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Instruction Manual

Tektronix

VITS 200
NTSC VITS Inserter

070-8332-04

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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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.

Connect and Disconnect Properly. Do not connect or disconnect probes or test leads while they are connected to a voltage source.

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.

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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.*

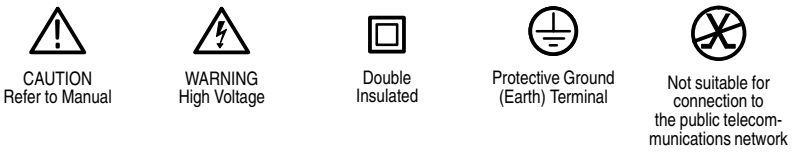
Terms on the Product. These terms may appear on the product:

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:



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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

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Getting Started

Product Description

The TEKTRONIX VITS 200 NTSC VITS INSERTER is a high quality signal generator designed for VITS and data insertion into the program signal. It provides three different modes of standby operation in the event of program line failure. The VITS 200 provides a complement of digitally generated test signals, all of which may be inserted as VITS. There is a one-line source identification code (recognizable by the VM700A) which may also be inserted in the vertical interval. There are also four external inputs which will accept other signals or data to insert in the vertical interval.

The VITS 200 also provides internally-generated text. Up to 15 one-line messages may be programmed into memory, for insertion into the vertical interval, and three pages of standby messages can be programmed into memory for use in standby operation. Control of both the vertical interval text and standby text is provided through the remote control, as well as the front panel. All of the operating mode, VITS assignment, and text selections are stored in nonvolatile memory in case of power line failure.

Test Signal Generator

The VITS 200 uses 12-bit data at an 8 F_{SC} data rate to ensure accurate test signal generation. These test signals may be used as VIT signals, and may be programmed to be output as the full field signal if the Program Input should fail. The test signals are also available at the TEST SIGNAL output on the rear panel. The signal available at this output may be selected independently of the VIT or Program Failure signals, except when the VITS 200 is in Standby mode operation. It then reverts to the selected standby signal. The test signals generated by the VITS 200 include:

- 10 MHz Sweep
- NTC7 Combination
- NTC7 Composite
- FCC Multiburst
- 50% Gray
- $^{SIN\ X}/_{X}$
- FCC Color Bars
- FCC Composite
- Multipulse

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- Vertical Interval Reference Signal (VIRS)
- Red Field
- 0 IRE Flat Field (0% Black)
- 7.5% Black

For instruments with S/N B020249 and above:

- FCC Composite 20 IRE (Std, Opt 1C only)
- CBC Composite 15°–360° (Opt 1C only)
- BTA Ghost Cancellation Reference (Opt 1J)
- Phillips Ghost Cancellation Reference (Std and Opt 1C)
  When called as a full field test signal, only the GCR Positive will be used.
- Korean Ghost Cancellation Reference (Opt 1K)

Insert/Delete Functions

The VITS 200 may be programmed to insert any internally-generated signal, external input, or the source identification. These may be inserted on lines 10 through 23 or on lines 17 through 30. VITS can be programmed on even and odd fields or in a four-field sequence. The VITS 200 may be genlocked to either the Program signal or the EXTERNAL 1 input. If you like, you can program the same signal or external input to be inserted on more than one line. This may be useful in insertion of external data signals, such as Teletext.

Four external inputs are provided for inserting externally-generated test and data signals. These inputs may be either AC-coupled and clamped, or DC-coupled. See the Operating Basics section for details of how to change the external input coupling. The VITS 200 confirms that the inputs are synchronous with the program signal before allowing it to be inserted in the vertical interval.

Automatic VIRS Detection

When the AUTO VIRS function is selected, the VITS 200 will check the specified line(s) and field(s) for a VIRS signal on the incoming Program Video. If VIRS is detected as being present in the proper location, the signal is passed with no processing. However, if VIRS is not detected on the specified line(s) and field(s), then the internally-generated VIRS signal will be inserted on them.

Automatic Closed Captioning Detection

The AUTO CAPT function sets the VITS 200 to examine specified line(s) and field(s) for close-captioned text. This consists of checking the specified line(s) and field(s) of the incoming program video for any activity greater than 285 mV. If there is activity above this level, it is passed with no processing. If there is no activity at this level, then the selected External Input is inserted onto the line. For example, Auto Capt 1 would insert the signal applied to the EXT 1 input onto the specified line(s) and field(s) as close-captioned text.

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Program Channel

Maintaining program channel continuity is one of the main considerations in the VITS 200. Depending on its programming, the VITS 200 provides agile response to different types of signal or equipment failure. Bypass mode switches the PROGRAM INput to the PROGRAM OUTPUT, with a delay built into the path so it matches the Program Channel path. Standby mode allows a page of text, an internal signal, or an external signal to be applied to the PROGRAM OUTPUT.

If the power to the VITS 200 fails, the VITS 200 switches to Bypass mode immediately. The VITS 200 may be programmed to attempt to genlock to the EXTERNAL 1 input if no video is present at the PROGRAM INput. If video is present but the VITS 200 cannot genlock to it (non-timebase corrected video, for example), then the program is passed with no VITS inserted. If there is no video present, the VITS 200 may be programmed to provide any of the following responses after a user-adjustable delay:

- Switch to Relay Bypass (Standby disabled).
- Pass the Program channel (no relay bypass).
- Switch to one of the four external inputs.
- Switch to an internally-generated test signal, with or without a full page standby message.

The VITS 200 passes program video through as soon as it is present, and begins insertion of VITS as soon as it is genlocked.

The VITS 200 can also insert reconstructed sync and burst into the program signal, in order to ensure the proper amplitude relationships between the inserted VITS and sync & burst. This does not affect active video to blanking interval timing. If the program signal is monochrome, the VITS 200 will insert regenerated sync only.

Text Generator

The VITS 200 includes a text generator which produces a complete set of alphabetical and numerical characters, along with a selection of special symbols. Each character is a 32x32 pixel array.

As many as 15 one-line text messages can be programmed into memory. Any one of these messages may be inserted on lines 10 through 16, or the VITS 200 can be programmed to scroll through any consecutive series of these 15 messages. Test signals or External inputs can also be programmed on lines 10 through 16, and these always take priority over characters.

Up to three full pages of text may be programmed into memory. A page is defined as a maximum of 13 20-character lines. Any one of the three pages may be selected if a test signal is chosen as the Standby mode.

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Source Identification

The VITS 200 provides a one-line 16-bit source identification code, providing 16,384 possible codes plus start and stop bits. DIP switches, accessible through the rear panel, provide quick and easy control of each bit's state. This ID signal may be placed on any of the available lines in vertical blanking. The VM700A Video Measurement Set utilizes this signal in it's displays and print-outs, to identify the source of the signal being measured.

Remote Control

Remote control of many of the VITS 200 functions is available through the rear-panel REMOTE CONTROL connector, a 25-pin ground closure system, and through the RS-232 connector. Both provide manual switching between Bypass and Operate modes, page selection and on/off control of the full-page standby text, message selection and on/off control of the vertical interval text, and full field test signal selection.

The REMOTE CONTROL connector also drives four indicator lights on the remote control: Bypass, Genlock, Power and Remote Enable. The ground closure remote control, however, is not capable of programming the text messages for the standby pages or the vertical interval text.

Controlling the VITS 200 through the RS-232 port provides full front-panel control capability, and makes programming and controlling text messages extremely easy.

Video Clapboard

Beginning with S/N B020249, the VITS 200 includes a Video Clapboard function for synchronizing the audio and video path delays in the studio. This requires the use of an ASG 100 that has been modified for video clapboard operation. See Section 3 for details.

Installation

Packaging

At installation time, save the shipping carton and packaging materials for repackaging in case reshipment becomes necessary.

Instrument Configuration

The following tables give information about circuit board jumpers for the entire instrument. The ▼ symbol on a circuit board identifies pin 1. Green jumpers are used to select operating modes; red jumpers are used for testing the instrument.



WARNING. *These jumpers are located inside the instrument. Make sure to switch off the instrument power and unplug the power cord before removing the instruments top cover. The red jumpers should only be accessed by qualified service personnel.*

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Table 1–1: Inserter Board (A1) Operating Mode Selection Jumpers (Green)

Function	Jumper #	Description	Factory Setting
Sound-in-sync mode	J9 < 5 >	Pins 1–2: No sound-in-sync on PROGRAM IN. Pins 2–3: Sound-in-sync on PROGRAM IN (blocks sound-in-sync pulses from the Genlock circuit).	Pins 1–2
Line Select Mode	J22 < 3 >	Pins 1–2: Front panel selection of lines 10 through 21 or lines 17 through 30. Pins 2–3: Lines 10 through 21 available for VITS. No Plug: Lines 17 through 30 available for VITS.	Pins 1–2
Bypass Lockout	J28 < 3 >	Pins 1–2: Front panel BYPASS button enabled. Pins 2–3: Front panel BYPASS button disabled.	Pins 1–2

Table 1–2: Controller Board (A3) Operating Mode Selection Jumpers (Green)

Function	Jumper #	Description	Factory Setting
Front Panel Lockout	J8 < 3 >	Pins 1–2: Front panel enabled. Pins 2–3: Front Panel disabled.	Pins 1–2
External 1 Clamp Mode	J19 < 1 >	Pins 1–2: Clamp timing derived from External 1 Input. Pins 2–3: Clamp timing derived from VITS 200 Genlock (locked to Program Video or free-running).	Pins 1–2
External 2 Clamp Mode	J20 < 1 >	Pins 1–2: Clamp timing derived from External 2 Input. Pins 2–3: Clamp timing derived from VITS 200 Genlock (locked to Program Video or free-running).	Pins 1–2
External 3 Clamp Mode	J21 < 2 >	Pins 1–2: Clamp timing derived from External 3 Input. Pins 2–3: Clamp timing derived from VITS 200 Genlock (locked to Program Video or free-running).	Pins 1–2
External 4 Clamp Mode	J22 < 2 >	Pins 1–2: Clamp timing derived from External 4 Input. Pins 2–3: Clamp timing derived from VITS 200 Genlock (locked to Program Video or free-running).	Pins 1–2
Never Used	J49 < 5 >	Never used. Removed at B020249.	Pins 1–2

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Table 1–3: Inserter Board (A1) Test Jumpers (Red)

Function	Jumper #	Description	Factory Setting
Genlock Processor Reset	J5 < 4 >	Pins 1–2: Reset controlled by hardware watchdog. Pins 2–3: Holds processor in reset mode. No Plug: No hardware resets.	Pins 1–2
Hardware Watchdog Reset	J6 < 4 >	Pins 1–2: No Reset. Pins 2–3: Hold in Reset mode.	Pins 1–2
VCO Control	J12 < 6 >	Pins 1–2: VCO Control loop closed. Pins 2–3: VCO Control voltage set to ground, to set VCO center frequency.	Pins 1–2
Oven Control	J13 < 6 >	Pins 1–2: Oscillator oven on. Pins 2–3: Oscillator oven off.	Pins 1–2
Housekeeping Supply	J17 < 8 >	Pins 1–2: Housekeeping supply enabled. No Plug: Housekeeping supply disabled.	Pins 1–2
Transformer Enable	J18 < 8 >	Pins 1–2: Connects power to transformer. No Plug: Disables Power Supply.	Pins 1–2
Overcurrent Shutdown	J19 < 8 >	Pins 1–2: Shutdown enabled No Plug: Shutdown disabled	Pins 1–2
Power Supply Disconnect (Jumper Off = Disconnect)	J20 < 9 >	Pins / Supply 1–2 / +12V 3–4 / –12V 5–6, 7–8 / +5V 9–10, 11–12 / –5V 13–14, 15–16 / GND (No Jumpers)	 ON ON ON ON OFF
Clock Disable [1]	J32	Pins 1–2: DAC Clock Enabled Pins 2–3 DAC Clock Disabled	Pins 1–2
Character Set Up Control [1]	J33	Pins 1–2: 7.5% Character Set-Up (Std, Opt 1C) Pins 2–3: 0% Character Set-Up (Opt 1J)	Pins 1–2
Memory Bank Select [1]	J54	Pins 1–2: Std and Opt 1C signals Pins 2–3: Opt 1J signals	Pins 1–2
V Drive [1]	J55	Pins 1–2: Normal operation Pins 2–3: Not used (VITS 100 ONLY)	Pins 1–2
V Sync [1]	J56	Pins 1–2: Normal operation Pins 2–3: Not used (VITS 100 ONLY)	Pins 1–2
Blanking [1]	J57	Pins 1–2: Normal operation Pins 2–3: Not used (VITS 100 ONLY)	Pins 1–2

[1] B020249 and above.

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Table 1–4: Controller Board (A3) Test Jumpers (Red)

Function	Jumper #	Description	Factory Setting
Controller Reset	J6 < 3 >	Pins 1–2: Reset controlled by hardware watchdog. Pins 2–3: Controller held in reset mode. No Plug: No hardware resets.	Pins 1–2
Controller PROM Size (Removed B020249)	J7 < 3 >	Pins 1–2: 27C010 or 27C512. Pins 2–3: 27C512 or 27C256.	Pins 2–3
Display Test*	J14 < 5 >	Pins 1–2: Normal Operation. Pins 2–3: Display Test.	
Black Burst Setup (B020249 & up)	J57	Pins 1–2: 7.5% Setup Pins 2–3: 0% Setup (Opt 1J only)	Pins 1–2

*Power must be cycled off and on after moving jumper.

Electrical Installation

The power supply in this instrument operates over a line frequency range of 48 to 62 Hz and a voltage range of 90 to 250 Vac. See Table 3–6, page 3–16, for more information about the power supply characteristics. No changes to the instrument are necessary to operate on either voltage range.

Mechanical Installation

The VITS 200 is shipped with hardware for rackmounting. The instrument fits in a standard 19-inch rack. Spacing between the front rails of the rack must be at least 17–3/4 inches to allow clearance for the slide-out tracks.

Rack slides conveniently mount in any rack that has a front-to-rear rail spacing between 15–1/2 and 28 inches. Six inches of clearance between the instrument's rear panel and any rear cabinet panel is required for connector space and to provide adequate air circulation.

Rack Mounting

Locate the proper rack holes as shown in Fig. 1–1. Notice that the hole spacing varies with the type of rack. When installing the slides in EIA-type racks, make certain that the slides are attached to the 1/2 inch-spaced holes.

Mount the rails using enclosed hardware as shown in Fig. 1–2. Figures 1–3 through 1–5 show the rail mounting details for both deep and shallow racks. Make sure the stationary sections are horizontally aligned and are level and parallel.

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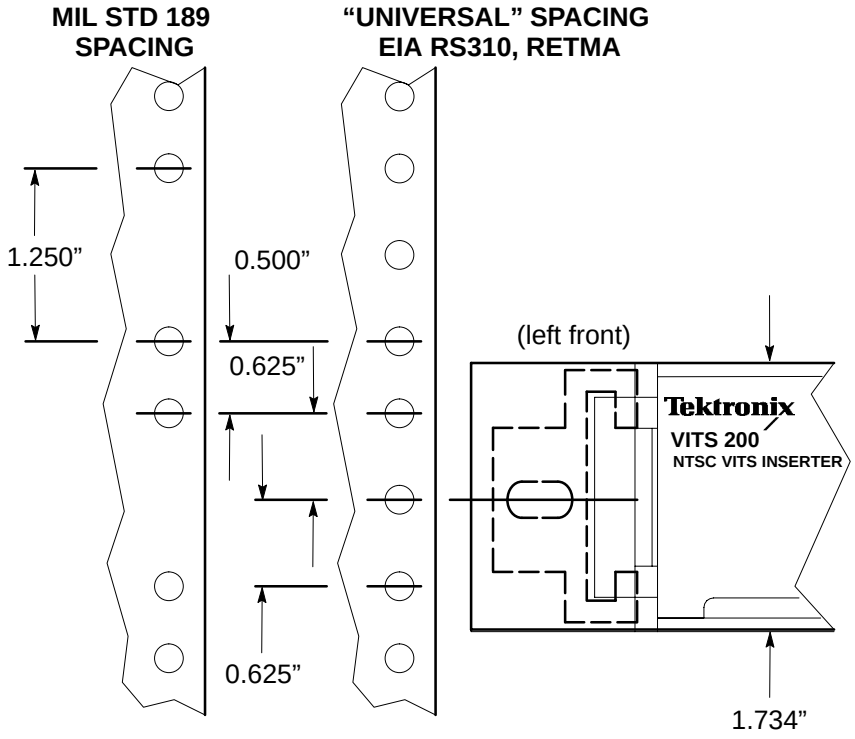
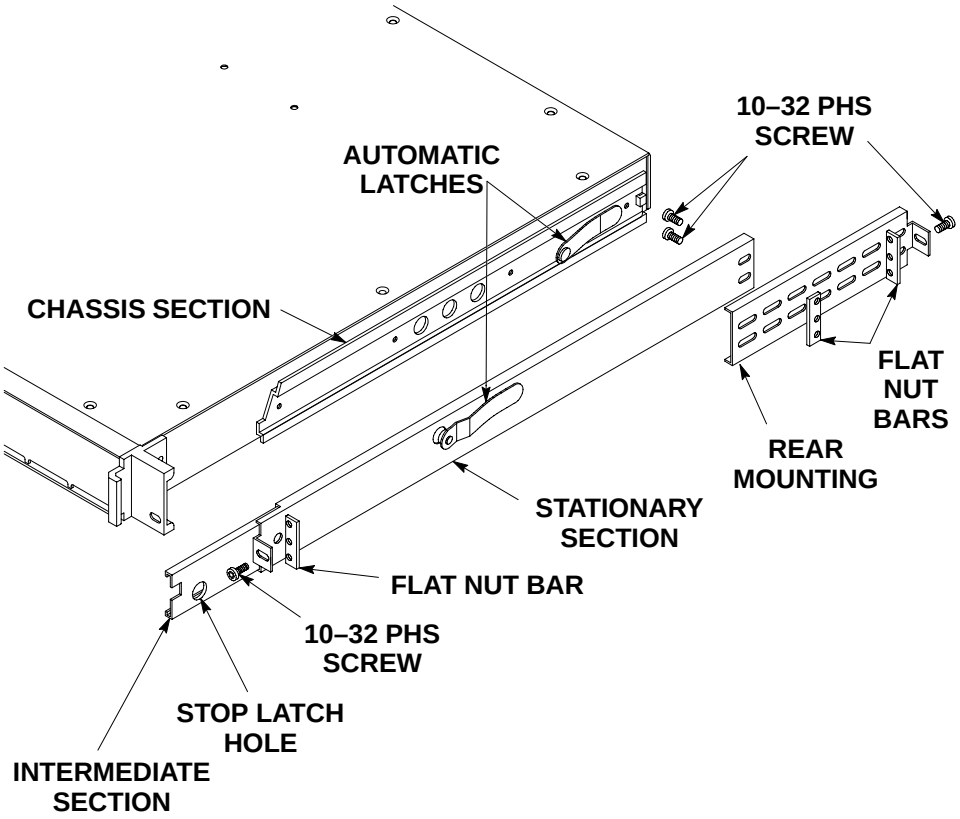


Figure 1–1: Rail Detail for Mounting Slide Tracks

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NOTE: Right-hand and left-hand stationary section is designated by the RH and the LH marked on the rails. Stop latch holes should be towards the bottom when slides are in place. (The right-hand rail is shown above.)

Figure 1–2: Assembly of Rack Mounting Hardware

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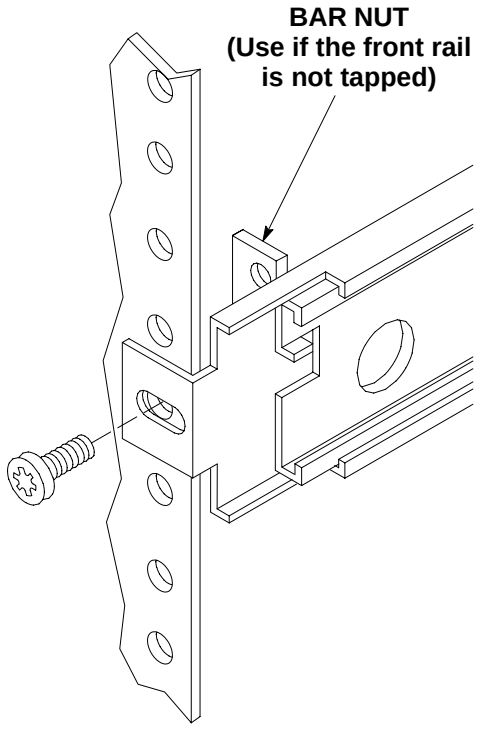


Figure 1–3: Mounting Stationary Track Sections (Front Rail Mount)

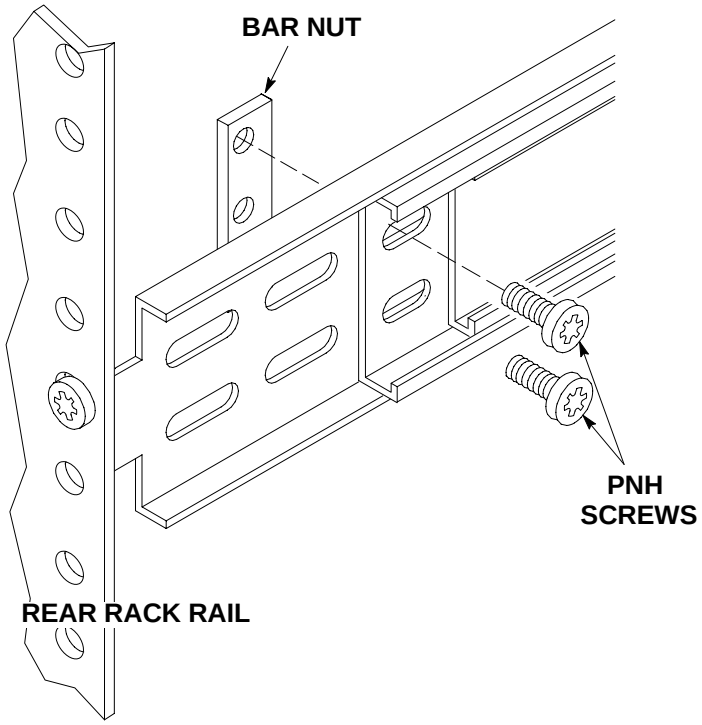


Figure 1–4: Mounting Stationary Track Sections (Deep Rack Mount)

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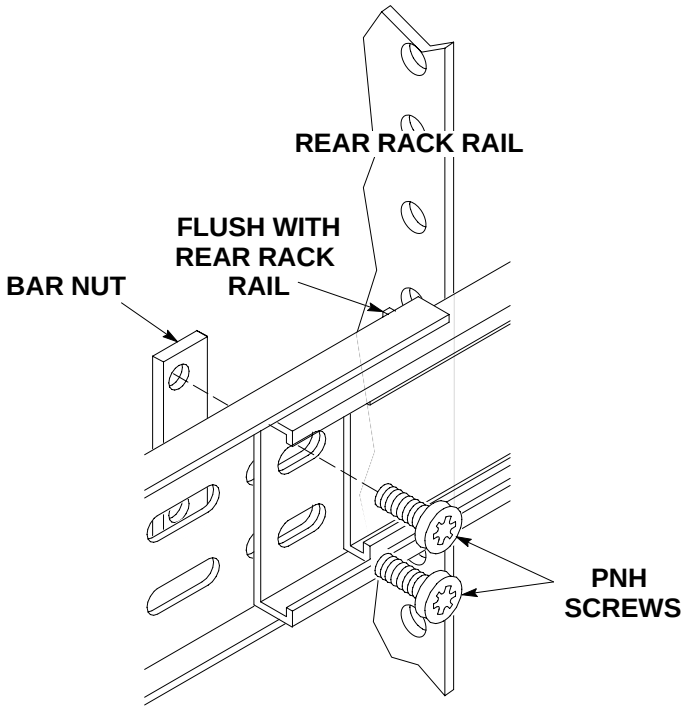


Figure 1–5: Mounting Stationary Track Sections (Shallow Rack Mount).

Installing the Instrument

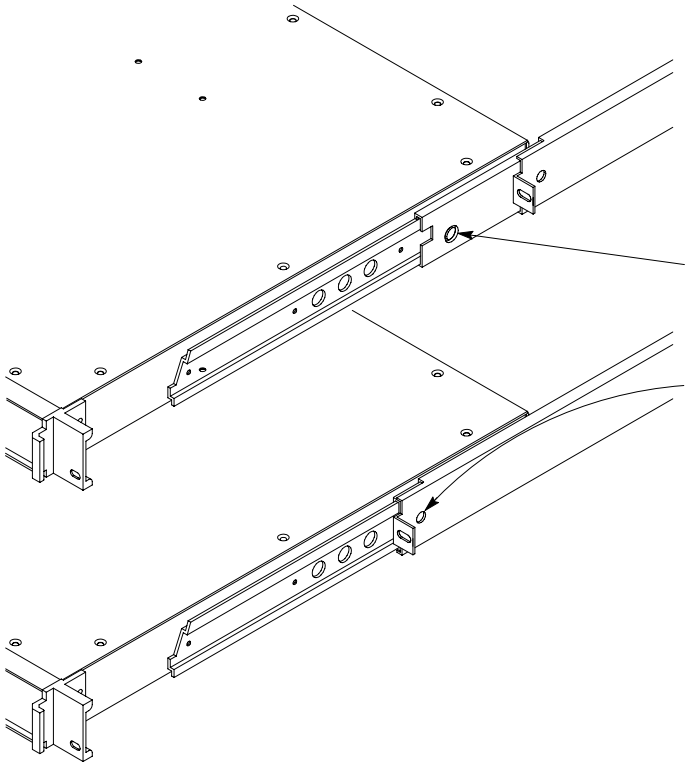
Install the instrument in the rack, as shown in Fig. 1–6.

Rack Adjustments

After installation, the slide tracks may bind if they are not properly adjusted. To adjust the tracks, slide the instrument out about 10 inches, slightly loosen the screws holding the tracks to the front rails, and allow the tracks to seek an unbound position. Retighten the screws and check the tracks for smooth operation by sliding the instrument in and out of the rack several times.

Once the instrument is in place within the rack, tighten the knurled retaining screw to fasten it securely into the rack.

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TO INSTALL:

1. **Pull the slide-out track section to the fully extended position.**
2. **Insert the instrument chassis sections into the slide-out sections.**
3. **Press the stop latches and push the instrument toward the rack until the latches snap into their holes.**
4. **Again press the stop latches and push the instrument fully into the rack.**
5. **Tighten the front-panel retaining screws.**

TO REMOVE:

1. **Loosen retaining screw and pull instrument outward until the stop latches snap into the holes.**
2. **Press stop latches and remove instrument.**

Figure 1–6: Racking and Unracking the VITS 200

Rack Slide Maintenance

The slide-out tracks do not require lubrication. The dark gray finish on the tracks is a permanent, lubricated coating.

To completely remove the instrument, press both release-latch buttons (visible in the stop-latch holes) and carefully slide the instrument free from the tracks. Be sure that all cabling is disconnected before removing the instrument.

Options

This section explains the instrument options that were available at the time of this printing.

Option 1J

Option 1J offers the entire complement of test signals with the following changes:

- FCC Color Bars and MultiPulse have a 0% setup level instead of 7.5% setup.
- The Sweep Signal has a 4.2 MHz stop frequency, instead of 10 MHz.

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- Option 1J does not have the Phillips Ghost Cancelling Reference signals.
- Red Field amplitude changes (see Specifications for details).

Option 1J is fully documented in this manual.

Option 1C

Option 1C contains several signals requested by the Canadian Broadcasting Company. These 21 test signals are referred to as CBC Composite 15 through CBC Composite 360, and are used to identify specific signal sources. These signals are NTC7 Composite signals, with different phases in the modulated pulse.

Initializing the Signal Sets (B020249 and above)

To initialize the test signal set, follow these steps:

1. Hold the TEST SIGNAL button in while turning the VITS 200 on.
2. Continue to hold the TEST SIGNAL button in until the front panel display says `Select Signal Set`. The second line of the display will show the currently-selected signal set.
3. Use the `INCREMENT` and `DECREMENT` buttons to select the desired signal set.
4. Press the `SAVE/RECALL` button.

If this initialization concerns the Option 1J, as either the incoming or outgoing signal set, you must reposition jumpers A1J54 (on the Inserter board) and A3J57 (on the Controller board). See the Instrument Configuration section (page 1–4) for the required jumper positions for each of the options.

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Operating Basics

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Operating Basics

There are three different methods of operating the VITS 200: from the front panel, through a ground-closure remote control, and through the RS-232 port.

Of these, the ground closure remote control is the most limited. It provides control of only a part of the instruments capabilities, and limited feedback about which selections are being made.

The front panel provides full control of all functions, and the display provides complete information concerning the selections being made.

The RS-232 port also provides full control of all functions, with selection information appearing on the terminal. This control mode has the benefit of direct text entry from the keyboard for the vertical interval and standby mode text messages.

The remainder of this section will discuss each of these control methods in greater detail, as well as the connectors and switches on the rear panel.

Front Panel

The VITS 200 front panel (see Fig. 2–1) is divided into four main areas: the Control area, which includes the manual BYPASS button, the FRONT PANEL DISABLE button, and the three indicator lights; the Menu area, six buttons which call the menus used to make the various operating selections; the Selection area, eight buttons used to move through and make selections in the menus; and the display, which provides two 20-character lines of text about the menu selections and instrument operation.

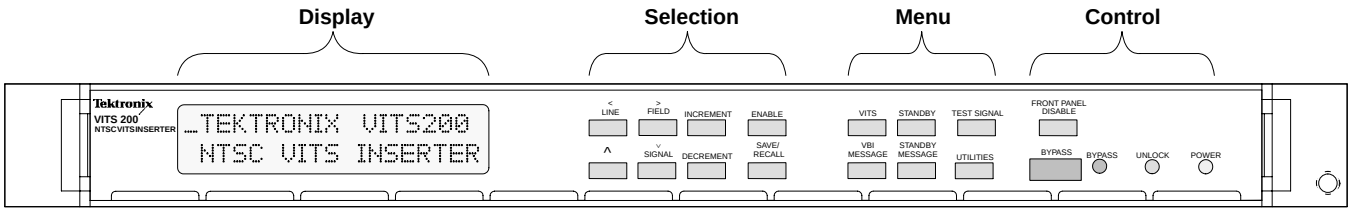
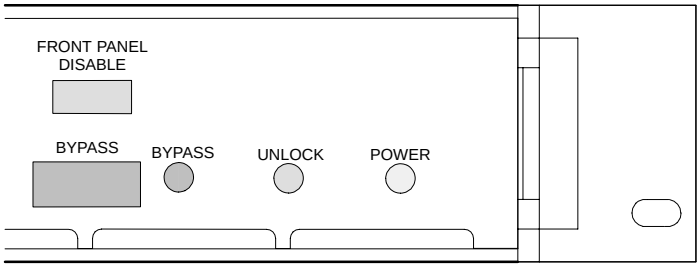


Figure 2–1: VITS 200 Front Panel

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Control

The control area of the front panel contains the FRONT PANEL DISABLE button, the manual BYPASS button, and the three indicator LEDs: BYPASS, UNLOCKED, and POWER.



FRONT PANEL DISABLE

This button locks out all the rest of the front-panel buttons, except the manual BYPASS and TEST SIGNAL buttons. When you press FRONT PANEL DISABLE, the display reads:

```
FRONT PANEL DISABLED
HOLD [FPD] TO ENABLE
```

To re-enable the front-panel buttons, press and hold the FRONT PANEL DISABLE [FPD] button until the display reads:

```
VITS200 FRONT PANEL
IS NOW ENABLED
```

(this takes approximately 2 seconds).

BYPASS

This is the manual bypass control. Pressing this button puts the VITS 200 into Relay Bypass mode; the PROGRAM INPUT is applied directly to the PROGRAM OUTPUT, through a delay line which matches the program channel through the instrument in normal operation. The BYPASS LED lights to indicate that the VITS 200 is in Bypass mode. Pressing this button a second time puts the instrument back into Operate mode.

Bypass Indicator

The BYPASS LED lights to indicate that the instrument is in Bypass mode.

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When illuminated, the VITS 200 is applying the PROGRAM INPUT directly to the PROGRAM OUTPUT with no processing.

UNLOCKED Indicator

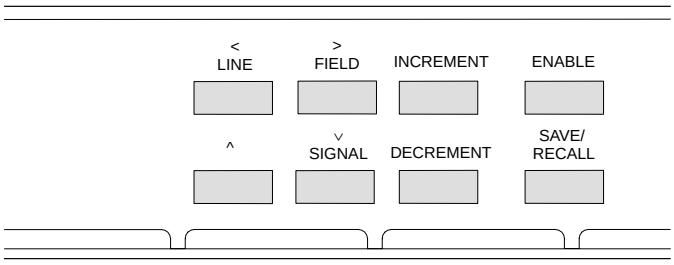
The UNLOCKED LED lights to indicate that the VITS 200 can not acquire or maintain genlock. The VITS 200 genlocks to the program input, and can also be set to use a signal applied to the EXT 1 input as an alternate genlock source if the program signal fails. This is accomplished through the Alternate Genlock Source function in the UTILITIES menu.

POWER Indicator

The POWER LED lights to indicate that the VITS 200 is turned on and has power applied. When the instrument is switched on, the LED does not light until after the power supply has completed its startup process (approximately one second).

Selection

The selection area of the front panel contains eight push buttons which are used to move through the selections within a menu, and save the selections to nonvolatile memory. The button function may change according to the menu that you are in. See the specific menu descriptions for information on which buttons are active, and the function they perform in that menu.



Cursor Control (<, >, ∨, ∧)

The four cursor control buttons (<, >, ∨, and ∧) move the cursor around within the menu. The arrow indicates the direction that the cursor will move. In the VITS menu, the LINE, FIELD, and SIGNAL nomenclature is active. These buttons move you to the Line, Field, or Signal selection area of the display, where you then use the INCREMENT and DECREMENT buttons.

INCREMENT and DECREMENT

The INCREMENT and DECREMENT buttons are used to scroll through the available selections, such as the character list, when selecting text messages or the test signal names when selecting a full-field test signal.

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ENABLE

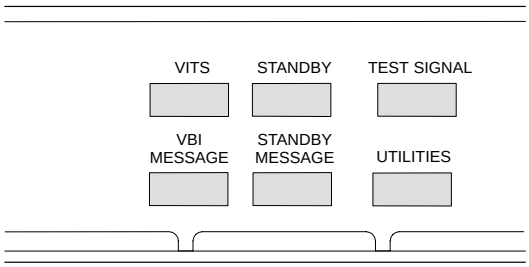
The ENABLE button is used to enable and disable the VBI Message, Standby Message, and Standby modes. Pushing this button while in these menus will toggle the state of the mode.

SAVE/RECALL

This button saves the user selections to nonvolatile memory. When pressed, the display will show the word SAVED while writing to memory. It is always necessary to save VITS selections for them to be inserted. Vertical messages and standby messages are saved automatically; they do not require use of the SAVE/RECALL button. This button is also used when recalling previously saved presets.

Menu

The menu buttons are the center group of six push buttons. These are used to call the menus used in making the VITS assignments, VBI message selections, Standby mode signal selections, standby message, full-field test signal selections, and to access the utilities routines. Fig. 2–2 gives a summary of front-panel operation.



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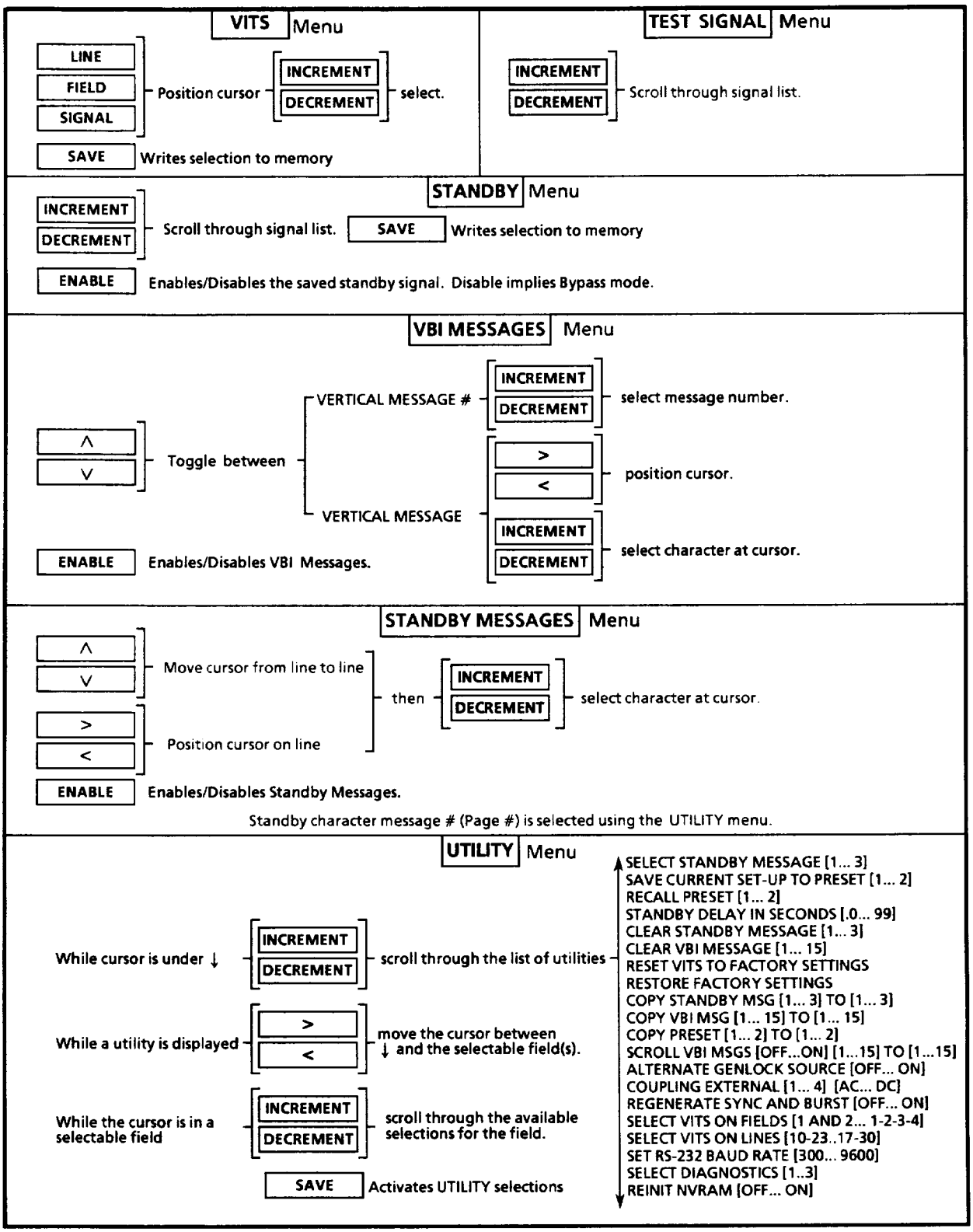
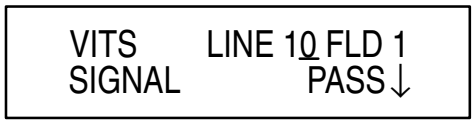


Figure 2–2: VITS 200 Menu Structure

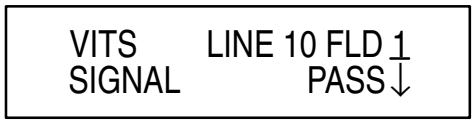
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VITS Menu

The VITS menu allows you to select the VITS line, field, and signal assignments. When this button is pressed, the display changes to read:

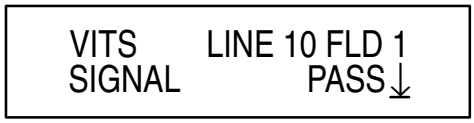


Note that the cursor is initially in the Line section of the menu. While in the VITS menu, the LINE, FIELD, and SIGNAL buttons move the cursor to the named area, and the INCREMENT and DECREMENT buttons scroll through the available selections. While the cursor is in the Line area, the INCREMENT and DECREMENT buttons will scroll through line numbers 10 to 23 (or 17 to 30. See UTILITIES menu). Pressing the FIELD button will move the cursor to the Field section of the display:



and the INCREMENT and DECREMENT buttons will scroll through the four fields or toggle between fields one and two, depending on the selection made in the Select VITS On Fields function of the UTILITIES menu.

Pressing the SIGNAL button will move the cursor to the bottom line of the display, in the Signal area:



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and the INCREMENT and DECREMENT buttons will scroll through the available signals which may be inserted as VITS:

- Pass (Program Video)
- Color Bars
- FCC Composite
- MultiPulse
- VIRS
- GCR (BTA, Opt 1J [1])
- GCR (Phillips [1,2])
- GCR (Korean [4])
- Red Field
- 0% Black
- 7.5% Black
- 10 MHz Sweep
- NTC7 Combination
- NTC7 Composite
- MultiBurst
- 50% Gray
- Auto Capt 1
- Auto Capt 2
- Auto Capt 3
- Auto Capt 4
- VIRS Auto
- $^{Sin\ X}/_{X}$
- Source ID
- 20 IRE Composite [1,2]
- Cable Sweep [2,3]
- Cable Multiburst [2,3]
- External 1
- External 2
- External 3
- External 4
- CBC Cmp1 15 – 360 (Opt 1C) [1]

[1] S/N B020249 and above [2] Std and Opt 1C only [3] S/N B020510 and above [4] Opt 1K only

When the Line, Field, and Signal are set as desired, pressing the SAVE/RECALL button stores the selections in nonvolatile memory and enables insertion, and you repeat the process for the next line or field.

STANDBY Menu

The STANDBY menu is used to enable or disable the standby function, and to select which output signal to use if the program signal should fail.

NOTE. *If STANDBY mode is disabled, the instrument switches to Bypass mode on program signal failure.*

The delay between program signal failure and the switch to Standby mode may be set by the user to be between 0 and 99 seconds. See the Standby Delay in Seconds topic in the UTILITY menu discussion for details.

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When the STANDBY button is pressed, the display changes to read:

```
STANDBY MODE DISABLE
SIGNAL       0% Black ↓
```

The word DISABLE indicates that Standby mode is disabled. Pressing the front–panel ENABLE button toggles this choice between DISABLE and ENABLE. The current signal selection is shown as Black 0% Setup, the factory default. This selection is changed with the INCREMENT and DECREMENT buttons, which scroll through the list of test signals available for use in Standby mode:

- 0% Black
- 7.5% Black
- 10 MHz Sweep
- NTC7 Combination
- NTC7 Composite
- MultiBurst
- 50% Gray
- $\frac{\text{Sin X}}{X}$
- 20 IRE Composite [1,2]
- Cable Sweep [2,3]
- Cable Multiburst [2,3]
- External 1
- External 2
- External 3
- External 4
- CBC Cmp1 15 – 360 (Opt 1C) [1]
- PASS (Program Video)
- Color Bars
- FCC Composite
- MultiPulse
- VIRS
- Red Field

[1] S/N B020249 and above [2] Std and Opt 1C and above [3] S/N B020510 and above

When the desired signal is showing on the display, press the SAVE/RECALL button to store the selection in the nonvolatile memory.

TEST SIGNAL Menu

The TEST SIGNAL menu selects the test signal for the rear-panel TEST SIGNAL output. Making test signal selections does not affect any other aspect of the VITS 200's operation.

All VITS selections, vertical characters, and any enabled standby text will be applied to the selected test signal output while program video is present.

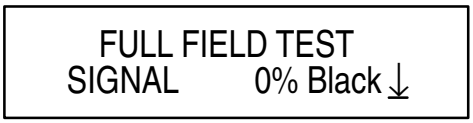
The behavior of this output when program video fails depends on how the VITS 200 is programmed to respond for Standby operation:

- If the VITS 200 Standby mode is disabled, the TEST SIGNAL output will continue to provide the selected test signal, and the TEST SIGNAL menu will continue to operate.

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- If the VITS 200 is programmed to provide a test signal for Standby mode operation, the TEST SIGNAL OUTPUT will switch to that standby signal, identical to PROGRAM OUT.
- If the VITS 200 is programmed to switch to one of the EXTERNAL inputs for the standby signal, the TEST SIGNAL output will switch to 0% Black.

When the TEST SIGNAL button is pressed, the display changes to read:



and the INCREMENT and DECREMENT buttons will scroll through the available test signals:

- 10 MHz Sweep
- NTC7 Combination
- NTC7 Composite
- MultiBurst
- 50% Gray
- $^{SinX}/_{X}$
- 20 IRE Composite [1,2]
- Cable Sweep [2,3]
- Cable Multiburst [2,3]
- CBC Cmp1 15 – 360 (Opt 1C) [1]
- Color Bars
- FCC Composite
- MultiPulse
- VIRS
- GCR
- Red Field
- 0% Black
- 7.5% Black

[1] S/N B020249 and above [2] Std and Opt 1C only [3] S/N B020510 and above

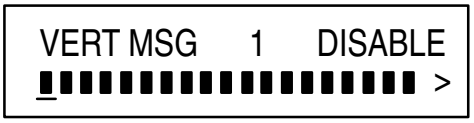
The test signals change at the output as soon as the new signal name appears in the display, and the selection is written to nonvolatile memory automatically. None of the selection buttons except INCREMENT and DECREMENT have any effect in this menu.

VBI MESSAGE Menu

The Vertical Blanking Interval (VBI) MESSAGE menu is used to set and select up to 15 23-character messages which may be inserted in the vertical interval. When enabled, the selected message appears in the vertical interval on lines 10 through 16. If any of these lines are programmed for VITS signals, the VITS signal has precedence over the VBI text.

When this button is pressed the display changes to read:

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VERT MSG 1 DISABLE means that the display is showing the VBI (Vertical Blanking Interval) MESSAGE one, and that the VBI Messages are disabled. The front-panel ENABLE button toggles this between DISABLED and ENABLED states. The cursor may be on either line when using the ENABLE button.

The second line shows the text of the vertical interval message. While there are only 20 character spaces on the display, the message line can contain up to 23 characters. The > at the right of the message line indicates that the additional character spaces are to the right.

While on the second line of the display the < and > arrow buttons (LINE and FIELD) move the cursor left and right. When the cursor is moved to the right most position, the display shifts four characters to the left. This brings the last four characters of the message line into view, and a < appears in the leftmost character space to show that the unseen character spaces are to the left.

To select the characters for the message, move the cursor to each space in turn, and use the INCREMENT and DECREMENT buttons to select the character for that position. If the button is held down, the character list scroll rate will speed up after two or three characters. If that VBI message number is enabled, the output will change as the characters change on the display. See Table 2–1 for a list of the available characters.

Table 2–1: Character List for the VITS 200

Display Char	Decimal (to RAM)	Display Char	Decimal (to RAM)	Display Char	Decimal (to RAM)	Display Char	Decimal (to RAM)	Display Char	Decimal (to RAM)
0	0	C	12	O	24	Sp	36	?	49
1	1	D	13	P	25	!	37	(	51
2	2	E	14	Q	26	#	39	)	52
3	3	F	15	R	27	*	40	|	75
4	4	G	16	S	28	+	41	^	78
5	5	H	17	T	29	,	42	┼→	81*
6	6	I	18	U	30	–	43		
7	7	J	19	V	31	.	44		
8	8	K	20	W	32	/	45		
9	9	L	21	X	33	:	46		

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Table 2–1: Character List for the VITS 200 (Cont.)

Display Char	Decimal (to RAM)	Display Char	Decimal (to RAM)	Display Char	Decimal (to RAM)	Display Char	Decimal (to RAM)	Display Char	Decimal (to RAM)
A	10	M	22	Y	34	;	47		
B	11	N	23	Z	35	\	48		

* Character number 81 is the cursor, and may not be selected for use as a programmed character.

The ∨ and ∧ buttons will both toggle the cursor between the message text line and the message number line. When toggled to the upper line the cursor underlines the message number, and the INCREMENT and DECREMENT buttons scroll through the 15 message numbers.

If the VBI messages are enabled, the last message selected will be output in the vertical interval. You may also set the
VITS 200 to scroll through a number of the VBI messages, using the Scroll VBI MSGS function under the UTILITY menu. If the Vertical Interval messages are disabled there will be no character in the vertical interval.

The message lines are written directly to memory. This means that a message will be saved, even through a power interruption in the middle of programming a line.

STANDBY MESSAGE Menu

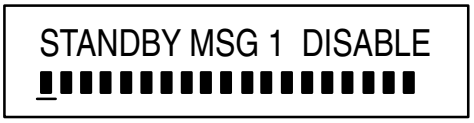
The STANDBY MESSAGE menu is used to select and program a full page (13 lines of 20 characters) of text. Three such pages of text may be programmed into memory for each preset. Any one of these pages may be selected for insertion into the standby test signal during Standby operation. The other pages may be selected whenever desired, even during Standby operation. If the standby message is enabled, it will always be present on the TEST SIGNAL output, over the selected test signal.

This menu addresses programming the selected page and enabling the message.

***NOTE**. Page selection is accomplished through the UTILITIES menu.*

Programming the full page standby messages is the same as programming the vertical interval characters, except that there are more lines of text to deal with. When this button is pressed the display changes to read:

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STANDBY MSG1 DISABLE means that standby channel has page 1 selected, and it is disabled. The front-panel ENABLE button toggles this between ENABLED and DISABLED.

The second line of the display shows one of the 13 text lines at a time. Use all four of the arrow keys to move the cursor across a line and from line to line. When the cursor is in the extreme right (or left) position trying to move one more character position in that direction moves to the line below (or above).

Just as with the vertical interval characters, the INCREMENT and DECREMENT buttons are used to select the character at the current cursor position.

UTILITIES Menu

This button operates a little differently than the other menu buttons. While the other menu buttons deal with one specific function, this button calls a list of functions. The INCREMENT and DECREMENT buttons are used to scroll through the functions.

NOTE. *No utility function selection will be activated until the SAVE/RECALL button is pressed.*

When the UTILITIES button is first pressed, the display changes to read:



UTIL appears in the upper-left corner to show that you are in the UTILITIES menu. It changes to SAVED when the SAVE/RECALL button is pressed, to show that the selection is being written to memory.

The functions available in the UTILITIES menu are:

- Select Standby Message 1
- Save Current Setup to Preset 1
- Recall Preset 1
- Standby Delay in Seconds 0

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- Clear Standby Message 1
- Clear VBI Message 1
- Reset VITS To Factory Settings
- Restore Factory Settings
- Copy Standby MSG 1 to 2
- Copy VBI MSG 1 to 2
- Copy Preset 1 to 2
- Scroll VBI MSGS OFF 1 to 1
- Alternate Genlock Source OFF
- Coupling External 1 AC
- Regenerate Sync and Burst OFF
- Select VITS On Fields 1 AND 2
- Select VITS On Lines 10 23
- Reinit NVRAM OFF

Select Standby Message 1 ↓ – This function selects the active standby message. Either the < or > button will toggle the cursor to the page number section of the display. The INCREMENT and DECREMENT buttons then scroll through page numbers 1, 2, and 3. Once the desired page number is displayed, press the SAVE/RECALL button to store the selection. The selected page can then be seen on the TEST SIGNAL output, and will be the selected message number in the STANDBY MESSAGE menu.

Save Current Setup to Preset 1 – This selection will save all of the current user selections and programming into the NVRAM, as an instrument preset. There are two presets, which may be recalled as needed. Use the < or > button to toggle the cursor to the preset number section of the display. The INCREMENT and DECREMENT buttons then toggle between preset numbers 1 and 2. Once the desired number is displayed, press the SAVE/RECALL button to store the selection.

Recall Preset 1 – This selection recalls the presets created by the Save Current Setup To Preset selection, discussed above. Use the < or > button to toggle the cursor to the preset number section of the display. The INCREMENT and DECREMENT buttons then toggle between preset numbers 1 and 2. Once the desired number is displayed, press the SAVE/ RECALL button to recall the preset.

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Standby Delay in Seconds 0 – This selection is used to set the time delay between loss of program video and the switch to standby. This delay may be set in one-tenth second intervals between zero and one second, and in one second intervals between one and ninety-nine seconds.

Clear Standby Message 1 – This function clears a complete standby message page at a time. Use the < or > button to move the cursor to the page number, and then use INCREMENT or DECREMENT to select the page number to clear. When the desired page number is displayed, pressing the SAVE/ RECALL button clears the page of all text.

Clear VBI Message 1 – This function works the same as the preceding one, but clears one specified VBI message at a time.

Reset VITS To Factory Settings – This function returns the current VITS selections to the factory default settings. Press the SAVE/RECALL button to reset the VITS.

Restore Factory Settings – This function returns the entire VITS 200, except presets, to the factory defaults for VITS selections, VBI messages, standby messages, EXT coupling, LINE mode, FIELD mode, alternate genlock, and regenerated sync selections. Press the SAVE/RECALL button to restore the instrument defaults.

Table 2–2: Factory VITS assignments for Std and Opt 1C.

Line	17	18	19	20
Field 1	NTC7 Comp	Pass	Phillips GCR [1], Pass [2]	Pass, Korean GCR [2]
Field 2	NTC7 Comb	Pass	Phillips GCR [1], Pass [2]	Pass, Korean GCR [2]

[1] Line 19 programmed for VIRS prior to S/N B020510 [2] Option 1K

Table 2–3: Factory VITS assignments for Opt 1J.

Line	17	18	19	20
Field 1	FCC Comp	BTA GCR	Color Bars	$\frac{\sin X}{X}$
Field 2	Multiburst	BTA GCR	4.2 MHz Sweep	Red Field

Copy Standby MSG 1 to 2 – This function copies all of the text programmed for one standby message page to another. Use the < and > buttons to place the cursor in the page number positions, and then use the INCREMENT and DECREMENT buttons to select the page numbers. When the correct page numbers are displayed, press the SAVE/RECALL button to write the copy to memory.

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Copy VBI MSG 1 to 2 – This function copies the text of one Vertical Interval Character message to another. Use the < and > buttons to move the cursor to the vertical character message number positions, and then use the INCREMENT and DECREMENT buttons to select the message numbers. Press the SAVE/RECALL button to make the copy.

Copy Preset 1 to 2 – This function makes a duplicate of one of the instrument presets. Use the < and > buttons to move the cursor to the instrument preset number position, and then use the INCREMENT and DECREMENT buttons to select the preset numbers. Press the SAVE/RECALL button to make the copy.

Scroll VBI MSGS OFF 1 to 1 – This function selects a range of VBI messages, and then inserts them into the vertical interval one at a time. Each of the messages is inserted for approximately five seconds, and the sequence repeats until it is turned off or the VBI messages are disabled. Use the < and > buttons to move the cursor between the OFF position and the message number positions. INCREMENT and DECREMENT toggle the OFF/ON selection when the cursor is in that position, and scroll through the VBI message numbers when the cursor is at either of those positions. Press SAVE/RECALL to store the selection.

Alternate Genlock Source OFF – This selection allows the EXTERNAL 1 input to be used as an alternate genlock input, during failure of the program video. When program video returns, the VITS 200 will immediately switch back to it as the genlock source. Use either the < or > button to move the cursor to the word OFF, and then use the INCREMENT or the DECREMENT button to toggle the state between OFF and ON. Pressing SAVE/RECALL stores the selection.

Coupling External 1 AC – This function selects AC or DC coupling for each of the four external inputs. Use the < or > button to move the cursor to the coupling mode or the external input number. When the cursor is under the external input number, the INCREMENT and DECREMENT buttons scroll through the four inputs, so they may each be set individually. While the cursor is in the coupling mode section, both the INCREMENT and DECREMENT buttons toggle the selection between AC and DC. Pressing SAVE/RECALL stores the selection.

Regenerate Sync and Burst OFF – The VITS 200 can insert sync and burst into the program video. This utility turns that capability on and off. Press the < or > button once, to move the cursor to the word OFF (or ON), and press INCREMENT or DECREMENT to toggle the selection. Press the SAVE/RECALL button to store the selection.

Select VITS On Fields 1 AND 2 – This function allows selection of using odd and even fields only for VITS assignments, or addressing each of the four fields separately. Use the < or > button to move the cursor to the field numbers, and press INCREMENT or DECREMENT to toggle between Fields 1 AND 2 and Fields 1234. Press the SAVE/RECALL button to store the selection.

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Select VITS on Lines 10 – 23 – This function selects between lines 10 through 23 (broadcast) and lines 17 through 30 (cable) for VITS assignments. Lines 17 through 23 are the same in both modes, but lines 10 through 16 in broadcast mode become lines 24 through 30 in cable mode.

Reinit NVRAM OFF – This function selects the Nonvolatile RAM initialization sequence.

***NOTE**. This selection clears the NVRAM, and returns the VITS 200 to the factory selections and programming. ALL USER MADE SELECTIONS AND PROGRAMMING WILL BE LOST.*

If you need to reinitialize the NVRAM, use the < or > button to move the cursor to the word OFF, and use the INCREMENT or DECREMENT button to toggle the selection to ON. Press the SAVE/RECALL button to make the selection, and the display should change to read:

```
Hit save again to RE
INIT            NVRAM  !!!!!
```

Wait until this message disappears. Then, when you press the SAVE/RECALL button a second time, the display will change to read:

```
When Power is Cycled
NVRAM  Will  REINIT  !!!
```

This will remain displayed for approximately two seconds. At this time, cycling the power off and back on will reinitialize the NVRAM.

If you do not want to lose the user selections and programming, press the < or > button to move the cursor to the word ON, and toggle it back to OFF with the INCREMENT or DECREMENT button. Press the SAVE/RECALL button, and you should see:

```
                    NVRAM
WLL  NOT  REINIT  !!!
```

appear on the display, which means that the NVRAM reinitialization sequence has been aborted.

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Remote Control

The VITS 200 can be remotely controlled through the 25-pin REMOTE CONTROL connector on the rear-panel (see Fig. 2–3). Using simple ground closure, the remote control can lock out the VITS 200 front panel, place the VITS 200 into Bypass mode, force the VITS 200 into Standby mode, select the full-field test signal output, and select and enable the VBI messages and the standby messages. It cannot be used to change the text of the messages, however.

A Remote Control unit is not a production item, and there are no plans to offer one as either a standard or optional accessory to the VITS 200.

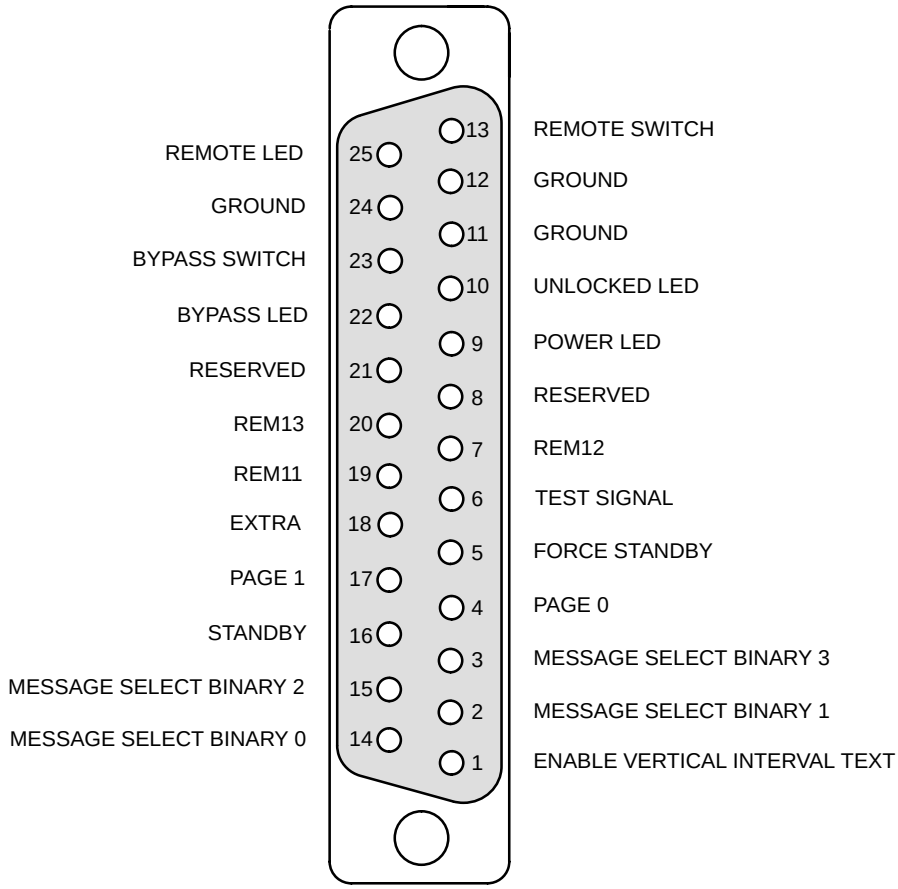


Figure 2–3: Remote Control Connector

Pins 13, 25 REMOTE ENABLE – When pin 13 is first grounded, the Remote Control unit is enabled and the VITS 200 front panel is locked out. The Remote Control must be enabled to use any control pins: the TEST SIGNAL selection pins and the ENABLE and SELECT pins for the standby and VBI messages.

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When the Remote Control is enabled, pin 25 will provide power to light an LED on the Remote Control, and the
VITS 200 display will change to read:

```
REMOTE ENABLED
FRONT PANEL DISABLED
```

While in this mode the VITS 200 front-panel push buttons are disabled, except for the BYPASS, TEST SIGNAL, and FRONT PANEL DISABLE push buttons. The BYPASS button may still be used to put the VITS 200 into Bypass mode, and both the VITS 200 and the Remote Control BYPASS indicators will light.

When REMOTE SWITCH pin 13 is open (off), the LED will go out and the VITS 200 display will change to read:

```
FRONT PANEL ENABLED
REMOTE DISABLED
```

This message will remain on the display until one of the VITS 200 Selection buttons are pressed.

While the Remote Control is enabled, VITS 200 front-panel control may be regained by pressing and holding the FRONT PANEL DISABLE push button, just as if the front panel had been disabled by it. After holding the button down for approximately five seconds, the display will change to read:

```
VITS200 FRONT PANEL
IS NOW ENABLED
```

and the REMOTE LED on the Remote Control will go out, even though the REMOTE SWITCH pin is grounded (enabled). To re-enable the Remote Control, the REMOTE SWITCH pin must be opened and regrounded.

Pins 22, 23 BYPASS – The BYPASS LED and BYPASS SWITCH pins work just like the BYPASS push button and indicator on the VITS 200. The BYPASS LEDs work in parallel. Both of them will light whenever the VITS 200 is in the Bypass mode of operation.

The BYPASS SWITCH pin will switch the VITS 200 into the Bypass mode of operation when it is grounded, whether the Remote Control is enabled or not.

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Pin 10 UNLOCKED LED – This pin drives an LED, which works just like the one on the VITS 200 front panel. It lights to indicate that the VITS 200 can not acquire or maintain genlock. This indicator works whether the Remote Control is enabled or not.

Pin 9 POWER LED – This LED lights when the Remote Control is connected to the VITS 200, and the VITS 200 is turned on. This indicator works whether the Remote Control is enabled or not.

Pin 6 TEST SIGNAL – This pin selects the full-field test signal output, when the Remote Control is enabled. Used with a momentary contact switch to ground, this pin is just like using the front-panel INCREMENT push button while in the TEST SIGNAL menu. Pressing the button steps through the twelve test signals, and holding the button down scrolls through them.

There is one difference between using the front-panel button and the one on the Remote Control. There is no visual feedback of the selected test signal on either the Remote Control or the VITS 200 front panel. You must have a monitor of some sort connected to the TEST SIGNAL output in order to determine the selected signal.

Pin 5 FORCE STANDBY – Grounding this pin forces the VITS 200 into Standby mode.

Pins 16, 4, 17 STANDBY MESSAGE – These three pins are used to enable or disable the standby messages, and to select which of the three pages to output when in Standby mode. These can only be used to select messages which have been programmed in through the front panel, or through the RS-232 port. Text messages cannot be programmed by the Remote Control.

The two pins labeled PAGE 0 and PAGE 1 are used to select the page. Pin 4 is the LSB and pin 17 is the MSB. See Table 2–4. The only indication on the Remote Control or the VITS 200 of which standby message has been selected is the positions of the switches used to control these pins.

Table 2–4: Binary Standby Message Select

Pin 17	Pin 4	Output Page
1	1	Page 1
0	1	Page 1
1	0	Page 2
0	0	Page 3

While the Remote Control is enabled, pin 16 can enable and disable the STANDBY MESSAGE pages, no matter what the status of the page was under front panel control.

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Pins 1, 2, 3, 14, 15 VBI MESSAGE – These five pins are used to enable or disable the vertical interval messages, and to select which of the 15 messages to insert into the vertical interval. These can be used only to select messages which have been programmed in through the front panel or through the RS-232 port. Text messages cannot be programmed by the Remote Control.

The four VBI MESSAGE pins select the message to be inserted in the vertical interval, with pin 14 as the LSB and pin 3 as the MSB. See Table 2–5 for details. As with the STANDBY MESSAGE, the only indication on the Remote Control or the VITS 200 of which message has been selected is by the switch positions.

Table 2–5: Binary VBI Message Select

Pin 3	Pin 15	Pin 2	Pin 14	Vertical Message #
1	1	1	1	Message 1
1	1	1	0	Message 1
1	1	0	1	Message 2
1	1	0	0	Message 3
1	0	1	1	Message 4
1	0	1	0	Message 5
1	0	0	1	Message 6
1	0	0	0	Message 7
0	1	1	1	Message 8
0	1	1	0	Message 9
0	1	0	1	Message 10
0	1	0	0	Message 11
0	0	1	1	Message 12
0	0	1	0	Message 13
0	0	0	1	Message 14
0	0	0	0	Message 15

Video Clapboard

Video Clapboard is for timing audio and video delays, so that they may be synchronized throughout the studio. This function requires a Tektronix ASG 100 modified for Video Clapboard operation. When in use, the VITS 200 will turn the vertical interval text off and on in a 0.5 second on and 4.5 second off pattern, and turn the ASG 100 audio tone on and off in the same pattern. The VBI text will appear following the second vertical interval after the high to low

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transition on pin 13. The VM700A measurement “Audio Video Timing” will remove this lag before presenting the measured time difference.

Configuring the VITS 200 for Video clapboard operation:

1. Genlock the VITS 200 to a video source.
2. Press the VBI Message button, select VERT MSG 2 and ENABLE it.

NOTE. *Any of the vertical interval messages may be used. Message two is used here by grounding pin 2 of the VITS 200 remote connector. To use another message, ground the appropriate selection pins for it (see Table 2–5).*

3. Enter some text for the Vertical Message. A minimum of one character is required.
4. Connect the VITS 200 and ASG 100 remote connectors as shown in Figure 2–4.

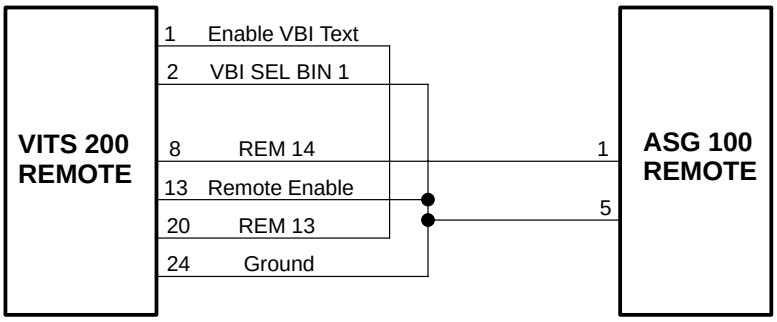


Figure 2–4: Video Clapboard Connections

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RS-232 Control

The VITS 200 may be controlled through a 3-wire RS-232 interface, or by any device that can generate or transmit commands in ASCII characters. Using XON and XOFF makes it possible to control the VITS 200 directly from an ASCII terminal, personal computer (PC), or a VM700A (See Figure 2–5).

Communications Setup
First, designate and configure the VM700A communication port to use with the VITS 200. This is accomplished by selecting the VM700A front panel configure button, then select the "Configure Files" softkey on the touch-panel screen menu. Finally, select the "Communications Setup" softkey.

In the Communications Setup, designate your choice of control port (Serial Port 0 or 1) and then set the parity, baud rate, and flow control for that port. The example shown here has the VITS 200 connected to the VM700A serial port 0.

Sending Commands to the VITS 200
Communication with the VITS 200 is accomplished with simple user-created functions. An example of one such function which changes the VITS 200 TEST SIGNAL output to a Color Bar signal, lets call it CBAR, would look like this:

```
control :tsig CBR ^M
```

This function may be executed directly by pressing the VM700A front panel "Function" key and then selecting the CBAR softkey. It may also be executed by embedding it in another function with the VM700A "Playback" command. See the VM700A Users Manual and "Controlling RS-232C Devices with the VM700A" (21W-7108) for more information.

```
Copy
    Port:                       Serial Port 1
    format:                     Epson LQ
Report
    Port:                       None
    Format:                     Epson LQ
Log
    Port:                       None
    Format:                     Epson LQ
Control Port: Serial Port 0
Remote Control
    Port:                       None
    Prompt:                     VM700>
    Message Display:            Remote
    Non-SLIP Interfacing Mode:  Terminal
Port 0
    Protocol:                   None
    Baud Rate:                  9600
    Flow Control:               XON/XOFF
    Character Size:             8
    Parity:                     None
    Reset Character:            None
    Carrier Detect:             Disabled
Port 1Protocol:                 None
    Baud Rate:                  19200
    Flow Control:               None
    Character Size:             8
    Parity:                     None
    Reset Character:            None
    Carrier Detect:             Disabled
```

Figure 2–5: Controlling the VITS 200 with a VM700A.

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Typically, RS-232 control will be implemented with a PC which is running terminal-emulation or communication software, such as PROCOMM® or SmartComm®. Depending on the software used, commands that specify VITS 200 settings may be entered directly through the keyboard or by transmitting text files containing any number of commands. Many communications applications also permit the assignment of command "scripts" to function keys or key combinations.

RS-232 control will permit the operator to learn the current settings of the VITS 200 and change them from the terminal. New settings may be specified by name (e.g. "LINE") or value (e.g. "15"), eliminating the need to scroll through a list of choices as with the front panel controls or with the ground-closure remote. RS-232 commands and command syntax are explained in the following RS-232 COMMANDS discussion. Some of the ways to use RS-232 control are:

- Enter commands directly through the keyboard. The value of this approach is somewhat limited, however, because typing commands such as :STANdby:SIGNal SXX can quickly become tedious.

  As an example, to use EXTERNAL 1 input as a VITS on Line 19 Field 1, you would enter the following commands:

  ```
  :VITS:LINe 19
  :VITS:FIELd 1
  :VITS:SIGNal EX1
  :VITS:SAVe
  ```

  These commands may be issued in any order, except for the SAVe command. it must be the last one issued, and it *must* be issued before any VITS changes will take effect.

