07910	CD8220
CR163	152-0141-02	SEMICOND DEVICE: SILICON, 30V, 150MA	07910	CD8220
CR165	152-0141-02	SEMICOND DEVICE: SILICON, 30V, 150MA	07910	CD8220
CR167	152-0141-02	SEMICOND DEVICE: SILICON, 30V, 150MA	07910	CD8220
CR176	152-0141-02	SEMICOND DEVICE: SILICON, 30V, 150MA	07910	CD8220
CR177	152-0141-02	SEMICOND DEVICE: SILICON, 30V, 150MA	07910	CD8220
CR218	152-0141-02	SEMICOND DEVICE: SILICON, 30V, 150MA	07910	CD8220
CR224	152-0141-02	SEMICOND DEVICE: SILICON, 30V, 150MA	07910	CD8220
CR260	152-0141-02	SEMICOND DEVICE: SILICON, 30V, 150MA	07910	CD8220
Q10	151-0188-00	TRANSISTOR: SILICON, PNP	04713	2N3906
Q85	151-0220-00	TRANSISTOR: SILICON, PNP	80009	151-0220-00
Q86	151-0220-00	TRANSISTOR: SILICON, PNP	80009	151-0220-00
Q105	151-0190-02	TRANSISTOR: SILICON, NPN	04713	2N3904
Q116	151-0190-02	TRANSISTOR: SILICON, NPN	04713	2N3904
Q119	151-0190-02	TRANSISTOR: SILICON, NPN	04713	2N3904
Q125	151-0188-00	TRANSISTOR: SILICON, PNP	04713	2N3906
Q126	151-0207-00	TRANSISTOR: SILICON, NPN	03508	GET3415
Q127	151-0190-02	TRANSISTOR: SILICON, NPN	04713	2N3904
Q219	151-0188-00	TRANSISTOR: SILICON, PNP	04713	2N3906
Q227	151-0190-02	TRANSISTOR: SILICON, NPN	04713	2N3904
Q259	151-0220-00	TRANSISTOR: SILICON, PNP	80009	151-0220-00
Q261	151-0223-00	TRANSISTOR: SILICON, NPN	07263	S24848
Q265	151-0223-00	TRANSISTOR: SILICON, NPN	07263	S24848
Q275	151-0190-02	TRANSISTOR: SILICON, NPN	04713	2N3904

Ckt No.	Tektronix Part No.	Serial/Model No.	Mfr Code	Mfr Part Number
		Eff	Code	
		Dscont		
Q285	151-0301-00	TRANSISTOR:SILICON,PNP	04713	2N2907A
Q291	151-0190-02	TRANSISTOR:SILICON,NPN	04713	2N3904
R5	315-0302-00	RES.,FWD,COMP:3K OHM,5%,0.25W	01121	CB3025
R6	315-0302-00	RES.,FWD,COMP:3K OHM,5%,0.25W	01121	CB3025
R9	315-0101-00	RES.,FWD,COMP:100 OHM,5%,0.25W	01121	CB1015
R14	315-0102-00	RES.,FWD,COMP:1K OHM,5%,0.25W	01121	CB1025
R17	315-0153-00	RES.,FWD,COMP:15K OHM,5%,0.25W	01121	CB1535
R18	315-0182-00	RES.,FWD,COMP:1.8K OHM,5%,0.25W	01121	CB1825
R19	315-0152-00	RES.,FWD,COMP:1.5K OHM,5%,0.25W	01121	CB1525
R31	321-0275-00	RES.,FWD,FILM:7.15K OHM,1%,0.125W	75042	CEATO-7151F
R66	315-0100-00	RES.,FWD,COMP:10 OHM,5%,0.25W	01121	CB1005
R67	321-0085-00	RES.,FWD,FILM:75 OHM,1%,0.125W	75042	CEATO-75R00F
R69	315-0471-00	RES.,FWD,COMP:470 OHM,5%,0.25W	01121	CB4715
R76	315-0512-00	RES.,FWD,COMP:5.1K OHM,5%,0.25W	01121	CB5125
R77	321-0258-00	RES.,FWD,FILM:4.75K OHM,1%,0.125W	75042	CEATO-4751F
R78	321-0275-00	RES.,FWD,FILM:7.15K OHM,1%,0.125W	75042	CEATO-7151F
R79	315-0100-00	RES.,FWD,COMP:10 OHM,5%,0.25W	01121	CB1005
R82	315-0472-00	RES.,FWD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R83	321-0278-09	RES.,FWD,FILM:7.68K OHM,1%,0.125W	91637	MFF1816C76800F
R106	315-0302-00	RES.,FWD,COMP:3K OHM,5%,0.25W	01121	CB3025
R109	321-0277-00	RES.,FWD,FILM:7.5K OHM,1%,0.125W	75042	CEATO-7501F
R113	315-0101-00	RES.,FWD,COMP:100 OHM,5%,0.25W	01121	CB1015
R114	315-0152-00	RES.,FWD,COMP:1.5K OHM,5%,0.25W	01121	CB1525
R151	315-0512-00	RES.,FWD,COMP:5.1K OHM,5%,0.25W	01121	CB5125
R160	315-0182-00	RES.,FWD,COMP:1.8K OHM,5%,0.25W	01121	CB1825
R167	315-0182-00	RES.,FWD,COMP:1.8K OHM,5%,0.25W	01121	CB1825
R178	315-0103-00	RES.,FWD,COMP:10K OHM,5%,0.25W	01121	CB1035
R180	315-0103-00	RES.,FWD,COMP:10K OHM,5%,0.25W	01121	CB1035
R183	321-0334-00	RES.,FWD,FILM:29.4K OHM,1%,0.125W	75042	CEATO-2942F
R185	321-0281-00	RES.,FWD,FILM:8.25K OHM,1%,0.125W	75042	CEATO-8251F
R186	321-0059-00	RES.,FWD,FILM:40.2 OHM,1%,0.125W	75042	CEATO-40R20F
R187	321-0222-00	RES.,FWD,FILM:2K OHM,1%,0.125W	75042	CEATO-2001F
R189	321-0085-00	RES.,FWD,FILM:75 OHM,1%,0.125W	75042	CEATO-75R00F
R191	321-0114-00	RES.,FWD,FILM:150 OHM,1%,0.125W	75042	CEATO-1500F
R195	321-0096-00	RES.,FWD,FILM:97.6 OHM,1%,0.125W	75042	CEATO-97R60F
R202	321-0220-00	RES.,FWD,FILM:1.91K OHM,1%,0.125W	75042	CEATO-1911F
R205	321-0242-00	RES.,FWD,FILM:3.24K OHM,1%,0.125W	75042	CEATO-3241F
R212	307-0106-00	RES.,FWD,COMP:4.7 OHM,5%,0.25W	01121	CB47G5
R214	315-0302-00	RES.,FWD,COMP:3K OHM,5%,0.25W	01121	CB3025
R217	315-0102-00	RES.,FWD,COMP:1K OHM,5%,0.25W	01121	CB1025
R218	315-0302-00	RES.,FWD,COMP:3K OHM,5%,0.25W	01121	CB3025
R221	315-0332-00	RES.,FWD,COMP:3.3K OHM,5%,0.25W	01121	CB3325
R223	315-0302-00	RES.,FWD,COMP:3K OHM,5%,0.25W	01121	CB3025
R225	315-0153-00	RES.,FWD,COMP:15K OHM,5%,0.25W	01121	CB1535
R227	315-0102-00	RES.,FWD,COMP:1K OHM,5%,0.25W	01121	CB1025
R229	307-0106-00	RES.,FWD,COMP:4.7 OHM,5%,0.25W	01121	CB47G5
R258	315-0151-00	RES.,FWD,COMP:150 OHM,5%,0.25W	01121	CB1515
R259	315-0152-00	RES.,FWD,COMP:1.5K OHM,5%,0.25W	01121	CB1525
R261	315-0391-00	RES.,FWD,COMP:390 OHM,5%,0.25W	01121	CB3915
R263	321-0059-00	RES.,FWD,FILM:40.2 OHM,1%,0.125W	75042	CEATO-40R20F
R264	321-0059-00	RES.,FWD,FILM:40.2 OHM,1%,0.125W	75042	CEATO-40R20F
R265	321-0225-00	RES.,FWD,FILM:2.15K OHM,1%,0.125W	75042	CEATO-2151F
R267	321-0236-00	RES.,FWD,FILM:2.8K OHM,1%,0.125W	75042	CEATO-2801F
R269	321-0126-00	RES.,FWD,FILM:200 OHM,1%,0.125W	75042	CEATO-2000F
R271	321-0105-00	RES.,FWD,FILM:121 OHM,1%,0.125W	75042	CEATO-1210F
R273	321-0231-00	RES.,FWD,FILM:2.49K OHM,1%,0.125W	75042	CEATO-2491F
R275	321-0181-00	RES.,FWD,FILM:750 OHM,1%,0.125W	75042	CEATO-7500F
R278	321-0181-00	RES.,FWD,FILM:750 OHM,1%,0.125W	75042	CEATO-7500F
R279	321-0235-00	RES.,FWD,FILM:2.74K OHM,1%,0.125W	75042	CEATO-2741F

