Instruction Manual

Tektronix

VITS100
NTSC VITS Inserter

070-8333-02

Warning
The servicing instructions are for use by qualified personnel only. To avoid personal injury, do not perform any servicing unless you are qualified to do so. Refer to all safety summaries prior to performing service.

CE

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WARRANTY

Tektronix warrants that the products that it manufactures and sells will be free from defects in materials and workmanship for a period of one (1) year from the date of shipment. If a product proves defective during this warranty period, Tektronix, at its option, either will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product.

In order to obtain service under this warranty, Customer must notify Tektronix of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. Customer shall be responsible for packaging and shipping the defective product to the service center designated by Tektronix, with shipping charges prepaid. Tektronix shall pay for the return of the product to Customer if the shipment is to a location within the country in which the Tektronix service center is located. Customer shall be responsible for paying all shipping charges, duties, taxes, and any other charges for products returned to any other locations.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. Tektronix shall not be obligated to furnish service under this warranty a) to repair damage resulting from attempts by personnel other than Tektronix representatives to install, repair or service the product; b) to repair damage resulting from improper use or connection to incompatible equipment; c) to repair any damage or malfunction caused by the use of non-Tektronix supplies; or d) to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.

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Service Assurance

If you have not already purchased Service Assurance for this product, you may do so at any time during the product's warranty period. Service Assurance provides Repair Protection and Calibration Services to meet your needs.

Repair Protection extends priority repair services beyond the product's warranty period; you may purchase up to three years of Repair Protection.

Calibration Services provide annual calibration of your product, standards compliance and required audit documentation, recall assurance, and reminder notification of scheduled calibration. Coverage begins upon registration; you may purchase up to five years of Calibration Services.

Service Assurance Advantages

- Priced well below the cost of a single repair or calibration

- Avoid delays for service by eliminating the need for separate purchase authorizations from your company

- Eliminates unexpected service expenses

For Information and Ordering

For more information or to order Service Assurance, contact your Tektronix representative and provide the information below. Service Assurance may not be available in locations outside the United States of America.

Name	VISA or Master Card number and expiration
Company	date or purchase order number
Address	Repair Protection (1,2, or 3 years)
City, State, Postal code	Calibration Services (1,2,3,4, or 5 years)
Country	Instrument model and serial number
Phone	Instrument purchase date

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General Safety Summary

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it. To avoid potential hazards, use this product only as specified.

Only qualified personnel should perform service procedures.

To Avoid Fire or Personal Injury

Use Proper Power Cord. Use only the power cord specified for this product and certified for the country of use.

Ground the Product. This product is grounded through the grounding conductor of the power cord. To avoid electric shock, the grounding conductor must be connected to earth ground. Before making connections to the input or output terminals of the product, ensure that the product is properly grounded.

Observe All Terminal Ratings. To avoid fire or shock hazard, observe all ratings and markings on the product. Consult the product manual for further ratings information before making connections to the product.

Do not apply a potential to any terminal, including the common terminal, that exceeds the maximum rating of that terminal.

Do Not Operate Without Covers. Do not operate this product with covers or panels removed.

Use Proper Fuse. Use only the fuse type and rating specified for this product.

Avoid Exposed Circuitry. Do not touch exposed connections and components when power is present.

Wear Eye Protection. Wear eye protection if exposure to high-intensity rays or laser radiation exists.

Do Not Operate With Suspected Failures. If you suspect there is damage to this product, have it inspected by qualified service personnel.

Do Not Operate in Wet/Damp Conditions.

Do Not Operate in an Explosive Atmosphere.

Keep Product Surfaces Clean and Dry.

Provide Proper Ventilation. Refer to the manual's installation instructions for details on installing the product so it has proper ventilation.

Symbols and Terms

Terms in this Manual. These terms may appear in this manual:

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

CAUTION. *Caution statements identify conditions or practices that could result in damage to this product or other property.*

Terms on the Product. These terms may appear on the product:

DANGER indicates an injury hazard immediately accessible as you read the marking.

WARNING indicates an injury hazard not immediately accessible as you read the marking.

CAUTION indicates a hazard to property including the product.

Symbols on the Product. The following symbols may appear on the product:

CAUTION
Refer to Manual

WARNING
High Voltage

Double
Insulated

Protective Ground
(Earth) Terminal

Not suitable for
connection to
the public telecom-
munications network

Service Safety Summary

Only qualified personnel should perform service procedures. Read this *Service Safety Summary* and the *General Safety Summary* before performing any service procedures.

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

Disconnect Power. To avoid electric shock, switch off the instrument power, then disconnect the power cord from the mains power.

Use Care When Servicing With Power On. Dangerous voltages or currents may exist in this product. Disconnect power, remove battery (if applicable), and disconnect test leads before removing protective panels, soldering, or replacing components.

To avoid electric shock, do not touch exposed connections.

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Getting Started

Getting Started

The Tektronix VITS 100 NTSC VITS Inserter is a high quality signal generator designed to insert VITS (Vertical Interval Test Signals) into program video. It automatically switches to bypass mode in the event of power failure or loss of lock to the program video.

See *VITS Inserter Functions*, below, for a brief explanation of what the VITS inserter can do. See *Functional Check and Installation*, on page 1–3, to begin using your new VITS inserter.

VITS Inserter Functions

You can program the VITS inserter to generate test signals and a source identification signal and insert the signal(s) into selected lines of the vertical interval. You can also use the VITS inserter to overwrite VITS that already exist in program video; overwriting with a Black signal effectively deletes existing material.

Test Signals
The VITS inserter uses 12-bit data at an $8F_{SC}$ data rate to ensure accurate test signal generation. The standard VITS inserter can generate and insert the following VITS into your choice of lines 17, 18, 19, and 20 in the even or odd fields of NTSC video:

- NTC7 Combination

- NTC7 Composite

- FCC Multiburst

- 50% Gray

- SIN X/X

- FCC Color Bars

- FCC Composite

- Multipulse

- Vertical Interval Reference Signal (VIRS)

- Red Field

- 0% Black

- 7.5% Black

Source ID   The VITS inserter can also insert a one-line source identification code on any of the available lines in vertical blanking. The Tektronix VM 700A Video Measurement Set can then use this code to identify the source of the signal it is measuring.

Auto VIRS   Another function of the VITS inserter is Auto VIRS. When Auto VIRS is selected, the VITS inserter checks the specified lines and fields of the incoming program video for a VIRS signal. If VIRS is detected, the signal is passed with no processing; if VIRS is not detected, then the VITS inserter inserts the internally generated VIRS signal on the specified lines and fields.

Bypass   Maintaining program channel continuity is one of the main considerations in the VITS inserter. Therefore, the VITS inserter provides rapid response to signal or equipment failure. If there is a failure, input video is automatically routed to the program output through circuitry that that adds delay equal to normal inserter processing delay.

When video is present but the VITS inserter cannot genlock to it (uncorrected-time-base video for example), then the program is passed with no VITS inserted. If there is no video present, or if the power fails, the VITS inserter switches to the bypass mode immediately.

When the failure is corrected, the VITS inserter passes program video through as soon as it is present, and begins VITS insertion as soon as genlock is achieved.

Remote Control   The rear-panel REMOTE connector provides limited remote control of the VITS inserter. This is a 9-pin ground closure system to permit manual switching between Bypass and Operate modes. In addition, the interface can drive indicators to mimic the front-panel POWER, BYPASS, and UNLOCKED LEDs.

Accessories and Options

This instrument is shipped with the following accessories:

- This Instruction Manual

- A power cord appropriate to your local AC supply.

Optional configurations of the VITS inserter are available. See *Appendix A: Options* for more information.

Functional Check and Installation

It is good practice to perform a functional check of a new instrument before installing it into your system.

Functional Check   Perform the following functional check to confirm proper operation of your new VITS inserter and to familiarize yourself with its features.

1. Unpack the instrument. If possible, save all packing materials for later shipping or storage.

2. Connect the VITS inserter to the local AC power supply with the cord provided with the instrument. The VITS inserter operates on any 48–62 Hz, 90–250 V supply; no switch or jumper settings are required.

3. Connect the VITS inserter to a test signal generator and waveform monitor as shown in Figure 1–1.

4. Switch only the VITS inserter on. Confirm that, after approximately one second, all three front panel LEDs are lit.
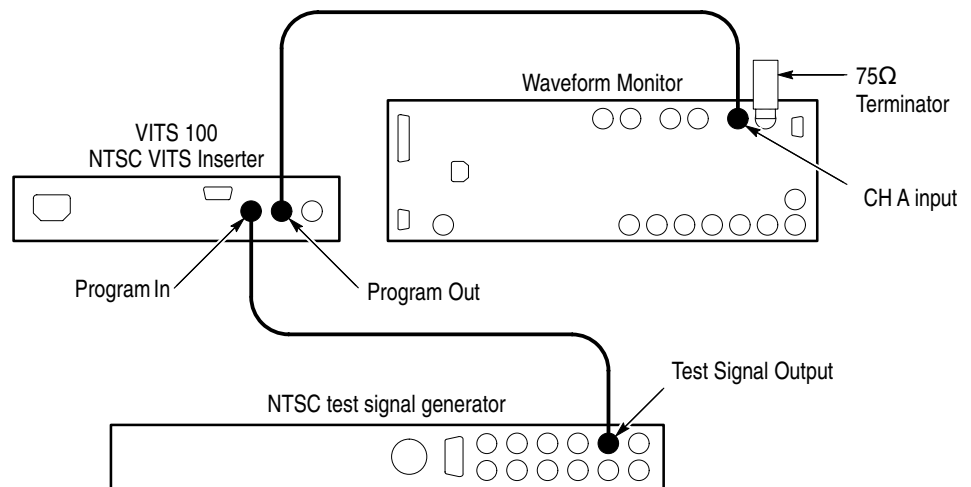
Figure 1–1: A setup for the functional check

5. Switch the test signal generator on and configure it, if necessary, to output a signal that does not contain any VITS (if it is available, select Black Burst). Confirm that the VITS inserter BYPASS and UNLOCKED LEDs are no longer lit.

6. Switch the waveform monitor on and configure it to display two *fields* of the VITS inserter PROGRAM OUT waveform.

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7. While watching the waveform monitor display, repeatedly press the VITS inserter BYPASS switch to alternate between bypass and normal operating modes. Confirm that the appearance of the vertical interval (that is, the "gap" between the two visible fields) changes in appearance, indicating the alternating presence and absence of inserted VITS. The change is easiest to see when the test signal generator is outputting a Black Burst signal.

8. Configure the waveform monitor line-select feature to view one line at a time. Check lines 17 through 20 of fields 1 and 2 for test signals. Tables 1–1 through 1–3 list the signals generated and inserted by a new VITS 100 NTSC VITS Inserter with the as-manufactured configuration. See the *Specifications* Section of this manual or *Appendix A: Options* for diagrams of the signal waveforms.

Table 1–1: Factory VITS, Standard and Option 1M

Field	Line	Signal
1	17	NTC7 Composite
1	19	VIRS
2	17	NTC7 Combination
2	19	VIRS

Table 1–2: Factory VITS, Option 1J

Field	Line	Signal
1	17	FCC Composite
1	19	Color Bars (No Setup)
1	20	Sin X/X
2	17	Multiburst
2	20	Red Field (modified Luminance and Chrominance)

Table 1–3: Factory VITS, Option 2

Field	Line	Signal
1	17	Cable Multiburst
1	18	FCC Composite
2	17	Cable Sweep
2	18	Sin X/X

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Installation You can mount the VITS inserter in a standard equipment rack or custom install it. In custom installations, be sure to provide easy access to the signal-selection DIP switches through the removeable panel in the top of the instrument. Also be sure not to block the cooling holes in the top cover. After performing the functional check, complete installation with the following steps:

1. If you wish, mount the VITS inserter in an existing equipment rack with one of the following Tektronix generator mounting kits:

    ■ TVGF11A—Single Rack Mount Adapter

    ■ TVGF13—Dual Rack Adapter

    ■ TVGF14—Dual Half-Rack Adapter

    Please contact your nearest Tektronix representative or field office for more information.

2. Connect the VITS inserter to your system as shown in Figure 1–2.

3. See the *Operating Basics* section of this manual for more information about configuring and using the VITS inserter.
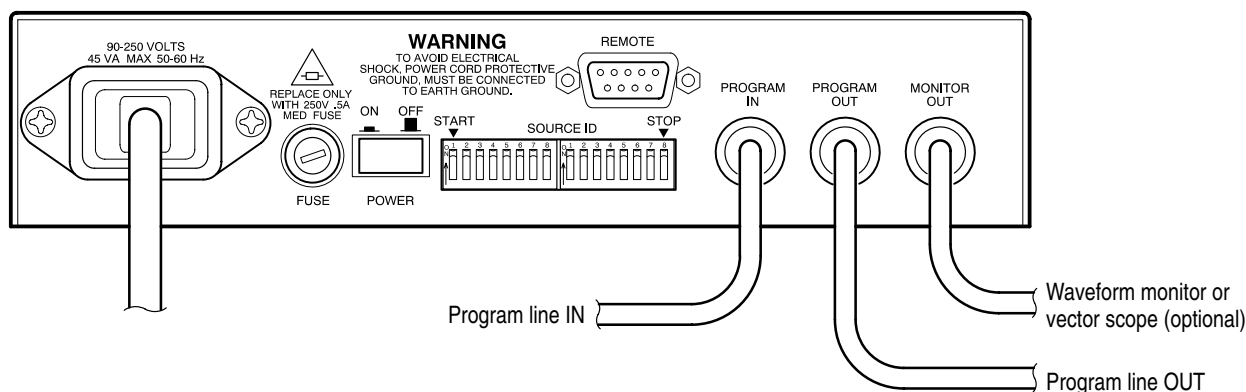
Figure 1–2: A typical installation

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Operating Basics

Operating Basics

The VITS 100 NTSC VITS Inserter can generate any one of thirteen test signals for insertion on lines 17 through 20 in the vertical interval of the video frame. If power fails or the instrument cannot genlock, the VITS inserter automatically switches to bypass mode.

VITS signal selection and line assignments are made with four DIP switches that are accessible through the top of the VITS inserter. See *VITS Selection*, on page 2–5, for more information.

Front Panel

The VITS inserter has one switch and three indicator LEDs on the front panel, as shown in Figure 2–1. These features are explained in the following paragraphs.
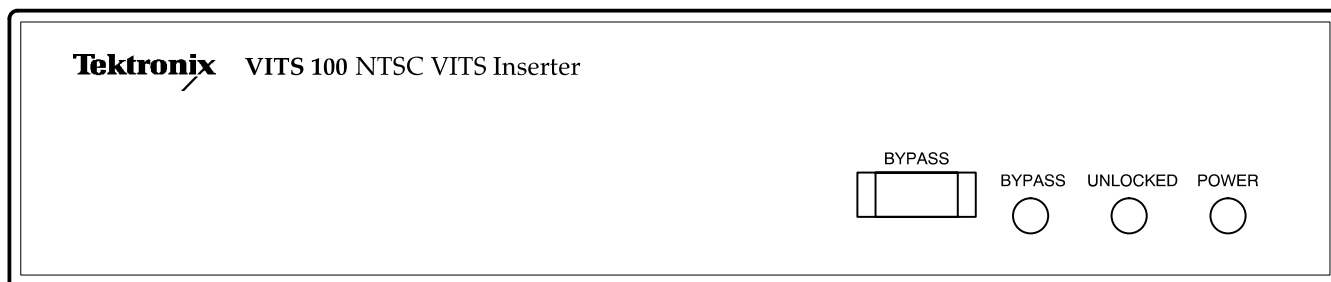
Figure 2–1: The front panel

BYPASS Switch and LED
Press the BYPASS button to place the VITS inserter into Relay Bypass mode. In this mode, the program input is applied directly to the program output through a delay line that matches the processing delays that affect the program channel in normal operation. Press BYPASS a second time to return to the normal operating mode. The red BYPASS LED is lit whenever the instrument is in bypass mode.

UNLOCKED LED
The UNLOCKED indicator is lit when the VITS inserter cannot acquire or maintain genlock to the program signal. To maintain correct timing, the VITS inserter must genlock to the input program.

POWER LED
The POWER LED indicates that the VITS inserter is switched on (through the rear-panel POWER switch). The LED lights when the power supply has completed its start-up process, approximately one second after you switch the VITS inserter on.

Rear Panel

The VITS 100 NTSC VITS Inserter rear panel, shown in Figure 2–2, contains the mains power input, switch, and fuse; the program input and output connectors; DIP switches for source identification code selection; and a remote connector.
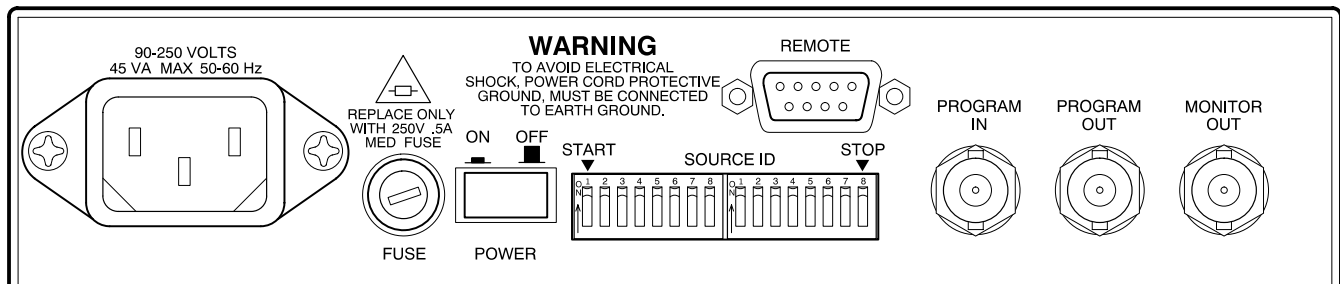
Figure 2–2: VITS 100 NTSC VITS Inserter rear panel

Power   The power block consists of the connector, fuse, and power switch. It is located on the left third of the panel.

Power Connector. This instrument uses a power supply that accepts line voltages from 90 to 250 VAC without changing voltage ranges or fuses.

Fuse. The fuse holder accepts a standard cartridge fuse. See the rear panel or the *Replaceable Electrical Parts* section of this manual for the correct value.

Switch. A push-push, on-off switch; power is on when the switch is latched in the in position, as indicated by the rear-panel graphic.

Source ID   This set of two dual in-line package (DIP) switches is used to select a source identification code. The source ID is a one-line, 16-bit word consisting of a start and stop bit and any one of 16,384 (2^{14}) possible identification codes. The ID can be inserted in the vertical interval (lines 17 through 20) to identify the source of the program signal.

The source ID signal is accepted by other video equipment, such as the Tektronix VM 700A Video Measurement Set, which can then include the source ID in reports or printouts to identify the source of the signal being measured.

Program In   The PROGRAM IN connector is the program video input. The input is AC coupled, clamped to ground, and internally terminated in 75 Ω.

Program Out   The PROGRAM OUT connector is the program video output. Output video can have user-selected VITS inserted on selected lines. If the instrument cannot lock to the program input video signal, or if power fails, the program automatically bypasses the VITS inserter processing circuitry; the input signal is then routed through a delay line, with a delay equivalent to the processing delays of the instrument, to PROGRAM OUT. Matching the delay eliminates timing errors whenever the VITS inserter must enter bypass mode.

Monitor Out   This connector provides the same output as the PROGRAM OUT connector, except that the MONITOR OUT is *not* in the bypass signal path. This means that—during loss of genlock or activation of the bypass mode—the monitor output will still contain any inserted VITS. There is no output from this connector if power is lost.

Remote Connector   This 9-pin connector enables ground-closure remote control of bypass mode. In addition, control lines that parallel the three front panel indicators (POWER, BYPASS, and UNLOCKED) are brought out to this connector.

Insertion Options

You can configure the VITS inserter to insert test signals, pass existing video, insert or pass VIRS, or insert a source ID on lines 17, 18, 19, and 20 of both the even and odd fields of NTSC video.

Inserting Test Signals   The standard VITS 100 NTSC VITS Inserter can insert the following test signals into the vertical interval:

- FCC Color Bars
- FCC Multiburst
- NTC7 Composite
- 7.5% Black
- Multipulse
- Red Field

- FCC Composite
- NTC7 Combination
- VIRS
- 0% Black
- SIN X/X
- 50% Gray

You can find descriptions of these waveforms in the *Specifications* section of this manual. If your instrument contains Option 1J, Option 1M, or Option 2, see *Appendix A: Options* for descriptions of the optional signals.

Passing Program Video   In addition to internally generated test signals, the VITS inserter can pass video signals that are already in the vertical interval of the program video. This includes the delete/insert lines, which are lines 17 through 20 in all fields.

Auto VIRS   When AUTO VIRS is selected, the instrument automatically checks the assigned line and field of the incoming video for a VIRS signal. If VIRS is detected, the line is passed with no processing. If VIRS is not detected, the internally generated VIRS signal is inserted onto the line.

Inserting a Source ID   Source identification can be inserted on any of the available vertical interval lines. The "Source ID" consists of sixteen equal-duration flags that can be set high or low with the rear-panel SOURCE ID switches. Source ID is set by the user to provide a visual identification of the signal path. Some equipment, such as the Tektronix VM700A Video Measurement Set, can use this signal to generate an alpha-numeric ID on the screen display or on printed reports. Figure 2–3 shows the waveform of a source identification code that is generated when all switch segments are set ON.
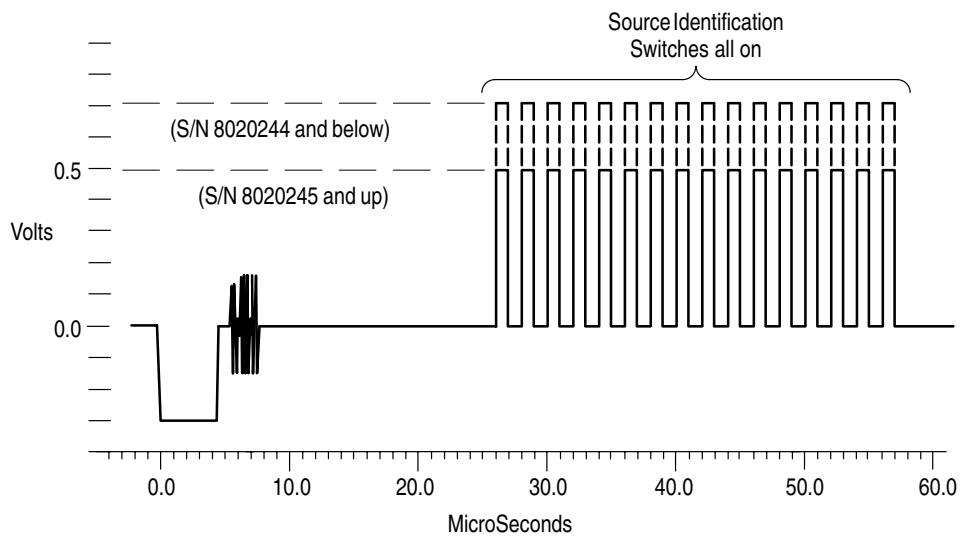
Figure 2–3: VITS 100 NTSC VITS Inserter source ID signal

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Factory Configuration   The VITS 100 NTSC VITS Inserter is configured during manufacture to insert the signals listed in Table 2–1. See *VITS Selection*, below, for instructions on configuring the VITS inserter to insert the signals that best suit your applications and facility.

Table 2–1: Standard Factory-Programmed Signals

Field	Line	Signal
1	17	NTC7 Composite signal
1	18	Pass*
1	19	VIRS
1	20	Pass*
2	17	NTC7 Combination signal
2	18	Pass*
2	19	VIRS
2	20	Pass*

*   Passed lines are not deleted or inserted by the VITS 100 NTSC VITS Inserter

VITS Selection

VITS signal selection for the individual vertical interval lines is made with four DIP switches (S1–S4) mounted on the VITS inserter circuit board. Remove the small panel from the top cover of the VITS inserter, as shown in Figure 2–4, to gain access to these switches.

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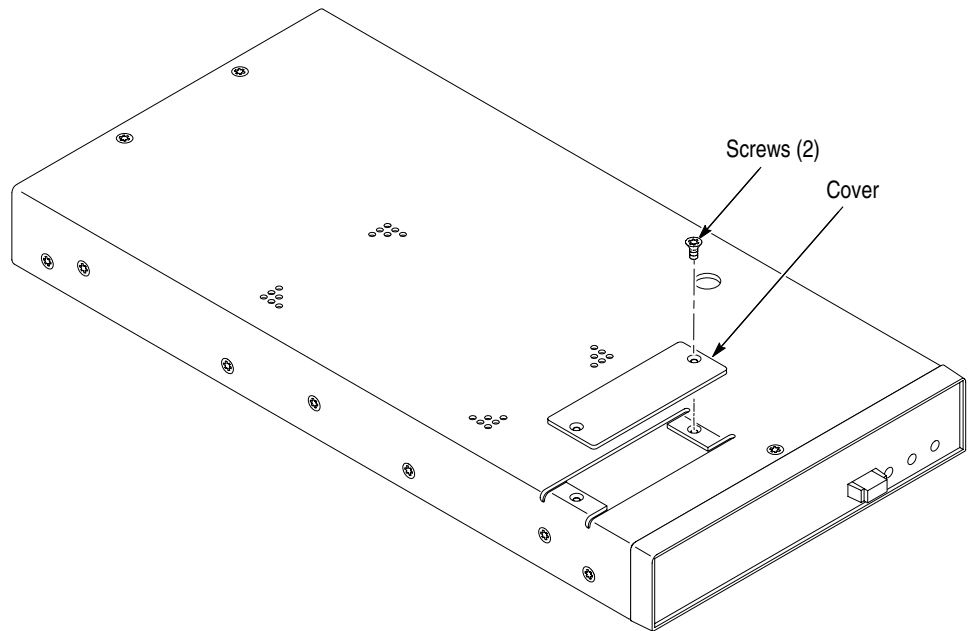
Figure 2–4: Location of VITS selection switches

Switch/Line Assignments   Switches S1 and S2 make the selections for fields 1 and 3, and switches S3 and S4 make the selections for fields 2 and 4. Each DIP switch selects the test signals for two of the vertical interval lines, as shown in Figure 2–5.
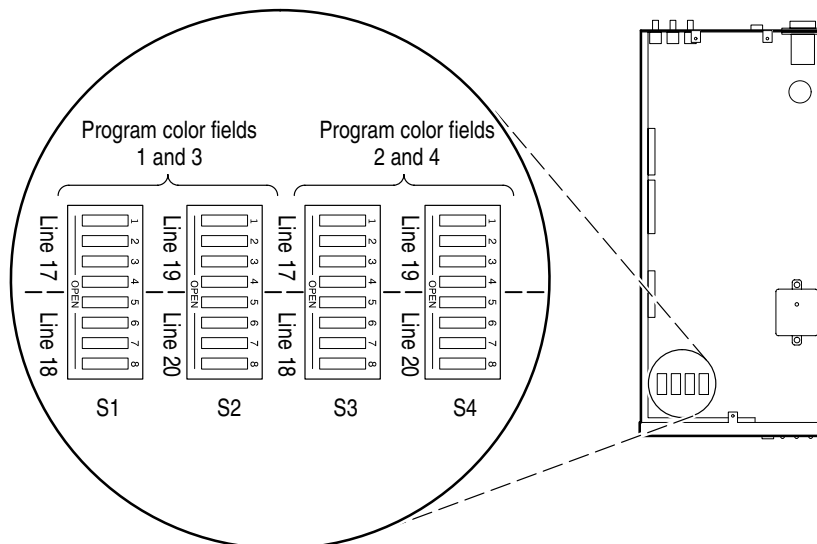
Figure 2–5: The VITS selection DIP switches

Switch Settings   The switch settings for signal selection are listed in Table 2–2. When a switch segment is thrown to the left (as viewed from the front of the VITS inserter), it is open; when thrown to the right, it is closed. Open positions are denoted in the table as 1, and closed are denoted as 0.

Table 2–2: DIP Switch Settings

VITS inserter Action		DIP Segment Settings*			
		1 (5)	**2 (6)**	**3 (7)**	**4 (8)**
Insert Test Signal:	0% Black (two settings)	0	1	1	0
		1	0	0	1
	7.5% Black	1	1	1	0
	50% Gray	1	1	0	1
	FCC Color Bars	0	0	0	0
	FCC Composite	1	0	0	0
	Multiburst	0	1	0	1
	Multipulse	0	1	0	0
	NTC 7 Composite	1	0	1	0
	NTC 7 Combination	0	0	0	1
	Red Field	1	1	0	0
	SIN X/X	0	0	1	0
	VIRS	1	0	1	1
Pass Program Video		1	1	1	1
Auto VIRS		0	0	1	1
Insert Source ID		0	1	1	1

* 1 signifies an OPEN switch; 0 signifies a closed switch

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Remote Control

Remote control in the standard VITS 100 NTSC VITS Inserter is limited to ground-closure Bypass control and (+5 V) outputs for remote BYPASS, UNLOCKED, and POWER indicator lights. See Figure 2–6 and Table 2–3 for the rear-panel REMOTE connector pin assignments.
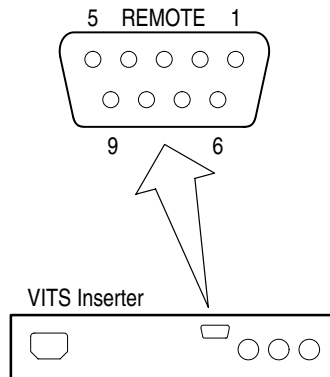
Figure 2–6: The REMOTE connector

Table 2–3: REMOTE Connector Pin Assignments

Function	Pins
Ground	1, 5
Force Bypass	6
BYPASS Indicator	2
UNLOCKED Indicator	7
POWER Indicator	3

To duplicate the function of the front panel at a remote location, run a cable from REMOTE pins 1, 2, 3, 5, 6, and 7 to an SPST switch and three indicator LEDs.

■   Connect the switch between pins 1 and 6.

■   Connect the Bypass indicator between pins 2 and 5.

■   Connect the Unlocked indicator between pins 7 and 5.

■   Connect the Power indicator between pins 3 and 5.

Close the switch to force the VITS inserter into bypass mode; the LEDs light with the corresponding front-panel indicators.

Specifications

Specifications

This section contains tables that list the specifications for the VITS 100 NTSC VITS Inserter. All specifications are guaranteed unless noted "typical."

The performance limits in this specification are valid with these conditions:

- The VITS inserter must have been calibrated/adjusted at an ambient temperature between +20° C and +30° C.

- The VITS inserter must be in an environment with temperature, altitude, humidity, and vibration within the operating limits described in these specifications.

- The VITS inserter must have had a warm-up period of at least 20 minutes.

Specification Tables

Table 3–1: Program channel characteristics

Characteristic	Information
Gain	Unity ± 1%
Frequency Response	±1% to 5.5 MHz
	±3% to 10 MHz
Chrominance-to-Luminance Gain	±0.5%
Chrominance-to-Luminance Delay	≤5 ns
Diff Phase	≤0.2°
Diff Gain	≤0.2%
Line Tilt	≤0.5%
DC Output Level	0 V ±10 mV
DC Matching of Inserted Test Signal to Program Signal	±3 mV
Phase Match (Relay Bypass Path to Signal Processing Path)	±1° at F_{SC}
Hum Rejection	50 dB (Measured right after burst)
Keyboard (No Noise)	Too small to measure on VM700A
Insertion Transients	≤10 mV (Measured on Tektronix 1780R. Typically <5 mV)
Input Impedance	75 Ω
Return Loss	36 dB to 5 MHz (Program In, Program Out, and Monitor Out)

Table 3–1: Program channel characteristics (Cont.)

Characteristic	Information
Phase Matching of Inserted Test Signal to Program Video	±1° (Program Sync and Burst Normal Level)
Pulse to Bar Ratio	100%±0.5% (Typically within ±0.25%)
Signal to Noise Ratio	>70 dB (Unweighted Filter at 5 MHz. Measured 91 dB on VM700A, relative to reference)

Table 3–2: Test Signal and Black Burst general characteristics

Characteristic	Information
Frequency Response	±1% to 5 MHz
	±5% to 10 MHz
Luminance Amplitude Accuracy	±1%
Chrominance-to-Luminance Gain	±0.5%
Chrominance-to-Luminance Delay	≤5 ns
Diff Phase	≤0.3°
Diff Gain	≤0.3%
Line Tilt	±0.5%
Output Impedance	75 Ω
Signal to Noise Ratio	>78 dB (Measured on a VM700A with an unweighted 5 MHz lowpass filter.)
Spurious Signals (5 MHz 50 MHz)	>55 dB down
Pulse to Bar Ratio	100% ±0.5%
K Factor (K2T)	0.3% (Typically 0.2%)
Crosstalk	≥60 dB down
DC Offset	0 V DC ±10 mV
SCH Phase Accuracy	0 ±5° (< ±2.5° typical)
Luminance Rise Time	140 ns ±20 ns
Chrominance Rise Time	300 ns ±35 ns

Table 3–3: Black and Gray Test Signal characteristics

Signal	Information
0% Black	0 IRE Luminance with sync and burst; see Figure 3–1.
7.5% Black	7.5 IRE Luminance with sync and burst; see Figure 3–2.
50% Gray	50 IRE Luminance with sync and burst; see Figure 3–3.

Table 3–4: FCC Composite characteristics

Characteristic	Information
Timing	See Figure 3–5
Modulated 5-step Staircase	
Luminance	
Amplitude	80.4 IRE ±0.7 IRE
Riser Amplitude	1/5 of 5-step amplitude ±0.5%
Rise Time	250 ns ±25 ns
Chrominance	
Phase	Same as burst ±0.3°
Envelope Risetime	375 ns ±37.5 ns
2T Pulse	
Pulse-to-Bar Ratio	100% ±0.5%
Half Amplitude Duration (HAD)	250 ns ±25 ns
Ringing	1.0 IRE or less
Modulated SIN^2 Pulse	
Pulse-to-Bar Peak Amplitude	100%
Half Amplitude Duration	1.563 µs ±150 ns
Phase	60.8° ±1°
Bar	
Amplitude	100 IRE ±1 IRE
Rise Time	250 ns ±25 ns

Table 3–5: FCC Color Bars characteristics

Characteristic	Information							
Timing	See Figure 3–4							
Luminance Rise Time	250 ns ±25 ns							
Bar Characteristics:	White	Yellow	Cyan	Green	Magenta	Red	Blue	Black
Luminance Amplitude (mV p-p)	714.3	494.3	400.7	345.7	256.0	202.1	107.8	53.5
Subcarrier Amplitude (mV p-p)	0.0	444.2	630.1	588.5	588.5	630.1	444.2	0.0
Subcarrier Phase (degrees)	0.0	167.1	283.4	240.8	60.8	103.4	347.1	0.0

Table 3–6: Multiburst characteristics

Characteristic	Information
Timing	See Figure 3–6
White Reference Bar Amplitude	100 IRE
Packet Amplitudes	60 IRE p-p
Pedestal	40 IRE
Burst Frequencies	500 kHz, 1.25 MHz, 2.0 MHz, 3.0 MHz, 3.58 MHz, 4.1 MHz
Packet Rise Time	
500 kHz	140 ns typical ($\sin^2$ shaped packets)
Other Packets	400 ns typical ($\sin^2$ shaped packets)

Table 3–7: Multipulse characteristics

Characteristic	Information
Timing	See Figure 3–7
Amplitudes	80 IRE
Frequencies	1.0 MHz, 2.0 MHz, 3.0 MHz, 3.58 MHz, and 4.2 MHz

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Table 3–8: NTC7 Combination characteristics

Characteristic	Information
Timing	See Figure 3–8
White Reference Bar	
Amplitude	100 IRE ±0.7 IRE
Rise Time	250 ns ±25 ns
Multiburst Packets	
Amplitude	50 IRE ±0.5 IRE p-p
Average Level	50 IRE ±0.5 IRE
Frequencies	500 kHz, 1.0 MHz, 2.0 MHz, 3.0 MHz, 3.58 MHz, 4.2 MHz
Packet Rise Time	
500 kHz and 1.0 MHz	140 ns typical ($\sin^2$ shaped packets)
Other Frequencies	400 ns typical ($\sin^2$ shaped packets)
Modulated Pedestal	
Pedestal	
Amplitude	50 IRE ±0.5 IRE
Rise Time	250 ns ±25 ns
Chrominance	
Amplitude	
20 IRE	20.01 IRE ±0.5 IRE
40 IRE	40.02 IRE ±0.5 IRE
80 IRE	80.04 IRE± .5 IRE
Phase relative to burst	90° ±0.5°
Rise Time	400 ns ±40 ns

Table 3–9: NTC7 Composite characteristics

Characteristic	Information
Timing	See Figure 3–9
Modulated 5-step Staircase	
Luminance	
Amplitude	90.2 IRE $\pm$0.7 IRE
Riser Amplitude	1/5 of 5-step amplitude $\pm$0.5%
Rise Time	250 ns $\pm$25 ns
Chrominance	
Phase	Same as burst $\pm$0.3°
Envelope Risetime	400 ns $\pm$40 ns
2T Pulse	
Pulse-to-Bar Ratio	100% $\pm$0.5%
Half Amplitude Duration (HAD)	250 ns $\pm$25 ns
Ringing	1.0 IRE or less
Modulated SIN^2 Pulse	
Pulse-to-Bar Peak Amplitude	100%
Half Amplitude Duration	1.563 μs $\pm$150 ns
Phase	60.8° $\pm$1°
Bar	
Amplitude	100 IRE $\pm$1 IRE
Rise Time	125 ns $\pm$15 ns

Table 3–10: Red Field characteristics

Characteristic	Information
Timing	See Figure 3–10
Luminance	
Amplitude, Standard	202.2 mV $\pm$1%
Amplitude, Option 1J	160.72 mV $\pm$1%
Rise Time	250 ns $\pm$25 ns
Chrominance	
Amplitude, Standard	630.1 mV $\pm$1%
Amplitude, Option 1J	681.23 mV $\pm$1%
Phase	103.4° $\pm$0.3°
Rise Time	400 ns $\pm$40 ns

Table 3–11: SIN X/X characteristics

Characteristic	Information
Timing	See Figure 3–11
Bandwidth	4.75 MHz
Pedestal	24 IRE
Peak	90 IRE (Peak amplitude from pedestal)

Table 3–12: Vertical Interval Reference Signal characteristics

Characteristic	Information
Timing	See Figure 3–12
Chrominance Reference	
Amplitude	40 IRE
Phase	Same as burst ±0.3°
Envelope Rise Time	1 µs ±100 ns (sin^2 shaped)
Average Chrominance Level	70 IRE
Luminance Reference	
50 IRE Level	50 IRE
Black Reference	7.5 IRE

Table 3–13: Cable Multiburst (Option 2) characteristics

Characteristic	Information
Timing	See Figure 3–13
White Reference Bar Amplitude	60 IRE
Packet Amplitudes	60 IRE
Pedestal Amplitudes	30 IRE
Burst Frequencies	500 kHz, 1.25 MHz, 2.0 MHz, 3.0 MHz, 3.75 MHz, 4.0 MHz
Packet Rise Time	
500 kHz Packet	140 ns typical (sin^2 shaped packets)
Other Packets	400 ns typical (sin^2 shaped packets)

Table 3–14: Cable Sweep (Option 2) characteristics

Characteristic	Information
Timing	See Figure 3–14
Pedestal Amplitude	50 IRE
Sweep Amplitude	100 IRE
Sweep Start Frequency	0.1 MHz
Sweep End Frequency	4.2 MHz

Table 3–15: Genlock characteristics

Characteristic	Information
Burst Lock	
Genlock Phase Change with Input Amplitude	≤2° burst phase change for input sync or burst amplitude range of 287mV ±3 dB ≤4° burst phase change for amplitude range of 287mV ±6 dB (For either composite video or burst amplitude errors)
Genlock Phase Change with Input Signal APL	≤1° burst phase change over 10% to 90% APL
Genlock Phase Change with Input Signal Burst Frequency	≤1° burst phase change for ±20 Hz change in incoming subcarrier
Lock Range	
Frequency, Standard	3.579545 MHz ±20 Hz (NTSC)
Fequency, Option 1M	3.575611 MHz ±20 Hz (PAL-M)
Amplitude	+6 dB to −12 dB (Typically to −16 dB NTSC; −14 dB PAL-M)
Genlock Phase Jitter with Input Amplitude Change	Typically ≤0.2° peak for input sync or burst amplitude range of 287 mV ±3dB; no noise on input signal Typically ≤0.4° peak for input amplitude range of 287 mV ±6 dB; no noise on input signal
Sync Lock Jitter	≤10 ns for input sync amplitude range of 287 mV ±3 dB (No noise on input signal)
Noise Performance	Locks to 28 dB S/N Ratio Video

Table 3–16: Power Supply characteristics

Characteristic	Information
Output Voltages	+5 V ±200 mV from 1A to 3 A (voltage adjustable)
	−5.2 V ±300 mV from 0.5 A to 1 A
	±12 V ±120 mV from 0.05 A to 0.2 A (post regulated from ±14.5 V by linear regulators)
Output Ripple	
+5 V	≤50 mV switching ripple, ≤5 mV line frequency ripple
−5.2 V	≤50 mV switching ripple, ≤10 mV line frequency ripple
±12 V	≤10 mV switching ripple, ≤5 mV line frequency ripple
Line Input Range	Regulates from 90 to 250 VAC
Minimum Load	10 W minimum load required to operate. However, output voltages other than +5 V may not meet specifications outside the listed currents. At zero load the power supply cycles on and off
Power Consumption	40–50 W.
Overvoltage Protection	The 5 V output is protected by a crowbar circuit that engages at approximately 5.7 V. Overvoltage protection causes the power supply to cycle by engaging the primary side current limit time-out circuit
Power	70 W maximum controlled by primary side current limit circuits. Power supply cycles on and off when power limit is reached
Short-Circuit Protection	All outputs are protected by the primary side current limit and time-out circuits. In addition, the ±12 V outputs are limited to 1 A by the linear regulators
Efficiency	70% nominal
Fan Drive	15 V to 16.5 V, as determined by supply load

Table 3–17: Physical characteristics

Characteristic	Information
Height	1.734 in (4.404 cm)
Width	8.1 in (20.6 cm)
Length	17.2 in (43.7 cm)
Weight	
Net	4.7 lbs (2.1 kg)
Shipping	16.7 lbs (7.6 kg)

Table 3–18: Environmental characteristics

Characteristic	Information
Temperature	
Non-Operating	–40° to +65° C (–40° to +149° F)
Operating	0° to +50° C (32° to 122° F)
Altitude	
Non-Operating	To 50,000 ft (15,240 m)
Operating	To 15,000 ft (4,572 m)
Vibration (Operating)	Fifteen minutes each axis at 0.025 inch, frequency varied from 10-55-10 Hz in 4-minute cycles with the instrument secured to the vibration platform; ten minutes each axis at any resonant point, or at 55 Hz.
Shock	50 G, $^1/_2$ sine, 11 ms duration, three guillotine shocks per side
Transportation	Qualified under NTSB Test Procedure 1A, Category II (36-inch drop)

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Table 3–19: Certifications and compliances

Category	Standards or description

EC Declaration of Conformity – EMC	Meets intent of Directive 89/336/EEC for Electromagnetic Compatibility. Compliance was demonstrated to the following specifications as listed in the Official Journal of the European Union:
	
	EN 50081-1 Emissions:
	    EN 55022 Class B Radiated and Conducted Emissions
	
	EN 50082-1 Immunity:
	    IEC 801-2 Electrostatic Discharge Immunity
	    IEC 801-3 RF Electromagnetic Field Immunity
	    IEC 801-4 Electrical Fast Transient/Burst Immunity

Australia/New Zealand Declaration of Conformity – EMC	Complies with EMC provision of Radiocommunications Act per the following standard(s): AS/NZS 2064.1/2 Industrial, Scientific, and Medical Equipment: 1992 AS/NZS 3548 Information Technology Equipment: 1995
EMC Compliance	Meets the intent of Directive 89/336/EEC for Electromagnetic Compatibility when it is used with the product(s) stated in the specifications table. Refer to the EMC specification published for the stated products. May not meet the intent of the directive if used with other products.
FCC Compliance	Emissions comply with FCC Code of Federal Regulations 47, Part 15, Subpart B, Class A Limits.
Installation (Overvoltage) Category	Terminals on this product may have different installation (overvoltage) category designations. The installation categories are: CAT III Distribution-level mains (usually permanently connected). Equipment at this level is typically in a fixed industrial location. CAT II Local-level mains (wall sockets). Equipment at this level includes appliances, portable tools, and similar products. Equipment is usually cord-connected. CAT I Secondary (signal level) or battery operated circuits of electronic equipment.
Pollution Degree	A measure of the contaminates that could occur in the environment around and within a product. Typically the internal environment inside a product is considered to be the same as the external. Products should be used only in the environment for which they are rated. Pollution Degree 2 Normally only dry, nonconductive pollution occurs. Occasionally a temporary conductivity that is caused by condensation must be expected. This location is a typical office/home environment. Temporary condensation occurs only when the product is out of service.
Safety Standards	
U.S. Nationally Recognized Testing Laboratory Listing	UL1244 Standard for electrical and electronic measuring and test equipment.
Canadian Certification	CAN/CSA C22.2 No. 231 CSA safety requirements for electrical and electronic measuring and test equipment.
European Union Compliance	Low Voltage Directive 73/23/EEC, amended by 93/69/EEC EN 61010-1 Safety requirements for electrical equipment for measurement, control, and laboratory use.

Table 3–19: Certifications and compliances (Cont.)

Category	Standards or description	
Additional Compliance	IEC61010-1	Safety requirements for electrical equipment for measurement, control, and laboratory use.
Safety Certification Compliance		
Temperature, operating	+5 to +40° C	
Altitude (maximum operating)	2000 meters	
Equipment Type	Test and measuring	
Safety Class	Class 1 (as defined in IEC 1010-1, Annex H) – grounded product	
Overvoltage Category	Overvoltage Category II (as defined in IEC 1010-1, Annex J)	
Pollution Degree	Pollution Degree 2 (as defined in IEC 1010-1). Note: Rated for indoor use only.	