- Assign key combinations or function keys to certain settings or commands so that the VITS 200 can be controlled with a few keystrokes. For example, if the script ":VITS:LMOD 10–21" is associated with the F1 key, and ":VITS:LMOD 17–30" is associated with the F2 key, switching between standard and cable mode VITS assignments becomes an easy matter. (Note that key assignment is not a standard feature of all communication software; check your software manual.)

- While running communication software, execute simple programs to automate repetitive adjustments, or substitute short mnemonic strings for long commands. Many of the popular communications packages have this capability.

- Save an unlimited number of presets in the form of individual text files. One such file could program in an entire standby message page and then select it, saving several hundred keystrokes. This is one way to have more than the three preset messages on tap if they should be needed.

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Hardware and Software Requirements for RS-232 Control

Cable

If the RS-232 port is a DB25 connector, use a straight-through cable as described in Table 2–6. Do not use a "null modem" cable. If the port is a male DB9 connector, as on many IBM- compatible PCs, use a cable or adapter as described in Table 2–7. If the device uses a non-standard connector, determine which pins perform the functions listed in the center column of Table 2–7 and connect them through the appropriate pins of a DB25 connector as listed in the left column.

Table 2–6: RS-232 Connector Pin Functions – 25-Pin Serial Ports

VITS 200 (25-Pin Female)	Pin/Conductor	PC (25-Pin Male)
GND (Shield)	1	GND (Shield)
RxD	2	TxD
TxD	3	RxD
Signal GND	7	Signal GND

Table 2–7: 9-Pin to 25-Pin Adaptor Connections for RS-232

DB25 Pin Number	RS-232 Function	DB9 Pin Number
2	TxD	3
3	RxD	2
7	Signal GND	5

Communications Parameters

- TTY or VT100 TERMINAL EMULATION.
- XON/XOFF Flow Control.
- 8 Data bits, no Parity, 1 Stop bit.
- Local Echo (or Half Duplex).

Text Commands and Command Files

For best results, follow these guidelines when sending text to the VITS 200:

- Send one line at a time; wait for a carriage return between lines. (The VITS 200 will send a carriage return to signal that it has executed a command only if it is in TERM mode.)

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- Lines may be up to 128 characters.
- End each line, including the last one, with a carriage return.

RS-232 Commands

RS-232 commands may be used to query the VITS about the setting of particular variables, or to set the variable to a specific value. The basic syntax is:

:COMMAND?
or
:COMMAND parameter

where the first form is a query and the second will set the variable. Important points to remember are:

- Commands always begin with a colon (:) or an asterisk (*).
- There is never a space between the variable name (command header) and the question mark in a query.
- There is always a space between the header and the command parameter.
- Commands are not case-sensitive; headers and parameters may be entered in either capitals or lower case. For clarity in this manual, the mnemonic form of the header is capitalized, and the remaining characters of the complete form are shown in lower case. Either form may be used; entering :PRES? will have the same effect as entering :PRESET?. Parameters will be shown in italics.
- Parameters can be either numeric or character strings. String parameters, such as VBI and Standby message text strings must be enclosed in double quotes.
- Compound headers (such as :VITS:LMOD) are limited to those predefined for the VITS 200.
- A line can contain several commands, if they are separated by a semicolon (:COMMAND parameter1;:COMMAND parameter2;...), but no line may exceed 128 characters.

:AltGENlock
Parameters: ON or OFF

Turns the Alternate Genlock function, where EXT 1 is used as an alternate genlock source if the signal at the PROGRAM INPUT fails, ON or OFF. Query returns the current status.

:ByPASs
Parameters: ON or OFF

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:BYPASS ON is the RS-232 equivalent of pushing the front panel BYPASS button in, and OFF is the equivalent of releasing it. A query will return the current state of the VITS 200 mode, but will not distinguish the reason it's in that mode.

:COMMunicate?
Parameters: None, query only

Query returns the current Baud rate (300 to 9600) and communications mode (Terminal, SCPI, or VM700).

COMMunicate:MODe
Parameters: Mode

Sets the communications mode to SCPI, TERM, or VM700. Query returns the currently set mode.

COMMunicate:SERial:BAUD
Parameters: 300, 600, 1200, 2400, 4800, or 9600

Sets the baud rate for serial communication. Query returns the current baud rate.

:COUPling
Parameters: 1 to 4, AC or DC

Sets the individual ext inputs coupling mode. EXT INPUT 1 through EXT INPUT 4 may be set to be AC or DC coupling. A query will return the current coupling status for all four of the External Inputs.

:HELP?
Parameters: None, query only

Returns a list of available commands.

***IDN?**
Parameters: None, query only

This query is used to verify which device is connected to the active serial port.

:PRESet?
Parameters: None, query only

Query returns the current Preset number (1 or 2).

:PRESet:COPY
Parameters: Preset #, Preset #

Copies the first specified preset (1 or 2) to the second (1 or 2).

PRESet:RECall
Parameters: Preset #

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Recalls the specified preset (1 or 2).

:PRESet:SAVe
Parameters: Preset #

Saves the current instrument setup as the specified preset (1 or 2).

:REINitnvram
Parameters: ENA or DIS

This is the first step of reinitializing the NVRAM to the factory settings. When this is ENAbled, a *RST command will reset ALL of the VITS 200 settings to the factory defaults. When REINitnvram is set to DISable, an RST command will have no effect.

:RESYnc
Parameters: ON or OFF

When set ON, the VITS 200 will insert regenerated sync and burst. When set OFF, the program video sync and burst is passed to the output. Query returns the current selection.

***RST**
Parameters: None

No parameters, no query. All settings will be reset to their factory defaults. REINitnvram must be set to ENAble for this to have any effect.

:SoftwareVER?
Parameters: None, query only

This query will return the VITS 200 software version level.

:STANdby
Parameters: *ENA* or *DIS*

Enables or disables standby mode operation. Query returns the current mode state.

:STANdby:DELay
Parameters: 0.0 1.0 seconds (0.1 sec increments)
1 99 seconds (1 second increment)

Sets the delay time between the loss of program video and switching to Standby operation. Below 1.0 second you may use 0.1 second increments, down to 0.0 seconds for an immediate switch. Between 1 and 99 seconds, you must use 1 second increments. Query returns the current delay time.

:STANdby:FORCe
Parameters: ON or OFF

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ON forces the VITS 200 into Standby mode, even if locked to program video. OFF is the default setting.

:StandbyMES
Parameters: ENA or DIS

Enables or disables the Standby Message function. Query returns the current status.

:StandbyMES:ADD
Parameters: "TXT"

Adds text to the currently open Standby message, starting at the current line and column. Cursor is auto-incrementing.

:StandbyMES:CLeaR
Parameters: Msg #

Clears any text in the specified Standby message (1 to 3).

:StandbyMES:CLOSe
Parameters: None

Closes the currently open Standby message.

:StandbyMES:COPY
Parameters: Msg #, Msg #

Copies the text from the first specified Standby message (1 to 3) to the second (1 to 3).

:StandbyMES:EDIT
Parameters: Msg #

Opens the specified Standby message number (1 to 3) for editing. Query returns the number of the current open message.

:StandbyMES:MESSage
Parameters: Msg #, Line#, "TXT"

This command programs Standby messages. The parameters are the Standby message number (1 to 3), the line within the message (1 to 13), and the message text (1 to 20 characters).

:StandbyMES:MOVe
Parameters: Line #, Column #

Moves the cursor to the specified line and column in the open Standby message. Query returns the current line and column numbers.

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:StandbyMES:REPLace
Parameters: "TXT"

Replaces text in the currently open Standby message, starting at the current line and column. Cursor does not move.

:StandbyMES:SELect
Parameters: Msg #

Calls a Standby message by number (1 to 3) for insertion. Query returns the current Standby message number.

:STANdby:SIGNal
Parameters: *Signal mnemonic*

Selects the test signal to use as the Standby signal. Use the RS-232 mnemonic for the test signal name. Query returns the current selection.

:SYSTem:ERRor?
Parameters: None, query only

This query will return a message reporting any existing error condition in the VITS 200.

:SYSTem:VERSion?
Parameters: None, query only

This query will return the SCPI version that the VITS 200 conforms to.

:TestSIGnal
Parameters: "*Signal mnemonic*"

Selects the signal for the TEST SIGNAL output. Use the RS-232 mnemonic for the test signal name. Query returns the current selection.

:VerticalMES
Parameters: ENA or DIS

Enables and disables the Vertical Blanking Interval messages. Query returns the current status.

:VerticalMES:ADD
Parameters: "TXT"

Adds text to the currently open VBI Message. Cursor is auto-incrementing. An ampersand (&) is used as a pass character.

:VerticalMES:CLeaR
Parameters: Msg #

Clears the specified VBI message text.

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:VerticalMES:CLOSe
Parameters: None

Closes the currently open VBI Message.

:VerticalMES:COPY
Parameters: Msg #, Msg #

Copies the text of the first VBI Message number (1 to 15) to the second VBI Message number (1 to 15).

:VerticalMES:EDIT
Parameters: Msg #

Opens the specified VBI Message number (1 to 15) for editing. Query returns the currently open message.

:VerticalMES:MESSage
Parameters: Msg #, "TXT"

This command programs Vertical Blanking Interval messages. The parameters are the VBI Message number (1 to 15) , followed by the message text (1 to 23 characters).

:VerticalMES:MOVe
Parameters: Column #

Moves the cursor to the specified column number in the currently open VBI Message.

:VerticalMES:REPLace
Parameters: "TXT"

Replaces text in the currently open VBI Message. The cursor does not move. An ampersand (&) is used as a pass character.

:VerticalMES:SCRoll
Parameters: ON, #, # or OFF

Turns the VBI Message scroll feature ON, in which case you must specify the starting and ending message numbers, or OFF. Query returns the current ON or OFF state.

:VerticalMES:SELect
Parameters: Msg #

This command selects a particular VBI message number for insertion. Query returns the current message number.

:VITS?
Parameters: None, query only

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When used as a query, this will return current Field Mode, Line Mode, Line number, field number, and assigned signal.

:VITS:CLeaR
Parameters: None

Clears the current VITS assignments.

:VITS:FIELd
Parameters: *Field number*

Addresses a specific field for VITS assignment.

:VITS:FieldMODe
Parameters: *2FieLD* or *4FieLD*

Sets the Field Mode to 2 field (even/odd), or to 4 field (Fields 1, 2, 3, 4). Query returns current setting.

:VITS:LINe
Parameters: *Line number*

Addresses specific line number in the current Line Mode range, for VITS assignment. Query returns current selection.

:VITS:LineMODe
Parameters: *10–23* or *17–30*

Sets the VITS Line Mode to the standard VITS lines (lines 10–23) or to the cable VITS lines (lines 17–30). Query returns current selection.

:VITS:RESet
Parameters: None

Resets the VITS assignments to the factory selections.

:VITS:SAVe
Parameters: None

Saves the VITS assignments to nonvolatile memory. **MUST** be used for any VITS assignment changes to take effect.

:VITS:SIGNal
Parameters: "*Signal mnemonic*"

Specifies the signal for use as VITS on the current line and field. Use the RS-232 mnemonic for the test signal name. Query returns the current selection.

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Table 2–8: SCPI Commands (4.1.1 and 4.2.1)

Command Header	Purpose	Parameter Example
*CLS	No Action Clear Status command	
*ESE	No Action Standard Event Status Enable command	
*ESE	No Action Standard Event Status Enable query	
*ESR	No Action Standard Event Status Register query	
*OPC	No Action Operation Complete command	
*OPC?	No Action Operation Complete query	
*SRE	No Action Service Request Enable command	
*SRE?	No Action Service Request Enable query	
*STB?	No Action Read Status Bite query	
*TST?	No Action Self-test query	
*WAI	No Action Wait-to-continue command	
*IDN?	Identification query	No Parameters
*RST	Resets the VITS 200 to the factory defaults. Must have set REINitnvram to ENAble for this to have any effect.	No Parameters
:SYSTem :ERRor? :VERSion?	 Returns the SCPI version this instrument complies to. Query only.	
:STATus :OPERation :EVENt? :CONDition :ENAble :ENAble? :QUEStionable :EVENt? :CONDition :ENAble :ENAble? :PRESet	No Action No Action No Action No Action No Action No Action No Action No Action No Action No Action No Action No Action	

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Table 2–9: Defined RS-232 Commands for use with the VITS 200

Command Header	Purpose	Parameter Example
:HELP?		
:SoftwareVER?	Returns the VITS 200 software version. Query only.	No Parameters
:VITS?	Command/query. Query returns all of the following:	
:FieldMODe? [text]	Selects/queries between 2 and 4 field mode of operation.	2 FieLD
:LineMODe? [text]	Selects/queries standard or cable VITS assignments (lines 10–23 or 17–30).	10–23
:LINe? [#]	Addresses/queries specific line for VITS assignment (10–23 or 17–30).	15
:FIELd? [#]	Addresses/queries field assignment for VITS (1, 2, 3, or 4).	2
:SIGNal? [text]	Selects/queries test signal for VITS.	CBR (RS-232 mnemonic)
:SAVe	Saves new VITS assignments. Must be used for new assignment changes to take effect.	No Parameters
:CLeaR	Clears VITS assignments in current setup.	No Parameters
:RESet	Resets VITS assignments.	No Parameters
:TestSIGnal [text]	Selects the Full Field Test Signal output.	CBR (RS-232 mnemonic)
:STANdby? [text]	ENAble or DISable standby mode or query status.	ENA
:SIGNal? [text]	Selects/queries the standby test signal.	CBR (RS-232 mnemonic)
:DELay? [#]	Sets/queries the delay time for switching to standby mode (0.0199 sec).	0.5
:FORCe [text]	Forces the VITS 200 standby mode ON or OFF.	OFF
:AltGENlock?	Sets/queries whether EXTERNAL 1 is ON or OFF as alternate genlock source.	OFF
:RESYnc?	Sets/queries whether regenerated sync and burst is ON or OFF.	ON
:COUPling? [#],[text]	Sets/queries whether specified EXTERNAL INPUT # (1–4) to AC or DC coupling.	3, DC
:REINitnvram?	ENAbles the NVRAM reinitialization sequence (Requires an *RS T command to actually reinitialize the NVRAM.) or DISables the NVRAM reinitialization sequence (An *RST command will NOT reinitialize the NVRAM). Query will tell whether it is ENAbled or DISabled.	DIS
:ByPASs?	Sets/queries whether bypass is ON or OFF.	ON

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Table 2–9: Defined RS-232 Commands for use with the VITS 200 (Cont.)

Command Header	Purpose	Parameter Example
:VerticalMES? [txt]	ENAble or DISable VBI Messages, can also query status	DIS
:MESSage [#],[txt]	Programs specified VBI Message [1–15] text [1–23 characters]	11, "1–23 characters"
:SELect ? [#]	Calls specified VBI Message for insertion, queries which message is current	13
:SCRoll? ON,[#],[#]/OFF	Turns Scroll ON for starting message # to ending message #, or turns scroll OFF. Query returns status.	ON, 2, 12
:CLeaR [#]	Clears specified VBI Message text	11
:COPY [#],[#]	Copies one VBI Message to another	11, 12
:EDIT? [#]	Opens specified VBI Message # for editing	12
:MOVe? [#]	Moves	
:ADD [text]	Adds text to open VBI Message, with auto-incrementing cursor	"string" ("&" = pass character)
:REPLace [text]	Replace text to open VBI Message, cursor does not move	"string" ("&" = pass character)
:CLOSe	Closes open VBI Message	No Parameters
:StandbyMES? [txt]	ENAble or DISable standby messages	DIS
:MESSage? [#], [#], [txt]	Programs/queries specified Standby Message #, Line #, text (1–20 characters)	2, 11, Text
:SELect? [#]	Calls/queries specified Standby Message text for insertion	2
:CLeaR [#]	Clears specified Standby Message text	3
:COPY [#],[#]	Copies one Standby Message to another	1, 3
:EDIT? [#]	Opens/queries specified Standby Message # for editing	2
:MOVe? [#],[#]	Moves to/queries specified line, column of open Standby Message	12, 15
:ADD [text]	Adds text to open Standby Message, with auto-incrementing cursor	Text String
:REPLace [text]	Replace text in open Standby Message, cursor does not move	Text String
:CLOSe	Closes open Standby Message	No Parameters
:PRESet?		
:RECall [#]	Recalls specified preset # (1 or 2)	2
:SAVe [#]	Saves current setup as specified preset # (1 or 2)	1
:COPY [#],[#]	Copies one preset to the other	2, 1
:CLeaR [#]	Clears specified preset # (1 or 2)	2
:COMMunicate		
:SERial		
:BAUD? [#]	Sets/queries VITS 200 baud rate (300 9600 baud)	4800
:MODe	Sets serial mode to SCPI, VM700, or TERM.	VM700

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Table 2–10: RS-232 Mnemonics

Mnemonic	Signal Name	Mnemonic	Signal Name	Mnemonic	Signal Name
PAS	Pass	AC2	Auto Capt 2	090	CBC Composite 90 [3]
CBR	Color Bars	AC 3	Auto Capt 3	100	CBC Composite 100 [3]
FCP	FCC Composite	AC4	Auto Capt 4	110	CBC Composite 110 [3]
MP0	Multi Pulse	VRD	VIRS Auto detect	120	CBC Composite 120 [3]
VIR	VIRS	SXX	SIN X/X	135	CBC Composite 135 [3]
GCR	Ghost Cancellation	SID	Source ID	150	CBC Composite 150 [3]
RFL	Red Field	20I	FCC Comp 20 IRE [2]	165	CBC Composite 165 [3]
P00	0% Black	EX1	Extern 1	225	CBC Composite 225 [3]
PD1	7.5% B lack	EX2	Extern 2	240	CBC Composite 240 [3]
HSW	10 MHz Sweep	EX3	Ex tern 3	255	CBC Composite 255 [3]
HSW [1]	4.2 MHz Sweep	EX4	Extern 4	285	CBC Composite 285 [3]
CMB	NTC7 Combination	015	CBC Composite 15 [3]	300	CBC Composite 300 [3]
NCP	NTC7 Composite	030	CBC Compo site 30 [3]	315	CBC Composite 315 [3]
MB0	Multiburst	045	CBC Composite 45 [3]	330	CBC Composite 330 [3]
PD5	50% Gray	060	CBC Compo site 60 [3]	345	CBC Composite 345 [3]
AC1	Auto Capt 1	075	CBC Composite 75 [3]	360	CBC Composite 360 [3]
CSW	Cable Sweep [4]	CMU	Cable Multiburst [4]		

[1] Opt 1J only. [2] Not available in Opt 1J signal set. [3] Opt 1C only. [4] S/N B020510 and above.

Rear Panel

The VITS 200 rear panel, shown in Fig. 2–6, contains the line power socket, fuse, and power switch; the source ID selection switches, and assorted connectors. Fig. 2–6 is explained on the following page.

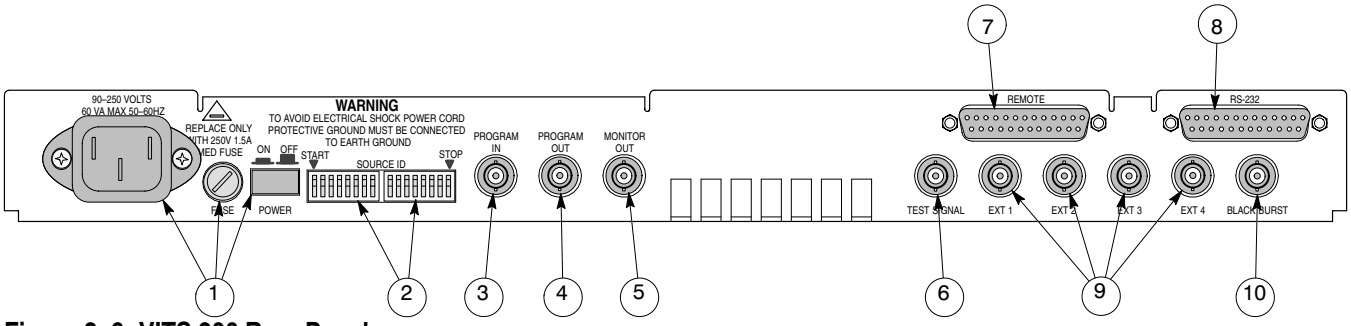


Figure 2–6: VITS 200 Rear Panel.

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1. POWER The AC power connector, fuse, and power switch. The VITS 200 uses a power supply which can accept line voltages from 90 to 250 VAC without changing ranges or fuses.

2. SOURCE ID Two DIP switches used to select the source identification code, a one-line, 16-bit word with 16,384 possible combinations. This identification signal can be inserted as one of the VITS signals, on any of the available vertical interval lines.

3. PROGRAM IN Program video input, onto which VITS will be inserted. This input is internally ac-coupled and clamped to ground, and is internally terminated in 75, except when the VITS 200 is in Bypass mode.

4. PROGRAM OUT Outputs the program video with user-selected VITS and vertical interval messages inserted. If the program video fails, the VITS 200 switches to the user-selected Standby signal with, if selected, one of the three full page standby messages as the output. If the power to the VITS 200 fails, a relay bypass switches the program video directly to this connector.

5. MONITOR OUT This connector provides the same output as the PROGRAM OUT connector, with one exception. During power failure this connector has no output.

6. TEST SIGNAL This connector provides the full-field test signal selected by the user, with any selected VITS, vertical interval messages, and standby text page inserted on it.

7. REMOTE CONTROL This 25-pin connector provides remote ground-closure control of manual bypass operation, force Standby mode, vertical interval messages, standby messages, and full-field test signal output. It also provides lines which drive bypass, unlocked, and power indicators.

8. RS-232 This 25-pin connector allows remote control of the VITS 200 with data which complies with the RS-232C standard.

9. EXTERNAL INPUTS These four inputs: EXT 1, EXT 2, EXT 3, and EXT 4, may be used to input external signals, such as additional test signals or teletext, which may be inserted into the vertical interval or used as standby signals. In addition EXT 1 may be selected as an alternate genlock input, for use during failure of the program video signal.

10. BLACK BURST This output provides regenerated sync and burst with a 7.5% setup flat field signal.

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Specifications

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Specifications

This section lists the performance requirements for the VITS 200, along with pertinent supplemental information. Performance requirements may be verified with the performance check procedure in Section 5 of the manual.

Items listed as Performance Requirements are quantitative, and are stated with tolerance limits. All Performance Requirements are guaranteed.

Items listed as Supplemental Information are not normally verified by the Performance Check Procedure; they are either explanatory notes or typical operating characteristics which are not guaranteed.

PERFORMANCE CONDITIONS

The Performance Requirements listed in this section apply over an ambient temperature range of 0° C to +50° C. The rated accuracies are valid when the instrument is calibrated at an ambient temperature in the range of 20° C to 30° C, after a warm-up time of 20 minutes.

The test equipment used to verify performance requirements must be calibrated and working within the limits specified in the Recommended Test Equipment list.

Table 3–1: Program Channel

Characteristics	Performance Requirements	Supplemental 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 FSC	
Crosstalk	≥ 60 dB down to 5.5 MHz	Typically >70 dB
Hum Rejection	50 dB	Measured right after burst.
Keyboard (No Noise)		Too small to measure on VM700A.

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Table 3–1: Program Channel (Cont.)

Characteristics	Performance Requirements	Supplemental Information
Insertion Transients	≤ 10 mV	Measured on 1780. Typically <5 mV.
Input Impedance	75 Ω	
Return Loss	36 dB to 5 MHz	PROGRAM IN, PROGRAM OUT, and MONITOR OUT
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: External Inputs

Characteristics	Performance Requirements	Supplemental Information
Gain	Unity ± 1%	
Frequency Response	± 1% to 5 MHz ± 3% to 10 MHz	
Chrominance-to-Luminance Gain	± 0.5%	
Chrominance-to-Luminance Delay	≤ 5 ns	
Diff Phase	≤ 0.3°	
Diff Gain	≤ 0.3%	
Line Tilt	≤ 0.5%	
DC Offset (DC Coupled)	0 V DC ± 10 mV	Internally DC coupled
Program Video to External Signal DC Match	3 mV	No hum, internally AC coupled
Crosstalk	≥ 60 dB down to 5.5 MHz	Any channel to any other
Hum Rejection		Typically 60 dB, measured right after burst.
Keyboard (No Noise)		Too small to measure on VM700A.
Input Impedance	75 Ω	
Return Loss	36 dB to 5 MHz	
Program to External Channel Timing Difference		Typically ± 2°
Signal to Noise Ratio	>70 dB	84 dB AC Coupled, 87 dB DC Coupled, relative to reference on VM700A with an unweighted 5 MHz low pass filter.

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Table 3–3: Test Signal and Black Burst General Characteristics

Characteristics	Performance Requirements	Supplemental 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	
Return Loss	36 dB to 5 MHz	
Signal to Noise Ratio Test Signal Black Burst	 >78 dB >70 dB	On VM700A with an unweighted 5 MHz low pass 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	
Sync Amplitude	285 mV ± 3 mV	
Sync Rise Time	140 ns ± 20 ns	
Burst Amplitude Rise Time Delay from Sync Duration	 285 mV ± 6 mV p-p 300 ns ± 35 ns 5.3 s ± 100 ns 2.5 s ± 100 ns	 From 50% point of Sync 9 cycles of subcarrier
Breezeway Duration	600 ns ± 100 ns.	
Front Porch Duration	1.5 μs 100 ns	50% amplitude point
Horizontal Sync Duration	4.7 μs 100 ns	50% amplitude point
Equalizing Pulse Duration	2.3 μs 100 ns	50% amplitude point

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Table 3–4: Test Signal Characteristics

Characteristics	Performance Requirements	Supplemental Information
0% Black	0 IRE Luminance with sync and burst	See Figure 3–1 for timing information.
7.5% Black	7.5 IRE Luminance with sync and burst	See Figure 3–2 for timing information.
10 MHz Sweep		See Figure 3–3 for timing information.
Pedestal		
Amplitude	45 IRE	
Rise Time	250 ns ± 25 ns	Frequency increases 1MHz/div, viewed at line rate on a waveform monitor (Std and Opt 1C).
Sweep Amplitude	50 IRE	
Start Frequency	1 MHz	
Stop Frequency		
Std, Opt 1C	10 MHz	
Opt 1J	4.2 MHz	
NTC7 Combination		See Figure 3–4 for timing information.
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, 3.0MHz, 3.58 MHz, 4.2 MHz	
Packet Rise Time		
500 kHz and 1.0 MHz		140 ns typical (sin^2 shaped packets)
Other Packets		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	

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Table 3–4: Test Signal Characteristics (Cont.)

Characteristics	Performance Requirements	Supplemental Information
FCC/NTC7 Composite		See Figure 3–5 for FCC Composite timing information. See Figure 3–6 for NTC7 Composite timing information.
Modulated 5-step Staircase		
Luminance		
Amplitude		
FCC	80.4 IRE ±0.7 IRE	
NTC7	90.2 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°	
Amplitude	40 IRE ±0.5 IRE	
Envelope Rise Time		
FCC	375 ns ±37.5 ns	
NTC7	400 ns ±40 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 s ±150 ns	
Phase	60.8° ± 1°	
Bar		
Amplitude	100 IRE ±1 IRE	
Rise Time		
FCC	250 ns ±25 ns	
NTC7	125 ns ±15 ns	
20 IRE Composite		Same as FCC Composite except Staircase. Chrominance Amplitude is 20 IRE ±0.5 IRE.
FCC Multiburst		See Figure 3–7 for timing information.
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, 3.0MHz, 3.58 MHz, 4.1 MHz	
Packet Rise Time		
500 kHz		140 ns typical (sin2 shaped packets)
Other Packets		400 ns typical (sin2 shaped packets)
50% Gray	50 IRE Luminance with sync and burst	See Figure 3–8 for timing information.
Sin X/X		See Figure 3–9 for timing information.
Bandwidth	4.75 MHz	
Pedestal	24 IRE	
Peak	90 IRE	Peak amplitude from pedestal

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Table 3–4: Test Signal Characteristics (Cont.)

Characteristics	Performance Requirements			Supplemental Information
FCC Color Bars				See Figure 3–10 for timing information.
Luminance Rise Time	250 ns ± 25 ns			
	Lum Ampl (mV)	Subc Ampl (mV p-p)	Subc Phase (deg)	
Color Bars				
White	714.3	0.0	0.0	
Yellow	494.3	444.2	167.1	
Cyan	400.7	630.1	283.4	
Green	345.7	588.5	240.8	
Magenta	256.0	588.5	60.8	
Red	202.1	630.1	103.4	
Blue	107.8	444.2	347.1	
Black	53.5	0.0	0.0	
Multipulse				See Figure 3–11 for timing information.
Amplitudes	80 IRE			
Frequencies	1.0 MHz, 2.0 MHz, 3.0 MHz, 3.58 MHz, and 4.2 MHz			
Vertical Interval Reference Signal (VIRS)				See Figure 3–12 for timing information.
Chrominance Reference				
Amplitude	40 IRE			
Phase	Same as burst ± 0.3			
Envelope Rise Time (SIN^2 shaped)	1 μs ± 100 ns			
Average Level of Chrominance	70 IRE			
Luminance Reference				
50 IRE Level	50 IRE			
Black Reference	7.5 IRE			
Red Field				See Figure 3–13 for timing information.
Luminance				
Amplitude				
Std, Opt 1C	202.2 mV ± 1%			
Opt 1J	160.72 mV ± 1%			
Rise Time	250 ns ± 25 ns			
Chrominance				
Amplitude				
Std, Opt 1C	630.1 mV ± 1%			
Opt 1J	681.23 mV ± %			
Phase	103.4° ± 0.3°.			
Rise Time	400 ns ± 40 ns			
BTA Ghost Canceller Reference (GCR)				See Figure 3–14 for timing information.
Bar				
Amplitude	70 IRE			
Positive Peak	77.3 IRE			
Negative Peak	–3.9 IRE			
Fall time	250 ns			

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Table 3–4: Test Signal Characteristics (Cont.)

Characteristics	Performance Requirements	Supplemental Information
GCR Phillips (STD, Opt 1C) (B020249 and above)		See Fig. 3–15 (GCR Positive) and 3–16 (GCR Negative) for timing information.
Pedestal Amplitude	30 IRE ±0.5 IRE	
Chrominance Amplitude	80 IRE ±1 IRE	
Spectrum	Flat to 4.1 MHz. –3 dB at 4.3 MHz	
VIT Sequence		GCR Positive – Fields 1, 3, 6, and 8 GCR Negative – Fields 2, 4, 5, and 7
GCR Korean (Opt 1K) (B020249 and above)		See Fig. 3–17 (GCR Positive) and 3–18 (GCR Negative) for timing information.
Pedestal Amplitude	30 IRE ±0.5 IRE	
Chrominance Amplitude	80 IRE ±0.5 IRE	
VIT Sequence		GCR Positive – Fields 1, 3, 5, and 7 GCR Negative – Fields 2, 4, 6, and 8
Cable Multiburst (S/N: B020510 & above)		See Figure for timing information.
White Reference Bar Amplitude	60 IRE	
Packet Amplitudes	60 IRE	
Pedestal Amplitudes	60 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		140 ns typical ($\sin^2$ shaped packets)
Other Packets		400 ns typical ($\sin^2$ shaped packets)
Cable Sweep (S/N: B020510 & above)		
Pedestal Amplitude	50 IRE	
Sweep		
Amplitude	100 IRE	
Frequencies		
Start	0.1 MHz	
Stop	4.2 MHz	

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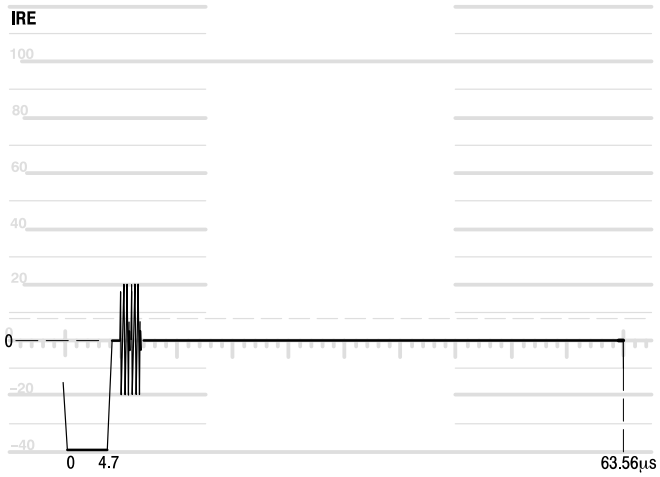


Figure 3–1: 0% Black

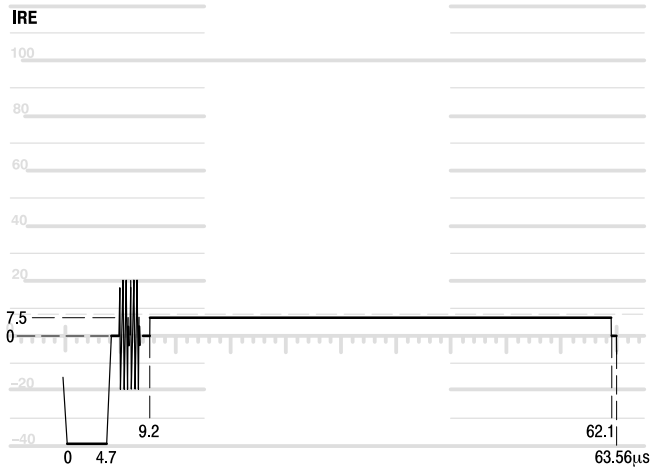


Figure 3–2: 7.5% Black

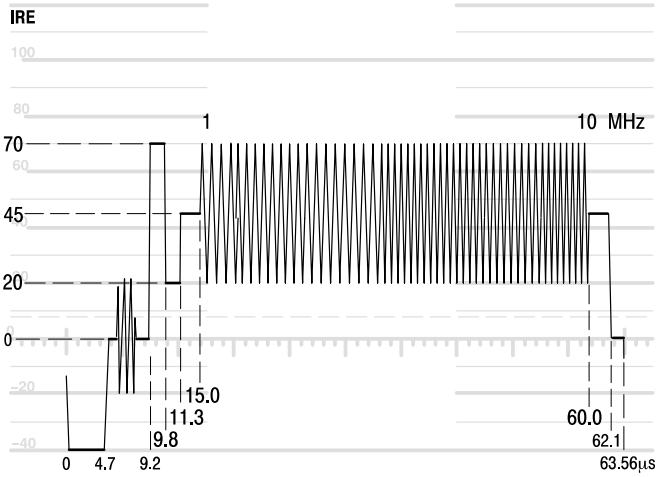


Figure 3–3: 10 MHz Sweep

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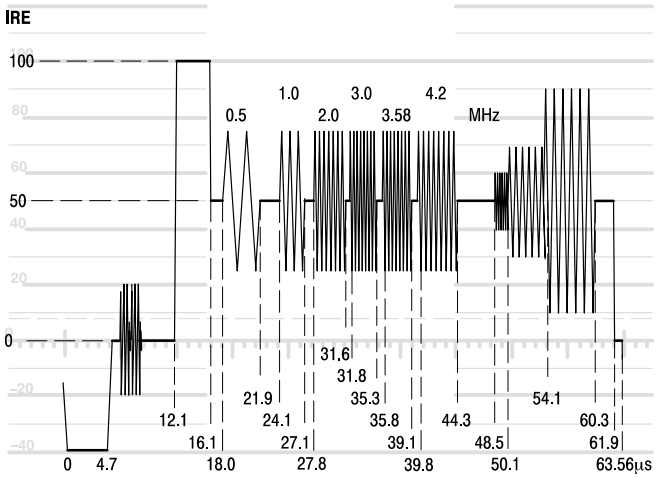


Figure 3–4: NTC7 Combination

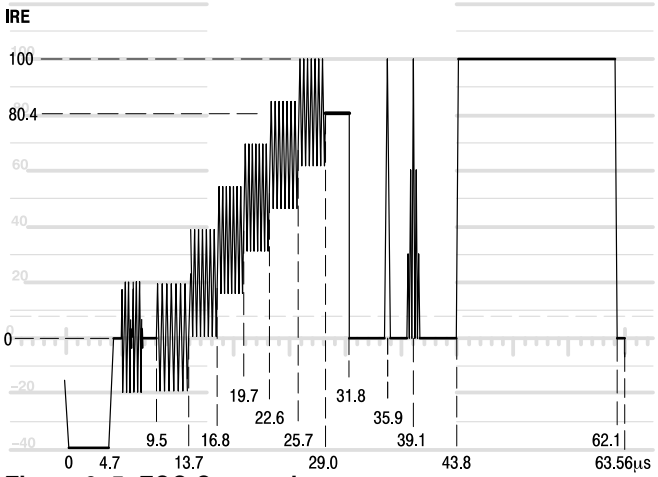


Figure 3–5: FCC Composite

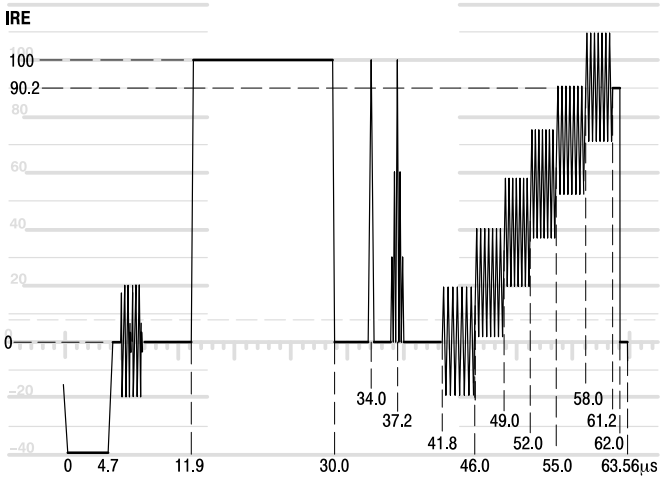


Figure 3–6: NTC7 Composite

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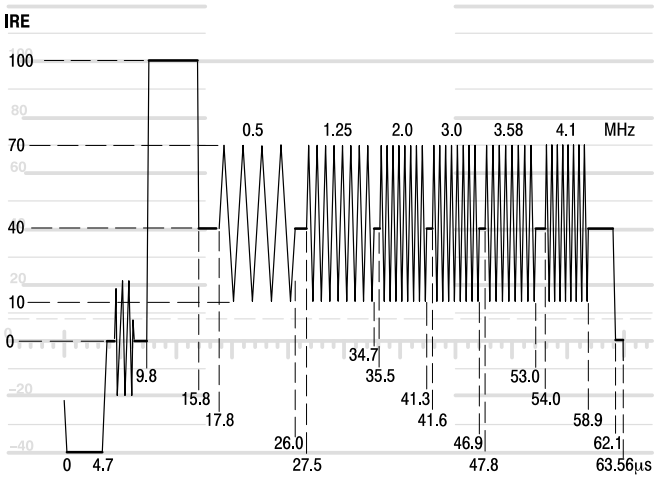


Figure 3–7: FCC Multiburst

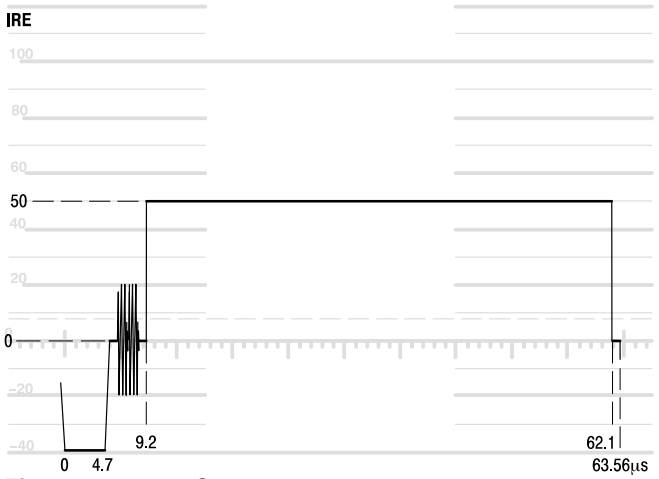


Figure 3–8: 50% Gray

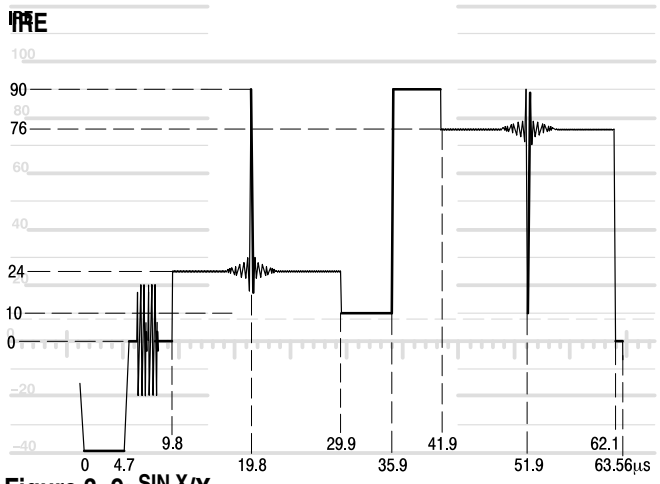


Figure 3–9: SIN X/X

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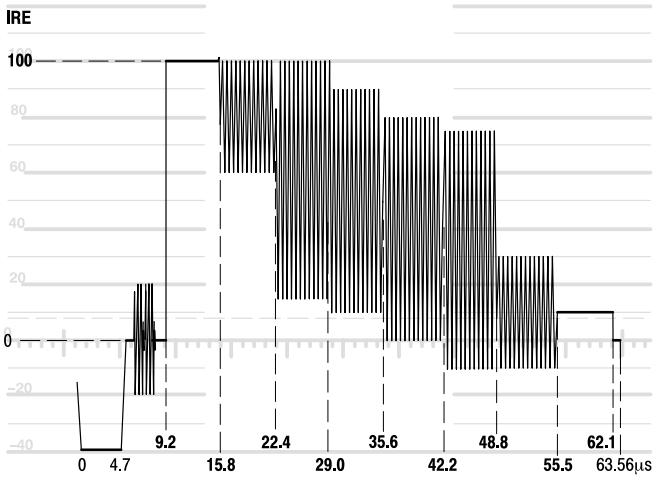


Figure 3–10: FCC Color Bars

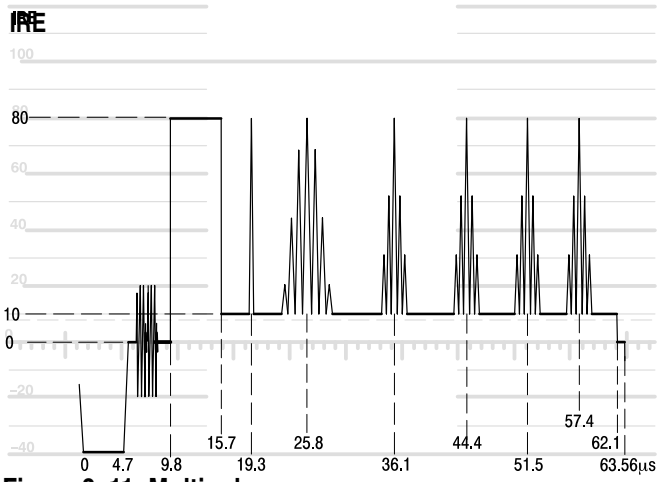


Figure 3–11: Multipulse

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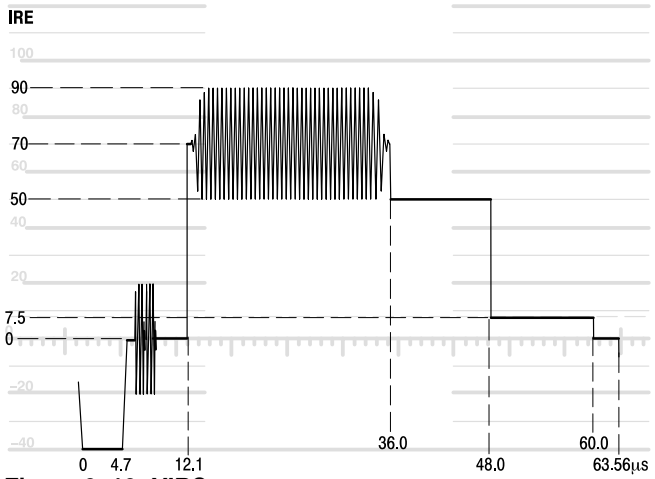


Figure 3–12: VIRS

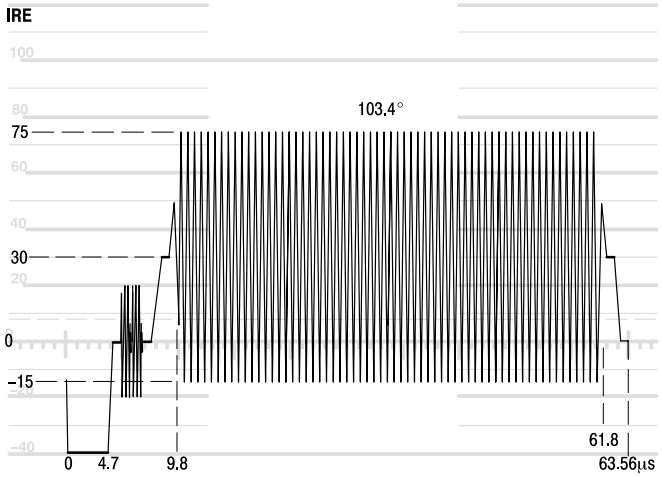


Figure 3–13: Red Field

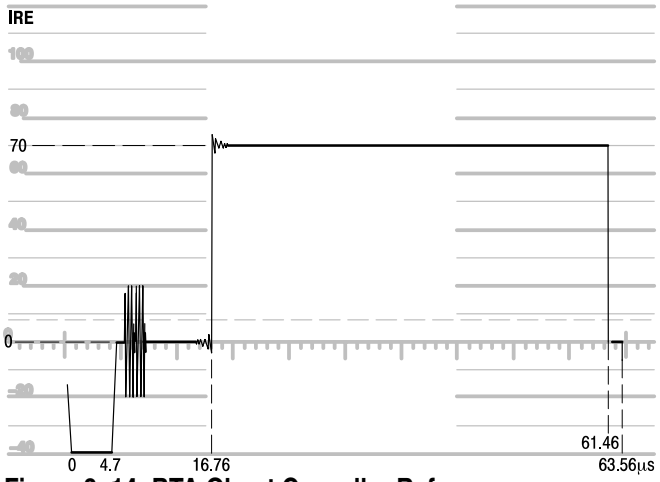


Figure 3–14: BTA Ghost Canceller Reference

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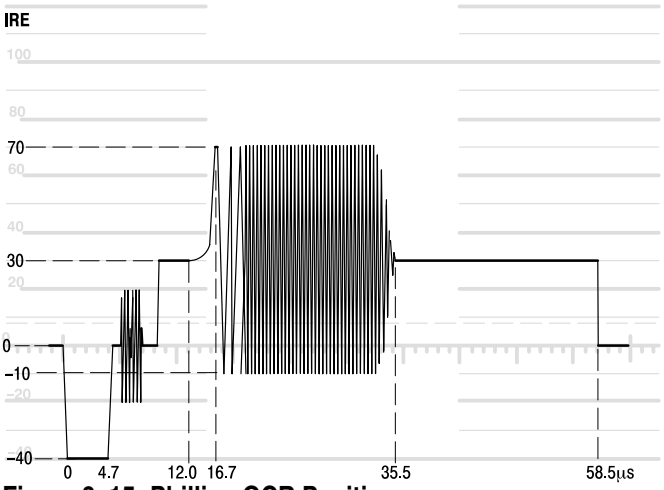


Figure 3–15: Phillips GCR Positive

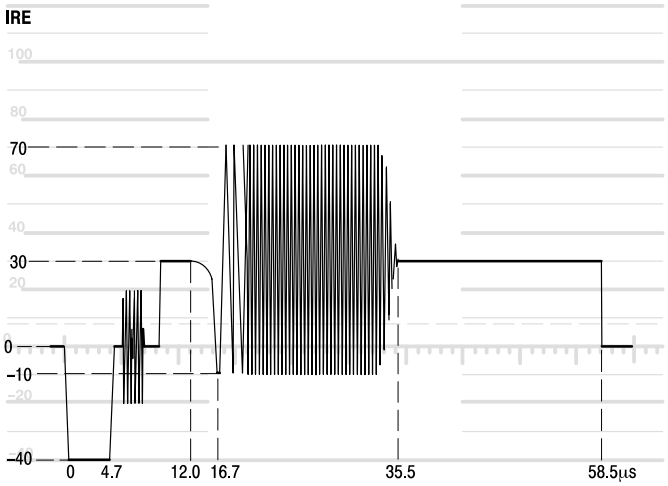


Figure 3–16: Phillips GCR Negative

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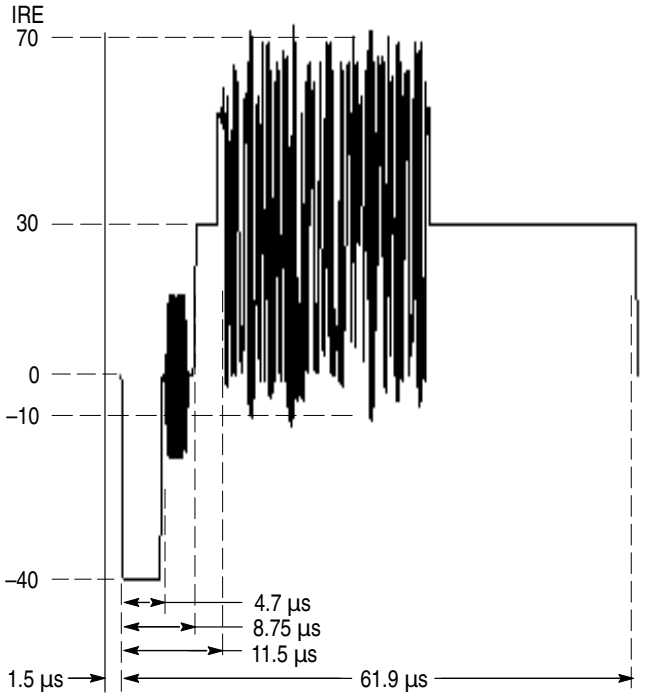


Figure 3–17: Korean GCR Positive

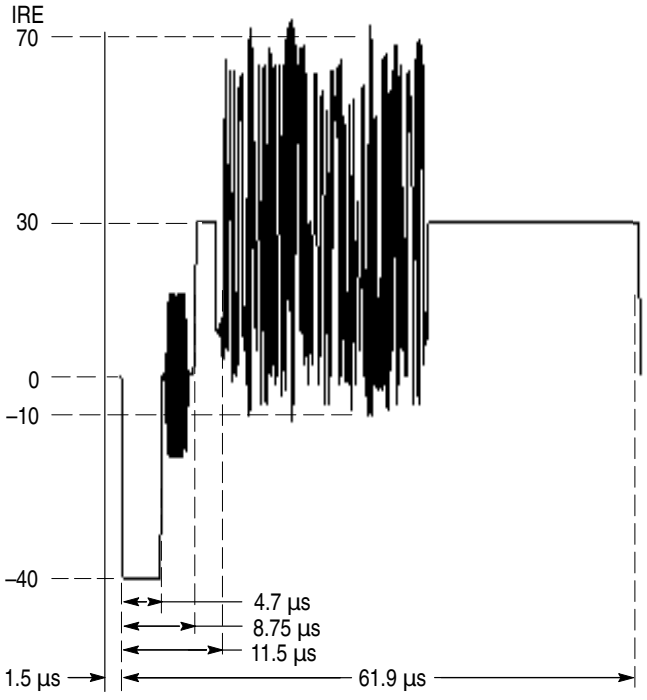


Figure 3–18: Korean GCR Negative

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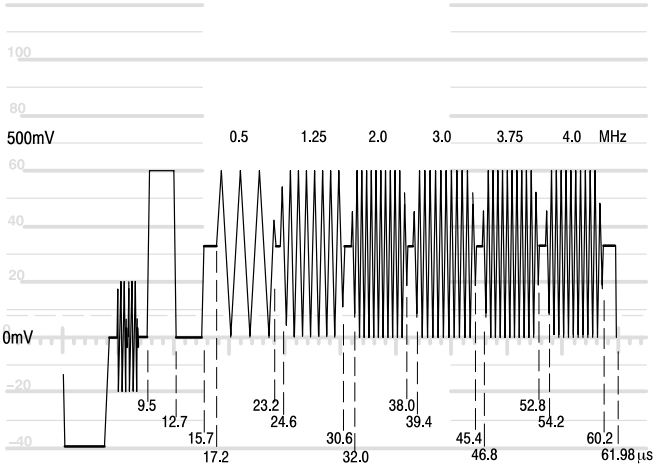


Figure 3–19: Cable Multiburst

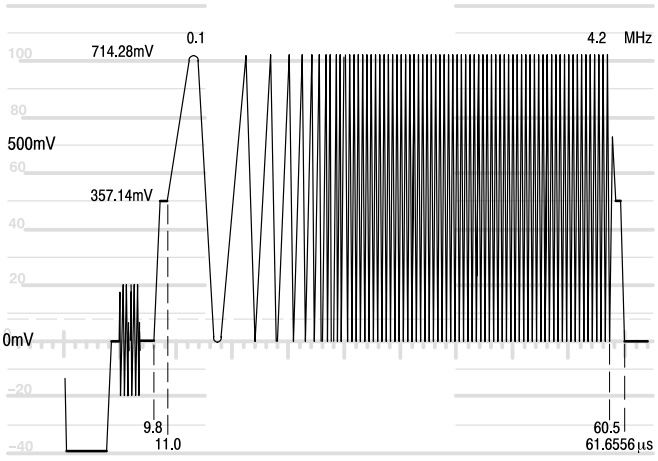


Figure 3–20: Cable Sweep

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Table 3–5: Genlock Characteristics

Characteristics	Performance Requirements	Supplemental 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	
Frequency Dependence on Input Burst	≤ 1° burst phase change for ± 20 Hz change in incoming subcarrier	
Lock Range		
Frequency	3.579545 MHz ± 20 Hz	
Amplitude	+6 dB to –12 dB	Typically to –21 dB
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 3–6: Power Supply Characteristics

Characteristics	Performance Requirements	Supplemental 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		± 240 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.	

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Table 3–6: Power Supply Characteristics (Cont.)

Characteristics	Performance Requirements	Supplemental Information
Minimum Load		10 watt 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 (described below).
Power		75 VA 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 3–7: Physical Characteristics

Characteristics	Performance Requirements	Supplemental Information
Dimensions Height Width Length	 1.734 inches (4.404 cm) 19.0 inches (48.3 cm) 18.4 inches (46.7 cm)	
Net Weight	9.5 lbs (4.3 kg)	
Shipping Weight	21.5 lbs (9.8 kg)	

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Table 3–8: Environmental Characteristics

Characteristics	Performance Requirements	Supplemental Information
Temperature Nonoperating Operating	 –40° to +65° C (–40° to +149° F) 0° to +50 °C (32° to 122° F)	
Altitude Nonoperating Operating	 To 50,000 ft (15,240 m) To 15,000 ft (4,572 m)	
Vibration (Operating)	Fifteen minutes each axis at 0.025 inch. Frequency varied from 105510 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's, $^1/_2$ sine, 11 ms duration, three guillotine shocks per side.	
Transportation	Qualified under NTSA Test Procedure 1A, Category II (36-inch drop).	

Table 3–9: Certifications and compliances

Category	Standards or description
EC Declaration of Conformity – EMC [1]	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 1 High-quality shielded cables must be used to ensure compliance to the above listed standards.
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.

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Table 3–9: Certifications and compliances (cont.)

Category	Standards or description	
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 1	No pollution or only dry, nonconductive pollution occurs. Products in this category are generally encapsulated, hermetically sealed, or located in clean rooms.
	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.
	Pollution Degree 3	Conductive pollution, or dry, nonconductive pollution that becomes conductive due to condensation. These are sheltered locations where neither temperature nor humidity is controlled. The area is protected from direct sunshine, rain, or direct wind.
	Pollution Degree 4	Pollution that generates persistent conductivity through conductive dust, rain, or snow. Typical outdoor locations.
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.
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.	

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WARNING

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

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Theory of Operation

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Theory of Operation

The VITS 200 contains three boards:
A1 Inserter,
A2 Front Panel, and
A3 Controller.

The Front Panel board contains only momentary contact switches and a connector, and needs no further discussion.

The Controller and Inserter boards interact quite intimately; therefore some of the circuit discussions will include parts of both boards.

This description will include the following sections:

Test Signal Generation
Genlock
External Inputs
Signal and Switching Control
Character Generation
Front Panel and Controller
Power Supply

When a new function is mentioned, the board name and reference designator for the part which performs that function will be put in parentheses; for example: The timing for the channel switch (A1U64) is generated by the Horizontal Timing PROM (A1U27).

Test Signal Generation

Test signal circuitry is located on the Inserter board and is found on the following schematics: Inserter<1>, Source ID and Bypass Controls <3>, and Analog Output <7>.

Test signals are generated by clocking data from PROMs to a digital-to-analog converter at an 8 FSC rate (28.636363 MHz). The output of this DAC is filtered and buffered before driving the Test Signal Output, the black burst channel switch (A3U60), and the VITS insertion channel switch (A1U64).

Test signal generation starts with a 4 FSC clock which clocks the Horizontal Counters (A1U28, schematic 3), to provide 910 counts per line of video. This part also decodes backporch clamp pulse "CLAMP", for clamping the test signal. The Horizontal Counter drives the Horizontal Decoder PROM (A1U27, schematic 3) which provides timing signals for various functions. The Horizontal Counters are reset by a pulse, "[FRAME]", from the Genlock circuitry so that

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the test signals are timed with program video. A pulse once per line from the Horizontal Decoder PROM enables the Vertical Counters (A1U24, schematic 3).

The Vertical Counters drive the Vertical Decoder PROM (A1U25, schematic 3). The Vertical Decoder PROM is latched twice per line by A1U26.

Test signal data is stored in PROMs A1U4, A1U5, and A1U6, shown on schematic 1. A1U4 and A1U5 store the eight MSBs of alternate data samples and U6 stores the four LSBs for samples from both U4 and U5. The outputs of U4 and U5 are multiplexed (A1U82 and A1U83, schematic 1), to increase the data rate from 4 FSC to 8 FSC, and latched (A1U1, schematic 1) before being converted to ECL levels (A1U9, A1U10, schematic 1) for the DAC (A1U65, schematic 7). The four LSBs are latched by A1U3 (schematic 1) and then selected by a multiplexer (A1U7, schematic 1) before being converted to ECL levels by A1U11 (schematic 1) for the DAC.

Data is stored in these PROMs in blocks of eight. These blocks of data are addressed by the Block PROM, A1U13 (schematic 1), and two test signal select lines. When the test signal select circuitry calls for a certain signal, the Block PROM (A1U13) uses V1 to determine the correct phase of subcarrier, "HALF-LINE" to determine when to generate a half line, and the seven MSBs of horizontal count to select the appropriate blocks of data.

The 12-bit Tektronix DAC, A1U65 (schematic 7), turns the data into analog voltage levels at an 8 FSC rate. A one-volt reference is generated for the DAC by A1U84 (schematic 7) and associated parts. The analog signal is then filtered by a seven-pole filter (A1L12, A1L13, A1L14, and associated capacitors, on schematic 7) with one second-order group delay correction stage (A1T2, schematic 7).

The signal is AC coupled to a buffer and clamped (A1U67, schematic 7) 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 TEST SIGNAL OUTPUT bnc (A3J54, schematic 6), the Black Burst circuitry (A3U60, schematic 6), and the channel switch (A1U64, schematic 7), which switches between Program Video, VITS, and external inputs. The output of the channel switch, A1U64, drives the MONITOR OUTPUT bnc and the PROGRAM OUTPUT bnc.

The Program Output goes through a relay (A1K2, schematic 7) which switches the Program Input through a delay line (A1L7, A1L3, C52, schematic 7) to the Program Output when the power shuts off or when the front-panel RELAY BYPASS button is pushed. The delay line in this Relay Bypass mode matches the time it takes when the video travels through the processing circuitry. Control of this relay will be explained in the CONTROLLER discussion of this section.

Black burst output is generated by switching off the active video and leaving the sync and burst. The test signal from A1U67 (schematic 7) goes over a cable to

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the black burst channel switch, A3U60 (schematic 6), which switches between the test signal and ground at the appropriate times.

Genlock

The Genlock circuitry is located on the Inserter board and is found on the following schematics: Genlock <4>, Input <5>, and Clocks and Genlock Offset <6>.

The Program Input is buffered and clamped by A1U42 (schematic 5). The video then enters the sync stripper IC, A1U44. This IC not only strips off composite sync but also generates back porch timing for clamping.

Comp sync and back porch timing are level shifted to TTL levels by A1Q1, A1Q3, A1VR1, and A1VR2 (schematic 5) and gated together by A1U57a and A1U57b (schematic 5), to get a clamp pulse to control A1U42. A1U44 also generates a program present signal as long as video greater than 35 dB is present. The controller, A3U23 (schematic 3), uses this signal to determine whether or not to try to lock to Program Video or to try to lock to the alternate genlock source, External 1. The alternate genlock mode must be enabled for this to be used.

Input buffer A1U42 also drives the analog-to-digital converter (ADC), A1U43 on schematic 5, for the genlock. The ADC has three inputs, two of which are used. Program Video drives one of the inputs and EXTernal 1 drives the other. Either can be used by the genlock circuit, as chosen by the controller. The ADC has an AGC and clamp, with "SYNCTIP" and "BACKPORCH" providing timing.

The clamped and AGC'd video is then routed through an anti-aliasing filter (A1L1, A1C19, A1C20, and A1C21 on schematic 5) and brought back into the ADC where it is digitized. The digital output goes into a PAL where it is inverted and latched. "SIS_TM" from the genlock ASIC (A1U29, schematic 4), if enabled, holds the same sample across the bottom of sync to block Sound-in-Sync pulses from reaching the genlock circuitry.

The data then goes to the genlock ASIC (A1U29, schematic 4) which has RAM, counters, decoders, and other circuitry necessary for genlocking. The composite sync from the chosen genlock input is also routed to the genlock ASIC through a PAL (A1U70, schematic 3) and is controlled by the same line that chooses the genlock input, "GLSEL1". The genlock ASIC uses the comp sync to roughly position the Horizontal and Vertical Counters within it.

The genlock processor (A1U35, schematic 4), an 8 MHz Z80, uses the data to calculate the SCH of the incoming video to determine the correct color framing. It then 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 PROM A1U33

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(schematic 4). The arctangent is then used as a correction to the system clock, a VCO on A1 schematic 6, thus making a phase-locked loop.

The correction is an eight-bit word which is sent to DAC A1U59 on schematic 6. The output of the DAC is integrated by an opamp (A1U61A, schematic 6) and a capacitor, A1C46. An analog switch (A1U60, schematic 6) is used to short the integrator when not genlocking, and to change the loop characteristics once lock is securely acquired. The processor also increases loop gain once lock has been acquired, and tells the genlock ASIC to send out a frame reset pulse which aligns the test signal counters with the genlock counters.

There are several other parts which support the genlock function. A1Y39, on schematic 4, is the clock for the genlock processor (NOT the system clock, VCO). A1U31, schematic 4, is a hardware watchdog which resets the processor if it fails to receive an "awake" signal from the processor within the right amount of time. A1U38, schematic 4, latches control signals "GLK/[INT]" and "ACQ/[HOLD]" for the analog switch, A1U60, schematic 6; the signal "LOCKED", which tells the rest of the VITS 200 that genlock has been achieved; and the signal "CLAPBRD", which is used in the Video Clapboard feature, described later. Counter/timer A1U30, schematic 4, is used to distinguish between even and odd fields of video.

Genlock sub-clock cycle timing can be adjusted up to 90 with A1S7, schematic 4. The VITS signals are timed to program video input at the factory, and should not need adjustment.

Diagnostics may be run on the genlock circuit by manually rotating A1S8, schematic 4.

External Inputs

The External Inputs circuitry is located on the Controller board and is found on the following schematics: External Inputs 1 & 2 <1>, External Inputs 3 & 4 <2>, Input <5>, and Clocks and Genlock Offset <6>.

There are four external inputs to the VITS 200, each of which may be selected for any lines of the vertical blanking interval just like a VITS signal. As the four external inputs are identical, this discussion will focus on the EXTernal 1 input.

The EXTernal 1 input is internally terminated in 75 ohms (A3R1, schematic 1) and AC-coupled by A3C1 to buffer and clamp amplifier A3U1, on schematic 1. The video buffer drives a separate sync stripper (A3U3, schematic 1) for the channel. The buffer and clamp amplifier and the sync stripper work the same as for the Program Video input. Refer to the GENLOCK section of this discussion for more details.

The external inputs have some features not found on the Program Input. The clamp for the external input can be run from its own sync stripper, or from the

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system timing; that is, a clamp pulse derived from the test signal counters. This is a jumper selection, made with A3J19 (schematic 1) for the EXTernal 1 input.

The external input comp sync is compared to system sync timing pulse "[SYNCT]" by A3U6A (schematic 1), to check that they are timed close to each other. "[SYNCT]" is a negative-going 10.8 s pulse which frames the acceptable time for sync pulses to occur. If any portion of the positive-going external input comp sync occurs outside of this period, one-shot A3U7A (schematic 1) is triggered to produce the "BADSYNC1" pulse.

The "BADSYNC1" output is monitored by A3U12 (schematic 6), which does not allow insertion into Program Video if the "BADSYNC1" pulse occurs. This protects the program from getting a sync pulse somewhere out in the middle of a line.

The external input may be changed to DC coupling. This selection is made in the UTILITIES menu. When this coupling mode is selected, the gate of FET A3Q1, pulled down to 12V by "DC/[AC1]" for AC coupling, is pulled up to the level of its source. The FET is then turned on, shorting out the AC-coupling capacitor, A3C1.

While DC coupled, the external input comp sync is not monitored, nor is insertion inhibited if sync is not correctly timed. The "CLAMP" pulse to the input buffer is turned off (A3U55A, A3U56A), and clamp capacitor A3C3 is shorted to ground by A3U57 on schematic 6. DC coupling of an external input, then, allows the insertion of signals which do not have sync pulses.

While DC coupled, the DC level may be adjusted with A3R60 When AC coupled the clamp level may be adjusted with A3R9. A3R15 is used to adjust the external input gain.

The video from the external input buffer is applied to channel switch A3U41 (schematic 5), which is controlled line-by-line by the signal selection circuitry. External input channel switch A3U41 drives the program channel switch, A1U64 on schematic 7, which switches between Program Video, VITS signals, and external input signals.

Signal and Switching Control

The Signal and Switching Control circuitry is located on the Controller board and is found on the following schematics: Microprocessor Kernel <3>, and Test Signal & Char Sel Memory <4>.

The circuitry for controlling the test signal generator, the external input channel switch, and the program channel switch resides on both the A3 Controller board and the A1 Inserter board. The controller (A3U23, schematic 3) stores VITS selections in RAM (A3U29, schematic 4) which is addressed by the system

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counters each line. The RAM output controls the channel switches and test signal generation.

The addressing for the test signal select RAM (A3U29, schematic 4) comes from the vertical decoding PROM (A1U25, schematic 3). The RAM does not contain a location for every line in the field so it is necessary to decode the vertical count. The RAM addressing goes through a buffer which can be tri-stated (A3U36, schematic 4) while the controller (A3U23, schematic 3) is writing into the RAM.

The output of the RAM is latched in a PAL (A3U38, schematic 4) where control signals for the external input channel switch (A3U41, schematic 5) are decoded. Two signals, "VSYNC" and "VDRIVE", which come from the vertical decoder PROM, force the output of U38 to select the vertical sync signal regardless of the output of the RAM. The controller uses that time to write to the RAM.

The signal "BADSYNC" is used by A3U38 to inhibit the selection of an external input when the sync from that input does not properly line up with the system sync. The decoded control signals for the external input channel switch are latched again by A3U58 (schematic 4) so they match the delay through the rest of the selection circuitry. A3U58 uses "BADSYNCEX" during alternate genlock mode to inhibit insertion of external inputs which have sync pulses that are not aligned with EXTernal 1 input, which is being used as the genlock source. A3U58 is also used to invert "[SYNCT]" to get "BLKBRST" which controls the black burst channel switch.

From U38 the test signal select lines FPTS[0..7] go to the A1 Inserter board. Two PALS, A1U16 and A1U17 (schematic 1), decode control signals and latch the signal selections. A1U16 latches the lower six bits to the test signal PROMs, decodes when the source ID signal is requested, and determines when it is okay to generate characters. It uses the two MSBs to determine what the program channel switch should select: Program Video, test signals, or external inputs. The "VDRIVE" input to A1U16 is used to hold the two MSBs constant while the controller writes other choices into the RAM.

A1U17 decodes when VIRS AUTO has been requested. It enables the circuitry which compares Program Video with the VIRS test signal to see if VIRS is already present on Program Video (Inserter schematic 5). A1U46 (schematic 5) is an operational amplifier which subtracts low-pass filtered Program Video from filtered test signals, and drives a window comparator (A1U47A and A1U47B, schematic 5).

If the program signal and the test signal match closely enough, the comparator output remains high and the output of OR gate A1U48A (schematic 5) remains high, and one-shot A1U71B (schematic 5) is not triggered. The OR gate can only trigger the one shot when A1U17 determines that VIRS AUTO has been requested and drives "[VIRSAMP]" active low. "VIRSPRES" from A1U71B returns to A1U17 and "CCVIRS" from A1U17 is sent to A1U14 (schematic 1) to control insertion.

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Similarly, when AUTO CAPT [1..4] is requested as a VITS, A1U17 (schematic 1) uses "CCLINE" to enable A1U41 (schematic 5) to look for close captioning on the selected video line on the genlock input. A1U41 drives "CAPTION" high whenever video goes above approximately 285 mV.

If "CAPTION" is activated by close-captioning pulses, one-shot A1U71A is triggered. "CCPRES" goes back to A1U17 (schematic 1), which activates "CCVIRS". This tells A1U14 whether to pass the close captioning or to switch to one of the four external inputs when close captioning is not on the Program Video.

A1U17 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 A1U16 and A1U17, the insertion timing "CHSWT", regeneration of sync and burst request and timing, character present signal, and other timing signals and determines three control signals: two for the program channel switch, "SW0" and "SW1", and one to choose between character generation and test signal generation, "TS/[CHAR]".

Character and Source ID Generation

The Character and Source ID Generation circuitry is located on the Inserter board and is found on the following schematics: Inserter <1> and Source ID & Bypass Controls <3>.

While the source ID circuitry is located entirely on the Inserter board, the character-generation circuitry is divided between the Inserter board and the Controller board. The character generator and the source ID generator share two ICs (A1U12 and A1U15, schematic 1) which form a state machine to generate the data for shaped pulse edges. When source ID pulses or characters are called for, the test signal data latch outputs (A1U1, schematic 1) become high impedance and the outputs of A1U12 are enabled. The character or ID data then goes to the DAC (A1U65, schematic 8) which converts the data to actual analog pulses.