Electrical Parts List—067-0690-00

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R280	311-1224-00			RES.,VAR,NONWIR:500 OHM,20%,0.50W	80294	3389F-P31-501
R281	315-0510-00			RES.,FXD,COMP:51 OHM,5%,0.25W	01121	CB5105
R283	323-0181-00			RES.,FXD,FILM:750 OHM,1%,0.50W	75042	CECT0-7500F
R285	321-0106-00			RES.,FXD,FILM:124 OHM,1%,0.125W	75042	CEATO-1240F
R287	321-0119-00			RES.,FXD,FILM:169 OHM,1%,0.125W	75042	CEATO-1690F
R289	321-0131-00			RES.,FXD,FILM:226 OHM,1%,0.125W	75042	CEATO-2260F
S295	260-1208-00			SWITCH,PUSH:DPDT	71590	2KAB010000-359
U25	156-0072-00			MICROCIRCUIT,DI:MONOSTABLE MV,TTL	12040	DM71421N
U35	156-0047-00			MICROCIRCUIT,DI:3-INPUT NAND GATE	01295	SN7410N
U135	156-0078-00			MICROCIRCUIT,DI:4 TO 16 LINE DECODER	01295	SN74154N
U145	156-0175-00			MICROCIRCUIT,DI:SYNC,4-BIT,UP/DOWN COUNTER	01295	SN74191N
U235	156-0047-00			MICROCIRCUIT,DI:3-INPUT NAND GATE	01295	SN7410N
U245	156-0041-00			MICROCIRCUIT,DI:DUAL D-TYPE FLIP-FLOP	27014	DM7474N

CHASSIS PARTS

DS1030	150-0048-00	LAMP , INCAND:5V, 60MA	08806	683
J1020	131-0955-00	CONNECTOR,RCPT,:BNC,FEMALE	24931	28JR200-1
J1022	131-0955-00	CONNECTOR,RCPT,:BNC,FEMALE	24931	28JR200-1
J1030	131-0955-00	CONNECTOR,RCPT,:BNC,FEMALE	24931	28JR200-1
J1032	131-0955-00	CONNECTOR,RCPT,:BNC,FEMALE	24931	28JR200-1
J1034	131-0955-00	CONNECTOR,RCPT,:BNC,FEMALE	24931	28JR200-1
J1038	131-0955-00	CONNECTOR,RCPT,:BNC,FEMALE	24931	28JR200-1

Section 5

DIAGRAMS

Symbols and Reference Designators

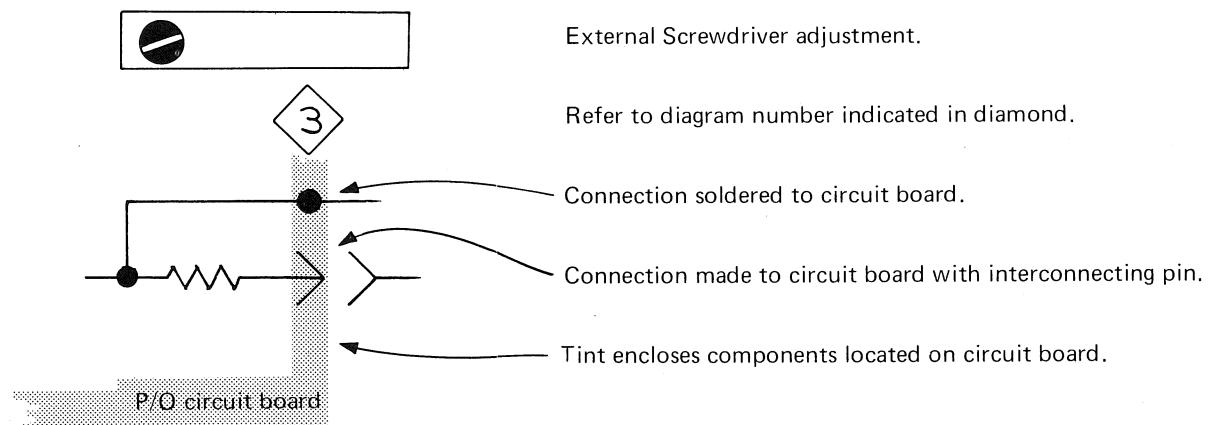
Electrical components shown on the diagrams are in the following units unless noted otherwise:

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

Symbols used on the diagrams are based on USA Standard Y32.2-1967.

Logic symbology is based on MIL-STD-806B in terms of positive logic. Logic symbols depict the logic function performed and may differ from the manufacturer's data.

The following special symbols are used on the diagrams:



The following prefix letters are used as reference designators to identify components or assemblies on the diagrams.

A	Assembly, separable or repairable (circuit board, etc.)	LR	Inductor/resistor combination
AT	Attenuator, fixed or variable	M	Meter
B	Motor	Q	Transistor or silicon-controlled rectifier
BT	Battery	P	Connector, movable portion
C	Capacitor, fixed or variable	R	Resistor, fixed or variable
CR	Diode, signal or rectifier	RT	Thermistor
DL	Delay line	S	Switch
DS	Indicating device (lamp)	T	Transformer
F	Fuse	TP	Test point
FL	Filter	U	Assembly, inseparable or non-repairable (integrated circuit, etc.)
H	Heat dissipating device (heat sink, heat radiator, etc.)	V	Electron tube
HR	Heater	VR	Voltage regulator (zener diode, etc.)
J	Connector, stationary portion	Y	Crystal
K	Relay		
L	Inductor, fixed or variable		