Waveform Diagrams

The diagrams in Figures 3–1 through 3–14 contain timing information for the various test signals generated by the VITS 100 NTSC VITS Inserter and described in Tables 3–3 through 3–14.
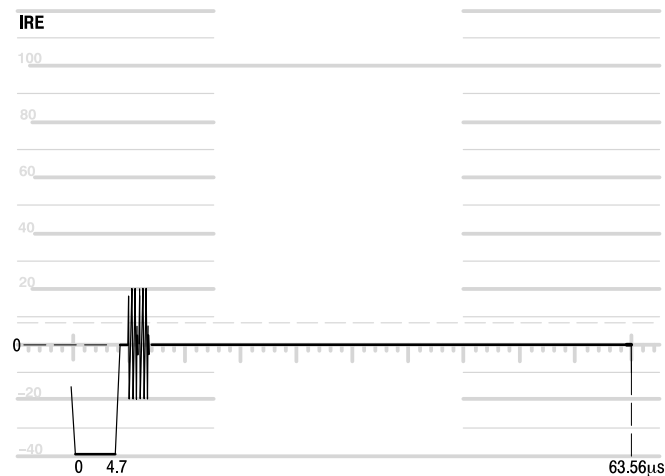
Figure 3–1: 0% Black
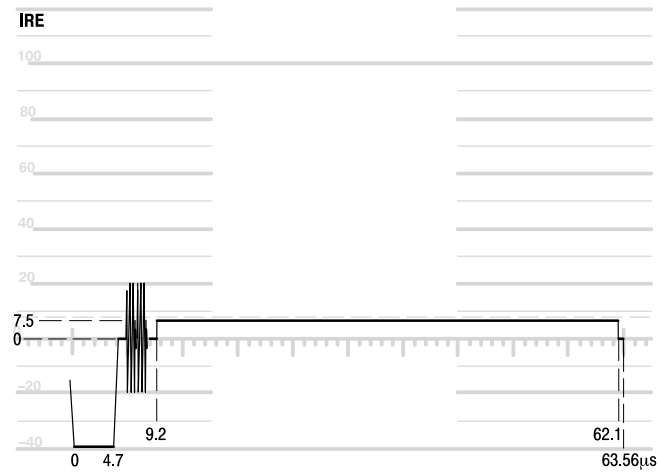
Figure 3–2: 7.5% Black
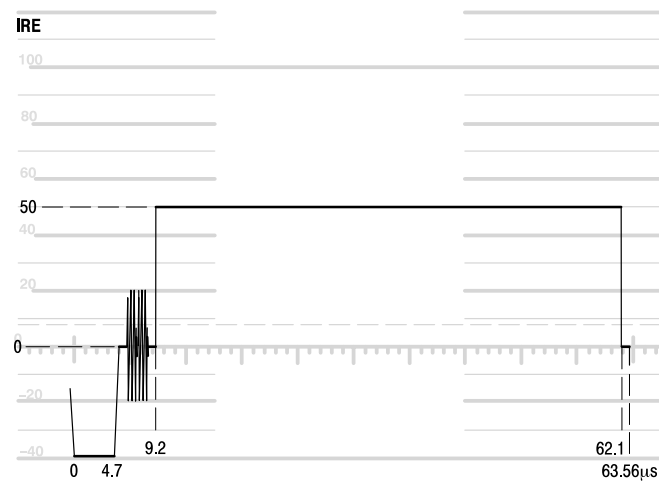
Figure 3–3: 50% Gray
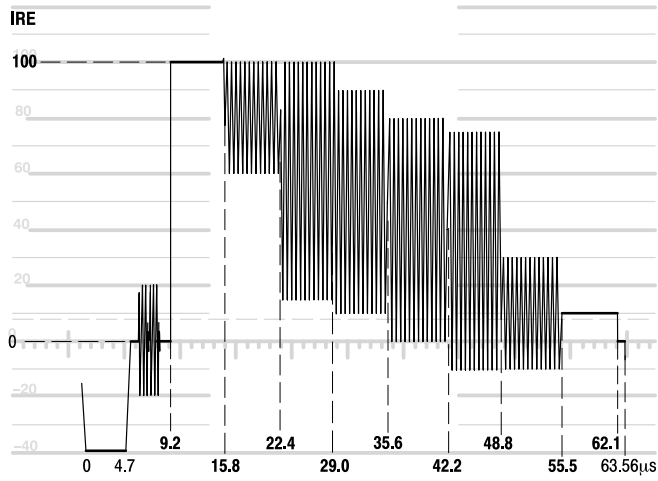
Figure 3–4: FCC Color Bars
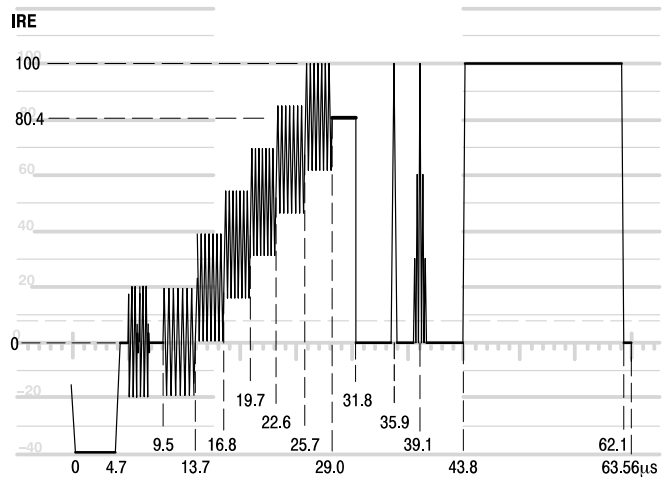
Figure 3–5: FCC Composite
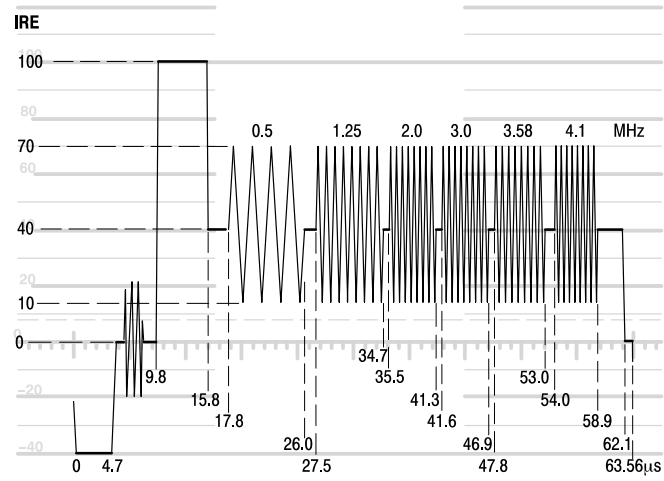
Figure 3–6: Multiburst
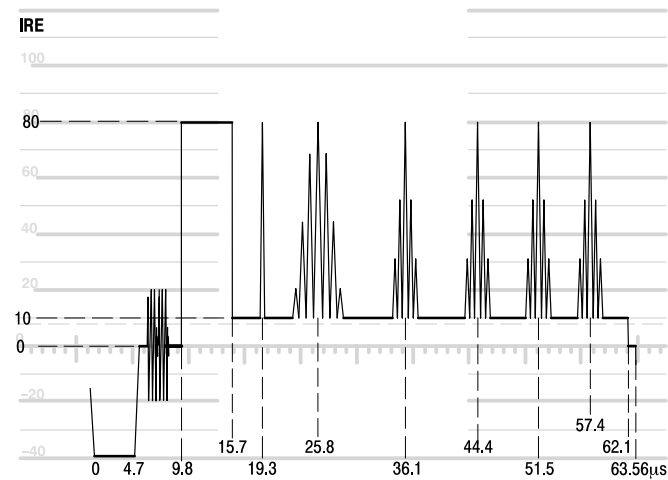
Figure 3–7: Multipulse
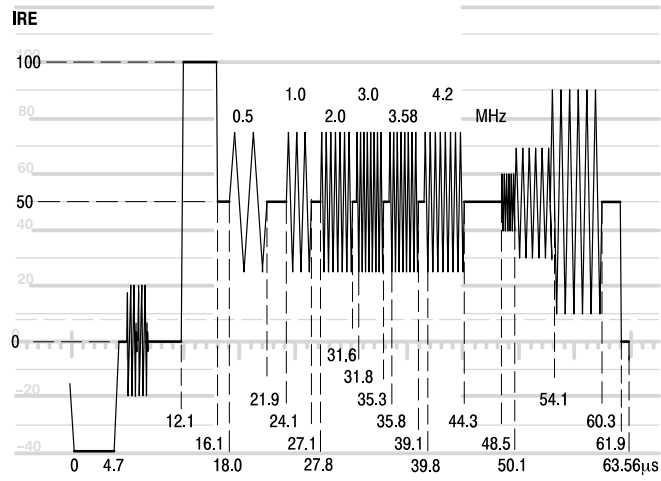
Figure 3–8: NTC7 Combination
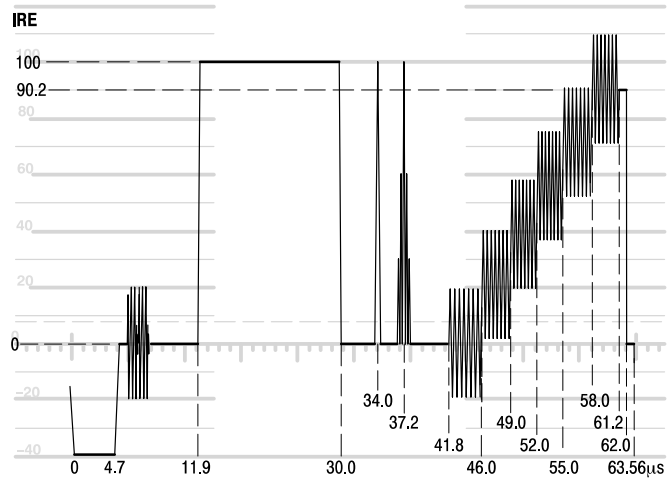
Figure 3–9: NTC7 Composite
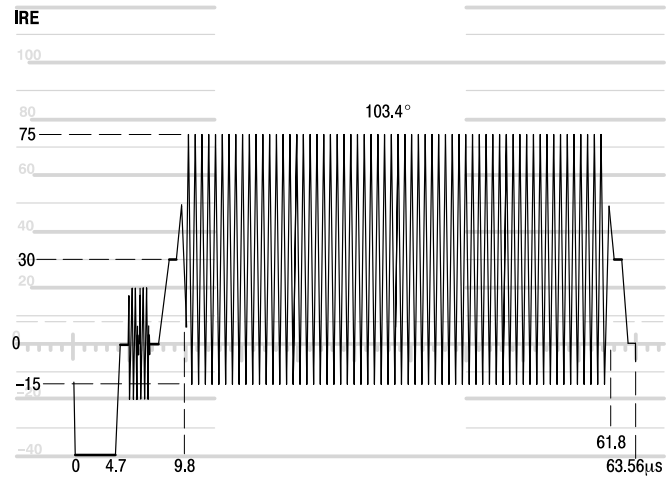
Figure 3–10: Red Field
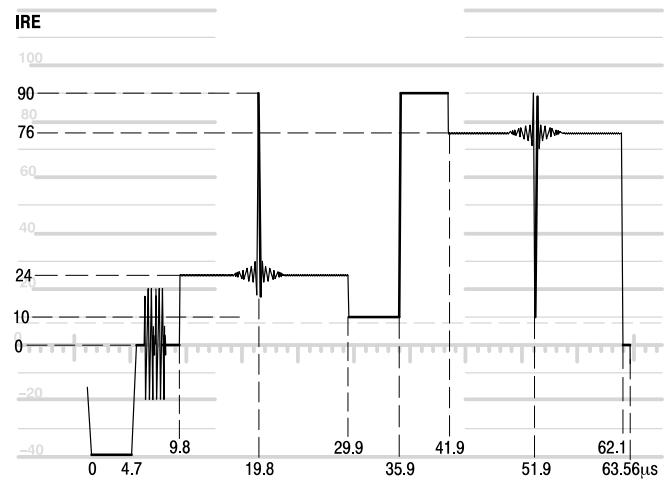
Figure 3–11: SIN X/X
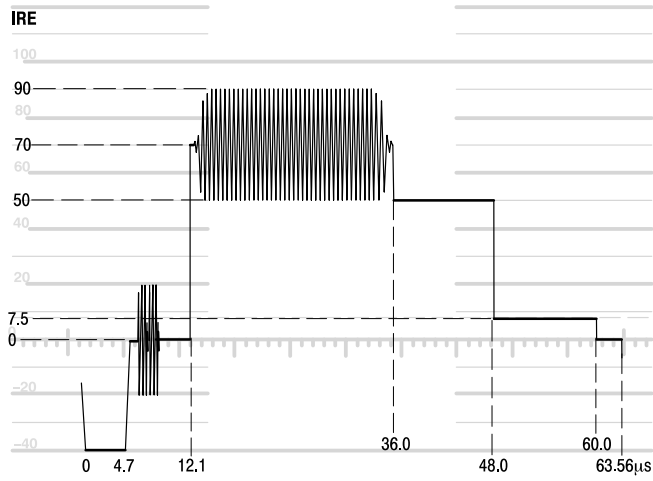
Figure 3–12: VIRS
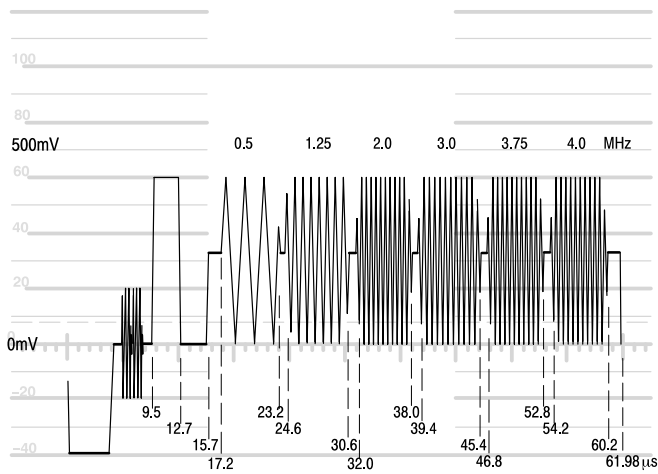
Figure 3–13: Cable Multiburst
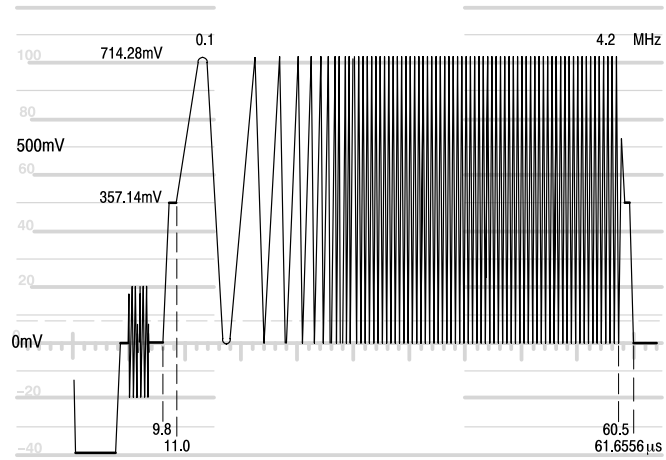
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Figure 3–14: Cable Sweep

Specifications

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Theory of Operation

Theory of Operation

This section of the manual begins with a functional description of the circuitry. This brief discussion is followed by a more detailed set of circuit descriptions that take you to the individual component level of the schematic diagrams.

Functional Description

Program In. The program input is buffered and clamped. The clamped program video drives the Sync Stripper that strips off composite sync and generates the backporch timing for the Clamp.

Genlock. The genlock calculates the SCH phase of the incoming video to determine the correct color framing. A phase-locked loop is used to control a voltage-controlled oscillator (VCO). When the VITS inserter is genlocked, a frame reset pulse is generated to align the test signal counters with genlock counters.

Test Signal Generation. The VITS 100 NTSC VITS Inserter can insert four lines on odd and even fields. Signals are selected with four DIP switches on the main circuit board. The lines from the switches are multiplexed and form one of the inputs to the Test Signal Generator.

Test signals are generated by clocking data from PROMs to a digital-to-analog converter (DAC) at an 8_{FSC} rate. The output of this DAC is filtered and buffered before driving the VITS Inserter.

Program Out. The VITS inserter video signal output can be from any of three sources: clamped video through the instrument, VITS signals inserted on one of the four VITS lines, or the bypassed program line. The bypassed program line has a built-in delay line to maintain the precise time relationship between the processed and bypassed video.

Remote Control. Remote control is limited to ground-closure bypass control and the power, unlocked, and bypass indicator lines.

Power Supply. The power supply, located on the Inserter board, is a current-mode controlled, discontinuous, flyback, switching power supply. The current output is distributed among the four supplies.

The power inductor is driven by switching the voltage to its primary winding on and off at a rate of approximately 45 kHz. The power inductor is used as an energy storage device. Energy is stored in the primary during the first half of the switching cycle. On the second half of the switching cycle, the stored energy is transferred to the secondaries.

Regulation is accomplished through feedback from the +5 V supply to the Pulse Width Modulator that controls the primary voltage. The Pulse Width Modulator varies the length of time that voltage is applied to the primary changing the amount of stored energy.

All primary voltages are referenced to a floating ground, not chassis ground. An isolation transformer or a differential amplifier is therefore required for trouble-shooting the circuitry in the primary and the Pulse Width Modulator.

Circuit Description

The following circuit description takes you down to the component level. Because of the arrangement of circuits on the schematic diagrams, most of the functional headings cover circuits that appear on more than one schematic diagram.

In this discussion active-low signals are denoted by overbars ($\overline{\text{like this}}$). Signal names are in lower case and enclosed in quotation marks ("like this").

Test Signal Generation

The circuitry that generates the test signals for insertion appears on three of the schematic diagrams located in the *Diagrams* section of this manual. Key circuitry is located on diagrams 1 (Test Signal Memory), 3 (H & V Counters, Source Identification & Bypass Controls), and 7 (Analog Output).

Diagram 3. Test signal generation starts with a 4_{FSC} clock that clocks the Horizontal Counter, U28, to provide 910 counts per line of video. In addition, this counter decodes the backporch clamp pulse, for the test signal. The output of the Horizontal Counter drives a Horizontal Decoder PROM, U27, to provide timing signals for various functions. The Horizontal Counter is reset by the frame pulse, from the genlock circuitry in order to time the test signals to program video.

A once-per-line pulse from the Horizontal Decoder PROM (pin 14) enables the Vertical Counter, U24. This synchronous output of the Vertical Counter drives the Vertical Decoder PROM, U25. Output of U25 is latched twice per line by U26, which is clocked by the "vlatch" from U27 (pin 16).

Diagram 1. Test signal data is stored in PROMs U4, U5, and U6. U4 and U5 store the eight MSBs of alternate data samples. U6 stores the four LSBs for all data

samples. The outputs of U4 and U5 are multiplexed by U82 and U83 to increase the data rate from 4 $_{FSC}$ to 8 $_{FSC}$. The outputs of U82 and U83 are latched by U1 before being converted to ECL levels. U9 and U10 are the level converters for the DAC, U65, which is located on Diagram 7. The four LSBs are latched by U3 and then selected by a multiplexer, U7 before being converted to ECL levels by U11.

Test signal data is stored in U4, U5, and U6 in blocks of eight. The blocks of data are addressed by the Block PROM, U13, and two test signal select lines. When the test signal select circuitry calls for a given test signal, the Block PROM uses V1 to determine the correct phase of subcarrier, uses "halfline" to determine when to generate a half line, and uses the seven MSBs of horizontal count to select the appropriate blocks of data.

Diagram 7. The U65 is a 12-bit DAC that turns the data into analog voltage levels at an 8 $_{FSC}$ rate. A one-volt reference is generated for the DAC by U84. The analog output signal is filtered by a 7-pole filter, L12, L13, and L14, with T2 functioning as a second order group delay correction.

The signal is AC coupled to a buffer, U67, and clamped to remove any DC level change with temperature. This allows the test signal DC level to match the Program Video DC level very accurately.

This video buffer drives the Channel Switch, U64, which switches between Program Video and VITS. The output of Channel Switch drives the MONITOR OUT and the Program Output.

K2 controls the signal to the PROGRAM OUT. It switches the PROGRAM IN through a delay line, L7, L3, and C52 to the PROGRAM OUT when the power shuts off or when the front-panel RELAY BYPASS button is pushed. The delay line in this bypass mode matches the time it takes for the video to travel through the processing circuitry.

Genlock The circuitry that genlocks to the incoming program signal appears on three of the schematic diagrams in the *Diagrams* section of this manual. Key circuitry is located on diagrams 4 (Genlock), 5 (Program Input, Sync Stripper, VIRS Detection, & Genlock A/D Input), and 6 (Clocks).

Diagram 5. U42 buffers and clamps the program input signal The output of U42 also drives the Sync Stripper, U44. U44 strips off the composite sync and generates the backporch timing pulse used by the clamps.

Composite sync and the backporch timing are shifted to TTL levels by Q1, Q3, VR1, and VR2. Their outputs are gated together by U57A and U57B to produce the clamp pulse for U42.

The Input Buffer, U42, also drives the genlock analog-to-digital converter (ADC), U43. The ADC also has AGC and is clamped with "synctip" and "backporch" signals, which provide the timing.

The clamped and AGC'd video is then routed through an anti-aliasing filter (L1, C19, C20, and C21), and then reinput to the ADC where it is digitized. The digital output is input to a PAL, U41. where it is inverted and latched. The signal "sis_tm" from the genlock ASIC, on diagram 4, holds the same sample across the bottom of sync to block Sound-in-Sync pulses from upsetting the genlock circuitry.

Diagram 4. The output data from the PAL on diagram 3 is input to the Genlock ASIC, U29, which has RAM, counters, decoders, and the other genlocking circuitry. Composite sync is routed to the genlock ASIC through a PAL, U70. The genlock ASIC uses the composite sync to roughly position the horizontal and vertical counters.

The Genlock Processor, U35, is an 8 MHz Z80 that calculates the SCH of the incoming video in order to determine the correct color framing. The processor uses the digitized color subcarrier burst to determine the tangent of the phase angle between the system clock and the burst. This tangent is used to look up the arctangent (that is, the angle itself), which is stored in a PROM, U33. The angle is used as a correction to the system clock, on diagram 6, to form a phase-locked loop.

Diagram 6. The correction is an 8-bit word which is sent to DAC, U59. The output of the DAC is integrated by an operational amplifier, U61A and C46. U60 is an analog switch that is used to short the integrator when searching for genlock and to change the loop characteristics once lock is securely acquired. The processor also increases loop gain once lock has been acquired and enables the Genlock ASIC to output a frame reset pulse to align the test signal counters with the genlock counters.

Y39 is the clock for the genlock processor (NOT the system clock). U31 is a hardware watchdog that resets the processor if it fails to receive an "awake" signal from the processor within the right amount of time. U38 latches control signals "glk/$\overline{\text{int}}$" and "acq/$\overline{\text{hold}}$" for U60, an analog switch, and the signal "locked" to signify that genlock has been achieved. Counter/Timer U30 is used to distinguish between even and odd fields of video.

Genlock sub-clock cycle timing can be adjusted up to 90° with S7. The VITS signals are timed to program video input at the factory and should not need adjustment.

S8 is a diagnostics switch; see the *Maintenance* section for details.

Signal and Switching Control

The circuitry that controls signal switching appears on three of the schematic diagrams in the *Diagrams* section of this manual. Key circuitry is located on diagrams 1 (Test Signal Memory), 2 (Test Signal Select), and 5 (Program Input, Sync Stripper, VIRS Detection, & Genlock A/D Input).

Diagram 2. Signal selection is accomplished with four dual in-line package (DIP) switches, S1, S2, S3, and S4. The lines from the switches are multiplexed by U18, U19, U20, and U21 to select the appropriate switch segments at the correct time (S1 segments 1 through 4 during line 17 odd fields, for example).

The multiplexing is controlled by two bits from the Vertical Decoder and the field signal from the Vertical Counters on diagram 3. Two PALs, U16 and U17, located on diagram 1, decode control signals and latch the signal selections. U16 latches the bits to the test signal PROMs, and decodes when the source ID signal is requested. Signals "vdrive" and "vsync" force the generation of vertical sync.

Diagram 5. U17, on diagram 1, decodes when Auto VIRS has been requested. It enables the circuitry that compares program video to the VIRS test signal to determine if VIRS is present on program video. U46 is an operational amplifier that subtracts low-pass filtered program video from filtered test signals and drives U47A and U47B, a window comparator.

If the program signal and the test signal match closely enough, the comparator output remains high and the output of an OR gate, U48A, remains high; a one shot, U71B, is not triggered. The OR gate can only trigger the one shot when U17, on diagram 1, determines that Auto VIRS has been requested and drives "virsamp" low. The signal "virpres" from U71B returns to U17, on diagram 1, and "ccvirs" from U17 is sent to U14 to control insertion.

Diagram 1. U17 also decodes "dvdrive" and "dvsync" which are delayed from "vdrive" and "vsync" by a half line and therefore are timed with the actual test signals that are generated.

U14 takes the information from U16 and U17, "chswt" (the insertion timing signal), and other timing signals; it then determines two control signals for the program channel switch, "sw0" and "sw1," and one signal to choose between source ID generation and test signal generation, "ts/char."

Source ID Generation

The circuitry that controls source ID generation appears on two of the schematic diagrams in the *Diagrams* section of this manual. Key circuitry is located on diagrams 1 (Test Signal Memory) and 3 (H & V Counters, Source Identification & Bypass Controls).

Diagram 1. U12 and U15 form a state machine to generate the data for shaped pulse edges. When U15 sees a low-to-high transition, it counts up to six and stops. When U15 sees a high-to-low transition it counts back to zero and stops. This count goes to U12, where it is decoded into the data used to produce rising and falling shaped edges out of the DAC, U65 on schematic 6.

When source ID pulses are called for, the outputs of the Test Signal Data Latch, U1, become high impedances, and the outputs of U12 are enabled.

The source identification signal is one line of video with up to sixteen pulses on it that can be recognized by a Tektronix VM 700A Video Measurement Set. The VM 700A expects a start and a stop bit, but the other 14 bits (pulses) can be used to identify up to 16,384 sources.

Diagram 3. The 16 bits can be set or cleared by two sets of DIP switches, S5 and S6, accessible through the rear panel of the instrument. The 16 bits are loaded into two shift registers, U22 and U23, once every line by a signal decoded from the Horizontal Counters. The bits are then shifted out by "idclock," a clock that is decoded from the Horizontal Counters.

Diagram 1. The serialized ID bits go to U15 where they are gated with "idclock" and latched by the 8 $_{FSC}$ clock. If Source ID is chosen for a certain line, U16 activates "iden," which causes the state machine in U15 to be controlled by the latched ID signal.

Remote Control

The circuitry that controls signal switching appears on one of the schematic diagrams located in the *Diagrams* section of this manual. Key circuitry is located on diagram 3 (H & V Counters, Source Identification & Bypass Controls).

Diagram 3. REMOTE, through J27, is limited to a ground closure bypass control signal and three indicator lines: "power," "unlocked," and "bypass." U70, a PAL, gates the remote bypass line, "rembypass," with the "locked" line from the genlock circuitry to control the bypass relay.

Power Supply

The power supply circuitry appears on two of the schematic diagrams in the *Diagrams* section of this manual. Key circuitry is located on diagram 8 (Power Supply) and diagram 9 (Regulator & Decoupling Caps).

Diagram 8. The line current passes through line filter LF1, fuse F1, and power switch S10, and is applied to full-wave bridge rectifier CR12. Two of the diodes within CR12 conduct on each half cycle of the AC input, causing charge to build up on C110. The voltage on C110 will vary anywhere from 120 VDC at low-line (90 VAC) to 350 VDC at high-line, (250 VAC). R157 discharges C110 when power is turned off.

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RT1 is a thermistor that limits inrush current on power-up. RV1 is metal-oxide-varistor that clips any high voltage spikes on the AC line before they get to the switching circuits. DS4 is part of a relaxation oscillator that blinks when the instrument is powered up. L17 and C96 form a low-pass filter to keep noise, developed by the power supply, from getting onto C110 and out to the mains supply. C85 and C86 also attenuate internal noise.

When the instrument is first turned on, C113 charges through R154. When the charge across C113 reaches approximately 16 V, Pulse Width Modulator U78 begins to switch Q16 on and off through the emitter drive circuitry (Q17, CR22, CR21, etc.). The power to maintain the +16 V charge, on C113, comes from the housekeeping winding of T1 through CR9.

If there is insufficient power to maintain the charge on C113, the charge on C115 is quickly depleted. U78 stops oscillating when the voltage on C115 drops to approximately 10 V. When U78 quits oscillating, C113 slowly charges through R154 to begin the kick-start sequence again.

Jumper P17 may be used as a troubleshooting jumper. When it is removed, the housekeeping winding will be disabled and the power supply will start to come up and quickly shut down as charge drains from C113.

Inductor T1 is initially uncharged (zero magnetic flux and no current in the primary winding). Q16 and Q17 form a switch that is turned on by the drive pulse from U78. When the switch turns on, the voltage developed on C110 is applied across the primary winding. See Figure 4–1.

The polarity of this voltage induces secondary voltages that reverse-bias the rectifier diodes, and no current flows in the secondaries while current is flowing in the primary. The primary current builds as a linear ramp, storing energy in T1.

The current path is broken when Q16 and Q17 are switched off. The flyback action of T1 causes the voltages in the secondaries to reverse polarity and the rectifier diodes to turn on. The current in the secondaries linearly ramps down as the energy that was stored in the primary charges the output capacitors and supplies the load demand.

When all of the stored energy from the first half of the cycle is delivered to the load, secondary currents go to zero and the diodes turn off. No current flows in either the primary or the secondaries until Q16 and Q17 are turned back on to start the next cycle.

When the +5 V goes too high, U78 narrows the pulse width to reduce the amount of energy stored in T1; the stored energy is transferred to the load and, as a result, the +5 V goes down. When the +5 V is too low, U78 increases the pulse width and the mechanism is reversed.

Removing P18, a troubleshooting jumper, interrupts the power to T1 for inspection of U78 and the emitter-drive circuit for Q16.
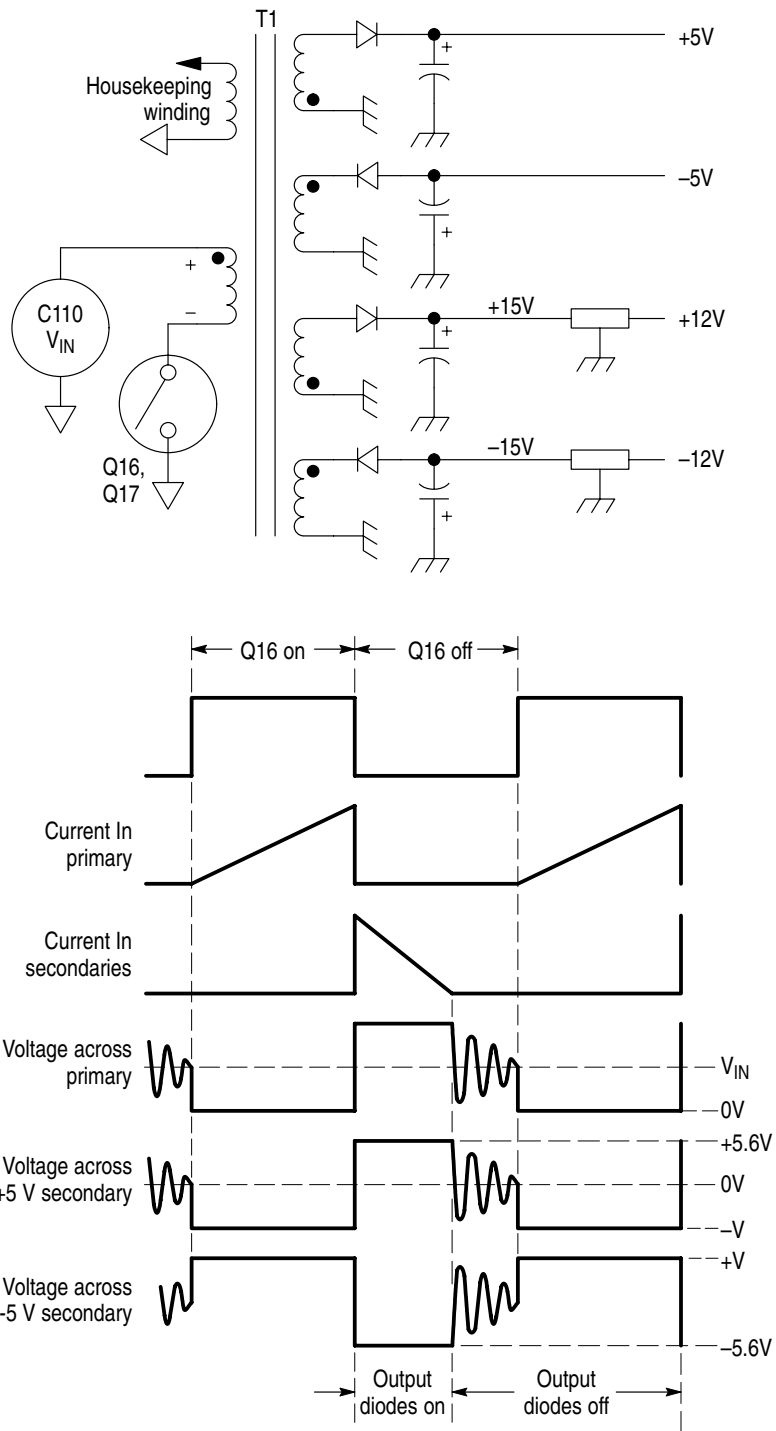
Figure 4–1: Inductor and switching transistor switching functions

VITS 100 NTSC VITS Inserter Instruction Manual

The Pulse Width Modulator, U78, is a current-mode controller. Using inputs from the primary circuit and the +5 V output, it varies the width of the pulse that controls Q16. This pulse width variation regulates the secondary voltages throughout variations in the input voltage, output load, and temperature. R163 senses the current in the primary winding of T1 and applies it to U78–3 as a voltage.

At the start of the cycle a flip-flop within U78 turns Q16 and Q17 on. The primary current, and therefore the voltage to pin 3, ramps up until the level is sufficient to trip the internal comparator, which resets the flip-flop and terminates the drive pulse to Q17, and the energy stored in the transformer transfers to the secondary windings.

Line regulation is automatic and without voltage feedback. As the input voltage increases, the slope of the ramp increases and the trip point is reached sooner, creating a narrower pulse width.

Load regulation is accomplished by sensing the +5 V output, resistively dividing it to 2.5 V, and comparing it to a 2.5 V reference to develop the error signal fed back to the Pulse Width Modulator. U74 is a band-gap reference set to function as an error amplifier with a 2.5 V internal reference. Pin 3 of U74 provides the error signal that is coupled through U75, an opto-isolator, to U78.

If the load increases, the signal at U78, pin 2, drops in voltage, which causes U78 to increase the pulse width and thus increase the current through T1. If the load decreases, the +5 V increases momentarily and output pulse width decreases. Q18 adds a portion of the timing ramp to improve noise immunity.

If the ramp voltage at U78, pin 2, reaches 1 V the output drive pulse ends and Q16 and Q17 shut off. The maximum primary current in T1 is limited to about 1.5 A, which corresponds to a maximum power level of approximately 60 W.

U78, pin 1 is an indication of the peak current in T1. This voltage is fed to the inverting input of U76 and compared to a fixed voltage set by divider R161, R171, and R160. R171, an output power adjustment, is set so the trip point will be approximately 70 W. If U78, pin 1 goes high enough to trip U76A, pin 1 low, C99 starts to charge. If this condition persists long enough for the charge on C99 to reach 700 or 800 mV, Q18 turns on and applies the reference voltage directly to U78, pin 3 to shut down the supply. In this condition the supply will continuously cycle through kick start, current limit, and shutdown until the problem is corrected.

Jumper P9 is included for troubleshooting; its removal disables the current limit shutdown circuits.

Q16 is a high blocking voltage (1000V) power transistor. To prevent transistor failure and ensure proper operation, its base must have a large forward current during the on-time and a large momentary reverse current pulse during turn off.

These requirements are met by using a FET, Q17, in the emitter circuit to turn Q16 on and off. The modulated pulse from U78 gates Q17.

When Q17 turns on, base current flows in Q16 through R149 and CR22 (which turns on) and current flows in the primary winding of T1, completing the circuit through Q16, Q17, and R163 into the floating ground. CR20 keeps Q16 from going into hard saturation by diverting some of the base current into the collector when it turns completely on.

When Q17 turns off, the current path from the collector of Q16 to its emitter no longer exists. For a brief time, the collector current becomes reverse flowing base current in Q16. When this current flows out of the base through CR21, it charges the housekeeping capacitor, C113, which turns Q16 off very rapidly.

When Q16 turns off, a voltage spike appears at its collector. A combination of reflected secondary voltages, input voltage, and transformer leakage inductance produces a voltage spike of high magnitude. A snubber circuit consisting of R153, CR19, and C97 dissipates some of the energy in the T1 leakage inductance.

12 V is generated from the 15 V secondary output of T1. The 15 V at C102 and C103 passes through RC filters and is applied to the three-terminal linear regulators (U73 and U85) to derive the + and –12 V outputs.

Over-voltage protection is provided on the +5 V output by a crowbar circuit composed of Q15, VR4, and R146. If the +5 V output exceeds approximately +5.5 V, VR4 will start to conduct. When VR4 draws enough current through R146 to raise the gate voltage for Q15 (an SCR) above its cathode by approximately 0.7 V, VR4 turns on and shorts the +5 V output to ground, forcing the primary circuit into current limit.

Diagram 9. The regulated 5 V supplies used by the ADC and the DAC are generated from the 12 V supplies by three-terminal linear regulators (U52 and U53).

Performance Verification

Performance Verification

This section contains procedures for verifying that the VITS 100 NTSC VITS Inserter performs according to the characteristics stated in the *Specifications* section of this manual.

If the VITS inserter fails to meet a performance requirement, consult the *Adjustment Procedure* section and make only those adjustments that affect the "out of spec" characteristic.

Verify the performance of the VITS inserter at regular intervals to ensure that the instrument continues to perform within tolerance. The recommended interval for performance verification is 2000 hours of operation or 12 months, whichever comes first.

Incoming Inspection Test

Two procedures may be used for incoming inspections. Use the *Functional Check* procedure in the *Getting Started* section to verify instrument function. To confirm that the instrument meets guaranteed specifications, use the following Performance Verification procedure.

Verification of Tolerance Values

For Performance Verification, use test equipment with measurement accuracy of at least four times the tolerance of the specification being tested. If you do not, the error of the measuring apparatus may invalidate the test results.

Equipment Required

Table 5–1 lists the test equipment recommended for Performance Verification. Alternate equipment must meet the minimum requirements for the listed equipment. Use of inadequate test equipment may result in faulty measurements and invalid results.

Table 5–1: Equipment Required

Item	Requirements	Example
Variable Autotransformer	Variable range of 90 to 120 VAC (220 V operation use 220 VAC autotransformer)	General Radio metered auto transformer: W10MT3W.
Video Measurement Set	Waveform storage and automatic waveform comparison	Tektronix VM 700A, Option 01
Waveform/Vector Monitor	Combination waveform monitor and vectorscope capable of displaying line-rate and field-rate signals	Tektronix 1780R Video Measurement Set
Television Test Signal Generator	NTC7 Composite, Flat Field, Multiburst, and Red Field signals	Tektronix TSG-170A NTSC Television Generator
Television Test Signal Generator/Sync Pulse Generator (TSG/SPG)	Variable burst amplitude and frequency and high frequency multiburst signal	—
Spectrum Analyzer	1 MHz to 50 MHz with a frequency span of 1 MHz/div to 10 MHz/div and 30 kHz resolution, and internal tracking generator	Tektronix 2712 Spectrum Analyzer with Tracking Generator Option 04
75 Ω Return Loss Bridge	50 dB return loss balanced bridge, 50 kHz to 5 MHz frequency range	Wide Band Engineering A57TLSCR with A56T75B (75 Ω terminator)
Test Oscilloscope	Vertical amplifier bandwidth of 40 MHz, 1 mV sensitivity, and 0.25% accuracy. Horizontal time base of 5 msec/div to 2 msec/div and external triggering.	Tektronix TAS465
Oscilloscope 10X Probe		Tektronix P6137 10X Probe
Frequency Counter	Measure frequencies up to 30 MHz ECL levels, with 10 Hz accuracy at 28.6 MHz	Tegam DC503A a Universal Counter/Timer
Peak-to-Peak Detector and Detector Head	Amplitude of up to 1 V_{p-p} and a flatness of +0.2% from 50 kHz to 10 MHz	Tektronix part number 015-0408-00
Video Noise Generator	White noise on composite video, signal-to-noise ratio of at least 28 dB, Hum noise on composite video with a 0 dB signal-to-noise ratio, 1 dB steps with DC coupling, 75 Ω impedance, and flat response to 5.5 MHz.	—
Multimeter	Accuracy of +0.7% to measure 0–20 VDC.	Tektronix DM252
Power Module	Power supply for Frequency Counter, Peak-to-Peak Detector, video noise generator, and Multimeter	Tegam TM506A Power Module Mainframe
75 Ω End-Line Terminators (two)	0.25% Accuracy	Tektronix part number 011-0102-01

Table 5–1: Equipment Required (Cont.)

Item	Requirements	Example
75 Ω Feed-Through Terminator	BNC-type, accuracy of 0.2%.	Tektronix part number 011-0103-02
BNC Adaptor	Female-to-female	Tektronix part number 103-0028-00
75 Ω BNC Cables (five)	42 in coaxial cables, male BNC ends	Tektronix part number 012-0159-00
Precision 50 Ω BNC cables (two)	Male BNC ends	Tektronix part number 012-0482-00
50 Ω to 75 Ω Minimum Loss Attenuator	BNC connectors.	Tektronix part number 011-0057-01

Verification Procedure

This is a step-by-step procedure that begins with switching the instrument on. While waiting for the VITS inserter to warm up, store the signal references in the video measurement set.

Power Up

This is a preparatory step that ensures all equipment will be ready to operate when you begin to verify VITS inserter performance.

1. Connect the VITS inserter power cord to the variable autotransformer.

2. Set the autotransformer for 115 volts. (Set it to 230 volts for systems powered with 220/240 volt sources.)

3. Turn on the autotransformer, test signal generator, and video measurement set.

4. Turn the VITS inserter power on.

5. Allow all equipment to warm up for the period prescribed by the equipment manufacturers (a minimum of 20 minutes).

Test Signal References

The video measurement set stores reference signals for later comparison. The following steps store the references for these comparisons. The test signal is the NTC7 composite waveform from the television test signal generator. See *Specifications* for more information on this signal.

NOTE. *Steps 1 through 8 store reference signals in the video measurment set (VM700A) that are later recalled for signal element comparisons.*

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1. Connect a 75 Ω coaxial cable from the output of the television test signal generator to the video measurement set Ch A input. Terminate the open side of the loop-through input with a 75 Ω end-line terminator.

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2. Select the NTC7 Composite signal from the television test signal generator.

3. Store the bar and the line time portions of the NTC7 composite signal as a video measurement set reference signal.

4. Store the C–L gain + delay portions of the NTC7 composite signal as the video measurement set reference.

5. Store the diff phase + gain portions of the NTC7 composite signal as the video measurement set reference.

6. Select Waveform on the video measurement set.

7. Select the black burst signal from the television test signal generator.

8. Store the black burst signal as the noise spectrum signal for the video measurement set.

Select VITS   To make the remainder of this procedure easier to perform, start by inserting only the 0% black signal on line 17 of fields 1 and 3. Be sure to record the current settings of the VITS selection switches before resetting them for this procedure; reset the switches to these settings when returning the instrument to service.

1. Remove the small access plate from the top of the VITS inserter and check the settings of dual-inline-package (DIP) switches S1–S4 (see Figure 5–1). Record the settings so you can restore them once you complete this procedure.
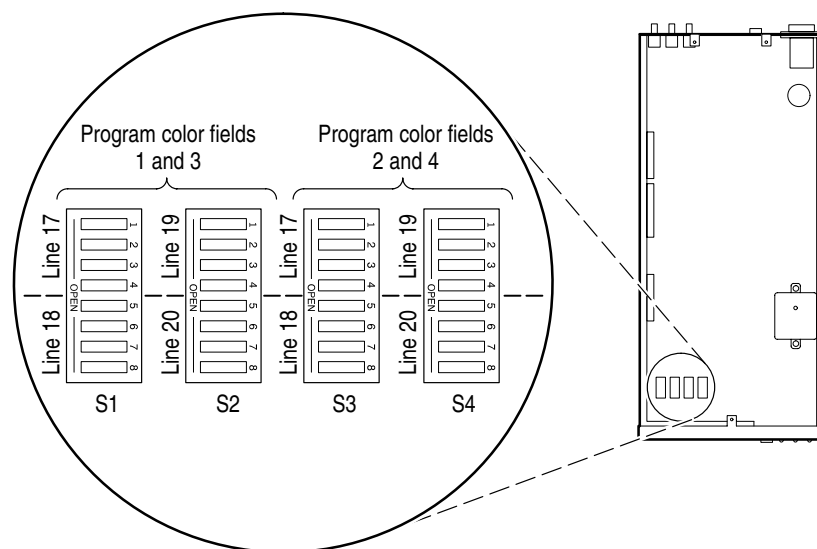
Figure 5–1: VITS selection DIP switches

NOTE. The settings of S1-S2-S3-S4 dictate the signals, lines, and fields for the VITS insertion program. Because the instrument may contain a required operating program, it is essential that the switches be reset to the original settings when this procedure is completed.

2. Set DIP switch S1, segments 1, 2, 3, and 4 (line 17, field 1) for 0% Black (0110) signal; see Table 5–2.

NOTE. Switch settings in Table 5–2 are for standard instruments. Signal, line, and field assignments for the options are in Appendix A: Options.

Table 5–2: DIP Switch Settings

VITS inserter Action		DIP Segment Settings*			
		1 (5)	2 (6)	3 (7)	4 (8)
Insert Test Signals:	0% Black (use either setting)	0	1	1	0
		1	0	0	1
	7.5% Black	1	1	1	0
	50% Gray	1	1	0	1
	FCC Color Bars	0	0	0	0
	FCC Composite	1	0	0	0
	Multipulse	0	1	0	0
	Multiburst	0	1	0	1
	NTC 7 Composite	1	0	1	0
	NTC 7 Combination	0	0	0	1
	Red Field	1	1	0	0
	SIN X/X	0	0	1	0
	VIRS	1	0	1	1
Pass Program Video		1	1	1	1
Auto VIRS		0	0	1	1
Insert Source ID		0	1	1	1

* 1 signifies an OPEN switch; 0 signifies a closed switch

3. Set all the remaining DIP switches to the "pass incoming" position, which is all segments open (1111).

Line Input Range Requirement: Stable VITS inserter operation over an AC input range of
90–250 V

■ Vary the autotransformer between 90 and 125 Vac (210 and 250 Vac for "220
volt" sources) and verify stable instrument operation.

**Program Channel to
Test Signal Matching** Requirements:
DC offset $= 0$ V ± 10 mV
Insertion transients ≤ 10 mV
DC matching of inserted test signal to program signal ± 3 mV

1. Connect a 75 Ω coaxial cable from the television test signal generator signal
output to the VITS inserter PROGRAM IN. See Figure 5–2.
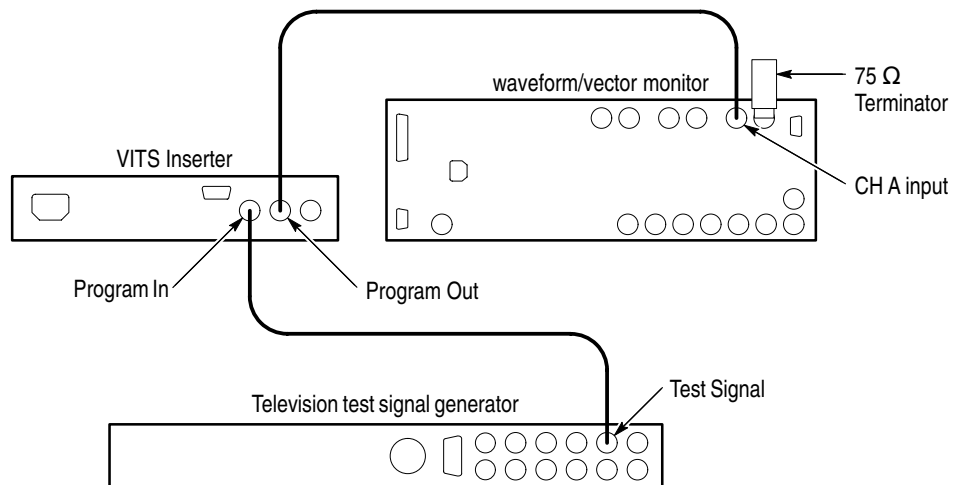
Figure 5–2: Measuring VITS on a waveform/ vector monitor

2. Connect a 75 Ω cable from the VITS inserter PROGRAM OUT to the
waveform/vector monitor CH A Input. Terminate the remaining side of the
loop-through input with a 75 Ω end-line terminator. See Figure 5–2.

3. Use the waveform/vector monitor input selector switch to ground the input
and position the waveform monitor trace on 0 IRE level of the graticule.

4. Set the waveform/vector monitor to Ch A DC input.

5. Check that the signal blanking is at 0 V ± 10 mV (± 3 minor div). See
Figure 5–3.

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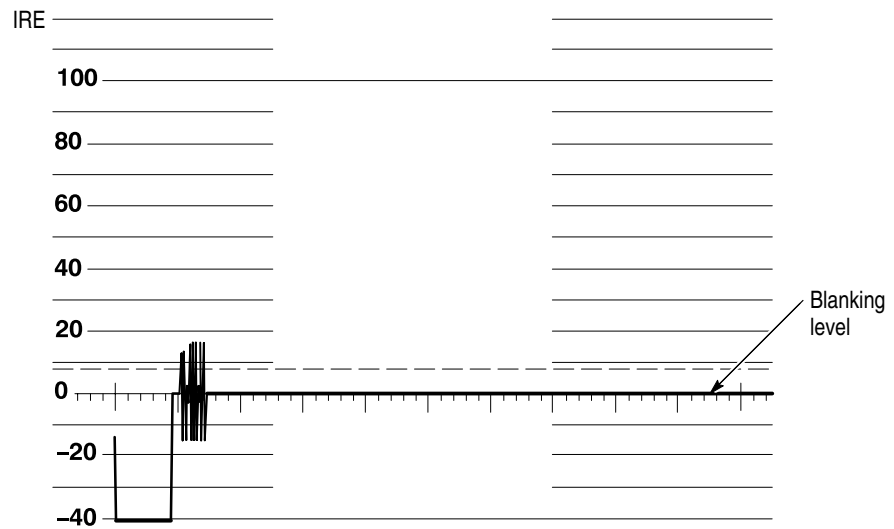
Figure 5–3: Blanking level at 0 IRE

6. Move the 75 Ω coaxial cable from the VITS inserter PROGRAM OUT to the MONITOR OUT.

7. Repeat steps 3, 4, and 5.

8. Move the 75 Ω coaxial cable from the VITS inserter MONITOR OUT to PROGRAM OUT.

9. Use the waveform/vector monitor line select to display line 17 for all fields.

10. Check that the inserted 0% black (line 17 fields 1 and 3) matches the blanking level of the passed lines (line 17 of fields 2–4) ±3 mV (1 minor division).

