318A

LOGIC ANALYZER SERVICE MANUAL

R, 9E

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

FIRST PRINTING AUGUST 1987

WARNING

THE FOLLOWING SERVICING INSTRUCTIONS ARE FOR USE BY QUALIFIED PERSONNEL ONLY. TO AVOID PERSONAL INJURY, DO NOT PERFORM ANY SERVICING OTHER THAN THAT CONTAINED IN OPERATING INSTRUCTIONS UNLESS YOU ARE QUALIFIED TO DO SO.

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OPERATOR'S SAFETY SUMMARY

The general safety information in this summary is for both operator and service personnel. Specific cautions and warnings are found throughout the manual where they apply, but may not appear in this summary.

TERMS IN THIS MANUAL

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

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

TERMS AS MARKED ON EQUIPMENT

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

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

SYMBOLS AS MARKED ON EQUIPMENT


DANGER – High voltage.


Protective ground (earth) terminal.


ATTENTION – refer to manual.

GROUNDING THE PRODUCT

This product is intended to operate from a power source that does not apply more than 250 volts rms between the supply conductors or between either supply conductor and ground.

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

DANGER ARISING FROM LOSS OF GROUND

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

USE THE PROPER POWER CORD

Use only the power cord and connector specified for your product, and be sure it is in good condition.

Refer to the *Operating Information* section of this manual for information on power cords and connectors.

USE THE PROPER FUSE

To avoid fire hazard, use only a fuse of the correct type, voltage rating, and current rating as specified in the parts list for this product. Also, ensure that the line selector switch is in the proper position for the power source being used.

BATTERY REPLACEMENT

Refer lithium battery replacement to qualified service personnel.

DO NOT OPERATE IN EXPLOSIVE ATMOSPHERES

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

SERVICE SAFETY SUMMARY

FOR QUALIFIED SERVICE PERSONNEL ONLY
Refer also to the Operator's Safety Summary.

DO NOT SERVICE ALONE

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

USE CARE WHEN SERVICING WITH POWER ON

Dangerous voltages exist at several points in this product. To avoid personal injury, do not touch exposed connections and components while power is on.

Disconnect power before removing protective panels, soldering, or replacing components.

USE CAUTION WHEN SERVICING THE CRT

The CRT should be serviced only by qualified personnel familiar with CRT servicing procedures and precautions.

CRTs retain hazardous voltages for long periods of time after power-down. Before attempting any work inside the monitor, discharge the CRT by shorting the anode to chassis ground. When discharging the CRT, connect the discharge path to ground and then the anode.

Use extreme caution when handling the CRT. Rough handling may cause it to implode. Do not nick or scratch the glass or subject it to undue pressure during removal or installation. When handling the CRT, wear safety goggles and heavy gloves for protection.

REMOVE LOOSE OBJECTS

During disassembly or installation procedures, screws or other small objects may fall to the bottom of the mainframe. To avoid shorting out the power supply, do not power up the instrument until such objects have been removed.

LITHIUM BATTERY REPLACEMENT

To avoid personal injury, observe proper procedures for handling and disposal of lithium batteries. Improper handling may cause fire, explosion, or severe burns. Don't recharge, crush, disassemble, heat the battery above 212° F (100° C), incinerate, or expose contents of the battery to water. Dispose of battery in accordance with local, state, and national regulations.

INTRODUCTION

This manual will help you service the Sony/Tektronix 318A Logic Analyzer. The procedures and descriptions contained herein apply to the 318A only. For a list of specifications refer to the *318A Operator's Manual*.

DESCRIPTION

The Sony/Tektronix 318A is a keyboard-controlled, multifunction, portable logic analyzer. It can operate as a parallel timing analyzer or a parallel state analyzer, and is provided with composite video output and non-volatile memory. The Sony/Tektronix 318AS1 provides the additional features of serial state analysis and a RS-232C interface.

The instrument is a menu-driven system. This means that all operations are set up via menus that are displayed on the monitor screen. There are three menus for setting up parallel data acquisition, three menus for setting up serial data acquisition, one menu for remote operation, one menu for non-volatile memory operation, and two menus for data display.

MODES OF OPERATION

When used as a parallel timing analyzer, the 318A provides a 16-channel-wide input, 50 MHz (maximum) clock speed, and 4096 bits/channel memory for data. Glitches are captured on all 16 channels. Three word recognizers can be specified on all channels and used in several different triggering sequences. The digital delay counts up to 65,000 clock cycles. In the 318A, data before or after the occurrence of a specified trigger sequence can be acquired and stored at sample intervals ranging from 20 ns to 500 ms with two clock and trigger qualifiers. Composite video output for hard-copy units or video terminals is provided. This feature allows documentation of test results and operating parameters.

As a serial state analyzer, the 318AS1 acquires serial data in five, six, seven, eight, or nine bits/character in asynchronous or synchronous timing. Two continuous word recognizers provide triggering upon recognition of preset words. The digital delay counts up to 65,000 words. Data before or after the occurrence of a specified trigger sequence can be acquired and stored at baud rates ranging from 50 to 19.2K baud. The stored data is displayed on the CRT screen in binary, octal, decimal, hexadecimal, ASCII, or EBCDIC format.

The RS-232C interface port allows the 318AS1 to be linked with terminal equipment through an asynchronous, full-duplex modem. In remote control mode, the 318AS1 can receive all control commands, memory control commands, or reference memory data from the terminal equipment instead of the keyboard. It can send the CRT display information or memory data to the terminal equipment via the RS-232C port.

The non-volatile memory in a standard 318A can retain three setups and one set of reference or acquired data for about five years. Each memory area is selectable for the use of parallel or serial information. The current setup of the instrument is stored by keyboard control or control commands from the terminal. The stored setup information is recalled in the same manner.

All functional parameters and operation of the instrument are programmable from the front panel or over the RS-232C port.

CONFIGURATIONS

The Sony/Tektronix 318A is available in the following configurations:

- 318A Logic Analyzer
- 318AS1 Logic Analyzer (with serial analysis and a RS-232C interface). A standard 318 can be upgraded to 318AS1 status by installing the 318AF1 package.

  318AF1 Package: Optional field-installable circuit board, probe, and connectors that upgrade the 318A Logic Analyzer to 318AS1 status. The package adds serial analysis and a RS-232C interface to the basic 318A feaures.

RELATED DOCUMENTS

In addition to this service manual, the *318A Operator's Manual, and* the *318A Logic Analyzer Reference Guide* will also help you understand and operate the 318A.

STANDARD AND OPTIONAL ACCESSORIES

Standard Accessories:

016-0697-00	Accessory Pouch
070-6636-00	*318A Logic Analyzer Operator's Manual*
070-6635-00	*318A Logic Analyzer Reference Guide*
010-6107-03	P6107 Probe (1 probe with 318A) (2 probes with 318AS1)
010-6451-07	P6451 Probe (2 probes with 318A)
161-0104-00	Power Cord

Options:

A1 Power Cord	Universal Euro 220V/16A
A2 Power Cord	UK 240V/13A
A3 Power Cord	Australlan 240V/10A
A4 Power Cord	North American 240V/10A
A5 Power Cord	Switzerland 240V/10A
318AF1	Field-installable upgrade package; adds serial analysis, RS-232C interface, and non-volatile memory to standard 318A.

Optional Accessories:

070-6637-00	*318A Logic Analyzer Service Manual*
067-1159-00	Service Maintenance Kit
012-0530-00	Null Modem Cable
013-0173-01	Self Test Adapter

VERIFICATION AND ADJUSTMENT PROCEDURES

INTRODUCTION

This section of the manual contains three main parts:

- Functional check procedures
- Adjustment procedures
- Performance check procedures

These procedures, along with the test setup information at the beginning of this section, allows a qualified technician to adjust and verify the operation of the 318A.

NOTE

Throughout this manual the term verification is used to mean either a functional check or a performance check.

Functional Check Procedures. These tests verify that the device undergoing the functional test is basically operational. The procedure exercises the main user interfaces of the device to verify their operation and checks the main internal features. These tests can be used to determine whether adjustment and/or repair is necessary.

Adjustment Procedures. These instructions for setting variables should bring the device being adjusted whithin product specifications. If the instrument can not meet the specifications given in this manual after adjustment, repair is necessary.

Performance Check Procedures. These tests provide a detailed check of internal and external product characteristics. All specifications listed in the performance requirements column of the specifications are verified. These checks can be extensive and time consuming. Under normal circumstances, the functional check procedure provides an adequate test of product performance in a less-costly or less time-consuming manner.

318A MULTI-PROBE TEST FIXTURE

We recommend that you construct the following test fixture to assist in checking the performance of the 318A.

The 318A multi-probe test fixture functions as a BNC-to-square pin adapter with 50 ohm termination. Its purpose is to connect multiple 318A probe leads to a single pulse generator output without causing excessive capacitive and inductive loading. It also provides a connection for the test oscilloscope's 10X probe used in monitoring the pulse generator's output.

NOTE

The lead distance from the ground pins to the BNC connector body is critical; keep this distance as short as possible. Any excessive lead length in the fixture will distort high-speed signals. Also, use only short comb lead sets when connecting this fixture to the P6451 probe.

Parts list:	Part number	Quantity
Connector (BNC), male	131-0602-00	1
Connector, Rcp. Elect. (oscilloscope probe)	131-0258-00	1
Plain hex nut	210-0413-00	1
Right-angle terminal set (right-angle square pins)	131-1425-00	2
Connector terminal set (straight square pins)	131-1343-00	2
Terminal lug 1/4 inch	210-0223-00	1
Terminal lug .391 inch I.D.	210-0225-00	1
Resistor, 51 ohm, 1 watt	303-0510-00	1
Short flying lead set	012-0987-00	1

1. Fabricate the chassis.

   a. Using 50 mil aluminum, cut and drill the chassis according to Figure 2-1.

   b. Bend the chassis up to right angles at each bend line on the wide part of the chassis. Do not make the final 3/8-inch bend on the tail end at this time.

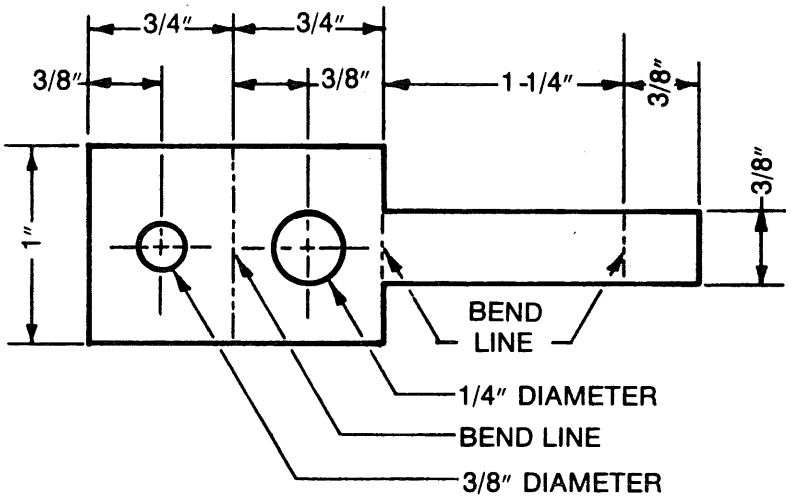

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Figure 2-1. Test Fixture construction diagram.

2. Assemble the square pins.

   a. Cut two 11-pin lengths of right-angle square-pin terminals, and two 11-pin lengths of straight-pin terminals.

   b. Glue one strip of right-angle square pins on to one strip of straight pins so that the pins align vertically.

   c. Solder each right-angle pin to the straight pin immediately below. Repeat this procedure for the other set of straight and right-angle square pins.

   d. Place the square pin strips back to back and solder the last pins on each end of the strips together. (You should now have the outermost four pins on each end of the assembly soldered together.)

e. Now solder together the middle nine sets of pins so that all nine middle sets are electrically connected.

f. Clip the end set of four pins (one pin off each strip) from one end of the square-pin assembly. This is now the back end of the assembly. The front set of four pins (those not soldered to the middle nine sets) will be connected to ground.

3. Assemble the parts

a. Refer to Figure 2-2. Solder the ground lug from the BNC plug to the first set of four pins (front end) on the square-pin assembly. It is important that this connection be as short as practical to avoid high-speed signal loss.

b. Solder one end of the 50 ohm resistor to the scope probe connector's ground lug.

c. Attach the scope probe connector and the BNC connector (including ground lugs and attached square-pin assembly) to the chassis.

d. Bend the tail end of the aluminum chassis up and glue it to the back end of the square-pin assembly.

e. Solder the center connectors from the BNC connector, and the oscilloscope probe connector to the center nine pin sets on the square-pin assembly. Keep this connection as short as practical to avoid high-speed signal loss.

f. Solder the remaining lead from the 50 ohm resistor to the center pin of the BNC connector. The test fixture is ready for use.

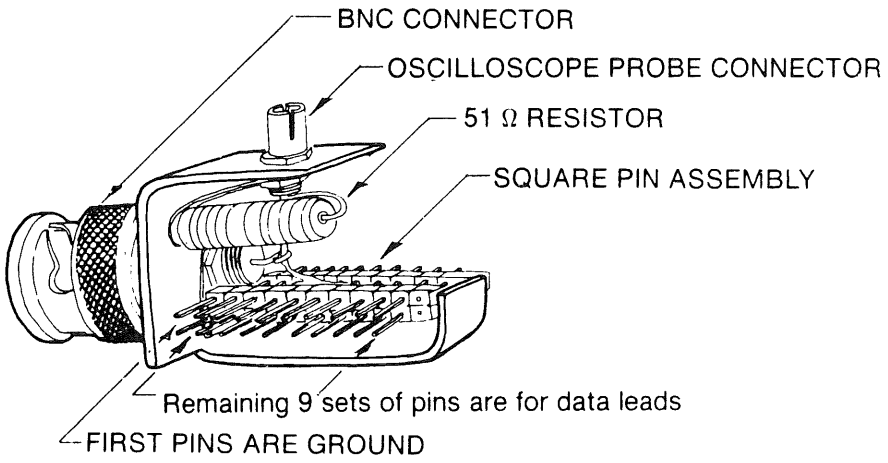

Figure 2-2. Assembled Test Fixture

NOTE

Use only short comb lead sets when connecting the test fixture to the P6451 Probe. Here too, short lead lengths are important in avoiding high-speed signal losses.

a. Refer to Figure 2-2. Solder the ground lug from the BNC plug to the first set of four pins (front end) on the square-pin assembly. It is important that this connection be as short as practical to avoid high-speed signal loss.

b. Solder one end of the 50 ohm resistor to the scope probe connector's ground lug.

c. Attach the scope probe connector and the BNC connector (including ground lugs and attached square-pin assembly) to the chassis.

d. Bend the tail end of the aluminum chassis up and glue it to the back end of the square-pin assembly.

e. Solder the center connectors from the BNC connector, and the oscilloscope probe connector to the center nine pin sets on the square-pin assembly. Keep this connection as short as practical to avoid high-speed signal loss.

f. Solder the remaining lead from the 50 ohm resistor to the center pin of the BNC connector. The test fixture is ready for use.

TEST SETUP INFORMATION

The procedures in this *Verification and Adjustment Procedures* section require some test equipment and general information relevant to all configurations of the 318A Logic Analyzer. This information is presented here at the front of the section to prevent duplication throughout the following procedures.

SUGGESTED TEST INSTRUMENTS

There are three procedures in this section: the functional check, the adjustments, and the performance check. The functional check uses the TEST OUTPUT signal, which is delivered from the 318A right side panel; no other instruments are necessary. The adjustments and the performance checks require other instruments. Table 2-1 lists the instruments used at some point in each of these procedures, along with their Tektronix equivalents.

Table 2-1
EQUIPMENT NEEDED FOR THE ADJUSTMENT PROCEDURES
AND THE PERFORMANCE CHECK PROCEDURES

Description	Perf. Check	Adj. Proc.	Tektronix Equivalent
Oscilloscope 100 MHz dual trace (Mainframe)	1	1	7904
Vertical plug-in	1	1	7A26
Horizontal plug-in	1	1	7B80
Horizontal plug-in	1	1	7B85
Power module	1	1	TM503
Pulse generator	2	1	PG502
Digital delay	1		DD501
Digital multimeter (DMM)	1	1	DM501
Regulated dc power supply	1		PS501
Serial data generator	1		834
Extender boards		2	Maintenance kit 067-1159-00
Ejector		2	
BNC 50 Ω 2 W termination	4	1	011-0049-01
1 MΩ, 40pF normalizer		1	067-0935-00
2 SQR-pin to probe-tip adapter		1	
BNC T-connector	3	1	103-0030-00
BNC elbow male-to-female adapter	3		103-0031-00
BNC female-to-female adapter		1	103-0029-00
BNC male-to-dual-binder adapter	4		103-0035-00
BNC male-to-male adapter	1		103-0028-00
BNC male-to-probe tip adapter	3	2	013-0084-01
BNC 50 Ω cable, 18 inches long	1		012-0076-00
BNC 50 Ω cable, 42 inches long	1		012-0057-01
Bus wire	5		18 gauge, 4"
Computer terminal	1		4025
Probe to square pin adapter			015-0325-00

Table 2-2
MINIMUM SPECIFICATIONS FOR TEST EQUIPMENT

Equipment	Specification	Tektronix Equivalent Instrument
Two-channel oscilloscope with 1-meter probes	175 MHz	7904 (mainframe) with 7A26 (200 MHz dual trace amplifier), 7B80 (1 ns/div delayed timebase), 7B85 (Δ delayed timebase), and P6106 probes
Pulse generator	250 MHz pulse rate, variable output levels	PG502
Digital delay		DD501
Digital multimeter	4.5 digits, 0.05% dc volts accuracy	DM501
Regulated dc power supply		PS501
Power module (optional)		TM506
Serial data generator	performance and features equal to Tektronix 834	834
Computer terminal		4025

FUNCTIONAL CHECK PROCEDURES FOR THE 318A

The following procedures are for the 318A Logic Analyzer only.

The Functional Check Procedure verifies that all major sections of the logic analyzer are operational. These tests can be used to determine whether adjustment and/or repair is necessary. The procedures are organized into sets of tests for the mainframe, the acquisition module, each type of probe, and the 318AS1 serial acquisition and communication option.

Refer to the beginning of this *Verification and Adjustment Procedures* section, and to the *318A Operator's Manual* for instructions on probe connections and use of menus.

NOTE

These procedures assume that the user has a moderate understanding of the operation of the 318A menus and hardware. Power-up of the 318A will preset menu selections; power-up must be performed when so instructed.

INDEX OF FUNCTIONAL CHECKS

MAINFRAME AND PARALLEL ANALYZER

CHECK 1. POWER-UP DIAGNOSTICS

1. Turn on the 318A.
2. Approximately seven seconds after power is turned on, the screen display is initialized. Check to ensure that FAIL is not displayed in any of the test fields. Refer to Figure 2-3.

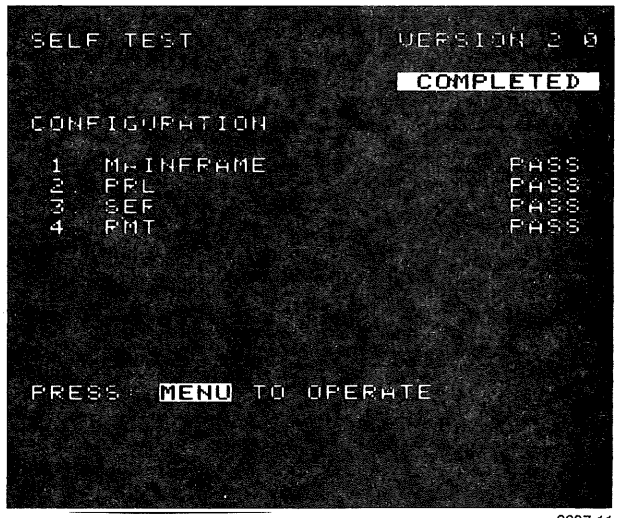

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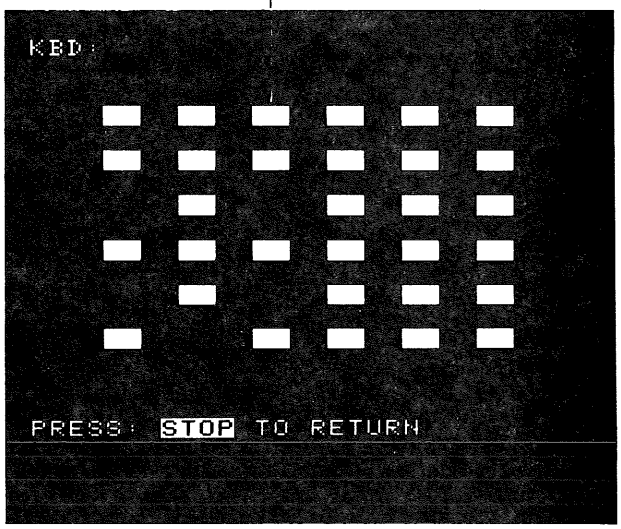
Figure 2-3. 318A Successful Power-up diagnostics display.

This key blinks when hit.



4433-07

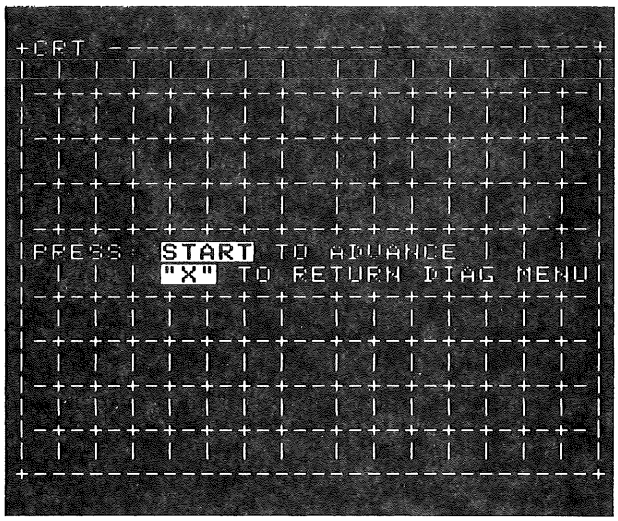
Figure 2-4. 318A Keyboard test display.

CHECK 2. KEYBOARD

1. Keyboard operation can be checked with the diagnostic program 0.KBD. To start this program, turn on the power while pressing any numeric key until an error message appears on the CRT.

2. When an error message appears, press the START key. The Diagnostics menu will be displayed on the screen. Press 0 to run the KBD test. Refer to Figure 2-4.

3. Press each key individually and observe the CRT display to make sure the corresponding rectangle blinks. Press the STOP key last. The keyboard generates an interrupt and corresponding key code for the MPU when any key except the STOP key is pressed. The MPU reads the key code upon receiving the interrupt from the keyboard and blinks the corresponding rectangle in the key array displayed on the screen. This test provides a check to ensure that each key (except for the STOP key) is sending the correct key code to the MPU. The STOP key is used to exit this program; thus the STOP key's function can be checked at the end of this test.



4433-08

Figure 2-5. 318A CRT test cross-hatch pattern.

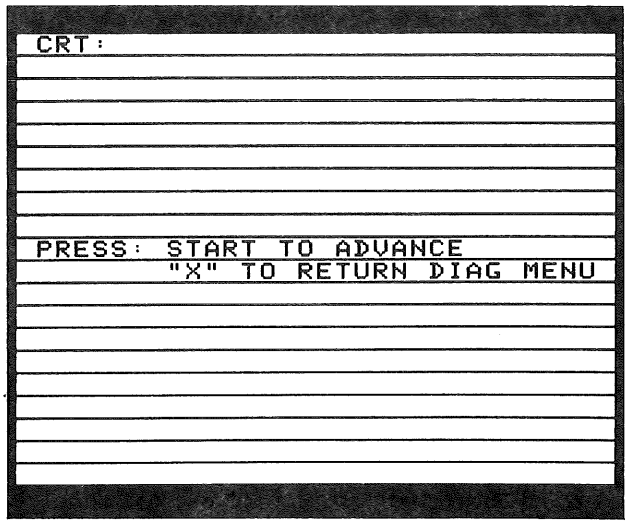


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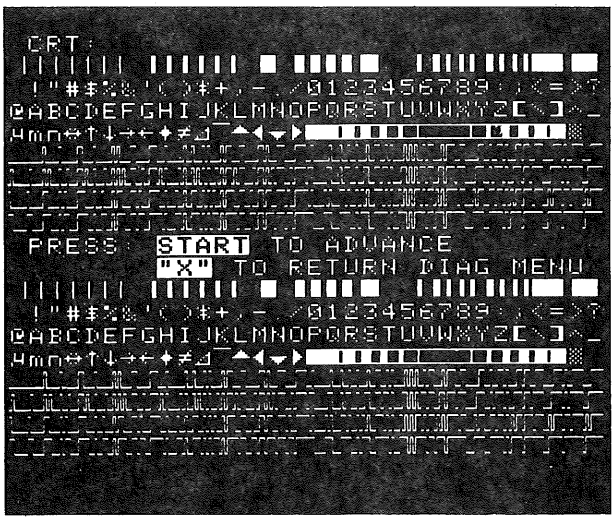
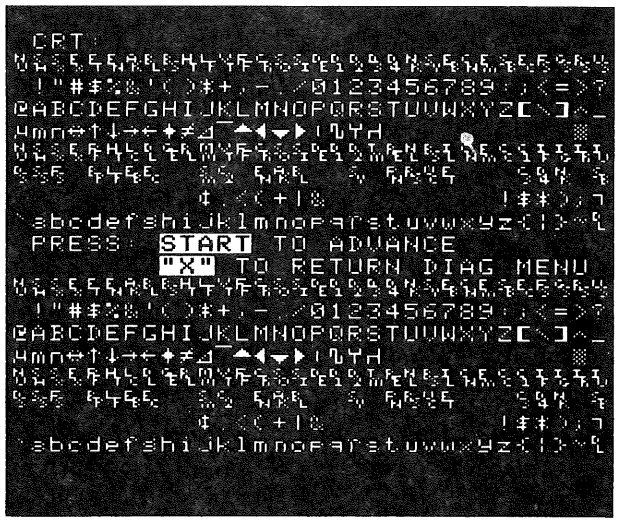
Figure 2-6. 318A CRT test white pattern.



4433-10

Figure 2-7. 318A CRT test parallel acquisition character fonts.



4433-11

Figure 2-8. 318A CRT test serial acquisition character fonts.

CHECK 3. CRT

Refer to Figures 2-5, 2-6, 2-7, and 2-8.

1. The CRT can be visually checked with the diagnostic program 1.CRT. To start this diagnostic program, turn on the power while pressing any numeric key until an error message is displayed on the CRT.
2. When an error message is displayed, press the START key. When the Diagnostics menu is displayed on the screen, select #1 for CRT.

The CRT test generates the following types of patterns for the CRT adjustment and visual check.

- Cross-hatch pattern (Figure 2-5). Used to adjust the CRT circuit.
- White pattern (Figure 2-6). Used to check for phosphor defects.
- All character fonts for Parallel Analyzer mode (Figure 2-7). Used to check the CRT circuit and the CROM (character ROM) for parallel analyzer operations.
- All character fonts for Serial Analyzer mode (Figure 2-8). Used to check the CRT circuit and the CROM for serial analyzer operations.

3. Press the X key to return to the Diagnostic menu.

CHECK 4. THRESHOLD VOLTAGE

1. Power-up the 318A.
2. Connect all the data and ground leads of the P6451 Parallel Data probes in both Pod A and Pod B together and connect them to the instrument ground.
3. Press the THRESHOLD menu key (normal operating mode).

Threshold Level TTL

a. Set INPUT Thresholds to TTL for for both Pod A and Pod B.

b. Press the START key. The trigger position (indicated by T) will be displayed on the screen. The trigger position will be <T=7W>, <T=2047W>, or <T=4089W> depending on the trigger position setting in the Trigger menu (begin, center, or end).

c. Check that all data acquired are 0's.

Threshold Level V1

a. Set Threshold LEVEL V1 to +0.3 V.

b. Set both Pod A and Pod B equal to V1.

c. Press the START key. The trigger position displayed on the screen will be <T=7W>, <T=2047W>, or <T=4089W> depending on the trigger position setting in the Trigger menu.

d. Check that all data acquired are 0's.

e. Set Threshold LEVEL V1 to −0.3 V.

f. Press the START key. The trigger position displayed on the screen will be <T=7W>, <T=2047W>, or <T=4089W> depending on the trigger position setting in the Trigger menu.

g. Check that all data acquired are 1's.

Threshold Level V2

a. Set Threshold LEVEL V2 to +0.3 V.

b. Set both Pod A and Pod B equal to V2.

c. Press the START key. The trigger position is displayed on the screen will be <T=7W>, <T=2047W>, or <T=4089W> depending on the trigger position setting in the Trigger menu.

d. Check that all data acquired are 0's.

e. Set Threshold LEVEL V2 to −0.3 V.

f. Press the START key. The Trigger position displayed on the screen will be <T=7W>, <T=2047W>, or <T=4089W> depending on the trigger position setting in the Trigger menu.

g. Check that all data acquired are 1's.

Threshold Level V3

a. Set Threshold LEVEL V1 to +2.0V and V2 to −1.5 V.

b. Check that the Threshold LEVEL V3 is +0.25 V.

c. Set both Pod A and Pod B equal to V3.

d. Press the START key. The trigger position displayed on the screen will be <T=7W>, <T=2047W>, or <T=4089W> depending on the trigger position setting in the Trigger menu.

e. Check that all data acquired are 0's.

f. Set Threshold LEVEL V1 to -2.0 V and V2 to +1.5 V.

g. Check that Threshold LEVEL V3 is -0.25 V.

h. Press the START key. The trigger position displayed on the screen will be <T=7W>, <T=2047W>, or <T=4089W> depending on the trigger position setting in the Trigger menu.

i. Check that all data acquired are 1's.

CHECK 5. PARALLEL DATA ACQUISITION WITH TEST OUTPUT

1. Parallel Data Acquisition

   a. Power-up the 318A and connect the P6107 External Clock probe tip to TEST OUTPUT-C on the right side pannel. Refer to Figure 2-9.

   b. Connect the data leads of the P6451 Parallel Data probe in Pod A to TEST OUTPUT as follows:

P6451 Channel	TEST OUTPUT
G	G
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
Q	Not Connected

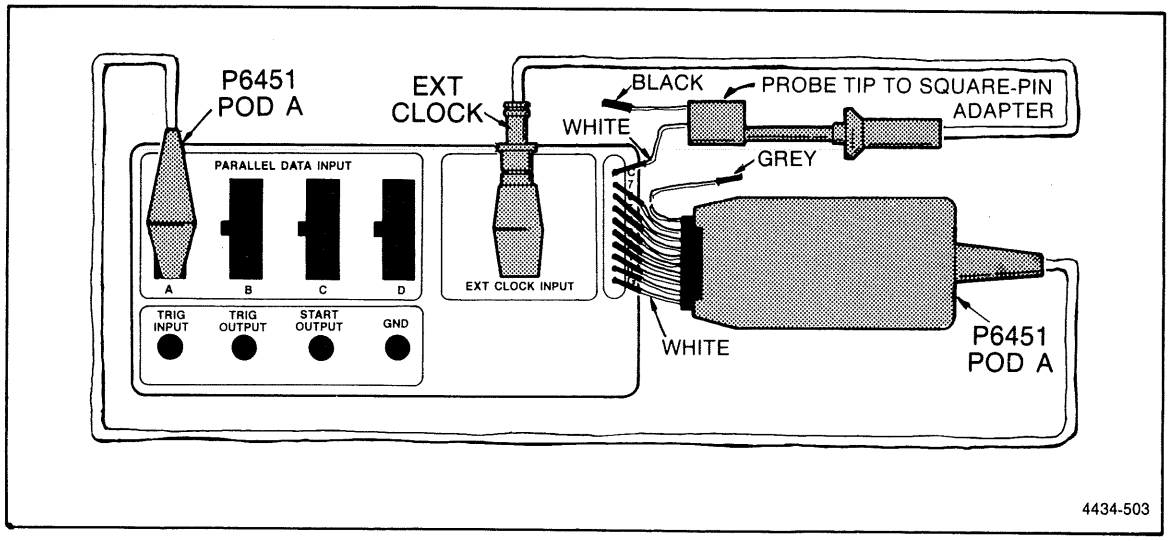


Figure 2-9. 318A Parallel data acquisition check setup.

c. Power up the 318A and set up as follows:

SETUP MENU
PLR
GROUP G1 ON = AAAAAAAA
76543210
G2 OFF

THRESHOLD MENU
LEVEL V1 = +1.3V
V2 = −1.3V

INPUT
EXT CLK = TTL
POD A = TTL
POD B = TTL

TRIGGER MENU
Source INT TRIG
CLK EXT
TRIG IMMEDIATELY
POSN DELAY
3964

```
Events          00064*WA  FLW'D BY:WB  RESET ON:WC

WA =            XXXXXX11 binary
WB =            10000001 binary (81 hex)
WC =            10000000 binary (80 hex)

GLITCH            76543210
 POD A          OFF
 POD B          OFF

QUALIFIERS (POD)
 A OFF    B OFF
```

2. Pod A
   a. Press the START key.
   b. Check that the data acquired for Pod A is a decrementing pattern from FF_{hex} to 00_{hex} starting at position 0, and that the Trigger Word (indicated by T) is 81_{hex} at position 126.
3. Pod B
   a. Disconnect the 10-terminal plug from the probe head of the P6451 Parallel Data probe in Pod A.
   b. Push that 10-terminal plug into the socket on the probe head of the P6451 Parallel Data probe in Pod B.
   c. Set G1 to OFF and G2 to ON for B7-B0.
   d. Set CLK to EXT▼.
   e. Set Trigger Words as follows:

WA	XXXXXX11 binary
WB	10000001 binary (81 hex)
WC	10000000 binary (80 hex)

   f. Press the START key.
   g. Check that the data acquired for Pod B is a decrementing pattern from FF_{hex} to 00_{hex}, starting at position 0, and that the trigger word (indicated by T) is 81_{hex} at position 126.
4. 50 MHz Acquisition
   a. Set CLK to 20 ns and POSN to DELAY 04090.
   b. Set Trigger: 9 * WA OFF:WB OFF:WC
   c. Set Trigger Word WA to 00_{hex}.
   d. Press the START key.
   e. Check that data acquired for Pod B contains 492 times 00_{hex}, starting at position 0 and that the trigger word (indicated by T)is 00_{hex} at position 0.
5. EXT TRIGGER Check
   a. Refer to Figure 2-10. Connect the data leads of the P6451 Parallel Data probe in Pod A to TEST OUTPUT as follows:

P6451 Channel	TEST OUTPUT
G	G
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	See Text
Q	Not Connected

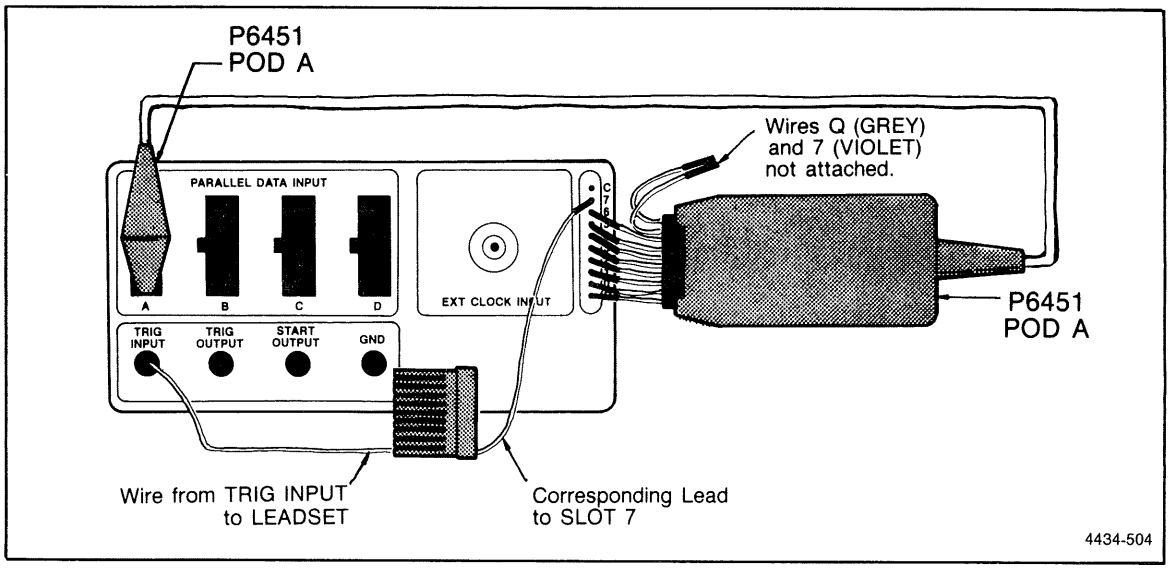


Figure 2-10. 318A External trigger check setup.

b. Connect TRIG INPUT, on the right side panel, to TEST OUTPUT-7.

c. Setup the 318A as follows:

SETUP MENU

PLR			
GROUP	G1	ON =	AAAAAAAA 76543210
	G2	OFF	

THRESHOLD MENU

LEVEL	V1 =	+1.3V
	V2 =	−1.3V
INPUT		
	EXT CLK =	TTL
	POD A =	TTL
	POD B =	TTL

TRIGGER MENU

Source	EXT TRIG
CLK	10 μS
TRIG	IMMEDIATELY
POSN	DELAY

4090
EXT TRIG POL = ▲

QUALIFIERS (POD)
A OFF B OFF

d. Press the START key.

e. Check that all data acquired for Pod A is a repetitive decrementing pattern from $7F_{hex}$ to 00_{hex}, and that the trigger word (indicated by T) is 7F at position 0 with <T = 0◆> showing in the lower right corner of the display.

f. Set EXT TRIG POL to ▼.

g. Press the START key.

h. Check that all the data acquired for Pod A is a repetitive decrementing pattern from $7F_{hex}$ to 00_{hex}, and that the Trigger Word (indicated by T) is 7F at position 0, with <T = 0◆> showing in the lower-right corner of the display.

6. Trigger Qualifier Check

a. Refer to Figure 2-11. Connect the data leads of the P6451 Parallel Data probe in Pod B to TEST OUTPUT as follows:

P6451 Channel	TEST OUTPUT
G	G
0	0
1	1
2	2
3	3
4	4
5	5
6	Not Connected
7	Not Connected
Q	See Text

b. Ground all the qualifier and ground leads of the P6451 Parallel Data probes in both Pod A and Pod B.

c. Set up the 318A as follows:

SETUP MENU
PLR
GROUP G1 OFF
G2 ON = BBBBBB
543210

THRESHOLD MENU
LEVEL V1 = +1.3V
V2 = −1.3V

INPUT
EXT CLK = TTL
POD A = TTL
POD B = TTL

```
TRIGGER MENU
        Source      INT TRIG
        CLK         10 µS
        TRIG        IMMEDIATELY
        POSN        DELAY
                    04029
        Events      00016*WA  FLW'D BY:WB  RESET ON:WC

        WA =        XXXX11binary
        WB =        000010binary (02hex)
        WC =        000000binary (00hex)

        GLITCH        76543210
         POD A      OFF
         POD B      OFF

        QUALIFIERS (POD)
          A TRG=H  B TRG=H
```

d. Press the START key.

e. Check to make sure the 318A is never triggered.

f. Press the STOP key.

g. Connect the qualifier lead of the P6451 Parallel Data probe in Pod A to TEST OUTPUT-7 and the qualifier lead of the P6451 probe in Pod B to TEST OUTPUT-6.

h. Press the START key and wait for the acquisition to be completed.

i. Check that the data acquired for Pod B is a repetitive decrementing pattern from $3F_{hex}$ to 00_{hex} starting at position 0, and that the Trigger Word (indicated by T) is 02_{hex} at position 61.

j. Set QUALIFIER Pod A and Pod B to TRG-L.

k. Press the START key and wait for the acquisiton to be completed.

l. Check that the data acquired for Pod B is a repetitive decrementing pattern from $3F_{hex}$ to 00_{hex}, starting at position 0, and Trigger Word (indicated by T) is 02_{hex} at position 61.

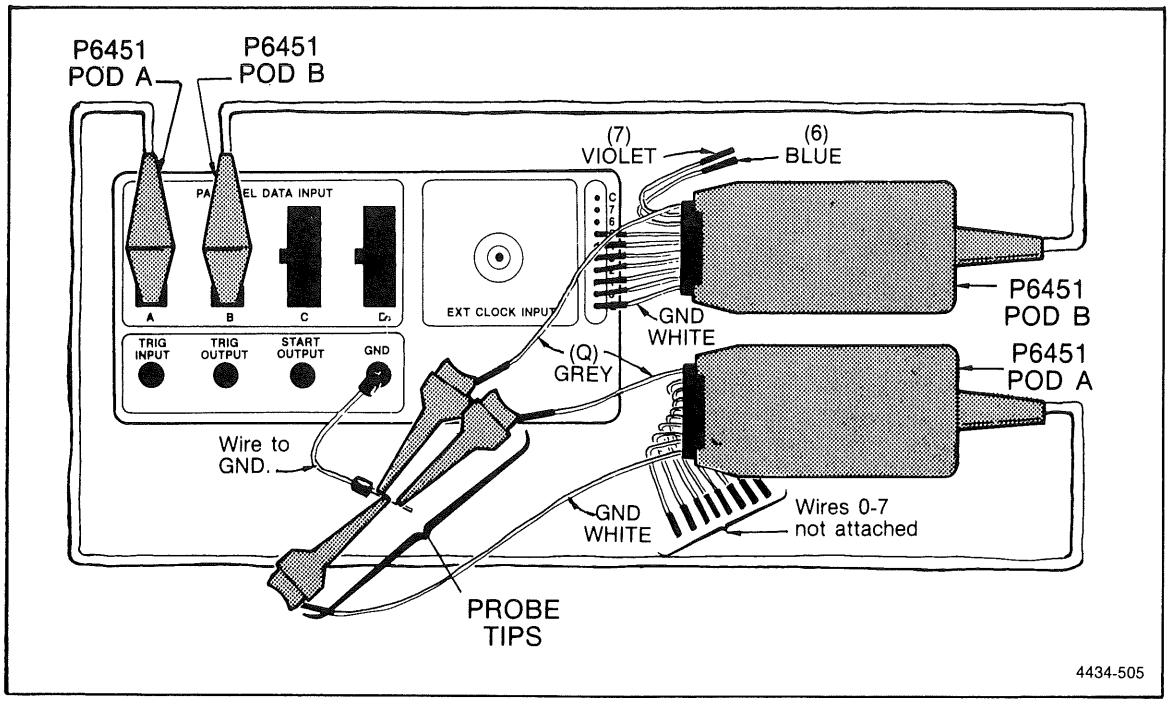


Figure 2-11. 318A Trigger qualifier check setup.