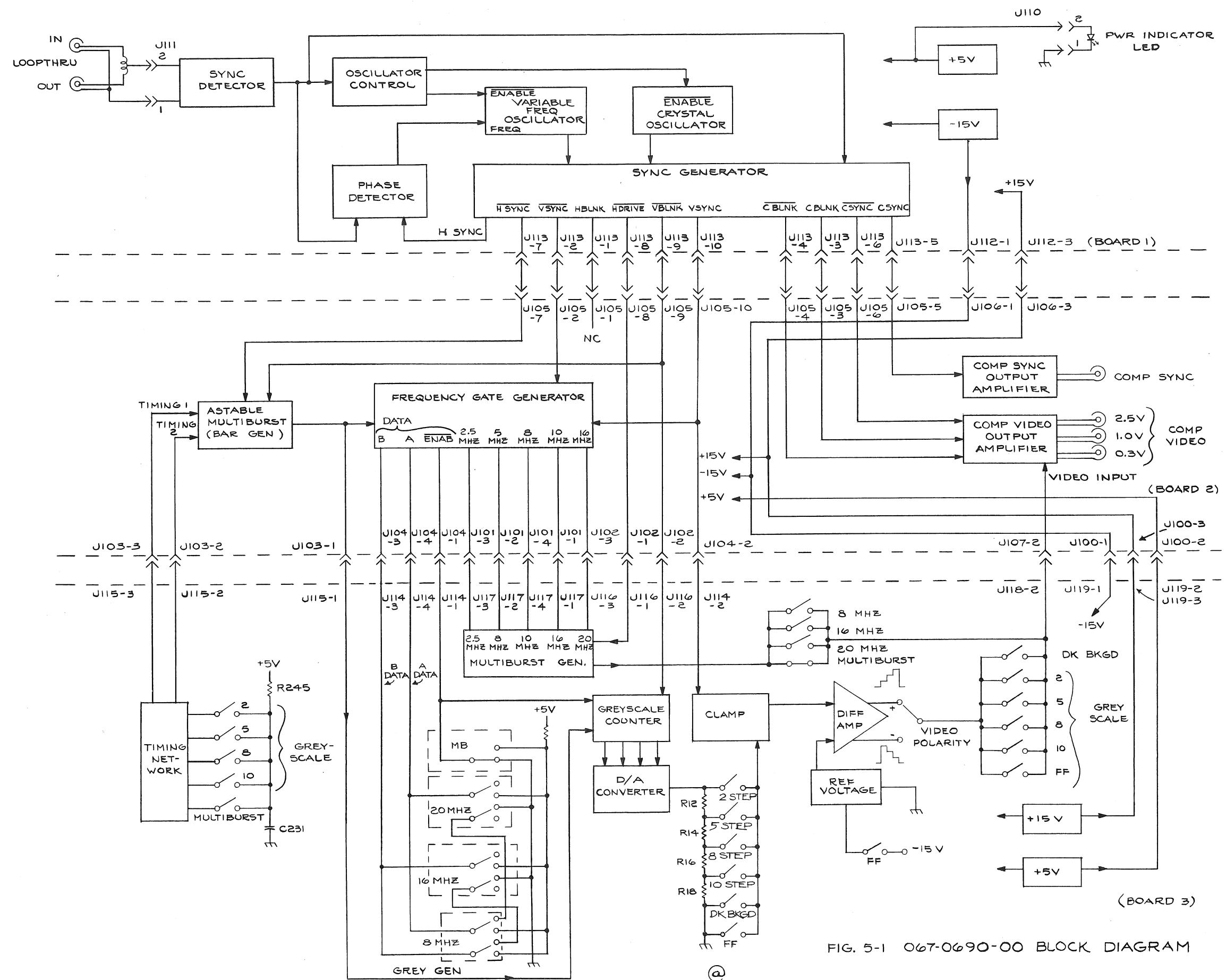


FIG. 5-1 067-0690-00 BLOCK DIAGRAM

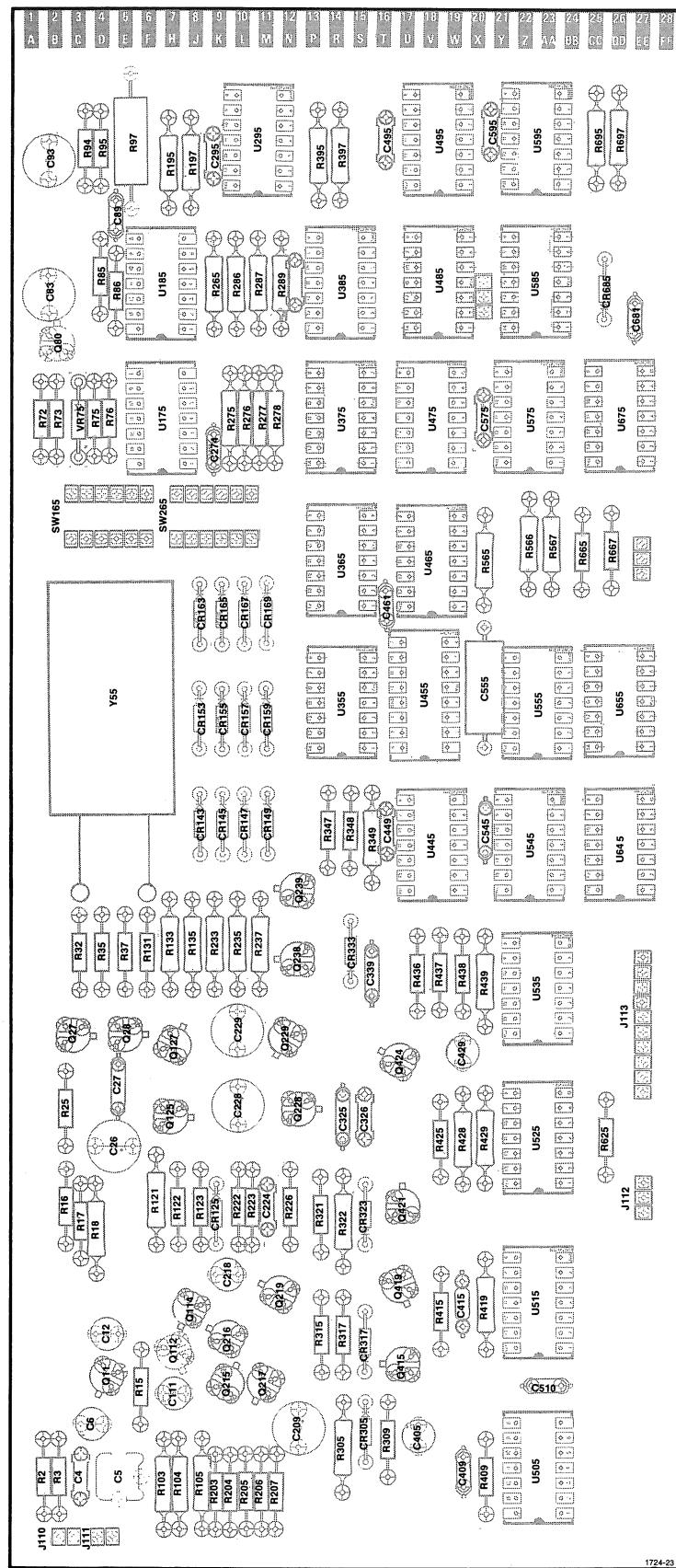
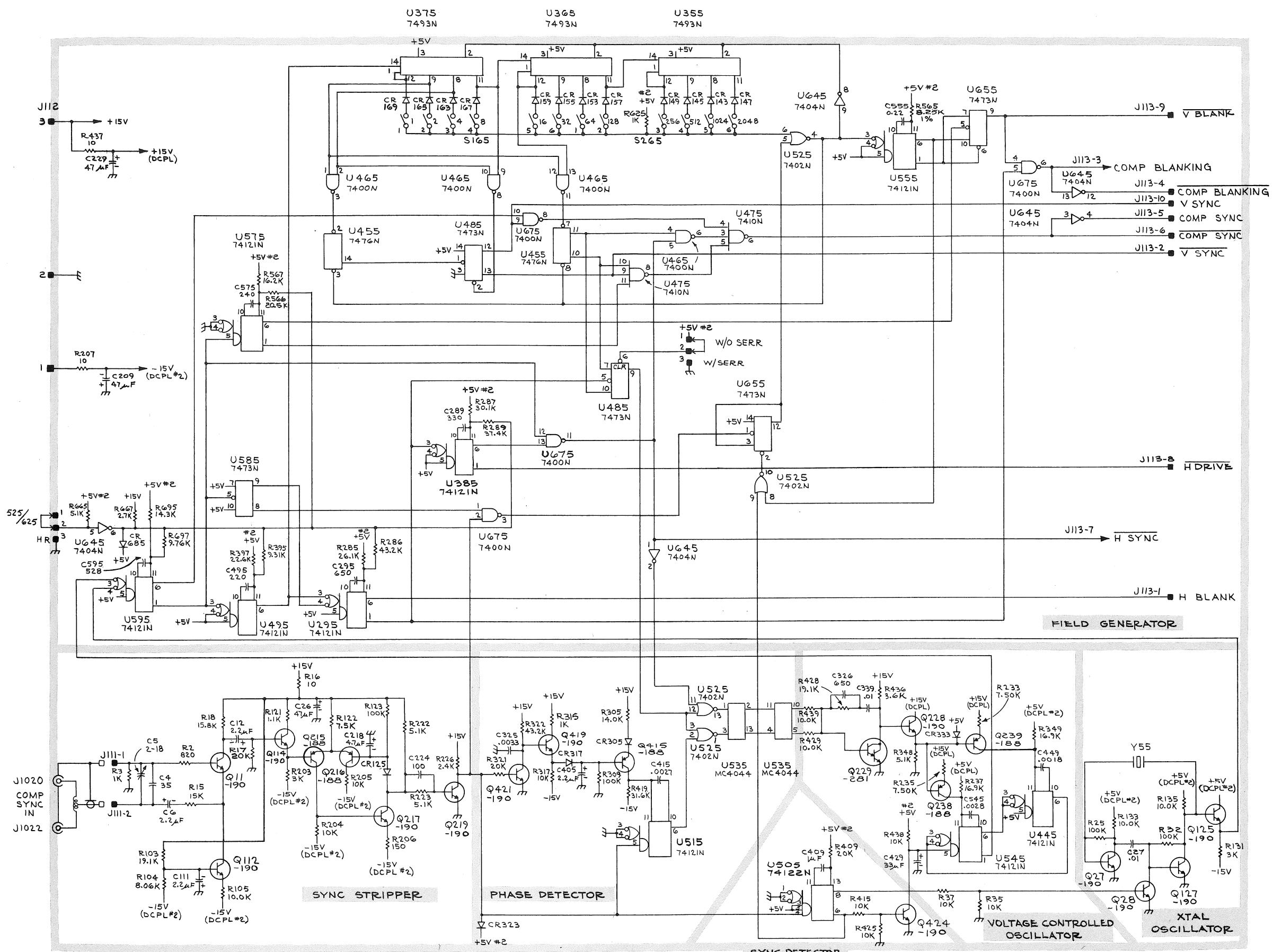


Fig. 5-2. Sync Generator board showing components.