Phase Match of Inserted Test Signal to Program Video Channel

Requirement: Phase match ±1°

1. Connect a 75 Ω coaxial cable from the Test Signal Generator/Sync Pulse Generator (TSG/SPG) subcarrier output to the waveform/vector monitor Ext CW Ref. Terminate the remaining side of the loop-through input with a 75 Ω end-line terminator. See Figure 5–4.
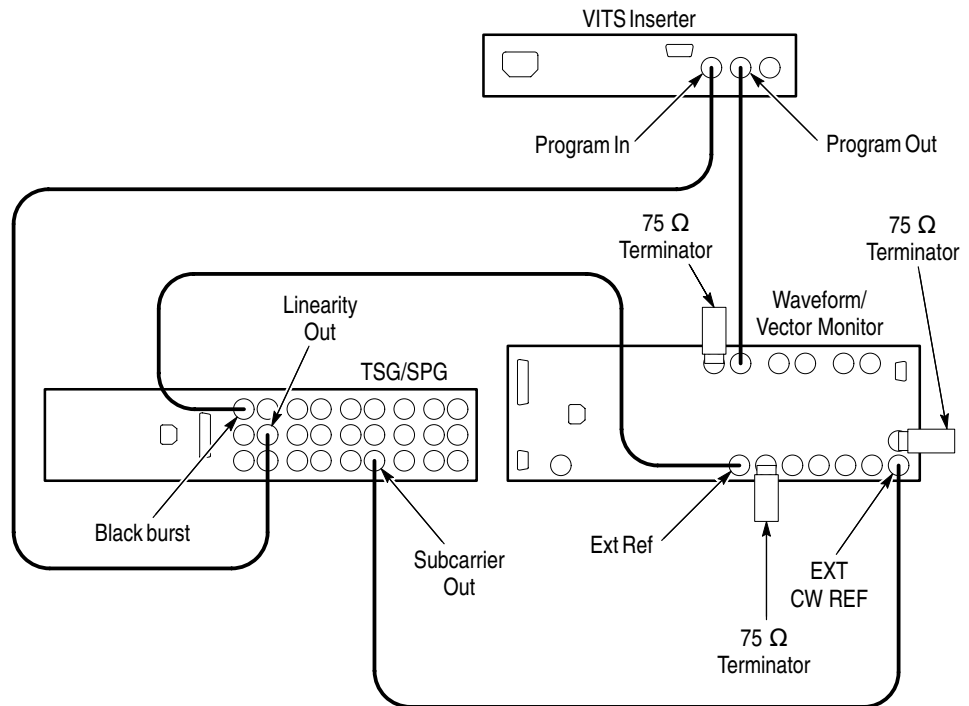
Figure 5–4: Equipment connections for phase matching

2. Connect a 75 Ω coaxial cable from the TSG/SPG black burst output to the waveform/vector monitor External Ref. Terminate the remaining side of the loop-through input with a 75 Ω end-line terminator. See Figure 5–4.

3. Connect a 75 Ω coaxial cable from the TSG/SPG linearity output to the VITS inserter PROGRAM IN. See Figure 5–4.

4. Select the modulated ramp as the TSG/SPG linearity signal.

5. Connect a 75 Ω coaxial cable from the VITS inserter PROGRAM OUT to the waveform/vector monitor CH A input. See Figure 5–4. Terminate the remaining side of the loop-through input with a 75 Ω end-line terminator.

6. Select External CW Ref on the waveform/vector monitor.

7. Select waveform/vector monitor Diff Phase measurement.

8. Set the burst vector to the outer circle and 0° on the vectorscope. Use the phase control to null the burst on the waveform CRT.

9. Set the waveform/vector monitor for line select to display field 1, line 17.

10. Check that the burst vector is still at 0° ± 1°.

Phase Match Bypass Path to Program Path

Requirement: Phase error $= 0° \pm 1°$ at F_{SC}.

1. Turn off waveform/vector monitor line select.

2. Set the burst vector to the outer circle and $0°$ on the vectorscope. Use the phase control to null the burst on the waveform CRT.

3. Press the BYPASS switch on the VITS inserter front panel; the BYPASS LED should light and stay lit.

4. Check that the vector moves no more than $1°$ as seen on the waveform/vector monitor vector display.

Program Video Gain and Line Tilt

Requirements:
  Gain $=$ Unity $\pm 1\%$
  Line Tilt $\leq 0.5\%$

1. Press the VITS inserter BYPASS switch and return to normal operation (BYPASS LED off).

2. Connect a 75 Ω coaxial cable from the VITS inserter MONITOR OUT to the video measurement set Ch A input. Terminate the remaining side of the loop-through input with a 75 Ω end-line terminator. See Figure 5–5.
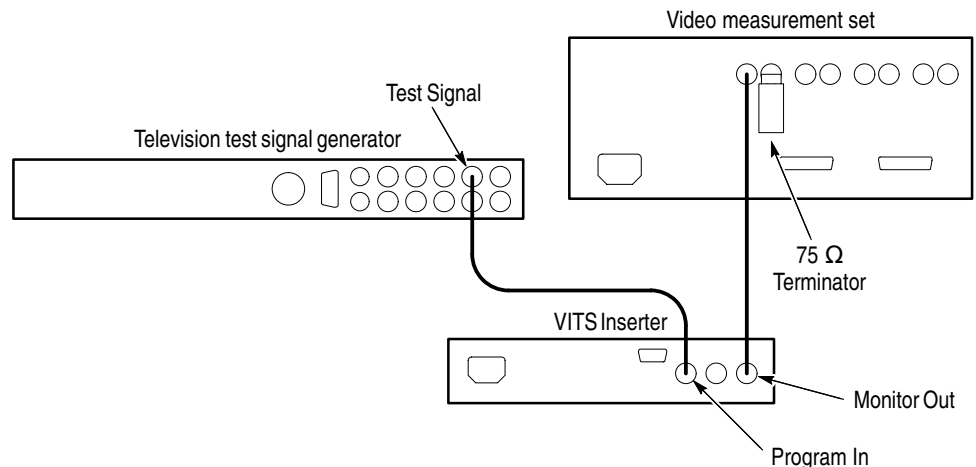
Figure 5–5: Using the video measurement set to measure waveform characteristics

3. Connect a 75 Ω coaxial cable from the television test signal generator output to the VITS inserter PROGRAM IN.

4. Set VITS inserter DIP switches S1 and S3 to 1010 (segments 5 and 7 open, segments 6 and 8 closed) to insert the NTC 7 Composite test signal on line 18 of all fields.

5. Select the NTC 7 Composite test signal from the television test signal generator.

6. Select Relative to Ref Bar & Line Time on the video measurement set.

7. Check that the bar amplitude is 100 IRE $\pm$ 1% (1RE).

8. Check that the bar tilt is $\leq$ 0.5%.

9. Move the 75 Ω coaxial cable from the VITS inserter MONITOR OUT to the PROGRAM OUT.

10. Check that the bar amplitude is 100 IRE $\pm$ 1% (1RE).

11. Check that the bar tilt is $\leq$ 0.5%.

12. On the video measurement set, select line 18 (any field).

13. Check that the bar tilt is $\leq$ 0.5%.

14. Check that the bar amplitude is 100 IRE $\pm$ 1% (1RE).

Chrominance to Luminance Gain and Delay

Requirements:
    Chrominance-to-luminance gain $\leq \pm 0.5\%$
    Chrominance-to-luminance delay $\leq$ 0.5 ns

1. Select Relative to Ref C–L Gain + Delay on the video measurement set.

2. Return the video measurement set to full field measurement.

3. Check that the chroma gain is 100.0 $\pm$ 0.5%.

4. Check that the chroma delay is 0.0 $\leq$ 5 ns.

5. Select line 18, any field, on the video measurement set.

6. Check that the chroma gain is 100.0 $\pm$ 0.5%.

7. Check that the chroma delay is 0.0 $\leq$ 5 ns.

8. Move the coaxial cable at the VITS inserter from PROGRAM OUT to MONITOR OUT.

9. Return the video measurement set to full field measurement.

10. Check that the chroma gain is 100.0 $\pm$ 0.5%.

11. Check that the chroma delay is 0.0 $\leq$ 5 ns.

Differential Gain and Phase

Requirements:
  Differential gain $\leq 0.2\%$
  Differential phase $\leq 0.2°$

1. Select Relative to Ref Diff Phase + Gain on the video measurement set.

2. Check that the differential gain is $\leq 0.2\%$.

3. Check that the differential phase is $\leq 0.2°$.

4. Move the coaxial cable from the VITS inserter MONITOR OUT to the PROGRAM OUT.

5. Check that the differential gain is $\leq 0.2\%$.

6. Check that the differential phase is $\leq 0.2°$.

7. Select line 18, any field, on the video measurement set.

8. Check that the differential gain is $\leq 0.2\%$.

9. Check that the differential phase is $\leq 0.2°$.

Pulse-to-Bar Ratio

Requirement: Ratio $= 100\% \pm 0.5\%$.

1. Use two 75 Ω coaxial cables, joined with a BNC female-to-female adaptor to connect the test signal generator (TSG) to the video measurement set Ch A Input. Terminate the remaining side of the Ch A loop-through input with a 50 Ω end-line terminator. Select the NTC7 Composite test signal from the TSG. See Figure 5–6.
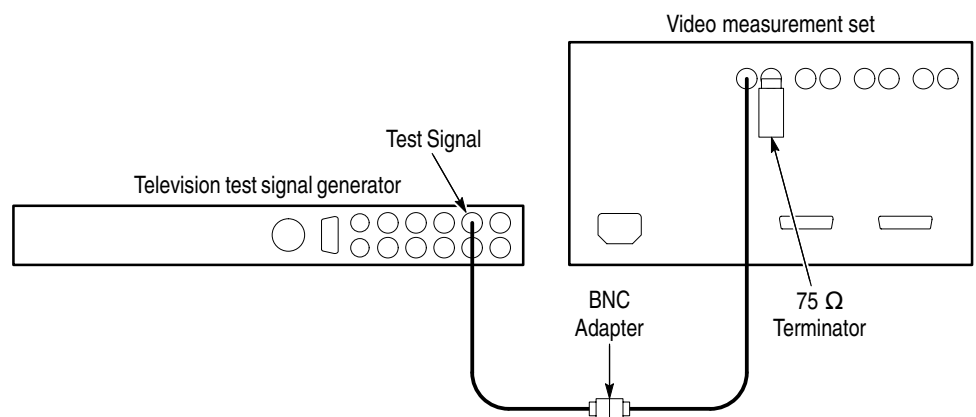
Figure 5–6: Setting up for pulse-to-bar measurement

2. Observe and remember the pulse-to-bar ratio on the video measurement set screen.

3. Remove the BNC female-to-female adaptor and connect the coaxial cable from the video measurement set CH A to the VITS inserter PROGRAM OUT. See Figure 5–7.
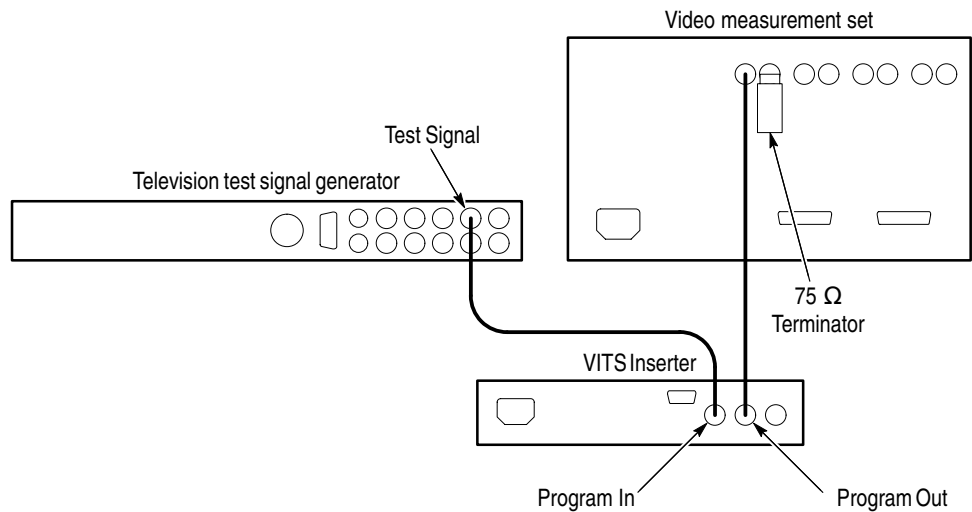
Figure 5–7: Using the video measurement set to compare signals

4. Connect the 75 Ω coaxial cable from the television test signal generator output to the VITS inserter PROGRAM IN. See Figure 5–7.

5. Check that the pulse-to-bar ratio is within ±0.5% of the reading in step 2.

6. Select line 18, any field, on the video measurement set.

7. Check that the pulse-to-bar ratio is within ±0.5% of the reading in step 2.

8. Move the coax from VITS inserter PROGRAM OUT to MONITOR OUT.

9. Return the video measurement set to full field measurement.

10. Check that the pulse-to-bar ratio is within ±0.5% of the reading in step 2.

K-Factor Requirement: K-Factor (2T) ≤ 0.3%.

1. At the video measurement set, select K-Factor measurement.

2. Check that K-factor (2T) is ≤ 0.3%.

3. Select line 18, any field, on the video measurement set.

4. Check that K-factor (2T) is ≤ 0.3%.

SCH Phase   Requirement: SCH phase $= 0° \pm 5°$.

1. Select the video measurement set SCH Phase measurement.

2. Check that the SCH phase is $0° \pm 5°$.

3. Select line 18, any field, on the video measurement set.

4. Check that the SCH phase is $0° \pm 5°$.

Signal-to-Noise Ratio   Requirement: Signal-to-noise ratio >70 dB.

1. Select black burst from the television test signal generator.

2. Check the black burst noise spectrum on the video measurement set for a noise level number greater than 70 dB.

3. Move the coaxial cable from VITS inserter MONITOR OUT to the PROGRAM OUT.

4. Check that the noise level number is greater than 70 dB.

5. Select line 18, any field, on the video measurement set.

6. Check that the noise level number is greater than 70 dB.

Hum Rejection   Requirement: Hum rejection ≥ 50 dB.

1. Connect a 75 Ω coaxial cable from the television test signal generator to the video noise generator Video Input. See Figure 5–8.

2. Connect a 75 Ω coaxial cable from the video noise generator Output to the VITS inserter PROGRAM IN.

3. Turn video noise generator Hum On.

4. Set video noise generator attenuator to 0 dB.

5. Connect a 75 Ω coaxial cable from the VITS inserter PROGRAM OUT to the video measurement set Ch A. Terminate the remaining side of the loop-through input with a 75 Ω terminator. See Figure 5–8.

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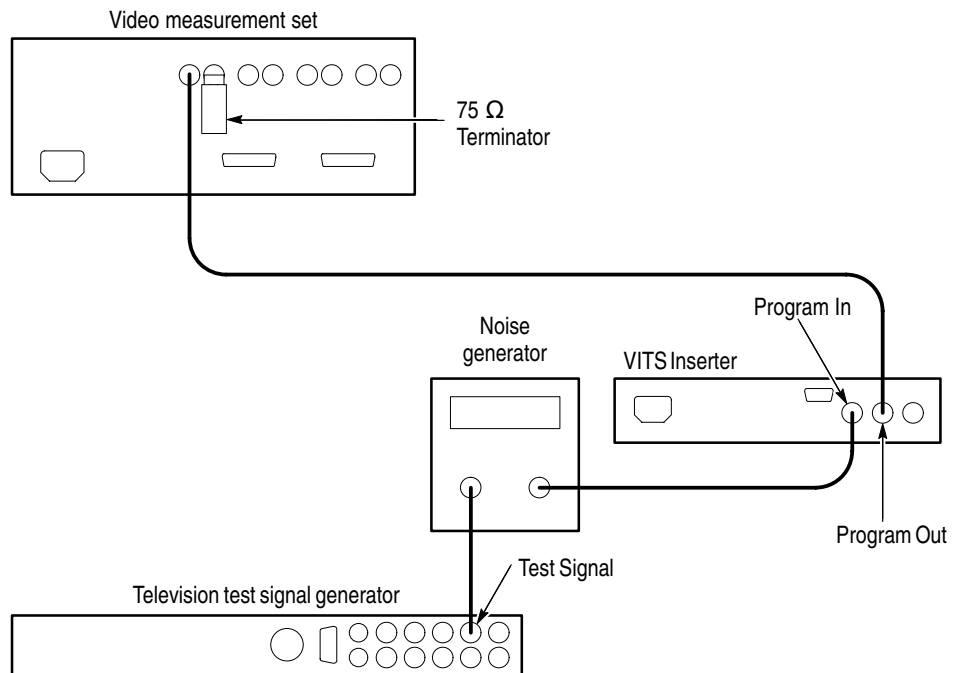
Figure 5–8: Measuring hum rejection

6. Select Waveform on the video measurement set.

7. Check that hum is present on the porch before and after sync.

8. Check that the porch before burst drifts up and down at hum rate.

9. Check that the back porch following burst drifts less than 0.32 IRE at the hum rate.

10. Turn video noise generator Hum off.

Luminance Risetime   Requirement: Luminance risetime = 140 ns ± 20 ns

1. Connect a 75 Ω coaxial cable from the television test signal generator Test Signal output to the VITS inserter PROGRAM IN. See Figure 5–2.

2. Connect a 75 Ω coaxial cable from the VITS inserter PROGRAM OUT to the waveform/vector monitor Ch A Input. Terminate the remaining side of the loop-through input with a 75 Ω terminator. See Figure 5–2 on page 5–6.

3. Measure the leading edge of the bar between the 10 and 90% points (10 IRE to 90 IRE on the waveform graticule).

4. Check that the risetime is between 120 ns and 160 ns.

Chrominance Risetime   Requirement: Chrominance risetime $= 300$ ns ± 35 ns

1. Turn on the waveform/vector monitor vertical magnifier.

2. Position the signal blanking level to the graticule 0 IRE line.

3. Use the waveform/vector monitor vertical variable gain to place the top of color burst at the 100 IRE line.

4. Measure the risetime of the leading edge of burst between the 10 and 90% points (10 IRE to 90 IRE).

5. Check that the risetime is between 265 ns and 335 ns.

Genlock Checks   Requirements:
   Burst phase change $\leq 1°$ over 10% to 90% APL
   Sync lock jitter ≤ 10 ns ($\leq 12°$) over input sync amplitude range of 287 mV ± 3 dB
   Burst phase change $\leq 3°$ for 287 mV ± 6 dB input burst amplitude
   Amplitude lock range $\geq +6$ dB to -12 dB
   Burst phase change $\leq 2°$ over input sync or burst amplitude range of 287 mV ± 3 dB
   Burst phase change $\leq 1°$ for input burst frequency of 3.579545 MHz ± 20 Hz
   Lock to 28 dB S/N ratio video signal

1. Connect a 75 Ω coaxial cable from the TSG/SPG black burst output to the waveform/vector monitor Ext Ref. Terminate the remaining side of the loop-through input with a 75 Ω terminator. See Figure 5–4.

2. Connect a 75 Ω coaxial cable from the TSG/SPG Subcarrier to the waveform/vector monitor Ext CW Ref. Terminate the remaining side of the loop-through input with a 75 Ω terminator.

3. Connect a 75 Ω coaxial cable from the TSG/SPG linearity output to the video noise generator Video Input.

4. Connect a 75 Ω coaxial cable from the video noise generator Video Output to the VITS inserter PROGRAM IN.

5. Set the video noise generator for a 0 dB output level.

6. Connect a 75 Ω coaxial cable from the VITS inserter PROGRAM OUT to the waveform/vector monitor Ch A input. Terminate the remaining side of the loop-through input with a 75 Ω terminator

7. Set the waveform/vector monitor line select to line 19 and check that the VIRS signal is displayed.

8. Set the VITS inserter VITS Selection DIP switches S2 and S4 for the red field signal; segments 1, 3, and 4 are open and segment 2 is closed (1011).

9. Set the waveform/vector monitor for Ext Ref + CW.

10. Select DIFF PHASE.

11. Set the red vector to the outer circle and 0° on the waveform/vector monitor vectorscope. Set the red bar amplitude to null on the waveform monitor.

12. Select the TSG/SPG Linearity AC Bounce.

13. Check that the red bar phase shifts ≤ 1° (10 IRE).

14. Cancel Bounce.

15. Move the coaxial cable from the TSG/SPG linearity out to the full field color bars out.

16. Cancel burst on the TSG/SPG Color Bar.

17. Set the video noise generator Attenuation to + 3 dB.

18. Set the red vector to the outer circle and 0° on the vectorscope.

19. Check that the sync edge jitter is ≤ 12° while changing the video noise generator Attenuation from + 3 dB to –3 dB.

20. Turn on TSG/SPG color bar burst.

21. Return the video noise generator Attenuation to + 6 dB.

22. Set the red vector to the outer circle and 0° on the waveform/vector monitor vectorscope. Set the red bar to null on the waveform monitor.

23. Check that the red bar phase changes ≤ 3° and that the VITS inserter maintains lock while changing the video noise generator attenuation from +6 dB to –6 dB.

24. Continue increasing the video noise generator attenuation to –12 dB.

25. Check that the VITS inserter stays locked.

26. Set the video noise generator attenuation to –3 dB.

27. Set the red vector to the outer circle and 0° on the waveform/vector monitor vectorscope. Set the red bar to null on the waveform monitor.

28. Check that the red bar phase changes ≤ 2° as you vary the video noise generatordB to +3 dB.

29. Return the video noise generator Attenuation to 0 dB.

30. Change the coaxial cable from the TSG/SPG color bar output to the black burst output.

31. Measure burst amplitude. It should measure about 40 IRE.

32. Use the TSG/SPG variable burst control to reduce burst amplitude to 28 IRE (−3 dB).

33. Set the red vector to the outer circle and 0° on the waveform/vector monitor vectorscope. Set the red bar to null on the waveform monitor.

34. Check that the red bar phase changes ≤ 2° as you vary the Burst amplitude from 28 IRE to 56 IRE (−3 dB to +3 dB).

35. Set the burst amplitude to 80 IRE the waveform monitor (+ 6 dB).

36. Set the red bar to null on the waveform monitor.

37. Check that the red bar phase changes ≤ 3° as you vary the burst amplitude from 80 IRE to 20 IRE (+6 dB to −6 dB).

38. Return the TSG/SPG variable burst control to normal.

39. Set the red vector to the outer circle and 0° on the waveform/vector monitor vectorscope. Set the red bar to null on the waveform monitor.

40. Set the TSG/SPG for 20 Hz of offset.

41. Check after the genlock has settled that the red bar has shifted less than 1° (10 IRE).

42. Change the 20 Hz offset polarity.

43. Check after the genlock has settled, that the red bar has shifted less than 1° (10 IRE).

44. Turn off the 20 Hz offset.

45. Set video noise generator for 28 dB noise.

46. Turn White Noise on.

47. Check that the VITS inserter remains locked.

48. Disconnect the video noise generator from the VITS inserter.

Return Loss and Input/Output Impedance

Requirements:

Return loss ≥ 36 dB to 5 MHz.
Spurious signals > 55 dB down

NOTE. *Successful completion of the Return Loss checks guarantees that the input and output impedances are within specification.*

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1. Connect a 50 Ω coaxial cable from the spectrum analyzer RF In to the RF Out on the RF Bridge. See Figure 5–9.
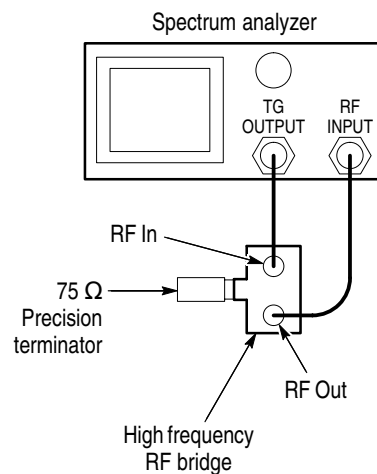
Figure 5–9: Connecting the RF bridge to the spectrum analyzer/tracking generator

2. Connect a 50 Ω coaxial cable from the spectrum analyzer TG Out to the RF In on the RF Bridge.

3. Select Demod/TG on the spectrum analyzer. Turn on the Tracking Generator and set the Fixed Level to 0.00 dBm.

4. Set the spectrum analyzer Span/Div to 1 MHz, Resolution Bandwidth to 30 kHz, and the Center Frequency to 2 MHz.

5. Set the spectrum analyzer Reference Level to the first major division down from the top on the analyzer display.

6. Set the spectrum analyzer Vertical Scale to 10 dB.

7. Set the spectrum analyzer Marker to 5 MHz.

8. Reconnect the cable to the RF Bridge.

9. Note the marker reference level readout.

10. Adjust the spectrum analyzer external attenuation amplitude by the amount noted in step 9.

11. Connect the precision high-frequency terminator to the Device Under Test connector on the RF Bridge.

12. Check that the frequency response from 0 MHz to 5 MHz is ≥ 40 dBm.

13. Return the spectrum analyzer frequency marker to 5 MHz, if necessary.

14. Remove the precision high-frequency terminator from the RF Bridge.

15. Connect the Device Under Test connector on the RF Bridge to the VITS inserter PROGRAM IN.

16. Check that the marker reference level readout on the spectrum analyzer is ≥ 36 dBm down.

17. Connect the precision high-frequency terminator to the VITS inserter PROGRAM OUT.

18. Push the VITS inserter BYPASS.

19. Check that the marker reference level readout is ≥ 36 dBm down.

20. Push the VITS inserter BYPASS switch to go back to program video.

21. Remove the precision high-frequency terminator from the VITS inserter PROGRAM OUT.

22. Connect the Device Under Test connector on the RF Bridge to the VITS inserter PROGRAM OUT.

23. Check that the Marker Level readout is ≥ 36 dBm down.

24. Connect the Device Under Test connector on the RF Bridge to the VITS inserter MONITOR OUT.

25. Check that the marker level readout is ≥ 36 dBm down.

26. Set the spectrum analyzer controls as shown in Table 5–3.

Table 5–3: Spectrum Analyzer Settings

Control	Setting
Center Frequency	10 MHz
Reference Level	0 dB
Freq Span/Div	10 MHz

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27. Connect a 50 Ω-to-75 Ω minimum loss attenuator to the spectrum analyzer RF Input.

28. Connect a 75 Ω coaxial cable from the 50 Ω-to-75 Ω minimum loss attenuator to the VITS inserter PROGRAM OUT.

29. Connect a 75 Ω coaxial cable from the television test signal generator output to the VITS inserter PROGRAM IN.

30. Select television test signal generator Red Field.

31. Select maximum hold on the spectrum analyzer.

32. Set the spectrum analyzer frequency marker to the top of the chrominance spike of the red field.

33. Set the spectrum analyzer Marker control to differential mode.

34. Leave one marker at the top of the red field spike and move the other marker to any spurious spikes out to 50 MHz to verify that all spurious spikes are at least 55 dBm down as displayed on the differential marker level readout.

Frequency Response and Crosstalk

Requirement: Flat frequency response ± 1% to 5.5 MHz; ± 3% to 10 MHz

NOTE. Successful completion of the frequency response checks guarantees that crosstalk is within specification.

1. Use two 75 Ω coaxial cables connected together with a BNC female-to-female adapter to connect the TSG/SPG Multiburst Generator output to the Peak-to-Peak Detector Head Input. See Figure 5–10.
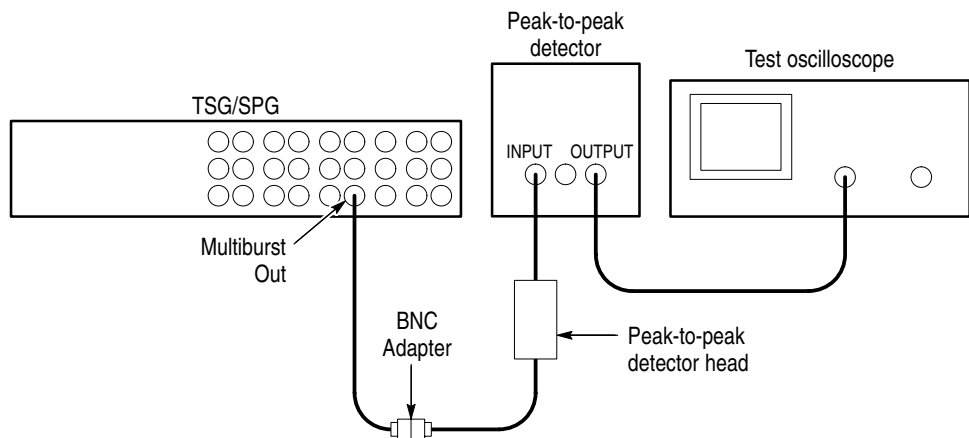
Figure 5–10: The initial frequency response setup

2. Set the TSG/SPG Multiburst output as shown in Table 5–4.

Table 5–4: Multiburst Controls

Control	Setting
Frequency Range	High
Markers	On
Composite	On
Amplitude	Full
Sweep	On

3. Connect 75 Ω coax from detector head output to peak-to-peak detector + input.

4. Enable the peak-to-peak detector + input.

5. Set + input level to light the green LED (full clockwise).

6. Connect 75 Ω cable from the peak-to-peak detector output to the test oscilloscope input.

7. Measure the sweep envelope. See Figure 5–11.
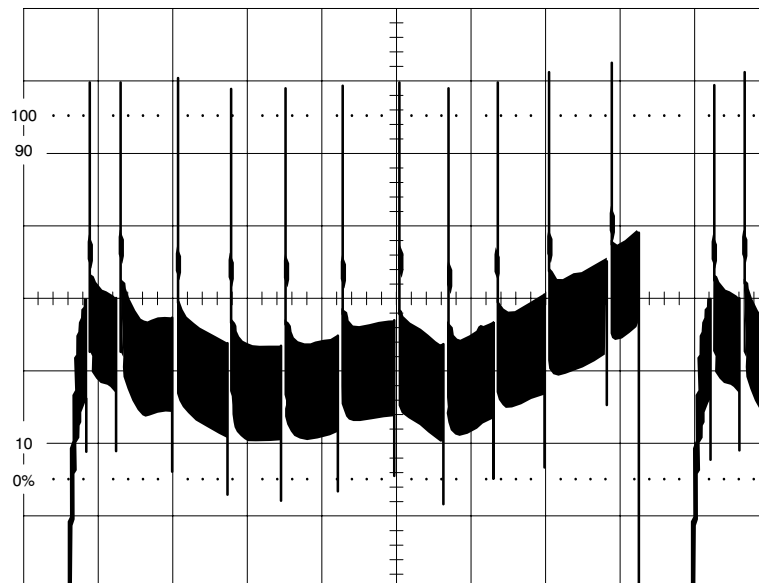
Figure 5–11: Frequency response display

8. Remove the BNC female to-female adaptor.

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9. Connect the coaxial cable from the TSG/SPG multiburst output to the VITS inserter PROGRAM IN. See Figure 5–12.

Figure 5–12: Measuring frequency response

10. Connect the coaxial cable from the peak-to-peak detector head input to the VITS inserter PROGRAM OUT.

11. Check that the sweep envelope matches the previous waveform $\pm$ 4.3 mV from 2 MHz to 6 MHz (second marker to fourth marker). See Figure 5–11.

12. Check that the sweep waveform top matches the waveform measured in step 7 (the "pattern") within $\pm$ 12.9 mV from 6 MHz to 10 MHz (fourth marker to sixth marker). See Figure 5–11.

13. Move the Peak-to-Peak Detector Head and cable from PROGRAM OUT to MONITOR OUT.

14. Check that the sweep envelope matches the pattern $\pm$ 4.3 mV from 2 MHz to 6 MHz (second marker to fourth marker). See Figure 5–11.

15. Check that the sweep envelope matches the pattern $\pm$ 12.9 mV from 6 MHz to 10 MHz fourth marker to sixth marker). See Figure 5–11.

Auto VIRS Insertion   Requirement: Proper VIRS insertion

1. Connect a 75 Ω coaxial cable from the TSG/SPG black burst output to the VITS inserter PROGRAM IN.

2. Connect a 75 Ω coaxial cable from the VITS inserter PROGRAM OUT to the waveform/vector monitor input. Terminate the remaining side of the loop-through connector with a 75 Ω end-line terminator.

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3. Set the waveform/vector monitor line select to line 19, all fields.

4. Check for VIRS. If there is a signal other than VIRS, you will need to either reprogram the TSG/SPG VITS signals or find a VIRS signal on another line. VIRS is required on both fields.

5. Set VITS selection switch S2, segments 1 through 4, to 0011 (segments 1 and 2 closed, 3 and 4 open).

6. Confirm that S4 segments 1, 2, 3, and 4 are all open (1111).

7. Turn off the TSG/SPG power switch.

8. Using the waveform/vector monitor line and field selection switches, verify that the VIRS signal is on field 1 and missing on field 2.

Source ID   Requirement: 16 asserted bits $\cong$ 0.5 V

1. Check and note the position of all rear-panel SOURCE ID switches. These switches determine the source identification output by the VITS inserter; restore the original settings after completing this check.

2. Set all 16 switches to the down position.

3. Set VITS inserter line/field selection switch S1, segments 5 through 8, to 0111 (segment 5 closed and segments 6, 7, and 8 open).

4. Select line 18, field 1, on the waveform/vector monitor.

5. Check that there are 16 positive excursions (from 0 V) of approximately 0.5 V. (Instruments with serial numbers below B020425 will have excursions of approximately 0.7 V.)

6. Switch the waveform/vector monitor Field selection to field 2 and check that the source ID signal is not present.

Remote Control   Requirement: Grounding pin 6 of the rear-panel REMOTE connector forces the instrument into bypass mode.

1. Connect a 75 Ω coaxial cable from the VITS inserter PROGRAM OUT to the waveform/vector monitor Ch A input. Terminate the remaining side of the loop-through input with a 75 Ω end-line terminator.

2. Set the waveform/vector monitor line select to line 19, field 1.

3. Check that the VIRS signal is displayed on the waveform/vector monitor.

4. Use a short piece of wire to short pin 6 of the rear-panel REMOTE connector to ground. (Pins 1, 4, and 9 of the REMOTE connector are ground.)

5. Check that the VIRS signal disappears and the VITS inserter front-panel BYPASS light comes on.

6. Remove the grounding wire.

7. Check that the VIRS signal reappears and the VITS inserter front-panel BYPASS light goes out.

Adjustment Procedure

Adjustment Procedures

If VITS 100 NTSC VITS Inserter performance is not within tolerance for a particular characteristic, determine the cause, repair if necessary, and then use the appropriate adjustment procedure to return the instrument operation to performance specification. After any adjustment, verify performance by repeating the applicable part of the *Performance Verification* procedure.

Allow the instrument to warm up for at least 20 minutes in an ambient temperature of 20° C to 30° C before making any adjustments. Waveform illustrations in the procedure are typical and may differ from one instrument to another. These waveforms should not be construed as being representative of specific tolerances.

Static Discharge Precautions

Many semiconductor components, especially MOS types, can be damaged by static discharge. Damage may not be catastrophic and, therefore, not immediately apparent. It usually appears as a degradation of the semiconductor characteristics. Devices that are particularly susceptible are MOS, CMOS, JFETs, and high impedance operational amplifiers (FET input stages). The damaged parts may operate within acceptable limits over a short period, but their reliability may be severely impaired. Damage can be significantly reduced by observing the following precautions during performance of the adjustment procedure.

- Handle equipment containing static sensitive components or circuit assemblies at or on a static free work surface. Work stations should contain a static free bench cover or work plane such as conductive polyethylene sheeting and a grounding wrist strap. The work plane should be connected to earth ground.

- All test equipment and accessories should be connected to earth ground.

More information about handling static sensitive assemblies and components can be found in the *Maintenance* section of this manual.

Recommended Test Equipment

Table 6–1 lists test equipment and fixtures recommended for the adjustment procedure. The characteristics specified are the minimum required for the checks. Substitute equipment must meet or exceed these characteristics.

Table 6–1: Recommended Test Equipment

Item	Minimum Requirements	Example
Variable Autotransformer	Variable range of 90 to 120 VAC (220 VAC operation use 220 Vac autotransformer)	General Radio metered auto transformer: W10MT3W.
Waveform/Vector Monitor	Combination waveform monitor and vectorscope capable of displaying line-rate and field-rate signals	Tektronix 1780R Video Measurement Set
Television Test Signal Generator	NTC7 Composite, Flat Field, Multiburst, and Red Field signals	Tektronix TSG-170A NTSC Television Generator
Television Test Signal Generator/Sync Pulse Generator (TSG/SPG)	Generator that can output a high frequency multiburst signal.	—
Test Oscilloscope	Vertical amplifier bandwidth of 40 MHz, 1 mV sensitivity, and 0.25% accuracy. Horizontal time base of 5 msec/div to 2 msec/div and external triggering.	Tektronix TAS465
Oscilloscope 10X Probe		Tektronix P6137 10X Probe
Frequency Counter	Counter to measure frequencies up to 30 MHz ECL levels, with 10 Hz accuracy at 28.6 MHz	Tegam DC503A a Universal Counter/Timer
Frequency Standard	Oscillator with an accuracy of 1×10^{-9} (WWV receiver in the USA)	
Peak-to-Peak Detector and Detector Head	Amplitude of up to 1 $V_{p\text{-}p}$ and a flatness of +0.2% from 50 kHz to 10 MHz	Tektronix part number 015-0408-00
Video Noise Generator	White noise on composite video, signal-to-noise ratio of at least 28 dB, Hum noise on composite video with a 0 dB signal-to-noise ratio, 1 dB steps with DC coupling, 75 Ω impedance, and flat response to 5.5 MHz.	—
Multimeter	Accuracy of +0.7% to measure 0–20 VDC.	Tektronix DM252
Power Module	Power supply for Frequency Counter, Peak-to-Peak Detector, Video Noise Generator, and Multimeter	Tegam TM506A Power Module Mainframe
75 Ω End-Line Terminators (two)	BNC-type terminators, accuracy of 0.25%	Tektronix part number 011-0102-01
75 Ω Feed-Through Terminator	BNC-type terminator, accuracy of 0.2%.	Tektronix part number 011-0103-02
BNC Adaptor	Female-to-Female	Tektronix part number 103-0028-00
75 Ω BNC Cables (five)		Tektronix part number 012-0159-00

Adjustment Procedure

This procedure is written to accommodate partial or full readjustment. In some cases only one or two adjustments may be required to return the instrument to operation within its stated specifications. In these cases you need only adjust the portion of the VITS inserter that does not meet specifications.

Preliminary Setup   With the exception of the video signal connection, this step is the starting point for any adjustment.

- Disconnect power and remove the cabinet. See the *Maintenance* section of this manual for instructions.

- Connect the VITS inserter AC power cord to the variable autotransformer. Turn the power on and set the autotransformer to 110 V.

- Connect a 75 Ω coaxial cable from the television test signal generator output to the VITS inserter PROGRAM IN.

- Turn on all test equipment and allow for any required warm-up period.

- Figure 6–1 shows the location of adjustments and test points (TP) used in this procedure.

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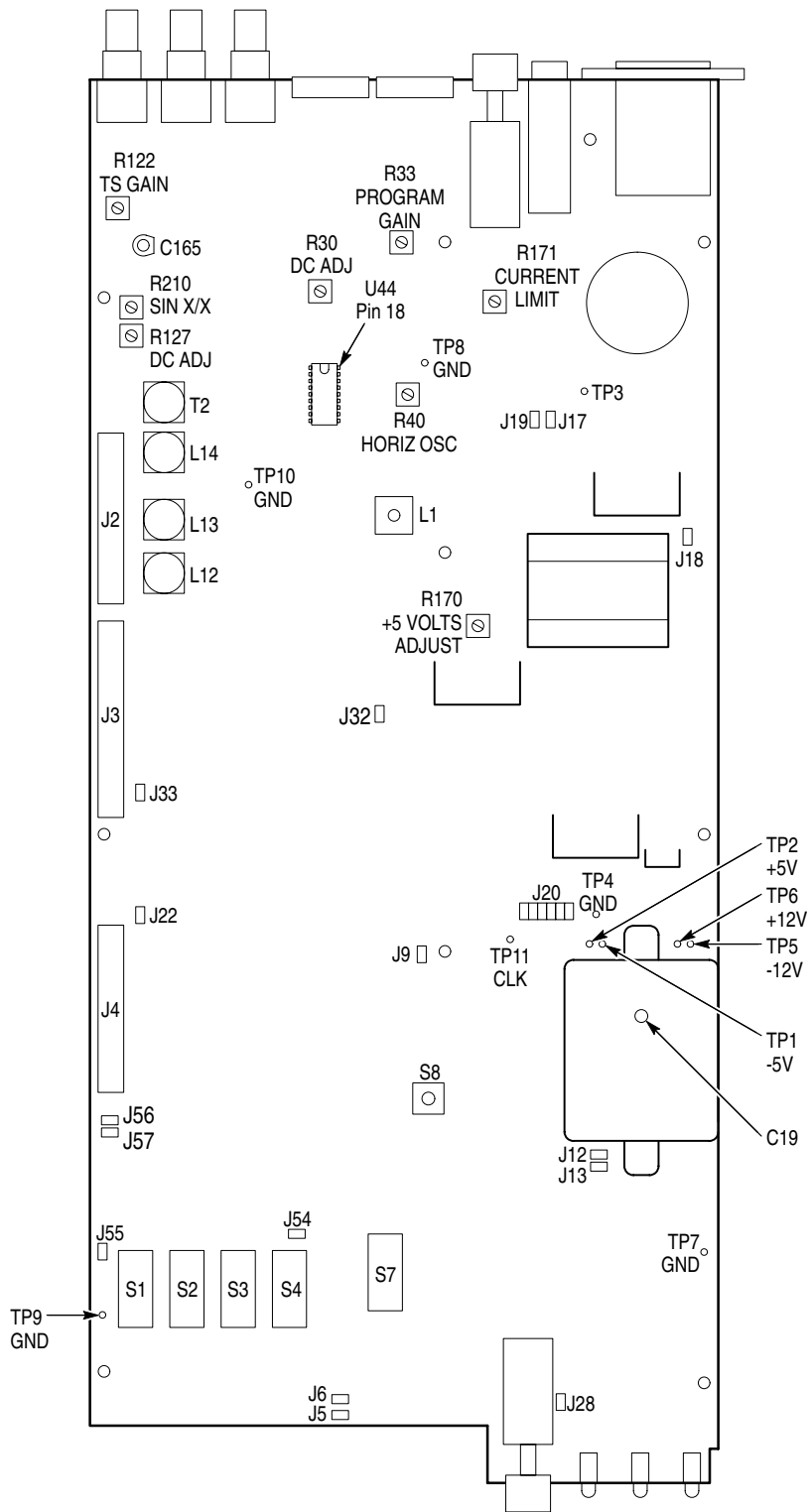
Figure 6–1: Adjustments and test points

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Power Supply Adjustment

Use this step to adjust the +5 V Adjust, R170, which serves as the reference for all other power supplies in the VITS inserter.

NOTE. This adjustment affects all adjustments in the VITS inserter. Therefore, if the +5 V supply is within tolerance, do not *reset R170 unless you are prepared to perform the complete Adjustment Procedure.*

1. Connect a multimeter to TP2 (test point 2) and TP7 (ground) on the circuit board. See Figure 6–1 for the location of the test points.

2. Adjust R170 for 5.0 V.

3. Check power supply tolerances as shown in Table 6–2.

Table 6–2: Power Supply Tolerances

Power Supply	Voltage Range	Test Point
+5 V	+4.8 V to +5.2 V	TP2
−5.2 V	−4.9 V to +5.5 V	TP1
+12 V	+11.88 V to 12.12 V	TP6
−12 V	−11.88 V to 12.12 V	TP5
Ground		TP7

Genlock Adjustments

Adjust genlock performance with the following steps.

1. Connect the Test Oscilloscope X10 probe to U44 Pin 18.

2. Select the NTC7 Composite signal from the test signal generator.

3. Adjust R40, Horizontal Osc, for a clean 6.0 V trace.

4. Check that both the Front Panel UNLOCK and BYPASS light-emitting diodes (LEDs) are off.

5. Connect a 75 Ω coaxial cable from the VITS inserter PROGRAM OUT to the waveform/vector monitor Ch A input. Terminate the remaining side of the loop-through input with a 75 Ω end-line terminator. See Figure 6–2.
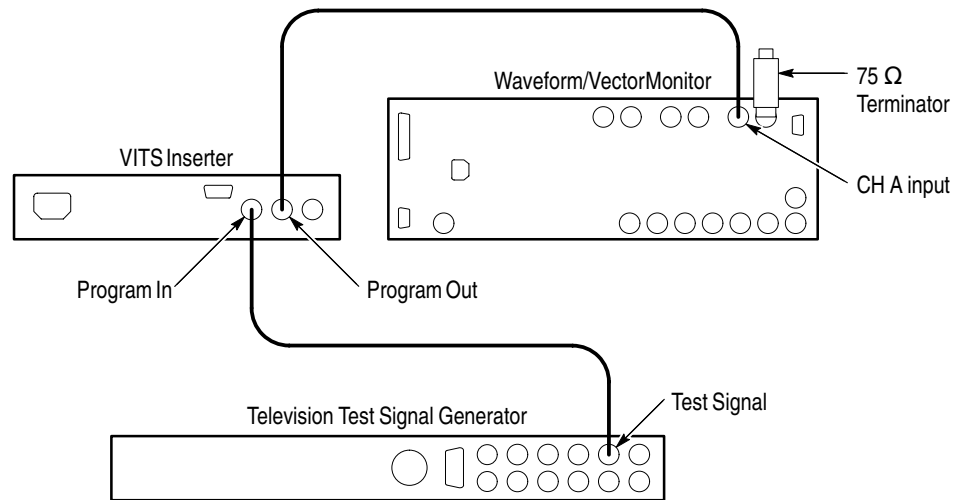
Figure 6–2: A setup for genlock adjustments

6. Connect a 75 Ω coaxial cable from the television test signal generator output to the VITS inserter PROGRAM IN.

7. Adjust R30, Program Blanking DC Level Adjust, for blanking at 0 IRE on the waveform/vector monitor waveform graticule.

8. Check that the PROGRAM OUT blanking level matches the trace position when no signal is applied (remove and then replace the coaxial cable to the PROGRAM IN).

9. Move the coaxial cable from VITS inserter PROGRAM OUT to MONITOR OUT.

10. Check that the blanking level is 0 V ± 10 mV (3 minor div).

11. Set S1 VITS selection dual-inline-package (DIP) switch segments 1 and 4 closed, 2 and 3 open (0110). See Figure 6–3 for the location of S1.
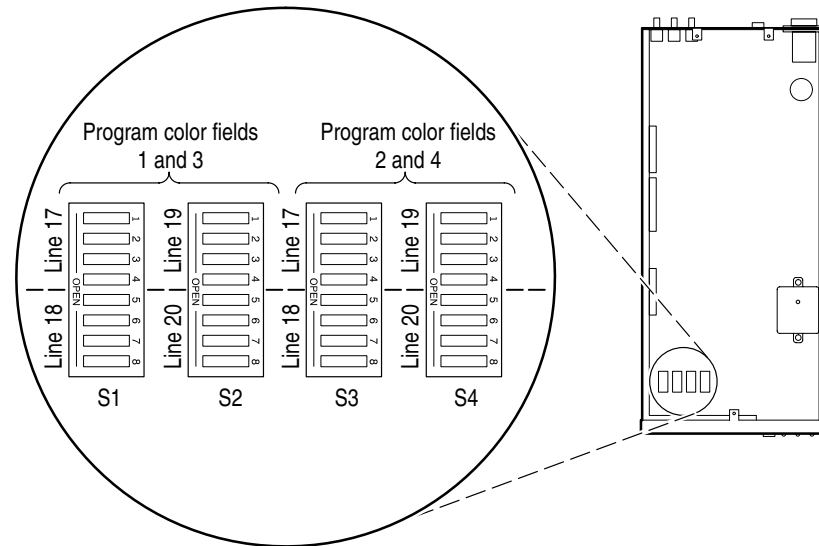
Figure 6–3: VITS selection DIP switches

12. Change the coaxial cable from the VITS inserter MONITOR OUT to the PROGRAM OUT.

13. Set the waveform/vector monitor line selector for line 17 all fields.

14. Set the waveform/vector monitor waveform gain to X5.

15. Adjust the DC ADJ, R127, to match the inserted 0% black to the program lines from fields 2 and 4.

16. Turn the waveform/vector monitor line-select off.

Gain Adjustments   Adjust program and test signal gain with the following steps.

1. Connect the test signal generator to the CH A input of the waveform/vector monitor with two 75 Ω coaxial cables and a female-to-female BNC connector as shown in Figure 6–4. Terminate the remaining side of the monitor loop-through with a 75 Ω terminator.