7. Clock Qualifier Check

Setup

a. Connect the data leads of the P6451 Parallel Data probe in Pod A to TEST OUTPUT as follows:

P6451 Channel	TEST OUTPUT
G	G
0	Not Connected
1	1
2	2
3	3
4	4
5	5
6	6
7	7
Q	0

b. Connect the qualifier lead of the P6451 Parallel Data probe in Pod A to TEST OUTPUT-0.

c. Set up the 318A as follows:

SETUP MENU

PLR

GROUP	G1	ON = AAAAAAA (note:A0 = off) 7654321
	G2	OFF

THRESHOLD MENU

LEVEL	V1 =	+1.3V
	V2 =	−1.3V
INPUT		
	EXT CLK =	TTL
	POD A =	TTL
	POD B =	TTL

TRIGGER MENU

CLK	10 µS
TRIG	IMMEDIATELY
POSN	DELAY
	04089
Events	00016*WA FLW'D BY:WB OFF:WC
WA =	XXXXXX11*binary*
WB =	11111110*binary* (7E*hex*)
WC =	
GLITCH	76543210
POD A	OFF
POD B	OFF

QUALIFIERS (POD)
A CLK=L B OFF

POD A

a. Set QUALIFIER Pod A to CLK-L and Pod B to OFF.

b. Press the START key and wait for the acquistion to be completed.

c. Check that the data acquired for Pod A is a repetitive decrementing pattern from 7F*hex* to 00*hex*, starting at position 0, and that the Trigger Word (indicated by T) is 7E*hex* at position 1.

d. Set QUALIFIER Pod A to CLK-H.

e. Press the START key and wait for the acquisition to be completed.

f. Check that the data acquired for Pod A is a repetitive decrementing pattern from 7F*hex* to 00*hex*, starting at position 0, and that the Trigger Word (indicated by T) is 7E*hex* at position 1.

POD B

a. Disconnect the 10-terminal plug from the probe head of the P6451 Parallel Data probe in Pod A.

b. Push that 10-terminal plug into the socket on the probe head of the P6451 Parallel Data probe in Pod B.

c. Set G1 to OFF and G2 to ON for B7 – B1.

d. Set the Trigger Words as follows:

WA = XXXXX11*binary*
WB = 1111110*binary*
(7E*hex*)
WC =

e. Set QUALIFIER Pod A to OFF and Pod B to CLK-L.

f. Press the START key and wait for the acquition to be completed.

g. Check that the data acquired for Pod B is a repetitive decrementing pattern from $7F_{hex}$ to 00_{hex}, starting at position 0, and that the Trigger Word (indicated by T) is $7E_{hex}$ at position 1.

h. Set QUALIFIER Pod B to CLK-H.

i. Press the START key.

j. Check that the data acquired for Pod B is a repetitive decrementing pattern from $7F_{hex}$ to 00_{hex} starting at position 0, and that the Trigger Word (indicated by T) is $7E_{hex}$ at position 1.

CHECK 6. GLITCH DATA ACQUISITION WITH TEST OUTPUT

1. Glitch Data Acquisition

a. Connect the data leads of the P6451 Parallel Data probe in Pod A to TEST OUTPUT as follows:

P6451 Channel	TEST OUTPUT
G	G
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
Q	Not Connected

b. Power-up the 318A and set up the 318A as follows:

SETUP MENU
PLR
GROUP G1 ON = AAAAAAAA
76543210
G2 OFF

THRESHOLD MENU
LEVEL V1 = +1.3V
V2 = −1.3V

INPUT
EXT CLK = TTL
POD A = TTL
POD B = TTL

```
TRIGGER MENU
        CLK             10 mS
        TRIG            IMMEDIATELY
        POSN            DELAY
                        04090
        Events          00000*WA  OFF:WB  OFF:WC

        GLITCH              76543210
         POD A          ON ◆
         POD B          OFF

        QUALIFIERS (POD)
          A OFF    B OFF
```

2. Pod A

   a. Press the START key and wait for the acquisition to be completed.

   b. Check that all the data for Pod A is displayed in inverse video in the GLITCH SEARCH mode, and that <T = 0◆> is showing in the lower-right corner of the screen.

   c. De-select Trigger Glitch A7.

   d. Repeat steps (a) through (c) for each of the remaining channels, A6 through A0. Glitch Triggering must be checked one channel at a time for the test to be valid.

3. Pod B

   a. Disconnect the 10-terminal plug from the probe head of the P6451 Parallel Data probe in Pod A.

   b. Push the 10-terminal plug into the socket on the probe head of the P6451 Parallel Data probe in Pod B.

   c. Set G1 to OFF and G2 to ON for B7 - B0.

   d. Set GLITCH Pod A to OFF and Pod B to ON for B7.

   e. Press the START key and wait for the acquisition to be completed.

   f. Check that all the data for Pod B is displayed in inverse video in the GLITCH SEARCH mode, and that <T = 0◆> appears in the lower-right corner of the screen.

   g. Repeat procedures (e) through (f) for channels B6 through B0 of the Pod B GLITCH Trigger. Glitch Triggering must be checked one channel at a time for the test to be valid.

CHECK 7. SERIAL STATE ANALYZER CHECK FOR THE 318AS1

1. Serial Data Aquisition

   a. Connect the test setup as shown in Figure 2-12.

   b. Set the terminal character format to 8 bits per character.

   c. Set the 318A POWER switch to ON and press the SETUP key after the diagnostic program has run.

   d. Set the major mode to SERIAL and press the EXECUTE key.

e. Set the baud rate and parity to match that of the terminal. Press the THRESHOLD Menu key.

f. Set the data threshold to 0.00 V. Press the TRIGGER Menu key.

g. Set the trigger mode to IMMEDIATELY. Press the DATA key.

h. Press the START key.

i. Press the A key on the terminal keyboard 10 times.

j. Press the STOP key.

k. Check that the acquired data equals 10 bytes of ASCII A on the screen.

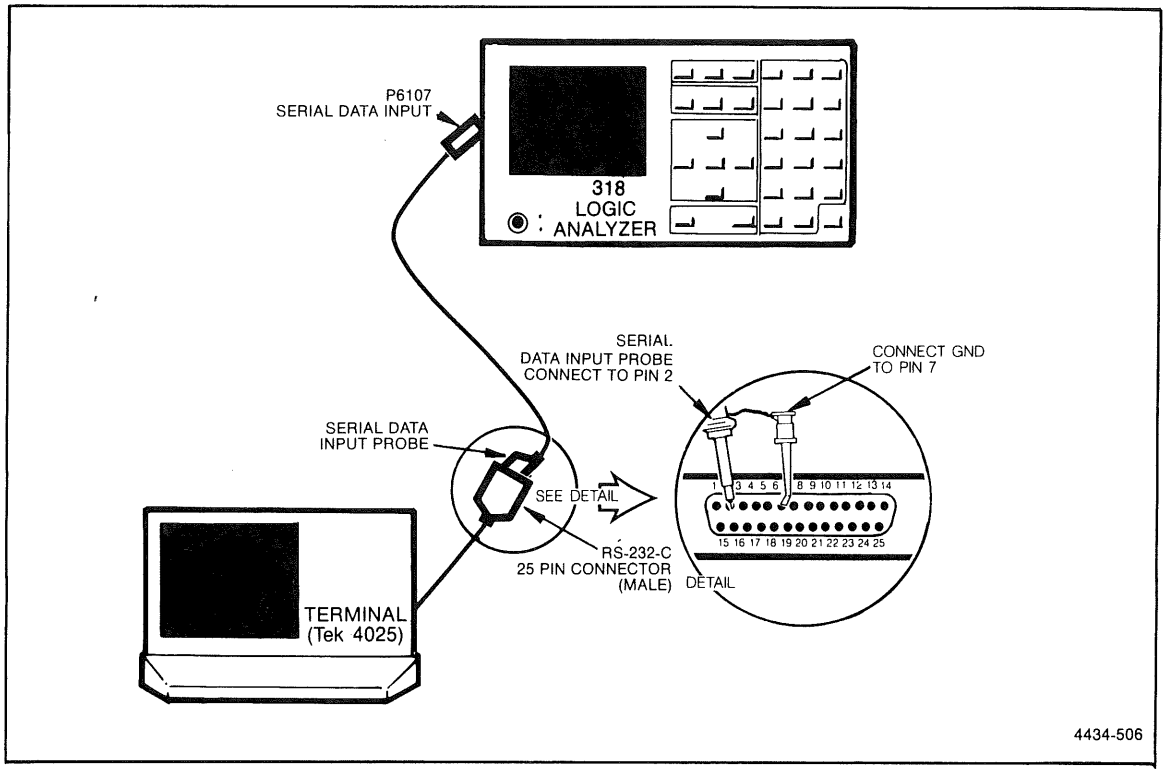


Figure 2-12. 318A Setup for serial data analysis.

2. Remote Control Operation

a. Connect the test setup as shown in Figure 2-13.

b. Set the terminal character format to 8 bits per character, even parity, (on the 4025, type *!parity even*) and set the echo mode to remote.

c. Set the 318A POWER switch to ON and press the SETUP key after the diagnostic program has run.

d. Connect P6451 probes to all input pods of the 318A.

e. Connect all channels of the P6451 probes to ground.

f. Press the START key and allow the 318A to trigger.

g. Press the DATA key and verify that acquisition data is all 0's.

h. Transfer the acquisition data to the reference memory.

i. Set the source mode to RMT, then press the EXECUTE key.

j. Set the RS-232 baud rate to match that of the terminal.

k. Press the START key.

l. Key in the IDENT command from the terminal and wait for prompt.

m. Key in the REF? command from the terminal and wait for a prompt.

n. Check that the reference data displayed on the terminal is all 0's.

o. Press the STOP key to end remote control operation.

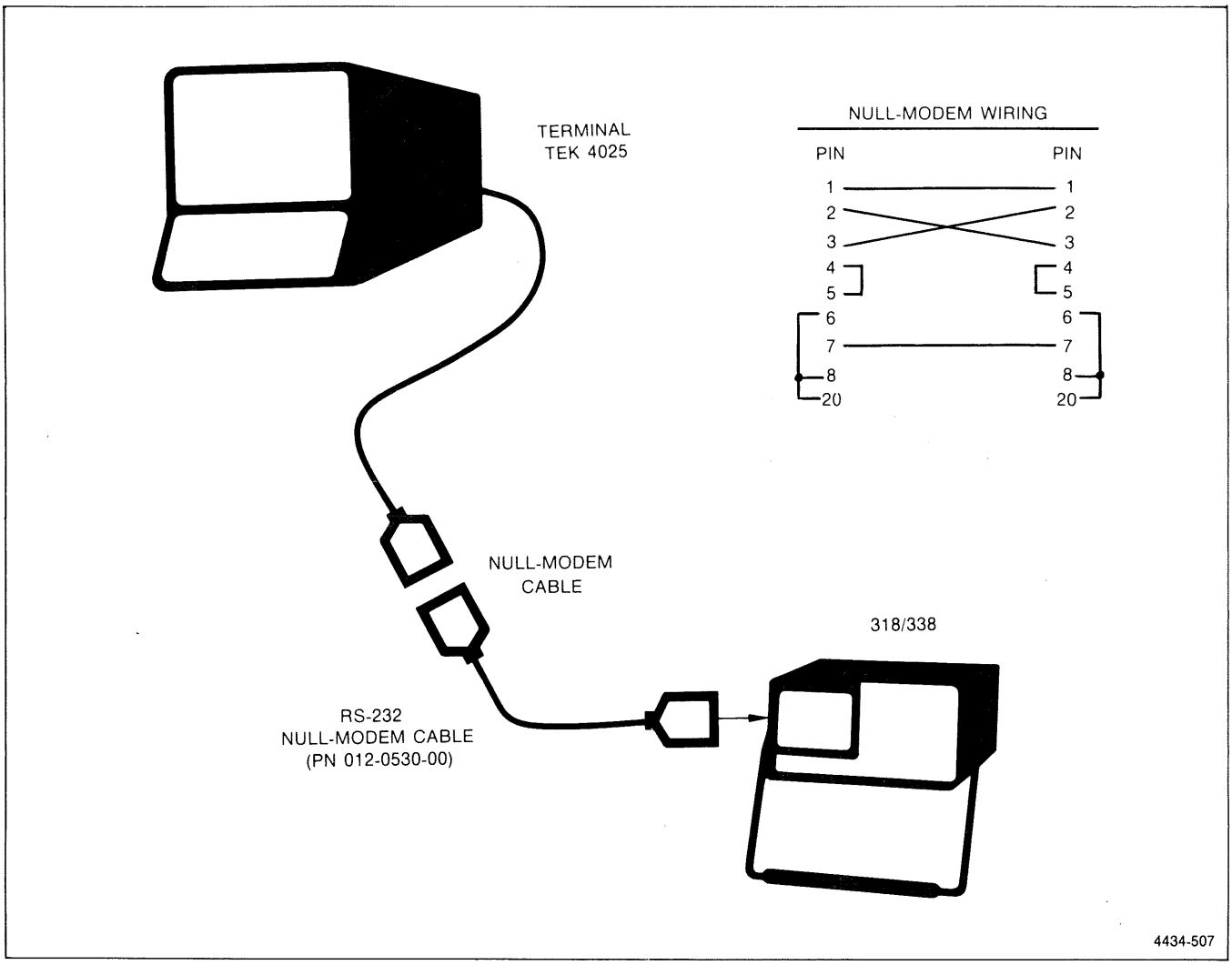


Figure 2-13. 318A Setup for RS-232C control.

ADJUSTMENT PROCEDURES FOR THE 318A

INTRODUCTION

The following pages contains the Adjustment Procedures for the 318A Logic Analyzer.

The following pages contain procedures for adjusting instrument variables so that the instrument meets or exceeds performance specifications. If the product cannot be made to meet or exceed specifications by following these procedures, repair is necessary.

IMPORTANT—PLEASE READ BEFORE USING THIS PROCEDURE

PURPOSE

The Adjustment Procedure provides a sequence for adjustments. It is not a troubleshooting guide or a verification procedure. The Adjustment Procedure is divided into sub-sections that describe adjustments for one particular board or set of boards in the 318A.

LIMITS AND TOLERANCES

All limits and tolerances given in this procedure are adjustment guides. They should not be interpreted as instrument specifications unless they are also found in the *Specifications* part of this manual.

Tolerances given are for the instrument under test and do not include test equipment error.

EQUIPMENT REQUIRED

The equipment listed at the beginning of this *Adjustment and Verification Procedures* section in Table 2-1 is necessary to complete all the adjustment procedures. A partial list of equipment needed for each individual check and adjustment is also shown at the beginning of each procedure's major step. The equipment specifications given in Table 2-2 are the minimum necessary to produce accurate results. Therefore, equipment substitution must meet or exceed the listed specifications. Detailed instructions for operating the test equipment are not offered in this manual. Refer to the manual for the specific test equipment if more information is required.

EQUIPMENT ALTERNATIVES

When equipment other than recommended test equipment is substituted, control settings or adjustment setups may need to be altered. If the exact equipment listed in Table 2-1 is not available, check the Minimum Specification column in Table 2-2 carefully to see if any other equipment will suffice.

ADJUSTMENT INTERVAL

To ensure correct instrument operation, adjustment should be checked every 1000 hours of operation or every six months if used infrequently. Before performing the adjustment procedures, perform preventive maintenance as outlined in *Section 6:Maintenance*.

TEST SEQUENCE

NOTE

These adjustment procedures assume prior knowledge of some aspects of disassembly of the 318A. If further information is required, refer to the disassembly procedures in Section 6:General Maintenance.

It is necessary to perform the following sequence step by step, because all timings in the 318A are level-sensitive.

INDEX OF ADJUSTMENT STEPS

Mainframe

1. Power Supplies
2. CRT Circuit
3. Threshold Voltages on the A05 Memory Board

Parallel Analyzer

4. Threshold Voltages on the A02 INPUT-B Board
5. Probe Compensation for the P6107 External Clock Probe
6. EXT CLK ▲ EXT CLK ▼ Delay
7. DLD CLK Delay
8. RET CLK, $\overline{WE}$, ADRS CLK, and TRIG CLK Delay and Width

Serial State Analyzer (318AS1)

9. Threshold Voltages on the A07 Board

MAINFRAME

1. Adjust Power Supplies

Equipment Required

1 Digital Multimeter (DMM)

a. Refer to Figure 2-14. Remove the 318A's wrap-around cover.

b. Connect P6451 Parallel Data Probes to Inputs A and B.

c. Set the DMM to measure dc voltage.

d. Connect the DMM minus (−) lead to J1 pin 11 (GND) on the A12 REGULATOR board. (See the bottom of the power supply chassis.)

e. Connect the DMM plus (+) lead to each point, starting at −5 V shown in Table 2-3. (Set the DMM range as required.)

f. Adjust the corresponding potentiometer on the A12 REGULATOR board to set the voltage level within the limits given in Table 2-3.

g. Move the DMM plus (+) lead to each point shown in Table 2-4. (Set the DMM range as required.)

h. Check that the DMM readings are within the limits given in Table 2-4.

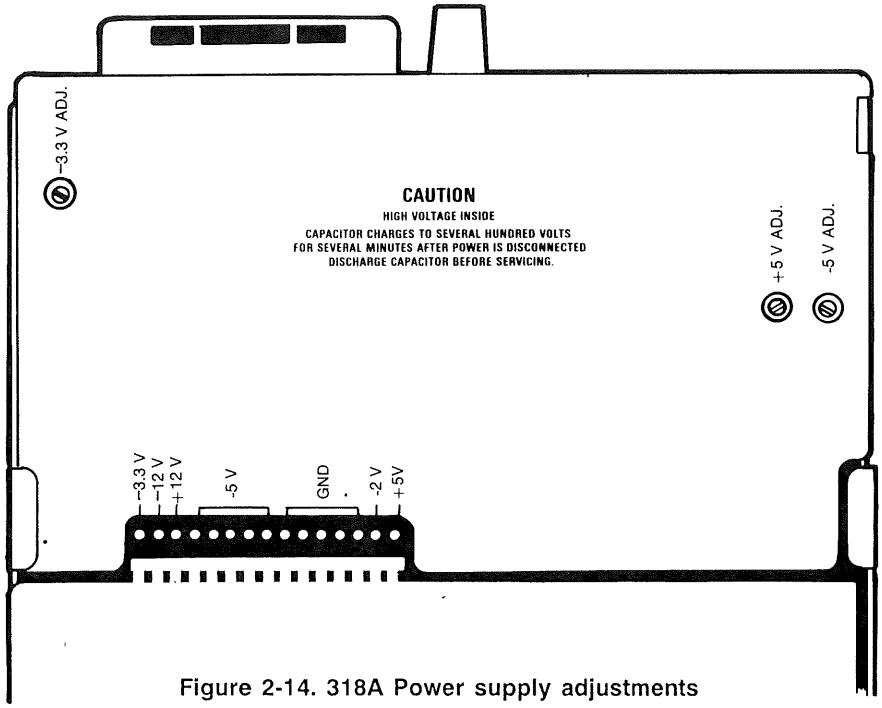


Figure 2-14. 318A Power supply adjustments

4434-584

Table 2-3
318A ADJUSTABLE POWER SUPPLY TOLERANCES

Pin Voltage	Voltage Limits	Potentiometer
each −5 V pin	−4.95 V to −5.05 V	R18 (labeled −5 V)
+5 V pin	+4.95 V to +5.05 V	R11 (labeled +5 V)
−3.3 V pin	−3.25 V to −3.35 V	R72 (labeled −3.3 V)

Table 2-4
318A NON-ADJUSTABLE POWER SUPPLY TOLERANCES

J1 Pin Number	Voltage Limits
−12 V pin	−11.0 V to −13.0 V
+12 V pin	+11.0 V to +13.0 V
−2 V pin	−1.80 V to −2.20 V

2. Adjust CRT Circuit

Equipment Required

None

a. Run the diagnostic program 1 CRT to generate a cross-hatch pattern. (To enter the diagnostic program, turn on the power switch while depressing any numeric key until the display appears.)
b. Refer to Figure 2-15. Adjust INTENSITY control R245 on the A10 CRT board to midrange.
c. Adjust INTENSITY LIMIT (CRT BIAS) R247 on the A10 CRT board for normal intensity.
d. Press the start key to display a horizontal line.
e. Loosen the setting screw of L150 (yoke coil).
f. Rotate the L150 so that the displayed white stripe is parallel to the bezel window.
g. Tighten the setting screw of L150.
h. Adjust the MAGNET RINGS on L150 on CRT to obtain the minimum trace bowing.
i. Adjust V-POSITION R033 on the A10 CRT board to position the display to vertical center of the CRT.
j. Adjust the MAGNET RINGS to position the display to the center of the CRT.
k. Adjust V-SIZE R015 on the A10 CRT board for vertical display size of about 2 mm less than the CRT display.
l. Adjust V-LINEARITY R031 on the A10 CRT board for optimum display.

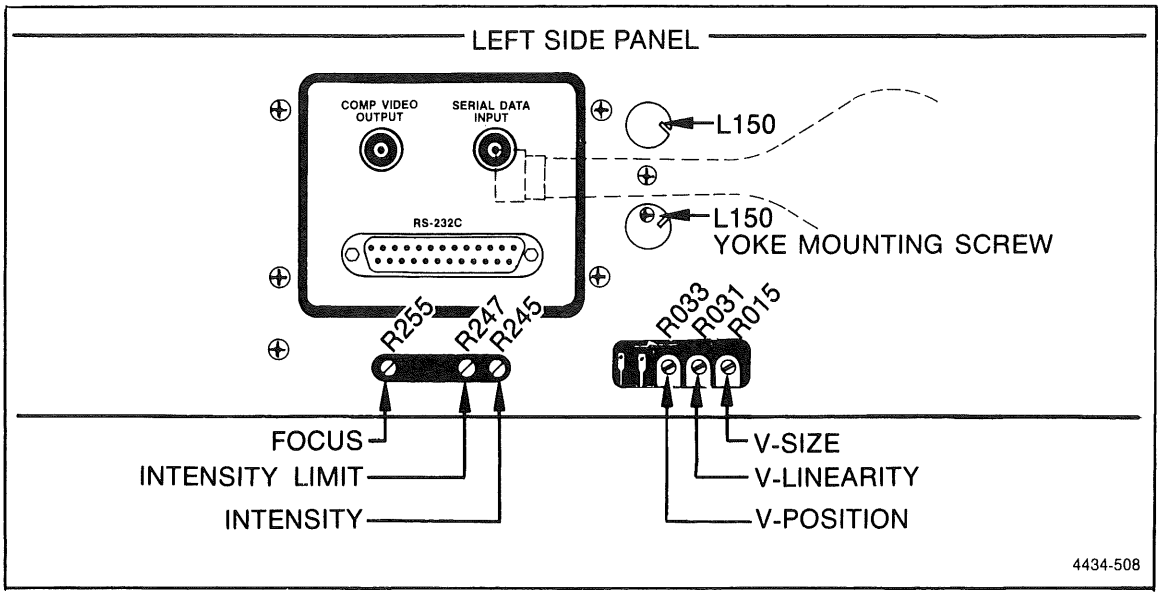


Figure 2-15. 318A CRT adjustments

3. Adjust Threshold Voltages on the A05 Memory board

Equipment Required
1 Digital Multimeter (DMM)

Refer to: Figure 2-16.

a. Reference Voltage Adjustment

(1) Connect the P6451 probes to PARALLEL DATA INPUTS A and B.
(2) Set the DMM range to measure about 5 V dc.
(3) Connect the DMM minus (−) lead to TP 510 on the A05 Memory board.
(4) Connect the DMM plus (+) lead to TP512 (REF) on the A05 Memory board.
(5) Adjust REF ADJ R554 on the A05 Memory board for a voltage indication of 3.200 ± .010 V.

b. Threshold VA 0-VOLT Adjustment

(1) Set Threshold LEVEL V1 to 0.0.
(2) Press the START key.
(3) Move the DMM plus (+) lead to TP514 (V1/4) on the A05 Memory board.
(4) Adjust VA 0-VOLT ADJ R562 on the A05 Memory board for a DMM indication of 0.000 ± 0.010 V.
(5) Press the STOP key.
(6) Set Threshold LEVEL V1 to +10.0 V.
(7) Press the START key.
(8) Check that the DMM reading is +2.500 ± 0.010 V.

(9) Press the STOP key.
(10) Set Threshold LEVEL V1 to −10.0 V.
(11) Press the START key.
(12) Check that the DMM reading is −2.500±0.010V.
(13) Press the STOP key.

c. Threshold VB 0-VOLT Adjustment

(1) Set Threshold LEVEL V2 to 0.0.
(2) Press the START key.
(3) Move the DMM plus (+) lead to TP516 (V2/4) on the A05 Memory board.
(4) Adjust VB 0-VOLT ADJ R574 on the A05 Memory board for a DMM indication of 0.000±0.010 V.
(5) Press the STOP key.
(6) Set Threshold LEVEL V2 to +10.0 V.
(7) Press the START key.
(8) Check the DMM reading is +2.500±0.010 V.
(9) Press the STOP key.
(10) Set Threshold LEVEL V2 to −10.0 V.
(11) Press the START key.
(12) Check the DMM reading is −2.500±0.010 V.
(13) Press the STOP key.

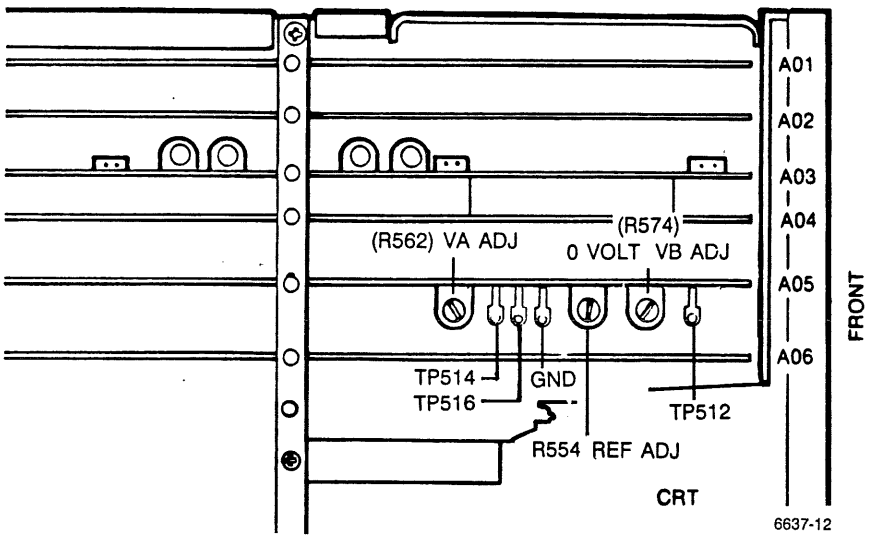


Figure 2-16. 318A Threshold voltage adjustments on the Memory & Threshold board (A05).

PARALLEL ANALYZER

4. Adjust Threshold Voltages on the A02 INPUT-B board

Equipment Required

1 Regulated DC Power Supply
1 Digital Multimeter (DMM)
1 Oscilloscope

Refer to Figure 2-17.

A. EXT CLK Threshold Adjustment

1. Setup

a. Connect the oscilloscope channel 1 probe tip to TP108 on the A01 INPUT-A board.
b. Set the oscilloscope triggering source to channel 1 and the sweep rate to 1 μs/div.
c. Enter the Threshold menu and set EXT CLK input to V1.
d. Set CLK to EXT +.
e. Select the TRIGGER Menu and set the events field: 00000*WA OFF:WB OFF:WC. This will cause the 318A to acquire data without triggering.

2. DC Balance

a. Ground the P6107 External Clock probe tip.
b. Enter the Threshold menu and set Threshold LEVEL V1 to 0.0.
c. Press the START key.
d. Turn EXT CLK DC BALANCE R234 on the A02 INPUT-B board to the counterclockwise end.
e. Turn R234 clockwise slowly while observing the oscilloscope waveform and mark the point where the waveform moves from stationary-low level to stationary-high level.
f. Then turn R234 to the clockwise end.
g. Turn R234 counterclockwise slowly while observing the oscilloscope waveform and mark the point where the waveform moves from stationary-high level to stationary-low level.
h. Adjust R234 to the center position between the points marked by procedures (e) and (g).
i. Press the STOP key.

3. DC Gain

a. Connect the P6107 External Clock probe ground clip to the power supply common terminal.
b. Connect the P6107 External Clock probe tip to the power supply plus (+) terminal.
c. Connect the DVM leads to the power supply terminals (low to common, high to +).
d. Adjust the regulated dc power supply output voltage to +10.00 V.
e. Set Threshold LEVEL V1 to +10.0 V.
f. Press the START key.

g. Turn EXT CLK DC GAIN R239 on the A02 INPUT-B board to the counterclockwise end.
h. Turn R239 clockwise slowly while observing the oscilloscope waveform and mark the point where the waveform moves from stationary-low level to stationary-high level.
i. Turn R239 to the clockwise end.
j. Turn R239 counterclockwise slowly while observing the oscilloscope waveform and mark the point where the waveform moves from stationary-low level to stationary-high level.
k. Adjust R239 to the center position between the points marked by procedures (h) and (j).
l. Press the STOP key.

B. DATA Threshold DC Balance Adjustment

1. Setup

a. Ground all the leads of the P6451 Parallel Data probes in both POD A and POD B.
b. Set the oscilloscope triggering source to channel 1 and the sweep rate to 1 μs/div.
c. Set Threshold LEVEL V1 = 0.0 V.
d. Select Threshold for POD A = V1, and POD B = V1.
e. Select TRIGGER menu and set CLK to EXT◆.
f. Set the events field: 00000*WA OFF:WB OFF:WC. This will cause the 318A to acquire data without triggering.

2. Pod-A

a. Connect the oscilloscope channel 1 probe lead to TP110 on the A01 INPUT-A board.
b. Press the START key.
c. Turn POD A Threshold DC BALANCE R308 on the A02 INPUT-B board to the counter-clockwise end.
d. Turn R308 clockwise slowly while observing the oscilloscope waveform and mark the point where the waveform moves from stationary low level to stationary high level.
e. Turn R308 to the clockwise end.
f. Turn R308 counterclockwise slowly while observing the oscilloscope waveform and mark the point where the waveform moves from stationary-high level to stationary-low level.
g. Adjust R308 to the center position between the points marked by procedures (d) and (f).
h. Press the STOP key.

3. Pod-B

a. Connect the oscilloscope channel 1 probe lead to TP208 on the A02 INPUT-B board.
b. Press the START key.
c. Turn POD B Threshold DC BALANCE R302 on the A02 INPUT-B board to the counter-clockwise end.
d. Turn R302 clockwise slowly while observing the oscilloscope waveform and mark the point where the waveform moves from stationary-low level to stationary-high level.
e. Turn R302 to the clockwise end.
f. Turn R302 counterclockwise slowly while observing the oscilloscope waveform and mark the point where the waveform moves from stationary-high level to stationary-low level.
g. Adjust R302 to the center position between the points marked in procedures (d) and (f).
h. Press the STOP key.

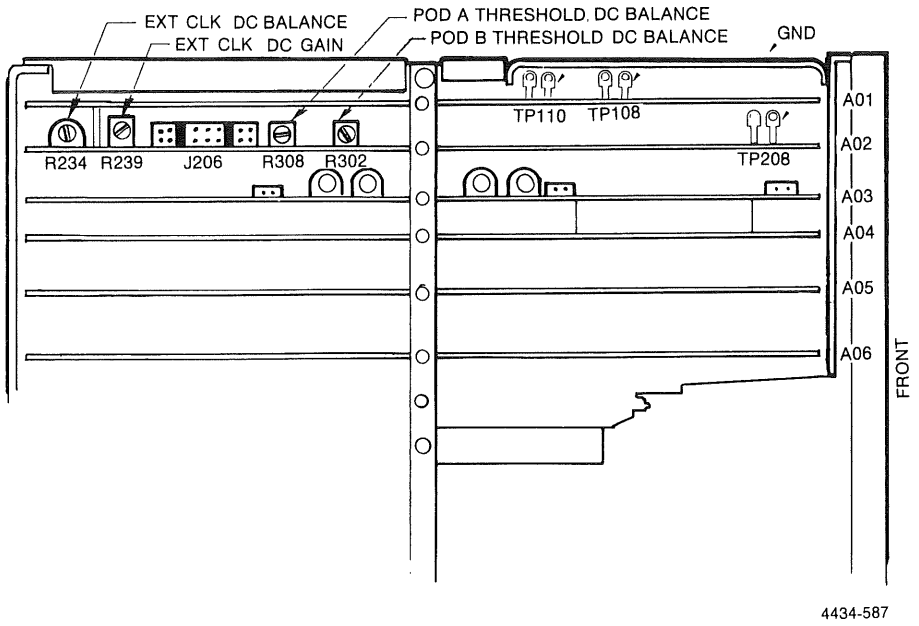


Figure 2-17. 318A Threshold voltage adjustments on the INPUT-B board (A02).

5. Probe Compensation for the P6107 External Clock Probe

Equipment Required

None

If you are using a standard 318A Logic Analyzer you will have one P6107 probe labeled External Clock Probe. This probe needs to be compensated to 20 pF according to the procedure described in Section 3: *Operating Instructions*. See the *Probe Compensation* paragraph in the Diagnostic Test Descriptions.

Two nearly identical P6107 probes are supplied with the 318AS1 Logic Analyzers; one is the External Clock Probe, and the other is the Serial Data Acquisition Probe. If the probes were supplied as original equipment, they will be labeled as either EXT CLOCK, or SERIAL DATA with a sticker on the compensation box. The External Clock Probe is compensated to 20 pF, and the Serial Data Acquisition Probe is compensated to 40 pF.

If you have purchased replacement probes, or if you are adding the 318AF1/338F1 Serial Analysis/RS-232C upgrade kit to a standard 318A, you need to choose which probe will be the External Clock Probe and adjust the compensation accordingly.
Probes supplied from the factory are compensated to 40 pF.

The P6107 Serial Data Acquisition Probe has been factory compensated (40 pF) and sealed with a CALIB. sticker. Recompensation must be performed by qualified service personnel only. It is not necessary to compensate this probe. We recommend that you install the colored marker band (supplied) on the probe for identification purposes.

If the P6107 External Clock Probe is a replacement the compensation must be altered. Remove and discard the CALIB. sticker. Then perform the probe compensation procedure described in the *Operating Instructions* section (section 3) of this manual. (See Probe Compensation under Diagnostic Test Descriptions.) We recommend that you install the colored marker band (supplied) on the probe to help in identification.

6. Adjust EXT CLK▲ and EXT CLK▼ Delay

Equipment Required

1 Oscilloscope Tektronix 7904 with plug in units 7A26, 7B80, and 7B85.
1 Pulse Generator Tektronix PG502
1 BNC 50 Ω termination
1 BNC T-connector
2 BNC male to Probe tip Adapters
1 2 SQR-pin to Probe tip Adapter

Figure 2-18 shows the test equipment setup for the Clock Delay adjustment.

Refer to Figures 2-18 and 2-19.

A. Oscilloscope Setup

1. Install the modules into the 7904 oscilloscope main frame; 7A26 amplifier in the left vertical slot, 7B85 time base in Horizontal slot A and 7B80 time base in Horizontal slot B.
2. Connect a 50 Ω terminator to the pulse generator OUTPUT. Connect a BNC T-connector to the 50 Ω terminator. Connect the CH1 oscilloscope probe to one side of the BNC T-conector.
3. Connect the P6107 External Clock probe tip to the other side of the BNC T-connector.
4. Setup the oscilloscope as follows:

7904 Mainframe	Horizontal Mode B	
7A26	Position	Rising edge at center screen
Channel 1	VOLTS/DIV	20 mv (200 mV with 10X probe)
	Trigger Source	CH 1
	Display Mode	ALT
	Position	0 v at mid screen
Channel 2	VOLTS/DIV	50 mV (500 mV with 10X probe)
	Position	0 v 2.4 divisions above midscreen (−1.4 V at midscreen)
7B85	Slope	+
	Triggering	Mode Coupling Source Auto AC INT
	Magnification	1X
	Hold Off	at minimum
	B Delay Mode	B Starts after DLY
	Time/DIV	50 ns (5 ns with magnifiction)
	Trace Sep	On, minimum
	Δ Time	zero

7B80	slope	+
	Triggering	Mode Coupling Source Auto AC INT
	Position	rising edge at center screen
	Hold Off	at minimum
	Time/Div	10 ns (1 ns with magnification)

5. Set the pulse generator as follows:

Termination	BACK TERM (pull switch out)
Period	0.1 μs
Duration	10 ns (5 ns × 2)
High level	+0.35 V
Low level	−0.35 V

6. Select the A timebase and place the rising edge of the channel 1 waveform on the center graticule on the oscilloscope screen.
7. Select the B timebase.
8. Connect the oscilloscope channel 2 probe tip to TP108 on the A01 INPUT-A board.
9. Enter the Threshold menu and set EXT CLK to V3 (0.00V).
10. Select the TRIGGER Menu and set the events field to: 00000*WA OFF:WB OFF:WC. This will cause the 318A to acquire data without triggering.

B. EXT▲

1. Set CLK to EXT▲.
2. Press the START key.
3. Turn DELAY TIME of the A timebase to place the rising edge of the channel 1 waveform on the center graticule.
4. Turn Δ-TIME clockwise to obtain a reading of 25.00±0.1 ns.
5. Adjust EXT▲ DELAY by moving the jumper at J206 (2 to 12) on the A02 INPUT-B board to place the rising edge of the channel 2 waveform within one graticule division of the rising edge of the channel 1 waveform.
6. Press the STOP key.

C. EXT ▼

1. Set CLK to EXT▼.
2. Press the START key.
3. Turn DELAY TIME of the A timebase to place the falling edge of the channel 1 waveform on the center graticule.
4. Turn Δ-TIME clockwise to obtain a reading of 25.00±0.1 ns.
5. Adjust EXT▼ DELAY P202 (14 to 24) on the A02 INPUT-B board to place the rising edge of the channel 2 waveform within one graticule division of the falling edge of the channel 1 waveform.
6. Press the STOP key.

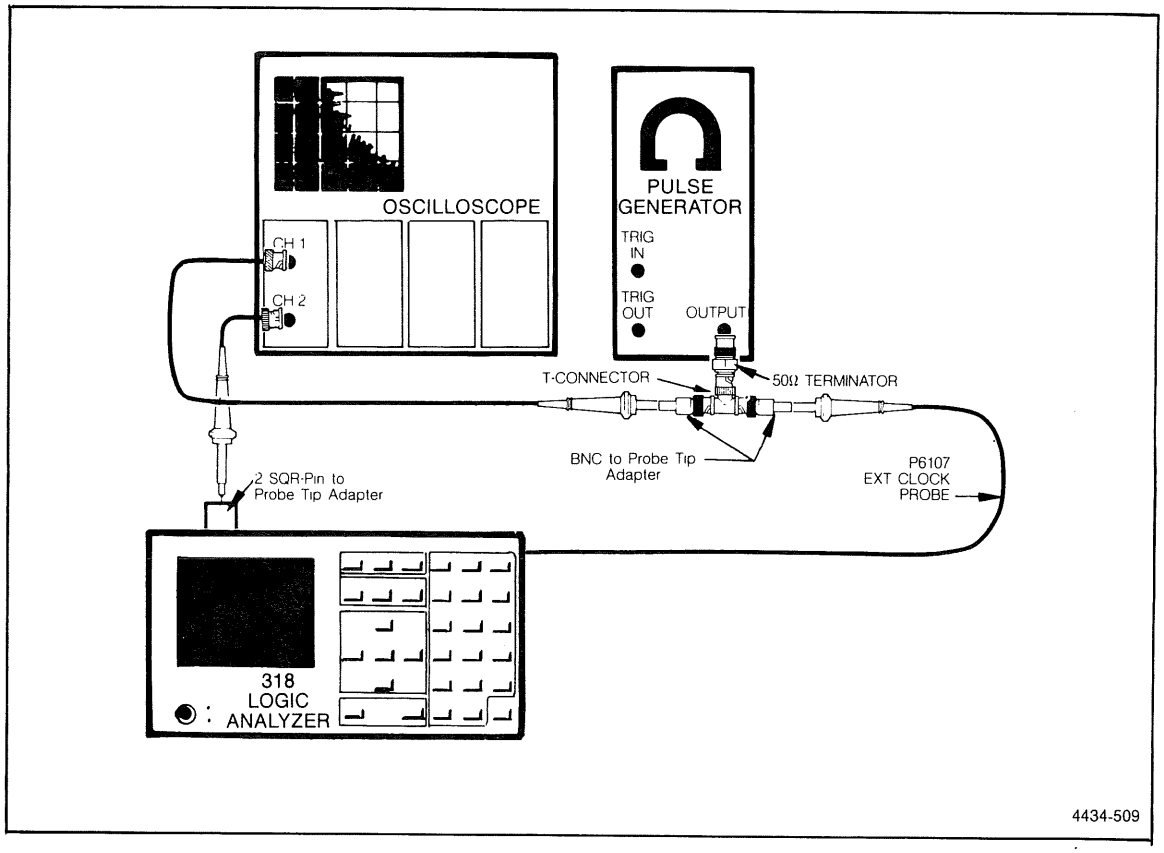


Figure 2-18. 318A Test equipment setup for the Clock Delay adjustment.

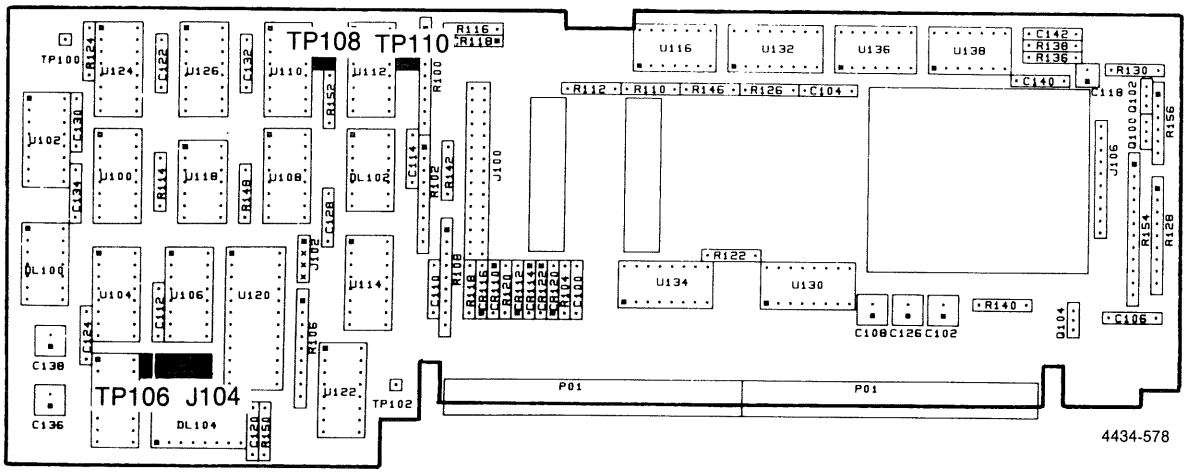


Figure 2-19. 318A EXT CLK and DLD CLK signal adjustment locations.