067-0690-00

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FIG. 5-3

SYNC GENERATOR
670-3257-00 (AI)

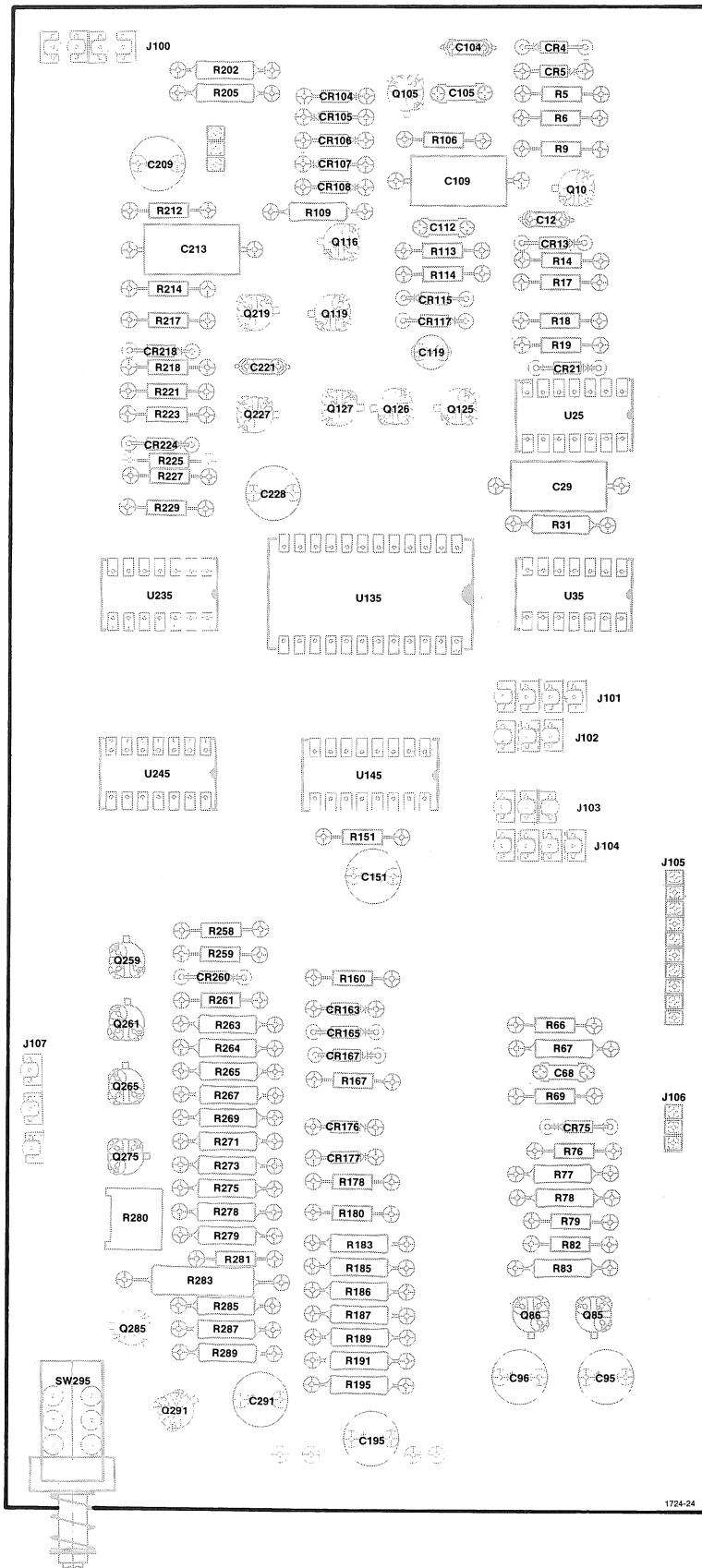


Fig. 5-4. Oscillator and Gray Scale board showing components.

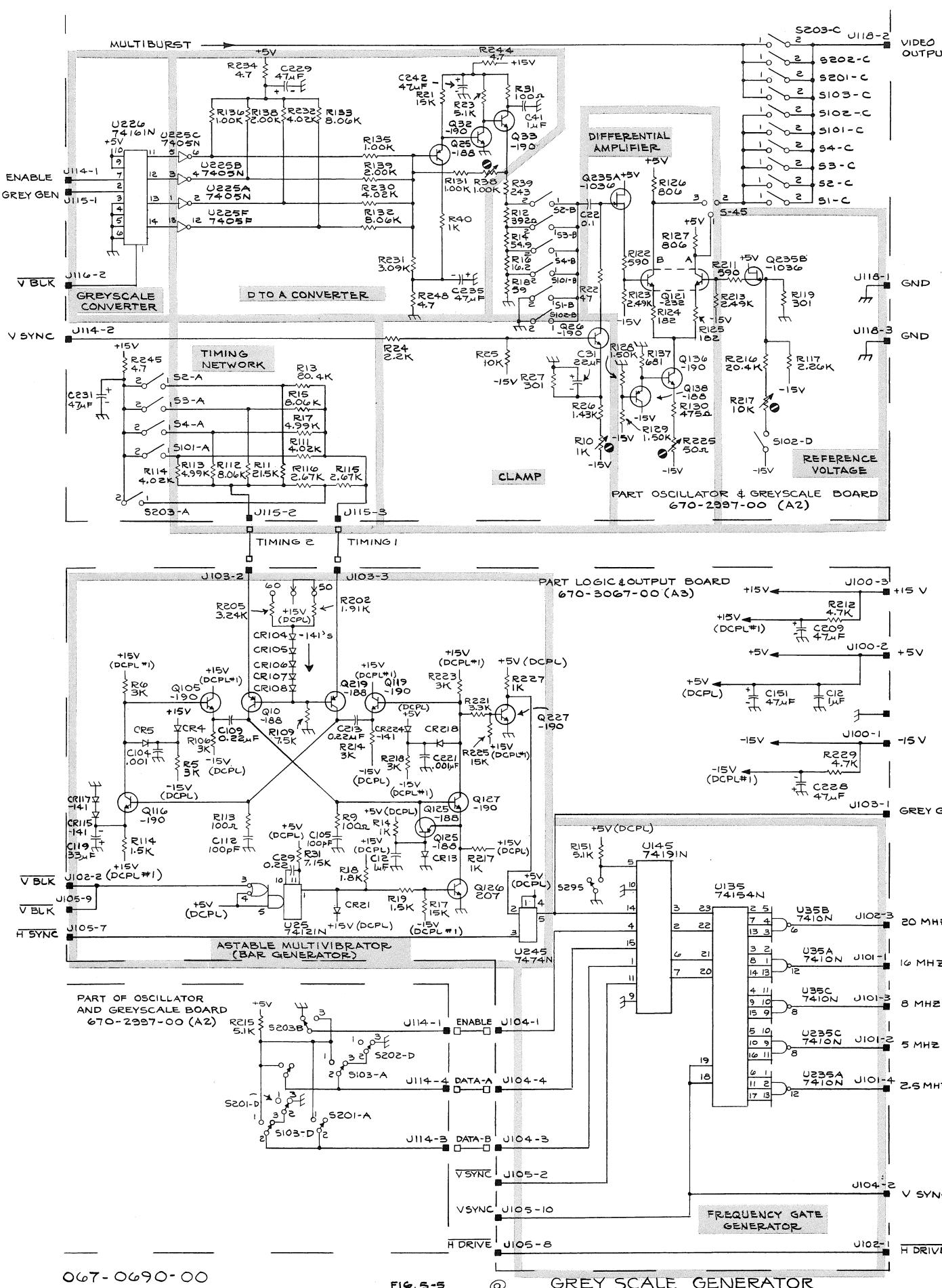
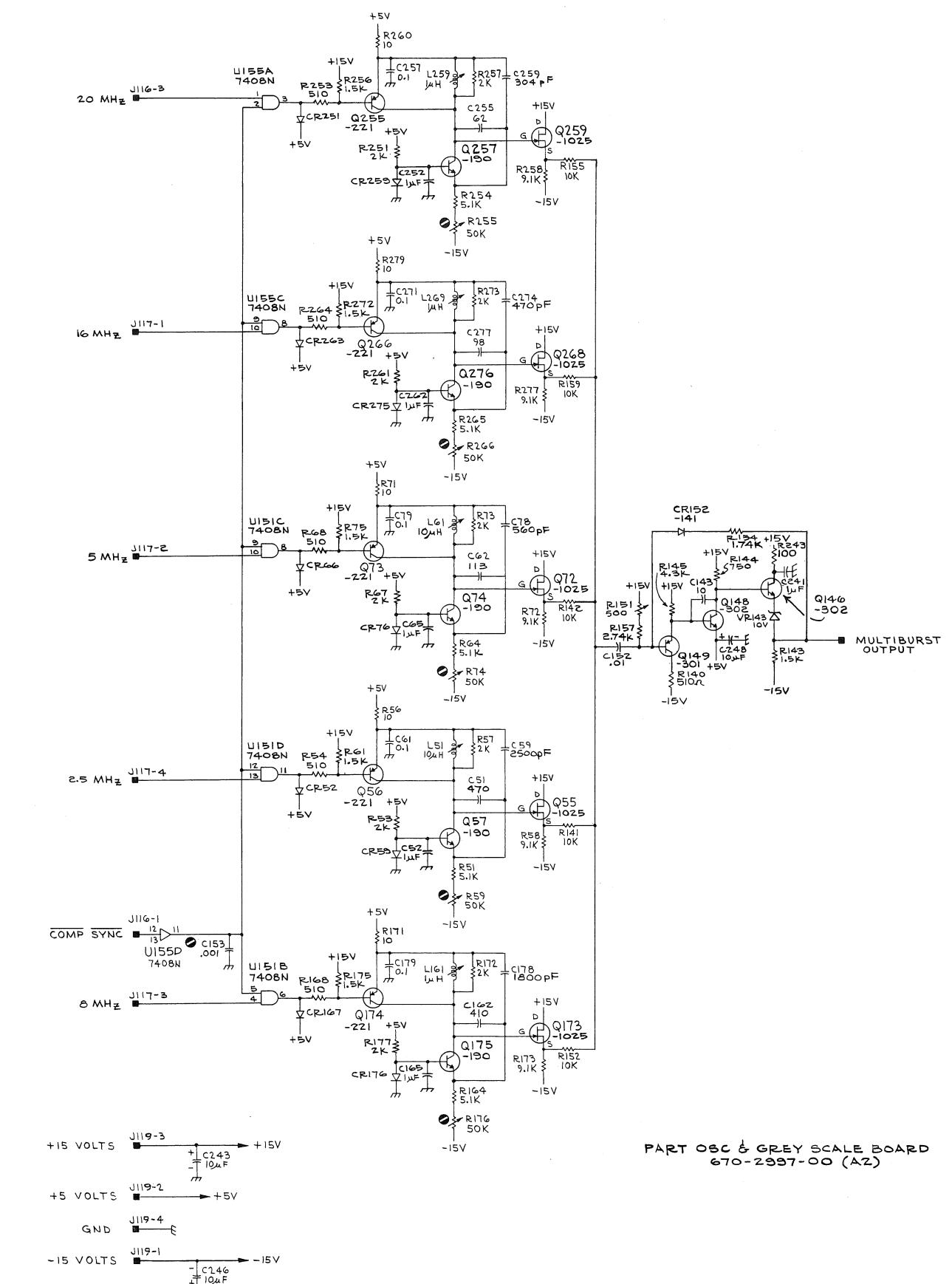