When the state machine sees a low-to-high transition, it counts up to six and stops. When the state machine sees a high-to-low transition, it counts back to zero and stops. This count goes to A1U12, where it is decoded into the data which produces rising and falling shaped edges out of the DAC.

The source-identification signal is one line of video with up to 16 pulses on it, which can be recognized by a TEKTRONIX VM700A. The VM700A expects a start and a stop bit, but the other 14 bits (pulses) can be used to identify up to 16,384 sources (214).

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The 16 bits can be set or cleared by two sets of DIP switches (A1S5 and A1S6, schematic 3) accessible through the rear panel of the instrument. The 16 bits are loaded into two shift registers (A1U22 and A1U23, schematic 3) once every line by a signal decoded from the Horizontal Counters. The bits are then shifted out by "IDCLOCK", a clock which is also decoded from the Horizontal Counters.

The serialized ID bits go to A1U15 (schematic 1) where they are gated with "IDCLOCK" and latched by the eight times subcarrier (8 FSC) clock. If Source ID is chosen for a certain line, A1U16 (schematic 1) activates "IDEN" which causes the state machine in A1U15 to be controlled by the latched ID signal.

Character generation begins on the Controller board, A3. Controller A3U23 writes VBI (Vertical Blanking Interval) character selections made from the front panel or RS-232 into RAM (A3U32, schematic 4) during the vertical sync. The top 512 bytes contain the 15 different vertical blanking interval messages. Each vertical message may be up to 23 characters. The lower three blocks of 512 bytes hold three different pages, or frames, of character messages. Each page may contain 20 characters across by 13 lines down, for a total of 260 characters per page. In the RAM each character is represented by one byte.

During the vertical blanking interval, P0 and P1 are forced high by "[BLANK]" (A3U39C and D, schematic 4) to select the block of RAM holding the vertical interval messages. During the active portion of the picture frame one of the lower three blocks of data is addressed by CA9 and CA10 from the controller.

Part of the lower nine address bits come from a vertical decoder PROM (A3U37, schematic 4), and the remainder come from the Horizontal Counters. The address lines driven by the Horizontal Counters change the character slot in the RAM as the video scans right over the picture frame. The address lines from the vertical decoder PROM tell the RAM when a new line of characters is needed. This addressing is latched by A3U34 (schematic 4) which goes to high impedance when the controller is writing to the RAM.

From the RAM, the bytes, each representing a character, go to the pixel PROM (A3U31, schematic 4). The pixel PROM contains an array of 32 by 32 pixels for each character. The pixels are made by serializing 8-bit words out of the pixel PROM. "BH3" and "BH4" select these four words as the video scans horizontally. "FLD" takes care of the field interlace. The 16 lines per field per character are addressed by "DV[0..3]" from vertical decoder PROM A3U37 (schematic 4).

A3U30 (schematic 4) serializes the data. Data is loaded every eight clock cycles (4 FSC) by "CHLOAD" from A3U35 (schematic 4). A3U30 shifts the pixel data over to the Inserter board where it is given shaped edges by the state machine described in the source ID description.

A3U35 (schematic 4) performs several functions besides deriving "CHLOAD" from the Horizontal Counters. It also looks at the data coming out of the RAM to determine if a character is being called. If it is, "CHARPRES" is asserted

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unless characters have been disabled by "[CHAREN]" or "[VCHAREN]" from the controller. "[CHAREN]" enables or disables the characters in the active picture area, and "[VCHAREN]" enables or disables characters in the vertical blanking interval. The vertical blanking lines are defined by "[BLANK]".

"DATACOMP", from the Inserter board, indicates when the level of the character pulse is approximately equal to or greater than the test signal data. This signal controls when "[CHARPRES]" is deasserted, so that the transition from character to test signal will be smooth. Bit 7 from RAM A3U32 is used to invert the data coming from the serializer, A3U30, when a cursor is desired. This bit should be set for only one location in the RAM at a time. The data inversion occurs in A1U15 (schematic 1).

Front Panel, Remote Controls, and Controller

The Front Panel, Remote Controls, and Controller circuitry is located on the Controller board and is found on the following schematics: Microprocessor Kernel <3>, External Multiplexer <5>, and Processor I/O <7>.

All functions of the VITS 200 may be controlled from the front panel. The momentary contact switches on the front panel are debounced by A3U19 (schematic 3), which then outputs a code which indicates the activated switch and sends an interrupt to the controller (A3U23, schematic 3).

Remote Controls

Control of the VITS 200 may also be accomplished through the RS-232 port. A cable attaches the rear panel RS-232 connector to A3J11 (schematic 5). A3U40 (schematic 5) level shifts the RS-232 data to and from TTL levels for the controller. The controller has two RS-232 interfaces built into it.

The third control method for the VITS 200 is a ground closure remote which can be connected to the rear-panel REMOTE CONTROL connector. A cable connects this to A3J12 on the Controller board (schematic 5), see Fig. 71. Note that there is not a one-to-one correspondence between the pins on the board and on the rear-panel connector. Pin numbers in this discussion refer to the pins of A3J12. Pins 1 through 15 connect to tri-state buffers (A3U50 and A3U62, schematic 7) which the controller can read. Capacitors and diodes (A3CR2, A3CR3, and A3CR4, schematic 7) protect these inputs from static discharge.

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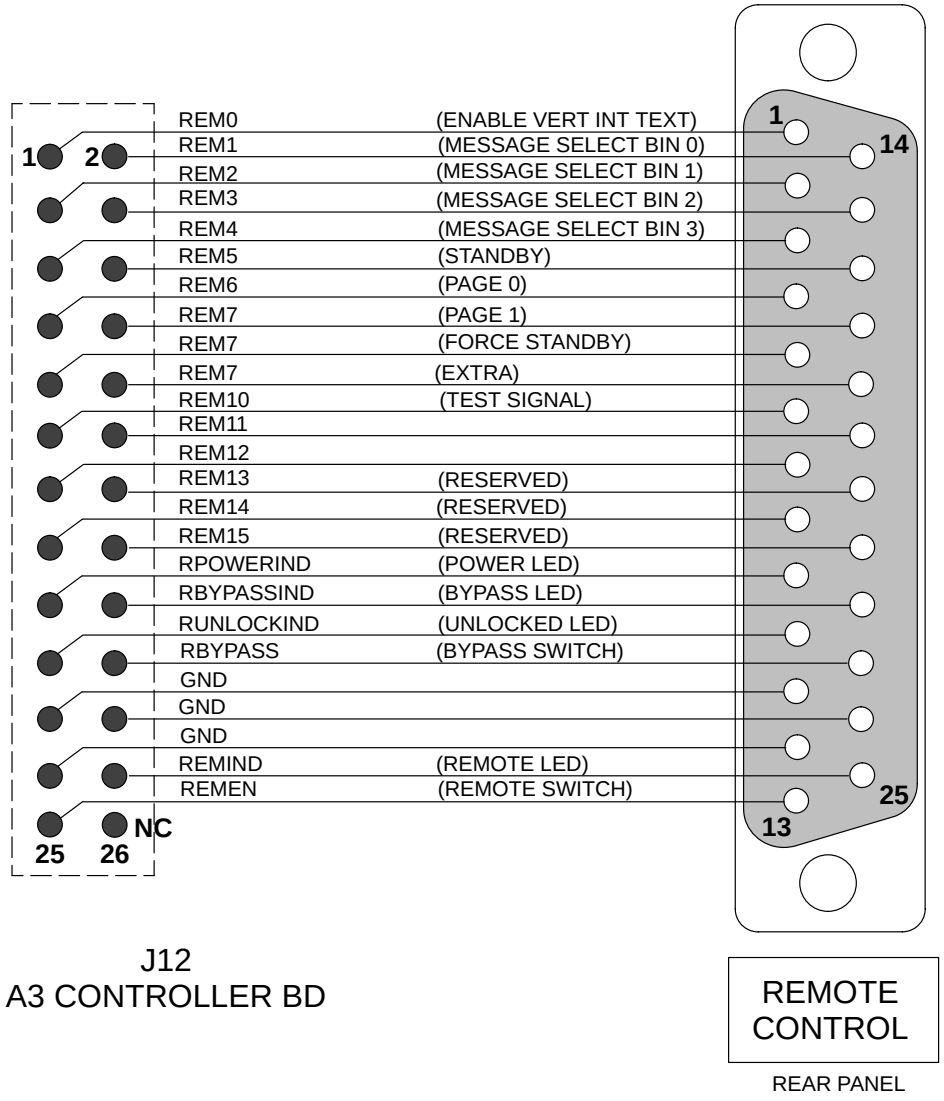


Figure 4–1: Remote Control Connector Pinout.

Pin 16 is driven by an open collector transistor (A3Q40, schematic 7), and pulls down when the VITS 200 is in Standby mode. This is intended to be used as a trigger for other instruments with ground closure remotes, such as the TEKTRONIX ASG 100. Pin 17 is intended to drive an LED to indicate power on. Pins 18 and 19 are to drive LEDs indicating when the VITS 200 is in Bypass mode and when it is not genlocked (UNLOCKED). A3U43A and A3U43B (schematic 5) are used as buffers to drive A3Q17 and A3Q18, respectively. Both transistors work in the same manner; when the buffer inputs are high, the base of the transistor is pulled up to +5V and is turned completely off. When the buffer inputs are low, the transistor is saturated and drives current to the LED in the

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remote. The current to the remote LEDs is limited by collector resistors A3R149 and A3R150.

Pin 20 of the ground closure remote forces the VITS 200 into Relay Bypass mode when pulled low by the remote. Pin 20 is ORed (A3U59, schematic 5) with a bypass control line from the controller, and then sent to the Inserter board bypass controller (A1U70, schematic 3). Pins 21 through 23 are grounds. Pin 24 is intended to drive an LED indicating when the ground closure remote has control of the VITS 200. Pin 25 is connected to the controller, and is pulled low by the remote to request control of the VITS 200.

Controller

A3Y1 (schematic 5) is the clock for the controller (A3U23, schematic 3). A3U44A and A3U44B (schematic 5) convert the clock output to a differential signal before it goes to the controller. A3U17 (schematic 3) is a hardware watchdog for the controller. If it is not given an "[AWAKE]" signal every so often, it assumes that the processor is not functioning correctly and resets it. It will also reset the processor if the +5V supply drops below +4.5V.

The address space of the controller is decoded by A3U21 (schematic 3) to get chip enables and latch pulses. A3U28 (schematic 3) generates output enables for the software PROM (A3U26, schematic 3), the stack RAM (A3U18, schematic 3), and the nonvolatile RAM (A3U27, schematic 3). A3U28 also generates the output enables and read/write signals for the test signal select RAM (A3U29, schematic 4) and the character select RAM (A3U32, schematic 4).

The controller latches addresses to the test signal RAM with A3U22 (schematic 3) and reads and writes data to the RAM via A3U25 (schematic 3), a bidirectional tristate buffer. Similarly, the controller latches addresses to the character select RAM with A3U20 (schematic 3) and reads and writes data to the RAM via A3U24 (schematic 3). An extended data bus is accessed via A3U53 (schematic 7).

On the extended bus are tristate buffers A3U52 (schematic 7) for reading front-panel encoder A3U19 (schematic 3), A3U51 (schematic 7) for reading status bits from the genlock processor, and A3U50 and A3U62 (schematic 7) for reading the ground closure remote.

Output enables for A3U50, A3U51, A3U53, and A3U62 are generated by A3U54 (schematic 7). Also on the extended data bus are latch A3U47 (schematic 7) for front-panel display data, latch A3U48 (schematic 7) to control the external input clamps and genlock diagnostics, and latch A3U61 (schematic 7) for various control signals.

A3U61 pin 19 controls the regeneration of sync and burst. A3U61 pin 16 allows the controller to put the VITS 200 into Bypass mode. A3U61 pin 15 allows the controller to put the VITS 200 into Standby mode. A3U61 pin 12 selects between the mode that allows programming of lines 10 through 23 and the mode that allows programming of lines 17 through 30. A3U61 pin 9 controls whether

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the VITS 200 tries to lock to program input or EXTernal 1 input. This line switches the input to the genlock A/D (A1U43, schematic 5), the back porch signal to the A/D, and the comp sync to the genlock with A1U70 (schematic 3). A3U61 pin 6 drives the remote indicator output. A3U61 pin 5 goes to A1U14 (schematic 1) and allows the controller to inhibit insertion of test signals while still passing program signal.

Power Supply Overview

The power supply is located on the Inserter board and is found on schematics <8> and <9>. This type of power supply is called a current-mode-controlled, discontinuous, flyback, switching power supply. The current output is distributed between the four supplies as follows:

+12V	0.5 Amps max
+5V	4 Amps max
5V	1.5 Amps max
12V	0.2 Amps max

The power inductor, T1 (schematic 8), is driven by switching the voltage to its primary winding on and off at a rate of approximately 45kHz. T1 is not used as a transformer, but as an energy storage device; the energy is stored in the primary during the first half of the switching cycle, while voltage is being applied. On the second half of the switching cycle, voltage to the primary is switched off and the energy stored in T1 is transferred to the secondaries.

Regulation is accomplished through feedback from the +5V supply to the Pulse Width Modulator, U78 (schematic 8), controlling voltage to the primary. This varies the length of time that voltage is applied to the primary, causing it to store either more or less energy.

There is also circuitry to provide for operation from both 110 and 220 VAC supplies, overvoltage protection (crowbar) on the +5V supply, and shutdown circuitry which forces a restart of the supply if it remains in current limit for more than a short period of time (<1 sec).



WARNING. *All primary voltages are referenced to a floating ground, not chassis ground. An isolation transformer or a differential amplifier is therefore required for troubleshooting the circuitry in the primary and the Pulse Width Modulator, and in their supporting circuits.*

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Power Supply Detailed Description

Input and AC to DC Converter <8>

This circuitry filters and rectifies the input AC voltage directly off the line, placing a DC voltage on C110.

The line current passes through line filter LF1, fuse F1, and power switch S10, and is applied to full-wave bridge rectifier CR12 (all on schematic 8). Two of the diodes within CR12 will 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).

Thermistor RT1 limits inrush current on power-up, RV1 is a MOV (metal-oxide-varistor) which will clip any high-voltage spikes on the AC line before they get to the switching circuits. R157 discharges C110 when power is turned off. DS4 and associated parts form a relaxation oscillator, so DS4 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 the line cord. C85 and C86 also attenuate internal noise which could get to the line cord.

Kick Starter and Housekeeping Supply <8>

These circuits supply the power to start and maintain oscillation of the Pulse Width Modulator, so long as the input AC voltage is sufficient to maintain regulation.

When the VITS 200 is first turned on, C113 charges through R154. When the charge across C113 reaches approximately 16V, Pulse Width Modulator U78 begins to switch Q16 on and off through the emitter drive circuitry (Q17, CR22, CR21, and associated circuitry). The power to maintain the +16V charge on C113 is now provided by the housekeeping winding of T1, pins 5 and 6, through CR9.

If there is insufficient power to maintain the charge on C113 for any reason, such as the removal of P17, then the charge on C115 is quickly depleted. U78 will stop oscillation when the voltage on C115 drops to approximately 10V. Then, C113 will slowly charge again through R154, and the kick start sequence will be repeated.

Jumper P17 may be used as a troubleshooting jumper. With P17 pulled and power applied to T1 through P18, the housekeeping winding will be disabled and the power supply will start to come up and quickly shut down as charge drains from C113. This sequence will repeat as C113 charges and discharges. In this manner the kick start sequence and the operation of the supply can be verified before leaving the supply on full time.

Power Inductor Operation <8>

The heart of this power supply is T1, the multi-winding power inductor. The operation of T1 is as follows (see Fig. 4–2). Inductor T1 is initially uncharged (has zero magnetic flux and no current in the primary winding). Q16 and Q17,

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acting as a switch, are turned on by the drive pulse from U78. This places the voltage developed on C110 across the primary winding

The polarity of this voltage is such that the voltages induced in the secondaries all reverse bias their respective diodes (note the polarity dots). In this way, there is no current flowing in the secondaries while current is flowing in the primary. The primary current builds as a linear ramp, storing energy in T1 according to the relationship $E=^1/_2Li^2$, where L is the primary inductance and i is the current flowing through it.

The current path is broken when Q16 and Q17 are switched off, so current stops flowing in the primary. The flyback action of T1 then causes the voltages in the secondaries to reverse polarities, and all their diodes to turn on. The current in the secondaries linearly ramps down as the energy which was stored in T1's primary is delivered to the load, charging the output capacitors.

When all of the energy which was stored in T1 during the first half of this cycle is delivered to the load, the current in the secondaries is at zero, and the diodes turn off. There is no current flowing in either the primary or the secondaries until Q16 and Q17 are turned back on to start the next cycle. As there is not a continuous flow of energy in T1, this is called discontinuous flyback operation.

At low line voltages, or high loads, all the power in inductor T1 may not be transferred to the load during the second half of the cycle, in which case the diodes will not be off when Q16 turns back on. There will also be some energy still stored in T1 at the end of the cycle (at low line or high load).

Load regulation is provided by sensing the +5V supply with a divider comprised of R168, R169, and R170, and using U74 to convert this to an error signal. This error signal is optically coupled through U75 back to the Pulse Width Modulator, U78. Pulse Width Modulator U78 uses the error signal to vary the width of the pulse which drives Q17.

When the +5V goes too high, U78 narrows the pulse width. This reduces the amount of energy stored in T1 and, therefore, the amount transferred to the load, so the +5V goes down. Contrariwise, when the +5V is too low, the pulse width is increased, increasing the amount of energy stored in T1, and then transferred to the load, so the voltage goes up.

Jumper P18 is included for troubleshooting. Removing P18 will interrupt power to T1, which will allow inspection of U78 and the Q16 emitter drive circuits. Once U78 and Q16 have checked out, high voltage can be applied to T1.

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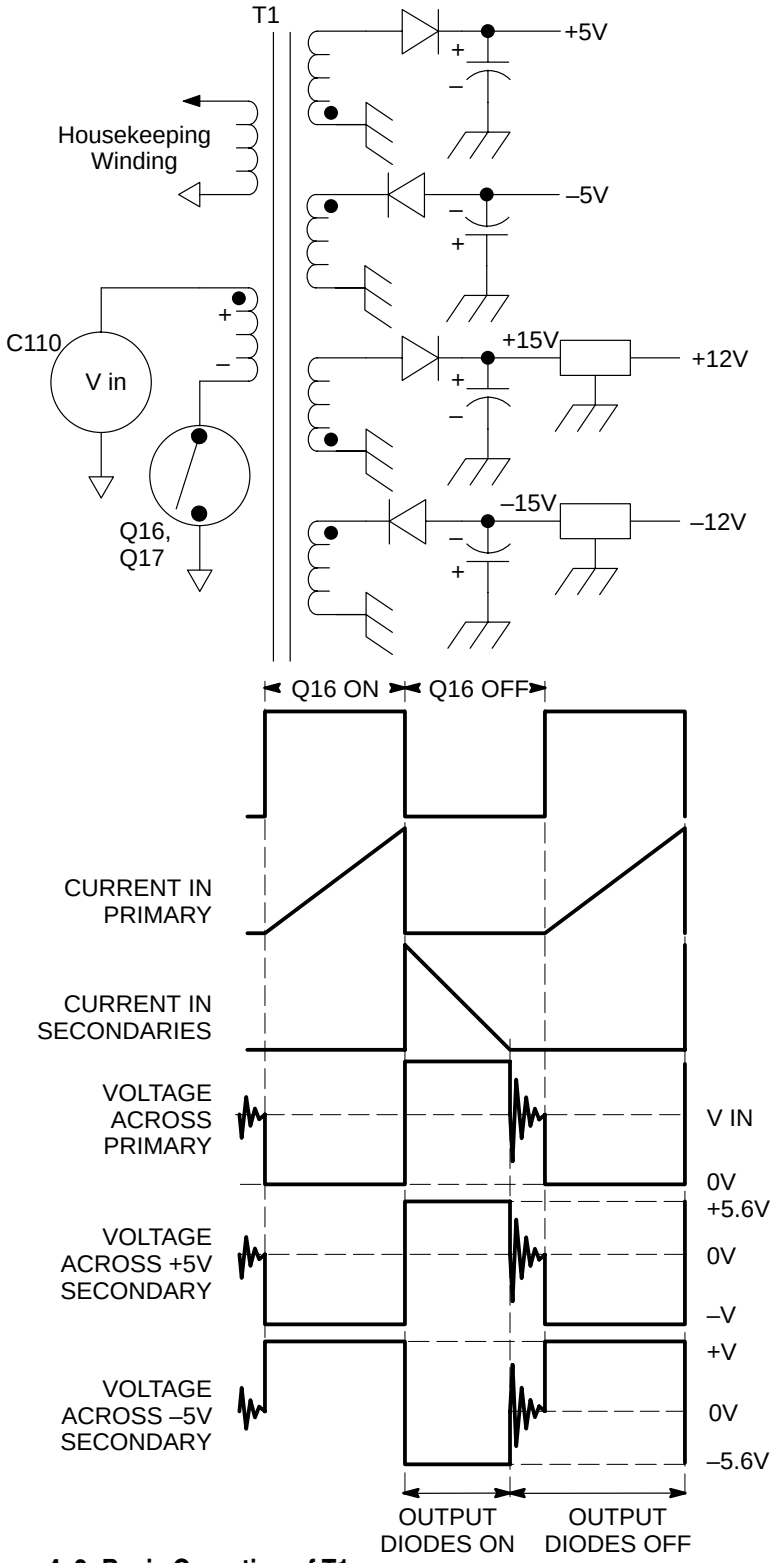


Figure 4–2: Basic Operation of T1

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Pulse Width Modulator and Error Amplifier <8>

Pulse Width Modulator U78 is a current-mode controller. It uses inputs from the primary circuit and from the +5V output to vary the width of the pulse which controls Q16, as mentioned earlier. This regulates the secondary voltages throughout variations in the input voltage, output load, and temperature. Current mode control works by allowing the current flowing in the primary to reach a peak level that is set by the output of the error amplifier, which is controlled by the +5V output. The current in the primary winding is sensed by R163 and applied to U78–3 as a voltage ("I SENSE").

At the start of the cycle, the oscillator sets the flip-flop within U78, turning Q16 and Q17 on. The primary current, and therefore the voltage to U78–3, ramps up until the level is sufficient to trip the comparator. This resets the flip-flop, ending the drive pulse to Q17, and the energy stored in the transformer is transferred to the secondaries.

Line regulation is accomplished automatically without voltage feedback. As the input voltage increases, the slope of the ramp increases, and the trip point is reached sooner. This results in a narrower pulse width. A decrease in line voltage causes a decrease in the slope of the ramp, and it takes longer to reach the trip point. The same peak current is reached in both cases, however, so the same amount of energy is transferred to the load. Line regulation, then, is achieved before variations in output voltage can occur.

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

If the load increases, the signal at U78–2 drops in voltage. This causes U78 to increase the pulse width, and thus the current and power through T1. On the other hand, if the load decreases, the +5V increases momentarily. The output pulse width then decreases along with the current in T1, and less power is transferred to the secondaries. In this way, the +5V is kept constant through changes in the load.

A portion of the timing ramp at U78–4 is added to "ISENSE" by Q180, to improve noise immunity.

Current Limit <8>

Current limit is provided for the primary circuit by the internal circuitry of U78. If the ramp voltage at U78–2 ever reaches 1V, the output drive pulse ends. This shuts Q16 and Q17 off, so no further voltage is supplied. Thus, the maximum primary current in T1 is limited to approximately 1.5 Amps, which corresponds to a maximum power level of approximately 60 Watts.

As the supply goes into current limit, U76A and Q18 come into play. U78–1 is an indication of the peak current in T1. This voltage is fed to the inverting input

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of comparator U76 and compared to a fixed voltage set by divider R161, R171, and R160. R171 is an output power adjustment, which is set so the trip point will be approximately 70 Watts. If U78–1 goes high enough to trip U76A–1 low, then C99 will start to charge.

If the current limit condition persists long enough for the charge on C99 to reach 700 or 800 mV, Q18 is turned on. This applies the reference voltage from U78–8 directly to U78–3, shutting down the supply and forcing a kick start. The supply will then cycle through kick start, current limit, and shutdown continuously until the problem is corrected. Jumper P9 is included for troubleshooting; its removal will disable the current limit shutdown circuits.

Base Drive and Snubber <8>

Q16 is a high (1000V) blocking voltage power transistor. To prevent transistor failure and ensure proper operation, Q16's base must have a large forward current during the on-time and a large momentary reverse current pulse during turn-off. This is accomplished by using an FET in the emitter to turn Q16 on and off. The modulated pulse from U78–6 drives FET Q17.

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

When Q17 turns off, the current path from Q16's collector to emitter no longer exists. For a brief time the collector current becomes reverse flowing base current in Q16, and flows out of Q16's base through CR21 and into the housekeeping capacitor, C113. This turns Q16 off very rapidly.

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

Secondary Circuits <8>

The secondary circuits all work in the same manner. As mentioned earlier under basic operation, during the first half of the cycle all their diodes are reverse biased, so there is no current flow. On the second half of the cycle, when Q16 is shut off, the flyback action reverses the polarities of the secondaries, and the diodes are forward biased. This allows the energy stored within T1 to charge up the capacitors in the secondaries. The $+5V_p$ and $-5V_p$ supplies use LC filters from this point, to further smooth the voltage and eliminate most of the ripple.

12 Volts Generation <8>

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

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Open Circuit Protection <8>

Overvoltage protection is provided on the +5V output by a crowbar circuit composed of Q15, VR4, and R146. If the +5V output exceeds approximately +5.5V, VR4 will start to conduct. When VR4 is drawing enough current through R146 to raise SCR Q15's gate voltage above its cathode by approximately 0.7V, Q15 will turn on. This shorts the +5V output to ground, forcing the primary circuit into current limit.

Regulated 5 Volts <9>

A regulated ±5V is used by the ADC (A1U43, schematic 5) and the DAC (A1U59, schematic 6). These regulated supplies are generated from the ±12V supplies, which are applied to three-terminal linear regulators (U52 and U53) to derive the ±5V supplies.

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Performance Verification

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Performance Verification

The specifications for this instrument can be verified using the following step-by-step procedure. Equipment that is called out in this procedure is assumed to be operating correctly and within calibration.

An accuracy ratio of 4:1 or better for warranted measurement specifications will be obtained using the equipment called out in the "Recommended Equipment List," with the following exceptions. Accuracy ratio for the equipment used to measure:

Monitor Out Gain Accuracy is 1.5:1

External Reference Return Loss is 3.1:1

Test Signal: K Factor is 1:1
SCH Phase is 1:1
Sync Amplitude is 2:1

The performance verification procedures should be performed at regular intervals to ensure that instrument performance is within tolerance. The recommended interval for performance verification is 2000 hours of operation, or at least every 12 months.

Recommended Equipment List

The following equipment and accessory items are required to do the Performance Verification Procedure. Broad specifications are followed by an example of equipment that meets these specifications.

Electrical Instruments

1. Variable Autotransformer
   For example: General Radio Metered Auto Transformer W10MT3W. If 220V operation must be checked, a conversion transformer or appropriate 220 volt autotransformer is needed.

2. NTSC Video Measurement Set
   For example: Tektronix VM 700A, Option 01

3. Multimeter
   Capable of measuring: 0–20 VDC, Accuracy ±0.7%

   For example: Tektronix DM252

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4. Frequency Counter
Capable of measuring frequencies up to 30 MHz at ECL levels
Accuracy: within 10 Hz at 28.6 MHz

For example: Tektronix DC503A

5. Peak-to-Peak Detector
Detector to calibrate the frequency response flatness
Input signal to 1 V_{p-p}, ±0.2% flatness from 50 kHz to 10 MHz

For example: Tektronix Peak-to-Peak Detector: Part No. 015–0408–00

6. Detector Head
For example: Tektronix 015–0413–00

7. Oscilloscope
Vertical Amplifier: 40 MHz Bandwidth, 1 mV Sensitivity
Accuracy: 0.25%
Time Base: 5 μsec/div to 2 msec/div, capable of dual time base and accepting external triggering

For example: Tektronix 11403 with a 11A34 Vertical Amplifier

8. Oscilloscope 10X Probe
For example: Tektronix P6137

9. NTSC Vectorscope and Waveform Monitor
Capable of displaying line-rate and field-rate signals, bandwidth of 50 KHz to 6 MHz. Equipped with an internal variable amplitude calibrator (VAC). Capable of measuring phase, differential phase, differential gain.

For example: Tektronix 1780R

10. NTSC Video Generator
Capable of producing: NTC7 Composite, FlatField, Multiburst, and Red Field.

For example: Tektronix TSG-170D

11. Spectrum Analyzer
Capable of measuring signals from 1 MHz to 50 MHz.
Frequency span of 1 MHz/div to 10 MHz/div, 30 kHz resolution.
Equipped with internal tracking generator.

For example: Tektronix 2712 Option 04

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12. Step Attenuator
1 dB steps; DC coupled with 75Ω impedance; flat response to 5.5 MHz.

For example: Tektronix 1434

13. White Noise Generator
Capable of inserting white noise on composite video with a signal-to-noise ratio of 28 dB.

For example: Tektronix 1434

14. Hum Noise Generator
Capable of inserting hum noise on composite video with a signal-to-noise ratio of 0 dB.

For example: Tektronix 1434

15. 75Ω Return Loss Bridge
50 dB return loss balanced, 50 kHz to 5 MHz

For example: Wide Band Engineering A57TLSCR with A56T75B (75Ω terminator)

Auxiliary Equipment

16. 75Ω Terminators
Two – 0.025% end-line terminators
One – feedthrough terminator

For example: Tektronix End-line Terminator, Part No. 011–0102–01
Tektronix Feedthrough Terminator, Part No. 011–0103–00

17. BNC Coax Cables
75Ω low loss video cables

For example: Tektronix Part No. 012–0159–02

18. BNC Adapter
For example: Tektronix Part No. 103–0028–00

Calibration Data Report

The Calibration Data Report that follows can be used to document instrument performance. In addition, it can be used as a short-form Performance Check for those familiar with the Performance Verification Procedure.

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Tektronix

Calibration Data Report

Instrument VITS 200 **Cal. Date**_____

Serial Number_____

Certificate Number [1]_____ **Technician**_____

Procedure 070-8967-00 **Revision Date**_____

Characteristics	Performance Requirement	Step	Incoming	Outgoing
Power Supply Characteristics				
Line Input Range	Regulates from 90 V_{AC} to 250 V_{AC}	6		
Program Channel				
Gain	Unity ± 1%	10		
Frequency Response	± 1% to 5.5 MHz ± 3% to 10 MHz	42		
Chrominance-to-Luminance Gain	± 0.5%	11		
Chrominance-to-Luminance Delay	≤ 5 ns	11		
Diff Phase	≤ 0.2°	12		
Diff Gain	≤ 0.2%	12		
Line Tilt	≤ 0.5%	10		
DC Output Level	0 V ± 10 mV	7		
DC Matching of Inserted Test Signal to Program Signal	± 3 mV	7		
Phase Match — Relay Bypass Path to Signal Processing Path	± 1° at F_{SC}	9		
Hum Rejection	50 dB	15		
Insertion Transients	≤ 10 mV	7		
Input Impedance	75 Ω	40		
Return Loss	36 dB to 5 MHz	40		
Phase Matching of Inserted Test Signal to Program Video	± 1°	8		
Pulse-to-Bar Ratio	100% ± 0.5%	13		
Signal-to-Noise Ratio	>70 dB	14		
External Input				
Gain	Unity ± 1%	17		
Frequency Response	± 1% to 5 MHz ± 3% to 10 MHz	43		

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Characteristics	Performance Requirement	Step	Incoming	Outgoing
Chrominance-to-Luminance Gain	± 0.5%	18		
Chrominance-to-Luminance Delay	≤ 5 ns	18		
Diff Phase	≤ 0.3°	19		
Diff Gain	≤ 0.3%	19		
Line Tilt	≤ 0.5%	17		
DC Offset (DC Coupled)	0 V_{DC} ± 10 mV	7		
Program Video to External Signal DC Match	3 mV	7		
Input Impedance	75 ΩW	40		
Return Loss	36 dB to 5 MHz	40		
Signal-to-Noise Ratio	>70 dB	20		
Test Signal and Black Burst General Characteristics				
Frequency Response	± 1% to 5 MHz ± 5% to 10 MHz	44		
Luminance Amplitude Accuracy	± 1%	22		
Chrominance-to-Luminance Gain	± 0.5%	23		
Chrominance-to-Luminance Delay	≤ 5 ns	23		
Diff Phase	≤ 0.3°	24		
Diff Gain	≤ 0.3%	24		
Line Tilt	± 0.5%	22		
Output Impedance	75 Ω	40		
Return Loss	36 dB to 5 MHz	40		
Signal-to-Noise Ratio Test Signal Black Burst	 > 78 dB > 70 dB	 27 27		
Spurious Signals (5 MHz–50 MHz)	> 55 dB down	41		
Pulse to Bar Ratio	100% ± 0.5%	33		
K Factor (K_{2T})	0.3%	25		
DC Offset	0 V_{DC} ± 10 mV	7		
SCH Phase Accuracy	0 ± 5°	26		
Luminance Rise Time	140 ns ± 20 ns	29		
Chrominance Rise Time	300 ns ± 35 ns	30		

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Characteristics	Performance Requirement	Step	Incoming	Outgoing
Sync				
Amplitude	285 mV ±3 mV	28		
Rise Time	140 ns ±20 ns	28		
Burst				
Amplitude	285 mV ±6 mV_{p-p}	28		
Rise Time	300 ns ±35 ns	28		
Delay from Sync	5.3 µs ±100 ns	28		
Duration	2.5 µs ±100 ns	28		
Breezeway Duration	600 ns ±100 ns	28		
Front Porch Duration	1.5 µs ±100 ns	31		
Horizontal Sync Duration	4.7 µs ±100 ns	28		
Equalizing Pulse Duration	2.3 µs ±100 ns	32		
Genlock Characteristics				
Burst Lock				
Genlock Phase Change with Input Amplitude	≤ 2° burst phase change for input sync or burst amplitude range of 287 mV ±3 dB	37		
	≤ 4° burst phase change for amplitude range of 287 mV ±6 dB	36		
Genlock Phase Change with Input Signal APL	≤ 1° burst phase change over 10% to 90% APL	34		
Frequency Dependence on Input Burst	≤ 1° burst phase change for ±20 Hz change in incoming subcarrier	38		
Lock Range				
Frequency	3.579545 MHz ±20 Hz	38		
Amplitude	+6 dB to –12 dB	36		
Sync Lock Jitter	≤ 10 ns for input sync amplitude range of 287 mV ±3 dB	35		
Noise Performance	Locks to 28 dB S/N Ratio Video	39		

[1] Certificate number not provided, unless “Certificate of Traceability” is issued.

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Verification Procedure

1. Turn On

   a. Connect the
   VITS 200 AC power cord to the variable autotransformer. Set the variac for 120 volts. Set the mains Power switch for the variac to On.

   b. Turn the
   VITS 200 POWER ON.

   c. Apply power to the test gear and allow the instruments to warm up as specified by the manufacturer.

NOTE. *Steps 2 through 5 store reference signals in the VM700A that are later recalled during the performance verification.*

2. Reference Gain and Line Tilt

   a. Connect the output of the TSG–170D to Channel A of the VM700A. Terminate the Ch. A loopthrough with a precision 75 Ω terminator.

   b. Select the NTC7 Composite signal from the TSG–170D other signals, Bar, Pulse, Mod Pulse & Mod Stairstep.

      May have to scroll through Other Signals watching the VM700A Wfm readout for NTC-7 Composite.

   c. Store the NTC7 reference Bar & Line Time signal on the VM700A.

      i. Press Measure.

      ii. Press BAR LINE TIME soft key (on screen).

      iii. Press Average and Menu.

      iv. Press Reference soft key.

      v. Press Store (1) Reference soft key.

3. Reference Chroma-to-Luminance Gain and Delay

   a. Store the NTC7 reference C–L Gain + Delay signal on the VM700A.

      i. Press Measure.

      ii. Press Chrom Lum Gain Delay soft key (on screen).

      iii. Press Average and Menu.

      iv. Press Reference soft key.

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v. Press Store (1) Reference soft key.

4. Reference Diff Phase and Diff Gain

a. Store the NTC7 reference Diff Phase + Gain signal on the VM700A.

i. Press Measure.

ii. Press DGDP soft key (on screen).

iii. Press Average and Menu.

iv. Press Reference soft key.

v. Press Store (1) Reference soft key.

5. Reference Signal to Noise

a. Press Waveform on the VM700A.

b. Press Black Burst from the TSG–170D 100/10 button.

c. Store the Black Burst reference Noise Spectrum signal on the VM700A.

i. Press Measure.

ii. Press NOISE SPECTRUM soft key (on screen).

iii. Press Average and Menu.

iv. Press Filters Selection.

v. Press Low Pass 5.0 MHz.

vi. Press Menu.

vii. Press Reference soft key.

viii. Press Store (1) Reference soft key.

6. Line Input Range

REQUIREMENT — Stable operation over an AC input range of 90–250 V.

a. CHECK – for stable instrument operation while varying the autotransformer over the 90–250 V range.

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7. Program, External, and Test Signal DC Levels

REQUIREMENT — DC Offset: 0 V_{DC} ± 10 mV.
Insertion Transients: ≤ 10 mV.
DC Matching of Inserted Test Signal to Program Signal: ± 3 mV.
Program Video to External Signal DC Match: ± 3 mV.

a. Connect the TSG–170D to the VITS 200 rear panel PROGRAM IN.

b. Set the VITS 200 as follows:

i. Press VITS.

ii. INCREMENT or DECREMENT to Line 15.

iii. Select 0% Black Set.

iv. Press SAVE.

v. Press LINE.

vi. Select Line 11.

vii. Press SIGNAL.

viii. Select External 1.

ix. Press SAVE.

x. INCREMENT to next line.

xi. Repeat steps viii and ix for the remaining Externals.

c. Connect a 75Ω cable from 1780R CH A to VITS 200 PROGRAM OUT (terminate CH A with precision 75Ω Terminator).

d. Set the 1780R for DC level checks.

i. Press Configure on the 1780R.

ii. Check that DC Restorer is set to OFF.

iii. Set Coupling to Ground.

iv. Set Gain for X5 Waveform.

v. Use Vertical Position to set the Waveform Monitor trace to the 0 IRE Line.

vi. Set Coupling to DC on the Vectorscope display.

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vii. Cancel Configure by pressing it again.

viii. Set 1780R for one line display.

e. CHECK – for Blanking at 0 V ± 10 mV (± 3 minor div).

f. Move the cable from PROGRAM OUT to MONITOR OUT on the VITS 200.

g. CHECK – that the MONITOR OUT Blanking is 0V ± 10 mV (± 3 minor div).

h. Move the cable from MONITOR OUT to TEST SIGNAL.

i. CHECK – that the TEST SIGNAL DC level is 0V ± 10 mV (± 3 minor div).

j. Move the cable from TEST SIGNAL to PROGRAM OUT.

k. On the 1780R select Line 15.

l. On the 1780R Vectorscope display, select Field ALL from the Line Sel Menu.

m. CHECK – for match of inserted 0% Black to the lines from Fields 2–4 (± 3 mV match between traces, 1 minor div).

n. Use Utilities to set Externals to DC coupling saving each.

i. Select UTILITIES from VITS 200 Front Panel.

ii. Use Decrement to select Coupling External 1.

iii. Use an arrow button to move the cursor to AC.

iv. Use Increment or Decrement to change to DC.

v. Press SAVE.

vi. Repeat steps ii through v for Ext 2 through 4.

o. On the 1780R select Line 11.

p. CHECK – that the active portion of Line 11 is 0 V ± 10 mV (± 3 minor div).

q. On the 1780R select Field 1 Line 12.

r. CHECK – that the active portion of Line 12 is 0 V ± 10 mV (± 3 minor div).

s. On the 1780R select Field 1 Line 13.

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t. CHECK – that the active portion of Line 13 is 0 V ± 10 mV (± 3 minor div).

u. On the 1780R select Field 1 Line 14.

v. CHECK – that the active portion of Line 14 is 0 V ± 10 mV (± 3 minor div).

w. CHECK – using the 1780R Magnifier, that the insertion point just after burst is ≤ 10 mV_{p-p}.

x. CHECK – that any insertion transients are ≤ 10 mV_{p-p} while cycling through Lines 10 through 20 (insertion transients appear before sync and following burst).

y. Cancel Magnifier on the 1780R.

z. Set Externals to AC coupling (see step n).

aa. CHECK – that the active portion of Line 11 matches signal porch ± 3 mV (± 1 minor div on 1780R).

ab. CHECK – that the active portion of Line 12 matches signal porch ± 3 mV (± 1 minor div on 1780R).

ac. CHECK – that the active portion of Line 13 matches the signal porch ± 3 mV (± 1 minor div on 1780R).

ad. CHECK – that the active portion of Line 14 matches the signal porch ± 3 mV (± 1 minor div on 1780R).

ae. CHECK – using the 1780R Magnifier, that the insertion points before sync and just after burst are ≤ 10 mV p-p.

af. CHECK – while cycling through Lines 10 to 20, that any insertion transients are ≤ 10 mV_{p-p}.

ag. Cancel Line Select, Magnifier, and X5 Waveform Gain on the 1780R.

Program Channel Checks

8. Phase Matching of Inserted Test Signal to Program Video

REQUIREMENT — ± 1°.

a. Connect 1410 Subcarrier to SUBC (Subcarrier out from the 1410 to the 1780R Ext CW Ref).

b. Connect 1410 rear panel J1 Black Burst to SYNC (Black Burst out of the 1410 to the 1780R External Ref input).

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c. Ensure the 1410 Switcher Output is connected to the VITS 200 rear panel PROGRAM IN.

d. Select the Linearity Module from the 1410 Switcher.

e. Select Mod Ramp from the 1410 Linearity Module.

i. Ramp and both 180 Subcarrier buttons in.

ii. Knob to 50%.

f. Ensure the VITS 200 PROGRAM OUT is connected to the 1780R CH 1 Input.

g. Set the 1780R for External CW Ref by holding down the REF button.

h. Select Measure and Diff Phase from the 1780R.

i. Set the Burst vector to the outer circle and 0° on the 1780R Vectorscope. Use the phase control to null the burst on the waveform CRT.

j. Set the VITS 200 to Regenerate Sync and Burst.

i. Select UTILITIES from VITS 200 Front Panel.

ii. Use DECREMENT to select Regenerate Sync and Burst.

iii. Use the LINE button to move the cursor to OFF.

iv. Use INCREMENT/DECREMENT to change to ON.

v. Press SAVE.

k. CHECK – that the regenerated burst is at 0° ± 1° on the 1780R Vectorscope. Check that the diff phase portion of the regenerated burst matches the position of the 1410 burst as displayed on the waveform CRT.

9. Phase Match — Relay Bypass Path to Signal Processing Path

REQUIREMENT — ± 1° at F_{SC}.

a. Use the VITS 200 Utilities menu to cancel Regenerate Sync and Burst.

i. Select UTILITIES from VITS 200 front panel.

ii. Use DECREMENT to select Regenerate Sync and Burst.

iii. Use the LINE button to move the cursor to ON.

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iv. Use INCREMENT or DECREMENT to change to OFF.

v. Press SAVE.

b. Use the 1780R knob to null the Burst Diff Phase display.

c. Press REFERENCE SET on the 1780R.

d. Press the BYPASS switch on the VITS 200 front panel.

e. CHECK – that the vector moves less than 1° as seen on the Burst Diff Phase display on the 1780R.

f. Press the BYPASS switch to return the VITS 200 to normal operation.

10. Relative Gain and Line Tilt

REQUIREMENT — Gain: Unity ± 1%. Line Tilt: ≤ 0.5%.

a. Connect a cable from the VITS 200 MONITOR OUT to the VM700A Channel A input

b. Connect the test signal generator output cable to the VITS 200 PROGRAM IN.

c. Set the generator to output NTC7 Composite.

d. Select Relative to Ref Bar & Line Time on the VM700A.

i. Select Measure.

ii. Select BAR LINE TIME soft key (on screen).

iii. Select Menu, and then the Relative to Ref and Use (1) Reference soft keys.

iv. Select Average.

e. CHECK – that the Bar Tilt is < 0.5%.

f. Move the VM700A coax from Monitor Out to Program Out.

g. CHECK – that the Bar Tilt is < 0.5%.

11. Relative Chrominance-to-Luminance Gain and Delay

REQUIREMENT — Gain: ±0.5%. Delay: ≤ 0.5%.

a. Select Relative to Ref C–L Gain + Delay on the VM700A.

i. Select Measure.

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ii. Select ChromLum Gain Delay soft key (on screen).

iii. Select Menu, and then the Relative to Ref and Use (1) Reference soft keys.

iv. Select Average.

b. CHECK – that the Chroma Gain is 100.0 ± 0.5%.

c. CHECK – that the Chroma Delay is 0.0 ≤ 5 ns.

d. Move the VM700A coax from Program Out to Monitor Out.

e. CHECK – that the Chroma Gain is 100.0 ± 0.5%.

f. CHECK – that the Chroma Delay is 0.0 ≤ 5 ns.

12. Relative Diff Phase and Diff Gain

REQUIREMENT — Phase: ≤ 0.2°. Gain: ≤ 0.2%.

a. Select Relative to Ref Diff Phase + Gain on the VM700A.

i. Select Measure.

ii. Select DGDP soft key (on screen).

iii. Select Menu, and then the Relative to Ref and Use (1) Reference soft keys.

iv. Select Average.

b. CHECK – that the Differential Gain is ≤ 0.2%.

c. CHECK – that the Differential Phase is ≤ 0.2°.

d. Move the VM700A coax from Monitor Out to Program Out.

e. CHECK – that the Differential Gain is ≤ 0.2%.

f. CHECK – that the Differential Phase is ≤ 0.2°.

13. Pulse-to-Bar Ratio

REQUIREMENT — 100% ±0.5%.

a. Connect the NTC7 Composite signal from the TSG–170D to the VM700A CH A Input with a barrel connector.

b. Select Measure.

c. Select K_FACTOR soft key (on screen).

d. Note the PB Ratio on the VM700A screen.

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e. Remove barrel and connect the coax from VM700A to PROGRAM OUT on the VITS 200.

f. Connect the coax from the TSG–170D to the VITS 200 PROGRAM IN.

g. CHECK – that the PB Ratio is within ± 0.5% of the above noted Ratio.

h. Move the coax from PROGRAM OUT to MONITOR OUT.

i. CHECK – that the PB Ratio is within ± 0.5% of the above noted Ratio.

14. Signal-to-Noise Ratio

REQUIREMENT — >70 dB.

a. Select Black Burst from the TSG–170D 100/10 button.

b. CHECK – the Black Burst Noise Spectrum on the VM700A.

i. Select Measure.

ii. Select NOISE SPECTRUM soft key (on screen).

iii. Select Menu, and then the Relative to Ref and Use (1) Reference soft keys.

iv. Select Average.

c. CHECK – that the Noise Level number is > 70 dB.

d. Move the VM700A coax from MONITOR OUT to PROGRAM OUT.

e. CHECK – that the Noise Level number is > 70 dB.

15. Hum Rejection

REQUIREMENT — 50 dB.

a. Connect the TSG–170D to the 1434 Video Input.

b. Connect the 1434 OUTPUT to the VITS 200 PROGRAM IN.

c. Turn Hum ON in 1434 CH B Section.

d. Use the 1434 Attenuator Select “Fast” and “–” buttons together until the B ATTEN dB display shows 00.

e. Ensure VM700A CH A connected to PROGRAM OUT of VITS 200.

f. Select Waveform on the VM 700A.

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g. Select Menu, Clamp Couple, and DC Coupling on the VM700A.

h. Expand the signal vertically around burst until the range of the IRE:FIX scale is about –1 to 2 at full screen.

i. Check that hum is present on the porch before and after Sync.

j. Move the color back porch to the horizontal line near 0.0 on the IRE:FLT scale.

k. CHECK – using the IRE:FLT scale, that while the porch before burst drifts up and down at hum rate, that the back porch following burst drifts less than 0.32 IRE at the hum rate.

l. Turn Hum OFF in 1434 CH B Section.

16. Program Channel Pulse-to-Bar Ratio

REQUIREMENT — 100 ±0.5%.

a. Connect two 75Ω bnc cables with a barrel connector, and then attach one end to the TSG–170D TEST SIGNAL output. Attach a 75Ω feedthrough terminator to the cable assemblies free end, and then connect the assembly to CH 1 of the 11A34.

b. Verify that NTC7 Compos(ite) is selected as the VITS 200 Full Field Test Signal.

c. Set the 11K oscilloscope:

i. Enable CH 1 on the 11A34.

ii. Press the Waveform hard key and then set the following:

Control	Setting
Vertical Desc	AVG C1 Fast
Horizontal Desc	Main @ 10240 pts
Acquire Desc	continuous
Vert Size: C1	5 mV/div
Vert Offset: C1	710 mV
Impedance	1 MΩ
Coupling	DC
BW Limit	300 MHz

iii. Press the Trigger hard key and then set the following:

Control	Setting
Trigger Select	main
Source	C1
Level	703.5 mV
Trigger Holdoff	33.4 ms
Main Size	10 µs/div

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Main Pos . . . . . –2 µs
Mode . . . . . Auto
Coupling . . . . . DC
Slope . . . . . –

iv. Select Cursors from the top of the display and set Cursor Type to Horizontal Bars.

v. Set one cursor at the top of the white bar and place the other cursor at the top of the 2T pulse.

d. NOTE – the ΔV readout.

e. Remove the barrel connector.

f. Connect the TSG–170D cable to the VITS 200 PROGRAM IN.

g. Connect the 11A34 CH 1 cable to the VITS 200 PROGRAM OUT.

h. Set one cursor at the top of the white bar and place the other cursor at the top of the 2T pulse.

i. CHECK – that the difference between the ΔV readout in step d and the current ΔV readout is ≤ 3.5 mV.

External Channel Checks

17. Relative Gain and Line Tilt

REQUIREMENT — Gain: Unity ± 1%. Line Tilt: ≤ 0.5%.

a. Disconnect the output of the TSG–170D from the 1434 and then reconnect it to the VITS 200 External 1.

b. Set VITS 200 STANDBY to Extern(al) 1.

c. Select NTC7 Composite from the TSG–170D Other Signals.

d. Select Relative to Ref Bar & Line Time on the VM700A.

i. Select Measure.

ii. Select BAR LINE TIME soft key (on screen).

e. CHECK – that the Bar Level is 100 IRE ± 1 IRE.

f. CHECK – that the Bar Tilt is ≤ 0.5%.

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18. Chroma-to-Luminance Gain and Delay

REQUIREMENT — Gain: ±0.5%. Delay: ≤5 ns.

a. Select Relative to Ref C–L Gain + Delay on the VM700A.

i. Select Measure.

ii. Select ChromLum Gain Delay soft key (on screen).

b. CHECK – that the Chroma Gain is 100.0 ±0.5%.

c. CHECK – that the Chroma Delay is ≤5 ns.

19. Differential Phase and Gain

REQUIREMENT — Differential Phase: ≤0.3°. Differential Gain ≤0.3%.

a. Select Relative to Ref Diff Phase + Gain on the VM700A.

i. Select Measure.

ii. Select DGDP soft key (on screen).

b. CHECK – that the Differential Gain is ≤0.3%.

c. CHECK – that the Differential Phase is ≤0.3°.

20. Signal-to-Noise

REQUIREMENT — >70 dB.

a. Select Waveform on the VM700A.

b. Select Black Burst from the TSG–170D 100/10 button.

c. Select Noise Spectrum on the VM700A.

i. Select Measure.

ii. Select NOISE SPECTRUM soft key (on screen).

d. CHECK – that the Noise Level number is > 70 dB.

21. Repeat steps 17 through 20 for External Channels 2, 3, and 4.

Test Signal Checks

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22. Line Tilt and Luminance Amplitude Accuracy

REQUIREMENT — Line Tilt: ± 0.5%.
Luminance Amplitude Accuracy: ± 1%.

a. Connect a 75Ω coaxial cable from the VM700A to the VITS 200 TEST SIGNAL output.

b. Verify that the test signal generator is connected to the VITS 200. PROGRAM IN.

c. Select NTC7 Composite as the VITS 200 Full Field Test Signal.

d. Select Relative Bar Line Time on the VM700A.

i. Select Measure.

ii. Select Bar Line Time soft key.

iii. Select Menu.

iv. Select Relative to Ref soft key.

v. Select Use (2) Reference soft key.

vi. Select Average.

e. CHECK – that the Bar Tilt is ± 0.5%.

f. CHECK – that the Bar Level (Luminance Amplitude Accuracy) is 100 IRE ± 1 IRE.

23. Chrominance-to-Luminance Gain and Delay

REQUIREMENT — Gain: ± 0.5%. Delay: ≤ 5 ns.

a. Select Relative Chroma Luminance on the VM 700A.

i. Press Measure, ChromLum GainDelay soft key, Menu, and Relative to Ref.

ii. Press Use (2) Reference soft key.

iii. Select Average

b. CHECK – that the Chroma Gain Shown on the VM700A is 100 ± 0.5%.

c. CHECK – that the Chroma Delay shown on the VM700A is 0 ≤ 5 ns.

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24. Diff Phase and Gain

REQUIREMENT — Diff Phase: ≤0.3°. Diff Gain: ≤0.3 %.

a. Select Relative Diff Gain and Phase on the VM 700A.

i. Select Measure, DGDP soft key, Menu, and Relative to Ref soft key.

ii. Select Use (2) Reference soft key.

iii. Select Average.

b. CHECK – Diff Gain ≤0.3 %.

c. Select Use (2) Reference soft key to cancel the Reference function.

d. CHECK – Diff Phase ≤0.3°.

25. K-Factor

REQUIREMENT — K-Factor: 0 ±0.3%.

a. Select Measure, K_FACTOR soft key, and Average.

b. CHECK – that the K–2T is 0 ±0.3%.

26. SCH Phase

REQUIREMENT — 0° ± 5°.

a. Select Measure, SCH_Phase soft key, and Average.

b. CHECK – that the SCH Phase is 0° ± 5°.

27. Signal-to-Noise Ratio

REQUIREMENT — Test Signal: >78 dB. Black Burst: >70 dB.

a. Select TEST SIGNAL on the VITS 200.

b. Use DECREMENT to select 0% BLACK.

c. Select Measure, Noise Spectrum soft key, Menu, and Relative to Ref soft key.

d. Cancel Relative to Ref by pressing Use (1) Reference soft key.

e. CHECK – that the Noise Level number is >78 dB.

f. Move the VM700A cable from the TEST SIGNAL to the BLACK BURST output.

g. CHECK – that the Noise Level is >70 dB.

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28. Sync Amplitude, Burst Amplitude, Sync Rise Time, Burst Delay from Sync, Burst Duration, Breezeway Duration

REQUIREMENT — Sync Amplitude: 285 mV ±3 mV_{p-p}.
Sync Duration: 4.7 µs ±100 ns. Sync Rise Time: 140 ns ±20 ns.
Burst Delay from Sync: 5.3 µs ±100 ns. Burst Duration: 2.5 µs ±100 ns.
Burst Amplitude: 285 mV ±6 mV_{p-p}.
Breezeway Duration: 600 ns ±100 ns.

a. Select Measure, H_Timing soft key, and Average. See Figure 5–1.

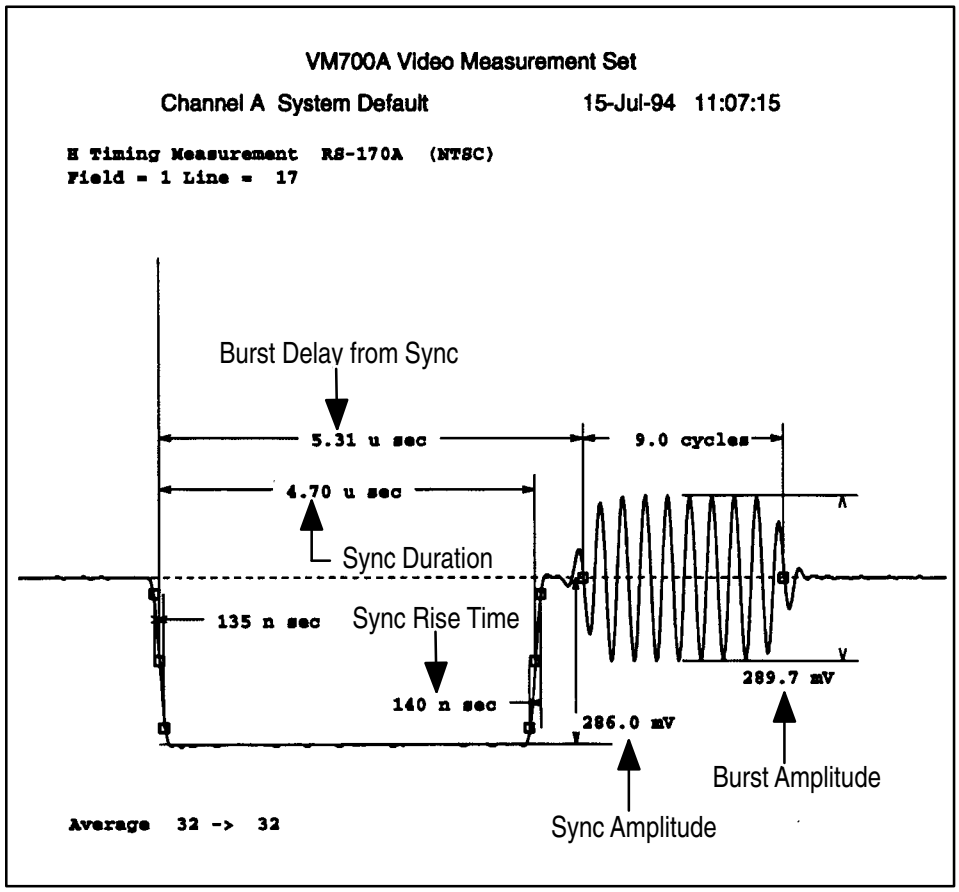


Figure 5–1: VM700A Horizontal Timing Measurement Display

b. CHECK – that Sync Amplitude is 285 mV ±3 mV_{p-p} (40 IRE ±0.5 IRE).

c. CHECK – that Sync Duration is 4.7 µs ±100 ns.

d. CHECK – that Sync Rise Time is 140 ns ±20 ns.

e. CHECK – that Burst Delay from Sync is 5.3 µs ±100 ns.

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f. CHECK – that Burst Duration is 2.5 µs ± 100 ns: multiply number of Burst cycles by 280 ns.

g. CHECK – that Burst Amplitude is 285 mV ± 6 mV_{p-p} (40 IRE ± 0.5 IRE).

h. CHECK – that Breezeway Duration is 600 ns ± 100 ns.
To check Breezeway Duration subtract Sync Duration from Burst Delay from Sync.

29. Luminance Rise Time

REQUIREMENT — 140 ns ± 20 ns.

a. Disconnect VM700A from Black Burst. Connect the VITS 200 TEST SIGNAL to 1780R Video A.

b. Select NTC7 Composite as the VITS 200 test signal.

c. On the 1780R:

i. Set REF to INT.

ii. Use the variable waveform gain control to set bar amplitude from 0 IRE to 100 IRE.

d. Ensure signal starts at 0 mark on graticule and rises to 1.0 mark.

e. Set time cursors at 10 IRE and 90 IRE on the rising edge of BAR.

f. CHECK – DT (in circle at bottom of screen) is 140 ns ± 20 ns.

30. Chrominance Rise Time

REQUIREMENT — 300 ns ± 35 ns.

a. Set 1780R WAVEFORM GAIN control to VAR and X5.

b. Adjust vertical position to match blanking level to 0.0 mark on graticule.

c. Adjust the 1780R WAVEFORM GAIN knob so the top of burst falls on the 100 IRE graticule line.

d. Set the 1780R Magnifier to 0.50 µs/div.

e. Place one of the time cursors at the 10 IRE graticule line on the leading edge of burst. Place the other cursor on the 90 IRE graticule line on the leading edge of burst.

f. CHECK – DT is 300 ns ± 35 ns.

g. Turn off the 1780R Magnifier.

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31. Front Porch Duration

REQUIREMENT — 1.5 µs ±100 ns.

a. Set the
VITS 200 TEST SIGNAL to 7.5% Black.

b. Use variable gain to put sync tip and blanking 100 IRE apart (use the graticules).

c. Set Time cursor 1 to 50 IRE.

d. Put Time cursor 2 to 50% point on the falling edge of 7.5% Black.

e. CHECK – DT is 1.5 µs ±20 ns.

f. Cancel the 1780R variable gain and X5 waveform gain.

32. Equalizing Pulse Duration

REQUIREMENT — 2.3 µs ±100 ns.

a. On the 1780R use Line Mode to view line 7.

b. Set the time/dive to 0.50 µs/div (use the magnifier).

c. CHECK – using the graticules, that from leading 50% of equalizer pulse to trailing edge of equalizer pulse is 2.3 µs ±100 ns.

33. Pulse-to-Bar Ratio

REQUIREMENT — 100 ±0.5%.

a. Connect two 75Ω bnc cables with a barrel connector, and then attach one end to the TSG–170D TEST SIGNAL output. Attach a 75Ω feedthrough terminator to the cable assembly, and then connect the assembly to CH 1 of the 11A34.

b. Select NTC7 Compos(ite) as the
VITS 200 Full Field Test Signal.

c. Set the 11K oscilloscope:

i. Enable CH 1 on the 11A34.

ii. Press the Waveform hard key and then set the following:

Control	Setting
Vertical Desc	AVG C1 Fast
Horizontal Desc	Main @ 10240 pts
Acquire Desc	continuous
Vert Size: C1	5 mV/div
Vert Offset: C1	710 mV

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Impedance . . . . . 1 MΩ
Coupling . . . . . DC
BW Limit . . . . . 300 MHz

iii. Press the Trigger hard key and then set the following:

Control	Setting
Trigger Select	main
Source	C1
Level	703.5 mV
Trigger Holdoff	33.4 ms
Main Size	10 µs/div
Main Pos	–2 µs
Mode	Auto
Coupling	DC
Slope	–

iv. Select Cursors from the top of the display and set Cursor Type to Horizontal Bars.

v. Set one cursor at the top of the white bar and place the other cursor at the top of the 2T pulse.

d. CHECK – that the ΔV readout is ≤3.5 mV.

Genlock Checks

34. Phase Change with Input Signal APL

REQUIREMENT — ≤1° burst phase change over 10% to 90% APL.

a. Check that the 1410 J1 output is connected to the 1780R External Reference.

b. Check that the 1410 SUBCARRIER is connected to the 1780R Ext CW Ref.

c. Connect the 1410 Switcher or Linearity module output to the 1434 VIDEO INPUT.

d. Connect the 1434 VIDEO OUTPUT to the VITS 200 PROGRAM IN.

e. Set the following 1434 Video Noise Generator controls:

Control	Setting
CH A Impulse	OFF (OUT)
CH A Input	ATTEN (IN)

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Ext	OFF (OUT)
Gate	OFF (OUT)
White	OFF (OUT)
5 kHz	OFF (OUT)
CH B Impulse	OFF (OUT)
Input	Direct (OUT)
Ext	OFF (OUT)
Gate	OFF (OUT)
White	OFF (OUT)
Hum	OFF (OUT)
Attenuator Select	A
Gain	ON (IN)
+3 dB/+6 dB	6 dB (IN)

f. Push the 1434 Attenuator Select "+" or "–" button until 06 is displayed on the A ATTEN dB display. This is normal 0 dB output.

g. Select the 1410 Linearity Module.

h. Connect the
VITS 200 TEST SIGNAL to the 1780R CH 1 Input.

i. Select Test Signal on the
VITS 200 then use Decrement to select Red Field as the Full Field Test Signal.

j. Set the 1780R for External Ref + CW by holding in the REF button.

k. Select Measure and DIFF PHASE from the 1780R.

l. Set the Red vector to the outer circle and 0° on the 1780R Vectorscope. Set the Red bar to null on the 1780R waveform monitor.

m. Select AC Bounce from the 1410 TSG3 Linearity Module.

n. CHECK – that the Red bar phase shifts ≤ 1° (10 IRE or by Readout).

o. Cancel Bounce on the Linearity module.

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35. Sync Lock Jitter

REQUIREMENT — ≤ 10 ns for input sync amplitude range of 287 mV ± 3 dB.

a. Select the 1410 Color Bars module from the Switcher.

b. Set the 1410 Color Bar module for Full Field Color Bars.

c. Cancel Burst on the 1410 Color bar module.

d. Set the 1434 Attenuation to + 3 dB (A ATTEN dB display shows 03).

e. Set the Red vector to the outer circle and 0° on the 1780R Vectorscope.

f. CHECK – that the Sync edge jitter is ≤ 12° while changing the 1434 Attenuation from + 3 dB to – 3 dB (A ATTEN dB display from 03 to 09).

g. Return Burst to the Color Bar signal.

36. Lock Range, Phase Change and Jitter with Input Amplitude

REQUIREMENT — Phase Change with Input Amplitude: ≤ 3° burst phase change for amplitude range of 287 mV ± 6 dB.
Sync Lock Jitter: ≤ 10 ns for input sync amplitude range of 287 mV ± 3 dB.
Amplitude Lock Range: +6 dB to –12 dB.

a. Return the 1434 Attenuation to + 6 dB (A ATTEN dB display shows 00).

b. Set the Red vector to the outer circle and 0° on the 1780R Vectorscope. Set the Red bar to null on the 1780R waveform monitor.

c. CHECK – that the Red bar phase changes ≤ 4° and that the VITS 200 maintains lock while changing the 1434 Attenuation from + 6 dB to – 6 dB (A ATTEN dB display from 00 to 12).

d. Continue increasing the 1434 Attenuation to – 12 dB (A ATTEN dB display shows 18).

e. CHECK – that the VITS 200 maintains lock.

f. Set the 1434 Attenuation to –3 dB (A ATTEN dB display shows 09).

g. Set the Red vector to the outer circle and 0° on the 1780R Vectorscope. Set the Red bar to null on the 1780R waveform monitor.

h. CHECK – that the Red bar phase changes ≤ 2° while changing the 1434 Attenuation from – 3 dB to + 3 dB (A ATTEN dB display from 09 to 03).

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i. Return the 1434 Attenuation to 0 dB (A ATTEN dB display shows 06).

37. Phase Change and Jitter with Burst Amplitude

REQUIREMENT — ≤ 2° burst phase change for input sync or burst amplitude range of 287 mV ± 3 dB.

a. Move the 1434 Input coax from the 1410 switcher output to Black Burst out of the 1410 SPG2A Option AA module.

b. Connect Program Out to the VM 700A CH A Input.

c. VM 700A Select Measure and H TIMING and turn off Average. Burst should measure about 40 IRE.

d. Use the 1410 SPG2A Variable Burst control to vary the Burst amplitude down to 28 IRE (–3 dB) as seen on the VM 700A.

e. Set the Red vector to the outer circle and 0° on the 1780R Vectorscope. Set the Red bar to null on the 1780R waveform monitor.

f. CHECK – that the Red bar phase changes ≤ 2° as the Burst amplitude is varied from 28 IRE to 56 IRE (– 3 dB to + 3 dB). Most extreme shift may be at other than + or – 3 dB.

g. Set the Burst amplitude up to 80 IRE as seen on the VM 700A (+ 6 dB).

h. Set the bar to null on the 1780R waveform monitor.

i. CHECK – that the Red bar phase changes ≤ 3° as the Burst amplitude is varied from 80 IRE to 20 IRE (+ 6 dB to – 6 dB). Most extreme shift may be at other than + or – 6 dB.

j. Return the 1410 SPG2A Variable Burst control to normal (detente).

38. Phase Shift over Frequency

REQUIREMENT — Frequency: 3.579545 MHz ± 20 Hz.

a. Set the Red vector to the outer circle and 0° on the 1780R Vectorscope. Set the Red bar to null on the 1780R waveform monitor.

b. Set the 1410 SPG2A Option AA module for 20 Hz offset.

c. Enable the 20 Hz offset.

d. CHECK – after the genlock has settled that the Red bar has shifted less than 1° (10 IRE or by Readout).

e. Change the 20 Hz offset polarity (+ to – or – to +).

f. CHECK – after the genlock has settled, that the Red bar has shifted less than 1° (10 IRE or by Readout).

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g. Turn off the 20 Hz offset on the 1410.

39. Noise Performance

REQUIREMENT — Locks to 28 dB S/N Ratio Video.

a. Set 1434 Attenuator Select to B and push the 1434 Attenuator Select "Fast" and "+" simultaneously together until the B ATTEN dB display shows 28.

b. Turn White Noise ON in 1434 CH B Section.

c. CHECK – that the VITS 200 remains locked.

d. Turn White Noise OFF in 1434 CH B Section.

e. Disconnect the 1434 from the VITS 200.

Return Loss, and Input/Output Impedance Checks

NOTE. *Input and Output Impedance specifications are guaranteed to be within specification by successfully completing the Return Loss checks.*

40. Return Loss

REQUIREMENT — 36 dB to 5 MHz.

a. Connect a precision 50 Ω cable from the spectrum analyzer RF Input to the RF Output on the RF Bridge.

b. Connect a precision 50 Ω cable from the spectrum analyzer TG Output to the RF Input on the RF Bridge.

c. Select Demod/TG on the spectrum analyzer. Turn on the tracking generator and set the Fixed Level to 0.00 dBm.

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

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

f. Set the Vertical Scale to 10 dB.

g. Set a Marker to 5 MHz.

h. Reconnect the cable to the RF Bridge.

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i. NOTE – the Marker Reference Level readout.

j. Adjust the spectrum analyzer External Attenuation Amplitude by the amount noted in the previous step.

k. On the spectrum analyzer select the Input menu — External Atten/Ampl. Note: The Marker Reference Level Readout should now be 0.00 dBm.

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

m. CHECK – that the frequency response from 0 MHz to 5 MHz is ≥ 40 dBm.

n. Return the spectrum analyzer Frequency Marker to 5 MHz if it was moved.

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

p. Connect the Device Under Test connector on the RF Bridge to the VITS 200 PROGRAM IN.

q. CHECK – that the Marker Reference Level readout on the spectrum analyzer is ≥ 36 dBm down.

r. Connect the precision high-frequency terminator to the VITS 200 PROGRAM OUT.

s. Set the VITS 200 to Bypass.

t. CHECK – that the Marker Reference Level readout is ≥ 36 dBm down.

u. Set the VITS 200 to Operate mode.

v. Remove the precision high-frequency terminator from the VITS 200 PROGRAM OUT.

w. Connect the Device Under Test connector on the RF Bridge to the VITS 200 PROGRAM OUT.

x. CHECK – that the Marker Level readout is ≥ 36 dBm down.

y. Connect the Device Under Test connector on the RF Bridge to the VITS 200 MONITOR OUT.

z. CHECK – that the Marker Level readout is ≥ 36 dBm down.

aa. Remove the twelve screws that secure the VITS 200 top cover.