7. Adjust DLD CLK Delay

Equipment Required

1 Oscilloscope, Tektronix 7904 with plug in units 7A26, 7B80, and 7B85.
1 Pulse Generator
1 BNC 50 Ω termination
1 BNC T-connector
2 BNC male to Probe tip Adapters
1 2 SQR-pin to Probe tip Adapter

Refer to Figures 2-18 and 2-19.

a. Install the 7B85 plug-in module into the 7904 A timebase, and install the 7B80 module into the B timebase.
b. Connect a 50 Ω terminator to the pulse generator OUTPUT. Connect a BNC T-connector to the 50 Ω terminator. Connect the oscilloscope channel 1 probe lead to one side of the BNC T-connector.
c. Connect the P6107 External Clock probe lead to other side of the BNC T-connector.
d. Setup the oscilloscope as follows:

7904 Mainframe	Horizontal Mode B	
7A26	Position	Rising edge at center screen
Channel 1	VOLTS/DIV	20 mv (200 mv with 10X probe)
	Trigger Source	CH 1
	Display Mode	ALT
	Position	0 v at mid screen
Channel 2	VOLTS/DIV	50 mv (500 mv with 10X probe)
	Position	0 v 2.4 divisions above midscreen (−1.4 v at midscreen)
7B85	Slope	+
	Triggering	Mode Coupling Source Auto AC INT
	Magnification	1X
	Hold Off	at minimum
	B Delay Mode	B Starts after DLY
	Time/DIV	50 ns (5 ns with magnifiction)
	Trace Sep	On, minimum
	Δ Time	zero
7B80	slope	+
	Triggering	Mode Coupling Source Auto AC INT
	Position	rising edge at center screen
	Hold Off	at minimum
	Time/Div	10 ns (1 ns with magnification)

e. Set the pulse generator as follows:

Termination	BACK TERM (pull switch out)
Period	0.1 μs
Duration	10 ns (5 ns × 2)
High level	+0.35 V
Low level	−0.35 V

f. Select the A timebase and place the rising edge of the channel 1 waveform on the center graticule on the oscilloscope screen.
g. Select the B timebase.
h. Turn DELAY TIME of the A timebase to place the rising edge of the channel 1 waveform on the center graticule.
i. Connect the oscilloscope channel 2 probe tip to TP106 on the A01 INPUT-A board.
j. Select the Threshold menu and set INPUT EXT CLK = V3.
k. Set CLK to EXT▲.
l. Select the Trigger menu and set the events field to 00000*WA OFF:WB OFF:WC. This will cause the 318A to acquire data without triggering.
m. Press the START key.
n. Turn Δ-TIME clockwise to obtain a reading of 43.00 ± 0.1 ns.
o. Adjust DLD CLK DELAY by moving the jumper at J104 on the A01 INPUT-A board to place the rising edge of the channel 2 waveform within one graticule division of the rising edge of the channel 1 waveform.
p. Press the STOP key.

8. Adjust RET CLK, $\overline{WE}$, ADRS CLK, and TRIG CLK Delay and Width

Equipment Required

1 Oscilloscope, Tektronix 7904 with plug-in modules 7A26, 7B80, and 7B85.
1 Pulse Generator
1 BNC 50 Ω termination
1 BNC T-connector
2 BNC male-to-Probe-tip Adapters
1 2 SQR pin-to-Probe-tip Adapter
2 Extender Boards
2 Board Ejectors

Refer to Figures 2-18 and 2-20.

A. Equipment Setup

1. Install the 7B85 plug-in module into the 7904 timebase A, and install the 7B80 module into timebase B.
2. Connect a 50 Ω terminator to the pulse generator OUTPUT. Connect a BNC T-connector to the 50 Ω terminator. Connect the oscilloscope channel 1 probe tip to one side of the BNC T-connector.

3. Connect the P6107 External Clock probe tip to the other side of the BNC T-connector.
4. Setup the oscilloscope as follows:

Mainframe	Horizontal Mode B	
7A26	Position	Rising edge at center screen
Channel 1	VOLTS/DIV	20 mv (200 mv with 10X probe)
	Trigger Source	CH 1
	Display Mode	ALT
	Position	0 v at mid screen
Channel 2	VOLTS/DIV	50 mv (500 mv with 10X probe)
	Position	0 v 2.4 divisions above midscreen (−1.4 v at midscreen)
7B85	Slope	+
	Triggering	Mode Coupling Source Auto AC INT
	Magnification	1X
	Hold Off	at minimum
	B Delay Mode	B Starts after DLY
	Time/DIV	50 ns (5 ns with magnifiction)
	Trace Sep	On, minimum
	Δ Time	zero
7B80	slope	+
	Triggering	Mode Coupling Source Auto AC INT
	Position	rising edge at center screen
	Hold Off	at minimum
	Time/Div	10 ns (1 ns with magnification)

5. Set the pulse generator as follows:

Termination	BACK TERM (pull switch out)
Period	0.1 μs
Duration	10 ns (5 ns × 2)
High level	+0.35 V
Low level	−0.35 V

6. Select the A timebase and place the rising edge of the channel 1 waveform on the center graticule on the oscilloscope screen.
7. Select the B timebase.
8. Turn DELAY TIME of the A timebase to place the rising edge of the channel 1 waveform on the center graticule.

B. Strap adjustment with Extender boards (Optional Maintenance Kit Required)

1. Turn off the 318A.
2. Remove the A03 ACQ CONTROL board and the A04 ACQ MEMORY board using the Board ejectors.
3. Install Extender boards into the J03 and J04 connectors.
4. Mount the A03 ACQ CONTROL board and the A04 ACQ MEMORY board on the top of the Extender boards.
5. Turn on the 318A.
6. Select the Threshold menu and set INPUT EXT CLK = V3 (0.00 V).
7. Set CLK to EXT⏏.

8. Select the Trigger menu and set the Events field to: 00000*WA OFF:WB OFF:WC. This will cause the 318A to acquire data without triggering.
9. Press the START key.
10. Repeat the following procedures, (11) through (13), to adjust each clock delay with Extender boards shown in Table 2-5.
11. Connect the oscilloscope channel 2 probe tip to the corresponding test point given in Table 2-5.
12. Turn Δ-TIME clockwise to display the clock delay value listed in Table 2-5.
13. Adjust the corresponding jumper to place the rising or falling edge (indicated by ▲ or ▼ in Table 2-5) of the channel 2 waveform within one ms of the rising edge of the channel 1 waveform.
14. Press the STOP key.
15. Turn off the 318A.
16. Dismount the A03 ACQ CONTROL board and the A04 ACQ MEMORY board from the Extender boards.
17. Remove the Extender boards from slots A03 and A04.
18. Install the A03 ACQ CQNTROL board and the A04 ACQ MEMORY board into slots A03 and A04 respectivey.
19. Turn on the 318A.

Table 2-5
318A CLOCK DELAY WITH EXTENDER

Clock	Signal Edge*	Delay (ns)	Test Point	Jumper
RET CLK	▲	47.60 ± 1.00	TP400 (A03)	J200(A03)
$\overline{WE}$	▼	55.50 ± 1.00	TP400-2(A04)	J300(A03)
TRIG CLK	▲	68.10 ± 1.00	TP500 (A03)	J400(A03)

* ▲ means rising edge; ▼ means falling edge

C. Capacitor adjustment

1. Refer to Figures 2-21 and 2-22. Select the Threshold menu and set INPUT EXT CLK = V3 (0.00 V).
2. Select the Trigger menu and set CLK = EXT▲.
3. Set the Events field to: 00000*WA OFF:WB OFF:WC. This will cause the 318A to acquire data without triggering.
4. Press the START key.
5. Repeat the following procedures, (6) through (f), to adjust each clock delay and/or width shown in Table 2-6.
6. Connect the oscilloscope channel 2 probe tip to the corresponding test point given in Table 2-6.
7. Turn Δ-TIME clockwise to display the clock delay value given in Table 2-6.

8. Adjust the corresponding capacitor to place the rising or falling edge (indicated by ◆ or ◆ in Table 2-6) of the channel 2 waveform within one graticule division of the rising edge of the channel 1 waveform.

9. Press the STOP key.

NOTE

Vertically position signals to center around mid-screen. Delays are measured from threshold to threshold of each circuit.

Table 2-6
318A CLOCK DELAY WITHOUT EXTENDER

Clock	Signal Edge*	Delay (ns)	Test Point	Adjustment Capacitor
RET CLK	◆	46.60 ± 0.50	TP400 (A03)	C100(A03)
$\overline{WE}$	◆	54.50 ± 0.50	TP400-2(A04)	C102(A03)
$\overline{WE}$ C106(A03)	◆	64.50 ± 0.50	TP400-2(A04)	
ADRS CLK	◆	63.30 ± 0.50	TP400-4(A04)	C104(A03)

* ◆ means rising edge; ◆ means falling edge

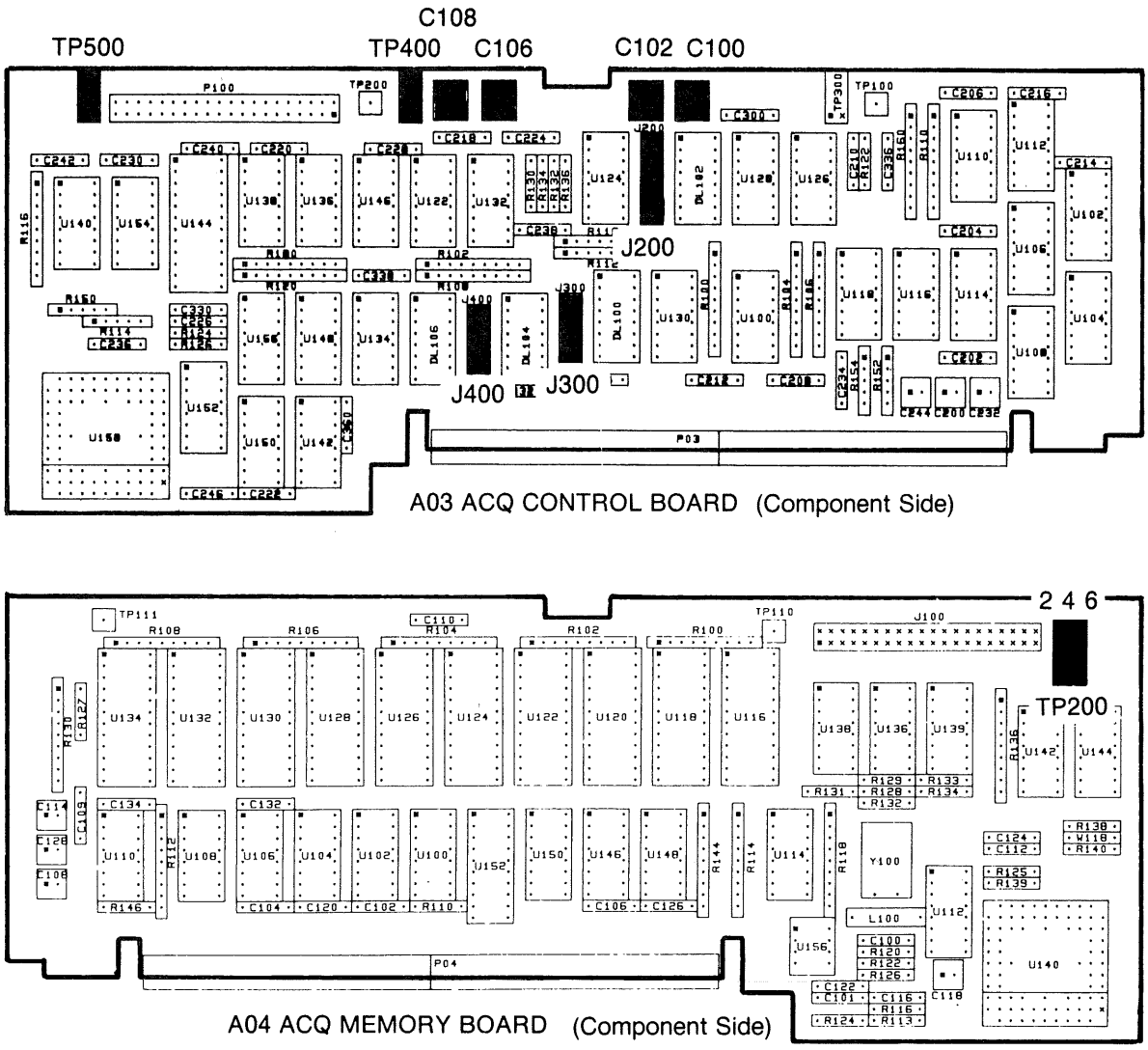


Figure 2-20. 318A RET CLK, $\overline{WE}$, ADRS CLK, and TRIG CLK adjustments.

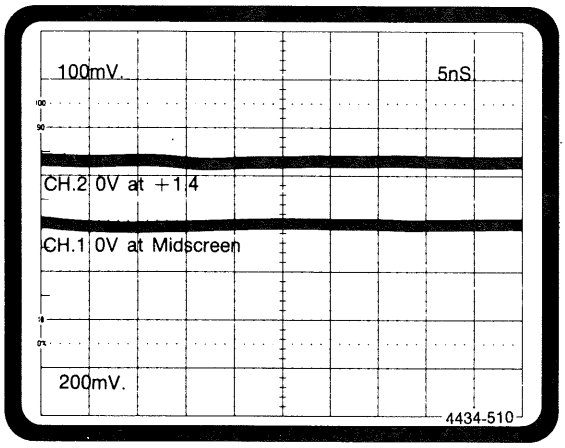


Figure 2-21. 318A Capacitor adjustment oscilloscope setup waveform.

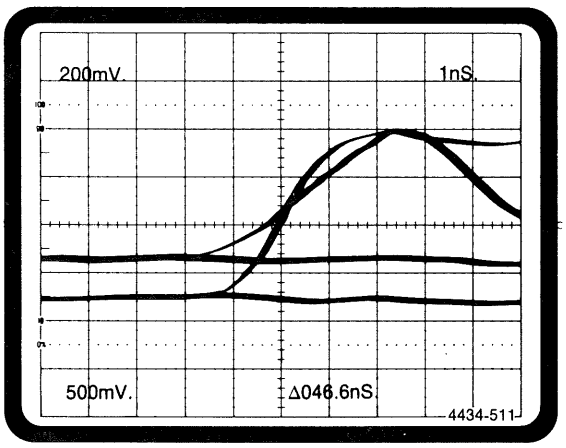


Figure 2-22. 318A Capacitor adjustment waveform.

SERIAL STATE ANALYZER

9. Adjust the Threshold Voltages on the A07 Board (318AS1 Instruments Only)

Equipment Required

1 Digital Multimeter (DMM)

Refer to Figures 2-23 and 2-24

a. Set MODE to SER (any menu).
b. Select the Threshold menu and set V1 = 0.0 V and V2 = 0.0 V.
c. Connect the DMM minus (−) lead to TP700 (GND) on the A07 board.
d. Connect the DMM plus (+) lead to TP720 (Threshold) on the A07 board.
e. Set INPUT DATA = V1.
f. Press the START key.
g. Record the voltage and label it V0 (V0 will be used as a reference later).
h. Connect the P6107 Serial Data probe tip to TP700 on the A07 board.
i. Move the DMM plus (+) lead to TP710 on the A07 board.
j. Adjust R716 DC BALANCE on the A07 board for a DMM indication of V0 ±0.001 V (the voltage measured in step (7) ± 0.001 V).
k. Press the STOP key.
l. Set INPUT DATA = V2.
m. Press the START key.
n. Check that the DMM indication is V0±0.001 V.
o. Press the STOP key.
p. Set INPUT DATA = V3.
q. Press the START key.
r. Check that the DMM indication is V0±0.001 V.
s. Press the STOP key.

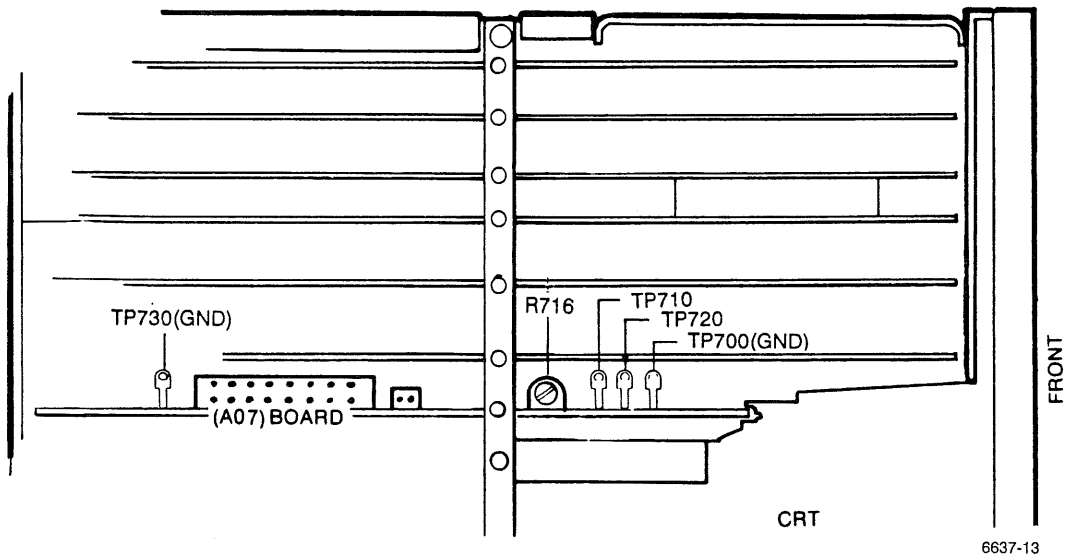


Figure 2-23. 318A Serial Analysis/RS-232C test point and adjustment locations

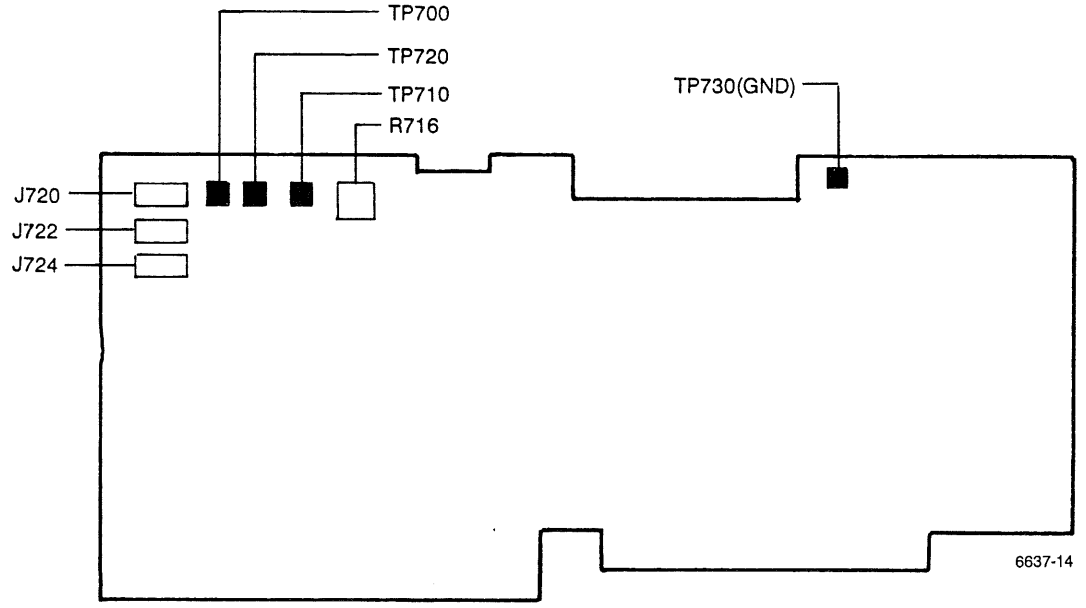


Figure 2-24. 318A Side view of A07, Serial Analysis/ RS-232C board.

10. Adjust Non-volatile Memory Battery Backup Threshold

Equipment Required

1 Oscilloscope
1 Digital Multimeter (DMM)

Refer to Figures 2-25 and 2-27.

a. Connect the DMM minus (−) lead to TP500 (GND) on the A05 board.

b. Connect the DMM plus (+) lead to TP504 (+5 V) on the A05 board.
c. Record the voltage measured.
d. Adjust +5V POTENTIOMETER R11 on the A12 REGULATOR board for a DMM indication of 4.65 ± 0.01 V.
e. Connect the oscilloscope channel 1 probe tip to TP502 on the A05 board.
f. Set the oscilloscope to 1 μs/div. and 2 V/div., dc.
g. Turn NVM THRESHOLD R512 on the A05 board clockwise until the oscilloscope indication is low.
h. Adjust NVM THRESHOLD R101 by slowly turning counterclockwise until the oscilloscope waveform level rises to high.
i. Adjust +5V POTENTIOMETER R11 on the A12 REGULATOR board for a DMM indication equal to that recorded in step (c) above.

PERFORMANCE CHECK FOR THE 318A

The Performance Check Procedure provides a detailed check of internal and external product characteristics. These checks can be extensive and time-consuming. Under normal circumstances the Functional Check Procedures will provide an adequate test of product performance in a less costly manner.

The Performance Check Procedure is organized into sets of tests for the mainframe, the acquisition module, each type of probe, and 318AS1 serial analyzer option.

INDEX OF PERFORMANCE CHECKS

THE PERFORMANCE CHECKS

Test 1. Threshold Voltages

Equipment Required	Tektronix Equivalent
1 Oscilloscope	7904 with 7A26 and 7B80 plug-in modules
2 Oscilloscope Probes 10X	P6106
2 Pulse Generators	PG 502
1 Digital Multimeter (DMM)	DM 502
1 Regulated DC Power Supply	PS 501
1 BNC T-Connecter	103-0030-00
2 BNC male-to-Probe-tip Adapters	013-0084-02
1 BNC 50 Ω Cable 18 inches long	012-0076-00
1 BNC 50 Ω Cable 42 inches long	012-0057-01
2 Flying Lead set 5in. (short leads)	012-0987-00
1 Test Fixture	See Figure 2-2.
1 BNC Female-to-Dual-Banana connector	

1. Threshold Voltage Test Setup

   a. Install the P6107 EXT CLK Probe and both P6451 Parallel Data Probes in the 318A. Connect a BNC T-connector to the pulse generator OUTPUT. Connect the P6107 External Clock probe tip to one side of the BNC T-connector. Refer to Figure 2-25.

   b. Connect the Test Scope Channel 1 10X Probe tip to the other side of the BNC T-connector.

   c. Set the pulse generator as follows:

      PERIOD 30ms
      DURATION SQ Wave

   d. Connect the DMM minus (−) lead to the power supply reference (−) terminal and the plus (+) lead to the plus (+) terminal.

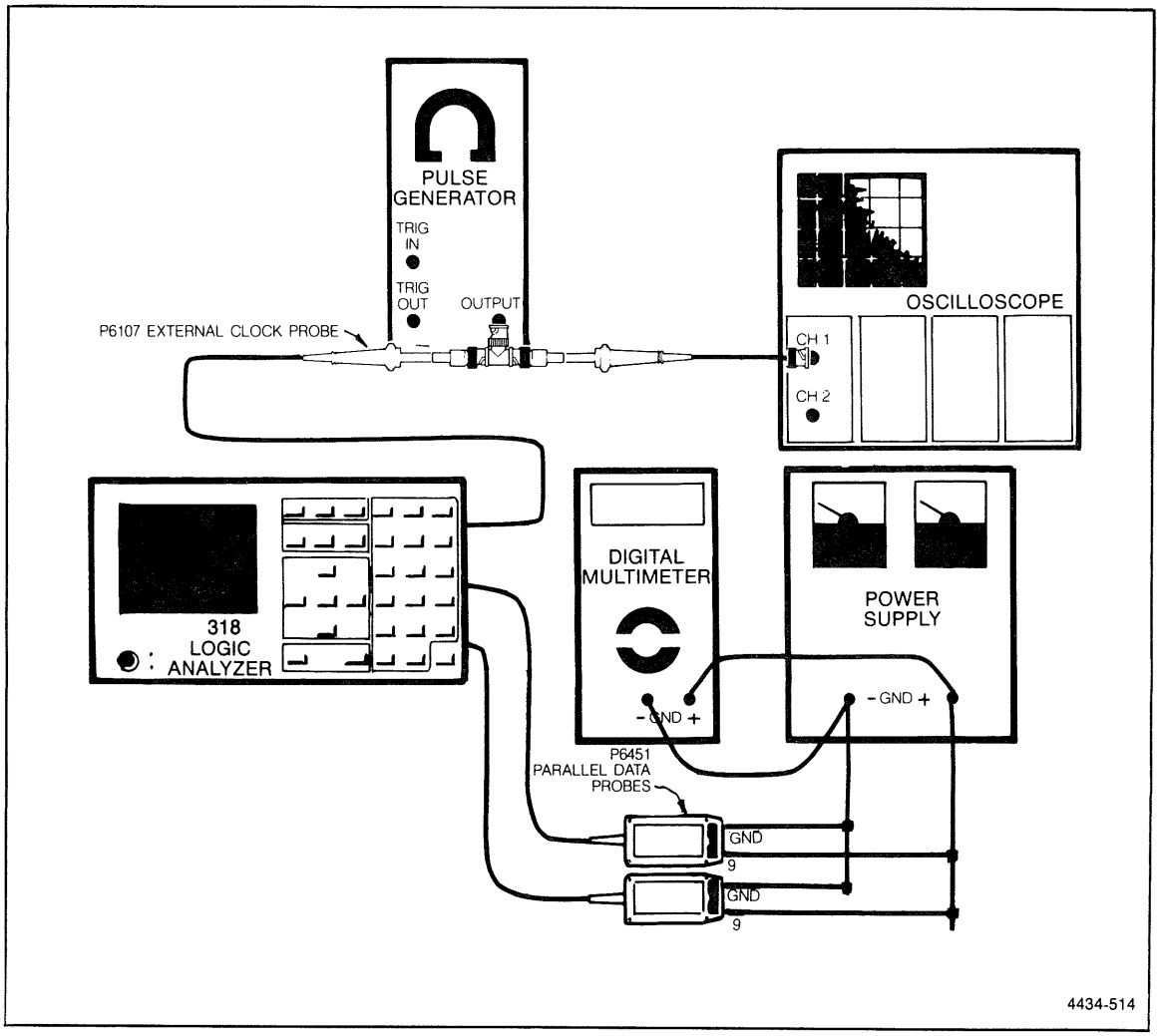


Figure 2-25. Threshold voltage check setup.

CAUTION

Do not reverse the power supply connections when common is connected to ground; that would allow excessive current to pass through to the P6451 Probe ground. If the P6451 Probe ground lead is connected to a large current source the probe will be damaged.

e. Make sure that the DC Power Supply reference terminal is at the same potential as the 318A ground; this is to prevent excessive current from passing through to the P6451 Probe ground.

f. Connect the P6451 Probe GND leads from Pods A and B to the power supply reference (−) terminal.

g. Connect the P6451 Probe DATA leads from Pods A and B to the power supply plus (+) terminal.

h. Power-up and setup 318A as follows:

```
THRESHOLD MENU
      INPUT
                        EXT CLK =   TTL
                        POD A =     TTL
                        POD B =     TTL
TRIGGER MENU
      CLK               EXT
      POSN              DELAY
                        04089
      Events            00001*WA  FLW'D BY:WB  OFF:WC
```

2. Threshold Level TTL

   a. Repeat the following procedures, (b) through (e), for two voltage levels of the power supply output given in Table 2-7.

   b. Set the pulse generator output level to that given in Table 2-7 as measured by the oscilloscope. Set the oscilloscope so that +1.4 V is at midscreen:

      1. Set the power supply for 1.40 V
      2. Momentarily move the oscilloscope CH1 probe to the power supply +1.40 V output.
      3. Set the oscilloscope vertical Volts/DIV so that the screen reads 200 mV (20 mV setting using 10× probe).
      4. Adjust the vertical position so that the trace is at midscreen (+1.40 V at midscreen).
      5. Return the oscilloscope CH1 probe to the pulse generator's BNC T-connector.
      6. Adjust the pulse generator output so that the signal is 1 1/4 divisiions above and 1 1/4 divisions below midscreen (+1.15 V to +1.65 V).

   c. Set the power supply level to the voltage given in Table 2-7 as measured with the DVM.

   d. Press the START key and wait for the acquisition to be completed; make sure that SLOW CLOCK is not displayed on the CRT.

   e. Press the DATA key until the State Table is displayed. Check that data acquired are equal to the Expected Data given in Table 2-7.

Table 2-7.
318A VOLTAGE LEVELS FOR TESTING TTL

Power Supply	Pulse Generator		T/H LEVEL			Expected
Output (V)	High(V)	Low(V)	V1(V)	V2(V)	V3(V)	Data
+1.65	+1.65	+1.15	----	----	----	all Fs (hex)
+1.15	+1.65	+1.15	----	----	----	all 0s

3. Threshold Levels V1, V2, and V3

   a. Press the 318A THRESHOLD key.

b. Refer to the values given in Table 2-8 in setting the power supply output level, the pulse generator output level, the system threshold levels, and the INPUT Clock and Pod Threshold levels.

c. Set the test equipment to the values necessary for Test 1 in Table 2-8 and press the DATA key.

d. Press the START key and wait for the acquisition to be completed. Check to make sure that SLOW CLOCK is not displayed on the screen.

e. Check that data acquired are equal to the Expected Data given in Table 2-8.

f. Set the 318A SRCH WORD to equal the Expected Data and then check that the quantity of SRCH words equals 4096.

g. Repeat Steps (a) to (f) for each test in Table 2-8.

h. Disconnect the test setup.

Table 2-8.
318A VOLTAGE LEVELS FOR TESTING V1, V2, AND V3

Test #	Power Supply Output (V)	Pulse Generator High (V)	Pulse Generator Low (V)	T/H Level V1 (V)	T/H Level V2 (V)	T/H Level V3 (V)	T/H Input Clk A, B	Expected Data
1	+5.25	+5.25	+4.75	+5.0	—	—	V 1	all Fs
2	+4.75	+5.25	+4.75	+5.0	—	—	V 1	all 0s
* 3	−4.75	−4.75	−5.25	−5.0	—	—	V 1	all Fs
* 4	−5.25	−4.75	−5.25	−5.0	—	—	V 1	all 0s
5	+5.25	+5.25	+4.75	—	+5.0	—	V 2	all Fs
6	+4.75	+5.25	+4.75	—	+5.0	—	V 2	all 0s
* 7	−4.75	−4.75	−5.25	—	−5.0	—	V 2	all Fs
* 8	−5.25	−4.75	−5.25	—	−5.0	—	V 2	all 0s
9	+5.00	+5.00	+4.50	+10.0	−0.5	+4.75	V 3	all Fs
10	+4.50	+5.00	+4.50	+10.0	−0.5	+4.75	V 3	all 0s
11	+0.25	+0.25	−0.25	0.0	0.0	0.00	V 3	all Fs
*12	−0.25	+0.25	−0.25	0.0	0.0	0.00	V 3	all 0 s
*13	−4.50	−4.50	−5.00	+0.5	−10.0	−4.75	V 3	all Fs
*14	−5.00	−4.50	−5.00	+0.5	−10.0	−4.75	V 3	all 0s

* Insure that the P6451 probe GND lead connected to the Power Supply Reference terminal is at the same potential as the 318A ground.

TEST 2. Parallel Data Acquisition Word Recognition and Trigger Sequencer Check with External Clock Minimum Period. Note Test 2 verifies setup and hold time and minimum data and clock amplitude.

Equipment Required	Tektronix Equivalent
1 Oscilloscope	7904 with 7A26 and 7B80 plug-in modules
2 Oscilloscope Probes 10X	P6106
2 Pulse Generators	PG 502
1 Digital Delay	DD 501
4 BNC 50 Ω terminators	011-0049-01
3 BNC T-Connecters	103-0030-00
3 BNC male-to-Probe-tip Adapters	013-0084-02
3 BNC elbow male-to-female adapters	103-0031-00
1 BNC female-to-female adapter	103-0038-00
1 BNC male-to-male adapter	103-0029-00
1 BNC 50 Ω Cable 18 inches long	012-0076-00
1 BNC 50 Ω Cable 42 inches long	012-0057-01
1 Test Fixture	See Fig. 2-2.
2 Flying Lead set 5in. (short leads)	012-0987-00

Refer to Figure 2-26.

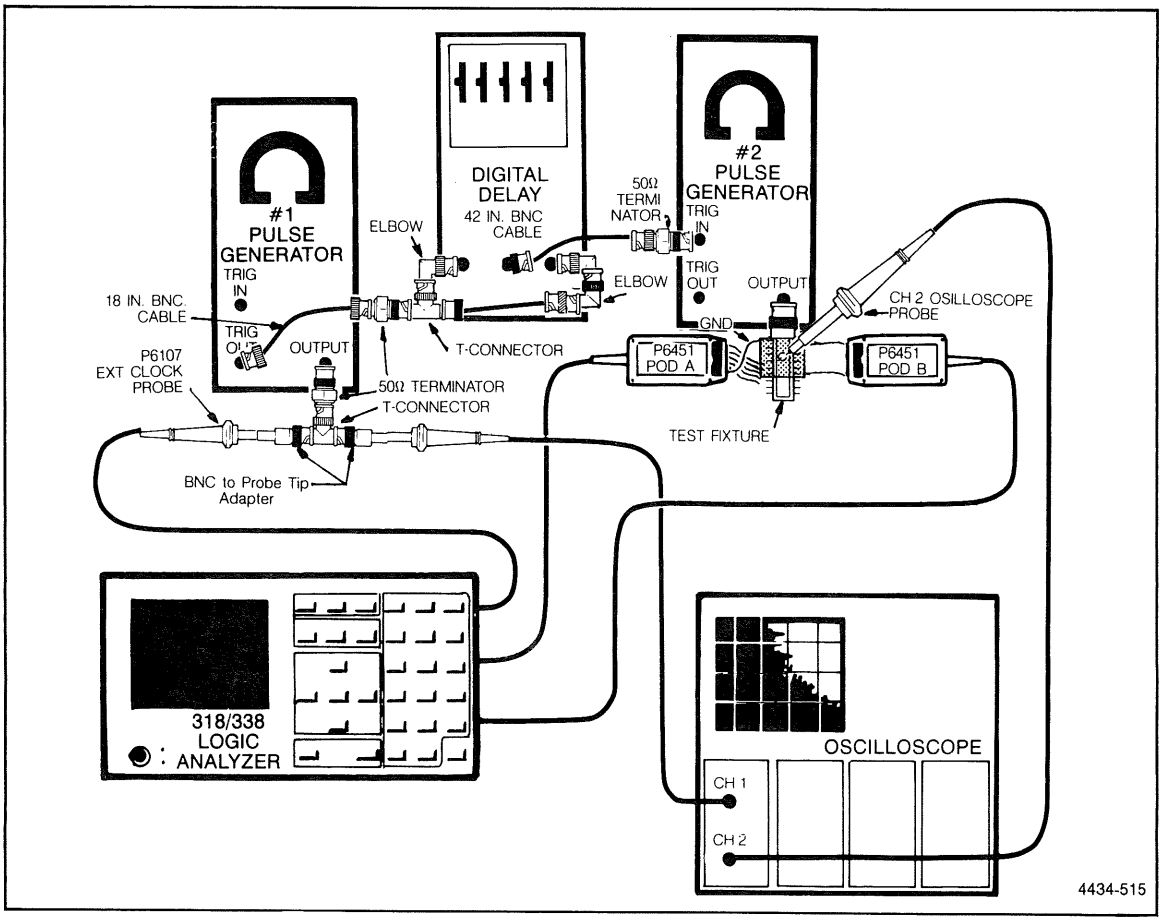


Figure 2-26. 318A Parallel data acquisition test setup.

1. Connect a 50 Ω terminator to the #1 pulse generator's OUTPUT. Connect a BNC T-connector to the 50 Ω terminator. Connect the P6107 EXT CLOCK probe tip to one side of the BNC T-connector.

2. Connect the oscilloscope channel 1 10X probe tip to the other side of the BNC T-connector.

3. Connect a BNC elbow to the Digital Delay's EVENTS INPUT. Connect a BNC T-connector to the elbow. Connect one side of the T-connector to the #1 pulse generator's + TRIG OUT using an 18 inch BNC cable and a 50 Ω terminator. Connect the other side of the Digital Delay's BNC T-connector to the Digital Delay's START INPUT (see Figure 2-26). Using 2 BNC elbows and a BNC female-to-female conector will help here.

4. Connect the Digital Delay DLY'D TRIG OUT to the #2 pulse generator's +TRIG/DURATION INPUT using a 42 inch BNC cable

5. Connect all the leads from Pod A, and the Qualifier lead from Pod B, to the Test Fixture; then connect the Test Fixtrue to the #2 pulse generator's OUTPUT. Make sure that the P6451 probe GND leads are connected to the Test Fixture ground pins (those pins nearest the BNC connector are ground).

6. Set the #1 pulse generator's Range Switches to 10 ns PERIOD and 5 ns DURATION.

7. Set the Digital Delay's EVENT DELAY COUNT to 00001 and adjust the EVENTS and START LEVEL until triggered.
8. Connect oscilloscope channel 2 to the #2 pulse generator's OUTPUT using 10X probe and the probe tip connector on the Test Fixture.
9. Power-up and setup the 318A as shown:

SETUP MENU

PLR GROUP	G1	ON = AAAAAAAA 76543210
	G2	OFF

THRESHOLD MENU

LEVEL	V1 =	+10.0V
	V2 =	−10.0V
INPUT		
	EXT CLK =	V3
	POD A =	V3
	POD B =	V3

TRIGGER MENU

Source	INT TRIG
CLK	EXT◄
TRIG	IMMEDIATELY
POSN	DELAY 04089
Events	00001*WA FLW'D BY:WB OFF:WC
WA =	XX
WB =	XX
WC	

10. Set the oscilloscope as shown:

7904 Mainframe Horizontal Mode B

7A26

Channel 1	**VOLTS/DIV**	**100 mV (10 mV with 10X probe)**
	Trigger Source	**CH 2**
	Display Mode	**ALT**
	Position	**0 V at mid screen**
Channel 2	**VOLTS/DIV**	**100 mV (10 mV with 10X probe)**
	Position	**0 V at midscreen**

7B80

	Triggering	Mode Coupling Source Auto AC INT
	Time/DIV	5 ns (50 ns with magnification)

11. Set up the Pulse Generators as shown:

Pulse Generator Setup

	1	2
NORM/COMPLEMENT	COMPLEMENT	NORM
PERIOD	20 ns at 0 V level	EXT TRIG
DURATION	10 ns at 0 V level	14 ns + pulse at 0 V level
HIGH LEVEL	+0.35V	+0.25
LOW LEVEL	−0.35	−0.25
BACK TERM	OUT (pull)	OUT (pull)

12. Set the oscilloscope triggering SOURCE to CH2 ONLY.
13. Adjust DD501 EVENTS LEVEL slowly until the channel 2 waveform's falling edge crosses the channel 1 waveform's rising edge at 0 V (mid-screen). See Figure 2-27 (14 ns setup, 0 ns hold).

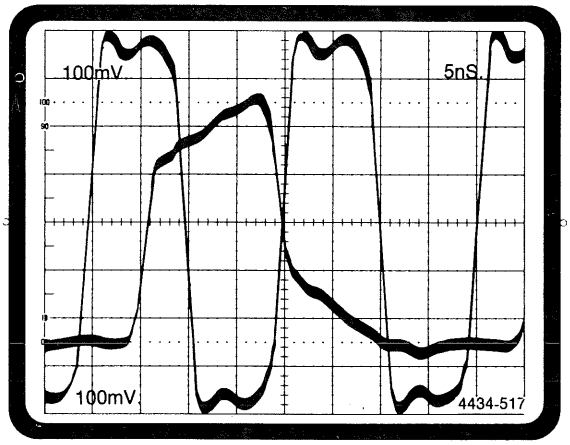


Figure 2-27. 318A Parallel data acquisition test waveform #1.

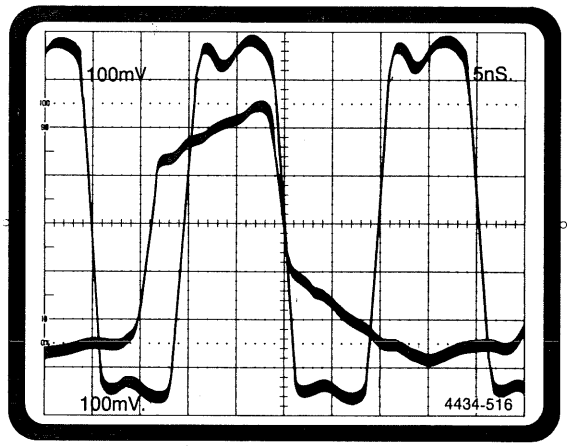


Figure 2-28. 318A Parallel data acquisition test waveform #2.

NOTE

Over adjustment of the EVENTS LEVEL will cause a loss of the DD501 triggering and oscilloscope display. If the adjustment range is not adequate, replace the 42 inch BNC cable, from DLY'D TRIG OUT to the #2 Pulse Generator's +TRIG INPUT, with a longer or shorter cable.

14. Set the 318A CLK and QUALIFIERS for Condition 1 in Table 2-9.
15. Press the 318A DATA key until the State Table is displayed.
16. Press the START key.

17. Check that the data acquired is equal to the Expected Data in Table 2-9.
    Note: To enable this test to pass, it may be necessary to vary V3 within ±100 mV from 0.00 V to optimize the threshold within the threshold specification window. Recalibration of the threshold voltages may be required if this test will not pass with V3 set between +100 mV and -100 mV. After the optimum threshold has been achieved, leave it set to this value for the remainder of the verification tests.
18. Setup the 318A CLK and QUALIFIERS TRIG MENU for Conditions 2 and 3 in Table 2-9. Repeat steps 16 to 17 for each Condition.
19. Set the #1 pulse generator's OUTPUT to NORM.
20. Adjust DD501 EVENTS LEVEL until the channel 2 waveform's falling edge crosses channel 1's falling edge at 0 V (mid-screen). See Figure 2-28 (14 ns setup, 0 ns hold).
21. Change the 318A CLK and QUALIFIERS for Conditions 4, 5, and 6 in Table 2-9. Repeat steps 16 to 17 for each Condition.

Table 2-9
318A PARALLEL DATA TEST CONDITION AND EXPECTATIONS

Condition	1	2	3	4	5	6
Test Waveform Figure	2-29	2-29	2-29	2-30	2-30	2-30
CLK	EXT▲	EXT▲	EXT▲	EXT▼	EXT▼	EXT▼
QUALIFIERS A	OFF	CLK-H	CLK-H	OFF	TRG-L	TRG-L
B	OFF	TRG-L	TRG-H	OFF	CLK-L	CLK-H
EXPECTED DATA	00	**	FF	00	00	**
	FF	**	FF	FF	00	**
	00	**	FF	00	00	**
	FF	**	FF	FF	00	**

NOTE

*The ** means the* 318A *acquires data without triggering. Press the STOP key to stop data acquisition*

22. Switch the P6451 probes connected to the Parallel Data inputs A and B. All of the leads from Pod B and the Qualifier lead from Pod A should now be connected to the test fixture.
23. Select the SETUP menu and set GROUP G1 = B7-B0.
24. Swap the Qualifier values for A and B in Table 2-9 and repeat steps 11 through 21.
25. Return the #1 pulse generator's OUTPUT to COMPLEMENT.
26. Adjust the DD501 events level slowly until the channel 2 waveform's falling edge crosses the channel 1 waveform's rising edge at 0 V (mid-screen). See Figure 2-27 (14 ns setup, 0 ns hold).
27. Change the 318A settings as follows:

SETUP MENU

ACQ. MODE	REPEAT ACQ

TRIGGER MENU

CLK =		EXT ◄
POSITION		DELAY 04086
EVENTS		00001 * WA THEN:WB THEN:WC
		WA = 00
		WB = FF
		WC = 00
QUALIFIERS (Pod)		
	A	OFF
	B	OFF

28. Press the START key.
29. Check for the following data and proper trigger location. It may be necessary to scroll through the display.

