Service Manual

Tektronix

SDA 601
Serial Digital Analyzer

070-8914-02

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

CE

Printed in the U.S.A.

Tektronix, Inc., P.O. Box 1000, Wilsonville, OR 97070–1000

WARRANTY

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

In order to obtain service under this warranty, Customer must notify Tektronix of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. Tektronix will provide such service at Customer's site without charge during the warranty period, if the service is performed within the normal on-site service area. Tektronix will provide on-site service outside the normal on-site service area only upon prior agreement and subject to payment of all travel expenses by Customer. When or where on-site service is not available, Customer shall be responsible for packaging and shipping the defective product to the service center designated by Tektronix, with shipping charges prepaid. Tektronix shall pay for the return of the product to Customer if the shipment is to a location within the country in which the Tektronix service center is located. Customer shall be responsible for paying all shipping charges, duties, taxes, and any other charges for products returned to any other locations.

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

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Contacting Tektronix

Product Support	For application-oriented questions about a Tektronix measurement product, call toll free in North America: 1-800-TEK-WIDE (1-800-835-9433 ext. 2400) 6:00 a.m. – 5:00 p.m. Pacific time Or contact us by e-mail: tm_app_supp@tek.com For product support outside of North America, contact your local Tektronix distributor or sales office.
Service Support	Contact your local Tektronix distributor or sales office. Or visit our web site for a listing of worldwide service locations. http://www.tek.com
For other information	In North America: 1-800-TEK-WIDE (1-800-835-9433) An operator will direct your call.
To write us	Tektronix, Inc. P.O. Box 1000 Wilsonville, OR 97070-1000

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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.

Replace Batteries Properly. Replace batteries only with the proper type and rating specified.

Recharge Batteries Properly. Recharge batteries for the recommended charge cycle only.

Use Proper AC Adapter. Use only the AC adapter specified for this product.

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

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

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

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

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

Do Not Operate in Wet/Damp Conditions.

Do Not Operate in an Explosive Atmosphere.

Keep Product Surfaces Clean and Dry.

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

Symbols and Terms

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

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

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

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

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

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

CAUTION indicates a hazard to property including the product.

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

WARNING
High Voltage

Protective Ground
(Earth) Terminal

CAUTION
Refer to Manual

Double
Insulated

Battery Recycling

This product contains a Nickel Cadmium (NiCd) battery, which must be recycled or disposed of properly. For the location of a local battery recycler in the U.S. or Canada, please contact:

RBRC
Rechargeable Battery Recycling Corp.
P.O. Box 141870
Gainesville, Florida 32614

(800) BATTERY
(800) 227-7379
www.rbrc.com

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, disconnect the mains power by means of the power cord or, if provided, the power switch.

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.

Specifications

Specifications

Introduction

The material in this section is organized into two main groupings: the specification tables and the supporting figures. The specification tables include:

- General input and output signal characteristics and specifications
- Physical and environmental specifications

The supporting figures (waveform diagrams and related data) follow the specification tables.

Reference Documentation

The following documents were used as references in the preparation of these specifications:

Recommendations and Reports of the CCIR, 1978; Transmission of Sound Broadcasting and Television Signals Over Long Distances (CMTT).

IEEE Standard Dictionary of Electrical Terms, Second Edition (1977) IEEE Standard 100–1977.

IEC 60B (Secretariat) 170, “Helical-scan digital composite cassette recording system using 19 mm magnetic tape (Format D–2) (NTSC, PAL, PAL-M).”

ANSI/ISA S82 — Safety Standard for Electrical and Electronic Test, Measuring, controlling, and Related Equipment.

CAN/CSA C22.2 No. 1010.1-92 — Safety Requirements for Electrical Equipment for Measurement, control, and Labratory Use.

IEC1010-1 — Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use (1990).

Performance Conditions

The Performance Requirements are valid if the instrument has been adjusted at approximately 25° C, is being operated within environmental limits (see Table 1–4), and has had a minimum warm-up of 20 minutes.

EMI Compliance

The following electromagnetic interference (EMI) regulatory requirements are applicable to the SDA 601:

- EN 50 081-1 Electromagnetic Compatibility — Generic Emission Standard. Part 1: residential, commercial, and light industry.
- EN 50 082-1 Electromagnetic Compatibility — Generic Immunity Standard. Part 1: residential, commercial, and light industry.
- FCC EMI Compatibility — FCC Rrules Part 15 Subpart J, Class A.

NOTE. *Shielded cables were used in the certification of this instrument; therefore, shielded cables are recommended to be used when operating. (EC 92)*

Specification Tables

Table 1–1: Serial Digital Video Input

Characteristic	Performance Requirements	Supplemental Information
Format		CCIR 601 Component 525/625, 10 bits data, Scrambled NRZI; 270 Mb/s. Complies with SMPTE 259M and CCIR 656.
Input Impedance		75 Ω
Input Level		800 mV ± 80 mV (peak-to-peak) at signal source
Return Loss	≥ 15dB	1 MHz to 270 MHz
Serial Receiver Equalization Range	Proper operation with 800 mV launch amplitude and up to 15 dB loss at 135 MHz using coaxial cable with $1/\sqrt{f}$ loss characteristics.	Nominally 150 m of Belden 8281 coaxial cable; typically up to 200 m.
Error detection protocols supported	EDH (RP-165), ØAPCRC	

Table 1–2: Signal Level Meter

Characteristic	Information
Resolution	2 dB @ 135 MHz

Table 1–3: AUX Output

Characteristic	Performance Requirements	Supplemental Information
Output		5-bit output; monochrome signal
White Amplitude	700 mV ± 10%	Terminated into 75 Ω
Sync Amplitude	300 mV ± 10%	Terminated into 75 Ω
DC Offset	≤ 500 mV	Terminated into 75 Ω
Quantization		22 mV
Impedance		75 Ω nominal
Return Loss		≥ 10 dB to 10 MHz

Table 1–4: Power Supply

Characteristic	Performance Requirements	Supplemental Information
DC Input Range	9 to 15 Vdc	≥12 V required to charge optional battery pack
Supply Accuracy		+5 V ±250 mV
Hum		Typical: 25 mV
Noise		≤ 50 mV
Fuse		2 A slow blow, 32 V min

Table 1–4: Power Supply (Cont.)

Characteristic	Performance Requirements	Supplemental Information
Power Limit without adapter with adapter		 6 W 7 W
Power Consumption Back light off Back light on		Typical: 5.0 W 5.5 W

Table 1–5: Physical Characteristics

Characteristic	Information
Height	5.6 cm (2.2 in)
Width	9.1 cm (3.6 in)
Depth	19.1 cm (7.5 in)
Net Weight SDA 601 SDA 601 with battery pack	 0.48 kg (1.06 lb) 0.68 kg (1.5 lb)
Shipping Weight (with AC adapter)	1.50 kg (3.31 lb)

Table 1–6: Environmental Characteristics

Characteristic	Information
Temperature Operating Storage	 0° C to +35° C (32° F to +95° F) –30° C to +65° C (–22° F to +149° F)
Altitude Operating Storage	 to 15,000 feet (4572 m); IEC 1010-1 compliance to 2000 m to 50,000 feet (15420 m)
Equipment Type	Test
Equipment Class	Class III (as defined in IEC 1010-1, Annex H)
Installation Category	Category II (as defined in IEC 1010-1, Annex J) Note: Rated for indoor use only.
Pollution Degree	Pollution Degree 2 (as defined in IEC 1010-1)
Transportation	Meets the requirements of NTSB Test Procedure 1A, category II (24 inch drop)

Table 1–7: Certifications and compliances

EC Declaration of Conformity – EMC	Meets intent of Directive 89/336/EEC for Electromagnetic Compatibility. Compliance was demonstrated to the following specifications as listed in the Official Journal of the European Communities: EN 55011 Class A Radiated and Conducted Emissions EN 50081-1 Emissions: EN 60555-2 AC Power Line Harmonic 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 IEC 801-5 Power Line Surge Immunity
EMC Compliance	Meets the intent of Directive 89/336/EEC for Electromagnetic Compatibility when it is used with the product(s) stated in the specifications table. Refer to the EMC specification published for the stated products. May not meet the intent of the Directive if used with other products.
FCC Compliance	Emissions comply with FCC Code of Federal Regulations 47, Part 15, Subpart B, Class A Limits
Installation Category Descriptions	Terminals on this product may have different installation 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

Operating Information

Operating Information

This section duplicates material contained in the SDA 601 user manual (Tektronix p/n 070-8910-XX). The material is included here for your convenience. Please check the user manual whenever you need more information on any topic.

Getting Started

Please note the following statements before using your SDA 601.

CAUTION. *Attempting to operate the SDA 601 with an improper AC-to-DC adapter can result in damage to the instrument. To avoid damage, USE ONLY AN APPROPRIATE DC POWER SOURCE: Voltage must be 9 to 15 VDC; the connector must have the NEGATIVE contact in the center; and open-circuit voltage of the power source must not exceed 18 VDC.*

For best results, use the AC adapter that is supplied with the instrument. If the supplied adapter is incorrect for the local AC power supply, contact your nearest Tektronix representative.

WARNING. *Install or replace batteries only with the instrument switched OFF and the AC adapter disconnected.*

Replace the batteries only with standard AA batteries (1.2–1.5 V, nominal), or with a Tektronix rechargeable battery pack (p/n 119-4488-00).

If you have any questions regarding the operation of this instrument, please contact your nearest Tektronix representative or field office. In the United States and Canada, you may also call the Tektronix information number, 1-800-TEK-WIDE (1-800-835-9433), extension TV, between 8:00 am and 5:00 pm Pacific time.

Supplying Power

The SDA 601 is DC powered. You may power it with the standard AC adapter, the optional 9.6 V NiCad battery pack, eight standard AA batteries, or a “BP” type external battery pack with the correct voltage and polarity. The external DC power connector is on the left side of the instrument.

To install AA batteries or the battery pack, open the battery compartment of the SDA 601 by pressing down on the cover and sliding it in the direction of the inscribed arrow, as shown in Figure 2–1. When the cover tabs line up with the slots in the case, lift the cover away from the instrument. Install batteries in alternating directions as indicated by the graphic molded into the "floor" of the battery compartment. If using the optional battery pack, take the time to identify both contacts and install the pack properly.

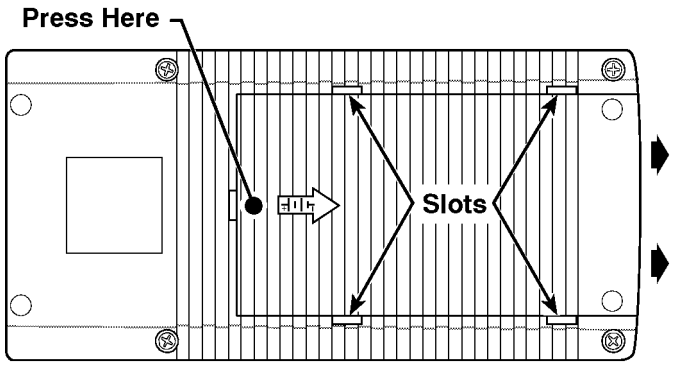


Figure 2–1: Opening the Battery Compartment

When selecting a power source for your SDA 601, please remember:

- Attempting to use an improper AC adapter can cause permanent damage to the instrument. USE AN APPROPRIATE DC POWER SOURCE ONLY: Voltage must be between 9 and 15 VDC; the center contact of the connector must be NEGATIVE polarity; and open-circuit voltage must not exceed 18 VDC. For best results, use the adapter supplied with the instrument.
- There is no need to remove the optional NiCad battery pack for recharging. The SDA 601 will "trickle charge" the battery pack whenever the standard AC adapter is attached *and the instrument is switched off*. It can take up to 16 hours to fully charge the battery pack. *Note that charging will occur only if the adapter supplies at least 12 V; make sure that the adapter you use is appropriate for the local AC supply.*
- AA batteries are not included with the instrument; buy them locally. Rechargeable AA batteries may be used, but they are NOT recharged automatically. To recharge AA batteries, remove them from the instrument and use an appropriate charger. For safety, read and follow the battery charger instructions. Do NOT attempt to recharge standard alkaline batteries.
- After three minutes with no key press, the LCD back light will be dimmed to save battery charge. (This may be disabled through the Utility/Diagnostics/ Power Manage menu; see page 2–12.)

- To guard against battery discharge if you forget to turn the SDA 601 off, enable Auto Power Off through the Utility/Diagnostics/Power Manage menu (see page 2–11).
- The SDA 601 can sense low battery voltage. It will warn you when the charge is sufficient for approximately ten more minutes of operation. The instrument will shut itself down when the battery voltage becomes too low for reliable operation

The **ON** key toggles instrument power On and Off.

NOTE*. If the instrument is operating with low batteries, it may turn itself off and on. The batteries should be replaced or recharged depending on battery types.*

Connecting the SDA 601

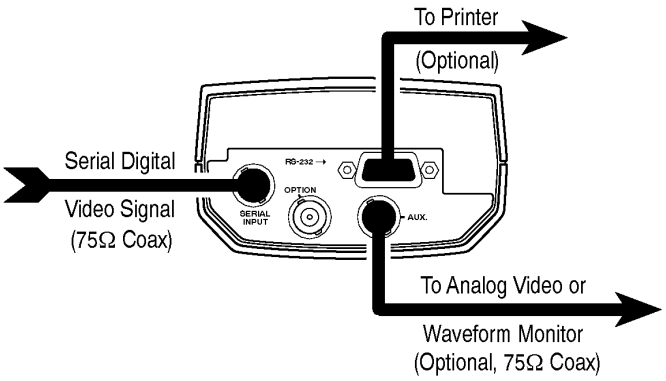


Figure 2–2: Connecting the SDA 601

Connect the instrument as shown in Figure 2–2. The OPTION connector is reserved for later versions of the instrument. Note that the SDA 601 has many capabilities and features, and you may wish to gain familiarity with it by first connecting it directly to a serial digital, component video signal generator such as the Tektronix TSG 601, an analog video monitor, and—if convenient—a compact printer, such as the Seiko DPU 411 printer (Tektronix part number 119-4594-00), available from Tektronix distributors and through TekDirect.

SERIAL INPUT Connect the instrument to your system through the SERIAL INPUT with 75Ω coaxial cable.

***NOTE**. The SDA 601 has internal,* active *termination. Any signal path that ends with the instrument will be properly terminated* only *when the SDA 601 is switched on.*

AUX Output The AUX output signal may be thought of as "pseudo video." It is derived from the serial video input signal and converted to composite monochrome analog video by an unfiltered 5-bit DAC. It is suitable for identifying the input and displaying the cursor cross hairs, Highlighting, and the "OSD." It:

- Lets you view the picture for convenient source identification.
- Can contain the On-screen Display (OSD; see page 2–9), which shows the most recent Watch or Analyze results one page at a time—instead of one item at a time as on the SDA 601 display.
- With Pulse Cross enabled (see page 2–24), lets you "see" the contents of the vertical and horizontal interval portions of the serial video signal.
- Can include Cursor cross hairs for convenient positioning of the Cursors (see page 2–22).
- When Highlighting (see page 2–24) is turned on, can help you locate and identify errors in the picture, or the digital encoding of the signal.

By factory default, the AUX output is the Y (luminance) video component; you may configure it, through the I/O menu, to be the R–Y or B–Y component instead. (To access this setting, press **Shift**, then **Insert On/Off**, then ▲.)

RS-232 Interface Connect an ASCII, serial printer to the RS-232 connector to create "hard copy" analysis reports, or to log errors detected during a Watch session. You may also capture the RS-232 output on a personal computer running a communications application such as PROCOMM® or the Terminal accessory of Microsoft® Windows™. With a printer or PC connected, you can choose—through the Alarm menu—to have the SDA 601 log every error as it occurs, or to print a Watch report every ten seconds. This will permit unattended monitoring of your system. See page 2–19 for more information.

Connecting to the RS-232 Port. The SDA 601 is an RS-232 DCE device. Table 2–1 lists the pin assignments of the connector. The connector pinout has been chosen to interface directly with an IBM PC/AT 9-pin serial port using a straight-through cable. Thus, when communicating with a DTE device that has a male 9-pin (DB9) connector, use a cable that connects pins 2, 3, 5, 7, and 8

straight-through—a simple ribbon cable may be adequate. Use a null modem cable (which swaps the lines between pins 2 and 3 and pins 7 and 8) to communicate with another DCE device. Figures 2–3 and 2–4 illustrate cable wiring for communicating with a device that has a 25-pin serial connector.

Because of space limitations on the connector end of the SDA 601, you may have to insert a 9-pin adapter between the cable and the connector. If the cable has a female end, use a male/male adapter such as ITT Cannon p/n 111805–1.

Table 2–1: RS-232 Connector Pin Assignments

764 DB9 Pin	Signal Name	Signal Direction
1	Not connected	—
2	RXD (Received Data)	From SDA 601
3	TXD (Transmitted Data)	To SDA 601
4	Not connected	—
5	Signal Ground	—
6	Not connected	—
7	RTS (Request to Send)	To SDA 601
8	CTS (Clear to Send)	From SDA 601
9	Not connected	—

***NOTE**. RS-232 signals are named from the perspective of the DTE device. Since the SDA 601 is a DCE device, pin 2 ("Received Data") is an* output *from the instrument; that is, the data is received by the connected DTE device.*

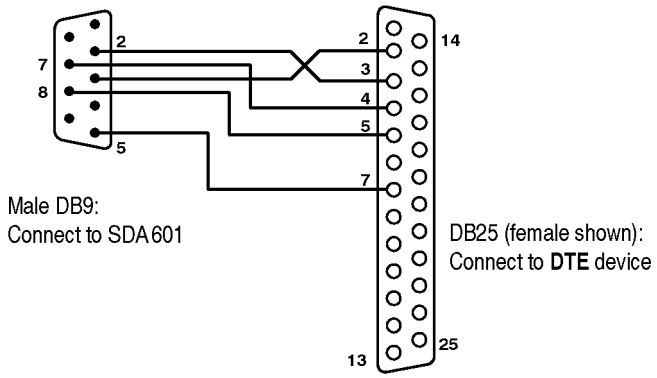


Figure 2–3: Connecting to a DTE Device with a DB25 Serial Port

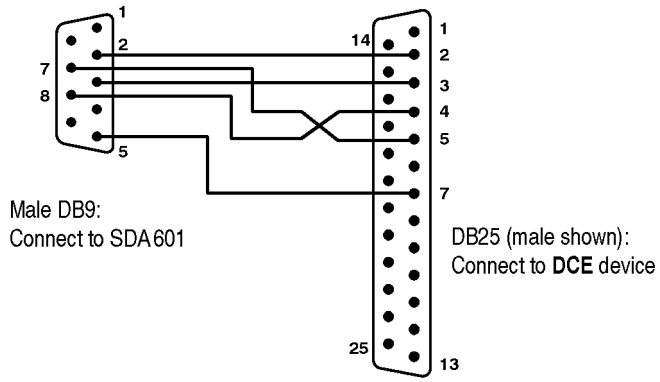


Figure 2–4: Connecting to a DCE Device with a DB25 Serial Port

NOTE. *Most Personal Computers are DTE devices; however, printers may be either DTE or DCE, and the type may not be obvious from the printer documentation or the gender of the RS-232 connector. If you have trouble outputting from the SDA 601, first verify that communication parameter and Baud rate settings are correct, then try reversing the conductors at pins 2 and 3 and 7and 8 at the cable end that is connected to the SDA.*

RS-232/Printer Setups. Set the receiving device to 8 data bits, and one stop bit, if possible.

The SDA 601 supports both hardware (RTS/CTS) and software (Xon/Xoff) handshaking; choose the appropriate handshaking protocol through the Utility/ Printer Setup submenu. Specify 60 lines per page (also in the Utility/Printer Setup submenu) for most printers that use 8.5 x 11.0 inch paper.

Set the Baud rate and Parity—through the Utility/RS-232 Setup submenu—to match the printer. When in doubt, set Parity to None.

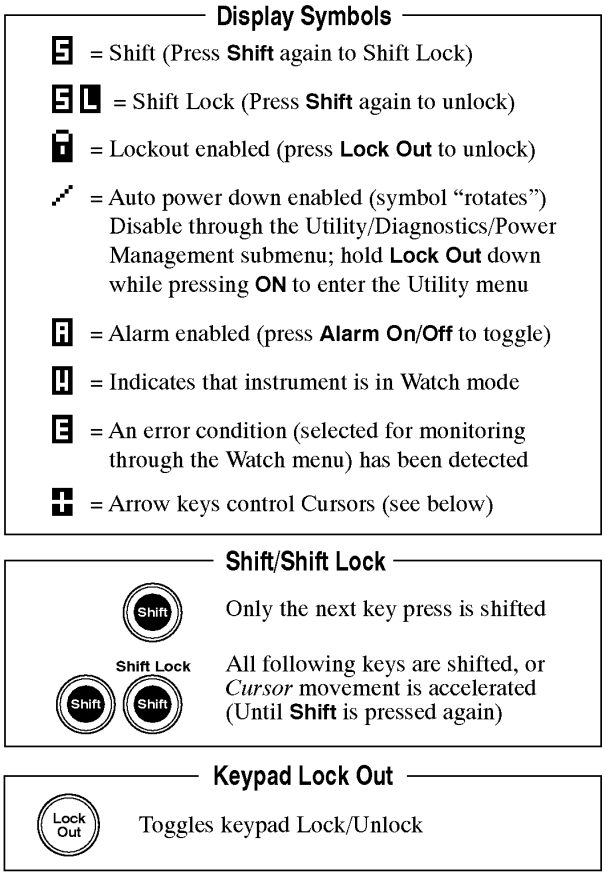
Testing the Connection and Settings. To test your printer connection and settings, perform a signal analysis by pressing **Analyze**. Then, press **Shift-Analyze**. The printer should respond by printing an analysis report that resembles the one shown in Figure 2–5.

```
Page    1


Analyze at 08-Jul-94 13:25:40

270 Mb Component
625 lines
Video Present
8 Bit Video
EDH Found
Audio:  ----------------
Stuck Bits:  --------LL

No Errors Found
NO Illegal Value
Video In Range
Line/Fld Len OK
TRS OK
ANC Format OK
NO Zero Len ANC
NO AP CRC Change
FF CRC Changes
NO AP EDH Errors
NO FF EDH Errors
AP CRC is 0
EDH Flag NOT Set
```

Figure 2–5: A Printed Analysis Report

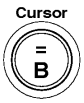
Keypad and Display Conventions

Please see the Instruction card (p/n 070-8912-00) supplied with your SDA 601 for a "tour" of the keypad and an explanation of the display symbols. For your convenience, the following panels are taken from the card.



Additional key functions are:

SLM (A) — Invokes the SLM display mode. Press this key to supercede any other display mode and display the Signal Level Meter on the SDA 601 LCD. See page 2–21.



Cursor (B) — Invokes the Cursor data display mode. Press this key to supercede any other display mode and display the cursor position (line and sample) on the SDA 601 LCD. See page 2–21.

Pulse Cross (E) — Press repeatedly to cycle through the four AUX output pulse cross modes: Normal, H (horizontal), V (vertical), and Both (horizontal and vertical) See page 2–24.

Time (F) — Invokes the Time display mode. Press this key to supercede any other display mode and display the current date and time on the SDA 601 LCD. See page 2–23.

Review (G) — Invokes the Review display mode. Press this key to supercede any other display mode and review the results of the latest Analysis or Watch session on the SDA 601 LCD. See page 2–23.

The On-Screen Display (OSD)

The OSD is a 12 line, 24 column display that can contain results from SDA 601 Analyze and Watch sessions. It can be superimposed on the AUX output and viewed on an attached video monitor. Toggle the OSD On/Off with the **Insert On/Off** key. The default OSD will resemble Figure 2–6 when the instrument is in Watch mode. You can control several OSD characteristics (size, color, screen position) through the Utility/OSD Setups submenu; see the User manual for details.

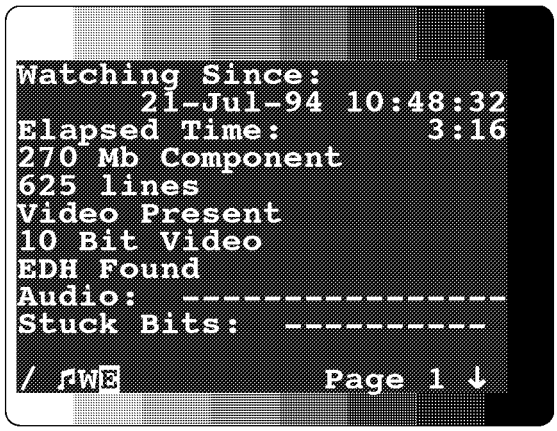


Figure 2–6: The Default "Watching" OSD

The symbols on the bottom line of the OSD have the following meanings:

- The rotating line in the lower left indicates that Auto Power Off is enabled.
- The musical note symbol indicates that Alarms are toggled On with the **Alarm** key or through the Alarm menu. This symbol can appear even when the beeper and print errors items in the Alarm menu are set to Off.
- The "W" appears when the instrument is in Watch mode.
- The reversed "E" means that an error is detected.

- Similar reversed “S” and “SL” icons (not shown) will appear when SDA 601 keypad is shifted and shift locked.
- The down-arrow in the lower right indicates that the ▼ key may be used to reveal another (higher-numbered) page. An up-arrow will appear in all other pages to indicate that the ▲ key may be used.

The Analyze OSD is similar; see Figure 2–10, on page 2–14.

Preliminary Settings

Once the SDA 601 is up and running, you should choose some settings depending on how you’ll be using the instrument. These settings are made through the Utility menu. Follow these directions to set the current date and time, set the Battery Type, and enable Auto Power Down (if desired).

Set the Date and Time

1. To enter the SDA 601 Utility menu, hold the **Lock Out** key down and press the **ON** button. Release the **ON** button, but continue to press the **Lock Out** key until the display resembles Figure 2–7.

Figure 2–7: The Initial SDA 601 Utility Menu Display

2. Once in the Utility menu, use the ▲ and ▼ keys to scroll to the Set Time item, and press **Enter**. The instrument display will change to resemble Figure 2–8.

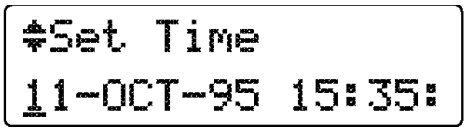


Figure 2–8: The Set Time Display

3. The underline cursor indicates the active character position. Move the cursor with the ◀ and ▶ keys. Enter the appropriate character from the SDA 601 keypad. When the cursor is in positions that require numeric entry, the keys will be automatically shifted. When you enter an appropriate character for the field, the cursor will move one position to the right. The acceptable

month abbreviations are the first three characters of the English name: JAN; FEB; MAR; APR; MAY; JUN; JUL; AUG; SEP; OCT; NOV; DEC.

Enter the time in 24 hour format; that is, if the present time is 4:15 pm, enter 16:15.

4. When the correct date and time is shown on the display, press **Enter**. If all values are valid, the instrument will respond with the message "Time Accepted." If you have made an error and entered an invalid date or time, the instrument will respond with an appropriate error message. If that happens, correct the error and press enter.

5. Press any rectangular key to exit the Utility menu, or proceed to other preliminary settings, as appropriate.

Set the Battery Type

Confirm that the Battery Type setting is correct, and change it if necessary.

1. After setting the clock, press the ▼ key once to scroll to the Diagnostics submenu item, and press **Enter**.

2. In the Diagnostics submenu, scroll down to the Power Manage item with the ▼ key. Again, press **Enter**.

3. The top item in the Power Manage submenu is Battery Type. Toggle to the selection that matches the type of battery you have installed in your SDA 601 by pressing either ◀ or ▶. The choices are "rechargeable" and "disposable." Select rechargeable when using NiCad AA cells or the optional battery pack; choose disposable when you are using common Alkaline AA batteries, which cannot be recharged. Press **Enter** to confirm the choice.

4. When the correct battery type is indicated by an asterisk (*) on the lower right of the LCD, continue to Auto Power Off, or press any rectangular key to exit the Utility/Diagnostics/Power Manage submenu and return to normal operation.

Enable (Disable) Auto Power Off

"Auto Power Off" will switch the instrument off when ten minutes have passed without a key press. Enable this feature when you are using battery power and operating in an environment in which unplanned shutdown of the SDA 601 is permissible.

1. While still in the Utility/Diagnostics/Power Manage submenu, press the ▼ key twice to scroll to the Auto Power Off item.

2. Disable/enable Auto Power Off by pressing either ◀ or ▶. Press **Enter** to confirm the choice. Enabled Auto Power Down is indicated by a "rotating line" symbol on the second line of the instrument display, and in the lower-left corner of the OSD.

3. Use the ▲ and ▼ keys to scroll to other "power manage" items, or press any rectangular key to exit the menu and resume normal operation.

Disable (Enable) Timed LCD Backlight Turn Off

Another power saving feature of the SDA 601 is timed turn-off of the LCD backlight. It is enabled by default in a new or reset instrument. If you will always operate with the AC adapter, you may wish to disable the feature. To toggle backlight turn-off:

1. In the Utility/Diagnostics/Power Manage submenu, use the ▲ and ▼ keys to scroll to the LCD Backlight item.
2. Choose between "Timed Turn Off" and "On all the time" with either ◀ or ▶, then press **Enter** to confirm the choice.
3. As before, use the ▲ and ▼ keys to scroll to other "power manage" items, or press any rectangular key to exit the menu and resume normal operation.