FIG. 5-5 @ GREY SCALE GENERATOR



PART OSC & GREY SCALE BOARD
670-2007-02 (A2)

067-0690-00

067-0690-

MULTIBURST GENERATOR

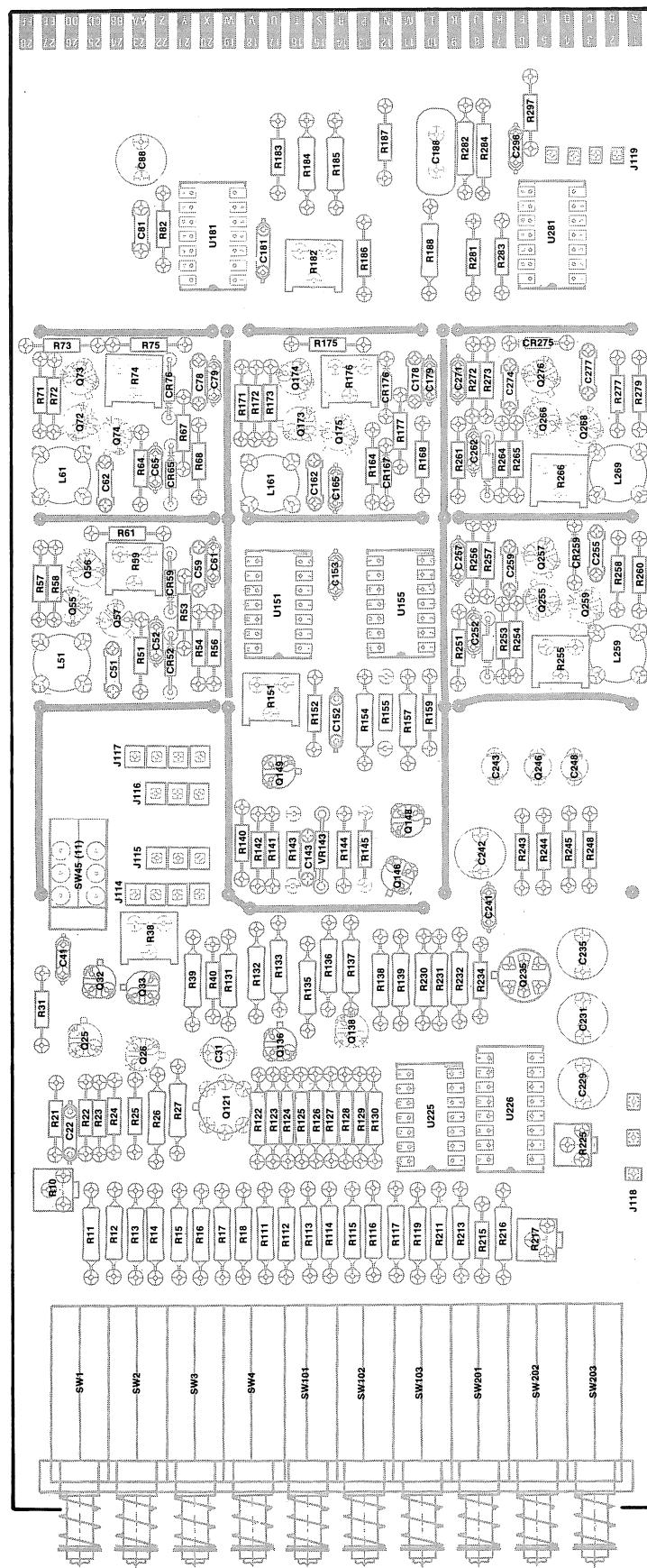
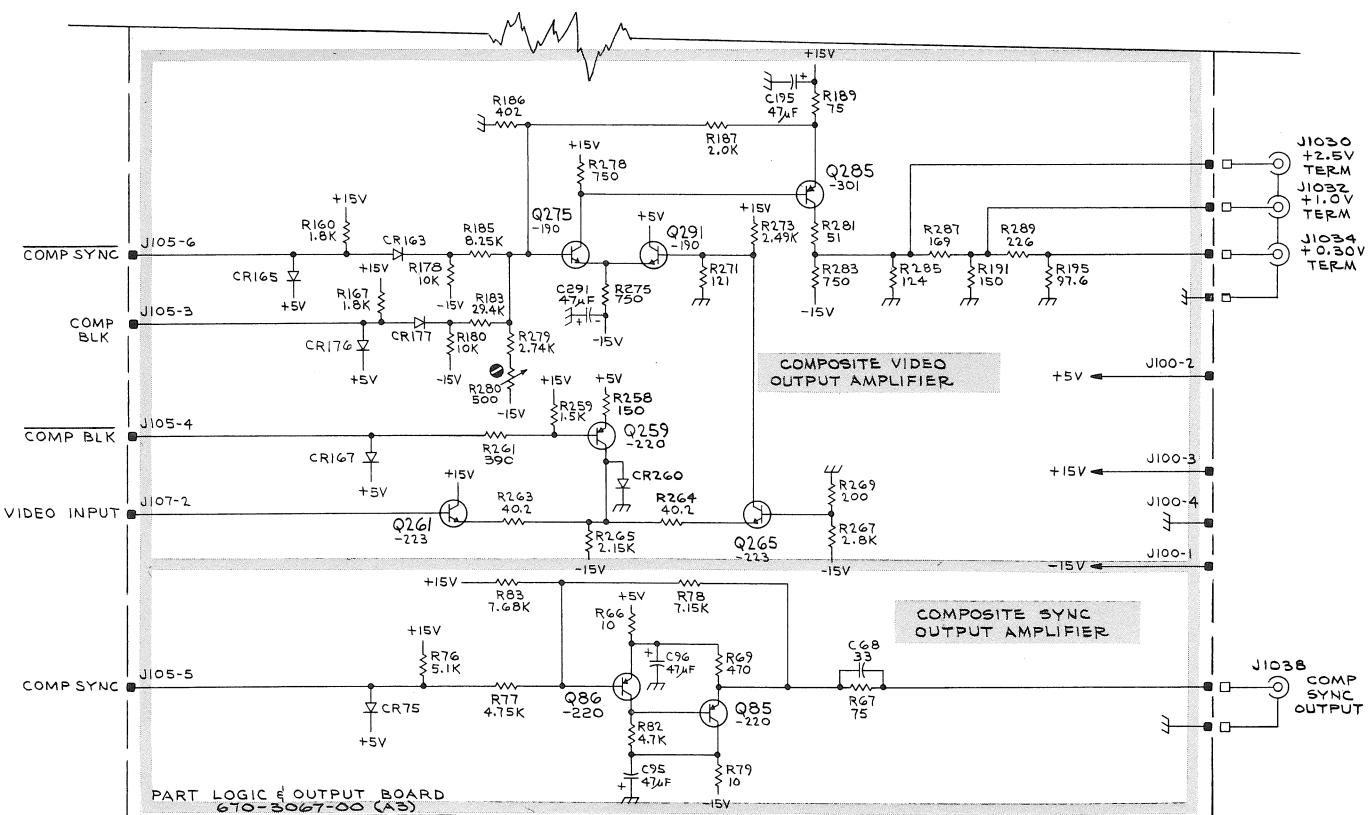
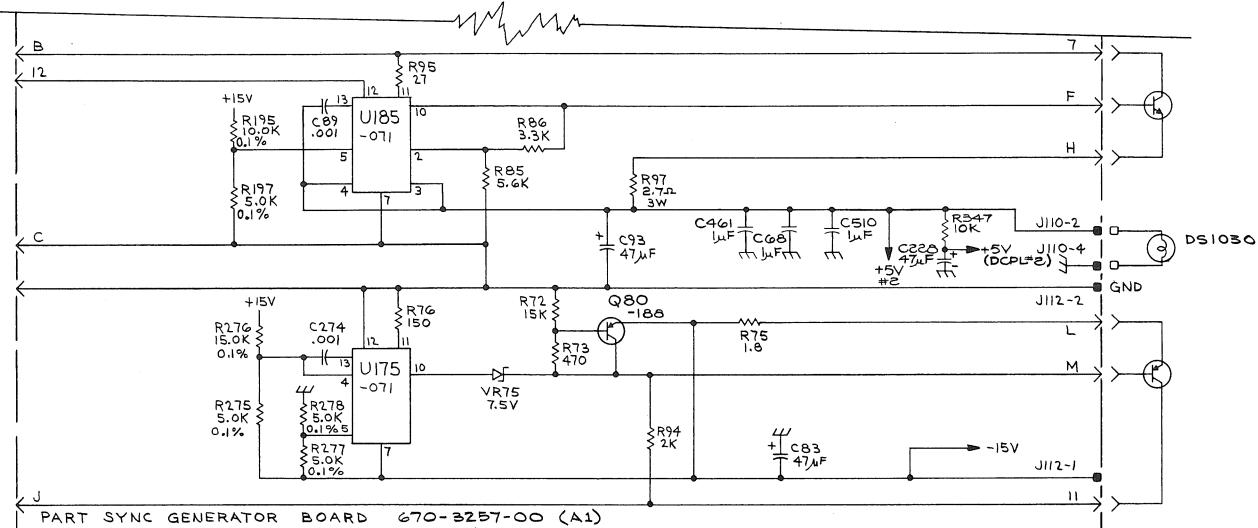
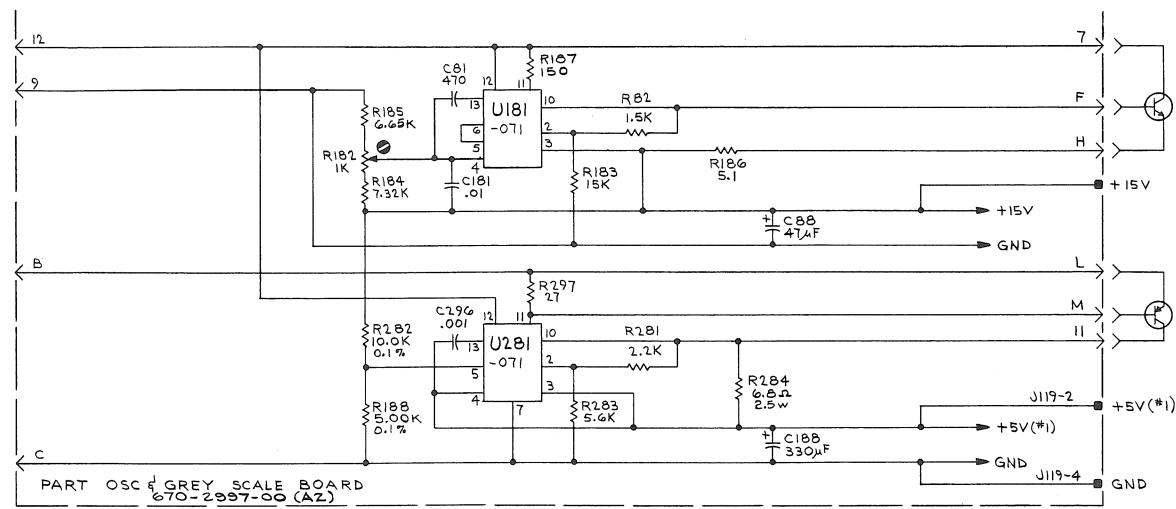


Fig. 5-7. Logic and Output board showing components.



067-0690-00

FIG. 5-8 POWER SUPPLIES AND COMP VIDEO AND SYNC OUTPUT @

MECHANICAL REPLACEABLE PARTS LIST

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 developed in our engineering department. It is therefore important, when ordering parts, to include the following information in your order: Part number, instrument type or number, serial number, and 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.

SPECIAL NOTES AND SYMBOLS

X000 Part first added at this serial number

00X Part removed after this serial number

FIGURE AND INDEX NUMBERS

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

INDENTATION SYSTEM

This mechanical parts list is indented to indicate item relationships. Following is an example of the indentation system used in the description column.

1 2 3 4 5	<i>Name & Description</i>
	<i>Assembly and/or Component</i>
	<i>Attaching parts for Assembly and/or Component</i>

	<i>Detail Part of Assembly and/or Component</i>
	<i>Attaching parts for Detail Part</i>

	<i>Parts of Detail Part</i>
	<i>Attaching parts for Parts of Detail Part</i>

Attaching 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. The separation symbol --- * --- indicates the end of attaching parts.

Attaching parts must be purchased separately, unless otherwise specified.

ITEM NAME

In the Parts List, an Item Name is separated from the description by a colon (:). Because of space limitations, an Item Name may sometimes appear as incomplete. For further Item Name identification, the U.S. Federal Cataloging Handbook H6-1 can be utilized where possible.