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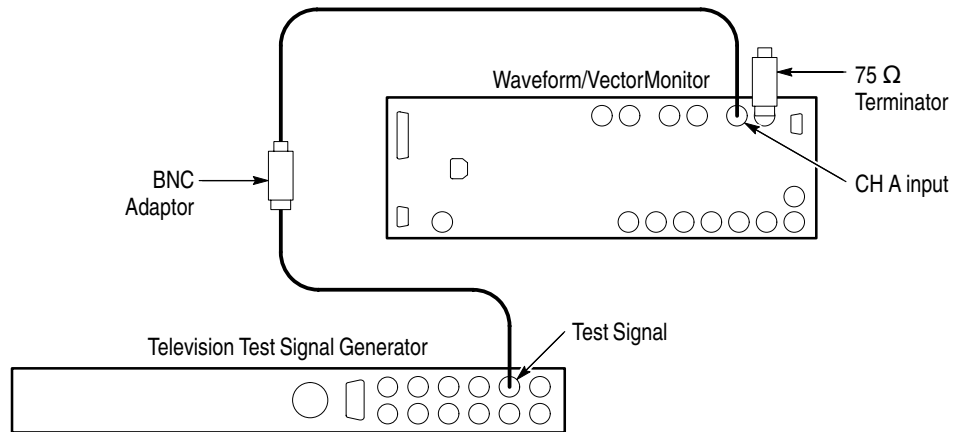
Figure 6–4: Equipment connections for gain adjustments

2. Select the NTC7 Composite signal from the generator.

3. Set the waveform/vector monitor waveform gain to X5.

4. Use WFM + CAL on the waveform/vector monitor to check the amplitude of the bar portion of the signal. Note the amplitude.

5. Remove the female-to-female BNC adapter and connect the VITS inserter to the generator and monitor as shown in Figure 6–5.

6. Adjust Program Gain, R33, to match the amplitude noted in step 4.
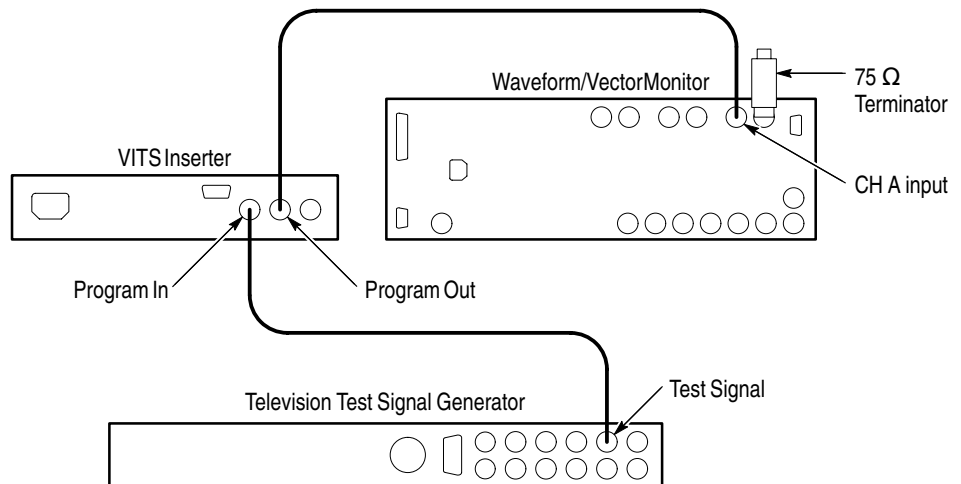
Figure 6–5: Equipment for setting gain adjustments

7. Set VITS selection DIP S1, segments 1 through 4, to 0001 (segments 1, 2, and 3 closed and segment 4 open). See Figure 6–3 for the location of S1.

8. Set the waveform/vector monitor for line select and select line 17, all fields.

9. Set the waveform/vector monitor waveform gain to X5.

10. Adjust Test Signal Gain, R122, for a bar amplitude of 714 mV.

Frequency Response Adjustments

Adjust frequency response characteristics with the following steps.

1. Connect a 75 Ω coaxial cable from the output of the television test signal generator to the VITS inserter PROGRAM IN.

2. Connect a 75 Ω coaxial cable from the VITS inserter PROGRAM OUT to the waveform/vector monitor Ch A Input, terminate remaining side of the loop-through input with a 75 Ω terminator.

3. Select the Sin X/X signal from the television test signal generator.

4. Set the waveform/vector monitor waveform gain to X5.

5. Adjust T2 for matched Sin X/X signal pulse tips.

NOTE. When T2 is adjusted during manufacture, a spot of glue is applied to prevent vibrations from changing the setting. Avoid removing the glue unless adjustment is necessary.

---

6. Remove the 75 Ω coaxial cable from the VITS inserter PROGRAM IN.

7. Connect the multiburst output from the television test signal generator/sync pulse generator (TSG/SPG) to the peak-to-peak detector head input with two 75 Ω coaxial cables and a female-to-female BNC adapter, as shown in Figure 6–6.
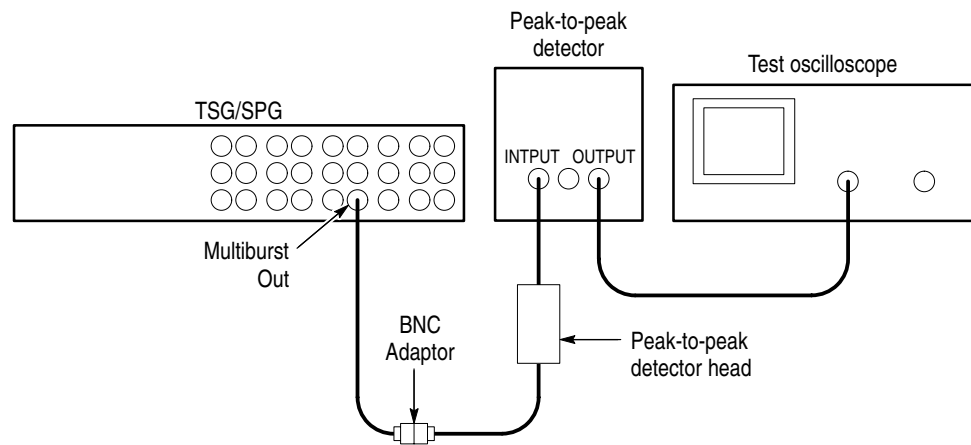
Figure 6–6: Peak-to-peak detector connections

8. Set the TSG/SPG Multiburst output as shown in Table 6–3.

Table 6–3: TSG/SPG Multiburst Settings

Control	Setting
Frequency Range	High
Markers	On
Composite	On
Amplitude	Full
Sweep	On

9. Connect a 75 Ω coaxial cable from the detector head output to the peak-to-peak detector + input.

10. Enable peak-to-peak detector + input.

11. Set + input level to light the green LED (full clockwise).

12. Connect a 75 Ω coaxial cable from the peak-to-peak detector output to test oscilloscope input.

13. Measure the sweep envelope. See Figure 6–7.
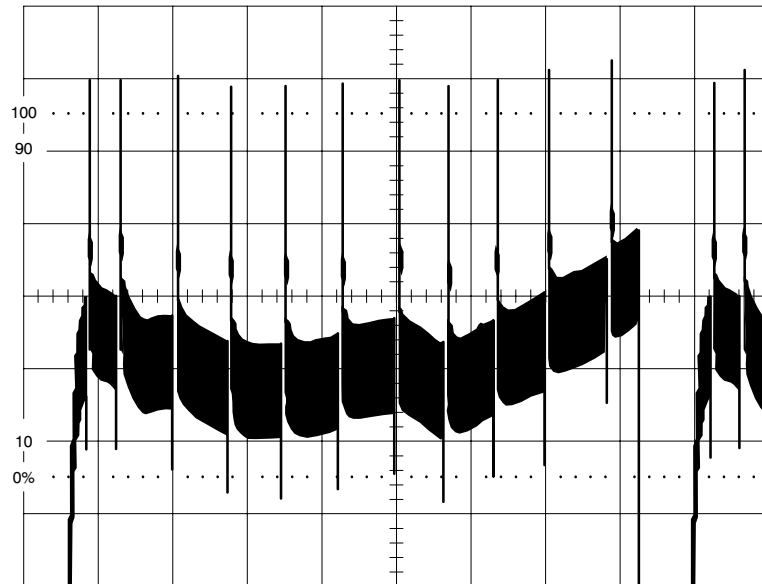
Figure 6–7: Display for adjusting flatness

14. Remove the female to-female BNC adapter.

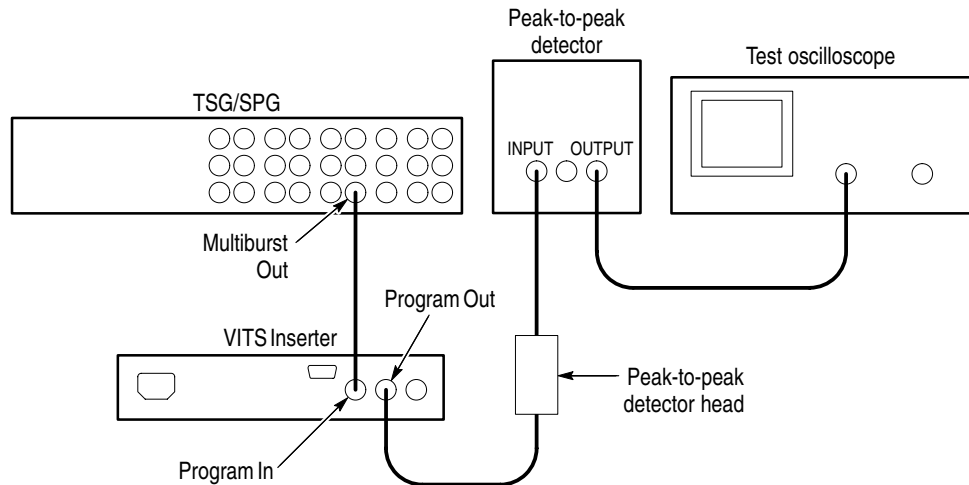**15.** Connect the 75 Ω coaxial cable from the TSG/SPG multiburst output to the VITS inserter PROGRAM IN as shown in Figure 6–8.
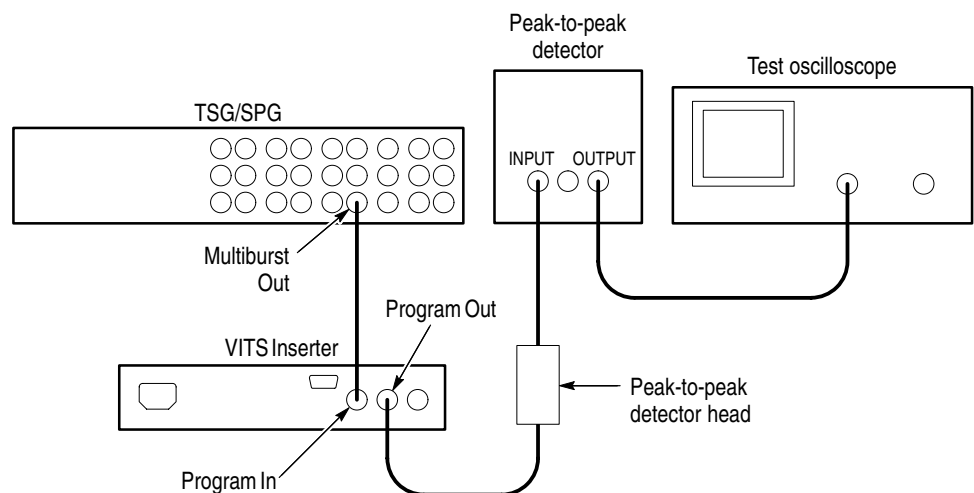
Figure 6–8: Setting flatness

16. Connect the 75 Ω coaxial cable from the Peak-to-Peak Detector Head Input to the VITS inserter PROGRAM OUT as shown in Figure 6–8.

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17. Adjust R210 and C165 for a display on the Test Oscilloscope that matches the sweep envelope to the previous waveform ± 4.3 mV from 2 MHz to 6 MHz (second marker to fourth marker) and ± 12.9 mV from 6 MHz to 10 MHz (fourth marker to sixth marker). See Figure 6–7.

18. Move the 75 Ω coaxial cable that connects to the Peak-to-Peak Detector Head Input from VITS inserter PROGRAM OUT to MONITOR OUT.

19. Check that the sweep envelope matches that observed in step 17, ± 4.3 mV from 2 MHz to 6 MHz (second marker to fourth marker)

20. Check that the sweep envelope matches that observed in step 17, ± 12.9 mV from 6 MHz to 10 MHz (fourth marker to sixth marker).

NOTE. If the VITS inserter does not meet frequency response specifications in the 5.5 to 10 Mhz range, adjust L12 and L13 for optimum flatness in that range. These two coils are sealed with a drop of glue during manufacture; adjust them only if the VITS Inserter is operating outside of specifications.

Oscillator Adjustment   Adjust the oscillator frequency with the following procedure.

1. Disconnect the 75 Ω coaxial cable from the VITS inserter PROGRAM IN.

2. Connect the X10 probe from the Frequency Counter input to VITS inserter TP 11. See Figure 6–1 (on page 6–4) for test point location.

3. Connect the WWV signal to the other input of the Frequency Counter and set it for Ratio A/B.

4. Remove the plastic plug from the oscillator cover to reveal C19. See Figure 6–1.

5. Adjust C19 for an oscillator frequency of 28.636364 MHz ±1 Hz.

6. Replace the C19 access plug.

7. Disconnect the X10 probe from the VITS inserter TP 11.

Maintenance

Maintenance

This section discusses the following topics related to maintaining and servicing the VITS 100 NTSC VITS Inserter:

- Service Strategy (below)

- Tektronix Service Offerings (below)

- Preparation (page 7–2)

- Static Sensitive Components (page 7–2)

- Circuit Board Jumpers (page 7–4)

- Cleaning and Inspection (page 7–7)

- Removal and Replacement Instructions (page 7–8)

- Diagnostics (page 7–11)

Service Strategy

This manual contains all information needed for periodic maintenance of the VITS 100 NTSC VITS Inserter (for example, performance verification procedures and mechanical removal and replacement procedures). Further, it contains information for repair to the component level. To isolate a failure to a component, use the troubleshooting procedures, schematic diagrams, and circuit board drawings. Once you isolate a fault, find the part in either the *Replaceable Electrical Parts List* or the *Mechanical Parts List.* All components listed can be obtained from Tektronix.

Tektronix Service Offerings

Tektronix provides service to cover repair under warranty. Other services are available that may provide a cost-effective answer to your service needs.

Whether providing warranty repair service or any of the other services listed below, Tektronix service technicians, trained on Tektronix products, are best equipped to service your VITS 100 NTSC VITS Inserter. Tektronix technicians are informed of the improvements to the product as well as the latest product options.

Warranty Repair Service   Tektronix warrants this product for one year from the date of purchase. (The warranty appears at the front of this manual.) Tektronix technicians provide

warranty service at most Tektronix service locations. Do not service the VITS 100 NTSC VITS Inserter yourself during the warranty period; rather, contact your nearest Tektronix representative, field office, or service center for information and instructions.

Repair Service

Tektronix offers single per-incident and annual maintenance agreements that provide Depot Service repair of this instrument.

Of these services, the annual maintenance agreement offers a particularly cost-effective approach to service for many owners of the VITS 100 NTSC VITS Inserter. Such agreements can be purchased to span several years.

For More Information

Contact your nearest Tektronix service center or sales engineer for more information about any of the available repair or adjustment services.

Preparation

The servicing instructions in this manual are intended for qualified service personnel only. Before performing any maintenance, be sure to read the *General Safety Summary* and the *Service Safety Summary*, both at the front of this manual.

Always consult the *Getting Started* and *Operating Basics* sections if you need more information about operating or configuring the VITS 100 NTSC VITS Inserter.

Static Sensitive Components

> **CAUTION.** *Static discharge can damage any semiconductor component in this product.*

This instrument contains electrical components that are susceptible to damage from static discharge. Static voltages from 1 kV to 30 kV are common in unprotected environments.

Observe the following precautions to avoid damaging static-sensitive devices:

1. Minimize handling of static-sensitive components.

2. Transport and store static-sensitive components or assemblies in their original containers, on a metal rail, or on conductive foam. Label any package that contains static-sensitive components or assemblies.

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3. Discharge the static voltage from your body by wearing a wrist grounding strap when handling static-sensitive components. Always service assemblies that contain static-sensitive components at static-free work stations.

4. Remove any device capable of generating or holding a static charge from the work station surface.

5. Whenever possible keep the component leads shorted together.

6. Pick up components by the body, never by the leads.

7. Do not slide components over any surface.

8. Avoid handling components in areas where the floor or work surface covering is capable of generating a static charge.

9. Use a soldering iron that is connected to earth ground.

10. Use only special antistatic suction or wick-type desoldering tools.

Circuit Board Jumpers

There are 3 plug jumpers for mode selection and 14 test jumpers for use during repair or troubleshooting on the VITS 100 NTSC VITS Inserter circuit board. See Figure 7–1 for plug jumper locations and Tables 7–1 and 7–2 for their functions. In all cases, pin 1 is indicated by the ▼ symbol imprinted on the circuit board.
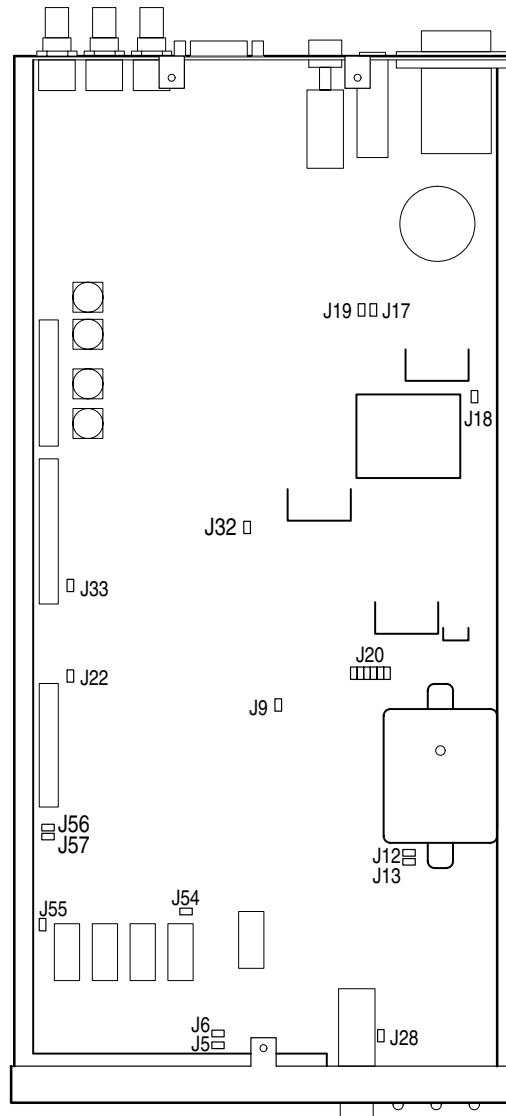
Figure 7–1: Moveable plug jumpers on the inserter circuit board

Mode Selection Jumpers   All installation procedures that do not require removing the protective cover of the VITS inserter are discussed in the *Getting Started* section of this manual. The VITS 100 NTSC VITS Inserter does have some additional flexibility, however, that is provided with the internal plug jumpers. Instructions for setting the jumpers appear in this section because the jumpers can be accessed only by removing the instrument cover, which could expose unqualified personnel to potentially hazardous voltages.

⚠️   *WARNING. Operating the VITS 100 NTSC VITS Inserter with the cover removed can expose personnel to hazardous electrical potentials. Do not operate this instrument with the cover removed.*

Table 7–1: Mode Selection Jumpers

Function	Jumper Number	Description	Factory Setting
Sound-in-Sync Mode	J9	Pins 1–2: No sound-in-sync on PROGRAM IN.	1–2
		Pins 2–3: Sound-in-sync on PROGRAM IN (blocks sound-in-sync pulses from the Genlock circuit).	(Not implemented)
Line Select Mode	J22	Pins 1–2: No lines available for VITS.	2–3
		Pins 2–3: Lines 17 through 20 available for VITS.	
Bypass Lockout	J28	Pins 1–2: Front-panel BYPASS button enabled.	1–2
		ins 2–3: Front-panel BYPASS button disabled.	

Test Jumpers   In addition to the mode selection jumpers, the VITS inserter contains fourteen test jumpers for use in the adjustment procedure and for troubleshooting purposes. These jumpers can be located in Figure 7–1; test jumper functions are detailed in Table 7–2. Pin 1 is indicated by the ▼ symbol printed on the circuit board.

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Table 7–2: Test Jumpers

Function	Jumper #	Description	Factory Setting
Genlock Processor Reset	J5	Pins 1–2: Reset controlled by hardware watchdog. Pins 2–3: Holds processor in reset mode. No Plug: No hardware resets.	1–2
Hardware Watchdog Reset	J6	Pins 1–2: No Reset. Pins 2–3: Hold in Reset mode.	1–2
VCO Control	J12	Pins 1–2: VCO Control loop closed. Pins 2–3: VCO Control voltage set to ground, to set VCO center frequency.	1–2
Oscillator Oven Control	J13	Pins 1–2: Oscillator oven on. Pins 2–3: Oscillator oven off.	1–2
Housekeeping Supply Enable	J17	Pins 1–2: Supply enabled. No Plug: Supply disabled.	1–2
Transformer Enable	J18	Pins 1–2: Connects power to transformer. No Plug: Disables Power Supply.	1–2
Overcurrent Shutdown	J19	Pins 1–2: Shutdown enabled. No Plug: Shutdown disabled.	1–2
Power Supply Disconnect (Jumper Off = Disconnect)	J20	<u>Pins</u> <u>Supply</u> 1–2 +12V 3–4 –12V 5–6, 7–8 +5V 9–10, 11–12 –5V 13–14, 15–16 GND	ON ON ON ON No Jumper
Clock Disable	J32	Pins 1–2: DAC Clock Enabled. Pins 2–3 DAC Clock Disabled.	1–2
Character Set Up Control	J33	Pins 1–2: 7.5% Character Set-Up (Standard). Pins 2–3: 0% Character Set-Up (Option 1J).	1–2
Memory Bank Select	J54	Pins 1–2: Standard signals. Pins 2–3: Option 1J signals.	1–2
V Drive	J55	Pins 1–2: Used by VITS 200. Pins 2–3: VITS 100.	2–3

Table 7–2: Test Jumpers (Cont.)

Function	Jumper #	Description	Factory Setting
V Sync	J56	Pins 1–2: Used by VITS 200. Pins 2–3: VITS 100.	2–3
Blanking	J57	Pins 1–2: Used by VITS 200. Pins 2–3: VITS 100.	2–3

Cleaning and Inspection

Preventive maintenance consists of cleaning and visual inspection. The schedule depends on the severity of the operating environment. Under average conditions, perform preventive maintenance every 2000 hours of operation; do it more frequently if you operate the VITS inserter in an especially dusty or humid environment.

Cleaning   Clean the entire VITS inserter often enough to prevent dust and dirt from accumulating. Dirt or dust buildup can act as a thermal insulating blanket that prevents effective heat dissipation; it can also provide high-resistance electrical leakage paths between conductors or components in a humid environment.

Exterior. Wipe the outside surfaces occasionally with a damp soft cloth. Do not use commercial cleaners that can discolor or damage the finish.

Check all air vents regularly to ensure that dust buildup does not impede the flow of cooling air.

⚠ *WARNING. To avoid any potential of electrical shock, disconnect power before removing the instrument cover.*

Interior. Interior cleaning is not recommended, but if necessary, use low-velocity, dry air to blow away dust or lint. If air alone does not remove all of the dust and lint, use a soft brush to complete the task. Exercise extreme care not to disturb components on the circuit board during cleaning.

⚠ *CAUTION. This instrument contains static sensitive devices that can be damaged by static discharge. Please read* Static Sensitive Components, *on page 7–2, before attempting to clean the interior of the VITS inserter.*

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Removal and Replacement Instructions

Use the following procedures to remove and replace the top cover, front panel, inserter circuit board assembly, and oscillator oven.

Top Cover   This procedure requires a #1 phillips screwdriver.

⚠ **WARNING.** *To avoid possible electrical shock, disconnect the power cord before removing the top cover.*

Removal. Use the following procedure to remove the top cover:

1. Remove the four screws from each side of the instrument.

2. Remove the three screws (one at the front edge, two at the back) from the top of the instrument. It is not necessary to remove the screws that hold the programming access plate onto the top cover.

3. Lift the cover from the instrument.

Replacement. Use the following procedure to replace the top cover:

1. Set the top cover in place with the programming opening toward the front panel.

2. Install the three screws on the top of the instrument.

3. Install the four screws on each side of the instrument.

Front Panel   This procedure requires a #1 phillips screwdriver.

Removal. Use the following procedure to remove the front panel:

1. Remove the instrument top cover.

2. Place the instrument top-down on the work surface.

3. Remove the two flat head screws from the front edge of the instrument bottom.

4. Slide the front panel assembly forward until it is clear of the LEDs and BYPASS switch.

Replacement. Use the following procedure to replace the front panel:

1. Carefully slide the front panel over the BYPASS switch and the three LEDs.

2. Install the two flat head screws that hold the front panel to the front edge of the instrument bottom.

3. Install the instrument top cover.

Inserter Circuit Board   This procedure requires a #1 phillips screwdriver and a $^9/_{16}$ inch box end wrench.

Removal. Use the following procedure to remove the inserter circuit board assembly; see Figure 7–2 for the location of the various components and fasteners.

1. Remove the instrument top cover.

2. Remove the front panel.

3. Remove the hex nuts on the three BNC connectors that extend through the rear panel.

4. Unplug the remote connector cable from J27 on the inserter circuit board.

5. Remove the three mounting screws that hold the power supply shield to the circuit board and lift the shield off of the inserter circuit board.

6. Remove the two screws that hold the line filter (and AC plug) to the rear panel.

7. Remove the seven screws that hold the inserter circuit board to the bottom chassis pan.

8. Slide the inserter circuit board forward until the BNC connectors clear the rear panel. Then lift the board away from the chassis.

Replacement. Use the following procedure to replace the inserter circuit board:

1. Slide the inserter circuit board toward the rear panel until the BNC connectors protrude through the rear panel.

2. Install the seven screws that hold the inserter circuit board onto the bottom chassis pan.

3. Install the two screws that fasten the line filter to the rear panel.

4. Set the power supply shield in place and install the three screws that hold the shield onto the inserter circuit board.

5. Plug the remote connector cable (from the rear panel) into J27 on the inserter circuit board.

6. Install the hex nuts on the three rear-panel BNC connectors.

7. Replace the front panel.

8. Replace the instrument top cover.
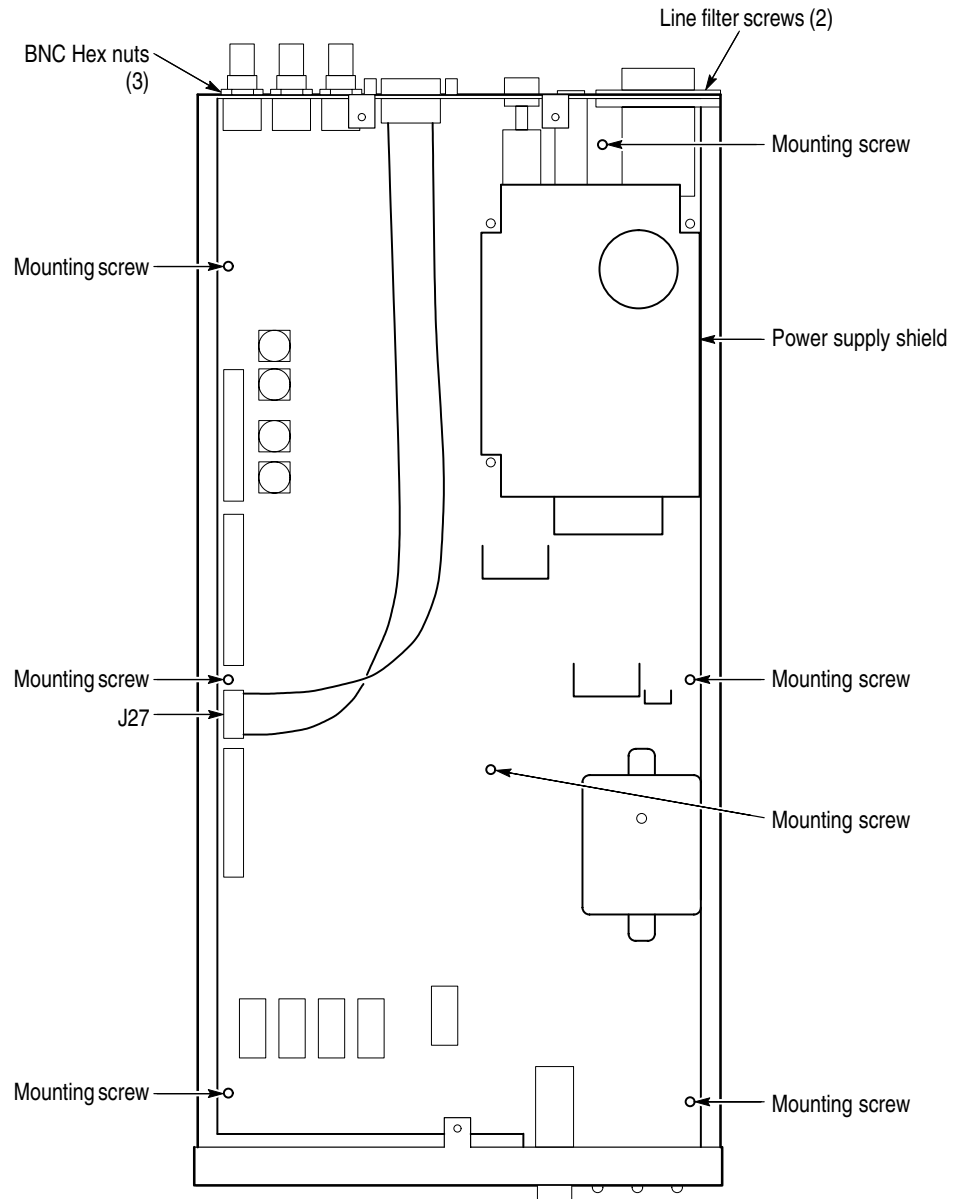
Figure 7–2: Mounting hardware for the inserter circuit board

Oscillator Circuit Board Removal/Replacement

This procedure requires a #2 POZIDRIV® screwdriver, a #4 hex nut driver, and a #1 POZIDRIV® screwdriver.

Removal. Use the following procedure to remove the oscillator circuit board.

1. Remove the instrument top cover.

2. Remove the two screws that hold the plastic insulating case to the inserter circuit board and remove the top part of the case.

3. Remove the screw and hex nut that attach the power transistor to the outside of the metal oven.

4. Remove the oven from the Inserter board by carefully pulling the oven off the seven square pins that attach it to the Inserter board.

5. Remove the screw attaching the metal cover to the oven.

6. Remove the screw that holds the oscillator circuit board to the oven and then pull the oscillator out of the oven.

Replacement. Use the following procedure to replace the oscillator circuit board and oven assembly.

1. Set the oscillator circuit board in the oven. Install the screw that attaches the circuit board to the oven.

2. Set the metal oven cover in place and install the attaching screw.

3. Carefully press the metal oven onto the seven square pins that connect it to the Inserter board.

4. Reinstall the screw and hex nut that attach the power transistor to the outside of the metal oven.

5. Set the plastic oven cover in place and install the two screws that attach the oven case to the inserter circuit board.

6. Replace the instrument top cover.

Diagnostics

The primary means of troubleshooting this instrument is through built-in diagnostic routines that are accessed through rotary switch S8. (To locate S8, see Figure 7–3.)

The built-in diagnostics are free-running, continuous loop routines during which the processor sends a periodic signal through a particular data path.The signal can then be viewed on a scope at points along the path to isolate problems. Table 7–3 lists the S8 settings that call the routines; it also provides a short description of each routine.

Three of the routines—the RAM, ARCTAN, and CTC tests—run automatically each time the instrument is powered up. If any of these fail, the front-panel UNLOCKED LED lights, and the routine runs again. The VITS inserter will not lock to program video until it successfully completes the power-up diagnostics.
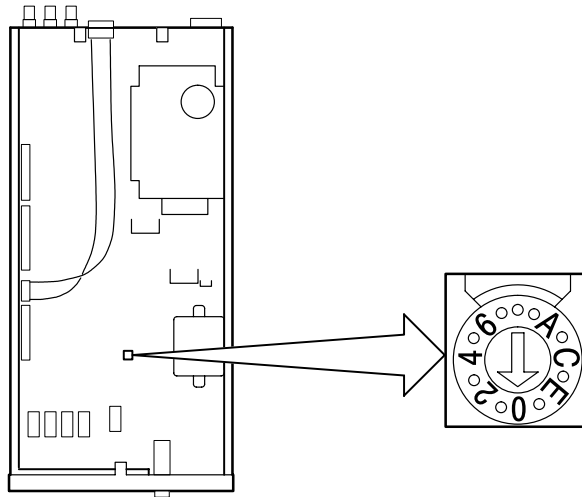
Figure 7–3: Diagnostics switch, S8

To run a user diagnostic (including those run at power up), set S8 to the position for the desired diagnostic and then cycle the power off and on. The processor then runs through the power up process, polls the diagnostic port, and runs the selected diagnostic.

Table 7–3: The User Diagnostics

Diagnostic Switch (S8) Setting	Test	Description	Test Result Indication
0	None	Normal setting, no diagnostics.	
1	Not Used		
2	RAM Tests	Writes to and then reads from all PRAM locations in the genlock IC (A1U29); compares "read" data to written. Writes to and reads from all sample RAM locations in the genlock IC; compares read data to written. This test runs once during power-up diagnostics.	In the event of failure, the UNLOCKED LED lights and the instrument does not lock to program (input) video.
3	ARCTAN PROM Test	Computes the checksum of the arctangent EPROM (A1U33) and compares the value with one that has been written in the processor EPROM. When selected through the diagnostic switch, the test runs continuously. During power up diagnostics, it runs once.	In the event of failure, the UNLOCKED LED lights and the instrument does not lock to program (input) video.

Table 7–3: The User Diagnostics (Cont.)

Diagnostic Switch (S8) Setting	Test	Description	Test Result Indication
4	CTC Test	Sets up the Counter Timer Chip (CTC, A1U30), and checks to see that the timers can generate interrupts. Each of the four CTC sections should interrupt after the 4096 processor clock cycles. If any CTC section does not interrupt within the allocated time, the test fails. This test runs once during power-up diagnostics.	In the event of failure, the UNLOCKED LED lights and the instrument does not lock to program (input) video.
5	Not Used		
6	Not Used		
7	Port test	Used to check the data and load paths connected to the I/O ports. Counts from 0–255 on the I/O ports (the ED0–ED7 bus) of the microprocessor system.	ED0–ED7 bus should show a binary count pattern when viewed with an oscilloscope
8	VCO DAC test	Used to check the VCO DAC and Integrator. Generates a field rate ramp at the VCO DAC for checking the genlock DAC.	Ramp may be viewed at A1J12–2.
9	Sampler test 1	Used to check the Genlock Acquisition circuitry. This test acquires a sample of sync and burst via the genlock input and then reconstructs the sampled sync and burst at equivalent time through the VCO DAC A1J12–2. A1C46 (schematic 6) must be shorted out for this test.	
A	Sampler test 2	Sets up the genlock acquisition system to sample incoming video continuously. Used for checking acquisition timing.	Use an oscilloscope to check for correct genlock timing pulses on CTC A1U30 pins 20–23. Trigger on input video.
B	Not Used		
C	Not Used		
D	Not Used		
E	Not Used		
F	Not Used		

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Replaceable Electrical Parts

Replaceable Electrical Parts

This section contains a list of the electrical components for the VITS 100 NTSC VITS Inserter. Use this list to identify and order replacement parts.

Parts Ordering Information

Replacement parts are available through your local Tektronix field office or representative.

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

- ■ Part number

- ■ Instrument type or model number

- ■ Instrument serial number

- ■ Instrument modification number, if applicable

If you order a part that has been replaced with a different or improved part, your local Tektronix field office or representative will contact you concerning any change in part number.

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

Using the Replaceable Electrical Parts List

The tabular information in the Replaceable Electrical Parts List is arranged for quick retrieval. Understanding the structure and features of the list will help you find all of the information you need for ordering replacement parts. The following table describes each column of the electrical parts list.

Parts List Column Descriptions

Column	Column Name	Description
1	Component Number	The component number appears on diagrams and circuit board illustrations, located in the diagrams section. Assembly numbers are clearly marked on each diagram and circuit board illustration in the *Diagrams* section, and on the mechanical exploded views in the *Replaceable Mechanical Parts* list section. The component number is obtained by adding the assembly number prefix to the circuit number (see Component Number illustration following this table). The electrical parts list is arranged by assemblies in numerical sequence (A1, with its subassemblies and parts, precedes A2, with its subassemblies and parts). Chassis-mounted parts have no assembly number prefix, and they are located at the end of the electrical parts list.
2	Tektronix Part Number	Use this part number when ordering replacement parts from Tektronix.
3 and 4	Serial Number	Column three indicates the serial number at which the part was first effective. Column four indicates the serial number at which the part was discontinued. No entry indicates the part is good for all serial numbers.
5	Name & Description	An item name is separated from the description by a colon (:). Because of space limitations, an item name may sometimes appear as incomplete. Use the U.S. Federal Catalog handbook H6-1 for further item name identification.
6	Mfr. Code	This indicates the code number of the actual manufacturer of the part.
7	Mfr. Part Number	This indicates the actual manufacturer's or vendor's part number.

Abbreviations   Abbreviations conform to American National Standard ANSI Y1.1–1972.

Component Number

Component Number

A23A2R1234   **A23**   **A2**   **R1234**

Assembly number   Subassembly Number   Circuit Number
                      (optional)
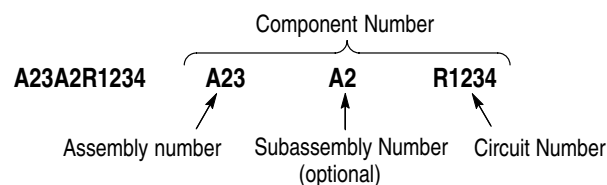
Read: Resistor 1234 (of Subassembly 2) of Assembly 23

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

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

Mfr. Code to Manufacturer Cross Index   The table titled Manufacturers Cross Index shows codes, names, and addresses of manufacturers or vendors of components listed in the parts list.

Manufacturers Cross Index, Electrical Parts

Mfr. Code	Manufacturer	Address	City, State, Zip Code
00213	NYTRONICS COMPONENTS GROUP INC SUBSIDIARY OF NYTRONICS INC	ORANGE ST	DARLINGTON SC 29532
00779	AMP INC	2800 FULLING MILL PO BOX 3608	HARRISBURG PA 17105
01295	TEXAS INSTRUMENTS INC SEMICONDUCTOR GROUP	13500 N CENTRAL EXPY PO BOX 655303	DALLAS TX 75262–5303
02875	HUDSON TOOL AND DIE CO INC	18 MALVERN ST	NEWARK NJ 07105–1511
04222	AVX/KYOCERA DIV OF AVX CORP	19TH AVE SOUTH P O BOX 867	MYRTLE BEACH SC 29577
04713	MOTOROLA INC SEMICONDUCTOR PRODUCTS SECTOR	5005 E MCDOWELL RD	PHOENIX AZ 85008–4229
05276	ITT POMONA ELECTRONICS DIV	1500 E 9TH ST PO BOX 2767	POMONA CA 91766–3835
06090	RAYCHEM CORP	300 CONSTITUTION DRV	MENLO PARK CA 94025–1111
09023	CORNELL–DUBILIER ELECTRONICS DIV FEDERAL PACIFIC ELECTRIC CO	2652 DALRYMPLE ST	SANFORD NC 27330
09922	BURNDY CORP	1 RICHARDS AVE	NORWALK CT 06856
0B0A9	DALLAS SEMICONDUCTOR CORP	4350 BELTWOOD PKWY SOUTH	DALLAS TX 75244
0GV52	SCHAFFNER EMC INC	9–B FADEM ROAD	SPRINGFIELD, NJ 07081
0H1N5	TOSHIBA MARCON ELECTRONICS AMERICA CORPORATION	998 FIRST EDGE DRV	VERNON HILLS IL 60061
0JR03	ZMAN MAGNETICS INC	7633 S 180th	KENT WA 98032
0JR04	TOSHIBA AMERICA INC ELECTRONICS COMPONENTS DIV	9775 TOLEDO WAY	IRVINE CA 92718
0JR05	TRIQUEST CORP	3000 LEWIS AND CLARK HWY	VANCOUVER WA 98661–2999
0KB01	STAUFFER SUPPLY	810 SE SHERMAN	PORTLAND OR 97214
0LUA3	PHILIPS COMPONENTS	100 PROVIDENCE PIKE	SLATERSVILLE, RI 02876
0MS63	QUALITY TECHNOLOGIES CORP	610 N MARY AVENUE	SUNNYVALE CA 94086
11236	CTS CORPORATION RESISTOR NETWORKS DIVISION	406 PARR ROAD	BERNE IN 46711–9506
11502	IRC, INC	PO BOX 1860	BOONE NC 28607–1860
12969	MICROSEMI CORPORATION WATERTOWN DIVISION	530 PLEASANT STREET	WATERTOWN MA 02172
13103	THERMALLOY CO INC	2021 W VALLEY VIEW LN PO BOX 810839	DALLAS TX 75381
14936	GENERAL INSTRUMENT CORP POWER SEMICONDUCTOR DIV	600 W JOHN ST	HICKSVILLE NY 11802–0709
15454	KETEMA RODAN DIVISION	2900 BLUE STAR STREET	ANAHEIM CA 92806–2591
15513	DATA DISPLAY PRODUCTS	301 CORAL CIR	EL SEGUNDO CA 90245–4620
17856	SILICONIX INC	2201 LAURELWOOD RD	SANTA CLARA CA 95054–1516
18565	CHOMERICS INC	77 DRAGON COURT	WOBURN MA 01801–1039

Manufacturers Cross Index, Electrical Parts (Cont.)

Mfr. Code	Manufacturer	Address	City, State, Zip Code
18796	MURATA ELECTRONICS NORTH AMERICA INC. STATE COLLEGE OPERATIONS	1900 W COLLEGE AVE	STATE COLLEGE PA 16801–2723
19701	PHILIPS COMPONENTS DISCRETE PROD-UCTS DIV RESISTIVE PRODUCTS FACILITY AIRPORT ROAD	PO BOX 760	MINERAL WELLS TX 76067–0760
1CH66	PHILIPS SEMICONDUCTORS	811 E ARQUES AVENUE PO BOX 3409	SUNNYVALE CA 94088–3409
22526	BERG ELECTRONICS INC (DUPONT)	857 OLD TRAIL RD	ETTERS PA 17319
24355	ANALOG DEVICES INC	1 TECHNOLOGY DRV	NORWOOD MA 02062
24546	DALE ELECTRONICS A VISHAY INTERTECHNOLOGY INC CO	550 HIGH ST	BRADFORD PA 16701–3737
26364	COMPONENTS CORP	6 KINSEY PLACE	DENVILLE NJ 07834–2611
27014	NATIONAL SEMICONDUCTOR CORP	2900 SEMICONDUCTOR DR	SANTA CLARA CA 95051–0606
2K262	BOYD CORP	6136 NE 87th AVE PO BOX 20038	PORTLAND OR 97220
31223	MICRO PLASTICS INC	20821 DEARBORN ST	CHATSWORTH CA 91311–5916
31918	ITT SCHADOW INC	8081 WALLACE RD	EDEN PRAIRIE MN 55344–2224
33096	COLORADO CRYSTAL CORP	2303 W 8TH ST	LOVELAND CO 80537–5268
34335	ADVANCED MICRO DEVICES	901 THOMPSON PL PO BOX 3453	SUNNYVALE CA 94086–3413
34371	HARRIS CORP HARRIS SEMICONDUCTOR PRODUCTS GROUP	200 PALM BAY BLVD PO BOX 883	MELBOURNE FL 32919
48726	UNITRODE INTEGRATED CIRCUITS CORP (UICC)	7 CONTINENTAL BLVD PO BOX 399	MERRIMACK NH 03054–0399
50139	ALLEN–BRADLEY CO ELECTRONIC COMPONENTS	1414 ALLEN BRADLEY DR	EL PASO TX 79936
51406	MURATA ELECTRONICS NORTH AMERICA INC HEADQUARTERS AND GEORGIA OPERATIONS	2200 LAKE PARK DR	SMYRNA GA 30080
52763	STETCO INC	3344 SCHIERHORN	FRANKLIN PARK IL 60131
53387	3M COMPANY ELECTRONIC PRODUCTS DIV	3M AUSTIN CENTER	AUSTIN TX 78769–2963
54937	DEYOUNG MANUFACTURING INC	12920 NE 125TH WAY	KIRKLAND WA 98034–7716
55285	BERGQUIST CO INC THE	5300 EDINA INDUSTRIAL BLVD	MINNEAPOLIS MN 55435–3707
55680	NICHICON /AMERICA/ CORP	927 E STATE PKY	SCHAUMBURG IL 60195–4526
56708	ZILOG INC	1315 DELL AVE	CAMPBELL CA 95008–6609
56845	DALE ELECTRONICS INC	2300 RIVERSIDE BLVD PO BOX 74	NORFOLK NE 68701–2242
57668	ROHM CORPORATION	15375 BARRANCA PARKWAY SUITE B207	IRVINE CA 92718
59492	QUARTZTEK INC	20 S 48TH AVE	PHOENIX AZ 85043–3820

Manufacturers Cross Index, Electrical Parts (Cont.)

Mfr. Code	Manufacturer	Address	City, State, Zip Code
5Y400	TRIAX METAL PRODUCTS INC DIV OF BEAVERTON PARTS MFG CO	1800 NW 216TH AVE	HILLSBORO OR 97124–6629
61429	FOX ELECTRONICS DIV OF FOX ELECTRONICS INC	5842 CORPORATION CIRCLE	FOR MEYERS FL 33905
61529	AROMAT CORP	629 CENTRAL AVE	NEW PROVIDENCE NJ 07974
61935	SCHURTER INC	1016 CLEGG COURT	PETALUMA CA 94952–1152
62643	UNITED CHEMICON INC	9801 W HIGGINS ST SUITE 430	ROSEMONT, IL 60018–4771
64154	LAMB INDUSTRIES INC	4826 SW SCHOLLS FERRY ROAD	PORTLAND OR 97225
64762	ELANTEC INC	1996 TAROB COURT	MILPITAS CA 95035–6824
66302	VLSI TECHNOLOGY INC	1109 MCKAY DR	SAN JOSE CA 95131–1706
71400	BUSSMANN DIV OF COOPER INDUSTRIES INC	114 OLD STATE RD PO BOX 14460	ST LOUIS MO 63178
75042	IRC ELECTRONIC COMPONENTS PHILADELPHIA DIV TRW FIXED RESISTORS	401 N BROAD ST	PHILADELPHIA PA 19108–1001
75498	MULTICOMP INC	3005 SW 154TH TERRACE #3	BEAVERTON OR 97006
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON OR 97077–0001
81073	GRAYHILL INC	561 HILLGROVE AVE PO BOX 10373	LA GRANGE IL 60525–5914
91293	JOHANSON MFG CO	400 ROCKWAY VALLEY RD	BOONTON NJ 07005
91637	DALE ELECTRONICS INC	2064 12TH AVE PO BOX 609	COLUMBUS NE 68601–3632
D5243	ROEDERSTEIN ERNST GMBH	LUDMILLASTRASSE 23	8300 LANDSHUT GERMANY
TK0213	TOPTRON CORP		TOKYO JAPAN
TK0409	HUMKE KEN R	2211 NW NICOLAI PO BOX 5128	PORTLAND OR 97208
TK0435	LEWIS SCREW CO	4300 S RACINE AVE	CHICAGO IL 60609–3320
TK0515	EVOX–RIFA INC	100 TRI–STATE INTERNATIONAL SUITE 290	LINCOLNSHIRE IL 60015
TK0679	DILECTRON INC	2669 S MRYTLE AVE	MONROVIA CA 91016
TK0891	MICONICS	1 FAIRCHILD AVE	PLAINVIEW NY 11803
TK0977	ELECTRICAL INSULATION SUPPLIERS, INC –(DIST)	3549 N W YEON	PORTLAND OR 97210
TK1547	MOORE ELECTRONICS INC (DIST)	19500 SW 90TH COURT PO BOX 1030	TUALATIN OR 97062
TK1727	PHILIPS NEDERLAND BV AFD ELONCO	POSTBUS 90050	5600 PB EINDHOVEN THE NETHERLANDS
TK1743	UNITRODE (UK) LTD	6 CRESSWELL PARK BLACKHEATH	LONDON SE 3 9RD ENGLAND
TK1828	LITE SPECIALTY METAL WORKS	20460 SW AVERY CT	TUALATIN OR 97062
TK1913	WIMA THE INTER–TECHNICAL GROUP IND	2269 SAW MILL RIVER ROAD PO BOX 127	ELMSFORD NY 10523

Manufacturers Cross Index, Electrical Parts (Cont.)