Performance Verification

A performance verification procedure, which some users may require for acceptance testing, is included in Section 3 of this manual.

Using Your SDA 601

NOTE. *For more information on Serial Digital Video Systems, request Tektronix publication 25W-7203-1 "A Guide to Digital Television System and Measurements" from your nearest Tektronix representative or field office.*

See Figure 2–9 for a front and side view of the SDA 601.

Here's what you can do with your SDA 601. Instructions for each function begin on the indicated page.

- **Analyze** one second of the incoming signal and read the results on the instrument display or an attached video monitor (page 2–13). You may also print the results on an attached ASCII, serial printer (page 2–15).
- **Watch** the input signal, paying attention to selected signal characteristics, or groups of characteristics (page 2–15). Errors are reported to the instrument display panel and an attached video monitor. You may also log errors to an attached printer (page 2–19).
- Set audible **alarms** to warn you of any errors encountered while the instrument is "watching" the input signal (page 2–19).

- View decoded video on an analog picture monitor attached to the **AUX** output (see page 2–4)
- **Highlight**, on the picture monitor, selected signal conditions or errors in the context of the video signal. (page 2–24)
- Measure the approximate level of the digital input signal with the built-in Signal Level Meter (**SLM**; page 2–21)
- Discover, with the help of video **Cursors**, the hex value of any sample in the video frame (page 2–22).
- Shift the video frame horizontally and vertically with the **Pulse Cross** feature to "see" the H and V intervals on the AUX picture monitor (page 2–24).

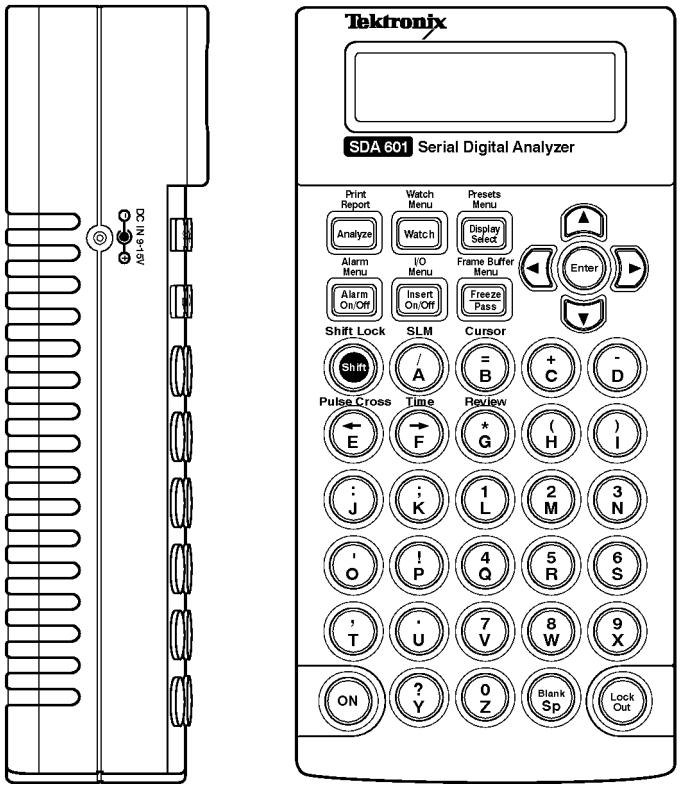


Figure 2–9: Front and side views

Analyzing a Signal

Analyze Mode may be selected with the Analyze key at any time. In this mode, the instrument attempts to lock onto the digital video signal and, if successful, accumulates data from one second of the incoming signal. The instrument then analyzes the status of the various signal characteristics and reports the results to the Review List. The Review List may be viewed on the OSD (on an attached

video monitor) as well as on the SDA 601 LCD. The SDA 601 up and down arrow keys are used to scroll through the list of detected “conditions.”

The conditions detected and reported in an SDA 601 analysis are:

- Video format
- Line standard (625 or 525)
- Video present or missing
- Video resolution (8 or 10 bits)
- EDH packet found/missing
- Audio status (16 channels)
- Stuck bits (if any)
- Illegal (digital word) values
- Video In/Out of range
- Line/field length (OK/incorrect)
- TRS (OK/incorrect)
- ANC Format (OK/incorrect)
- Zero length ANC (yes/no)
- APCRC changes (yes/no)
- FFCRC changes (yes/no)
- APCRC errors (yes/no)
- FFCRC errors (yes/no)
- ØAPCRC (yes/no)
- EDH flag set/not set

Performing an Analysis. To analyze a signal, simply press **Analyze**. The SDA 601 will observe the incoming signal for one second, analyze the data, and write the results to a “condition review list” and the OSD.

Reviewing the results on the OSD. There are three pages of results; use the ▼ and ▲ keys, as indicated by the arrow icons on the lower right of the OSD, to see all three pages.

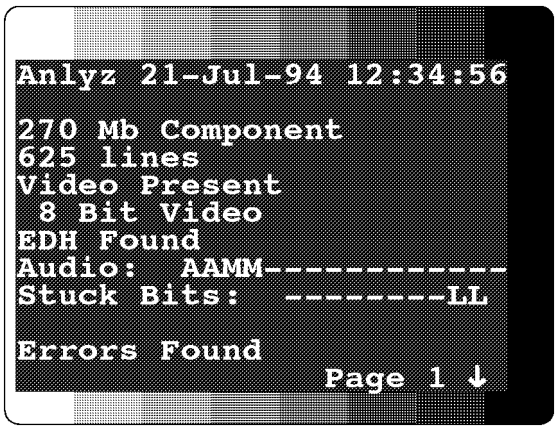


Figure 2–10: The Analyze OSD

Reviewing the results on the LCD. Use the ▼ and ▲ keys to scroll through the condition list on the instrument LCD. The display will “time out” after three seconds of no key press and return to its pre-analysis state—Idle, or the data enabled through the Display Select menu. Press **Enter** to return to the last-reviewed condition; press ▼ or ▲ to scroll down or up the list. You may also press

Review (G) to supercede all other LCD display modes and prevent "time out" of the results display.

Printing an Analysis Report. With a printer connected to the RS-232 port and properly configured (see the Reference section of the User manual), press **Shift**, then **Analyze**. A report, resembling the printout shown in Figure 2–5 (page 2–7), will be printed.

Audio and Stuck Bits Explained. Audio content and stuck bits are reported on the LCD and Printer output in the same format as in the OSD, shown in Figure 2–10:

- The "Audio:" result line has room to display the status of all 16 audio channels that can be embedded in digital video. The status of channels (#1 through #16, from left to right) are reported as "–" for no audio detected, "A" for active audio, and "M" for mute (present, but silent).
- The "Stuck Bits:" line shows the status of the 10 bits of the video word (in the active picture area), MSB to LSB left to right. If the signal contains any stuck bits, they are indicated by an H (stuck high) or L (stuck low) in the appropriate position. The two LSBs will be reported as L when an 8-bit video signal is received. Other stuck bits may suggest either an incorrect signal or faulty equipment.

Zero-length ANC. Is reported by the SDA 601 when a Ø-value ANC "Data Count word" is detected in the input data. The detection of zero-length ANC is important because some digital video equipment can insert such an ANC into the serial digital video data stream, even though it can cause difficulty in some systems.

Watching a Signal

While Analyze takes a one-second "snapshot" of the input signal and reports the status of a predefined list of characteristics, Watch mode permits continuous observation of the signal characteristics—or "conditions"—of your choice. In addition to reporting errors to the instrument display and the OSD, Watch mode can also be configured to sound an audible ("beep" or "tick") alarm to alert you of any error, and log errors to a printer for later review.

The steps to monitoring a signal with the SDA 601 are:

1. Select the conditions to be watched. This is done through the Watch menu, which can be set—through the Utility menu—for selection of conditions on a "Group" or "Item" basis. Group selection is the factory default.

   In all, there are 20 Watch conditions. Eight conditions are always watched and reported when "Watch Menu Type" is set to Group Select:

Video format	EDH packet found/missing
Line standard (625 or 525)	Audio present/missing
Video present or missing	Stuck bits (if any)
Bits in active picture (8 or 10)	Other ANC (if any)

The twelve remaining conditions are organized into the four Watch groups:

Data Value Group:	**CRC Change Group:**
Illegal (word) values	APCRC changes (yes/no)
Video In/Out of range	FFCRC changes (yes/no)
Format Group:	APCRC is/not Ø
Line/field length (OK/incorrect)	**EDH Group:**
ANC Format (OK/incorrect)	AP EDH errors (yes/no)
TRS (OK/incorrect)	FF EDH errors (yes/no)
Zero length ANC (yes/no)	EDH flag set/not set

When only the Data Value group is set to "Watch," then, the SDA 601 will actually observe the status of ten conditions—the eight default conditions, plus Illegal Values and Video In/Out of Range. If all four groups are selected, all 20 conditions will be monitored.

Group selection can be inconvenient in some circumstances, however. An example is observing a changing test signal that is being generated with ØAPCRC. In this case, FFCRC changes are not an error, but a non-zero APCRC is. Watching the CRC Change Group, then, could result in inappropriate or misleading alarms.

To prevent this conflict, set the Watch Menu Type to "Item Select" through the Utility menu and select the "AP CRC Not Ø" item through the Watch Menu. To set the Watch Menu Type:

a. Hold the **Lock Out** key down and press the **ON** button to enter the Utility menu. Release the **ON** button, but continue to press the **Lock Out** key until the display resembles Figure 2–11.

Figure 2–11: The Initial SDA 601 Utility Menu Display

b. Go to the Watch Menu Type menu item by pressing the ▼ key three times.

c. Press the ▶ key once to choose Item Select, then press **ENTER** to confirm the choice.

d. Press **Watch** to exit the Utility menu.

When Item Select is in effect, the list of "always-watched" conditions is reduced to Video Format (270 Mb Component, for example) only. All other items must be selected one-by-one through the Watch menu. The Watch items, in the order they appear on the Watch menu, are:

Line Standard (report 525 or 625, or alarm on one or the other)
Video Missing
Active Picture Bits (8 or 10)
EDH Packet
Embedded Audio
Stuck Bits
Other ANC Data (*not* Audio or EDH)
Illegal Word Values
Over-range Video
Line/Field Length
TRS Errors
ANC Format Errors
Zero Length ANC
APCRC Changes
FFCRC Changes
APCRC not Ø (report, or alarm if not Ø)
AP EDH Errors
FF EDH Errors
EDH Flag Set

2. Set the appropriate alarms; see page 2–19.

3. Once all conditions have been selected and alarms configured, begin the Watch session by pressing **Watch**. The message "Watch Started" will appear briefly on the LCD. If none of the display options (Signal Level, Cursor Data, or Current Time) have been turned on, the display will "time out" to resemble Figure 2–12. If one or more of the LCD display modes (see page 2–20) *has* been activated, the display will revert to the display mode(s), and the Watch session will continue in the background. In all cases, the results of the session will be written to the OSD; press **Insert On/Off**, if necessary.

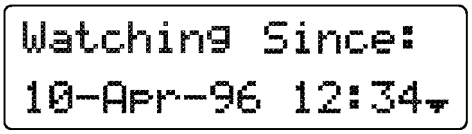
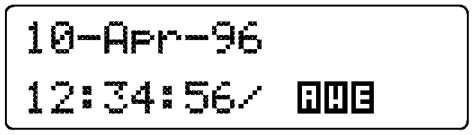


Figure 2–12: The SDA 601 "Watching" Display

4. Review the condition list on the SDA 601 LCD by pressing the ▼ key until you reach the END OF LIST message. Use ▲ to scroll back up the list as desired. The LCD Watch review list will "time out" if more than 3.5 seconds pass without a key press (press the **Review** key to prevent this time out). After the display has timed out, press **Enter** to return to the last-displayed item;

press ▲ to move up the list and display the previous item; press ▼ to display the next item "down" the list.

5. If you have a video monitor connected to the AUX output, you may review the condition list on the OSD. Toggle the OSD On with the **Insert On/Off** key, then page the OSD up and down with the ▲ / ▼ keys.



Pausing a Watch Session. A Watch session is temporarily suspended when you invoke any other SDA 601 menu (besides the Watch menu). Data collection continues, but OSD and printer updates are suspended. When you exit the menu by pressing a rectangular key, the OSD will update to include all events during the time spent in the menu.

Stopping a Watch Session. The current Watch session will end when you press Analyze or enter the Watch menu. After the analysis, or on leaving the Watch menu, you may begin a new Watch session by pressing Watch. Note that the SDA 601 will "forget" all data collected during a Watch session when the session is concluded.

Restarting a Watch session. Pressing Watch during a Watch session will restart the Watch mode, resetting the elapsed time counter and the printer page count to zero.

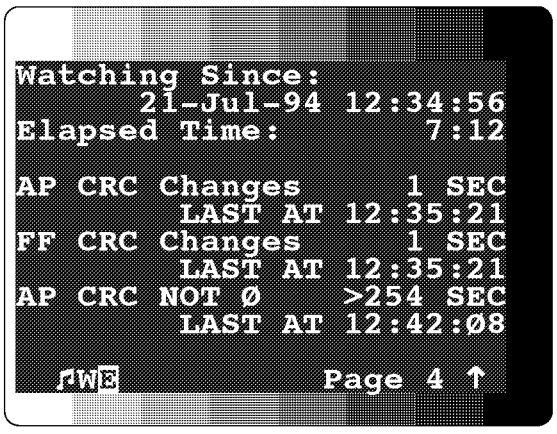


Figure 2–13: Watch Errors Reported on the OSD

Interpreting Error Reports. The SDA 601 reports errors in many Watch conditions to the review list on an "errored seconds" basis, as shown in Figure 2–13. In this illustration, one second of the Watched signal—approximately 25 seconds after the Watch session was started—contained one or more changes in both the FFCRC and the APCRC. In addition, more than 254 one-second periods of the signal contained non-zero APCRCs (254 is the highest count possible in the SDA 601). The most-recent non-zero APCRC was detected in the last reported one-second period, 7:12 into the Watch session.

The same reporting format is used on the SDA 601 LCD.

Alarms

Alarms are enabled through the Alarm menu. When enabled, an alarm is generated when one or more signal conditions or errors are detected by the SDA 601 in Watch mode. The SDA 601 has two types of alarm:

- A "beeper" (audible) alarm that may be configured in one of three ways:
  - Long Beep — Several seconds long, produced each time an alarm condition is detected. In the case of frequently-recurring errors, the beep will repeat continuously, if necessary; however, there may be fewer than one alarm per error condition.
  - Short Beep — One second duration; otherwise similar to the Long Beep.
  - Beep "Tick" — A very short beep, almost a tick; useful when there are many alarm conditions, when they occur in "bursts," or for audible feedback when performing equipment adjustments for proper operation.
- A Printer alarm, output on the RS-232 port. There are two ways to use the printer during watch sessions:
  - Log each error — or as many as the printer buffer allows. Intended for extended monitoring of the signal when few, if any errors are expected. You can leave the SDA 601 (powered by the AC adapter) and a printer unattended to log and help diagnose intermittent problems. This is the same as the audible alarm in that, once configured, it can be controlled with the **Alarm On/Off** key.
  - Print an error report every ten seconds — Strictly speaking, this option is not an alarm because when it is selected, the instrument will print a report every ten seconds of the Watch session *whether an error has been detected or not, and regardless of the Alarm On/Off state* (set with the key or through the menu). The print line will contain at least the time and video format; errors, if any, that have occurred in the preceding ten-second interval will also be printed.

Select alarm conditions or errors through the Watch menu (see "Watch Mode," above). Conditions that will always trigger an alarm if detected by the SDA 601 in Watch mode are:

No PLL Lock
Video Missing
“Other” ANC Data
Illegal Value
Video Over Range
Line/Field Len
EAV/SAV/TRS Error
ANC Format Error
Zero Length ANC
AP CRC change
FF CRC change
AP EDH error
FF EDH error
Flag Set

Conditions that will trigger an alarm only if they are configured to do so through the Item Watch menu are:

Line Std Detect (if “Alarm if 525” or “Alarm if 625” is selected)
AP Bits (8/10) (if “Alrm if 8 bits” or “Alrm if 10 bits” is selected)
EDH packet miss (if “Alarm if Miss” is selected)
AP CRC Not Ø (if “Alarm Not Ø” is selected)

Configure the beeper and printer alarms through the Alarm Menu. As you might expect:

1. Enter the Alarm menu (press **Shift**, then **Alarm On/Off**).
2. Scroll to the desired menu item with the ▼ / ▲ keys.
3. Select the option with the ◀ / ▶ keys.
4. Confirm the option choice by pressing **Enter**.
5. Exit the Alarm menu by pressing any rectangular key.

Once the alarms are configured through the Alarm Menu, you may toggle all alarms On/Off with the **Alarm On/Off** key (which duplicates and overrides the function of the “Alarm On/Off” item in the Alarm Menu). Note that turning the alarms “On” with this key (or menu item) is equivalent to “arming” the alarms: regardless of all other configuration options, the alarms will not “sound” unless they are also turned On through the “Alarm On/Off” menu item or with the **Alarm On/Off** key.

LCD Display Modes

Three SDA 601 LCD display modes—SLM (Signal Level Meter), Cursor, and Time—may be invoked directly with the corresponding key (see Figure 2–14), or through the **Display Select** key/menu. When the mode is selected with its key, it supercedes all other uses of the display. When selected through the **Display Select** menu, a mode will “time share” the display with any previously active mode(s).

A fourth display mode, Review, may be invoked with the **Review** key only. The four display modes are explained in the next few paragraphs.

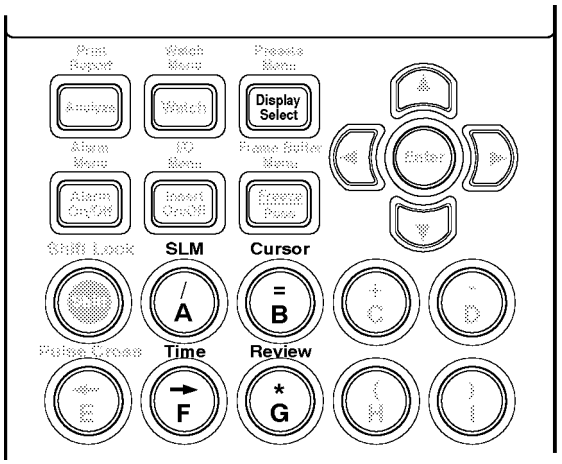


Figure 2–14: The Display Mode Selection Keys

SLM Display Mode. The SDA 601 displays the relative level of the serial digital input signal when you press the **SLM (A)** key, or toggle "Disp Sig Level" On through the **Display Select** key/menu. The display will resemble Figure 2–15; note that a longer "bar" indicates a *weaker* signal (often due to a *longer* cable).The SDA 601 SLM can help you identify points in your system where the digital video signal may be marginal because of long cable runs or faulty equipment. The signal level display will report an 800 mV_{p-p} input signal as approximately Ø dB (usually, only one segment will be "lighted," if any).

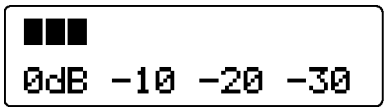


Figure 2–15: The SDA 601 Signal Level Display

Selecting the Cursor, Time, or Review operating modes with the respective keys—(**Cursor (B)**, **Time (F)**, or **Review (G)**—will turn the SLM Off. Reselect the Signal Level display by pressing the front panel **SLM (A)** key, or—if you want two or more modes to alternate on the display—toggle the SLM On through the **Display Select** key/menu.

Cursor Display Mode. The SDA 601 Cursor mode, selected by pressing the **Cursor (B)** key, makes it possible to locate a single word in the digital video frame and discover the actual (hexadecimal) value of the selected word and the three words

that follow. See Figure 2–16. The location of the selected word in the video frame is also indicated by “cross hair” cursors in the AUX output; connect an analog video monitor to see the cross hairs.

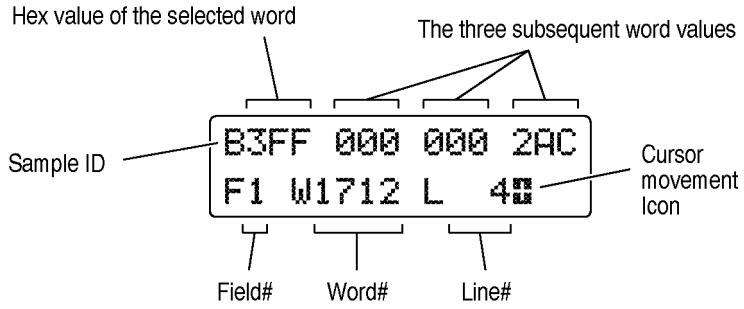


Figure 2–16: The Cursor Data Display

The first line of the cursor data display contains the hexadecimal values of the selected word and the three that follow it. Values typical for the SAV timing and reference signal are shown in Figure 2–16. The video “type” of the selected word is indicated by the sample ID:

B = C_B color difference
Y = Cosited luminance
R = C_R color difference
y (lowercase) = Isolated luminance

The second line contains the coordinates of the selected word. In the example, the selected word is number 1712 of line 4 in field 1.

The cursor movement icon will be visible on the second line when the arrow keys are “active” for cursor positioning. Normal cursor movement is one line up or down for each ▲ or ▼ key press, and one word per press of the ◀ or ▶ key. Engage shift lock (pressing **Shift** twice) to accelerate horizontal movement to 20 words per key press, and increase vertical movement to 10 lines per key press. Press Shift again to return to “fine” cursor control.

The cursor cross hairs are inserted in the AUX output whenever the **Cursor** key is pressed; they are *not* removed when Cursor mode is deactivated. You may remove the cross hairs from the video display by setting Video Cursor, in the I/O menu, to “No Display.”

The Cursor Data display may also be invoked through the **Display Select** menu, but Cursor cross hairs must then be enabled separately, through the **I/O** menu.

To exit the Cursor Data display mode, press the **SLM (A)**, **Time (F)**, or **Review (G)** key, or turn the display Off through the **Display Select** menu.

NOTE. *To remove the cross hairs from AUX output—regardless of how you exit Cursor Data display mode—you must also set the Video Cursor item in the* ***I/O*** *menu to "No Display."*

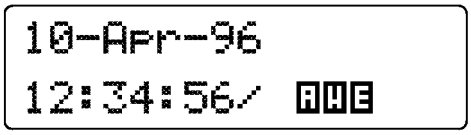
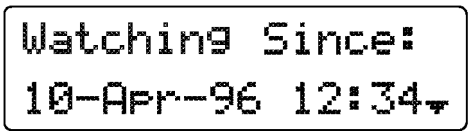


Figure 2–17: The SDA 601 Time Display

Time Display Mode. Press the **Time (F)** key to devote the SDA 601 display to the current date and time. If you wish to alternate the time display with previously-selected SLM or Cursor data, toggle the "Disp Cur Time" item On through the Display Select menu. The LCD will resemble Figure 2–17.

Review Display Mode. Press the **Review (G)** key to cancel the other display modes (SLM, Cursor, and Time) and review the results of the ongoing Watch session—or the most recent Analysis—on the LCD. Once you have pressed **Review (G)**, the SDA 601 display will resemble one of the two shown in Figure 2–18; use the ▼ key to review the status of individual Analyze or Watch items.



OR

Figure 2–18: The First Review Display

AUX Output Modes

Recall that the AUX output signal is "pseudo-video" that is decoded from the digital input signal. It may be viewed on an analog video monitor. The AUX output has three optional modes: the OSD (on-screen display), Pulse Cross, and

Highlighting. See page 2–9 for an explanation of the OSD; Pulse Cross and Highlighting are discussed in the following paragraphs.

Pulse Cross. Pulse Cross is an SDA 601 AUX output mode that allows the user to "see" the horizontal and/or vertical intervals, which are normally blanked in video monitors. The original four-word timing reference signals (TRS, which contain EAV and SAV) are replaced with legal video samples, and analog H and V sync information is inserted in the original active picture region. There are four pulse cross "states":

Normal — blanked intervals, the instrument default
HCross — reveals the "horizontal interval" region of the signal
VCross — reveals the "vertical interval" region of the signal
Both — combines HCross and VCross

To select among the four pulse cross states, press the **Pulse Cross (E)** key repeatedly until the desired state is visible on the video monitor.

To invoke pulse cross through the I/O menu:

1. Enter the I/O menu (press **Shift**, then **Insert On/Off**).
2. Press the ▼ key repeatedly to scroll down to the Pulse Cross menu item.
3. With the ◀ / ▶ keys, scroll to the desired pulse cross option.
4. Press **Enter** to select the new option.
5. Press any rectangular key to exit the I/O menu.

Highlighting. When the Highlighting option is selected, the SDA 601 "flashes" pixels in the AUX "video" output that correspond to certain Watch conditions. With highlighting, you can visually monitor the occurrence, placement, and prevalence of these signal conditions in the context of the video signal.

The following Watch conditions or errors can be highlighted on an attached video monitor:

- ANC packet format error (e.g., checksum or parity errors)
- Zero-length ANC packets
- Other ANC data (data that is neither audio nor EDH format)
- Incorrect line/field length
- Incorrect TRS/EAV/SAV format
- Illegal data values
- Out of range video levels

To use Highlighting:

1. Configure the SDA 601 to monitor one or more of the above items; see "Watching a Signal" beginning on page 14.
2. Enter the I/O menu (press **Shift**, then **Insert On/Off**).
3. The first I/O menu item is Highlighting. Use the ◀ or ▶ key to select "On, Dim Video" then press **Enter** to confirm the choice.

   Dim Video reduces the video signal by 50%, ensuring good contrast between the video signal and highlighted pixels.
4. Exit the I/O menu by pressing any rectangular key.
5. If necessary, start or restart the Watch session by pressing **Watch**.
6. The default OSD will obscure any highlighting in the portion of the picture that it occupies. Therefore, if the OSD is on, toggle it off with the **Insert On/Off** key.

A convenient way to see the effects of Highlighting is to set either the Data Value Group or the Video Over Range item to Watch, then input a Pluge signal. The "sub-black" portion of active video will be highlighted.

Note that the ANC highlight conditions occur in the horizontal or vertical interval. Use Pulse Cross to "see" those conditions.

Saving and Recalling Presets

The configuration of the SDA 601 at any given time may be saved as a Preset for later recall. Three different instrument configurations can be saved. Using presets, you can easily change between completely different combinations of (for instance) Watch conditions, alarm settings, LCD display options, and AUX output options. To save a Preset:

1. Enter the Presets menu (press **Shift**, then **Display Select**).
2. Press ▼ once to reach the Save Preset item.
3. Choose a preset storage location (1, 2, or 3) with the ◀ / ▶ keys. Remember that previous contents of the storage location will be overwritten in the next step.
4. Press **Enter** to save the current settings in the indicated location. "Working... Done" will appear on the LCD during the save process.
5. Press any rectangular key to exit the Presets menu.

To recall a previously saved Preset:

1. Enter the Presets menu.
2. Choose the Preset (1, 2, or 3) with the ◀ / ▶ keys.
3. Press **Enter** to recall the saved configuration. “Working... Done” will appear on the LCD. Some settings (I/O and Display settings, for example) will change instantly; Watch and Alarm settings will be restored in the next Watch session.
4. Press any rectangular key to exit the Presets menu.

NOTE. *Recalling a preset will turn Watch mode off.*

Software Reset

To reset the instrument NVRAM and restore the SDA 601 to “factory” default settings, select the Factory Reset item in the Utility/Diagnostics/NVRAM/TIC Dgs submenu. See page 3–6 for instructions.

CAUTION. *All user settings and presets will be lost.*

Performance Verification

Performance Verification Procedures

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.

Perform these verification procedures at regular intervals to ensure that instrument performance is within tolerance. The recommended frequency of performance verification is once every 2000 hours (approximately 12 months) of operation.

A performance verification checklist begins on page 3–3.

Step-by-step performance verification procedures begin on page 3–4.

Required Test Equipment

The following list of equipment represents the minimum required for the Performance Verification procedures. Alternate equipment must meet the minimum specifications for the listed equipment. Use of inadequate equipment may result in faulty measurements or calibration.

Table 3–1: Required Test Equipment

Item	Qty	Information/Requirements	Example
AC Adapter	1		Std. SDA 601 accessory
Cable Simulator		Able to simulate 25 and 150 meters of Belden 8281 coaxial cable.	Faraday Cable Clone
Video Measurement Set	1	Monochrome Picture Monitor Capability; 6.25% (or better) waveform amplitude measurement accuracy.	Tektronix 1780R or 1781R
75 Ω Coaxial Cables	3	Belden 8281 coax; Male/Male BNC ends	Tektronix 012-0159-00
75 Ω BNC Termination	1	0.025% precision	Tektronix 011-0102-01

Table 3–1: Required Test Equipment (Cont.)