ABBREVIATIONS

"	INCH	FLH	FLAT HEAD	PWR	POWER
#	NUMBER SIZE	FLTR	FILTER	RCPT	RECEPTACLE
ACTR	ACTUATOR	FR	FRAME or FRONT	RES	RESISTOR
ADPTR	ADAPTER	FSTNR	FASTENER	RDG	RIGID
ALIGN	ALIGNMENT	FT	FOOT	RLF	RELIEF
AL	ALUMINUM	FXD	FIXED	RTNR	RETAINER
ASSEM	ASSEMBLED	GSKT	GASKET	SCH	SOCKET HEAD
ASSY	ASSEMBLY	HDL	HANDLE	SCOPE	OSCILLOSCOPE
ATTEN	ATTENUATOR	HEX	HEXAGON	SCR	SCREW
AWG	AMERICAN WIRE GAGE	HEX HD	HEXAGONAL HEAD	SE	SINGLE END
BD	BOARD	HEX SOC	HEXAGONAL SOCKET	SECT	SECTION
BRKT	BRACKET	HLCPs	HELICAL COMPRESSION	SEMICOND	SEMICONDUCTOR
BRS	BRASS	HLEXT	HELICAL EXTENSION	SHLD	SHIELD
BRZ	BRONZE	HV	HIGH VOLTAGE	SHLDR	SHOULDERED
BSHG	BUSHING	IC	INTEGRATED CIRCUIT	SKT	SOCKET
CAB	CABINET	ID	INSIDE DIAMETER	SL	SLIDE
CAP	CAPACITOR	IDENT	IDENTIFICATION	SLFLKG	SELF-LOCKING
CER	CERAMIC	IMPLR	IMPELLER	SLVG	SLEEVING
CHAS	CHASSIS	IN	INCH	SPR	SPRING
CKT	CIRCUIT	INCAND	INCANDESCENT	SQ	SQUARE
COMP	COMPOSITION	INSUL	INSULATOR	SST	STAINLESS STEEL
CONN	CONNECTOR	INTL	INTERNAL	STL	STEEL
COV	COVER	LPHLDR	LAMPHOLDER	SW	SWITCH
CPLG	COUPLING	MACH	MACHINE	T	TUBE
CRT	CATHODE RAY TUBE	MECH	MECHANICAL	TERM	TERMINAL
DEG	DEGREE	MTG	MOUNTING	THD	THREAD
DWR	DRAWER	NIP	NIPPLE	THK	THICK
ELCTRN	ELECTRON	NON WIRE	NOT WIRE WOUND	TNSN	TENSION
ELEC	ELECTRICAL	OBD	ORDER BY DESCRIPTION	TPG	TAPPING
ELCTLT	ELECTROLYTIC	OD	OUTSIDE DIAMETER	TRH	TRUSS HEAD
ELEM	ELEMENT	OVH	oval head	V	VOLTAGE
EPL	ELECTRICAL PARTS LIST	PH BRZ	PHOSPHOR BRONZE	VAR	VARIABLE
EQPT	EQUIPMENT	PL	PLAIN or PLATE	W/	WITH
EXT	EXTERNAL	PLSTC	PLASTIC	WSHR	WASHER
FIL	FILLISTER HEAD	PN	PART NUMBER	XFMR	TRANSFORMER
FLEX	FLEXIBLE	PNH	PAN HEAD	XSTR	TRANSISTOR

CROSS INDEX MFR. CODE NUMBER TO MANUFACTURER

MFR.CODE	MANUFACTURER	ADDRESS	CITY,STATE,ZIP
00779	AMP, Inc.	P. O. Box 3608	Harrisburg, PA 17105
08261	Spectra-Strip Corp.	7100 Lampson Ave.	Garden Grove, CA 92642
22526	Berg Electronics, Inc.	Youk Expressway	New Cumberland, PA 17070
23499	Gavitt Wire and Cable, Division of Amerace Esna Corp.	455 N. Quince St.	Escondido, CA 92025
45722	USM Corp., Parker-Kalon Fastener Div.	1 PeeRay Drive	Clifton, NJ 07014
71590	Centralab Electronics, Div. of Globe-Union, Inc.	5757 N. Green Bay Ave.	Milwaukee, WI 53201
71785	TRW Electronic Components, Cinch Connector Operations	1501 Morse Ave.	Elk Grove Village, IL 60007
73743	Fischer Special Mfg. Co.	446 Morgan St.	Cincinnati, OH 45206
78189	Illinois Tool Works, Inc.	St. Charles Road	Elgin, IL 60126
80009	Shakeproof Division Tektronix, Inc.	P. O. Box 500	Beaverton, OR 97005
83385	Central Screw Co.	2530 Crescent Dr.	Broadview, IL 60153
91506	Augat, Inc.	33 Perry Ave.	Attleboro, MA 02703