Mfr. Code	Manufacturer	Address	City, State, Zip Code
TK1989	GASKET SPECIALTIES	4968 NE 122ND AVE	PORTLAND OR 97220
TK2058	TDK CORPORATION OF AMERICA	1600 FEEHANVILLE DRV	MOUNT PROSPECT, IL 60056
TK2073	TOKYO AMERICA INC	565 W GULF ROAD	ARLINGTON HEIGHTS IL 60005
TK2096	KELVIN ASSOCIATES	14724 VENTURA BLVD SUITE 1003	SHERMAN OAKS CA 91403–3501
TK2262	RPM ENTERPRISES SUB OF MICROSEMI CORP	3305 W CASTOR ST	SANTA ANA CA 92704
TK2598	MAXIM – ASIC	120 SAN GABRIEL DRV	SUNNYVALE, CA 94086

Replaceable Electrical Parts List

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
				(BEGIN STANDARD ONLY)		
A1	671–2132–01	B010100	B010112	CIRCUIT BD ASSY:INSERTER	80009	671213201
A1	671–2132–02	B010113	B010169	CIRCUIT BD ASSY:INSERTER	80009	671213202
A1	671–2132–03	B010170	B010195	CIRCUIT BD ASSY:INSERTER	80009	671213203
A1	671–2132–04	B010196	B010229	CIRCUIT BD ASSY:INSERTER	80009	671213204
A1	671–2132–06	B010230	B020244	CIRCUIT BD ASSY:INSERTER	80009	671213206
A1	671–2132–07	B020245	B020288	CIRCUIT BD ASSY:INSERTER	80009	671213207
A1	671–2132–10	B020289	B020294	CIRCUIT BD ASSY:INSERTER	80009	671213210
A1	671–2132–11	B020295	B020300	CIRCUIT BD ASSY:INSERTER	80009	671213211
A1	671–2132–13	B020301	B020322	CIRCUIT BD ASSY:INSERTER	80009	671213213
A1	671–2132–14	B020323		CIRCUIT BD ASSY:INSERTER	80009	671213214
				(END STANDARD ONLY)		
				(BEGIN OPTION 1J ONLY)		
A1	671–2545–00	B010100	B010112	CIRCUIT BD ASSY:INSERTER	80009	671254500
A1	671–2545–01	B010113	B010136	CIRCUIT BD ASSY:INSERTER	80009	671254501
A1	671–2545–02	B010137	B010169	CIRCUIT BD ASSY:INSERTER	80009	671254502
A1	671–2545–03	B010170	B010195	CIRCUIT BD ASSY:INSERTER	80009	671254503
A1	671–2545–04	B010196	B010229	CIRCUIT BD ASSY:INSERTER	80009	671254504
A1	671–2132–06	B010230	B020244	CIRCUIT BD ASSY:INSERTER	80009	671213206
A1	671–2132–07	B020245	B020288	CIRCUIT BD ASSY:INSERTER	80009	671213207
A1	671–2132–10	B020289	B020294	CIRCUIT BD ASSY:INSERTER	80009	671213210
A1	671–2132–11	B020295	B020300	CIRCUIT BD ASSY:INSERTER	80009	671213211
A1	671–2132–13	B020301	B020322	CIRCUIT BD ASSY:INSERTER	80009	671213213
A1	671–2132–14	B020323		CIRCUIT BD ASSY:INSERTER	80009	671213214
				(END OPTION 1J ONLY)		
				(BEGIN OPTION 1M ONLY)		
A1	671–2849–00	B020288	B020288	CIRCUIT BD ASSY:INSERTER	80009	671284900
A1	671–2849–01	B020289	B020294	CIRCUIT BD ASSY:INSERTER	80009	671284901
A1	671–2849–02	B020295	B020300	CIRCUIT BD ASSY:INSERTER	80009	671284902
A1	671–2849–04	B020301	B020322	CIRCUIT BD ASSY:INSERTER	80009	671284904
A1	671–2849–05	B020323		CIRCUIT BD ASSY:INSERTER	80009	671284905
				(END OPTION 1M ONLY)		
				(BEGIN OPTION 02 ONLY)		
A1	671–3022–00	B020288	B020288	CIRCUIT BD ASSY:INSERTER	80009	671302200
A1	671–3022–02	B020289	B020300	CIRCUIT BD ASSY:INSERTER	80009	671302202
A1	671–3022–04	B020301	B020322	CIRCUIT BD ASSY:INSERTER	80009	671302204
A1	671–3022–05	B020323		CIRCUIT BD ASSY:INSERTER	80009	671302205
				(END OPTION 02 ONLY)		
A1A1	119–4328–00	B010100	B010195	OVEN ASSEMBLY:VITS100/200,28MHZ	80009	119432800
A1A1	119–4328–01	B010196	B020322	OVEN ASSEMBLY:VITS100/200,28MHZ	80009	119432801
A1A1	119–4328–02	B020323		OVEN ASSEMBLY:VITS100/200,28MHZ	80009	119432802
				ATTACHED PARTS		
	131–0157–00			TERMINAL,PIN:0.25 L X 0.04 OD,BRS,SLDR PL	05276	013–100–1000–47
				END ATTACHED PARTS		

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A1C1	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C2	281–0809–00			CAP,FXD,CER:MLC;200 PF,5%,100V,0.100 X0.170	04222	SA101A201JAA
A1C3	290–0990–00			CAP,FXD,ALUM:10UF,20%,50V,8X11.5	55680	UET1H100MPH
A1C4	281–0765–00			CAP,FXD,CER DI:100PF,5%,100V	04222	SA102A101JAA
A1C5	283–0100–00			CAP,FXD,CER DI:0.0047UF,10%,200V	04222	SR302A472KAA
A1C6	283–0129–00			CAP,FXD,CER DI:0.56UF,20%,100V	04222	SR501C564MAA
A1C7	281–0773–00			CAP,FXD,CER:MLC;0.01UF,10%,100V	TK1743	CGB103KEX
A1C8	281–0925–01			CAP,FXD,CER:MLC;0.22UF,20%,50V,Z5U.0.170 X 0.120	04222	SA115E224MAA
A1C9	281–0707–00			CAP,FXD,CER DI:15000PF,10%,200V	04222	MA302C153KAA
A1C10	281–0925–01			CAP,FXD,CER:MLC;0.22UF,20%,50V,Z5U.0.170 X 0.120	04222	SA115E224MAA
A1C11	283–0100–00			CAP,FXD,CER DI:0.0047UF,10%,200V	04222	SR302A472KAA
A1C12	281–0925–01			CAP,FXD,CER:MLC;0.22UF,20%,50V,Z5U.0.170 X 0.120	04222	SA115E224MAA
A1C13	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C14	290–0782–01			CAP,FXD,ALUM:4.7UF,20%,35V,ESR=42.33 OHM (120HZ,20C)	55680	UVX1V4R7MAA1TD
A1C15	281–0772–00	B020295		CAP,FXD,CER:MLC;4700PF,10%,100V,0.100 X	04222	SA101C472KAA
A1C16	290–0782–01			CAP,FXD,ALUM:4.7UF,20%,35V,ESR=42.33 OHM (120HZ,20C)	55680	UVX1V4R7MAA1TD
A1C17	281–0925–01			CAP,FXD,CER:MLC;0.22UF,20%,50V,Z5U.0.170 X 0.120	04222	SA115E224MAA
A1C18	281–0909–00			CAP,FXD,CER:MLC;0.022UF,20%,50V,0.100 X	TK2058	DA12X7R1H223M–T
A1C19	281–0757–00			CAP,FXD,CER:MLC;10PF,10%,200V,NPO,0.100	04222	SA102A100KAA
A1C20	281–0810–00			CAP,FXD,CER:MLC;5.6PF,+/–0.5PF,100V,0.100 X 0.170	04222	SA102A5R6DAA
A1C21	281–0819–00			CAP,FXD,CER:MLC;33 PF,5%,50V,0.100 X 0.170	04222	SA102A330JAA
A1C22	283–0177–00			CAP,FXD,CER DI:1UF,+80–20%,25V	04222	SR303E105ZAA
A1C23	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C24	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C25	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C26	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C27	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C28	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C29	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C30	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C31	283–0108–00	B020301		CAP,FXD,CER DI:220PF,10%,200V	04222	SR152A221KAA
A1C33	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C34	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C36	290–0942–00			CAP,FXD,ELCTLT:100UF,+100–10%,25V,ALUMINUM	0H1N5	CEUFM1E101
A1C37	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C38	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C39	281–0928–00			CAP,FXD,CER DI:150PF,5%	04222	SA101A151JAA
A1C40	281–0862–00			CAP,FXD,CER:MLC;1000PF,20%,100V,X7R,0.100 X 0.170	04222	SA101C102MAA
A1C41	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C42	281–0862–00			CAP,FXD,CER:MLC;1000PF,20%,100V,X7R,0.100 X 0.170	04222	SA101C102MAA
A1C43	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C46	290–0990–00			CAP,FXD,ALUM:10UF,20%,50V,8X11.5	55680	UET1H100MPH
A1C51	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C52	283–0633–00			CAP,FXD,MICA DI:77PF,1%,100V	TK0891	RDM15ED770F03
A1C53	290–0990–00			CAP,FXD,ALUM:10UF,20%,50V,8X11.5	55680	UET1H100MPH
A1C54	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C55	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C56	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A1C57	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C58	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C59	281–0757–00			CAP,FXD,CER:MLC;10PF,10%,200V,NPO,0.100	04222	SA102A100KAA
A1C60	281–0810–00			CAP,FXD,CER:MLC;5.6PF,+/–0.5PF,100V,0.100 X 0.170	04222	SA102A5R6DAA
A1C61	281–0810–00			CAP,FXD,CER:MLC;5.6PF,+/–0.5PF,100V,0.100 X 0.170	04222	SA102A5R6DAA
A1C65	283–0690–00			CAP,FXD,MICA DI:560PF,1%,300V	TK0891	RDM15FC561F03
A1C66	283–0647–01			CAP,FXD,MICA DI:70PF,1%,500V,TAPE & AMMO PACK	09023	CDA15ED700F03
A1C67	283–0156–00	B010100	B010229	CAP,FXD,CER DI:1000PF,+80–20%,200VSQUARE	04222	SR152E102ZAA
A1C67	283–0000–04	B010230		CAP,FXD,CER DI:0.001UF,+100–0X,500V,T&A	18796	DD05–90HAY5U102
A1C68	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C69	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C70	290–0942–00			CAP,FXD,ELCTLT:100UF,+100–10%,25V,ALUMINUM	0H1N5	CEUFM1E101
A1C71	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C72	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C73	283–0648–01			CAP,FXD,MICA DI:10PF,5%,500VTAPED & REELED	TK0891	RDM15CD100D03
A1C74	283–0600–01			CAP,FXD,MICA DI:43PF,5%,500VTAPE & AMMO PACK	09023	CDA10ED430J03
A1C75	283–0615–01			CAP,FXD,MICA DI:33PF,5%,500V,TAPE & AMMO PACK	09023	CDA15ED330J03
A1C76	283–0768–00			CAP,FXD,MICA DI:132 PF,1%,500V	TK0891	RDM15FD132OFO3
A1C77	283–0769–00			CAP,FXD,MICA DI:278 PF,1%,500V	TK0891	RDM15FD278OFO3
A1C78	283–0788–00			CAP,FXD,MICA DI:267PF,1%,500V	TK0891	RDM15FD2670F03
A1C79	283–0672–00			CAP,FXD,MICA DI:200PF,1%,500V	TK0891	RDM15FD201F03
A1C83	283–0177–00			CAP,FXD,CER DI:1UF,+80–20%,25V	04222	SR303E105ZAA
A1C84	285–1252–00			CAP,FXD,PLASTIC:0.15UF,10%,250VAC	D5243	F1772–415–2000
A1C85	285–1196–00			CAP,FXD,PPR DI:0.01UF,20%,250V	TK0515	PME 290 MB 5100
A1C86	285–1196–00			CAP,FXD,PPR DI:0.01UF,20%,250V	TK0515	PME 290 MB 5100
A1C87	283–0211–00			CAP,FXD,CER DI:0.1UF,10%,200V	04222	SR302C104KAA
A1C88	283–0481–00			CAP,FXD,CER DI:220PF,10%,250VAC	18796	DE7090B221KVA1–
A1C89	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C91	290–1069–00	B010100	B010229	CAP,FXD,ALUM:1000UF,20%,6.3V,12.5MM X 25MM	55680	UPL1E102MHH
A1C91	290–1301–00	B010230		CAP,FXD,ALUM:2700UF,20%,10V,12.5 X 30MM(0.492 X 1.180)	0H1N5	CEEFM1A272M7
A1C92	290–1292–00	B010100	B010229	CAP,FXD,ALUM:4700UF,20%,6.3V,23 X 32MM;RADIAL	62643	767D472M6R3HE1C
A1C92	290–1301–00	B010230		CAP,FXD,ALUM:2700UF,20%,10V,12.5 X 30MM(0.492 X 1.180)	0H1N5	CEEFM1A272M7
A1C94	290–0942–00			CAP,FXD,ELCTLT:100UF,+100–10%,25V,ALUMINUM	0H1N5	CEUFM1E101
A1C95	290–0942–00			CAP,FXD,ELCTLT:100UF,+100–10%,25V,ALUMINUM	0H1N5	CEUFM1E101
A1C96	285–1331–00			CAP,FXD,MTLZD:0.47UF,5%,400V	TK1913	MKS4 .47/400/5
A1C97	285–1329–00			CAP,FXD,PLSTC:MTLZD FILM;680PF,10%,1600V	TK1913	FKP1 680/1600/1
A1C98	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C99	290–0755–00	B010100	B010229	CAP,FXD,ELCTLT:100UF,+50%–20%,10WVDC	0H1N5	CEUSM1C101
A1C99	290–0973–01	B010230		CAP,FXD,ALUM:100UF,20%,25VDC	55680	UVX1E101MEA1TA
A1C100	283–0177–00			CAP,FXD,CER DI:1UF,+80–20%,25V	04222	SR303E105ZAA
A1C101	283–0177–00			CAP,FXD,CER DI:1UF,+80–20%,25V	04222	SR303E105ZAA
A1C102	290–1034–00	B010100	B010229	CAP,FXD,ALUM:330UF,20%,25V,13 X 25MM	55680	UPL1J331MHH
A1C102	290–1302–00	B010230		CAP,FXD,ALUM:1000UF,20%,35V,12.5 X 30MM(0.492 X 1.180)	0H1N5	CEEFM1V102M7
A1C103	290–1034–00	B010100	B010229	CAP,FXD,ALUM:330UF,20%,25V,13 X 25MM	55680	UPL1J331MHH
A1C103	290–1302–00	B010230		CAP,FXD,ALUM:1000UF,20%,35V,12.5 X 30MM(0.492 X 1.180)	0H1N5	CEEFM1V102M7
A1C104	290–0943–00			CAP,FXD,ALUM:47UF,+50–20%,25V,6 X 11MM	0H1N5	CEUSM1E470–Q
A1C105	290–0943–00			CAP,FXD,ALUM:47UF,+50–20%,25V,6 X 11MM	0H1N5	CEUSM1E470–Q
A1C106	283–0177–00			CAP,FXD,CER DI:1UF,+80–20%,25V	04222	SR303E105ZAA

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A1C107	283–0177–00			CAP,FXD,CER DI:1UF,+80–20%,25V	04222	SR303E105ZAA
A1C108	283–0177–00			CAP,FXD,CER DI:1UF,+80–20%,25V	04222	SR303E105ZAA
A1C109	283–0177–00			CAP,FXD,CER DI:1UF,+80–20%,25V	04222	SR303E105ZAA
A1C110	290–1291–00	B010100	B010229	CAP,FXD,ALUM:150UF,20%,400V,30 X 30MM;SNAPIN,105 DEG	0H1N5	CEAUF2G151M30
A1C110	290–1301–00	B010230		CAP,FXD,ALUM:2700UF,20%,10V,12.5 X 30MM(0.492 X 1.180)	0H1N5	CEEFM1A272M7
A1C111	281–0773–00			CAP,FXD,CER:MLC;0.01UF,10%,100V	TK1743	CGB103KEX
A1C112	283–0249–00			CAP,FXD,CER DI:0.068UF,10%,50V	04222	SR215C683KAA
A1C113	290–0942–00			CAP,FXD,ELCTLT:100UF,+100–10%,25V,ALUMINUM	0H1N5	CEUFM1E101
A1C114	283–0197–02			CAP,FXD,CER DI:470PF,5%,50VTAPED & REELED	04222	SR591A471JAAAP1
A1C115	283–0177–00			CAP,FXD,CER DI:1UF,+80–20%,25V	04222	SR303E105ZAA
A1C116	283–0238–00			CAP,FXD,CER DI:0.01UF,10%,50V	04222	SR075C103KAA
A1C117	283–0024–00			CAP,FXD,CER:MLC;0.1UF,20%,50V,X7R,0.200	04222	SR215C104MAA
A1C118	283–0359–00			CAP,FXD,CER DI:1000PF,10%,200V	04222	SR212A102KAA
A1C119	283–0863–00			CAP,FXD,CER DI:CER CHIP,0.1UF,20%,25V,TYPE X7R	12969	24D104MBX
A1C120	283–0863–00			CAP,FXD,CER DI:CER CHIP,0.1UF,20%,25V,TYPE X7R	12969	24D104MBX
A1C121	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C122	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C123	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C124	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C125	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C126	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C128	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C129	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C130	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C131	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C132	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C133	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C134	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C135	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C136	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C137	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C139	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C140	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C141	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C142	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C143	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C144	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C145	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C146	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C147	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C148	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C149	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C150	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C152	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C153	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C154	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C155	281–0775–01	B010100	B010229	CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C156	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A1C157	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C158	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C159	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C160	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C161	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C162	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C163	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C164	290–0990–00			CAP,FXD,ALUM:10UF,20%,50V,8X11.5	55680	UET1H100MPH
A1C165	281–0265–00			CAP,VAR,CER DI:5.2–30PF,100V	51406	TZ03R300FR169
A1C167	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C168	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C169	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C170	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C171	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C172	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C173	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C174	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C175	281–0809–00			CAP,FXD,CER:MLC;200 PF,5%,100V,0.100 X0.170	04222	SA101A201JAA
A1C176	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C177	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C178	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C179	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C180	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C181	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C182	281–0759–00			CAP,FXD,CER:MLC;22PF,10%,100V,0.100 X 0.170	04222	SA102A220KAA
A1C183	281–0819–00			CAP,FXD,CER:MLC;33 PF,5%,50V,0.100 X 0.170	04222	SA102A330JAA
A1C184	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C185	283–0359–00			CAP,FXD,CER DI:1000PF,10%,200V	04222	SR212A102KAA
A1C500	290–0943–02			CAP,FXD,ELCTLT:47UF,20%,25VTAPED & REELED	55680	UVX1E470MDA1TD
A1C501	283–0221–00			CAP,FXD,CER DI:0.47UF,20%,50V	04222	SR305C474MAA
A1C503	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C504	290–1313–00			CAP,FXD,ALUM:10UF,20%,50V,8 X 11MM;105 DEG,RADIAL	55680	UET1H100MPH1TA
A1C505	290–1313–00			CAP,FXD,ALUM:10UF,20%,50V,8 X 11MM;105 DEG,RADIAL	55680	UET1H100MPH1TA
A1C506	283–0669–00			CAP,FXD,MICA DI:360PF,1%,500V	TK0891	RDM15FD361F03
A1C507	281–0782–00			CAP,FXD,CER DI:33 PF,10%,500V	52763	2RDPZZ007 33POK
A1C508	283–0177–05			CAP,FXD,CER DI:1UF,+80–20%,25V	04222	SR303E105ZAAAP1
A1C509	283–0223–00	B010230		CAP,FXD,CER DI:3PF,+/–5PF,50V	TK0679	TC501–NPO–309D
A1C510	281–0775–01	B010230		CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C511	281–0775–01	B010230		CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1E1	337–1417–00	B010100	B010229	SHIELD,ELEC:0.55 SQ X 0.685 INCH HIGH	02875	SO–9649–CN
A1CR5	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A1CR7	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A1CR8	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A1CR9	152–0601–01			DIODE,RECT:ULTRA FAST;150V,25NS,35A IFSM	04713	MUR115RL
A1CR10	152–0601–01			DIODE,RECT:ULTRA FAST;150V,25NS,35A IFSM	04713	MUR115RL
A1CR11	152–0601–01			DIODE,RECT:ULTRA FAST;150V,25NS,35A IFSM	04713	MUR115RL
A1CR12	152–0497–00			DIODE,RECT:BRIDGE,600V,1.5A,1.05VF	14936	2KBP06M
A1CR13	152–0582–00			DIODE,RECT:SCHTKY;20V,3A,.475VF,80A IFSM	04713	1N5820

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A1CR14	152–0884–00			DIODE,RECT:SCHTKY;35V,16A,150A IFSM,630MVF	04713	MBR1635
				ATTACHED PARTS		
	210–0586–00			NUT,PL,ASSEM WA:4–40 X 0.25,STL CD PL	TK0435	ORDER BY DESC
	210–1178–00			WASHER,SHLDR:U/W TO–220 XSTR	13103	7721–7PPS
	211–0097–00			SCREW,MACHINE:4–40 X 0.312,PNH,STL	TK0435	ORDER BY DESC
	214–2953–00			HEAT SINK,SEMIC:XSTR,TO–220;VERTICALMOUNT,SLOT HOLE,(3)SOLDERABLE TABS,COPPER,BLACK PAINT	13103	6030B–TT
	342–0563–00			INSULATOR,PLATE:XSTR,FBRGL REINFORCED SILICON RBR	18565	69–11–8805–1674
				END ATTACHED PARTS		
A1CR15	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A1CR16	152–0601–01			DIODE,RECT:ULTRA FAST;150V,25NS,35A IFSM	04713	MUR115RL
A1CR17	152–0601–01			DIODE,RECT:ULTRA FAST;150V,25NS,35A IFSM	04713	MUR115RL
A1CR18	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A1CR19	152–1085–00			DIO,RECT:ULTRA FAST;1000V,1A,30A IFSM,75NS SOFT RCVRY	0LUA3	BYV26E
A1CR20	152–1085–00			DIO,RECT:ULTRA FAST;1000V,1A,30A IFSM,75NS SOFT RCVRY	0LUA3	BYV26E
A1CR21	152–0601–01			DIODE,RECT:ULTRA FAST;150V,25NS,35A IFSM	04713	MUR115RL
A1CR22	152–0601–01			DIODE,RECT:ULTRA FAST;150V,25NS,35A IFSM	04713	MUR115RL
A1CR24	152–0601–01			DIODE,RECT:ULTRA FAST;150V,25NS,35A IFSM	04713	MUR115RL
A1CR25	152–0964–00			DIODE,SIG:ULTRA FAST;ARRAY,6 COM CATH/COM ANODE PAIR,12 DIODES,50V,200MA,4NS,2.5PF	TK2262	DM 308BT100SP–4
A1CR26	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A1CR27	152–0964–00	B010230		DIODE,SIG:ULTRA FAST;ARRAY,6 COM CATH/COM ANODE PAIR,12 DIODES,50V,200MA,4NS,2.5PF	TK2262	DM 308BT100SP–4
A1CR28	152–0964–00	B010230		DIODE,SIG:ULTRA FAST;ARRAY,6 COM CATH/COM ANODE PAIR,12 DIODES,50V,200MA,4NS,2.5PF	TK2262	DM 308BT100SP–4
A1CR29	152–0964–00	B010230		DIODE,SIG:ULTRA FAST;ARRAY,6 COM CATH/COM ANODE PAIR,12 DIODES,50V,200MA,4NS,2.5PF	TK2262	DM 308BT100SP–4
A1DS1	150–1090–00			DIODE,OPTO:LED;RED,626NM,4MCD AT 10MA,60 DEG VIEW ANGLE,RT ANGLE MT W/EVEN SHEARED LEADS	15513	SP850211
A1DS2	150–1120–00			DIODE,OPTO:LED;AMBER,583NM,8MCD AT 20MA,T1	15513	PCL200–BA
A1DS3	150–1111–00			LT EMITTING DIO:GREEN,D565NM,35MA	15513	PCL200–MG
A1DS4	150–0035–00			LAMP,GLOW:NEON;90V,0.3MA,AID–T,WIRE LD	TK0213	JH005/3011JA
A1E1	337–1417–00	B010100	B010229	SHIELD,ELEC:0.55 SQ X 0.685 INCH HIGH (OPTION 1J ONLY)	02875	SO–9649–CN
A1F1	159–0032–00			FUSE,CARTRIDGE:3AG,0.5A,250V,SLOW BLOW	71400	MDL 1/2
				MOUNTING PARTS		
	200–2264–00			CAP,FUSEHOLDER:3AG FUSES	61935	FEK 031 1666
	204–0906–00			BODY,FUSEHOLDER:3AG & 5 X 20MM FUSES	61935	TYPE FAU 031.35
				END MOUNTING PARTS		
A1J2	131–3364–00			CONN,HDR:PCB;MALE,STR,2 X 17,0.1 CTR,0.365D	53387	2534–6002UB
A1J3	131–3323–00			CONN,HDR:PCB;MALE,STR,2 X 20,0.1 CTR,0.365D	22526	66506–025
A1J4	131–3364–00			CONN,HDR:PCB;MALE,STR,2 X 17,0.1 CTR,0.365D	53387	2534–6002UB
A1J5	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB;MALE,STR,0.025SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE (QUANTITY 3)	22526	48283–018
A1J6	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB;MALE,STR,0.025SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE (QUANTITY 3)	22526	48283–018

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A1J9	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB;MALE,STR,0.025SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE (QUANTITY 3)	22526	48283–018
A1J10	131–3378–00			CONN,RF JACK:BNC;50 OHM,FEMALE,RTANG,PCB/REAR PNL,0.5–28 THD,0.625 H X 0.187 TAIL,W/O	00779	227677–1
A1J11	131–0787–00			TERMINAL,PIN:PCB/PRESSFIT;MALE,STR,0.025 SQ,0.448 MLG X 0.137 TAIL,0.600 L,PHOS BRZ,50 GOLD (QUANTITY 5)	22526	47359–001
A1J12	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB;MALE,STR,0.025SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE (QUANTITY 3)	22526	48283–018
A1J13	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB;MALE,STR,0.025SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE (QUANTITY 3)	22526	48283–018
A1J14	131–3378–00			CONN,RF JACK:BNC;50 OHM,FEMALE,RTANG,PCB/REAR PNL,0.5–28 THD,0.625 H X 0.187 TAIL,W/O	00779	227677–1
A1J15	131–3378–00			CONN,RF JACK:BNC;50 OHM,FEMALE,RTANG,PCB/REAR PNL,0.5–28 THD,0.625 H X 0.187 TAIL,W/O	00779	227677–1
A1J17	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB;MALE,STR,0.025SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE (QUANTITY 2)	22526	48283–018
A1J18	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB;MALE,STR,0.025SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE (QUANTITY 2)	22526	48283–018
A1J19	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB;MALE,STR,0.025SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE (QUANTITY 2)	22526	48283–018
A1J20	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB;MALE,STR,0.025SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE (QUANTITY 16)	22526	48283–018
A1J21	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB;MALE,STR,0.025SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE (QUANTITY 2)	22526	48283–018
A1J22	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB;MALE,STR,0.025SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE (QUANTITY 3)	22526	48283–018
A1J26	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB;MALE,STR,0.025SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE (QUANTITY 2)	22526	48283–018
A1J27	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB;MALE,STR,0.025SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE (QUANTITY 10)	22526	48283–018
A1J28	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB;MALE,STR,0.025SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE (QUANTITY 3)	22526	48283–018
A1J32	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB;MALE,STR,0.025SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE (QUANTITY 3)	22526	48283–018
A1J33	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB;MALE,STR,0.025SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE (QUANTITY 3)	22526	48283–018
A1J50	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB;MALE,STR,0.025SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE (QUANTITY 2)	22526	48283–018

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A1J51	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB;MALE,STR,0.025SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE (QUANTITY 2)	22526	48283–018
A1J52	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB;MALE,STR,0.025SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE (QUANTITY 2)	22526	48283–018
A1J53	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB;MALE,STR,0.025SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE (QUANTITY 2)	22526	48283–018
A1J54	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB;MALE,STR,0.025SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE (QUANTITY 3)	22526	48283–018
A1J55	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB;MALE,STR,0.025SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE (QUANTITY 3)	22526	48283–018
A1J56	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB;MALE,STR,0.025SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE (QUANTITY 3)	22526	48283–018
A1J57	131–0608–00			CONN,TERMINAL:PRESSFIT/PCB;MALE,STR,0.025SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE (QUANTITY 3)	22526	48283–018
A1K2	148–0232–00			RELAY,ARM:2 FORM C,75 OHM,COIL,12V 411 OHM,CONTACTS,24VDC 1A,INSERTION LOSS 1DB MAX @900MHZ	61529	RG2E–12V
A1L1	108–0459–00	B010100	B010229	COIL,RF:FIXED,39.5UH	0JR03	108–0459–00
A1L1	108–1544–00	B010230		COIL,RF:IDCTR;FXD,39.5UH,10%,Q=100,TAPPED,SHIELDED *ATTACHED PARTS*	0JR03	108–1544–00 (Z–
	162–0532–00			INSUL SLVG,ELEC:HT SHRINK,0.375 IDPOLYOLEFIN,BLK,0.022 *END ATTACHED PARTS*	06090	VERSAFIT
A1L2	108–0215–00			COIL,RF:INDUCTOR;FXD,1.1UH,10%,38AWG,31 TURNS	0JR03	108–0215–00
A1L3	108–0215–00			COIL,RF:INDUCTOR;FXD,1.1UH,10%,38AWG,31 TURNS	0JR03	108–0215–00
A1L6	108–0912–00			COIL,RF:FIXED,83NH	0JR03	108–0912–00
A1L7	108–0182–00			COIL,RF:FIXED,293NH	0JR03	108–0182–00
A1L8	108–0182–00			COIL,RF:FIXED,293NH	0JR03	108–0182–00
A1L12	114–0364–00			COIL,RF:VARIABLE,1.42–1.68UHPOT CORE	54937	500–3893
A1L13	114–0364–00			COIL,RF:VARIABLE,1.42–1.68UHPOT CORE	54937	500–3893
A1L14	114–0463–00			COIL,RF:VAR 0.90UH – 1.07UH, PRESET/SECURED	54937	500–4752
A1L15	108–1263–00			IDCTR,FXD:PWR;10UH,10%,I<2.1A,RDC<0.043 OHM,Q>20	TK2058	TSL0707–100K1R9
A1L16	108–0554–00			IDCTR,FXD:PWR;5UH,20%,I<10A,DCR<0.01 OHM,17.5	0JR03	108–0554–00
A1L17	108–0959–00			COIL,RF:FIXED,150UH	0JR03	108–0959–00
A1L18	108–1212–00			COIL,RF:FIXED,9UH,2%	0JR03	108–1212–00
A1L19	108–1212–00			COIL,RF:FIXED,9UH,2%	0JR03	108–1212–00
A1L20	108–1204–00			COIL,RF:FIXED,1.51 UH,1%	0JR03	108–1204–00
A1L21	108–1206–00			COIL,RF:FIXED,413NH,1%	0JR03	108–1206–00
A1LF1	119–1946–00			FILTER,RFI:1A,250V,400HZ W/PC TERMINAL	0GV52	FN326–1/02–K–D–
A1P5	131–0993–02			BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P6	131–0993–02			BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P9	131–0993–05			BUS,CONDUCTOR:SHUNT ASSEMBLY,GREEN	00779	850100–5
A1P12	131–0993–02			BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P13	131–0993–02			BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P17	131–0993–02			BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P18	131–0993–02			BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A1P19	131–0993–02			BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P20	131–0993–02			BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P22	131–0993–05			BUS,CONDUCTOR:SHUNT ASSEMBLY,GREEN	00779	850100–5
A1P28	131–0993–05			BUS,CONDUCTOR:SHUNT ASSEMBLY,GREEN	00779	850100–5
A1P32	131–0993–02			BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P33	131–0993–02			BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P34	131–0993–02			BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P34	131–0993–02	B010230		BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P35	131–0993–02			BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P35	131–0993–02	B010230		BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P36	131–0993–02			BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P36	131–0993–02	B010230		BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P37	131–0993–02			BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P38	131–0993–02	B010230		BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P54	131–0993–02	B010230		BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P55	131–0993–02	B010230		BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P56	131–0993–02	B010230		BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P57	131–0993–02	B010230		BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1Q1	151–0190–00			XSTR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	04713	2N3904
A1Q2	151–0190–00			XSTR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	04713	2N3904
A1Q3	151–0190–00			XSTR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	04713	2N3904
A1Q4	151–0622–00			XSTR,SIG:BIPOLAR,PNP;40V,1.0A,50MHZ,AMPL	04713	MPS6727
A1Q5	151–0710–00			XSTR,SIG:BIPOLAR,NPN;40V,1.0A,50MHZ,AMPL	04713	MPSW01A
A1Q6	151–0342–00			XSTR,SIG:BIPOLAR,PNP;60V,50MA,40MHZ,AMPL	04713	MPS4249
A1Q7	151–0341–00			XSTR,SIG:BIPOLAR,NPN;45V,50MA,40MHZ,AMPL	04713	MPS6520
A1Q8	151–0190–00			XSTR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	04713	2N3904
A1Q9	151–0656–00			XSTR,PWR:BIPOLAR,NPN;80V,8.0A,4.0MHZ,DARLINGTON,AMPL	04713	2N6044
A1Q11	151–0190–00			XSTR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	04713	2N3904
A1Q12	151–0254–00			XSTR,SIG:BIPLAR,NPN;30V,500MA,125MHZ,AMPL,DARLINGTON	0JR04	MPS–A14
A1Q13	151–0190–00			XSTR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	04713	2N3904
A1Q14	151–0190–00			XSTR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	04713	2N3904
A1Q15	151–0528–00			THYRISTOR,PWR:BIPOLAR,SCR;50V,16A RMS,PHASE	04713	2N6400
A1Q16	151–0908–00			XSTR,PWR:BIPOLAR,NPN;500V VCEO,1000VVCEV,5A *ATTACHED PARTS*	04713	MJH16002A
	210–0586–00			NUT,PL,ASSEM WA:4–40 X 0.25,STL CD PL	TK0435	ORDER BY DESC
	210–0589–00			NUT,SLFLKG,HEX:4–40 X 0.246,STL CD PL	TK0409	CF22NM40
	210–1178–00			WASHER,SHLDR:U/W TO–220 XSTR	13103	7721–7PPS
	211–0097–00			SCREW,MACHINE:4–40 X 0.312,PNH,STL	TK0435	ORDER BY DESC
	214–2953–00			HEAT SINK,SEMIC:XSTR,TO–220;VERTICAL MOUNT,SLOT HOLE,(3)SOLDERABLE TABS,COPPER,BLACK PAINT	13103	6030B–TT
	342–0354–00			INSULATOR,PLATE:XSTR,SILICONE RUBBER *END ATTACHED PARTS*	2K262	342–0354–00
A1Q17	151–1171–00			XSTR,PWR:MOS,N–CH;50V,12A,0.12 OHM	04713	MTP15N05E
A1Q18	151–0188–00			XSTR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	04713	2N3906
A1Q180	151–0190–00			XSTR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	04713	2N3904
A1R3	307–0539–00			RES NTWK,FXD,FI:(7)510 OHM,10%,1W	11236	750–81–R510 OHM
A1R4	307–0539–00			RES NTWK,FXD,FI:(7)510 OHM,10%,1W	11236	750–81–R510 OHM
A1R5	307–0650–00			RES NTWK,FXD,FI:9,2.7K OHM,5%,0.150W	11236	750–101–R2.7K

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A1R6	307–0446–00			RES NTWK,FXD,FI:10K OHM,20%,(9)RES	11236	750–101–R10K
A1R7	307–0446–00			RES NTWK,FXD,FI:10K OHM,20%,(9)RES	11236	750–101–R10K
A1R8	307–0446–00			RES NTWK,FXD,FI:10K OHM,20%,(9)RES	11236	750–101–R10K
A1R9	307–0446–00			RES NTWK,FXD,FI:10K OHM,20%,(9)RES	11236	750–101–R10K
A1R10	322–3235–00			RES,FXD:METAL FILM;2.74K OHM,1%,0.2W,TC=100	91637	CCF501G27400F
A1R11	307–0650–00			RES NTWK,FXD,FI:9,2.7K OHM,5%,0.150W	11236	750–101–R2.7K
A1R12	307–0650–00			RES NTWK,FXD,FI:9,2.7K OHM,5%,0.150W	11236	750–101–R2.7K
A1R13	307–0650–00			RES NTWK,FXD,FI:9,2.7K OHM,5%,0.150W	11236	750–101–R2.7K
A1R14	322–3235–00			RES,FXD:METAL FILM;2.74K OHM,1%,0.2W,TC=100	91637	CCF501G27400F
A1R18	322–3306–00			RES,FXD:METAL FILM;15K OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G1502F
A1R19	322–3147–00			RES,FXD:METAL FILM;332 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G332R0F
A1R20	322–3318–00			RES,FXD:METAL FILM;20K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20001F
A1R21	322–3318–00			RES,FXD:METAL FILM;20K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20001F
A1R22	322–3318–00			RES,FXD:METAL FILM;20K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20001F
A1R23	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A1R24	322–3295–00			RES,FXD:METAL FILM;11.5K OHM,1%,0.2W,TC=100	91637	CCF50G11501F
A1R25	322–3126–01			RES,FXD,FILM:200 OHM,0.5%,0.2W,TC=TOSMALL BODY	91637	CCF501G200R0D
A1R26	322–3126–01			RES,FXD,FILM:200 OHM,0.5%,0.2W,TC=TOSMALL BODY	91637	CCF501G200R0D
A1R27	322–3295–00			RES,FXD:METAL FILM;11.5K OHM,1%,0.2W,TC=100	91637	CCF50G11501F
A1R28	322–3258–00			RES,FXD:METAL FILM;4.75K OHM,1%,0.2W,TC=100	56845	CCF50–2–G4751FT
A1R29	322–3482–02			RES,FXD,FILM:14.2K OHM,5%,0.2W,TC=TO	91637	CCF501D14201D
A1R30	311–2230–00			RES,VAR,TRMR:CERMET;500 OHM,20%,0.5W,0.197 SQ	TK2073	GF06UT2 501 M L
A1R31	322–3304–00			RES,FXD,FILM:14.3K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF50G14301F
A1R32	322–3143–00	B010100	B020300	RES,FXD,FILM:301 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G301ROF
A1R32	322–3154–00	B020301		RES,FXD:METAL FILM;392 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G392R0F
A1R33	311–2226–00	B010100	B010169	RES,VAR,TRMR:CERMET;50 OHM,20%,0.5W,0.197 SQ	TK2073	GF06UT2 500 M L
A1R33	311–2227–00	B010170	B020300	RES,VAR,TRMR:CERMET;100 OHM,20%,0.5W,0.197 SQ	TK2073	GF06UT2 101 M L
A1R33	311–2228–00	B020301		RES,VAR,TRMR:CERMET;200 OHM,20%,0.5W,0.197 SQ	TK2073	GF06UT2 201 M L
A1R34	322–3143–00	B010100	B020300	RES,FXD,FILM:301 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G301ROF
A1R34	322–3154–00	B020301		RES,FXD:METAL FILM;392 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G392R0F
A1R35	322–3154–00			RES,FXD:METAL FILM;392 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G392R0F
A1R36	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A1R37	322–3143–00			RES,FXD,FILM:301 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G301ROF
A1R38	322–3143–00			RES,FXD,FILM:301 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G301ROF
A1R39	322–3126–01			RES,FXD,FILM:200 OHM,0.5%,0.2W,TC=TOSMALL BODY	91637	CCF501G200R0D
A1R40	311–2238–00			RES,VAR,TRMR:CERMET;50K OHM,20%,0.5W,0.197 SQ	TK2073	GF06UT2 503 M L
A1R41	322–3392–00			RES,FXD,FILM:118K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF501G11802F
A1R42	322–3295–00			RES,FXD:METAL FILM;11.5K OHM,1%,0.2W,TC=100	91637	CCF50G11501F
A1R43	322–3385–00			RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10002F
A1R44	322–3258–00			RES,FXD:METAL FILM;4.75K OHM,1%,0.2W,TC=100	56845	CCF50–2–G4751FT
A1R45	322–3373–00			RES,FXD,FILM:75K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G75001F
A1R46	322–3177–00			RES,FXD:METAL FILM;681 OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2G681R0F
A1R47	322–3306–00			RES,FXD:METAL FILM;15K OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G1502F
A1R48	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A1R49	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A1R50	322–3223–00			RES,FXD,FILM:2.05K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G20500F
A1R51	322–3235–00			RES,FXD:METAL FILM;2.74K OHM,1%,0.2W,TC=100	91637	CCF501G27400F
A1R52	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F

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Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A1R53	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A1R54	322–3443–00			RES,FXD,FILM:402K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF501G40202F
A1R55	322–3001–00			RES,FXD:METAL FILM;10 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10R00F
A1R56	322–3231–00			RES,FXD,FILM:2.49K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF50–1G24900F
A1R57	322–3243–00			RES,FXD:METAL FILM;3.32K OHM,1%,0.2W,TC=100	91637	CCF50–1–G33200F
A1R58	322–3260–00			RES,FXD,FILM:4.99K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G49900F
A1R59	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A1R60	322–3164–00			RES,FXD,FILM:499 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G499ROF
A1R61	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A1R62	322–3164–00			RES,FXD,FILM:499 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G499ROF
A1R63	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A1R64	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A1R65	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A1R66	317–0047–00			RES,FXD,CMPSN:4.7 OHM,5%,0.125W	50139	BB47G5
A1R67	317–0047–00			RES,FXD,CMPSN:4.7 OHM,5%,0.125W	50139	BB47G5
A1R68	322–3165–00			RES,FXD,FILM:511 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G511R0F
A1R69	322–3318–00			RES,FXD:METAL FILM;20K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20001F
A1R70	322–3385–00			RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10002F
A1R71	322–3385–00			RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10002F
A1R72	322–3230–00			RES,FXD,FILM:2.43K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF50–2–G2431FT
A1R73	322–3273–00			RES,FXD:METAL FILM;6.81K OHM,1%,0.2W,TC=100	91637	CCF50–2–G68100F
A1R74	322–3239–00			RES,FXD,FILM:3.01K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G30100F
A1R76	322–3250–00			RES,FXD:METAL FILM;3.92K OHM,1%,0.2W,TC=100	91637	CCF50–2F39200F
A1R77	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A1R78	322–3354–00			RES,FXD:METAL FILM;47.5K OHM,1%,0.2W,TC=100	91637	CCF501G47501F
A1R79	322–3414–00			RES,FXD:METAL FILM;200K OHM,1%,0.2W,TC=100PPM	91637	CCF501G20002F
A1R80	322–3354–00			RES,FXD:METAL FILM;47.5K OHM,1%,0.2W,TC=100	91637	CCF501G47501F
A1R81	322–3414–00			RES,FXD:METAL FILM;200K OHM,1%,0.2W,TC=100PPM	91637	CCF501G20002F
A1R82	322–3318–00			RES,FXD:METAL FILM;20K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20001F
A1R83	308–0677–00			RES,FXD,WW:1 OHM,5%,2W	75042	SPH 1 OHM 5 PER
A1R86	322–3442–00			RES,FXD,FILM:392K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF50–2G39202F
A1R87	322–3318–00			RES,FXD:METAL FILM;20K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20001F
A1R88	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A1R89	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A1R90	322–3346–00			RES,FXD:METAL FILM;39.2K OHM,1%,0.2W,TC=100	91637	CCF50–2–G39201F
A1R91	322–3226–00			RES,FXD:METAL FILM;2.21K OHM,1%,0.2W,TC=100	91637	CCF501G22100F
A1R92	322–3258–00			RES,FXD:METAL FILM;4.75K OHM,1%,0.2W,TC=100	56845	CCF50–2–G4751FT
A1R98	322–3039–00			RES,FXD,FILM:24.9 OHM,1%,0.2W,TC=T0,SMALL BODY	91637	CCF50–2–G24R90F
A1R99	322–3085–00			RES,FXD:METAL FILM;75 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G75R00F
A1R100	322–3085–00			RES,FXD:METAL FILM;75 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G75R00F
A1R101	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A1R102	322–3239–00			RES,FXD,FILM:3.01K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G30100F
A1R103	322–3085–07			RES,FXD:METAL FILM;75 OHM,0.1%,0.2W,TC=25 PPM	91637	CCF502–C75ROOBT
A1R104	322–3114–00			RES,FXD:METAL FILM;150 OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G1500F
A1R105	322–3114–00			RES,FXD:METAL FILM;150 OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G1500F
A1R106	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A1R108	322–3085–07			RES,FXD:METAL FILM;75 OHM,0.1%,0.2W,TC=25 PPM	91637	CCF502–C75ROOBT
A1R109	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A1R110	322–3201–00			RES,FXD:METAL FILM;1.21K OHM,1%,0.2W,TC=100	91637	CCF501G12100F
A1R111	322–3201–00			RES,FXD:METAL FILM;1.21K OHM,1%,0.2W,TC=100	91637	CCF501G12100F
A1R112	322–3085–07			RES,FXD:METAL FILM;75 OHM,0.1%,0.2W,TC=25 PPM	91637	CCF502–C75ROOBT
A1R113	322–3085–07			RES,FXD:METAL FILM;75 OHM,0.1%,0.2W,TC=25 PPM	91637	CCF502–C75ROOBT
A1R114	322–1618–07			RES,FXD,FILM:400 OHM,0.1%,0.2W,TC=T9	91637	CCF501C400R0B
A1R115	322–1618–07			RES,FXD,FILM:400 OHM,0.1%,0.2W,TC=T9	91637	CCF501C400R0B
A1R116	322–1618–07			RES,FXD,FILM:400 OHM,0.1%,0.2W,TC=T9	91637	CCF501C400R0B
A1R117	322–1618–07			RES,FXD,FILM:400 OHM,0.1%,0.2W,TC=T9	91637	CCF501C400R0B
A1R118	322–3085–00			RES,FXD:METAL FILM;75 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G75R00F
A1R119	322–3085–00			RES,FXD:METAL FILM;75 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G75R00F
A1R120	322–3154–00			RES,FXD:METAL FILM;392 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G392R0F
A1R121	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A1R122	311–2226–00			RES,VAR,TRMR:CERMET;50 OHM,20%,0.5W,0.197 SQ	TK2073	GF06UT2 500 M L
A1R123	322–3101–00			RES,FXD,FILM:110 OHM,1%,0.2W,TC=TOMI,SMALL BODY	91637	CCF50–2G110R0F
A1R124	322–3167–00			RES,FXD,FILM:536 OHM,1%,0.2W,TC=T0MI,SMALL BODY	57668	CRB20 FXE 536E
A1R125	322–3482–02			RES,FXD,FILM:14.2K OHM,5%,0.2W,TC=TO	91637	CCF501D14201D
A1R126	322–3304–00			RES,FXD,FILM:14.3K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF50G14301F
A1R127	311–2230–00			RES,VAR,TRMR:CERMET;500 OHM,20%,0.5W,0.197 SQ	TK2073	GF06UT2 501 M L
A1R130	322–3085–00			RES,FXD:METAL FILM;75 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G75R00F
A1R132	322–3138–00			RES,FXD,FILM:267 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G267R0F
A1R133	322–3135–00			RES,FXD,FILM:249 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G249R0F
A1R134	322–3135–00			RES,FXD,FILM:249 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G249R0F
A1R135	322–3235–00			RES,FXD:METAL FILM;2.74K OHM,1%,0.2W,TC=100	91637	CCF501G27400F
A1R137	322–3254–00			RES,FXD,FILM:4.32K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF502G4321FT
A1R138	322–3254–00			RES,FXD,FILM:4.32K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF502G4321FT
A1R141	322–3414–00			RES,FXD:METAL FILM;200K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20002F
A1R142	322–3235–00			RES,FXD:METAL FILM;2.74K OHM,1%,0.2W,TC=100	91637	CCF501G27400F
A1R143	315–0226–00			RES,FXD,FILM:22M OHM,5%,0.25W	50139	CB2265
A1R144	315–0105–00			RES,FXD,FILM:1M OHM,5%,0.25W	TK1727	SFR25 2322–181–
A1R145	315–0106–00			RES,FXD,FILM:10M OHM,5%,0.25W	TK1727	SFR25 2322–181–
A1R146	315–0102–00			RES,FXD,FILM:1K OHM,5%,0.25W	TK1727	SFR25 2322–181–
A1R147	315–0270–00			RES,FXD,FILM:27 OHM,5%,0.25W	TK1727	SFR25 2322–181–
A1R149	308–0585–00	B010100	B010229	RES,FXD,WW:50 OHM,0.5%,5W	91637	RS550R00D T/R
A1R149	308–0223–00	B010230		RES,FXD,WW:35 OHM,5%,3W	00213	1240S–35–5
A1R150	315–0100–00			RES,FXD,FILM:10 OHM,5%,0.25W,	TK1727	SFR25 2322–182–
A1R151	315–0103–00			RES,FXD,FILM:10K OHM,5%,0.25W	TK1727	SFR25 2322–181–
A1R152	322–3210–00			RES,FXD:METAL FILM;1.5K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G15000F
A1R153	301–0274–00	B010100	B010229	RES,FXD,FILM:270K OHM,5%,0.5W	19701	5053CX270K0J
A1R153	303–0274–00	B010230		RES,FXD,CMPSN:270K OHM,5%,1W	80009	303027400
A1R154	305–0104–00			RES,FXD,CMPSN:100K OHM,5%,2W	11502	GF–3 OR GS–3 10
A1R155	308–0555–00			RES,FXD,WW:5 OHM,5%,3W	00213	1200S–5.0–5
A1R156	308–0555–00			RES,FXD,WW:5 OHM,5%,3W	00213	1200S–5.0–5
A1R157	301–0274–00	B010100	B010229	RES,FXD,FILM:270K OHM,5%,0.5W	19701	5053CX270K0J
A1R157	303–0274–00	B010230		RES,FXD,CMPSN:270K OHM,5%,1W	80009	303027400