Item	Qty	Information/Requirements	Example
Serial Digital Television Signal Generator	1	Generates (per CCIR 601): Equalizer SDI Checkfield 100% Color Bars Limit Ramp 60% Sweep; Erroneous FF CRC Erroneous AP CRC Zero-value (Ø) AP CRC	Tektronix TSG 601 or TSG 422
Spectrum Analyzer	1	Freq. Range: 325 MHz Sensitivity: up to 50 dB Internal tracking generator	Tektronix 2712 Option 04
N-to-BNC adapter	2	Male N to female BNC	Standard Tektronix 2712 accessory; Tektronix part number 103-0045-00
High Frequency RF Bridge	1	≥46 dB return loss sensitivity, 50 kHz to 325 MHz	Wideband Engineering part number A57TGACR
75 Ω BNC adapter	1	Male-to-male	Hewlett-Packard part number 1250-1288
Precision 50 Ω BNC cable	2		Tektronix part number 012-0482-00

Performance Verification Checklist

Use the following checklist if you are familiar with the operation of the SDA 601 as well as digital video performance verification techniques. Step-by-step instructions for all of the procedures begin on page 3–4.

1. Beeper and LCD display
2. OSD (on-screen display)
3. Keypad Test
4. AP CRC present, not 0
5. Erroneous FF CRC
6. Erroneous AP CRC
7. Ø AP CRC
8. Cursor and Data Values
9. Signal Level Meter Accuracy/Resolution
10. Current Time
11. Highlighting
12. Pulse Cross
13. Pixmon Y (white amplitude, sync amplitude, DC offset)
14. Pixmon R–Y Peak Amplitude
15. Pixmon B–Y Peak Amplitude
16. Serial Receiver Equalization
17. Print Report
18. Return Loss

Performance Verification Procedures

Use the following step-by-step procedures to verify that the SDA 601 meets published specifications (see Section 1 of this manual). The order of these procedures has been chosen to minimize changes in equipment setup. Performance parameters may be checked in any order.

Preparation

1. Connect the equipment as shown in Figure 3–1. Be sure all cable simulator switches are in the “OUT” position.

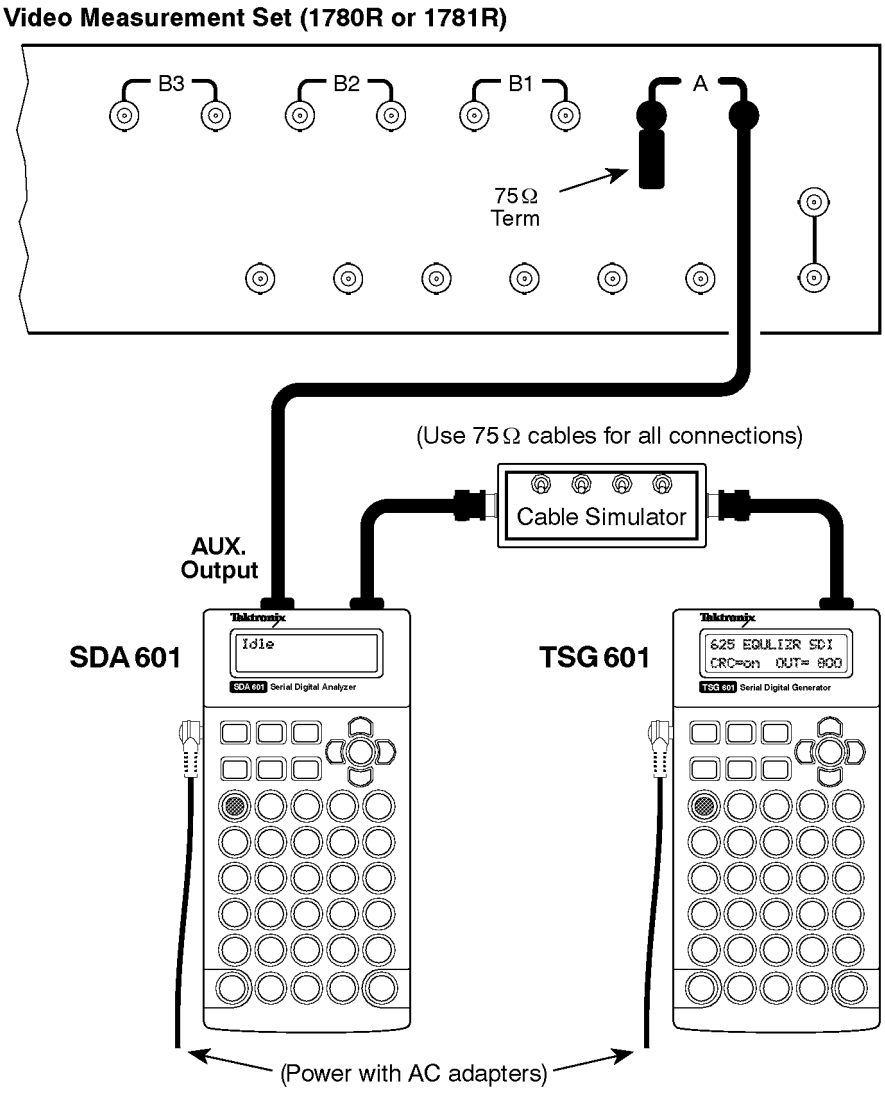


Figure 3–1: An Equipment Setup for Performance Verification

2. Switch the equipment on and allow a 20-minute warm-up. Set the front panel controls of the Tektronix 1780 (or 1781) as listed in Table 3–2.

Table 3–2: Initial Settings for the Video Measurement Set

Control	Setting
LEFT DISPLAY	PIX
RIGHT DISPLAY	WFM
INPUT	CH A
REF	INT
FILTER	FLAT
WFM HORIZONTAL	TWO, LINE
GAIN	NORMAL
MAGNIFIER	OFF

The picture on the Left Display of the Video Measurement Set should resemble Figure 3–2. If the center portion of the display does not contain the darker OSD (on-screen display) rectangle, press the SDA 601 **Insert On/OFF** button to toggle the OSD On.

Figure 3–2: AUX Output Containing the On-Screen Display (OSD)

3. To enter the SDA 601 Utility menu, hold the **Lock Out** key down and press the **ON** button. Release the **ON** button, but continue to press the **Lock Out** key until the display resembles Figure 3–3.

Figure 3–3: The Initial SDA 601 Utility Menu Display

4. Reset the SDA 601 software through the Utility:Diagnostics:NVRAM/TIC Dgs:Factory Reset menu item. To do so:

   - Press ▲ once to reach the "Diagnostics.." menu item, then press **Enter** to "drop into" the Diagnostics submenu.
   - Press ▼ three times to reach the "NVRAM/TIC Dgs.." menu item, then press **Enter** to "drop into" the NVRAM/TIC Dgs submenu.
   - Press ▲ twice to reach the "Factory Reset" menu item, then press **Enter**.

Procedures

Miscellaneous Functions

1. **Beeper and LCD display**

   a. Enter the SDA 601 Utility/Diagnostics/Device Tests submenu with the following steps:

   - Press the ▲ button once, then press **ENTER** to "drop into" the Diagnostics submenu.
   - Press the ▼ button twice, then press **ENTER** to access the Device Tests submenu. The first submenu item is "Test Beeper."

   b. Press **ENTER** to **verify** the function of the audible alarm "beeper."

   c. Press the ▼ button once to access the "LCD Pattern" menu item, then press **ENTER** to **verify** the function of all LCD pixels. All character blocks will cycle on, then off.

   d. Press the ▼ button once to end the LCD test and enter the next device test, "Clear OSD."

2. **OSD (on-screen display)**

   a. Continuing from procedure **1**, press the ▼ button once again to reach the "Fill OSD Screen" menu item.

   b. Press **ENTER**. Check the Left Display of the Video Measurement Set to **verify** that the OSD rectangle is filled with display characters.

3. **Keypad Test**

   a. Continuing from the previous procedure, press the ▼ button, then press **ENTER** to access the "Keypad Test" menu item.

   b. Press every SDA 601 key and button (except **ENTER** and **On**) one at a time. **Verify** that the name of each key/button is written to the second LCD line when the key or button is pressed.

   c. After you have verified the operation of the keypad, press **Watch** to exit the Utility menu.

Analyze Functions.

4. **APCRC present, not 0**

   a. On the TSG 601, press **M** to select the Equalizer SDI signal.

   b. If the TSG 601 LCD indicates "CRC=off," press **CRC On/Off** to toggle the CRC On.

   c. Enter the TSG 601 CRC menu by pressing **Shift**, then **CRC On/Off**.

   d. The TSG 601 display should indicate that both the Full-Field (FF) and Active-Picture (AP) CRCs are set to "NORM," as shown in Figure 3–4. If either CRC is *not* set to NORM, use the ◀ and ▶ keys to select between FFCRC and APCRC and the up/down keys to change the status. Press **ENTER** to confirm the changes. When you are done, the display should resemble Figure 3–4.

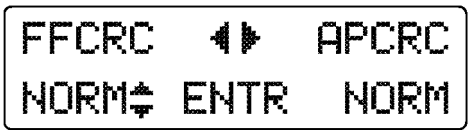


Figure 3–4: The TSG 601 Display Indicating Normal CRCs

   e. Press the SDA 601 **Analyze** button. The left measurement display will change to resemble Figure 3–5; this is the first "page" of the OSD analysis report.

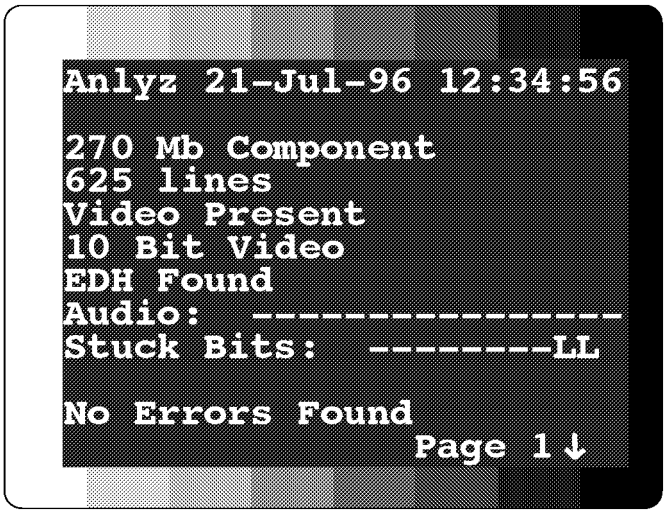


Figure 3–5: The Analyze OSD

f. Press ▼ on the SDA 601 to view the second page of the analysis report. **Verify** that this page contains the following lines:

```
No Illegal Value
Video in Range
Line/Fld Len OK
TRS OK
ANC Format OK
NO Zero Len ANC
```

g. Press ▼ on the SDA 601 to view the third page of the analysis report. **Verify** that this page contains the following lines:

```
NO AP CRC Change
NO FF CRC Change
NO AP EDH Errors
NO FF EDH Errors
AP CRC NOT Ø
EDH Flag NOT Set
```

5. Erroneous FF CRC

a. Continuing from procedure 4, use the TSG 601 arrow keys to change the FFCRC status to ERR (error), and press **Enter** to confirm the status. The display will resemble Figure 3–6.

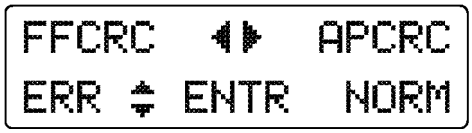


Figure 3–6: The TSG 601 Display Indicating an Erroneous FFCRC

b. Press the SDA 601 **Analyze** button. The instrument will analyze the incoming signal and, in a few seconds, return to the first page of the analysis report.

c. **Verify** that page 1 of the analysis report contains the line:

```
Errors Found
```

d. Press the SDA 601 ▼ button twice to view the third page of the analysis report on the video measurement set. **Verify** that this page contains the line:

```
NO AP EDH Errors
FF EDH Errors       Error
```

6. Erroneous AP CRC

a. Continuing from procedure 5, use the TSG 601 arrow keys to change the FFCRC status back to normal, and the APCRC status to ERRO (error). The display should resemble Figure 3–7. Press **Enter** to confirm the status.

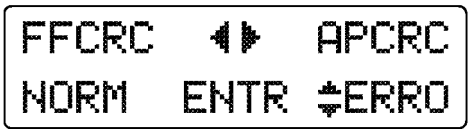


Figure 3–7: The TSG 601 Display Indicating an Erroneous APCRC

b. Press the SDA 601 **Analyze** button. The instrument will analyze the incoming signal and, in a few seconds, return to the first page of the analysis report.

c. **Verify** that page 1 of the analysis report contains the line:

```
Errors Found
```

d. Press the SDA 601 ▼ button twice to view the third page of the analysis report on the video measurement set. **Verify** that this page contains the lines:

```
AP EDH Errors       Error
NO FF EDH Error
AP CRC NOT Ø
```

7. Ø AP CRC

a. Continuing from procedure 6, use the TSG 601 arrow keys to change the APCRC status to ZERO (Ø). The display should resemble Figure 3–8. Press **Enter** to confirm the status.

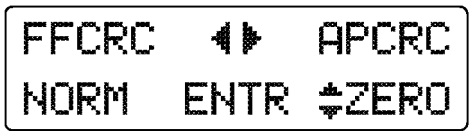


Figure 3–8: The TSG 601 Display Indicating a Zero APCRC

b. Press the SDA 601 **Analyze** button. The instrument will analyze the incoming signal and, in a few seconds, return the OSD to the first page of the analysis report.

c. **Verify** that page 1 of the analysis report contains the line:

```
Warnings Found
```

d. Press the SDA 601 ▼ button twice to view the third page of the analysis report on the video measurement set. **Verify** that this page contains the lines:

```
NO AP EDH Errors
NO FF EDH Errors
AP CRC is Ø
```

Display Options

8. Cursor and Data Values

a. Confirm that the TSG 601 signal still contains NORMal FFCRC and Ø APCRC. The generator CRC Menu display should still resemble Figure 3–8. Press the TSG **Test Signals** key to exit the CRC menu, then press **B** to output the 100% Color Bars signal.

b. Press the SDA 601 **Cursor (B)** key to invoke the Cursor Display mode. The SDA display should resemble Figure 3–9.

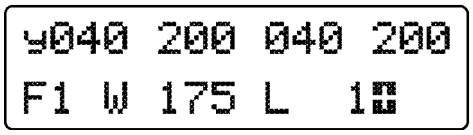


Figure 3–9: The SDA 601 Cursor Display

c. Move the Cursor vertically to the indicated line.

- For 525 line signals, press the SDA 601 ▲ key once. **Verify** that the second line of the LCD reads "F2 W 175 L262"
- For 625 line signals, press the SDA 601 ▼ key four times. **Verify** that the second line of the LCD reads "F2 W 175 L 5"

d. Press the SDA **Shift** key twice to enter "shift-lock" mode. Shift-lock mode "accelerates" cursor movement.

e. Press ◀ repeatedly until the second line of the LCD reads:

- For 525 line signals, "F2 W1435 L262"
- For 625 line signals, "F1 W1707 L 5"

f. **Verify** that the sample values on the top line of the LCD are:

- For 525 line signals, "Y2AØ 2ØØ ØC4 ØE4"
- For 625 line signals, "y2ØØ 2ØØ 18Ø 1C8" (note lowercase "y")

g. While watching the left "PIX" display of the video measurement set, press and hold the SDA 601 ▲ key; **verify** that the horizontal cross hair is visible and moving towards the top of the picture. Release the ▲ key.

h. Continue to watch the PIX display and press and hold the SDA ◀ key; verity that the vertical cross hair is visible and moves from right to left in the picture. (Note that you may have to hold the key down a few seconds before the cross hair becomes visible on the right edge of a 625-line picture.) Release the ◀ key.

i. Press **Shift** to exit the SDA 601 shift-lock mode.

9. Signal Level Meter Accuracy/Resolution

a. On the TSG 601, press **M** to select the Equalizer SDI signal.

b. Confirm that all switches on the cable simulator (or attenuator) are in the OUT position.

c. On the SDA 601, press **A** (**SLM**) to display the signal level meter. **Verify** that 0, 1, or 2 meter segments are "on," and note the number.

d. Set the cable simulator to 25 meters (if you are using a variable attenuator, set it to 2.5 dB).

e. **Verify** that 1 or 2 more meter segments are "on" than in step **c**.

10. Current Time

a. Press the SDA 601 **Time (F)** key.

b. **Verify** that the current date and time are correct.

I/O Menu.

11. Highlighting

a. On the TSG 601, press **F** to select the "Limit Ramp" signal. Confirm that the limit ramp signal is visible on the left display of the video measurement set.

b. Enter the SDA 601 Watch menu (press **Shift**, then **Watch**). The LCD will resemble Figure 3–10.

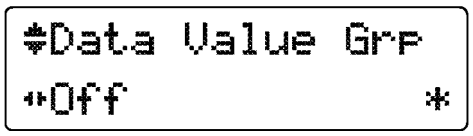


Figure 3–10: The First Watch Menu Display

c. Press the SDA 601 ▶ key once to toggle the second line to "Watch." Press **Enter** to confirm the change.

d. Press **Watch**.

e. If the OSD is present on the left display of the video measurement set, press **Insert On/Off** (on the SDA 601) to toggle the OSD off.

f. Enter the SDA 601 I/O menu (press **Shift**, then **Insert On/Off**). The LCD will resemble Figure 3–11.

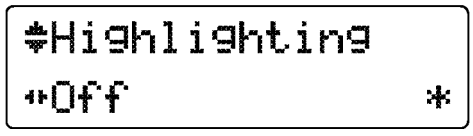


Figure 3–11: The I/O Menu/Highlighting Item Display

g. Press the SDA 601 ▶ key once to change the second display line to "On." Press **Enter** to confirm the change.

h. **Verify** that the "sub-black" region of the picture alternates ("flashes") between the original luminance level and white.

i. Press the SDA 601 ▶ key once to change the second line to "On, Dim Video." Press **Enter** to confirm the change.

j. **Verify** a reduction (approximately 50%) in the picture brightness. **Verify** that the sub-black region of the picture continues to flash, and that the "over-white" region of the ramp alternates beween its new (50% gray) level and white.

k. Press the SDA 601 ▶ key once more to change the second display line to "Off." Press **Enter** to remove Highlighting from the picture.

12. Pulse Cross

a. Continuing from the previous procedure, press the SDA ▼ key once to reach the Video Cursor item of the I/O menu. If this item is set to "Display," press ▶ to change the second display line to "No Display," and then press **Enter** to confirm the change.

b. Press any rectangular SDA 601 key to exit the I/O menu.

c. On the TSG 601, press **J** to select the "60% Sweep" signal. Confirm that the sweep signal is visible on the left "PIX" display of the video measurement set.

d. Press the SDA 601 **Pulse Cross** key once; **verify** that the "horizontal blanking" region is visible (as a dark vertical band) on the left measurement set display.

e. Press the SDA 601 **Pulse Cross** key once again; **verify** that the "vertical blanking" region is visible (as a dark horizontal band) on the measurement set display.

f. Press the **Pulse Cross** key a third time; **verify** that both vertical and horizontal blanking regions are visible on the left measurement set display.

g. Press the **Pulse Cross** key one last time to return the picture to normal.

AUX Output.

13. Pixmon Y (sync amplitude, peak amplitude, DC offset)
Specifications: 300 ± 75 mV; 700 ± 175 mV; ≤ 500 mV

a. On the TSG 601, press **B** to select the 100% Bars signal. Confirm that the 100% Bars signal is visible on the measurement set PIX display.

b. Enter the SDA 601 I/O menu by pressing **Shift**, then **Insert On/Off**.

c. Press the SDA ▲ key once to reach the AUX menu item. Confirm that the current setting (on the second LCD line) is "Pixmon Y."

d. Select the voltage cursors on the right measurement set waveform display. Use the cursors to **verify** that the Sync amplitude of the SDA 601 output is between 225 mV and 375 mV.

e. Use the measurement set voltage cursors to **verify** that the peak Y amplitude of the SDA 601 output is between 525 and 875 mV (700 ± 175 mV) above blanking level.

f. Through the measurement set CONFIGURE touch-display, set the input coupling to GND and adjust the trace to a convenient ground reference.

g. Change the measurement set coupling back to DC and **verify** that blanking level is at 0 V ± 500 mV.

14. Pixmon R–Y Peak Amplitude

Specification: 700 ± 175 mV

a. Continuing from procedure **13**, press the SDA ▶ key once to change the AUX output choice to "Pixmon R–Y." Press Enter to confirm the choice.

b. Use the measurement set voltage cursors to **verify** that the peak R–Y amplitude is between 525 and 875 mV above blanking level.

15. Pixmon B–Y Peak Amplitude

Specification: 700 ± 175 mV

a. Continuing from procedure **14**, press the SDA ▶ key once to change the AUX output choice to "Pixmon B–Y." Press Enter to confirm the choice.

b. Use the measurement set voltage cursors to **verify** that the peak B–Y amplitude is between 525 and 875 mV above blanking level.

c. Press the SDA ▶ key once again to change the AUX output choice back to "Pixmon Y." Press Enter to confirm the choice.

Input Characteristics.

16. Serial Receiver Equalization

Specification: Proper operation with 800 mV launch amplitude and up to 15 dB loss at 135 MHz, using coaxial cable with $1/\sqrt{f}$ loss characteristics.

a. At the TSG 601, press the **B** key to select the 100% Color Bars signal.

b. Confirm that the Color Bars and the OSD are visible on the measurement set PIX monitor. Toggle the OSD On, if necessary, by pressing **Insert On/OFF** (on the SDA).

c. Through the SDA 601 Watch menu, set the EDH group to "Watch" and all other groups to "Off."

- Press **Shift**, then **Watch** to enter the Watch menu.
- Use the ▲ and ▼ keys to select the watch groups.
- Use the ◀ and ▶ keys to select the appropriate state (Off or Watch), then press **Enter** to confirm the selection.
- When all groups are set correctly, press any rectangular key to exit the Watch menu.

d. Set the cable simulator to 150 meters (set an attenuator to 15 dB).

e. **Verify** that the PIX monitor video is still stable.

f. Press the SDA 601 **Watch** key to initiate Watch mode.

g. Press the SDA ▼ key to change to OSD page five; it will resemble Figure 3–12.

Figure 3–12: Page Five of the Watching OSD

h. Allow the instrument to run for at least 2.5 minutes.

i. Check the OSD to **Verify** that no EDH errors have occurred.

RS-232 Port.

17. Print Report

a. Connect a cable wired as shown in Figure 3–13 between the SDA 601 RS-232 connector and the DB25 COM2 port of a personal computer.

b. At the PC, run the Terminal accessory of Microsoft® Windows™, or another communications application.

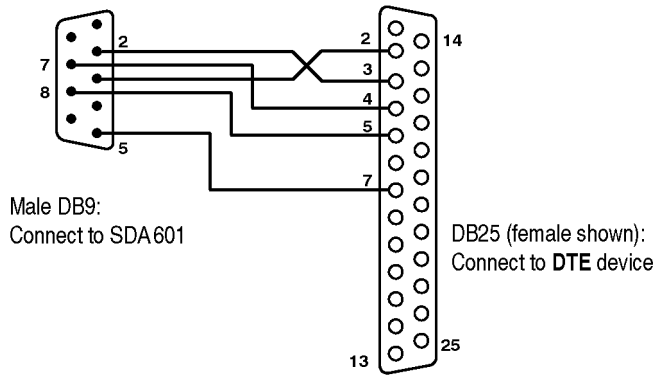


Figure 3–13: SDA 601-to-PC Cable Connections

c. Set the PC communications parameters:

- Baud = 9600
- Data Bits = 8
- Stop Bits = 1
- Parity = none
- Flow control = Software (Xon/Xoff)
- Connector = COM2

d. Set the following parameters in the SDA 601 Utility:Printer Setup submenu:

- Page Limit = 10
- Top of Form = Form Feed
- Lines per Page = 60
- End of Line = CR and LF
- Flow Control = Software(XOFF)

e. Set the following parameters in the SDA 601 Utility:RS232 Setup submenu:

- Baud Rate = 9600
- Set Parity = None

f. Press **Shift**, then **Analyze** on the SDA 601. **Verify** that the PC receives a Analysis report similar to the one shown in Figure 2–5.

18. Return Loss

Specification: ≥ 15 dB from 1 MHz to 270 MHz, power On.

a. Connect a precision 50 Ω cable from the spectrum analyzer TG output to the RF input of the RF bridge.

b. Connect a precision 50 Ω cable from the spectrum analyzer RF input to the RF output of the RF bridge.

c. Connect a **75 Ω** male-to-male BNC adapter to the RF bridge "device under test" connector. The equipment setup should now resemble the arrangement illustrated in Figure 3–14.

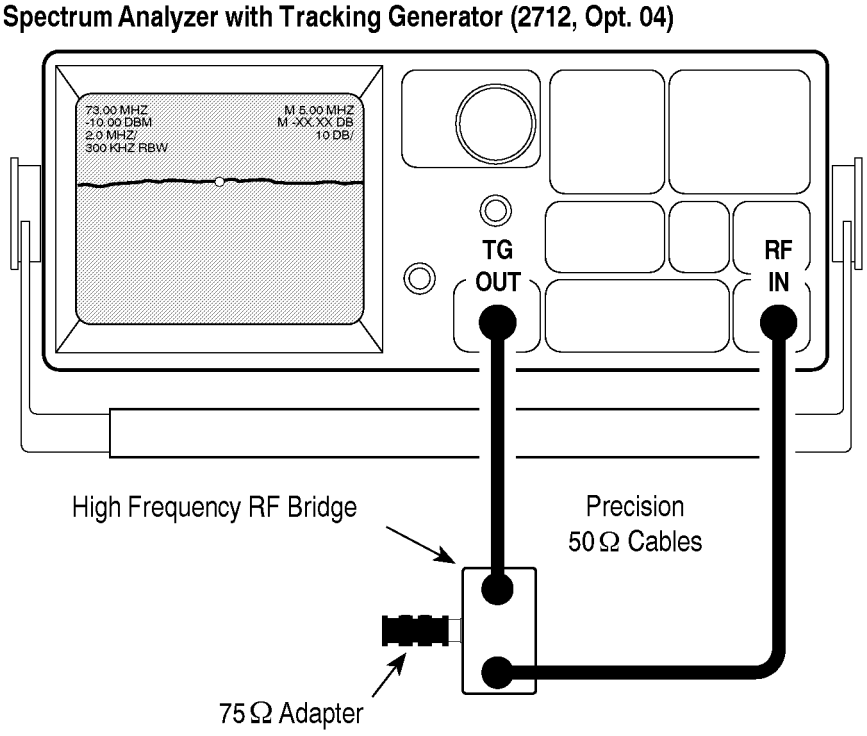


Figure 3–14: Initial Return Loss Setup

d. Through the spectrum analyzer DEMOD/TG Menu, switch the tracking generator ON and set the FIXED LEVEL to 0.00 dBm. Exit the DEMOD/TG menu.

e. Set the spectrum analyzer:

- Span/div to 50 MHz;
- Vertical scale to 10 dB (per division);
- Frequency range to 300 MHz; and
- Resolution bandwidth to 300 kHz.

f. Turn the spectrum analyzer marker (MKR) ON and set it to 270 MHz.

g. Through the Input menu, set EXTERNAL ATTEN/AMPL to 0 dB.

h. Set the spectrum analyzer reference level to the first major division down from the top on the analyzer display.

i. Note the reference level readout. This number will depend on the characteristics of the RF Bridge and connecting cables.

j. Enter the Input Menu again and set the EXTERNAL ATTEN/AMPL Amplitude to offset the reference level noted in the previous step. (For example, if the Reference Level reading was –24.5 dBm, enter 24.5, then press the – dBx key.)

k. Confirm that the reference level readout is now –0.00 dB.

l. Connect the RF Bridge Device Under Test connector (with the 75 Ω Male-to-Male BNC adapter) to the SDA 601 Serial Input. The BNC adapter eliminates the need for a cable between the Bridge and the SDA, and increases the accuracy of this measurement.

m. Confirm that the SDA 601 is switched on, then **Verify** that the spectrum analyzer reference level readout is ≥ 15 dBm (that is, at least 15 dBm down), and that the spectrum analyzer trace is below the reference level at every frequency below the marker frequency.

Adjustment Procedures

Adjustment Procedures

This section consists of a detailed adjustment procedure that you may used to return the instrument to in-spec operation. Equipment that is called out in this procedure is assumed to be operating correctly and within calibration.

Adjust the Signal Level Meter once every 2000 hours or one year of operation. Adjust the Deserializer VCO if the instrument fails to meet the Serial Receiver Equalization specification during Performance Verification (see the previous Section).

Perform these procedures in any convenient order. Note, however, that the instrument must be “cold” (at room temperature, and switched Off for several hours) when you begin the Signal Level Meter adjustment procedure.

Step-by-step adjustment procedures begin on page 4–2.

Required Test Equipment

The following list of equipment represents the minimum required for the Performance Verification and Adjustment procedures. While alternate equipment may be used, it is not recommended. Alternate equipment must meet the minimum specifications for the listed equipment. Use of inadequate equipment may result in faulty measurements or calibration.