	0	##	(Always no data)
	1	## or FF	
	2	00	
	3	FF	
T	4	00	(Trigger location)

30. Press the STOP key and change TRIGGER MENU Word C to WC = FF.
31. Press the START key and check that the 318A does not trigger.
32. Press the STOP key.
33. Change the TRIGGER MENU as follows:

POSITION	DELAY 04085	
EVENTS	00001 * WA	THEN:WB FLW'D BY WC
		WA = 00
		WB = FF
		WC = FF

34. Press the START key.
35. Check for the following data and proper trigger location.

	0	##	(Always no data)
	1	## or FF	
	2	00	
	3	FF	
	4	00	
T	5	FF	(Trigger location)

36. Press the STOP key and then the TRIGGER key.
37. Change the TRIGGER MENU Word B to WB = 00.
38. Press the START key and check that the 318A does not trigger.
39. Press the STOP key.
40. Change the TRIGGER MENU as follows:

EVENTS	00001 *WA FLW'D BY:WB FLW'D BY:WC

41. Press the START key.
42. Check for the following data and proper trigger location.

	0	##	(Always no data)
	1	## or FF	
	2	00	
	3	FF	
	4	00	
T	5	FF	(Trigger location)

43. Press the STOP key and then the TRIGGER key.

44. Change the TRIGGER MENU as follows:
    EVENTS 00002 * WA OR :WB OR :WC
    WA = XX
    WB = 00
    WC = FF

45. Press START key.

46. Check for the following data and proper trigger location.

	0	##	(Always no data)
	1	##	(Always no data)
	2	##	(Always no data)
	3	##	(Always no data)
	4	##	(Always no data)
T	5		00 and/or FF (Check several acquisitions) (and make sure that both 00 and) (FF triggers occur.)

47. Press the STOP key and then the TRIGGER key.

48. Change the TRIGGER MENU as follows:
    EVENTS 00002 * WA OFF:WB RESET ON:WC
    WA = FF
    WB
    WC = 00

49. Press the START key and check that the 318A does not trigger.

50. Press the STOP key.

51. Change the TRIGGER MENU as follows:

    POSN DELAY = 00000
    Events 00001 * WA OFF:WB RESET ON:WC

52. Press the DATA key, the ▲ key (scroll), and then the START key.

53. Check for the following data and proper trigger location.

	4083	##	(Always no data)
	4084	##	(Always no data)
	4085	##	(Always no data)
	4086	##	(Always no data)
	4087	##	(Always no data)
	4088	##	(Always no data)
	4089	## or 00	
T	4090	FF	(Trigger location)

54. Press the STOP key and the the TRIGGER key.

55. Increase the DD501 DELAY COUNT by steps of 01000 until the oscilloscope display starts to become too dim to observe.

56. Adjust the oscilloscope horizontal POSITION to display the channel 2 waveform.

57. Adjust the DD501 EVENTS LEVEL slowly until the channel 2 waveform's falling edge crosses the channel 1 waveform's rising edge at 0 V (mid-screen). See Figure 2-29 (14 nS setup, 0 nS hold).

NOTE

If adjustment range is not adequate then replace the DLY'D TRIG OUT BNC cable with a longer or shorter one.

58. Set the DD501 DELAY COUNT to 65000.

59. Change the TRIGGER MENU as follows:

```
POSITION        DELAY = 65000
EVENTS          00001 * WA OFF:WB OFF:WC
                WA = FF
```

60. Press the START key.

61. Check that data at location 4091 contains FF, and all other data locations contain 00.

62. Press the STOP key and check the display, lower right for:

```
ST:T = -60910W
```

63. Change the TRIGGER MENU as follows:

```
POSITION        DELAY = 00000
EVENTS          65000 *WA OFF:WB RESET ON:WC
                WA = 00
                WB
                WC = FF
```

64. Press the START key.

65. Check for the following data and proper trigger location.

```
        4083    00
        4084    00
        4085    00
        4086    00
        4087    00
        4088    00
        4089    00
T       4090    00      (Trigger location)
        4091    FF
        4092    00
```

66. Press the STOP key and then the ▼ (scroll) key.

67. Return the DD501 DELAY COUNT to 00001.

68. Adjust the DD501 EVENTS LEVEL slowly until the channel 2 waveform's falling edge crosses the channel 1 waveform's rising edge at 0 V (mid-screen). See Figure 2-29 (14 nS setup, 0 nS hold).

69. Disconnect the P6451 probe from the Pod A PARALLEL DATA INPUT connector on the right side pannel and connect it to the Pod B connector. Connect the P6451 probe that was connected to the Pod B connector to the Pod A connector (i.e. swap the P6451 probes connected to Pods A and B).

70. Change 318A SETUP to GROUP G1 ON = A7-A0.

71. Repeat steps 27 to 68.

Test 3. Glitch Data Aquisition and Glitch Trigger

Equipment Required

1 Oscilloscope
2 Pulse Generators
3 BNC 50 Ω terminations
2 BNC T-Connecters
3 BNC male-to-probe-tip Adapters
1 BNC male-to-dual-binding Adapter
2 Bus Wires
1 BNC 50 Ω Cable 18 inches long
1 Test Fixture

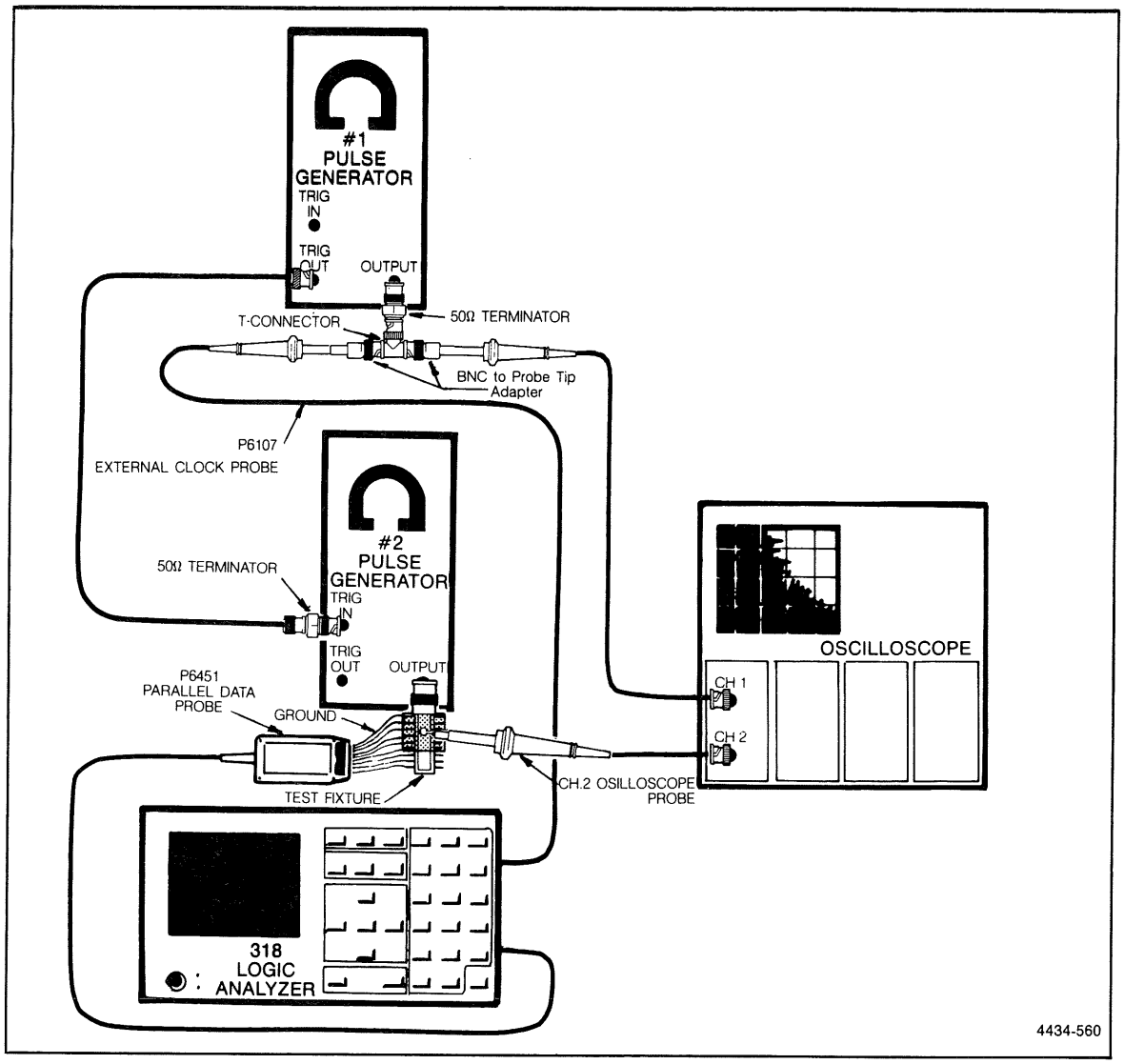


Figure 2-29. 318A Glitch data acquisition test setup.

1. Setup

   a. Refer to Figure 2-29. Connect a 50 Ω terminator to the #1 pulse generator's OUTPUT. Connect a BNC T-connector to the 50 Ω terminator. Connect the P6107 External Clock probe to one side of the BNC T-conector.

   b. Connect the oscilloscope's channel 1 10X Probe tip to the other side of the BNC T-connector.

   c. Connect the #1 pulse generator's TRIG OUT to the #2 pulse generator's TRIG INPUT using the 42 inch long BNC cable.

   d. Connect all the Pod-A P6451 Probe Data leads to the Test Fixture square pins and then connect the Test Fixture to the #2 pulse generator's OUTPUT. Make sure that the P6451 Probe GND lead is connected to one of the Test Fixture ground pins (those pins nearest the BNC connector).

e. Connect the oscilloscope chanel 2 10X Probe tip to the Test Fixture at the #2 pulse generator's OUTPUT.

f. Power-up and set up the 318A as follows:

SETUP MENU

PLR
GROUP G1 ON = AAAAAAAA
76543210
G2 OFF
G3 OFF
G4 OFF

THRESHOLD MENU

LEVEL V1 = +10.0V
V2 = −10.0V

INPUT
EXT CLK = V3
POD A = V3
POD B = V3

TRIGGER MENU

CLK EXT◆
TRIG IMMEDIATELY
Events 00000*WA OFF:WB OFF:WC

GLITCH 76543210
POD A ON ◆
POD B ON

QUALIFIERS (POD)
A OFF B OFF

2. Positive Glitch

a. Set the Pulse Generator as per Table 2-10 and Figure 2-30.

Table 2-10
318A POSITIVE GLITCH PULSE GENERATOR SETUP

	Pulse Generator	
	# 1	# 2
Termination	BACK TERM	BACK TERM
Output	COMPLEMENT	NORMAL
Period	20 ns	EXT TRIG
Duration	10 ns	5ns @ +0.35 V level
High level	+0.35V	+0.50V
Low level	-0.35V	-0.50V

NOTE

HIGH level, LOW level, and DURATION adjustments interact and require readjustment.

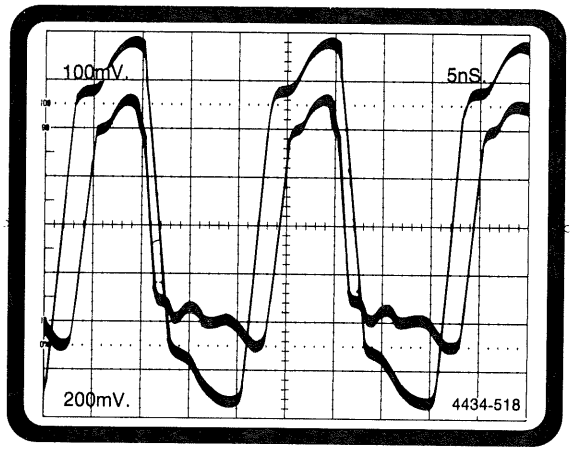


Figure 2-30. 318A Glitch data acquistion test waveform #1.

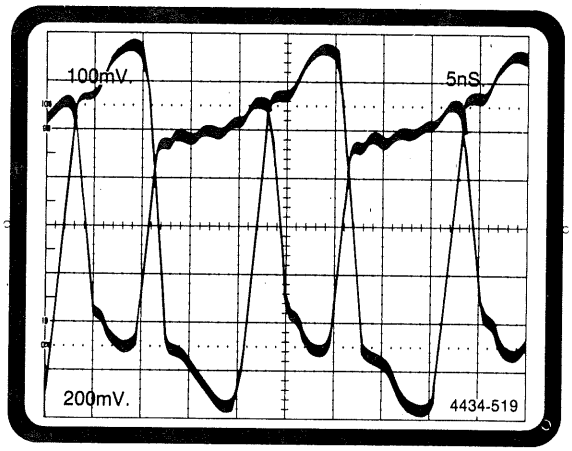


Figure 2-31. 318A Glitch data acquisition test waveform #2.

NOTE

Insure that the Glitch waveform timing does not occur 0-14 ns prior to the clock waveform's rising edge or the Glitch may appear as data in this test. Glitch data width must be at least 5 ns as measured at 350 mv above threshold.

b. Press the 318A DATA key until the State Table is displayed.

c. Press the 318A START key.

d. Check that all data acquired, at the trigger location and after, are displayed in inverse video in the SRCH GLITCH mode (SRCH = 1/4089).

e. Press the 318A TRIGGER key, select the next GLITCH channel, one channel at a time, and repeat steps (b) through (d) until channels 0 through 7 have been tested.

f. Move the P6451 Probe connector from Pod A to Pod B PARALLEL DATA INPUT.

g. Change the SETUP MENU to GROUP G1 ON = B7—B0.

h. Press the TRIGGER MENU and select GLITCH Pod B channel 0 only.

i. Repeat steps (b) to (e).

3. Negative Glitch

a. Set the pulse generators as per Table 2-11 and Figure 2-31.

NOTE

HIGH level, LOW level and DURATION adjustments interreact and require readjustment.

b. Follow the same procedure as in the POSITIVE GLITCH test; select the State Table, press the START key, check for Glitch Data, select the next channel and repeat until all channels have been tested.

c. Move the P6451 Probe back to the Pod-A INPUT, setup the 318A for G1 =A7—A0 and repeat step (b) for Pod-A.

Table 2-11.
318A NEGATIVE GLITCH PULSE GENERATOR SETUP

	Pulse Generator	
	# 1	# 2
Termination	BACK TERM	BACK TERM
Out	COMPLEMENT	COMPLEMENT
Period	20ns	EXT TRIG
Duration	10 ns	5 ns @ —0.35 V level
High level	+0.35 V	+0.50 V
Lowlevel	—0.35 V	—0.50 V

Test 4. Start Output and Trigger Output Test.

EQUIPMENT REQUIRED

2 PATCH CORDS, 2 inches long 012-0200-00

1. Connect Pod A and Pod B GND leads to the 318A GND mini-jack using one patch cord and grabber tips.
2. Connect Pod A and Pod B channel 0 leads to the 318A START OUTPUT mini-jack using another patch cord and grabber tips.
3. Power-up and setup the 318A as follows:

SETUP MENU	REPEAT ACQ
THRESHOLD MENU	
LEVEL	V1 = +0.7 V V2 = +2.4 V
INPUT	Pod A = V1 Pod B = V2
TRIGGER MENU	
CLOCK	20 ns
TRIG =	IMMEDIATELY
EVENTS	1 * WA OFF:WB OFF:WC WA = 00 00

4. Press the DATA key until State Table is displayed.
5. Set the Search Word to Word = 01-01.
6. Press the START key and check for the following display:

SRCH = 1/7 (Approximately)

WORD =	01 G1 H	-01 G2 H	
0	##	##	(Always no data)
1	##	##	(Always no data)
2	##	##	(Always no data)
3	##	##	(Always no data)
4	##	##	(Always no data)
5	##	##	(Always no data)
6	##	##	(Always no data)
T 7	00	00	(Trigger location)
8	0X	0X	/X = Don't care and it may \
9	0X	0X	\change with each acquisition/
10	01	01	(Start Output)
11	01	01	
12	01	01	

7. Move the mini-jack cable from START OUTPUT to TRIG OUTPUT.
8. Press the START key and check that TRIGGER OUTPUT, WORD 01-01, starts at or near location 12 and the quantity of SRCH WORDS exceed 4080.

Test 5. External Trigger Input Test.

Equipment Required

1 BNC to Mini-Jack Cable 175-1178-00
1 Oscilloscope
1 Pulse Generator
1 10X Probe
1 50 ohm Terminator
1 BNC-to-Probe Adapter

1. Connect a 50 ohm terminator to PG502 OUTPUT.
2. Connect a 10X probe from the oscilloscope CH1 to a BNC-to-probe-tip adapter and then to the 50 ohm terminator at the PG502 OUTPUT.
3. Setup the Oscilloscope as follows:

TRIGGERING	AUTO, AC, INT, CH1
TIME/DIV	5 ns (Use 10X MAGNIFIER if necessary)
CH1 VOLTS/DIV	1.0 V DC
CH1 POSITION	0 V (GND) set to the middle of screen

4. Set the Pulse Generator as follows:

BACK TERM	OUT
OUTPUT	NORM
PERIOD	0.1 μs
HIGH LEVEL	+2.80 V
LOW LEVEL	0.00 V
DURATION	20 ns @ +1.4 V level

5. Remove the 10X Probe and BNC-to-probe-tip adapter from the pulse generator.
6. Connect the BNC-to-minijack Cable from the 50 ohm terminator at the PG502 OUTPUT to the 318A TRIG INPUT minijack. Connect the cable braid lead to the 318A GND minijack.
7. Power-up and setup the 318A as follows:

TRIGGER MENU	
SOURCE	EXT TRIG
EXT TRIG POL	▲

8. Press the START key and check that the 318A triggers.
9. Set the pulse generator Period to EXT TRIG and insure that no cables are connectd to the pulse generator External Trigger input.
10. Press the START key and then press the PG502 MAN TRIG.
11. Check that the 318A triggers only after the PG502 MAN TRIG button is pushed.
12. Set the EXT TRIG POL to negative and the PG502 OUTPUT to COMPLIMENT.
13. Repeat steps (10) and (11).

Test 6. Serial State Analyzer (318AS1)

Equipment Required

1 Serial Data Generator

Refer to : Figure 2-32.

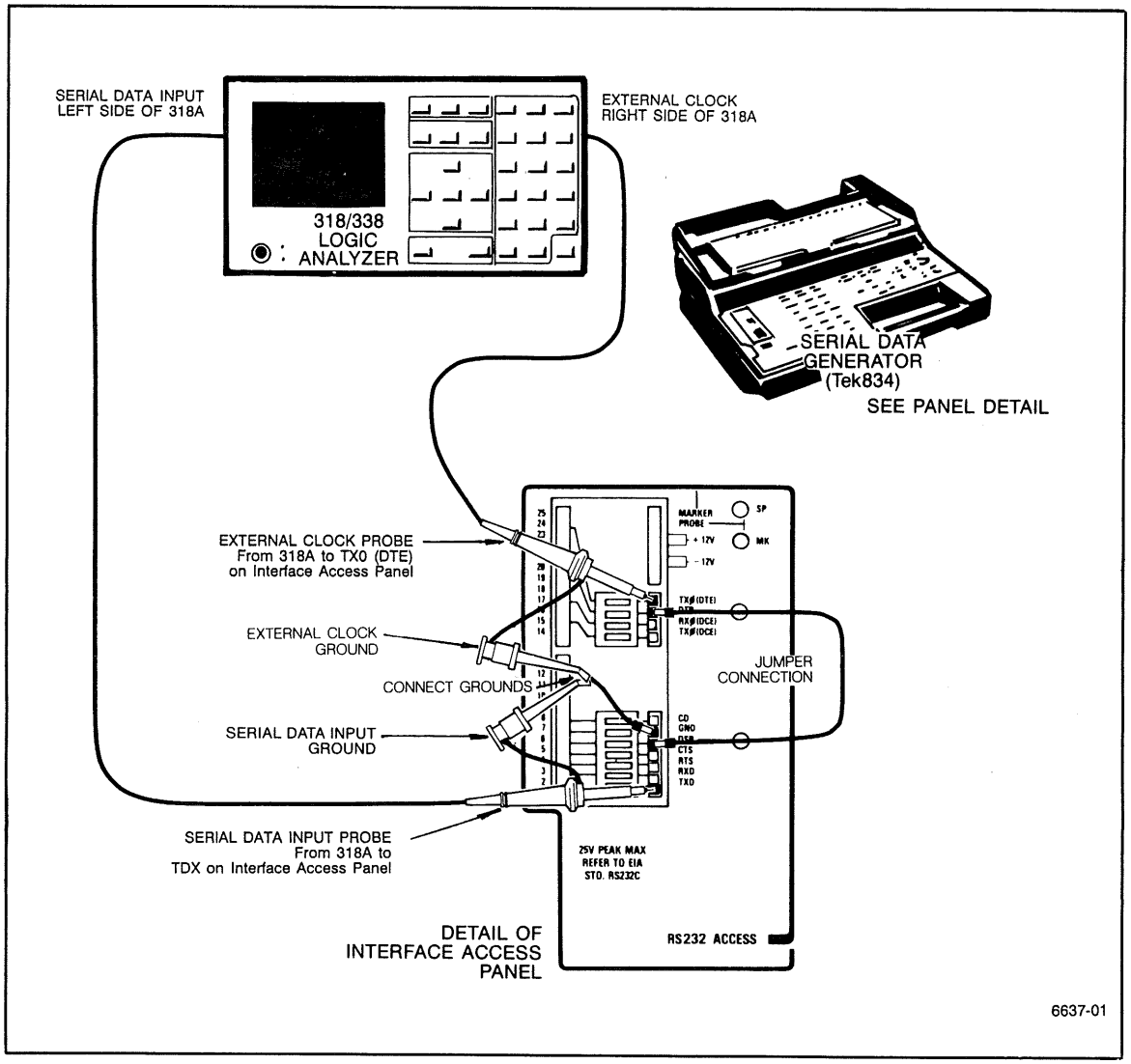


Figure 2-32. 318A Serial state analyzer performance test setup.

1. Set the 318A POWER switch to ON.
2. Set the 318A major mode to SERIAL and press the EXECUTE key.

3. Select the SETUP MENU and set the baud rate to 2400.
4. Select the Threshold menu and set DATA and EXT CLK Threshold to 0.00 V.
5. Allow 15 minutes for the 318A to stabilize.
6. Connect test setup as shown in Figure 2-32.
7. Set the serial data generator power to ON, and select DTE SIMULATE mode.
8. Set serial data generator SETUP as follows;
   CODE=ASCII, BAUD=2400, DUPLEX=FULL, DELAY=200, SETUP=ASYNC,
   BITS/CHAR=8,PARITY=NONE, STOPBITS=1, EOF=0A, TIMING=NORMAL.
9. Load the following program into the serial data generator:

STEP	MNEMONIC CODE	
1	SEND	#1
2	JMP	#1

10. Load the following hexadecimal data in the serial data generator buffer #1 : E0, E0, E2, E4, E6, E8
11. Press the START key on the serial data generator.
12. Select the DATA DISPLAY STATE TABLE and press the START key.
13. When the 318A displays data on the crt, press the serial data generator STOP key.
14. Check that the 318A display matches the WORD SEQUENCE column on Table 2-12, step 1.
15. Set the 318A baud rate to 19.2K (DATA screen).
16. Set the serial data generator baud rate to 19.2K.
17. Set the 318A and the serial data generator controls as indicated in step 1 of Table 2-12 and repeat preceding steps of Test 6 (11) through (14).
18. Finish steps 2 through 7 Table 2-12 as set up in step (17) of Test 6.

TABLE 2-12
318A SERIAL STATE ANALYZER TEST STEPS

Step	318A	Serial Data Generator	Word Sequence
1	BITS/WORD = 8	BITS/CHAR = 8	E0, E0, E2, E4, E6, E8
2	BITS/WORD = 7	BITS/CHAR = 7	60, 60, 62, 64, 66, 68
3	BITS/WORD = 6	BITS/CHAR = 6	20, 20, 22, 24, 26, 28
4	BITS/WORD = 5	BITS/CHAR = 5	00, 00, 02, 04, 06, 08
5	BAUD RATE = EXT16 BITS/WORD = 6	BITS/CHAR = 6	20, 20, 22, 24, 26, 28
6	COM. MODE = SYNC BITS/WORD = 8 SYNC WORD 1 = 16 SYNC WORD 2 = 16	SETUP = SYNC BITS/CHAR = 8 CLOCK = DERIVED (INSERT DATA 16, 16 TO TOP OF BUFFER #1)	E0, E0, E2, E4, E6, E8, FF, FF, FF
7	BITS/WORD = 5 SYNC WORD 1 = AD SYNC WORD 2 = 05 HUNT WORD = 08	BITS/CHAR = 5	00, 02, 04, 06, 08

NOTE

Selection field for BITS/WORD and COM.MODE (SYNC or ASYNC) and BAUD RATE appear in the 318A *SETUP Menu. Selection fields for SYNC WORD and HUNT WORD are in the TRIGGER Menu.*

To load SETUP parameters into the serial data generator, the operator must: (a) press SETUP, (b) select SETUP item using LEFT or RIGHT Vector keys, (c) select SETUP parameters using UP or DOWN VECTOR key.

To load data into the serial data generator buffer #1, the operator must: (a) press PROGRAM, (b) press RIGHT VECTOR, (c) press DOWN VECTOR, (d) press keys for the two hexadecimal characters to be entered, and (e) press ENTER. To load additional data , repeat parts (d) and (e).

To load the program into the serial data generator, the operator must: (a) press PROGRAM, (b) select program code by LEFT or RIGHT VECTOR, (c) if program code includes distination number, press alphanumeric key to be entered, and press ENTER, (d) press DOWN VECTOR, to next program step.

MAINTENANCE: TROUBLESHOOTING

This section contains information about the 318A Logic Analyzer Diagnostic tests. At the end of this section you will find lithium battery information.

318A DIAGNOSTIC TEST DESCRIPTIONS

INDEX OF 318A DIAGNOSTIC TEST DESCRIPTIONS

Mainframe

1. Keyboard Test
2. CRT Test
3. Display RAM Test
4. SYSTEM RAM Test
5. ROM Test
6. Non-Volatile Memory Test

Parallel Analyzer

7. Clock Test
8. Word Recognizer Test
9. Acquisition RAM Test
10. Sequence RAM Test
11. N & DELAY Test
12. Threshold Test
13. SEQ Test

318AS1 Serial Analysis/RS232C

14. RS-232 Test
15. Serial Test

318A DIAGNOSTIC TEST COMMON SIGNAL PATHS

Some Diagnostic Tests share a common signal path for setting up or reading data. When two or more Diagnostic tests that shares the same signal path indicate a failure, the components in the path may be the cause of the test failure.

Table 3-1 lists the components common to the signal paths that cause multiple Diagnostic Test failures.

Table 3-1
318A DIAGNOSTIC TEST COMMON SIGNAL PATHS

Clock	Threshold	WR	ACQ	SQRAM	N&DL	SEQ	Component
X	X	X	X	X	X	X	A04 U456 A03 U126, A03 U112 A04 U438
		X	X	X	X	X	A04 U452, A04 U446 A04 U428, A03 U112 A04 U438, A04 U426
X					X		A03 U156, A03 U158 A03 U112, A04 U438 A04 U454 (VBB)
X	X		X				A04 U454, A04 U448 A03 U112, A04 U438
		X		X			A03 U146, A03 U108 A03 U126, A03 U112
		X	X			X	A01 U100 to U110 A02 U200 to U214 A02 U220, A02 U222 A01 U112, A01 U114 A02 U232, A02 U234
					X	X	A03 U106, A03 U108 A03 U114, A03 U116 A03 U118, A03 U130 A03 U142
			X			X	A03 U106, A03 U108 A03 U114, A03 U116 A03 U118, A03 U130 A03 U132, A03 U142 A03 U140, A03 U156

MAINFRAME

1. KEYBOARD TEST

Program : KBD

Function :

Power on — When power is turned on, the KBD program checks the keyboard to see if any keys are stuck in the closed position. The MPU reads the resulting data at address 800F0*hex* and verifies that the data is 80*hex*.

Troubleshooting — Refer to Figure 3-1. The keyboard generates an interrupt and sends a corresponding key code to the MPU when any key except the STOP key is pressed. The MPU reads the key code at 800F0*hex* upon receiving the interrupt from the keyboard, and blinks the corresponding rectangle in the key array on the screen. This function also provides a check to see that each key (except the STOP key) is providing the correct key code to the MPU.

The STOP key is used to exit this program; thus the STOP key can be checked at the end of this test.

Description: Key codes are generated by the A09 board when any key is pressed. The Y-lines and X-lines of the key matrix on the A09 board (excepting the STOP key) are connected to U632 and U634 (8-bit priority encoder, 4053BP) on the A06 MPU/DISPLAY board through the A08 Mother board. U634 is enabled when U632 receives a key signal and issues a keyboard interrupt to the MPU through the CR timer circuit. The interrupt signal is controlled by U648 (PAL16LB) on the A06 board with KBMASKP from U540 (74LS273) on the A05 Memory/Threshold board.

The STOP key on the A09 board generates the interrupt level 7 to the MPU through the A08 board without decoding, though it is buffered by U656 (inverter, 74HC14) on the A06 board. This signal is also controlled by the CR timer to avoid key chattering.

The MPU reads the key code from U636 (octal buffer/line driver with tri-state output, 40H244) on the A06 board, usually on interrupt at 800F0*hex*. KBCS, which enables this buffer, is delivered from U538A on the A05 board when the MPU accesses address 800F0*hex*.

A key code with interrupt is expected as shown in Table 3-2.

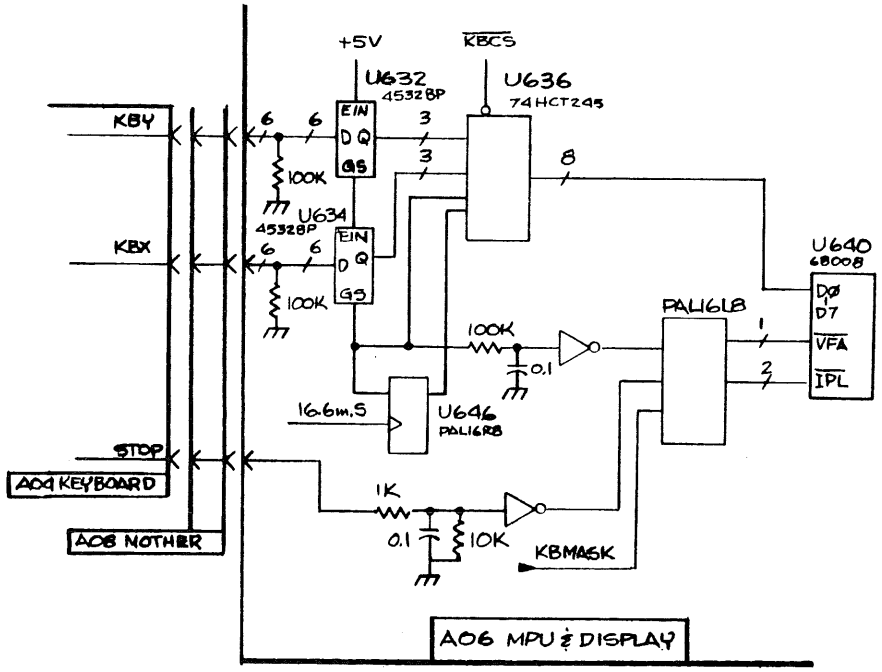
Table 3-2
318A KEYBOARD TEST KEY CODE AND INTERRUPT ASSIGNMENT

7	6	5	4	3	2	1	0
LT	ST	D5	D4	D3	D2	D1	D0

ST:1 if any key is pressed, otherwise 0.
LT:0 if any key is pressed more than .5 sec. Otherwise LT:1

Key Code Assignment. Blocks correspond to the key position on the front panel.

00	08	10	18	20	28
01	09	11	19	21	29
--	0A	--	1A	22	2A
03	0B	13	1B	23	2B
--	0C	--	1C	24	2C
05	--	STOP	1D	25	2D



6637-02

Figure 3-1. 318A Keyboard test schematic.

2. CRT TEST

Program : CRT

Function :

Power on — None.

Troubleshooting — The CRT generates the following four kinds of patterns for the CRT adjustment and visual check.

1. Cross-hatch pattern
   To adjust the CRT circuit.
2. White pattern
   To check for phospor defects.
3. All character fonts for the parallel analyzer mode.
   To check the CRT circuit and the Character ROM (CROM) for parallel operation.
4. All character fonts for the serial state analyzer mode.
   To check the CRT circuit and the CROM for serial operation.

Description: Refer to Figure 3-2. The CRT displays 32 characters by 20 lines of data from the Display RAM U612 (16 K-bits static CMOS RAM, MB8416) on the A06 MPU/Display board. Each character in the CRT display uses two bytes of data, consisting of one selection code followed by one character code. A total of 1280 bytes of the Display RAM are used, ranging from address 60000 to 604FF.

The MPU writes two bytes of data (for each character to be displayed) into the Display RAM through both U616 (octal bus transceiver, 74HT245) and U608 (display controller, MB62110) on the A06 board.

The Display Controller sends the first address to the Display RAM to select the character code to be displayed, and instructs U620 (octal D-type flip-flop, 74LS273) on the A06 board to store the output data from the Display RAM. This data is supplied to the Character ROM U622 (128 K-bits EPROM, 27128) on the A06 board to select the character font. The Display Controller receives this font code and sends the second address to the Display RAM to get a control code.

Then the Display Controller issues Z, GLITCH, CHD, and VD signals to the A10 CRT board, along with these two bytes of data. These signals are buffered and/or controlled and sent the A10 board through the A08 Mother board.

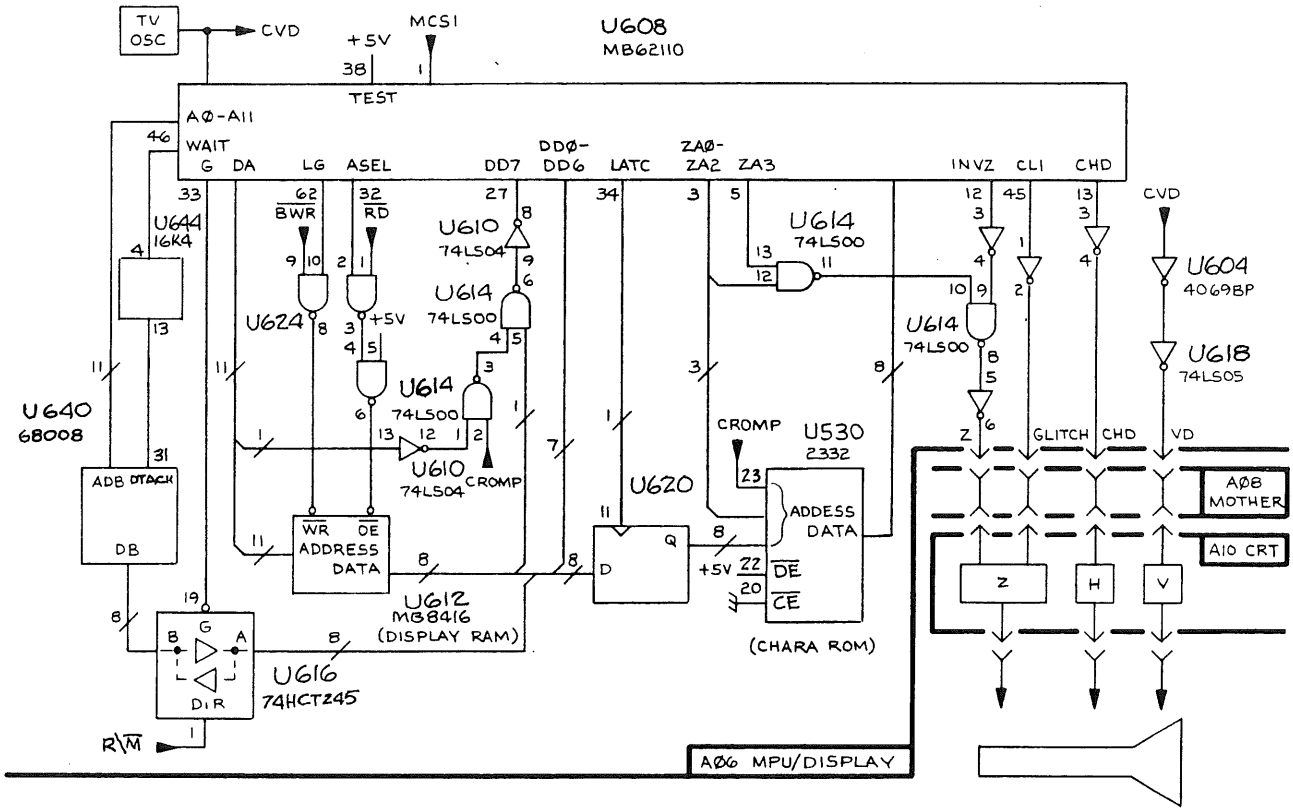


Figure 3-2. 318A CRT calibration and check schematic. 6637-03

3. DISPLAY RAM TEST

Program :

Function :

Power on -The Display RAM is checked with a checkerboard marching pattern from 60000 to 607FF. (A checkerboard marching pattern is an alternating 0 and 1 pattern that is loaded into a memory location, checked, shifted, and then checked again.)

Step 1. The word 55 is written into all RAM addresses.

Step 2. A word is read from a diagnostic cell and checked with the expected word 55. If it is not equal to word 55, an error message is displayed and the MPU is halted.

Step 3. If the previous test was successfully completed, the word AA is written into that cell. Then a word in the same cell is read back and compared with AA. If it is not equal to AA, an error message is displayed and the MPU is halted.

Step 4. Steps 2 and 3 are repeated for all RAM addresses.

Troubleshooting – None.

Description: The read and write operation on the Display RAM U612 (16 K-bit static CMOS RAM, MB8416ASK) on the A06 MPU/Display board is completely controlled by Display Controller U608 (display controller, MB62110) on the A06 board.

The MPU reads/writes data from/to the Display RAM through U616 (octal bus transceiver) on the A06 board, which is enabled by the Display Controller and the data direction is specified (read or write) by the MPU's read signal. The addresses to the Display RAM are supplied by both the MPU and the Display Controller, however the addresses from the MPU are sent to the Display Controller and the Display Controller gates these signals to the Display RAM.

If there is competition between the MPU and the Display Controller for access to the Display RAM, the Display Controller forces the MPU to wait until it completes the current read operation by asserting the WAIT signal to the MPU.

The MPU checks the Display RAM with a checkerboard marching pattern. The read and write sequences are already mentioned in the preceding *Power on* paragraph. If the data read is incorrect, the MPU will display an error message.

4. SYSTEM RAM TEST

Program :

Function :

Power on – SYSTEM RAMs are checked with a checkerboard marching pattern from addresses 30000 through 37FFF.

Step 1. The word 55 is written into all RAM addresses.

Step 2. A word is read from a selected diagnostic cell and checked against the expected word 55.

If it is not equal to word 55, an error message is displayed and the MPU is halted.

Step 3. If the first test is successfully completed, the word AA is written into that cell. Then the word in the same cell is read back and compared with AA. If it is not equal to AA, an error message is displayed and the MPU is halted.

Step 4. Steps 2 and 3 are repeated for all RAM addresses.

Troubleshooting – None.

Description: RAMs U508 (F000-F7FF) on the A05 MPU/Display board used by the MPU are called the System RAM.

The MPU checks the System RAMs with the checkerboard marching pattern. The read and write sequences are mentioned in the *Power on* section above. If the data read is incorrect, the MPU will issue an error message.

5. ROM TEST

Program :

Function :

Power on – ROM1 through ROM3 are checked by individually calculating their checksums.

Troubleshooting – None.

Description: Refer to Figure 3-3. All the ROMs (ROM1 through ROM7) are located on the A05 ROM/Threshold board.

Table 3-3
318A ROM TEST ADDRESS ASSIGNMENT

ROM	U#	Address
ROM1	U500	0000-FFFF
ROM2	U502	10000-1FFFF
ROM3	U504	20000-2FFFF

The chip-select signals for U500, U502 and U504 are decoded by U510 (74F138).

The MPU calculates the checksum for each ROM and determines whether it is correct or not. If it is incorrect, an error message will be displayed.

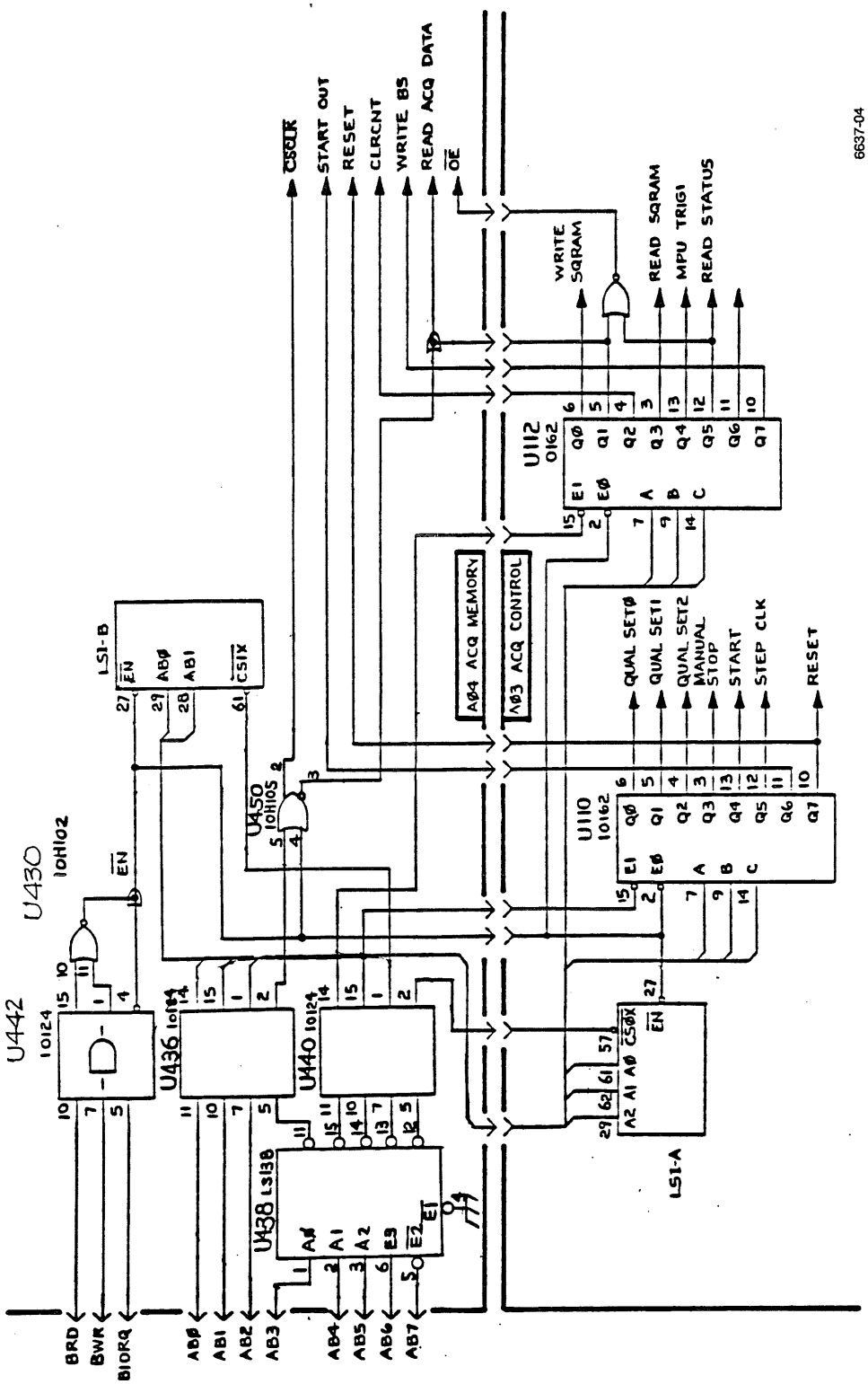


Figure 3-3. 318A A03 and A04 Partial ACQ address assignment.