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ab. On the Inserter board move J32 to pins 2 & 3 (disables the DAC clock). Place the lid over the instrument but do not replace the screws.

ac. Connect the Device Under Test connector on the RF Bridge to the VITS 200 TEST SIGNAL output.

ad. CHECK – that the Marker Level readout is ≥ 36 dBm down.

ae. Move J32 back to pins 1 & 2.

af. Connect the Device Under Test connector to the VITS 200 EXT 1 input.

ag. CHECK – that the Marker Level readout is ≥ 36 dBm down.

ah. Connect the Device Under Test connector to the VITS 200 EXT 2 input.

ai. CHECK – that the Marker Level readout is ≥ 36 dBm down.

aj. Connect the Device Under Test connector to the VITS 200 EXT 3 input.

ak. CHECK – that the Marker Level readout is ≥ 36 dBm down.

al. Connect the Device Under Test connector to the VITS 200 EXT 4 input.

am. CHECK – that the Marker Level readout is ≥ 36 dBm down.

an. On the Controller board move J55 and J56 to their respective 2 & 3 pins.

ao. Connect the Device Under Test connector to the VITS 200 BLACK BURST output.

ap. CHECK – that the Marker Level readout is ≥ 36 dBm down.

aq. Remove the RF Bridge from the VITS 200 BLACK BURST output.

ar. Move Controller board jumpers J55 and J56 back to pins 1 & 2. Move Inserter board jumper J32 back to pins 1 & 2.

as. Select External Atten/Ampl from the spectrum analyzer's Input menu.

at. Set the spectrum analyzer External Attenuation back to 0 dBm.

41. Test Signal Spurious Signals

REQUIREMENT — > 55 dB down.

a. Set the following on the spectrum analyzer:

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

b. Connect a minimum loss pad to the spectrum analyzer RF Input.

c. Connect a 75 Ω BNC cable to the min. loss pad, and the other end to the VITS 200 TEST SIGNAL output.

d. Set the
VITS 200 Standby to Red Field, Enable, and Save.

e. Select Max. Hold on the spectrum analyzer.

f. Set the spectrum analyzer Frequency Marker to the top of the chrominance spike of the red field.

g. Set the spectrum analyzer Marker control to Differential mode.

h. CHECK – by leaving the one marker at the top of the red field spike and moving the other marker to any spurious spikes (out to 50 MHz), that all spurious spikes are >55 dBm down as displayed on the Differential Marker Level readout.

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Frequency Response and Crosstalk

NOTE. *Crosstalk specifications are guaranteed to be within specification by successfully completing the Frequency Response checks.*

42. Program Channel Frequency Response

REQUIREMENT — ± 1% to 5.5 MHz. ± 3% to 10 MHz.

a. Set the 1410 TSG 6, Multiburst module:

Control	Setting	(switch position)
Frequency Range	High	(out)
Markers	On	(in)
Composite	On	(in)
Amplitude	Full	(in)
Sweep	On	(in)
others		(out)

b. Connect Sweep out from the 1410 to the P-P Detector Head Input with a 75 Ω coax and barrel connector.

c. Connect 75 Ω coax from Detector Head Output to P-P Detector + Input.

d. Enable P-P Detector + Input.

e. Set + Input Level to light green LED (full clockwise).

f. Connect 75 Ω coax from P-P detector Output to Test Scope plug in 11A34 CH 1.

g. Store waveform of detected sweep as a reference.

h. Set the 11K oscilloscope with 11A34 module installed in center slot:

Control	Setting
Vertical	5 mV/div
Horizontal	2 ms/div
Horizontal Desc	10240
Acquire Desc	continuous
Trigger Select	main
Source	C1
Level	20% or as needed to stabilize waveform
Time Holdoff	6 ms
Mode	Auto Level
Coupling	DC
Slope	–
Vertical Position	as needed to view waveform
Horizontal Mag.	1x

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i. Remove the barrel between the P-P Detector Head and the 1410 coax.

j. Move the 1410 Sweep Out coax to the VITS 200 PROGRAM IN.

k. Connect the P-P Detector Head Input to the VITS 200 Program Out.

l. Recall the previously stored waveform and then overlay the Sweep envelope on top of stored waveform.

m. CHECK — that the Sweep envelope (top of waveform) matches the stored waveform ± 4.3 mV from 2 MHz to 6 MHz (2nd Marker to 4th Marker).

NOTE. *Touching the up and down Vertical symbol at the left side of the screen, allows you to use the lower Knob to position one trace vertically to help check waveform match.*
Touching CURSORS, at the top of the screen, allows you to use the Knobs to move the two cursors to help make measurements.
Only A. or B. works at one time. To change the Knob function to the one you want, touch the proper selection.

---

n. CHECK — Sweep Waveform top matches the stored waveform ± 12.9 mV from 6 MHz to 10 MHz (4^{th} marker to 6^{th} marker).

o. Move the P-P Detector Head and coax from Program Out to Monitor Out.

p. CHECK — that the Sweep envelope matches the pattern ± 4.3 mV from 2 MHz to 6 MHz (2^{nd} marker to 4^{th}).

q. CHECK — that the Sweep envelope matches the pattern ± 12.9 mV from 6 MHz to 10 MHz (4^{th} marker to 6^{th}).

43. External 1 Frequency Response

REQUIREMENT — ± 1% to 5 MHz. ± 3% to 10 MHz.

a. Move the Sweep coax from PROGRAM IN to External 1.

b. Set the VITS 200 Standby to External 1.

i. Press Standby on the VITS 200 Front Panel.

ii. Use the Increment or Decrement to set the Standby Signal to External 1.

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iii. Press Save.

c. CHECK — that the Sweep envelope matches the pattern ± 4.3 mV from 2 MHz to 6 MHz (2nd Marker to 4th Marker).

d. CHECK — Sweep envelope matches the pattern ± 12.9 mV from 6 MHz to 10 MHz (4th marker to 6th).

e. Move the Sweep coax from External 1 to External 2.

f. Set Standby to External 2 and Save.

g. CHECK — that the Sweep envelope matches the pattern ± 4.3 mV from 2 MHz to 6 MHz (2nd Marker to 4th Marker).

h. CHECK — that the Sweep envelope matches the pattern ± 12.9 mV from 6 MHz to 10 MHz (4th marker to 6th).

i. Move the Sweep coax from External 2 to External 3.

j. Set Standby to External 3 and Save.

k. CHECK — that the Sweep envelope matches the pattern ± 4.3 mV from 2 MHz to 6 MHz (2nd Marker to 4th Marker).

l. CHECK — that the Sweep envelope matches the pattern ± 12.9 mV from 6 MHz to 10 MHz (4th marker to 6th).

m. Move the Sweep coax from External 3 to External 4.

n. Set Standby to External 4 and Save.

o. CHECK — that the Sweep envelope matches the pattern ± 4.3 mV from 2 MHz to 6 MHz (2nd Marker to 4th Marker).

p. CHECK — Sweep envelope matches the pattern ± 12.9 mV from 6 MHz to 10 MHz (4th marker to 6th).

q. Move the Sweep coax from External 4 to Program In.

44. Test Signals Frequency Response

REQUIREMENT — ± 1% to 5 MHz. ± 5% to 10 MHz.

a. If your Instrument has a 1J option you will need to select the USA test signal set. To change the signal set perform the following steps, otherwise go to step b:

i. Turn off the VITS 200.

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ii. Hold in the Front Panel TEST SIGNAL button while turning the instrument back on; hold the button in until the front panel message reads “Select Signal Set Used.”

iii. Decrement to “USA 1V” and press SAVE.

iv. On the Inserter board move J54 to pins 1 & 2.

b. Decrement to 10 MHz Sweep as the Full Field Test Signal.

c. Connect the precision 75 Ω terminator to CH1 of the 11A34 in the 11403A scope. Connect the Low Loss 75 Ω coax from the terminator to TEST SIGNAL on the
VITS 200.

d. Connect a probe from CH3 of the 11A34 in the 11403A scope to U24 Pin 7 on the
VITS 200 Inserter board.

e. Set 11K Scope:

i. Press Utility and initialize.

ii. Enable CH3 on the 11A34.

iii. Press the Trigger hard key and then set the following:

Control	Setting
Trigger Select	main
Source	C3
Vertical Size CH3	2V/div
Vertical Offset CH3	0 V
Level	350 mV
Time Holdoff	20 ms
Main Size	50 µs/div
Main Position	–410 µs
Mode	Auto
Coupling	DC
Window Holdoff	HO: none Trig: main
Slope	–

iv. Enable CH1 on the 11A34.

v. Select Window1 soft key.

vi. Set: Window Size 5 µs/div
Window Pos. –370.5 µs

vii. Press the Waveform hard key, and then set the following:

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Control	Setting
Vertical Desc	Avg C1 Fast
Horizontal Desc	Window @ 10240 pts Main @ 5120 pts
Acquire Desc	Continuous
Vert Size: C1	3.6 mV/div
Vert Offset: C1	507.6 mV
Impedance	1 MΩ
Coupling	DC
BW Limit	300 MHz

f. Touch the lower waveform to enable control of it.

g. Select the vertical arrows that appear at center screen on the 11k scope.

h. Select cursors from the top of the lower window part of the 11403A screen, and then set cursor type to Horizontal Bars.

i. Use the upper knob to set one cursor to the amplitude of the flag on the left of the screen.

j. CHECK – that the sweep out to 5 MHz (4th major division after start of sweep) is within ± 1% (± 3.6 mV) of the flag cursor.
May have to wait for signal to settle.

k. Use the lower knob to set the second cursor 3.6 mV above or below the first cursor depending on sweep signal.

l. CHECK – that the sweep past 5 MHz is within ± 5% (± 17.8 mV) of the flag cursor. Use the lower knob to set the second cursor 17.8 mV above or below the first cursor depending on sweep signal.

m. If the instrument has the 1J option then perform the following step, otherwise skip to step n.

i. Turn off the VITS 200.

ii. Press and hold the TEST SIGNAL key and turn the instrument back on.

iii. When the message displayed is “Select Signal Set Used”, increment to JAPAN 1V.

iv. Press SAVE, then move J54 to pins 2 and 3 on the Inserter board.

n. Install the lid on the instrument with the twelve screws removed earlier.

This completes the Performance Check procedure.

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Adjustment Procedures

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Adjustment Procedures

Recommended Equipment List

The following equipment and accessory items are required to perform the Adjustment Procedures. Broad specifications are followed by an example of specific equipment that meet these specifications.

Electrical Instruments

1. Variable Autotransformer
   For example: General Radio Metered Auto Transformer W10MT3W. If 220V operation must be checked, a conversion transformer or appropriate 220 volt autotransformer is needed.

2. NTSC Test Signal Generator
   Capable of producing: NTC7 Composite, FlatField, Multiburst, and Red Field

   For example: Tektronix TSG–170A

3. Multimeter
   Capable of measuring: 5 Vdc, Accuracy ±0.1%

   For example: Tektronix DM252

4. Oscilloscope
   Vertical Amplifier: 40 MHz Bandwidth, 1 mV Sensitivity
   Accuracy: 0.25%
   Time Base: 5 µsec/div to 2 msec/div, capable of dual time base and accepting external triggering

   For example: Tektronix 11403 with a 11A34 Vertical Amplifier

5. Oscilloscope 10X Probe
   For example: Tektronix P6137

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6. NTSC Vectorscope and Waveform Monitor
   Capable of displaying line-rate and field-rate signals, bandwidth of 50 KHz to 6 MHz. Equipped with an internal variable amplitude calibrator (VAC). Capable of measuring phase, differential phase, differential gain.

   For example: Tektronix 1780R

7. NTSC Video Measurement Set
   For example: Tektronix VM 700A, Option 01

8. Frequency Counter
   Capable of measuring frequencies up to 30 MHz at ECL levels.
   Accuracy: within 10 Hz at 28.6 MHz

   For example: Tektronix DC503A

9. Accurate Frequency Standard
   For example: National Bureau of Standards WWV signal

Auxiliary Equipment

10. 75Ω Terminators
    Two – 0.025% end-line terminators
    One – feedthrough terminator

    For example: Tektronix End-line Terminator, Part No. 011–0102–01
    Tektronix Feedthrough Terminator, Part No. 011–0103–00

11. BNC Coax Cables
    75Ω low loss video cables

    For example: Tektronix Part No. 012–0159–02

12. BNC Adapter (Barrel Connector)
    For example: Tektronix Part No. 103–0028–00

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Calibration Procedure

Preliminary Setup

- Connect the
  VITS 200 AC power cord to the variable autotransformer. Turn the power on and set the autotransformer to 110 V.
- Connect the test signal generator output to the
  VITS 200 PROGRAM IN with a 75 ohm coax.
- Turn on all test equipment and allow for any required warm-up period.

Power Supply Adjustments

1. Adjust +5 Volts Supply

a. Connect multimeter to TP2 (test point 2) on the Inserter board

b. ADJUST – R170 (power supply section of Inserter board) for 5.0 V.

c. CHECK – all power supply characteristics listed in Table 6–1.

Table 6–1: Power Supply Characteristics

Supply	Voltage	Switching Ripple	Line Ripple
+5.0	+4.95 to +5.05	< 100 mV	< 10 mV
-5.2	–4.9 to –5.5	< 100 mV	< 20 mV
+12	+11.64 to +12.36	< 20 mV	< 10 mV
–12	–11.64 to –12.36	< 20 mV	< 10 mV

Genlock Adjustments

2. Inserter Board

a. Connect scope to U44 Pin 18.

b. Verify that the test signal generator is connected to PROGRAM IN.

c. Select NTC7 Composite as the test signal generator output signal.

d. ADJUST – R40 (Inserter board) for a clean 6.0 V trace.

e. Check that both the Front Panel UNLOCK and BYPASS LEDs are off.

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3. Controller Board

   a. Move the test signal generator output to EXT 1.

   b. Connect the scope to Pin 18 of U3.

   c. ADJUST – R32 for 6.0 V.

   d. Move the test signal to EXT 2.

   e. Connect the scope to Pin 18 of U4.

   f. ADJUST – R35 for 6.0 V.

   g. Move the test signal to EXT 3.

   h. Connect the scope to Pin 18 of U11.

   i. ADJUST – R92 for 6.0 V.

   j. Move the test signal to EXT 4.

   k. Connect the scope to Pin 18 of U9.

   l. ADJUST – R93 for 6.0 V.

DC Level Adjustments

4. Program, External, and Test Signal DC Levels

   a. Set the VITS 200 as follows:

      i. Press VITS.

      ii. INCREMENT or DECREMENT to Line 15.

      iii. Select 0% Black Set.

      iv. Press SAVE.

      v. Press LINE.

      vi. Select Line 11.

      vii. Press SIGNAL.

      viii. Select External 1.

      ix. Press SAVE.

      x. INCREMENT to next line.

      xi. Repeat steps vii through x for the remaining Externals.

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b. Connect a 75Ω cable from the 1780R CH A to the VITS 200 PROGRAM OUT (terminate CH A loopthrough with precision 75Ω terminator).

c. Connect the test signal generator to the VITS 200 PROGRAM IN.

d. Set the 1780R for DC level Checks.

i. Press Configure on the 1780R.

ii. Check that DC Restorer is set to OFF.

iii. Set Coupling to Ground.

iv. Set Gain for X5 Waveform.

v. Align trace with the base line of the waveform display graticule.

vi. Set Coupling to DC on the Vectorscope display.

vii. Cancel Configure by pressing it again.

viii. Set 1780R for one line display.

e. ADJUST – R30 (Inserter board) for Blanking at 0 IRE on waveform display graticule.

f. CHECK – that the PROGRAM OUT blanking level matches the trace position when no signal is applied (remove and then replace the coax).

g. Move the cable from PROGRAM OUT to MONITOR OUT.

h. CHECK – that the Monitor Out Blanking is 0V ± 10 mV (3 minor div).

i. Connect PROGRAM OUT to 1780R CH A.

j. Set the 1780R for LINE SELECT, Line 15, and X5 Waveform Gain.

k. Select Field All from the Line Sel Menu on the 1780R Vectorscope display.

l. ADJUST – R127 (Inserter board) to match inserted % Black to the lines from Fields 2–4.

m. Move the cable from PROGRAM OUT to TEST SIGNAL.

n. CHECK – that the Test Signal DC level is 0 V ± 10 mV (3 minor div).

o. Move the cable from TEST SIGNAL to PROGRAM OUT.

p. Use Utilities to set Externals to DC coupling saving each.

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i. Select UTILITIES from VITS 200 Front Panel.

ii. Use Decrement to select Coupling External 1.

iii. Use an arrow button to move the cursor to AC.

iv. Use Increment or Decrement to change to DC.

v. Press SAVE.

vi. Repeat steps ii through v for Externals 2 through 4.

q. On the 1780R select Line 11.

r. ADJUST – R60 (Controller board) to match Line 11 Inserted level to the level of Fields 2 and 4.

s. On the 1780R select Field 1 Line 12.

t. ADJUST – R61 (Controller board) to match Line 12 Inserted level to the level of Fields 2 and 4.

u. On the 1780R select Field 1 Line 13.

v. ADJUST – R119 (Controller board) to match Line 13 Inserted level to the level of Fields 2 and 4.

w. On the 1780R select Field 1 Line 14.

x. ADJUST – R122 (Controller board) to match Line 14 Inserted level to the level of Fields 2 and 4.

y. Select Utilities, Coupling External, and save all Externals to AC coupling.

z. ADJUST – R9 to match Line 11 Inserted level to the level of Fields 2 and 4.

aa. ADJUST – R12 to match Line 12 Inserted level to the level of Fields 2 and 4.

ab. ADJUST – R68 to match Line 13 Inserted level to the level of Fields 2 and 4.

ac. ADJUST – R71 to match Line 14 Inserted level to the level of Fields 2 and 4.

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Gain Adjustments

5. Inserter Board

   a. Connect the test signal generator output coax to the input coax of the 1780R with a barrel connector.

   b. Select the NTC7 Composite signal from the generator.

   c. Cancel Line Select on the 1780R then turn on the X5 Waveform Gain.

   d. Use the 1780R WFM + CAL to check the amplitude of the signal. Note the amplitude.

   e. Remove the barrel connector and connect the generator coax to PROGRAM IN.

   f. Connect the 1780R coax to PROGRAM OUT.

   g. ADJUST – R33 to match the amplitude noted in step d. PROGRAM OUT amplitude should match within ±2 mV.

   h. Move the 1780R input coax from PROGRAM OUT to TEST SIGNAL.

   i. Select TEST SIGNAL on the VITS 200 and increment to NTC7 Compos(ite).

   j. ADJUST – R122 on the inserter board for 714 mV.

6. Controller Board

   a. Move 1780R input coax from TEST SIGNAL to PROGRAM OUT.

   b. Move the test signal generator coax to EXT 1.

   c. Set STANDBY to Extern 1.

      i. Press STANDBY on the VITS 200 front panel.

      ii. Use DECREMENT to select Extern 1.

      iii. Press SAVE and then ENABLE on the VITS 200 front panel.

   d. ADJUST – R15 to match the amplitude noted in step 5–d.

   e. Move the test signal generator coax to EXT 2.

   f. Set STANDBY to Extern 2.

   g. ADJUST – R57 to match the amplitude noted in step 5–d.

   h. Move the test signal generator coax to EXT 3.

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i. Set STANDBY to Extern 3.

j. ADJUST – R78 to match the amplitude noted in step 5–d.

k. Move the test signal generator coax to EXT 4.

l. Set STANDBY to Extern 4.

m. ADJUST – R79 to match the amplitude noted in step 5–d.

Frequency Response Adjustments

7. Overall Frequency Response

a. Connect the test signal generator to the VITS 200 PROGRAM IN.

b. Connect coax from 1780R to the VITS 200 TEST SIGNAL output.

c. Select Test Signal on the VITS 200 and Increment to Sin X/X.

d. Select X5 Waveform Gain on the 1780R.

e. ADJUST – T2 (Inserter board) for matched tips of Sin X/X signal.

f. Decrement to 10 MHz Sweep as the Full Field Test Signal.

g. ADJUST – R210 and C165 for the best frequency response on 1780R.

h. Connect coax from VM 700A to the VITS 200 TEST SIGNAL output.

i. Increment to NTC7 Compos(ite) as the Full Field Test Signal.

j. Select Chroma Luminance Delay Gain on the VM 700A.

i. Select Measure.

ii. Select ChromLum Gain Delay soft key (on screen).

iii. Select Average.

***NOTE**. This method of using the VM700A Chroma Luminance Delay and Gain Measurement provides an accuracy ratio of 1:1.*

k. ADJUST – R210 for a Chroma Gain of 100 ±0.5% (99.5 to 100.5).

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l. If your Instrument has a 1J option you will need to select the USA test signal set. To change the signal set perform the following steps, otherwise go to step m:

i. Turn off the VITS 200.

ii. Hold in the Front Panel TEST SIGNAL button while turning the instrument back on. Continue holding the button in until the front panel message reads “Select Signal Set Used.”

iii. Decrement to “USA 1V” and press SAVE.

iv. On the Inserter board move J54 to pins 1 & 2.

m. Decrement to 10 MHz Sweep as the Full Field Test Signal.

n. Connect the precision 75 Ω feedthrough terminator to CH 1 of the 11A34 in the 11403A scope. Connect the Low Loss 75 Ω coax from the terminator to Test Signal on the VITS 200.

o. Connect a probe from CH 3 of the 11A34 to U24 Pin 7 on the VITS 200 Inserter board (11A34 installed in the center slot of the 11403A).

p. Set 11K Scope:

i. Press Utility and initialize.

ii. Enable CH 3 on the 11A34.

iii. Press the Trigger hard key and then set the following:

Control	Setting
Trigger Select	main
Source	C3
Vertical Size CH3	2V/div
Vertical Offset CH3	0 V
Level	350 mV
Time Holdoff	20 ms
Main Size	50 µs/div
Main Position	–410 µs
Mode	Auto
Coupling	DC
Window Holdoff	HO: none Trig: main
Slope	–

iv. Enable CH 1 on the 11A34.

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v. Select Window1 soft key.

vi. Set: Window Size 5 µs/div
Window Pos. –370.5 µs

vii. Press the Waveform hard key and then set the following:

Control	Setting
Vertical Desc	Avg C1 Fast
Horizontal Desc	Window @ 10240 pts Main @ 5120 pts
Acquire Desc	Continuous
Vert Size: C1	3.6 mV/div
Vert Offset: C1	507.6 mV
Impedance	1 MΩ
Coupling	DC
BW Limit	300 MHz

q. Touch the lower waveform to enable control of it.

r. Select the vertical arrows that appear at center screen on the 11k scope.

s. Select cursors from the top of the lower window part of the 11403A screen, and then set cursor type to Horizontal Bars.

t. Use the upper knob to set one cursor to the amplitude of the flag on the left of the screen.

NOTE. *All Frequency Response adjustments are interactive. If adjustment is necessary in the following steps, the entire procedure will have to be repeated until no adjustment is necessary.*

---

u. ADJUST – if necessary, the sweep from 5 MHz to 10 MHz with L12 and L13.

v. ADJUST – if necessary, R210 and C165 for the best frequency response possible.

w. CHECK – that the frequency response is ±1% (3.5 mV) out to 5.5 MHz, and ±5 % ⟨±17.5 mV) from 5.5 MHz to 10 MHz.

x. If adjustments were made in steps u or v, repeat the entire Frequency Response Adjustment procedure.

y. If instrument is a 1J option, return J54 (Inserter board) to pins 2 and 3, and select JAPAN 1V as signal set, and SAVE.

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Oscillator Adjustment

8. Oscillator Adjustment

a. Disconnect signal to PROGRAM IN.

b. Connect scope probe from CH A of the DC503A to TP 11 on the Inserter board.

c. Connect WWV signal to CH B of the DC503A, and set FUNCTION switch to RATIO A/B.

d. Remove plastic plug from oscillator C19 (Inserter board).

e. ADJUST – oscillator C19 (adjustment under plug in oven cover) for 28.636364 MHz ±1 Hz.

f. Replace the C19 plug.

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Maintenance

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Maintenance

This section has four main parts: preventive maintenance, troubleshooting aids, diagnostics, and corrective maintenance.

Preventive Maintenance

Under average environmental conditions, preventive maintenance should be done about every 2000 hours. This includes cleaning, visual inspection, a performance check, and, if needed, calibration. See Section 5 for performance check and calibration procedures.

Cleaning

Clean the instrument often enough to prevent dust or dirt from accumulating in or on it. Dirt prevents efficient heat dissipation. It also provides high-resistance electrical leakage paths between conductors or components in a humid environment.

Static-Sensitive Components

Static discharge can damage any semiconductor component in this instrument.

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

Observe the following precautions to avoid damage:

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 assemblies or components.
3. Discharge the static voltage from your body by wearing a wrist strap while handling these components. Servicing static-sensitive assemblies or components should be performed only at a static-free work station by qualified personnel.
4. Nothing capable of generating or holding a static charge should be allowed on the work station surface.
5. Keep the component leads shorted together whenever possible.
6. Pick up components by the body, never by the leads.
7. Do not slide the components over any surface.

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8. Avoid handling components in areas that have a floor or work surface covering capable of generating a static charge.
9. Use a soldering iron that is connected to earth ground.
10. Use only special antistatic, suction-type or wick-type desoldering tools.

Troubleshooting Aids

The following is miscellaneous information about schematics, circuit board illustrations, component numbering, and assembly numbering.

NOTE*. No repair should be attempted during the warranty period.*

Foldout Pages

The foldout pages at the back of the manual contain block and schematic diagrams and circuit board illustrations. See Figure 7–1.

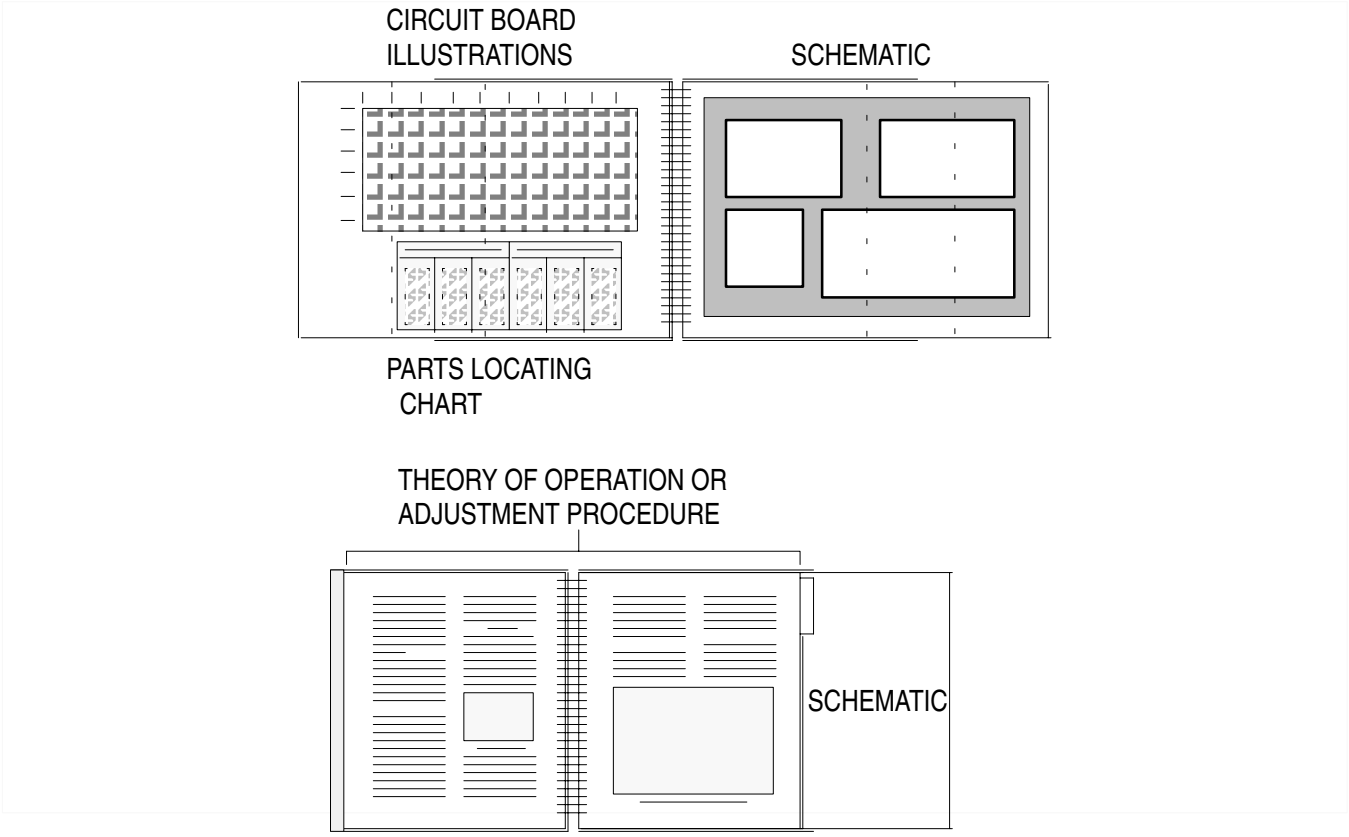


Figure 7–1: Using the Foldout Pages

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Diagrams

The circuit number and electrical value of each component is shown on the diagrams. The first page in the Diagrams section explains the schematic symbols. The Replaceable Electrical Parts List gives a complete description of each component. Those portions of the circuit that are mounted on circuit boards or assemblies are enclosed in a heavy border, with the name and assembly number shown on the border.

NOTE. *Check the Change Information section at the rear of the manual for inserts describing corrections and modifications to the instrument and manual.*

Circuit Board Illustrations

Electrical components, connectors, and test points are identified on circuit board illustrations located on the inside fold of the corresponding circuit diagram or the back of the preceding diagram.

Assembly and Circuit Numbering

The circuit board assemblies are assigned assembly numbers starting with A1. Figure 7–2 shows the location of the circuit board assemblies in the instrument. This illustration also shows the location of chassis-mounted components.

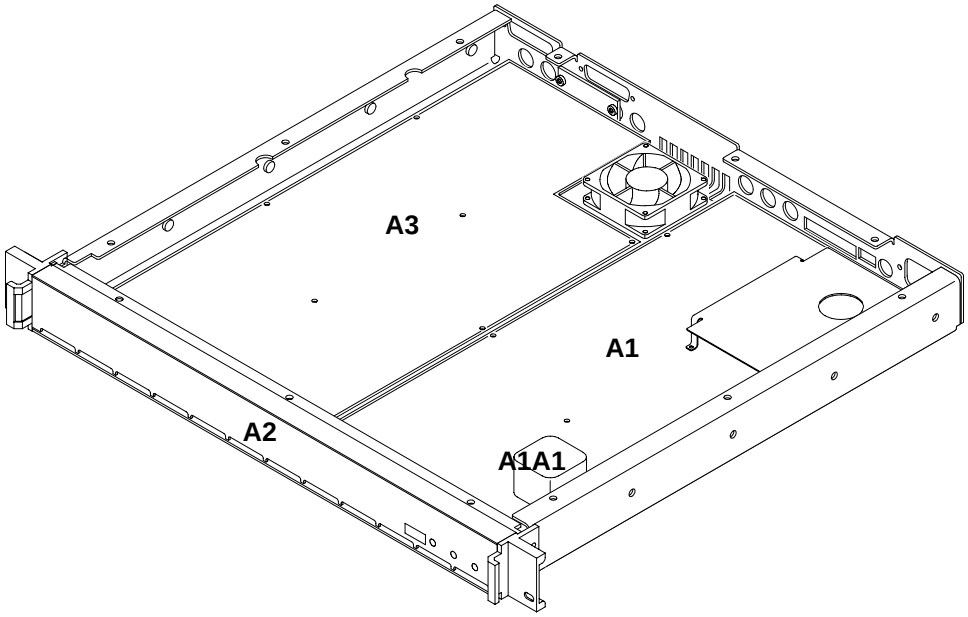


Figure 7–2: Circuit Board Assembly Locations.

Circuit boards have been assigned an assembly number so that they may be ordered from Tektronix, Inc. They are as follows:

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A1	Inserter Board Assembly
A1A1	Crystal Oven Board Assembly
A2	Front Panel Board Assembly
A3	Controller Board Assembly

The part numbers for ordering these boards are given on the first page of the Replaceable Electrical Parts List.

The Replaceable Electrical Parts List is arranged in assembly-by-assembly order, as designated by ANSI Standard Y32.16– 1975. Each component is assigned a circuit number according to its location within an assembly. The circuit number, in the parts list, is made up by combining the assembly number and the circuit number.

EXAMPLE: R123 on A2 would be listed in the Replaceable Parts List as A2R123.

In the Replaceable Electrical Parts List, assemblies are listed first, followed by circuit board-mounted parts in alpha numeric order.

NOTE*. The complete part number shown in the parts list should be used when ordering replacement parts.*

Diagnostics

Two Types of Diagnostics

Both the Inserter and the Controller boards contain their own diagnostic routines, which are divided into two types: power-up diagnostics and user diagnostics.

The Controller board power up diagnostics are automatically executed one time by the P, when the instrument is powered up or reset. These diagnostics show failure information on the front-panel display. Controller board user diagnostics, not enabled at the time of this printing, may be accessed through the front-panel UTILITIES menu.

Inserter board power-up diagnostics are also executed automatically. These are the RAM, ARCTAN, and CTC tests. If any of these fail, the UNLOCKED LED on the front-panel lights, and the instrument re-runs them. The VITS 200 will not lock to program video until the power-up diagnostics are completed successfully. User diagnostics for the Inserter board are accessed through rotary switch A1S8. See Table 7–1 for descriptions of these diagnostic routines.

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Table 7–1: Inserter Board Diagnostics

S8 Setting	Test	Description	Test Result Indication
0	None	Normal Genlock setting, no diagnostics.	NA
1	Do not use	This position is not used for the VITS 200.	NA
2	RAM Tests	Writes to and then reads from all the µP RAM locations in the genlock IC (A1U29), and compares the two. Writes to and reads from all sample RAM locations in the genlock IC, and compares the two. During power-up diagnostics, this test is run once.	On failure, lights the UNLOCKED LED, and the instrument will not lock to program 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. This test is run continuously. During power up diagnostics, this test is run once.	On failure, lights the UNLOCKED led, and the instrument will not lock to program video.
4	CTC Test	This test sets up the Counter Timer Chip (CTC) (A1U30) as timers, and checks to see that they can generate interrupts. Each of the CTC's four sections are set up to interrupt after 4096 processor clock cycles. If any of the CTC's sections have not interrupted within the allocated time, the test fails. During power-up diagnostics, this test is run once.	On failure, lights the UNLOCKED led, and the instrument will not lock to program video.
5	Do not use	This position is not used for the VITS 200.	NA
6	Do not use	This position is not used for the VITS 200.	NA
7	Port Test	Counts from 0–255 on the I/O ports of the the microprocessor system. This is the ED0-ED7 bus.	Used to check the data and load paths connected to the I/O ports. ED0ED7 bus should show a binary count pattern when viewed with a scope
8	VCO DAC Test	Generates a field rate ramp at the VCO DAC for checking the genlock DAC. This ramp may be viewed at A1J12–2.	Used to check the VCO DAC and Integrator.
9	Sampler Test 1	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.	Used to check the Genlock Acquisition circuitry.
A	Sampler Test 2	Sets up the genlock acquisition system to sample incoming video continuously, for checking acquisition timing.	Use a scope to check genlock timing pulses on CTC A1U30 pins 20–23. Trigger on input video.
B	Do not use	This position is not used for the VITS 200.	NA
C	Do not use	This position is not used for the VITS 200.	NA
D	Do not use	This position is not used for the VITS 200.	NA
E	Do not use	This position is not used for the VITS 200.	NA
F	Do not use	This position is not used for the VITS 200.	NA

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When selecting Inserter board user diagnostics, set A1S8 to the position for the desired diagnostic and cycle the power off and on, or momentarily move A1P5 to the pins 2–3 position to reset the μP. The μP will then run through the power-up process, poll the diagnostic port, and run the selected diagnostic.

User diagnostics are free-running, continuous-loop routines which allow a data path to be tested. The P sends a periodic signal through the path under test. The signal can then be viewed on a scope, at points along the path, to isolate problems.

Corrective Maintenance

Corrective maintenance deals with obtaining replacement parts, torque specifications, and component replacement.

Obtaining Replacement Parts

Replacement parts are available from or through the local Tektronix, Inc., field office or representative.

When ordering parts, be sure to include the following information in your order:

1. Instrument type (and option numbers, if any)
2. Instrument serial number
3. Description of the part, as it appears in the Replaceable Electrical or Mechanical Parts Lists.
4. The Tektronix part number

If a part that has been ordered is replaced with a new or improved part, the local Tektronix field office or representative will contact you concerning any change in the part number. After repair, the circuits may need readjustment.

Torque Specifications

Only #4, #6, and #8 screws are used in the VITS 200. Table 7–2 shows the torque ranges for these.

Table 7–2: Torque Specifications

Screw #	Torque Range (in inch pounds)
4	$3\ ^1/_2 - 5$
6	7 – 9
8	14 – 18

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Replacing Circuit Assemblies

Disconnect the instrument power cord before replacing components.



WARNING. *Disconnect the instrument power cord before replacing components.*

Use the following procedures to remove circuit board assemblies. Reverse the order of the removal procedures to reinstall or replace an assembly.

Front Panel Removal

1. Disconnect the three front-panel cable assemblies from the Controller board.
2. Remove the three screws along the front edge, on the bottom of the VITS 200.
3. Lift the front-panel assembly away from the VITS 200.

Inserter Board Removal

1. Remove the Front Panel, as described above.
2. Remove the retaining nuts on the three BNC connectors that extend through the rear panel.
3. Disconnect the three ribbon cables and four coax cables which connect the Inserter and Controller boards.
4. Remove the three mounting screws securing the power supply shield, and lift the shield off of the Inserter board.
5. Remove the two screws securing the motor base to the rear panel.
6. Remove the seven mounting screws securing the Inserter board to the bottom pan.
7. Slide the inserter board towards the front of the instrument until the BNC connectors clear the rear panel, and then lift the board away from the instrument.

Oven Assembly Removal

1. Remove the Inserter board, as described earlier.
2. Remove the two screws at the sides of the plastic insulating case and lift off the top part of the case.
3. Remove the screw and nut that attach the power transistor to the outside of the metal oven.

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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 attaching the circuit board to the oven and pull the oscillator out of the oven.

Controller Board Removal

1. Disconnect the REMOTE and RS-232 ribbon cables.
2. Remove the retaining nuts on the six BNC connectors that extend through the rear panel.
3. Disconnect the three ribbon cables and four coax cables which connect the Controller and Inserter boards.
4. Disconnect the three front-panel cable assemblies from the Controller board.
5. Remove the nine mounting screws.
6. Carefully angle the front of the circuit board up and slide it forward until the BNC connectors clear the rear panel, and then lift the board away from the instrument.

Test Selectable Parts

Test selectable capacitors A1C31, A3C66, A3C67, A3C68, and A3C69 are normally not needed. These capacitors are only installed when the associated integrated circuit pin 18 cannot be adjusted for a clean 6V ±1V during the Genlock Adjustment procedure (see Table). When needed, these capacitors are usually 130 pF, but may be selected from the range of 0 pF to 470 pF.

Table 7–3: Test Selectable Parts

Pin 18 of	Add Capacitor	In Parallel With
A1U44	A1C31	A3C11
A3U3	A3C66	A3C7
A3U4	A3C67	A3C8
A3U9	A3C69	A3C31
A3U11	A3C68	A3C32

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Replaceable Electrical Parts List

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Replaceable Electrical Parts

This section contains a list of the components that are replaceable for the VITS 200. Use this list to identify and order replacement parts. There is a separate Replaceable Electrical Parts list for each instrument.

Parts Ordering Information

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

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

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

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

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

Using the Replaceable Electrical Parts List

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

Cross Index–Mfr. Code Number to Manufacturer

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

Abbreviations

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

List of Assemblies

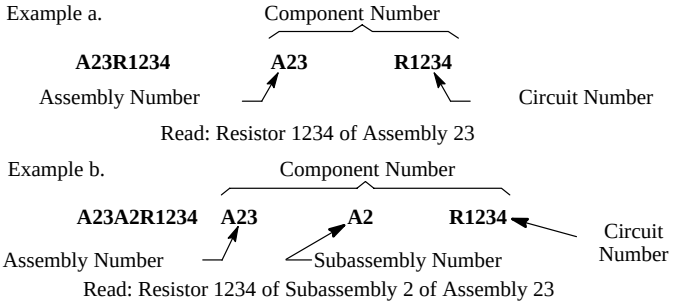
A list of assemblies can be found at the beginning of the electrical parts list. The assemblies are listed in numerical order. When the complete component number of a part is known, this list will identify the assembly in which the part is located.

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Column Descriptions

Component No. (Column 1)

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



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

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

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

Tektronix Part No. (Column 2)

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

Serial/Assembly No. (Column 3 and 4)

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

Name and Description (Column 5)

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

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

Mfr. Code (Column 6)

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

Mfr. Part No. (Column 7)

Indicates actual manufacturer's part number.

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Cross Index – Mfr. Code Number To Manufacturer

Mfr. Code.	Manufacturer	Address	City, State, Zip Code
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
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
TK2262	RPM ENTERPRISES SUB OF MICROSEMI CORP	3305 W CASTOR ST	SANTA ANA CA 92704
TK2424	CHAMPION TECHNOLOGIES	2553 N EDGINGTON ST	FRANKLIN PARK IL 60131
TK2598	MAXIM – ASIC	120 SAN GABRIEL DRV	SUNNYVALE, CA 94086
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
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

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Mfr. Code.	Manufacturer	Address	City, State, Zip Code
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
07716	IRC, INC	2850 MT PLEASANT AVE	BURLINGTON IA 52601
09023	CORNELL–DUBILIER ELECTRONICS DIV FEDERAL PACIFIC ELECTRIC CO	2652 DALRYMPLE ST	SANFORD NC 27330
09922	BURNDY CORP	1 RICHARDS AVE	NORWALK CT 06856
1CH66	PHILIPS SEMICONDUCTORS	811 E ARQUES AVENUE PO BOX 3409	SUNNYVALE CA 94088–3409
1ES66	MAXIM INTEGRATED PRODUCTS INC	120 SAN GABRIEL DRV	SUNNYVALE CA 94086
1Y013	DEANCO, ACACIA DIVISION	3101 SW 153RD DRV	BEAVERTON OR 97006
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
18796	MURATA ELECTRONICS NORTH AMERICA INC. STATE COLLEGE OPERATIONS	1900 W COLLEGE AVE	STATE COLLEGE PA 16801–2723
19701	PHILIPS COMPONENTS DISCRETE PRODUCTS DIV RESISTIVE PRODUCTS FACILITY AIRPORT ROAD	PO BOX 760	MINERAL WELLS TX 76067–0760
2K262	BOYD CORP	6136 NE 87th AVE PO BOX 20038	PORTLAND OR 97220
2W944	PAPST MECHATRONIC CORP	AQUIDNECK INDUSTRIAL PK	NEWPORT RI 02840
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
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
4T165	NEC ELECTRONICS USA INC ELECTRON DIV	475 ELLIS ST PO BOX 7241	MOUNTAIN VIEW CA 94039

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Mfr. Code.	Manufacturer	Address	City, State, Zip Code
48726	UNITRODE INTEGRATED CIRCUITS CORP (UICC)	7 CONTINENTAL BLVD PO BOX 399	MERRIMACK NH 03054–0399
5Y400	TRIAX METAL PRODUCTS INC DIV OF BEAVERTON PARTS MFG CO	1800 NW 216TH AVE	HILLSBORO OR 97124–6629
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
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
61964	OMRON ELECTRONICS INC	1 EAST COMMERCE	SCHAUMBURG IL 60173
62643	UNITED CHEMICON INC	9801 W HIGGINS ST SUITE 430	ROSEMONT, IL 60018–4771
62786	HITACHI AMERICA LTD HITACHI PLAZA	2000 SIERRA POINT PARKWAY	BRISBANE CA 94005
64154	LAMB INDUSTRIES INC	4826 SW SCHOLLS FERRY ROAD	PORTLAND OR 97225
64762	ELANTEC INC	1996 TAROB COURT	MILPITAS CA 95035–6824
65786	CYPRESS SEMICONDUCTOR CORP	3901 N 1ST ST	SAN JOSE CA 95134–1506
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
9M860	ELECTRONIC SUB ASSEMBLY MFG CORP (ESAM)	930 SE M STREET PO BOX 376	GRANTS PASS OR 97526–3248
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

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Replaceable Electrical Parts

Component Number	Tektronix Part Number	Serial / Assembly Number Effective	Discontinued	Name & Description	Mfr. Code	Mfr. Part Number
A1	671–2132–00	B010100	B010118	CIRCUIT BD ASSY:INSERTER	80009	671213200
A1	671–2132–01	B010119	B010122	CIRCUIT BD ASSY:INSERTER	80009	671213201
A1	671–2132–02	B010123	B010202	CIRCUIT BD ASSY:INSERTER	80009	671213202
A1	671–2132–03	B010203	B010239	CIRCUIT BD ASSY:INSERTER	80009	671213203
A1	671–2132–04	B010240	B020248	CIRCUIT BD ASSY:INSERTER	80009	671213204
A1	671–2132–05	B020249	B020271	CIRCUIT BD ASSY:INSERTER	80009	671213205
A1	671–2132–06	B020272	B020305	CIRCUIT BD ASSY:INSERTER	80009	671213206
A1	671–2132–07	B020306	B020395	CIRCUIT BD ASSY:INSERTER	80009	671213207
A1	671–2132–08	B020396	B020412	CIRCUIT BD ASSY:INSERTER	80009	671213208
A1	671–2132–09	B020413	B020447	CIRCUIT BD ASSY:INSERTER	80009	671213209
A1	671–2132–10	B020448	B020509	CIRCUIT BD ASSY:INSERTER	80009	671213210
A1	671–2132–11	B020510	B020536	CIRCUIT BD ASSY:INSERTER	80009	671213211
A1	671–2132–12	B020537	B020549	CIRCUIT BD ASSY:INSERTER	80009	671213212
A1	671–2132–13	B020550	B020762	CIRCUIT BD ASSY:INSERTER	80009	671213213
A1	671–2132–14	B020763	B021118	CIRCUIT BD ASSY:INSERTER	80009	671213214
A1	671–2132–15	B021119		CIRCUIT BD ASSY:INSERTER (STANDARD ONLY)	80009	671213215
A1	671–2545–00	B010100	B010122	CIRCUIT BD ASSY:INSERTER	80009	671254500
A1	671–2545–01	B010123	B010164	CIRCUIT BD ASSY:INSERTER	80009	671254501
A1	671–2545–02	B010165	B010202	CIRCUIT BD ASSY:INSERTER	80009	671254502
A1	671–2545–03	B010203	B010239	CIRCUIT BD ASSY:INSERTER	80009	671254503
A1	671–2545–04	B010240	B020248	CIRCUIT BD ASSY:INSERTER	80009	671254504
A1	671–2132–05	B020249	B020271	CIRCUIT BD ASSY:INSERTER	80009	671213205
A1	671–2132–06	B020272	B020305	CIRCUIT BD ASSY:INSERTER	80009	671213206
A1	671–2132–07	B020306	B020395	CIRCUIT BD ASSY:INSERTER	80009	671213207
A1	671–2132–08	B020396	B020412	CIRCUIT BD ASSY:INSERTER	80009	671213208
A1	671–2132–09	B020413	B020447	CIRCUIT BD ASSY:INSERTER	80009	671213209
A1	671–2132–10	B020448	B020509	CIRCUIT BD ASSY:INSERTER	80009	671213210
A1	671–2132–11	B020510	B020536	CIRCUIT BD ASSY:INSERTER	80009	671213211
A1	671–2132–12	B020537	B020549	CIRCUIT BD ASSY:INSERTER	80009	671213212
A1	671–2132–13	B020550	B020762	CIRCUIT BD ASSY:INSERTER	80009	671213213
A1	671–2132–14	B020763	B021118	CIRCUIT BD ASSY:INSERTER	80009	671213214
A1	671–2132–15	B021119		CIRCUIT BD ASSY:INSERTER (OPTION 1J ONLY)	80009	671213215
A1A1	119–4328–00	671–2132–00	671–2132–03	OVEN ASSEMBLY:VITS100/200,28MHZ	80009	119432800
A1A1	119–4328–01	671–2132–04	671–2132–13	OVEN ASSEMBLY:VITS100/200,28MHZ	80009	119432801
A1A1	119–4328–02	671–2132–14		OVEN ASSEMBLY:VITS100/200,28MHZ (STANDARD ONLY)	80009	119432802
A1A1	119–4328–00	671–2545–00	671–2545–03	OVEN ASSEMBLY:VITS100/200,28MHZ	80009	119432800
A1A1	119–4328–01	671–2545–04	671–2132–13	OVEN ASSEMBLY:VITS100/200,28MHZ	80009	119432801
A1A1	119–4328–02	671–2132–14		OVEN ASSEMBLY:VITS100/200,28MHZ (OPTION 1J ONLY)	80009	119432802
A2	671–2133–00			CIRCUIT BD ASSY:FRONT PANEL	80009	671213300
A3	671–2131–00	B010100	B010118	CIRCUIT BD ASSY:CONTROLLER	80009	671213100
A3	671–2131–01	B010119	B020248	CIRCUIT BD ASSY:CONTROLLER	80009	671213101
A3	671–2131–02	B020249	B020294	CIRCUIT BD ASSY:CONTROLLER	80009	671213102
A3	671–2131–03	B020295	B020509	CIRCUIT BD ASSY:CONTROLLER	80009	671213103
A3	671–2131–04	B020510	B020777	CIRCUIT BD ASSY:CONTROLLER	80009	671213104
A3	671–2131–05	B020778		CIRCUIT BD ASSY:CONTROLLER	80009	671213105
A4	119–4078–00			DISPLAY,FLAT PL:VACUUM FLOURESCENT,2 X 40;ALPHA-NUMERIC,5 X 7 DOT MATRIX,DC/DC AC CONVERT,CHAR GEN, LOGIC & MICRO COMP	4T165	FC20X2JA–BB
A1	671–2132–00	B010100	B010118	CIRCUIT BD ASSY:INSERTER	80009	671213200
A1	671–2132–01	B010119	B010122	CIRCUIT BD ASSY:INSERTER	80009	671213201
A1	671–2132–02	B010123	B010202	CIRCUIT BD ASSY:INSERTER	80009	671213202

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Component Number	Tektronix Part Number	Serial / Assembly Number Effective	Discontinued	Name & Description	Mfr. Code	Mfr. Part Number
A1	671–2132–03	B010203	B010239	CIRCUIT BD ASSY:INSERTER	80009	671213203
A1	671–2132–04	B010240	B020248	CIRCUIT BD ASSY:INSERTER	80009	671213204
A1	671–2132–05	B020249	B020271	CIRCUIT BD ASSY:INSERTER	80009	671213205
A1	671–2132–06	B020272	B020305	CIRCUIT BD ASSY:INSERTER	80009	671213206
A1	671–2132–07	B020306	B020395	CIRCUIT BD ASSY:INSERTER	80009	671213207
A1	671–2132–08	B020396	B020412	CIRCUIT BD ASSY:INSERTER	80009	671213208
A1	671–2132–09	B020413	B020447	CIRCUIT BD ASSY:INSERTER	80009	671213209
A1	671–2132–10	B020448	B020509	CIRCUIT BD ASSY:INSERTER	80009	671213210
A1	671–2132–11	B020510	B020536	CIRCUIT BD ASSY:INSERTER	80009	671213211
A1	671–2132–12	B020537	B020549	CIRCUIT BD ASSY:INSERTER	80009	671213212
A1	671–2132–13	B020550	B020762	CIRCUIT BD ASSY:INSERTER	80009	671213213
A1	671–2132–14	B020763	B021118	CIRCUIT BD ASSY:INSERTER	80009	671213214
A1	671–2132–15	B021119		CIRCUIT BD ASSY:INSERTER (STANDARD ONLY)	80009	671213215
A1	671–2545–00	B010100	B010122	CIRCUIT BD ASSY:INSERTER	80009	671254500
A1	671–2545–01	B010123	B010164	CIRCUIT BD ASSY:INSERTER	80009	671254501
A1	671–2545–02	B010165	B010202	CIRCUIT BD ASSY:INSERTER	80009	671254502
A1	671–2545–03	B010203	B010239	CIRCUIT BD ASSY:INSERTER	80009	671254503
A1	671–2545–04	B010240	B020248	CIRCUIT BD ASSY:INSERTER	80009	671254504
A1	671–2132–05	B020249	B020271	CIRCUIT BD ASSY:INSERTER	80009	671213205
A1	671–2132–06	B020272	B020305	CIRCUIT BD ASSY:INSERTER	80009	671213206
A1	671–2132–07	B020306	B020395	CIRCUIT BD ASSY:INSERTER	80009	671213207
A1	671–2132–08	B020396	B020412	CIRCUIT BD ASSY:INSERTER	80009	671213208
A1	671–2132–09	B020413	B020447	CIRCUIT BD ASSY:INSERTER	80009	671213209
A1	671–2132–10	B020448	B020509	CIRCUIT BD ASSY:INSERTER	80009	671213210
A1	671–2132–11	B020510	B020536	CIRCUIT BD ASSY:INSERTER	80009	671213211
A1	671–2132–12	B020537	B020549	CIRCUIT BD ASSY:INSERTER	80009	671213212
A1	671–2132–13	B020550	B020762	CIRCUIT BD ASSY:INSERTER	80009	671213213
A1	671–2132–14	B020763	B021118	CIRCUIT BD ASSY:INSERTER	80009	671213214
A1	671–2132–15	B021119		CIRCUIT BD ASSY:INSERTER (OPTION 1J ONLY) *ATTACHED PARTS*	80009	671213215
	131–0157–00			TERMINAL,PIN:0.25 L X 0.04 OD,BRS,SLDR PL	05276	013–100–1000–47
	200–3266–01			CAP,HEAT SINK:PLASTIC (USED WITH OVEN ASSEMBLY)	0JR05	200–3266–01
	210–0586–00			NUT,PL,ASSEM WA:4–40 X 0.25,STL CD PL (USED WITH OVEN ASSEMBLY)	TK0435	ORDER BY DESC
	211–0021–00			SCREW,MACHINE:4–40 X 1.25,PNH,STL (USED WITH OVEN ASSEMBLY)	TK0435	ORDER BY DESC
	211–0513–00			SCREW,MACHINE:6–32 X 0.625,PNH,STL (QUANTITY 2, USED WITH OVEN ASSEMBLY)	TK0435	ORDER BY DESC
	348–0935–00			GASKET:2.0 X 1.7,NEOPRENE (USED WITH OVEN ASSEMBLY)	TK1989	ORDER BY DESC
	432–0154–00			BASE,HEAT SINK:PLASTIC (USED WITH OVEN ASSEMBLY) *END ATTACHED PARTS*	80009	432015400
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

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Component Number	Tektronix Part Number	Serial / Assembly Number Effective	Discontinued	Name & Description	Mfr. Code	Mfr. Part Number
A1C14	290–0782–01			CAP,FXD,ALUM:4.7UF,20%,35V,ESR=42.33 OHM(120HZ,20C)	55680	UVX1V4R7MAA1TD
A1C15	281–0772–00	671–2132–12		CAP,FXD,CER:MLC;4700PF,10%,100V,0.100 X	04222	SA101C472KAA
				ATTACHED PARTS		
	162–0607–00	671–2132–12		INSUL SLVG,ELEC:HT SHRINK,0.046 ID,BLK0.013 THK W	06090	VERSAFIT
				END ATTACHED PARTS		
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	671–2132–13		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
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	671–2132–00	671–2132–04	CAP,FXD,CER DI:1000PF,+80–20%,200VSQUARE	04222	SR152E102ZAA
A1C67	283–0000–04	671–2132–05		CAP,FXD,CER DI:0.001UF,+100–0X,500V	18796	DD05–90HAY5U102
A1C67	283–0156–00	671–2545–00	671–2545–04	CAP,FXD,CER DI:1000PF,+80–20%,200VSQUARE	04222	SR152E102ZAA
A1C67	283–0000–04	671–2132–05		CAP,FXD,CER DI:0.001UF,+100–0X,500V	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

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Component Number	Tektronix Part Number	Serial / Assembly Number Effective	Discontinued	Name & Description	Mfr. Code	Mfr. Part Number
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	283–0633–00			CAP,FXD,MICA DI:77PF,1%,100V	TK0891	RDM15ED770F03
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	671–2132–00	671–2132–04	CAP,FXD,ALUM:1000UF,20%,6.3V,12.5MM X 25MM	55680	UPL1E102MHH
A1C91	290–1301–00	671–2132–05		CAP,FXD,ALUM:2700UF,20%,10V,12.5 X 30MM (0.492 X 1.180)	0H1N5	CEEFM1A272M7
A1C91	290–1069–00	671–2545–00	671–2545–04	CAP,FXD,ALUM:1000UF,20%,6.3V,12.5MM X 25MM	55680	UPL1E102MHH
A1C91	290–1301–00	671–2132–05		CAP,FXD,ALUM:2700UF,20%,10V,12.5 X 30MM (0.492 X 1.180)	0H1N5	CEEFM1A272M7
A1C92	290–1292–00	671–2132–00	671–2132–04	CAP,FXD,ALUM:4700UF,20%,6.3V,23 X 32MM;RADIAL,LOW IMPED,105 DEG,BULK	62643	767D472M6R3HE1C
A1C92	290–1301–00	671–2132–05		CAP,FXD,ALUM:2700UF,20%,10V,12.5 X 30MM (0.492 X 1.180)	0H1N5	CEEFM1A272M7
A1C92	290–1292–00	671–2545–00	671–2545–04	CAP,FXD,ALUM:4700UF,20%,6.3V,23 X 32MM;RADIAL,LOW IMPED,105 DEG,BULK	62643	767D472M6R3HE1C
A1C92	290–1301–00	671–2132–05		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,PLASTIC:METALIZED FILM;680PF,10%,1600V, POLYPROPYLENE,.70X.43	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	671–2132–00	671–2132–04	CAP,FXD,ELCTLT:100UF,+50%–20%,10WVDC	0H1N5	CEUSM1C101
A1C99	290–0973–01	671–2132–05		CAP,FXD,ALUM:100UF,20%,25VDC	55680	UVX1E101MEA1TA
A1C99	290–0755–00	671–2545–00	671–2132–04	CAP,FXD,ELCTLT:100UF,+50%–20%,10WVDC	0H1N5	CEUSM1C101
A1C99	290–0973–01	671–2132–05		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	671–2132–00	671–2132–04	CAP,FXD,ALUM:330UF,20%,25V,13 X 25MM	55680	UPL1J331MHH
A1C102	290–1302–00	671–2132–05		CAP,FXD,ALUM:1000UF,20%,35V,12.5 X 30MM (0.492 X 1.180)	0H1N5	CEEFM1V102M7
A1C102	290–1034–00	671–2545–00	671–2545–04	CAP,FXD,ALUM:330UF,20%,25V,13 X 25MM	55680	UPL1J331MHH
A1C102	290–1302–00	671–2132–05		CAP,FXD,ALUM:1000UF,20%,35V,12.5 X 30MM (0.492 X 1.180)	0H1N5	CEEFM1V102M7
A1C103	290–1034–00	671–2132–00	671–2132–04	CAP,FXD,ALUM:330UF,20%,25V,13 X 25MM	55680	UPL1J331MHH
A1C103	290–1302–00	671–2132–05		CAP,FXD,ALUM:1000UF,20%,35V,12.5 X 30MM (0.492 X 1.180)	0H1N5	CEEFM1V102M7
A1C103	290–1034–00	671–2545–00	671–2545–04	CAP,FXD,ALUM:330UF,20%,25V,13 X 25MM	55680	UPL1J331MHH
A1C103	290–1302–00	671–2132–05		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
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	671–2132–00	671–2132–04	CAP,FXD,ALUM:150UF,20%,400V,30 X 30MM;SNAPIN,105 DEG,BULK	0H1N5	CEAUF2G151M30
A1C110	290–1301–00	671–2132–05		CAP,FXD,ALUM:2700UF,20%,10V,12.5 X 30MM (0.492 X 1.180)	0H1N5	CEEFM1A272M7

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Component Number	Tektronix Part Number	Serial / Assembly Number Effective	Discontinued	Name & Description	Mfr. Code	Mfr. Part Number
A1C110	290–1291–00	671–2545–00	671–2545–04	CAP,FXD,ALUM:150UF,20%,400V,30 X 30MM;SNAPIN,105 DEG,BULK	0H1N5	CEAUF2G151M30
A1C110	290–1301–00	671–2132–05		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%,50V TAPED & 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	671–2132–00	671–2132–04	CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C155	281–0775–01	671–2545–00	671–2545–04	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
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

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Component Number	Tektronix Part Number	Serial / Assembly Number Effective	Discontinued	Name & Description	Mfr. Code	Mfr. Part Number
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	671–2132–01		CAP,FXD,CER DI:1000PF,10%,200V	04222	SR212A102KAA
A1C500	290–0943–02			CAP,FXD,ELCTLT:47UF,20%,25V TAPED & 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	671–2132–05		CAP,FXD,CER DI:3PF,+/–5PF,50V	TK0679	TC501–NPO–309D
A1C510	281–0775–01	671–2132–05		CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C511	281–0775–01	671–2132–05		CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1E1	337–1417–00	671–2132–00	671–2132–04	SHIELD,ELEC:0.55 SQ X 0.685 INCH HIGH	02875	SO–9649–CN
A1E1	337–1417–00	671–2545–00	671–2545–04	SHIELD,ELEC:0.55 SQ X 0.685 INCH HIGH	02875	SO–9649–CN
A1F1	159–0160–00			FUSE,CARTRIDGE:3AG,1.5 A,250 V,18 SEC,ULSAF CONT (FOR 90–250VAC OPERATION)	71400	MDL–1.5
				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
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

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Component Number	Tektronix Part Number	Serial / Assembly Number Effective	Discontinued	Name & Description	Mfr. Code	Mfr. Part Number
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
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
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	671–2132–05		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	671–2132–05		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	671–2132–05		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	671–2132–05		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

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Component Number	Tektronix Part Number	Serial / Assembly Number Effective	Discontinued	Name & Description	Mfr. Code	Mfr. Part Number
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	671–2132–00	671–2132–04	COIL,RF:FIXED,39.5UH	0JR03	108–0459–00
A1L1	108–1544–00	671–2132–05		COIL,RF:INDUCTOR;FXD,39.5UH,10%,Q=100,TAPPED,SHIELDED,POWEREDIRON	0JR03	108–1544–00 (Z–
A1L1	108–1544–00	671–2132–05		COIL,RF:INDUCTOR;FXD,39.5UH,10%,Q=100,TAPPD,SHIELDED,POWEREDIRON	0JR03	108–1544–00 (Z–
A1L1	108–0459–00	671–2545–00	671–2545–04	COIL,RF:FIXED,39.5UH	0JR03	108–0459–00
				ATTACHED PARTS		
	162–0532–00			INSUL SLVG,ELEC:HT SHRINK,0.375 IDPOLYOLEFIN,BLK,0.022 THK W	06090	VERSAFIT
				END ATTACHED PARTS		
A1L2	108–0215–00			COIL,RF:INDUCTOR;FXD,1.1UH,10%,38AWG,31 TURNS,276–0020–00 FORM,NYLON	0JR03	108–0215–00
A1L3	108–0215–00			COIL,RF:INDUCTOR;FXD,1.1UH,10%,38AWG,31 TURNS,276–0020–00 FORM,NYLON	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			INDUCTOR,FXD:POWER;10UH,10%,I<2.1A,RDC<0.043 OHM,Q>20,SRF>19MHZ	TK2058	TSL0707–100K1R9
A1L16	108–0554–00			INDUCTOR,FXD:POWER;5UH,20%,I<10A,DCR<0.01 OHM,17.5 TURNS/2LAYERS ONCORE 276–0147–00	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
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
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
A1P35	131–0993–02			BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P36	131–0993–02			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			BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P54	131–0993–02	671–2132–05		BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P55	131–0993–02	671–2132–05		BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P56	131–0993–02	671–2132–05		BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A1P57	131–0993–02	671–2132–05		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

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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,DARLING-TON,AMPL	04713	2N6044
A1Q11	151–0190–00			XSTR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	04713	2N3904
A1Q12	151–0254–00			XSTR,SIG:BIPOLAR,NPN;30V,500MA,125MHZ,AMPL,DAR-LINGTON	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,SWITCHING	04713	MJH16002A
				ATTACHED PARTS		
	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;VERTICALMOUNT,SLOT HOLE,(3)SOLDERABLE TABS,COPPER,BLACK PAINT	13103	6030B–TT
	342–0354–00			INSULATOR,PLATE:XSTR,SILICONE RUBBER	2K262	342–0354–00
				END ATTACHED PARTS		
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
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,0.197SQ,TOP ADJUST	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	671–2132–00	671–2132–12	RES,FXD,FILM:301 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G301ROF
A1R32	322–3154–00	671–2132–13		RES,FXD:METAL FILM;392 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G392R0F
A1R33	311–2226–00	671–2132–00	671–2132–02	RES,VAR,TRMR:CERMET;50 OHM,20%,0.5W,0.197 SQ,TOP ADJUST	TK2073	GF06UT2 500 M L
A1R33	311–2227–00	671–2132–03	671–2132–12	RES,VAR,TRMR:CERMET;100 OHM,20%,0.5W,0.197SQ,TOP ADJUST	TK2073	GF06UT2 101 M L
A1R33	311–2228–00	671–2132–13		RES,VAR,TRMR:CERMET;200 OHM,20%,0.5W,0.197SQ,TOP ADJUST	TK2073	GF06UT2 201 M L

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Component Number	Tektronix Part Number	Serial / Assembly Number Effective	Discontinued	Name & Description	Mfr. Code	Mfr. Part Number
A1R33	311–2226–00	671–2545–00	671–2545–02	RES,VAR,TRMR:CERMET;50 OHM,20%,0.5W,0.197 SQ,TOP ADJUST	TK2073	GF06UT2 500 M L
A1R33	311–2227–00	671–2545–03		RES,VAR,TRMR:CERMET;100 OHM,20%,0.5W,0.197SQ,TOP ADJUST	TK2073	GF06UT2 101 M L
A1R34	322–3143–00	671–2132–00	671–2132–12	RES,FXD,FILM:301 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G301ROF
A1R34	322–3154–00	671–2132–13		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,SM BODY	91637	CCF501G301ROF
A1R38	322–3143–00			RES,FXD,FILM:301 OHM,1%,0.2W,TC=T0MI,SM 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,0.197SQ,SIDE ADJUST	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	322–3347–00	671–2132–00	671–2132–00	RES,FXD,FILM:40.2K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF50–2–G40201F
A1R43	322–3385–00	671–2132–01		RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100PPM	91637	CCF501G10002F
A1R43	322–3347–00	671–2545–00	671–2545–04	RES,FXD,FILM:40.2K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF50–2–G40201F
A1R43	322–3385–00	671–2132–05		RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100PPM	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,SM 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
A1R53	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A1R54	322–3414–00	671–2132–00	671–2132–00	RES,FXD:METAL FILM;200K OHM,1%,0.2W,TC=100PPM	91637	CCF501G20002F
A1R54	322–3443–00	671–2132–01		RES,FXD,FILM:402K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF501G40202F
A1R54	322–3414–00	671–2545–00	671–2545–04	RES,FXD:METAL FILM;200K OHM,1%,0.2W,TC=100PPM	91637	CCF501G20002F
A1R54	322–3443–00	671–2132–05		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,SM 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,SM 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,SM 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=100PPM	91637	CCF501G10002F
A1R71	322–3385–00			RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100PPM	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

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Component Number	Tektronix Part Number	Serial / Assembly Number Effective	Discontinued	Name & Description	Mfr. Code	Mfr. Part Number
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
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,TOP ADJUST	TK2073	GF06UT2 500 M L
A1R123	322–3101–00			RES,FXD,FILM:110 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50–2G110R0F
A1R124	322–3167–00			RES,FXD,FILM:536 OHM,1%,0.2W,TC=T0MI,SM 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=T0	91637	CCF50G14301F
A1R127	311–2230–00			RES,VAR,TRMR:CERMET;500 OHM,20%,0.5W,0.197SQ,TOP ADJUST	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,SM BODY	91637	CCF501G267R0F
A1R133	322–3135–00			RES,FXD,FILM:249 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G249R0F
A1R134	322–3135–00			RES,FXD,FILM:249 OHM,1%,0.2W,TC=T0MI,SM 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=100PPM	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	671–2132–00	671–2132–04	RES,FXD,WW:50 OHM,0.5%,5W	91637	RS550R00D T/R
A1R149	308–0223–00	671–2132–05		RES,FXD,WW:35 OHM,5%,3W	00213	1240S–35–5
A1R149	308–0585–00	671–2545–00	671–2545–04	RES,FXD,WW:50 OHM,0.5%,5W	91637	RS550R00D T/R

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A1R149	308–0223–00	671–2132–05		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=100PPM	91637	CCF501G15000F
A1R153	301–0274–00	671–2132–00	671–2132–04	RES,FXD,FILM:270K OHM,5%,0.5W	19701	5053CX270K0J
A1R153	303–0274–00	671–2132–05		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	671–2132–00	671–2132–04	RES,FXD,FILM:270K OHM,5%,0.5W	19701	5053CX270K0J
A1R157	303–0274–00	671–2132–05		RES,FXD,CMPSN:270K OHM,5%,1W	80009	303027400
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	308–0679–00			RES,FXD:0.51 OHM,5%,2W	91637	CPF–2–0R51JT1
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=100PPM	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=100PPM	91637	CCF501G15000F
A1R170	311–2231–00			RES,VAR,TRMR:CERMET;1K OHM,20%,0.5W,0.197 SQ,TOP ADJUST	TK2073	GF06UT2 102 M L
A1R171	311–2231–00			RES,VAR,TRMR:CERMET;1K OHM,20%,0.5W,0.197 SQ,TOP ADJUST	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,SM BODY	91637	CCF501G301ROF
A1R190	322–3165–00			RES,FXD,FILM:511 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G511R0F
A1R191	322–3165–00			RES,FXD,FILM:511 OHM,1%,0.2W,TC=T0MI,SM 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,SM BODY	91637	CCF501G261R0F
A1R207	322–3117–00			RES,FXD,FILM:162 OHM,1%,0.2W,TC=T0MI,SM 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,0.197SQ,TOP ADJUST	TK2073	GF06UT2 101 M L
A1R211	322–3135–00			RES,FXD,FILM:249 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G249R0F
A1R212	322–3135–00			RES,FXD,FILM:249 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G249R0F
A1R213	322–3135–00			RES,FXD,FILM:249 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G249R0F
A1R214	322–3164–00			RES,FXD,FILM:499 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G499ROF
A1R215	322–3235–00	671–2132–00	671–2132–04	RES,FXD:METAL FILM;2.74K OHM,1%,0.2W,TC=100	91637	CCF501G27400F
A1R215	322–3235–00	671–2545–00	671–2545–04	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,SM BODY	91637	CCF501G511R0F
A1R221	322–3165–00			RES,FXD,FILM:511 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G511R0F