Table 4–1: Required Test Equipment

Item	Qty	Information/Requirements	Example
AC adapter	1		Std. SDA 601 accessory
Serial Digital Television Signal Generator	1	Generates (CCIR rec 601) Equalizer SDI Checkfield	Tektronix TSG 601 or TSG 422
Cable Simulator	1	Able to simulate 100, 200, and 300 meters of Belden 8281 coax cable.	Faraday Cable Clone
75 Ω Coaxial Cables	2	Belden 8281 coax; Male/Male BNC ends	Tektronix 012-0159-00

Adjustment Procedures

Adjust SLM (Signal Level Meter)

To ensure greatest accuracy of the SDA 601 Signal Level meter over the entire range of operating temperatures, perform this two-part procedure once every twelve months. Please read completely through the following procedure before attempting to adjust the SLM.

The first "pass" *must* be conducted on a "cold" instrument at room temperature (approximately 20° C = 68° F). For best results, leave the SDA 601 switched Off overnight and perform steps **4a** through **4g** immediately after switching the instrument On. The second pass (step **6**) must be conducted after the instrument has operated (On, but not Watching) at an elevated ambient temperature (approximately 50° C = 122° F) for at least one hour.

The instrument software saves and uses the "cal factors" from the two most recent "Calibrate SLM" sequence; thus, for proper adjustment, both parts of this procedure must be completed *in order* (cold, then hot).

1. Connect the equipment as shown in Figure 4–1.

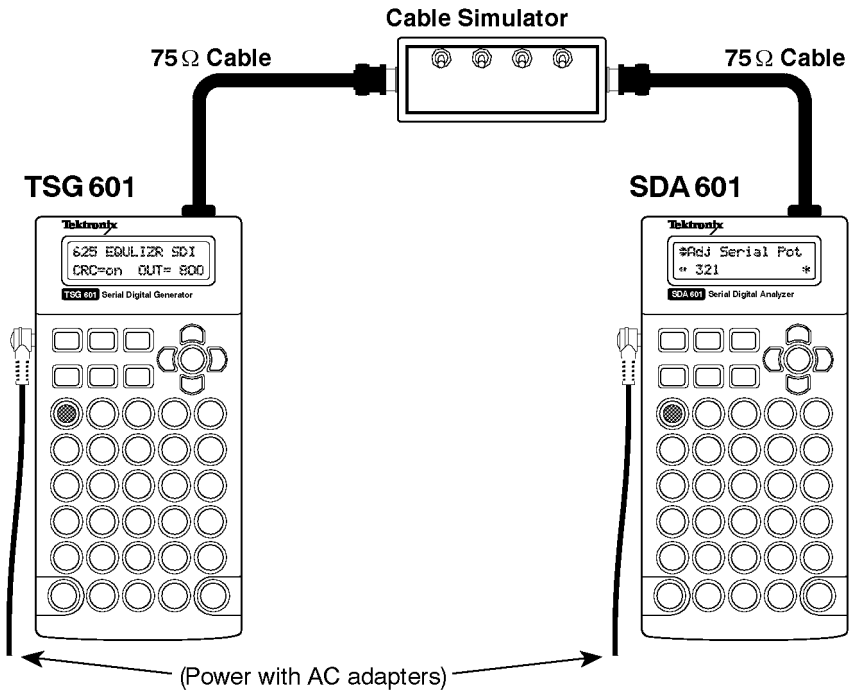


Figure 4–1: A Setup for SLM Adjustment

2. Press the TSG 601 **M** key to select the EQULIZR SDI (Equalizer SDI Checkfield) signal.

3. Switch the SDA 601 On.

4. Perform the first, room temperature pass of the Calibrate SLM sequence.

   a. Select the SDA 601 Utility/Diagnostics/Calibration/**Calibrate SLM** menu item with the following steps:

      - Hold the **Lock Out** key down, and press the **ON** button.
      - Press the ▲ key once, then press **ENTER** to access the Diagnostics submenu.
      - Press the ▲ key four times, then press **ENTER** to access the Calibration submenu.
      - Press **ENTER** again to begin the SLM calibration sequence. The display will resemble Figure 4–2 (note that the number on the second line is unlikely to be 160).

Figure 4–2: The First SLM Calibration Display

   b. Verify that all switches on the cable simulator or attenuator are in the OUT (0 meters) position, then press the SDA 601 **ENTER** button.

   c. The SDA 601 LCD will be blank for a few seconds. Wait until the message “Set to 100 meter” appears on the top line of the LCD. Set the cable simulator to 100 meters (if using an attenuator, set it to 10 dB), then press the SDA 601 **ENTER** button.

   d. Wait until the message “Set to 200 meter” appears on the LCD. Set the cable simulator to 200 meters (or attenuate by 20 dB), then press the SDA 601 **ENTER** button.

   e. Wait until the message “Set to 300 meter” appears on the LCD. Set the cable simulator to 300 meters (set attenuator to 30 dB), then press the SDA 601 **ENTER** button.

   f. Wait until the message “Press Enter to Save Cal Factors” appears on the LCD. Press **ENTER** to complete the sequence.

g. Wait until the "Calibrate SLM; Saving" message disappears from the SDA 601 display to ensure acceptance of the new Cal Factors.

5. Place the SDA 601 in an elevated temperature (50° C = 122° F) environment for at least one hour. Power the instrument with an AC adapter and leave it switched On, but do not provide an input signal.

***NOTE**. If no suitable oven is available for operating the SDA 601 at an elevated ambient temperature, you may substitute the following procedure for step **5**:*

- *Leave the instruments connected as shown in Figure 4–1; set all cable simulator (or attenuator) switches to the OUT position.*
- *At the TSG 601, press the **G** key to select the Shallow Ramp test signal; set the ramp amplitude to 4 with the ◀ and ▶ keys; and turn the Cb and Cr output channels* off *through the "Channel Output Selection" item in the Output Menu. (If using a Tektronix TSG 422 as the signal source, simply set it to output the Digital Gray test signal.)*
- *Press the SDA 601 **Watch** button to start (or restart) the Watch mode.*
- *Operate the TSG/SDA combination with these settings for* at least *two hours, then proceed to the next step.*

---

6. Repeat the Calibrate SLM sequence (steps **4a** through **4g**).

Adjust the Deserializer VCO ("Serial Pot")

The Serial Pot settings influence the ability of the SDA 601 to meet the Serial Receiver Equalization specification.

1. Connect the equipment as shown in Figure 4–3.

2. Power up the TSG 601 and SDA 601. Allow a 20-minute warm-up.

3. At the TSG 601, press the **M** key to select the EQULIZR SDI (Equalizer SDI Checkfield) signal.

4. Press the SDA 601 **Watch** button to initiate the watch mode.

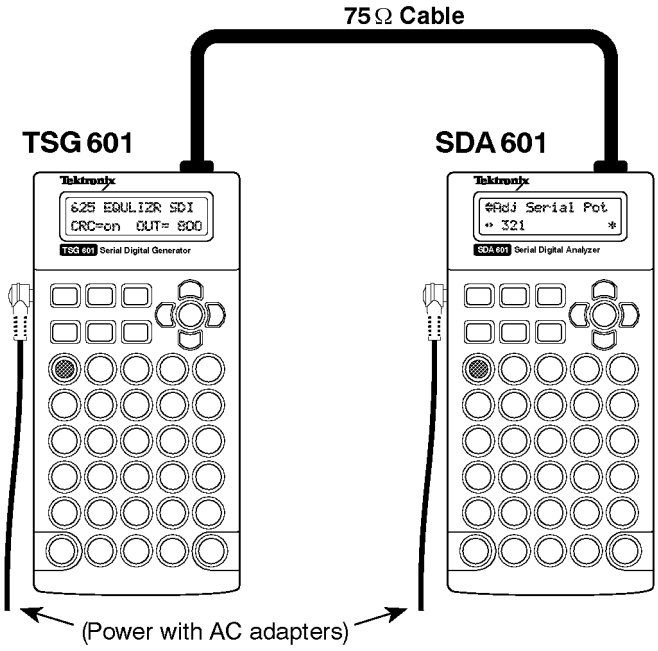


Figure 4–3: A Setup for Adjusting the De-serializer VCO

5. Select the SDA 601 Utility/Diagnostics/Calibration/**Adj Serial Pot** menu item with the following steps:

- Hold the **Lock Out** key down, and press the **ON** button.
- Press the ▲ key once, then press **ENTER** to access the Diagnostics submenu.
- Press the ▲ key four times, then press **ENTER** to access the Calibration submenu.
- Press the ▼ key. The SDA 601 LCD should now resemble Figure 4–4 (the value of the adjustment will be between the minimum of Ø and the maximum of 511; it is unlikely to be 321 as shown).

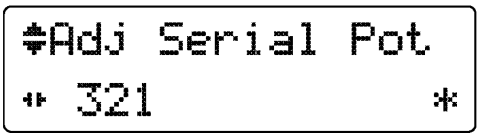


Figure 4–4: The "Adj Serial Pot" Menu Item

6. Enter a value of zero by pressing the SDA 601 **0/Z** key, and then **ENTER**. The display will resemble Figure 4–5. The letter "E" may appear on the second display line as shown, indicating VCO lock error. If the letter E is visible (either constantly, or flashing on and off), continue with the next step; if the "E" is *not* present, note that the lower permissible value is Ø and proceed to step **8**.

Figure 4–5: The VCO Lock Error Indicator

7. Press and hold the ▶ key down until the "E" disappears from the display, then press the ◀ key repeatedly until it returns. Adjust the setting until you have discovered the lowest possible "no E" value. Note this value for later use.

8. Enter a Serial Pot value of 511 by pressing **5/R**–**1/L**–**1/L**, and then **ENTER**. As in step **6** (above), the "E" may appear on the second display line to indicate VCO lock error. If so, continue to the next step; if not, note that the higher permissible value is 511 and proceed to step **10**.

9. Press and hold the ◀ key down until the "E" disappears from the display, then press the ▶ key repeatedly until it returns. Adjust the setting until you have discovered the highest possible "no E" value. Note this value.

10. Subtract the low "no E" value from the high value, multiply the remainder by 0.6, and add the product to the low value. The result is the appropriate "Serial Pot" value for this SDA 601.

For example, if the lowest possible value discovered in step **7** was 45, and the highest value—from step **9**—was 492, the correct Serial Pot value would be:

$$[(492 - 45) \times 0.6] + 45 = 313.2$$

11. Round *your* result (not the example!) from the previous step to the nearest integer, and enter the value with the SDA 601 numeric keys; press **ENTER** twice to confirm the new setting. When this step is complete, the display should again resemble Figure 4–4, with the asterisk (*) at the end of the second line.

Set the Date and Time

During normal instrument operation, press the **Time (F)** key. If the date or time displayed on the LCD is incorrect, follow these steps to reset the internal clock.

1. Enter the SDA 601 Utility menu by holding **Lock Out** down, while pressing the **ON** key.
2. Once in the Utility menu, use the ▲ and ▼ keys to scroll to the Set Time item, and press **Enter**. The instrument display will change to resemble Figure 4–6.

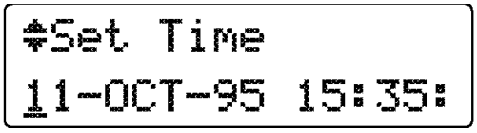


Figure 4–6: The "Set Time" Display

3. The underline cursor indicates the active character position. Move the cursor with the ◀ and ▶ keys. Enter the appropriate character from the SDA 601 keypad. When the cursor is in positions that require numeric entry, the keys will be automatically shifted. When you enter an appropriate character for the field, the cursor will move one position to the right. The acceptable month abbreviations are the first three characters of the English name: JAN; FEB; MAR; APR; MAY; JUN; JUL; AUG; SEP; OCT; NOV; DEC.

   Enter the time in 24 hour format; that is, if the present time is 4:15 pm, enter 16:15.

4. When the correct date and time is shown on the display, press **Enter**. If all values are valid, the instrument will respond with the message "Time Accepted." If you have made an error and entered an invalid date or time, the instrument will respond with an appropriate error message. If that happens, correct the error and press enter.
5. Press any rectangular key to exit the Utility menu, or proceed to other preliminary settings, as appropriate.

Maintenance

Maintenance

Subsections are: Battery Hints; Preventive Maintenance; Troubleshooting Aids; and Corrective Maintenance.

Battery Hints

For optimal battery life and capacity, use the rechargeable NiCad battery pack (Tektronix p/n 119-4488-00) in full charge/discharge cycles. In other words, fully discharge the battery pack before recharging, and then charge the battery pack until fully charged, approximately 16 hours. A new battery pack will take a few charge/discharge cycles to reach full capacity.

The Battery Type, Auto Power Down, and LCD Backlight functions in the Utility/Diagnostic/Power Manage submenu also have an impact on battery life. The battery types are disposable (Alkaline) or rechargeable (NiCad). The battery type setting determines the voltage threshold for display of the “battery low” message, and also controls the cut-off voltage for instrument operation. Be sure this setting matches the type of battery installed in the SDA 601. (See page 2–11)

The Auto Power Down function, when enabled, switches the SDA 601 Off to conserve battery life after approximately 10 minutes with no keypress. Auto Power Down is indicated by a “rotating” line symbol that is visible (depending on other display messages) in the middle of the second display line. (See page 2–11.)

“Timed Turn Off” of the LCD Backlight is another charge-saving measure, and is the factory default setting. When it is selected, the LCD backlight will be extinguished after approximately three minutes of instrument inactivity. (See page 2–12.)

Preventive Maintenance

Under average conditions, the SDA 601 should have preventive maintenance performed about every 2000 hours. This is approximately one year of operation. Preventive maintenance includes cleaning, visual inspection, a performance verification and, if necessary, adjustment. See Section 3 for performance verification, and Section 4 for adjustment procedures.

Cleaning

Clean the instrument often enough to prevent dust and dirt from accumulating in or on it. Dirt can provide high-resistance electrical leakage paths between conductors or components in a humid environment.

CAUTION. *The SDA 601 case is made of molded plastic. Do not allow water to get inside of any enclosed assembly or component. Do not clean any plastic materials with organic cleaning solvents, such as benzene, tuolene, xylene, acetone, or similar compounds, because they may damage the plastic.*

Static-Sensitive Components

The SDA 601 contains electrical components that are susceptible to damage from static discharge. Static voltages of 1 kV to 30 kV are common in unprotected environments.

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

Observe the following precautions to avoid static damage:

- Minimize handling of static-sensitive components.
- 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.
- Discharge the static voltage from your body by wearing a wrist strap while handling these components. Servicing static-sensitive assemblies or components should only be performed at a static-free workstation by qualified personnel.
- Nothing capable of generating or holding a static charge should be allowed on the workstation surface.
- Keep the component leads shorted together whenever possible.
- Pick up components by the body, never by the leads.
- Do not slide the components over any surface.
- Avoid handling components in areas that have a floor or work surface covering capable of generating a static charge.
- Use a soldering iron that is connected to earth ground.
- 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.

Diagrams

The circuit number and electrical value of each component is shown on the schematic diagrams. The first page in the Diagrams section (Section 7) explains the schematic symbols and notations found on the diagrams. The Replaceable Electrical Parts list gives a complete description of each component. Circuit boards and assemblies are shown with a heavy border, for identification. If the border does not completely encircle the schematic then that schematic only portrays part of the circuitry on that board or assembly. The name and assembly number of the circuit board are shown along the border as well as the serial number range that the schematic represents.

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 a preceding diagram.

Numbering

The circuit board assemblies are assigned assembly numbers starting with A1.

Circuit boards have been assigned an assembly number so that they may be ordered from Tektronix, Inc. The assembly numbers are as follows:

A1 Main Board Assembly

A2 Keypad Board Assembly

A3 LCD Board Assembly

A4 I/O Board Assembly

The part numbers for ordering these boards are listed first in the Replaceable Electrical Parts list (EPL), in Section 6.

The EPL is arranged in assembly-by-assembly order, as designated in ANSI Standard Y32.16-1975. Each component is assigned a circuit number according to its location within a circuit, which is shown in the parts list by combining the assembly number and the circuit number.

EXAMPLE: R123 on assembly A2 would be listed in the EPL as A2R123.

Assembly listings in the EPL are followed by circuit board-mounted parts in alphanumeric order. Chassis-mounted parts are listed at the end of the EPL.

***NOTE**. The complete part number shown in the parts list should be used when ordering replacement parts.*

Self-Diagnostics

Several self-diagnostic tools are built in to the instrument software. Most of these tools may be found in the Utility/Diagnostics submenu.

The Diagnositics submenu is the last item in the Utility menu. Enter the Utility menu when the instrument is in a normal operating mode—that is, not in a menu—by holding **Lock Out** down while pressing **ON**. Once in the Utility menu, select the Diagnostics submenu by pressing the ▲ key once; then **ENTER** to access the Diagnostics choices, which are listed below. Some of the Diagnostic submenu items are explained in other parts of this manual, or in the SDA 601 User manual; the remaining submenu items are discussed after this listing.

(1) ⇳ Show SW/FW Vers
Press Enter

(2) ⇳ Power Manage ..
Press Enter

(a) ⇳ Battery Type
Rechargeable **<>** Alkaline

(b) ⇳ LCD Backlight
Timed Turn Off **<>** On all the time

(c) ⇳ Auto Power Off
Disabled **<>** Enabled

(d) ⇳ Previous Menu
Press Enter

(3) ⇳ Device Tests ..
Press Enter

(a) ⇳ Test Beeper
Press Enter

(b) ⇳ LCD Pattern
Press Enter

(c) ⇳ Clear OSD
Press Enter

(d) ⇳ Fill OSD Screen
Press Enter

(e) ⇳ Keypad Test
Press Enter

(f) ⇳ RS232 loop back
Press Enter

(g) ⇳ Disp RS232 outs
Off **<>** On

(h) ⇳ Disp SLM Numeri
Off **<>** On

(i) ⇳ Previous Menu
Press Enter

(4) ⇳ NVRAM/TIC Dgs..
Press Enter

(a) ⇳ Get TIC Serial
Press Enter

(b) ⇳ Get TIC Time
Press Enter

(c) ⇳ Read TIC Memory
<> 0

(d) ⇳ Factory Reset[1]
Press Enter

(e) ⇳ Previous Menu
Press Enter

(5) ⇳ Flash Diags..
Press Enter

(a) ⇳ Checksum Memory
Press Enter

(b) ⇳ Read Byte 10000
Press Enter

(c) ⇳ Writ Byte 10000
MIN = 0 **<>** MAX = 255

(d) ⇳ Erase Sec 10000
Press Enter

(e) ⇳ Read SLM Cals
Press Enter

(f) ⇳ Write Byte Loop
MIN = 0 **<>** MAX = 255

(g) ⇳ Previous Menu
Press Enter

(6) ⇳ Calibration..
Press Enter

(a) ⇳ Calibrate SLM
Press Enter

(b) ⇳ Adj Serial Pot
MIN = 0 **<>** MAX = 511[2]

(c) ⇳ Show Curr Temp
Press Enter

(d) ⇳ Set Manuf Watch
Press Enter

(e) ⇳ Previous Menu
Press Enter

(7) ⇳ FW Upgrade ..
Press Enter

[1] **This will reset the instrument to factory defaults; all current user settings will be overwritten.**

[2] **This value is adjusted during manufacture. To be changed only by qualified service personnel; see page 4–4.**

(a) ⇳ Show Cur Bank
Press Enter
(b) ⇳ Download
Press Enter
(c) ⇳ Copy B1 to B∅
Press Enter
(d) ⇳ Previous Menu
Press Enter

(8) ⇳ Write Test Reg
tr: 0 **<>** 255

(9) ⇳ Previous Menu
Press Enter

Submenu items explained.

1. Show SW/FW Vers — Press **ENTER** to discover the Software Version (SWV) and Gate Array Version (GAV) installed in your particular SDA 601.

2. Power Manage .. *see page 5–4*

3. Device Tests ..

a. Test Beeper *see page 3–6*

b. LCD Pattern *see page 3–6*

c. Clear OSD *self explanatory; used with the next item.*

d. Fill OSD Screen *see page 3–6*

e. Keypad Test *see page 3–7*

f. RS232 loop back — This is a test of the SDA 601 RS-232 hardware. To perform this test, short conductors two and three (pins 2 and 3) of the RS-232 connector, then press **ENTER**. The first line of the LCD will indicate “RS232 looping bk.” Watch the display for at least ten seconds; the hardware is operating correctly if no error messages appear (to see the error message, remove the short and watch the display for approximately five seconds).

g. Disp RS232 outs — This diagnostic was used during product development and is not intended for servicing the instrument. When “On” is selected, the number of unsent characters in the RS-232 buffer are displayed—in some circumstances—on the LCD.

h. Disp SLM Numeri (Display SLM Numeric data) — This item was used in developing the signal level meter (SLM) and the algorithm used to calculate temperature-correction factors for the SLM. It may be helpful in diagnosing problems with the SLM. When “On” is selected, a display resembling Figure 5–1 will appear on the LCD during normal instrument operation.

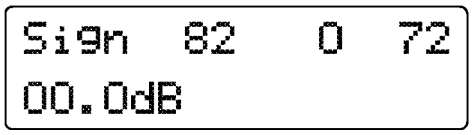


Figure 5–1: Numeric SLM Data

The top line contains—in A/D units, or "LSBs"—the internal instrument temperature, the corrected signal level, and the uncorrected ("raw") signal level. The second line contains a numeric readout of the corrected signal strength in dB. This value corresponds to the LSBs reported in the top line, and to the normal bar-graph display of the SLM.

To exit the numeric SLM display mode and replace the display with the normal SLM bar graph, press the **SLM (A)** key.

4. NVRAM/TIC Dgs.

The NVRAM/Timer (Touch Memory™) microprocessor in the SDA 601 is contained in a button-shaped stainless steel can with its own lithium battery. It is known widely as the "time in a can"—or "TIC."

a. Get TIC Serial — Press **ENTER** to discover the unique serial number of the TIC. This is an easy way to verify the presence and function of the TIC NVRAM.

b. Get TIC Time — Press **ENTER** to read the number of seconds since 00:00 hours, January 1, 1970; the display will update each second and verify the function of the TIC clock.

c. Read TIC Memory — Enter any TIC memory address (0–255) to read the contents and verify that the instrument can retrieve data from TIC NVRAM. To read the contents of memory location 159, for example, press **1 (L)**, **5 (R)**, and **9 (X)**, then press **ENTER**.

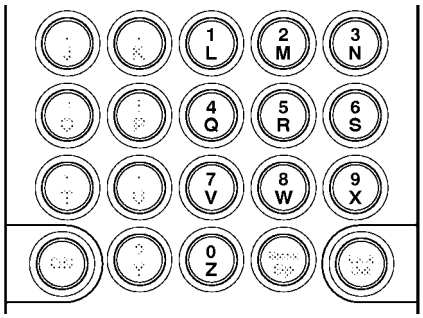


Figure 5–2: The SDA Number Keys

d. Factory Reset *see page 3–6*

5. Flash Diags.

a. Checksum Memory — Press **ENTER** to calculate a checksum of all 512 Kbytes of flash memory. The calculation will require approximately 7 seconds.

Typically, you will use the next three flash diagnostic items (**b**, **c**, and **d**) together to confirm that the instrument can erase, read, and write to flash memory. A useful approach is to:

- Read byte 1000 (**b**);
- erase sector 1, which begins at byte 10000 (**d**);
- read byte 10000 (**b**) to confirm the erase (the byte value should be FF);
- then write a new value into the byte (**c**); and finally
- read it back (**b**), to confirm the write.

b. Read Byte 10000 — Press **ENTER** to read the content of byte 10000.

c. Write Byte 10000 — Enter a number from 0 to 255 with the number keys (see Figure 5–2), then press **ENTER**.

d. Erase Sec 10000 — Press **ENTER** to erase sector 1, which begins with byte 10000.

e. Read SLM Cals — Developed for use during design and manufacture; not intended for use in the field.

f. Write Byte Loop — Developed for use during design and manufacture; not intended for servicing the instrument. Pressing **ENTER** will put the SDA 601 into an infinite loop; switch the instrument Off to exit the loop.

6. Calibration.

a. Calibrate SLM *see page 4–2*

b. Adj Serial Pot *see page 4–4*

c. Show Curr Temp — Press **ENTER** to check the internal instrument temperature in "A/D units," *not* degrees F or C.

d. Set Manuf Watch — Developed for use during manufacture; not intended for servicing the instrument. Pressing **ENTER** will initiate special, undocumented Watch-mode "conditions."

7. FW Upgrade

CAUTION. *DO NOT attempt to use any "FW Upgrade" items unless you are carefully following instructions supplied with a Tektronix firmware upgrade kit. Selecting item* ***c*** *without using the correct software and procedures can erase portions of instrument memory and remove the ability to upgrade the firmware.*

   a. Show Cur Bank

   b. Download

   c. Copy B1 to B∅

8. Write Test Reg — This diagnostic was used during product development and is not intended for servicing the instrument.

Corrective Maintenance

Corrective maintenance deals with obtaining and replacing parts and assemblies in the SDA 601.

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 electrical or mechanical parts list.
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 Specification

Small, #4 screws are used to secure the SDA 601 case halves together. DO NOT USE MORE THAN 3 INCH POUNDS OF TORQUE ON THESE SCREWS.

Replacing Assemblies

Refer to Figure 5–3 and use the following procedures to remove and replace instrument assemblies.

WARNING. *Disconnect the AC adapter and batteries before replacing any components.*

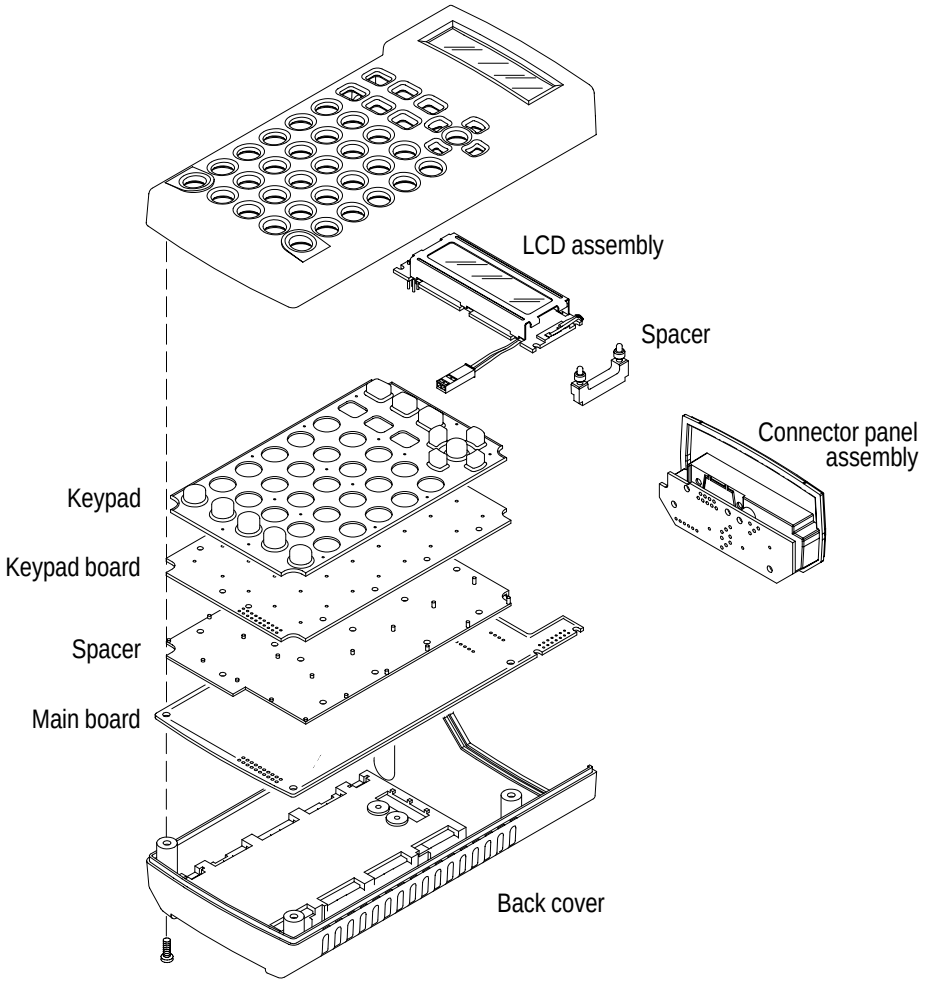


Figure 5–3: Exploded View of the SDA 601

Back Cover. Follow this procedure to remove and replace the back cover of the SDA 601:

1. Remove the four screws securing the back cover to the front cover.
2. Gently separate the back cover about one inch (2.5 cm) from the instrument, taking care to not pull the “rear” (connector) panel away with it.

3. Disconnect the battery wire connecter from J7. Be sure to pull on the connector housing, not on the wires. The back cover is now free and may moved away from the instrument.

4. Replacement is the reverse of removal. DO NOT USE MORE THAN 3 INCH POUNDS OF TORQUE ON THE CASE SCREWS.

Connector Panel. Follow this procedure to remove and replace the connector ("rear") panel of the SDA 601:

1. With the back cover off, remove the 6-pin connector from J21 on the connecter panel board. Again, pull on the connector housing, not on the wires.

2. Lift the connector panel assembly slightly up and away from the "front" panel and remove the SMB connectors from J11 and J13. Set the connector panel assembly aside.

3. Replacement is the reverse of removal. Note that the cable leading from J2 (COMP/TRIG) on the main board attaches to J11, and the cable leading from J8 (DESERIALIZER) attaches to J13.