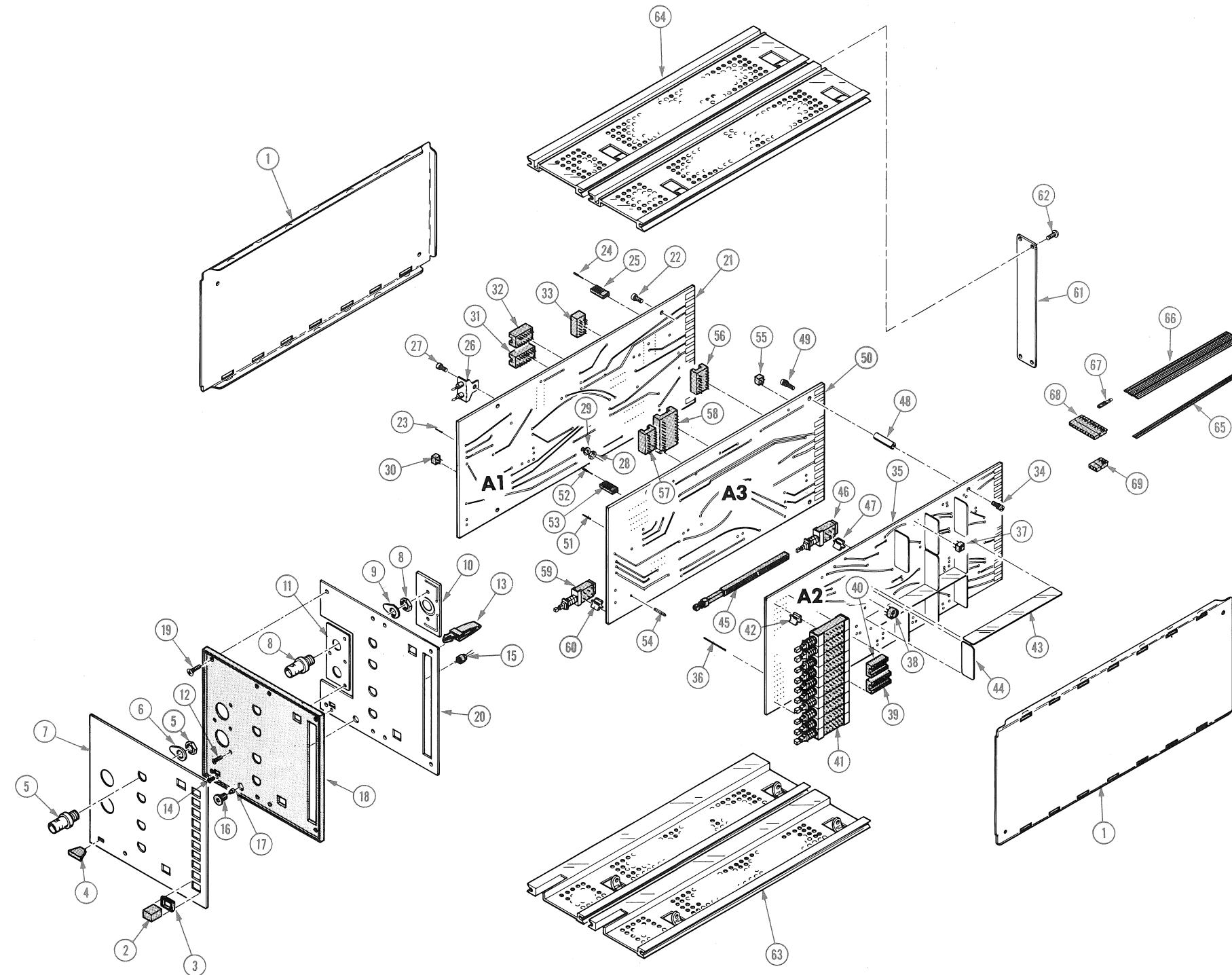
FIGURE 1 EXPLODED

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Qty	Name & Description					Mfr Code	Mfr Part Number
				1	2	3	4	5		
1-1	337-1399-00		2	SHLD,ELECTRICAL:SIDE					80009	337-1399-00
-2	366-1257-00		12	PUSH BUTTON:GRAY PLASTIC					80009	366-1257-00
-3	426-0681-00		12	FR,PUSH BUTTON:GRAY PLASTIC					80009	426-0681-00
-4	366-1422-01		1	KNOB:LATCH					80009	366-1422-01
-5	-----		4	CONNECTOR,RCPT,:(SEE J1030,1032,1034,1038 EPL) (ATTACHING PARTS FOR EACH)						
-6	210-0255-00		1	TERMINAL,LUG:0.391" ID INT TOOTH					80009	210-0255-00
-7	333-1898-00		1	PANEL,FRONT:					80009	333-1898-00
-8	-----		2	CONNECTOR,RCPT,:(SEE J1020,1022 EPL) (ATTACHING PARTS FOR EACH)						
-9	210-0255-00		1	TERMINAL,LUG:0.391" ID INT TOOTH					80009	210-0255-00
-10	388-2307-00		1	PRINTED WIRING BD:					80009	388-2307-00
-11	386-2025-00		1	PLATE,CONN MTG:BNC (ATTACHING PARTS)					80009	386-2025-00
-12	211-0038-00		4	SCREW,MACHINE:4-40 X 0.312"100 DEG,FLH STL					83385	OBD
-13	214-1513-01		1	LCH,PLUG-IN RET: (ATTACHING PARTS)					80009	214-1513-01
-14	213-0254-00		1	SCR,TPG,THD CTG:2-56X0.25"100 DEG,FLH STL					45722	OBD
-15	200-0935-00		1	BASE,LAMPHOLDER:0.29 OD X 0.19" L,BK PLSTC					80009	200-0935-00
-16	352-0157-00		1	LAMPHOLDER:WHITE PLASTIC					80009	352-0157-00
-17	378-0602-00		1	LENS,LIGHT:GREEN					80009	378-0602-00
-18	386-2355-03		1	SUBPANEL,FRONT: (ATTACHING PARTS)					80009	386-2355-03
-19	213-0229-00		8	SCR,TPG,THD FOR:6-20X0.375 100 DEG,FLH STL					83385	OBD
-20	337-2042-00		1	SHIELD,ELEC:SUPANEL,REAR					80009	337-2042-00
-21	-----		1	CKT BOARD ASSY:SYNC GENERATOR(SEE A1 EPL) (ATTACHING PARTS)						
-22	213-0146-00		4	SCR,TPG,THD FOR:6-20 X 0.313 INCH,PNH STL					83385	OBD
-23	131-0608-00		-	. CKT BOARD ASSY INCLUDES:						
	131-0993-00		21	. CONTACT,ELEC:0.365 INCH LONG					22526	47357
-24	131-0707-00		2	. LINK,TERM.CONNE:JUMPER					80009	131-0993-00
-25	352-0169-00		2	. . CONTACT,ELEC:0.48 L,22-26 AWG WIRE					22526	47439
	175-0529-00		2	. . HOLDER,TERM.CON:2 WIRE BLACK					80009	352-0169-00
-26	136-0153-00		FT	. WIRE ELECTRICAL:26 AWG					23499	TEK-175-0529-00
			1	. SOCKET,CRYSTAL:2 PIN W/CLAMP (ATTACHING PARTS)					91506	8000AG6
-27	211-0022-00		1	. SCREW,MACHINE:2-56 X 0.188 INCH,PNH STL					83385	OBD
-28	210-0405-00		1	. NUT,PLAIN,HEX.:2-56 X 0.188 INCH,BRS					73743	2X12157-402
-29	210-0001-00		1	. WASHER,LOCK:INTL,0.092 ID X 0.18"OD STL					78189	1202-00-00-0541C
-30	136-0220-00		20	. SOCKET,PLUG-IN:3 PIN					71785	133-23-11-034
-31	136-0260-01		1	. SOCKET,PLUG-IN:16 CONTACT,RECT SHAPE					71785	133-51-02-075
-32	136-0269-00		24	. SOCKET,PLUG-IN:14 PIN DUAL INLINE					71785	133-59-02-073
-33	-----		2	. SW,ROCKER:(SEE S165,S265 EPL)						
	672-0475-00		1	CKT BOARD ASSY:VIDEO (ATTACHING PARTS)					80009	672-0475-00
-34	211-0116-00		4	SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS					83385	OBD
-35	-----		-	. VIDEO ASSY INCLUDES:						
-36	131-0592-00		1	. CKT BOARD ASSY:OSC AND GRAY SCALE(SEE A2 EPL)						
-37	136-0220-00		21	. CONTACT,ELEC:0.885 INCH LONG					22526	47353
-38	136-0235-00		23	. SOCKET,PLUG-IN:3 PIN					71785	133-23-11-034
-39	136-0260-01		1	. . SOCKET,PLUG-IN:6 CONTACT,ROUND					71785	133-96-12-062
-40	136-0269-00		1	. . SOCKET,PLUG-IN:16 CONTACT,RECT SHAPE					71785	133-51-02-075
-41	260-1621-00		5	. . SOCKET,PLUG-IN:14 PIN DUAL INLINE					71785	133-59-02-073