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Component Number	Tektronix Part Number	Serial / Assembly Number Effective	Discontinued	Name & Description	Mfr. Code	Mfr. Part Number
A1R222	322–3165–00			RES,FXD,FILM:511 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G511R0F
A1R223	322–3165–00			RES,FXD,FILM:511 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G511R0F
A1R224	322–3165–00			RES,FXD,FILM:511 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G511R0F
A1R225	322–3165–00			RES,FXD,FILM:511 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G511R0F
A1R226	322–3165–00			RES,FXD,FILM:511 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G511R0F
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=100PPM	91637	CCF501G15000F
A1R231	322–3135–00			RES,FXD,FILM:249 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G249R0F
A1R500	301–0105–00	671–2132–00	671–2132–04	RES,FXD,FILM:1M OHM,5%,0.50W	19701	5053CX1M000J
A1R500	303–0105–00	671–2132–05		RES,FXD,CMPSN:1M OHM,5%,1W	24546	FP32 OR FP1 1 M
A1R500	301–0105–00	671–2545–00	671–2545–04	RES,FXD,FILM:1M OHM,5%,0.50W	19701	5053CX1M000J
A1R500	303–0105–00	671–2132–05		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	671–2132–00	671–2132–05	RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100PPM	91637	CCF501G10002F
A1R504	322–3289–00	671–2132–06		RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A1R504	322–3385–00	671–2545–00	671–2132–05	RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100PPM	91637	CCF501G10002F
A1R504	322–3289–00	671–2132–06		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	671–2132–05		RES,FXD:METAL FILM;20K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20001F
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			SWITCH,PWR:DPDT;PUSH PUSH ALT ACT,PC PINS,6A 250VAC/1A 100VDC,36A AC SURGE,RIGHT ANG MNT,W/HARD END WIRE BAIL *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			SWITCH,PWR:DPDT;PUSH PUSH ALT ACT,PC PINS,6A 250VAC/1A 100VDC,36A AC SURGE,RIGHT ANG MNT,W/HARD END WIRE BAIL *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
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	671–2132–00	671–2132–04	IC,MEMORY:CMOS,EPROM;8K X 8,40NS,RGTRED	80009	160861200
A1U4	160–8612–01	671–2132–05	671–2132–10	IC,MEMORY:CMOS,EPROM;8K X 8	80009	160861201
A1U4	160–8612–02	671–2132–11		IC,MEMORY:CMOS,PROM;32K X 8,40NS,RGTRED	80009	160861202
A1U4	160–8867–00	671–2545–00	671–2545–01	IC,MEMORY:CMOS,PROM;8K X 8,40NS,RGTRED	80009	160886700
A1U4	160–8867–01	671–2545–02	671–2545–02	IC,MEMORY:CMOS,EPROM;32K X 8	80009	160886701
A1U4	160–8867–02	671–2545–02	671–2545–04	IC,MEMORY:CMOS,EPROM;32K X 8	80009	160886702
A1U4	160–8612–01	671–2132–05		IC,MEMORY:CMOS,EPROM;8K X 8	80009	160861201
A1U4	160–9573–00			IC,MEMORY:CMOS,8K X 8,EPROM (Opt 1C Philips GCR)	80009	160957300
A1U4	163–1015–00			IC,MEMORY:CMOS,32K X 8,EPROM (Opt 1K Korean GCR) *MOUNTING PARTS*	80009	163101500

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	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	671–2132–00	671–2132–04	IC,MEMORY:CMOS,EPROM;8K X 8,40NS,RGTRED	80009	160861300
A1U5	160–8613–01	671–2132–05	671–2132–10	IC,MEMORY:CMOS,EPROM;8K X 8	80009	160861301
A1U5	160–8613–02	671–2132–11		IC,MEMORY:CMOS,PROM;32K X 8,40NS,RGTRED	80009	160861302
A1U5	160–8868–00	671–2545–00	671–2545–01	IC,MEMORY:CMOS,PROM;8K X 8,40NS,RGTRED	80009	160886800
A1U5	160–8868–01	671–2545–02	671–2545–02	IC,MEMORY:CMOS,EPROM;32K X 8	80009	160886801
A1U5	160–8868–02	671–2545–02	671–2545–04	IC,MEMORY:CMOS,EPROM;32K X 8	80009	160886802
A1U5	160–8613–01	671–2132–05	671–2132–10	IC,MEMORY:CMOS,EPROM;8K X 8	80009	160861301
A1U5	160–8613–02	671–2132–11		IC,MEMORY:CMOS,PROM;32K X 8,40NS,RGTRED	80009	160861302
A1U5	160–9574–00			IC,MEMORY:CMOS,8K X 8,EPROM (Opt 1C Philips GCR)	80009	160957400
A1U5	163–1016–00			IC,MEMORY:CMOS,32K X 8,EPROM (Opt 1K Korean GCR)	80009	163101600
				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		
A1U6	160–8614–00	671–2132–00	671–2132–04	IC,MEMORY:CMOS,EPROM;8K X 8,40NS,RGTRED	80009	160861400
A1U6	160–8614–01	671–2132–05	671–2132–10	IC,MEMORY:CMOS,EPROM;8K X 8	80009	160861401
A1U6	160–8614–02	671–2132–11		IC,MEMORY:CMOS,PROM;32K X 8,40NS,RGTRED	80009	160861402
A1U6	160–8869–00	671–2545–00	671–2545–01	IC,MEMORY:CMOS,PROM;8K X 8,40NS,RGTRED	80009	160886900
A1U6	160–8869–01	671–2545–02	671–2545–02	IC,MEMORY:CMOS,EPROM;32K X 8	80009	160886901
A1U6	160–8869–02	671–2545–02	671–2545–04	IC,MEMORY:CMOS,EPROM;32K X 8	80009	160886902
A1U6	160–8614–01	671–2132–05	671–2132–10	IC,MEMORY:CMOS,EPROM;8K X 8	80009	160861401
A1U6	160–8614–02	671–2132–11		IC,MEMORY:CMOS,PROM;32K X 8,40NS,RGTRED	80009	160861402
A1U6	160–9575–00			IC,MEMORY:CMOS,8K X 8,EPROM (Opt 1C Philips GCR)	80009	160957500
A1U6	163–1017–00			IC,MEMORY:CMOS,32K X 8,EPROM (Opt 1K Korean GCR)	80009	163101700
				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	671–2132–00	671–2132–04	IC,DIGITAL:TTL,RGTR;10–BIT BFRED, NONINV, 3–STATE	34335	AM29821PC
A1U8	156–2063–00	671–2132–05		IC,DGTL:ALSTTL,FLIP FLOP;OCTAL NONINV D–TYPE,3–STATE	01295	SN74ALS374AN
A1U8	156–1702–00	671–2545–00	671–2545–04	IC,DIGITAL:TTL,RGTR;10–BIT BFRED, NONINV, 3–STATE	34335	AM29821PC
A1U8	156–2063–00	671–2132–05		IC,DIGITAL:ALSTTL,FLIP FLOP;OCTAL NONINV D–TYPE, 3–STATE	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	671–2132–00	671–2132–06	IC,DIGITAL:CMOS,PLD;EEPLD,16V8,25NS,90MA	80009	160860100
A1U12	160–8601–01	671–2132–07		IC,DIGITAL:CMOS,PLD;EEPLD,16V8,25NS,90MA	80009	160860101
A1U12	160–8601–00	671–2545–00	671–2132–06	IC,DIGITAL:CMOS,PLD;EEPLD,16V8,25NS,90MA	80009	160860100
A1U12	160–8601–01	671–2132–07		IC,DIGITAL:CMOS,PLD;EEPLD,16V8,25NS,90MA	80009	160860101
				MOUNTING PARTS		
	136–0752–00			SKT,PL–IN ELEK:MICROCIRCUIT,20 DIP	09922	DILB20P–108
				END MOUNTING PARTS		
A1U13	160–8606–00	671–2132–00	671–2132–04	IC,MEMORY:CMOS,EPROM;32K X 8,W/3 STATE OUT	80009	160860600
A1U13	160–8606–01	671–2132–05	671–2132–10	IC,MEMORY:CMOS,EPROM;64K X 16	80009	160860601
A1U13	160–8606–02	671–2132–11		IC,MEMORY:CMOS,EPROM;64K X 16,150NS,OTP,27C210,PLCC44	80009	160860602
A1U13	160–8870–00	671–2545–00	671–2545–01	IC,MEM:CMOS,EPROM;32K X 8 W/3–STATE OUT,27C256–250,DIP28.6	80009	160887000
A1U13	160–8870–01	671–2545–02	671–2545–02	IC,MEMORY:CMOS,EPROM;32K X 8 WITH 3 STATE OUT	80009	160887001
A1U13	160–8870–02	671–2545–02	671–2545–04	IC,MEMORY:CMOS,EPROM;32K X WITH 3 STATE OUT	80009	160887002
A1U13	160–8606–01	671–2132–05	671–2132–10	IC,MEMORY:CMOS,EPROM;64K X 16	80009	160860601
A1U13	160–8606–02	671–2132–11		IC,MEM:CMOS,EPROM;64K X 16,150NS,OTP,27C210, PLCC44	80009	160860602

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A1U13	160–9576–00			IC,MEMORY:CMOS,EPROM;32K X 8, (Opt 1C Philips GCR)	80009	160957600
A1U13	163–1018–00			IC,MEMORY: CMOS,EPROM;64K X 16 (Opt 1K Korean GCR)	80009	163101800
				MOUNTING PARTS		
	136–0755–00			SOCKET,DIP:PCB;FEMALE,STR,2 X 14,28 POS,0.1 X 0.6 CTR,0.175 H X0.130 TAIL,BECU,TIN,ACCOM 0.008–0.0015 X 0.014–0.022	09922	DILB28P–108
				END MOUNTING PARTS		
A1U14	160–8602–00	671–2132–00	671–2132–04	IC,DIGITAL:CMOS,PLD;OTP,22V10,25NS,33.3MHZ,90MA	80009	160860200
A1U14	160–8602–00	671–2545–00	671–2545–04	IC,DIGITAL:CMOS,PLD;OTP,22V10,25NS,33.3MHZ,90MA	80009	160860200
				MOUNTING PARTS		
	136–0925–00	671–2132–00	671–2132–04	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		
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	671–2132–00	671–2132–04	IC,DIGITAL:CMOS,PLD;OTP,22V10,25NS,33.3MHZ,90MA	80009	160860700
A1U16	160–8607–01	671–2132–05		IC,DIGITAL:CMOS,PLD;OTP,22V10,25NS,33.3MHZ,90MA	80009	160860701
A1U16	160–8607–00	671–2545–00	671–2545–04	IC,DIGITAL:CMOS,PLD;OTP,22V10,25NS,33.3MHZ,90MA	80009	160860700
A1U16	160–8607–01	671–2132–05		IC,DIGITAL:CMOS,PLD;OTP,22V10,25NS,33.3MHZ,90MA	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	160–8604–00	671–2132–00	671–2132–00	IC,DIGITAL:CMOS,PLD;EEPLD,16V8,25NS,90MA	80009	160860400
A1U17	160–8604–01	671–2132–01		IC,DIGITAL:CMOS,PLD;EEPLD,16V8,25NS,90MA	80009	160860401
				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
A1U21	156–0470–02			IC,DIGITAL:LSTTL,MUX/ENCODER	01295	SN74LS251N
A1U22	156–2141–00			IC,DIGITAL:LSTTL,SHIFT RGTR;8–BIT, WITH	01295	SN74LS597N
A1U23	156–2141–00			IC,DIGITAL:LSTTL,SHIFT RGTR;8–BIT, WITH	01295	SN74LS597N
A1U24	160–8615–00	671–2132–00	671–2132–01	IC,DGTL:CMOS,PLD;OPT,DUAL CLK,16MACROCELL,35NS	80009	160861500
A1U24	160–8615–01	671–2132–02	671–2132–04	IC,DIGITAL:CMOS,PLD;OPT,DUAL CLOCK	80009	160861501
A1U24	160–8615–02	671–2132–05		IC,DIGITAL:CMOS,PLD;OPT,DUAL CLOCK	80009	160861502
A1U24	160–8615–00	671–2545–00	671–2545–00	IC,DGTL:CMOS,PLD;OPT,DUAL CLK,16MACROCELL,35NS	80009	160861500
A1U24	160–8615–01	671–2545–01	671–2545–02	IC,DIGITAL:CMOS,PLD;OPT,DUAL CLOCK	80009	160861501
A1U24	160–8615–02	671–2132–05		IC,DIGITAL:CMOS,PLD;OPT,DUAL CLOCK	80009	160861502
A1U24	160–8615–02	671–2545–02	671–2545–04	IC,DIGITAL:CMOS,PLD;OPT,DUAL CLOCK	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;FEMALE,STR,2 X 14,28 POS,0.1 X 0.6 CTR,0.175 H X0.130 TAIL,BECU,TIN,ACCOM 0.008–0.0015 X 0.014–0.022	09922	DILB28P–108
				END MOUNTING PARTS		

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Component Number	Tektronix Part Number	Serial / Assembly Number Effective	Discontinued	Name & Description	Mfr. Code	Mfr. Part Number
A1U26	156–1998–00			IC,DIGITAL:ALSTTL,FLIP FLOP;OCTAL D–TYPE,CLEAR;74ALS273,DIP,20.3,TUBE	80009	156199800
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	671–2132–00	671–2132–01	IC,DGTL:CMOS,PLD;OPT,DUAL CLK,16MACROCELL,35NS	80009	160861600
A1U28	160–8616–01	671–2132–02	671–2132–11	IC,DIGITAL:CMOS,PLD;OTP,EP610,35NS,37MHZ	80009	160861601
A1U28	160–8616–02	671–2132–12		IC,DIGITAL:CMOS,PLD;OPT,DUAL CLOCK	80009	160861602
A1U28	160–8616–00	671–2545–00	671–2545–00	IC,DGTL:CMOS,PLD;OPT,DUAL CLK,16MACROCELL,35NS	80009	160861600
A1U28	160–8616–01	671–2545–01		IC,DIGITAL:CMOS,PLD;OTP,EP610,35NS,37MHZ	80009	160861601
				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		
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,PRPHL;CNTR/TIMERCKT,8MHZ	56708	Z84C3008PEC
				MOUNTING PARTS		
	136–0755–00			SOCKET,DIP:PCB;FEMALE,STR,2 X 14,28 POS,0.1 X 0.6 CTR,0.175 H X0.130 TAIL,BECU,TIN,ACCOM 0.008–0.0015 X 0.014–0.022	09922	DILB28P–108
				END MOUNTING PARTS		
A1U31	156–3050–00			IC,MISC:CMOS,PWR SUPPLY SUPERVISOR;MPU RESET GEN,5V SUPPLY SENSING,MPU WATCHDOGTIMER	0B0A9	DS1232
A1U32	160–8610–00	671–2132–00	671–2132–04	IC,MEMORY:CMOS,EPROM;16K X 8,120NS,27C512	80009	160861000
A1U32	160–8610–01	671–2132–05	671–2132–07	IC,MEMORY:CMOS,EPROM;16K X 8	80009	160861001
A1U32	160–8610–02	671–2132–08	671–2132–08	IC,MEMORY:CMOS,EPROM;32K X 8,120NS	80009	160861002
A1U32	160–8610–03	671–2132–09	671–2132–11	IC,MEMORY:CMOS,EPROM;32K X 8,120NS	80009	160861003
A1U32	160–8610–04	671–2132–12	671–2132–12	IC,MEMORY:CMOS,EPROM;32K X 8,120NS	80009	160861004
A1U32	160–8610–05	671–2132–13		IC,MEMORY:CMOS,EPROM;32K X 8,120NS	80009	160861005
A1U32	160–8610–00	671–2545–00	671–2545–04	IC,MEMORY:CMOS,EPROM;16K X 8,120NS,27C512	80009	160861000
A1U32	160–8610–01	671–2132–05		IC,MEMORY:CMOS,EPROM;16K X 8	80009	160861001
				MOUNTING PARTS		
	136–0755–00			SOCKET,DIP:PCB;FEMALE,STR,2 X 14,28 POS,0.1 X 0.6 CTR,0.175 H X0.130 TAIL,BECU,TIN,ACCOM 0.008–0.0015 X 0.014–0.022	09922	DILB28P–108
				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;FEMALE,STR,2 X 14,28 POS,0.1 X 0.6 CTR,0.175 H X0.130 TAIL,BECU,TIN,ACCOM 0.008–0.0015 X 0.014–0.022	09922	DILB28P–108
				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;FEMALE,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,DGTL:ALSTTL,BFR/DRVR;OCTALNONINV, HI DRV,3–STATE	01295	SN74ALS244A–1N

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A1U37	156–1754–02			IC,DIGITAL:ALSTTL,BFR/DRVR;OCTALNONINV, HIGH DRV, 3–STATE	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
				END MOUNTING PARTS		
A1U40	156–1998–00	671–2132–00	671–2132–04	IC,DIGITAL:ALSTTL,FLIP FLOP;OCTAL D–TYPE, W/CLEAR	01295	SN74ALS273N
A1U40	156–1998–00	671–2545–00	671–2545–04	IC,DIGITAL:ALSTTL,FLIP FLOP;OCTAL D–TYPE, W/CLEAR	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,AMPL;100MHZ,CURRENTFEED-BACK,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 INTERFACE WITH 8–BIT,30MSPS A/D	1CH66	TDA8708N
				MOUNTING PARTS		
	136–0755–00			SOCKET,DIP:PCB;FEMALE,STR,2 X 14,28 POS,0.1 X 0.6 CTR,0.175 H X0.130 TAIL,BECU,TIN,ACCOM 0.008–0.0015 X 0.014–0.022	09922	DILB28P–108
				END MOUNTING PARTS		
A1U44	156–3131–00			IC,MISC:BIPOLAR,VIDEO SUBSYSTEM;HORIZSYNC 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,CONVERTER:CMOS,D/A;8 BIT,400NS,CURRENT OUT,MPU COMPATIBLE,MULTIPLYING	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,AMPL;100MHZ,CURRENTFEED-BACK,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		

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A1U70	160–8605–00	671–2132–00	671–2132–04	IC,DIGITAL:CMOS,PLD;OTP,22V10,25NS,33.3MHZ,90MA	80009	160860500
A1U70	160–8605–01	671–2132–05		IC,DIGITAL:CMOS,PLD;OTP,22V10,25NS,33.3MHZ,90MA	80009	160860501
A1U70	160–8605–00	671–2545–00	671–2545–04	IC,DIGITAL:CMOS,PLD;OTP,22V10,25NS,33.3MHZ,90MA	80009	160860500
A1U70	160–8605–01	671–2132–05		IC,DIGITAL:CMOS,PLD;OTP,22V10,25NS,33.3MHZ,90MA	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,DIGITAL:LSTTL,MULTIVIBRATOR;DUAL RETRIGMO-NOSTABLE	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,FIBERGLASS REINFORCED SILICON RUBBER	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–REGULATOR CONTROL-LER;PWM,CURRENT MODE,SINGLE TOTEM POLE OUTPUT	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;HI 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,FIBERGLASS REINFORCED SILICON RUBBER	18565	69–11–8805–1674
				END ATTACHED PARTS		
A1U86	156–2063–00	671–2132–05		IC,DIGITAL:ALSTTL,FLIP FLOP;OCTAL NONINV D–TYPE, 3–STATE	01295	SN74ALS374AN
A1U87	160–9405–00	671–2132–05		IC,DIGITAL:	80009	160940500
				MOUNTING PARTS		
	136–0925–00	671–2132–05		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		
A1W1	131–4566–00	671–2132–00	671–2132–04	BUS,CONDUCTOR:0 OHM,300 SPACING,MI,DUM RES	91637	FRJ–50
A1W1	131–4566–00	671–2545–00	671–2545–04	BUS,CONDUCTOR:0 OHM,300 SPACING,MI,DUM RES	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
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

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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
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,FIBERGLASS REINFORCED SILICON RUBBER	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			DIODE,RECT:ULTRA FAST;1000V,1A,30A IFSM,75NS SOFT RECOVERY	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/COMANODE 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	671–2132–05		DIODE,SIG:ULTRA FAST;ARRAY,6 COM CATH/COMANODE PAIR,12 DIODES,50V,200MA,4NS,2.5PF	TK2262	DM 308BT100SP–4
A1CR28	152–0964–00	671–2132–05		DIODE,SIG:ULTRA FAST;ARRAY,6 COM CATH/COMANODE PAIR,12 DIODES,50V,200MA,4NS,2.5PF	TK2262	DM 308BT100SP–4
A1CR29	152–0964–00	671–2132–05		DIODE,SIG:ULTRA FAST;ARRAY,6 COM CATH/COMANODE 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
A1LF1	119–1946–00			FILTER,RFI:1A,250V,400HZ W/PC TERMINAL	0GV52	FN326–1/02–K–D–
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
A1TP1	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAPCB,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 DIAPCB,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 DIAPCB,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 DIAPCB,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 DIAPCB,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 DIAPCB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A1TP7	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAPCB,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 DIAPCB,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 DIAPCB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02

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A1TP10	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAPCB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A1TP11	214–4085–00	671–2132–05		TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAPCB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
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	671–2132–00	671–2132–04	DIODE,ZENER:5V,1%,0.4W	04713	SZG195RL
A1VR4	152–0279–00	671–2132–05		DIODE,ZENER:5.1V,5%,0.4W	04713	1N751ARL
A1VR4	152–0662–00	671–2545–00	671–2545–04	DIODE,ZENER:5V,1%,0.4W	04713	SZG195RL
A1VR4	152–0279–00	671–2132–05		DIODE,ZENER:5.1V,5%,0.4W	04713	1N751ARL
A1A1	119–4328–00	671–2132–00	671–2132–03	OVEN ASSEMBLY:VITS100/200,28MHZ	80009	119432800
A1A1	119–4328–01	671–2132–04	671–2132–13	OVEN ASSEMBLY:VITS100/200,28MHZ	80009	119432801
A1A1	119–4328–02	671–2132–14		OVEN ASSEMBLY:VITS100/200,28MHZ (STANDARD ONLY)	80009	119432802
A1A1	119–4328–00	671–2545–00	671–2545–03	OVEN ASSEMBLY:VITS100/200,28MHZ	80009	119432800
A1A1	119–4328–01	671–2545–04	671–2132–13	OVEN ASSEMBLY:VITS100/200,28MHZ	80009	119432801
A1A1	119–4328–02	671–2132–14		OVEN ASSEMBLY:VITS100/200,28MHZ (OPTION 1J ONLY)	80009	119432802
				ATTACHED PARTS		
	134–0209–00			BUTTON,PLUG:0.187 DIA HOLE,PLASTIC	31223	62PP018BM14
	162–0581–00			INSUL SLVG,ELEC:0.027 ID,PTFE,CLEAR (QUANTITY 0.0420 FT)	TK0977	PER TEK DOCUMEN
	200–3264–00			COVER,TOP:ALUMINUM	5Y400	ORDER BY DESC
	211–0244–00			SCR,ASSY WSHR:4–40 X 0.312,PNH,STL,CD PL,POZ,MACH (QUANTITY 2)	TK0435	7772–312
	214–3863–01	119–4328–00	119–4328–01	HEAT SINK,ELEC:ALUMINUM	TK1828	ORDER BY DESC
	214–4585–00	119–4328–02		HTSK,ELEC:1.55 X 0.96,YEL CHROMATECVRSN COATING	80009	214458500
	253–0143–00	119–4328–02		TAPE,PRESS SENS:KAPTON,1.0 X 0.00136YDS PER (QUANTITY 1.250 INCHES)	80009	253014300
	342–0991–00	119–4328–02		INSULATOR:	55285	342–0991–00
				END ATTACHED PARTS		
A1A1C6	283–5025–00	119–4328–00	119–4328–00	CAP,FXD,CER:MLC;220PF,5%,50V,NPO,1206	TK2058	C3216COG1H221J–
A1A1C6	283–5001–00	119–4328–01		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;FEMALE,RTANG,1 X 5,0.1 CTR,0.14 X 0.115 TAIL,2 X5 PCB,0.31 X 0.1 CTR PTH,40 GOLD,SIDE ENTRY,DAP	22526	65001–110
A1A1Q10	151–5035–00			XSTR,SIG:BIPOLAR,NPN;25V,30MA,650MHZ,AMPL	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	119–4328–00	119–4328–00	RES,FXD:THICK FILM;121 OHM,1%,0.125W,TC=100	50139	BCK1210FT
A1A1R9	321–5012–00	119–4328–01		RES,FXD:THICK FILM;332 OHM,1%,0.125W,TC=100	50139	BCK3320FT
A1A1Y1	————————			XTAL,UNIT,QTZ:28.636360 MHZ,5 PPM,PARALLEL,CL 32PF,2 MW DRV LEVEL;HC–43U (REPLACEABLE AT A1A1 ONLY)		
A1A1CR14	152–0612–00			DIODE,SIG:VVC;50V,15–20PF,C4/30=2.33,Q=15	04713	SMV1561
A1A1RT11	307–0181–01			RES,THERMAL:20K OHM,5%,AT 60 DEG C	91637	C771
A2	671–2133–00			CIRCUIT BD ASSY:FRONT PANEL	80009	671213300
A2J1	131–3152–00			CONN,HDR:PCB;MALE,STR,2 X 8,0.1 CTR,0.365H X 0.112 TAIL,SHRD/4 SIDES,CTR PLZ,30 GOLD	53387	2516–6002UB

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A2S1	260–2401–00			SWITCH,PUSH:SPST;MOM,NO,150 GRM FRC,SEALED,50MA,24VDC,100M OHM	61964	B3E–1000
				ATTACHED PARTS		
	366–0683–00			PUSH BUTTON:SWITCH CAP	0JR05	366–0683–00
				END ATTACHED PARTS		
A2S2	260–2401–00			SWITCH,PUSH:SPST;MOM,NO,150 GRM FRC,SEALED,50MA,24VDC,100M OHM	61964	B3E–1000
				ATTACHED PARTS		
	366–0683–00			PUSH BUTTON:SWITCH CAP	0JR05	366–0683–00
				END ATTACHED PARTS		
A2S3	260–2401–00			SWITCH,PUSH:SPST;MOM,NO,150 GRM FRC,SEALED,50MA,24VDC,100M OHM	61964	B3E–1000
				ATTACHED PARTS		
	366–0683–00			PUSH BUTTON:SWITCH CAP	0JR05	366–0683–00
				END ATTACHED PARTS		
A2S4	260–2401–00			SWITCH,PUSH:SPST;MOM,NO,150 GRM FRC,SEALED,50MA,24VDC,100M OHM	61964	B3E–1000
				ATTACHED PARTS		
	366–0683–00			PUSH BUTTON:SWITCH CAP	0JR05	366–0683–00
				END ATTACHED PARTS		
A2S5	260–2401–00			SWITCH,PUSH:SPST;MOM,NO,150 GRM FRC,SEALED,50MA,24VDC,100M OHM	61964	B3E–1000
				ATTACHED PARTS		
	366–0683–00			PUSH BUTTON:SWITCH CAP	0JR05	366–0683–00
				END ATTACHED PARTS		
A2S6	260–2401–00			SWITCH,PUSH:SPST;MOM,NO,150 GRM FRC,SEALED,50MA,24VDC,100M OHM	61964	B3E–1000
				ATTACHED PARTS		
	366–0683–00			PUSH BUTTON:SWITCH CAP	0JR05	366–0683–00
				END ATTACHED PARTS		
A2S7	260–2401–00			SWITCH,PUSH:SPST;MOM,NO,150 GRM FRC,SEALED,50MA,24VDC,100M OHM	61964	B3E–1000
				ATTACHED PARTS		
	366–0683–00			PUSH BUTTON:SWITCH CAP	0JR05	366–0683–00
				END ATTACHED PARTS		
A2S8	260–2401–00			SWITCH,PUSH:SPST;MOM,NO,150 GRM FRC,SEALED,50MA,24VDC,100M OHM	61964	B3E–1000
				ATTACHED PARTS		
	366–0683–00			PUSH BUTTON:SWITCH CAP	0JR05	366–0683–00
				END ATTACHED PARTS		
A2S9	260–2401–00			SWITCH,PUSH:SPST;MOM,NO,150 GRM FRC,SEALED,50MA,24VDC,100M OHM	61964	B3E–1000
				ATTACHED PARTS		
	366–0683–00			PUSH BUTTON:SWITCH CAP	0JR05	366–0683–00
				END ATTACHED PARTS		
A2S10	260–2401–00			SWITCH,PUSH:SPST;MOM,NO,150 GRM FRC,SEALED,50MA,24VDC,100M OHM	61964	B3E–1000
				ATTACHED PARTS		
	366–0683–00			PUSH BUTTON:SWITCH CAP	0JR05	366–0683–00
				END ATTACHED PARTS		
A2S11	260–2401–00			SWITCH,PUSH:SPST;MOM,NO,150 GRM FRC,SEALED,50MA,24VDC,100M OHM	61964	B3E–1000
				ATTACHED PARTS		
	366–0683–00			PUSH BUTTON:SWITCH CAP	0JR05	366–0683–00
				END ATTACHED PARTS		
A2S12	260–2401–00			SWITCH,PUSH:SPST;MOM,NO,150 GRM FRC,SEALED,50MA,24VDC,100M OHM	61964	B3E–1000
				ATTACHED PARTS		
	366–0683–00			PUSH BUTTON:SWITCH CAP	0JR05	366–0683–00

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				END ATTACHED PARTS		
A2S13	260–2401–00			SWITCH,PUSH:SPST;MOM,NO,150 GRM FRC,SEALED,50MA,24VDC,100M OHM	61964	B3E–1000
				ATTACHED PARTS		
	366–0683–00			PUSH BUTTON:SWITCH CAP	0JR05	366–0683–00
				END ATTACHED PARTS		
A2S14	260–2401–00			SWITCH,PUSH:SPST;MOM,NO,150 GRM FRC,SEALED,50MA,24VDC,100M OHM	61964	B3E–1000
				ATTACHED PARTS		
	366–0683–00			PUSH BUTTON:SWITCH CAP	0JR05	366–0683–00
				END ATTACHED PARTS		
A2S15	260–2401–00			SWITCH,PUSH:SPST;MOM,NO,150 GRM FRC,SEALED,50MA,24VDC,100M OHM	61964	B3E–1000
				ATTACHED PARTS		
	366–0683–00			PUSH BUTTON:SWITCH CAP	0JR05	366–0683–00
				END ATTACHED PARTS		
A3	671–2131–00	B010100	B010118	CIRCUIT BD ASSY:CONTROLLER	80009	671213100
A3	671–2131–01	B010119	B020248	CIRCUIT BD ASSY:CONTROLLER	80009	671213101
A3	671–2131–02	B020249	B020294	CIRCUIT BD ASSY:CONTROLLER	80009	671213102
A3	671–2131–03	B020295	B020509	CIRCUIT BD ASSY:CONTROLLER	80009	671213103
A3	671–2131–04	B020510	B020777	CIRCUIT BD ASSY:CONTROLLER	80009	671213104
A3	671–2131–05	B020778		CIRCUIT BD ASSY:CONTROLLER	80009	671213105
				ATTACHED PARTS		
	131–0157–00			TERMINAL,PIN:0.25 L X 0.04 OD,BRS,SLDR PL (QUANTITY 3)	05276	013–100–1000–47
				END ATTACHED PARTS		
A3C1	290–0990–00			CAP,FXD,ALUM:10UF,20%,50V,8X11.5	55680	UET1H100MPH
A3C2	290–0990–00			CAP,FXD,ALUM:10UF,20%,50V,8X11.5	55680	UET1H100MPH
A3C3	281–0765–00			CAP,FXD,CER DI:100PF,5%,100V	04222	SA102A101JAA
A3C4	281–0765–00			CAP,FXD,CER DI:100PF,5%,100V	04222	SA102A101JAA
A3C5	281–0925–01			CAP,FXD,CER:MLC;0.22UF,20%,50V,Z5U.0.170 X 0.120	04222	SA115E224MAA
A3C6	281–0925–01			CAP,FXD,CER:MLC;0.22UF,20%,50V,Z5U.0.170 X 0.120	04222	SA115E224MAA
A3C7	283–0100–00			CAP,FXD,CER DI:0.0047UF,10%,200V	04222	SR302A472KAA
A3C8	283–0100–00			CAP,FXD,CER DI:0.0047UF,10%,200V	04222	SR302A472KAA
A3C9	281–0773–00			CAP,FXD,CER:MLC;0.01UF,10%,100V	TK1743	CGB103KEX
A3C10	281–0773–00			CAP,FXD,CER:MLC;0.01UF,10%,100V	TK1743	CGB103KEX
A3C11	281–0925–01			CAP,FXD,CER:MLC;0.22UF,20%,50V,Z5U.0.170 X 0.120	04222	SA115E224MAA
A3C12	281–0925–01			CAP,FXD,CER:MLC;0.22UF,20%,50V,Z5U.0.170 X 0.120	04222	SA115E224MAA
A3C13	281–0707–00			CAP,FXD,CER DI:15000PF,10%,200V	04222	MA302C153KAA
A3C14	281–0707–00			CAP,FXD,CER DI:15000PF,10%,200V	04222	MA302C153KAA
A3C15	283–0179–00			CAP,FXD,CER DI:0.68UF,10%,100V	04222	SR501C684KAA
A3C16	283–0100–00			CAP,FXD,CER DI:0.0047UF,10%,200V	04222	SR302A472KAA
A3C17	283–0179–00			CAP,FXD,CER DI:0.68UF,10%,100V	04222	SR501C684KAA
A3C18	283–0100–00			CAP,FXD,CER DI:0.0047UF,10%,200V	04222	SR302A472KAA
A3C19	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C20	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C21	281–0925–01			CAP,FXD,CER:MLC;0.22UF,20%,50V,Z5U.0.170 X 0.120	04222	SA115E224MAA
A3C22	281–0925–01			CAP,FXD,CER:MLC;0.22UF,20%,50V,Z5U.0.170 X 0.120	04222	SA115E224MAA
A3C23	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C24	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C25	281–0925–01			CAP,FXD,CER:MLC;0.22UF,20%,50V,Z5U.0.170 X 0.120	04222	SA115E224MAA
A3C26	281–0925–01			CAP,FXD,CER:MLC;0.22UF,20%,50V,Z5U.0.170 X 0.120	04222	SA115E224MAA
A3C27	290–0990–00			CAP,FXD,ALUM:10UF,20%,50V,8X11.5	55680	UET1H100MPH
A3C28	290–0990–00			CAP,FXD,ALUM:10UF,20%,50V,8X11.5	55680	UET1H100MPH
A3C29	281–0765–00			CAP,FXD,CER DI:100PF,5%,100V	04222	SA102A101JAA
A3C30	281–0765–00			CAP,FXD,CER DI:100PF,5%,100V	04222	SA102A101JAA
A3C31	283–0100–00			CAP,FXD,CER DI:0.0047UF,10%,200V	04222	SR302A472KAA
A3C32	283–0100–00			CAP,FXD,CER DI:0.0047UF,10%,200V	04222	SR302A472KAA

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Component Number	Tektronix Part Number	Serial / Assembly Number Effective	Discontinued	Name & Description	Mfr. Code	Mfr. Part Number
A3C33	281–0773–00			CAP,FXD,CER:MLC;0.01UF,10%,100V	TK1743	CGB103KEX
A3C34	281–0773–00			CAP,FXD,CER:MLC;0.01UF,10%,100V	TK1743	CGB103KEX
A3C35	281–0707–00			CAP,FXD,CER DI:15000PF,10%,200V	04222	MA302C153KAA
A3C36	281–0707–00			CAP,FXD,CER DI:15000PF,10%,200V	04222	MA302C153KAA
A3C37	283–0179–00			CAP,FXD,CER DI:0.68UF,10%,100V	04222	SR501C684KAA
A3C38	283–0100–00			CAP,FXD,CER DI:0.0047UF,10%,200V	04222	SR302A472KAA
A3C39	283–0179–00			CAP,FXD,CER DI:0.68UF,10%,100V	04222	SR501C684KAA
A3C40	283–0100–00			CAP,FXD,CER DI:0.0047UF,10%,200V	04222	SR302A472KAA
A3C41	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C42	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C43	281–0925–01			CAP,FXD,CER:MLC;0.22UF,20%,50V,Z5U.0.170 X 0.120	04222	SA115E224MAA
A3C44	281–0925–01			CAP,FXD,CER:MLC;0.22UF,20%,50V,Z5U.0.170 X 0.120	04222	SA115E224MAA
A3C45	281–0925–01			CAP,FXD,CER:MLC;0.22UF,20%,50V,Z5U.0.170 X 0.120	04222	SA115E224MAA
A3C46	281–0925–01			CAP,FXD,CER:MLC;0.22UF,20%,50V,Z5U.0.170 X 0.120	04222	SA115E224MAA
A3C47	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C48	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C49	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C50	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C51	281–0756–00			CAP,FXD,CER:MLC;2.2PF,+/–0.5PF,200V,NPO,0.100 X 0.170	04222	SA102A2R2DAA
A3C52	281–0811–00			CAP,FXD,CER:MLC;10PF,10%,200V,0.100 X 0.170	04222	SA102A100KAA
A3C53	281–0756–00			CAP,FXD,CER:MLC;2.2PF,+/–0.5PF,200V,NPO,0.100 X 0.170	04222	SA102A2R2DAA
A3C54	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C55	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C56	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C57	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C58	283–0177–00			CAP,FXD,CER DI:1UF,+80–20%,25V	04222	SR303E105ZAA
A3C59	290–0942–00			CAP,FXD,ELCTLT:100UF,+100–10%,25V,ALUMINUM	0H1N5	CEUFM1E101
A3C60	283–0177–00			CAP,FXD,CER DI:1UF,+80–20%,25V	04222	SR303E105ZAA
A3C61	290–0804–00			CAP,FXD,ELCTLT:10UF,+50–20%,25V	0H1N5	CEUSM1E100
A3C62	290–0804–00			CAP,FXD,ELCTLT:10UF,+50–20%,25V	0H1N5	CEUSM1E100
A3C63	290–0804–00			CAP,FXD,ELCTLT:10UF,+50–20%,25V	0H1N5	CEUSM1E100
A3C64	290–0804–00			CAP,FXD,ELCTLT:10UF,+50–20%,25V	0H1N5	CEUSM1E100
A3C65	290–0804–00			CAP,FXD,ELCTLT:10UF,+50–20%,25V	0H1N5	CEUSM1E100
A3C66	283–0108–00	671–2131–04		CAP,FXD,CER DI:220PF,10%,200V	04222	SR152A221KAA
A3C67	283–0108–00	671–2131–04		CAP,FXD,CER DI:220PF,10%,200V	04222	SR152A221KAA
A3C68	283–0108–00	671–2131–04		CAP,FXD,CER DI:220PF,10%,200V	04222	SR152A221KAA
A3C69	283–0108–00	671–2131–04		CAP,FXD,CER DI:220PF,10%,200V	04222	SR152A221KAA
A3C71	281–0863–00			CAP,FXD,CER:MLC;240PF,5%,100V,0.100 X 0.170	04222	SA101A241JAA
A3C72	281–0863–00			CAP,FXD,CER:MLC;240PF,5%,100V,0.100 X 0.170	04222	SA101A241JAA
A3C73	281–0863–00			CAP,FXD,CER:MLC;240PF,5%,100V,0.100 X 0.170	04222	SA101A241JAA
A3C74	281–0863–00			CAP,FXD,CER:MLC;240PF,5%,100V,0.100 X 0.170	04222	SA101A241JAA
A3C75	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C76	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C77	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C78	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C80	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C81	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C82	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C83	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C84	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C85	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C87	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C88	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C89	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C90	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C91	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C92	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C93	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA

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Component Number	Tektronix Part Number	Serial / Assembly Number Effective	Discontinued	Name & Description	Mfr. Code	Mfr. Part Number
A3C94	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C95	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C96	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C97	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C98	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C99	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C100	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C101	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C102	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C103	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C104	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C105	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C106	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C107	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C108	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C109	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C111	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C112	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C113	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C114	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C115	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C116	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C117	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C118	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C119	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C120	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C121	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C122	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C123	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C124	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C125	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C130	281–0811–00			CAP,FXD,CER:MLC;10PF,10%,200V,0.100 X 0.170	04222	SA102A100KAA
A3C131	281–0756–00			CAP,FXD,CER:MLC;2.2PF,+/–0.5PF,200V,NPO,0.100 X 0.170	04222	SA102A2R2DAA
A3C132	290–0942–00			CAP,FXD,ELCTLT:100UF,+100–10%,25V,ALUMINUM	0H1N5	CEUFM1E101
A3C133	283–0177–00			CAP,FXD,CER DI:1UF,+80–20%,25V	04222	SR303E105ZAA
A3C134	281–0756–00			CAP,FXD,CER:MLC;2.2PF,+/–0.5PF,200V,NPO,0.100 X 0.170	04222	SA102A2R2DAA
A3C135	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C136	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C137	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C138	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C139	283–0177–00			CAP,FXD,CER DI:1UF,+80–20%,25V	04222	SR303E105ZAA
A3C140	290–0942–00			CAP,FXD,ELCTLT:100UF,+100–10%,25V,ALUMINUM	0H1N5	CEUFM1E101
A3C141	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C142	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C143	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C144	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C145	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C146	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C147	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C148	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C149	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C150	290–0942–00			CAP,FXD,ELCTLT:100UF,+100–10%,25V,ALUMINUM	0H1N5	CEUFM1E101
A3C151	290–0942–00			CAP,FXD,ELCTLT:100UF,+100–10%,25V,ALUMINUM	0H1N5	CEUFM1E101
A3C152	290–0942–00			CAP,FXD,ELCTLT:100UF,+100–10%,25V,ALUMINUM	0H1N5	CEUFM1E101
A3C153	290–0942–00			CAP,FXD,ELCTLT:100UF,+100–10%,25V,ALUMINUM	0H1N5	CEUFM1E101
A3C154	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C155	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C156	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA

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Component Number	Tektronix Part Number	Serial / Assembly Number Effective	Discontinued	Name & Description	Mfr. Code	Mfr. Part Number
A3C157	281–0775–01			CAP,FXD,CER:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C158	281–0811–00			CAP,FXD,CER:MLC;10PF,10%,200V,0.100 X 0.170	04222	SA102A100KAA
A3C159	281–0770–00			CAP,FXD,CER DI:1000PF,20%,100V	04222	SA101C102MAA
A3C160	281–0770–00			CAP,FXD,CER DI:1000PF,20%,100V	04222	SA101C102MAA
A3C161	281–0770–00			CAP,FXD,CER DI:1000PF,20%,100V	04222	SA101C102MAA
A3C162	281–0770–00			CAP,FXD,CER DI:1000PF,20%,100V	04222	SA101C102MAA
A3C163	290–0942–00			CAP,FXD,ELCTLT:100UF,+100–10%,25V,ALUMINUM	0H1N5	CEUFM1E101
A3C164	283–0359–00	671–2131–01		CAP,FXD,CER DI:1000PF,10%,200V	04222	SR212A102KAA
A3C165	283–0359–00	671–2131–01		CAP,FXD,CER DI:1000PF,10%,200V	04222	SR212A102KAA
A3C166	283–0359–00	671–2131–01		CAP,FXD,CER DI:1000PF,10%,200V	04222	SR212A102KAA
A3C167	283–0359–00	671–2131–01		CAP,FXD,CER DI:1000PF,10%,200V	04222	SR212A102KAA
A3J1	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
A3J2	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
A3J3	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
A3J4	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
A3J5	131–3152–00			CONN,HDR:PCB;MALE,STR,2 X 8,0.1 CTR,0.365H X 0.112 TAIL,SHRD/4 SIDES,CTR PLZ,30 GOLD	53387	2516–6002UB
A3J6	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
A3J7	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
A3J8	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
A3J9	131–3364–00			CONN,HDR:PCB;MALE,STR,2 X 17,0.1 CTR,0.365D	53387	2534–6002UB
A3J10	131–3323–00			CONN,HDR:PCB;MALE,STR,2 X 20,0.1 CTR,0.365D	22526	66506–025
A3J11	131–3362–00			CONN,HDR:PCB;MALE,STR,2 X 13,0.1 CTR,0.365D	53387	2526–6002UB
A3J12	131–3362–00			CONN,HDR:PCB;MALE,STR,2 X 13,0.1 CTR,0.365D	53387	2526–6002UB
A3J13	131–3364–00			CONN,HDR:PCB;MALE,STR,2 X 17,0.1 CTR,0.365D	53387	2534–6002UB
A3J14	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
A3J15	131–5356–00			CONN,HDR:PCB;MALE,STR,1 X 2,0.98 CTR,295 MLG X 0.137 TAIL,PLZWALL,TIN	00779	171825–2
A3J16	131–3362–00			CONN,HDR:PCB;MALE,STR,2 X 13,0.1 CTR,0.365D	53387	2526–6002UB
A3J17	131–3364–00			CONN,HDR:PCB;MALE,STR,2 X 17,0.1 CTR,0.365D	53387	2534–6002UB
A3J18	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
A3J19	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
A3J20	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
A3J21	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
A3J22	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
A3J49	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

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Component Number	Tektronix Part Number	Serial / Assembly Number Effective	Discontinued	Name & Description	Mfr. Code	Mfr. Part Number
A3J50	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
A3J51	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
A3J52	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
A3J53	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
A3J54	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
A3L1	108–0311–00			COIL,RF:FIXED,150NH	0JR03	108–0311–00
A3L2	108–0311–00			COIL,RF:FIXED,150NH	0JR03	108–0311–00
A3L3	108–0311–00			COIL,RF:FIXED,150NH	0JR03	108–0311–00
A3L4	108–0311–00			COIL,RF:FIXED,150NH	0JR03	108–0311–00
A3L6	108–1212–00			COIL,RF:FIXED,9UH,2%	0JR03	108–1212–00
A3L7	108–1212–00			COIL,RF:FIXED,9UH,2%	0JR03	108–1212–00
A3L8	108–1212–00			COIL,RF:FIXED,9UH,2%	0JR03	108–1212–00
A3L9	108–1212–00			COIL,RF:FIXED,9UH,2%	0JR03	108–1212–00
A3P6	131–0993–02			BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A3P7	131–0993–02			BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A3P8	131–0993–05			BUS,CONDUCTOR:SHUNT ASSEMBLY,GREEN	00779	850100–5
A3P14	131–0993–02			BUS,CONDUCTOR:SHUNT ASSEMBLY,RED	00779	1–850100–O
A3P19	131–0993–05			BUS,CONDUCTOR:SHUNT ASSEMBLY,GREEN	00779	850100–5
A3P20	131–0993–05			BUS,CONDUCTOR:SHUNT ASSEMBLY,GREEN	00779	850100–5
A3P21	131–0993–05			BUS,CONDUCTOR:SHUNT ASSEMBLY,GREEN	00779	850100–5
A3P22	131–0993–05			BUS,CONDUCTOR:SHUNT ASSEMBLY,GREEN	00779	850100–5
A3P49	131–0993–05			BUS,CONDUCTOR:SHUNT ASSEMBLY,GREEN	00779	850100–5
A3Q1	151–1059–00			XSTR,SIG:JFET,N–CH;10V,30MA(MIN),30OHM,300MW	04713	MPF4391
A3Q2	151–1059–00			XSTR,SIG:JFET,N–CH;10V,30MA(MIN),30OHM,300MW	04713	MPF4391
A3Q3	151–0190–00			XSTR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	04713	2N3904
A3Q4	151–0190–00			XSTR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	04713	2N3904
A3Q6	151–0190–00			XSTR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	04713	2N3904
A3Q7	151–0190–00			XSTR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	04713	2N3904
A3Q8	151–0190–00			XSTR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	04713	2N3904
A3Q9	151–1059–00			XSTR,SIG:JFET,N–CH;10V,30MA(MIN),30OHM,300MW	04713	MPF4391
A3Q10	151–1059–00			XSTR,SIG:JFET,N–CH;10V,30MA(MIN),30OHM,300MW	04713	MPF4391
A3Q11	151–0190–00			XSTR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	04713	2N3904
A3Q12	151–0190–00			XSTR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	04713	2N3904
A3Q13	151–0190–00			XSTR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	04713	2N3904
A3Q14	151–0190–00			XSTR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	04713	2N3904
A3Q17	151–0220–00			XSTR,SIG:BIPOLAR,PNP;40V,200MA,400MHZ,AMPL	27014	S036228.22
A3Q18	151–0220–00			XSTR,SIG:BIPOLAR,PNP;40V,200MA,400MHZ,AMPL	27014	S036228.22
A3Q40	151–0190–00			XSTR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	04713	2N3904
A3R1	322–3085–07			RES,FXD:METAL FILM;75 OHM,0.1%,0.2W,TC=25 PPM	91637	CCF502–C75ROOBT
A3R2	322–3085–07			RES,FXD:METAL FILM;75 OHM,0.1%,0.2W,TC=25 PPM	91637	CCF502–C75ROOBT
A3R3	322–3306–00			RES,FXD:METAL FILM;15K OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G1502F
A3R4	322–3306–00			RES,FXD:METAL FILM;15K OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G1502F
A3R5	322–3335–00			RES,FXD,FILM:30.1K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G30101F
A3R6	322–3335–00			RES,FXD,FILM:30.1K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G30101F
A3R7	322–3482–02			RES,FXD,FILM:14.2K OHM,5%,0.2W,TC=TO	91637	CCF501D14201D
A3R8	322–3304–00			RES,FXD,FILM:14.3K OHM,1%,0.2W,TC=T0	91637	CCF50G14301F
A3R9	311–2230–00			RES,VAR,TRMR:CERMET;500 OHM,20%,0.5W,0.197SQ,TOP ADJUST	TK2073	GF06UT2 501 M L
A3R10	322–3482–02			RES,FXD,FILM:14.2K OHM,5%,0.2W,TC=TO	91637	CCF501D14201D
A3R11	322–3304–00			RES,FXD,FILM:14.3K OHM,1%,0.2W,TC=T0	91637	CCF50G14301F

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Component Number	Tektronix Part Number	Serial / Assembly Number Effective	Discontinued	Name & Description	Mfr. Code	Mfr. Part Number
A3R12	311–2230–00			RES,VAR,TRMR:CERMET;500 OHM,20%,0.5W,0.197SQ,TOP ADJUST	TK2073	GF06UT2 501 M L
A3R13	322–3178–00			RES,FXD,FILM:698 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50–2G698ROF
A3R14	322–3178–00			RES,FXD,FILM:698 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50–2G698ROF
A3R15	311–2228–00			RES,VAR,TRMR:CERMET;200 OHM,20%,0.5W,0.197SQ,TOP ADJUST	TK2073	GF06UT2 201 M L
A3R16	322–3167–00			RES,FXD,FILM:536 OHM,1%,0.2W,TC=T0MI,SM BODY	57668	CRB20 FXE 536E
A3R17	322–3167–00			RES,FXD,FILM:536 OHM,1%,0.2W,TC=T0MI,SM BODY	57668	CRB20 FXE 536E
A3R18	322–3154–00			RES,FXD:METAL FILM;392 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G392R0F
A3R19	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R20	322–3154–00			RES,FXD:METAL FILM;392 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G392R0F
A3R21	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R22	322–3143–00			RES,FXD,FILM:301 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G301ROF
A3R23	322–3143–00			RES,FXD,FILM:301 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G301ROF
A3R24	322–3126–01			RES,FXD,FILM:200 OHM,0.5%,0.2W,TC=TO,SMALL BODY	91637	CCF501G200R0D
A3R25	322–3126–01			RES,FXD,FILM:200 OHM,0.5%,0.2W,TC=TOSMALL BODY	91637	CCF501G200R0D
A3R26	322–3143–00			RES,FXD,FILM:301 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G301ROF
A3R27	322–3143–00			RES,FXD,FILM:301 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G301ROF
A3R28	322–3143–00			RES,FXD,FILM:301 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G301ROF
A3R30	322–3306–00			RES,FXD:METAL FILM;15K OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G1502F
A3R31	322–3306–00			RES,FXD:METAL FILM;15K OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G1502F
A3R32	311–2238–00			RES,VAR,TRMR:CERMET;50K OHM,20%,0.5W,0.197SQ,SIDE ADJUST	TK2073	GF06UT2 503 M L
A3R33	322–3295–00			RES,FXD:METAL FILM;11.5K OHM,1%,0.2W,TC=100	91637	CCF50G11501F
A3R34	322–3385–00			RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100PPM	91637	CCF501G10002F
A3R35	311–2238–00			RES,VAR,TRMR:CERMET;50K OHM,20%,0.5W,0.197SQ,SIDE ADJUST	TK2073	GF06UT2 503 M L
A3R36	322–3392–00			RES,FXD,FILM:118K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF501G11802F
A3R37	322–3392–00			RES,FXD,FILM:118K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF501G11802F
A3R38	322–3295–00			RES,FXD:METAL FILM;11.5K OHM,1%,0.2W,TC=100	91637	CCF50G11501F
A3R39	322–3385–00			RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100PPM	91637	CCF501G10002F
A3R40	322–3235–00			RES,FXD:METAL FILM;2.74K OHM,1%,0.2W,TC=100	91637	CCF501G27400F
A3R41	322–3235–00			RES,FXD:METAL FILM;2.74K OHM,1%,0.2W,TC=100	91637	CCF501G27400F
A3R42	322–3235–00			RES,FXD:METAL FILM;2.74K OHM,1%,0.2W,TC=100	91637	CCF501G27400F
A3R44	322–3373–00			RES,FXD,FILM:75K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G75001F
A3R45	322–3373–00			RES,FXD,FILM:75K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G75001F
A3R46	322–3258–00			RES,FXD:METAL FILM;4.75K OHM,1%,0.2W,TC=100	56845	CCF50–2–G4751FT
A3R47	322–3177–00			RES,FXD:METAL FILM;681 OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2G681R0F
A3R48	322–3177–00			RES,FXD:METAL FILM;681 OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2G681R0F
A3R49	322–3258–00			RES,FXD:METAL FILM;4.75K OHM,1%,0.2W,TC=100	56845	CCF50–2–G4751FT
A3R50	322–3235–00			RES,FXD:METAL FILM;2.74K OHM,1%,0.2W,TC=100	91637	CCF501G27400F
A3R51	322–3469–00			RES,FXD,FILM:750K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF501G75002F
A3R52	322–3469–00			RES,FXD,FILM:750K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF501G75002F
A3R54	322–3235–00			RES,FXD:METAL FILM;2.74K OHM,1%,0.2W,TC=100	91637	CCF501G27400F
A3R55	322–3235–00			RES,FXD:METAL FILM;2.74K OHM,1%,0.2W,TC=100	91637	CCF501G27400F
A3R56	322–3223–00			RES,FXD,FILM:2.05K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G20500F
A3R57	311–2228–00			RES,VAR,TRMR:CERMET;200 OHM,20%,0.5W,0.197SQ,TOP ADJUST	TK2073	GF06UT2 201 M L
A3R58	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R59	322–3302–00			RES,FXD,FILM:13.7K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF502G13701F
A3R60	311–2234–00			RES,VAR,TRMR:CERMET;5K OHM,20%,0.5W,0.197 SQ,TOP ADJUST	TK2073	GF06UT2 502 M L
A3R61	311–2234–00			RES,VAR,TRMR:CERMET;5K OHM,20%,0.5W,0.197 SQ,TOP ADJUST	TK2073	GF06UT2 502 M L
A3R62	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R63	322–3302–00			RES,FXD,FILM:13.7K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF502G13701F
A3R64	322–3085–07			RES,FXD:METAL FILM;75 OHM,0.1%,0.2W,TC=25 PPM	91637	CCF502–C75ROOBT
A3R65	322–3085–07			RES,FXD:METAL FILM;75 OHM,0.1%,0.2W,TC=25 PPM	91637	CCF502–C75ROOBT
A3R66	322–3482–02			RES,FXD,FILM:14.2K OHM,5%,0.2W,TC=TO	91637	CCF501D14201D

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A3R67	322–3304–00			RES,FXD,FILM:14.3K OHM,1%,0.2W,TC=T0	91637	CCF50G14301F
A3R68	311–2230–00			RES,VAR,TRMR:CERMET;500 OHM,20%,0.5W,0.197SQ,TOP ADJUST	TK2073	GF06UT2 501 M L
A3R69	322–3482–02			RES,FXD,FILM:14.2K OHM,5%,0.2W,TC=TO	91637	CCF501D14201D
A3R70	322–3304–00			RES,FXD,FILM:14.3K OHM,1%,0.2W,TC=T0	91637	CCF50G14301F
A3R71	311–2230–00			RES,VAR,TRMR:CERMET;500 OHM,20%,0.5W,0.197SQ,TOP ADJUST	TK2073	GF06UT2 501 M L
A3R72	322–3335–00			RES,FXD,FILM:30.1K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G30101F
A3R73	322–3335–00			RES,FXD,FILM:30.1K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G30101F
A3R74	322–3306–00			RES,FXD:METAL FILM;15K OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G1502F
A3R75	322–3306–00			RES,FXD:METAL FILM;15K OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G1502F
A3R76	322–3178–00			RES,FXD,FILM:698 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50–2G698ROF
A3R77	322–3178–00			RES,FXD,FILM:698 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50–2G698ROF
A3R78	311–2228–00			RES,VAR,TRMR:CERMET;200 OHM,20%,0.5W,0.197SQ,TOP ADJUST	TK2073	GF06UT2 201 M L
A3R79	311–2228–00			RES,VAR,TRMR:CERMET;200 OHM,20%,0.5W,0.197SQ,TOP ADJUST	TK2073	GF06UT2 201 M L
A3R80	322–3167–00			RES,FXD,FILM:536 OHM,1%,0.2W,TC=T0MI,SM BODY	57668	CRB20 FXE 536E
A3R81	322–3167–00			RES,FXD,FILM:536 OHM,1%,0.2W,TC=T0MI,SM BODY	57668	CRB20 FXE 536E
A3R82	322–3154–00			RES,FXD:METAL FILM;392 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G392R0F
A3R83	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R84	322–3154–00			RES,FXD:METAL FILM;392 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G392R0F
A3R85	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R86	322–3143–00			RES,FXD,FILM:301 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G301ROF
A3R87	322–3143–00			RES,FXD,FILM:301 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G301ROF
A3R88	322–3126–01			RES,FXD,FILM:200 OHM,0.5%,0.2W,TC=TOSMALL BODY	91637	CCF501G200R0D
A3R89	322–3143–00			RES,FXD,FILM:301 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G301ROF
A3R90	322–3143–00			RES,FXD,FILM:301 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G301ROF
A3R91	322–3126–01			RES,FXD,FILM:200 OHM,0.5%,0.2W,TC=TOSMALL BODY	91637	CCF501G200R0D
A3R92	311–2238–00			RES,VAR,TRMR:CERMET;50K OHM,20%,0.5W,0.197SQ,SIDE ADJUST	TK2073	GF06UT2 503 M L
A3R93	311–2238–00			RES,VAR,TRMR:CERMET;50K OHM,20%,0.5W,0.197SQ,SIDE ADJUST	TK2073	GF06UT2 503 M L
A3R94	322–3392–00			RES,FXD,FILM:118K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF501G11802F
A3R95	322–3392–00			RES,FXD,FILM:118K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF501G11802F
A3R96	322–3295–00			RES,FXD:METAL FILM;11.5K OHM,1%,0.2W,TC=100	91637	CCF50G11501F
A3R97	322–3295–00			RES,FXD:METAL FILM;11.5K OHM,1%,0.2W,TC=100	91637	CCF50G11501F
A3R98	322–3385–00			RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100PPM	91637	CCF501G10002F
A3R99	322–3385–00			RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100PPM	91637	CCF501G10002F
A3R100	322–3235–00			RES,FXD:METAL FILM;2.74K OHM,1%,0.2W,TC=100	91637	CCF501G27400F
A3R101	322–3235–00			RES,FXD:METAL FILM;2.74K OHM,1%,0.2W,TC=100	91637	CCF501G27400F
A3R102	322–3306–00			RES,FXD:METAL FILM;15K OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G1502F
A3R103	322–3306–00			RES,FXD:METAL FILM;15K OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G1502F
A3R105	322–3373–00			RES,FXD,FILM:75K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G75001F
A3R106	322–3373–00			RES,FXD,FILM:75K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G75001F
A3R107	322–3258–00			RES,FXD:METAL FILM;4.75K OHM,1%,0.2W,TC=100	56845	CCF50–2–G4751FT
A3R108	322–3177–00			RES,FXD:METAL FILM;681 OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2G681R0F
A3R109	322–3258–00			RES,FXD:METAL FILM;4.75K OHM,1%,0.2W,TC=100	56845	CCF50–2–G4751FT
A3R110	322–3177–00			RES,FXD:METAL FILM;681 OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2G681R0F
A3R111	322–3469–00			RES,FXD,FILM:750K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF501G75002F
A3R112	322–3235–00			RES,FXD:METAL FILM;2.74K OHM,1%,0.2W,TC=100	91637	CCF501G27400F
A3R113	322–3469–00			RES,FXD,FILM:750K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF501G75002F
A3R114	322–3235–00			RES,FXD:METAL FILM;2.74K OHM,1%,0.2W,TC=100	91637	CCF501G27400F
A3R115	322–3235–00			RES,FXD:METAL FILM;2.74K OHM,1%,0.2W,TC=100	91637	CCF501G27400F
A3R119	311–2234–00			RES,VAR,TRMR:CERMET;5K OHM,20%,0.5W,0.197 SQ,TOP ADJUST	TK2073	GF06UT2 502 M L
A3R120	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R121	322–3302–00			RES,FXD,FILM:13.7K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF502G13701F

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A3R122	311–2234–00			RES,VAR,TRMR:CERMET;5K OHM,20%,0.5W,0.197 SQ,TOP ADJUST	TK2073	GF06UT2 502 M L
A3R123	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R124	322–3302–00			RES,FXD,FILM:13.7K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF502G13701F
A3R125	322–3235–00			RES,FXD:METAL FILM;2.74K OHM,1%,0.2W,TC=100	91637	CCF501G27400F
A3R126	322–3235–00			RES,FXD:METAL FILM;2.74K OHM,1%,0.2W,TC=100	91637	CCF501G27400F
A3R127	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R128	322–3235–00			RES,FXD:METAL FILM;2.74K OHM,1%,0.2W,TC=100	91637	CCF501G27400F
A3R129	322–3235–00			RES,FXD:METAL FILM;2.74K OHM,1%,0.2W,TC=100	91637	CCF501G27400F
A3R130	322–3235–00			RES,FXD:METAL FILM;2.74K OHM,1%,0.2W,TC=100	91637	CCF501G27400F
A3R131	322–3235–00			RES,FXD:METAL FILM;2.74K OHM,1%,0.2W,TC=100	91637	CCF501G27400F
A3R132	322–3254–00			RES,FXD,FILM:4.32K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF502G4321FT
A3R133	322–3254–00			RES,FXD,FILM:4.32K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF502G4321FT
A3R134	322–3254–00			RES,FXD,FILM:4.32K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF502G4321FT
A3R135	322–3138–00			RES,FXD,FILM:267 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G267R0F
A3R136	322–3130–00			RES,FXD:METAL FILM;221 OHM,1%,0.2W,TC=100 PPM	57668	RB20FX221E
A3R137	322–3235–00			RES,FXD:METAL FILM;2.74K OHM,1%,0.2W,TC=100	91637	CCF501G27400F
A3R138	321–0773–03			RES,FXD,FILM:400 OHM,0.25%,0.125W,TC=T2	19701	5033RC400R0C
A3R139	321–0912–03			RES,FXD,FILM:408 OHM,0.25%,0.125W,TC=T2	07716	CEA 408OHM 0.25
A3R140	322–3085–00			RES,FXD:METAL FILM;75 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G75R00F
A3R141	322–3201–00			RES,FXD:METAL FILM;1.21K OHM,1%,0.2W,TC=100	91637	CCF501G12100F
A3R142	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R143	321–0773–03			RES,FXD,FILM:400 OHM,0.25%,0.125W,TC=T2	19701	5033RC400R0C
A3R144	321–0912–03			RES,FXD,FILM:408 OHM,0.25%,0.125W,TC=T2	07716	CEA 408OHM 0.25
A3R145	322–3001–00			RES,FXD:METAL FILM;10 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10R00F
A3R146	322–3001–00			RES,FXD:METAL FILM;10 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10R00F
A3R148	322–3254–00			RES,FXD,FILM:4.32K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF502G4321FT
A3R149	322–3135–00			RES,FXD,FILM:249 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G249R0F
A3R150	322–3135–00			RES,FXD,FILM:249 OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G249R0F
A3R160	322–3085–07			RES,FXD:METAL FILM;75 OHM,0.1%,0.2W,TC=25 PPM	91637	CCF502–C75ROOBT
A3R163	322–3239–00			RES,FXD,FILM:3.01K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G30100F
A3R170	322–3210–00			RES,FXD:METAL FILM;1.5K OHM,1%,0.2W,TC=100PPM	91637	CCF501G15000F
A3R183	307–0650–00			RES NTWK,FXD,FI:9,2.7K OHM,5%,0.150W	11236	750–101–R2.7K
A3R184	307–0851–00			RES NTWK,FXD,FI:(8),220 OHM,2%,0.25W	11236	761–3–R220 OHM
A3R185	322–3130–00			RES,FXD:METAL FILM;221 OHM,1%,0.2W,TC=100 PPM	57668	RB20FX221E
A3R186	322–3115–00			RES,FXD,FILM:154 OHM,1%,0.2W,TC=T0MI,SM BODY	56845	CCF502G154R0F
A3R187	322–3114–00			RES,FXD:METAL FILM;150 OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G1500F
A3R188	321–0773–03			RES,FXD,FILM:400 OHM,0.25%,0.125W,TC=T2	19701	5033RC400R0C
A3R189	321–0773–03			RES,FXD,FILM:400 OHM,0.25%,0.125W,TC=T2	19701	5033RC400R0C
A3R190	322–3001–00			RES,FXD:METAL FILM;10 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10R00F
A3R191	322–3201–00			RES,FXD:METAL FILM;1.21K OHM,1%,0.2W,TC=100	91637	CCF501G12100F
A3R192	321–0773–03			RES,FXD,FILM:400 OHM,0.25%,0.125W,TC=T2	19701	5033RC400R0C
A3R193	321–0912–03			RES,FXD,FILM:408 OHM,0.25%,0.125W,TC=T2	07716	CEA 408OHM 0.25
A3R194	322–3001–00			RES,FXD:METAL FILM;10 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10R00F
A3R195	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R196	307–0650–00			RES NTWK,FXD,FI:9,2.7K OHM,5%,0.150W	11236	750–101–R2.7K
A3R197	307–0851–00			RES NTWK,FXD,FI:(8),220 OHM,2%,0.25W	11236	761–3–R220 OHM
A3R198	322–3254–00			RES,FXD,FILM:4.32K OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF502G4321FT
A3R199	322–3295–00			RES,FXD:METAL FILM;11.5K OHM,1%,0.2W,TC=100	91637	CCF50G11501F
A3U1	156–4150–00			IC,LINEAR:BIPOLAR,AMPL;100MHZ,CURRENTFEED-BACK,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		
A3U2	156–4150–00			IC,LINEAR:BIPOLAR,AMPL;100MHZ,CURRENTFEED-BACK,SAMPLE/HOLD,VIDEO DC RESTORATION	64762	EL2090CN
				MOUNTING PARTS		
	136–0728–00			SKT,PL–IN ELEK:MICROCKT,14 CONTACT	09922	DILB14P–108

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				END MOUNTING PARTS		
A3U3	156–3131–00			IC,MISC:BIPOLAR,VIDEO SUBSYSTEM;HORIZSYNC PROCESSOR	1CH66	TDA2595N
A3U4	156–3131–00			IC,MISC:BIPOLAR,VIDEO SUBSYSTEM;HORIZSYNC PROCESSOR	1CH66	TDA2595N
A3U5	156–2091–00			IC,DIGITAL:ALSTTL,GATE;QUAD 2–INPUT NAND	01295	SN74ALS00AN
A3U6	156–2113–00			IC,DIGITAL:ALSTTL,GATE;QUAD 2–INPUT AND	01295	SN74ALS08N
A3U7	156–1335–00			IC,DIGITAL:LSTTL,MULTIVIBRATOR;DUAL RETRIGMO-NOSTABLE	27014	DM96LS02N
A3U8	156–4150–00			IC,LINEAR:BIPOLAR,AMPL;100MHZ,CURRENTFEED-BACK,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		
A3U9	156–3131–00			IC,MISC:BIPOLAR,VIDEO SUBSYSTEM;HORIZSYNC PROCESSOR	1CH66	TDA2595N
A3U10	156–4150–00			IC,LINEAR:BIPOLAR,AMPL;100MHZ,CURRENTFEED-BACK,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		
A3U11	156–3131–00			IC,MISC:BIPOLAR,VIDEO SUBSYSTEM;HORIZSYNC PROCESSOR	1CH66	TDA2595N
A3U12	160–8577–00			IC,DIGITAL:CMOS,PLD;EEPLD,16V8,25NS,90MA,16V8–25, DIP20.3,TUBE	80009	160857700
				MOUNTING PARTS		
	136–0752–00			SKT,PL–IN ELEK:MICROCIRCUIT,20 DIP	09922	DILB20P–108
				END MOUNTING PARTS		
A3U15	156–2091–00			IC,DIGITAL:ALSTTL,GATE;QUAD 2–INPUT NAND	01295	SN74ALS00AN
A3U16	156–1335–00			IC,DIGITAL:LSTTL,MULTIVIBRATOR;DUAL RETRIGMO-NOSTABLE	27014	DM96LS02N
A3U17	156–3050–00			IC,MISC:CMOS,PWR SPLY SUPERVISOR;MPU RESET GENERATOR,5V SPLY SENSING,MPU WATCHDOGTIMER	0B0A9	DS1232
A3U18	156–3251–00			IC,MEMORY:CMOS,SRAM;32K X 8,120NS	62786	HM62256ALP–12
				MOUNTING PARTS		
	136–0963–00			SKT,PL–IN ELEK:MICROCKT,32 PIN	00779	2–644018–3
				END MOUNTING PARTS		
A3U19	156–1215–01			IC,DIGITAL:CMOS,MUX/ENCODER	27014	MM74C923N
A3U20	156–2342–00			IC,DIGITAL:ALSTTL,LATCH;10–BIT D–TYPE,3–STATE	01295	SN74ALS841NT
A3U21	160–8584–00	671–2131–00	671–2131–01	IC,DIGITAL:STTL,PLD;PAL,20L10A,30NS,165MA	80009	160858400
A3U21	160–8584–01	671–2131–02	671–2131–02	IC,DIGITAL:STTL,PLD;PAL	80009	160858401
A3U21	160–8584–02	671–2131–03		IC,DIGITAL:CMOS,PLD;OTP,22V10,25NS,33.3MHZ,90MA	80009	160858402
				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		
A3U22	156–1065–00			IC,DIGITAL:LSTTL,LATCH;OCTAL D TRANSPARENT	01295	SN74LS373N
A3U23	156–6319–00			IC,PROCESSOR:CMOS,MICROCOMPUTER;16–BIT INTERNAL,5MHZ,ROMLESS,V25	4T165	UPD70320L
				MOUNTING PARTS		
	136–0965–00			SOCKET,PLCC:PCB;84,0.05 CTR,0.360 H X0.125	00779	821573–1
				END MOUNTING PARTS		
A3U24	156–1748–02			IC,DIGITAL:ALSTTL,TRANSCEIVER;OCTAL NONINV	01295	SN74ALS245AN
A3U25	156–1748–02			IC,DIGITAL:ALSTTL,TRANSCEIVER;OCTAL NONINV	01295	SN74ALS245AN
A3U26	160–8586–00	671–2131–00	671–2131–01	IC,MEMORY:CMOS,EPROM;64K X 8	80009	160858600
A3U26	160–8586–01	671–2131–02	671–2131–03	IC,MEMORY:CMOS,EPROM;64K X 8,27C512	80009	160858601
A3U26	160–8586–03	671–2131–04		IC,MEMORY:CMOS,EPROM;64K X 8,150NS	80009	160858603
A3U26	160–9577–00			IC,MEMORY:CMOS,EPROM;64K X 8 (Opt 1C Philips GCR)	80009	160957700