Main Board and LCD. The Main board is connected to the LCD board by 14 pins at header J4, and is connected to the Keypad circuit board by 20 pins at header J3. Follow this procedure to remove and replace the LCD assembly and Main circuit board:

1. After removing the back cover and connector panel assembly, grasp the front half of the case in one hand and, with a pair of needle-nose pliers, gently pull the J3 header—and the Main circuit board to which it is attached—up and away from the rest of the instrument. Pull straight up; do NOT twist the connector housing.

2. When J3 is free of the Keypad board pins, carefully lift the Main board and LCD assembly away from the display end of the case. Set aside the front half of the case, with the Keypad board still inside.

3. To separate the Main board and LCD display module, disconnect the LCD backlight cable from J5, then gently pull the two assemblies apart at J4. The rubber LCD/board spacers should remain attached to the LCD display.

4. Reverse this procedure to replace the LCD assembly and Main board.

Keypad — Removal. Follow this procedure to remove the SDA 601 Key board and keypad:

1. Once the Main board is out of the way, lift the plastic spacer out of the instrument. It is held in place by a friction fit only. Note: The spacer has a front and a back; be sure to notice the difference or mark one side to ensure proper reassembly. Set the spacer aside.
2. Lift the Keypad board out of the instrument. This, too, is held in place by a friction fit.
3. Peel the rubber keypad out of the front panel.

Keypad — Replacement. Follow this procedure to replace the SDA 601 keypad:

1. Place the Keypad board with the pins of the connector towards the work-bench.
2. Place the rubber keypad on top of the Keypad board, positioning it so that the ON button is in the corner closest the connector.
3. Adjust the rubber keypad so that the fingers on its back side fit through the corresponding holes in the Keypad board.
4. Holding the keypad and Keypad board with the buttons up, slide the front case onto them, aligning the rubber buttons with the holes for them in the front case as you do so. The Keypad board is a friction fit in the front case half, so you must apply some slight pressure to fully seat the assemblies into the case.
5. Place the assembled front case and keypad face down on the workbench and press the plastic spacer board into place. The cylindrical plastic “fingers” will be facing up.

Replaceable Electrical Parts

Replaceable Electrical Parts

This section contains a list of the components that are replaceable for the SDA 601. Use this list to identify and order replacement parts. There is a separate Replaceable Electrical Parts list for each instrument.

Parts Ordering Information

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

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

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

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

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

Using the Replaceable Electrical Parts List

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

Cross Index–Mfr. Code Number to Manufacturer

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

Abbreviations

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

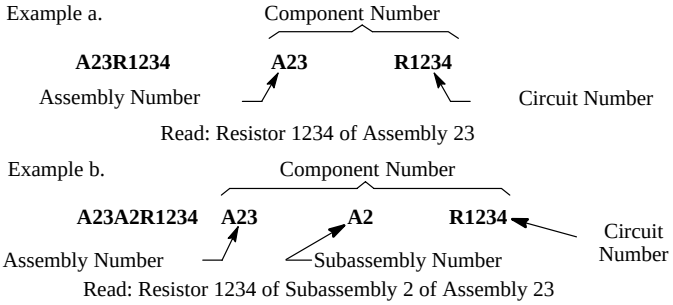
List of Assemblies

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

Column Descriptions

Component No. (Column 1)

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



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

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

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

Tektronix Part No. (Column 2)

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

Serial/Assembly No. (Column 3 and 4)

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

Name and Description (Column 5)

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

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

Mfr. Code (Column 6) Indicates the code number of the actual manufacturer of the part. (Code to name and address cross reference can be found immediately after this page.)

Mfr. Part No. (Column 7) Indicates actual manufacturer's part number.

Cross Index – Mfr. Code Number To Manufacturer

Mfr. code.	Manufacturer	Address	City, state, zip code
TK0875	MATSUO ELECTRONICS INC	831 S DOUBLAS ST	EL SEGUNDO CA 92641
TK2058	TDK CORPORATION OF AMERICA	1600 FEEHANVILLE DRIVE	MOUNT PROSPECT, IL 60056
TK2598	MAXIM – ASIC	120 SAN GABRIEL DRIVE	SUNNYVALE, CA 94086
0B0A9	DALLAS SEMICONDUCTOR CORP	4350 BELTWOOD PKWY SOUTH	DALLAS TX 75244
0JR03	ZMAN MAGNETICS INC	7633 S 180th	KENT WA 98032
0JR04	TOSHIBA AMERICA INC ELECTRONICS COMPONENTS DIV	9775 TOLEDO WAY	IRVINE CA 92718
0LXM2	LZR ELECTRONICS INC	8051 CESSNA AVENUE	GAITHERSBURG MD 20879
00779	AMP INC	2800 FULLING MILL PO BOX 3608	HARRISBURG PA 17105
02113	COILCRAFT INC	1102 SILVER LAKE RD	CARY IL 60013–1658
04222	AVX/KYOCERA DIV OF AVX CORP	19TH AVE SOUTH P O BOX 867	MYRTLE BEACH SC 29577
04713	MOTOROLA INC SEMICONDUCTOR PRODUCTS SECTOR	5005 E MCDOWELL RD	PHOENIX AZ 85008–4229
09969	DALE ELECTRONICS INC	EAST HIGHWAY 50 P O BOX 180	YANKTON SD 57078
1CH66	PHILIPS SEMICONDUCTORS	811 E ARQUES AVENUE PO BOX 3409	SUNNYVALE CA 94088–3409
1ES66	MAXIM INTEGRATED PRODUCTS INC	120 SAN GABRIEL DRIVE	SUNNYVALE CA 94086
1W344	UNITED CHEMI–CON INC		
17856	SILICONIX INC	2201 LAURELWOOD RD	SANTA CLARA CA 95054–1516
22526	BERG ELECTRONICS INC (DUPONT)	857 OLD TRAIL RD	ETTERS PA 17319
24931	SPECIALTY CONNECTOR CO INC	2100 EARLYWOOD DR PO BOX 547	FRANKLIN IN 46131
25088	SIEMENS CORP	186 WOOD AVE S	ISELIN NJ 08830–2704
27014	NATIONAL SEMICONDUCTOR CORP	2900 SEMICONDUCTOR DR	SANTA CLARA CA 95051–0606
34335	ADVANCED MICRO DEVICES	901 THOMPSON PL PO BOX 3453	SUNNYVALE CA 94086–3413
37964	GENNUM CORPORATION	970 FRASER DRIVE PO BOX 489, STA A	BURLINGTON, ONTARIO, CANADA L7R 3Y3
4T165	NEC ELECTRONICS USA INC ELECTRON DIV	475 ELLIS ST PO BOX 7241	MOUNTAIN VIEW CA 94039
50139	ALLEN–BRADLEY CO ELECTRONIC COMPONENTS	1414 ALLEN BRADLEY DR	EL PASO TX 79936
50434	HEWLETT–PACKARD CO OPTOELECTRONICS DIV	370 W TRIMBLE RD	SAN JOSE CA 95131–1008
51406	MURATA ELECTRONICS NORTH AMERICA INC HEADQUARTERS AND GEORGIA OPERATIONS	2200 LAKE PARK DR	SMYRNA GA 30080
53387	3M COMPANY ELECTRONIC PRODUCTS DIV	3M AUSTIN CENTER	AUSTIN TX 78769–2963
55322	SAMTEC INC	810 PROGRESS BLVD PO BOX 1147	NEW ALBANY IN 47150–2257
55680	NICHICON /AMERICA/ CORP	927 E STATE PKY	SCHAUMBURG IL 60195–4526
56845	DALE ELECTRONICS INC	2300 RIVERSIDE BLVD PO BOX 74	NORFOLK NE 68701–2242
57668	ROHM CORPORATION	15375 BARRANCA PARKWAY SUITE B207	IRVINE CA 92718
61429	FOX ELECTRONICS DIV OF FOX ELECTRONICS INC	5842 CORPORATION CIRCLE	FOR MEYERS FL 33905
62712	SEIKO INSTRUMENTS USA INC	ELECTRONIC COMPONENTS DIV 2990 W LOMITA BLVD	TORRANCE, CA 90505

Mfr. code.	Manufacturer	Address	City, state, zip code
68994	XILINX INC	2100 LOGIC DRIVE	SAN JOSE CA 95124
75915	LITTELFUSE TRACOR INC SUB OF TRACOR INC	800 E NORTHWEST HWY	DES PLAINES IL 60016–3049
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON OR 97077–0001
91637	DALE ELECTRONICS INC	2064 12TH AVE PO BOX 609	COLUMBUS NE 68601–3632

Replaceable Electrical Parts

Component number	Tektronix part number	Serial / Assembly number Effective	Discontinued	Name & description	Mfr. code	Mfr. part number
A1	671–2966–00		B020129	CKT BD ASSY:MAIN	80009	671296600
A1	671–2966–01	B020130	B030479	CIRCUIT BD ASSY:MAIN BD,678–2966–01,389–1724–00 WIRED,SDA601,	80009	671–2966–01
A1	671–2966–02	B030480	B030589	CIRCUIT BD ASSY:MAIN BD,678–2966–03 TESTED,389–1724–00 WIRED,SDA601	80009	671–2966–02
A1	671–2966–03	B030590	B030512	CIRCUIT BD ASSY:MAIN BD,678–2966–03 TESTED,389–1724–00 WIRED,SDA601	80009	671–2966–03
A1	671–2966–04	B030513	B030659	CIRCUIT BD ASSY:MAIN,678–2966–04 TESTED,389–1724–00 WIRED,SDA601	80009	671–2966–04
A1	671–2966–05	B030659		CIRCUIT BD ASSY:MAIN BD,678–2966–05 TESTED,389–1724–00 WIRED,SDA601	80009	671–2966–05
A2	671–2586–01			CIRCUIT BD ASSY:KEYBOARD	80009	671258601
A3	119–4506–00		B030479	DISPLAY,MODULE:LCD;16 CHARACTERS X 2 LINES,5 X 7 DOT MATRIX,TRANSFLECTIVE,YEL/GRN LED	62712	M16327JY
A3	119–5566–00	B030480		DISPLAY MODULE:LCD,16 CHARACTERS X 2 LINES,5 X 7 DOT MATRIX,TRANSFLECTIVE,YEL/GRN LED BACKLIGHT	62712	L1672B1P000
A4	671–3228–00			CKT BD ASSY:INPUT/OUTPUT BOARD	80009	671322800
A1	671–2966–00			CKT BD ASSY:MAIN	80009	671296600
A1B1	119–3919–00			XDCR,AUDIO:PIEZOELECTRIC,IN 3 TO 20 VP–P,OUT 72DB@10CM@3V P–P,FREQ 3.5–5.5KHZ,PKG DIA17MM X 8.2 MM,W/COVER	51406	PKM17EPP–4001S
A1C1	290–5050–00			CAP,FXD,AL:47UF,20%,35V,6 H X 8 DIA MM;LOW IMP,SMD	1W344	MVF35VC47RM8TP
A1C2	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C3	283–5267–00			CAP,FXD,CER:MLC;1UF,+80%–20%,25V,Y5V,1206	04222	12063G105ZAT1A
A1C4	283–5267–00			CAP,FXD,CER:MLC;1UF,+80%–20%,25V,Y5V,1206	04222	12063G105ZAT1A
A1C5	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C6	283–5203–00			CAP,FXD,CER:MLC;1000PF,10%,100V,X7R,1206	04222	12061C102KAT1A
A1C7	283–5113–00			CAP,FXD,CER:MLC;0.047UF,10%,50V,X7R,1206	04222	12065C473KAT1A
A1C8	283–5279–00			CAP,FXD,CER:MLC;0.47UF,10%,50V,X7R,.180X.250	04222	18255C474KAT1A
A1C9	283–5283–00			CAP,FXD,CER:MLC;1.5PF,+/–.25PF,100V,NPO,.120X.060	04222	12061A1R5CAT*A
A1C10	283–5267–00			CAP,FXD,CER:MLC;1UF,+80%–20%,25V,Y5V,1206	04222	12063G105ZAT1A
A1C11	283–5003–00			CAP,FXD,CER:MLC;0.01UF,10%,50V,X7R,1206	TK2058	C3216X7R1H103K–
A1C12	283–5003–00			CAP,FXD,CER:MLC;0.01UF,10%,50V,X7R,1206	TK2058	C3216X7R1H103K–
A1C13	283–5282–00			CAP,FXD,CER:MLC;2.2UF,+80–20%,16V,Y5V,0.120 X 0.060	04222	1206YG225ZAT2A
A1C14	283–5282–00			CAP,FXD,CER:MLC;2.2UF,+80–20%,16V,Y5V,0.120 X 0.060	04222	1206YG225ZAT2A
A1C15	283–5282–00			CAP,FXD,CER:MLC;2.2UF,+80–20%,16V,Y5V,0.120 X 0.060	04222	1206YG225ZAT2A
A1C16	283–5282–00			CAP,FXD,CER:MLC;2.2UF,+80–20%,16V,Y5V,0.120 X 0.060	04222	1206YG225ZAT2A
A1C17	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C18	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C19	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C20	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C21	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C22	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C23	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C24	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C25	283–5203–00			CAP,FXD,CER:MLC;1000PF,10%,100V,X7R,1206	04222	12061C102KAT1A
A1C26	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C27	283–5203–00			CAP,FXD,CER:MLC;1000PF,10%,100V,X7R,1206	04222	12061C102KAT1A
A1C28	283–5203–00			CAP,FXD,CER:MLC;1000PF,10%,100V,X7R,1206	04222	12061C102KAT1A
A1C29	283–5003–00			CAP,FXD,CER:MLC;0.01UF,10%,50V,X7R,1206	TK2058	C3216X7R1H103K–

Component number	Tektronix part number	Serial / Assembly number Effective	Discontinued	Name & description	Mfr. code	Mfr. part number
A1C30	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C31	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C32	283–5187–00			CAP,FXD,CER:MLC;15PF,5%,100V,NPO,1206	04222	12061A150JAT1A
A1C33	283–5187–00			CAP,FXD,CER:MLC;15PF,5%,100V,NPO,1206	04222	12061A150JAT1A
A1C34	283–5203–00			CAP,FXD,CER:MLC;1000PF,10%,100V,X7R,1206	04222	12061C102KAT1A
A1C35	283–5203–00			CAP,FXD,CER:MLC;1000PF,10%,100V,X7R,1206	04222	12061C102KAT1A
A1C36	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C37	283–5267–00			CAP,FXD,CER:MLC;1UF,+80%–20%,25V,Y5V,1206	04222	12063G105ZAT1A
A1C38	283–5025–00			CAP,FXD,CER:MLC;220PF,5%,50V,NPO,1206	TK2058	C3216COG1H221J–
A1C39	283–5025–00			CAP,FXD,CER:MLC;220PF,5%,50V,NPO,1206	TK2058	C3216COG1H221J–
A1C40	283–5025–00			CAP,FXD,CER:MLC;220PF,5%,50V,NPO,1206	TK2058	C3216COG1H221J–
A1C41	283–5025–00			CAP,FXD,CER:MLC;220PF,5%,50V,NPO,1206	TK2058	C3216COG1H221J–
A1C42	283–5003–00			CAP,FXD,CER:MLC;0.01UF,10%,50V,X7R,1206	TK2058	C3216X7R1H103K–
A1C43	283–5003–00			CAP,FXD,CER:MLC;0.01UF,10%,50V,X7R,1206	TK2058	C3216X7R1H103K–
A1C44	283–5201–00			CAP,FXD,CER:MLC;33PF,5%,100V,NPO,1206	04222	12061A330JAT1A
A1C45	283–5041–00			CAP,FXD,CER:MLC;7PF,+/–0.5PF,50V,NPO,1206	TK2058	C3216C0G1H070D–
A1C46	283–5195–00			CAP,FXD,CER:MLC;10PF,5%,100V ,NPO,1206	04222	12061A100JAT1A
A1C47	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C48	283–5003–00			CAP,FXD,CER:MLC;0.01UF,10%,50V,X7R,1206	TK2058	C3216X7R1H103K–
A1C49	283–5203–00			CAP,FXD,CER:MLC;1000PF,10%,100V,X7R,1206	04222	12061C102KAT1A
A1C50	283–5107–00			CAP,FXD,CER:MLC;22PF,5%,100V,NPO,1206	04222	12061A220JAT1A
A1C51	283–5113–00			CAP,FXD,CER:MLC;0.047UF,10%,50V,X7R,1206	04222	12065C473KAT1A
A1C52	283–5203–00			CAP,FXD,CER:MLC;1000PF,10%,100V,X7R,1206	04222	12061C102KAT1A
A1C53	283–5113–00			CAP,FXD,CER:MLC;0.047UF,10%,50V,X7R,1206	04222	12065C473KAT1A
A1C54	290–5003–00			CAP,FXD,TANT:47UF,20%,10V,0.287 X 0.169;7343,SMD,13MM,T&R	TK0875	267M1002–476–MR
A1C55	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C56	283–5003–00			CAP,FXD,CER:MLC;0.01UF,10%,50V,X7R,1206	TK2058	C3216X7R1H103K–
A1C57	283–5267–00			CAP,FXD,CER:MLC;1UF,+80%–20%,25V,Y5V,1206	04222	12063G105ZAT1A
A1C58	283–5282–00			CAP,FXD,CER:MLC;2.2UF,+80–20%,16V,Y5V,0.120 X 0.060	04222	1206YG225ZAT2A
A1C59	283–5049–00			CAP,FXD,CER:MLC;180PF,5%,50V,NPO,1206	TK2058	C3216C0G1H181J–
A1C60	283–5049–00			CAP,FXD,CER:MLC;180PF,5%,50V,NPO,1206	TK2058	C3216C0G1H181J–
A1C61	283–5041–00			CAP,FXD,CER:MLC;7PF,+/–0.5PF,50V,NPO,1206	TK2058	C3216C0G1H070D–
A1C62	283–5025–00			CAP,FXD,CER:MLC;220PF,5%,50V,NPO,1206	TK2058	C3216COG1H221J–
A1C63	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C64	283–5025–00			CAP,FXD,CER:MLC;220PF,5%,50V,NPO,1206	TK2058	C3216COG1H221J–
A1C66	283–5049–00			CAP,FXD,CER:MLC;180PF,5%,50V,NPO,1206	TK2058	C3216C0G1H181J–
A1C67	283–5113–00			CAP,FXD,CER:MLC;0.047UF,10%,50V,X7R,1206	04222	12065C473KAT1A
A1C68	283–5049–00			CAP,FXD,CER:MLC;180PF,5%,50V,NPO,1206	TK2058	C3216C0G1H181J–
A1C69	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C70	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C71	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C72	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C73	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C74	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C75	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C76	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C77	283–5282–00			CAP,FXD,CER:MLC;2.2UF,+80–20%,16V,Y5V,0.120 X 0.060	04222	1206YG225ZAT2A
A1C78	283–5282–00			CAP,FXD,CER:MLC;2.2UF,+80–20%,16V,Y5V,0.120 X 0.060	04222	1206YG225ZAT2A
A1C79	283–5203–00			CAP,FXD,CER:MLC;1000PF,10%,100V,X7R,1206	04222	12061C102KAT1A
A1C80	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C81	283–5203–00			CAP,FXD,CER:MLC;1000PF,10%,100V,X7R,1206	04222	12061C102KAT1A
A1C82	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C83	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A

Component number	Tektronix part number	Serial / Assembly number Effective	Discontinued	Name & description	Mfr. code	Mfr. part number
A1C84	290–5003–00			CAP,FXD,TANT:47UF,20%,10V,0.287 X 0.169;7343,SMD,13MM,T&R	TK0875	267M1002–476–MR
A1C86	290–1322–00			CAP,FXD,ALUM:;470UF,20%,16V,ESR = 0.095OHM(20C,100KHZ),10 X 12.5MM,LS=5MM	55680	UPY1C471MPH
A1C87	290–1322–00			CAP,FXD,ALUM:;470UF,20%,16V,ESR = 0.095OHM(20C,100KHZ),10 X 12.5MM,LS=5MM	55680	UPY1C471MPH
A1C88	283–5195–00			CAP,FXD,CER:MLC;10PF,5%,100V ,NPO,1206	04222	12061A100JAT1A
A1C90	283–5267–00			CAP,FXD,CER:MLC;1UF,+80%–20%,25V,Y5V,1206	04222	12063G105ZAT1A
A1C91	283–5267–00			CAP,FXD,CER:MLC;1UF,+80%–20%,25V,Y5V,1206	04222	12063G105ZAT1A
A1C92	283–5267–00			CAP,FXD,CER:MLC;1UF,+80%–20%,25V,Y5V,1206	04222	12063G105ZAT1A
A1C93	283–5267–00			CAP,FXD,CER:MLC;1UF,+80%–20%,25V,Y5V,1206	04222	12063G105ZAT1A
A1C94	283–5267–00			CAP,FXD,CER:MLC;1UF,+80%–20%,25V,Y5V,1206	04222	12063G105ZAT1A
A1C95	283–5267–00			CAP,FXD,CER:MLC;1UF,+80%–20%,25V,Y5V,1206	04222	12063G105ZAT1A
A1C98	283–5341–00			CAP,FXD,CER:MLC;4.7PF,.25PF,100V,NPO	04222	12061A4R7CATMA
A1C99	283–5341–00			CAP,FXD,CER:MLC;4.7PF,.25PF,100V,NPO	04222	12061A4R7CATMA
A1C100	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C101	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C102	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C103	283–5203–00			CAP,FXD,CER:MLC;1000PF,10%,100V,X7R,1206	04222	12061C102KAT1A
A1C104	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C105	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C106	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C107	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C108	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C109	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C110	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C111	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C112	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C113	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C114	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C115	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C116	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C120	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C130	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C131	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C132	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C133	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C134	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C135	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C136	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C137	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C138	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C139	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C141	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C142	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C143	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1C177	283–5282–00			CAP,FXD,CER:MLC;2.2UF,+80–20%,16V,Y5V,0.120 X 0.060	04222	1206YG225ZAT2A
A1C178	283–5282–00			CAP,FXD,CER:MLC;2.2UF,+80–20%,16V,Y5V,0.120 X 0.060	04222	1206YG225ZAT2A
A1C179	283–5282–00			CAP,FXD,CER:MLC;2.2UF,+80–20%,16V,Y5V,0.120 X 0.060	04222	1206YG225ZAT2A
A1C180	283–5114–00			CAP,FXD,CER:MLC;0.1UF,10%,50V,X7R,1206	04222	12065C104KAT(1A
A1CR1	152–5018–00			DIODE,SIG:ULTRA FAST;100V,0.74VF,4NS,2.0PF,SER–PAIR	27014	MMBD1203–HIGH
A1CR2	152–5027–00			DIODE,RECT:SCHTKY;40V,1A	04713	MBRS140T3
A1CR3	152–5027–00			DIODE,RECT:SCHTKY;40V,1A	04713	MBRS140T3
A1CR4	152–0843–00			DIODE,SIG:SCHTKY;SER–PAIR,20V,410MV,1.3PF	50434	HSMS–2812–T31
A1CR5	152–5000–00			DIODE,SIG:ULTRA FAST;70V,0.15A,6NS,COM–CATH	25088	BAV70T3 (E6327)

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A1CR6	152–5027–00			DIODE,RECT:SCHTKY;40V,1A	04713	MBRS140T3
A1CR7	152–0845–00			DIODE,SIG:SCHTKY;COM–CATH,20V,410MV,1.3PF	50434	HSMS–2814–T31
A1CR8	152–0845–00			DIODE,SIG:SCHTKY;COM–CATH,20V,410MV,1.3PF	50434	HSMS–2814–T31
A1CR9	152–0845–00			DIODE,SIG:SCHTKY;COM–CATH,20V,410MV,1.3PF	50434	HSMS–2814–T31
A1CR10	152–0845–00			DIODE,SIG:SCHTKY;COM–CATH,20V,410MV,1.3PF	50434	HSMS–2814–T31
A1CR11	152–5018–00			DIODE,SIG:ULTRA FAST;100V,0.74VF,4NS,2.0PF,SER–PAIR	27014	MMBD1203–HIGH
A1E1	108–5084–00			COIL,RF:FERRITE CHIP BEAD,52 OHM +/–25%@100MHZ,DCR 0.3 OHM,IMAX 400 MA,8MM T&R	TK2058	HF70ACB322513T
A1E2	108–5084–00			COIL,RF:FERRITE CHIP BEAD,52 OHM +/–25%@100MHZ,DCR 0.3 OHM,IMAX 400 MA,8MM T&R	TK2058	HF70ACB322513T
A1E3	108–5084–00			COIL,RF:FERRITE CHIP BEAD,52 OHM +/–25%@100MHZ,DCR 0.3 OHM,IMAX 400 MA,8MM T&R	TK2058	HF70ACB322513T
A1E4	108–5084–00			COIL,RF:FERRITE CHIP BEAD,52 OHM +/–25%@100MHZ,DCR 0.3 OHM,IMAX 400 MA,8MM T&R	TK2058	HF70ACB322513T
A1E5	108–5084–00			COIL,RF:FERRITE CHIP BEAD,52 OHM +/–25%@100MHZ,DCR 0.3 OHM,IMAX 400 MA,8MM T&R	TK2058	HF70ACB322513T
A1E6	108–5084–00			COIL,RF:FERRITE CHIP BEAD,52 OHM +/–25%@100MHZ,DCR 0.3 OHM,IMAX 400 MA,8MM T&R	TK2058	HF70ACB322513T
A1E7	108–5084–00			COIL,RF:FERRITE CHIP BEAD,52 OHM +/–25%@100MHZ,DCR 0.3 OHM,IMAX 400 MA,8MM T&R	TK2058	HF70ACB322513T
A1F1	159–0363–00			FUSE,WIRE LEAD:4A,125V,FAST BLOW,ULREC,CSACERT;,	75915	251004
A1FL1	119–2590–00			FILTER,RFI:10.7MHZ	51406	SFE 10.7 MA8–A
A1J1	131–4750–00			CONN,HDR:PCB;MALE,STR,1 X 6,0.100 CTR,0.230 MLG X 0.110 TAIL,30 GOLD	53387	2406–6112TB
A1J2	131–0391–00			CONN,RF JACK:SMB;50 OHM,STR,PCB,GOLD/GOLD,0.293 H X 0.155 TAIL,3/0.045 SQ TAIL 0.038DIA CTRCOND,0.2 SQ PCB,0.312 HEX	24931	32JR105–1
A1J3	131–5543–01			CONN,BOX:PCB,BOTTOM ENTRY;FEMALE,STR,2 X 10,0.1 CTR,0.235 H X 0.125 TAIL,30 GOLD,SLDRMASK POST,DUAL ENTRY	53387	929842–01–10–30
A1J4	131–5542–01			CONN,BOX:PCB,BOTTOM ENTRY;FEMALE,STR,2 X 7,0.1 CTR,0.235 H X 0.125 TAIL,30 GOLD,SLDR MASK-POSTS,DUAL ENTRY	53387	929842–01–07–30
A1J5	131–4917–00			CONN,HDR:PCB;MALE,STR,1 X 2,0.1 CTR,0.235MLG X 0.110 TAIL,30GOLD,TUBE,HIGH TEMP	00779	104714–3
A1J6	131–5527–00			JACK,PWR DC:PCB;MALE,RTANG,2MM PIN,11MMH(0.433) X 3.5MM(0.137) TAIL,9MM(0.354) W,TIN,W/SW,DC PWR JACK	0LXM2	DJ005A
A1J7	131–5240–00			CONN,HDR:PCB;MALE,STR,1 X 5,0.1 CTR,0.230MLG X 0.120 TAIL,30GOLD	22526	68001–105
A1J8	131–0391–00			CONN,RF JACK:SMB;50 OHM,STR,PCB,GOLD/GOLD,0.293 H X 0.155 TAIL,3/0.045 SQ TAIL 0.038DIA CTRCOND,0.2 SQ PCB,0.312 HEX	24931	32JR105–1
A1J9	131–0391–00			CONN,RF JACK:SMB;50 OHM,STR,PCB,GOLD/GOLD,0.293 H X 0.155 TAIL,3/0.045 SQ TAIL 0.038DIA CTRCOND,0.2 SQ PCB,0.312 HEX	24931	32JR105–1
A1L1	108–1545–00			IDCTR,DUAL:TOROID,314UH,10%,157UH AT 1ADCMAX,0.25 OHMS,15 X 12MM	80009	108154500
A1L6	120–1939–00			TRANSFORMER:Z–92266	0JR03	Z–92266 (120–19
A1L7	108–5018–00			COIL,RF:IDCTR;FXD,4.7UH,20%,Q=50,SRF=45MHZ,DCR=1.0 OHM,IMAX=315MA	TK2058	NL453232T–4R7M
A1L8	108–5018–00			COIL,RF:IDCTR;FXD,4.7UH,20%,Q=50,SRF=45MHZ,DCR=1.0 OHM,IMAX=315MA	TK2058	NL453232T–4R7M
A1L9	108–5051–00			COIL,RF:IDCTR;FXD,10UH,10%,Q=50,SRF=20MHZ,DCR=1.6 OHM,IMAX=250MA	TK2058	NL453232T–100K
A1L10	108–5057–00			COIL,RF:IDCTR;FXD,68UH,10%,Q=50,SRF=12MHZ,DCR=6.0 OHM,IMAX=130MA	TK2058	NL453232T–680K