-42	361-0542-00		1	. . SWITCH,PUSH:10 BUTTON					80009	260-1621-00
-43	337-1994-00		6	. . SPACER,SWITCH:PLASTIC					71590	J-64281
-44	337-2049-00		2	. . SHIELD,ELEC:					80009	337-1994-00
-45	384-1101-00		9	. . SHIELD,ELEC:					80009	337-2049-00
-46	260-1208-00		1	. . EXTENSION SHAFT:4.14 INCH LONG					80009	384-1101-00
-47	361-0492-00		1	. . SWITCH,PUSH:DPT					71590	2KAB010000-359
-48	361-0105-00		2	. . SPACER,SWITCH:0.140 INCH LONG					80009	361-0492-00
-49	211-0116-00		4	. . SPACER,HOUSING:0.187 OD X 0.775 INCH LONG (ATTACHING PARTS FOR EACH)					80009	361-0105-00
			1	. SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS					83385	OBD

Mechanical Parts List—067-0690-00

FIGURE 1 EXPLODED (CONT)

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Qty	Name & Description					Mfr Code	Mfr Part Number	
				1	2	3	4	5			
1-50	-----		1	CKT BOARD ASSY:LOGIC AND OUTPUT(SEE A3 EPL)							
-51	131-0608-00		16	. . CONTACT,ELEC:0.365 INCH LONG					22526	47357	
	131-0993-00		1	. . LINK,TERM.CONNE:JUMPER					80009	131-0993-00	
-52	131-0707-00		2	. . . CONTACT,ELEC:0.48 "L,22-26 AWG WIRE					22526	47439	
-53	352-0169-00		1	. . . HOLDER,TERM.CON:2 WIRE BLACK					80009	352-0169-00	
	175-0529-00		FT	. . . WIRE,ELECTRICAL:26 AWG					23499	TEK-175-0529-00	
-54	136-0327-01		21	. . CONTACT,ELEC:0.067 INCH DIA					00779	86281-2	
-55	136-0220-00		17	. . SOCKET,PLUG-IN:3 PIN					71785	133-23-11-034	
-56	136-0260-01		1	. . SOCKET,PLUG-IN:16 CONTACT,RECT SHAPE					71785	133-51-02-075	
-57	136-0269-00		4	. . SOCKET,PLUG-IN:14 PIN DUAL INLINE					71785	133-59-02-073	
-58	136-0432-00		1	. . SOCKET,PLUG-IN:24 CONTACT,DIP					71785	133-59-02-011	
-59	260-1208-00		1	. . SWITCH,PUSH:DDPT					71590	2KAB010000-359	
-60	361-0542-00		2	. . SPACER,SWITCH:PLASTIC					71590	J-64281	
-61	386-2827-00		1	PLATE,SUPPORT:REAR (ATTACHING PARTS)					80009	386-2827-00	
-62	213-0146-00		4	SCR,TPG,THD FOR:6-20 X 0.313 INCH,PNH STL					83385	OBD	
-63	426-0724-04		2	FR SECT,PLUG-IN:BOTTOM					80009	426-0724-04	
-64	426-0725-05		2	FR SECT,PLUG-IN:TOP					80009	426-0725-05	
	175-1468-00		1	CABLE ASSY:					80009	175-1468-00	
-65	175-0826-00		1	. WIRE,ELECTRICAL:3 WIRE RIBBON					08261	TEK-175-0826-00	
-66	175-0833-00		1	. WIRE,ELECTRICAL:10 WIRE RIBBON					23499	TEK-175-0833-00	
-67	131-0707-00		26	. CONTACT,ELEC:0.48 "L,22-26 AWG WIRE					22526	47439	
-68	352-0168-00		2	. HOLDER,TERM.CON:10 WIRE BLACK					80009	352-0168-00	
-69	352-0169-00		2	. HOLDER,TERM.CON:2 WIRE BLACK					80009	352-0169-00	
 ACCESSORIES											
065-0230-00			1	CARTON ASSY:					80009	065-0230-00	
070-1724-00			1	MANUAL,TECH:INSTRUCTION					80009	070-1724-00	



MANUAL CHANGE INFORMATION

At Tektronix, we continually strive to keep up with latest electronic developments by adding circuit and component improvements to our instruments as soon as they are developed and tested.

Sometimes, due to printing and shipping requirements, we can't get these changes immediately into printed manuals. Hence, your manual may contain new change information on following pages.

A single change may affect several sections. Sections of the manual are often printed at different times, so some of the information on the change pages may already be in your manual. Since the change information sheets are carried in the manual until ALL changes are permanently entered, some duplication may occur. If no such change pages appear in this section, your manual is correct as printed.