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A1R158	322–3235–00			RES,FXD:METAL FILM;2.74K OHM,1%,0.2W,TC=100	91637	CCF501G27400F
A1R159	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A1R160	322–3281–00			RES,FXD:METAL FILM;8.25K OHM,1%,0.2W,TC=100	91637	CCF501G82500F
A1R161	322–3258–00			RES,FXD:METAL FILM;4.75K OHM,1%,0.2W,TC=100	56845	CCF50–2–G4751FT
A1R162	322–3314–00			RES,FXD:METAL FILM;18.2K OHM,1%,0.2W,TC=100	91637	CCF501G18201F
A1R163	308–0806–00			RES,FXD,WW:45K,0.01%,0.125W,TC=5PPM	TK2096	812–P 45 K .01P
A1R164	322–3347–00			RES,FXD,FILM:40.2K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF50–2–G40201F
A1R165	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A1R166	322–3162–00			RES,FXD:METAL FILM;475 OHM,1%,0.2W,TC=100 PPM	91637	CCF50G475R0F
A1R167	322–3402–00			RES,FXD:METAL FILM;150K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G15002F
A1R168	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A1R169	322–3210–00			RES,FXD:METAL FILM;1.5K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G15000F
A1R170	311–2231–00			RES,VAR,TRMR:CERMET;1K OHM,20%,0.5W,0.197 SQ	TK2073	GF06UT2 102 M L
A1R171	311–2231–00			RES,VAR,TRMR:CERMET;1K OHM,20%,0.5W,0.197 SQ	TK2073	GF06UT2 102 M L
A1R172	322–3318–00			RES,FXD:METAL FILM;20K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20001F
A1R173	322–3239–00			RES,FXD,FILM:3.01K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G30100F
A1R174	322–3258–00			RES,FXD:METAL FILM;4.75K OHM,1%,0.2W,TC=100	56845	CCF50–2–G4751FT
A1R175	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A1R177	307–0650–00			RES NTWK,FXD,FI:9,2.7K OHM,5%,0.150W	11236	750–101–R2.7K
A1R178	307–0650–00			RES NTWK,FXD,FI:9,2.7K OHM,5%,0.150W	11236	750–101–R2.7K
A1R179	307–0650–00			RES NTWK,FXD,FI:9,2.7K OHM,5%,0.150W	11236	750–101–R2.7K
A1R180	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A1R184	322–3225–00			RES,FXD,FILM:2.15K OHM,1%,0.2W,TC=T0	91637	CCF501G21500F
A1R185	322–3143–00			RES,FXD,FILM:301 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G301R0F
A1R190	322–3165–00			RES,FXD,FILM:511 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G511R0F
A1R191	322–3165–00			RES,FXD,FILM:511 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G511R0F
A1R192	322–3235–00			RES,FXD:METAL FILM;2.74K OHM,1%,0.2W,TC=100	91637	CCF501G27400F
A1R206	322–3137–00			RES,FXD,FILM:261 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G261R0F
A1R207	322–3117–00			RES,FXD,FILM:162 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G162R0F
A1R208	322–3306–00			RES,FXD:METAL FILM;15K OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G1502F
A1R209	322–3114–00			RES,FXD:METAL FILM;150 OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G1500F
A1R210	311–2227–00			RES,VAR,TRMR:CERMET;100 OHM,20%,0.5W,0.197 SQ	TK2073	GF06UT2 101 M L
A1R211	322–3135–00			RES,FXD,FILM:249 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G249R0F
A1R212	322–3135–00			RES,FXD,FILM:249 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G249R0F
A1R213	322–3135–00			RES,FXD,FILM:249 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G249R0F
A1R214	322–3164–00			RES,FXD,FILM:499 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G499R0F
A1R215	322–3235–00	B010100	B010229	RES,FXD:METAL FILM;2.74K OHM,1%,0.2W,TC=100	91637	CCF501G27400F
A1R216	322–3318–00			RES,FXD:METAL FILM;20K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20001F
A1R217	307–1318–00			RES NTWK,FXD,FI:(2) 162 OHM,(2) 260 OHM,2%,0.125W	91637	CSC04B–05–162/2
A1R218	307–1318–00			RES NTWK,FXD,FI:(2) 162 OHM,(2) 260 OHM,2%,0.125W	91637	CSC04B–05–162/2
A1R219	307–1318–00			RES NTWK,FXD,FI:(2) 162 OHM,(2) 260 OHM,2%,0.125W	91637	CSC04B–05–162/2
A1R220	322–3165–00			RES,FXD,FILM:511 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G511R0F
A1R221	322–3165–00			RES,FXD,FILM:511 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G511R0F
A1R222	322–3165–00			RES,FXD,FILM:511 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G511R0F
A1R223	322–3165–00			RES,FXD,FILM:511 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G511R0F
A1R224	322–3165–00			RES,FXD,FILM:511 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G511R0F
A1R225	322–3165–00			RES,FXD,FILM:511 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G511R0F
A1R226	322–3165–00			RES,FXD,FILM:511 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G511R0F

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A1R227	322–3001–00			RES,FXD:METAL FILM;10 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10R00F
A1R228	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A1R229	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A1R230	322–3210–00			RES,FXD:METAL FILM;1.5K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G15000F
A1R231	322–3135–00			RES,FXD,FILM:249 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G249R0F
A1R500	301–0105–00	B010100	B010229	RES,FXD,FILM:1M OHM,5%,0.50W	19701	5053CX1M000J
A1R500	303–0105–00	B010230		RES,FXD,CMPSN:1M OHM,5%,1W	24546	FP32 OR FP1 1 M
A1R501	322–3318–00			RES,FXD:METAL FILM;20K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20001F
A1R502	322–3335–00			RES,FXD,FILM:30.1K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G30101F
A1R503	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A1R504	322–3385–00	B010100	B010229	RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10002F
A1R504	322–3289–00	B010230		RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A1R506	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A1R508	322–3318–00	B010230		RES,FXD:METAL FILM;20K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20001F
A1RT1	307–0746–00			RES,THERMAL:5 OHM,10%,7A/DEG C	15454	SG200–S STRAI
A1RV1	307–0663–00			RES,V SENSITIVE:330 V,0.25 W	34371	V250LA4
A1S1	260–1721–00			SWITCH,ROCKER:8,SPST,125MA,30VDC	81073	76SB08S
A1S2	260–1721–00			SWITCH,ROCKER:8,SPST,125MA,30VDC	81073	76SB08S
A1S3	260–1721–00			SWITCH,ROCKER:8,SPST,125MA,30VDC	81073	76SB08S
A1S4	260–1721–00			SWITCH,ROCKER:8,SPST,125MA,30VDC	81073	76SB08S
A1S5	260–2447–00			SWITCH,ROCKER:SINGLE,RTANG	81073	76SB08S RA
A1S6	260–2447–00			SWITCH,ROCKER:SINGLE,RTANG	81073	76SB08S RA
A1S7	260–1721–00			SWITCH,ROCKER:8,SPST,125MA,30VDC	81073	76SB08S
A1S8	260–2126–00			SWITCH,ROTARY:MEMORY SELECTOR	64154	41J34G
A1S9	260–2443–00			SW,PWR:DPDT;PUSH PUSH ALT ACT,PC PINS,6A 250VAC/1A 100VDC,36A AC SURGE,RIGHT ANG MNT,W/HARD END *ATTACHED PARTS*	31918	NE18–00–EE–N–47
	366–1160–00			PUSH BUTTON:CHARCOAL,0.523 X 0.253 X 0.43 *END ATTACHED PARTS*	80009	366116000
A1S10	260–2443–00			SW,PWR:DPDT;PUSH PUSH ALT ACT,PC PINS,6A 250VAC/1A 100VDC,36A AC SURGE,RIGHT ANG MNT,W/HARD END *ATTACHED PARTS*	31918	NE18–00–EE–N–47
	366–1160–00			PUSH BUTTON:CHARCOAL,0.523 X 0.253 X 0.43 *END ATTACHED PARTS*	80009	366116000
A1T1	120–1831–00			TRANSFORMER,RF:FLYBACK,OUTPUTS +/–15 & +/–5	75498	128–8038–00
A1T2	120–1861–00			TRANSFORMER,RF:VAR 1.40 – 1.65UH, PRESET/SECURED TO 1.55 UH, +/– 1%Q=160, POT CORE	54937	500–4757
A1TP1	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A1TP2	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A1TP3	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A1TP4	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A1TP5	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A1TP6	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A1TP7	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A1TP8	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A1TP9	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A1TP10	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A1U1	156–1704–00			IC,DIGITAL:FTTL,FLIP FLOP;OCTAL D–TYPE, 3–STATE	01295	SN74F374N
A1U3	156–1704–00			IC,DIGITAL:FTTL,FLIP FLOP;OCTAL D–TYPE, 3–STATE	01295	SN74F374N
A1U4	160–8612–00	B010100	B010229	IC,MEMORY:CMOS,EPROM;8K X 8,40NS,REGISTERED (STANDARD ONLY)	80009	160861200
A1U4	160–8867–00	B010100	B010136	IC,MEMORY:CMOS,PROM;8K X 8,40NS,REGISTERED (OPTION 1J ONLY)	80009	160886700
A1U4	160–8867–01	B010137	B010229	IC,MEMORY:CMOS,EPROM;32K X 8 (OPTION 1J ONLY)	80009	160886701
A1U4	160–8612–01	B010230	B020294	IC,MEMORY:CMOS,EPROM;8K X 8 (STANDARD AND OPTION 1J ONLY)	80009	160861201
A1U4	160–8612–02	B020295		IC,MEMORY:CMOS,PROM;32K X 8,40NS,REGISTERED (STANDARD AND OPTION 1J ONLY)	80009	160861202
A1U4	160–8612–00	B020288	B020288	IC,MEMORY:CMOS,EPROM;8K X 8,40NS,REGISTERED (OPTION 1M ONLY)	80009	160861200
A1U4	160–8612–01	B020289	B020294	IC,MEMORY:CMOS,EPROM;8K X 8 (OPTION 1M ONLY)	80009	160861301
A1U4	160–8612–02	B020295		IC,MEMORY:CMOS,PROM;32K X 8,40NS,REGISTERED (OPTION 1M ONLY)	80009	160861202
A1U4	160–9755–00	B020288		IC,DIGITAL:CMOS,PROM;32K X 8,40NS,RGTRD (OPTION 02 ONLY)	80009	160975500
				MOUNTING PARTS		
	136–1038–00			SOCKET,DIP:PCB;STR,28 POS,2 X 14,0.1X 0.3CTR,0.185 H X 0.130 TAIL,TIN,BD RETENTION,BECU	00779	2–382571–3
				END MOUNTING PARTS		
A1U5	160–8613–00	B010100	B010229	IC,MEMORY:CMOS,EPROM;8K X 8,40NS,REGISTERED (STANDARD ONLY)	80009	160861300
A1U5	160–8868–00	B010100	B010136	IC,MEMORY:CMOS,PROM;8K X 8,40NS,REGISTERED (OPTION 1J ONLY)	80009	160886800
A1U5	160–8868–01	B010137	B010229	IC,MEMORY:CMOS,EPROM;32K X 8 (OPTION 1J ONLY)	80009	160886801
A1U5	160–8613–01	B010230	B020294	IC,MEMORY:CMOS,EPROM;8K X 8 (STANDARD AND OPTION 1J ONLY)	80009	160861301
A1U5	160–8613–02	B020295		IC,MEMORY:CMOS,PROM;32K X 8,40NS,REGISTERED (STANDARD AND OPTION 1J ONLY)	80009	160861302
A1U5	160–8613–00	B020288	B020288	IC,MEMORY:CMOS,EPROM;8K X 8,40NS,REGISTERED (OPTION 1M ONLY)	80009	160861300
A1U5	160–8613–01	B020289	B020294	IC,MEMORY:CMOS,EPROM;8K X 8 (OPTION 1M ONLY)	80009	160861301
A1U5	160–8613–02	B020295		IC,MEMORY:CMOS,PROM;32K X 8,40NS,REGISTERED (OPTION 1M ONLY)	80009	160861302
A1U5	160–9756–00	B020288		IC,MEMORY:CMOS,PROM;32K X 8,40NS,REGISTERED (OPTION 02 ONLY)	80009	160975600
				MOUNTING PARTS		

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
	136–1038–00			SOCKET,DIP:PCB;STR,28 POS,2 X 14,0.1X 0.3CTR,0.185 H X 0.130 TAIL,TIN,BD RETENTION,BECU	00779	2–382571–3
				END MOUNTING PARTS		
A1U6	160–8614–00	B010100	B010229	IC,MEMORY:CMOS,EPROM;8K X 8,40NS,REGISTERED (STANDARD ONLY)	80009	160861400
A1U6	160–8869–00	B010100	B010136	IC,MEMORY:CMOS,PROM;8K X 8,40NS,REGISTERED (OPTION 1J ONLY)	80009	160886900
A1U6	160–8869–01	B010137	B010229	IC,MEMORY:CMOS,EPROM;32K X 8 (OPTION 1J ONLY)	80009	160886901
A1U6	160–8614–01	B010230	B020294	IC,MEMORY:CMOS,EPROM;8K X 8 (STANDARD AND OPTION 1J ONLY)	80009	160861401
A1U6	160–8614–02	B020295		IC,MEMORY:CMOS,PROM;32K X 8,40NS,REGISTERED (STANDARD AND OPTION 1J ONLY)	80009	160861402
A1U6	160–8614–00	B020288	B020288	IC,MEMORY:CMOS,EPROM;8K X 8,40NS,REGISTERED (OPTION 1M ONLY)	80009	160861400
A1U6	160–8614–01	B020289	B020294	IC,MEMORY:CMOS,EPROM;8K X 8 (OPTION 1M ONLY)	80009	160861401
A1U6	160–8614–02	B020295		IC,MEMORY:CMOS,PROM;32K X 8,40NS,REGISTERED (OPTION 1M ONLY)	80009	160861402
A1U6	160–9757–00	B020288		IC,MEMORY:CMOS,PROM;32K X 8,40NS,REGISTERED (OPTION 02 ONLY)	80009	160975700
				MOUNTING PARTS		
	136–1038–00			SOCKET,DIP:PCB;STR,28 POS,2 X 14,0.1X 0.3CTR,0.185 H X 0.130 TAIL,TIN,BD RETENTION,BECU	00779	2–382571–3
				END MOUNTING PARTS		
A1U7	156–1909–00			IC,DIGITAL:FTTL,MUX;QUAD 2–TO–1 DATA SELECTOR	01295	SN74F157AN
A1U8	156–1702–00	B010100	B010229	IC,DIGITAL:TTL,REGISTER;10–BIT BFRED, NONINV, 3–STATE (STANDARD ONLY)	34335	AM29821PC
A1U8	156–1702–00	B010100	B010229	IC,DIGITAL:TTL,REGISTER;10–BIT BFRED, NONINV, 3–STATE (OPTION 1J ONLY)	34335	AM29821PC
A1U8	156–2063–00	B010230		IC,DGTL:ALSTTL,FLIP FLOP;OCTAL NONINV D–TYPE, 3–STATE (STANDARD AND OPTION 1J ONLY)	01295	SN74ALS374AN
A1U9	156–2289–00			IC,DIGITAL:ECL,TRANSLATOR;QUAD TTL–TO–ECL	04713	MC10H124P
A1U10	156–2289–00			IC,DIGITAL:ECL,TRANSLATOR;QUAD TTL–TO–ECL	04713	MC10H124P
A1U11	156–2289–00			IC,DIGITAL:ECL,TRANSLATOR;QUAD TTL–TO–ECL	04713	MC10H124P
A1U12	160–8601–00	B010100	B020244	IC,DIGITAL:CMOS,PLD;EEPLD,16V8,25NS,90MA (STANDARD ONLY)	80009	160860100
A1U12	160–8601–00	B010100	B020244	IC,DIGITAL:CMOS,PLD;EEPLD,16V8,25NS,90MA (OPTION 1J ONLY)	80009	160860100
A1U12	160–8601–01	B020245		IC,DIGITAL:CMOS,PLD;EEPLD,16V8,25NS,90MA (STANDARD AND OPTION 1J ONLY)	80009	160860101
				MOUNTING PARTS		
	136–0752–00			SKT,PL–IN ELEK:MICROCIRCUIT,20 DIP	09922	DILB20P–108
				END MOUNTING PARTS		
A1U13	160–8606–00	B010100	B010229	IC,MEMORY:CMOS,EPROM;32K X 8,W/3 STATE OUT (STANDARD ONLY)	80009	160860600
A1U13	160–8870–00	B010100	B010136	IC,MEM:CMOS,EPROM;32K X 8 W/3–STATE OUT,27C256–250 (OPTION 1J ONLY)	80009	160887000
A1U13	160–8870–01	B010137	B010229	IC,MEMORY:CMOS,EPROM;32K X 8 WITH 3 STATE OUT (OPTION 1J ONLY)	80009	160887001
A1U13	160–8606–01	B010230	B020294	IC,MEMORY:CMOS,EPROM;64K X 16 (STANDARD AND OPTION 1J ONLY)	80009	160860601

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A1U13	160–8606–02	B020295		IC,MEM:CMOS,EPROM;64K X 16,150NS,OTP,27C210,PLCC44 (STANDARD AND OPTION 1J ONLY)	80009	160860602
A1U13	160–8606–00	B020288	B020288	IC,MEMORY:CMOS,EPROM;32K X 8,W/3 STATE OUT (OPTION 1M ONLY)	80009	160860600
A1U13	160–8606–01	B020289	B020294	IC,MEMORY:CMOS,EPROM;64K X 16 (OPTION 1M ONLY)	80009	160860601
A1U13	160–8606–02	B020295		IC,MEM:CMOS,EPROM;64K X 16,150NS,OTP,27C210,PLCC44 (OPTION 1M ONLY)	80009	160860602
A1U13	160–9758–00	B020288		IC,MEM:CMOS,EPROM,64K X 16,150NS,OTP;27C210,PLCC44 (OPTION 02 ONLY)	80009	160975800
				MOUNTING PARTS		
	136–0755–00			SKT,DIP:PCB;FEM,STR,2 X 14,28 POS,0.1 X 0.6 CTR,0.175 H X0.130 TAIL,BECU,TIN,ACCOM 0.008–0.0015 X 0.014–0.022	09922	DILB28P–108
				END MOUNTING PARTS		
A1U14	160–8602–00	B010100	B010229	IC,DIGITAL:CMOS,PLD;OTP,22V10,25NS,33.3MHZ,90MA (STANDARD ONLY)	80009	160860200
A1U14	160–8602–00	B010100	B010229	IC,DIGITAL:CMOS,PLD;OTP,22V10,25NS,33.3MHZ,90MA (OPTION 1J ONLY)	80009	160860200
				MOUNTING PARTS		
	136–0925–00	B010100	B010229	SKT,DIP:PCB;24 POS,2 X 12,0.1 X 0.3 CTR,0.196 H X 0.130 TAIL,BECU,TIN,ACCOM 0.008–0.015THRU 0.014 X 0.022 LEADS (STANDARD ONLY)	00779	2–641932–3
	136–0925–00	B010100	B010229	SKT,DIP:PCB;24 POS,2 X 12,0.1 X 0.3 CTR,0.196 H X 0.130 TAIL,BECU,TIN,ACCOM 0.008–0.015THRU 0.014 X 0.022 LEADS (OPTION 1J ONLY)	00779	2–641932–3
				END MOUNTING PARTS		
A1U15	160–8603–00			IC,DIGITAL:CMOS,PLD;OTP,22V10,25NS,33.3MHZ,90MA	80009	160860300
				MOUNTING PARTS		
	136–0925–00			SOCKET,DIP:PCB;24 POS,2 X 12,0.1 X 0.3 CTR,0.196 H X 0.130 TAIL,BECU,TIN,ACCOM 0.008–0.015THRU 0.014 X 0.022 LEADS	00779	2–641932–3
				END MOUNTING PARTS		
A1U16	160–8607–00	B010100	B010229	IC,DIGITAL:CMOS,PLD;OTP,22V10,25NS,33.3MHZ,90MA (STANDARD ONLY)	80009	160860700
A1U16	160–8607–00	B010100	B010229	IC,DIGITAL:CMOS,PLD;OTP,22V10,25NS,33.3MHZ,90MA (OPTION 1J ONLY)	80009	160860700
A1U16	160–8607–01	B010230		IC,DIGITAL:CMOS,PLD;OTP,22V10,25NS,33.3MHZ,90MA (STANDARD AND OPTION 1J ONLY)	80009	160860701
				MOUNTING PARTS		
	136–0925–00			SOCKET,DIP:PCB;24 POS,2 X 12,0.1 X 0.3 CTR,0.196 H X 0.130 TAIL,BECU,TIN,ACCOM 0.008–0.015THRU 0.014 X 0.022 LEADS	00779	2–641932–3
				END MOUNTING PARTS		
A1U17	160–8604–01			IC,DIGITAL:CMOS,PLD;EEPLD,16V8,25NS,90MA (STANDARD ONLY)	80009	160860401
A1U17	160–9754–00			IC,DIGITAL:CMOS,PLD;EEPLD,16V8,25NS,90MA (OPTION 02 ONLY)	80009	160975400
				MOUNTING PARTS		
	136–0752–00			SKT,PL–IN ELEK:MICROCIRCUIT,20 DIP	09922	DILB20P–108
				END MOUNTING PARTS		
A1U18	156–0470–02			IC,DIGITAL:LSTTL,MUX/ENCODER	01295	SN74LS251N
A1U19	156–0470–02			IC,DIGITAL:LSTTL,MUX/ENCODER	01295	SN74LS251N
A1U20	156–0470–02			IC,DIGITAL:LSTTL,MUX/ENCODER	01295	SN74LS251N

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A1U21	156–0470–02			IC,DIGITAL:LSTTL,MUX/ENCODER	01295	SN74LS251N
A1U22	156–2141–00			IC,DIGITAL:LSTTL,SHIFT REGISTER;8–BIT, WITH	01295	SN74LS597N
A1U23	156–2141–00			IC,DIGITAL:LSTTL,SHIFT REGISTER;8–BIT, WITH	01295	SN74LS597N
A1U24	160–8615–00	B010100	B010112	IC,DGTL:CMOS,PLD;OPT,DUAL CLK,16MACROCELL,35NS (STANDARD ONLY)	80009	160861500
A1U24	160–8615–01	B010113	B010229	IC,DIGITAL:CMOS,PLD;OPT,DUAL CLOCK (STANDARD ONLY)	80009	160861501
A1U24	160–8615–00	B010100	B010112	IC,DGTL:CMOS,PLD;OPT,DUAL CLK,16MACROCELL,35NS (OPTION 1J ONLY)	80009	160861500
A1U24	160–8615–01	B010113	B010229	IC,DIGITAL:CMOS,PLD;OPT,DUAL CLOCK (OPTION 1J ONLY)	80009	160861501
A1U24	160–8615–02	B010230		IC,DIGITAL:CMOS,PLD;OPT,DUAL CLOCK (STANDARD AND OPTION 1J ONLY)	80009	160861502
				MOUNTING PARTS		
	136–0925–00			SOCKET,DIP:PCB;24 POS,2 X 12,0.1 X 0.3 CTR,0.196 H X 0.130 TAIL,BECU,TIN,ACCOM 0.008–0.015THRU 0.014 X 0.022 LEADS	00779	2–641932–3
				END MOUNTING PARTS		
A1U25	160–8609–00			IC,MEMORY:CMOS,EPROM;16K X 8,150NS,27C128	80009	160860900
				MOUNTING PARTS		
	136–0755–00			SOCKET,DIP:PCB;FEM,STR,2 X 14,28 POS,0.1 X 0.6 CTR,0.175 H X0.130 TAIL,BECU,TIN,ACCOM 0.008–0.0015 X 0.014–0.022	09922	DILB28P–108
				END MOUNTING PARTS		
A1U26	156–1998–00			IC,DIGITAL:ALSTTL,FLIP FLOP;OCTAL D–TYPE, W/CLEAR	01295	SN74ALS273N
A1U27	160–8764–00			IC,MEMORY:CMOS,PROM;1K X 8,4ONS	80009	160876400
				MOUNTING PARTS		
	136–0925–00			SOCKET,DIP:PCB;24 POS,2 X 12,0.1 X 0.3 CTR,0.196 H X 0.130 TAIL,BECU,TIN,ACCOM 0.008–0.015THRU 0.014 X 0.022 LEADS	00779	2–641932–3
				END MOUNTING PARTS		
A1U28	160–8616–00	B010100	B010112	IC,DGTL:CMOS,PLD;OPT,DUAL CLK,16MACROCELL,35NS (STANDARD ONLY)	80009	160861600
A1U28	160–8616–01	B010113	B020300	IC,DIGITAL:CMOS,PLD;OTP,EP610,35NS,37MHZ (STANDARD ONLY)	80009	160861601
A1U28	160–8616–02	B020301		IC,DIGITAL:CMOS,PLD;OPT,DUAL CLOCK (STANDARD ONLY)	80009	160861602
A1U28	160–8616–00	B010100	B010112	IC,DGTL:CMOS,PLD;OPT,DUAL CLK,16MACROCELL,35NS (OPTION 1J ONLY)	80009	160861600
A1U28	160–8616–01	B010113		IC,DIGITAL:CMOS,PLD;OTP,EP610,35NS,37MHZ (OPTION 1J ONLY)	80009	160861601
A1U28	160–8616–00	B020288	B020294	IC,DGTL:CMOS,PLD;OPT,DUAL CLK,16MACROCELL,35NS (OPTION 1M ONLY)	80009	160861600
A1U28	160–8616–01	B020295	B020300	IC,DIGITAL:CMOS,PLD;OTP,EP610,35NS,37MHZ (OPTION 1M ONLY)	80009	160861601
A1U28	160–8616–02	B020301		IC,DIGITAL:CMOS,PLD;OPT,DUAL CLOCK (OPTION 1M ONLY)	80009	160861602
A1U28	160–8616–01	B020288	B020300	IC,DIGITAL:CMOS,PLD;OTP,EP610,35NS,37MHZ (OPTION 02 ONLY)	80009	160861601
A1U28	160–8616–02	B020301		IC,DIGITAL:CMOS,PLD;OPT,DUAL CLOCK (OPTION 02 ONLY)	80009	160861602
				MOUNTING PARTS		
	136–0925–00			SOCKET,DIP:PCB;24 POS,2 X 12,0.1 X 0.3 CTR,0.196 H X 0.130 TAIL,BECU,TIN,ACCOM 0.008–0.015THRU 0.014 X 0.022 LEADS	00779	2–641932–3

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
				END MOUNTING PARTS		
A1U29	156–6117–00			IC,ASIC:CMOS,CUSTOM;Z80 GENLOCK IC,ADG236	66302	VF4697QC–CC0001
				MOUNTING PARTS		
	136–0965–00			SOCKET,PLCC:PCB;84,0.05 CTR,0.360 H X0.125	00779	821573–1
				END MOUNTING PARTS		
A1U30	156–3715–00			IC,PROCESSOR:CMOS,PERIPHERAL;CNTR/TMRCRT,8MHZ	56708	Z84C3008PEC
				MOUNTING PARTS		
	136–0755–00			SOCKET,DIP:PCB;FEM,STR,2 X 14,28 POS,0.1 X 0.6 CTR,0.175 H X0.130 TAIL,BECU,TIN,ACCOM 0.008–0.0015 X 0.014–0.022	09922	DILB28P–108
				END MOUNTING PARTS		
A1U31	156–3050–00			IC,MISC:CMOS,PWR SUPPLY SUPERVISOR;MPU RESET GENERATOR,5V SUPPLY SENSING,MPU WATCHDOG TIMER	0B0A9	DS1232
A1U32	160–8610–00	B010100	B010229	IC,MEMORY:CMOS,EPROM;16K X 8,120NS,27C512 (STANDARD ONLY)	80009	160861000
A1U32	160–8610–00	B010100	B010229	IC,MEMORY:CMOS,EPROM;16K X 8,120NS,27C512 (OPTION 1J ONLY)	80009	160861000
A1U32	160–8610–01	B010230	B020288	IC,MEMORY:CMOS,EPROM;16K X 8 (STANDARD AND OPTION 1J ONLY)	80009	160861001
A1U32	160–8610–03	B020289	B020300	IC,MEMORY:CMOS,EPROM;32K X 8,120NS (STANDARD AND OPTION 1J ONLY)	80009	160861003
A1U32	160–8610–05	B020301		IC,MEMORY:CMOS,EPROM;32K X 8,120NS (STANDARD AND OPTION 1J ONLY)	80009	160861005
A1U32	160–9525–00	B020288		IC,MEM:CMOS.EPROM;64 X 8,120NS,27C256–120,DIP28.6 (OPTION 1M ONLY)	80009	160952500
A1U32	160–8610–02	B020288	B020288	IC,MEMORY:CMOS,EPROM;32K X 8,120NS (OPTION 02 ONLY)	80009	160861002
A1U32	160–8610–03	B020289	B020300	IC,MEMORY:CMOS,EPROM;32K X 8,120NS (OPTION 02 ONLY)	80009	160861003
A1U32	160–8610–05	B020301		IC,MEMORY:CMOS,EPROM;32K X 8,120NS (OPTION 02 ONLY)	80009	160861005
				MOUNTING PARTS		
	136–0755–00			SOCKET,DIP:PCB;FEM,STR,2 X 14,28 POS,0.1 X 0.6 CTR,0.175 H X0.130 TAIL,BECU,TIN,ACCOM 0.008–0.0015 X 0.014–0.022	09922	DILB28P–108
				END MOUNTING PARTS		
A1U33	160–8611–00			IC,MEMORY:CMOS,EPROM;64K X 8,150NS,27C512	80009	160861100
				MOUNTING PARTS		
	136–0755–00			SOCKET,DIP:PCB;FEM,STR,2 X 14,28 POS,0.1 X 0.6 CTR,0.175 H X0.130 TAIL,BECU,TIN,ACCOM 0.008–0.0015 X 0.014–0.022	09922	DILB28P–108
				END MOUNTING PARTS		
A1U34	156–1998–00			IC,DIGITAL:ALSTTL,FLIP FLOP;OCTAL D–TYPE, W/CLEAR	01295	SN74ALS273N
A1U35	156–3728–00			IC,PROCESSOR:CMOS,MICROPROCESSOR;8–BIT,8MHZ	56708	Z84C0008PEC
				MOUNTING PARTS		
	136–0757–00			SOCKET,DIP:PCB;FEM,STR,2 X 20,40 POS,0.1 X 0.6 CTR,0.175 H X0.130 TAIL,BECU,TIN,ACCOM 0.008–0.015 X 0.014–0.022 IC	09922	DILB40P–108
				END MOUNTING PARTS		
A1U36	156–1754–02			IC,DIGITAL:ALSTTL,BFR/DRVR;OCTALNONINV, HIGH DRV	01295	SN74ALS244A–1N
A1U37	156–1754–02			IC,DIGITAL:ALSTTL,BFR/DRVR;OCTALNONINV, HIGH DRV	01295	SN74ALS244A–1N
A1U38	156–1998–00			IC,DIGITAL:ALSTTL,FLIP FLOP;OCTAL D–TYPE, W/CLEAR	01295	SN74ALS273N
				MOUNTING PARTS		
	136–0752–00			SKT,PL–IN ELEK:MICROCIRCUIT,20 DIP	09922	DILB20P–108

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Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
				END MOUNTING PARTS		
A1U40	156–1998–00	B010100	B010229	IC,DIGITAL:ALSTTL,FLIP FLOP;OCTAL D–TYPE, W/CLEAR (STANDARD ONLY)	01295	SN74ALS273N
A1U40	156–1998–00	B010100	B010229	IC,DIGITAL:ALSTTL,FLIP FLOP;OCTAL D–TYPE, W/CLEAR (OPTION 1J ONLY)	01295	SN74ALS273N
A1U41	160–8608–00			IC,DIGITAL:CMOS,PLD;OPT,22V10,25NS,33.3MHZ,90MA	80009	160860800
				MOUNTING PARTS		
	136–0925–00			SOCKET,DIP:PCB;24 POS,2 X 12,0.1 X 0.3 CTR,0.196 H X 0.130 TAIL,BECU,TIN,ACCOM 0.008–0.015THRU 0.014 X 0.022 LEADS	00779	2–641932–3
				END MOUNTING PARTS		
A1U42	156–4150–00			IC,LINEAR:BIPOLAR,AMPLIFIER;100MHZ,CURRENT FEEDBACK,SAMPLE/HOLD,VIDEO DC RESTORATION	64762	EL2090CN
				MOUNTING PARTS		
	136–0728–00			SKT,PL–IN ELEK:MICROCKT,14 CONTACT	09922	DILB14P–108
				END MOUNTING PARTS		
A1U43	156–4197–00			IC,MISC:BIPOLAR,VIDEO SUBSYSTEM;ANALOG INTFC WITH 8–BIT,30MSPS A/D	1CH66	TDA8708N
				MOUNTING PARTS		
	136–0755–00			SOCKET,DIP:PCB;FEM,STR,2 X 14,28 POS,0.1 X 0.6 CTR,0.175 H X0.130 TAIL,BECU,TIN,ACCOM 0.008–0.0015 X 0.014–0.022	09922	DILB28P–108
				END MOUNTING PARTS		
A1U44	156–3131–00			IC,MISC:BIPOLAR,VIDEO SUBSYSTEM;HORIZ SYNC PROCESSOR	1CH66	TDA2595N
A1U46	156–1191–01			IC,LINEAR:BIFET,OP–AMP;6MV VOS	01295	TL072ACP
A1U47	156–1226–01			IC,LINEAR:BIPOLAR,COMPARATOR	1CH66	LM319N
A1U48	156–2093–00			IC,DIGITAL:ALSTTL,GATE;QUAD 2–INPUT OR	01295	SN74ALS32N
A1U50	156–0853–00			IC,LINEAR:BIPOLAR,OP–AMP;DUAL,SINGLESUPPLY	01295	LM358P
A1U51	156–1173–00			IC,LINEAR:BIPOLAR,V REF;POS,2.5V,1.0%,40PPM,SERIES	04713	MC1403U
A1U52	156–0277–00			IC,LINEAR:BIPOLAR,VR;POSITIVE,5.0V,1.0A,4%	01295	UA7805CKC
A1U53	156–0846–00			IC,LINEAR:BIPOLAR,VR;NEGATIVE,–5.0V,1.0A,4.0%	27014	LM7905CT
A1U54	156–0316–04			IC,DIGITAL:ECL,TRANSLATOR;QUAD ECL TOTTL	04713	MC10125P
A1U55	156–1640–00			IC,DIGITAL:ECL,RECEIVER;TRIPLE LINE	04713	MC10H116P
A1U56	156–0158–07			IC,LINEAR:BIPOLAR,OP–AMP	01295	MC1458P
A1U57	156–1707–00			IC,DIGITAL:FTTL,GATE;QUAD 2–INPUT NAND	04713	MC74F00N
A1U59	156–1367–00			IC,CONV:CMOS,D/A;8 BIT,400NS,CUR OUT,MPU COMPATIBLE	24355	AD7524JN
A1U60	156–1850–00			IC,MISC:CMOS,ANALOG SWITCH;QUAD	17856	DG211CJ
A1U61	156–0158–07			IC,LINEAR:BIPOLAR,OP–AMP	01295	MC1458P
A1U62	156–0316–04			IC,DIGITAL:ECL,TRANSLATOR;QUAD ECL TOTTL	04713	MC10125P
A1U63	156–1640–00			IC,DIGITAL:ECL,RECEIVER;TRIPLE LINE	04713	MC10H116P
A1U64	234–0428–20			QUICK CHIP:VIDEO CHANNEL SWITCH,PKG	TK2598	234042820
				MOUNTING PARTS		
	136–0752–00			SKT,PL–IN ELEK:MICROCIRCUIT,20 DIP	09922	DILB20P–108
				END MOUNTING PARTS		
A1U65	155–0316–02			IC,ASIC:BIPOLAR,12 BIT D/A CONV;FULL CUSTOM,M460	TK2598	155031602
				MOUNTING PARTS		
	136–0871–00			SOCKET,PLCC:PCB;68 POS,0.05 CTR,0.360H X0.125 TAIL,TIN,0.1 CTRPCB,0.060 SHOULDER HEIGHT	00779	3–821574–1
				END MOUNTING PARTS		
A1U67	156–4150–00			IC,LINEAR:BIPOLAR,AMPLIFIER;100MHZ,CURRENT FEEDBACK,SAMPLE/HOLD,VIDEO DC RESTORATION	64762	EL2090CN

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
				MOUNTING PARTS		
	136–0728–00			SKT,PL–IN ELEK:MICROCKT,14 CONTACT	09922	DILB14P–108
				END MOUNTING PARTS		
A1U70	160–8605–00	B010100	B010229	IC,DIGITAL:CMOS,PLD;OTP,22V10,25NS,33.3MHZ,90MA (STANDARD ONLY)	80009	160860500
A1U70	160–8605–00	B010100	B010229	IC,DIGITAL:CMOS,PLD;OTP,22V10,25NS,33.3MHZ,90MA (OPTION 1J ONLY)	80009	160860500
A1U70	160–8605–01	B010230		IC,DIGITAL:CMOS,PLD;OTP,22V10,25NS,33.3MHZ,90MA (STANDARD OPTION 1J ONLY)	80009	160860501
				MOUNTING PARTS		
	136–0925–00			SOCKET,DIP:PCB;24 POS,2 X 12,0.1 X 0.3 CTR,0.196 H X 0.130 TAIL,BECU,TIN,ACCOM 0.008–0.015THRU 0.014 X 0.022 LEADS	00779	2–641932–3
				END MOUNTING PARTS		
A1U71	156–1335–00			IC,DGTL:LSTTL,MULTIVIBRATOR;DUAL RETRIGMONOSTABLE	27014	DM96LS02N
A1U72	156–2558–00			IC,LINEAR:BIPOLAR,VR;POSITIVE,12V,1.5A,2%	01295	TL780–12CKC
A1U73	156–2559–00			IC,LINEAR:BIPOLAR,VR;NEGATIVE,–12V,1.5A,2%	48726	UC7912ACT
				ATTACHED PARTS		
	210–0586–00			NUT,PL,ASSEM WA:4–40 X 0.25,STL CD PL	TK0435	ORDER BY DESC
	210–1178–00			WASHER,SHLDR:U/W TO–220 XSTR	13103	7721–7PPS
	211–0097–00			SCREW,MACHINE:4–40 X 0.312,PNH,STL	TK0435	ORDER BY DESC
	214–3478–00			HEAT SINK,SEMIC:XSTR,TO–202;HORZ/VERT	13103	6278B
	342–0563–00			INSULATOR,PLATE:XSTR,FBRGL REINFORCED SILICON RBR	18565	69–11–8805–1674
				END ATTACHED PARTS		
A1U74	156–1631–00			IC,LINEAR:BIPOLAR,VR;SHUNT,ADJUSTABLE,100MA	01295	TL431CLP
A1U75	156–0885–00			CPLR,OPTOELECTR:LED,5KV ISOLATION	0MS63	H11AX861
A1U76	156–1225–01			IC,LINEAR:BIPOLAR,COMPARATOR	01295	LM393P
A1U78	156–2524–00			IC,LINEAR:BIPOLAR,SW–RGLTR CONT;PWM,CUR MODE,SGL TOTEM POLE OUT	48726	UC3842N
A1U80	160–8762–00			IC,DIGITAL:CMOS,PLD;EEPLD,16V8,25NS,90MA	80009	160876200
				MOUNTING PARTS		
	136–0752–00			SKT,PL–IN ELEK:MICROCIRCUIT,20 DIP	09922	DILB20P–108
				END MOUNTING PARTS		
A1U81	156–1639–00			IC,DIGITAL:ECL,FLIP FLOP;DUAL D–TYPE MASTER–SLAVE	04713	MC10H131P
A1U82	156–1909–00			IC,DIGITAL:FTTL,MUX;QUAD 2–TO–1 DATA SELECTOR	01295	SN74F157AN
A1U83	156–1909–00			IC,DIGITAL:FTTL,MUX;QUAD 2–TO–1 DATA SELECTOR	01295	SN74F157AN
A1U84	156–1338–01			IC,LIN:BIPOLAR,OP–AMP;HIGH OUT DRV,MAX NOISE SPECS	01295	NE5534AP
A1U85	156–2558–00			IC,LINEAR:BIPOLAR,VR;POSITIVE,12V,1.5A,2%	01295	TL780–12CKC
				ATTACHED PARTS		
	210–0586–00			NUT,PL,ASSEM WA:4–40 X 0.25,STL CD PL	TK0435	ORDER BY DESC
	210–1178–00			WASHER,SHLDR:U/W TO–220 XSTR	13103	7721–7PPS
	211–0097–00			SCREW,MACHINE:4–40 X 0.312,PNH,STL	TK0435	ORDER BY DESC
	342–0563–00			INSULATOR,PLATE:XSTR,FBRGL REINFORCED SILICON RBR	18565	69–11–8805–1674
				END ATTACHED PARTS		
A1U86	156–2063–00	B010230		IC,DGTL:ALSTTL,FLIP FLOP;OCTAL NONINV D–TYPE, 3–STATE (STANDARD AND OPTION 1J ONLY)	01295	SN74ALS374AN
A1U87	160–9406–00	B010230		IC,DIGITAL:CMOS,PLD;OTP,22V10,25NS,33.3MHZ,90MA (STANDARD AND OPTION 1J ONLY)	80009	160940600
				MOUNTING PARTS		

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
	136–0925–00	B010230		SOCKET,DIP:PCB;24 POS,2 X 12,0.1 X 0.3 CTR,0.196 H X 0.130 TAIL,BECU,TIN,ACCOM 0.008–0.015THRU 0.014 X 0.022 LEADS (STANDARD AND OPTION 1J ONLY)	00779	2–641932–3
				END MOUNTING PARTS		
A1VR1	152–0760–00			DIODE,ZENER:6.2V,2%,0.4W	04713	SZG30205
A1VR2	152–0760–00			DIODE,ZENER:6.2V,2%,0.4W	04713	SZG30205
A1VR3	152–0688–00			DIODE,ZENER:2.4V,5%,0.4W	04713	1N4370A
A1VR4	152–0662–00	B010100	B010229	DIODE,ZENER:5V,1%,0.4W (STANDARD ONLY)	04713	SZG195RL
A1VR4	152–0662–00	B010100	B010229	DIODE,ZENER:5V,1%,0.4W (OPTION 1J ONLY)	04713	SZG195RL
A1VR4	152–0279–00	B010230		DIODE,ZENER:5.1V,5%,0.4W (STANDARD AND OPTION 1J ONLY)	04713	1N751ARL
A1W1	131–4566–00	B010100	B010229	BUS,CNDCT:0 OHM,300 SPACING,SM BODYMI,DUM RES (STANDARD ONLY)	91637	FRJ–50
A1W1	131–4566–00	B010100	B010229	BUS,CNDCT:0 OHM,300 SPACING,SM BODYMI,DUM RES (OPTION 1J ONLY)	91637	FRJ–50
A1Y39	158–0391–00			OSC,XTAL CLOCK:8.0 MHZ,+/–0.01% HCMOS,CL 15PF,4 PIN 14 PIN COMPATIBLE PKG	61429	F5C–8.0 MHZ
A1A1	119–4328–00	B010100	B010195	OVEN ASSEMBLY:VITS100/200,28MHZ	80009	119432800
A1A1	119–4328–01	B010196	B020322	OVEN ASSEMBLY:VITS100/200,28MHZ	80009	119432801
A1A1	119–4328–02	B020323		OVEN ASSEMBLY:VITS100/200,28MHZ	80009	119432802
				ATTACHED PARTS		
	162–0581–00			INSUL SLVG,ELEC:0.027 ID,PTFE,CLEAR (QUANTITY 0.0420 FT)	TK0977	PER TEK DOCU-MEN
	342–0991–00	B020323		INSULATOR:	55285	342–0991–00
				END ATTACHED PARTS		
A1A1C6	283–5025–00	B010100	B010195	CAP,FXD,CER:MLC;220PF,5%,50V,NPO,1206	TK2058	C3216COG1H221J–
A1A1C6	283–5001–00	B010196		CAP,FXD,CER:MLC;100PF,5%,50V,NPO,1206	TK2058	C3216C0G1H101J–
A1A1C8	283–5238–00			CAP,FXD,CER:MLC;150PF,5%,100V,NPO,1206	04222	12061A151JAT1A
A1A1C15	283–5008–00			CAP,FXD,CER:MLC;12PF,5%,50V,NPO,1206	TK2058	C3216C0G1H120J–
A1A1C16	283–5163–00			CAP,FXD,CER:MLC;36PF,1%,100V,NPO,0.08X0.05	04222	08051A360FAT2A
A1A1C17	283–5004–00			CAP,FXD,CER:MLC:0.1UF,10%,25V,X7R,1206	TK2058	C3216X7R1E104K–
A1A1C18	283–5004–00			CAP,FXD,CER:MLC:0.1UF,10%,25V,X7R,1206	TK2058	C3216X7R1E104K–
A1A1C19	281–0165–00			CAP,VAR,AIR DI:0.8–10PF,250V	91293	5201/3469
A1A1P33	131–2002–00			CONN,BOX:PCB;FEM,RTANG,1 X 5,0.1 CTR,0.14 X 0.115 TAIL,2 X 5 PCB,0.31 X 0.1 CTR PTH,40 GLD,SIDE ENTRY,DAP	22526	65001–110
A1A1Q10	151–5035–00			XSTR,SIG:BIPOLAR,NPN;25V,30MA,650MHZ,AMPLIFIER	04713	MMBTH10LT1
A1A1R1	321–5043–00			RES,FXD:THICK FILM;47.5 OHM,1%,0.125W,TC=100 PPM	57668	MCR18FWEA47E5
A1A1R3	307–1161–00			RES,FXD,FILM:1M OHM,5%,0.062W,0805,8MMTAPED	50139	ACD1004JT
A1A1R4	321–5280–00			RES,FXD:THICK FILM;20K OHM,1%,0.125W,TC=100	91637	CRCW1206–2002FT
A1A1R5	321–5280–00			RES,FXD:THICK FILM;20K OHM,1%,0.125W,TC=100	91637	CRCW1206–2002FT
A1A1R9	321–5007–00	B010100	B010195	RES,FXD:THICK FILM;121 OHM,1%,0.125W,TC=100	50139	BCK1210FT
A1A1R9	321–5012–00	B010196		RES,FXD:THICK FILM;332 OHM,1%,0.125W,TC=100	50139	BCK3320FT
A1A1RT11	307–0181–01			RES,THERMAL:20K OHM,5%,AT 60 DEG C	91637	C771
A1A1Y1	—————			XTAL,UNIT,QTZ:28.636360 MHZ,5 PPM,PARALLEL,CL 32PF,2 MW DRV LEVEL;HC–43U (REPLACEABLE AT A1A1 ONLY)		