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A3U26	163–1014–00			IC,MEMORY: CMOS,EPROM;64K X 8 (Opt 1K Korean GCR)	80009	163101400
				MOUNTING PARTS		
	136–0963–00			SKT,PL–IN ELEK:MICROCKT,32 PIN	00779	2–644018–3
				END MOUNTING PARTS		
A3U27	156–2991–00			IC,MEM:CMOS,NVRAM;8K X 8,200NS,SRAM,INTEGRAL BTRY	0B0A9	DS1225Y
				MOUNTING PARTS		
	136–0755–00			SOCKET,DIP:PCB;FEMALE,STR,2 X 14,28 POS,0.1 X 0.6 CTR,0.175 H X0.130 TAIL,BECU,TIN,ACCOM 0.008–0.0015 X 0.014–0.022	09922	DILB28P–108
				END MOUNTING PARTS		
A3U28	160–8578–00	671–2131–00	671–2131–02	IC,DIGITAL:CMOS,PLD;EEPLD,16V8,25NS,90MA	80009	160857800
A3U28	160–8578–01	671–2131–03		IC,DIGITAL:CMOS,PLD;EEPLD,16V8,25NS,90MA	80009	160857801
				MOUNTING PARTS		
	136–0752–00			SKT,PL–IN ELEK:MICROCIRCUIT,20 DIP	09922	DILB20P–108
				END MOUNTING PARTS		
A3U29	156–2992–00			IC,MEMORY:CMOS,SRAM;2K X 8,35NS,OE	65786	CY7C128A–35PC
A3U30	156–2259–00			IC,DIGITAL:FTTL,RGTR;8–BIT UNIVERSAL SHIFT	01295	SN74F299N
A3U31	160–8581–00			IC,MEMORY:CMOS,EPROM;16K X 8	80009	160858100
				MOUNTING PARTS		
	136–0755–00			SOCKET,DIP:PCB;FEMALE,STR,2 X 14,28 POS,0.1 X 0.6 CTR,0.175 H X0.130 TAIL,BECU,TIN,ACCOM 0.008–0.0015 X 0.014–0.022	09922	DILB28P–108
				END MOUNTING PARTS		
A3U32	156–2992–00			IC,MEMORY:CMOS,SRAM;2K X 8,35NS,OE	65786	CY7C128A–35PC
A3U33	156–0982–03			IC,DIGITAL:LSTTL,FLIP FLOP	01295	SN74LS374N
A3U34	156–1702–00			IC,DGTL:TTL,RGTR;10–BIT BFRED, NONINV, 3–STATE	34335	AM29821PC
A3U35	160–8579–00	671–2131–00	671–2131–01	IC,DGTL:CMOS,PLD;EEPLD,16V8,25NS,90MA,16V8–25,DIP2 0.3,TUBE	80009	160857900
A3U35	160–8579–01	671–2131–02		IC,DIGITAL:CMOS,PLD;EEPLD,16V8,25NS,90MA	80009	160857901
				MOUNTING PARTS		
	136–0752–00			SKT,PL–IN ELEK:MICROCIRCUIT,20 DIP	09922	DILB20P–108
				END MOUNTING PARTS		
A3U36	156–1065–00			IC,DIGITAL:LSTTL,LATCH;OCTAL D TRANSPARENT	01295	SN74LS373N
A3U37	160–8582–00			IC,MEMORY:CMOS,EPROM;16K X 8	80009	160858200
				MOUNTING PARTS		
	136–0755–00			SOCKET,DIP:PCB;FEMALE,STR,2 X 14,28 POS,0.1 X 0.6 CTR,0.175 H X0.130 TAIL,BECU,TIN,ACCOM 0.008–0.0015 X 0.014–0.022	09922	DILB28P–108
				END MOUNTING PARTS		
A3U38	160–8583–00			IC,DIGITAL:CMOS,PLD;OTP,22V10,25NS,33.3MHZ,90MA	80009	160858300
				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		
A3U39	156–0382–02			IC,DIGITAL:LSTTL,GATES	01295	SN74LS00N
				MOUNTING PARTS		
	136–0728–00			SKT,PL–IN ELEK:MICROCKT,14 CONTACT	09922	DILB14P–108
				END MOUNTING PARTS		
A3U40	156–2724–00			IC,MISC:CMOS,INTERFACE;DUAL RS–232LINE DRVR/RE-CEIVER,+5V VCC,EXTERNAL CAPS REQUIRED	1ES66	MAX232EPE
A3U41	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		
A3U42	156–2321–00			IC,DIGITAL:ASTTL,GATE;QUAD 2–INPUT AND	01295	SN74AS08N
A3U43	156–0728–02			IC,DIGITAL:LSTTL,GATES	01295	SN74LS09N
A3U44	156–3142–00			IC,DIGITAL:HCTCMOS,GATE;QUAD 2–INPUT NAND	01295	SN74HCT00N

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A3U47	156–1998–00			IC,DIGITAL:ALSTTL,FLIP FLOP;OCTAL D–TYPE, W/CLEAR	01295	SN74ALS273N
A3U48	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
				END MOUNTING PARTS		
A3U50	156–1754–02			IC,DIGITAL:ALSTTL,BFDRVR/R;OCTALNONINV, HIGH DRV, 3–STATE	01295	SN74ALS244A–1N
A3U51	156–1754–02			IC,DIGITAL:ALSTTL,BFR/DRVR;OCTALNONINV, HIGH DRV, 3–STATE	01295	SN74ALS244A–1N
A3U52	156–1754–02			IC,DIGITAL:ALSTTL,BFR/DRVR;OCTALNONINV, HIGH DRV, 3–STATE	01295	SN74ALS244A–1N
A3U53	156–1748–02			IC,DIGITAL:ALSTTL,TRANSCEIVER;OCTAL NONINV	01295	SN74ALS245AN
A3U54	160–8580–00	671–2131–00	671–2131–01	IC,DIGITAL:CMOS,PLD;EEPLD,16V8,25NS,90MA,16V8–25, DIP20.3,TUBE	80009	160858000
A3U54	160–8580–01	671–2131–02		IC,DIGITAL:CMOS,PLD;EEPLD,16V8,25NS,90MA	80009	160858001
				MOUNTING PARTS		
	136–0752–00			SKT,PL–IN ELEK:MICROCIRCUIT,20 DIP	09922	DILB20P–108
				END MOUNTING PARTS		
A3U55	156–2093–00			IC,DIGITAL:ALSTTL,GATE;QUAD 2–INPUT OR	01295	SN74ALS32N
A3U56	156–2091–00			IC,DIGITAL:ALSTTL,GATE;QUAD 2–INPUT NAND	01295	SN74ALS00AN
A3U57	156–1850–00			IC,MISC:CMOS,ANALOG SWITCH;QUAD	17856	DG211CJ
A3U58	160–8585–00			IC,DIGITAL:CMOS,PLD;EEPLD,16V8,25NS,90MA	80009	160858500
				MOUNTING PARTS		
	136–0752–00			SKT,PL–IN ELEK:MICROCIRCUIT,20 DIP	09922	DILB20P–108
				END MOUNTING PARTS		
A3U59	160–8761–00			IC,DIGITAL:CMOS,PLD;EEPLD,16V8,25NS,90MA	80009	160876100
				MOUNTING PARTS		
	136–0752–00			SKT,PL–IN ELEK:MICROCIRCUIT,20 DIP	09922	DILB20P–108
				END MOUNTING PARTS		
A3U60	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		
A3U61	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
				END MOUNTING PARTS		
A3U62	156–1754–02			IC,DIGITAL:ALSTTL,BFR/DRVR;OCTALNONINV, HIGH DRV,3–STATE	01295	SN74ALS244A–1N
A3U63	156–0411–00			IC,LINEAR:BIPOLAR,COMPARATOR;QUAD,SGL SPLY,300NS	01295	LM339N
A3Y1	119–1555–00			OSCILLATOR,RF:4MHZ,0.01%,CRYSTALDEC.CERTIFIED	TK2424	RASCO PLUS 4.0
A3CR2	152–0964–00			DIODE,SIG:ULTRA FAST;ARRAY,6 COM CATH/COMANODE PAIR,12 DIODES,50V,200MA,4NS,2.5PF	TK2262	DM 308BT100SP–4
A3CR3	152–0964–00			DIODE,SIG:ULTRA FAST;ARRAY,6 COM CATH/COMANODE PAIR,12 DIODES,50V,200MA,4NS,2.5PF	TK2262	DM 308BT100SP–4
A3CR4	152–0964–00			DIODE,SIG:ULTRA FAST;ARRAY,6 COM CATH/COMANODE PAIR,12 DIODES,50V,200MA,4NS,2.5PF	TK2262	DM 308BT100SP–4
A3TP1	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAPCB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A3TP2	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAPCB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A3TP3	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAPCB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A3TP4	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAPCB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A3TP5	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAPCB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A3TP6	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAPCB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02

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Component Number	Tektronix Part Number	Serial / Assembly Number Effective	Discontinued	Name & Description	Mfr. Code	Mfr. Part Number
A3TP7	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAPCB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A3TP8	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAPCB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A3TP9	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAPCB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A3TP10	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAPCB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A3TP11	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAPCB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A3VR1	152–0760–00			DIODE,ZENER:6.2V,2%,0.4W	04713	SZG30205
A3VR2	152–0760–00			DIODE,ZENER:6.2V,2%,0.4W	04713	SZG30205
A3VR3	152–0760–00			DIODE,ZENER:6.2V,2%,0.4W	04713	SZG30205
A3VR4	152–0760–00			DIODE,ZENER:6.2V,2%,0.4W	04713	SZG30205
A3VR5	152–0760–00			DIODE,ZENER:6.2V,2%,0.4W	04713	SZG30205
A3VR6	152–0760–00			DIODE,ZENER:6.2V,2%,0.4W	04713	SZG30205
A3VR7	152–0760–00			DIODE,ZENER:6.2V,2%,0.4W	04713	SZG30205
A3VR8	152–0760–00			DIODE,ZENER:6.2V,2%,0.4W	04713	SZG30205
A4	119–4078–00			DISPLAY,FLAT PL:VACUUM FLOURESCENT,2 X 40;ALPHA-NUMERIC,5 X 7 DOT MATRIX,DC/DC AC CONVERT,CHAR GEN, LOGIC & MICRO COMP	4T165	FC20X2JA–BB
B100	119–4270–00			FAN,TUBEAXIAL:12 VDC,2.6W,0.22A,4200 RPM,32DB,16.6CFM,60X60MM,25MMTHICK,W/288MM LEADS&SLEEVE,W/CONNECT,FBA TYPE	2W944	612
W2	174–0034–00			CA ASSY,SP,ELEC:28 AWG,3.0 L,RIBBON,2X17 X 2X17 0.1 CTR BOX(CONNECTED AT A1J2 & A3J9)	TK1547	ORDER BY DESC
W3	174–2190–00			CA ASSY,SP,ELEC:40,28 AWG,3.0 L,RIBBON,2 X20,0.1 CTR,RCPT X 2 X 20,0.1 CTR,RCPT (CONNECTED AT A1J3 & A3J10)	80009	174219000
W4	174–0034–00			CA ASSY,SP,ELEC:28 AWG,3.0 L,RIBBON,2X17 X 2X17 0.1 CTR BOX (CONNECTED AT A1J4 & A3J17)	TK1547	ORDER BY DESC
W11	174–1460–00	B010100	B020321	CA ASSY,SP,ELEC:26,28 AWG,10.0 L	1Y013	174–1460–00
W11	174–1460–01	B020322		CA ASSY,SP:11.0 L (CONNECTED AT A3J11 TO "RS232" REAR PNL)	80009	174146001
				MOUNTING PARTS		
	214–3903–01			SCR,JACK:4–40 X 0.312 EXT THD,4–40 INT THD,0.188 HEX,STEEL,CAD PLATE (QUANTITY 2)	80009	214–3903–01
				END MOUNTING PARTS		
W12	174–1460–00	B010100	B020321	CA ASSY,SP,ELEC:26,28 AWG,10.0 L	1Y013	174–1460–00
W12	174–1460–01	B020322		CA ASSY,SP:11.0 L (CONNECTED AT A3J12 TO "REMOTE" REAR PNL)	80009	174146001
				MOUNTING PARTS		
	214–3903–01			SCR,JACK:4–40 X 0.312 EXT THD,4–40 INT THD,0.188 HEX,STEEL,CAD PLATE (QUANTITY 2)	80009	214–3903–01
				END MOUNTING PARTS		
W13	174–0034–00			CA ASSY,SP,ELEC:28 AWG,3.0 L,RIBBON,2X17 X 2X17 0.1 CTR BOX (CONNECTED AT A3J13 & A4P1)	TK1547	ORDER BY DESC
W15	174–2383–00			CA ASSY,SP,ELEC:2,26 AWG,8.0 L,RIBBON (CONNECTED AT A3J15 & A4P2)	TK1547	174–2383–00
W50	174–0080–01			CABLE ASSY,RF:75 OHM COAX,9.0 L (CONNECTED AT A1J50 TO A3J50)	9M860	ORDER BY DESC
W51	174–2594–00			CABLE ASSY,RF:75 OHM COAX,13.0 L,W/CONN &HOLDER (CONNECTED AT A1J51 TO A3J51)	TK1547	174–2594–00

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Component Number	Tektronix Part Number	Serial / Assembly Number Effective	Discontinued	Name & Description	Mfr. Code	Mfr. Part Number
W52	174–0080–01			CABLE ASSY,RF:75 OHM COAX,9.0 L (CONNECTED AT A1J52 TO A3J52)	9M860	ORDER BY DESC
W53	174–0080–01			CABLE ASSY,RF:75 OHM COAX,9.0 L (CONNECTED AT A1J53 TO A3J53)	9M860	ORDER BY DESC

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Schematics

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Diagrams/Circuit Board Illustrations

Symbols

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

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

Overline, parenthesis, or leading slash indicate a low asserting state.

Example: $\overline{\text{ID CONTROL}}$, (ID CONTROL), or /ID CONTROL.

Abbreviations are based on ANSI Y1.1–1972.

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

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

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

Component Values

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

Capacitors — Values one or greater are in picofarads (pF). Values less than one are in microfarads (μF).

Resistors — Ohms (Ω).

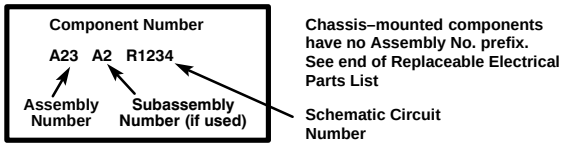
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The following information and special symbols may appear in this manual.

Assembly Numbers

Each assembly in the instrument is assigned an assembly number (e.g., A20). The assembly number appears on the diagram (in circuit board outline), circuit board illustration title, and lookup table for the schematic diagram.

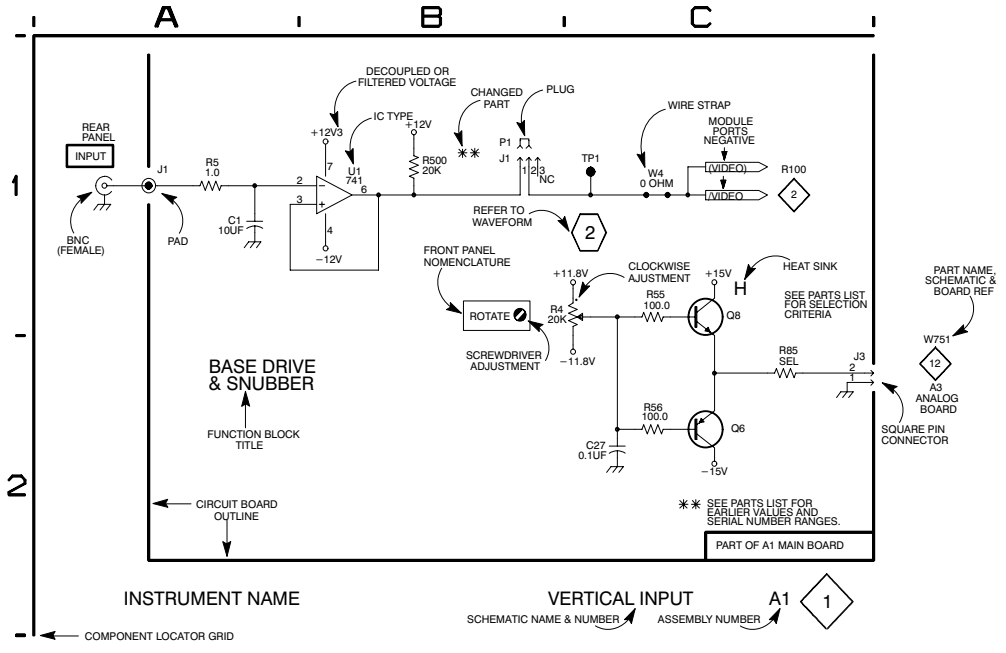
The Replaceable Electrical Parts List is arranged by assembly number in numerical sequence; the components are listed by component number. Example:



Grid Coordinates

The schematic diagram and circuit board component location illustration have grids. A lookup table with the grid coordinates is provided for ease of locating the component. Only the components illustrated on the facing diagram are listed in the lookup table.

When more than one schematic diagram is used to illustrate the circuitry on a circuit board, the circuit board illustration will only appear opposite the first diagram; the lookup table will list the diagram number of other diagrams that the other circuitry appears on.



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Replaceable Mechanical Parts List

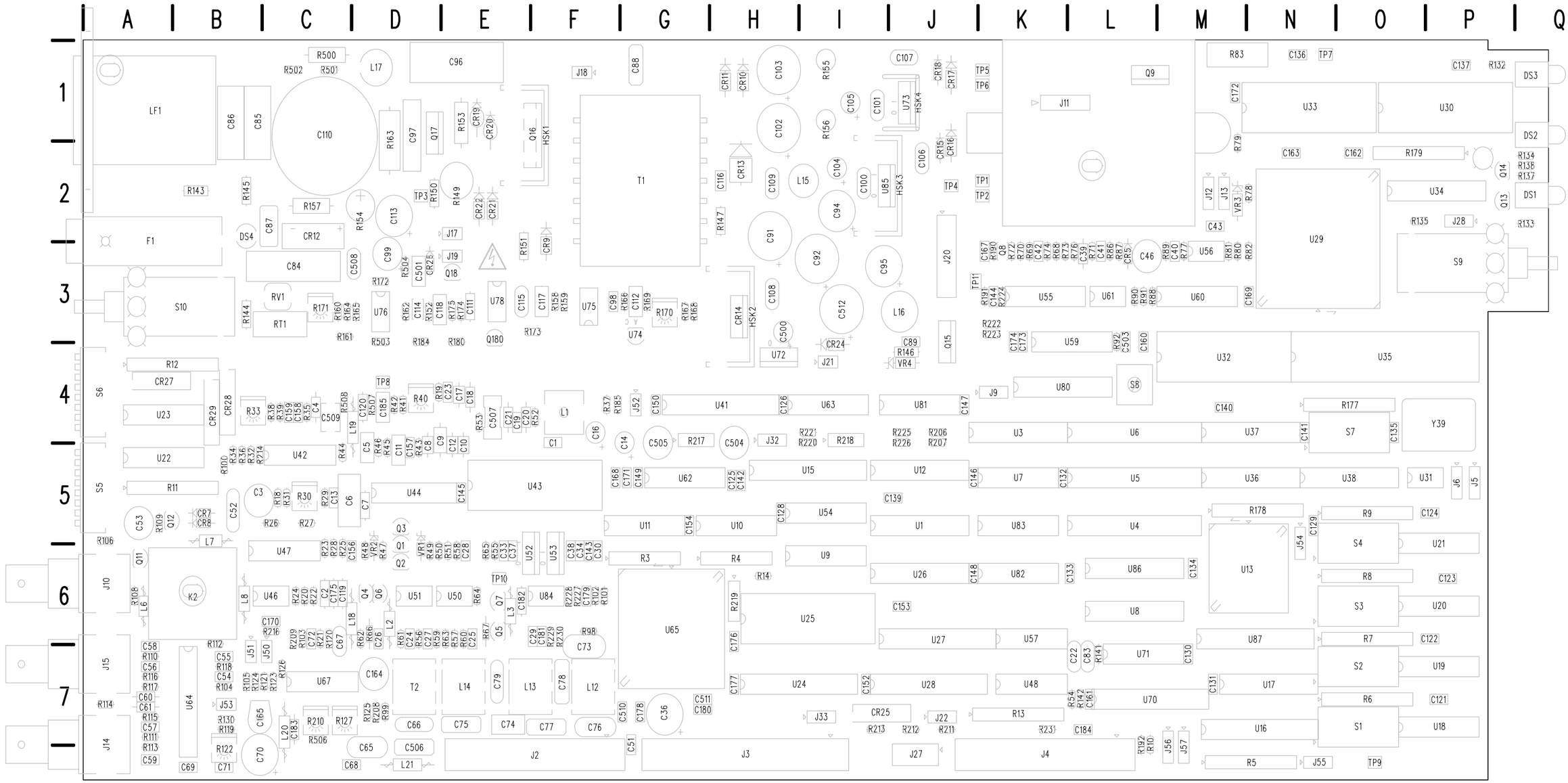
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A1 Inserter Board
671-2132-05 & Up
Lookup Chart

A1 Inserter Board and Diagram <1> Component Locator *(with cross-references to schematic diagrams 2 thru 9).*

Comp No	Diag No	Diag Loc	Bd Loc
C1	5	D5	F5
C2	5	E4	C6
C3	5	A1	B5
C4	5	C2	C4
C5	5	F2	D5
C6	5	E2	D5
C7	5	E2	D5
C8	5	F2	D5
C9	5	F2	E5
C10	5	E2	E5
C11	5	D1	D5
C12	5	D1	E5
C13	5	B2	C5
C14	5	D4	G5
C15	5	E1	D5
C16	5	D4	F4
C17	5	D5	E4
C18	5	D5	E4
C19	5	F5	E4
C20	5	F5	E4
C21	5	F5	E4
C22	5	G3	L7
C23	5	E5	E4
C24	9	E3	D7
C25	9	E4	E7
C26	9	D3	D7
C27	9	G3	D7
C28	9	G3	E6
C29	9	G3	F6
C30	9	G3	F6
C31	5	D2	D4
C33	9	D1	E6
C34	9	D2	F6
C36	9	E2	G7
C37	9	E1	E6
C38	9	E2	F6
C39	7	C1	L3
C40	7	E2	M3
C41	7	D2	L3
C42	7	E2	K3
C43	7	C5	M2
C46	7	E4	L3
C51	7	B5	G8
C52	7	F4	B5
C53	7	H4	A5
C54	7	B4	B7
C55	7	B4	B7
C56	7	B4	A7
C57	7	C4	A7
C58	7	B5	A7
C59	7	D5	A8
C60	7	E4	A7
C61	7	D5	A7
C65	7	E2	D8
C66	7	E2	D7
C67	7	G2	C7
C68	7	F2	C8
C69	7	C5	B8
C70	7	C5	B8
C71	7	C5	B8
C72	7	G2	C7
C73	7	D1	F7
C74	7	D1	E7
C75	7	E1	E7
C76	7	D2	F7
C77	7	D2	F7
C78	7	D2	F7
C79	7	E2	E7
C83	5	H4	L7
C84	8	B1	C3
C85	8	C1	B1
C86	8	C2	B1
C87	8	D2	C2
C88	8	E1	G1
C89	8	G4	J4
C91	8	F4	H2
C92	8	F4	I3
C94	8	G4	I2
C95	8	G4	I3
C96	8	D3	E1
C97	8	E4	D2
C98	8	F5	F3
C99	8	B3	D3
C100	8	G2	I2
C101	8	G3	I1
C102	8	F2	H1
C103	8	F3	H1
C104	8	F2	I2
C105	8	F3	I1
C106	8	G2	J2
C107	8	G3	J1
C108	8	G4	H3
C109	8	F4	H2
C110	8	C2	C1
C111	8	D3	E3
C112	8	F5	G3
C113	8	E3	D2
C114	8	C4	D3
C115	8	D3	E3
C116	8	F4	H2
C117	8	C2	F3
C118	8	C3	E3
C119	7	G1	C6
C120	5	C1	D4
C121	9	B4	P7
C122	9	C4	O6
C123	9	C4	P6
C124	9	D4	O5
C125	7	G3	H5
C126	9	B5	H4
C128	7	H3	H5
C129	9	D4	N5
C130	9	D4	M7
C131	9	E4	M7
C132	9	E4	K5
C133	1	F5	L6
C134	9	F4	M6
C135	4	A3	O4
C136	4	E5	N1
C137	9	F4	P1
C139	9	F4	I5
C140	9	B5	M4
C141	9	C5	N4
C142	1	G5	H5
C143	1	G5	F6
C144	1	G5	K3
C145	9	C5	E5
C146	9	D5	J5
C147	9	D5	J4
C148	1	H5	J6
C149	9	D5	G5
C150	5	A5	G4
C152	9	E5	I7
C153	9	E5	J6
C154	1	H5	G5
C156	9	F5	D6
C157	5	B5	D5
C158	5	B5	C4
C159	5	B5	C4
C160	5	H4	L4
C161	3	C5	L7
C162	9	F5	O2
C163	9	F5	N2
C164	7	E2	D7
C165	7	D1	C7
CR5	7	F4	L3
CR7	7	G3	B5
CR8	7	F3	B5
CR9	8	E2	F3
CR10	8	F2	H1
CR11	8	F3	H1
CR12	8	C1	C2
CR13	8	F4	H2
CR14	8	F3	H3
CR15	8	G2	J2
CR16	8	H2	J2
CR17	8	H3	J1
CR18	8	G3	J1
CR19	8	E4	E1
CR20	8	E3	E1
CR21	8	E3	E2
CR22	8	E3	E2
CR24	8	G2	I4
CR25	3	B5	I7
CR26	8	B4	D3
CR27	3	E3	A4
CR28	3	E4	B4
CR29	3	E4	B5
DS1	3	D5	Q2
DS2	3	E5	Q1
DS3	3	E5	Q1
DS4	8	D2	B2
F1	8	A1	A3
J2	3	A3	F7
J3	3	H2	I7
J4	3	A2	L7
J5	4	B2	P5
J6	4	A1	P5
J9	5	G4	K4
J10	5	A1	A6
J11	7	C1	K1
J12	7	G3	M2
J13	7	D4	M2
J14	7	H5	A7
J15	7	H4	A6
J17	8	E2	E2
J18	8	E3	F1
J19	8	C4	E3
J20	9	B1	J2
J21	8	H2	I4
J22	3	E3	J7
J27	3	A5	J7
J28	3	D4	P2
J32	7	F2	H4
J33	1	F2	H7
J50	7	H1	C7
J51	7	H1	B6
J52	5	A4	G4
J53	7	A4	B7
J54	1	A1	N6
J55	1	B4	N8
J56	1	B4	M7
J57	1	B4	M7
K2	7	G4	A6
L1	5	F5	F4
L2	9	D2	D6
L3	9	E4	E6
L6	7	G4	A6
L7	7	F4	B6
L8	7	F4	B6
L12	7	D2	F7
L13	7	D2	F7
L14	7	E2	E7
L15	8	G4	I2
L16	8	G3	J3
L17	8	D1	D1
L18	7	G1	D6
L19	5	C1	D4
L20	7	E1	C7
L21	7	E2	D8
LF1	8	A1	A2
P5	4	B2	
P6	4	A1	
P9	5	G4	
P12	7	G3	
P13	7	D4	
P17	8	E2	
P18	8	E3	
P19	8	C4	
P20	9	B1	
P22	3	E3	
P28	3	D4	
P32	7	F2	
P33	1	F2	
P34	9	B1	
P35	9	B1	
P36	9	B1	
P37	9	B1	
P38	9	B1	
P54	1	A1	
P55	1	B4	
P56	1	B4	
P57	1	B4	
Q1	5	F1	D5
Q2	5	F2	D6
Q3	5	G2	D5
Q4	9	G2	D6
Q5	9	G3	E7
Q6	9	G2	D6
Q7	9	G4	E6
Q8	7	D1	K2
Q9	7	E4	L1
Q11	7	F4	A6
Q12	7	G3	A5
Q13	3	D5	P2
Q14	3	E5	P2
Q15	8	G4	J3
Q16	8	E3	E1
Q17	8	E4	D2
Q18	8	C4	E3
Q180	8	D3	E4
R3	1	G2	F6
R4	1	G3	H6
R5	1	A3	M8
R6	2	C1	N7
R7	2	C2	N6
R8	2	C3	N6
R9	2	C4	N5
R10	3	B3	L8
R11	3	F4	A5
R12	3	F4	A4
R13A	3	D3	J7
R13B	3	C3	J7
R13C	3	C5	J7
R13D	3	B3	J7
R13E	3	B3	J7
R13F	3	C3	J7
R13G	3	A5	J7
R13H	3	B5	J7
R13I	3	B2	J7
R14	3	F2	H6
R18	5	A1	C5
R19	5	D5	E4
R20	5	D3	C6
R21	5	D3	C7
R22	5	E3	C6
R23	5	E3	C6
R24	5	F3	C6
R25	5	E3	C6
R26	5	E3	C5
R27	5	E4	C5
R28	5	F3	C6
R29	5	B2	C5
R30	5	B2	C5
R31	5	B2	C5
R32	5	B1	B5
R33	5	B1	B4
R34	5	C1	B5
R35	5	C1	C4
R36	5	C1	B5
R37	5	C4	F4
R38	5	C4	C4
R39	5	D1	C4
R40	5	D2	D4
R41	5	D2	D4
R42	5	D2	D4
R43	5	D2	D5
R44	5	E2	C5
R45	5	F2	D5
R46	5	F2	D5
R47	5	F1	D6
R48	5	G2	D6
R49	5	F3	D6
R50	5	G2	E6
R51	5	G2	E6
R52	5	E5	F4
R53	5	E5	E4
R54	5	G3	L7
R55	5	E5	E6
R56	9	E2	D7
R57	9	E3	E7
R58	9	F4	E6
R59	9	F4	E7
R60	9	G4	E7
R61	9	F2	D6
R62	9	F2	D7
R63	9	G3	E7
R64	9	G3	E6
R65	9	G3	E6
R66	9	G2	D6
R67	9	G4	E6
R68	7	C1	K3
R69	7	D1	K3
R70	7	D1	K3
R71	7	D2	L3
R72	7	D1	K3
R73	7	E2	L3
R74	7	E2	K3
R76	7	D2	L3
R77	7	D5	M3
R78	7	C5	N2
R79	7	D5	M2
R80	7	C4	M3
R81	7	C4	M3
R82	7	C4	N3
R83	7	E5	M1
R87	7	G4	L3
R88	7	F4	L3
R89	7	F4	M3
R90	7	E4	L3
R91	7	E4	L3
R92	7	E3	L4
R98	7	D2	F6
R99	7	E2	D7
R100	7	A4	B5
R101	7	B2	F6
R102	7	B2	F6
R103	7	G1	C7
R104	7	G3	B7
R105	7	G2	B7
R106	7	F4	A6
R108	7	G4	A6
R109	7	H3	A5
R110	7	E5	A7
R111	7	D5	A7
R112	7	E4	B7
R113	7	D5	A8
R114	7	D5	A7
R115	7	D5	A7
R116	7	D4	A7
R117	7	E4	A7
R118	7	A4	B7
R119	7	C4	B7
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R124	7	F1	B7
R125	7	E2	D7
R126	7	E2	C7
R127	7	E2	C7
R130	7	B4	B7
R132	3	E5	P1
R133	3	D5	Q2
R134	3	E5	Q2
R135	3	C4	O2
R137	3	D5	Q2
R138	3	D5	Q2
R141	5	H4	L7
R142	5	H5	L7
R143	8	A1	B2
R144	8	B1	B3
R145	8	D1	B2
R146	8	H4	J4
R147	8	F4	H2
R149	8	E3	E2
R150	8	E4	D2
R151	8	D4	E3
R152	8	E4	D3
R153	8	E3	E1
R154	8	D2	D2
R155	8	F3	I1
R156	8	F2	I2
R157	8	C1	C2
R158	8	C5	F3
R159	8	C4	F3
R160	8	A5	C3
R161	8	A4	C3
R162	8	B3	D3
R163	8	E4	D2
R164	8	A4	C3
R165	8	B3	D3
R166	8	E5	G3
R167	8	E5	G3
R168	8	F5	G3
R169	8	F5	G3
R170	8	F5	G3
R171	8	A4	C3
R172	8	B4	D3
R173	8	D3	E3
R174	8	C4	E3
R175	8	C3	E3
R177	4	E1	N4
R178	4	D1	M5
R179A	4	B5	P2
R179B	4	B3	P2
R179C	4	C3	P2
R179D	4	G3	P2
R179E	4	G5	P2
R179F	4	G5	P2
R179G	4	G5	P2
R179H	4	E1	P2
R179I	4	A5	P2
R180	8	D3	E4
R184	8	D4	D4
R185	5	D4	G4
R190	7	E1	K3
R191	7	E1	K3
R192	5	C4	L8
R206	7	F1	J4
R207	7	F1	J5
R208	7	E2	D7
R209	7	G1	C7
R210	7	E1	C7
R211	3	D5	J7
R212	3	D5	J7
R213	3	A5	I7
R214	5	B1	C5
R216	5	D3	C6
R217	7	G1	G5
R218	7	F2	I4
R219	7	G2	H6
R220	7	G2	I5
R221	7	G2	I4
R222	7	F2	K3
R223	7	F2	K3
R224	7	F1	K3
R225	7	G1	J4
R226	7	G1	J5
R227	7	B2	F6
R228	7	B2	F6
R229	7	A2	F7
R230	7	A2	F6
R231	3	B5	K7
R500	8	A2	C1
R501	8	A2	C1
R502	8	A3	C1
R503	8	B4	D4
R504	8	B4	D3
R506	7	E1	C7
R507	5	C2	D4
R508	5	C2	C4
RT1	8	B1	C3
RV1	8	B1	C3
S1	2	B1	O8
S2	2	B2	N7
S3	2	B3	N6
S4	2	B4	N6
S5	3	F5	A5
S6	3	F4	A4
S7	4	D2	N5
S8	4	C1	L4
S9B	3	C5	Q3
S10A	8	B1	B4
S10B	8	B1	B4
T1	8	E2	G1
T2	7	E2	D7
TP1	9	B2	K2
TP2	9	B2	K2
TP3	8	D2	D2
TP4	9	B3	J2
TP5	9	B2	J1
TP6	9	B1	K1
TP7	9	B3	N1
TP8	9	B3	D4
TP9	9	C3	O8
TP10	9	C3	E6
TP11	7	F1	J3
U1	1	F4	I6
U3	1	E1	J5
U4	1	D4	L6
U5	1	D5	L5
U6	1	D1	L5
U7	1	F1	J5
U8	1	C1	L6
U9	1	G2	H6
U10	1	G2	G6
U11	1	G1	F6
U12	1	F3	I5
U13	1	B1	M6
U15	1	E2	H5
U16	1	B3	M8
U17	1	B5	M7
U18	2	F1	O8
U19	2	F2	O7
U20	2	F3	O6
U21	2	F4	O6
U22	3	G4	A5
U23	3	G5	A4
U24	3	D2	H7
U25	3	E3	H7
U26	3	F3	I6
U27	3	D1	I7
U28	3	C1	J7
U29	4	D3	N3
U30	4	F4	O2
U31	4	A2	O5
U32	4	F3	M4
U33	4	H4	M2
U34	4	G4	O2
U35	4	B3	N4
U36	4	F1	M5
U37	4	F2	M5
U38	4	G3	N5
U41	5	G4	G4
U42	5	B1	C5
U43	5	E4	E5
U44	5	E1	D5
U46A	5	E3	B6
U47A	5	F3	B6
U47B	5	F3	B6
U48A	5	G4	K7
U50A	9	F2	D6
U50B	9	F3	D6
U51	9	D2	D6
U52	9	D1	E6
U53	9	D2	F6
U54	7	H1	H5
U55A	7	D1	K3
U55B	7	F2	K3
U55C	7	F1	k3
U56A	7	D4	M3
U56B	7	D2	M3
U57A	5	G2	K7
U57B	5	H2	K7
U57C	1	D2	K7
U57D	3	E1	K7
U59	7	D3	K4
U60	7	F4	M3
U61A	7	E3	L3
U62	7	H3	G5
U63A	7	F2	H4
U63B	7	E3	H4
U63C	7	F3	H4
U64	7	C4	A7
U65	7	C1	G7
U67	7	F2	C7
U70	3	C4	L7
U71A	5	H4	L7
U71B	5	G3	L7
U72	8	F2	H4
U73	8	G3	J1
U74	8	E5	F4
U75	8	E4	F3
U76A	8	B4	D3
U76B	8	B4	D3
U78	8	C3	E3
U80	4	F4	K4
U81A	7	F1	I4
U82	1	E4	K6
U83	1	E5	J6
U84	7	A2	F6
U85	8	G2	I2
U86	1	C1	L6
U87	1	C4	M7
VR1	5	F2	D6
VR2	5	G2	D6
VR3	7	D5	M2
VR4	8	G4	J4
Y39	4	A3	O5

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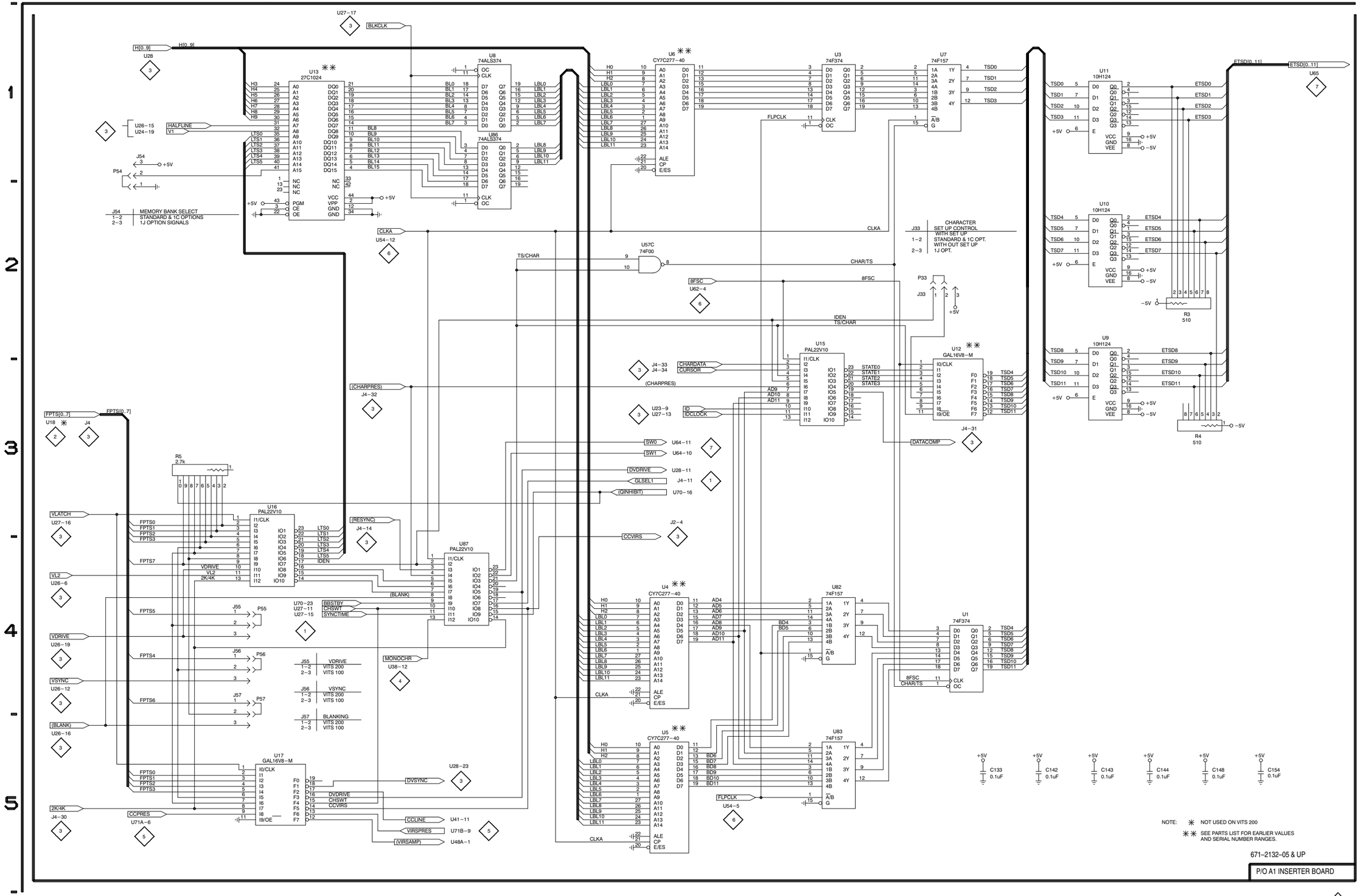
Static Sensitive Devices
See Maintenance Section

671-2132-05 & Up

A1 Inserter Board

Component locator for diagram **<1>**
located on back of this page.

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VITS 200

REV AUG 1995

TEST SIGNAL MEMORY

1

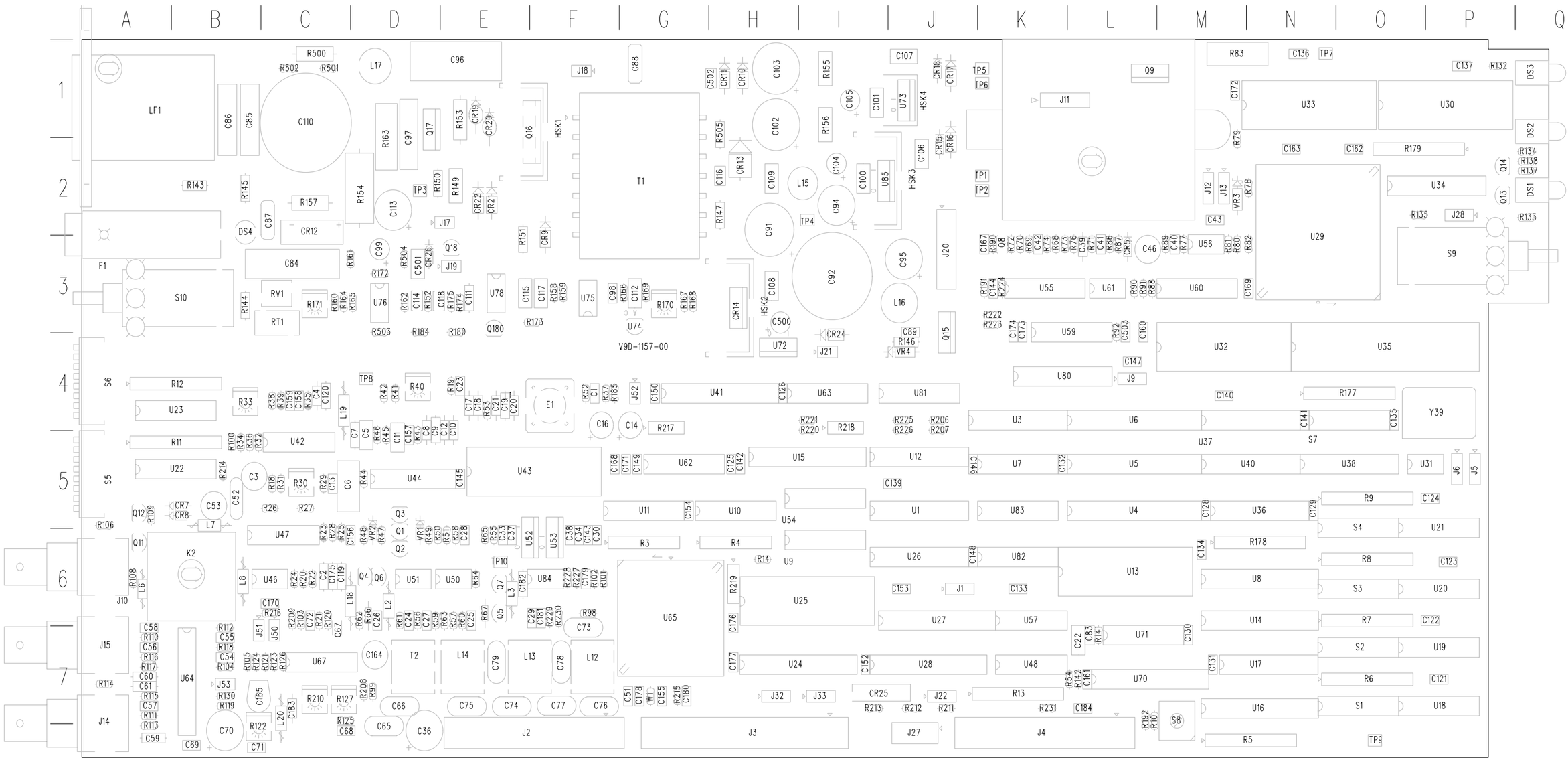
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VITS 200

A1 Inserter Board and Diagram <1> Component Locator *(with cross-references to schematic diagrams 2 thru 9).*

Comp No	Diag No	Diag Loc	Bd Loc
C1	D5	5	F4
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	E7
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	E3	8	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	O5
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	B4
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	3	D5	Q2
R134	3	E5	Q2
R135	3	C4	O2
R137	3	D5	Q2
R138	3	D5	Q2
R141	5	H4	L7
R142	5	H5	L7
R143	8	A1	B2
R144	8	B1	B3
R145	8	D1	B2
R146	8	H4	J4
R147	8	F4	H2
R149	8	E3	E2
R150	8	E4	E2
R151	8	D4	E3
R152	8	E4	D3
R153	8	E3	E2
R154	8	D2	D2
R155	8	F3	I1
R156	8	F2	I1
R157	8	C1	C2
R158	8	C5	F3
R159	8	C4	F3
R160	8	A5	C3
R161	8	A4	D3
R162	8	B3	D3
R163	8	E4	D2
R164	8	A4	C3
R165	8	B3	D3
R166	8	E5	G3
R167	8	E5	G3
R168	8	F5	G3
R169	8	F5	G3
R170	8	F5	G3
R171	8	A4	C3
R172	8	B4	D3
R173	8	D3	E3
R174	8	C4	E3
R175	8	C3	E3
R177	4	E1	N4
R178	4	D1	M6
R179A	4	B5	P2
R179B	4	B3	P2
R179C	4	C3	P2
R179D	4	G3	P2
R179E	4	G5	P2
R179F	4	G5	P2
R179G	4	G5	P2
R179H	4	E1	P2
R179I	4	A5	P2
R180	8	D3	E4
R184	8	D4	D4
R185	5	D4	F4
R190	7	E1	K3
R191	7	E1	K3
R192	5	C4	L8
R206	7	F1	J4
R207	7	F1	J5
R208	7	E2	D7
R209	7	G1	C7
R210	7	E1	C7
R211	3	D5	J7
R212	3	D5	J7
R213	3	A5	I7
R214	5	B1	B5
R215	1	C3	G7
R216	5	D3	C6
R217	7	G1	G5
R218	7	F2	I4
R219	7	G2	H6
R220	7	G2	I5
R221	7	G2	I4
R222	7	F2	K3
R223	7	F2	K3
R224	7	F1	K3
R225	7	G1	J4
R226	7	G1	J5
R227	7	B2	F6
R228	7	B2	F6
R229	7	A2	F7
R230	7	A2	F6
R231	3	B5	K7
R500	8	A2	C1
R501	8	A2	C1
R502	8	A3	C1
R503	8	B4	D4
R504	8	B4	D3
R505	5	H5	L7
R506	7	E1	C7
RT1	8	B1	C3
RV1	8	B1	C3
S1	2	B1	N8
S2	2	B2	N7
S3	2	B3	N6
S4	2	B4	N6
S5	3	F5	A5
S6	3	F4	A4
S7	4	D2	N5
S8	4	C1	M8
S9	3	C5	Q3
S10A	8	B1	B4
S10B	8	B1	B4
T1	8	E2	G1
T2	7	E2	D7
TP1	9	B2	K2
TP2	9	B2	K2
TP3	8	D2	D2
TP4	9	B3	J2
TP5	9	B2	J1
TP6	9	B1	K1
TP7	9	B3	N1
TP8	9	B3	D4
TP9	9	C3	O8
TP10	9	C3	E6
U1	1	F4	I6
U3	1	E1	J5
U4	1	D4	L6
U5	1	D5	L5
U6	1	D1	L5
U7	1	F1	J5
U8	1	C1	M6
U9	1	G2	H6
U10	1	G2	G6
U11	1	G1	F6
U12	1	F3	I5
U13	1	B1	L6
U14	1	C3	M7
U15	1	E2	H5
U16	1	B3	M8
U17	1	B5	M7
U18	2	F1	O8
U19	2	F2	O7
U20	2	F3	O6
U21	2	F4	O6
U22	3	G4	A5
U23	3	G5	A5
U24	3	D2	H7
U25	3	E3	H7
U26	3	F3	I6
U27	3	D1	I7
U28	3	C1	J7
U29	4	D3	N3
U30	4	F4	O2
U31	4	A2	O5
U32	4	F3	M4
U33	4	H4	M2
U34	4	G4	O2
U35	4	B3	N4
U36	4	F1	M6
U37	4	F2	M5
U38	4	G3	N5
U40	4	G2	M5
U41	5	G4	G4
U42	5	B1	C5
U43	5	E4	E5
U44	5	E1	D5
U46A	5	E3	B6
U47A	5	F3	B6
U47B	5	F3	B6
U48A	5	G4	K7
U50A	9	F2	D6
U50B	9	F3	D6
U51	9	D2	D6
U52	9	D1	E6
U53	9	D2	F6
U54	7	H1	H5
U55A	7	D1	K3
U55B	7	F2	K3
U55C	7	F1	K3
U56A	7	D4	M3
U56B	7	D2	M3
U57A	5	G2	K7
U57B	5	H2	K7
U57C	1	D2	K7
U57D	3	E1	K7
U59	7	D3	K4
U60	7	F4	M3
U61A	7	E3	L3
U62	7	H3	G5
U63A	7	F2	H4
U63B	7	E3	H4
U63C	7	F3	H4
U64	7	C4	A7
U65	7	C1	G7
U67	7	F2	C7
U70	3	C4	L7
U71A	5	H4	L7
U71B	5	G3	L7
U72	8	F2	H4
U73	8	G3	J1
U74	8	E5	G4
U75	8	E4	F3
U76A	8	B4	D3
U76B	8	B4	D3
U78	8	C3	E3
U80	4	F4	K4
U81A	7	F1	I4
U82	1	E4	K6
U83	1	E5	J6
U84	7	A2	F6
U85	8	G2	I2
VR1	5	F2	D6
VR2	5	G2	D6
VR3	7	D5	M2
VR4	8	G4	J4
W1	4	A3	P4
Y39	4	A3	O5

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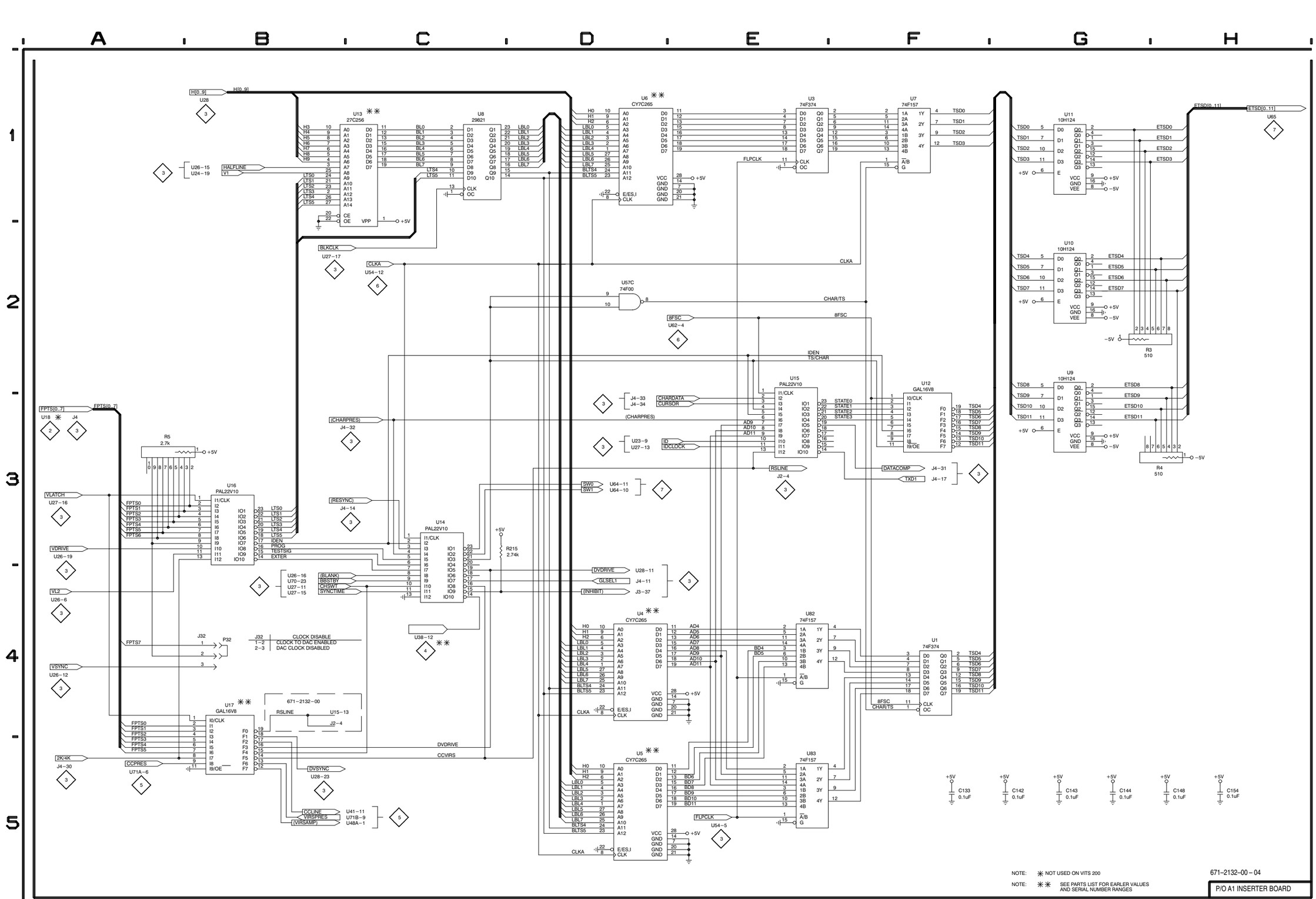
Static Sensitive Devices
See Maintenance Section

671-2132-00 – 04

A1 Inserter Board

Component locator for diagram **<1>** located on back of this page.

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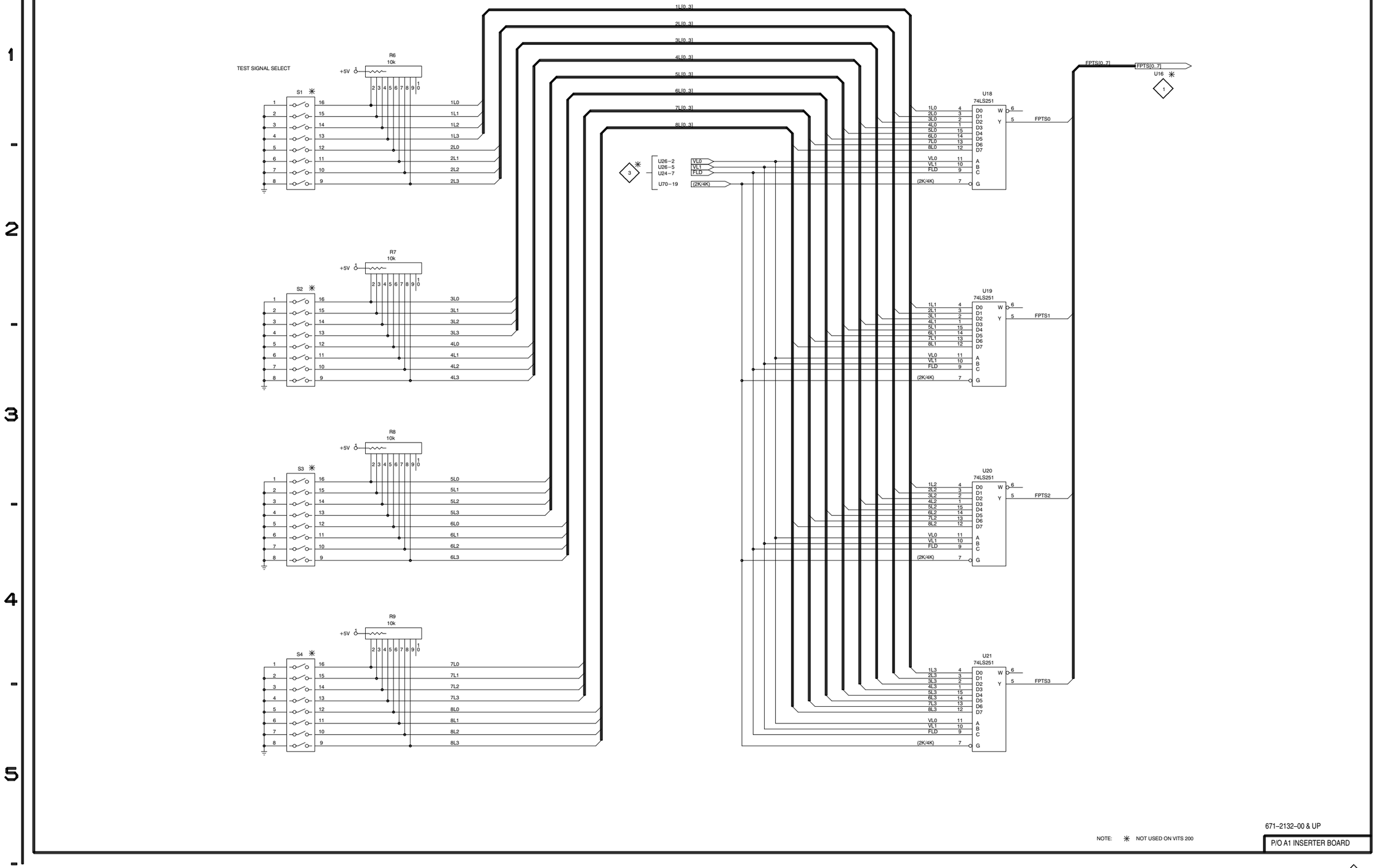
Schematic Diagram <2>
A1 Component Locator Chart

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A1. *(Partial Assembly A1 also shown on schematic 1 and 3 thru 9.*

Comp No	Diag Loc	Bd Loc
R6	C1	N7
R7	C2	N6
R8	C3	N6
R9	C4	N5
S1	B1	O8
S2	B2	N7
S3	B3	N6
S4	B4	N6
U18	F1	O8
U19	F2	O7
U20	F3	O6
U21	F4	O6

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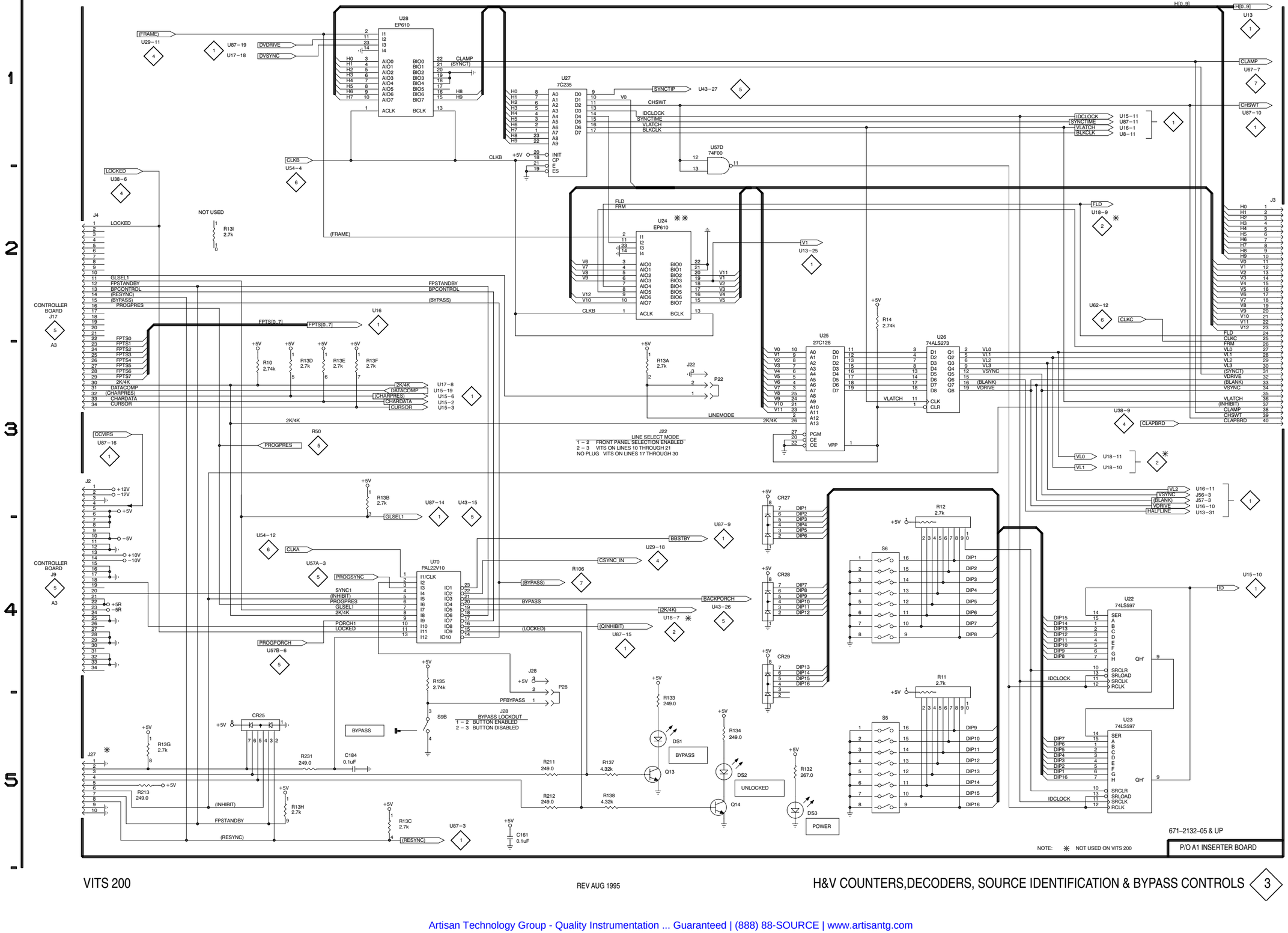
Schematic Diagram <3> Component Locator Chart
671–2132–05 & Up

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A1. *(Partial Assembly A1 also shown on schematic 1, 2, and 4 thru 9).*

Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc
C161	C5	L7	J27	A5	J7	R13E	B3	J7			
C184	C5	L7	J28	D4	P2	R13F	C3	J7	S5	F5	A5
						R13G	A5	J7	S6	F4	A4
CR25	B5	I7	P22	E3		R13H	B5	J7	S9B	C5	Q3
CR27	E3	A4	P28	D4		R13I	B2	J7			
CR28	E4	B4				R14	F2	H6	U22	G4	A5
CR29	E4	B5	Q13	D5	P2	R132	E5	P1	U23	G5	A4
			Q14	E5	P2	R133	D5	Q2	U24	D2	H7
DS1	D5	Q2				R134	E5	Q2	U25	E3	H7
DS2	E5	Q1	R10	B3	L8	R135	C4	O2	U26	F3	I6
DS3	E5	Q1	R11	F4	A5	R137	D5	Q2	U27	D1	I7
			R12	F4	A4	R138	D5	Q2	U28	C1	J7
J2	A3	F7	R13A	D3	J7	R211	D5	J7	U57D	E1	K7
J3	H2	I7	R13B	C3	J7	R212	D5	J7	U70	C4	L7
J4	A2	L7	R13C	C5	J7	R213	A5	I7			
J22	E3	J7	R13D	B3	J7	R231	B5	K7			

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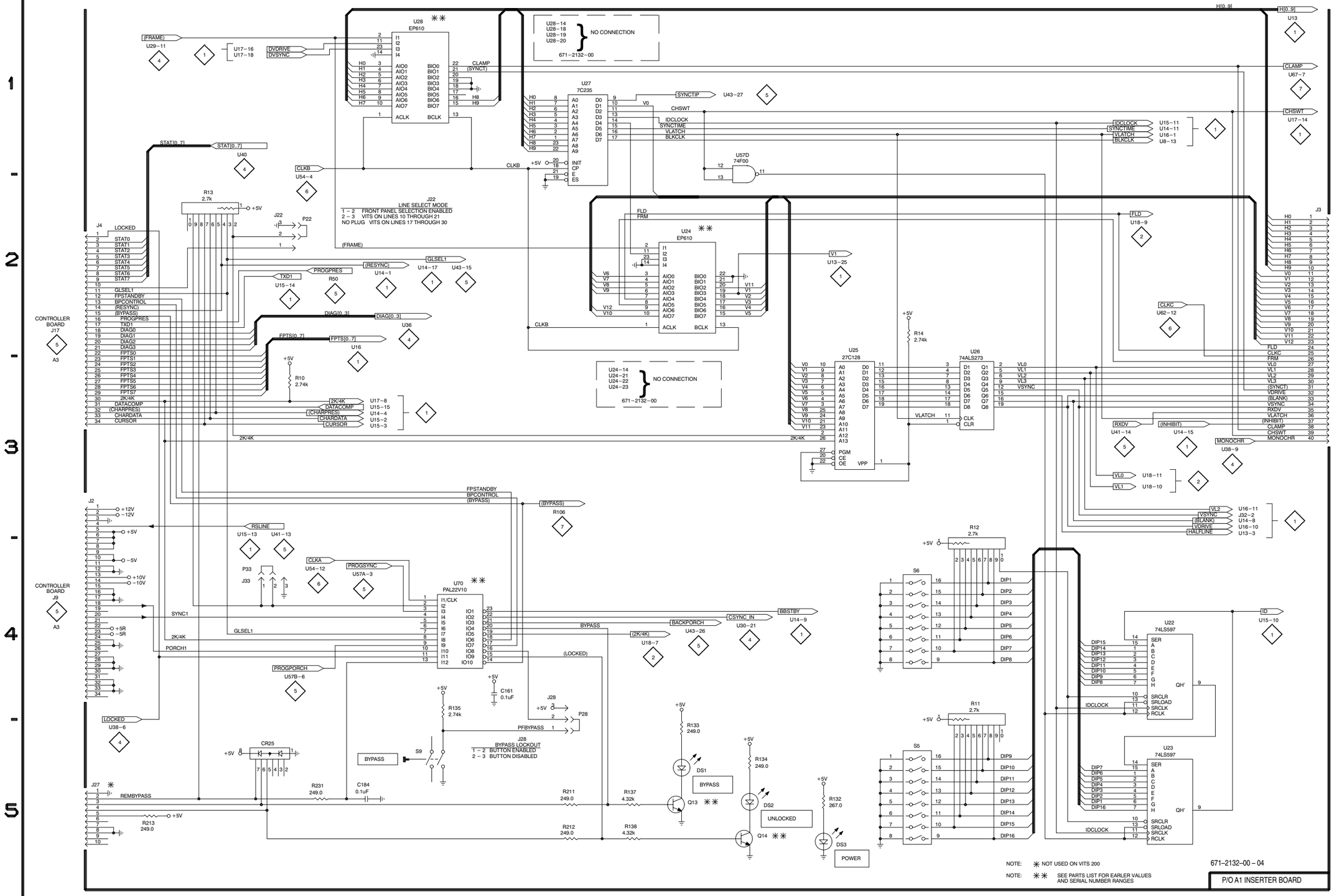
Schematic Diagram <3> Component Locator Chart
671-2132-00 & 04

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A1. *(Partial Assembly A1 also shown on schematic 1, 2, 3, and 5 thru 9).*

Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc
C161	C4	L7	J28	D4	P2	R14	F2	H6	S6	F4	A4
C184	C5	L7	J33	B4	I7	R132	E5	P1	S9	C5	Q3
						R133	D5	Q2			
CR25	B5	I7	P22	B2		R134	E5	Q2	U22	G4	A5
			P28	D4		R135	C4	O2	U23	G5	A5
DS1	D5	Q2	P33	B4		R137	D5	Q2	U24	D2	H7
DS2	E5	Q2							U25	E3	H7
DS3	E5	Q1	Q13	D5	P2	R138	D5	Q2	U26	F3	I6
			Q14	E5	P2	R211	D5	J7			
J2	A3	G7				R212	D5	J7	U27	D1	I7
J3	H2	H7	R10	B3	M8	R213	A5	I7	U28	C1	J7
J4	A2	K7	R11	F4	A5	R231	B5	K7	U57D	E1	K7
J22	B2	J7	R12	F4	A4				U70	C4	L7
J27	A5	J7	R13	A2	K7	S5	F5	A5			