6. NON-VOLATILE MEMORY TEST

Program: TSTNV1 (power on), TSTNV2 (Troubleshooting)

Function:

Power-on — The NVM has a checksum word that is used for checking non-volatile memory data. The TSTNV1 program calculates the checksum by reading NVM data and comparing it with the NVM checksum.

Troubleshooting — The TSTNV2 diagnostic program includes 12 test programs. For all of these tests, the method is read data after write. (Refer to the failure code list for check data format.)

All NVM data is cleared after the diagnostic test has run.

Description — The NVM address is from 30000 through 37FFF. If the power moniter circuit detects low power ($< 4.6V$), the NVM can not be selected.

PARALLEL ANALYZER

7. CLOCK TEST

Program : CLK

Function :

Power on — The timebase is programmed for several ranges; its operation is checked by the MPU, which monitors the slow clock flag on each timer interrupt.

Troubleshooting — This is not a verification test, but the user should observe the timebase with an oscilloscope or some similar instrument. ALL (all programmable timebases) or SINGLE (one particular timebase) can be selected from the menu for this test.

If ALL is selected, each of the possible timebase values is sequentially set up into the timebase and tested for approximately five seconds. The next timebase value is then loaded. This test will run continuously until the STOP key is pressed. The CRT screen will display the timebase range being set up. If SINGLE is selected, the user enters the range to be observed using the keyboard and then presses the START key. In this case, nothing will appear on the screen.

The following programmable timebase ranges are available:

20nS, 50nS, 100nS, 200nS, 500nS, 1μS, 100uS, 1mS, 10mS, 1S

Description: Refer to Figure 3-4. The Slow Clock Detector compares the SYSCLK signal coming into this detector with the gate clock internally selected. As long as the SYSCLK is two or more times as fast as the gate clock the slow clock flag is not set. If the SYSCLK is less than twice as fast as the gate clock the slow clock flag is set.

This program also checks the clock path using the Slow Clock Detector.

The MPU selects the internal CLK by writing 11110_{binary} into shift register U224 (hex D master-slave flip-flop, 10176) on the A02 INPUT-B board at I/O address 80001_{hex}. This shift register enables U222B (dual 3-input 3-output NOR gate, 10211) on the A02 board which transmits the INTCLK signal.

The Slow Clock Detector, the Timer, and their associated circuits are located in U444 (timebase, μPB3Z199R) on the A04 ACQ Memory board. The Timer is programmed to generate an interrupt to the MPU every 100 ms. Then the MPU unmasks the Timer Interrupt and sets the gate clock and the SYSCLK interval as shown in Table 3-4.

Table 3-4
318A CLOCK TEST PROGRAM RANGES

Gate Clock	SYSCLK	SLOW CLOCK flag
1 ms	20 ns	reset
	50 ns	reset
	100 μs	reset
	1 ms	set
	200 μs	reset
	2 ms	set
	50 μs	reset
	5 ms	set
10 ms	500 μs	reset
	10 ms	set

The INTCLK signal is generated by the timebase circuit, U444, which counts 10 ns clock pulses to produce a range of timebase signals ranging from 20 ns to 500 ms. The INTCLK signal is buffered by U430 (quad 2-input NOR gate, 10H102) on the A04 board. This signal is sent to U222 on the A02 board through the A08 Mother board. The output of U222 is returned to the SYSCLK input of U444 on the A04 board via the A08 board.

U158 (event/delay counter, uPD3Z198R) on the A03 ACQ Control board generates the interrupt to the MPU when it receives the timer signal from U444 on the A04 board. This interrupt is sent to the MPU as $\overline{\text{INT}}$ via U458 (comparator with open collector output, μPD311C) and via the A08 board.

The MPU reads the status by issuing READ STATUS at I/O address 5D$_{hex}$ through U454 (quad ECL-to-TTL translator with tri-state output, MC3431). U454 is enabled by $\overline{\text{OE}}$ from U126 (quad 2-input NOR gate, 10102). The status from U444 is selected by U448 (quad 2-input multiplexer, 10158) on the A04 board and is converted from ECL to TTL level by U454 on the A04 board for the MPU. The MPU compares the slow clock flag with the expected value (see Table 3-4), and displays an error message if it does not match.

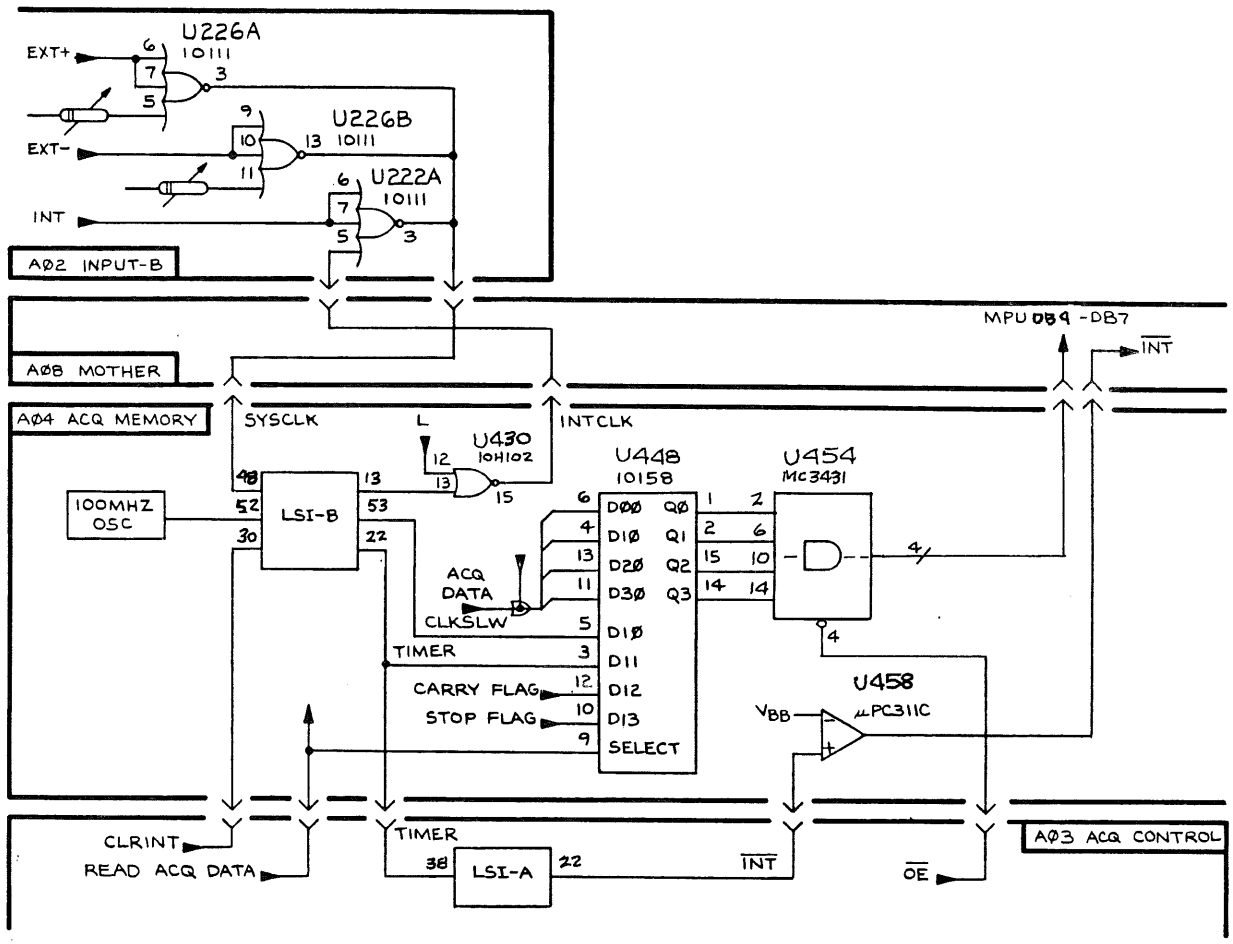


Figure 3-4. 318A Clock test.

8. WORD RECOGNIZER TEST

Program : WR

Function :

Power on – The word recognition (WR) RAMs are checked with the checkerboard marching pattern from 00 through FF.

Step 1. The word 15 is written into all RAM addresses.

Step 2. A word is read from a diagnostic cell and checked with the expected word 15.

If it is not equal to word 15, an error message is displayed and the MPU is halted.

Step 3. If the first test is successful, the word 2A is written into that cell. The word is then read back out of the cell and its value is compared with 2A. If it is not equal to 2A, an error message is displayed and the MPU is halted.

Step 4. Steps 2 and 3 are repeated for all RAM addresses.

Troubleshooting — This test is the same as that automatically run when the power is first turned on, but here the looping test feature is available. The LOOP field can have any of the following 4 options; OFF, I/O, ERROR, and TEST. When the field is set to I/O, the looping feature allows only I/O instructions to be run repeatedly. The I/O address will appear on the screen. When the field is set to ERROR, the looping feature allows the tests in which an error is detected to be run repeatedly. When the field is set to TEST, the looping feature allows one test, or sequence of tests, to be run continuously. When the field is set to OFF, the looping feature is not available and one test, or sequence of tests, runs once.

When the field is set to I/O or ERROR, the prompt message START TO ADVANCE appears at the bottom of the the screen. If START is pressed during LOOP tests, the current loop of the test stops and the next loop of test is started, You can change fields during tests. Use this feature to catch intermittent faults and for circuit tracing with an oscilloscope.

In the I/O Looping test, only one or more OUT instructions (subroutines) including one of the following addresses will be run. Unless STOP is pressed, this test will loop continuously without displaying the result of the verification. Use an oscilloscope to observe the word recognizers.

Table 3-5
318A WORD RECOGNIZER TEST PORT ADDRESSES (Hex)

Address	Content of Looping Test
80003	increment WR-address counter for WR0 test.
8005B	write WR0 data55 into data latch.
8005B	write WR0 dataAA into data latch.
80003	increment WR-address counter for WR1 test.
8005B	write WR1 data55 into data latch.
8005B	write WR1 dataAA into data latch.

The ERROR looping feature is available only if errors are detected. If no errors are detected the test will perform as if the LOOP test were set to OFF. If some errors are detected, the ERROR looping feature is available for the read cycle of the test, and the result of this verification will appear on the screen. Refer to *Appendix B* of this manual for a description of error codes.

Description: Refer to Figure 3-5. On the A01 INPUT-A board, data from channels 0 through 7 (Pod-A) is latched by M218s U100 through U114 <1> (logic analyzer input, M218) and supplied to the word recognizer (WR) U120 (256 word X 4 bit RAM, HM10422) for trigger detection. These output lines are wired together with U124 and U126 <2> (4-bit binary counter, F10016) outputs, respectively, to set up the WR.

During acquisition, the outputs of U124 and U126 are held at the reset level by the counter signal from U132 (quad TTL-TO-ECL translator, 10124) which is generated by U130 (3-line to 8-line decoder/demultiplexer, 74LS 138) when the MPU writes any data at I/O address 80002*hex*.

During WR setup, all the M218's outputs are set to off (low level) by the OFF/ON signal (TTL swing, shifted to −5V) from U240A (quad comparator, μPC339C) on the A02 INPUT-B board. This signal is delivered from U224 (hex D master-slave flip-flop, 10176) on the A02 board when the MPU writes X1XXX*binary* serially at I/O address 80001*hex*. This operation enables U124 and U126 to act as a WR address counter to point to any address in the WR. This WR address counter can be incremented by a clock pulse generated when the MPU writes to address 80003*hex*.

The word written into the WR is provided along with signals EDB0, EDB1, and EDB2 from the A04 ACQ Memory board, (translated from the TTL-level of the MPU data bus to ECL-level) The write pulse to the WR is generated by U130 (74LS138), and is converted to ECL-level by U132 (10124) when the MPU writes at I/O address 80000*hex*.

For channels 8 through 15 on the A02 board, the operation is the same as that described in the preceding paragraph. The words for WR U220 (HM10422) are supplied from EDB3, EDB4, and EDB5.

Each output of these two WRs is wired together on the A08 Mother board, and the outputs are sent to U136 and U138 (dual type D master-slave flip-flop, 10231) on the A03 ACQ Control board for triggering. These signals are routed to U146 (quad 2-input multiplexer/latch, 10173) on the A03 board. The data to U146 (10173) is latched by $\overline{\text{READ SQRAM}}$ from U112 (binary to 1-8 line decoder, 10162) through inverter U126 (quad 2-input NOR gate, 10102), after being selected by LDSQRAM from U108 (hex D master-slave flip-flop, 10176) on the A03 board. LDSQRAM is set when the MPU writes X1XXXX*binary* at I/O address 80051*hex* and $\overline{\text{READ SQRAM}}$ is generated by the MPU's access to I/O address 8005B*hex*.

The four outputs of U146 (10173) are connected to U446 (quad 2-input multiplexer, 10158) on the A04 board with the outputs of the ACQ Memories U418 to U424 (MBM10484) on the A04 board. Thus, all the ACQ Memories should be set to off by forcing CE high. This is done by writing X011binary into U426 (quad D latch, 10133) on the A04 board with WRITE BS from U112 (10162) on the A03 board, and then reading I/O address 8006C*hex*.

The MPU reads the data from U452 (quad ECL-To-TTL translator with tri-state output, MC3431) on the A04 board, when U452 is enabled by $\overline{\text{OE}}$ from U112 (10162) via U126 (10102) on the A03 board. The data fed to U452 (MC3431) is selected by U446 (10158) on the A04 board with the READ SQRAM signal from U112 (10162) on the A03 board at I/O address 80059*hex*.

The MPU follows steps 1 through 4 of the I/O operation described in *Power on* paragraph at the begining of this test section, and compares the data with the expected value for each I/O read. If the data is wrong, the MPU will issue an error message.

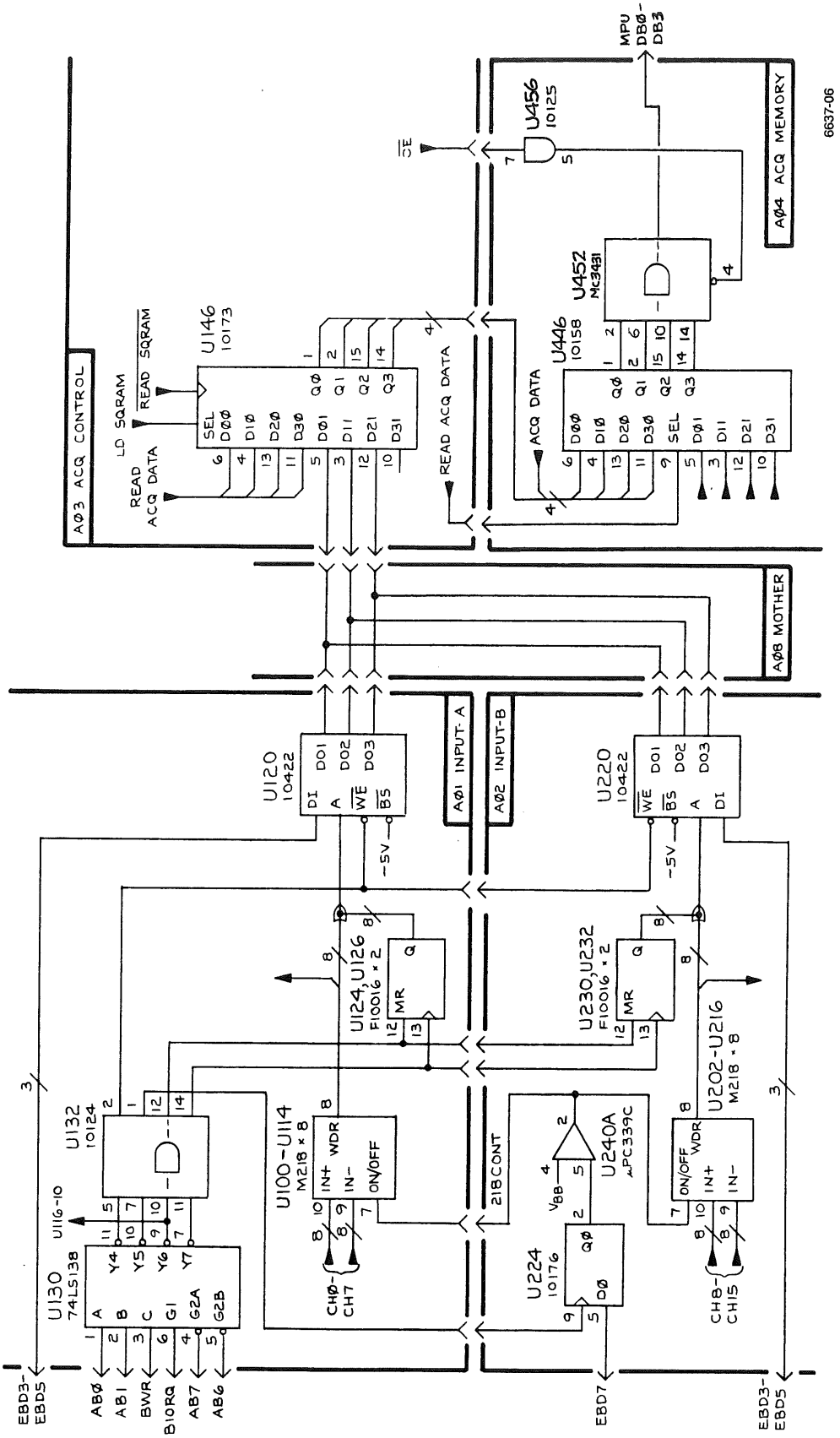


Figure 3-5. 318A Word recognizer test.

9. ACQUISITION RAM TEST

Program : ACQ

Function :

Power on — All the ACQ RAMs are checked with the checkerboard marching pattern from 00 through FF.

Step 1. The word 55 is written into all RAM addresses.

Step 2. A word is read from a diagnostic cell and compared with the expected word 55.

If the diagnostic cell's value is not equal to 55, an error message is displayed and the MPU is halted.

Step 3. If no error is found in the above test, the word AA is written into that cell. Then a word in same cell is read back and is compared with AA. If that word is not equal to AA, an error message is displayed and the MPU is halted.

Step 4. Steps 2 and 3 are repeated for all RAM addresses.

Troubleshooting — This test is the same as that performed automatically when the power is turned on, but here the Looping test feature is available. The Looping feature has four options; OFF, I/O, ERROR, and TEST. When the field is set to I/O, the looping feature allows only I/O instrucions to be run repeatedly. The I/O address will appear on the screen. When the field is set to ERROR, the looping feature allows the tests in which an error is detected to be run repeatedly. When the field is set to TEST, the looping feature allows one test, or sequence of tests, to be run continuously. When the field is set to OFF, the looping feature is not available and one test, or sequence of tests, runs once.

When the I/O Looping test is selected, only those OUT instructions (subroutines) including one of the addresses listed in Table 3-6 below will run. Unless the STOP key is pressed, the selected portions of the test will loop continuously without displaying the result of the verification. In this case, use an oscilloscope to observe the acquisition circuit board.

Table 3-6
318A ACQ TEST PORT ADDRESSES (Hex)

Address	Content of Looping Test
80002	reset WR-address counter to increment WR-address counter to 55 to write 55 into the background of High-speed memory.
8005A	write CS0 & CS1 into CS-latch to read 55 from High-speed memory.
80055	write AA into High-speed memory after reading 55 from High-speed memory.
8005A	write CS0 & CS1 into CS-latch to read AA from High-speed memory.
80055	write 55 into High-speed memory after reading AA from High-speed memory.

When ERROR is selected in the looping test field, looping is available only if errors are detected. If no errors are detected, the test runs to completion just as if the looping function had been set to OFF. If some errors are detected, the ERROR looping feature is available for the read cycle of the test, and the result of the verification will appear on the screen. Refer to *Appendix B* of this manual for an explanation of error codes.

Description: Refer to Figure 3-6. The test data for ACQ Memories U410 to U424 <8> (4K-word X 4-bit RAM, MBM10484) on the A04 ACQ Memory board are generated by U124 and U126 <2> (4-bit binary counter, F10016) on the A01 INPUT-A board, and U230 and U232 <3> (F10016) on the A02 INPUT-B board, instead of using the M218's actual data. The operation for generating this pseudo data is the same as the one used in the WR Test.

Each output of both the M218s and the F10016s respectively are connected together and are delivered to U122 and U128 (hex D master-slave flip-flop, 10176) on the A01 board, and U228 and U234 (10176) on the A02 board (these flip-flops are used for delay). The outputs of the flip-flops are connected to each input of the ACQ memories on the A04 board through the A08 Mother board.

The addresses for the ACQ Memories are selected by U402, 404 and U406 (4-bit binary counter, MC10H016) on the A04 board. These counters are set to COUNT ENABLE by U156 (quad 2-input NOR gate, 10102) on the A03 ACQ Control board, and are reset by RESET from U112 (10162) on the A03 board.

At least one pair of the ACQ Memories can be enabled by U428 (4-bit universal shift register, 10141) on the A04 board, when the MPU reads I/O address 80060*hex* by $\overline{\text{CSCLK}}$ from U450 (10H105) on the A04 board.

The flip-flop U148A <7> (dual D master-slave flip-flop, 10231) sets the STOP condition, and is reset by RESET from U110 (10162) on the A03 board. It also frees the $\overline{\text{WE}}$ line. START2, also from U110 (10162), enables the Strobe Generator circuit by setting the flip-flop U124B (dual D master-slave flip-flop, 10131) on the A03 board.

After the above setup is complete, the MPU selects the internal CLK and sets the timebase U444 (timebase, μPB3Z199R) on the A04 board to generate a single clock pulse when the MPU writes to I/O address 8004A*hex*. Then the MPU unmasks the carry interrupt from U402, U404 and U406 (MC10H016) on the A04 board.

The MPU starts the test by performing steps 1 through 4 described in the *Power On* paragraph at the beginning of this section.

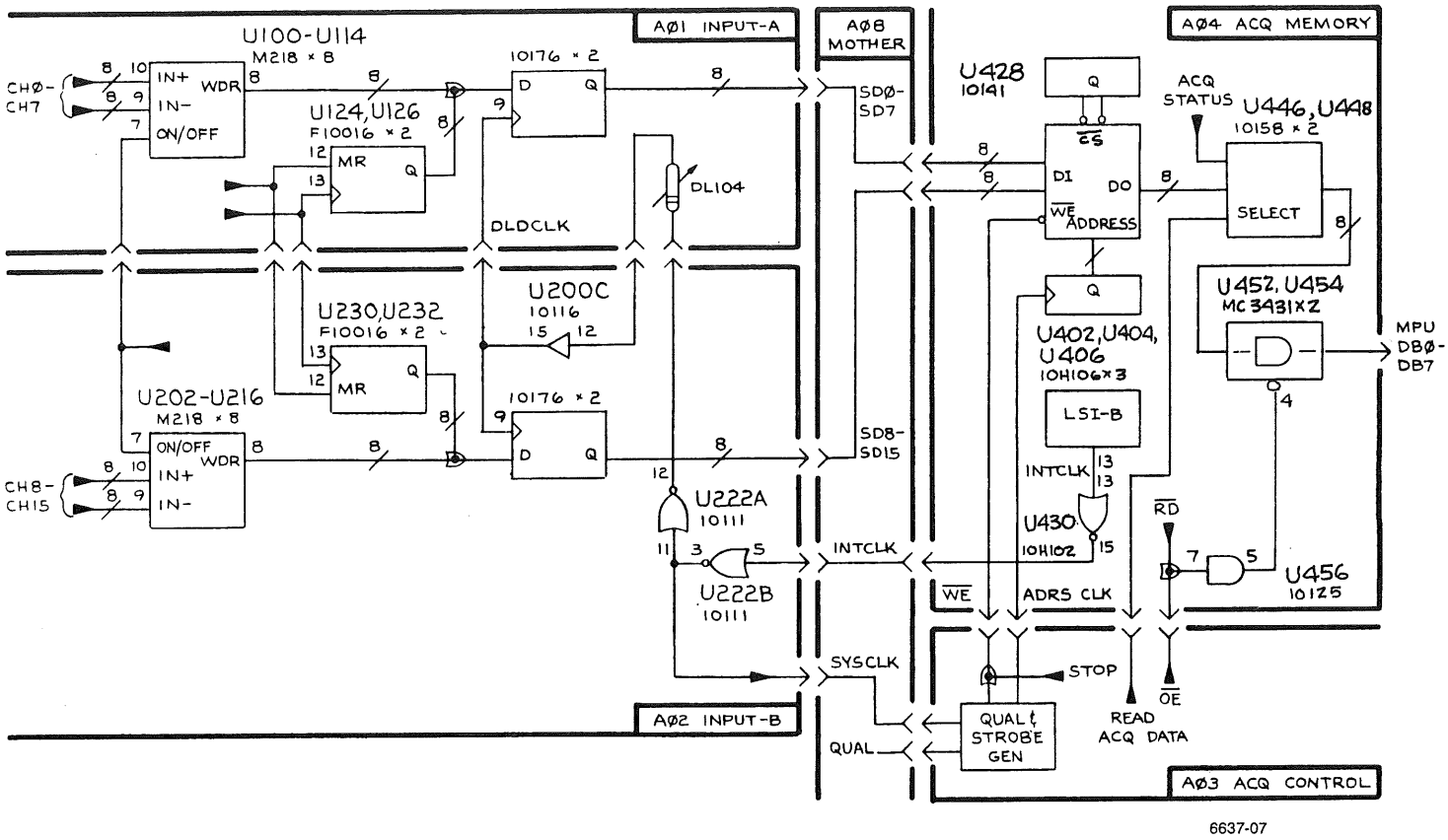
Writing to I/O address 8004A*hex* generates the internal clock from U444 (uPB3Z199R) on the A04 board. This clock is buffered by U430D (quad 2-input NOR gate, MC10H102) and is sent to U222B (dual 3-input/3-output NOR gate, 10211) on the A02 board. Then this clock is returned to the Strobe Generator circuit on the A03 board, and is also sent to U222A (10211) on the A02 board to produce DLDCLK in conjunction with DL104 (delay line, ZD10-20) on the A01 board. DLDCLK clocks U122 and U128 (10176) on the A01 board and U228 and U234 (10176) on the A02 board. The Strobe Generator on the A03 board delivers $\overline{\text{WE}}$ and ADRS CLK to the A04 board unless the clock qualifier is set to off.

During the read phase, the MPU receives data from U452 and U454 (quad ECL-To-TTL translator with 3-state output, MC3431) by issuing READ ACQ DATA at I/O address 80059*hex*. The READ ACQ DATA signal switches the inputs of U446 and U448 (quad 2-input multiplexer, 10158) on the A04 board to the output of the ACQ Memories.

Outputs of the ACQ Memories are wired together with the outputs of U146 (quad 2-input multiplexer/latch, 10173) on the A03 board, or with Threshold TEST from U244C (QUAD 2-INPUT NOR GATE, 10102) on the A02 board via the A08 Mother board. These signals must be kept low in order to read the correct data from the ACQ Memories. To write 0's into U146 (10173) on the A03 board, the MPU loads 00 into the SQRAM U144 (256 word X 4 bit RAM, HM10422) on the A03 board, then changes the inputs of U146 (10173) to the SQRAM output and issues $\overline{\text{READ SQRAM}}$. The output of U244C (10102) on the A02 board can be disabled by writing 1XXXX*binary* serially into U224 (hex D master-slave flip-flop, 10176) on the A02 board at I/O address 80001*hex*.

The data read is checked by the MPU and an error message is displayed if the data is incorrect.

The MPU also checks the interrupt from the carry flip-flop U408B on the A04 board. The carry flip-flop is set when U402, U404 and U406 (10H016) on the A04 board issue a carry bit at the same time.



6637-07

Figure 3-6. 318A ACQ memory test

10. SEQUENCE RAM TEST

Program : SQRAM

Function :

Power on — The SQRAM is checked with the checkerboard marching pattern from 00 through FF.

Step 1. The word 55 is written into all RAM addresses.

Step 2. A word is read from a diagnostic cell and compared with the expected word 55. If the selected word is not equal to 55, an error message is displayed and the MPU is halted.

Step 3. The word AA is written into that diagnostic cell. Then a word in same cell is read back and is compared with AA. If it is not equal to AA, an error message is displayed and the MPU is halted.

Step 4. Steps 2 and 3 are repeated for all RAM addresses.

Troubleshooting — This test is the same as that run automatically when the power is first turned on, but here the looping feature is available. The looping feature has 4 options; OFF, I/O, ERROR, and TEST. When the field is set to I/O, the looping feature allows only I/O instructions to be run repeatedly. The I/O address will appear on the screen. When the field is set to ERROR, the looping feature allows the tests in which an error is detected to be run repeatedly. When the field is set to TEST, the looping feature allows one test, or sequence of tests, to be run continuously. When the field is set to OFF, the looping feature is not available and one test, or sequence of tests, will run once.

When I/O looping is selected, only those looping instructions including one of the addresses listed in Table 3-7 will run. Unless the STOP key is pressed, the program will continue looping without displaying the result of the verification. In this case, the user should observe the ACQ. circuit board with an oscilloscope.

Table 3-7
318A SQRAM TEST PORT ADDRESSES (Hex)

Address	Content of Looping Test
8005A	set CS all OFF into CS-latch to write 55 in the background of the SQRAM.
80050	set 1 into QUAL (D0 & D2) register and set 0 into QUAL (D1 & D3) register.
80058	write 55 into the background of the SQRAM.
8005B	SQRAM data is latched to read 55 from High-speed memory.
80058	write AA into SQRAM after reading 55 from High-speed memory.
8005B	SQRAM data is latched to read AA from High-speed memory.

When the ERROR looping function is selected, the program loops only if errors are detected. If no errors are detected, the program runs once and displays the result of the verification just as if the looping function were turned OFF. If errors are detected, the ERROR looping function is available for the read cycle of the test. The results of the read cycle verification will appear on the screen. Refer to *Appendix B* of this manual for a description of error codes.

Description: Refer to Figure 3-7. The SQRAM U144 (256 word X 4-bit RAM, HM10422) on the A03 ACQ Control board holds the trigger sequence table called Trigger menu.

The SQRAM receives data from U106 and U108 (hex D master-slave flip-flop, 10176) on the A03 board with the following connection.

Table 3-8
318A SQRAM TEST SQRAM DATA CONNECTIONS

SQRAM U144	Setup	
	Latch	MPU Data
DI0 (pin 6)	U106 Q1 (pin 3)	D0
DI1 (pin 7)	U106 Q3 (pin 13)	D1
DI2 (pin 18)	U108 Q1 (pin 3)	D2
DI3 (pin 19)	U108 Q3 (pin 13)	D3

To provide the data to the SQRAM, the MPU writes the two least significant bits of the four data bits into U106 (10176) at I/O address 80050*hex*, and the two most-significant bits into U108 (10176) at I/O address 80051*hex*.

Each address line of the SQRAM is connected to two output lines which are wired together as follows:

Table 3-9
318A SQRAM TEST SQRAM ADDRESS CONNECTIONS

SQRAM U144	TRIGGER F-F	Setup	
		Gate	MPU Data
A0 (pin 13)	U138 pin 15	U140 pin 2	D0
A1 (pin 14)	U150 pin 15	U140 pin 3	D1
A2 (pin 15)	U136 pin 15	U140 pin 4	D2
A3 (pin 16)	U136 pin 2	U140 pin 13	D3
A4 (pin 17)	U138 pin 2	U140 pin 14	D4
A5 (pin 9)	U150 pin 3	U140 pin 15	D5
A6 (pin 10)	U134 pin 2	U154 pin 14	D6
A7 (pin 11)	U148 pin 14	U154 pin 3	D7

In order to set up the SQRAM, the MPU data (translated to ECL level) points to the address of the SQRAM. These data bits are gated as in the preceding table, enabled by LDSQRAM from U108 <5> (10176) bit 4 on the A03 board. Bit 4 is maintained high during this setup.

The write pulse to the SQRAM, WRITE SQRAM, is generated when the MPU writes to I/O address 80058*hex*. At the same time, the address to the SQRAM is supplied by the MPU data.

The read process is the same as in the WR test, except that the inputs for U146 (quad 2-input multiplexer/latch 10173) on the A03 board are switched to the outputs of the SQRAM.

During each read, the MPU verifies the data and issues an error message if it is not equal to the expected data.

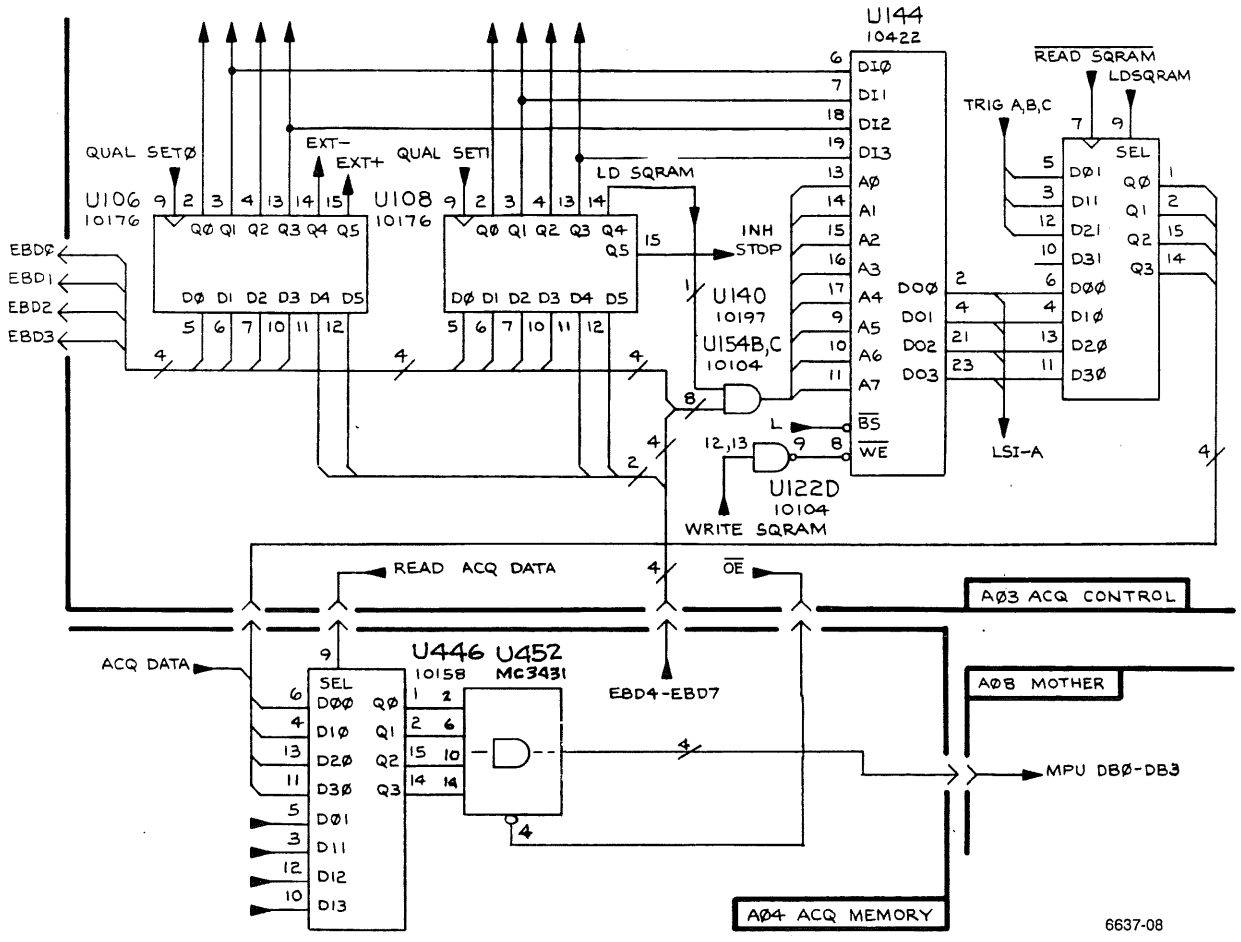


Figure 3-7. 318A SQRAM test.

11. N & DELAY TEST

Program: N & DLY

Function:

Power on — The Event/Delay counter counts word "A" N times when functioning as the Event counter, and counts a certain number of clock signals for delay when functioning as the Delay counter.

When functioning as the Event counter, the MPU loads a small N value into the counter register and increments the counter using clock pulses while observing the carrry bit. The Delay counter functions the same way, using the DELAY value as the initial counter value. In both cases the number of clock signals needed to generate the carry are compared with the expected values.

Troubleshooting — This is not a verificaion test, so no test result will appear on the CRT screen. This test should be observed on an oscilloscope. The troubleshooting routine automatically tests the N&DELAY Counter by alternately loading and running the counter, first with N values as the Event counter, and then with DELAY values for the Delay counter. The user programs the N and DELAY values before beginning the test. This test will run forever, or until the user presses the STOP key. If no test values are entered, the N Counter is set to 1 and the DELAY counter is set to 0. In this case, the N&DELAY Counter will not run. To run this test, N must be greater than 1, and DELAY must be greater than 0.

Description: Refer to Figure 3-8. The Event Delay Counter U158 (event/delay counter, μPB3Z198R) on the A03 ACQ CONTROL board is controlled by three signals, $\overline{CE}$, LOAD N, and LOAD DL from the SQRAM U144 (256 word X 4 bit RAM, HM10422) on the A03 board. The counter generates $\overline{N\text{-}1}$ as a carry when it reaches full count. This Event/Delay Counter has two registers, the one which holds the N value is called the N-register and the one which holds the DELAY value is called the DL register.

In this test, the MPU writes $000F_{hex}$ as the N value into the N-register at I/O addresses 80041_{hex} and 80042_{hex}, and $005A_{hex}$ as the DELAY value into the DL register at I/O address 80043_{hex} and 80044_{hex}.

Start flip-flop U124B (dual type D master-slave flip-flip, 10131) on the A03 board is set by START2 from U110 (binary to 1-8 decoder/multiplexer, 10162) on the A03 board. U124B passes a clock signal generated by the MPU.

Latches U106 and U108 (hex D master-slave flip-flop, 10176) on the A03 board are set to hold data 1100_{binary} for the SQRAM. They also enable U140 (hex AND-gate, 10197) and U154 (quad 2-input AND-gate, 10104) on the A03 board. Those gates control the data supplied to the address line of the SQRAM.

The MPU writes the data already set in the latches into the SQRAM at address FF*hex* using the WRITE SQRAM signal from U112 <6> (10162) on the A03 board. This data generates the LOAD N command for the Event/Delay Counter. After this setup, latches U106 and U108 (10176) are written to set the clock qualifier to off, which enables the MPU to send a single clock. The MPU generates STEP CLK by writing at I/O address 80055*hex* from U110 (10162) on the A03 board, using FF*hex* as data. That is, the SQRAM delivers the data at address FF*hex* as pointed to by the MPU. Event/Delay counter data (LOAD N), and the Strobe Generator circuit on the A03 board generate the TRIG CLK signal to the Event/Delay counter.

By this procedure, the value of the N-register in the Event/Delay counter is loaded into the counter itself.

To keep the Event/Delay Counter enabled during the test, the SQRAM must supply $\overline{CE}$ to the Event/Delay Counter. So, the same setups mentioned above are repeated in order to load 0000*binary* into the SQRAM.

After that, the MPU unmasks the interrput of the Event/Delay Counter Carry by writing at I/O address 80040*hex*.

Then the MPU generates STEP CLK by writing FF*hex* for the SQRAM address until it receives an interrupt signal. Once the interrupt occurs, the MPU reads the status from I/O address 8005D*hex*. The signal path for reading the status is same as in the Clock Test.

The MPU checks to see whether the Event/Delay Counter Carry Flag is set, and also checks the number of STEP CLKs generated.

If the flag is set and the clock count is correct, the MPU proceeds to the next step, otherwise it issues an error message and stops the test.

The DELAY count can be tested in the same way as the Event count, N. In this case, 1010*binary* is set in latches U106 and U108 (10176) on the A03 board.

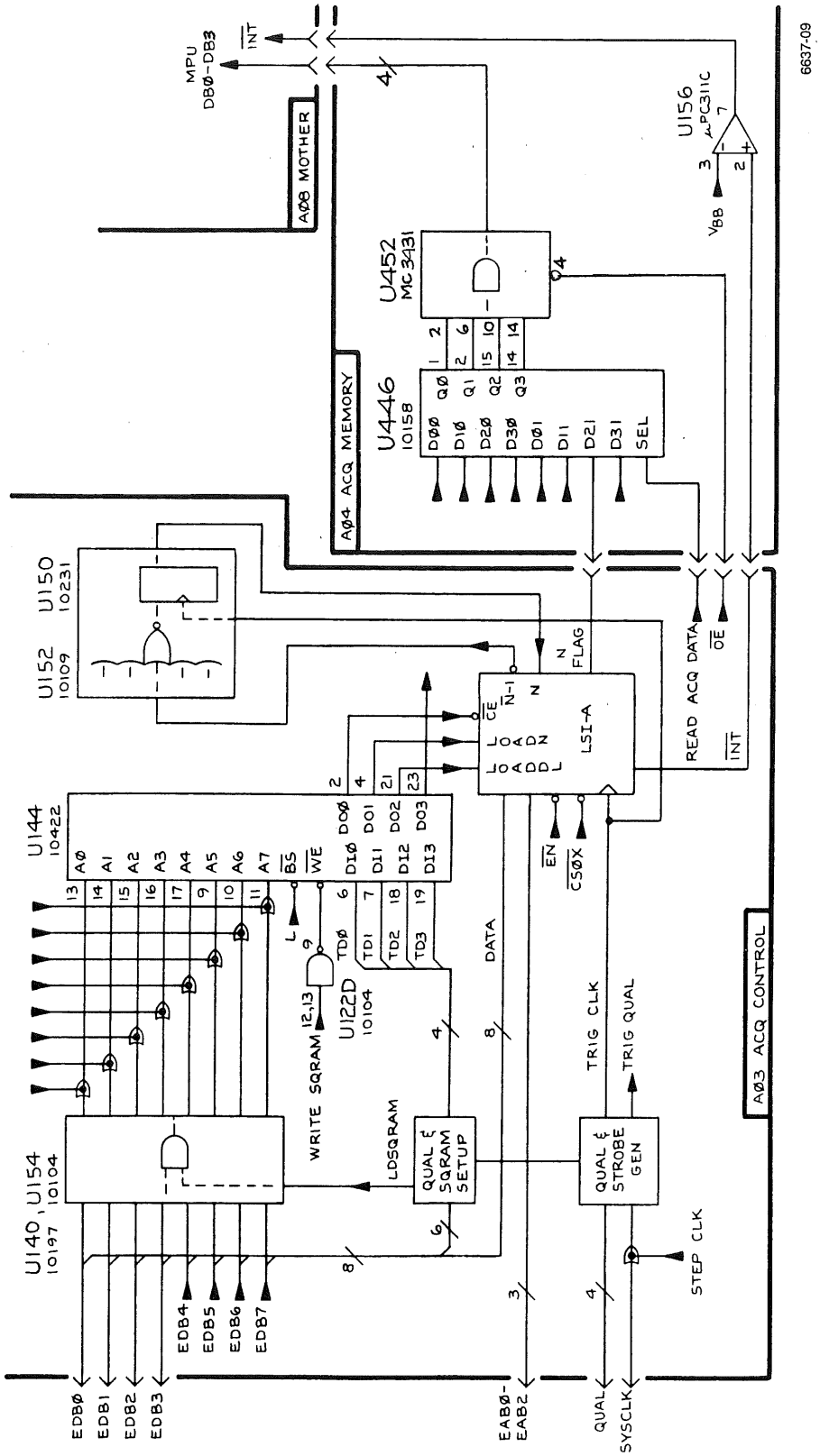


Figure 3-8. 318A N and DELAY counter test.