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Diagrams

A1 VITS Inserter Board (671-2132-05 & Up)
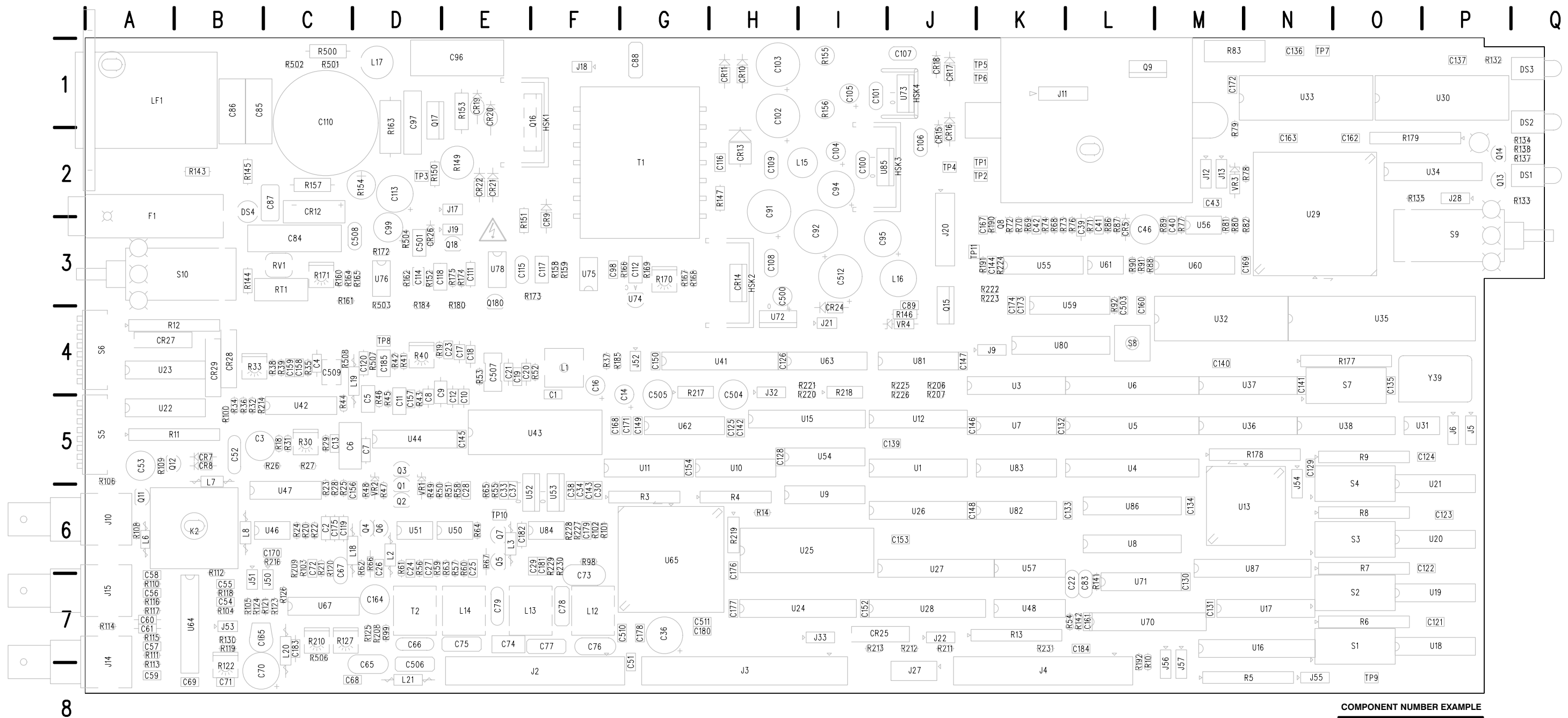
Figure 9–1: A1 VITS Inserter Board (671–2132–05 & Up)

COMPONENT NUMBER EXAMPLE
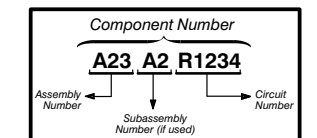
Component Number

A23 A2 R1234

Assembly Number | Subassembly Number (if used) | Circuit Number

Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

STATIC SENSITIVE DEVICES

Table 9–1: A1 Component Locator 671–2132–05 & Up

CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION
C1	5	D5	A1	F5	C84	8	B1	A1	C3	C157	5	B5	A1	D5	DS4	8	D2	A1	B2	P28	3	D4	A1	
C2	5	E4	A1	C6	C85	8	C1	A1	B1	C158	5	B5	A1	C4						P32	7	F2	A1	
C3	5	A1	A1	B5	C86	8	C2	A1	B1	C159	5	B5	A1	C4	F1	8	A1	A1	A3	P33	1	F2	A1	
C4	5	C2	A1	C4	C87	8	D2	A1	C2	C160	5	H4	A1	L4	J2	3	A3	A1	F8	P34	9	B1	A1	
C5	5	F2	A1	D5	C88	8	E1	A1	G1	C161	3	C5	A1	L7	J3	3	H2	A1	H8	P35	9	B1	A1	
C6	5	E2	A1	D5	C89	8	G4	A1	J4	C162	9	F5	A1	O2	J4	3	A2	A1	K8	P36	9	B1	A1	
C7	5	E2	A1	D5	C91	8	F4	A1	H3	C163	9	F5	A1	N2	J5	4	B2	A1	P5	P37	9	B1	A1	
C8	5	E2	A1	D5	C92	8	F4	A1	I3	C164	7	E2	A1	D7	J6	4	A1	A1	P5	P38	9	B1	A1	
C9	5	F2	A1	E5	C94	8	G4	A1	I2	C165	7	D1	A1	C7	J9	5	G4	A1	K4	P39	1	A1	A1	
C10	5	E2	A1	E5	C95	8	G4	A1	I3	C167	9	D5	A1	K3	J10	5	A1	A1	A6	P55	1	B4	A1	
C11	5	D1	A1	D5	C96	8	D3	A1	E1	C168	9	D5	A1	F5	J11	7	C1	A1	K1	P56	1	B4	A1	
C12	5	D1	A1	E5	C97	8	E4	A1	D2	C169	9	F5	A1	N3	J12	7	G3	A1	M2	P57	1	B4	A1	
C13	5	B2	A1	C5	C98	8	F5	A1	F3	C170	9	F5	A1	C6	J13	7	D4	A1	M2					
C14	5	D4	A1	G5	C99	8	B3	A1	D3	C171	9	F5	A1	G5	J14	7	H5	A1	A8	Q1	5	F1	A1	D6
C16	5	D4	A1	F4	C100	8	G2	A1	I2	C172	9	G3	A1	M1	J15	7	H4	A1	A7	Q2	5	F2	A1	D6
C17	5	D5	A1	E4	C101	8	G3	A1	I1	C173	9	G3	A1	K4	J17	8	E2	A1	E2	Q3	5	G2	A1	D5
C18	5	D5	A1	E4	C102	8	F2	A1	H1	C174	9	E1	A1	K4	J18	8	E3	A1	F1	Q4	9	G2	A1	D6
C19	5	F5	A1	E4	C103	8	F3	A1	H1	C175	5	D3	A1	C6	J19	8	C4	A1	E3	Q5	9	G3	A1	E6
C20	5	F5	A1	E4	C104	8	F2	A1	I2	C176	7	C2	A1	H7	J20	9	B1	A1	J3	Q6	9	G2	A1	D6
C21	5	F5	A1	E4	C105	8	F3	A1	I1	C177	7	B2	A1	H7	J21	8	H2	A1	I4	Q7	9	G4	A1	E6
C22	5	G3	A1	L7	C106	8	G2	A1	J2	C178	7	C2	A1	G7	J22	3	E3	A1	J7	Q8	7	D1	A1	K3
C23	5	E5	A1	E4	C107	8	G3	A1	J1	C179	7	B2	A1	F6	J27	3	A5	A1	J8	Q9	7	E4	A1	L1
C24	9	E3	A1	D7	C108	8	G4	A1	H3	C180	7	B2	A1	G7	J28	3	D4	A1	P2	Q11	7	F4	A1	A6
C25	9	E4	A1	E7	C109	8	F4	A1	H2	C181	7	A2	A1	F7	J32	7	F2	A1	H5	Q12	7	G3	A1	B5
C26	9	D3	A1	D7	C110	8	C2	A1	C1	C182	7	A2	A1	E6	J33	1	F2	A1	I7	Q13	3	D5	A1	P2
C27	9	G3	A1	D7	C111	8	D3	A1	E3	C183	7	E1	A1	C7	J50	7	H1	A1	C7	Q14	3	E5	A1	P2
C28	9	G3	A1	E6	C112	8	F5	A1	G3	C184	3	C5	A1	L7	J51	7	H1	A1	B7	Q15	8	G4	A1	J4
C29	9	G3	A1	F6	C113	8	E3	A1	D2	C185	5	D2	A1	D4	J52	5	D4	A1	G4	Q16	8	E3	A1	F1
C30	9	G3	A1	F6	C114	8	C4	A1	D3	C500	8	G2	A1	H3	J53	7	B4	A1	B7	Q17	8	E4	A1	D1
C33	9	D1	A1	E6	C115	8	D3	A1	E3	C501	8	B4	A1	D3	J54	1	A1	A1	N6	Q18	8	C4	A1	E3
C34	9	D2	A1	F6	C116	8	F4	A1	H2	C503	9	C5	A1	L4	J55	1	B4	A1	N8	Q180	8	D3	A1	E4
C36	9	E2	A1	G7	C117	8	C2	A1	F3	C504	9	H3	A1	H5	J56	1	B4	A1	M8	R3	1	G2	A1	G6
C37	9	E1	A1	E6	C118	8	C3	A1	E3	C505	9	H3	A1	G5	J57	1	B4	A1	M8	R4	1	G3	A1	H6
C38	9	E2	A1	F6	C119	7	G1	A1	C6	C506	9	E2	A1	D8						R5	1	A3	A1	N8
C39	7	C1	A1	L3	C120	5	C1	A1	D4	C507	5	E5	A1	E4	K2	7	G4	A1	B6	R6	2	C1	A1	O7
C40	7	E2	A1	M3	C121	8	B4	A1	P7	C508	8	A3	A1	D3						R7	2	C2	A1	O6
C41	7	D2	A1	L3	C122	9	C4	A1	O6	C510	7	D2	A1	G7	L1	5	F5	A1	F4	R8	2	C3	A1	O6
C42	7	E2	A1	K3	C123	9	C4	A1	P6	C511	7	D2	A1	G7	L2	9	D2	A1	D6	R9	2	C4	A1	O5
C43	7	C5	A1	M2	C124	9	D4	A1	O5	C512	8	F4	A1	I3	L3	9	E4	A1	E6	R10	3	B3	A1	L8
C46	7	E4	A1	L3	C125	7	G3	A1	H5						L6	7	G4	A1	A6	R11	3	F4	A1	A5
C51	7	B5	A1	G8	C126	9	B5	A1	H4	CR5	7	F4	A1	L3	L7	7	F4	A1	B6	R12	3	F4	A1	A4
C52	7	F4	A1	B5	C128	7	H3	A1	H5	CR7	7	G3	A1	B5	L8	7	F4	A1	B6	R13A	3	D3	A1	K7
C53	7	H4	A1	A5	C129	9	D4	A1	N5	CR8	7	F3	A1	B5	L12	7	D2	A1	F7	R13B	3	C3	A1	K7
C54	7	B4	A1	B7	C130	9	D4	A1	M7	CR9	8	E2	A1	F3	L13	7	D2	A1	E7	R13C	3	C5	A1	K7
C55	7	B4	A1	B7	C131	9	E4	A1	M7	CR10	8	F2	A1	H1	L14	7	E2	A1	E7	R13D	3	B3	A1	K7
C56	7	B4	A1	A7	C132	9	E4	A1	K5	CR11	8	F3	A1	H1	L15	8	G4	A1	H2	R13E	3	B3	A1	K7
C57	7	C4	A1	A7	C133	1	F5	A1	L6	CR12	8	C1	A1	C2	L16	8	G3	A1	J3	R13F	3	C3	A1	K7
C58	7	B5	A1	A7	C134	9	F4	A1	M6	CR13	8	F4	A1	H2	L17	8	D1	A1	D1	R13G	3	A5	A1	K7
C59	7	D5	A1	A8	C135	4	A3	A1	O4	CR14	8	F3	A1	H3	L18	7	G1	A1	D6	R13H	3	B5	A1	K7
C60	7	E4	A1	A7	C136	4	E5	A1	N1	CR15	8	G2	A1	J2	L19	5	C1	A1	D4	R13I	3	B2	A1	K7
C61	7	D5	A1	A7	C137	9	F4	A1	P1	CR16	8	H2	A1	J2	L20	7	E1	A1	C7	R14	3	F2	A1	H6
C65	7	E2	A1	D8	C139	9	F4	A1	I5	CR17	8	H3	A1	J1	L21	7	E2	A1	D8	R18	5	A1	A1	C5
C66	7	E2	A1	D7	C140	9	B5	A1	M4	CR18	8	G3	A1	J1						R19	5	D5	A1	E4
C67	7	G2	A1	C7	C141	9	C5	A1	N4	CR19	8	E4	A1	E1	LF1	8	A1	A1	A1	R20	5	D3	A1	C6
C68	7	F2	A1	C8	C142	1	G5	A1	H5	CR20	8	E3	A1	E1						R21	5	D3	A1	C7
C69	7	C5	A1	B8	C143	1	G5	A1	F6	CR21	8	E3	A1	E2	P5	4	B2	A1		R22	5	E3	A1	C6
C70	7	C5	A1	C8	C144	1	G5	A1	K3	CR22	8	E3	A1	E2	P6	4	A1	A1		R23	5	E3	A1	C6
C71	7	C5	A1	B8	C145	9	C5	A1	E5	CR24	8	G2	A1	I4	P9	5	G4	A1		R24	5	F3	A1	C6
C72	7	G2	A1	C7	C146	9	D5	A1	J5	CR25	8	B5	A1	I7	P12	7	G3	A1		R25	5	E3	A1	C6
C73	7	D1	A1	F7	C147	9	D5	A1	J4	CR26	8	B4	A1	D3	P13	7	D4	A1		R26	5	E3	A1	C5
C74	7	D1	A1	E7	C148	1	H5	A1	J6	CR27	3	E3	A1	A4	P17	8	E2	A1		R27	5	E4	A1	C5
C75	7	E1	A1	E7	C149	9	D5	A1	G5	CR28	3	E4	A1	B4	P18	8	E3	A1		R28	5	F3	A1	C6
C76	7	D2	A1	F7	C150	5	A5	A1	G4	CR29	3	E4	A1	B4	P19	8	C4	A1		R29	5	B2	A1	C5
C77	7	D2	A1	F7	C152	9	E5	A1	I7						P20	9	B1	A1		R30	5	B2	A1	C5
C78	7	D2	A1	F7	C153	9	E5	A1	J6	DS1	3	D5	A1	Q2	P22	3	E3	A1						
C79	7	E2	A1	E7	C154	1	H5	A1	G5	DS2	3	E5	A1	Q1										
C83	5	H4	A1	L7	C156	9	F5	A1	D6	DS3	3	E5	A1	Q1										

Table 9–1: A1 Component Locator (continued)

CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION
R31	5	B2	A1	C5	R100	7	A4	A1	B5	R169	8	F5	A1	G3	S2	2	B2	A1	O7	U37	4	F2	A1	M4
R32	5	B1	A1	B5	R101	7	B2	A1	F6	R170	8	F5	A1	G3	S3	2	B3	A1	O6	U38	4	G3	A1	O5
R33	5	B1	A1	B4	R102	7	B2	A1	F6	R171	8	A4	A1	C3	S4	2	B4	A1	O6	U41	5	G4	A1	H4
R34	5	C1	A1	B5	R103	7	G1	A1	C7	R172	8	B4	A1	D3	S5	3	F5	A1	A5	U42	5	B1	A1	C5
R35	5	C1	A1	C4	R104	7	G3	A1	B7	R173	8	D3	A1	E3	S6	3	F4	A1	A4	U43	5	E4	A1	E5
R36	5	C1	A1	B5	R105	7	G2	A1	B7	R174	8	C4	A1	E3	S7	4	D2	A1	O4	U44	5	E1	A1	D5
R37	5	C4	A1	F4	R106	7	F4	A1	A6	R175	8	C3	A1	E3	S8	4	C1	A1	L4	U46A	7	E3	A1	C6
R38	5	C4	A1	C4	R108	7	G4	A1	A6	R177	4	E1	A1	O4	S9B	3	C5	A1	P3	U47A	5	F3	A1	C6
R39	5	D1	A1	C4	R109	7	H3	A1	A5	R178	4	D1	A1	N5	S10A	8	B1	A1	B3	U47B	5	F3	A1	C6
R40	5	D2	A1	D4	R110	7	E5	A1	A7	R179A	4	B5	A1	O2	S10B	8	B1	A1	B3	U48A	5	G4	A1	K7
R41	5	D2	A1	D4	R111	7	D5	A1	A7	R179B	4	B3	A1	O2						U50A	9	F2	A1	E6
R42	5	D2	A1	D4	R112	7	E4	A1	B7	R179C	4	C3	A1	O2	T1	8	E2	A1	G2	U50B	9	F3	A1	E6
R43	5	D2	A1	D5	R113	7	D5	A1	A8	R179D	4	G3	A1	O2	T2	7	E2	A1	D7	U51	9	D2	A1	D6
R44	5	E2	A1	C5	R114	7	D5	A1	A7	R179E	4	G5	A1	O2						U52	9	D1	A1	F6
R45	5	F2	A1	D5	R115	7	D5	A1	A7	R179F	4	G5	A1	O2	TP1	9	B2	A1	J2	U53	9	D2	A1	F6
R46	5	F2	A1	D5	R116	7	D4	A1	A7	R179G	4	G5	A1	O2	TP2	9	B2	A1	J2	U54	7	H1	A1	I5
R47	5	F1	A1	D6	R117	7	E4	A1	A7	R179H	4	E1	A1	O2	TP3	8	D2	A1	D2	U55A	7	D1	A1	K3
R48	5	G2	A1	D6	R118	7	A4	A1	B7	R179I	4	A5	A1	O2	TP4	9	B3	A1	J2	U55B	7	F2	A1	K3
R49	5	F3	A1	D6	R119	7	C4	A1	B7	R180	8	D3	A1	E4	TP5	9	B2	A1	J1	U55C	7	F1	A1	K3
R50	5	G2	A1	E6	R120	7	G1	A1	C7	R184	8	D4	A1	D4	TP6	9	B1	A1	J1	U56A	7	D4	A1	M3
R51	5	G2	A1	E6	R121	7	F1	A1	C7	R185	5	D4	A1	G4	TP7	9	B3	A1	N1	U56B	7	D2	A1	M3
R52	5	E5	A1	F4	R122	7	F1	A1	B8	R190	7	E1	A1	K3	TP8	9	B3	A1	D4	U57A	5	G2	A1	K6
R53	5	E5	A1	E4	R123	7	F1	A1	C7	R191	7	E1	A1	K3	TP9	9	C3	A1	O8	U57B	5	H2	A1	K6
R54	5	G3	A1	L7	R124	7	F1	A1	B7	R192	5	C4	A1	L8	TP10	9	C3	A1	E6	U57C	1	D2	A1	K6
R55	5	E5	A1	E6	R125	7	E2	A1	D7	R206	7	F1	A1	J4	TP11	7	F1	A1	K3	U57D	3	E1	A1	K6
R56	9	E2	A1	D7	R126	7	E2	A1	C7	R207	7	F1	A1	J5						U59	7	D3	A1	K4
R57	9	E3	A1	E7	R127	7	E2	A1	C7	R208	7	E2	A1	D7	U1	1	F4	A1	J5	U60	7	F4	A1	M3
R58	9	F4	A1	E6	R130	7	B4	A1	B7	R209	7	G1	A1	C7	U3	1	E1	A1	K4	U61A	7	E3	A1	L3
R59	9	F4	A1	D7	R132	3	E5	A1	P1	R210	7	E1	A1	C7	U4	1	D4	A1	L5	U62	7	H3	A1	G5
R60	9	G4	A1	E7	R133	3	D5	A1	Q2	R211	3	D5	A1	J7	U5	1	D5	A1	L5	U63A	7	F2	A1	I4
R61	9	F2	A1	D7	R134	3	E5	A1	Q2	R212	3	D5	A1	J7	U6	1	D1	A1	L4	U63B	7	E3	A1	I4
R62	9	F2	A1	D7	R135	3	C4	A1	O2	R213	3	A5	A1	I7	U7	1	F1	A1	K5	U63C	7	F3	A1	I4
R63	9	G3	A1	E7	R137	3	D5	A1	Q2	R214	5	B1	A1	C5	U8	1	C1	A1	L6	U64	7	C4	A1	B7
R64	9	G3	A1	E6	R138	3	D5	A1	Q2	R216	5	D3	A1	C6	U9	1	G2	A1	I6	U65	7	C1	A1	G6
R65	9	G3	A1	E6	R141	5	H4	A1	L7	R217	7	G1	A1	G5	U10	1	G2	A1	H5	U67	7	F2	A1	C7
R66	9	G2	A1	D6	R142	5	H5	A1	L7	R218	7	F2	A1	I5	U11	1	G1	A1	G5	U70	3	C4	A1	L7
R67	9	G4	A1	E6	R143	8	A1	A1	B2	R219	7	G2	A1	H6	U12	1	F3	A1	J5	U71A	5	H4	A1	L7
R68	7	C1	A1	K3	R144	8	B1	A1	B3	R220	7	G2	A1	I5	U13	1	B1	A1	M6	U71B	5	G3	A1	L7
R69	7	D1	A1	K3	R145	8	D1	A1	B2	R221	7	G2	A1	I4	U15	1	E2	A1	I5	U72	8	F2	A1	H4
R70	7	D1	A1	K3	R146	8	H4	A1	J4	R222	7	F2	A1	K3	U16	1	B3	A1	N7	U73	8	G3	A1	J1
R71	7	D2	A1	L3	R147	8	F4	A1	H2	R223	7	F2	A1	K3	U17	1	B5	A1	N7	U74	8	E5	A1	G3
R72	7	D1	A1	K3	R149	8	E3	A1	E2	R224	7	F1	A1	K3	U18	2	F1	A1	P7	U75	8	E4	A1	F3
R73	7	E2	A1	L3	R150	8	E4	A1	D2	R225	7	G1	A1	J4	U19	2	F2	A1	P7	U76A	8	B4	A1	D3
R74	7	E2	A1	K3	R151	8	D4	A1	E3	R226	7	G1	A1	J5	U20	2	F3	A1	P6	U76B	8	B4	A1	D3
R76	7	D2	A1	L3	R152	8	E4	A1	D3	R227	7	B2	A1	F6	U21	2	F4	A1	P6	U78	8	C3	A1	E3
R77	7	D5	A1	M3	R153	8	E3	A1	E1	R228	7	B2	A1	F6	U22	3	G4	A1	A5	U80	4	F4	A1	K4
R78	7	C5	A1	N2	R154	8	D2	A1	D2	R229	7	A2	A1	F7	U23	3	G5	A1	A4	U81A	7	F1	A1	J4
R79	7	D5	A1	M2	R155	8	F3	A1	I1	R230	7	A2	A1	F7	U24	3	D2	A1	H7	U82	1	E4	A1	K6
R80	7	C4	A1	M3	R156	8	F2	A1	I1	R231	3	B5	A1	K7	U25	3	E3	A1	I6	U83	1	E5	A1	K5
R81	7	C4	A1	M3	R157	8	C1	A1	C2	R500	8	A2	A1	C1	U26	3	F3	A1	J6	U84	7	A2	A1	F6
R82	7	C4	A1	N3	R158	8	C5	A1	F3	R501	8	A2	A1	C1	U27	3	D1	A1	J6	U85	8	G2	A1	I2
R83	7	E5	A1	M1	R159	8	C4	A1	F3	R502	8	A3	A1	C1	U28	3	C1	A1	J7	U86	1	C1	A1	L6
R86	7	G4	A1	L3	R160	8	A5	A1	C3	R503	8	B4	A1	D4	U29	4	D3	A1	N3	U87	1	C4	A1	N6
R87	7	G4	A1	L3	R161	8	A4	A1	C3	R504	8	B4	A1	D3	U30	4	F4	A1	P1					
R88	7	F4	A1	L3	R162	8	B3	A1	D3	R506	7	E1	A1	C7	U31	4	A2	A1	O5	VR1	5	F2	A1	D6
R89	7	F4	A1	M3	R163	8	E4	A1	D2						U32	4	F3	A1	M4	VR2	5	G2	A1	D6
R90	7	E4	A1	L3	R164	8	A4	A1	C3	RT1	8	B1	A1	C3	U33	4	H4	A1	N1	VR3	7	D5	A1	M2
R91	7	E4	A1	L3	R165	8	B3	A1	D3						U34	4	G4	A1	P2	VR4	8	G4	A1	J4
R92	7	E3	A1	L4	R166	8	E5	A1	G3	RV1	8	B1	A1	C3	U35	4	B3	A1	O4					
R98	7	D2	A1	F6	R167	8	E5	A1	G3						U36	4	F1	A1	M5	Y39	4	A3	A1	
R99	7	E2	A1	D7	R168	8	F5	A1	G3	S1	2	B1	A1	O7										

FRONT

BACK

COMPONENT NUMBER EXAMPLE

STATIC
SENSITIVE
DEVICES
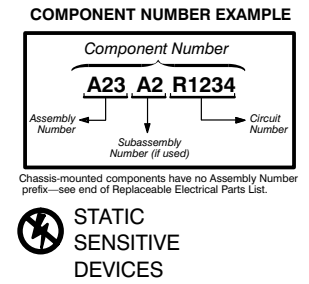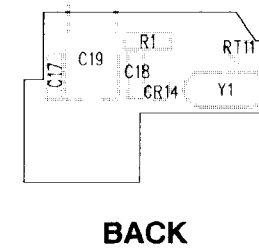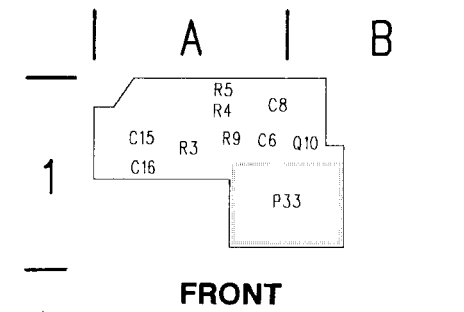
Figure 9–2: A1A1 Oven Board

Table 9–2: A1A1 Component Locator

A1A1 OVEN BOARD	
C6	B2
C8	B2
C15	A2
C16	A2
C17	B1
C18	B1
C19	A2
CR14	A1
P33	C1
Q10	B2
R1	C1
R3	A1
R4	B1
R5	B2
R9	B2
RT11	B2
Y1	A2

TEST SIGNAL MEMORY

P/O A1 INSERTER BOARD

REV MAY 1993
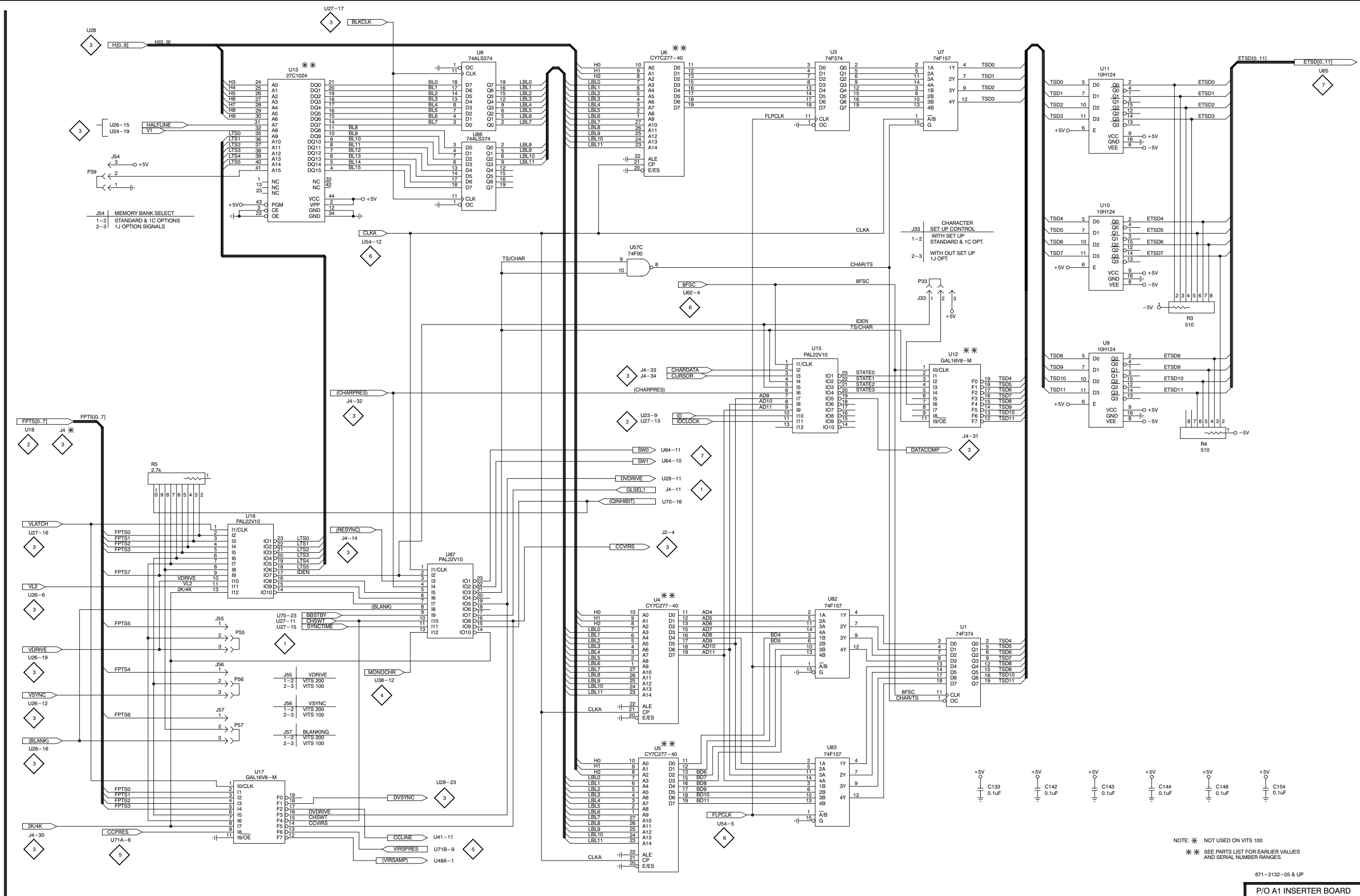
671-2132-05 & UP

NOTE: ✳ NOT USED ON VITS 100

✳✳ SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES.
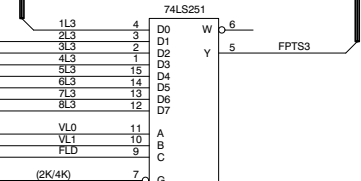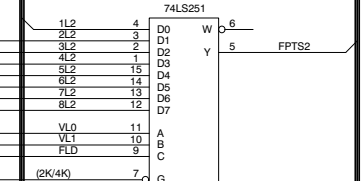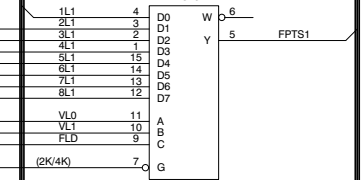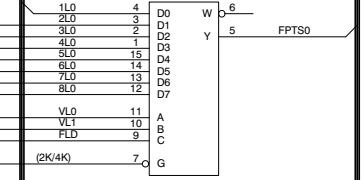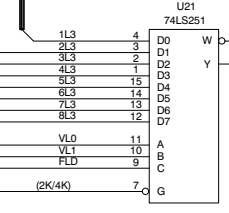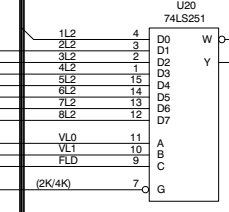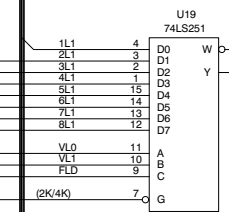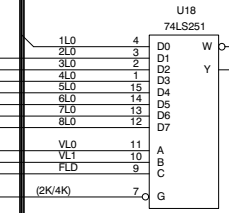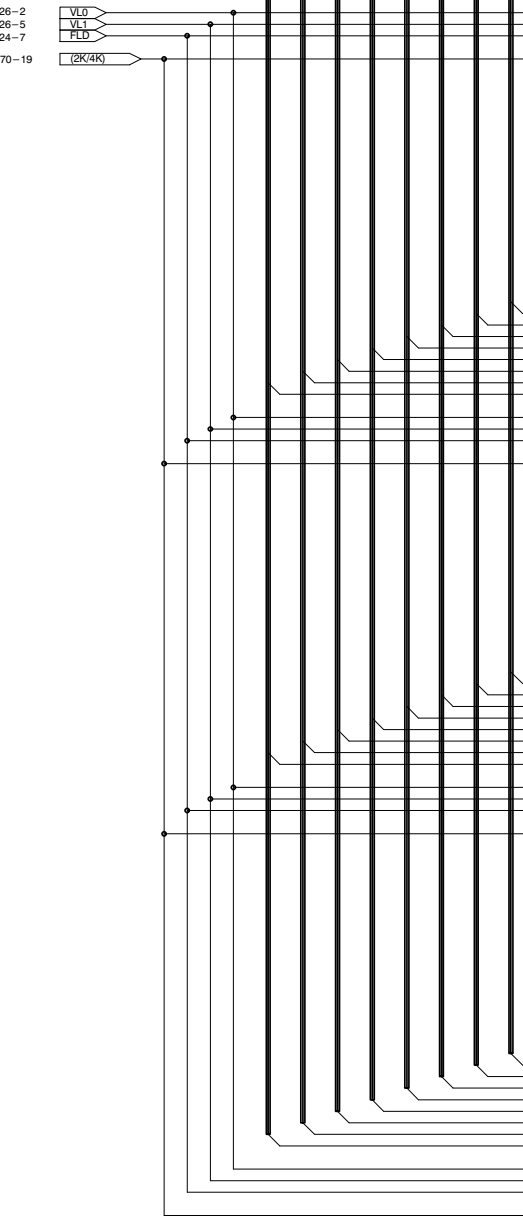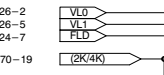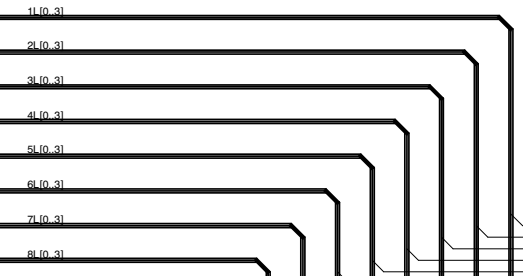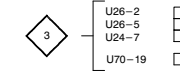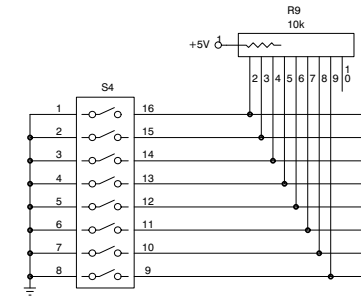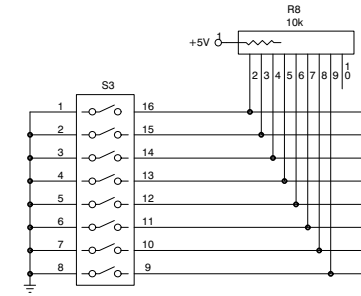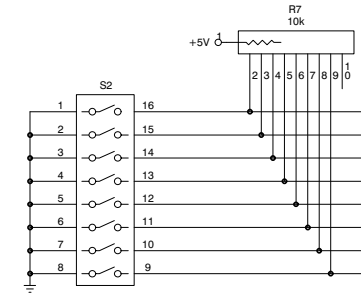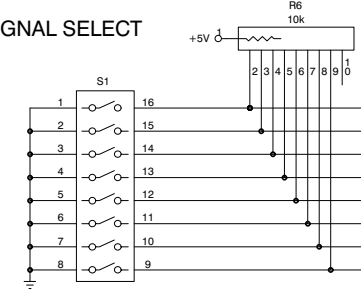
TEST SIGNAL SELECT

REV NOV 1992

P/O A1 INSERTER BOARD

TEST SIGNAL SELECT

2

H&V COUNTERS,DECODERS, SOURCE IDENTIFICATION & BYPASS CONTROLS ◇3

VITS 100 NTSC VITS Inserter Instruction Manual

GENLOCK 4

9–11
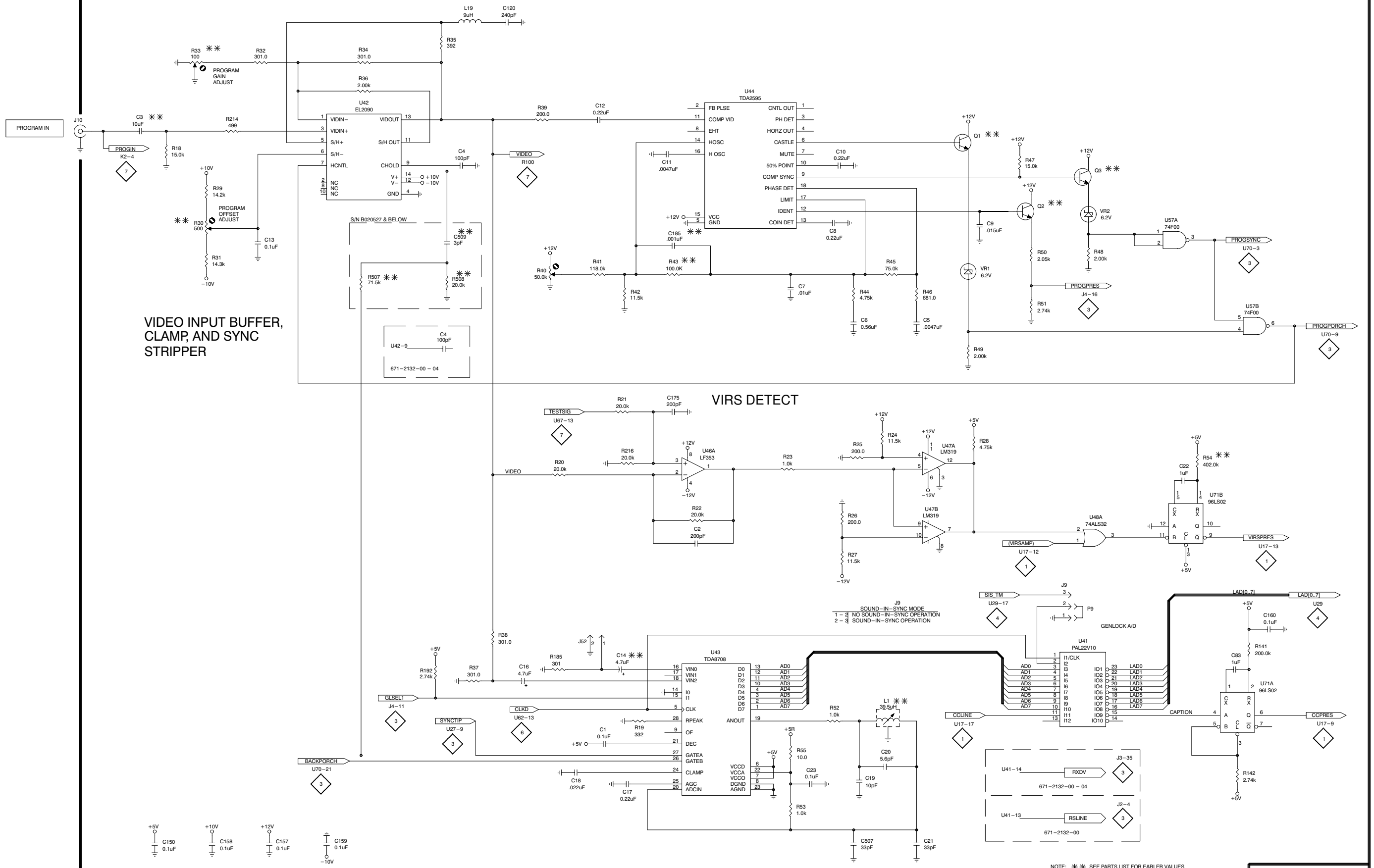
VIDEO INPUT BUFFER,
CLAMP, AND SYNC
STRIPPER

VIRS DETECT

GENLOCK A/D

NOTE: ✳✳ SEE PARTS LIST FOR EARLER VALUES
AND SERIAL NUMBER RANGES

P/O A1 INSERTER BOARD

NOTE: ✳✳ SEE PARTS LIST FOR EARLER VALUES AND SERIAL NUMBER BREAKS.

119–4328–01

A1A1 CRYSTAL OVEN BOARD

U59 AD7524

J12 VCO CONTROL
1 – 2 NORMAL OPERATION
2 – 3 VCO CENTER FREQUENCY ADJUST

J13 OVEN CONTROL
1 – 2 OSCILLATOR OVEN ON
2 – 3 OSCILLATOR OVEN OFF

NOTE: ✳✳ SEE PARTS LIST FOR EARLER VALUES AND SERIAL NUMBER RANGES

P/O A1 INSERTER BOARD

REV NOV 1992

CLOCKS 6

ANALOG OUTPUT 7

FLOATING COMMON

REAR PANEL
110V OR 220V
LF1
F1
S10A
RT1 5
RV1 330V
C84 0.15uF
R143 22M
R144 1M
S10B
CR12
C110 150UF
C85 .01uF
R157 270k
C86 .01uF
C87
R145 10M
DS4
L17 150UH
C88 220pF

U72 7812
IN OUT REF
C500 47uF
CR24
J21 P21
B100
FAN

R501 20.0k
R500 1M
R154 100K

J17 HOUSEKEEPING SUPPLY
1 – 2 HOUSEKEEPING SUPPLY ENABLE
NO PLUG HOUSEKEEPING SUPPLY DISABLE

J18 TRANSFORMER ENABLE
1 – 2 NORMAL OPERATION
NO PLUG DISABLES POWER SUPPLY

CR10
R156 5
+15V
U85 7812
CR15
IN OUT REF
C102 1000uF
C104 47uF
C100 1uF
C106 1uF
CR16
+12VP

R502 30.1K

C117 0.1uF
TP3 14.1V
P17 J17
CR9
T1 11

C115 1uF
C113 100uF
12
6

CR11
C103 1000uF
R155 5
C105 47uF
C101 1uF
U73 7912
REF IN OUT
C107 1uF
CR17
–12VP
13

C508 1uF
R165 10.0k
R175 10.0k
C118 .001uF
U78 3842
VREF COMP CT OUT GND IS
R173 3.01k
Q180
C111 .01uF
R180 10.0k
C96 0.47uF
P18 J18
8
4
2
CR18

C99 100uf
R162 18.2k
U76A LM393
R172 20.0k
Q18
R184 2.15k
R149 50
CR20 CR21 CR22 Q16
R153 270k
CR19
9
10
7

R164 40.02k
R150 10
Q17
CR14
L16 5uH
C92 2700uF
C512 2700uF
C108 1uF
C95 100uF
Q15
VR4 5.0V
+5VP

J19 OVERCURRENT SHUTDOWN
1 – 2 SHUTDOWN ENABLE
NO PLUG SHUTDOWN DISABLE
P19 J19
R151 10k
C97 680pF
R147 27
C116 .01uF
C89 0.1uF
R146 1k

R161 4.75k
CR26
R504 10.0k
R174 4.75k
C114 470pF
R152 1.50k
R163 0.51Ohm
CR13
C91 2700uF
C109 1uF
L15 10uH
C94 100uF
–5VP

C501 .47uF
U76B LM393
R503 10.0k
R159 10.0k
U75 SOC123A
R166 475
R167 150.0K
R168 2.00k
C98 0.1uF

R171 1k
+5V ADJ
R160 8.25k
R158 2.74k
C112 .068uF
U74 TL431C
R169 1.50k

R170 1k
OUTPUT VOLTAGE ADJUST

NOTE: ✳✳ SEE PARTS LIST FOR EARLER VALUES AND SERIAL NUMBER RANGES

P/O A1 INSERTER BOARD

REV MAY 1993

POWER SUPPLY 8

A B C D E F G H

J20

+12V OUTPUT P20 1 +12VP
  2 +12V
150 MA P34 3 −12VP
  4 −12V
−12V OUTPUT P35 5 +5VP
  6 +5V
150 MA P36 7 −5VP
  8 +5V
+5V OUTPUT P37 9 −5VP
  10 −5V
4AMPS 11
−5.2V OUTPUT P38 12
  13
1.5 AMPS 14
  15
  16

+12V

−12V

TP6 +12VP +12VP
TP5 −12VP −12VP
TP2 +5VP +5VP
TP1 −5VP −5VP

−5V VEE
+5V VCC

TP4 GND   TP7 GND   TP8 GND   TP9 GND   TP10 GND

U52
7805
IN OUT
REF

+12V

C33 0.1uF   C37 0.1uF   C174 0.1uF   +5R

U53
7905
REF
IN OUT

−12V   C34 0.1uF   C36 100uF   C38 0.1uF   −5R

L2 1.1uH

U51
MC1403
IN OUT
REF

+2.5V

C26 0.1uF   C24 0.1uF   R56 2.49k

R57 3.32k

U50A
358
2
3
1
4

R61 1.0k   R62 499   Q6 ✷✷   R66 4.7   Q4 ✷✷

R63 10.0k   C27 0.1uF   C172 0.1uF   C29 0.1uF   C504 10uF   +10V ✷✷

R64 10.0k

C28 0.1uF

R65 10.0k   C173 0.1uF   C30 0.1uF   C505 10uF ✷✷   −10V

U50B
358
5
6
7

R58 4.99k   R59 1.0k   Q5 ✷✷

R60 499   Q7 ✷✷

R67 4.7

L3 1.1uH   C25 0.1uF

+5V C121 0.1uF U18   +5V C122 0.1uF U19   +5V C123 0.1uF U20   +5V C124 0.1uF U21   +5V C129 0.1uF U36   +5V C130 0.1uF U16   +5V C131 0.1uF U17   +5V C132 0.1uF U14   +5V C134 0.1uF U38   +5V C137 0.1uF U33   +5V C139 0.1uF U32

+5V C140 0.1uF U37   +5V C141 0.1uF U40   +5V C145 0.1uF U8   +5V C146 0.1uF U3   +5V C147 0.1uF U7   +5V C149 0.1uF U41   +5V C152 0.1uF U28   +5V C153 0.1uF U26   +5V C156 0.1uF U45   +5V C162 0.1uF U29   +5V C163 0.1uF U29

C126 0.1uF −5V   C503 0.1uF −5V   +12V C167 0.1uF   +12V C168 0.1uF   C169 0.1uF −12V   C170 0.1uF −12V   C171 0.1uF −12V

NOTE: ✷✷ SEE PARTS LIST FOR EARLER VALUES AND SERIAL NUMBER RANGES

P/O A1 INSERTER BOARD

REV NOV 1992

REGULATOR & DECOUPLING CAPS 9

A1 VITS Inserter Board (671-2132-00 through -04)
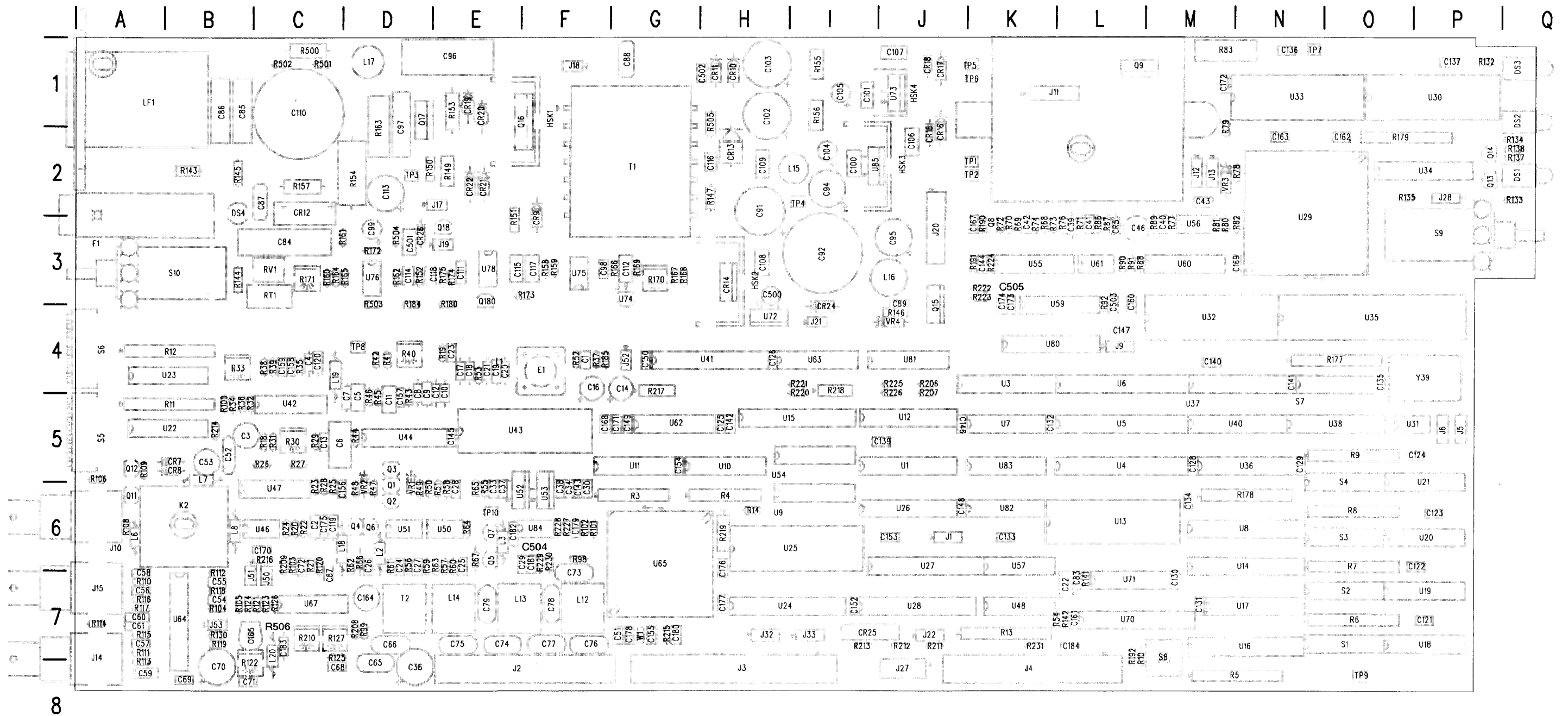
Figure 9–3: A1 VITS Inserter Board (671-2132-00 –04)