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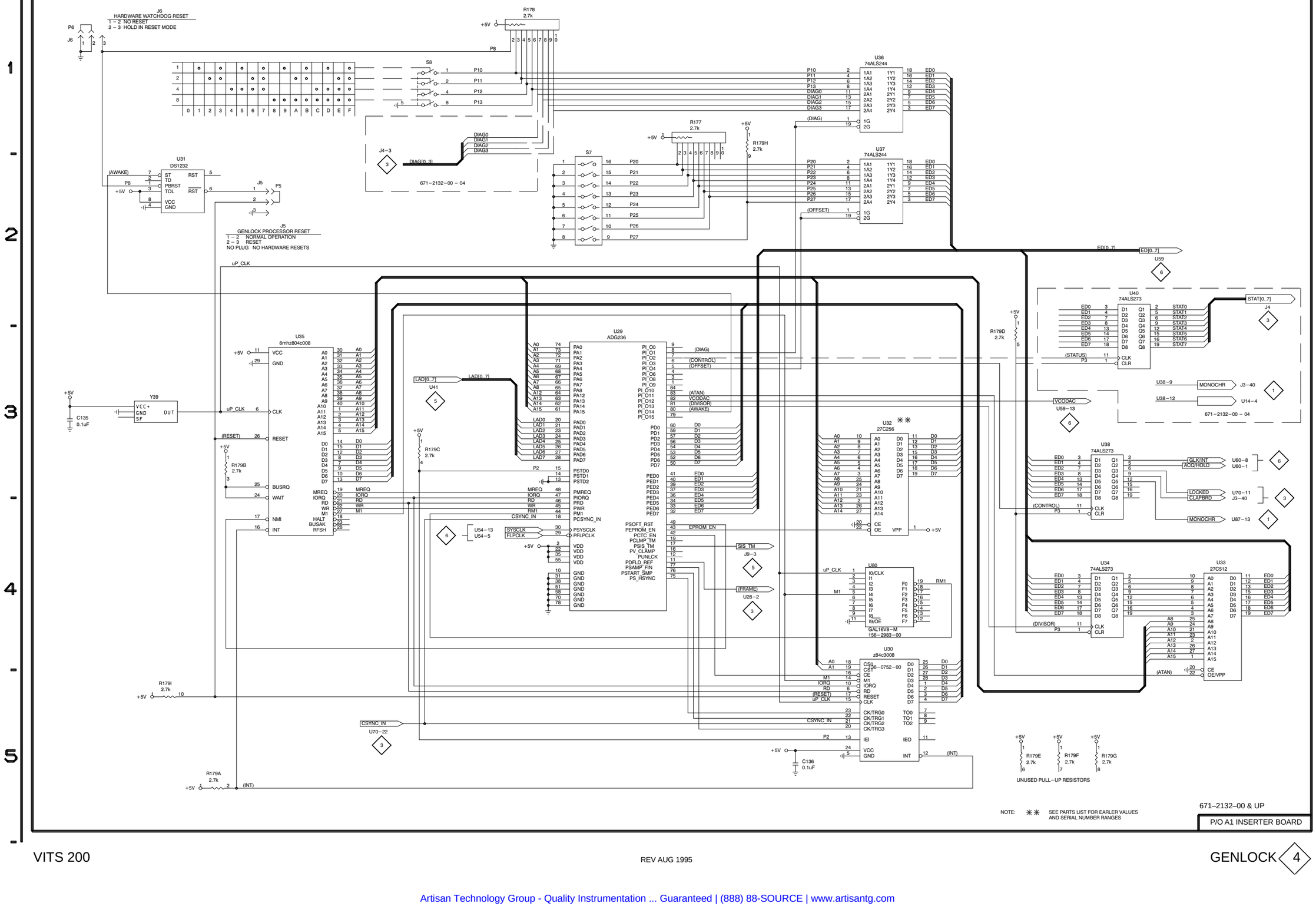
Schematic Diagram <4> Component Locator Chart

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A1. *(Partial Assembly A1 also shown on schematic 1, 2, 3, and 5 thru 9).*

Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc
C135	A3	O4	R178	D1	M5	S7	D2	N5	U35	B3	N4
C136	E5	N1	R179A	B5	P2	S8	C1	L4	U36	F1	M5
			R179B	B3	P2				U37	F2	M5
J5	B2	P5	R179C	C3	P2	U29	D3	N3	U38	G3	N5
J6	A1	P5	R179D	G3	P2	U30	F4	O2	U80	F4	K4
			R179E	G5	P2	U31	A2	O5			
P5	B2		R179F	G5	P2	U32	F3	M4	Y39	A3	O5
P6	A1		R179G	G5	P2	U33	H4	M2			
			R179H	E1	P2	U34	G4	O2			
R177	E1	N4	R179I	A5	P2						

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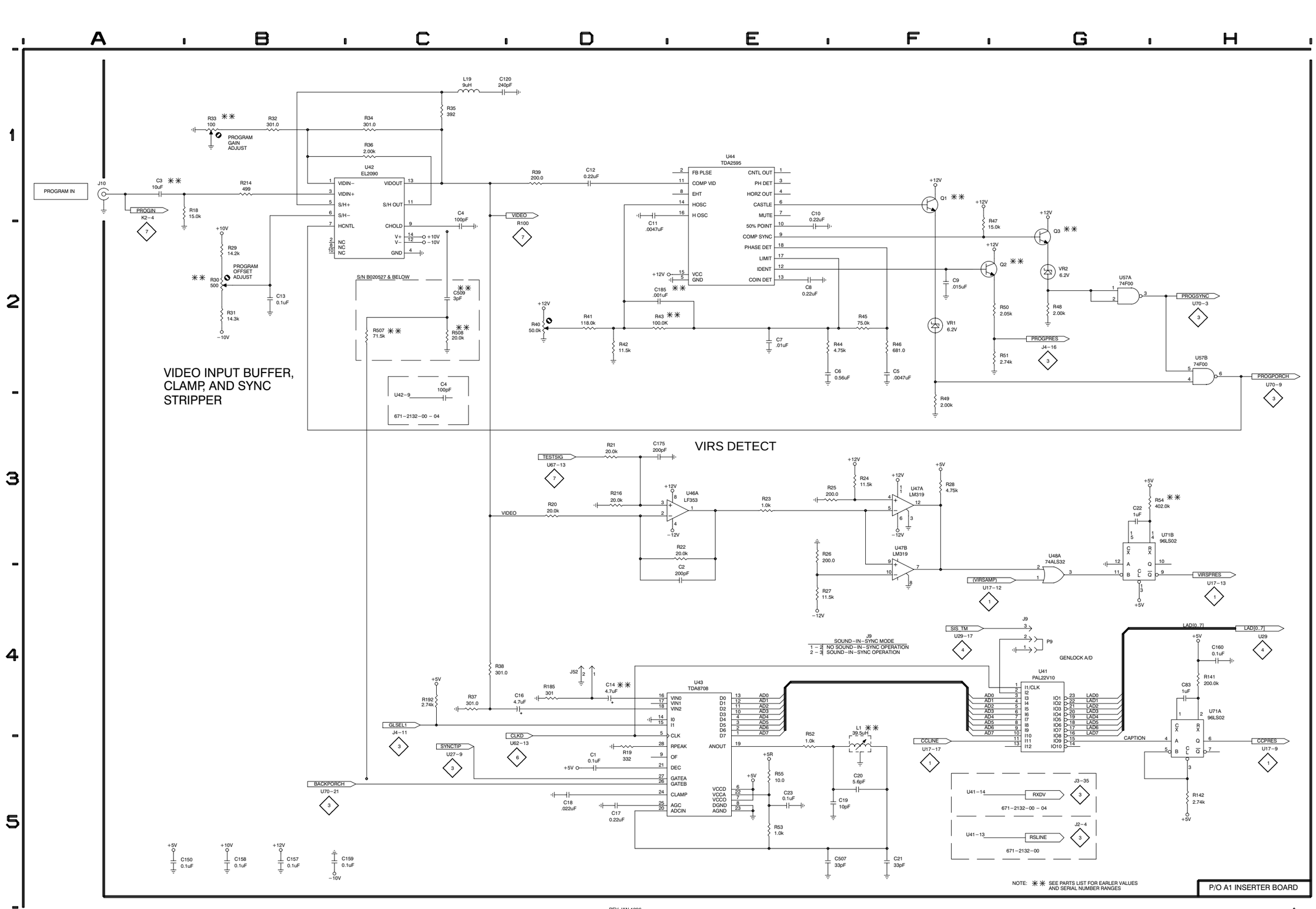
Schematic Diagram <5> Component Locator Chart

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A1. *(Partial Assembly A1 also shown on schematic 1 thru 4 and 6, 9).*

Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc
C1	D5	F5	C158	B5	C4	R26	E3	C5	R52	E5	F4
C2	E4	C6	C159	B5	C4	R27	E4	C5	R53	E5	E4
C3	A1	B5	C160	H4	L4	R28	F3	C6	R54	G3	L7
C4	C2	C4	C175	D3	C6	R29	B2	C5	R55	E5	E6
C5	F2	D5	C185	D2	D4	R30	B2	C5	R141	H4	L7
C6	E2	D5	C507	E5	E4				R142	H5	L7
C7	E2	D5	C509	C2	C4	R31	B2	C5	R185	D4	G4
C8	F2	D5				R32	B1	B5	R192	C4	L8
C9	F2	E5	J9	G4	K4	R33	B1	B4	R214	B1	C5
C10	E2	E5	J10	A1	A6	R34	C1	B5	R216	D3	C6
			J52	A4	G4	R35	C1	C4	R507	C2	D4
C11	D1	D5				R36	C1	B5	R508	C2	C4
C12	D1	E5	L1	F5	F4	R37	C4	F4			
C13	B2	C5	L19	C1	D4	R38	C4	C4	U41	G4	G4
C14	D4	G5				R39	D1	C4	U42	B1	C5
C15	E1	D5	P9	G4					U43	E4	E5
C16	D4	F4				R40	D2	D4	U44	E1	D5
C17	D5	E4	Q1	F1	D5	R41	D2	D4	U46A	E3	B6
C18	D5	E4	Q2	F2	D6	R42	D2	D4	U47A	F3	B6
C19	F5	E4	Q3	G2	D5	R43	D2	D5	U47B	F3	B6
C20	F5	E4				R44	E2	C5	U48A	G4	K7
			R18	A1	C5	R45	F2	D5	U57A	G2	K7
C21	F5	E4	R19	D5	E4	R46	F2	D5	U57B	H2	K7
C22	G3	L7	R20	D3	C6	R47	F1	D6	U71A	H4	L7
C23	E5	E4	R21	D3	C7	R48	G2	D6	U71B	G3	L7
C31	D2	D4	R22	E3	C6						
C83	H4	L7	R23	E3	C6	R49	F3	D6	VR1	F2	D6
C120	C1	D4	R24	F3	C6	R50	G2	E6	VR2	G2	D6
C150	A5	G4	R25	E3	C6	R51	G2	E6			
C157	B5	D5									

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Schematic Diagram <6> Component Locator Chart

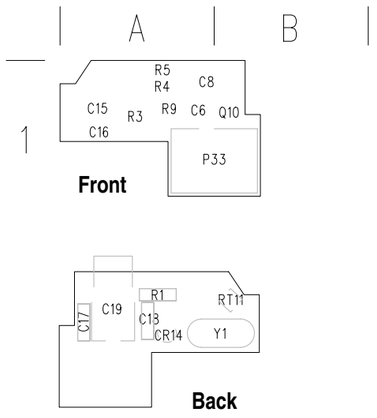
The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A1 & A1A1. *(Partial Assembly A1 also shown on schematic 1 thru 5 and 7, 8, 9).*

Comp No	Diag Loc	Bd Loc
C39	C1	L3
C40	E2	M3
C41	D2	L3
C42	E2	K3
C43	C5	M2
C46	E4	L3
C125	G3	H5
C128	H3	H5
CR5	F4	L3
J11	C1	K1
J12	G3	M2
J13	D4	M2
J32	F2	H5
P12	G3	M2
P13	D4	M2
P32	F2	H5
Q8	D1	K3
Q9	E4	L1
R68	C1	K3
R69	D1	K3
R70	D1	K3
R71	D2	L3
R72	D1	K3
R73	E2	L3
R74	E2	K3
R76	D2	L3
R77	D5	M3
R78	C5	N2
R79	D5	M2
R80	C4	M3
R81	C4	M3
R82	C4	N3
R83	E5	M1
R86	G4	L3
R87	G4	L3
R88	F4	L3
R89	F4	M3
R90	E4	L3
R91	E4	L3
R92	E3	L4
R190	E1	K3
R191	E1	K3
R206	F1	J4
R207	F1	J5
R217	G1	G5
R218	F2	I5
R219	G2	H6
R220	G2	I5
R221	G2	I4
R222	F2	K3
R223	F2	K3
R224	F1	K3
R225	G1	J4
R226	G1	J5
TP11	F1	K3
U54	H1	I5
U55A	D1	K3
U55B	F2	K3
U55C	F1	K3
U56A	D4	M3
U56B	D2	M3
U59	D3	K4
U60	F4	M3
U61A	E3	L3
U62	H3	G5
U63A	F2	I4
U63B	E3	I4
U63C	F3	I4
U81A	F1	J4
VR3	D5	M2

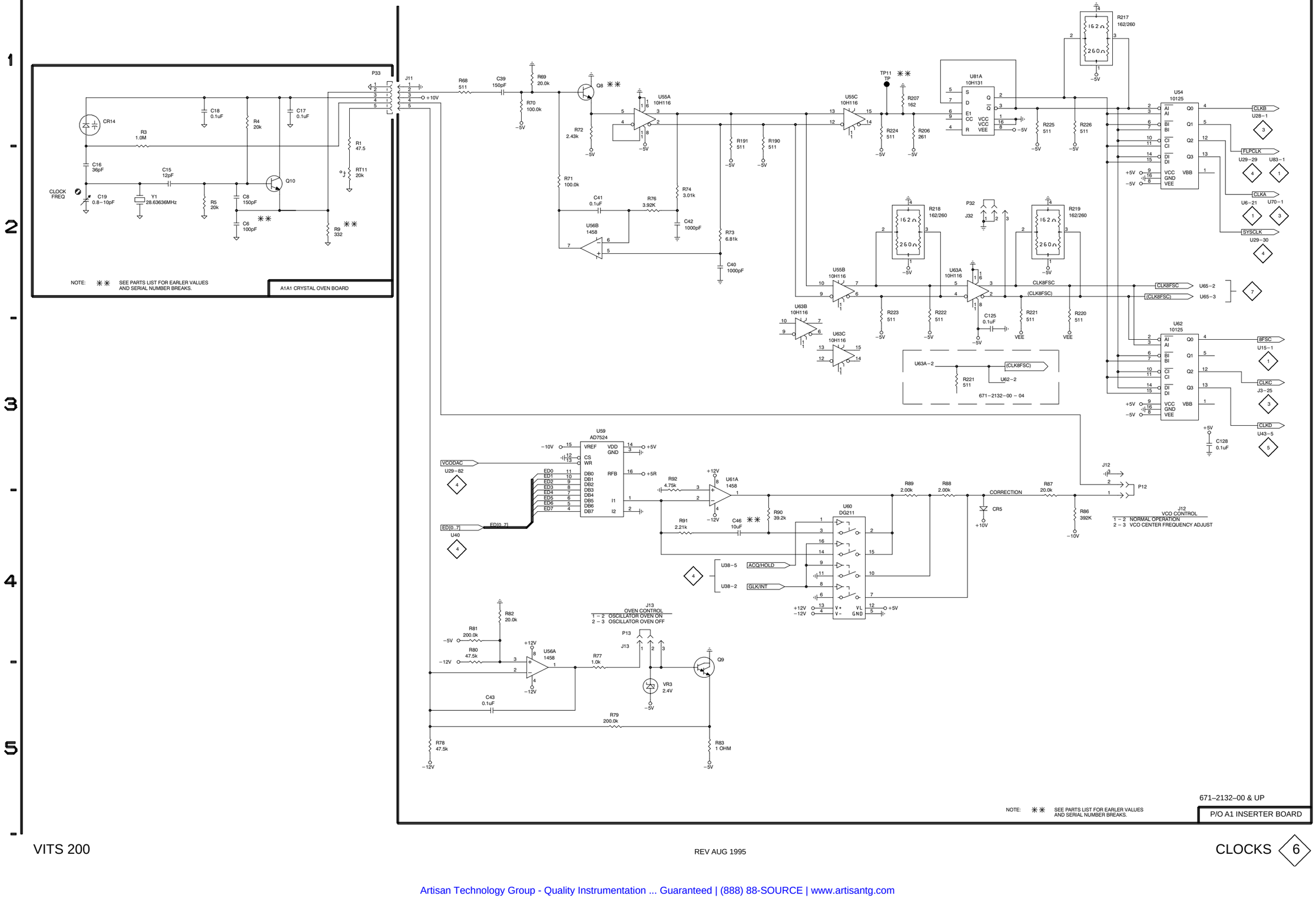
A1A1 Oven Board

Comp No	Diag Loc	Bd Loc
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	



A1A1 Oven Board
119–4228–00

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Schematic Diagram <7> Component Locator Chart

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A1. *(Partial Assembly A1 also shown on schematic 1 thru 6 and 8, 9).*

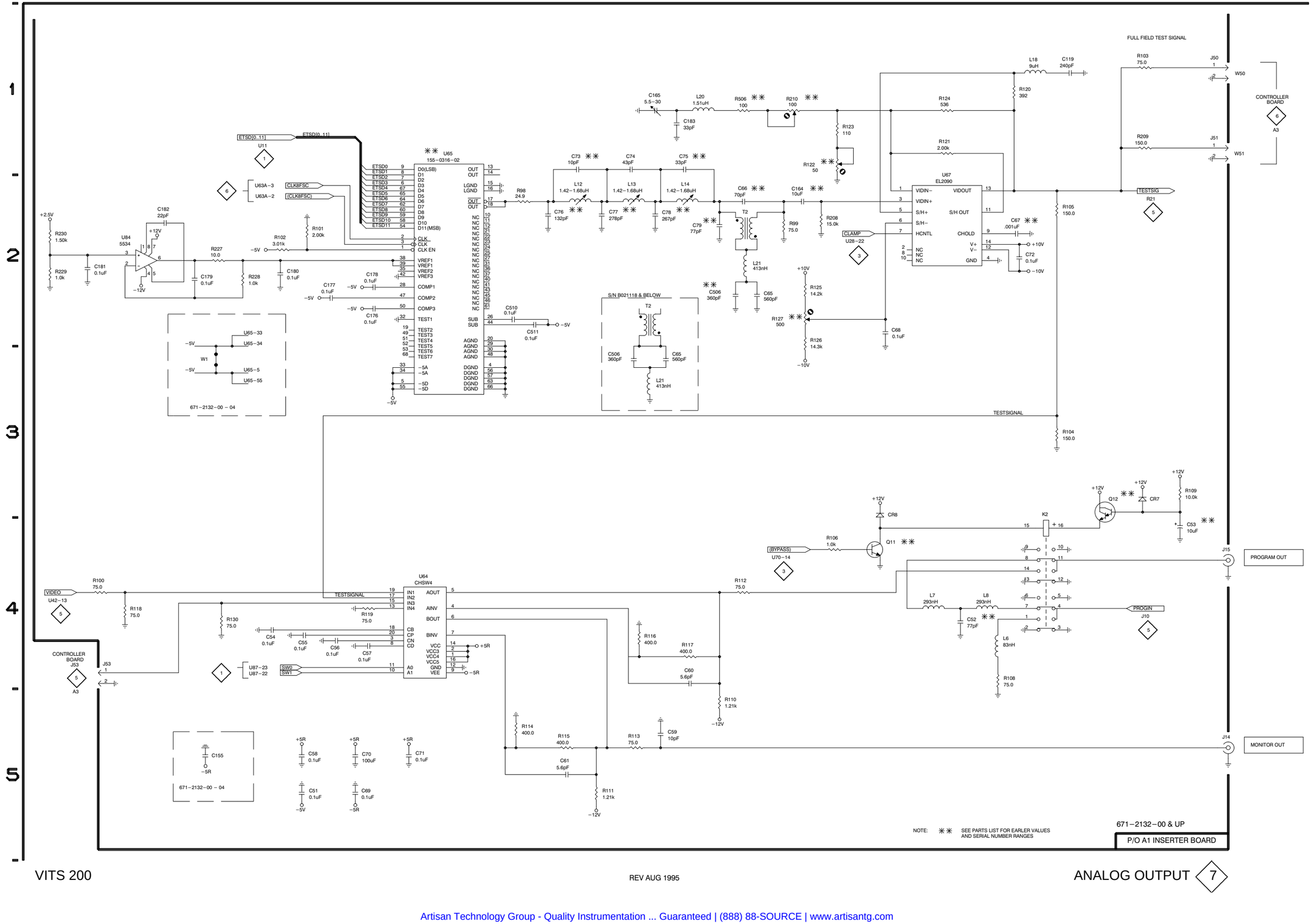
Comp No	Diag Loc	Bd Loc
C39	C1	L3
C40	E2	M3
C41	D2	L3
C42	E2	K3
C43	C5	M2
C46	E4	L3
C51	B5	G8
C52	F4	B5
C53	H4	A5
C54	B4	B7
C55	B4	B7
C56	B4	A7
C57	C4	A7
C58	B5	A7
C59	D5	A8
C60	E4	A7
C61	D5	A7
C65	E2	D8
C66	E2	D7
C67	G2	C7
C68	F2	C8
C69	C5	B8
C70	C5	B8
C71	C5	B8
C72	G2	C7
C73	D1	F7
C74	D1	E7
C75	E1	E7
C76	D2	F7
C77	D2	F7
C78	D2	F7
C79	E2	E7
C119	G1	C6
C125	G3	H5
C128	H3	H5
C164	E2	D7
C165	D1	C7
C176	C2	H7
C177	B2	H7
C178	C2	G7
C179	B2	F6
C180	B2	G7
C181	A2	F6
C182	A2	E6
C183	E1	C7

Comp No	Diag Loc	Bd Loc
C506	E2	D8
C510	D2	G7
C511	D2	G7
CR5	F4	L3
CR7	G3	B5
CR8	F3	B5
J11	C1	K1
J12	G3	M2
J13	D4	M2
J14	H5	A7
J15	H4	A6
J32	F2	H4
J50	H1	C7
J51	H1	B6
J53	A4	B7
K2	G4	A6
L6	G4	A6
L7	F4	B6
L8	F4	B6
L12	D2	F7
L13	D2	F7
L14	E2	E7
L18	G1	D6
L20	E1	C7
L21	E2	D8
P12	G3	
P13	D4	
P32	F2	
Q8	D1	K2
Q9	E4	L1
Q11	F4	A6
Q12	G3	A5
R68	C1	K3
R69	D1	K3
R70	D1	K3
R71	D2	L3
R72	D1	K3
R73	E2	L3
R74	E2	K3
R76	D2	L3

Comp No	Diag Loc	Bd Loc
R77	D5	M3
R78	C5	N2
R79	D5	M2
R80	C4	M3
R81	C4	M3
R82	C4	N3
R83	E5	M1
R86	G4	L3
R87	G4	L3
R88	F4	L3
R89	F4	M3
R90	E4	L3
R91	E4	L3
R92	E3	L4
R98	D2	F6
R99	E2	D7
R100	A4	B5
R101	B2	F6
R102	B2	F6
R103	G1	C7
R104	G3	B7
R105	G2	B7
R106	F4	A6
R108	G4	A6
R109	H3	A5
R110	E5	A7
R111	D5	A7
R112	E4	B7
R113	D5	A8
R114	D5	A7
R115	D5	A7
R116	D4	A7
R117	E4	A7
R118	A4	B7
R119	C4	B7
R120	G1	C7
R121	F1	C7
R122	F1	B8
R123	F1	C7
R124	F1	B7
R125	E2	D7
R126	E2	C7
R127	E2	C7

Comp No	Diag Loc	Bd Loc
R130	B4	B7
R190	E1	K3
R191	E1	K3
R206	F1	J4
R207	F1	J5
R208	E2	D7
R209	G1	C7
R210	E1	C7
R217	G1	G5
R218	F2	I4
R219	G2	H6
R220	G2	I5
R221	G2	I4
R222	F2	K3
R223	F2	K3
R224	F1	K3
R225	G1	J4
R226	G1	J5
R227	B2	F6
R228	B2	F6
R229	A2	F7
R230	A2	F6
R506	E1	C7
T2	E2	D7
TP11	F1	J3
U54	H1	H5
U55A	D1	K3
U55B	F2	K3
U55C	F1	K3
U56A	D4	M3
U56B	D2	M3
U59	D3	K4
U60	F4	M3
U61A	E3	L3
U62	H3	G5
U63A	F2	H4
U63B	E3	H4
U63C	F3	H4
U64	C4	A7
U65	C1	G7
U67	F2	C7
U81A	F1	I4
U84	A2	F6
VR3	D5	M2

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ANALOG OUTPUT 7

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Schematic Diagram <8> Component Locator Chart

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A1. *(Partial Assembly A1 also shown on schematic 1 thru 7 and 9).*

Comp No	Diag Loc	Bd Loc
C84	B1	C3
C85	C1	B1
C86	C2	B1
C87	D2	C2
C88	E1	G1
C89	G4	J4
C91	F4	H2
C92	F4	I3
C94	G4	I2
C95	G4	I3
C96	D3	E1
C97	E4	D2
C98	F5	F3
C99	B3	D3
C100	G2	I2
C101	G3	I1
C102	F2	H1
C103	F3	H1
C104	F2	I2
C105	F3	I1
C106	G2	J2
C107	G3	J1
C108	G4	H3
C109	F4	H2
C110	C2	C1
C111	D3	E3
C112	F5	G3
C113	E3	D2
C114	C4	D3
C115	D3	E3
C116	F4	H2
C117	C2	F3
C118	C3	E3
C500	G2	H3

Comp No	Diag Loc	Bd Loc
C501	B4	D3
C508	A3	D3
C512	F4	I3
CR9	E2	F3
CR10	F2	H1
CR11	F3	H1
CR12	C1	C2
CR13	F4	H2
CR14	F3	H3
CR15	G2	J2
CR16	H2	J2
CR17	H3	J1
CR18	G3	J1
CR19	E4	E1
CR20	E3	E1
CR21	E3	E2
CR22	E3	E2
CR24	G2	I4
CR26	B4	D3
DS4	D2	B2
F1	A1	A3
J17	E2	E2
J18	E3	F1
J19	C4	E3
J21	H2	I4
L15	G4	I2
L16	G3	J3
L17	D1	D1
LF1	A1	A2

Comp No	Diag Loc	Bd Loc
P17	E2	
P18	E3	
P19	C4	
Q15	G4	J3
Q16	E3	E1
Q17	E4	D2
Q18	C4	E3
Q180	D3	E4
R143	A1	B2
R144	B1	B3
R145	D1	B2
R146	H4	J4
R147	F4	H2
R149	E3	E2
R150	E4	D2
R151	D4	E3
R152	E4	D3
R153	E3	E1
R154	D2	D2
R155	F3	I1
R156	F2	I2
R157	C1	C2
R158	C5	F3
R159	C4	F3
R160	A5	C3
R161	A4	C3
R162	B3	D3
R163	E4	D2
R164	A4	C3
R165	B3	D3
R166	E5	G3
R167	E5	G3

Comp No	Diag Loc	Bd Loc
R168	F5	G3
R169	F5	G3
R170	F5	G3
R171	A4	C3
R172	B4	D3
R173	D3	E3
R174	C4	E3
R175	C3	E3
R180	D3	E4
R184	D4	D4
R500	A2	C1
R501	A2	C1
R502	A3	C1
R503	B4	D4
R504	B4	D3
RT1	B1	C3
RV1	B1	C3
S10A	B1	B4
S10B	B1	B4
T1	E2	G1
TP3	D2	D2
U72	F2	H4
U73	G3	J1
U74	E5	F4
U75	E4	F3
U76A	B4	D3
U76B	B4	D3
U78	C3	E3
U85	G2	I2
VR4	G4	J4 C

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FUSE:

FUSE BODY: 204−0906−00

FUSE CAP: 200−2264−00

110VAC − 2A SLOW 159−0023−00

220 VAC − 1A SLOW 159−0019−00

FLOATING COMMON

REAR PANEL

110V OR 220V

LF1

F1

S10A

S10B

RT1 5

R143 22M

R144 1M

RV1 330V

C84 0.15uF

CR12

C110 2700UF

R157 270k

C85 .01uF

C86 .01uF

R145 10M

C87 0.1uF

DS4

L17 150UH

C88 220pF

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

TP3 14.1V

C117 0.1uF

C115 1uF

P17 J17

CR9

C113 100uF

P18 J18

T1

C96 0.47uF

R149 35

CR20

CR22

CR21

Q16

R153 270k

CR19

Q17

R150 10

C97 680pF

R151 10k

R152 1.50k

R163 0.51Ohm

R502 30.1K

R165 10.0k

C508 1uF

U78 3842

R175 10.0k

C118 .001uF

R173 3.01k

Q180

C111 .01uF

R180 10.0k

R184 2.15k

J19
OVERCURRENT SHUTDOWN
1 − 2 SHUTDOWN ENABLE
NO PLUG SHUTDOWN DISABLE

P19 J19

R174 4.75k

C114 470pF

C99 100uf

R162 18.2k

Q18

U76A LM393

R172 20.0k

R164 40.02k

CR26

C501 .47UF

R504 10.0k

U76B LM393

R503 10.0k

R161 4.75k

R171 1k

+5V ADJ

R160 8.25k

R159 10.0k

R158 2.74k

U75 SOC123A

R166 475

R167 150.0K

R168 2.00k

C98 0.1uF

C112 .068uF

U74 TL431C

R169 1.50k

R170 1k

OUTPUT VOLTAGE ADJUST

U72 7812

C500 47uF

CR24

J21

P21

B100

FAN

CR15

U85 7812

+15V

R156 5

C102 1000uF

C104 47uF

C100 1uF

C106 1uF

CR16

+12VP

CR10

CR11

C103 1000uF

R155 5

C105 47uF

C101 1uF

U73 7912

C107 1uF

CR17

−12VP

CR18

CR14

L16 5uH

C92 2700uF

C512 2700uF

C108 1uF

C95 100uF

Q15

VR4 5.1V

+5VP

C89 0.1uF

R146 1k

R147 27

C116 .01uF

C91 2700uF

C109 1uF

L15 10uH

C94 100uF

−5VP

CR13

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

671–2132–00 & UP

P/O A1 INSERTER BOARD

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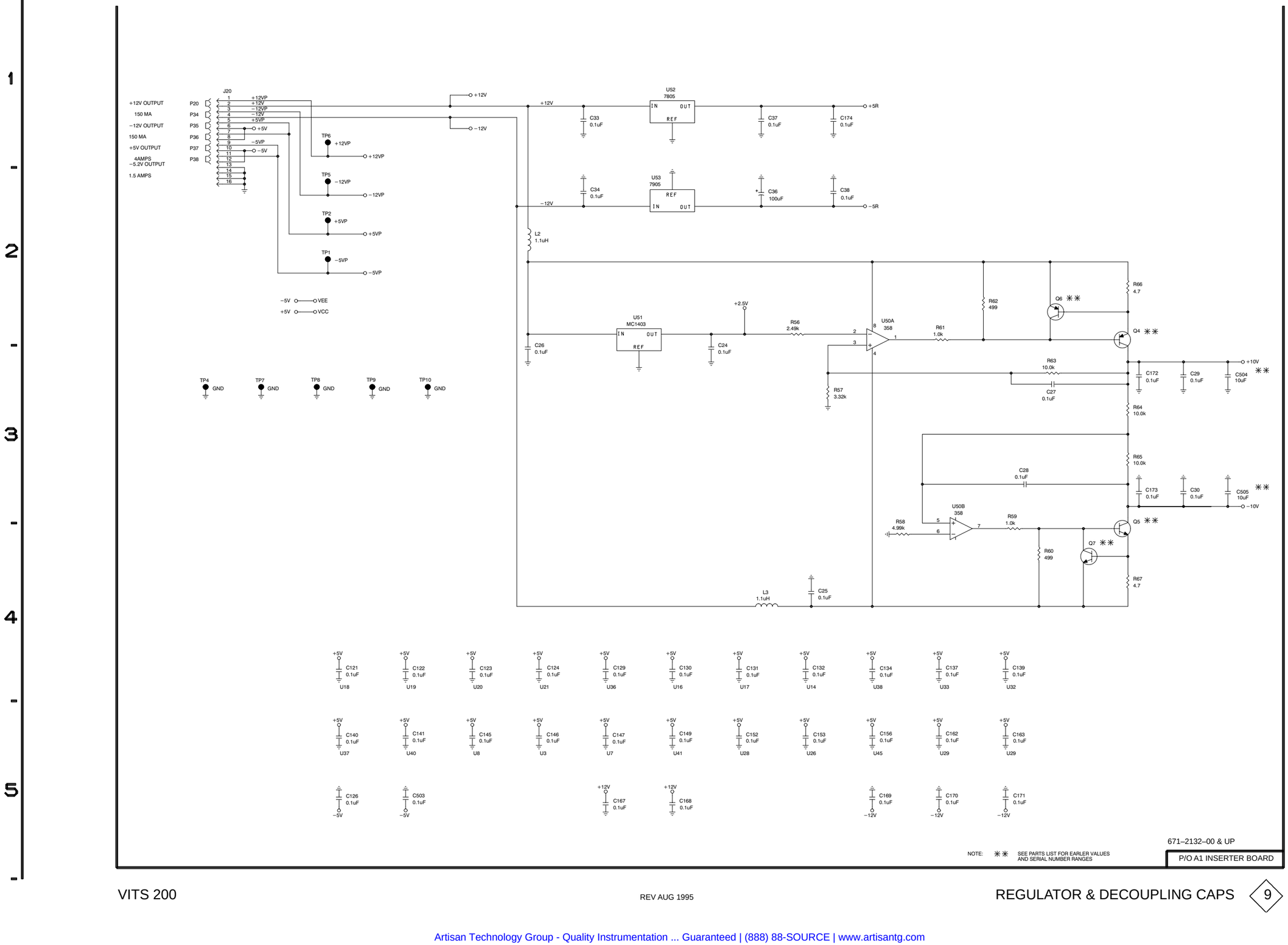
Schematic Diagram <9> Component Locator Chart

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A1. *(Partial Assembly A1 also shown on schematic 1 thru 8).*

Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc
C24	E3	D7	C139	F4	I5	C505	H3	G4	R61	F2	D6
C25	E4	E7	C140	B5	M4	J20	B1	J2	R62	F2	D7
C26	D3	D7	C141	C5	N4				R63	G3	E7
C27	G3	D7	C145	C5	E5	L2	D2	D6	R64	G3	E6
C28	G3	E6	C146	D5	J5	L3	E4	E6	R65	G3	E6
C29	G3	F6	C147	D5	J4				R66	G2	D6
C30	G3	F6	C149	D5	G5	P20	B1		R67	G4	E6
C33	D1	E6	C152	E5	I7	P34	B1				
C34	D2	F6				P35	B1		TP1	B2	K2
C36	E2	G7	C153	E5	J6	P36	B1		TP2	B2	K2
			C156	F5	D6	P37	B1		TP4	B3	J2
C37	E1	E6	C162	F5	O2	P38	B1		TP5	B2	J1
C38	E2	F6	C163	F5	N2				TP6	B1	K1
C121	B4	P7	C167	D5	K3	Q4	G2	D6	TP7	B3	N1
C122	C4	O6	C168	D5	F5	Q5	G3	E7	TP8	B3	D4
C123	C4	P6	C169	F5	N3	Q6	G2	D6	TP9	C3	O8
C124	D4	O5	C170	F5	C6	Q7	G4	E6	TP10	C3	E6
C126	B5	H4	C171	F5	G5						
C129	D4	N5	C172	G3	M1	R56	E2	D7	U50A	F2	D6
C130	D4	M7	C173	G3	K4	R57	E3	E7	U50B	F3	D6
C131	E4	M7	C174	E1	K4	R58	F4	E6	U51	D2	D6
C132	E4	K5	C503	C5	L4	R59	F4	E7	U52	D1	E6
C134	F4	M6	C504	H3	H4	R60	G4	E7	U53	D2	F6
C137	F4	P1									

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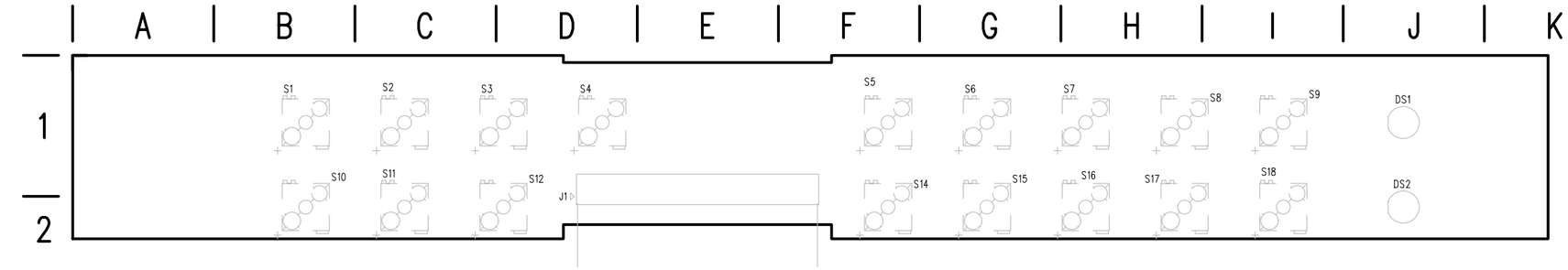


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Static Sensitive Devices
See Maintenance Section

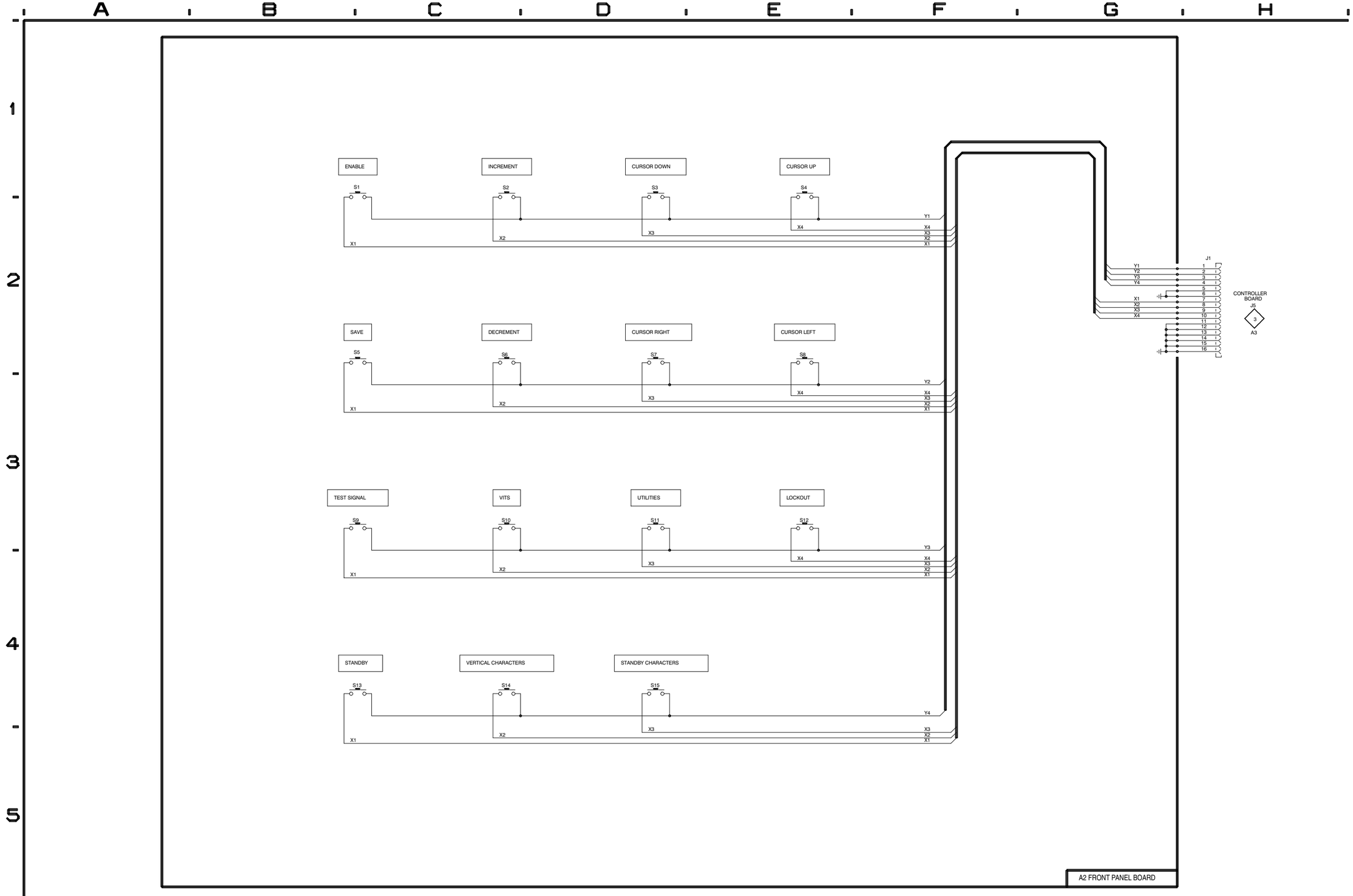
A2 Front Panel Board
Diagram <1> Component Locator

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A2.

Comp No	Diag Loc	Bd Loc
J1	H2	I1
S1	B1	C1
S2	C1	C1
S3	D1	B1
S4	E1	A1
S5	B2	C2
S6	C2	C2
S7	D2	B2
S8	E2	A2
S9	B3	E1
S10	C3	E1
S11	D3	F1
S12	E3	H1
S13	B4	E2
S14	C4	E2
S15	D4	F2

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FRONT PANEL 1

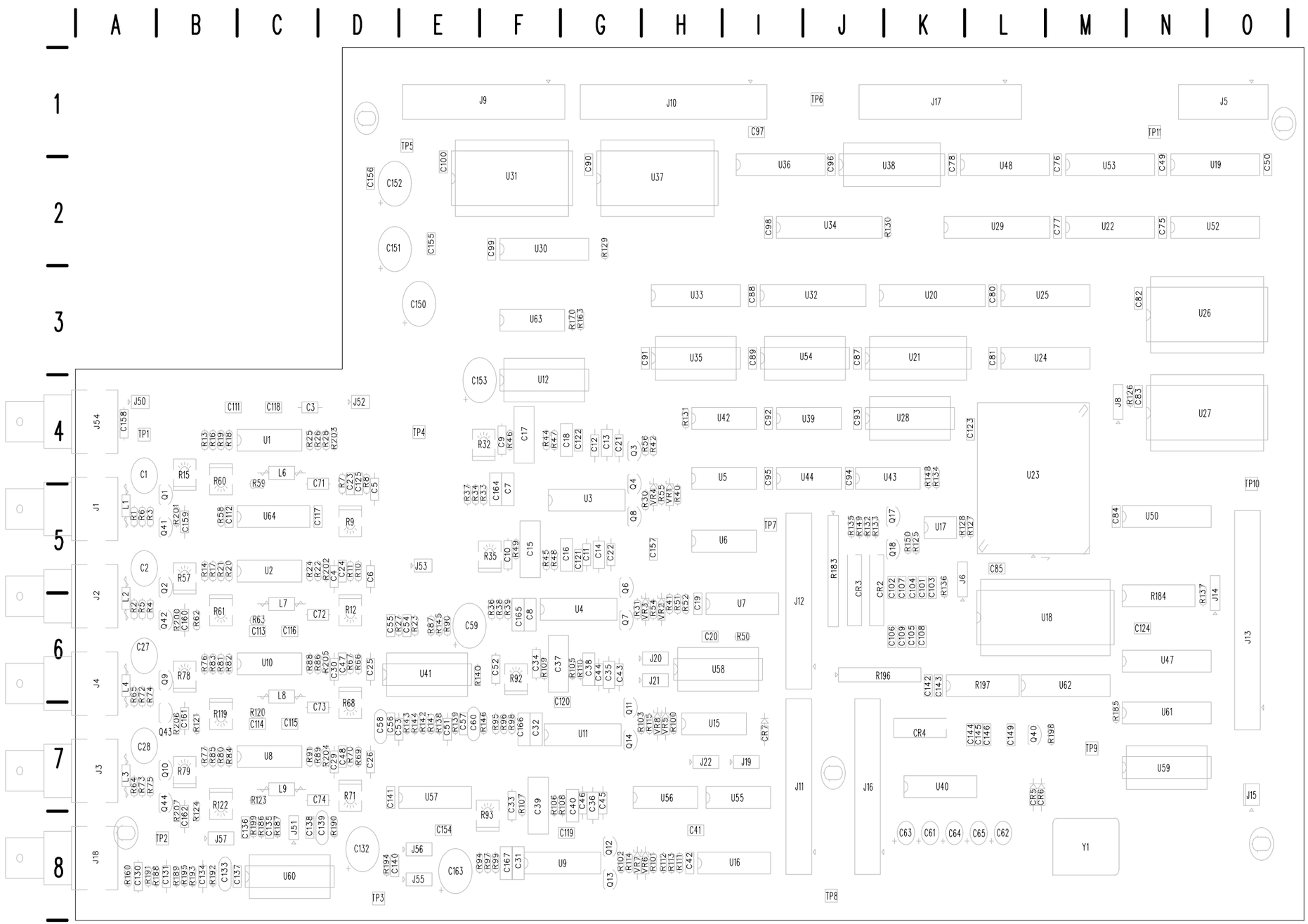
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A3 Controller Board and Diagram <1> Component Locator *(with cross-references to schematic diagrams 2 thru 7).*

Comp No	Diag No	Diag Loc	Bd Loc
C1	1	B1	A4
C2	1	B4	A5
C3	1	C2	C4
C4	1	C4	D5
C5	1	D1	D5
C6	1	D4	D5
C7	1	D2	F5
C8	1	D4	F6
C9	1	E2	F4
C10	1	E5	F5
C11	1	E4	G5
C12	1	E2	G4
C13	1	F2	G4
C14	1	E4	G5
C15	1	E5	F5
C16	1	F5	G5
C17	1	E3	F4
C18	1	F3	G4
C19	1	H4	H6
C20	1	H3	H6
C21	1	E2	G4
C22	1	E4	G5
C23	1	B2	D5
C24	1	B5	D5
C25	2	D1	D6
C26	2	D4	D7
C27	2	B2	A6
C28	2	B4	A7
C29	2	C4	D7
C30	2	C2	D6
C31	2	D4	F8
C32	2	D2	F7
C33	2	E5	F8
C34	2	E2	F6
C35	2	E2	G6
C36	2	E4	G8
C37	2	E3	G6
C38	2	E3	G6
C39	2	E5	F8
C40	2	E5	G8
C41	2	H4	H8
C42	2	H3	H8
C43	2	E2	G6
C44	2	E2	G6
C45	2	E4	G7
C46	2	E4	G7
C47	2	B2	D6
C48	2	B5	D7
C49	3	B2	N2
C50	3	A2	O2
C51	5	F1	E7
C52	5	F2	F6
C53	5	G1	E7
C54	5	D1	E6
C55	5	D1	D6
C56	5	D1	D7
C57	5	D1	E7
C58	5	E1	D7
C59	5	E1	E6
C60	5	E2	E7
C61	5	C4	K8
C62	5	B4	L8
C63	5	C4	K8
C64	5	C4	K8
C65	5	C4	L8
C66	1	D2	
C67	1	D4	
C68	2	D2	
C69	2	D4	
C71	1	B2	C5
C72	1	B4	C6
C73	2	B2	C7
C74	2	B4	C7
C75	7	A5	N2
C76	7	A5	M2
C77	7	A5	M2
C78	7	B5	K2
C80	7	B5	L3
C81	7	B5	L3
C82	7	B5	N3
C83	7	C5	N4
C84	7	C5	M5
C85	7	C5	L5
C87	7	D5	J3
C88	7	D5	I3
C89	7	D5	I3
C90	7	E5	G2
C91	7	E5	H3
C92	7	E5	I4
C93	7	E5	J4
C94	7	F5	J5
C95	7	F5	I5
C96	7	F5	J2
C97	7	G5	I1
C98	7	G5	I2
C99	7	G5	F2
C100	7	H5	E2
C101	7	C4	K6
C102	7	C4	K6
C103	7	A3	K6
C104	7	B4	K6
C105	7	B4	K6
C106	7	D4	K6
C107	7	C4	K6
C108	7	B4	K6
C109	7	B4	K6
C111	7	A5	B4
C112	7	A5	B5
C113	7	A5	C6
C114	7	B5	C7
C115	7	D5	C7
C116	7	D5	C6
C117	7	D5	D5
C118	7	E5	C4
C119	7	B5	G8
C120	7	B5	F7
C121	7	C5	G5
C122	7	C5	G4
C123	7	H5	L4
C124	7	H5	N6
C125	7	E5	D5
C130	6	F1	A8
C131	6	E1	B8
C132	6	E2	D8
C133	6	D2	B8
C134	6	F1	B8
C135	6	C1	C8
C136	6	C1	C8
C137	6	C1	C8
C138	6	C1	C8
C139	6	D2	D8
C140	6	D2	D8
C141	6	E2	D7
C142	7	D5	K6
C143	7	C5	K6
C144	7	C5	L7
C145	7	C5	L7
C146	7	C5	L7
C149	7	B5	L7
C150	5	E5	E3
C151	5	D5	D2
C152	5	D5	D2
C153	5	D5	E3
C154	5	C5	E8
C155	5	C5	E2
C156	5	B5	D2
C157	5	B5	H5
C158	6	G2	A4
C159	1	A2	B5
C160	1	A4	B6
C161	2	A2	B7
C162	2	A5	B8
C163	6	E2	E8
C164	1	D2	F5
C165	1	D4	F6
C166	2	D2	F7
C167	2	D5	F8
CR2	7	C3	J5
CR3	7	C3	J5
CR4	7	C4	K7
CR5	7	F4	L7
CR6	7	F4	L7
CR7	4	G4	I7
J1	1	A1	A4
J2	1	A4	A5
J3	2	A4	A7
J4	2	A1	A6
J5	3	A1	O1
J6	3	B3	K6
J8	3	C1	M4
J9	5	H1	F1
J10	5	A1	I1
J11	5	A4	J8
J12	5	H3	J6
J13	5	H2	O7
J14	5	G3	O6
J15	5	A4	O8
J16	5	H4	K8
J17	5	A3	L1
J18	6	H2	A8
J19	1	H3	I7
J20	1	H5	G6
J21	2	G2	G6
J22	2	G5	H7
J50	6	A2	A4
J51	6	A1	C8
J52	1	H1	D4
J53	5	H2	E5
J54	6	H2	A4
J55	6	C2	E8
J56	6	C2	E8
J57	6	D1	B8
L1	1	A2	A5
L2	1	A4	A6
L3	2	A4	A7
L4	2	A2	A6
L6	1	B2	C4
L7	1	B4	C6
L8	2	B2	C6
L9	2	B4	C7
P3	3	C1	
P6	3	B4	
P14	5	G3	
P19	1	H3	
P20	1	H5	
P21	2	G2	
P22	2	G5	
P55	6	C2	
P56	6	C2	
P57	6	D1	
Q1	1	B2	B4
Q2	1	B4	B5
Q3	1	F2	G4
Q4	1	F2	G4
Q6	1	F4	G5
Q7	1	F4	G6
Q8	1	G2	G5
Q9	2	B2	B6
Q10	2	B4	B7
Q11	2	F2	G6
Q12	2	F4	G8
Q13	2	F4	G8
Q14	2	F2	G7
Q17	5	F3	K5
Q18	5	G3	K5
Q40	7	F4	L7
Q41	1	A2	B5
Q42	1	A4	B6
Q43	2	A2	B7
Q44	2	B4	B8
R1	1	A2	A5
R2	1	A4	A6
R3	1	B2	A5
R4	1	B4	A6
R5	1	A4	A6
R6	1	A2	A5
R7	1	B2	D5
R8	1	B2	D5
R9	1	B2	D5
R10	1	B4	D5
R11	1	B5	D5
R12	1	B4	D6
R13	1	B1	B4
R14	1	B3	B5
R15	1	B1	B4
R16	1	C1	B4
R17	1	C3	B5
R18	1	C1	B4
R19	1	C1	B4
R20	1	C3	B5
R21	1	C4	B5
R22	1	D3	D5
R23	1	D3	E6
R24	1	D4	C5
R25	1	D1	C4
R26	1	D1	D4
R27	1	D1	E6
R28	1	D1	D4
R30	1	F2	H5
R31	1	F4	G6
R32	1	C2	F4
R33	1	D2	F5
R34	1	D2	E5
R35	1	C5	F5
R36	1	D5	F6
R37	1	D2	E5
R38	1	D5	F6
R39	1	D5	F6
R40	1	F3	H5
R41	1	F5	H6
R42	1	F2	H4
R44	1	E2	F4
R45	1	E5	F5
R46	1	E2	F4
R47	1	F2	F4
R48	1	F5	F5
R49	1	E5	F5
R50	1	H4	I6
R51	1	H3	H6
R52	1	H4	H6
R54	1	G5	H6
R55	1	G2	H5
R56	1	F2	H4
R57	1	B3	B5
R58	1	B1	B5
R59	1	B1	C5
R60	1	B1	C5
R61	1	B3	C6
R62	1	B3	B6
R63	1	B3	C6
R64	2	A4	A7
R65	2	A2	A7
R66	2	B2	D6
R67	2	B2	D6
R68	2	B2	D7
R69	2	B4	D7
R70	2	B5	D7
R71	2	B5	D7
R72	2	A2	A7
R73	2	A4	A7
R74	2	B2	A7
R75	2	B4	A7
R76	2	B1	B6
R77	2	B4	B7
R78	2	B1	B6
R79	2	B3	B7
R80	2	C3	B7
R81	2	C1	B6
R82	2	C1	B6
R83	2	C1	B6
R84	2	C3	B7
R85	2	C4	B7
R86	2	C1	D6
R87	2	D1	E6
R88	2	C1	C6
R89	2	C3	D7
R90	2	C3	E6
R91	2	C4	C7
R92	2	C2	F7
R93	2	C5	F8
R94	2	D5	F8
R95	2	D2	F7
R96	2	D2	F7
R97	2	D5	F8
R98	2	D2	F7
R99	2	D5	F8
R100	2	F2	H7
R101	2	F5	H8
R102	2	F4	G8
R103	2	F2	H7
R105	2	E2	G6
R106	2	E5	F8
R107	2	E5	F8
R108	2	E5	G8
R109	2	E2	F6
R110	2	E2	G6
R111	2	H3	H8
R112	2	H4	H8
R113	2	H3	H8
R114	2	F5	G8
R115	2	F2	H7
R119	2	A1	C7
R120	2	A1	C7
R121	2	A1	B7
R122	2	A3	C8
R123	2	A3	C7
R124	2	A3	B8
R125	3	A4	K5
R126	3	C1	N4
R127	3	B4	L5
R128	3	B3	L5
R129	4	G1	G2
R130	4	A5	K2
R131	5	B1	H4
R132	5	F3	J5
R133	5	F3	J5
R134	5	F4	K5
R135	5	G4	J5
R136	5	G4	K6
R137	5	G3	N6
R138	5	F2	E7
R139	5	F2	E7
R141	5	F1	E7
R142	5	F1	E7
R143	5	G1	E7
R144	5	G1	E7
R145	5	E1	E6
R146	5	E2	F7
R148	5	E3	K5
R149	5	F4	J5
R150	5	G3	K5
R160	6	F2	A8
R163	6	D4	G3
R170	6	D4	G3
R183	7	B3	J5
R184	7	D3	N6
R185	5	G4	M7
R186	6	C1	C8
R187	6	B1	C8
R188	6	E2	B8
R189	6	E2	B8
R190	6	E1	D8
R191	6	F1	A8
R192	6	G1	B8
R193	6	F1	B8
R194	6	D2	D8
R195	6	F1	B8
R196	7	B4	J6
R197	7	D4	K7
R198	7	F4	M7
R199	6	D1	C8
R200	1	A4	B6
R201	1	A2	B5
R202	1	C3	D5
R203	1	C1	D4
R204	2	C4	D7
R205	2	C1	D6
R206	2	A2	B7
R207	2	A4	B8
TP1	7	E5	A4
TP2	7	F5	A8
TP3	7	F5	D8
TP4	7	F5	E4
TP5	7	G5	E1
TP6	7	G5	J1
TP7	7	G5	I5
TP8	7	G5	J8
TP9	7	H5	M7
TP10	7	H5	O4
TP11	7	H5	N1
U1	1	C1	C4
U2	1	C4	C6
U3	1	D1	F5
U4	1	D4	F6
U5A	1	G2	H5
U5B	1	H2	H5
U5C	1	G4	H5
U5D	1	G5	H5
U6A	1	G3	H5
U6B	1	G4	H5
U6C	2	G3	H5
U6D	2	G4	H5
U7A	1	H3	H6
U7B	1	H4	H6
U8	2	B4	C7
U9	2	D4	F8
U10	2	B1	C6
U11	2	D1	F7
U12	6	D3	F4
U15A	2	G2	H7
U15B	2	G2	H7
U15C	2	G4	H7
U15D	2	G4	H7
U16A	2	G3	H8
U16B	2	G4	H8
U17	3	B4	K5
U18	3	F2	L6
U19	3	B1	N2
U20	3	G3	K3
U21	3	D1	J4
U22	3	G3	M2
U23	3	C2	L5
U24	3	G4	L4
U25	3	G5	L3
U26	3	F3	N3
U27	3	F5	N4
U28	3	D3	J4
U29	4	C4	K2
U30	4	G1	F3
U31	4	F1	E2
U32	4	E2	I3
U33	4	B3	H3
U34	4	C2	I2
U35	4	E3	H4
U36	4	B4	I2
U37	4	B2	G2
U38	4	E4	J2
U39A	4	A5	I4
U39B	4	B2	I4
U39C	4	E3	I4
U39D	4	E3	I4
U40	5	C4	K8
U41	5	D1	D6
U42A	5	B1	H4
U42B	5	B2	H4
U43A	5	F3	J5
U43B	5	E3	J5
U43C	5	F3	J5
U43D	5	F3	J5
U44A	5	F5	I5
U44B	5	F5	I5
U47	7	F1	N6
U48	7	F2	L2
U50	7	E3	N5
U52	7	E1	N2
U53	7	E2	M2
U54	7	C2	I4
U55A	1	B3	H8
U55B	1	B5	H8
U55C	2	B3	H8
U55D	2	B5	H8
U56A	1	B3	G8
U56B	1	B5	G8
U56C	2	B3	G8
U56D	2	B5	G8
U57	6	E3	E8
U58	4	G5	H6
U59	5	E4	N7
U60	6	D1	C8
U61	7	F3	N7
U62	7	E4	L7
U63A	6	E4	F3
U63B	6	E5	F3
U63C	6	E5	F3
U63D	6	E4	F3
U64	6	F3	C5
VR1	1	F2	H5
VR2	1	F4	H6
VR3	1	F4	H6
VR4	1	G2	H5
VR5	2	F2	H7
VR6	2	F5	H8
VR7	2	F4	G8
VR8	2	F2	H7
Y1	5	E5	L8

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A3 Controller Board
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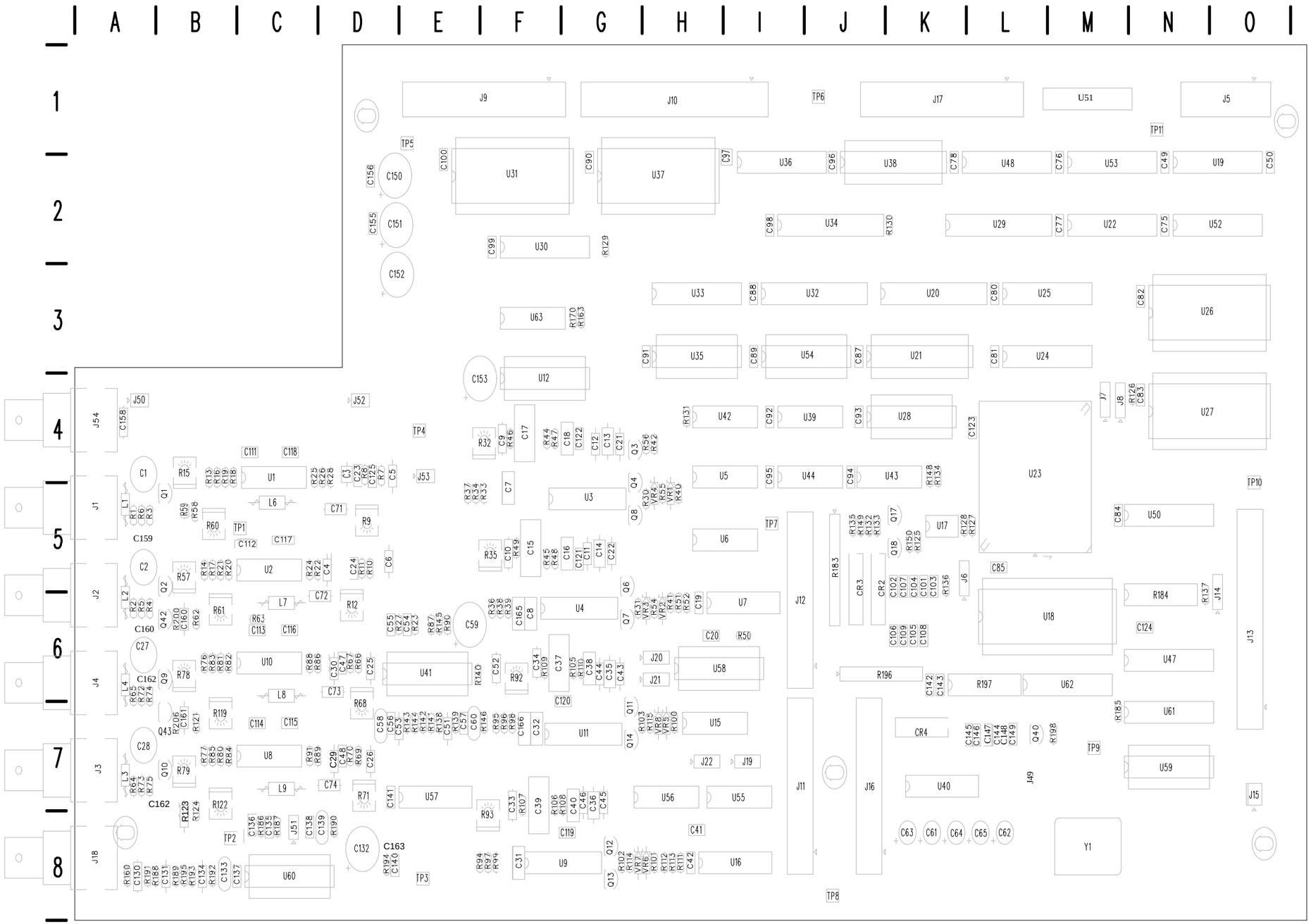
A3 Controller Board
671-2131-00 – 01

A3 Controller Board and Diagram <1> Component Locator *(with cross-references to schematic diagrams 2 thru 7).*

Comp No	Diag Loc	Diag No	Bd Loc
C1	B1	1	A4
C2	B4	1	A5
C3	C2	1	C4
C4	C4	1	D5
C5	D1	1	D5
C6	D4	1	D5
C7	D2	1	F5
C8	D4	1	F6
C9	E2	1	F4
C10	E5	1	F5
C11	E4	1	G5
C12	E2	1	G4
C13	F2	1	G4
C14	E4	1	G5
C15	E5	1	F5
C16	F5	1	G5
C17	E3	1	F4
C18	F3	1	G4
C19	H4	1	H6
C20	H3	1	H6
C21	E2	1	G4
C22	E4	1	G5
C23	B2	1	D5
C24	B5	1	D5
C25	D1	2	D6
C26	D4	2	D7
C27	B2	2	A6
C28	B4	2	A7
C29	C4	2	D7
C30	C2	2	D6
C31	D4	2	F8
C32	D2	2	F7
C33	E5	2	F8
C34	E2	2	F6
C35	E2	2	G6
C36	E4	2	G8
C37	E3	2	G6
C38	E3	2	G6
C39	E5	2	F8
C40	E5	2	G8
C41	H4	2	H8
C42	H3	2	H8
C43	E2	2	G6
C44	E2	2	G6
C45	E4	2	G7
C46	E4	2	G7
C47	B2	2	D6
C48	B5	2	D7
C49	B2	3	N2
C50	A2	3	O2
C51	F1	5	E7
C52	F1	5	F6
C53	G1	5	E7
C54	D1	5	E6
C55	D1	5	D6
C56	D1	5	D7
C57	D1	5	E7
C58	E1	5	D7
C59	E1	5	E6
C60	E2	5	E7
C61	C4	5	K8
C62	B4	5	L8
C63	C4	5	K8
C64	C4	5	K8
C65	C4	5	L8
C71	B2	1	C5
C72	B4	1	C6
C73	B2	2	C7
C74	B4	2	C7
C75	A5	7	N2
C76	A5	7	M2
C77	A5	7	M2
C78	B5	7	K2
C80	B5	7	L3
C81	B5	7	L3
C82	B5	7	N3
C83	C5	7	N4
C84	C5	7	M5
C85	C5	7	L5
C87	D5	7	J3
C88	D5	7	I3
C89	D5	7	I3
C90	E5	7	G2
C91	E5	7	H3
C92	E5	7	I4
C93	E5	7	J4
C94	F5	7	J5
C95	F5	7	I5
C96	F5	7	J2
C97	G5	7	I1
C98	G5	7	I2
C99	G5	7	F2
C100	H5	7	E2
C101	C4	7	K6
C102	C4	7	K6
C103	A3	7	K6
C104	B4	7	K6
C105	B4	7	K6
C106	D4	7	K6
C107	C4	7	K6
C108	B4	7	K6
C109	B4	7	K6
C111	A5	7	B4
C112	A5	7	B5
C113	A5	7	C6
C114	B5	7	C7
C115	D5	7	C7
C116	D5	7	C6
C117	D5	7	D5
C118	E5	7	C4
C119	B5	7	G8
C120	B5	7	F7
C121	C5	7	G5
C122	C5	7	G4
C123	H5	7	L4
C124	H5	7	N6
C125	E5	7	D5
C130	F1	6	A8
C131	E1	6	B8
C132	E2	6	D8
C133	D2	6	B8
C134	F1	6	B8
C135	C1	6	C8
C136	C1	6	C8
C137	C1	6	C8
C138	C1	6	C8
C139	D2	6	D8
C140	D2	6	D8
C141	E2	6	D7
C142	D5	7	K6
C143	C5	7	K6
C144	C5	7	L7
C145	C5	7	L7
C146	C5	7	L7
C149	B5	7	L7
C150	E5	5	E3
C151	D5	5	D2
C152	D5	5	D2
C153	D5	5	E3
C154	C5	5	E8
C155	C5	5	E2
C156	B5	5	D2
C157	B5	5	H5
C158	G2	6	A4
C159	A2	1	B5
C160	A4	1	B6
C161	A2	2	B7
C162	A5	2	B8
C163	E2	6	E8
C164 *	D2	1	F5
C165 *	D4	1	F6
C166 *	D2	2	F7
C167 *	D5	2	F8
CR2	C3	7	J5
CR3	C3	7	J5
CR4	C4	7	K7
CR5	F4	7	L7
CR6	F4	7	L7
CR7	G4	4	I7
J1	A1	1	A4
J2	A4	1	A5
J3	A4	2	A7
J4	A1	2	A6
J5	A1	3	O1
J6	B3	3	K6
J7 *	E4	3	M3
J8	C1	3	M4
J9	H1	5	F1
J10	A1	5	I1
J11	A4	5	J8
J12	H3	5	J6
J13	H2	5	O7
J14	G3	5	O6
J15	A4	5	O8
J16	H4	5	K8
J17	A3	5	L1
J18	H2	6	A8
J19	H3	1	I7
J20	H5	1	G6
J21	G2	2	G6
J22	G5	2	H7
J50	A2	6	A4
J51	A1	6	C8
J52	D1	1	D4
J53	F2	5	E5
J54	H2	6	A4
J55	C2	6	E8
J56	C2	6	E8
J57	D1	6	B8
L1	A2	1	A5
L2	A4	1	A6
L3	A4	2	A7
L4	A2	2	A6
L6	B2	1	C4
L7	B4	1	C6
L8	B2	2	C6
L9	B4	2	C7
P3	C1	3	M4
P6	B4	3	K6
P14	F3	5	O6
P19	H3	1	I7
P20	H5	1	G6
P21	G2	2	G6
P22	G5	2	H7
P55	C2	6	E8
P56	C2	6	E8
P57	D1	6	B8
Q1	B2	1	B4
Q2	B4	1	B5
Q3	F2	1	G4
Q4	F2	1	G4
Q6	F4	1	G5
Q7	F4	1	G6
Q8	G2	1	G5
Q9	B2	2	B6
Q10	B4	2	B7
Q11	F2	2	G6
Q12	F4	2	G8
Q13	F4	2	G8
Q14	F2	2	G7
Q17	F3	5	K5
Q18	G3	5	K5
Q40	F4	7	L7
Q41	A2	1	B5
Q42	A4	1	B6
Q43	A2	2	B7
Q44	B4	2	B8
R1	A2	1	A5
R2	A4	1	A6
R3	B2	1	A5
R4	B4	1	A6
R5	A4	1	A6
R6	A2	1	A5
R7	B2	1	D5
R8	B2	1	D5
R9	B2	1	D5
R10	B4	1	D5
R11	B5	1	D5
R12	B4	1	D6
R13	B1	1	B4
R14	B3	1	B5
R15	B1	1	B4
R16	C1	1	B4
R17	C3	1	B5
R18	C1	1	B4
R19	C1	1	B4
R20	C3	1	B5
R21	C4	1	B5
R22	D3	1	D5
R23	D3	1	E6
R24	D4	1	C5
R25	D1	1	C4
R26	D1	1	D4
R27	D1	1	E6
R28	D1	1	D4
R30	F2	1	H5
R31	F4	1	G6
R32	C2	1	F4
R33	D2	1	F5
R34	D2	1	E5
R35	C5	1	F5
R36	D5	1	F6
R37	D2	1	E5
R38	D5	1	F6
R39	D5	1	F6
R40	F3	1	H5
R41	F5	1	H6
R42	F2	1	H4
R44	E2	1	F4
R45	E5	1	F5
R46	E2	1	F4
R47	F2	1	F4
R48	F5	1	F5
R49	E5	1	F5
R50	H4	1	I6
R51	H3	1	H6
R52	H4	1	H6
R54	G5	1	H6
R55	G2	1	H5
R56	F2	1	H4
R57	B3	1	B5
R58	B1	1	B5
R59	B1	1	C5
R60	B1	1	C5
R61	B3	1	C6
R62	B3	1	B6
R63	B3	1	C6
R64	A4	2	A7
R65	A2	2	A7
R66	B2	2	D6
R67	B2	2	D6
R68	B2	2	D7
R69	B4	2	D7
R70	B5	2	D7
R71	B5	2	D7
R72	A2	2	A7
R73	A4	2	A7
R74	B2	2	A7
R75	B4	2	A7
R76	B1	2	B6
R77	B4	2	B7
R78	B1	2	B6
R79	B3	2	B7
R80	C3	2	B7
R81	C1	2	B6
R82	C1	2	B6
R83	C1	2	B6
R84	C3	2	B7
R85	C4	2	B7
R86	C1	2	D6
R87	D1	2	E6
R88	C1	2	C6
R89	C3	2	D7
R90	C3	2	E6
R91	C4	2	C7
R92	C2	2	F7
R93	C5	2	F8
R94	D5	2	F9
R95	D2	2	F7
R96	D2	2	F7
R97	D5	2	F8
R98	D2	2	F7
R99	D5	2	F8
R100	F2	2	H7
R101	F5	2	H8
R102	F4	2	G8
R103	F2	2	H7
R105	E2	2	G6
R106	E5	2	F8
R107	E5	2	F8
R108	E5	2	G8
R109	E2	2	F6
R110	E2	2	G6
R111	H3	2	H8
R112	H4	2	H8
R113	H3	2	H8
R114	F5	2	G8
R115	F2	2	H7
R119	A1	2	C7
R120	A1	2	C7
R121	A1	2	B7
R122	A3	2	C8
R123	A3	2	C7
R124	A3	2	B8
R125	A4	3	K5
R126	C1	3	N4
R127	B4	3	L5
R128	B3	3	L5
R129	G1	4	G2
R130	A5	4	K2
R131	B1	5	H4
R132	F3	5	J5
R133	F3	5	J5
R134	F4	5	K5
R135	G4	5	J5
R136	G4	5	K6
R137	G3	5	N6
R138	F2	5	E7
R139	F2	5	E7
R140	F2	5	F6
R141	F1	5	E7
R142	F1	5	E7
R143	G1	5	E7
R144	G1	5	E7
R145	E1	5	E6
R146	E2	5	F7
R148	E3	5	K5
R149	F4	5	J5
R150	G3	5	K5
R160	F2	6	A8
R163	D4	6	G3
R170	D4	6	G3
R183	B3	7	J5
R184	D3	7	N6
R185	G4	5	M7
R186	C1	6	C8
R187	B1	6	C8
R188	E2	6	B8
R189	E2	6	B8
R190	E1	6	D8
R191	F1	6	A8
R192	G1	6	B8
R193	F1	6	B8
R194	D2	6	D8
R195	F1	6	B8
R196	B4	7	J6
R197	D4	7	K7
R198	F4	7	M7
R199	D1	6	C8
R200	A4	1	B6
R201	A2	1	B5
R202	C3	1	D5
R203	C1	1	D4
R204	C4	2	D7
R205	C1	2	D6
R206	2	A2	B7
R207	2	A4	B8
TP1	7	E5	A4
TP2	7	F5	A8
TP3	7	F5	D8
TP4	7	F5	E4
TP5	7	G5	E1
TP6	7	G5	J1
TP7	7	G5	I5
TP8	7	G5	J8
TP9	7	H5	M7
TP10	7	H5	O4
TP11	7	H5	N1
U1	1	C1	C4
U2	1	C4	C6
U3	1	D1	F5
U4	1	D4	F6
U5A	1	G2	H5
U5B	1	H2	H5
U5C	1	G4	H5
U5D	1	G5	H5
U6A	1	G3	H5
U6B	1	G4	H5
U6C	2	G3	H5
U6D	2	G4	H5
U7A	1	H3	H6
U7B	1	H4	H6
U8	2	B4	C7
U9	2	D4	F8
U10	2	B1	C6
U11	2	D1	F7
U12	6	D3	F4
U15A	2	G2	H7
U15B	2	G2	H7
U15C	2	G4	H7
U15D	2	G4	H7
U16A	2	G3	H8
U16B	2	G4	H8
U17	3	B4	K5
U18	3	F2	L6
U19	3	B1	N2
U20	3	G3	K3
U21	3	D1	J4
U22	3	G3	M2
U23	3	C2	L5
U24	3	G4	L4
U25	3	G5	L3
U26 *	3	F3	N3
U27	3	F5	N4
U28	3	D3	J4
U29	4	C4	K2
U30	4	G1	F3
U31	4	F1	E2
U32	4	E2	I3
U33	4	B3	H3
U34	4	C2	I2
U35	4	E3	H4
U36	4	B4	I2
U37	4	B2	G2
U38	4	E4	J2
U39A	4	A5	I4
U39B	4	B2	I4
U39C	4	E3	I4
U39D	4	E3	I4
U40	5	C4	K8
U41	5	D1	D6
U42A	5	B1	H4
U42B	5	B2	H4
U43A	5	F3	J5
U43B	5	E3	J5
U43C	5	F3	J5
U43D	5	F3	J5
U44A	5	F5	I5
U44B	5	F5	I5
U47	7	F1	N6
U48	7	F2	L2
U50	7	E3	N5
U52	7	E1	N2
U53	7	E2	M2
U54	7	C2	I4
U55A	1	B3	H8
U55B	1	B5	H8
U55C	2	B3	H8
U55D	2	B5	H8
U56A	1	B3	G8
U56B	1	B5	G8
U56C	2	B3	G8
U56D	2	B5	G8
U57	6	E3	E8
U58	4	G5	H6
U59	5	E4	N7
U60	6	D1	C8
U61	7	F3	N7
U62	7	E4	L7
U63A	6	E4	F3
U63B	6	E5	F3
U63C	6	E5	F3
U63D	6	E4	F3
U64	6	F3	C5
VR2	1	F4	H6
VR3	1	F4	H6
VR4	1	G2	H5
VR5	2	F2	H7
VR6	2	F5	H8
VR7	2	F4	G8
VR8	2	F2	H7
Y1	5	E5	L8

* See parts list for serial number ranges.