Component number	Tektronix part number	Serial / Assembly number Effective	Discontinued	Name & description	Mfr. code	Mfr. part number
A1L11	108–5089–00			COIL,RF:IDCTR;FXD,180NH,5%,Q=25,SRF=700MHZ,DCR=0.77 OHM,IMAX=750MA	02113	1008CS–181XJBA
A1Q1	151–5066–00			TRANSISTOR,SIG:MOS,N–CH;60V,0.115A,7.5 OHM	04713	2N7002LT1
A1Q2	151–5044–00			TRANSISTOR,PWR:BIPOLAR,PNP;100V,3.0A,3.0MHZ,AMPL	04713	MJD32CT4
A1Q3	151–5066–00			TRANSISTOR,SIG:MOS,N–CH;60V,0.115A,7.5 OHM	04713	2N7002LT1
A1Q4	151–5066–00			TRANSISTOR,SIG:MOS,N–CH;60V,0.115A,7.5 OHM	04713	2N7002LT1
A1Q5	151–5000–00			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	04713	MMBT3906LT1
A1Q6	151–5000–00			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	04713	MMBT3906LT1
A1Q7	151–5001–00			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	04713	MMBT3904LT1
A1Q8	151–5000–00			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	04713	MMBT3906LT1
A1Q9	151–5088–00			TRANSISTOR,PWR:MOS,P–CH;30V,4.6A,0.07/0.135	17856	SI9435DY
A1Q10	151–5088–00			TRANSISTOR,PWR:MOS,P–CH;30V,4.6A,0.07/0.135	17856	SI9435DY
A1Q11	151–5001–00			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	04713	MMBT3904LT1
A1Q12	151–5066–00			TRANSISTOR,SIG:MOS,N–CH;60V,0.115A,7.5 OHM	04713	2N7002LT1
A1Q13	151–5001–00			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	04713	MMBT3904LT1
A1Q14	151–5088–00			TRANSISTOR,PWR:MOS,P–CH;30V,4.6A,0.07/0.135	17856	SI9435DY
A1Q15	151–5012–00			TRANSISTOR,SIG:BIPOLAR,PNP;15V,10MA,2.0GHZ,AMPL	04713	MMBTH69LT1
A1Q16	151–5066–00			TRANSISTOR,SIG:MOS,N–CH;60V,0.115A,7.5 OHM	04713	2N7002LT1
A1Q17	151–5088–00			TRANSISTOR,PWR:MOS,P–CH;30V,4.6A,0.07/0.135	17856	SI9435DY
A1Q18	151–5066–00			TRANSISTOR,SIG:MOS,N–CH;60V,0.115A,7.5 OHM	04713	2N7002LT1
A1Q19	151–5066–00			TRANSISTOR,SIG:MOS,N–CH;60V,0.115A,7.5 OHM	04713	2N7002LT1
A1R1	321–5015–00			RES,FXD:THICK FILM;562 OHM,1%,0.125W,TC=100	50139	BCK5620FT
A1R2	321–5030–00			RES,FXD:THICK FILM;10.0K OHM,1%,0.125W,TC=100 PPM	50139	BCK1002FT
A1R3	321–5030–00			RES,FXD:THICK FILM;10.0K OHM,1%,0.125W,TC=100 PPM	50139	BCK1002FT
A1R4	321–5009–00			RES,FXD:THICK FILM;182 OHM,1%,0.125W,TC=100	50139	BCK1820FT
A1R5	321–5051–00			RES,FXD:THICK FILM;0 OHM,1%,0.125W,TC=100 PPM	09969	CRCW1206 JUMPER
A1R6	321–5001–00			RES,FXD:THICK FILM;12.1 OHM,1%,0.125W,TC=100 PPM	91637	CRCW120612R1FT
A1R7	321–5001–00			RES,FXD:THICK FILM;12.1 OHM,1%,0.125W,TC=100 PPM	91637	CRCW120612R1FT
A1R8	321–5018–00			RES,FXD:THICK FILM;1.0K OHM,1%,0.125W,TC=100 PPM	50139	BCK1001FT
A1R9	321–5007–00			RES,FXD:THICK FILM;121 OHM,1%,0.125W,TC=100	50139	BCK1210FT
A1R10	321–5008–00			RES,FXD:THICK FILM;150 OHM,1%,0.125W,TC=100	50139	BCK1500FT
A1R11	321–5045–00			RES,FXD:THICK FILM;68.1 OHM,1%,0.125W,TC=100 PPM	50139	BCD68R1FT
A1R13	321–5146–00			RES,FXD,FILM:13.0K,1%,0.125W	91637	CRCW12061302FT
A1R14	321–5030–00			RES,FXD:THICK FILM;10.0K OHM,1%,0.125W,TC=100 PPM	50139	BCK1002FT
A1R15	321–5209–00			RES,FXD,FILM:243 OHM,1%,0.125WTAPE & REEL,SMD	91637	CRCW–1206–2430F
A1R16	321–5045–00		671-2966-02	RES,FXD:THICK FILM;68.1 OHM,1%,0.125W,TC=100 PPM	50139	BCD68R1FT
A1R16	321–5006–00	671-2966-03		RES,FXD,FILM:THICK FILM,100 OHM,1%,0.125W,TC=100 PPM,1206,T&R	50139	BCK1000FT
A1R17	321–5012–00			RES,FXD:THICK FILM;332 OHM,1%,0.125W,TC=100	50139	BCK3320FT
A1R18	321–5212–00			RES,FXD:THICK FILM;4.99K OHM,1%,0.125W,TC=100 PPM	91637	CRCW–1206–4991F
A1R19	321–5026–00			RES,FXD:THICK FILM;4.75K OHM,1%,0.125W,TC=100 PPM	50139	BCK4751FT
A1R20	321–5032–00			RES,FXD:THICK FILM;15.0K OHM,1%,0.125W,TC=100 PPM	50139	BCK1502FT
A1R21	321–5029–00			RES,FXD:THICK FILM;8.25K OHM,1%,0.125W,TC=100 PPM	50139	BCK8251FT
A1R22	321–5025–00			RES,FXD:THICK FILM;3.92K OHM,1%,0.125W,TC=100 PPM	50139	BCK3921FT
A1R23	321–5281–00			RES,FXD:THICK FILM;2K OHM,1%,0.125W,TC=100PPM	91637	CRCW1206–2001FT
A1R24	321–5044–00		671-2966-02	RES,FXD:THICK FILM;56.2 OHM,1%,0.125W,TC=100 PPM	50139	BCD56R2FT
A1R24	321–5045–00	671-2966-03		RES,FXD:THICK FILM,68.1 OHM,1%,0.125W,TC=100 PPM,1206,T&R	50139	BCD68R1FT
A1R25	321–5011–00			RES,FXD:THICK FILM;274 OHM,1%,0.125W,TC=100	50139	BCK2740FT
A1R26	321–5281–00			RES,FXD:THICK FILM;2K OHM,1%,0.125W,TC=100PPM	91637	CRCW1206–2001FT
A1R28	321–5018–00			RES,FXD:THICK FILM;1.0K OHM,1%,0.125W,TC=100 PPM	50139	BCK1001FT
A1R30	321–5113–00			RES,FXD:THICK FILM;75 OHM,1%,0.125W,TC=100PPM	56845	CRCW1206–75ROFT
A1R31	321–5011–00			RES,FXD:THICK FILM;274 OHM,1%,0.125W,TC=100	50139	BCK2740FT
A1R32	321–5228–00			RES,FXD,FILM:2.32K OHM,1%,0.125,1206,8MM	91637	CRCW1206–2321FT

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A1R34	321–5049–00			RES,FXD:THICK FILM;1M OHM,1%,0.125W,TC=100PPM	57668	MCR18FXEA1M
A1R35	321–5038–00			RES,FXD:THICK FILM;47.5K OHM,1%,0.125W,TC=100 PPM	50139	BCK4752FT
A1R36	321–5048–00			RES,FXD:THICK FILM;332K OHM,1%,0.125W,TC=100 PPM	57668	MCR18FXEA332K
A1R37	321–5000–00			RES,FXD:THICK FILM;10 OHM,1%,0.125W,TC=100PPM	91637	CRCW120610R0FT
A1R38	321–5047–00			RES,FXD:THICK FILM;100K OHM,1%,0.125W,TC=100 PPM	50139	BCK1003FT
A1R40	321–5006–00			RES,FXD:THICK FILM;100 OHM,1%,0.125W,TC=100	50139	BCK1000FT
A1R41	321–5006–00			RES,FXD:THICK FILM;100 OHM,1%,0.125W,TC=100	50139	BCK1000FT
A1R42	321–5044–00			RES,FXD:THICK FILM;56.2 OHM,1%,0.125W,TC=100 PPM	50139	BCD56R2FT
A1R43	321–5012–00			RES,FXD:THICK FILM;332 OHM,1%,0.125W,TC=100	50139	BCK3320FT
A1R44	321–5018–00			RES,FXD:THICK FILM;1.0K OHM,1%,0.125W,TC=100 PPM	50139	BCK1001FT
A1R45	321–5035–00			RES,FXD:THICK FILM;27.4K OHM,1%,0.125W,TC=100 PPM	50139	BCK2742FT
A1R49	321–5212–00			RES,FXD:THICK FILM;4.99K OHM,1%,0.125W,TC=100 PPM	91637	CRCW–1206–4991F
A1R50	321–5034–00			RES,FXD:THICK FILM;22.1K OHM,1%,0.125W,TC=100 PPM	50139	BCK2212FT
A1R51	321–5024–00			RES,FXD:THICK FILM;3.32K OHM,1%,0.125W,TC=100 PPM	50139	BCK3321FT
A1R52	321–5029–00			RES,FXD:THICK FILM;8.25K OHM,1%,0.125W,TC=100 PPM	50139	BCK8251FT
A1R54	307–5041–01			RES,NTWK FXD:FILM;(15),4.7K OHM,2%,0.08W EA,50PPM	91637	SOMC–1601–472G–
A1R55	321–5030–00			RES,FXD:THICK FILM;10.0K OHM,1%,0.125W,TC=100 PPM	50139	BCK1002FT
A1R56	321–5029–00			RES,FXD:THICK FILM;8.25K OHM,1%,0.125W,TC=100 PPM	50139	BCK8251FT
A1R58	321–5041–00			RES,FXD:THICK FILM;82.5K OHM,1%,0.125W,TC=100 PPM	50139	BCK8252FT
A1R59	321–5038–00			RES,FXD:THICK FILM;47.5K OHM,1%,0.125W,TC=100 PPM	50139	BCK4752FT
A1R60	321–5028–00		671-2966-01	RES,FXD:THICK FILM;6.81K OHM,1%,0.125W,TC=100 PPM	50139	BCK6811FT
A1R60	321–5016–00	671-2966-02		RES,FXD:THICK FILM,681 OHM,1%,0.125W,TC=100 PPM,1206,T&R	50139	BCK6810FT
A1R61	321–5016–00		671-2966-01	RES,FXD:THICK FILM;681 OHM,1%,0.125W,TC=100	50139	BCK6810FT
A1R61	321–5051–00	671-2966-02		RES,FXD:THICK FILM,0 OHM,1%,0.125W,TC=100 PPM,1206,T&R	50139	BCD0JUMPERT
A1R62	321–5014–00			RES,FXD:THICK FILM;475 OHM,1%,0.125W,TC=100	50139	BCK4750FT
A1R63	321–5014–00			RES,FXD:THICK FILM;475 OHM,1%,0.125W,TC=100	50139	BCK4750FT
A1R64	321–5030–00			RES,FXD:THICK FILM;10.0K OHM,1%,0.125W,TC=100 PPM	50139	BCK1002FT
A1R65	321–5030–00			RES,FXD:THICK FILM;10.0K OHM,1%,0.125W,TC=100 PPM	50139	BCK1002FT
A1R66	321–5113–00			RES,FXD:THICK FILM;75 OHM,1%,0.125W,TC=100PPM	56845	CRCW1206–75ROFT
A1R67	321–5030–00			RES,FXD:THICK FILM;10.0K OHM,1%,0.125W,TC=100 PPM	50139	BCK1002FT
A1R68	321–5045–00			RES,FXD:THICK FILM;68.1 OHM,1%,0.125W,TC=100 PPM	50139	BCD68R1FT
A1R69	321–5007–00			RES,FXD:THICK FILM;121 OHM,1%,0.125W,TC=100	50139	BCK1210FT
A1R70	321–5000–00			RES,FXD:THICK FILM;10 OHM,1%,0.125W,TC=100PPM	91637	CRCW120610R0FT
A1R71	321–5023–00			RES,FXD:THICK FILM;2.74K OHM,1%,0.125W,TC=100 PPM	50139	BCK2741FT
A1R72	321–5022–00			RES,FXD:THICK FILM;2.21K OHM,1%,0.125W,TC=100 PPM	50139	BCK2211FT
A1R75	321–5030–00			RES,FXD:THICK FILM;10.0K OHM,1%,0.125W,TC=100 PPM	50139	BCK1002FT
A1R76	321–5030–00			RES,FXD:THICK FILM;10.0K OHM,1%,0.125W,TC=100 PPM	50139	BCK1002FT
A1R78	321–5008–00			RES,FXD:THICK FILM;150 OHM,1%,0.125W,TC=100	50139	BCK1500FT
A1R79	321–5030–00			RES,FXD:THICK FILM;10.0K OHM,1%,0.125W,TC=100 PPM	50139	BCK1002FT
A1R80	321–5166–00			RES,FXD:THICK FILM;150K OHM,1%,0.125W,TC=100 PPM	91637	CRCW1206–1503FT
A1R81	321–5034–00			RES,FXD:THICK FILM;22.1K OHM,1%,0.125W,TC=100 PPM	50139	BCK2212FT
A1R82	321–5047–00			RES,FXD:THICK FILM;100K OHM,1%,0.125W,TC=100 PPM	50139	BCK1003FT
A1R83	321–5030–00			RES,FXD:THICK FILM;10.0K OHM,1%,0.125W,TC=100 PPM	50139	BCK1002FT
A1R84	315–0471–00	671-2966-02		RES,FXD,FILM:470 OHM,5%,0.25W MI	50139	CB4715
A1RT1	307–5100–00			RES,THERMAL:50K OHM,5% NTC,–4.40/DEGREE C AT 25 DEGREES C;1206,T&R	56845	NTHS–1206N01
A1U1	156–5074–02			IC,DIGITAL:	80009	156507402
A1U2	156–5441–01			IC,LINEAR:BIPOLAR,VOLTAGE REGULATOR;POSITIVE,ADJUSTABLE,100MA,2%MICROPOWER	27014	LP2951CMX
A1U3	156–6378–01			IC,MISC:CMOS,MISC;DIGITALLY CONTROLLED POTENTIOMETER,DUAL,10KOHM	0B0A9	DS1267S–10TRL

Component number	Tektronix part number	Serial / Assembly number Effective	Discontinued	Name & description	Mfr. code	Mfr. part number
A1U4	156–6714–00			IC,LINEAR:BIPOLAR,SW–REGULATOR;STEP–DOWN/BUCK,5.0V,500MA,4%,SHUTDOWN	27014	LM2574M–5.0
A1U5	156–6869–00			IC,MEMORY:CMOS,EPROM,512K X 8,120NS,5VOLTSFLASH,29F040,PLCC32	34335	AM29F040–120JC
A1U6	156–6664–00			IC,MISC:CMOS,INTERFACE;DUAL RS–232DRIVER/RECEIVER,+5V VCC,NEG INPUT THRESHOLD ON ONE RECEIVER	1ES66	MAX243CSE
A1U7	155–0417–00			IC,ASIC:	TK2598	155041700
A1U8	155–0416–00			IC,ASIC:BIPOLAR,VIDEO SERIALZER;FULL CUSTOM,M763	TK2598	155041600
A1U9	156–6662–00		671-2966-00	IC,DIGITAL:CMOS,PLD;FPGA,XC4000 FAMILY,4010,400 CLBS,160 IOBS,160 I/O,5 NS	68994	XC4010–5MQ208C
A1U9	156–7017–00	671-2966-01	671-2966-03	IC,DIGITAL:CMOS,PLD,FPGA,XC4000 FAMILY,4010,400 CLBS,160 IOBS,160 I/O,4 NS,4010–4,MQFP208,T	68994	XC4010–4MQ208C
A1U9	156–7017–01	671-2966-04		IC,DIGITAL:CMOS,PLD,FPGA,XC4000E FAMILY,4010E,400 CLBS,160 IOBS,160 I/O,–4 SPEED,4010E–4,PQ	68994	XC4010E–4PQ208C 0090
A1U10	156–6662–00		671-2966-00	IC,DIGITAL:CMOS,PLD;FPGA,XC4000 FAMILY,4010,400 CLBS,160 IOBS,160 I/O,5 NS	68994	XC4010–5MQ208C
A1U10	156–7017–00	671-2966-01	671-2966-03	IC,DIGITAL:CMOS,PLD,FPGA,XC4000 FAMILY,4010,400 CLBS,160 IOBS,160 I/O,4 NS,4010–4,MQFP208,T	68994	XC4010–4MQ208C
A1U10	156–7017–01	671-2966-04		IC,DIGITAL:CMOS,PLD,FPGA,XC4000E FAMILY,4010E,400 CLBS,160 IOBS,160 I/O,–4 SPEED,4010E–4,PQ	68994	XC4010E–4PQ208C 0090
A1U11	156–5478–01			IC,DIGITAL:HCMOS,LATCH;OCTAL D–TYPE, 3–STATE	0JR04	TC74HC573AFW(EL
A1U12	156–6481–01			IC,MISC:CMOS,PWR SUPPLY SUPERVISOR;MPU RESET GEN,5V SUPPLY SENSING,10%,350MS RESET TIME	0B0A9	DS1233Z–10
A1U13	156–6666–00			IC,LINEAR:BIPOLAR,AMPL;FM IF/DETECTOR,FSK DATA SHAPER,W/RSSI	04713	MC13055D
A1U14	156–6868–00			IC,MISC:BIPOLAR,MISC;DBL–BALANCED MIXERAND OSC	1CH66	NE602AD
A1U15	156–6668–00			IC,MISC:ECL,MISC;GENLINX CABLE DRIVER WITHTWO ADJUSTABLE OUTPUTS	37964	GS9008
A1U16	156–6661–00			IC,PROCESSOR:CMOS,MICRO COMPUTER;8–BIT,1K RAM,A/D,D/A,12MHZ	4T165	UPD78237GC–3B9
A1U17	156–6867–00			IC,MEMORY:CMOS,ROM ;12 LINES X 24 COLUMN TV	80009	156686700
A1U18	156–5588–01			IC,LINEAR:BIPOLAR,VOLTAGE REFERENCE;POSITIVE,2.5V,1.0%,40PPM,SERIES	04713	MC1403DR2
A1U19	156–6846–00			IC,MEMORY:CMOS,DRAM;256K X 16,70NS,FAST PAGE MODE,SELF–REFRESH	80009	156684600
A1U20	156–6846–00			IC,MEMORY:CMOS,DRAM;256K X 16,70NS,FAST PAGE MODE,SELF–REFRESH	80009	156684600
A1U21	156–6846–00			IC,MEMORY:CMOS,DRAM;256K X 16,70NS,FAST PAGE MODE,SELF–REFRESH	80009	156684600
A1U22	156–6846–00			IC,MEMORY:CMOS,DRAM;256K X 16,70NS,FAST PAGE MODE,SELF–REFRESH	80009	156684600
A1U23	156–6846–00			IC,MEMORY:CMOS,DRAM;256K X 16,70NS,FAST PAGE MODE,SELF–REFRESH	80009	156684600
A1U24	156–6846–00			IC,MEMORY:CMOS,DRAM;256K X 16,70NS,FAST PAGE MODE,SELF–REFRESH	80009	156684600
A1U25	156–4357–00			IC,MEM:CMOS,NVRAM;4K BITS,RTC,CLK CALENDAR,BTRY	0B0A9	DS1994L–F5
A1VR1	152–5046–00			DIODE,ZENER:;20V,5%,225MW	04713	MMBZ5250BLT1
A1VR2	152–5046–00			DIODE,ZENER:;20V,5%,225MW	04713	MMBZ5250BLT1
A1Y1	158–5028–00			XTAL UNIT,QTZ:12.0 MHZ,+/–0.01%,PRL,CLH,TYPE FPX–SM	61429	FPX120 20
A2	671–2586–01			CIRCUIT BD ASSY:KEYBOARD	80009	671258601
A2J1	131–5781–00			CONN,HDR:PCB;MALE,STR,2 X 10,0.1 CTR,0.380	55322	MTLW–110–08–S–D
A3	119–4506–00			DISPLAY,MODULE:LCD;16 CHARACTERS X 2 LINES,5 X 7 DOT MATRIX,TRANSFLECTIVE,YEL/GRN LED	62712	M16327JY

Component number	Tektronix part number	Serial / Assembly number Effective	Serial / Assembly number Discontinued	Name & description	Mfr. code	Mfr. part number
A4	671–3228–00			CKT BD ASSY:INPUT/OUTPUT BOARD	80009	671322800
A4J1	131–5436–00			CONN,RF JACK:BNC;50 OHM,FEMALE,STR,PCB,0.450 H X (4)0.040 SQ,0.189 TAIL,ON 0.250 CTRPCB	24931	28JR299–3
A4J2	131–5436–00			CONN,RF JACK:BNC;50 OHM,FEMALE,STR,PCB,0.450 H X (4)0.040 SQ,0.189 TAIL,ON 0.250 CTRPCB	24931	28JR299–3
A4J3	131–5436–00			CONN,RF JACK:BNC;50 OHM,FEMALE,STR,PCB,0.450 H X (4)0.040 SQ,0.189 TAIL,ON 0.250 CTRPCB	24931	28JR299–3
A4J11	131–0391–00			CONN,RF JACK:SMB;50 OHM,STR,PCB,GOLD/GOLD,0.293 H X 0.155 TAIL,3/0.045 SQ TAIL 0.038DIA CTRCOND,0.2 SQ PCB,0.312 HEX	24931	32JR105–1
A4J12	131–0391–00			CONN,RF JACK:SMB;50 OHM,STR,PCB,GOLD/GOLD,0.293 H X 0.155 TAIL,3/0.045 SQ TAIL 0.038DIA CTRCOND,0.2 SQ PCB,0.312 HEX	24931	32JR105–1
A4J13	131–0391–00			CONN,RF JACK:SMB;50 OHM,STR,PCB,GOLD/GOLD,0.293 H X 0.155 TAIL,3/0.045 SQ TAIL 0.038DIA CTRCOND,0.2 SQ PCB,0.312 HEX	24931	32JR105–1
A4J20	131–3904–00			CONN,DSUB:PCB/PNL;FEMALE,STR,9 POS,0.112 CTR,0.236 H X 0.125 TAIL,4–40 THD INSERT,BDRETENTION,GOLD/TIN	00779	2–747706–0
A4J21	131–4750–00			CONN,HDR:PCB;MALE,STR,1 X 6,0.100 CTR,0.230 MLG X 0.110 TAIL,30 GOLD	53387	2406–6112TB
W1	174–2889–00			CABLE ASSEMBLY: (CONNECTED @ A1J1 & A4J21)	80009	174288900
W2	174–3183–00			CABLE ASSEMBLY: (CONNECTED @ A1J2 & A4J11)	80009	174318300
W8	174–3183–00			CABLE ASSEMBLY: (CONNECTED @ A1J8 & A4J13)	80009	174318300
W9	174–3183–00			CABLE ASSEMBLY: (CONNECTED @ A1J9 & A4J12)	80009	174318300

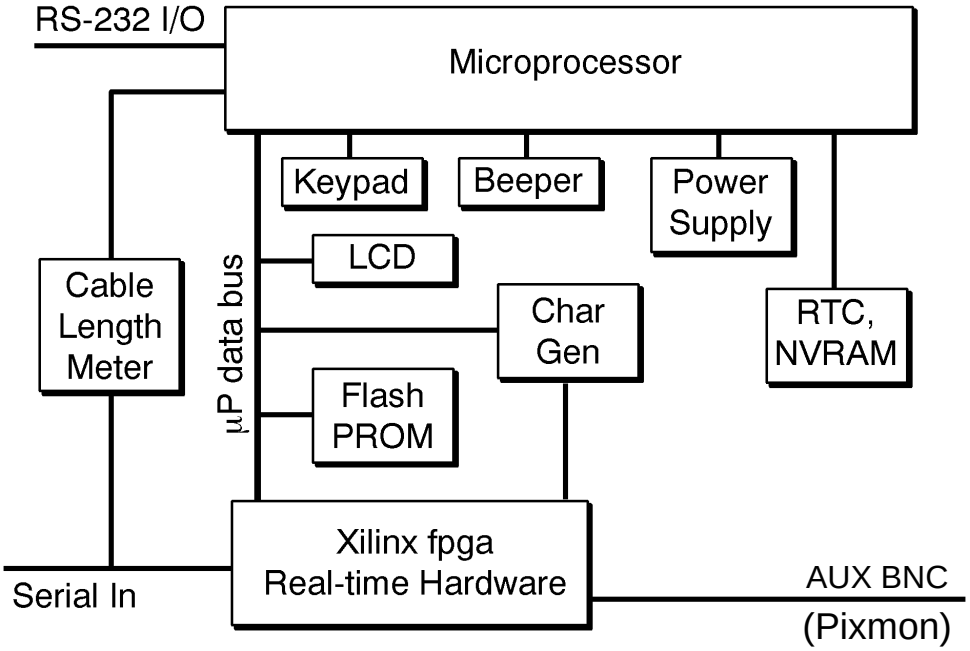
Diagrams

Diagrams and Circuit Board Illustrations

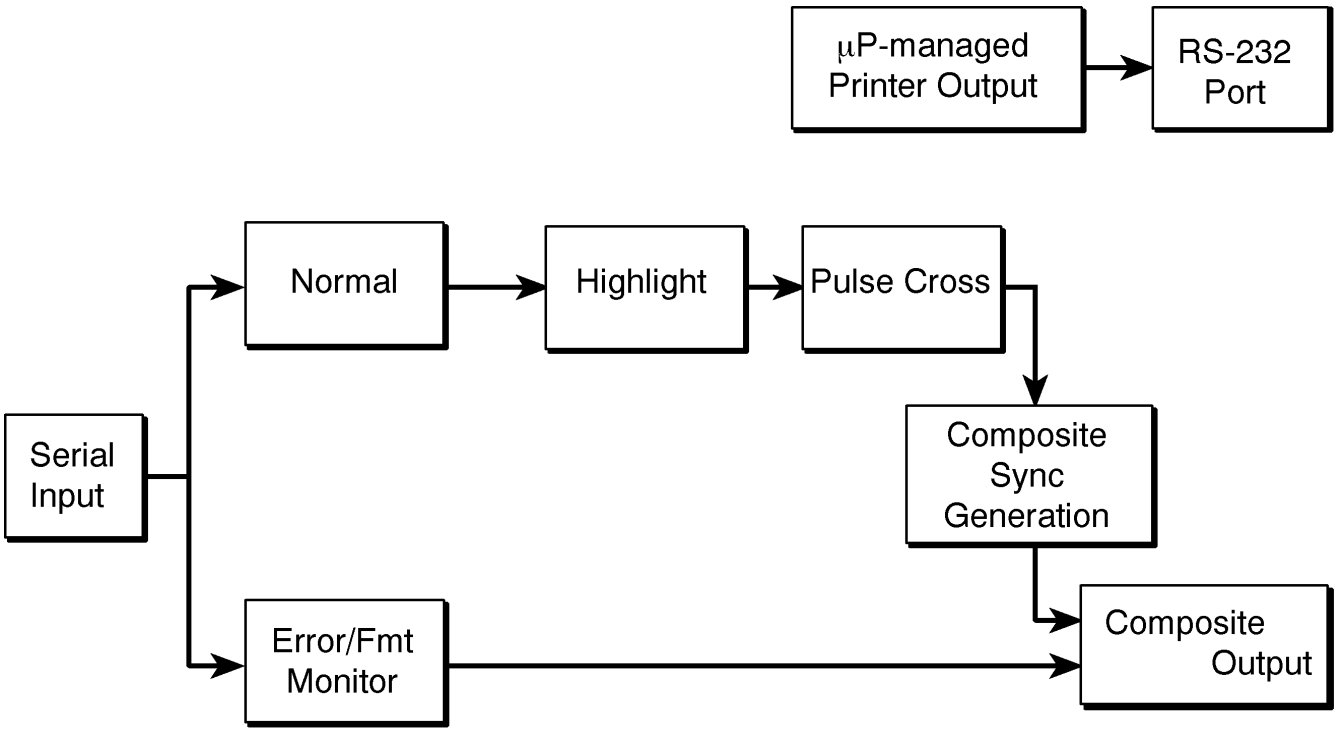
Circuit board illustrations and schematic diagrams follow page 7–4.

Block Diagrams

Hardware Diagram



Data Path Diagram



Circuit Board Illustrations

The circuit board illustrations in this manual follow the conventions explained in the following paragraphs.