12. THRESHOLD TEST

Program: THRSH

Function:

Power on – Threshold V1 and Threshold V2 are set for several levels to produce Threshold V3 at – 0.2V or +0.2V. For every setting the comparator will detect the Threshold V3 level relative to ground and the MPU checks the comparator's output against the expected data (0 or 1).

Troubleshooting – Threshold V1 and Threshold V2 are programmed from –10.0V to +10.0V incrementally with 0.1V steps in order to generate the saw-tooth waveform.

Description: Refer to Figure 3-9. Two levels of voltage, one for V1 and the other for V2, are produced by DAC U522 and U524 (CMOS 8-bit buffered multiplexing DAC, AD7524) on the A05 Memory/Threshold board. When the MPU writes data into these DACs, this setting is latched inside. The data is supplied from U630 (octal bus transceiver with 3-state output, 74LS245) on the A06 MPU/Display board through the A08 Mother board, and U516 (74LS245) on the A05 board.

When the MPU writes at I/O address 800C0*hex* the $\overline{WR}$ and $\overline{CS}$ signals are sent to U522 (DAC V1) to latch the data. $\overline{WR}$ and $\overline{CS}$ for U524 (DAC V2) are caused by the MPU's access at I/O address 800D0*hex*. The $\overline{WR}$ signal is delivered from U512B (quadruple 2-input positive NOR gate, 74LS02) on the A05 board, which comes from U642 (PAL 16L8A) on the A06 board. $\overline{CS}$ for these DACs are generated by U538A (dual 2-line to 4-line decoder/demultiplexer, 74F139) on the A05 board.

A number less than 80*hex* programs the DAC for positive output, and a number more than 80*hex* progarms it for negative output centered on GND (80*hex*) in 0.1V steps. The actual output of these DACs is 1/4 of that specified in the THRESHOLD menu.

This test sets the DACs to several values, given in Table 3-10, and checks V3 selected for CLK Threshold indirectly.

The settings and expected data are as follows;

Table 3-10
318A THRESHOLD TEST DATA VALUES

V1	V2	V3	Expected
+0.3V (83*hex*)	−0.1V (7F*hex*)	+0.2V	1
+0.7V (87*hex*)	−0.5V (7B*hex*)	+0.2V	1
+1.1V (8B*hex*)	−0.9V (77*hex*)	+0.2V	1
+1.9V (93*hex*)	−1.7V (6F*hex*)	+0.2V	1
+3.5V (A3*hex*)	−3.3V (5F*hex*)	+0.2V	1
+6.7V (C3*hex*)	−6.5V (3F*hex*)	+0.2V	1
−0.3V (7D*hex*)	+0.1V (81*hex*)	−0.2V	0
−0.7V (79*hex*)	+0.5V (85*hex*)	−0.2V	0
−1.1V (75*hex*)	+0.9V (89*hex*)	−0.2V	0
−1.9V (6D*hex*)	+1.7V (91*hex*)	−0.2V	0
−3.5V (5D*hex*)	+3.3V (A1*hex*)	−0.2V	0
−6.7V (3D*hex*)	+6.5V (C1*hex*)	−0.2V	0

V3 is calculated by (V1 + V2)/2 using two resisters, R582 and R584 (4.99 KΩ) on the A05 baord. V3 is selected by U534 (differential 4-channel multiplexer, 4052BP) on the A05 board and sent to U236 (ultra fast dual comparator, SP9687) and the Comparator U240C (quad comparator, uPC339C) on the A02 INPUT-B board through the A08 board. In the A02 board, V3 is compared with ground by the U240C Comparator and this result is sent to 244C (quad 2-inputNOR gate, 10102) on the A02 board. U244C is enabled by U224 (hex D master-slave flip-flop, 10176) on the A02 board when the MPU writes 0XXXX*binary* into it at I/O address 80001*hex*. U244C (10102) on the A02 board outputs the Threshold TEST signal to U448 (quad 2-input multiplexer, 10158) on the A04 board via the A08 board.

During this test, all outputs of the ACQ Memories on the A04 board are disabled (maintained at a low level) by forcing CE to high from U428 (4-bit universal shift register, 10141) on the A04 board. U428 is written by the MPU at I/O address 80060*hex*.

The MPU reads the data from the A04 board at I/O address 80060*hex*, i.e., with READ ACQ DATA from U450 (triple 2-3-2 input OR/NOR gate, 10H105) on the A04 board. This reading sequence is the same as in the ACQ Test.

Then the MPU compares the MSB of the data read with the one expected. If they don't match each other, the error message will be issued.

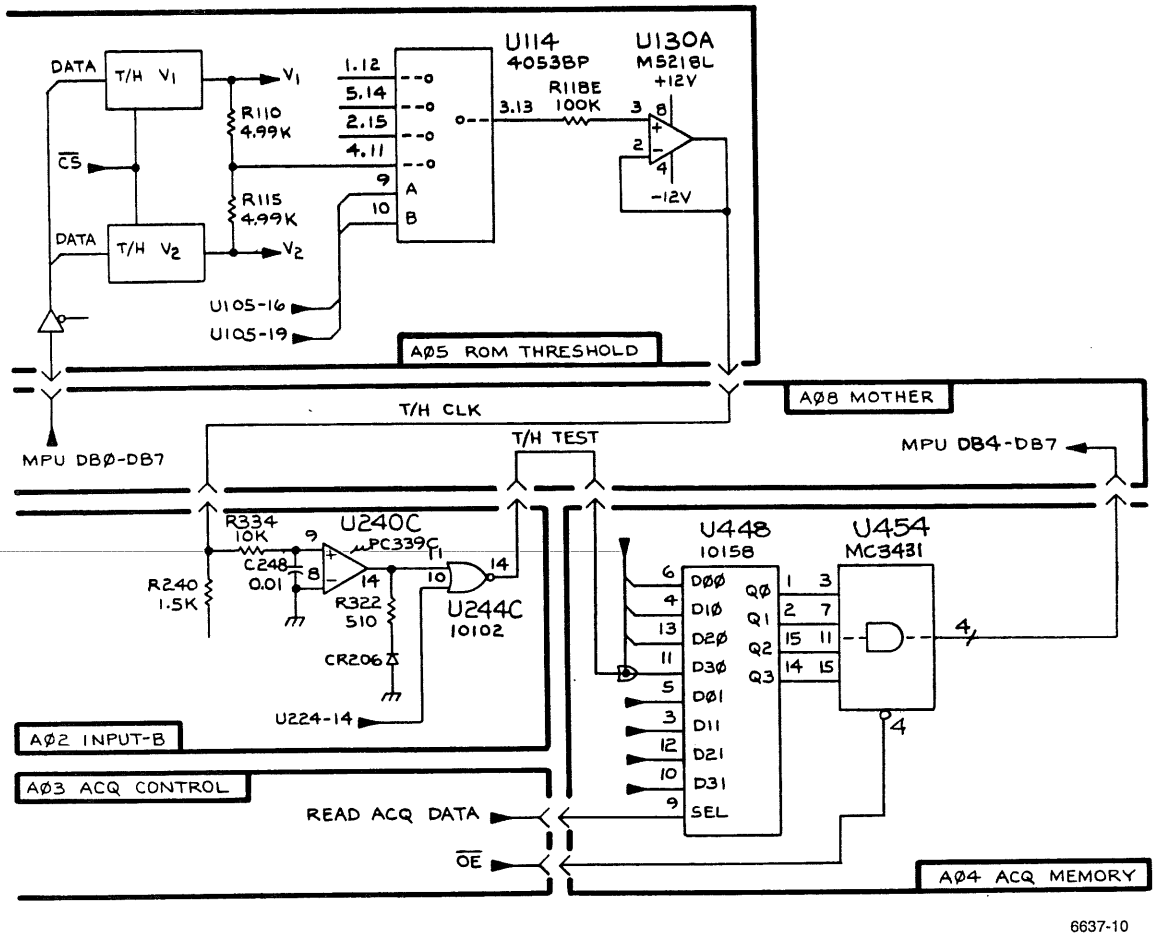


Figure 3-9. 318A Threshold test.

13. SEQ TEST

Program: SEQ

Function:

Power on — A single acquisition with a full trigger sequence is simulated to check a whole operation.

Troubleshooting — The content of this test is the same as that run automatically when the power is first turned on, but here the Looping feature is available. The Looping feature has 4 options; OFF, I/O, ERROR, and TEST. When the LOOP field is set to I/O, the looping feature allows only I/O instructions to be run repeatedly. The I/O address will appear on the screen. When the field is set to ERROR, the looping feature allows the tests in which an error is detected to be run repeatedly. When the field is set to TEST, the looping feature allows one test, or sequence of tests, to be run continuously. When the field is set to OFF, the looping feature is not available and one test, or sequence of tests, will run once.

When I/O Looping is selected, only those selected OUT instructions (subroutines), including one of the addresses listed below, will run. Unless the STOP key is pressed, this test will continue looping without displaying the result of the verification. In this case, the user should use an oscilloscope to observe the Acquisition circuit board.

PORT ADDRESSES (HEX)

Address	Content of Looping Test
80055	write WA into High-speed memory.

When ERROR is selected, looping will occur only if errors are detected. If no errors are detected, the ERROR looping test will run through its tests only once, and the results of the verification will be displayed on the CRT just as if the looping field had been selected to OFF. If errors are detected, the ERROR Looping function is available for the read cycle of the test, and the result of the verification will appear on the screen. Refer to the *Appendix B* of this manual for and explanation of error codes.

Description: A single acquisition is simulated to check the trigger sequencer operation. Pseudo data is generated in exactly the same way used in the WR and ACQ tests, and applied to the latches on the A01 INPUT-A and INPUT-B boards.

The words, WA, WB, and WC are set to 01_{hex}, 02_{hex} and 03_{hex} respectively. Then full trigger sequence, 00005*WA FLW'D BY:WB RESET ON:WC is selected with 16 clocks of delay to stop after the trigger recognition.

The data AAAXBCAAXAAAXABXABCXABCXABCXABC is supplied to the WR on the A01 and the A02 boards and to the ACQ Memories on the A04 ACQ MEMORY board. SYSCLK is generated by the MPU by writing at I/O address $8004A_{hex}$, which is into the timebase U444 on the A04.

The operation of the Trigger Sequencer is observed by the MPU by reading the interrupt and the ACQ status.The MPU checks these conditions on every clock pulse, and if there are any unexpected events the MPU displays an error message.

After the end of the acquisition (all flags are detected at certain clocks), the MPU reads the data from the ACQ Memories on the A04 board, and compares them with the word sequence applied. An error message is displayed if there are differences.

SERIAL ANALYSIS/RS232C

14. RS-232 TEST

Program: TSTRM1 (power on), TSTRM2 (Troubleshooting)

Setup: — Before starting TSTRM2, you must connect the self test adapter to the RS-232 commucation port.

Function:

Power on — TSTRM1 initializes the remote port and reads its initial status. If the initial status is good, it loads dummy data into the remote port and checks for status change.

Troubleshooting — TSTRM2 diagonostic has the following three functions:

1. checks MODEM control signals
2. checks the remote port status
3. checks data transmit and receive functions

Function 1 includes eight test programs. These programs check the status of MODEM signals RTS, CTS, CD, DTR, and DSR.

Function 2 includes seven test programs. These programs check the remote port initial status.

Function 3 includes nine test programs. These programs transmit increment pattern data from remote port, then receive and compare that data against the original data. Data speed is changed automatically from 110 baud through 9600 baud.

(The test data format is fixed at eight bits/word, even parity, and one stop bit.)

Description — Refer to the 318AS1 I/O function list, and simplified block diagrams when reading the following.

The I/O address of the remote port and other 318AS1 hardware is decoded by U702. The remote port controls RS-232 functions; that address is 80080, and the RS-232 baud rate selector address is 80090.

U724 (MB89251A) data lines connect to buffer U700; U700 is gated by the OPT. I/O address.

All but one of the MODEM control signals are controlled by remote port. The exception is the CD (carrier detect) signal, which appears in the status register at address 80080. All the signals coming into the remote port are converted from RS-232-levels to TTL levels by the receiver, U726; all outgoing signals are converted from TTL levels to RS-232 levels by the transmitter, U728.

The clock is supplied by U716 (baud rate selector). U714 latches the baud-rate-select data and its output defines the clock.

An I/O loop mode is available for TSTRM2. This mode is used to check the I/O address selection circuit. When the diagnostic program is running in the I/O loop mode, TSTRM2 executes the following program function continuously.

Table 3-11
318A RS-232C I/O ADDRESSES

Selected I/O Address	Program Function
80080	Read content of address 80080.
80090	Write data 80 to address 80090.
800B0	Write data 55 to serial port data register.
800B1	Read serial port register #0.

15. SERIAL TEST

Program: TSTSR1 (power on), TSTSR2 (Troubleshooting)

Setup: — Loop-back test data of TSTSR2 is supplied from the RS-232 port, so the P6107 SERIAL INPUT PROBE must be connected to pin #2 of the RS-232 connector.

Function:

Power on — TSTSR1 initializes the serial port and reads the initial status. If the initial status is good, it loads dummy data into the SIO and checks for any status change.

Troubleshooting — The TSTSR2 diagnostic program has the following three functions:

1. checks the serial port status
2. checks external trigger circuit
3. checks data passing through the circuit

Function 1 includes six test programs. These programs read the initial status of the serial port.

Function 2 includes two test programs. These programs control the external trigger transition and check the trigger status in bit #1 of the status register at address 80080 *hex*.

Function 3 includes eight test programs. These programs generate serial data (shift pattern data: 01 02 04 08 10 20 40) at pin #2 of the RS-232 connector. The programs also check incoming data at SIO Port-A. Serial data speed is changed automatically during the test.

(The test data format is fixed at eight bits/word, even parity, and one stop bit. The data threshold is TTL, and data polarity is NEGATIVE.)

Description — Refer to the I/O function list and the simplified diagram of the Serial Acquisition and RS-232 circuits when reading following.

The serial port is used for serial data acquisition. The serial port address is 800A0 *hex*, and the SERIAL parameter selector address is 80080 *hex*.

U708 latches the baud select data, input data polarity bit, the external trigger polarity bit and TRIG status bit. These are the parameters for serial acquisition control.

U710 generates the receive data sampling clock and supplies this clock to U722. U712A switches the input clock selector from either the 19.2 K internal clock or the external clock, but the TSTSR2 program does not test this logic.

The external trigger polarity is defined by U720C, and U712B latches on the transition of U720C's output. External trigger status appears at bit 0 of the status register; its address is 80080 *hex.*

The serial input data level is divided by 10 at input and this signal is amplified 2.5 times by U734 before reaching test point TP710. The data at TP710 is compared with Threshold C (supplied from the RAM board through bus connector 39B) by U736; then data polarity is defined by U720A and supplied to U722 pin #3.

The I/O loop feature is available for TSTSR2. This mode is used to check the I/O address selection circuit. When the diagnostic program is running in the I/O loop mode, TSTSR2 executes following program functions continuously.

Table 3-12
318A SERIAL TEST I/O ADDRESSES

Selected I/O Address	Program Function
80080	Read content of address 80080.
80080	Write data to address 80080.
800A0	Write data 55 to serial port data register.
800A1	Read serial port register #0

OPTION I/O FUNCTION LIST

I/O ADDRESS = 80080
CHIP = U730
CONTROL = READ ONLY

bit =	7	6	5	4	3	2	1	0
	x xxxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	MODEM CD STATUS	external trigger

bit 0: ON = external trigger has occurred.
OFF = external trigger has not occurred.

bit 1: ON = CD signal is OFF.
OFF = CD signal is ON.

I/O ADDRESS = 80090
CHIP = U714
FUNCTION = RS-232 BAUD RATE SETUP REGISTER
CONTROL = WRITE ONLY

bit =	7	6	5	4	3	2	1	0
	baud select as S3	baud select as S2	baud select as S1	baud select as S0	xxxxx	xxxxx	xxxxx	xxxxx

Table 3-13
318A SERIAL TEST BAUD SELECT BITS

S3	S2	S1	S0	Selected Baud Rate
OFF	OFF	OFF	OFF	NO CLOCK (EXTERNAL CLOCK)
OFF	OFF	OFF	ON	{NO CLOCK (19.2K)}
OFF	OFF	ON	OFF	50
OFF	OFF	ON	ON	75
OFF	ON	OFF	OFF	134.5
OFF	ON	OFF	ON	200
OFF	ON	ON	OFF	600
OFF	ON	ON	ON	2400
ON	OFF	OFF	OFF	9600
ON	OFF	OFF	ON	4800
ON	OFF	ON	OFF	1800
ON	OFF	ON	ON	1200
ON	ON	OFF	OFF	2400
ON	ON	OFF	ON	300
ON	ON	ON	OFF	150
ON	ON	ON	ON	110

NOTE: The baud rate in the bracket is a special speed; it is used only for serial data acquisition.

I/O ADDRESS = 80080
CHIP = U708
FUNCTION = SERIAL PARAMETER SETUP REGISTER
CONTROL = WRITE ONLY

bit =	7	6	5	4	3	2	1	0
	baud select as S3	baud select as S2	baud select as S1	baud select as S0	external trigger pol.	serial data pol.	trig status reset	xxxxx

bit 7, 6, 5, 4: these bits are used to set the serial baud rate. S3, S2, S1, S0 select the baud rate in the same manner shown in RS-232 BAUD RATE SETUP REGISTER.

bit 3: ON = sets the external trigger direction to the trailing edge.
OFF = sets the external trigger direction to the leading edge.

bit 2: ON = sets the serial input data polarity to negative.
OFF = sets the serial input data polarity to positive.

bit 1: ON = no operation.
OFF = resets the serial external trig status.

I/O ADDRESS	=	800A0
CHIP	=	U722
FUNCTION	=	READ DATA OF SERIAL PORT
CONTROL	=	READ
I/O ADDRESS	=	800A1
CHIP	=	U722
FUNCTION	=	SERIAL DATA ACQUISITION CONTROL
CONTROL	=	READ AND WRITE
I/O ADDRESS	=	800B0
CHIP	=	U724
FUNCTION	=	READ AND WRITE DATA OF RS-232 PORT
CONTROL	=	READ AND WRITE
I/O ADDRESS	=	800B1
CHIP	=	U724
FUNCTION	=	RS-232 MODEM SIGNAL AND DATA CONTROL
CONTROL	=	READ AND WRITE

Table 3-14
318A DIAGNOSTIC TEST FAILURE CODES

PART 1 --- TSTRM2 (RS232 TEST)

Code	Error Information
158 (9E)	STATUS REGISTER READ ERROR (FOR REMOTE PORT)
159 (9F)	RECEIVE READY FLAG NOT ON (" ")
160 (A0)	TRANSMIT EMPTY FLAG NOT OFF (" ")
163 (A3)	FRAMING ERROR FLAG NOT OFF (" ")
164 (A4)	OVER RUN ERROR FLAG NOT OFF (" ")
165 (A5)	PARITY ERROR FLAG NOT OFF (" ")
170 (AA)	WALKING PATTERN DATA (01, 02, 04 ...) LOOP BACK TEST(FROM RS-232 OUTPUT TO RS-232 INPUT) ERROR AT 110 BAUD
171 (AB)	" " " 150 BAUD
172 (AC)	" " " 300 BAUD
173 (AD)	" " " 600 BAUD
174 (AE)	" " " 1200 BAUD
175 (AF)	" " " 2400 BAUD
176 (B0)	" " " 4800 BAUD
177 (B1)	" " " 9600 BAUD

Table 3-14 (cont.)
318A DIAGNOSTIC TEST FAILURE CODES

PART 2 --- TSTSR2 (SERIAL TEST)

Code	Error Information
180 (B4)	REG #0 READ ERROR (FOR SERIAL PORT)
181 (B5)	RX READY NOT OFF (" ")
183 (B7)	FRAMING-ERR BIT NOT OFF (" ")
184 (B8)	OVER RUN-ERR BIT NOT OFF (" ")
185 (B9)	PARITY-ERR BIT NOT OFF (" ")
186 (BA)	EXT-TRIG BIT NOT OFF
187 (BB)	EXT-TRIG BIT NOT ON
188 (BC)	DATA LOOP-BACK TEST ERROR AT 75 BAUD(FROM RS-232 OUTPUT TO SERIAL INPUT)
189 (BD)	" " " 200 BAUD
190 (BE)	" " " 2400 BAUD
191 (BF)	" " " 1800 BAUD
192 (C0)	" " " 1200 BAUD
193 (C1)	" " " 300 BAUD
194 (C2)	" " " 110 BAUD
195 (C3)	" " " 9600 BAUD

LITHIUM BATTERY REPLACEMENT

If it is necessary to replace the lithumn battery (A05BT500) on the Memory and Threshold Boards, use standard soldering procedures.

LITHIUM BATTERY DISPOSAL

Typically, small quantites of batteries (less than 20) can be safely disposed of with ordinary garbage in a sanitary landfill. Larger quantites must be sent by surface transport to a Hazardous Waste Disposal Facility. The batteries should be individually packaged to prevent shorting and packed in a sturdy container that is clearly labeled "Lithium Batteries—DO NOT OPEN."

REPLACEABLE ELECTRICAL PARTS

PARTS ORDERING INFORMATION

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

Changes to Tektronix instruments are sometimes made to accommodate improved components as they become available, and to give you the benefit of the latest circuit improvements developed in our engineering department. It is therefore important, when ordering parts, to include the following information in your order: Part number, instrument type or number, serial number, and modification number if applicable.

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

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

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.

CROSS INDEX-MFR. CODE NUMBER TO MANUFACTURER

The Mfr. Code Number to Manufacturer 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.

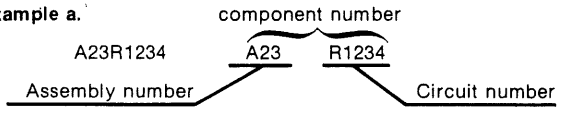
ABBREVIATIONS

Abbreviations conform to American National Standard Y1.1.

COMPONENT NUMBER (column one of the Electrical Parts List)

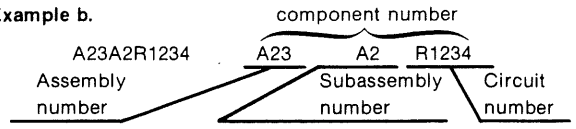
A numbering method has been used to identify assemblies, subassemblies and parts. Examples of this numbering method and typical expansions are illustrated by the following:

Example a.



Read: Resistor 1234 of Assembly 23

Example b.



Read: Resistor 1234 of Subassembly 2 of Assembly 23

Only the circuit number will appear on the diagrams and circuit board illustrations. Each diagram and circuit board illustration is clearly marked with the assembly number. Assembly numbers are also marked on the mechanical exploded views located 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 divided and arranged by assemblies in numerical sequence (e.g., assembly A1 with its subassemblies and parts, precedes assembly A2 with its subassemblies and parts).

Chassis-mounted parts have no assembly number prefix and are located at the end of the Electrical Parts List.

TEKTRONIX PART NO. (column two of the Electrical Parts List)

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

SERIAL/MODEL NO. (columns three and four of the Electrical Parts List)

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.

NAME & DESCRIPTION (column five of the Electrical Parts List)

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

MFR. CODE (column six of the Electrical Parts List)

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 seven of the Electrical Parts List)

Indicates actual manufacturers part number.

CROSS INDEX - MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip Code
00809	CROVEN	500 BEECH ST	WHITBY ONT CAN L1N 5S5
01121	ALLEN-BRADLEY CO	1201 SOUTH 2ND ST	MILWAUKEE WI 53204
01295	TEXAS INSTRUMENTS INC SEMICONDUCTOR GROUP	13500 N CENTRAL EXPRESSWAY P O BOX 225012 M/S 49	DALLAS TX 75265
01807	PETERSEN RADIO CO INC	2800 WEST BROADWAY	COUNCIL BLUFFS IA 51501
02735	RCA CORP SOLID STATE DIVISION	ROUTE 202	SOMERVILLE NJ 08876
04222	AVX CERAMICS DIV OF AVX CORP	19TH AVE SOUTH P O BOX 867	MYRTLE BEACH SC 29577
04713	MOTOROLA INC SEMICONDUCTOR GROUP	5005 E MCDOWELL RD	PHOENIX AZ 85008
05397	UNION CARBIDE CORP MATERIALS SYSTEMS DIV	11901 MADISON AVE	CLEVELAND OH 44101
07263	FAIRCHILD CAMERA AND INSTRUMENT CORP SEMICONDUCTOR DIV	464 ELLIS ST	MOUNTAIN VIEW CA 94042
07716	TRW INC TRW ELECTRONICS COMPONENTS TRW IRC FIXED RESISTORS/BURLINGTON	2850 MT PLEASANT AVE	BURLINGTON IA 52601
13511	AMPHENOL CADRE DIV BUNKER RAMO CORP		LOS GATOS CA
14859	TEXAS INSTRUMENTS INC CONTROL PRODUCTS DIV	300 NORTH MAIN	VERSAILLES KY 40383
18324	SIGNETICS CORP	811 E ARQUES	SUNNYVALE CA 94086
19701	MEPCO/ELECTRA INC A NORTH AMERICAN PHILIPS CO	P O BOX 760	MINERAL WELLS TX 76067
22526	DU PONT E I DE NEMOURS AND CO INC DU PONT CONNECTOR SYSTEMS	30 HUNTER LANE	CAMP HILL PA 17011
24546	CORNING GLASS WORKS	550 HIGH ST	BRADFORD PA 16701
27014	NATIONAL SEMICONDUCTOR CORP	2900 SEMICONDUCTOR DR	SANTA CLARA CA 95051
31433	UNION CARBIDE CORP ELECTRONICS DIV	PO BOX 5928	GREENVILLE SC 29606
31918	ITT SCHADOW INC	8081 WALLACE RD	EDEN PRAIRIE MN 55343
34371	HARRIS SEMICONDUCTOR DIV OF HARRIS CORP	P O BOX 883	MELBOURNE FL 32901
50434	HEWLETT-PACKARD CO OPTOELECTRONICS DIV	640 PAGE MILL RD	PALO ALTO CA 94304
54455	MIN-E-CON	17815 F SKYPARK BLVD	IRVINE CA 92714
54473	MATSUSHITA ELECTRIC CORP OF AMERICA	ONE PANASONIC WAY	SECAUCUS NJ 07094
57668	ROHM CORP	16931 MILLIKEN AVE	IRVINE CA 92713
59821	CENTRALAB INC SUB NORTH AMERICAN PHILIPS CORP	7158 MERCHANT AVE	EL PASO TX 79915
71400	BUSSMANN MFG CO MCGRAW EDISION CO	114 OLD STATE RD PO BOX 14460	ST LOUIS MO 63178
80009	TEKTRONIX INC	4900 S W GRIFFITH DR P O BOX 500	BEAVERTON OR 97077
91637	DALE ELECTRONICS INC	P O BOX 609	COLUMBUS NE 68601
TK00J	NEC CORP	5-33-1 SHIBA MINATO-KU	TOKYO, JAPAN
TK00R	NIPPIN MOTOROLA LTD	5-2-32 MINAMI-AZABU MINATO-KU	TOKYO JAPAN
TK0191	SONY TEKTRONIX	P. O. BOX 14, HANEDA AIRPORT	TOKYO, JAPAN
TK0935	MARQUARDT SWITCHES INC	MARQUARDT 67 ALBANY ST	CAZENOVIA NY 13035
TK0AD	MONOLITHIC MEMORIES JAPAN KK	5-17-9 SHINJUKU SHINJUKU-KU	TOKYO JAPAN
TK0AF	FUJITSU LTD	2-3-13 TORANOMON MINATO-KU	TOKYO JAPAN

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A01	670-7819-00			CIRCUIT BD ASSY:DATA INPUT-A	80009	670-7819-00
A02	670-7818-00			CIRCUIT BD ASSY:DATA INPUT-B	80009	670-7818-00
A03	670-7815-00			CIRCUIT BD ASSY:ACQ CONTROL	80009	670-7815-00
A04	671-0076-00			CIRCUIT BD ASSY:ACQ MEMORY	TK0191	ORDER BY DESCR
A05	671-0077-00			CIRCUIT BD ASSY:MEMORY & THRESHOLD	TK0191	ORDER BY DESCR
A06	671-0078-00			CIRCUIT BD ASSY:MPU & DISPLAY	TK0191	ORDER BY DESCR
A07	671-0079-00			CIRCUIT BD ASSY:SERIAL/RS232C (OPTION 01 ONLY)	TK0191	ORDER BY DESCR
A08	670-7811-00			CIRCUIT BD ASSY:MOTHER	80009	670-7811-00
A09	260-2133-00			SWITCH PB ASSY:KEYBOARD	80009	260-2133-00
A10	670-7810-01			CIRCUIT BD ASSY:CRT	80009	670-7810-01
A11	670-7821-01			CIRCUIT BD ASSY:INVERTER	80009	670-7821-01
A12	670-7820-00			CIRCUIT BD ASSY:REGULATOR	80009	670-7820-00
A01	670-7819-00			CIRCUIT BD ASSY:DATA INPUT-A	80009	670-7819-00
A01C100	281-0768-00			CAP,FXD,CER DI:470PF,20%,100V	04222	MA101A471MAA
A01C102	290-0995-00			CAP,FXD,ELCTLT:47UF,20%,16V	80009	290-0995-00
A01C104	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A01C106	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A01C108	290-0995-00			CAP,FXD,ELCTLT:47UF,20%,16V	80009	290-0995-00
A01C110	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A01C112	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A01C114	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A01C118	290-0995-00			CAP,FXD,ELCTLT:47UF,20%,16V	80009	290-0995-00
A01C120	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A01C122	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A01C124	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A01C126	290-0995-00			CAP,FXD,ELCTLT:47UF,20%,16V	80009	290-0995-00
A01C128	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A01C130	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A01C132	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A01C134	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A01C136	290-0995-00			CAP,FXD,ELCTLT:47UF,20%,16V	80009	290-0995-00
A01C138	290-0995-00			CAP,FXD,ELCTLT:47UF,20%,16V	80009	290-0995-00
A01C140	281-0819-00			CAP,FXD,CER DI:33 PF,5%,50V	04222	GC105A330J
A01C142	281-0819-00			CAP,FXD,CER DI:33 PF,5%,50V	04222	GC105A330J
A01CR110	152-0327-00			SEMICOND DVC,DI:SIG,SI	80009	152-0327-00
A01CR112	152-0581-01			SEMICOND DVC,DI:RECT,SI,20V,1A	80009	152-0581-01
A01CR114	152-0327-00			SEMICOND DVC,DI:SIG,SI	80009	152-0327-00
A01CR116	152-0581-01			SEMICOND DVC,DI:RECT,SI,20V,1A	80009	152-0581-01
A01CR118	152-0327-00			SEMICOND DVC,DI:SIG,SI	80009	152-0327-00
A01CR120	152-0581-01			SEMICOND DVC,DI:RECT,SI,20V,1A	80009	152-0581-01
A01CR122	152-0327-00			SEMICOND DVC,DI:SIG,SI	80009	152-0327-00
A01DL100	119-1608-00			DELAY LINE,ELEC:5.5NS,100 OHM	80009	119-1608-00
A01DL102	119-1608-00			DELAY LINE,ELEC:5.5NS,100 OHM	80009	119-1608-00
A01DL104	119-1609-00			DELAY LINE,ELEC:20NS,100 OHMS,TAPPED	80009	119-1609-00
A01J100	131-2936-01			CONN,RCPT,ELEC:FEMALE,2 X 15	80009	131-2936-01
A01J106	131-3143-00			CONN,RCPT,ELEC:HEADER,1 X 10,0.1 SPACING	80009	131-3143-00
A01Q100	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A01Q102	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A01Q104	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A01R100	307-0874-00			RES NTWK,FXD,FI:8,75 OHM,5%,0.1W	80009	307-0874-00
A01R102	307-0874-00			RES NTWK,FXD,FI:8,75 OHM,5%,0.1W	80009	307-0874-00
A01R104	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A01R106	307-0866-00			RES NTWK,FXD,FI:8,100 OHM,5%,0.1W	80009	307-0866-00
A01R108	307-0866-00			RES NTWK,FXD,FI:8,100 OHM,5%,0.1W	80009	307-0866-00
A01R110	321-0207-00			RES,FXD,FILM:1.40K OHM,1%,0.125W,TC=T0	19701	5033ED1K400F
A01R112	321-0247-00			RES,FXD,FILM:3.65K OHM,1%,0.125W,TC=T0	19701	5043ED3K650F

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A01R114	315-0472-00			RES,FXD,FILM:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
A01R116	315-0272-00			RES,FXD,FILM:2.7K OHM,5%,0.25W	57668	NTR25J-E02K7
A01R118	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A01R120	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A01R122	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A01R124	315-0511-00			RES,FXD,FILM:510 OHM,5%,0.25W	19701	5043CX510R0J
A01R126	315-0472-00			RES,FXD,FILM:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
A01R128	307-0865-00			RES NTWK,FXD,FI:8,1K OHM,5%,0.1W	80009	307-0865-00
A01R130	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A01R136	315-0332-00			RES,FXD,FILM:3.3K OHM,5%,0.25W	57668	NTR25J-E03K3
A01R138	315-0332-00			RES,FXD,FILM:3.3K OHM,5%,0.25W	57668	NTR25J-E03K3
A01R140	315-0332-00			RES,FXD,FILM:3.3K OHM,5%,0.25W	57668	NTR25J-E03K3
A01R142	307-0111-00			RES,FXD,CMPSN:3.6 OHM,5%,0.25W	80009	307-0111-00
A01R146	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A01R148	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A01R150	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A01R152	315-0510-00			RES,FXD,FILM:51 OHM,5%,0.25W	19701	5043CX51R00J
A01R154	307-0868-00			RES NTWK,FXD,FI:6,100 OHM,5%,0.1W	80009	307-0868-00
A01R156	307-0867-00			RES NTWK,FXD,FI:3,100 OHM,5%,0.1W	80009	307-0867-00
A01TP100	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A01TP102	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A01TP104	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A01TP106	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A01U100	155-0215-00			MICROCKT,DGTL:LOGIC ANALYZER INPUT,16 DIP	80009	155-0215-00
A01U102	155-0215-00			MICROCKT,DGTL:LOGIC ANALYZER INPUT,16 DIP	80009	155-0215-00
A01U104	155-0215-00			MICROCKT,DGTL:LOGIC ANALYZER INPUT,16 DIP	80009	155-0215-00
A01U106	155-0215-00			MICROCKT,DGTL:LOGIC ANALYZER INPUT,16 DIP	80009	155-0215-00
A01U108	155-0215-00			MICROCKT,DGTL:LOGIC ANALYZER INPUT,16 DIP	80009	155-0215-00
A01U110	155-0215-00			MICROCKT,DGTL:LOGIC ANALYZER INPUT,16 DIP	80009	155-0215-00
A01U112	155-0215-00			MICROCKT,DGTL:LOGIC ANALYZER INPUT,16 DIP	80009	155-0215-00
A01U114	155-0215-00			MICROCKT,DGTL:LOGIC ANALYZER INPUT,16 DIP	80009	155-0215-00
A01U116	156-1784-00			MICROCKT,LINEAR:DUAL COMPARATOR	80009	156-1784-00
A01U118	156-0651-02			MICROCKT,DGTL:8-BIT PRL-OUT SER SHF RGTR	01295	SN74LS164NP3
A01U120	156-1635-00			MICROCKT,DGTL:256 X 4 SRAM	27014	DM10422A
A01U122	156-0633-00			MICROCKT,DGTL:ECL,HEX D MASTER-SLAVE FF	04713	MC10176L
A01U124	156-1038-00			MICROCKT,DGTL:ECL,4 BIT BINARY COUNTER	07263	F10016DC
A01U126	156-1038-00			MICROCKT,DGTL:ECL,4 BIT BINARY COUNTER	07263	F10016DC
A01U130	156-0469-02			MICROCKT,DGTL:3/8 LINE DCDR,SCRN	01295	SN74LS138NP3
A01U132	156-0368-00			MICROCKT,DGTL:ECL,QUAD TTL TO ECL CONV	04713	MC10124L
A01U134	156-0633-00			MICROCKT,DGTL:ECL,HEX D MASTER-SLAVE FF	04713	MC10176L
A01U136	156-1172-01			MICROCKT,DGTL:DUAL 4 BIT BIN CNTR,SCRN	01295	SN74LS393NP3
A01U138	156-0092-02			MICROCKT,DGTL:HEX INV W/OPEN COLLECTOR,SCRN	18324	N7405(NB OR FB)
A02	670-7818-00			CIRCUIT BD ASSY:DATA INPUT-B	80009	670-7818-00
A02C200	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A02C202	290-0995-00			CAP,FXD,ELCTLT:47UF,20%,16V	80009	290-0995-00
A02C204	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A02C206	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A02C208	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A02C210	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A02C212	290-0995-00			CAP,FXD,ELCTLT:47UF,20%,16V	80009	290-0995-00
A02C214	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A02C216	290-0995-00			CAP,FXD,ELCTLT:47UF,20%,16V	80009	290-0995-00
A02C218	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A02C220	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A02C222	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A02C224	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A02C226	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A02C228	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A02C230	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A02C232	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A02C234	281-0815-00			CAP,FXD,CER DI:0.027UF,20%,50V	04222	MA205C273MAA
A02C236	281-0815-00			CAP,FXD,CER DI:0.027UF,20%,50V	04222	MA205C273MAA
A02C238	281-0815-00			CAP,FXD,CER DI:0.027UF,20%,50V	04222	MA205C273MAA
A02C240	281-0815-00			CAP,FXD,CER DI:0.027UF,20%,50V	04222	MA205C273MAA
A02C242	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A02C244	281-0812-00			CAP,FXD,CER DI:1000PF,10%,100V	04222	MA101C102KAA
A02C246	281-0812-00			CAP,FXD,CER DI:1000PF,10%,100V	04222	MA101C102KAA
A02C248	281-0773-00			CAP,FXD,CER DI:0.01UF,10%,100V	04222	MA201C103KAA
A02C250	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A02C262	281-0812-00			CAP,FXD,CER DI:1000PF,10%,100V	04222	MA101C102KAA
A02C264	281-0812-00			CAP,FXD,CER DI:1000PF,10%,100V	04222	MA101C102KAA
A02C268	290-0995-00			CAP,FXD,ELCTLT:47UF,20%,16V	80009	290-0995-00
A02C270	290-0995-00			CAP,FXD,ELCTLT:47UF,20%,16V	80009	290-0995-00
A02C272	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A02C274	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A02C276	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A02C300	281-0811-00			CAP,FXD,CER DI:10PF,10%,100V	04222	MA101A100KAA
A02CR200	152-0327-00			SEMICOND DVC,DI:SIG,SI	80009	152-0327-00
A02CR202	152-0323-03			SEMICOND DVC,DI:SW,SI,35V,0.1A	80009	152-0323-03
A02CR204	152-0323-03			SEMICOND DVC,DI:SW,SI,35V,0.1A	80009	152-0323-03
A02CR206	152-0327-00			SEMICOND DVC,DI:SIG,SI	80009	152-0327-00
A02DL106	119-1608-00			DELAY LINE,ELEC:5.5NS,100 OHM	80009	119-1608-00
A02DL108	119-1608-00			DELAY LINE,ELEC:5.5NS,100 OHM	80009	119-1608-00
A02DL110	119-1610-00			DELAY LINE,ELEC:5NS,100 OHM,TAPPED	80009	119-1610-00
A02J200	131-2944-00			CONN,RCPT,ELEC:HEADER,STRAIGHT,2 X 15	80009	131-2944-00
A02J202	131-1897-00			CONN,RCPT,ELEC:MICROMINIATURE,25 CONT MALE	54455	DSR-25P4C4-1.0
A02J204	131-1897-00			CONN,RCPT,ELEC:MICROMINIATURE,25 CONT MALE	54455	DSR-25P4C4-1.0
A02J206	131-2931-00			CONN,RCPT,ELEC:HEADER,ANGLE,2 X 12	80009	131-2931-00
A02J208	131-0955-00			CONN,RCPT,ELEC:BNC,FEMALE	13511	31-279
A02Q106	151-0188-00			TRANSISTOR:PNP,SI,TO-92	80009	151-0188-00
A02Q108	151-1032-00			TRANSISTOR:FE,DUAL N-CHAN,SI,TO-78A	04713	SFD1032
A02R200	307-0875-00			RES NTWK,FXD,FI:4,75 OHM,5%,0.1W	80009	307-0875-00
A02R202	307-0874-00			RES NTWK,FXD,FI:8,75 OHM,5%,0.1W	80009	307-0874-00
A02R204	307-0874-00			RES NTWK,FXD,FI:8,75 OHM,5%,0.1W	80009	307-0874-00
A02R206	307-0866-00			RES NTWK,FXD,FI:8,100 OHM,5%,0.1W	80009	307-0866-00
A02R208	307-0866-00			RES NTWK,FXD,FI:8,100 OHM,5%,0.1W	80009	307-0866-00
A02R210	315-0472-00			RES,FXD,FILM:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
A02R212	307-0869-00			RES NTWK,FXD,FI:8,510 OHM,5%,0.1W	80009	307-0869-00
A02R214	315-0511-00			RES,FXD,FILM:510 OHM,5%,0.25W	19701	5043CX510R0J
A02R216	315-0272-00			RES,FXD,FILM:2.7K OHM,5%,0.25W	57668	NTR25J-E02K7
A02R218	315-0272-00			RES,FXD,FILM:2.7K OHM,5%,0.25W	57668	NTR25J-E02K7
A02R220	315-0622-00			RES,FXD,FILM:6.2K OHM,5%,0.25W	19701	5043CX6K200J
A02R222	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A02R224	321-0481-04			RES,FXD,FILM:1M OHM,0.1%,0.125W,TC=T2	91637	CMF55116D10003B
A02R226	315-0104-00			RES,FXD,FILM:100K OHM,5%,0.25W	57668	NTR25J-E100K
A02R230	321-0030-00			RES,FXD,FILM:20.0 OHM,1%,0.125W,TC=T0	57668	CRB14FXE 20 OHM
A02R232	315-0100-00			RES,FXD,FILM:10 OHM,5%,0.25W	19701	5043CX10RR00J
A02R234	311-1608-00			RES,VAR,NONWW:CKT BD,20 OHM,20%,0.5W	80009	311-1608-00
A02R236	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A02R238	321-0187-00			RES,FXD,FILM:866 OHM,1%,0.125W,TC=T0	07716	CEAD866R0F
A02R239	311-1612-00			RES,VAR,NONWW:CKT,100 OHM,20%,0.5W	80009	311-1612-00
A02R240	321-0210-00			RES,FXD,FILM:1.50K OHM,1%,0.125W,TC=T0	19701	5033ED1K50F
A02R250	321-0929-07			RES,FXD,FILM:2.5K OHM,0.1%,0.125W,TC=T9	19701	5033RE2K500B
A02R252	315-0392-00			RES,FXD,FILM:3.9K OHM,5%,0.25W	57668	NTR25J-E03K9