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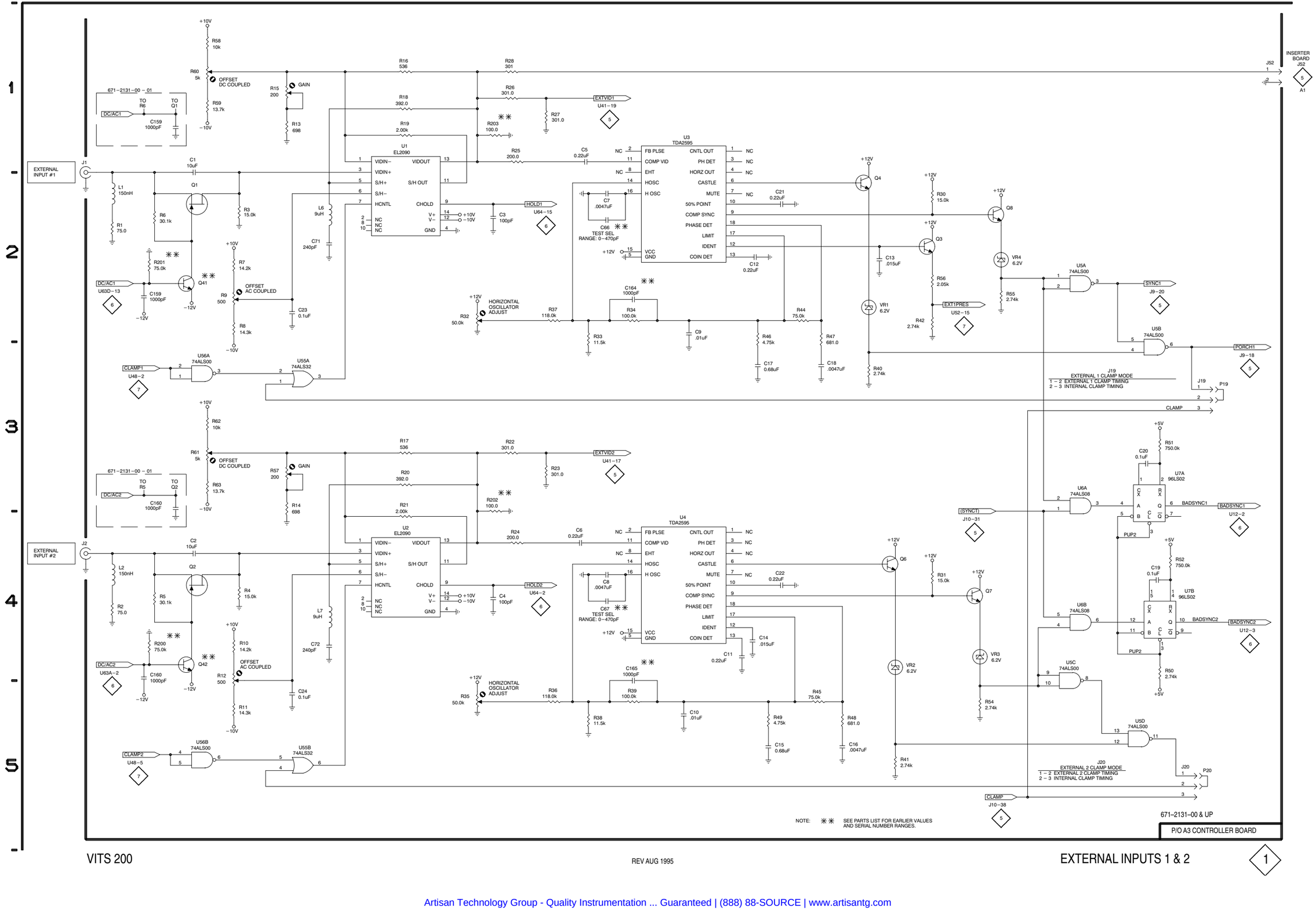


671-2131-00 – 01

Static Sensitive Devices
See Maintenance Section

A3 Controller Board
VITS 200

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VITS 200

REV AUG 1995

EXTERNAL INPUTS 1 & 2

1

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Schematic Diagram <2> A3 Component Locator Chart

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A3. *(Partial Assembly A3 also shown on schematic 1 and 3 thru 7.*

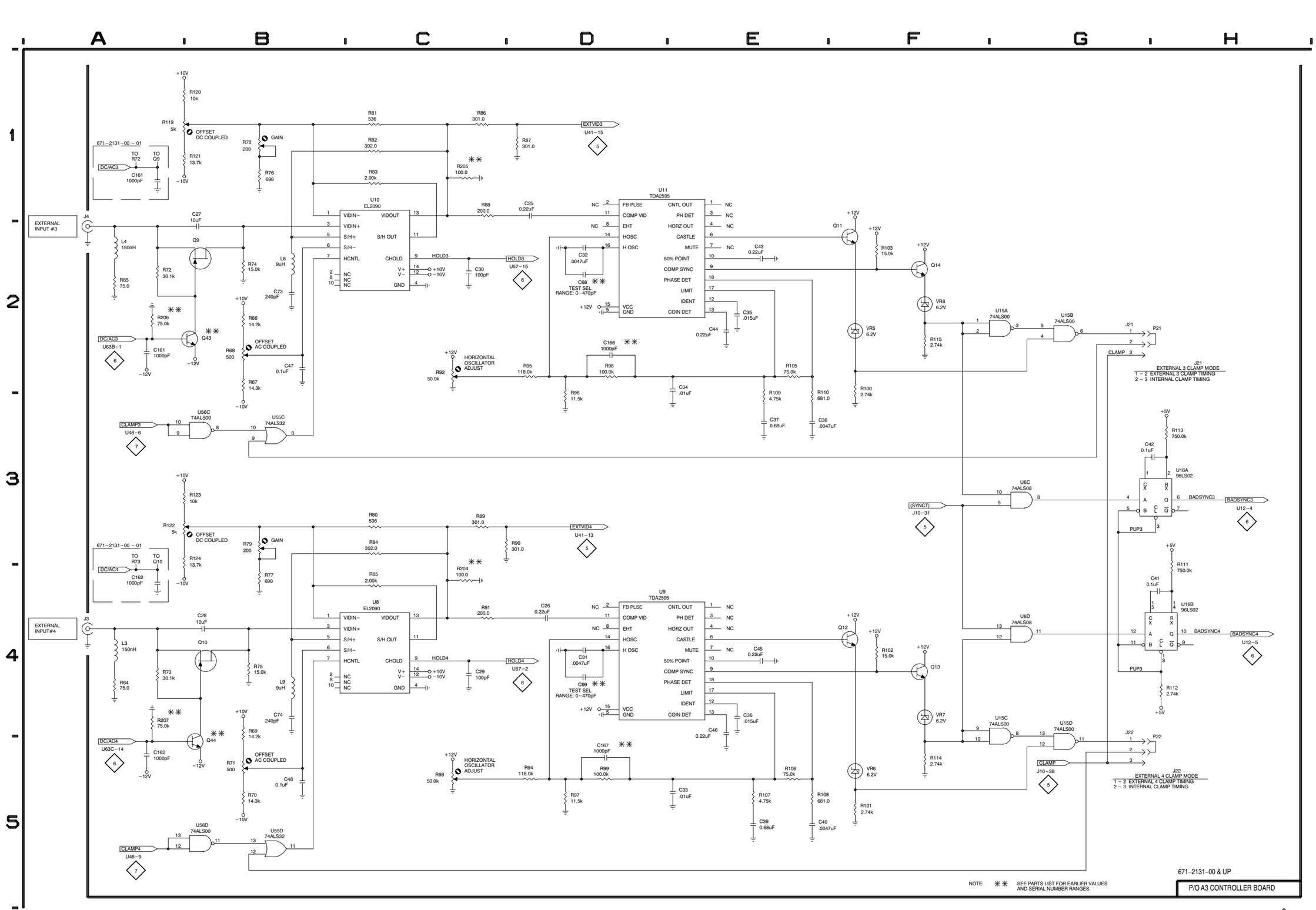
Comp No	Diag Loc	Bd Loc
C25	D1	D6
C26	D4	D7
C27	B2	A6
C28	B4	A7
C29	C4	D7
C30	C2	D6
C31	D4	F8
C32	D2	F7
C33	E5	F8
C34	E2	F6
C35	E2	G6
C36	E4	G8
C37	E3	G6
C38	E3	G6
C39	E5	F8
C40	E5	G8
C41	H4	H8
C42	H3	H8
C43	E2	G6
C44	E2	G6
C45	E4	G7
C46	E4	G7
C47	B2	D6
C48	B5	D7
C68	D2	
C69	D4	
C73	B2	C7
C74	B4	C7
C161	A2	B7
C162	A5	B8
C166	D2	F7
C167	D5	F8
J3	A4	A7
J4	A1	A6

Comp No	Diag Loc	Bd Loc
J21	G2	G6
J22	G5	H7
L3	A4	A7
L4	A2	A6
L8	B2	C6
L9	B4	C7
P21	G2	
P22	G5	
Q9	B2	B6
Q10	B4	B7
Q11	F2	G6
Q12	F4	G8
Q13	F4	G8
Q14	F2	G7
Q43	A2	B7
Q44	B4	B8
R64	A4	A7
R65	A2	A7
R66	B2	D6
R67	B2	D6
R68	B2	D7
R69	B4	D7
R70	B5	D7
R71	B5	D7
R72	A2	A7
R73	A4	A7
R74	B2	A7
R75	B4	A7
R76	B1	B6
R77	B4	B7
R78	B1	B6
R79	B3	B7

Comp No	Diag Loc	Bd Loc
R80	C3	B7
R81	C1	B6
R82	C1	B6
R83	C1	B6
R84	C3	B7
R85	C4	B7
R86	C1	D6
R87	D1	E6
R88	C1	C6
R89	C3	D7
R90	C3	E6
R91	C4	C7
R92	C2	F7
R93	C5	F8
R94	D5	F8
R95	D2	F7
R96	D2	F7
R97	D5	F8
R98	D2	F7
R99	D5	F8
R100	F2	H7
R101	F5	H8
R102	F4	G8
R103	F2	H7
R105	E2	G6
R106	E5	F8
R107	E5	F8
R108	E5	G8
R109	E2	F6
R110	E2	G6
R111	H3	H8
R112	H4	H8
R113	H3	H8

Comp No	Diag Loc	Bd Loc
R114	F5	G8
R115	F2	H7
R119	A1	C7
R120	A1	C7
R121	A1	B7
R122	A3	C8
R123	A3	C7
R124	A3	B8
R204	C4	D7
R205	C1	D6
R206	A2	B7
R207	A4	B8
U6C	G3	H5
U6D	G4	H5
U8	B4	C7
U9	D4	F8
U10	B1	C6
U11	D1	F7
U15A	G2	H7
U15B	G2	H7
U15C	G4	H7
U15D	G4	H7
U16A	G3	H8
U16B	G4	H8
U55C	B3	H8
U55D	B5	H8
U56C	B3	G8
U56D	B5	G8
VR5	F2	H7
VR6	F5	H8
VR7	F4	G8
VR8	F2	H7

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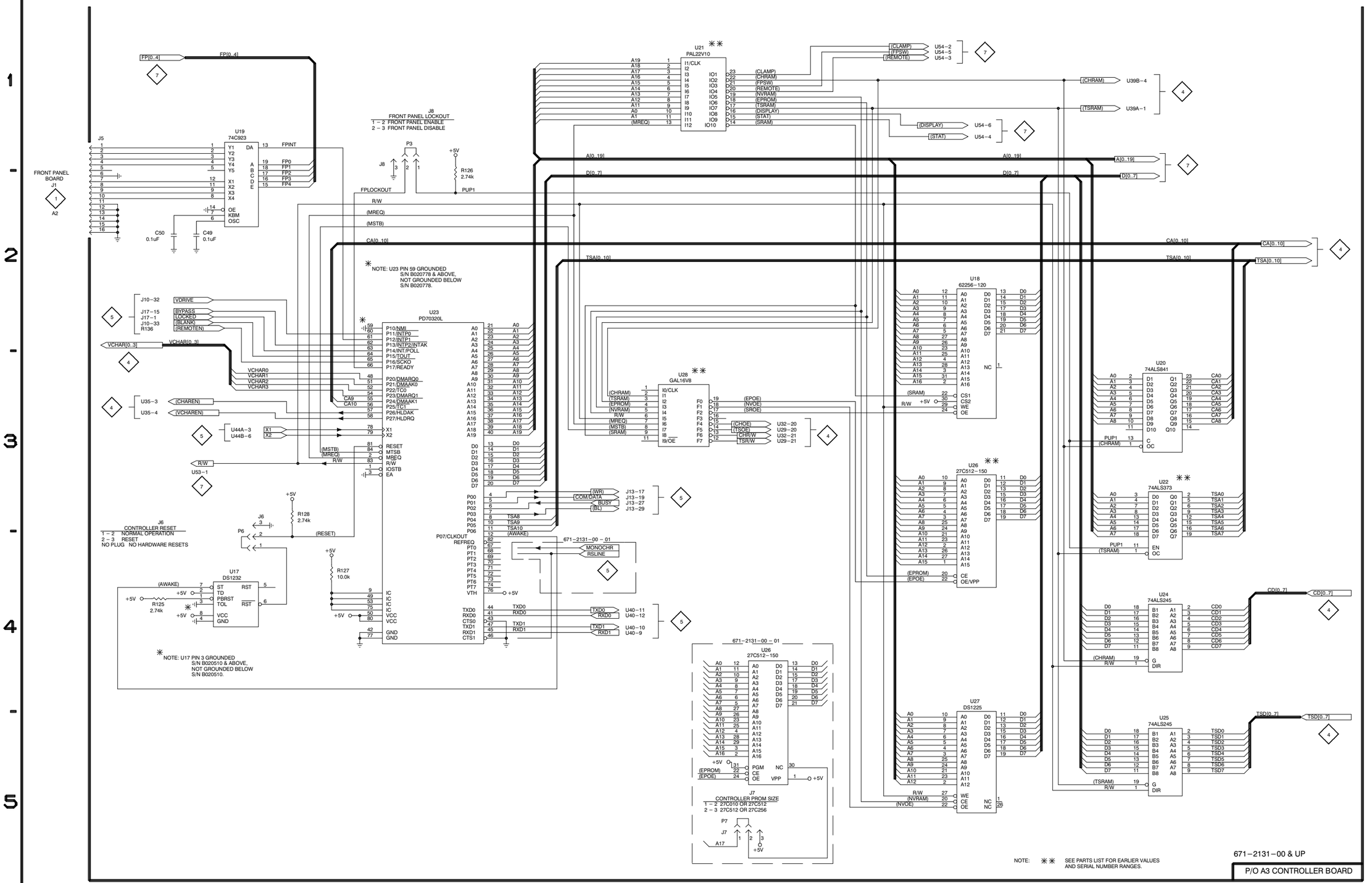
Schematic Diagram <3> Component Locator Chart

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A3. *(Partial Assembly A3 also shown on schematic 1, 2, and 4 thru 7).*

Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc
C49	B2	N2	P3	C1		U17	B4	K5	U23	C2	L5
C50	A2	O2	P6	B4		U18	F2	L6	U24	G4	L4
						U19	B1	N2	U25	G5	L3
J5	A1	O1	R125	A4	K5	U20	G3	K3	U26	F3	N3
J6	B3	K6	R126	C1	N4	U21	D1	J4	U27	F5	N4
J8	C1	M4	R127	B4	L5	U22	G3	M2	U28	D3	J4
			R128	B3	L5						

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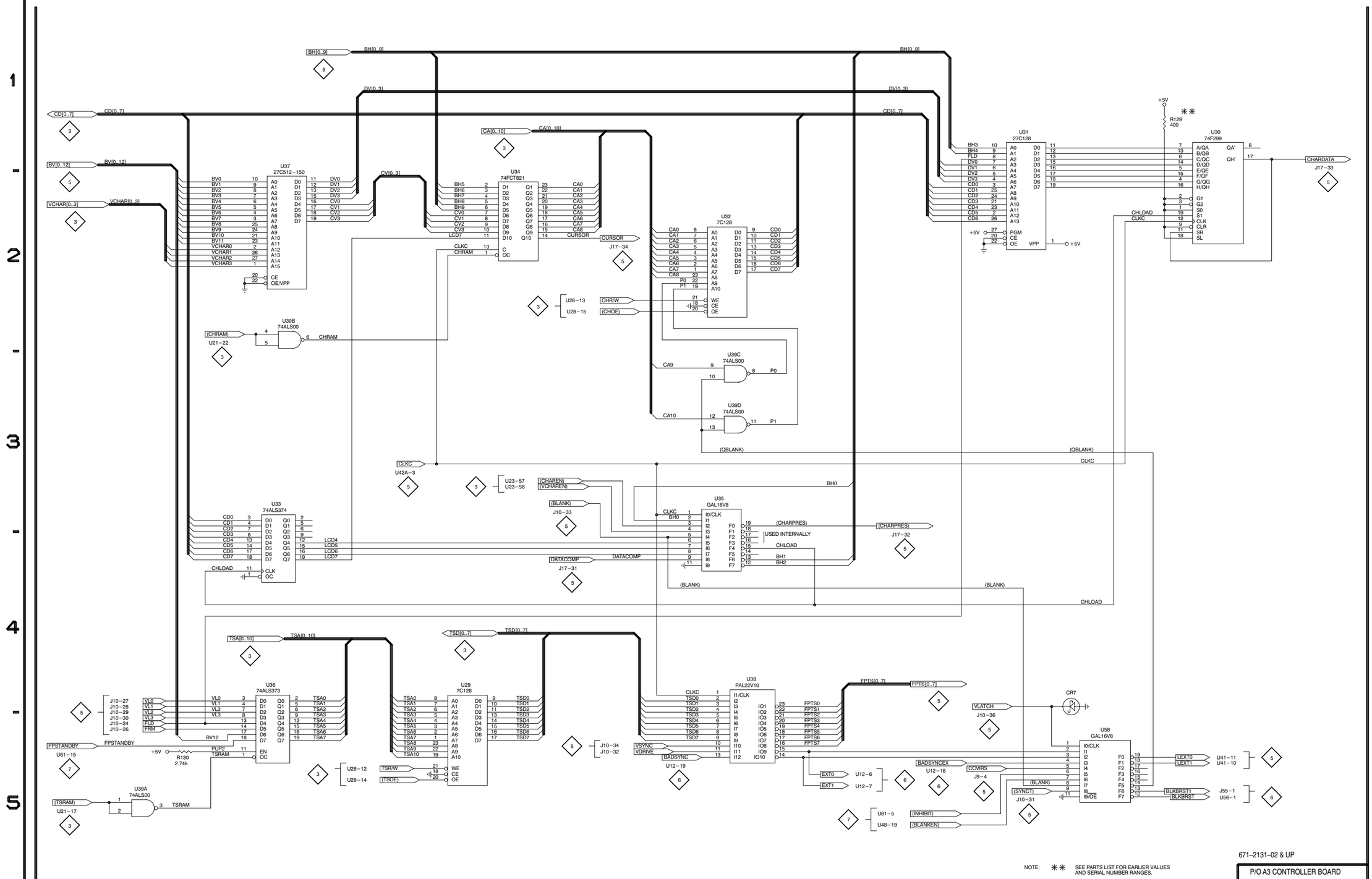
Schematic Diagram <4> Component Locator Chart
671-2131-02 & UP

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A3. *(Partial Assembly A3 also shown on schematic 1, 2, 3, and 5 thru 7).*

Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc
CR7	G4	I7	U30	G1	F3	U35	E3	H4	U39B	B2	I4
			U31	F1	E2	U36	B4	I2	U39C	E3	I4
R129	G1	G2	U32	E2	I3	U37	B2	G2	U39D	E3	I4
R130	A5	K2	U33	B3	H3	U38	E4	J2	U58	G5	H6
			U34	C2	I2	U39A	A5	I4			
U29	C4	K2									

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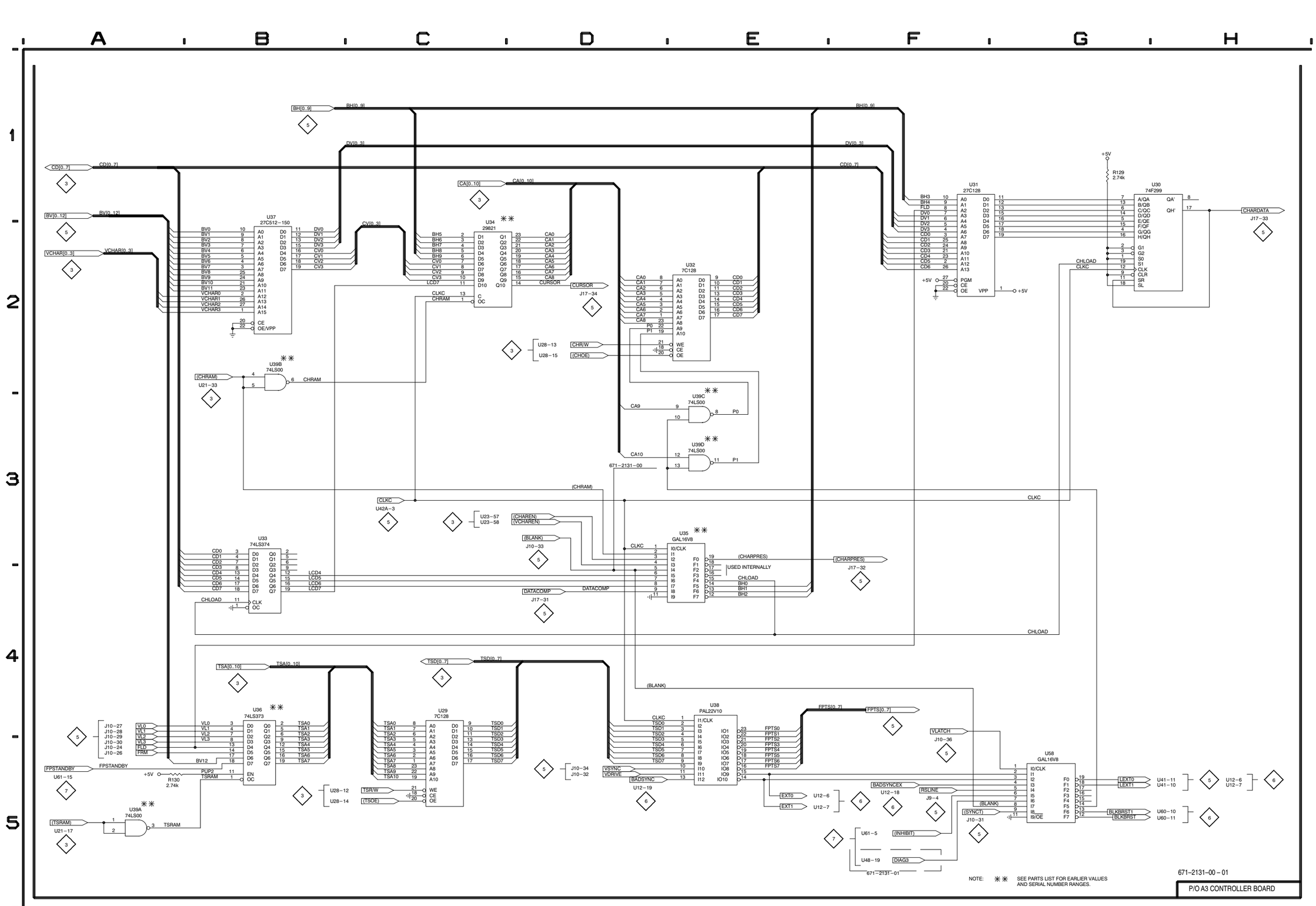
Schematic Diagram <4> Component Locator Chart
671-2131-00 – 01

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A3. *(Partial Assembly A3 also shown on schematic 1, 2, 3, 4, and 6 thru 7).*

Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc
CR7	G4	I7	U30	G1	F3	U35	E3	H4	U39B	B2	I4
			U31	F1	E2	U36	B4	I2	U39C	E3	I4
R129	G1	G2	U32	E2	I3	U37	B2	G2	U39D	E3	I4
R130	A5	K2	U33	B3	H3	U38	E4	J2	U58	G5	H6
			U34	C2	I2	U39A	A5	I4			
U29	C4	K2									

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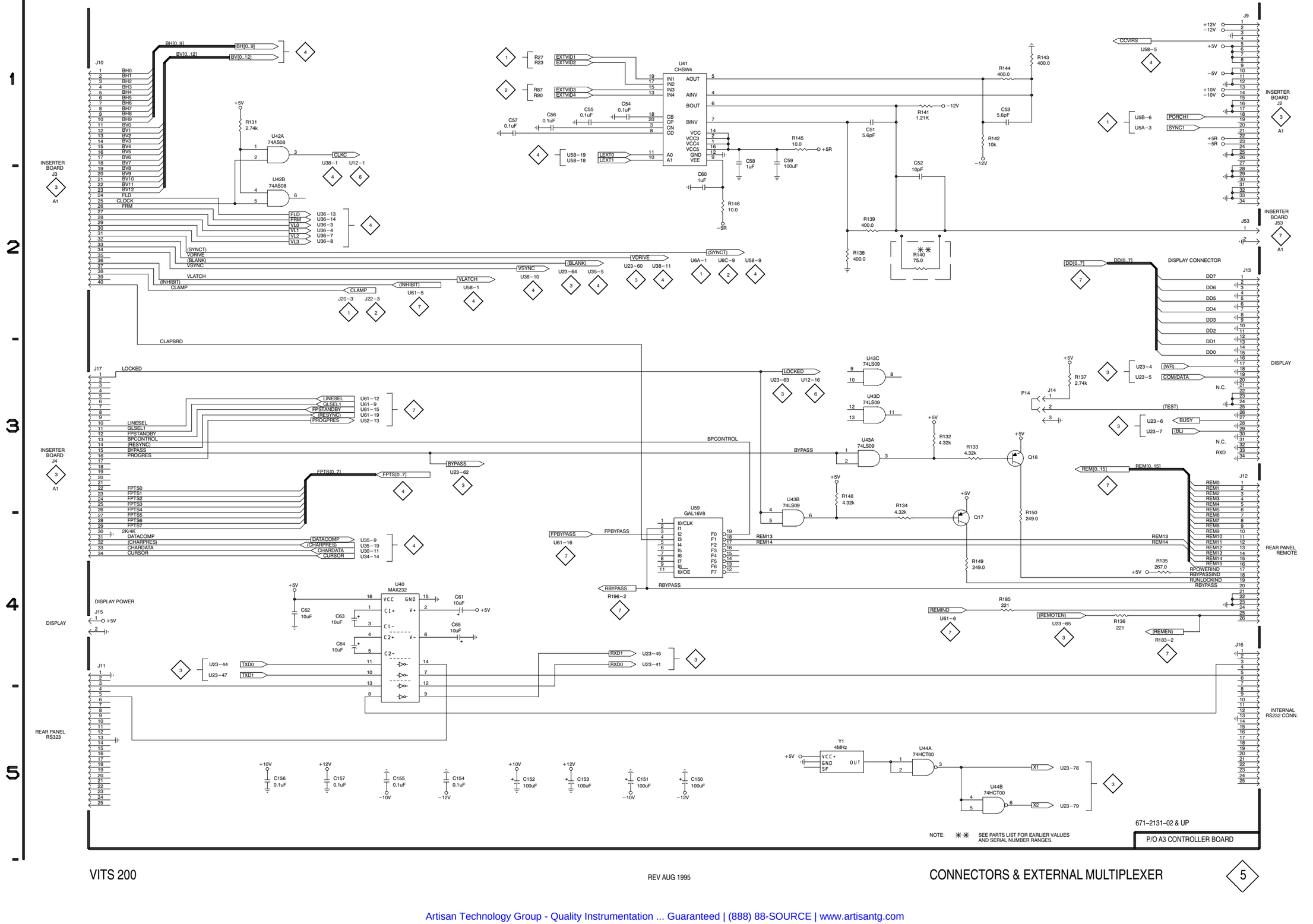
Schematic Diagram <5> Component Locator Chart
671-2131-02 & UP

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A3. *(Partial Assembly A3 also shown on schematic 1 thru 4 and 6, 7).*

Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc
C51	F1	E7	C153	D5	E3	Q17	F3	K5	R148	E3	K5
C52	F2	F6	C154	C5	E8	Q18	G3	K5	R149	F4	J5
C53	G1	E7	C155	C5	E2				R150	G3	K5
C54	D1	E6	C156	B5	D2	R131	B1	H4	R185	G4	M7
C55	D1	D6	C157	B5	H5	R132	F3	J5			
C56	D1	D7				R133	F3	J5	U40	C4	K8
C57	D1	E7	J9	H1	F1	R134	F4	K5	U41	D1	D6
C58	E1	D7	J10	A1	I1	R135	G4	J5	U42A	B1	H4
C59	E1	E6	J11	A4	J8	R136	G4	K6	U42B	B2	H4
C60	E2	E7	J12	H3	J6	R137	G3	N6	U43A	F3	J5
			J13	H2	O7	R138	F2	E7	U43B	E3	J5
C61	C4	K8	J14	G3	O6				U43C	F3	J5
C62	B4	L8	J15	A4	O8	R139	F2	E7	U43D	F3	J5
C63	C4	K8	J16	H4	K8	R141	F1	E7	U44A	F5	I5
C64	C4	K8	J17	A3	L1	R142	F1	E7	U44B	F5	I5
C65	C4	L8	J53	H2	E5	R143	G1	E7	U59	E4	N7
C150	E5	E3				R144	G1	E7			
C151	D5	D2	P14	G3		R145	E1	E6	Y1	E5	L8
C152	D5	D2				R146	E2	F7			

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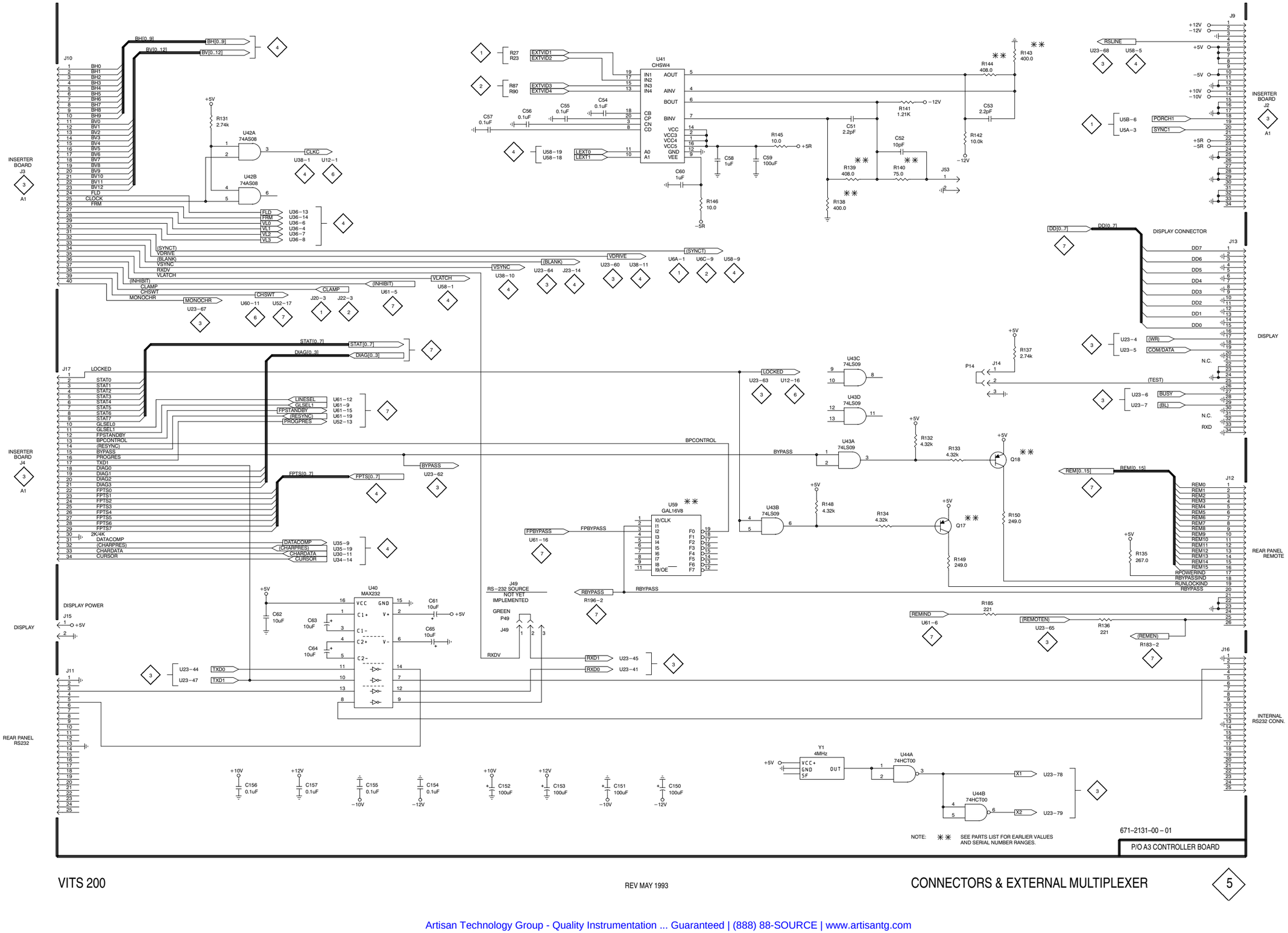
Schematic Diagram <5> Component Locator Chart
671-2131-00 – 01

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A3. *(Partial Assembly A3 also shown on schematic 1 thru 6 and 8 thru 9).*

Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc
C51	F1	E7	C154	C5	E8	Q18	G3	K5	R149	F4	J5
C52	F1	F6	C155	C5	E2				R150	G3	K5
C53	G1	E7	C156	B5	D2	R131	B1	H4	R185	G4	M7
C54	D1	E6	C157	B5	H5	R132	F3	J5			
C55	D1	D6				R133	F3	J5	U40	C4	K8
C56	D1	D7	J9	H1	F1	R134	F4	K5	U41	D1	D6
C57	D1	E7	J10	A1	I1	R135	G4	J5	U42A	B1	H4
C58	E1	D7	J11	A4	J8	R136	G4	K6	U42B	B2	H4
C59	E1	E6	J12	H3	J6	R137	G3	N6	U43A	F3	J5
C60	E2	E7	J13	H2	O7	R138	F2	E7	U43B	E3	J5
C61	C4	K8	J14	G3	O6	R139	F2	E7	U43C	F3	J5
			J15	A4	O8	R140	F2	F6	U43D	F3	J5
C62	B4	L8	J16	H4	K8	R141	F1	E7	U44A	F5	I5
C63	C4	K8	J17	A3	L1	R142	F1	E7	U44B	F5	I5
C64	C4	K8	J53	F2	E5	R143	G1	E7			
C65	C4	L8				R144	G1	E7	U59	E4	N7
C150	E5	E3	P14	F3	O6	R145	E1	E6			
C151	D5	D2				R146	E2	F7	Y1	E5	L8
C152	D5	D2	Q17	F3	K5	R148	E3	K5			
C153	D5	E3									

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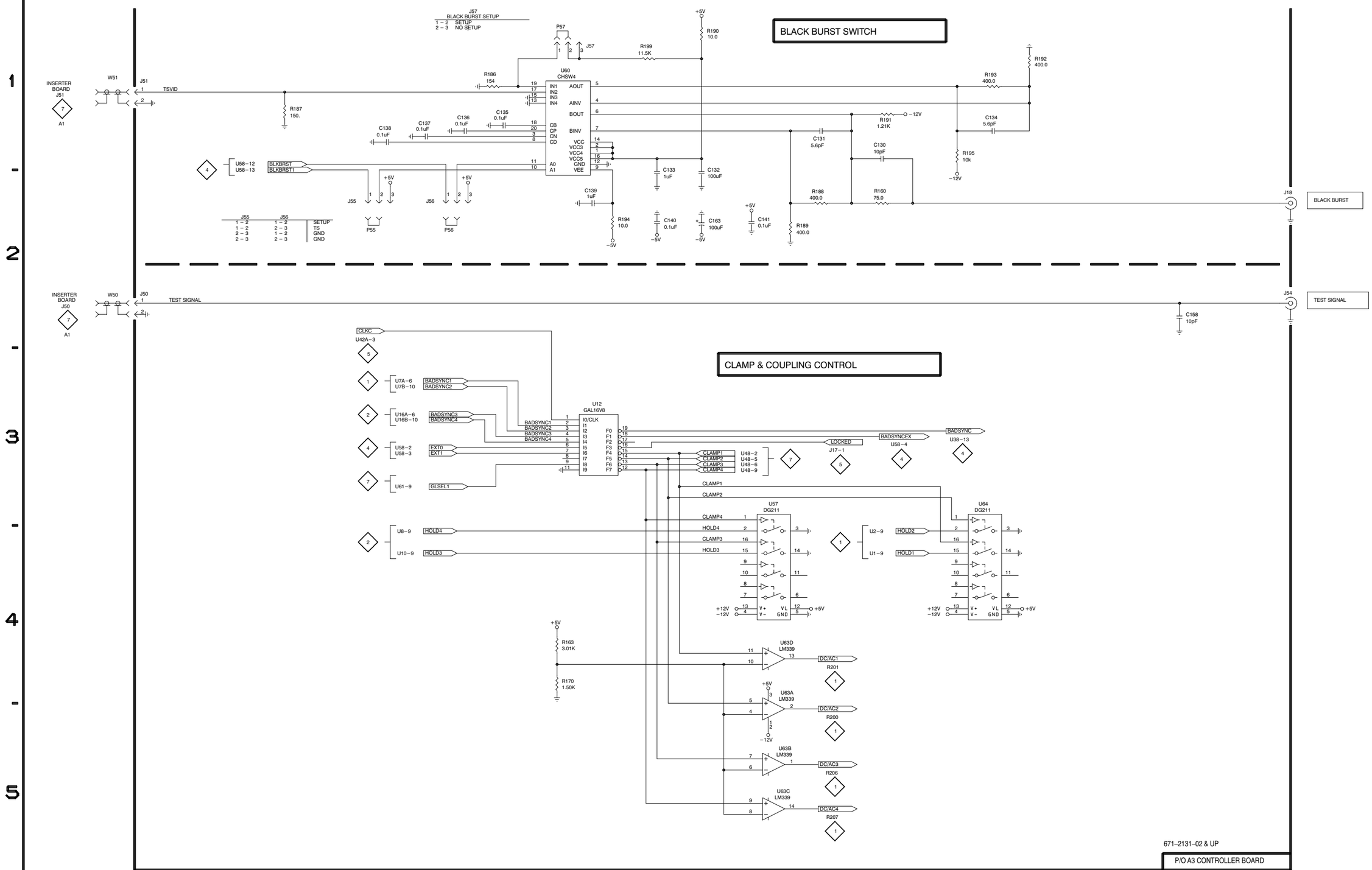
Schematic Diagram <6> Component Locator Chart
671-2131-02 and UP

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A3. *(Partial Assembly A3 also shown on schematic 1 thru 5 and 7).*

Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc
C130	F1	A8	C163	E2	E8				R195	F1	B8
C131	E1	B8				R160	F2	A8	R199	D1	C8
C132	E2	D8	J18	H2	A8	R163	D4	G3			
C133	D2	B8	J50	A2	A4	R170	D4	G3	U12	D3	F4
C134	F1	B8	J51	A1	C8	R186	C1	C8	U57	E3	E8
C135	C1	C8	J54	H2	A4	R187	B1	C8	U60	D1	C8
C136	C1	C8	J55	C2	E8	R188	E2	B8	U63A	E4	F3
C137	C1	C8	J56	C2	E8	R189	E2	B8	U63B	E5	F3
C138	C1	C8	J57	D1	B8	R190	E1	D8	U63C	E5	F3
C139	D2	D8				R191	F1	A8	U63D	E4	F3
C140	D2	D8	P55	C2		R192	G1	B8	U64	F3	C5
C141	E2	D7	P56	C2		R193	F1	B8			
C158	G2	A4	P57	D1		R194	D2	D8			

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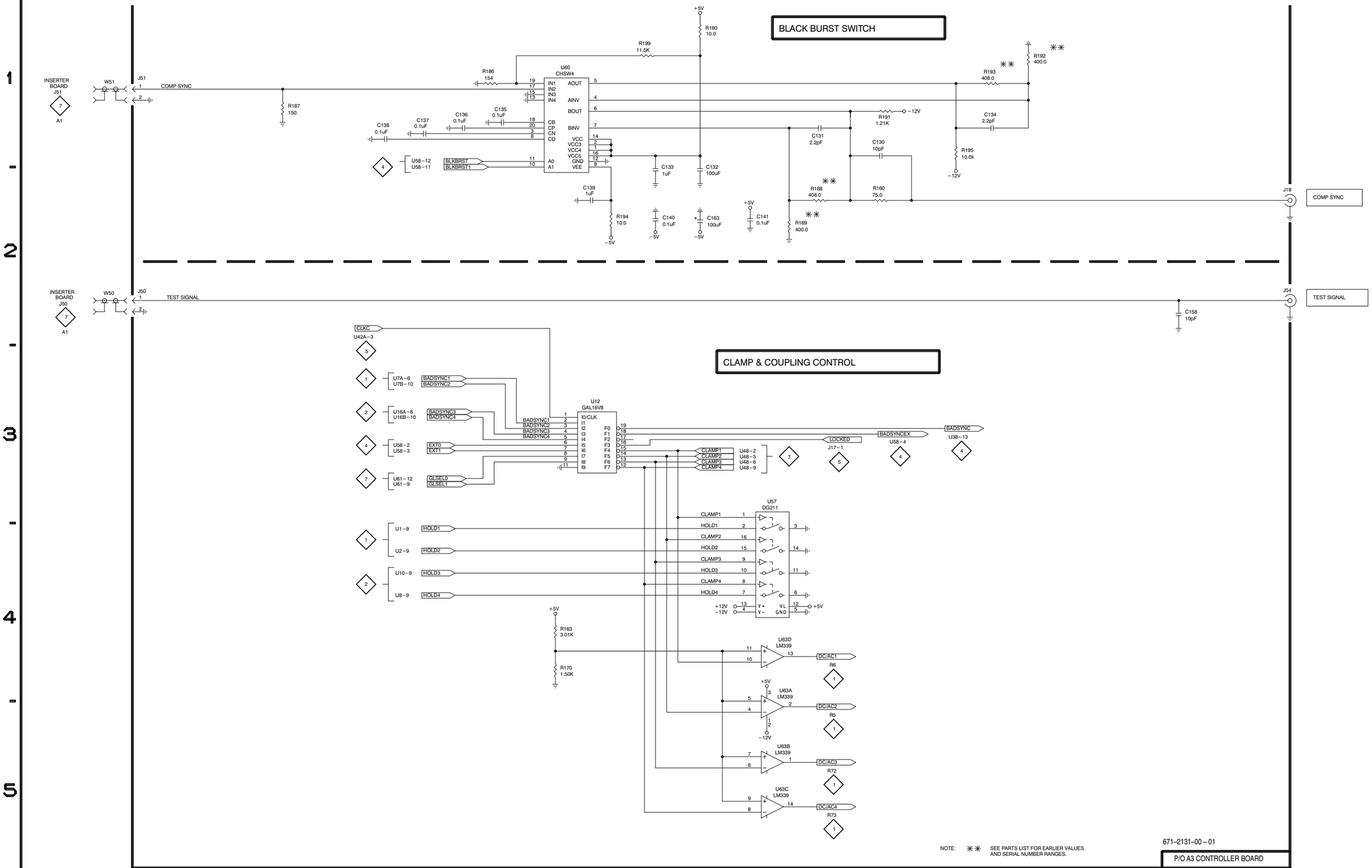
Schematic Diagram <6> Component Locator Chart
671-2131-00 – 01

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A3. *(Partial Assembly A3 also shown on schematic 1 thru 5 and 7).*

Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc
C130	F1	A8	C163	E2	E8				R194	D2	D8
C131	E1	B8				R160	F2	A8	R195	F1	B8
C132	E2	D8	J18	H2	A8	R163	D4	G3	R199	D1	C8
C133	D2	B8	J50	A2	A4	R170	D4	G3			
C134	F1	B8	J51	A1	C8	R186	C1	C8	U12	D3	F4
C135	C1	C8	J54	H2	A4	R187	B1	C8	U57	E3	E8
C136	C1	C8	J55	C2	E8	R188	E2	B8	U60	D1	C8
C137	C1	C8	J56	C2	E8	R189	E2	B8	U63A	E4	F3
C138	C1	C8	J57	D1	B8	R190	E1	D8	U63B	E5	F3
C139	D2	D8				R191	F1	A8	U63C	E5	F3
C140	D2	D8	P55	C2	E8	R192	G1	B8	U63D	E4	F3
C141	E2	D7	P56	C2	E8	R193	F1	B8	U64	F3	C5
C158	G2	A4	P57	D1	B8						

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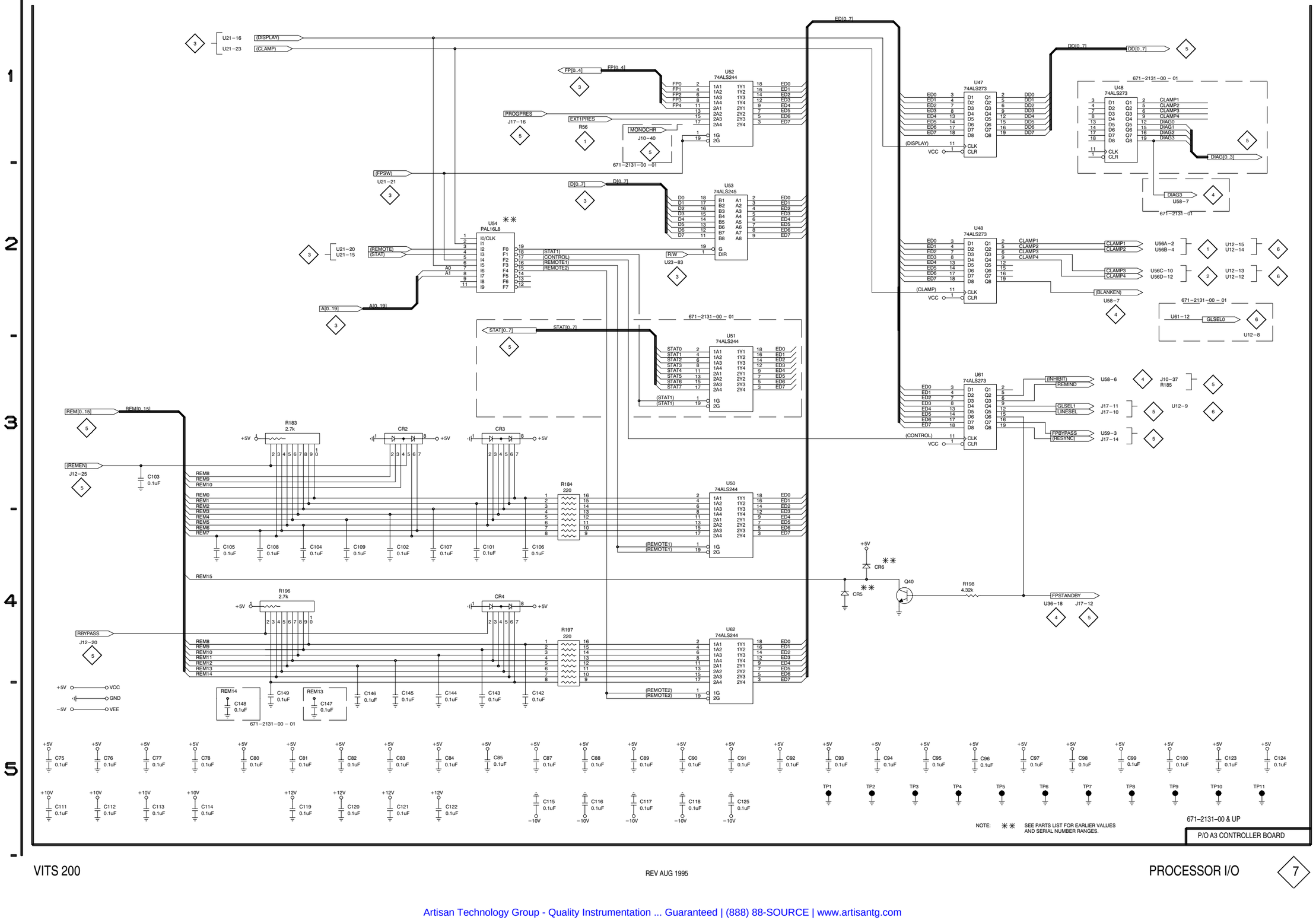
Schematic Diagram <7> Component Locator Chart

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A3. *(Partial Assembly A3 also shown on schematic 1 thru 6).*

Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc
C75	A5	N2	C99	G5	F2	C122	C5	G4	R198	F4	M7
C76	A5	M2	C100	H5	E2	C123	H5	L4			
C77	A5	M2	C101	C4	K6	C124	H5	N6	TP1	E5	A4
C78	B5	K2	C102	C4	K6	C125	E5	D5	TP2	F5	A8
C80	B5	L3	C103	A3	K6	C142	D5	K6	TP3	F5	D8
C81	B5	L3	C104	B4	K6	C143	C5	K6	TP4	F5	E4
C82	B5	N3	C105	B4	K6	C144	C5	L7	TP5	G5	E1
C83	C5	N4	C106	D4	K6	C145	C5	L7	TP6	G5	J1
C84	C5	M5	C107	C4	K6	C146	C5	L7	TP7	G5	I5
C85	C5	L5				C149	B5	L7	TP8	G5	J8
			C108	B4	K6				TP9	H5	M7
C87	D5	J3	C109	B4	K6	CR2	C3	J5	TP10	H5	O4
C88	D5	I3	C111	A5	B4	CR3	C3	J5	TP11	H5	N1
C89	D5	I3	C112	A5	B5	CR4	C4	K7			
C90	E5	G2	C113	A5	C6	CR5	F4	L7	U47	F1	N6
C91	E5	H3	C114	B5	C7	CR6	F4	L7	U48	F2	L2
C92	E5	I4	C115	D5	C7				U50	E3	N5
C93	E5	J4	C116	D5	C6	Q40	F4	L7	U52	E1	N2
C94	F5	J5	C117	D5	D5				U53	E2	M2
C95	F5	I5	C118	E5	C4	R183	B3	J5	U54	C2	I4
C96	F5	J2	C119	B5	G8	R184	D3	N6	U61	F3	N7
C97	G5	I1	C120	B5	F7	R196	B4	J6	U62	E4	L7
C98	G5	I2	C121	C5	G5	R197	D4	K7			

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VITS 200

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Replaceable Mechanical Parts

This section contains a list of the components that are replaceable for the VITS 200. Use this list to identify and order replacement parts. There is a separate Replaceable Mechanical Parts list for each instrument.

Parts Ordering Information

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

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

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

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

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

Using the Replaceable Mechanical Parts List

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

Cross Index–Mfr. Code Number to Manufacturer

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

Abbreviations

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

Chassis Parts

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

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Column Descriptions

Figure & Index No. (Column 1)

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

Tektronix Part No. (Column 2)

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

Serial No. (Column 3 and 4)

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

Qty (Column 5)

This indicates the quantity of mechanical parts used.

Name and Description (Column 6)

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

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

1 2 3 4 5 Name & Description

Assembly and/or Component
Mounting parts for Assembly and/or Component
MOUNTING PARTS/*END MOUNTING PARTS*
    Detail Part of Assembly and/or Component
    Mounting parts for Detail Part
    MOUNTING PARTS/*END MOUNTING PARTS*
        Parts of Detail Part
        Mounting parts for Parts of Detail Part
        MOUNTING PARTS/*END MOUNTING PARTS*

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

Mfr. Code (Column 7)

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

Mfr. Part Number (Column 8)

Indicates actual manufacturer's part number.

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Cross Index – Mfr. Code Number To Manufacturer

Mfr. Code	Manufacturer	Address	City, State, Zip Code
TK0435	LEWIS SCREW CO	4300 S RACINE AVE	CHICAGO IL 60609–3320
TK0941	BEARINGS INC (DIST)	2720 NW 29TH PO BOX 3005	PORTLAND OR 97210–1702
TK1465	BEAVERTON PARTS MFG CO	1800 NW 216TH AVE	HILLSBORO OR 97124–6629
TK1947	NORTHWEST ETCH TECHNOLOGY	2601 S HOOD ST PO BOX 110610	TACOMA, WA 98411–0610
TK2402	PANEL VIEW	2900 sw 219th SUITE 761	HILLSBORO, OR 97123
TK2548	XEROX BUSINESS SERVICES DIV OF XEROX CORPORATION	14181 SW MILLIKAN WAY	BEAVERTON OR 97077
0J4C1	TVT DIECASTING AND MFG INC	7330 SW LANDMARK LANE	PORTLAND OR 97223
0J9P4	DELTA ENGINEERING	19500 SW TETON	TUALATIN OR 97062
0KBZ5	MORELLIS Q & D PLASTICS	1812 16TH AVE	FOREST GROVE OR 97116
0KB01	STAUFFER SUPPLY	810 SE SHERMAN	PORTLAND OR 97214
06666	GENERAL DEVICES CO INC	1410 S POST RD PO BOX 39100	INDIANAPOLIS IN 46239–9632
09422	PLASTIC STAMPING CORP	2216 W ARMITAGE AVE	CHICAGO IL 60647–4461
2W944	PAPST MECHATRONIC CORP	AQUIDNECK INDUSTRIAL PK	NEWPORT RI 02840
4T165	NEC ELECTRONICS USA INC ELECTRON DIV	475 ELLIS ST PO BOX 7241	MOUNTAIN VIEW CA 94039
73743	FISCHER SPECIAL MFG CO	111 INDUSTRIAL RD	COLD SPRING KY 41076–9749
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON OR 97077–0001
80126	PACIFIC ELECTRICORD CO	747 W REDONDO BEACH PO BOX 10	GARDENA CA 90247–4203

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Replaceable Mechanical Parts

Fig. & Index No.	Tektronix Part No.	Serial Number Effective	Dscont	Qty	Name & Description	Mfr. Code	Mfr. Part No.
1–1	200–3972–00			1	COVER,TOP:ALUMINUM *MOUNTING PARTS*	0J9P4	200–3972–00
–2	211–0538–00			12	SCREW,MACHINE:6–32 X 0.312,FLH,100 DEG,STL *END MOUNTING PARTS*	TK0435	ORDER BY DESC
–3	367–0437–03			1	HANDLE:ALUMINUM *MOUNTING PARTS*	0J4C1	367–0437–03
–4	211–0538–00			2	SCREW,MACHINE:6–32 X 0.312,FLH,100 DEG,STL *END MOUNTING PARTS*	TK0435	ORDER BY DESC
–5	367–0437–01			1	HANDLE:ALUMINUM *MOUNTING PARTS*	0J4C1	367–0437–01
–6	211–0538–00			2	SCREW,MACHINE:6–32 X 0.312,FLH,100 DEG,STL *END MOUNTING PARTS*	TK0435	ORDER BY DESC
–7	213–0940–00			1	THUMBSCREW:10–32 X 1.15,0.375 OD,SST	80009	213094000
–8	210–0894–00			1	WASHER,FLAT:0.19 ID X 0.438 OD X 0.031 POLTHN	09422	ORDER BY DESC
–9	354–0025–00			1	RING,RETAINING:EXTERNAL,U/O 0.187 DIA SFT	TK0941	555–18MI
–10	426–2434–01			1	FRAME,FRONT:ALUMINUM *MOUNTING PARTS*	80009	426243401
–11	211–0541–00			3	SCREW,MACHINE:6–32 X 0.25,FLH,100 DEG,STL *END MOUNTING PARTS*	TK0435	ORDER BY DESC
–12	————————			1	CIRCUIT BD ASSY:FRONT PANEL (SEE A2 REPL) *MOUNTING PARTS*		
–13	211–0012–00			6	SCREW,MACHINE:4–40 X 0.375,PNH,STL *END MOUNTING PARTS*	TK0435	ORDER BY DESC
–14	————————			1	DISPLAY,FLAT PL:VACUUM FLOURESCENT,2 X 40;ALPHA-NUMERIC,5 X 7 DOT MATRIX,DC/DC AC CONVERT,CHAR GEN, LOGIC & MICRO COMP (SEE A4 REPL) *MOUNTING PARTS*		
–15	211–0012–00			4	SCREW,MACHINE:4–40 X 0.375,PNH,STL *END MOUNTING PARTS*	TK0435	ORDER BY DESC
–16	378–0384–00			1	FILTER,DISPLAY:ACRYLIC,BLUE	TK2402	378–0384–00
–17	337–3845–00			1	SHIELD,ELEC:PLASTIC	0KBZ5	337–3845–00
–18	333–3956–00			1	PANEL,FRONT:VITS200	0J9P4	333–3956–00
–19	337–3846–00			1	SHIELD,ELEC:POWER SUPPLY *MOUNTING PARTS*	80009	337384600
–20	211–0244–00			3	SCR,ASSY WSHR:4–40 X 0.312,PNH,STL,CD PL,POZ,MACH *END MOUNTING PARTS*	TK0435	7772–312
–21	————————			1	CIRCUIT BD ASSY:INSERTER (SEE A1 REPL) *MOUNTING PARTS*		
–22	211–0244–00			7	SCR,ASSY WSHR:4–40 X 0.312,PNH,STL,CD PL,POZ,MACH	TK0435	7772–312
–23	220–0497–00			3	NUT,PLAIN,HEX:0.5–28 X 0.562 HEX,BRS CD PL	73743	ORDER BY DESC
–24	210–1039–00			3	WASHER,LOCK:0.521 ID,INT,0.025 THK,SST	0KB01	1224–02–00–0541
–25	211–0014–00			2	SCREW,MACHINE:4–40 X 0.5,PNH,STL	TK0435	ORDER BY DESC
–26	337–3796–00	B010100	B020790	1	SHIELD,ELEC:LINE FILTER,ALUMINUM	TK1947	337–3796–00
	337–3796–01	B020791		1	SHIELD,ELEC:0.032 BRASS,C26000,0.5 HARD *END MOUNTING PARTS*	80009	337379601
–27	131–3573–00			1	CONN,PLUG,ELEC:MALE,W/LOCKING ADAPTER	80126	B–0779
–28	337–3844–00			1	SHIELD,ELEC:POWER SUPPLY,PLASTIC	80009	337384400
–29	————————			1	CIRCUIT BD ASSY:CONTROLLER (SEE A3 REPL) *MOUNTING PARTS*		
–30	211–0244–00			9	SCR,ASSY WSHR:4–40 X 0.312,PNH,STL,CD PL,POZ,MACH	TK0435	7772–312
–31	220–0497–00			6	NUT,PLAIN,HEX:0.5–28 X 0.562 HEX,BRS CD PL	73743	ORDER BY DESC

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Fig. & Index No.	Tektronix Part No.	Serial Number Effective	Dscont	Qty	Name & Description	Mfr. Code	Mfr. Part No.
–32	210–1039–00			6	WASHER,LOCK:0.521 ID,INT,0.025 THK,SST *END MOUNTING PARTS*	0KB01	1224–02–00–0541
–33	407–4134–00			1	BRKT,FAN,MTG:SPG1000 *MOUNTING PARTS*	80009	407413400
–34	211–0538–00			2	SCREW,MACHINE:6–32 X 0.312,FLH,100 DEG,STL *END MOUNTING PARTS*	TK0435	ORDER BY DESC
–35	————————			1	FAN,TUBEAXIAL:12 VDC,2.6W,0.22A,4200 RPM,32DB, 16.6CFM,60X60MM,25MMTHICK,W/288MM LEADS & SLEEVE,W/CONNECT,FBA TYPE (SEE B100 REPL)		
–36	211–0619–00			2	SCREW,MACHINE:6–32 X 1.5,FLH,100 DEG,STL CDPL,POZ	TK0435	ORDER BY DESC
–37	210–0457–00			2	NUT,PL,ASSEM WA:6–32 X 0.312,STL CD PL *END MOUNTING PARTS*	TK0435	ORDER BY DESC
–38	351–0104–03			1	SL SECT,DWR EXT:12.625 L,W/O HARDWARE *MOUNTING PARTS*	06666	C–720–3 (WITHOU
–39	212–0004–00			8	SCREW,MACHINE:8–32 X 0.312,PNH,STL *END MOUNTING PARTS*	TK0435	ORDER BY DESC
–40	200–3973–00	B010100	B020248	1	COVER,BOTTOM:ALUMINUM,PAN	0J9P4	200–3973–00
	200–3973–01	B020249		1	COVER,BOTTOM:ALUMINUM,PAN	80009	200397301
					STANDARD ACCESSORIES		
–41	161–0216–00			1	CABLE ASSY,PWR:3,18 AWG,2.5M L,BLACK	80126	C7120–25M–BL
	070–8332–04			1	MANUAL,TECH:INSTRUCTION,VITS200	TK2548	070833204
	351–0751–01	B010100	B020335	1	TRK,SL OUT SECT:STA & INTERMEDIATE SAF CONT	06666	CC3442–99–0006
	351–0859–00	B020336		1	TRK SL OUT SECT:STA & INTERMEDIATE SAF CONT	06666	CC3442–99–0005

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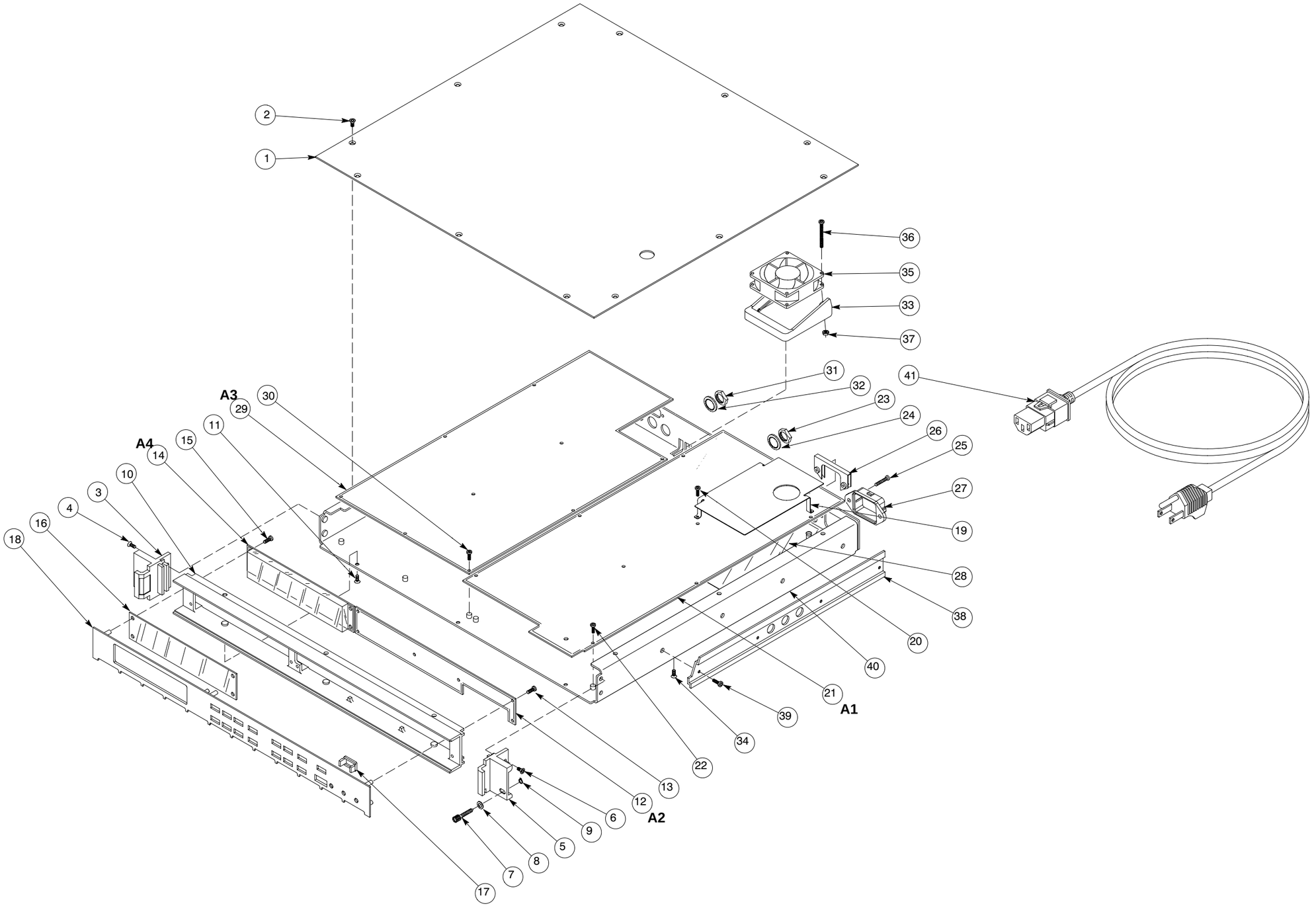
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FIG. 1 EXPLODED VIEW



VITS 200

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