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. For example:

$\overline{\text{ID CONTROL}}$, (ID CONTROL), or /ID CONTROL

Abbreviations are based on ANSI Y1.1–1972.

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

For these publications, contact:

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 of one (1.0) or greater are in picofarads (pF).
Values less than one (0.999, for example) are in microfarads (μF).

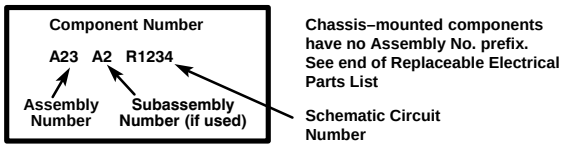
Resistors:

Ohms (Ω).

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), the circuit board illustration title, and the component locator chart(–s).

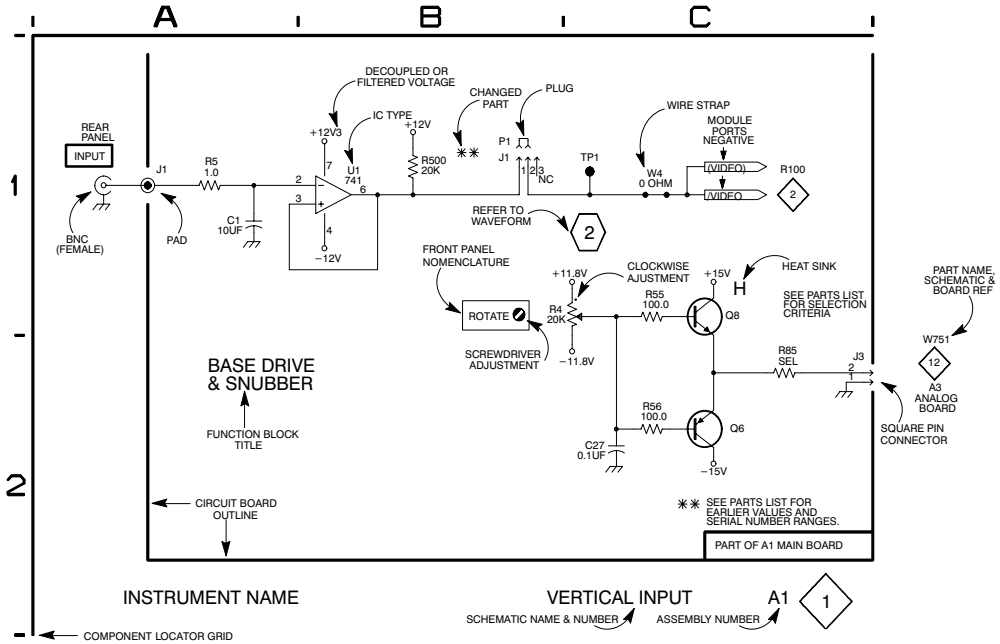
The Replaceable Electrical Parts List is arranged by assembly number in numerical sequence; the components are listed by component number. Example:

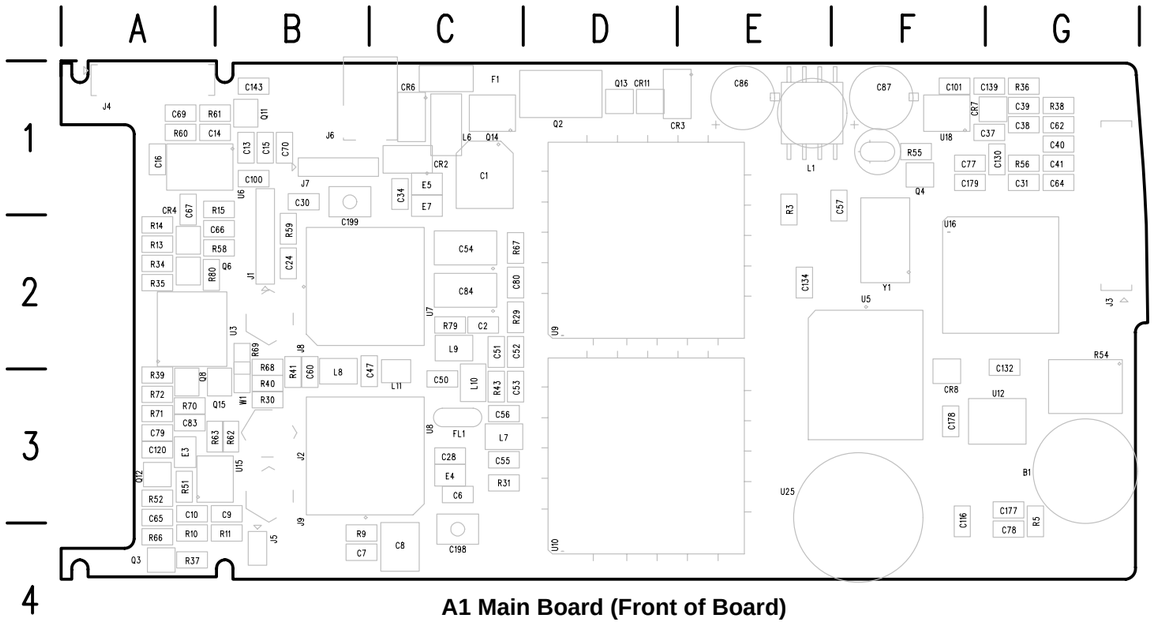


Grid Coordinates

The schematic diagram and circuit board illustration have grids, as shown below. Grid coordinates are used to indicate the horizontal and vertical location of the component on the illustration or schematic. Components J1, R5, and C1 in the example schematic are all in “Diag Loc” (diagram location) A1. A component locator chart accompanies each circuit board illustration.

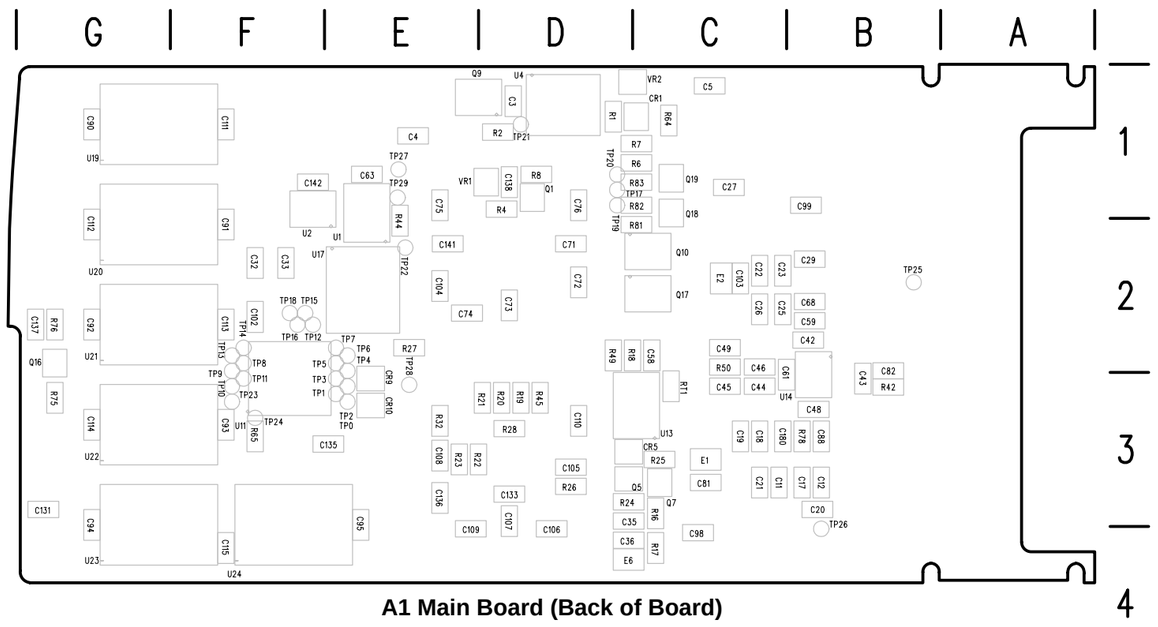
When more than one schematic diagram is required to illustrate the circuitry on a single circuit board, the circuit board illustration appears opposite the first diagram only. In such cases, the lookup table lists the number of the schematic that contains each component, and each additional schematic diagram is accompanied—on the facing page—by a smaller locator chart that lists only the components on that diagram.





A1 Main Board (Front of Board)

Static Sensitive Devices
See Maintenance Section

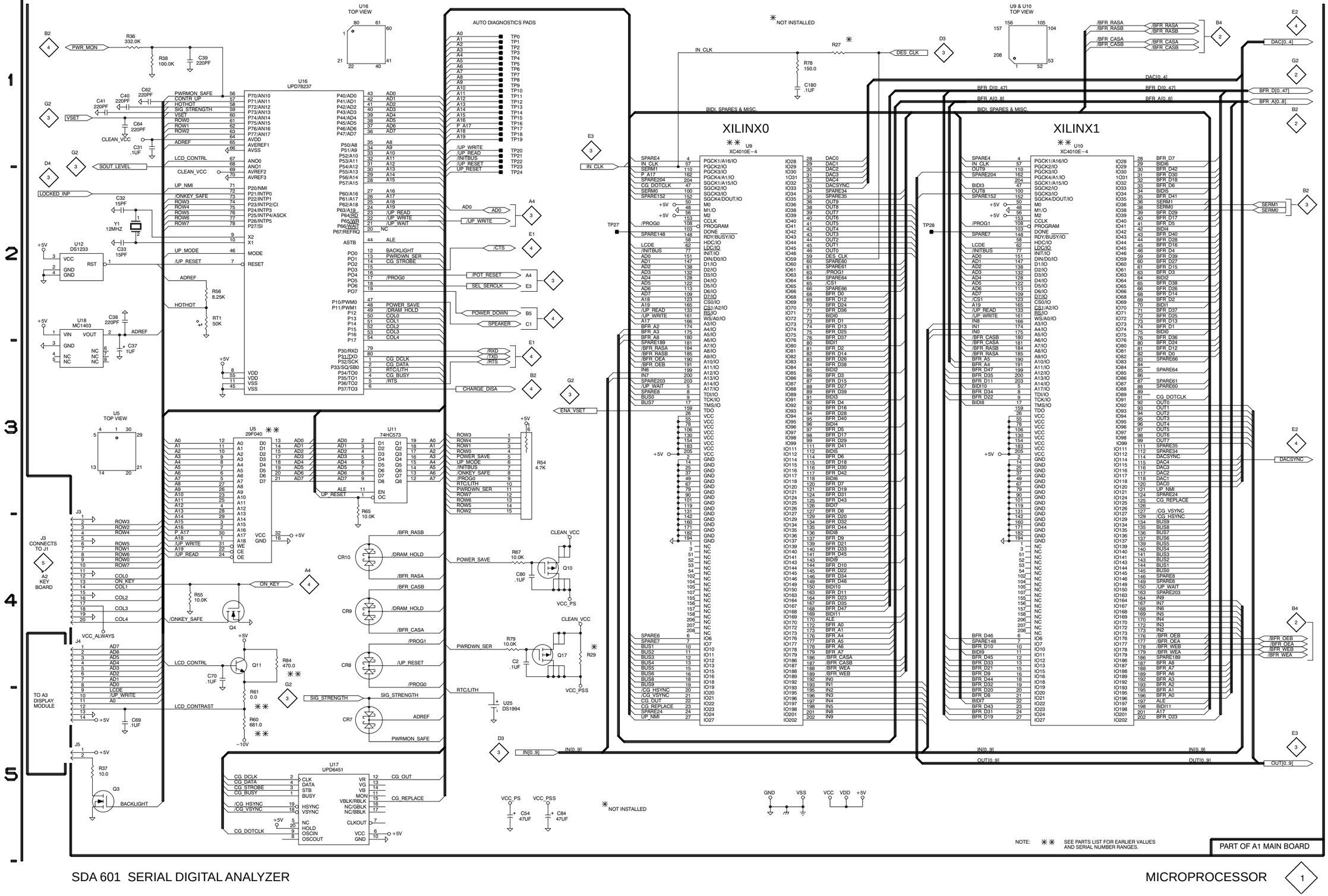


A1 Main Board (Back of Board)

A1 Main Board and Diagram Locator

(with cross-references to schematic diagrams 1, 2, 3, and 4).

Comp No	Diag No	Diag Loc	Bd Loc
C6	3	D3	C3
C7	3	E3	B4
C8	3	E3	C4
C9	3	H3	B3
C10	3	G3	A3
C11	3	E4	C3
C12	3	E4	B3
C13	4	E1	B1
C14	4	E1	A1
C15	4	F1	B1
C16	4	F1	A1
C17	3	F5	B3
C18	3	F5	C3
C19	3	F5	C3
C20	3	E5	B3
C21	3	F5	C3
C22	3	D5	C2
C23	3	C5	C2
C24	3	C5	B2
C25	3	C5	C2
C26	3	C5	C2
C27	3	C5	C1
C28	3	E5	C3
C29	3	C4	B2
C30	3	C4	B1
C31	1	A1	G1
C32	1	A2	F2
C33	1	A2	F2
C34	3	B3	C1
C35	4	F2	C3
C36	4	G2	C4
C37	1	A3	F1
C38	1	A2	G1
C39	1	B1	G1
C40	1	A1	G1
C41	1	A1	G1
C42	3	C1	B2
C43	3	C1	B2
C44	3	C2	C3
C45	3	C2	C3
C46	3	C2	C2
C47	3	D2	C3
C48	3	D2	B3
C49	3	D1	C2
C50	3	D1	C3
C51	3	E2	C2
C52	3	E2	C2
C53	3	E1	C3
C54	1	C5	C2
C55	3	E2	C3
C56	3	E2	C3
C57	4	D3	F1
C58	3	F2	C2
C59	3	B3	B2
C60	3	B3	B3
C61	3	C1	B2
C62	1	A1	G1
C63	4	C5	E1
C64	1	A1	G1
C65	3	G3	A3
C66	3	B3	A2
C67	3	B4	A2
C68	3	C4	B2
C69	1	A5	A1
C70	1	B4	B1
C71	2	C5	D2
C72	2	D5	D2
C73	2	D5	D2
C74	2	D5	E2
C75	2	D5	E1
C76	2	D5	D1
C77	2	D5	F1
C78	2	D5	G4
C79	3	G3	A3
C80	1	D4	C2
C81	3	E5	C3
C82	3	B3	B3
C83	3	B3	A3
C84	1	D5	C2
C86	4	F4	E1
C87	4	F4	F1
C88	3	E3	B3
C90	2	D5	G1
C91	2	D5	F2
C92	2	D5	G2
C93	2	D5	F3
C94	2	E5	G3
C95	2	E5	E3
C98	3	B3	C4
C99	3	B3	B1
C100	2	E5	B1
C101	2	E5	F1
C102	2	E5	F2
C103	3	D4	C2
C104	2	D5	E3
C105	2	D5	F3
C106	2	D5	G2
C107	2	D5	D3
C108	2	D5	E3
C109	2	D5	E4
C110	2	D5	D3
C111	2	E5	F1
C112	2	E5	G1
C113	2	E5	F2
C114	2	E5	G3
C115	2	D5	F4
C116	2	E5	F4
C120	3	G3	A3
C130	4	C5	G1
C131	4	C5	G3
C132	4	C5	G3
C133	4	C5	D3
C134	4	D5	E2
C135	4	D5	E3
C136	4	D5	E3
C137	4	D5	G2
C138	4	E5	D1
C139	4	E5	F1
C141	4	E5	E2
C142	4	D4	F1
C143	4	E5	B1
C177	2	E5	G3
C178	2	D5	F3
C179	2	E5	F1
C180	1	E1	C3
C198	3	D3	C4
C199	3	B3	B2
CR1	4	C2	D1
CR2	4	B3	C1
CR3	4	E4	D1
CR4	3	B4	A1
CR5	4	F3	D3
CR6	4	B3	C1
CR7	1	C5	F1
CR8	1	C4	F3
CR9	1	C4	E2
CR10	1	C4	E3
CR11	4	E4	D1
E1	3	E5	C3
E2	3	D3	C2
E3	3	G3	A3
E4	3	D3	C3
E5	3	B5	C1
E6	4	F2	D4
E7	3	B3	C1
F1	4	B3	C1
FL1	3	D1	C3
J1	4	G1	B2
J2	4	G3	B3
J3	1	A4	G2
J4	1	A4	A1
J5	1	A5	B4
J6	4	A3	B1
J7	4	A3	B1
J8	3	A3	B2
J9	3	H3	B4
L1A	4	F4	E1
L1B	4	F4	E1
L6	4	B3	C1
L7	3	E2	C3
L8	3	D2	B3
L9	3	D1	C2
L10	3	E1	C3
L11	3	C2	C3
Q1	4	D4	D1
Q2	4	C2	D1
Q3	1	A5	A4
Q4	1	B4	F1
Q5	4	F3	D3
Q6	3	B4	B2
Q7	4	F3	C3
Q8	3	B4	A3
Q9	4	E4	D1
Q10	1	D4	D2
Q11	1	B4	B1
Q12	3	G2	A3
Q13	4	E4	D1
Q14	4	C3	C1
Q15	3	B3	A3
Q16	4	D1	G2
Q17	1	D4	D2
Q18	4	B2	C1
Q19	4	B2	C1
R1	4	B2	D1
R2	4	E4	D1
R3	4	B5	E1
R4	4	E4	D1
R5	4	D1	G4
R6	4	C2	C1
R7	4	C2	C1
R8	4	D4	D1
R9	3	E3	B4
R10	3	G3	A4
R11	3	H3	B4
R13	3	B4	A2
R14	3	B4	A2
R15	3	B4	A1
R16	4	F3	C3
R17	4	F3	C4
R18	3	F2	C2
R19	4	F3	D3
R20	4	F3	D3
R21	4	E3	D3
R22	4	E3	D3
R23	4	E3	E3
R24	4	F2	C3
R25	4	F2	C2
R26	4	F3	D3
R27	1	E1	E2
R28	4	E3	D3
R29	1	D4	C2
R30	4	G3	B3
R31	4	G3	C3
R32	4	E2	E3
R34	3	B4	A2
R35	3	B4	A2
R36	1	A1	G1
R37	1	A5	A4
R38	1	A1	G1
R39	3	B4	A3
R40	3	B1	B3
R41	3	B1	B3
R42	3	C1	B3
R43	4	E2	C2
R45	4	E3	D3
R49	3	F2	D2
R50	3	C2	C2
R51	3	G3	A3
R52	3	G3	A3
R54	1	D3	G2
R55	1	B4	F1
R56	1	B2	G1
R58	3	C4	A2
R59	3	C4	B2
R60	1	B5	A1
R61	1	B5	A1
R62	3	F3	B3
R63	3	F3	B3
R64	4	C3	C1
R65	1	C3	F3
R66	3	G3	A4
R67	1	D4	C2
R68	3	B3	B3
R69	3	B2	B2
R70	3	B3	A3
R71	3	B3	A3
R72	3	B3	A3
R75	4	D1	G3
R76	4	D1	G2
R78	1	E1	B3
R79	1	C4	C2
R80	3	B4	B2
R81	4	B2	C2
R82	4	B2	C1
R83	4	B2	C1
R84	1	B4	B1
RT1	1	B2	C3
TP0	1	C1	E3
TP1	1	C1	E3
TP2	1	C1	E3
TP3	1	C1	E3
TP4	1	C1	E2
TP5	1	C1	E2
TP6	1	C1	E2
TP7	1	C1	E2
TP8	1	C1	F2
TP9	1	C1	F3
TP10	1	C1	F3
TP11	1	C1	F3
TP12	1	C1	F2
TP13	1	C1	F2
TP14	1	C1	F2
TP15	1	C1	F2
TP16	1	C1	F2
TP17	1	C1	D1
TP18	1	C1	F2
TP19	1	C1	D1
TP20	1	C1	D1
TP21	1	C1	D1
TP22	1	C1	E2
TP23	1	C1	E2
TP24	1	C2	F3
TP25	3	C3	B2
TP26	3	E3	B4
TP27	1	D2	E1
TP28	1	F2	E2
TP29	4	C4	E1
U1A	4	C4	E2
U1B	4	B4	E2
U2	4	D3	F2
U3	3	A4	B2
U4	4	D4	D1
U5	1	B3	F2
U6	4	F1	B1
U7	3	C3	C2
U8	3	F3	C3
U9	1	E1	D2
U10	1	G1	D4
U11	1	C3	E3
U12	1	A2	G3
U13	3	E1	D3
U14	3	C1	B3
U15	3	G3	B3
U16	1	B1	F2
U17	1	B5	E2
U18	1	A2	F1
U19	2	C2	F1
U20	2	C3	F2
U21	2	D2	F2
U22	2	D3	F3
U23	2	F2	F4
U24	2	F3	E4
U25	1	C5	E3
VR1	4	C4	D1
VR2	4	C3	D1
W1	3	B2	B3
Y1	1	A2	F2

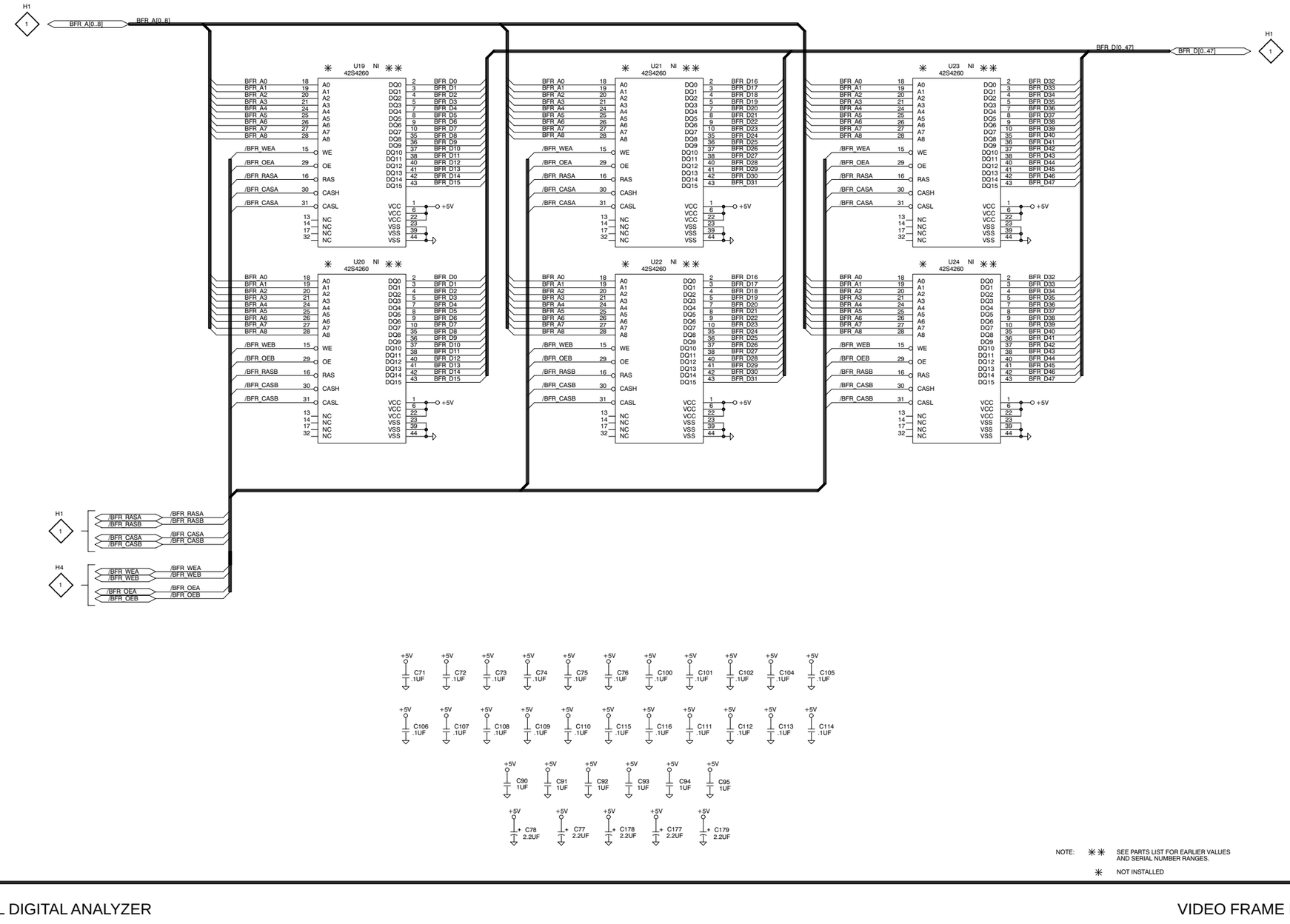

XILINX0
XC4010E–4
XILINX1
XC4010E–4
U16
UPD78237
U5
29F040
U11
74HC573
U17
UPD6451
U12
DS1233
U18
MC1403
U25
DS1994
AUTO DIAGNOSTICS PADS
NOT INSTALLED
BIDI SPARES & MISC.
IN_CLK
DES_CLK
DAC[0..4]
BFR_D[0..47]
BFR_A[0..8]
IN[0..9]
OUT[0..9]
PWR_MON
VSET
SOUT_LEVEL
LOCKED_INP
CLEAN_VCC
LCD_CONTRL
LCD_CONTRAST
UP_MODE
/UP_RESET
HOTHOT
ADREF
/ONKEY_SAFE
ON_KEY
VCC_ALWAYS
SIG_STRENGTH
PWRMON_SAFE
/CTS
/POT_RESET
SEL_SERCLK
POWER_DOWN
SPEAKER
/RXD
/TXD
/RTS
CHARGE_DISA
ENA_VSET
/DRAM_HOLD
/BFR_RASA
/BFR_CASB
/PROG1
/UP_RESET
/PROG0
/BFR_RASB
/BFR_CASA
/UP_READ
/UP_WRITE
/INITBUS
POWER_SAVE
PWRDWN_SER
RTC/LITH
CG_DCLK
CG_DATA
CG_STROBE
CG_BUSY
/CG_HSYNC
/CG_VSYNC
CG_DOTCLK
CG_OUT
CG_REPLACE
BACKLIGHT
TO A3 DISPLAY MODULE
J3 CONNECTS TO J1
A2 KEY BOARD
SERM0
SERM1
DACSYNC
/BFR_OEB
/BFR_OEA
/BFR_WEB
/BFR_WEA
NOTE: ✱✱ SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES.
PART OF A1 MAIN BOARD
SDA 601 SERIAL DIGITAL ANALYZER
MICROPROCESSOR
1

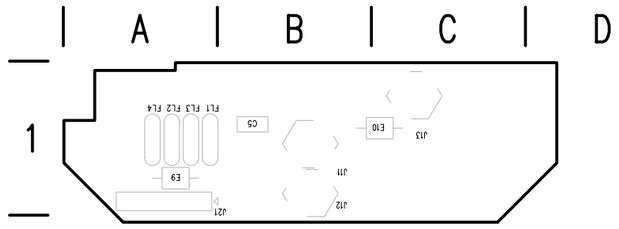
Schematic Diagram <2> Component Locator Chart

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

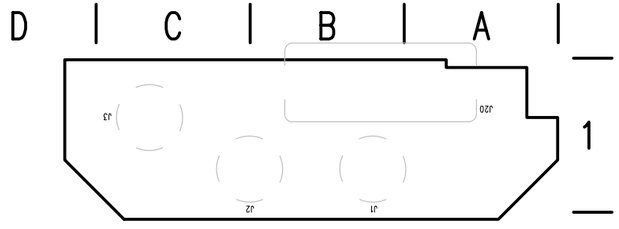
Assembly A1.

Comp No	Diag Loc	Bd Loc
C71	C5	D2
C72	D5	D2
C73	D5	D2
C74	D5	E2
C75	D5	E1
C76	D5	D1
C77	D5	F1
C78	D5	G4
C90	D5	G1
C91	D5	F2
C92	D5	G2
C93	D5	F3
C94	E5	G3
C95	E5	E3
C100	E5	B1
C101	E5	F1
C102	E5	F2
C104	E5	E2
C105	E5	D3
C106	C5	D4
C107	D5	D3
C108	D5	E3
C109	D5	E4
C110	D5	D3
C111	E5	F1
C112	E5	G1
C113	E5	F2
C114	E5	G3
C115	D5	F4
C116	E5	F4
C177	E5	G3
C178	D5	F3
C179	E5	F1
U19	C2	F1
U20	C3	F2
U21	D2	F2
U22	D3	F3
U23	F2	F4
U24	F3	E4


BFR_A[0..8]
BFR_D[0..47]
U19 NI 42S4260
U20 NI 42S4260
U21 NI 42S4260
U22 NI 42S4260
U23 NI 42S4260
U24 NI 42S4260
/BFR_WEA
/BFR_OEA
/BFR_RASA
/BFR_CASA
/BFR_CASB
/BFR_WEB
/BFR_OEB
/BFR_RASB
+5V
C71 .1UF
C72 .1UF
C73 .1UF
C74 .1UF
C75 .1UF
C76 .1UF
C100 .1UF
C101 .1UF
C102 .1UF
C104 .1UF
C105 .1UF
C106 .1UF
C107 .1UF
C108 .1UF
C109 .1UF
C110 .1UF
C115 .1UF
C116 .1UF
C111 .1UF
C112 .1UF
C113 .1UF
C114 .1UF
C90 1UF
C91 1UF
C92 1UF
C93 1UF
C94 1UF
C95 1UF
C78 2.2UF
C77 2.2UF
C178 2.2UF
C177 2.2UF
C179 2.2UF
NOTE: ✳✳ SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES.
✳ NOT INSTALLED
PART OF A1 MAIN BOARD



A4 IO Board (Front of Board)



A4 IO Board (Back of Board)

Static Sensitive Devices
See Maintenance Section

Schematic Diagram <3> Component Locator Chart

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assemblies A1 and A4.