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A02R254	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A02R256	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A02R258	321-0929-07			RES,FXD,FILM:2.5K OHM,0.1%,0.125W,TC=T9	19701	5033RE2K500B
A02R260	315-0392-00			RES,FXD,FILM:3.9K OHM,5%,0.25W	57668	NTR25J-E03K9
A02R262	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A02R264	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A02R266	307-0103-00			RES,FXD,CMPSN:2.7 OHM,5%,0.25W	01121	CB27G5
A02R268	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A02R270	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A02R300	315-0622-00			RES,FXD,FILM:6.2K OHM,5%,0.25W	19701	5043CX6K200J
A02R302	311-2084-01			RES,VAR,NONWW:500 OHM,20%,0.5W	80009	311-2084-01
A02R304	321-0929-07			RES,FXD,FILM:2.5K OHM,0.1%,0.125W,TC=T9	19701	5033RE2K500B
A02R306	315-0622-00			RES,FXD,FILM:6.2K OHM,5%,0.25W	19701	5043CX6K200J
A02R308	311-2084-01			RES,VAR,NONWW:500 OHM,20%,0.5W	80009	311-2084-01
A02R310	321-0929-07			RES,FXD,FILM:2.5K OHM,0.1%,0.125W,TC=T9	19701	5033RE2K500B
A02R312	315-0511-00			RES,FXD,FILM:510 OHM,5%,0.25W	19701	5043CX510R0J
A02R314	315-0510-00			RES,FXD,FILM:51 OHM,5%,0.25W	19701	5043CX51R00J
A02R316	315-0432-00			RES,FXD,FILM:4.3K OHM,5%,0.25W	57668	NTR25J-E04K3
A02R318	315-0511-00			RES,FXD,FILM:510 OHM,5%,0.25W	19701	5043CX510R0J
A02R320	315-0511-00			RES,FXD,FILM:510 OHM,5%,0.25W	19701	5043CX510R0J
A02R322	315-0511-00			RES,FXD,FILM:510 OHM,5%,0.25W	19701	5043CX510R0J
A02R324	315-0152-00			RES,FXD,FILM:1.5K OHM,5%,0.25W	57668	NTR25J-E01K5
A02R326	315-0100-00			RES,FXD,FILM:10 OHM,5%,0.25W	19701	5043CX10RR00J
A02R328	315-0100-00			RES,FXD,FILM:10 OHM,5%,0.25W	19701	5043CX10RR00J
A02R330	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A02R334	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A02R336	321-0261-00			RES,FXD,FILM:5.11K OHM,1%,0.125W,TC=T0	19701	5033ED5K110F
A02R338	321-0317-00			RES,FXD,FILM:19.6K OHM,1%,0.125W,TC=T0	07716	CEAD19601F
A02R350	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A02TP200	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A02TP202	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A02TP204	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A02TP206	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A02U200	156-0860-00			MICROCKT,DGTL:ECL,TRIPLE LINE RECEIVER	04713	MC10116L
A02U202	155-0215-00			MICROCKT,DGTL:LOGIC ANALYZER INPUT,16 DIP	80009	155-0215-00
A02U204	155-0215-00			MICROCKT,DGTL:LOGIC ANALYZER INPUT,16 DIP	80009	155-0215-00
A02U206	155-0215-00			MICROCKT,DGTL:LOGIC ANALYZER INPUT,16 DIP	80009	155-0215-00
A02U208	155-0215-00			MICROCKT,DGTL:LOGIC ANALYZER INPUT,16 DIP	80009	155-0215-00
A02U210	155-0215-00			MICROCKT,DGTL:LOGIC ANALYZER INPUT,16 DIP	80009	155-0215-00
A02U212	155-0215-00			MICROCKT,DGTL:LOGIC ANALYZER INPUT,16 DIP	80009	155-0215-00
A02U214	155-0215-00			MICROCKT,DGTL:LOGIC ANALYZER INPUT,16 DIP	80009	155-0215-00
A02U216	155-0215-00			MICROCKT,DGTL:LOGIC ANALYZER INPUT,16 DIP	80009	155-0215-00
A02U218	156-0651-02			MICROCKT,DGTL:8-BIT PRL-OUT SER SHF RGTR	01295	SN74LS164NP3
A02U220	156-1635-00			MICROCKT,DGTL:256 X 4 SRAM	27014	DM10422A
A02U222	156-0757-00			MICROCKT,DGTL:ECL,DUAL 3-IN,3-OUT OR NOR	04713	MC10211(P OR L)
A02U224	156-0633-00			MICROCKT,DGTL:ECL,HEX D MASTER-SLAVE FF	04713	MC10176L
A02U226	156-0757-00			MICROCKT,DGTL:ECL,DUAL 3-IN,3-OUT OR NOR	04713	MC10211(P OR L)
A02U228	156-0633-00			MICROCKT,DGTL:ECL,HEX D MASTER-SLAVE FF	04713	MC10176L
A02U230	156-1038-00			MICROCKT,DGTL:ECL,4 BIT BINARY COUNTER	07263	F10016DC
A02U232	156-1038-00			MICROCKT,DGTL:ECL,4 BIT BINARY COUNTER	07263	F10016DC
A02U234	156-0633-00			MICROCKT,DGTL:ECL,HEX D MASTER-SLAVE FF	04713	MC10176L
A02U236	156-1769-00			MICROCKT,LINEAR:ULTRA 1ST COMPTR DUALA/D	80009	156-1769-00
A02U238	156-0633-00			MICROCKT,DGTL:ECL,HEX D MASTER-SLAVE FF	04713	MC10176L
A02U240	156-1783-00			MICROCKT,LINEAR:QUAD COMPARATOR	80009	156-1783-00
A02U242	156-0158-00			MICROCKT,LINEAR:DUAL OPNL AMPL	04713	MC1458P1/MC1458U
A02U244	156-0205-00			MICROCKT,DGTL:ECL,QUAD 2-INPUT NOR GATE	80009	156-0205-00
A02U252						

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A03	670-7815-00			CIRCUIT BD ASSY:ACQ CONTROL	80009	670-7815-00
A03C100	281-0257-00			CAP,VAR,CER DI:4-28PF,250V	80009	281-0257-00
A03C102	281-0257-00			CAP,VAR,CER DI:4-28PF,250V	80009	281-0257-00
A03C104	281-0257-00			CAP,VAR,CER DI:4-28PF,250V	80009	281-0257-00
A03C106	281-0257-00			CAP,VAR,CER DI:4-28PF,250V	80009	281-0257-00
A03C200	290-0995-00			CAP,FXD,ELCTLT:47UF,20%,16V	80009	290-0995-00
A03C202	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A03C204	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A03C206	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A03C208	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A03C210	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A03C212	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A03C214	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A03C216	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A03C218	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A03C220	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A03C222	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A03C224	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A03C226	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A03C228	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A03C230	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A03C232	290-0995-00			CAP,FXD,ELCTLT:47UF,20%,16V	80009	290-0995-00
A03C234	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A03C236	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A03C238	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A03C240	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A03C242	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A03C244	290-0995-00			CAP,FXD,ELCTLT:47UF,20%,16V	80009	290-0995-00
A03C246	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A03C300	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A03C330	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A03C332	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A03C334	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A03C336	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A03C338	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A03C360	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A03DL100	119-1612-01			DELAY LINE,ELEC:20NS,100 OHM,TAPPED	80009	119-1612-01
A03DL102	119-1611-01			DELAY LINE,ELEC:20NS,100 OHM,TAPPED	80009	119-1611-01
A03DL104	119-1612-01			DELAY LINE,ELEC:20NS,100 OHM,TAPPED	80009	119-1612-01
A03DL106	119-1614-01			DELAY LINE,ELEC:5NS,100 OHM,TAPPED	80009	119-1614-01
A03J50	131-2872-00			CONN,RCPT,ELEC:HEADER,2 X 4,2.54 SPACING	80009	131-2872-00
A03J200	131-2230-01			CONN,RCPT,ELEC:HEADER,2 X 8,2.54 SPACING	80009	131-2230-01
A03J300	131-2933-00			CONN,RCPT,ELEC:HEADER,STRAIGHT,2 X 6	80009	131-2933-00
A03J400	131-2933-00			CONN,RCPT,ELEC:HEADER,STRAIGHT,2 X 6	80009	131-2933-00
A03R100	307-0876-00			RES NTWK,FXD,FI:8,100 OHM,5%,0.125	80009	307-0876-00
A03R102	307-0876-00			RES NTWK,FXD,FI:8,100 OHM,5%,0.125	80009	307-0876-00
A03R104	307-0876-00			RES NTWK,FXD,FI:8,100 OHM,5%,0.125	80009	307-0876-00
A03R106	307-0876-00			RES NTWK,FXD,FI:8,100 OHM,5%,0.125	80009	307-0876-00
A03R108	307-0876-00			RES NTWK,FXD,FI:8,100 OHM,5%,0.125	80009	307-0876-00
A03R110	307-0877-00			RES NTWK,FXD,FI:8,510 OHM,5%,0.125W	80009	307-0877-00
A03R112	307-0876-00			RES NTWK,FXD,FI:8,100 OHM,5%,0.125	80009	307-0876-00
A03R114	307-0879-00			RES NTWK,FXD,FI:4,51 OHM,5%,0.125W	80009	307-0879-00
A03R116	307-0876-00			RES NTWK,FXD,FI:8,100 OHM,5%,0.125	80009	307-0876-00
A03R118	307-0877-00			RES NTWK,FXD,FI:8,510 OHM,5%,0.125W	80009	307-0877-00
A03R120	307-0876-00			RES NTWK,FXD,FI:8,100 OHM,5%,0.125	80009	307-0876-00
A03R122	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A03R124	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A03R126	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0

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A03R130	315-0100-00			RES,FXD,FILM:10 OHM,5%,0.25W	19701	5043CX10RR00J
A03R132	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A03R134	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A03R136	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A03R150	307-0878-00			RES NTWK,FXD,FI:4,1K OHM,5%,0.125W	80009	307-0878-00
A03R152	307-0878-00			RES NTWK,FXD,FI:4,1K OHM,5%,0.125W	80009	307-0878-00
A03R154	307-0878-00			RES NTWK,FXD,FI:4,1K OHM,5%,0.125W	80009	307-0878-00
A03R160	307-0876-00			RES NTWK,FXD,FI:8,100 OHM,5%,0.125	80009	307-0876-00
A03R180	307-0877-00			RES NTWK,FXD,FI:8,510 OHM,5%,0.125W	80009	307-0877-00
A03TP100	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A03TP200	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A03U106	156-0633-00			MICROCKT,DGTL:ECL,HEX D MASTER-SLAVE FF	04713	MC10176L
A03U108	156-0633-00			MICROCKT,DGTL:ECL,HEX D MASTER-SLAVE FF	04713	MC10176L
A03U110	156-1495-01			MICROCKT,DGTL:1 OF 8 DECODER	80009	156-1495-01
A03U112	156-1495-01			MICROCKT,DGTL:1 OF 8 DECODER	80009	156-1495-01
A03U116	156-0295-00			MICROCKT,DGTL:ECL,TRIPLE 2-INP EXCL OR EXCL NOR	04713	MC10107
A03U118	156-0295-00			MICROCKT,DGTL:ECL,TRIPLE 2-INP EXCL OR EXCL NOR	04713	MC10107
A03U122	156-0458-00			MICROCKT,DGTL:ECL,QUAD AND GATE,2-INP	04713	MC10104L
A03U124	156-0230-00			MICROCKT,DGTL:ECL,DUAL D MASTER-SLAVE FF	04713	MC10131(L OR P)
A03U126	156-0205-00			MICROCKT,DGTL:ECL,QUAD 2-INPUT NOR GATE	80009	156-0205-00
A03U128	156-0880-04			MICROCKT,DGTL:DUAL D-TYPE MASTER SLAVE FF	80009	156-0880-04
A03U130	156-0880-04			MICROCKT,DGTL:DUAL D-TYPE MASTER SLAVE FF	80009	156-0880-04
A03U132	156-0880-04			MICROCKT,DGTL:DUAL D-TYPE MASTER SLAVE FF	80009	156-0880-04
A03U134	156-0880-04			MICROCKT,DGTL:DUAL D-TYPE MASTER SLAVE FF	80009	156-0880-04
A03U136	156-0880-04			MICROCKT,DGTL:DUAL D-TYPE MASTER SLAVE FF	80009	156-0880-04
A03U138	156-0880-04			MICROCKT,DGTL:DUAL D-TYPE MASTER SLAVE FF	80009	156-0880-04
A03U140	156-1021-02			MICROCKT,DGTL:ECL,HEX & GATE MC10197L	80009	156-1021-02
A03U142	156-0308-05			MICROCKT,DGTL:ECL,RECEIVER QUAD DIFF LINE	80009	156-0308-05
A03U144	156-1635-00			MICROCKT,DGTL:256 X 4 SRAM	27014	DM10422A
A03U146	156-0632-03			MICROCKT,DGTL:ECL,QUAD 2-INPUT MUX/LATCH	80009	156-0632-03
A03U148	156-0880-04			MICROCKT,DGTL:DUAL D-TYPE MASTER SLAVE FF	80009	156-0880-04
A03U150	156-0880-04			MICROCKT,DGTL:DUAL D-TYPE MASTER SLAVE FF	80009	156-0880-04
A03U152	156-0229-02			MICROCKT,DGTL:ECL,DUAL 4-5 INPUT OR/NOR	80009	156-0229-02
A03U154	156-0458-00			MICROCKT,DGTL:ECL,QUAD AND GATE,2-INP	04713	MC10104L
A03U156	156-0205-00			MICROCKT,DGTL:ECL,QUAD 2-INPUT NOR GATE	80009	156-0205-00
A03U158	156-1715-00			MICROCKT,DGTL:EVENT/DELAY COUNTER	80009	156-1715-00
A03W100	131-0566-00			BUS,CONDUCTOR:DUMMY RES,0.094 OD X 0.225 L	24546	OMA 07
A03W102	131-0566-00			BUS,CONDUCTOR:DUMMY RES,0.094 OD X 0.225 L	24546	OMA 07
A04	671-0076-00			CIRCUIT BD ASSY:ACQ MEMORY	TK0191	ORDER BY DESCR
A04C400	281-0811-00			CAP,FXD,CER DI:10PF,10%,100V	04222	MA101A100KAA
A04C402	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A04C404	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A04C406	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A04C408	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A04C410	290-0995-00			CAP,FXD,ELCTLT:47UF,20%,16V	80009	290-0995-00
A04C412	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A04C414	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A04C416	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A04C418	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A04C420	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A04C422	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A04C424	290-0995-00			CAP,FXD,ELCTLT:47UF,20%,16V	80009	290-0995-00
A04C425	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A04C426	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A04C427	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A04C428	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A04C430	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A04C432	290-0995-00			CAP,FXD,ELCTLT:47UF,20%,16V	80009	290-0995-00
A04C434	290-0995-00			CAP,FXD,ELCTLT:47UF,20%,16V	80009	290-0995-00
A04C436	290-0995-00			CAP,FXD,ELCTLT:47UF,20%,16V	80009	290-0995-00
A04C438	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A04J100	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ	22526	48283-029
A04L400	108-0182-00			COIL,RF:FIXED,293NH	80009	108-0182-00
A04R400	307-0876-00			RES NTWK,FXD,FI:8,100 OHM,5%,0.125	80009	307-0876-00
A04R402	307-0876-00			RES NTWK,FXD,FI:8,100 OHM,5%,0.125	80009	307-0876-00
A04R404	307-0876-00			RES NTWK,FXD,FI:8,100 OHM,5%,0.125	80009	307-0876-00
A04R406	307-0876-00			RES NTWK,FXD,FI:8,100 OHM,5%,0.125	80009	307-0876-00
A04R408	307-0876-00			RES NTWK,FXD,FI:8,100 OHM,5%,0.125	80009	307-0876-00
A04R410	307-0876-00			RES NTWK,FXD,FI:8,100 OHM,5%,0.125	80009	307-0876-00
A04R412	307-0876-00			RES NTWK,FXD,FI:8,100 OHM,5%,0.125	80009	307-0876-00
A04R414	315-0510-00			RES,FXD,FILM:51 OHM,5%,0.25W	19701	5043CX51R00J
A04R416	315-0510-00			RES,FXD,FILM:51 OHM,5%,0.25W	19701	5043CX51R00J
A04R420	315-0510-00			RES,FXD,FILM:51 OHM,5%,0.25W	19701	5043CX51R00J
A04R424	307-0877-00			RES NTWK,FXD,FI:8,510 OHM,5%,0.125W	80009	307-0877-00
A04R426	307-0877-00			RES NTWK,FXD,FI:8,510 OHM,5%,0.125W	80009	307-0877-00
A04R428	315-0512-00			RES,FXD,FILM:5.1K OHM,5%,0.25W	57668	NTR25J-E05K1
A04R430	315-0510-00			RES,FXD,FILM:51 OHM,5%,0.25W	19701	5043CX51R00J
A04R432	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A04R434	315-0221-00			RES,FXD,FILM:220 OHM,5%,0.25W	57668	NTR25J-E220E
A04R436	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A04R438	307-0877-00			RES NTWK,FXD,FI:8,510 OHM,5%,0.125W	80009	307-0877-00
A04R440	307-0877-00			RES NTWK,FXD,FI:8,510 OHM,5%,0.125W	80009	307-0877-00
A04R442	307-0877-00			RES NTWK,FXD,FI:8,510 OHM,5%,0.125W	80009	307-0877-00
A04R444	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A04R446	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A04R448	307-0877-00			RES NTWK,FXD,FI:8,510 OHM,5%,0.125W	80009	307-0877-00
A04TP110	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A04TP111	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A04TP400	131-2986-00			CONN,RCPT,ELEC:HEADER,RIGHT ANGLE 2 X 3	80009	131-2986-00
A04TP402	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A04TP404	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A04U400	156-1674-01			MICROCKT,DGTL:QUAD 2 INPUT AND GATE	80009	156-1674-01
A04U402	156-2312-00			MICROCKT,DGTL:BINARY COUNTER	80009	156-2312-00
A04U404	156-2312-00			MICROCKT,DGTL:BINARY COUNTER	80009	156-2312-00
A04U406	156-2312-00			MICROCKT,DGTL:BINARY COUNTER	80009	156-2312-00
A04U408	156-1639-02			MICROCKT,DGTL:ECL,DUAL D MA-SLAVE FF	80009	156-1639-02
A04U410	156-3083-00			MICROCKT,DGTL:ECL,4K X 4 RAM	TK0AF	MBM10484A-10C
A04U412	156-3083-00			MICROCKT,DGTL:ECL,4K X 4 RAM	TK0AF	MBM10484A-10C
A04U414	156-3083-00			MICROCKT,DGTL:ECL,4K X 4 RAM	TK0AF	MBM10484A-10C
A04U416	156-3083-00			MICROCKT,DGTL:ECL,4K X 4 RAM	TK0AF	MBM10484A-10C
A04U418	156-3083-00			MICROCKT,DGTL:ECL,4K X 4 RAM	TK0AF	MBM10484A-10C
A04U420	156-3083-00			MICROCKT,DGTL:ECL,4K X 4 RAM	TK0AF	MBM10484A-10C
A04U422	156-3083-00			MICROCKT,DGTL:ECL,4K X 4 RAM	TK0AF	MBM10484A-10C
A04U424	156-3083-00			MICROCKT,DGTL:ECL,4K X 4 RAM	TK0AF	MBM10484A-10C
A04U426	156-0520-02			MICROCKT,DGTL:QUAD LATCH D-TYPE NEG CLOCK	80009	156-0520-02
A04U428	156-0638-01			MICROCKT,DGTL:FOUR-BIT UNIV SHIFT RGTR,SCRN	04713	MC10141(PDORLD)
A04U430	156-1641-02			MICROCKT,DGTL:ECL,QUAD 2-INPUT NOR GATE	80009	156-1641-02
A04U432	156-0368-00			MICROCKT,DGTL:ECL,QUAD TTL TO ECL CONV	04713	MC10124L
A04U434	156-0368-00			MICROCKT,DGTL:ECL,QUAD TTL TO ECL CONV	04713	MC10124L
A04U436	156-0368-00			MICROCKT,DGTL:ECL,QUAD TTL TO ECL CONV	04713	MC10124L
A04U438	156-0469-02			MICROCKT,DGTL:3/8 LINE DCDR,SCRN	01295	SN74LS138NP3
A04U440	156-0368-00			MICROCKT,DGTL:ECL,QUAD TTL TO ECL CONV	04713	MC10124L

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A04U442	156-0368-00			MICROCKT,DGTL:ECL,QUAD TTL TO ECL CONV	04713	MC10124L
A04U444	156-1716-01			MICROCKT,DGTL:TIME BASE	80009	156-1716-01
A04U446	156-0746-02			MICROCKT,DGTL:ECL,QUAD 2-INPUT NON-INV MUX	80009	156-0746-02
A04U448	156-0746-02			MICROCKT,DGTL:ECL,QUAD 2-INPUT NON-INV MUX	80009	156-0746-02
A04U450	156-1642-02			MICROCKT,DGTL:TRIPLE 2-3-2 IN OR/NOR GATE	80009	156-1642-02
A04U452	156-1647-00			MICROCKT,DGTL:ML,QUAD HIGH-SPEED V COMPTR	04713	MC3431P
A04U454	156-1647-00			MICROCKT,DGTL:ML,QUAD HIGH-SPEED V COMPTR	04713	MC3431P
A04U456	156-0316-00			MICROCKT,DGTL:ECL,QUAD 2-INP ECL TO TTL	04713	MC10125L
A04U458	156-1126-00			MICROCKT,LINEAR:VOLTAGE COMPARATOR	01295	LM311P
A04Y400	158-0106-01			XTAL UNIT,QTZ:100 MHZ,0.0015%,SERIERS	80009	158-0106-01
A05	671-0077-00			CIRCUIT BD ASSY:MEMORY & THRESHOLD	TK0191	ORDER BY DESCR
A05BT500	146-0046-00			BATTERY,DRY:3.4V,850MA,LITHIUM	80009	146-0046-00
A05C500	290-0684-00			CAP,FXD,ELCTLT:10UF,20%,16V	80009	290-0684-00
A05C502	290-0993-00			CAP,FXD,ELCTLT:100UF,+5-10%,16V	80009	290-0993-00
A05C510	281-0814-00			CAP,FXD,CER DI:100 PF,10%,100V	04222	MA101A101KAA
A05C512	281-0812-00			CAP,FXD,CER DI:1000PF,10%,100V	04222	MA101C102KAA
A05C514	281-0814-00			CAP,FXD,CER DI:100 PF,10%,100V	04222	MA101A101KAA
A05C516	281-0812-00			CAP,FXD,CER DI:1000PF,10%,100V	04222	MA101C102KAA
A05C550	290-0995-00			CAP,FXD,ELCTLT:47UF,20%,16V	80009	290-0995-00
A05C552	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A05C554	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A05C556	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A05C558	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A05C560	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A05C562	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A05C564	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A05C566	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A05C568	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A05C570	290-0995-00			CAP,FXD,ELCTLT:47UF,20%,16V	80009	290-0995-00
A05C572	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A05C574	290-0995-00			CAP,FXD,ELCTLT:47UF,20%,16V	80009	290-0995-00
A05C576	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A05C578	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A05CR500	152-0327-00			SEMICOND DVC,DI:SIG,SI	80009	152-0327-00
A05CR502	152-0327-00			SEMICOND DVC,DI:SIG,SI	80009	152-0327-00
A05CR504	152-0327-00			SEMICOND DVC,DI:SIG,SI	80009	152-0327-00
A05CR510	152-0322-00			SEMICOND DVC,DI:SCHOTTKY,SI,15V,DO-35	50434	5082-2672
A05CR512	152-0322-00			SEMICOND DVC,DI:SCHOTTKY,SI,15V,DO-35	50434	5082-2672
A05CR514	152-0322-00			SEMICOND DVC,DI:SCHOTTKY,SI,15V,DO-35	50434	5082-2672
A05CR516	152-0322-00			SEMICOND DVC,DI:SCHOTTKY,SI,15V,DO-35	50434	5082-2672
A05Q500	151-0188-00			TRANSISTOR:PNP,SI,TO-92	80009	151-0188-00
A05Q502	151-0188-00			TRANSISTOR:PNP,SI,TO-92	80009	151-0188-00
A05Q504	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A05Q506	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A05R500	307-0750-00			RES NTWK,FXD,FI:(8)4.7K OHM,10%,0.125W	80009	307-0750-00
A05R502	307-0750-00			RES NTWK,FXD,FI:(8)4.7K OHM,10%,0.125W	80009	307-0750-00
A05R504	307-0750-00			RES NTWK,FXD,FI:(8)4.7K OHM,10%,0.125W	80009	307-0750-00
A05R510	315-0202-00			RES,FXD,FILM:2K OHM,5%,0.25W	57668	NTR25J-E 2K
A05R512	311-1615-00			RES,VAR,NONWW:2K OHM,20%,0.5W	80009	311-1615-00
A05R514	315-0681-00			RES,FXD,FILM:680 OHM,5%,0.25W	57668	NTR25J-E680E
A05R516	315-0821-00			RES,FXD,FILM:820 OHM,5%,0.25W	19701	5043CX820R0J
A05R518	315-0202-00			RES,FXD,FILM:2K OHM,5%,0.25W	57668	NTR25J-E 2K
A05R520	315-0511-00			RES,FXD,FILM:510 OHM,5%,0.25W	19701	5043CX510R0J
A05R522	315-0471-00			RES,FXD,FILM:470 OHM,5%,0.25W	57668	NTR25J-E470E
A05R524	315-0202-00			RES,FXD,FILM:2K OHM,5%,0.25W	57668	NTR25J-E 2K
A05R526	315-0104-00			RES,FXD,FILM:100K OHM,5%,0.25W	57668	NTR25J-E100K
A05R528	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A05R530	315-0622-00			RES,FXD,FILM:6.2K OHM,5%,0.25W	19701	5043CX6K200J

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A05R532	315-0152-00			RES,FXD,FILM:1.5K OHM,5%,0.25W	57668	NTR25J-E01K5
A05R534	315-0202-00			RES,FXD,FILM:2K OHM,5%,0.25W	57668	NTR25J-E 2K
A05R536	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A05R538	315-0202-00			RES,FXD,FILM:2K OHM,5%,0.25W	57668	NTR25J-E 2K
A05R540	315-0392-00			RES,FXD,FILM:3.9K OHM,5%,0.25W	57668	NTR25J-E03K9
A05R550	315-0681-00			RES,FXD,FILM:680 OHM,5%,0.25W	57668	NTR25J-E680E
A05R552	321-0285-00			RES,FXD,FILM:9.09K OHM,1%,0.125W,TC=T0	07716	CEAD90900F
A05R554	311-1741-00			RES,VAR,NONWW:TRMR,2K OHM,20%,0.5W	80009	311-1741-00
A05R556	321-0287-00			RES,FXD,FILM:9.53K OHM,1%,0.125W,TC=T0	19701	5033ED9K530F
A05R558	315-0754-00			RES,FXD,FILM:750K OHM,5%,0.25W,MI	19701	5043CX750K0J
A05R560	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A05R562	311-1745-00			RES,VAR,NONWW:TRMR,100K OHM,10%,0.5W	80009	311-1745-00
A05R564	321-0260-01			RES,FXD,FILM:4.99K OHM,0.5%,0.125W,TC=T0	07716	CEAD 49900D
A05R566	321-0260-01			RES,FXD,FILM:4.99K OHM,0.5%,0.125W,TC=T0	07716	CEAD 49900D
A05R568	321-1332-00			RES,FXD,FILM:28.4K OHM,1%,0.125W,TC=T0	19701	5033ED28K40F
A05R570	321-0245-00			RES,FXD,FILM:3.48K OHM,1%,0.125W,TC=T0	19701	5033ED3K48F
A05R572	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A05R574	311-1745-00			RES,VAR,NONWW:TRMR,100K OHM,10%,0.5W	80009	311-1745-00
A05R576	315-0754-00			RES,FXD,FILM:750K OHM,5%,0.25W,MI	19701	5043CX750K0J
A05R578	321-0260-01			RES,FXD,FILM:4.99K OHM,0.5%,0.125W,TC=T0	07716	CEAD 49900D
A05R580	321-0260-01			RES,FXD,FILM:4.99K OHM,0.5%,0.125W,TC=T0	07716	CEAD 49900D
A05R582	321-0260-01			RES,FXD,FILM:4.99K OHM,0.5%,0.125W,TC=T0	07716	CEAD 49900D
A05R584	321-0260-01			RES,FXD,FILM:4.99K OHM,0.5%,0.125W,TC=T0	07716	CEAD 49900D
A05R586	315-0511-00			RES,FXD,FILM:510 OHM,5%,0.25W	19701	5043CX510R0J
A05R588	315-0511-00			RES,FXD,FILM:510 OHM,5%,0.25W	19701	5043CX510R0J
A05R590	315-0511-00			RES,FXD,FILM:510 OHM,5%,0.25W	19701	5043CX510R0J
A05R592	307-0750-00			RES NTWK,FXD,FI:(8)4.7K OHM,10%,0.125W	80009	307-0750-00
A05TP500	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A05TP502	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A05TP504	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A05TP510	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A05TP512	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A05TP514	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A05TP516	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A05U500	160-4533-00			MICROCKT,DGTL:64K X 8 EPROM,PRGM	TK0AF	MBM27C512-25
A05U502	160-4534-00			MICROCKT,DGTL:64K X 8 EPROM,PRGM	TK0AF	MBM27C512-25
A05U504	160-4535-00			MICROCKT,DGTL:64K X 8 EPROM,PRGM	TK0AF	MBM27C512-25
A05U506	156-3084-00			MICROCKT,DGTL:CMOS,32K X 8 STATIC RAM	TK00J	UPD43256C-15L
A05U508	156-3084-00			MICROCKT,DGTL:CMOS,32K X 8 STATIC RAM	TK00J	UPD43256C-15L
A05U510	156-1727-00			MICROCKT,DGTL:1 OF 8 DCDR/DEMULTIPLEXER	04713	MC74F138 ND/JD
A05U512	156-1722-00			MICROCKT,DGTL:HEX INVERTER	04713	MC74F04ND
A05U514	156-1663-00			MICROCKT,DGTL:ASTTL,TPL 3-INP & GATE	04713	MC74F11ND/JD
A05U516	156-1111-02			MICROCKT,DGTL:OCTAL BUS XCVR W/3 STATE OUT	01295	SN74LS245N3
A05U518	156-1126-00			MICROCKT,LINEAR:VOLTAGE COMPARATOR	01295	LM311P
A05U520	156-1771-00			MICROCKT,LINEAR:DUAL OP-AMP	80009	156-1771-00
A05U522	156-1367-01			MICROCKT,LINEAR:8 BIT BUFFERED MULTIPLYING D/A CONVERTER AN7524 CMOS	80009	156-1367-01
A05U524	156-1367-01			MICROCKT,LINEAR:8 BIT BUFFERED MULTIPLYING D/A CONVERTER AN7524 CMOS	80009	156-1367-01
A05U526	156-1771-00			MICROCKT,LINEAR:DUAL OP-AMP	80009	156-1771-00
A05U528	156-1771-00			MICROCKT,LINEAR:DUAL OP-AMP	80009	156-1771-00
A05U530	156-0514-03			MICROCKT,DGTL:DIFF 4-CHANNEL MUX	80009	156-0514-03
A05U532	156-0514-03			MICROCKT,DGTL:DIFF 4-CHANNEL MUX	80009	156-0514-03
A05U534	156-0514-03			MICROCKT,DGTL:DIFF 4-CHANNEL MUX	80009	156-0514-03
A05U536	156-1771-00			MICROCKT,LINEAR:DUAL OP-AMP	80009	156-1771-00
A05U538	156-1726-00			MICROCKT,DGTL:DUAL 1 OF 4 DCDR,SCRN	18324	74F139(NB OR FB)
A05U540	156-0865-02			MICROCKT,DGTL:OCTAL D FF W/CLEAR,SCRN	01295	SN74LS273NP3
A05U542	156-1771-00			MICROCKT,LINEAR:DUAL OP-AMP	80009	156-1771-00

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A05VR500	152-0813-00			SEMICOND DVC,DI:ZENER,SI,3.0V,5%,5W	80009	152-0813-00
A05VR510	152-0461-00			SEMICOND DVC,DI:ZEN,SI,6.2V,5%,0.4W,DO-7	04713	SZG25002K2
A06	671-0078-00			CIRCUIT BD ASSY:MPU & DISPLAY	TK0191	ORDER BY DESCR
A06C604	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A06C640	290-0684-00			CAP,FXD,ELCTLT:10UF,20%,16V	80009	290-0684-00
A06C642	281-0763-00			CAP,FXD,CER DI:47PF,10%,100V	04222	MA101A470KAA
A06C644	281-0763-00			CAP,FXD,CER DI:47PF,10%,100V	04222	MA101A470KAA
A06C647	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A06C648	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A06C660	290-0995-00			CAP,FXD,ELCTLT:47UF,20%,16V	80009	290-0995-00
A06C661	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A06C662	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A06C663	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A06C664	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A06C665	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A06C666	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A06C667	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A06C668	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A06C670	290-0995-00			CAP,FXD,ELCTLT:47UF,20%,16V	80009	290-0995-00
A06C672	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A06CR640	152-0327-00			SEMICOND DVC,DI:SIG,SI	80009	152-0327-00
A06Q618	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A06R600	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A06R602	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A06R604	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A06R605	315-0154-00			RES,FXD,FILM:150K OHM,5%,0.25W	57668	NTR25J-E150K
A06R610	321-0147-00			RES,FXD,FILM:332 OHM,1%,0.125W,TC=T0	07716	CEAD332R0F
A06R612	321-0105-00			RES,FXD,FILM:121 OHM 1%,0.125W,TC=\0	07716	CEAD121R0F
A06R614	321-0143-00			RES,FXD,FILM:301 OHM,1%,0.125W,TC=T0	07716	CEAD301R0F
A06R616	321-0230-00			RES,FXD,FILM:2.43K OHM,1%,0.125W,TC=T0	19701	5043ED2K430F
A06R618	321-0260-01			RES,FXD,FILM:4.99K OHM,0.5%,0.125W,TC=T0	07716	CEAD 49900D
A06R620	321-0260-01			RES,FXD,FILM:4.99K OHM,0.5%,0.125W,TC=T0	07716	CEAD 49900D
A06R622	315-0750-00			RES,FXD,FILM:75 OHM,5%,0.25W	57668	NTR25J-E75E0
A06R624	315-0271-00			RES,FXD,FILM:270 OHM,5%,0.25W	57668	NTR25J-E270E
A06R632	307-0882-00			RES NTWK,FXD,FI:8,100K OHM,10%,0.125W	80009	307-0882-00
A06R634	307-0882-00			RES NTWK,FXD,FI:8,100K OHM,10%,0.125W	80009	307-0882-00
A06R640	315-0473-00			RES,FXD,FILM:47K OHM,5%,0.25W	57668	NTR25J-E47K0
A06R641	315-0472-00			RES,FXD,FILM:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
A06R642	315-0472-00			RES,FXD,FILM:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
A06R643	315-0820-00			RES,FXD,FILM:82 OHM,5%,0.25W	57668	NTR25J-E82E0
A06R644	315-0472-00			RES,FXD,FILM:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
A06R645	315-0820-00			RES,FXD,FILM:82 OHM,5%,0.25W	57668	NTR25J-E82E0
A06R646	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A06R647	315-0104-00			RES,FXD,FILM:100K OHM,5%,0.25W	57668	NTR25J-E100K
A06R648	315-0104-00			RES,FXD,FILM:100K OHM,5%,0.25W	57668	NTR25J-E100K
A06R649	315-0202-00			RES,FXD,FILM:2K OHM,5%,0.25W	57668	NTR25J-E 2K
A06R650	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A06TP600	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A06TP610	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A06U600	156-0910-02			MICROCKT,DGTL:DUAL DECADE COUNTER,SCRN	01295	SN74LS390N3
A06U602	156-1774-00			MICROCKT,DGTL:CMOS,TV SYNC GENERATOR	80009	156-1774-00
A06U604	156-0745-02			MICROCKT,DGTL:CMOS,INVERTER HEX	80009	156-0745-02
A06U606	156-1768-00			MICROCKT,DGTL:CMOS,HEX D-TYPE W/COMM CLEAR & COMM CLOCK	80009	156-1768-00
A06U608	156-1776-00			MICROCKT,DGTL:CMOS,DISPLAY CONTROLLER	80009	156-1776-00
A06U610	156-0385-02			MICROCKT,DGTL:HEX INVERTER,SCRN	07263	74LS04PCQR
A06U612	156-2004-00			MICROCKT,DGTL:2KB STATIC RAM 300 MILL	80009	156-2004-00
A06U614	156-0382-02			MICROCKT,DGTL:QUAD 2 INP NAND GATE BURN	18324	N74LS00NB

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A06U616	156-1921-00			MICROCKT,DGTL:TTL,OCTAL BUS TRANSCEIVER W/3 -STATE OUTPUT	27014	MM74HCT245N
A06U618	156-0724-02			MICROCKT,DGTL:HEX INV W/OC OUT,SCRN,	01295	SN74LS05NP3
A06U620	156-0865-02			MICROCKT,DGTL:OCTAL D FF W/CLEAR,SCRN	01295	SN74LS273NP3
A06U622	160-3916-00			MICROCKT,DGTL:16384 X 8 EPROM,PRGM	TK0191	160-3916-00
A06U624	156-0382-02			MICROCKT,DGTL:QUAD 2 INP NAND GATE BURN	18324	N74LS00NB
A06U630	156-1111-02			MICROCKT,DGTL:OCTAL BUS XCVR W/3 STATE OUT	01295	SN74LS245N3
A06U632	156-1282-00			MICROCKT,DGTL:8 BIT PRIORITY ENCODER	02735	CD4532BF
A06U634	156-1282-00			MICROCKT,DGTL:8 BIT PRIORITY ENCODER	02735	CD4532BF
A06U636	156-1921-00			MICROCKT,DGTL:TTL,OCTAL BUS TRANSCEIVER W/3 -STATE OUTPUT	27014	MM74HCT245N
A06U638	156-1611-00			MICROCKT,DGTL:ASTTL,DUAL D TYPE EDGE-TRIG	80009	156-1611-00
A06U640	156-3082-00			MICROCKT,DGTL:NMOS,8 BIT MICROPROCESSOR	TK00R	680008-8
A06U642	160-4536-00			MICROCKT,DGTL:STTL,LOGIC ARRAY,CLOCK GEN	TK0AD	PAL16L8A-4CN
A06U644	160-4537-00			MICROCKT,DGTL:STTL,LOGIC ARRAY,DTACK GEN	TK0AD	PAL16R4A-4CN
A06U646	160-4538-00			MICROCKT,DGTL:STTL,LOGIC ARRAY,DLY CNTR	TK0AD	PAL16R8A-4CN
A06U648	160-4539-00			MICROCKT,DGTL:STTL,LOGIC ARRAY,INTRPT,PRGM	TK0AD	PAL16L8A-4CN
A06U650	156-1111-02			MICROCKT,DGTL:OCTAL BUS XCVR W/3 STATE OUT	01295	SN74LS245N3
A06U652	156-1111-02			MICROCKT,DGTL:OCTAL BUS XCVR W/3 STATE OUT	01295	SN74LS245N3
A06U656	156-2392-00			MICROCKT,DGTL:CMOS,HEX SCHMITT TRIG INV	04713	MC74HC14ND
A06Y642	158-0252-00			XTAL UNIT,QTZ:15MHZ,0.01%,SERIES	00809	CODE 180
A06Y644	158-0268-00			XTAL UNIT,QTZ:10.227MHZ,20%,PAR	80009	158-0268-00
A07	671-0079-00			CIRCUIT BD ASSY:SERIAL/RS232C (OPTION 01 ONLY)	TK0191	ORDER BY DESCR
A07C700	281-0798-00			CAP,FXD,CER DI:51PF,1%,100V	04222	MA101A510GAA
A07C702	281-0798-00			CAP,FXD,CER DI:51PF,1%,100V	04222	MA101A510GAA
A07C706	281-0772-00			CAP,FXD,CER DI:4700PF,10%,100V	04222	MA201C472KAA
A07C708	281-0819-00			CAP,FXD,CER DI:33 PF,5%,50V	04222	GC105A330J
A07C710	283-0059-00			CAP,FXD,CER DI:1UF,+80-20%,50V	31433	C330C105M5R5CA
A07C712	281-0768-00			CAP,FXD,CER DI:470PF,20%,100V	04222	MA101A471MAA
A07C750	290-0995-00			CAP,FXD,ELCTLT:47UF,20%,16V	80009	290-0995-00
A07C752	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A07C754	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A07C756	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A07C758	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A07C760	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A07C762	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A07C764	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A07C766	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A07CR700	152-0323-03			SEMICOND DVC,DI:SW,SI,35V,0.1A	80009	152-0323-03
A07CR702	152-0323-03			SEMICOND DVC,DI:SW,SI,35V,0.1A	80009	152-0323-03
A07J700	131-2942-01			CONN,RCPT,ELEC:HEADER,ANGLE,2 X 13	80009	131-2942-01
A07J710	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ	22526	48283-029
A07J720	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL	22526	48283-036
A07J722	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL	22526	48283-036
A07J724	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL	22526	48283-036
A07P720	131-0993-00			BUS,CONDUCTOR:SHUNT ASSEMBLY,BLACK	22526	65474-005
A07P722	131-0993-00			BUS,CONDUCTOR:SHUNT ASSEMBLY,BLACK	22526	65474-005
A07P724	131-0993-00			BUS,CONDUCTOR:SHUNT ASSEMBLY,BLACK	22526	65474-005
A07R700	315-0106-00			RES,FXD,FILM:10M OHM,5%,0.25W	01121	CB1065
A07R702	315-0111-00			RES,FXD,FILM:110 OHM,5%,0.25W	57668	NTR25J-E110E
A07R704	315-0181-00			RES,FXD,FILM:180 OHM,5%,0.25W	57668	NTR25J-E180E
A07R706	315-0132-00			RES,FXD,FILM:1.3K OHM,5%,0.25W	57668	NTR25J-E01K3
A07R708	315-0392-00			RES,FXD,FILM:3.9K OHM,5%,0.25W	57668	NTR25J-E03K9
A07R710	315-0202-00			RES,FXD,FILM:2K OHM,5%,0.25W	57668	NTR25J-E 2K
A07R712	321-0481-04			RES,FXD,FILM:1M OHM,0.1%,0.125W,TC=T2	91637	CMF55116D10003B
A07R714	315-0474-00			RES,FXD,FILM:470K OHM,5%,0.25W	19701	5043CX470K0J92U
A07R716	311-1616-00			RES,VAR,NONWW:25K OHM,20%,0.5W	80009	311-1616-00