COMPONENT NUMBER EXAMPLE
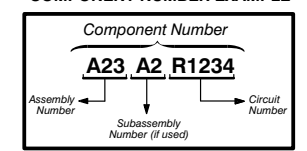
Component Number

A23 A2 R1234

Assembly Number   Subassembly Number (if used)   Circuit Number

Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

STATIC SENSITIVE DEVICES

Table 9–3: A1 Component Locator 671–2132–00 through -04

CKT NO.	SCHEM LOC	SCHEM NO.	BD LOC
B100	H2	8	
C1	D5	5	F4
C2	E4	5	C6
C3	A1	5	B5
C4	C2	5	C4
C5	F2	5	D5
C6	E2	5	D5
C7	E2	5	D5
C8	E2	5	D5
C9	F2	5	D5
C10	E2	5	E5
C11	D1	5	D5
C12	D1	5	E5
C13	B2	5	C5
C14	D4	5	G4
C16	C4	5	F4
C17	D5	5	E4
C18	D5	5	E4
C19	F5	5	E4
C20	F5	5	E4
C21	F5	5	E4
C22	G3	5	L7
C23	E5	5	E4
C24	E3	9	D7
C25	E4	9	E7
C26	D3	9	D7
C27	G3	9	D7
C28	G3	9	E6
C29	H3	9	F6
C30	H3	9	F6
C33	D1	9	E6
C34	D2	9	F6
C36	E2	9	D8
C37	E1	9	E6
C38	E2	9	F6
C39	C1	6	L3
C40	E2	6	M3
C41	D2	6	L3
C42	E2	6	K3
C43	C5	6	M2
C46	E4	6	L3
C51	B5	7	G7
C52	F4	7	B5
C53	H4	7	B5
C54	B4	7	B7
C55	B4	7	B7
C56	B4	7	A7
C57	C4	7	A7
C58	B5	7	A7
C59	D5	7	A8
C60	E4	7	A7
C61	D5	7	A7
C65	E2	7	D8
C66	E2	7	D7
C67	G2	7	C6
C68	F2	7	C8
C69	C5	7	B8
C70	C5	7	B8
C71	C5	7	B8
C72	G2	7	C7
C73	D1	7	F7
C74	D1	7	E7
C75	E1	7	E7
C76	D2	7	F7
C77	D2	7	F7
C78	D2	7	F7
C79	E2	7	E7
C83	H4	5	L7
C84	B1	8	C3
C85	C1	8	B1
C86	C2	8	B2
C87	D2	8	C2
C88	E1	8	G1
C89	G4	8	J4
C91	F4	8	H2
C92	F4	8	I3
C94	G4	8	I2
C95	G4	8	J3
C96	D3	8	E1
C97	E4	8	D1
C98	F5	8	F3
C99	B3	8	D3
C100	G2	8	I2
C101	G3	8	I1
C102	F2	8	H1
C103	F3	8	H1
C104	F2	8	I2
C105	F3	8	I1
C106	G2	8	J2
C107	G3	8	J1
C108	F4	8	H3
C109	F4	8	H2
C110	C2	8	C1
C111	D3	8	E3
C112	F5	8	G3
C113	E3	8	D2
C114	C4	8	D3
C115	D3	8	F3
C116	F4	8	H2
C117	C2	8	F3
C118	C3	8	E3
C119	G1	7	C6
C120	C1	5	C4
C121	B4	9	P7
C122	C4	9	O6
C123	C4	9	P6
C124	D4	9	O5
C125	G3	6	H5
C126	B5	9	H4
C128	H3	6	M5
C129	D4	9	N5
C130	D4	9	M7
C131	E4	9	M7
C132	E4	9	K5
C133	F5	1	K6
C134	F4	9	M6
C135	A3	4	O4
C136	E5	4	N1
C137	F4	9	P1
C139	F4	9	I5
C140	B5	9	M4
C141	C5	9	N4
C142	G5	1	H5
C143	G5	1	F6
C144	G5	1	K3
C145	C5	9	E5
C146	D5	9	J5
C147	D5	9	L4
C148	H5	1	J6
C149	D5	9	G5
C150	A5	5	G4
C152	E5	9	I7
C153	E5	9	J6
C154	H5	1	G5
C155	C5	7	G7
C156	F5	9	D6
C157	B5	5	D5
C158	B5	5	C4
C159	B5	5	C4
C160	H4	5	L4
C161	C4	3	L7
C162	F5	9	O2
C163	F5	9	N2
C164	E2	7	D7
C165	E1	7	C7
C167	D5	9	K3
C168	D5	9	F5
C169	F5	9	N3
C170	F5	9	C6
C171	F5	9	G5
C172	G3	9	M1
C173	G3	9	K4
C174	E1	9	K4
C175	D3	5	C6
C176	C2	7	H7
C177	B2	7	H7
C178	C2	7	G7
C179	B2	7	F6
C180	B2	7	G7
C181	A2	7	F6
C182	A2	7	E6
C183	E1	7	C7
C184	C5	3	L7
C185 *	D2	5	D4
C500	G2	8	H3
C501	B4	8	D3
C502	F3	8	G1
C503	C5	9	L4
C504	H3	9	K4
C505	H3	9	K4
CR5	F4	6	L3
CR7	G3	7	B5
CR8	F3	7	B5
CR9	E2	8	F3
CR10	F2	8	H1
CR11	F3	8	H1
CR12	C1	8	C2
CR13	F4	8	H2
CR14	F3	8	H3
CR15	G2	8	J2
CR16	H2	8	J2
CR17	H3	8	J1
CR18	G3	8	J1
CR19	E4	8	E1
CR20	E3	8	E1
CR21	E3	8	E2
CR22	E3	8	E2
CR24	G2	8	I4
CR25	B5	3	I7
CR26	B4	8	D3
DS1	D5	3	Q2
DS2	E5	3	Q2
DS3	E5	3	Q1
DS4	D2	8	B2
E1	F5	5	F4
F1	A1	8	A3
J1	C4	1	J6
J2	A3	3	G7
J3	H2	3	H7
J4	A2	3	K7
J5	B2	4	P5
J6	A1	4	P5
J9	G4	5	L4
J10	A1	5	A6
J11	C1	6	K1
J12	G3	6	M2
J13	D4	6	M2
J14	H5	7	A7
J15	H4	7	A6
J17	E2	8	E3
J18	E3	8	F1
J19	C4	8	E3
J20	B1	9	J2
J21	H2	8	I4
J22	B2	3	J7
J27	A5	3	J7
J28	D4	3	P2
J32	B4	1	H7
J33	B4	3	I7
J50	H1	7	C7
J51	H1	7	B7
J52	D4	5	G4
J53	B4	7	B7
K2	G4	7	A6
L1	F5	5	E4
L2	D2	9	D6
L3	E4	9	E6
L6	G4	7	A6
L7	F4	7	B6
L8	F4	7	B6
L12	D2	7	F7
L13	D2	7	F7
L14	E2	7	F7
L15	G4	8	H2
L16	G3	8	J3
L17	D1	8	D1
L18	G1	7	D6
L19	C1	5	C4
L20	E1	7	C8
LF1	A1	8	A2
P1	C4	1	
P5	B2	4	
P6	A1	4	
P9	G4	5	
P12	G3	6	
P13	D4	6	
P17	E2	8	
P18	E3	8	
P19	C4	8	
P20	B1	9	
P21	H2	8	
P22	B2	3	
P28	D4	3	
P32	B4	1	
P33	B4	3	
P34	B1	9	
P35	B1	9	
P36	B1	9	
P37	B1	9	
P38	B1	9	
Q1	F1	5	D6
Q2	F2	5	D6
Q3	G2	5	D5
Q4	G2	9	D6
Q5	G3	9	E7
Q6	G2	9	D6
Q7	G4	9	E6
Q8	D1	6	K2
Q9	E4	6	L1
Q11	F4	7	A6
Q12	G3	7	A5
Q13	D5	3	P2
Q14	E5	3	P2
Q15	G4	8	J3
Q16	B3	4	E1
Q17	E4	8	D2
Q18	C4	8	E3
Q180	D3	8	E4
R3	G2	1	G6
R4	G3	1	H6
R5	A3	1	N8
R6	C1	2	N7
R7	C2	2	N7
R8	C3	2	N6
R9	C4	2	A5
R10	B3	3	M8
R11	F4	3	A5
R12	F4	3	A4
R13	A2	3	K7
R14	F2	3	H6
R18	A1	5	C5
R19	D5	5	E4
R20	D3	5	C6
R21	D3	5	C7
R22	E3	5	C6
R23	E3	5	C6
R24	F3	5	C6
R25	E3	5	C6
R26	E3	5	C5
R27	E4	5	C5
R28	F3	5	C6
R29	B2	5	C5
R30	B2	5	C5
R31	B2	5	C5
R32	B1	5	C5
R33	B1	5	B5
R34	C1	5	B5
R35	C1	5	C4
R36	C1	5	B5
R37	C4	5	F4
R38	C4	5	C4
R39	D1	5	C4
R40	D2	5	D4
R41	D2	5	D4
R42	D2	5	D4
R43	D2	5	D5
R44	E2	5	D5
R45	F2	5	D5
R46	F2	5	D5
R47	F1	5	D6
R48	G2	5	D6
R49	F3	5	D6
R50	G2	5	E6
R51	G2	5	E6
R52	E5	5	F4
R53	E5	5	E4
R54	G3	5	L7
R55	E5	5	E6
R56	E2	9	D7
R57	E3	9	E7
R58	F4	9	E6
R59	F4	9	D7
R60	G4	9	E7
R61	F2	9	D7
R62	F2	9	D7
R63	G3	9	E7
R64	G3	9	E6
R65	G3	9	E6
R66	G2	9	D6
R67	G4	9	E6
R68	C1	6	K3
R69	D1	6	K3
R70	D1	6	K3
R71	D2	6	L3
R72	D1	6	K3
R73	E2	6	L3
R74	E2	6	K3
R76	D2	6	L3
R77	D5	6	M3
R78	C5	6	N2
R79	D5	6	M2
R80	C4	6	M3
R81	C4	6	M3
R82	C4	6	N3
R83	E5	6	M1
R86	G4	6	L3
R87	G4	6	L3
R88	F4	6	L3
R89	F4	6	M3
R90	E4	6	L3
R91	E4	6	L3
R92	E3	6	L4
R98	D2	7	F6
R99	E2	7	D7
R100	A4	7	B5
R101	B2	7	F6
R102	B2	7	F6
R103	G1	7	C7
R104	G3	7	B7
R105	G2	7	B7
R106	F4	7	A6
R108	G4	7	A6
R109	H3	7	A5
R110	E5	7	A7
R111	D5	7	A7
R112	E4	7	B7
R113	D5	7	A8
R114	D5	7	A7
R115	D5	7	A7
R116	D4	7	A7
R117	E4	7	A7
R118	A4	7	B7
R119	C4	7	B7
R120	G1	7	C7
R121	F1	7	C7
R122	F1	7	C8
R123	F1	7	C7
R124	F1	7	B7
R125	E2	7	C8
R126	E2	7	C7
R127	E2	7	C7
R130	B4	7	B7
R132	E5	3	P1
R133	D5	3	Q2
R134	E5	3	Q2
R135	C4	3	Q2
R137	D5	3	Q2
R138	D5	3	Q2
R141	H4	5	L7
R142	H5	5	L7
R143	A1	8	B2
R144	B1	8	B3
R145	D1	8	B2
R146	H4	8	J4
R147	F4	8	H2
R149	E3	8	E2
R150	E4	8	E2
R151	D4	8	E3
R152	E4	8	D3
R153	E3	8	E2
R154	D2	8	D2
R155	F3	8	I1
R156	F2	8	I1
R157	C1	8	C2
R158	C5	8	F3
R159	C4	8	F3
R160	A5	3	C3
R161	A4	3	D3
R162	B3	8	D3
R163	E4	8	D2
R164	A4	8	C3
R165	B3	8	D3
R166	E5	8	G3
R167	E5	8	G3
R168	F5	8	G3
R169	F5	8	G3
R170	F5	8	G3
R171	A4	8	C3
R172	B4	8	D3
R173	D3	8	E3
R174	C4	8	E3
R175	C3	8	E3
R177	E1	4	N4
R178	D1	4	M6
R179A	B5	4	P2
R179B	B3	4	P2
R179C	C3	4	P2
R179D	G5	4	P2
R179E	G5	4	P2
R179F	G5	4	P2
R179G	G5	4	P2
R179H	E1	4	P2
R179I	A5	4	P2
R180	D3	8	E4
R184	D4	8	D4
R185	D4	5	F4
R190	E1	6	K3
R191	E1	6	K3
R192	C4	5	L8
R206	F1	6	J4
R207	F1	6	J5
R208	E2	7	D7
R209	G1	7	C7
R210	E1	7	C7
R211	E5	7	A7
R212	D5	3	J7
R213	A5	3	I7
R214	B1	5	B5
R215	C3	1	G7
R216	D5	5	C6
R217	G1	6	G5
R218	F2	6	I4
R219	G2	6	H6
R220	G1	6	I5
R221	G2	6	I4
R222	F2	6	K3
R223	F2	6	K3
R224	F1	6	K3
R225	G1	6	J4
R226	G2	6	J5
R227	B2	7	F6
R228	A2	7	F7
R229	A2	7	F7
R230	A2	7	F6
R231	B5	3	K7
R500	A2	8	C1
R501	A2	8	C1
R502	A3	8	C1
R503	B4	8	D4
R504	B4	8	D3
R505	F2	8	H2
R506	E1	7	C7
RT1	B1	8	C3
RV1	B1	8	C3
S1	B1	2	N8
S2	B2	2	N7
S3	B3	2	N6
S4	B4	2	N6
S5	F5	3	A5
S6	F4	3	A4
S7	D2	4	N5
S8	C1	4	M8
S9	C5	3	Q3
S10A	B1	8	B4
S10B	B1	8	B4
T1	E2	8	G1
T2	E2	7	D7
TP1	B2	9	K2
TP2	B2	9	K2
TP3	D2	8	D2
TP4	B3	9	I2
TP5	B2	9	J1
TP6	B1	9	K1
TP7	B3	9	N1
TP8	B3	9	D4
TP9	C3	9	O8
TP10	C3	9	E6
U1	F4	1	I6
U3	E1	1	J5
U4	D4	1	L6
U5	D5	1	L5
U6	D1	1	L5
U7	F1	1	K5
U8	C1	1	M6
U9	G2	1	H6
U10	G2	1	G6
U11	G1	1	F6
U12	F3	1	I5
U13	B1	1	L6
U14	C3	1	M7
U15	E2	1	H5
U16	B3	1	M8
U17	B4	1	M7
U18	F1	2	O8
U19	F2	2	O7
U20	F3	2	O6
U21	F4	2	O6
U22	G4	3	A5
U23	G5	3	A5
U24	D2	3	H7
U25	E3	3	H7
U26	F3	3	I6
U27	D1	3	I7
U28	C1	3	J7
U29	D3	5	N3
U30	F4	4	O2
U31	A2	4	O5
U32	F3	4	M4
U33	H4	4	M2
U34	G4	4	O2
U35	B3	4	N4
U36	F1	4	M6
U37	F2	4	M5
U38	G3	4	N5
U40	G2	4	M5
U41	G4	5	G4
U42	B1	5	C5
U43	E4	5	E5
U44	E1	5	D5
U46A	E3	5	B6
U47A	F3	5	B6
U47B	F3	5	B6
U48A	G4	5	K7
U50A	F2	9	D6
U50B	F3	9	D6
U51	D2	9	D6
U52	D1	9	E6
U53	D2	9	F6
U54	H1	6	H5
U55A	D1	6	K3
U55B	F2	6	K3
U55C	F1	6	K3
U56A	D4	6	M3
U56B	D2	6	M3
U57A	G2	5	K7
U57B	H2	5	K7
U57C	D2	1	K7
U57D	E1	3	K7
U59	D3	6	K4
U60	F4	6	M3
U61A	E3	6	L3
U62	H3	6	G5
U63A	F2	6	H4
U63B	E3	6	H4
U63C	F3	6	H4
U64	C4	7	A7
U65	C1	7	G7
U67	F2	7	C7
U70	C4	3	L7
U71A	H4	5	L7
U71B	G3	5	L7
U72	F2	8	H4
U73	G3	8	J1
U74	E5	8	G4
U75	E4	8	F3
U76A	B4	8	D3
U76B	B4	8	D3
U78	C3	8	E3
U80	F4	4	K4
U81A	F1	6	J4
U82	E4	1	K6
U83	E5	1	J6
U84	A2	7	F6
U85	G2	8	I2
VR1	F2	5	D6
VR2	G2	5	D6
VR3	D5	6	M2
VR4	G4	8	J4
W1	C3	7	G7
Y39	A3	4	P4

* See parts list for serial number ranges

TEST SIGNAL MEMORY

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P/O A1 INSERTER BOARD

NOTE: ✳ NOT USED ON VITS 100

NOTE: ✳✳ SEE PARTS LIST FOR EARLER VALUES
AND SERIAL NUMBER RANGES

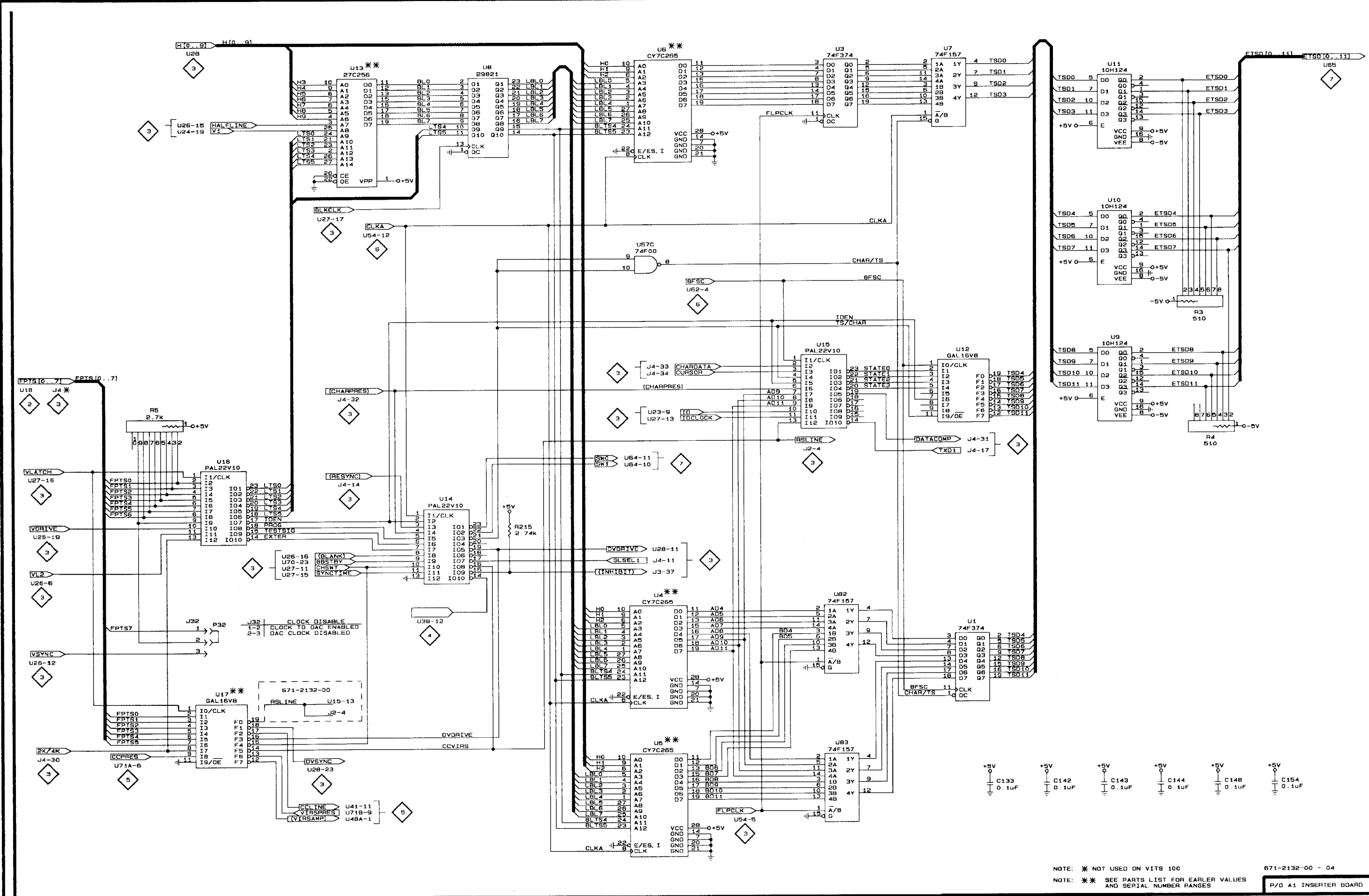H&V COUNTERS, DECODERS, SOURCE IDENTIFICATION & BYPASS CONTROLS

Replaceable Mechanical Parts

Replaceable Mechanical Parts

This section contains a list of the replaceable mechanical components for the VITS 100 NTSC VITS Inserter. Use this list to identify and order replacement parts.

Parts Ordering Information

Replacement parts are available through your local Tektronix field office or representative.

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

- Part number

- Instrument type or model number

- Instrument serial number

- Instrument modification number, if applicable

If you order a part that has been replaced with a different or improved part, your local Tektronix field office or representative will contact you concerning any change in part number.

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

Using the Replaceable Mechanical Parts List

The tabular information in the Replaceable Mechanical Parts List is arranged for quick retrieval. Understanding the structure and features of the list will help you find all of the information you need for ordering replacement parts. The following table describes the content of each column in the parts list.

Parts List Column Descriptions

Column	Column Name	Description
1	Figure & Index Number	Items in this section are referenced by figure and index numbers to the exploded view illustrations that follow.
2	Tektronix Part Number	Use this part number when ordering replacement parts from Tektronix.
3 and 4	Serial Number	Column three indicates the serial number at which the part was first effective. Column four indicates the serial number at which the part was discontinued. No entries indicates the part is good for all serial numbers.
5	Qty	This indicates the quantity of parts used.
6	Name & Description	An item name is separated from the description by a colon (:). Because of space limitations, an item name may sometimes appear as incomplete. Use the U.S. Federal Catalog handbook H6-1 for further item name identification.
7	Mfr. Code	This indicates the code of the actual manufacturer of the part.
8	Mfr. Part Number	This indicates the actual manufacturer's or vendor's part number.

Abbreviations   Abbreviations conform to American National Standard ANSI Y1.1–1972.

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

Mfr. Code to Manufacturer Cross Index   The table titled Manufacturers Cross Index shows codes, names, and addresses of manufacturers or vendors of components listed in the parts list.

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Manufacturers Cross Index, Mechanical Parts

Mfr. Code	Manufacturer	Address	City, State, Zip Code
01536	TEXTRON INC	1818 CHRISTINA ST	ROCKFORD, IL 61108
0J9P4	DELTA ENGINEERING & MFG. CO.	19500 SW TETON	TUALATIN, OR 97062
0JR05	TRIQUEST PRECISION PLASTICS	3000 LEWIS & CLARK HWY PO BOX 66008	VANCOUVER, WA 98666–6008
0KB01	STAUFFER SUPPLY CO	810 SE SHERMAN	PORTLAND, OR 97214–4657
13764	MICRO PLASTICS INC.	HIGHWAY 178 NORTH	FLIPPIN, AR 72634
22526	BERG ELECTRONICS INC	857 OLD TRAIL ROAD	ETTERS, PA 17319
2K262	BOYD CORPORATION	6136 NE 87TH AVENUE	PORTLAND, OR 97220
52152	3M COMPANY	INDUSTRIAL TAPE DIVISION 3M CENTER	ST PAUL, MN 55144–1000
5Y400	TRIAX METAL PRODUCTS INC	DIV OF BEAVERTON PARTS MFG CO. 1800 NW 216TH AVE	HILLSBORO, OR 97124–6629
73743	FISCHER SPECIAL MFG CO	111 INDUSTRIAL RD PO BOX 76500	COLD SPRINGS, KY 41076
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON, OR 97077–0001
80126	PACIFIC ELECTRICORD CO	747 WEST REDONDO BEACH PO BOX 10	GARDENA, CA 90247–4203
93907	CAMCAR DIV OF TEXTRON INC	ATTN: ALICIA SANFORD 516 18TH AVE	ROCKFORD, IL 611045181
TK0435	LEWIS SCREW CO.	4300 SOUTH RACINE AVENUE	CHICAGO, IL 60609
TK1547	MOORE ELECTRONICS INC	19500 SW 90TH CT PO BOX 1030	TUALATIN, OR 97062
TK1828	LITE SPECIALTY METAL WORKS	20460 SW AVERY CT	TUALATIN, OR 97062
TK1947	NORTHWEST ETCH TECHNOLOGY	2601 S HOOD ST PO BOX 110610	TACOMA, WA 98411–0610
TK2562	MOLDING SPECIALITIES INC	3000 LEWIS & CLARK HWY	VANCOUVER, WA 98661–2999

Replaceable Mechanical Parts List

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
1–1	211–0119–00			15	SCREW,MACH:4–40 X 0.25,FLH,100 DEG,STL BK OXD POZ	93907	ORDER BY DESCR
–2	200–3994–00			1	DOOR:ALUMINUM	0J9P4	200–3994–00
–3	200–3968–00			1	COVER,TOP:ALUMINUM	0J9P4	200–3968–00
–4	134–0209–00			1	BUTTON,PLUG:0.344 OD,SNAP–IN 0.187 DIA HOLE,NYLON 6/6,MATTE	13764	62PP018BM14
–5	210–1039–00			3	WASHER,LOCK:0.521 ID,INT,0.025 THK,SST	0KB01	1224–02–00–0541C
–6	220–0497–00			3	NUT,PLAIN,HEX:0.5–28 X 0.562 HEX,BRS CD PL	73743	ORDER BY DESCR
–7	175–9877–00			1	CA ASSY,SP,ELEC:10,28 AWG,12.5 L,RIBBON	TK1547	ORDER BY DESCR
–8	214–3903–01			2	SCREW,JACK:4–40 X 0.312 EXT THD,4–40 INT THD,0.188 HEX,STEEL,CADPLATE	0KB01	214–3903–01
–9	337–3796–00	B010100	B020335	1	SHIELD,ELEC:LINE FILTER,ALUMINUM	TK1947	337–3796–00
	337–3796–01	B020336		1	SHIELD,ELEC:0.032 BRASS,C26000,0.5 HARD	80009	337–3796–01
–10	211–0014–00			2	SCREW,MACHINE:4–40 X 0.5,PNH,STL CD PL,POZ	93907	ORDER BY DESCR
–11	131–3537–00			1	CONN,HDR:PCB,MALE,RTANG,1 X 12,0.1 CTR,0.230 MLG X 0.120 TAIL,30 GOLD	22526	68016–112
–12	337–3846–00			1	SHIELD,ELEC:POWER SUPPLY	80009	337–3846–00
–13	348–0844–00			6	PAD,CUSHIONING:0.05 SQ X 0.23 H,POLYURETHANE W/PRESSURE SENS ADHESIVE	52152	SJ–5018–GRAY
–14	211–0244–00			16	SCR,ASSEM WSHR:4–40 X 0.312,PNH,STL,CD PL,POZ	01536	821–02775
–15	200–3264–00			1	COVER,TOP:ALUMINUM	5Y400	ORDER BY DESCR
–16	211–0021–00			1	SCREW,MACHINE:4–40 X 1.25,PNH,STL CD PL,POZ	TK0435	ORDER BY DESCR
–17	348–0935–00			1	GASKET:2.0 X 1.7,NEOPRENE	2K262	ORDER BY DESCR
–18	432–0154–00			1	BASE,HEAT SINK:PLASTIC	TK2562	432–0154–00
–19	200–3975–00	B010100	B020554	1	COVER,BOTTOM:ALUMINUM	0J9P4	200–3975–00
–19	200–3975–02	B030555		1	COVER,BOTTOM:ALUMINUM	0J9P4	200–3975–02
–20	————————			1	CIRCUIT BD ASSY:INSERTER (SEE A1 REPL)		
–21	426–2420–01			1	FRAME,FRONT:ALUMINUM	80009	426–2420–01
–22	337–3812–00			1	SHIELD,ELEC:PLASTIC,BOTTOM	80009	337–3812–00
–23	333–3959–00			1	PANEL,FRONT:VITS100	0J9P4	333–3959–00
–24	————————			1	CIRCUIT BD ASSY:OVEN (SEE A1A1 REPL)		
	253–0143–00	B020323		1	TAPE,PRESS SENS:KAPTON,1.0 X 0.001 36YDS PER ROLL (QUANTITY 1.250 INCHES)	80009	253–0143–00
–25	210–0586–00			1	NUT,PL,ASSEM WA:4–40 X 0.25,STL CD PL	0KB01	ORDER BY DESCR
–26	214–3863–01	B010100	B020322	1	HEAT SINK,ELEC:ALUMINUM	TK1828	ORDER BY DESCR
	214–4585–00	B020323		1	HEAT SINK,ELEC:1.55 X 0.96,YELLOW CHROMATE CVRSN COATING	80009	214–4585–00
–27	211–0513–00			2	SCREW,MACHINE:6–32 X 0.625,PNH,STL CD PL	TK0435	ORDER BY DESCR
–28	200–3266–01			1	CAP,HEAT SINK:PLASTIC	0JR05	200–3266–01

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					STANDARD ACCESSORIES		
	161–0216–00			1	CABLE ASSY,PWR:3,18 AWG,2.5M L,BLACK	80126	C7120–25M–BL
	070–8333–00			1	MANUAL,TECH:VITS100	80009	070–8333–00
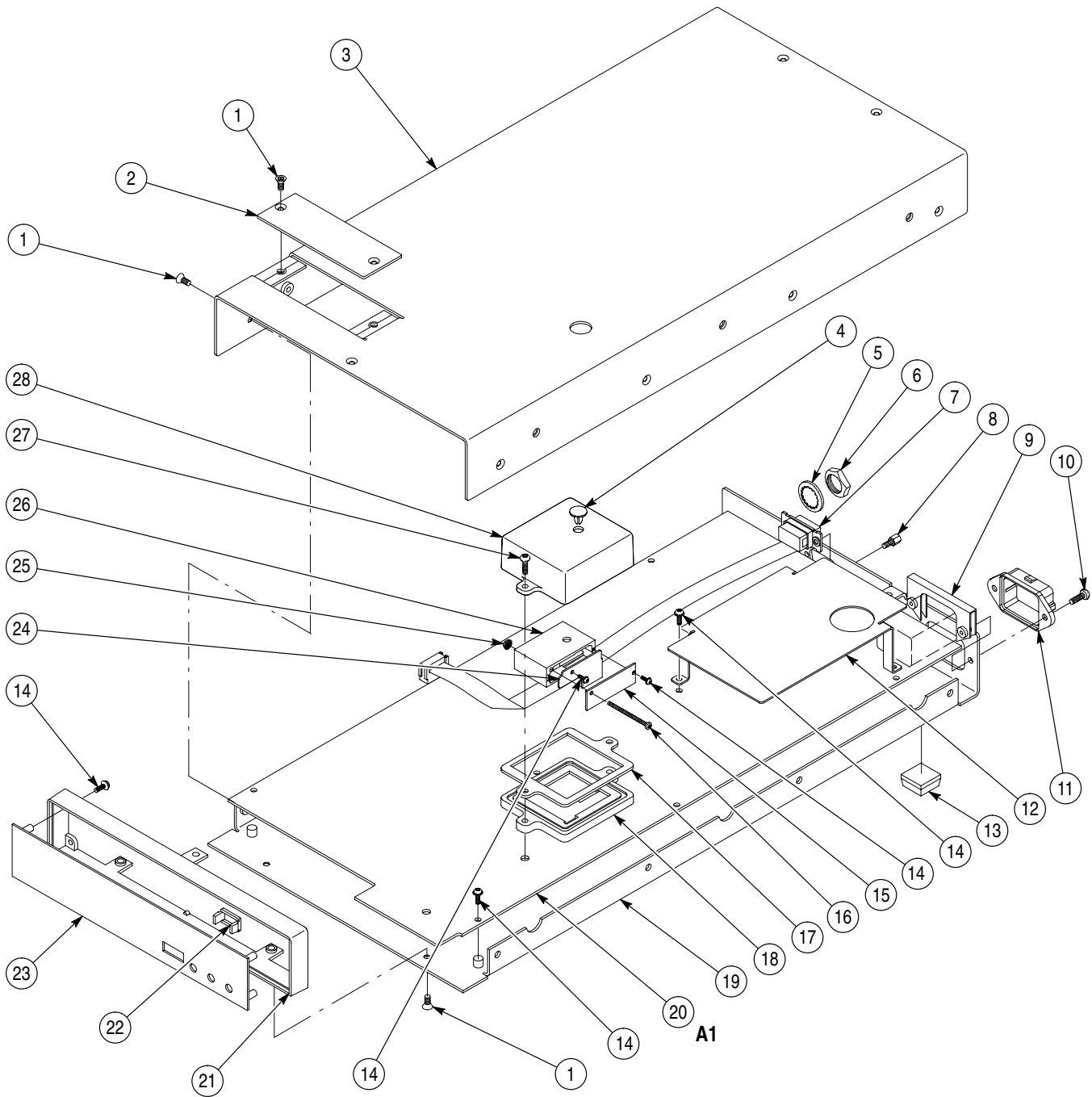
Figure 10–1: Exploded view

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Appendix

Appendix A: Options

This Appendix describes the available VITS 100 NTSC VITS Inserter options. Operation of the instrument is relatively straightforward; the following options expand its utility to situations other than typical broadcast applications:

- Option 1J has three signals that differ slightly from those in the standard signal set. These signals are FCC Color Bars without setup, Multipulse without setup, and Red Field with altered luminance and chrominance amplitudes. See page A–2 for more information.

- Option 1M inserts NTSC VITS into the vertical interval of PAL-M video signals. See page A–4 for more information.

- Option 2 is designed for the cable industry. It has two altered signals, a multiburst and continuous sweep that are optimized for cable applications. See page A–6 for more information.

Option 1J

The VITS 100 NTSC VITS Inserter Option 1J contains the following three signals that are modifications of those in the standard VITS inserter:

- Red Field, with modified luminance and chrominance amplitudes

- FCC Color Bars without setup

- Multipulse without setup

Signal Characteristics   See Figures A–1 through A–3 and Table A–1 for descriptions of these signals.
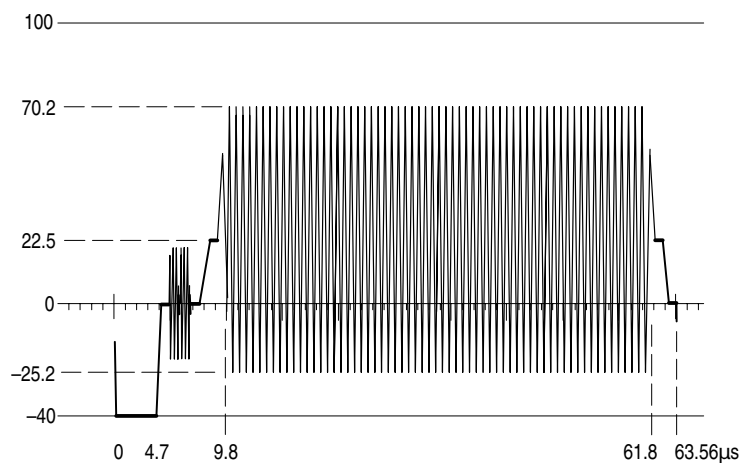

Figure A–1: Option 1J Red Field signal

Table A–1: Option 1J Red Field Characteristics

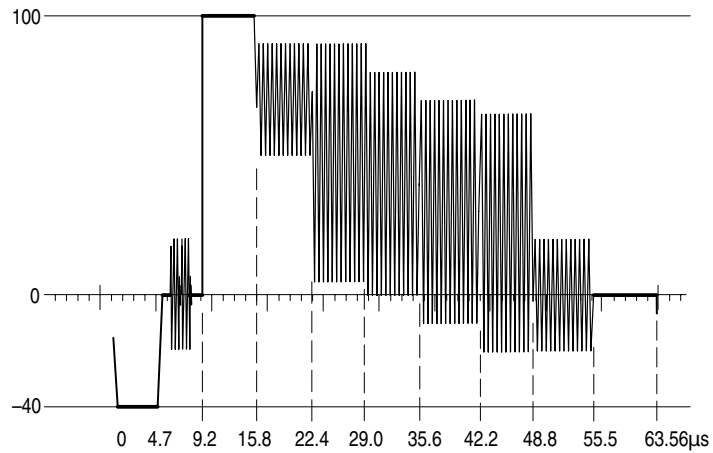| Characteristic	Description
Luminance	
Amplitude	160.72 mV $\pm$ 1%
Rise Time	250 ns $\pm$ 25 ns
Chrominance	
Amplitude	681.23 mV $\pm$ 1%
Phase	103.4° $\pm$ 0.3°
Rise Time	400 ns $\pm$ 40 ns

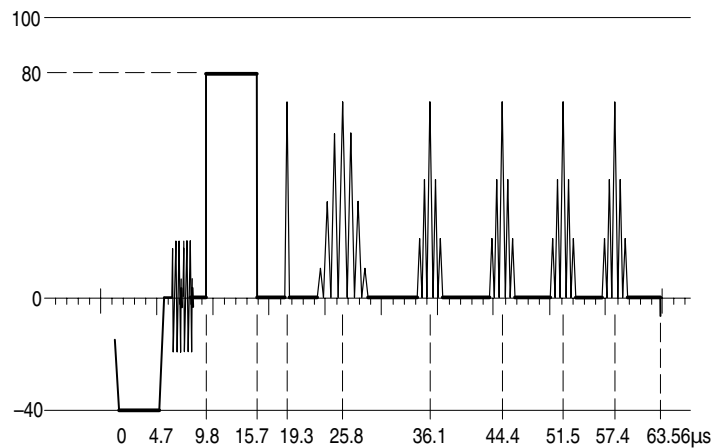**Figure A–2: Option 1J FCC Color Bar signal**

Figure A–3: Option 1J Multipulse signal

Factory Configuration   The factory-programmed selection of VITS signals is also unique in Option 1J; see Table A–2.

Table A–2: Option 1J Factory Programmed VITS Insertions

Line	Field	Signal
17	1	FCC Composite signal
17	2	Multiburst
18	1 and 2	Pass*
19	1	Color Bars (No Setup)
19	2	Pass*
20	1	Sin X/X
20	2	Red Field (Luminance and Chrominance altered)

*   Passed lines are not deleted or inserted by the VITS 100 NTSC VITS Inserter

Option 1M

The VITS 100 NTSC VITS Inserter with Option 1M is designed to genlock to a PAL-M color television signal. This option permits use of the VITS inserter in conjuction with a VM700A Video Measurement Set. When two VITS 100 NTSC VITS Inserters are used, as described below, you can use a VM700A Option 1 (NTSC) to make PAL-M system measurements. The VM700A Video Measurement Set Option 11 (PAL) *cannot* be used because it relies on a 50 Hz field rate, rather than the 60 Hz rate of the PAL-M standard.

Making Measurements with Option 1M

This application uses two VITS 100 NTSC VITS Inserters, connected as shown in Figure A–4, to make the automated vertical interval measurements from the VM700A menu. The first VITS inserter genlocks to the PAL-M signal and inserts NTSC VITS signals into the vertical interval. This instrument is locked to both sync and burst and is operating in a standard insertion mode.

The second VITS inserter, located near the VM700A Video Measurement Set, operates in the bypass mode. The video measurement set input is from the VITS inserter MONITOR OUT, which is an NTSC signal with PAL-M active video. VITS signals that have traversed the entire plant can be measured, but measurements that relate to sync and burst can only be made on the inserted NTSC sync and burst.

NOTE. *The VITS 100 NTSC VITS Inserter used with the VM700A Video Measurement Set* must *remain in bypass mode at all times; if it does not, the inserted sync and color burst will be distributed throughout the plant. Do not rely on the front-panel BYPASS switch; instead, hard wire the rear-panel REMOTE connector (as shown in Figure A–4) to force the VITS inserter to remain in bypass mode.*
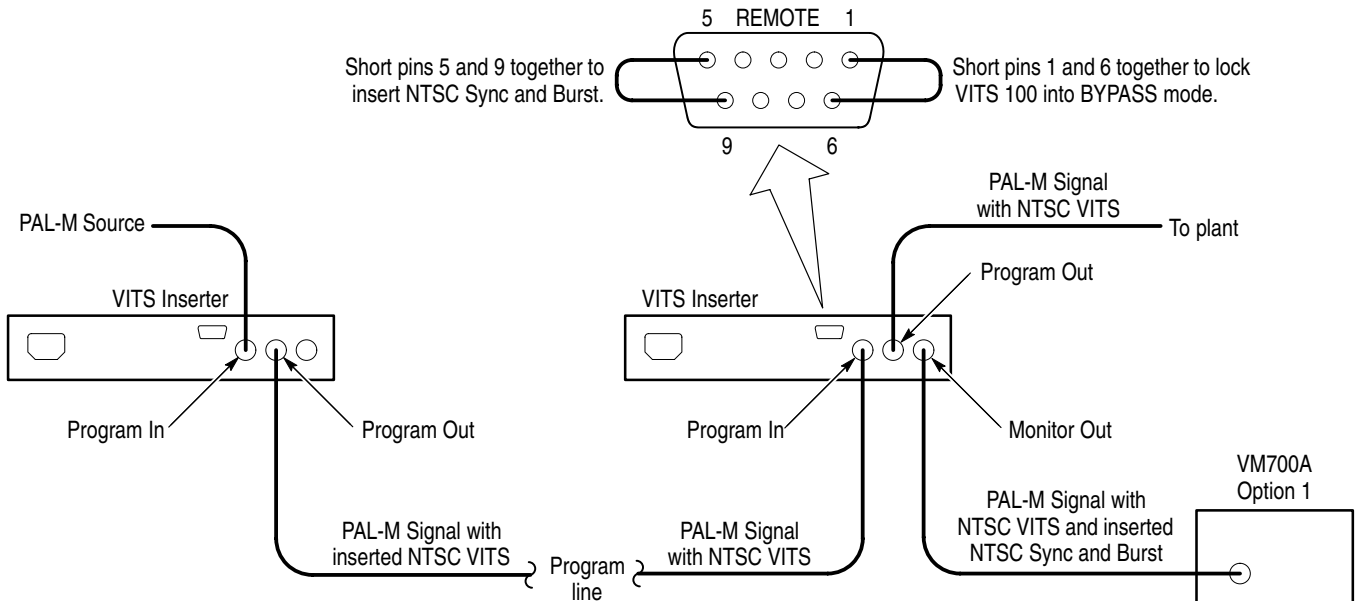

Figure A–4: Video Measurement Set application for Option 1M

Option 1M Signals

Option 1M VITS signals are the same as those available with the standard VITS 100 NTSC VITS Inserter. Table A–3 lists the factory configuration (through DIP switches S1–S4) of the VITS 100 NTSC VITS Inserter, Option 1M.

Table A–3: Option 1M Factory Programmed VITS Insertions

Line	Field	Signal
17	1	NTC7 Composite signal
17	2	NTC7 Combination signal
18	1 and 2	Pass*
19	1	VIRS
19	2	VIRS
20	1 and 2	Pass*

*   Passed lines are not deleted or inserted by the VITS 100 NTSC VITS Inserter

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Option 2

VITS 100 NTSC VITS Inserter Option 2 generates Cable Sweep and Cable Multiburst signals to accommodate cable system measurements. These signals replace the VIRS and Auto VIRS selections of the standard VITS inserter and are selected with the same DIP switch settings (see Table A–4). See *VITS Selection*, beginning on page 2–5, for more information about signal selection.

Table A–4: Option 2 DIP Switch Settings

Test Signal	DIP Segment Settings			
	1 (5)	2 (6)	3 (7)	4 (8)
Cable Multiburst	1	0	1	1
Cable Sweep	0	0	1	1

Option 2 VITS inserters are configured during manufacture to insert these signals; see *Factory Configuration*, on page A–8, for more information.

Signal Characteristics

Characteristics of the Cable Sweep and Cable Multiburst are listed in Table A–5; Figures A–5 and A–6 show the two waveforms.

Table A–5: Cable System Test Signal Characteristics

| Name	Description
Cable Multiburst	See Figure A–5 for timing information.
White Reference Bar Amplitude	60 IRE
Packet Amplitudes	60 IRE
Pedestal Amplitudes	30 IRE
Burst Frequencies	500 kHz, 1.25 MHz, 2.0 MHz, 3.0 MHz, 3.75 MHz, 4.0 MHz
Packet Rise Time	
500 kHz Other Packets	140 ns typical ($\sin^2$ shaped packets) 400 ns typical ($\sin^2$ shaped packets)
Cable Sweep	See Figure A–6 for timing information.
Pedestal Amplitude	50 IRE
Sweep	
Amplitude	100 IRE
Frequencies	
Start Stop	0.1 MHz 4.2 MHz
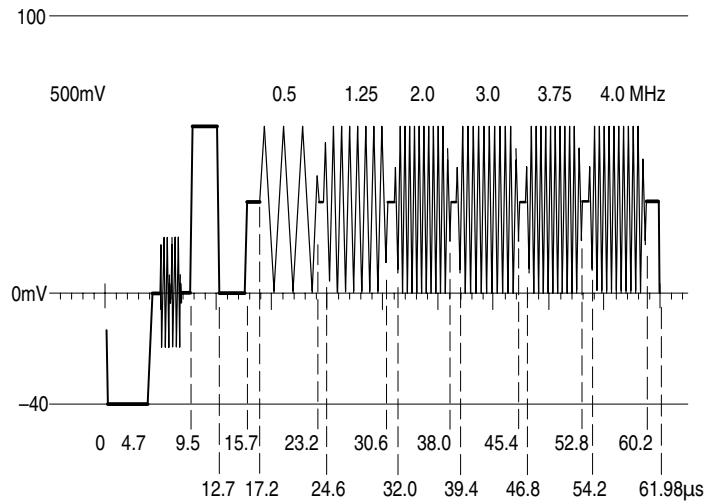
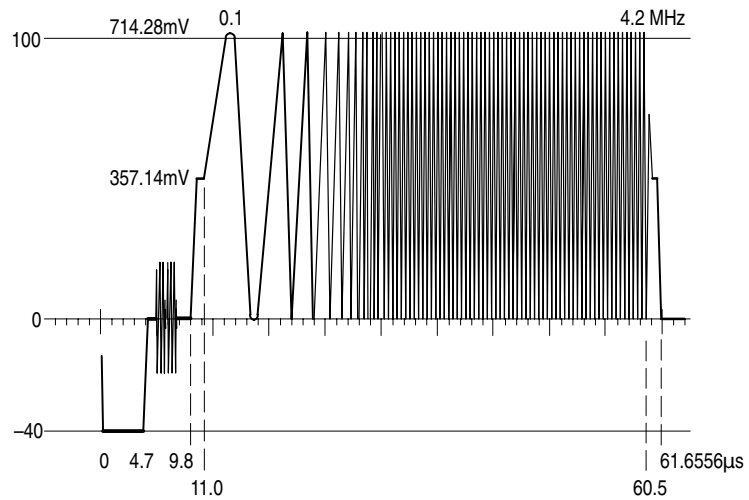**Figure A–5: Cable Multiburst**

Figure A–6: Cable Sweep

Factory Configuration   Table A–6 lists the factory configuration (through DIP switches S1–S4) of the Option 2 VITS inserter.

Table A–6: Option 2 Factory Programmed VITS Insertions

Line	Field	Signal
17	1	Cable Multiburst signal
17	2	Cable Sweep signal
18	1	FCC Composite signal
18	2	Sin X/X
19	1 and 2	Pass*
20	1 and 2	Pass*

*   **Passed lines are not deleted or inserted by the VITS 100 NTSC VITS Inserter**

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