Comp No	Diag Loc	Bd Loc
A1		
C6	D3	C3
C7	E3	B4
C8	E3	C4
C9	H3	B3
C10	G3	A3
C11	E4	C3
C12	E4	B3
C17	F5	B3
C18	F5	C3
C19	F5	C3
C20	E5	B3
C21	F5	C3
C22	D5	C2
C23	C5	C2
C24	C5	B2
C25	C5	C2
C26	C5	C2
C27	C5	C1
C28	E5	C3
C29	C4	B2
C30	C4	B1
C34	B3	C1
C42	C1	B2
C43	C1	B2
C44	C2	C3
C45	C2	C3
C46	C2	C2
C47	D2	C3
C48	D2	B3
C49	D1	C2
C50	D1	C3
C51	E2	C2
C52	E2	C2
C53	E1	C3
C55	E2	C3
C56	E2	C3
C58	F2	C2
C59	B3	B2
C60	B3	B3
C61	C1	B2
C65	G3	A3
C66	B3	A2
C67	B4	A2
C68	C4	B2
C79	G3	A3
C81	E5	C3
C82	B3	B3
C83	B3	A3
C88	E3	B3
C98	D3	C4
C99	B3	B1
C103	D4	C2
C120	G3	A3
C198	D3	C4
C199	B3	B2
CR4	B4	A1
E1	E5	C3
E2	D3	C2
E3	G3	A3
E4	D3	C3
E5	B5	C1
E7	B3	C1
FL1	D1	C3
J8	A3	B2
J9	H3	B4
L7	E2	C3
L8	D2	B3
L9	D1	C2
L10	E1	C3
L11	C2	C3
Q6	B4	B2
Q8	B4	A3
Q12	G2	A3
Q15	B3	A3
R9	E3	B4
R10	G3	A4
R11	H3	B4
R13	B4	A2
R14	B4	A2
R15	B4	A1
R18	F2	C2
R34	B4	A2
R35	B4	A2
R39	B4	A3
R40	B1	B3
R41	B1	B3
R42	C1	B3
R43	E1	C3
R49	F2	D2
R50	C2	C2
R51	G3	A3
R52	G3	A3
R58	C4	A2
R59	C4	B2
R62	F3	B3
R63	F3	B3
R66	G3	A4
R68	B3	B3
R69	B2	B2
R70	B3	A3
R71	B3	A3
R72	B3	A3
R80	B4	B2
TP25	C3	B2
TP26	E3	B4
U3	A4	B2
U7	C3	C2
U8	F3	C3
U13	E1	D3
U14	C1	B3
U15	G3	B3
W1	B2	B3
A4		
C5	G2	B1
E9	G2	A1
E10	G2	C1
FL1	H1	B1
FL2	H1	A1
FL3	H2	A1
FL4	H2	A1
J1	H3	B1
J2	H3	C1
J3	A3	C1
J11	G3	B1
J12	H3	B1
J13	A3	C1
J20	H1	B1
J21	G1	B1

SIGNAL STRENGTH METER

MIXER
90Mhz LO

IF FILTER
(10.7 MHZ)

RECEIVER AND
LOGGING

U14
NE602

U13
MC13055D

SIG_STRENGTH

SERIAL
INPUT

PART OF
A4 I/O
BOARD

DESERIALIZER

U7
GVG_DESERIALIZ

SERIAL OUTPUT

NOT INSTALLED

U8
GVG_SERIALIZER

U15
GS9008

SERIAL
OUTPUT

U3
DS1267

U7 & U8
TOP VIEW

NOT INSTALLED

PART OF A1 MAIN BOARD

PART OF
A4 I/O
BOARD

SDA 601 SERIAL DIGITAL ANALYZER

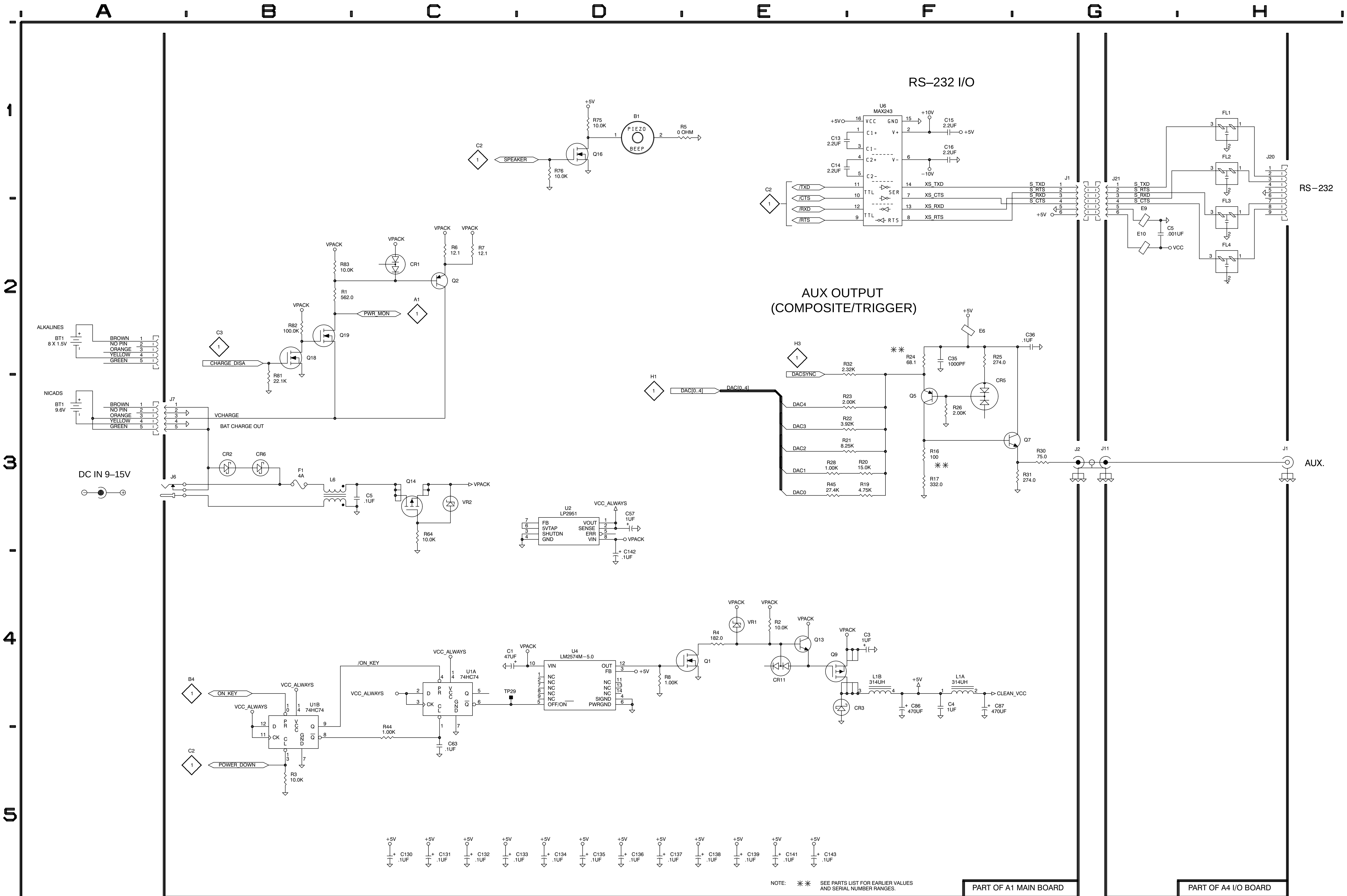
SERIAL INPUT & OUTPUT

Schematic Diagram <4> Component Locator Chart

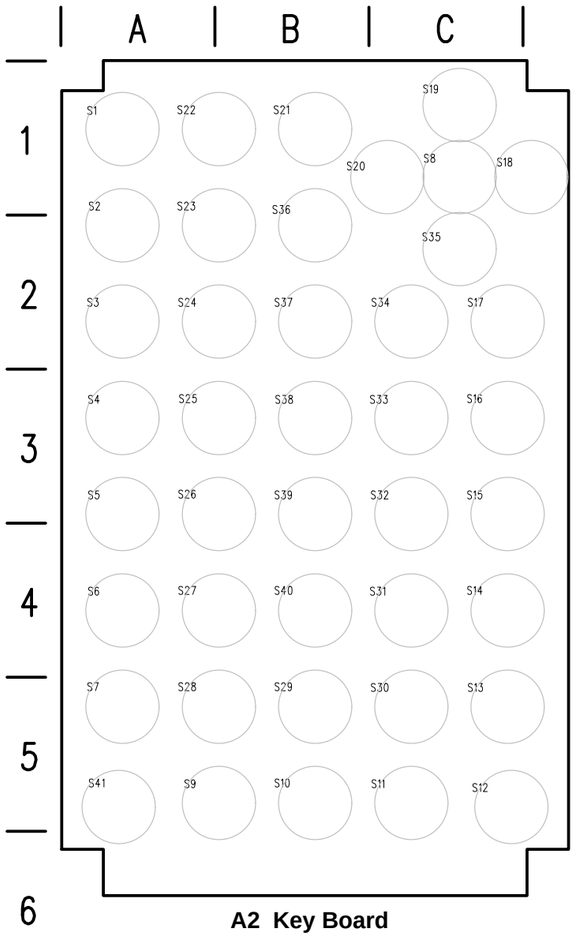
The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A1.

Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc
B1	D1	G3	CR6	B3	C1	R17	F3	C4
			CR11	E4	D1			
C1	C4	C1				R19	F3	D3
C3	F4	D1	E6	F2	D4	R20	F3	D3
C4	F4	E1				R21	E3	D3
C5	C3	C1	F1	B3	C1	R22	E3	D3
C13	E1	B1				R23	E3	E3
			J1	G1	B2			
C14	E1	A1	J2	G3	B3	R24	F2	C3
C15	F1	B1	J6	A3	B1	R25	F2	C3
C16	F1	A1	J7	A3	B1	R26	F3	D3
C35	F2	C3				R28	E3	D3
C36	G2	C4	L1A	F4	E1	R30	G3	B3
			L1B	F4	E1			
C57	D3	F1	L6	B3	C1	R31	G3	C3
C63	C5	E1				R32	E2	E3
C86	F4	E1	Q1	D4	D1	R44	C5	E1
C87	F4	F1	Q2	C2	D1	R45	E3	D3
C130	C5	G1	Q5	F3	D3	R64	C3	C1
			Q7	F3	C3			
C131	C5	G3	Q9	E4	D1	R75	D1	G3
C132	C5	G3				R76	D1	G2
C133	C5	D3	Q13	E4	D1	R81	B2	C2
C134	D5	E2	Q14	C3	C1	R82	B2	C1
C135	D5	E3	Q16	D1	G2	R83	B2	C1
			Q18	B2	C1			
C136	D5	E3	Q19	B2	C1	TP29	C4	E1
C137	D5	G2						
C138	E5	D1	R1	B2	D1	U1A	C4	E2
C139	E5	F1	R2	E4	D1	U1B	B4	E2
C141	E5	E2	R3	B5	E1	U2	D3	F2
			R4	E4	D1	U4	D4	D1
C142	D4	F1	R5	D1	G4	U6	F1	B1
C143	E5	B1						
			R6	C2	C1	VR1	E4	D1
CR1	C2	D1	R7	C2	C1	VR2	C3	D1
CR2	B3	C1	R8	D4	D1			
CR3	E4	D1	R16	F3	C3			
CR5	F3	D3						



RS–232 I/O
AUX OUTPUT
(COMPOSITE/TRIGGER)
RS–232
AUX.
DC IN 9–15V
ALKALINES
NICADS
U6 MAX243
U2 LP2951
U4 LM2574M–5.0
U1A 74HC74
U1B 74HC74
PIEZO BEEP
NOTE: ** SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES.
PART OF A1 MAIN BOARD
PART OF A4 I/O BOARD



A2 Key Board

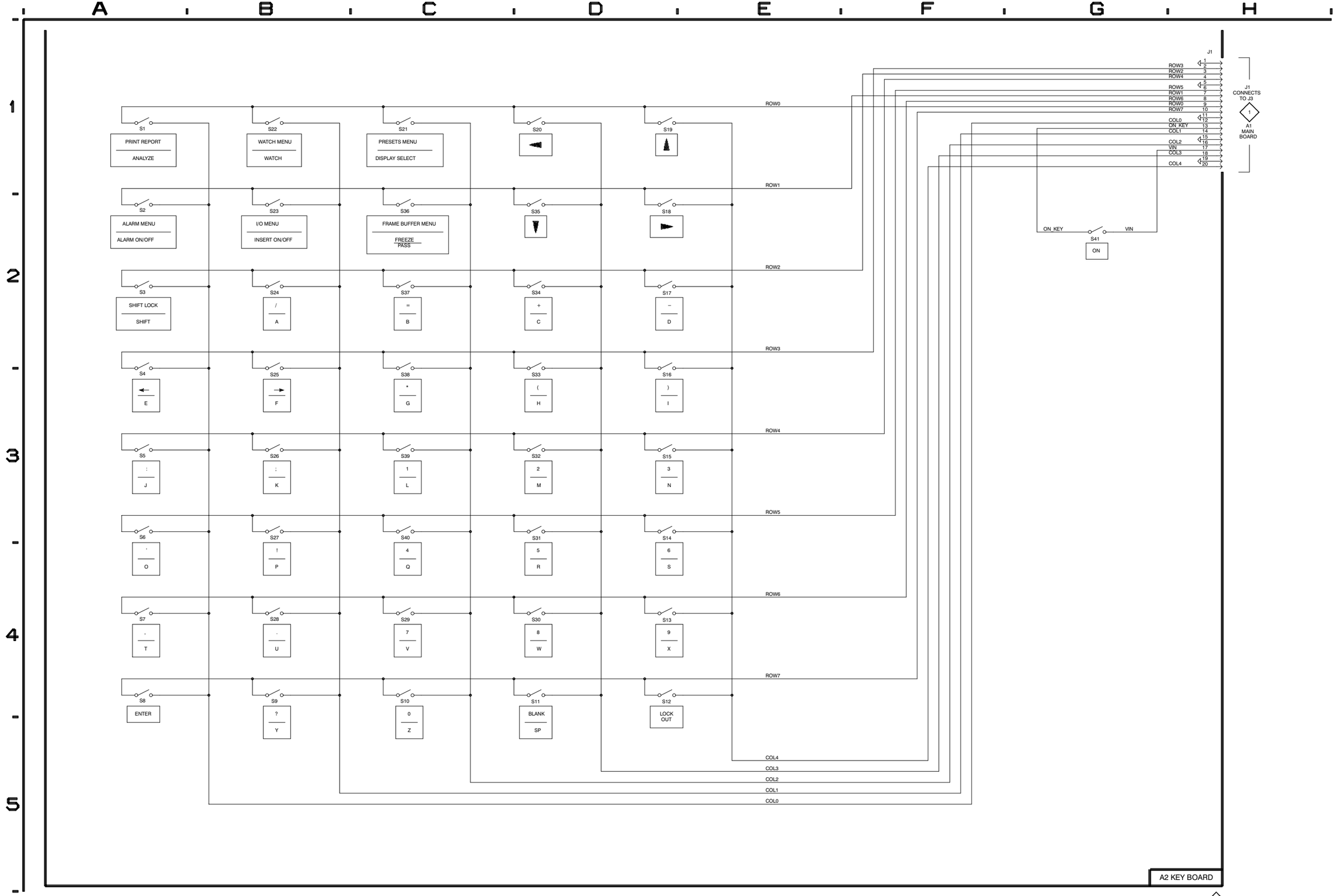
Schematic Diagram <5>
Component Locator Chart

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A2.

Comp No	Diag Loc	Bd Loc	Comp No	Diag Loc	Bd Loc
J1	H1	B6	S21	C1	B1
			S22	B1	A1
S1	A1	A1	S23	B1	A1
S2	A1	A1	S24	B2	A2
S3	A2	A2	S25	B2	A3
S4	A2	A3			
S5	A3	A3	S26	B3	A3
			S27	B3	A4
S6	A3	A4	S28	B4	A5
S7	A4	A5	S29	C4	B5
S8	A4	C1	S30	D4	C5
S9	B4	A5			
S10	C4	B5	S31	D3	C4
			S32	D3	C3
S11	D4	C5	S33	D2	C3
S12	D4	C5	S34	D2	C2
S13	D4	C5	S35	D1	C2
S14	D3	C4			
S15	D3	C3	S36	C1	B1
			S37	C2	B2
S16	D2	C3	S38	C2	B3
S17	D2	C2	S39	C3	B3
S18	D1	C1	S40	C3	B4
S19	D1	C1	S41	G2	A5
S20	D1	B1			

Static Sensitive Devices
See Maintenance Section


A
B
C
D
E
F
G
H
1
2
3
4
5
S1
PRINT REPORT
ANALYZE
S22
WATCH MENU
WATCH
S21
PRESETS MENU
DISPLAY SELECT
S20
S19
S2
ALARM MENU
ALARM ON/OFF
S23
I/O MENU
INSERT ON/OFF
S36
FRAME BUFFER MENU
FREEZE
PASS
S35
S18
S3
SHIFT LOCK
SHIFT
S24
/
A
S37
=
B
S34
+
C
S17
−
D
S4
E
S25
F
S38
*
G
S33
(
H
S16
)
I
S5
:
J
S26
;
K
S39
1
L
S32
2
M
S15
3
N
S6
'
O
S27
!
P
S40
4
Q
S31
5
R
S14
6
S
S7
,
T
S28
.
U
S29
7
V
S30
8
W
S13
9
X
S8
ENTER
S9
?
Y
S10
0
Z
S11
BLANK
SP
S12
LOCK
OUT
ROW0
ROW1
ROW2
ROW3
ROW4
ROW5
ROW6
ROW7
COL4
COL3
COL2
COL1
COL0
J1
ROW3
ROW2
ROW4
ROW5
ROW1
ROW6
ROW0
ROW7
COL0
ON_KEY
COL1
COL2
VIN
COL3
COL4
J1
CONNECTS
TO J3
1
A1
MAIN
BOARD
ON_KEY
VIN
S41
ON
A2 KEY BOARD

Replaceable Mechanical Parts

Replaceable Mechanical Parts

This section contains a list of the components that are replaceable for the SDA 601. Use this list to identify and order replacement parts. There is a separate Replaceable Mechanical Parts list for each instrument.

Parts Ordering Information

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

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

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

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

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

Using the Replaceable Mechanical Parts List

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

Cross Index–Mfr. Code Number to Manufacturer

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

Abbreviations

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

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

Column Descriptions

Figure & Index No. (Column 1) Items in this section are referenced by figure and index numbers to the illustrations.

Tektronix Part No. (Column 2) Indicates part number to be used when ordering replacement part from Tektronix.

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

Qty (Column 5) This indicates the quantity of mechanical parts used.

Name and Description (Column 6) An item name is separated from the description by a colon (:). Because of space limitations, an item name may sometimes appear as incomplete. Use the U.S. Federal Catalog handbook H6-1 for further item name identification.

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

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

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

Mfr. Code (Column 7) Indicates the code number of the actual manufacturer of the part. (Code to name and address cross reference can be found immediately after this page.)

Mfr. Part Number (Column 8) Indicates actual manufacturer's part number.

Cross Index – Mfr. Code Number To Manufacturer

Mfr. code	Manufacturer	Address	City, state, zip code
TK0435	LEWIS SCREW CO	4300 S RACINE AVE	CHICAGO IL 60609–3320
TK1155	QUALITY PLASTIC INJECTION MOLDING	3910 INDUSTRIAL AVE	COEUR D'ALENE ID 83814
TK2548	XEROX BUSINESS SERVICES DIV OF XEROX CORPORATION	14181 SW MILLIKAN WAY	BEAVERTON OR 97077
0DWW6	MICRO POWER ELECTRONICS	7973 SW CIRRUS DRIVE BLDG. #22	BEAVERTON OR 97005
0KB01	STAUFFER SUPPLY	810 SE SHERMAN	PORTLAND OR 97214
0VG90	GLOBTEK INC	186 VETERANS DRIVE	NORTHVALE, NJ 07647
62712	SEIKO INSTRUMENTS USA	2990 W LOMITA BLVD	TORRANCE CA 90505–5102
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON OR 97077–0001

Replaceable Mechanical Parts

Fig. & index no.	Tektronix part no.	Serial number Effective	Dscont	Qty	Name & description	Mfr. code	Mfr. part no.
1–1	614–0913–00			1	KIT ASSEMBLY:BATTERY HOLDER SUB ASSEMBLY *MOUNTING PARTS*	80009	614091300
–2	211–0097–00			1	SCREW,MACHINE:4–40 X 0.312,PNH,STL *END MOUNTING PARTS*	TK0435	ORDER BY DESC
–3	348–1347–00			4	PAD,CUSHIONING:TSG90	80009	348134700
–4	200–4075–00			1	DOOR,BATTERY:POLYCARBONATE	TK1155	200–4075–00
–5	333–4146–01			1	PANEL,REAR:PLASTIC,SDA601	80009	333414601
–6	————————			1	CKT BD ASSY:INPUT/OUTPUT BOARD (SEE A4 REPL) *MOUNTING PARTS*		
–7	211–0661–00			3	SCR,ASSEM WSHR:4–40 X 0.25,PNH,STL,CD PL,POZ,MACH	TK0435	ORDER BY DESC
–8	214–3903–01			2	SCR,JACK:4–4– X 0.312 EXT THD,4–40 INT THD,0.188 HEX,STEEL,CAD PLATE *END MOUNTING PARTS*	80009	214–3903–01
–9	————————			1	CKT BD ASSY:MAIN (SEE A1 REPL)		
–10	426–2408–00			1	SPACER,ECB:ABS,BLACK,TSG601	80009	426240800
–11	————————			1	CIRCUIT BD ASSY:KEYBOARD (SEE A2 REPL)		
–12	119–4710–00			1	KEYPAD:SDA601	80009	119471000
–13	361–1636–00			2	SPACER:SANTOPREN	80009	361163600
–14	————————			1	DISPLAY,MODULE:,LCD;16 CHARACTERS X 2 LINES ,5 X 7 DOT MATRIX,TRANSFLECTIVE,YEL/GRN LED BACKLIGHT,WIDE TEMP RANGE (SEE A3 REPL)		
–15	614–0921–00			1	KIT ASSEMBLY:TOP	80009	614092100
					STANDARD ACCESSORIES		
	016–1229–00			1	CASE,CARRYING:TSG90	80009	016122900
	070–8912–XX			1	MANUAL,TECH:INSTRUCTION,CARD	TK2548	0708912XX
–16	119–4538–00			1	POWER SUPPLY:12W; 12V 1A, 180CM CORD WITH 2 .1MM FEMALE RIGHT ANGLECONN, CN (STANDARD ONLY)	0VG90	WD1E1000CRA12CN
					OPTIONAL ACCESSORIES		
	119–4539–00			1	POWER SUPPLY:12W; 12V 1A, 180CM CORD WITH 2 .1MM FEMALE RIGHT ANGLECONN, CN (OPTION 1J ONLY)	0VG90	WD49E1000CRA12C
–17	119–4488–00			1	BAT PACK ASSY:	0DWW6	101–147–1
	070–8913–XX			1	MANUAL,TECH:USER	80009	0708913XX
	070–8914–XX			1	MANUAL,TECH:SERVICE	80009	0708914XX

Fig. & index no.	Tektronix part no.	Serial number Effective	Dscont	Qty	Name & description	Mfr. code	Mfr. part no.
	119–4540–00			1	POWER SUPPLY:12W;12V 1.0A,UNREGULATED,220VAC 50HZ,183CM CABLE W/5.5MM OD,2.1MM ID RT ANG CN COAX PLUG;TUV/IEC950,WALL MT (EUROPEAN OPTION A1 ONLY)	80009	119–4540–00
	119–4541–00			1	POWER SUPPLY: 12W;12V 1.0A,UNREGULATED,240VAC 50HZ,183CM CABLE W/5.5 MM OD,2.1MM ID RT ANG CN COAX PLUG;TUV/IEC950,WALL MT (UNITED KINGDOM OPTION A2 ONLY)	80009	119–4541–00
	119–4542–00			1	POWER SUPPLY:12W;12V 1.0A,UNREGULATED,240VAC 50HZ,183CM CABLE W/5.5MM OD,2.1MM ID RT ANG CN COAX PLUG;SAA/IEC742,WALL MT (AUSTRIALIAN OPTION A3 ONLY)	80009	119–4542–00
	119–4539–00			1	POWER SUPPLY: 12W;12V 1.0A,UNREGULATED,100VAC 50HZ,183CM CABLE W/5.5 MM OD,2.1MM ID RT ANG CN COAX PLUG;MITI T–MARK,WALL MT (OPTION A6 ONLY)	80009	119–4539–00
–18	386–6897–00			1	STAND:0.01/0.015 THK BLACK VINYL PLASTIC CONFORMAL COATING ALL OVER,TSG95	80009	386–6897–00

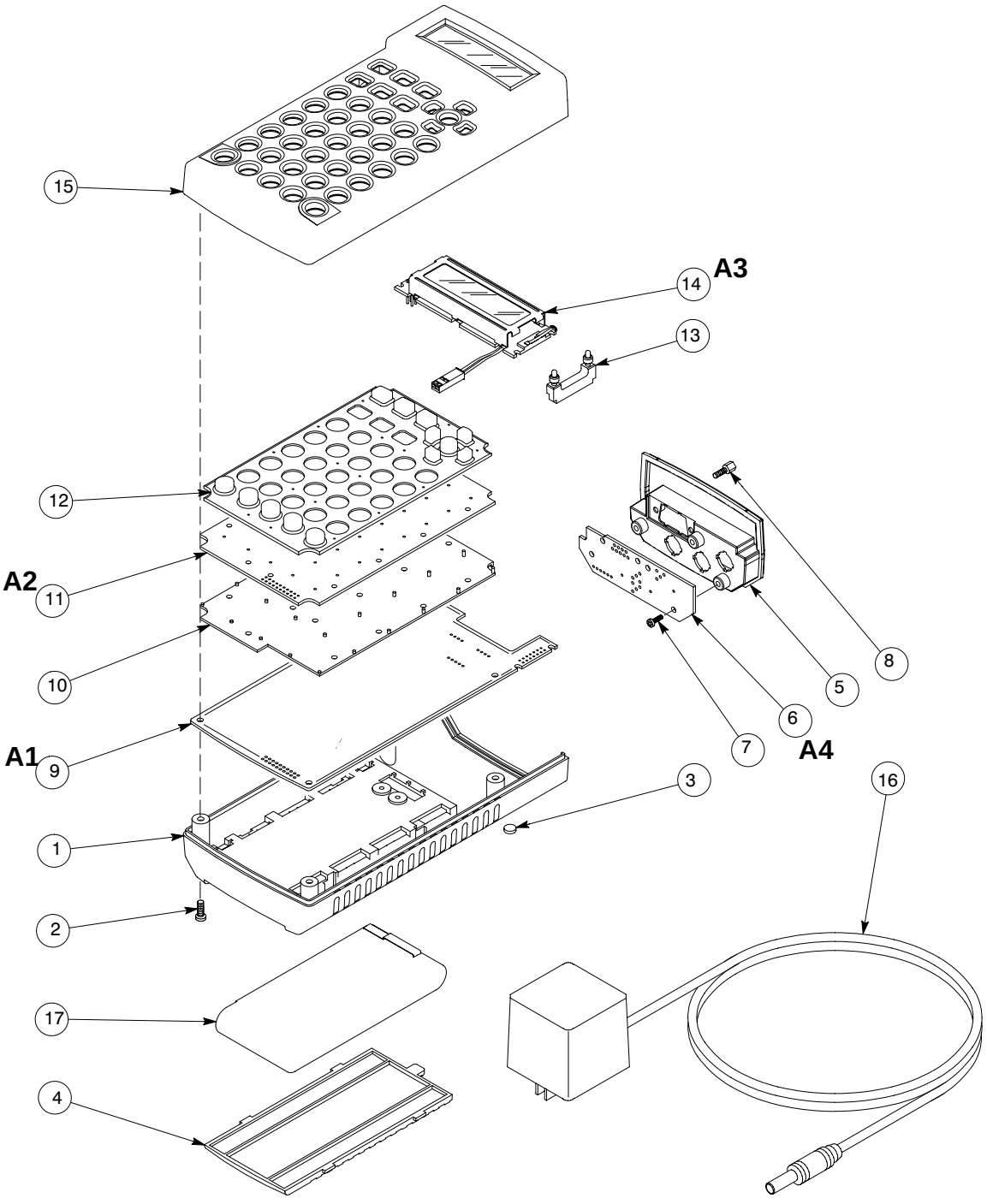


Figure 1: Exploded View

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