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A07R718	321-0289-03			RES,FXD,FILM:10.0K OHM,0.25%,0.125W,TC=T2	07716	CEAC10001C
A07R720	321-0603-07			RES,FXD,FILM:15K OHM,0.1%,0.125W,TC=T9	19701	5033RE15K00B
A07R722	315-0202-00			RES,FXD,FILM:2K OHM,5%,0.25W	57668	NTR25J-E 2K
A07R724	315-0202-00			RES,FXD,FILM:2K OHM,5%,0.25W	57668	NTR25J-E 2K
A07TP700	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A07TP710	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A07TP720	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A07TP730	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A07U700	156-1111-02			MICROCKT,DGTL:OCTAL BUS XCVR W/3 STATE OUT	01295	SN74LS245N3
A07U702	156-0541-02			MICROCKT,DGTL:DUAL 2-TO 4-LINE DCDR/DEMUX	04713	SN74LS139NDS
A07U704	156-1722-00			MICROCKT,DGTL:HEX INVERTER	04713	MC74F04ND
A07U706	156-0479-02			MICROCKT,DGTL:QUAD 2-INP OR GATE,SCRN	01295	SN74LS32NP3
A07U708	156-0391-02			MICROCKT,DGTL:HEX LATCH W/CLEAR,SCRN	01295	SN74LS174NP3
A07U710	156-0850-02			MICROCKT,DGTL:PRGM BIT RATE GEN,SCRN	34371	HD1-4702-9
A07U712	156-0388-03			MICROCKT,DGTL:DUAL D FLIP-FLOP,SCRN	01295	SN74LS74ANP3
A07U714	156-0391-02			MICROCKT,DGTL:HEX LATCH W/CLEAR,SCRN	01295	SN74LS174NP3
A07U716	156-0850-02			MICROCKT,DGTL:PRGM BIT RATE GEN,SCRN	34371	HD1-4702-9
A07U718	156-0383-02			MICROCKT,DGTL:QUAD 2-INP NOR GATE,SCRN,	18324	N74LS02NB
A07U720	156-0381-02			MICROCKT,DGTL:QUAD 2-INP EXCL OR GATE	07263	74LS86PCQR
A07U722	156-3085-00			MICROCKT,DGTL:UNIV SYNC/ASYNC R/T	TK0AF	MB89251A
A07U724	156-3085-00			MICROCKT,DGTL:UNIV SYNC/ASYNC R/T	TK0AF	MB89251A
A07U726	156-0878-02			MICROCKT,DGTL:TTL,QUAD RS232 LINE RCVR	80009	156-0878-02
A07U728	156-0878-02			MICROCKT,DGTL:TTL,QUAD RS232 LINE RCVR	80009	156-0878-02
A07U730	156-1373-01			MICROCKT,DGTL:QUAD BUS BFR GATES W/3 STATE OUT,SCREENED	27014	DM74LS125 NA+
A07U732	156-1126-00			MICROCKT,LINEAR:VOLTAGE COMPARATOR	01295	LM311P
A07U734	156-1156-01			MICROCKT,LINEAR:OPERATIONAL AMPL,SCREENED	80009	156-1156-01
A07U736	156-1126-00			MICROCKT,LINEAR:VOLTAGE COMPARATOR	01295	LM311P
A07Y700	158-0124-00			XTAL UNIT,QTZ:2.4576 MHZ,0.05%,PARALLEL	01807	Z9W
A08	670-7811-00			CIRCUIT BD ASSY:MOTHER	80009	670-7811-00
A08J001	131-3065-00			CONN,RCPT,ELEC:EDGECARD,50 FEMALE	80009	131-3065-00
A08J002	131-3065-00			CONN,RCPT,ELEC:EDGECARD,50 FEMALE	80009	131-3065-00
A08J003	131-3065-00			CONN,RCPT,ELEC:EDGECARD,50 FEMALE	80009	131-3065-00
A08J004	131-3065-00			CONN,RCPT,ELEC:EDGECARD,50 FEMALE	80009	131-3065-00
A08J005	131-3065-00			CONN,RCPT,ELEC:EDGECARD,50 FEMALE	80009	131-3065-00
A08J006	131-3065-00			CONN,RCPT,ELEC:EDGECARD,50 FEMALE	80009	131-3065-00
A08J007	131-3064-00			CONN,RCPT,ELEC:EDGECARD,25 FEMALE	80009	131-3064-00
A08J050	131-3062-00			CONN,RCPT,ELEC:CKT BD,5 MALE	80009	131-3062-00
A08J051	131-3063-00			CONN,RCPT,ELEC:CKT BD,10 MALE	80009	131-3063-00
A08J100	175-0049-00			CA ASSY,SP,ELEC:16,28 AWG,20CM	80009	175-0049-00
A09	260-2133-00			SWITCH PB ASSY:KEYBOARD	80009	260-2133-00
A09DS010	150-1057-00			LT EMITTING DIO:GREEN,20MA	80009	150-1057-00
A09J010	131-2230-01			CONN,RCPT,ELEC:HEADER,2 X 8,2.54 SPACING	80009	131-2230-01
A09R010	316-0331-00			RES,FXD,CMPSN:330 OHM,10%,0.25W	01121	CB3311
A09R020	316-0202-00			RES,FXD,CMPSN:2K OHM,10%,0.25W	80009	316-0202-00
A10	670-7810-01			CIRCUIT BD ASSY:CRT	80009	670-7810-01
A10C001	290-0536-00			CAP,FXD,ELCTLT:10UF,20%,25V TANTALUM	05397	T368B106M025AS
A10C005	290-0536-00			CAP,FXD,ELCTLT:10UF,20%,25V TANTALUM	05397	T368B106M025AS
A10C010	290-0512-00			CAP,FXD,ELCTLT:22UF,20%,15V	05397	T368B226M015AS
A10C015	290-0512-00			CAP,FXD,ELCTLT:22UF,20%,15V	05397	T368B226M015AS
A10C020	290-0536-00			CAP,FXD,ELCTLT:10UF,20%,25V TANTALUM	05397	T368B106M025AS
A10C030	290-0746-00			CAP,FXD,ELCTLT:47UF,+50-10%,16V	54473	ECE-A6V47L
A10C031	290-0991-00			CAP,FXD,ELCTLT:2200UF,+50-10%,16V	80009	290-0991-00
A10C040	290-0746-00			CAP,FXD,ELCTLT:47UF,+50-10%,16V	54473	ECE-A6V47L
A10C050	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A10C103	290-0861-00			CAP,FXD,ELCTLT:200UF,+30-10%,16V	80009	290-0861-00
A10C120	281-0814-00			CAP,FXD,CER DI:100 PF,10%,100V	04222	MA101A101KAA
A10C200	281-0809-00			CAP,FXD,CER DI:200 PF,5%,100V	04222	MA101A201JAA
A10C210	290-0854-00			CAP,FXD,ELCTLT:1UF,+75-10%,50V	80009	290-0854-00
A10C230	281-0774-00			CAP,FXD,CER DI:0.022MFD,20%,100V	04222	MA201E223MAA
A10C235	290-0992-00			CAP,FXD,ELCTLT:470UF,+50-10%,16V	80009	290-0992-00
A10C240	290-0957-00			CAP,FXD,ELCTLT:47UF,+85-40%,63V	80009	290-0957-00
A10C247	281-0773-00			CAP,FXD,CER DI:0.01UF,10%,100V	04222	MA201C103KAA
A10C250	283-0002-00			CAP,FXD,CER DI:0.01UF,+80-20%,500V	59821	D103Z40Z5ULADEG
A10C270	290-0861-00			CAP,FXD,ELCTLT:200UF,+30-10%,16V	80009	290-0861-00
A10C275	290-0861-00			CAP,FXD,ELCTLT:200UF,+30-10%,16V	80009	290-0861-00
A10C280	290-0861-00			CAP,FXD,ELCTLT:200UF,+30-10%,16V	80009	290-0861-00
A10C285	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A10C290	290-0862-00			CAP,FXD,ELCTLT:470UF,+30-10%,10V	80009	290-0862-00
A10CR220	152-0327-00			SEMICOND DVC,DI:SIG,SI	80009	152-0327-00
A10CR230	152-0414-00			SEMICOND DVC,DI:RECT,SI,200V,1.0A,TEK A59	04713	SR2069RL
A10CR240	152-0776-00			SEMICOND DVC,DI:RECT,SI,600V 800MA	80009	152-0776-00
A10CR250	152-0776-00			SEMICOND DVC,DI:RECT,SI,600V 800MA	80009	152-0776-00
A10GD001	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A10L116	108-1064-00			COIL,RF:FIXED,68UH	80009	108-1064-00
A10L140	108-1667-00			COIL,RF:FIXED,68UF	80009	108-1667-00
A10L150	119-1059-00			COIL,TUBE DEFL:FIXED,DEFLECTION YOKE	80009	119-1059-00
A10Q100	151-0702-01			TRANSISTOR:NPN,SI,TO-126	80009	151-0702-01
A10Q110	151-0702-01			TRANSISTOR:NPN,SI,TO-126	80009	151-0702-01
A10Q120	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A10Q200	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A10Q220	151-0601-00			TRANSISTOR:NPN,SI	80009	151-0601-00
A10R001	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A10R002	315-0302-00			RES,FXD,FILM:3K OHM,5%,0.25W	57668	NTR25J-E03K0
A10R005	315-0433-00			RES,FXD,FILM:43K OHM,5%,0.25W	19701	5043CX43K00J
A10R010	315-0682-00			RES,FXD,FILM:6.8K OHM,5%,0.25W	57668	NTR25J-E06K8
A10R015	311-1613-00			RES,VAR,NONWW:20K OHM,20%,0.5W	80009	311-1613-00
A10R030	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A10R031	311-1614-00			RES,VAR,NONWW:1K OHM,20%,0.5W	80009	311-1614-00
A10R032	315-0331-00			RES,FXD,FILM:330 OHM,5%,0.25W	57668	NTR25J-E330E
A10R033	311-1614-00			RES,VAR,NONWW:1K OHM,20%,0.5W	80009	311-1614-00
A10R034	315-0331-00			RES,FXD,FILM:330 OHM,5%,0.25W	57668	NTR25J-E330E
A10R035	307-0053-00			RES,FXD,CMPSN:3.3 OHM,5%,0.5W	01121	EB33G5
A10R100	315-0681-00			RES,FXD,FILM:680 OHM,5%,0.25W	57668	NTR25J-E680E
A10R105	315-0362-00			RES,FXD,FILM:3.6K OHM,5%,0.25W	19701	5043CX3K600J
A10R110	315-0751-00			RES,FXD,FILM:750 OHM,5%,0.25W	57668	NTR25J-E750E
A10R112	301-0122-00			RES,FXD,FILM:1.2K OHM,5%,0.5W	57668	TR50J-E 1K2
A10R116	301-0122-00			RES,FXD,FILM:1.2K OHM,5%,0.5W	57668	TR50J-E 1K2
A10R120	315-0183-00			RES,FXD,FILM:18K OHM,5%,0.25W	19701	5043CX18K00J
A10R122	315-0202-00			RES,FXD,FILM:2K OHM,5%,0.25W	57668	NTR25J-E 2K
A10R124	315-0472-00			RES,FXD,FILM:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
A10R130	315-0362-00			RES,FXD,FILM:3.6K OHM,5%,0.25W	19701	5043CX3K600J
A10R135	315-0132-00			RES,FXD,FILM:1.3K OHM,5%,0.25W	57668	NTR25J-E01K3
A10R140	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A10R200	315-0472-00			RES,FXD,FILM:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
A10R202	315-0242-00			RES,FXD,FILM:2.4K OHM,5%,0.25W	57668	NTR25J-E02K4
A10R210	315-0271-00			RES,FXD,FILM:270 OHM,5%,0.25W	57668	NTR25J-E270E
A10R240	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A10R245	311-1619-00			RES,VAR,NONWW:100K OHM,20%,0.5W	80009	311-1619-00
A10R247	311-1618-00			RES,VAR,NONWW:500K OHM,20%,0.5W	80009	311-1618-00
A10R250	315-0303-00			RES,FXD,FILM:30K OHM,5%,0.25W	19701	5043CX30K00J
A10R253	315-0105-00			RES,FXD,FILM:1M OHM,5%,0.25W	19701	5043CX1M000J
A10R255	311-1617-00			RES,VAR,NONWW:2M OHM,20%,0.5W	80009	311-1617-00

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A10R280	307-0023-00			RES,FXD,CMPSN:4.7 OHM,10%,0.5W	01121	EB47G1
A10T230	120-1205-00			TRANSFORMER,RF:FLYBACK	80009	120-1205-00
A10TP140	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A10TP145	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A10U001	156-1779-00			MICROCKT,LINEAR:V OSC & DRIVE	80009	156-1779-00
A10U280	156-1224-00			MICROCKT,LINEAR:3 TERM POS VOLTAGE REG	80009	156-1224-00
A11	670-7821-01			CIRCUIT BD ASSY:INVERTER	80009	670-7821-01
A11C102	285-1286-00			CAP,FXD,PLASTIC:0.47UF,20%,250V	80009	285-1286-00
A11C105	285-1330-00			CAP,FXD,PLASTIC:0.0033UF,20%,250V	80009	285-1330-00
A11C106	285-1330-00			CAP,FXD,PLASTIC:0.0033UF,20%,250V	80009	285-1330-00
A11C121	290-0998-00			CAP,FXD,ELCTLT:330UF,20%,200V	80009	290-0998-00
A11C122	290-0998-00			CAP,FXD,ELCTLT:330UF,20%,200V	80009	290-0998-00
A11C123	283-0496-00			CAP,FXD,CER DI:330PF,10%,1KV	80009	283-0496-00
A11C124	285-1263-00			CAP,FXD,MTLZD:0.01UF,10%,630V	80009	285-1263-00
A11C132	285-1264-00			CAP,FXD,MTLZD:0.22UF,10%,63V	80009	285-1264-00
A11C143	285-1265-00			CAP,FXD,PLASTIC:0.033UF,10%,50V	80009	285-1265-00
A11C147	285-1266-00			CAP,FXD,MTLZD:0.1UF,10%,250V	80009	285-1266-00
A11C150	283-0494-00			CAP,FXD,CER DI:470PF,10%,1KV	80009	283-0494-00
A11C151	285-1269-00			CAP,FXD,PLASTIC:0.01UF,10%,250V	80009	285-1269-00
A11C152	285-1269-00			CAP,FXD,PLASTIC:0.01UF,10%,250V	80009	285-1269-00
A11C153	285-1270-00			CAP,FXD,PLASTIC:0.0047UF,10%,250V	80009	285-1270-00
A11C154	285-1268-00			CAP,FXD,PLASTIC:0.0022UF,10%,250V	80009	285-1268-00
A11C155	290-1001-00			CAP,FXD,ELCTLT:100UF,20%,35V	80009	290-1001-00
A11C156	285-1277-00			CAP,FXD,PLASTIC:0.0033UF,10%,250V	80009	285-1277-00
A11CR101	152-0605-00			SEMICOND DVC,DI:RECT,SI,600V,4A,DO-32	80009	152-0605-00
A11CR123	152-0603-00			SEMICOND DVC,DI:RECT,SI,1KV,1A,D041	80009	152-0603-00
A11CR125	152-0603-00			SEMICOND DVC,DI:RECT,SI,1KV,1A,D041	80009	152-0603-00
A11CR135	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A11CR136	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A11CR137	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A11CR138	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A11CR142	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A11CR145	152-0603-00			SEMICOND DVC,DI:RECT,SI,1KV,1A,D041	80009	152-0603-00
A11CR146	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A11CR147	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A11CR148	152-0586-02			SEMICOND DVC,DI:RECT,SI,600V,0.5A	80009	152-0586-02
A11CR149	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A11CR151	152-0815-00			SEMICOND DVC,DI:SCHOTTKY,SI,40V,16A	80009	152-0815-00
A11CR152	152-0815-00			SEMICOND DVC,DI:SCHOTTKY,SI,40V,16A	80009	152-0815-00
A11CR153	152-0815-00			SEMICOND DVC,DI:SCHOTTKY,SI,40V,16A	80009	152-0815-00
A11CR154	152-0604-00			SEMICOND DVC,DI:RECT,SI,140V,8A,TO-220	80009	152-0604-00
A11CR155	152-0586-02			SEMICOND DVC,DI:RECT,SI,600V,0.5A	80009	152-0586-02
A11CR156	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A11E123	276-0015-00			CORE,EM:FERRITE	80009	276-0015-00
A11E124	276-0015-00			CORE,EM:FERRITE	80009	276-0015-00
A11J004	131-2988-00			CONN,RCPT,ELEC:2,MALE,CONTACT	80009	131-2988-00
A11J005	131-2988-00			CONN,RCPT,ELEC:2,MALE,CONTACT	80009	131-2988-00
A11J008	131-2983-00			CONN,RCPT,ELEC:CONTACT,8 MALE	80009	131-2983-00
A11J010	131-2983-00			CONN,RCPT,ELEC:CONTACT,8 MALE	80009	131-2983-00
A11J011	131-2988-00			CONN,RCPT,ELEC:2,MALE,CONTACT	80009	131-2988-00
A11L102	108-1264-00			COIL,RF:72UH (SF-T8-50S)	80009	108-1264-00
A11L103	108-1264-00			COIL,RF:72UH (SF-T8-50S)	80009	108-1264-00
A11PS001	620-0315-00			POWER SUPPLY:	80009	620-0315-00
A11Q131	151-0769-00			TRANSISTOR:NPN,SI,TO-220AB	80009	151-0769-00
A11Q134	151-0767-00			TRANSISTOR:PNP,SI,TO-92	80009	151-0767-00
A11Q135	151-0764-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0764-00

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A11Q139	151-0765-00			TRANSISTOR:NPN,SI,TO-92MOD	80009	151-0765-00
A11Q140	151-0764-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0764-00
A11Q141	151-0764-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0764-00
A11Q149	151-0766-00			TRANSISTOR:NPN,SI,TO-3P	80009	151-0766-00
A11R101	301-0105-00			RES,FXD,FILM:1M OHM,5%,0.50W	19701	5053CX1M000J
A11R121	301-0224-00			RES,FXD,FILM:220K OHM,5%,0.5W	01121	EB2245
A11R122	301-0224-00			RES,FXD,FILM:220K OHM,5%,0.5W	01121	EB2245
A11R124	305-0104-01			RES,FXD,CMPSN:100K OHM,5%,2W	80009	305-0104-01
A11R131	301-0684-00			RES,FXD,FILM:680K OHM,5%,0.50W	01121	EB6845
A11R132	322-1607-00			RES,FXD,FILM:6.2K OHM,1%,0.25W	80009	322-1607-00
A11R134	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A11R135	315-0472-00			RES,FXD,FILM:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
A11R137	315-0271-00			RES,FXD,FILM:270 OHM,5%,0.25W	57668	NTR25J-E270E
A11R138	315-0332-00			RES,FXD,FILM:3.3K OHM,5%,0.25W	57668	NTR25J-E03K3
A11R139	315-0561-00			RES,FXD,FILM:560 OHM,5%,0.25W	19701	5043CX560R0J
A11R140	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A11R141	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A11R142	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A11R143	315-0682-00			RES,FXD,FILM:6.8K OHM,5%,0.25W	57668	NTR25J-E06K8
A11R145	301-0100-00			RES,FXD,FILM:10 OHM,5%,0.50W	01121	EB1005
A11R147	307-0040-00			RES,FXD,CMPSN:4.7 OHM,5%,1W	80009	307-0040-00
A11R149	303-0220-00			RES,FXD,CMPSN:22 OHM,5%,1W	01121	GB2205
A11R151	301-0100-00			RES,FXD,FILM:10 OHM,5%,0.50W	01121	EB1005
A11R152	301-0100-00			RES,FXD,FILM:10 OHM,5%,0.50W	01121	EB1005
A11R154	301-0100-00			RES,FXD,FILM:10 OHM,5%,0.50W	01121	EB1005
A11RT101	307-0917-00			RES,THERMAL:5 OHM,20%	80009	307-0917-00
A11RT102	307-0917-00			RES,THERMAL:5 OHM,20%	80009	307-0917-00
A11S002	260-1967-00			SWITCH,SLIDE:DPDT 5A/250V 10A/125V MKD	TK0935	4021.0512
A11S003	260-0638-00			SWITCH,THRMSTC:NC,OPEN 75,CL 55,10A,240V	14859	20700 LA506-2042
A11T101	120-1625-00			TRANSFORMER:COMMON MODE	80009	120-1625-00
A11T102	120-1625-00			TRANSFORMER:COMMON MODE	80009	120-1625-00
A11T120	120-1500-00			TRANSFORMER,RF:CONVERTER	80009	120-1500-00
A11T140	120-1501-00			TRANSFORMER,RF:BASE DRIVER	80009	120-1501-00
A11VR101	119-0181-02			ARSR,ELEC SURGE:230V,15%	80009	119-0181-02
A11VR102	119-0181-02			ARSR,ELEC SURGE:230V,15%	80009	119-0181-02
A11VR131	152-0816-00			SEMICOND DVC,DI:ZEN,SI,12V,5%,0.5W	80009	152-0816-00
A11VR135	152-0817-00			SEMICOND DVC,DI:ZEN,SI,15V,5%,0.5W	80009	152-0817-00
A11VR138	152-0821-00			SEMICOND DVC,DI:ZEN,SI,6.8V,5%,0.5W	80009	152-0821-00
A11VR149	152-0818-00			SEMICOND DVC,DI:ZEN,SI,3.9V,5%,0.5W	80009	152-0818-00
A12	670-7820-00			CIRCUIT BD ASSY:REGULATOR	80009	670-7820-00
A12C003	285-1269-00			CAP,FXD,PLASTIC:0.01UF,10%,250V	80009	285-1269-00
A12C004	290-0999-00			CAP,FXD,ELCTLT:2200UF,20%,10V	80009	290-0999-00
A12C005	290-1000-00			CAP,FXD,ELCTLT:330UF,20%,10V	80009	290-1000-00
A12C006	285-1267-00			CAP,FXD,MTLZD:1UF,10%,100V	80009	285-1267-00
A12C007	285-1267-00			CAP,FXD,MTLZD:1UF,10%,100V	80009	285-1267-00
A12C009	285-1274-00			CAP,FXD,PLASTIC:0.01UF,10%,50V	80009	285-1274-00
A12C012	283-0497-00			CAP,FXD,CER DI:0.047UF,20%,25V	80009	283-0497-00
A12C017	285-1274-00			CAP,FXD,PLASTIC:0.01UF,10%,50V	80009	285-1274-00
A12C022	285-1267-00			CAP,FXD,MTLZD:1UF,10%,100V	80009	285-1267-00
A12C028	285-1271-00			CAP,FXD,PLASTIC:0.001UF,1%,100V	80009	285-1271-00
A12C029	283-0497-00			CAP,FXD,CER DI:0.047UF,20%,25V	80009	283-0497-00
A12C036	290-1001-00			CAP,FXD,ELCTLT:100UF,20%,35V	80009	290-1001-00
A12C050	283-0497-00			CAP,FXD,CER DI:0.047UF,20%,25V	80009	283-0497-00
A12C051	283-0497-00			CAP,FXD,CER DI:0.047UF,20%,25V	80009	283-0497-00
A12C053	290-1002-00			CAP,FXD,ELCTLT:330UF,20%,16V	80009	290-1002-00
A12C058	290-1003-00			CAP,FXD,ELCTLT:33UF,20%,35V	80009	290-1003-00

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A12C065	290-1004-00			CAP,FXD,ELCTLT:330UF,20%,25V	80009	290-1004-00
A12C066	290-1005-00			CAP,FXD,ELCTLT:100UF,20%,25V	80009	290-1005-00
A12C067	283-0498-00			CAP,FXD,CER DI:100PF,5%,50V	80009	283-0498-00
A12C069	283-0497-00			CAP,FXD,CER DI:0.047UF,20%,25V	80009	283-0497-00
A12C070	285-1275-00			CAP,FXD,PLASTIC:0.015UF,10%,50V	80009	285-1275-00
A12C071	283-0497-00			CAP,FXD,CER DI:0.047UF,20%,25V	80009	283-0497-00
A12C072	285-1276-00			CAP,FXD,PLASTIC:0.0015UF,10%,50V	80009	285-1276-00
A12C073	283-0497-00			CAP,FXD,CER DI:0.047UF,20%,25V	80009	283-0497-00
A12C074	290-1000-00			CAP,FXD,ELCTLT:330UF,20%,10V	80009	290-1000-00
A12C075	290-1000-00			CAP,FXD,ELCTLT:330UF,20%,10V	80009	290-1000-00
A12C076	285-1267-00			CAP,FXD,MTLZD:1UF,10%,100V	80009	285-1267-00
A12C077	285-1267-00			CAP,FXD,MTLZD:1UF,10%,100V	80009	285-1267-00
A12C078	283-0499-00			CAP,FXD,CER DI:220PF,10%,1KV	80009	283-0499-00
A12C081	283-0499-00			CAP,FXD,CER DI:220PF,10%,1KV	80009	283-0499-00
A12C082	290-0999-00			CAP,FXD,ELCTLT:2200UF,20%,10V	80009	290-0999-00
A12C083	290-0999-00			CAP,FXD,ELCTLT:2200UF,20%,10V	80009	290-0999-00
A12C084	290-0999-00			CAP,FXD,ELCTLT:2200UF,20%,10V	80009	290-0999-00
A12C085	290-0999-00			CAP,FXD,ELCTLT:2200UF,20%,10V	80009	290-0999-00
A12C086	290-0999-00			CAP,FXD,ELCTLT:2200UF,20%,10V	80009	290-0999-00
A12C087	285-1267-00			CAP,FXD,MTLZD:1UF,10%,100V	80009	285-1267-00
A12C088	285-1267-00			CAP,FXD,MTLZD:1UF,10%,100V	80009	285-1267-00
A12C089	285-1267-00			CAP,FXD,MTLZD:1UF,10%,100V	80009	285-1267-00
A12C090	285-1267-00			CAP,FXD,MTLZD:1UF,10%,100V	80009	285-1267-00
A12C091	290-1005-00			CAP,FXD,ELCTLT:100UF,20%,25V	80009	290-1005-00
A12C092	290-1005-00			CAP,FXD,ELCTLT:100UF,20%,25V	80009	290-1005-00
A12C093	290-1005-00			CAP,FXD,ELCTLT:100UF,20%,25V	80009	290-1005-00
A12C094	290-1005-00			CAP,FXD,ELCTLT:100UF,20%,25V	80009	290-1005-00
A12C095	285-1267-00			CAP,FXD,MTLZD:1UF,10%,100V	80009	285-1267-00
A12C096	285-1267-00			CAP,FXD,MTLZD:1UF,10%,100V	80009	285-1267-00
A12C097	285-1267-00			CAP,FXD,MTLZD:1UF,10%,100V	80009	285-1267-00
A12C098	285-1267-00			CAP,FXD,MTLZD:1UF,10%,100V	80009	285-1267-00
A12C099	285-1267-00			CAP,FXD,MTLZD:1UF,10%,100V	80009	285-1267-00
A12CR001	152-0066-04			SEMICOND DVC,DI:RECT,SI,400V,1A	80009	152-0066-04
A12CR002	152-0815-00			SEMICOND DVC,DI:SCHOTTKY,SI,40V,16A	80009	152-0815-00
A12CR005	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A12CR006	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A12CR007	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A12CR034	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A12CR035	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A12CR036	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A12CR044	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A12CR045	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A12CR046	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A12CR049	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A12CR053	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A12CR054	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A12CR061	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A12CR062	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A12CR063	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A12CR064	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A12CR065	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A12CR066	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A12CR071	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A12CR072	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A12CR073	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A12CR074	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A12CR075	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03
A12CR076	152-0333-03			SEMICOND DVC,DI:SIG,SI,50V,200MA	80009	152-0333-03

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A12CR091	152-0586-02			SEMICOND DVC,DI:RECT,SI,600V,0.5A	80009	152-0586-02
A12CR092	152-0586-02			SEMICOND DVC,DI:RECT,SI,600V,0.5A	80009	152-0586-02
A12FL001	119-0420-03			FILTER,RFI:3A,250VAC,400HZ	80009	119-0420-03
A12J001	131-2984-00			CONN,RCPT,ELEC:CONTACT,15 MALE	80009	131-2984-00
A12J002	131-2988-00			CONN,RCPT,ELEC:2,MALE,CONTACT	80009	131-2988-00
A12J003	131-2988-00			CONN,RCPT,ELEC:2,MALE,CONTACT	80009	131-2988-00
A12J006	131-2989-00			CONN,RCPT,ELEC:2,MALE,CONTACT	80009	131-2989-00
A12J007	131-2983-00			CONN,RCPT,ELEC:CONTACT,8 MALE	80009	131-2983-00
A12J009	131-2983-00			CONN,RCPT,ELEC:CONTACT,8 MALE	80009	131-2983-00
A12L001	108-1181-00			COIL,RF:FXD,330UH	80009	108-1181-00
A12L002	108-1182-00			COIL,RF:FXD,6UH	80009	108-1182-00
A12L071	108-1182-00			COIL,RF:FXD,6UH	80009	108-1182-00
A12L082	108-1182-00			COIL,RF:FXD,6UH	80009	108-1182-00
A12L083	108-1183-00			COIL,RF:FXD,3.3UH	80009	108-1183-00
A12Q001	151-0738-00			TRANSISTOR:NPN,SI,TO-3P	80009	151-0738-00
A12Q005	151-0765-00			TRANSISTOR:NPN,SI,TO-92MOD	80009	151-0765-00
A12Q032	151-0764-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0764-00
A12Q033	151-0764-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0764-00
A12Q034	151-0765-00			TRANSISTOR:NPN,SI,TO-92MOD	80009	151-0765-00
A12Q035	151-0764-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0764-00
A12Q036	151-0768-00			TRANSISTOR:NPN,SI,TO-220AB	80009	151-0768-00
A12Q057	151-0764-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0764-00
A12Q058	151-0764-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0764-00
A12Q059	151-0764-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0764-00
A12Q065	151-0635-00			TRANSISTOR:PNP,SI,TO-3P	80009	151-0635-00
A12Q071	151-0764-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0764-00
A12Q072	151-0765-00			TRANSISTOR:NPN,SI,TO-92MOD	80009	151-0765-00
A12Q073	151-0735-00			TRANSISTOR:NPN,SI,TO-3P	80009	151-0735-00
A12R001	301-0220-00			RES,FXD,FILM:22 OHM,5%,0.5W	19701	5053CX22R00J
A12R002	307-0053-00			RES,FXD,CMPSN:3.3 OHM,5%,0.5W	01121	EB33G5
A12R003	301-0100-00			RES,FXD,FILM:10 OHM,5%,0.50W	01121	EB1005
A12R004	308-0849-00			RES,FXD,WW:30M OHM,10%,2W	80009	308-0849-00
A12R005	315-0122-00			RES,FXD,FILM:1.2K OHM,5%,0.25W	57668	NTR25J-E01K2
A12R006	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A12R007	321-0097-00			RES,FXD,FILM:100 OHM,1%,0.125W,TC=T0	91637	CMF55116G100ROF
A12R008	315-0820-00			RES,FXD,FILM:82 OHM,5%,0.25W	57668	NTR25J-E82E0
A12R009	315-0222-00			RES,FXD,FILM:2.2K OHM,5%,0.25W	57668	NTR25J-E02K2
A12R010	315-0122-00			RES,FXD,FILM:1.2K OHM,5%,0.25W	57668	NTR25J-E01K2
A12R011	311-1611-00			RES,VAR,NONWW:TRMR,2K OHM,20%,0.5W	80009	311-1611-00
A12R012	315-0473-00			RES,FXD,FILM:47K OHM,5%,0.25W	57668	NTR25J-E47K0
A12R013	315-0222-00			RES,FXD,FILM:2.2K OHM,5%,0.25W	57668	NTR25J-E02K2
A12R014	315-0104-00			RES,FXD,FILM:100K OHM,5%,0.25W	57668	NTR25J-E100K
A12R015	322-0472-01			RES,FXD,FILM:4.7K OHM,1%,0.25W,TC=T0	80009	322-0472-01
A12R016	315-0222-00			RES,FXD,FILM:2.2K OHM,5%,0.25W	57668	NTR25J-E02K2
A12R017	315-0562-00			RES,FXD,FILM:5.6K OHM,5%,0.25W	57668	NTR25J-E05K6
A12R018	311-1611-00			RES,VAR,NONWW:TRMR,2K OHM,20%,0.5W	80009	311-1611-00
A12R019	315-0473-00			RES,FXD,FILM:47K OHM,5%,0.25W	57668	NTR25J-E47K0
A12R020	315-0222-00			RES,FXD,FILM:2.2K OHM,5%,0.25W	57668	NTR25J-E02K2
A12R021	315-0222-00			RES,FXD,FILM:2.2K OHM,5%,0.25W	57668	NTR25J-E02K2
A12R022	322-1615-00			RES,FXD,FILM:22K OHM,1%,0.25W	80009	322-1615-00
A12R023	315-0222-00			RES,FXD,FILM:2.2K OHM,5%,0.25W	57668	NTR25J-E02K2
A12R024	315-0104-00			RES,FXD,FILM:100K OHM,5%,0.25W	57668	NTR25J-E100K
A12R025	322-0472-01			RES,FXD,FILM:4.7K OHM,1%,0.25W,TC=T0	80009	322-0472-01
A12R026	315-0470-00			RES,FXD,FILM:47 OHM,5%,0.25W	57668	NTR25J-E47E0
A12R027	322-1614-00			RES,FXD,FILM:51 OHM,1%,0.25W	80009	322-1614-00
A12R028	322-1615-00			RES,FXD,FILM:22K OHM,1%,0.25W	80009	322-1615-00
A12R029	322-0289-01			RES,FXD,FILM:10K OHM,1%,0.25W,TC=T0	80009	322-0289-01
A12R030	315-0472-00			RES,FXD,FILM:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A12R031	315-0472-00			RES,FXD,FILM:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
A12R032	315-0272-00			RES,FXD,FILM:2.7K OHM,5%,0.25W	57668	NTR25J-E02K7
A12R033	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A12R034	315-0681-00			RES,FXD,FILM:680 OHM,5%,0.25W	57668	NTR25J-E680E
A12R035	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A12R036	315-0471-00			RES,FXD,FILM:470 OHM,5%,0.25W	57668	NTR25J-E470E
A12R037	307-0915-00			RES NTWK,FXD,FI:4,3.3K OHM,5%,0.125W EACH	80009	307-0915-00
A12R038	307-0915-00			RES NTWK,FXD,FI:4,3.3K OHM,5%,0.125W EACH	80009	307-0915-00
A12R039	307-0915-00			RES NTWK,FXD,FI:4,3.3K OHM,5%,0.125W EACH	80009	307-0915-00
A12R040	322-0293-01			RES,FXD,FILM:11K OHM,1%,25W,TC=T0	80009	322-0293-01
A12R041	322-1613-00			RES,FXD,FILM:9.1K OHM,1%,0.25W	80009	322-1613-00
A12R042	322-1615-00			RES,FXD,FILM:22K OHM,1%,0.25W	80009	322-1615-00
A12R043	322-1612-00			RES,FXD,FILM:24K OHM,1%,0.25W	80009	322-1612-00
A12R044	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A12R045	322-1611-00			RES,FXD,FILM:13K OHM,1%,0.25W	80009	322-1611-00
A12R046	322-0289-01			RES,FXD,FILM:10K OHM,1%,0.25W,TC=T0	80009	322-0289-01
A12R047	322-0289-01			RES,FXD,FILM:10K OHM,1%,0.25W,TC=T0	80009	322-0289-01
A12R048	322-0289-01			RES,FXD,FILM:10K OHM,1%,0.25W,TC=T0	80009	322-0289-01
A12R049	322-1611-00			RES,FXD,FILM:13K OHM,1%,0.25W	80009	322-1611-00
A12R050	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A12R051	322-1610-00			RES,FXD,FILM:2.2K OHM,1%,0.25W	80009	322-1610-00
A12R052	322-1610-00			RES,FXD,FILM:2.2K OHM,1%,0.25W	80009	322-1610-00
A12R053	315-0331-00			RES,FXD,FILM:330 OHM,5%,0.25W	57668	NTR25J-E330E
A12R054	315-0393-00			RES,FXD,FILM:39K OHM,5%,0.25W	57668	NTR25J-E39K0
A12R055	315-0472-00			RES,FXD,FILM:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
A12R056	315-0472-00			RES,FXD,FILM:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
A12R057	315-0682-00			RES,FXD,FILM:6.8K OHM,5%,0.25W	57668	NTR25J-E06K8
A12R058	315-0273-00			RES,FXD,FILM:27K OHM,5%,0.25W	57668	NTR25J-E27K0
A12R059	315-0683-00			RES,FXD,FILM:68K OHM,5%,0.25W	57668	NTR25J-E68K0
A12R060	315-0183-00			RES,FXD,FILM:18K OHM,5%,0.25W	19701	5043CX18K00J
A12R061	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A12R062	307-0916-00			RES NTWK,FXD,FI:4,4.7K OHM,5%,0.125W EACH	80009	307-0916-00
A12R063	301-0221-00			RES,FXD,FILM:220 OHM,5%,0.5W	19701	5053CX220R0J
A12R064	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A12R065	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A12R066	322-1608-00			RES,FXD,FILM:680 OHM,1%,0.25W	80009	322-1608-00
A12R067	321-0114-00			RES,FXD,FILM:150 OHM,1%,0.125 W,TC=T0	19701	5033ED150R0F
A12R068	322-1609-00			RES,FXD,FILM:4.3K OHM,1%,0.25W	80009	322-1609-00
A12R069	315-0471-00			RES,FXD,FILM:470 OHM,5%,0.25W	57668	NTR25J-E470E
A12R070	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A12R071	315-0822-00			RES,FXD,FILM:8.2K OHM,5%,0.25W	19701	5043CX8K200J
A12R072	311-1611-00			RES,VAR,NONWW:TRMR,2K OHM,20%,0.5W	80009	311-1611-00
A12R073	315-0122-00			RES,FXD,FILM:1.2K OHM,5%,0.25W	57668	NTR25J-E01K2
A12R074	315-0472-00			RES,FXD,FILM:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
A12R075	315-0222-00			RES,FXD,FILM:2.2K OHM,5%,0.25W	57668	NTR25J-E02K2
A12R076	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A12R077	315-0100-00			RES,FXD,FILM:10 OHM,5%,0.25W	19701	5043CX10RR00J
A12R078	315-0472-00			RES,FXD,FILM:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
A12R079	315-0820-00			RES,FXD,FILM:82 OHM,5%,0.25W	57668	NTR25J-E82E0
A12R080	325-0392-00			RES,FXD,FILM:0.56 OHM,5%,1W	80009	325-0392-00
A12R081	325-0392-00			RES,FXD,FILM:0.56 OHM,5%,1W	80009	325-0392-00
A12R082	315-0680-00			RES,FXD,FILM:68 OHM,5%,0.25W	57668	NTR25J-E68E0
A12R083	315-0222-00			RES,FXD,FILM:2.2K OHM,5%,0.25W	57668	NTR25J-E02K2
A12R084	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A12R085	308-0848-00			RES,FXD,WW:7M OHM,10%	80009	308-0848-00
A12R086	308-0848-00			RES,FXD,WW:7M OHM,10%	80009	308-0848-00
A12R087	315-0470-00			RES,FXD,FILM:47 OHM,5%,0.25W	57668	NTR25J-E47E0
A12R088	315-0121-00			RES,FXD,FILM:120 OHM,5%,0.25W	19701	5043CX120R0J

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A12R091	307-0659-00			RES,FXD,FILM:2.2 OHM,5%,0.25W	19701	5043CX2R200J
A12R092	307-0659-00			RES,FXD,FILM:2.2 OHM,5%,0.25W	19701	5043CX2R200J
A12R093	315-0222-00			RES,FXD,FILM:2.2K OHM,5%,0.25W	57668	NTR25J-E02K2
A12R094	315-0222-00			RES,FXD,FILM:2.2K OHM,5%,0.25W	57668	NTR25J-E02K2
A12RT065	307-0918-00			RES THERMAL:2.5K OHM,10%,5V	80009	307-0918-00
A12S001	260-1849-00			SWITCH,PUSH:DPDT,4A,250VAC	31918	NE15/F2U103EE
A12T001	120-1498-00			TRANSFORMER,RF:BASE DRIVER	80009	120-1498-00
A12T081	120-1499-00			TRANSFORMER,RF:REGULATOR	80009	120-1499-00
A12TP001	131-3066-00			TERMINAL,PIN:12.6MM L X 0.64MM SQ,BRASS	80009	131-3066-00
A12TP002	131-3066-00			TERMINAL,PIN:12.6MM L X 0.64MM SQ,BRASS	80009	131-3066-00
A12TP003	131-3066-00			TERMINAL,PIN:12.6MM L X 0.64MM SQ,BRASS	80009	131-3066-00
A12U001	156-1848-00			MICROCKT,LINEAR:PWR SPLY,SW RGLTR CONT	80009	156-1848-00
A12U021	156-1848-00			MICROCKT,LINEAR:PWR SPLY,SW RGLTR CONT	80009	156-1848-00
A12U041	156-1631-00			MICROCKT,LINEAR:ADJUSTABLE SHUNT REGULATOR	01295	TL431C-LP
A12U042	156-1631-00			MICROCKT,LINEAR:ADJUSTABLE SHUNT REGULATOR	01295	TL431C-LP
A12U051	156-1847-00			MICROCKT,LINEAR:QUAD OPERATIONAL AMP	80009	156-1847-00
A12U052	156-1631-00			MICROCKT,LINEAR:ADJUSTABLE SHUNT REGULATOR	01295	TL431C-LP
A12U065	156-1846-00			MICROCKT,LINEAR:VOLTAGE REGULATOR	80009	156-1846-00
A12U071	156-1846-00			MICROCKT,LINEAR:VOLTAGE REGULATOR	80009	156-1846-00
A12U091	156-1160-02			MICROCKT,LINEAR:VOLTAGE REGULATOR	80009	156-1160-02
A12U092	156-1160-02			MICROCKT,LINEAR:VOLTAGE REGULATOR	80009	156-1160-02
A12VR032	152-0127-02			SEMICOND DVC,DI:ZEN,SI,7.5V,5%,0.5W	80009	152-0127-02
A12VR036	152-0055-02			SEMICOND DVC,DI:ZEN,SI,11V,5%,0.5W,RD11EB2	80009	152-0055-02
A12VR037	152-0724-01			SEMICOND DVC,DI:ZEN,SI,4.7V,5%,0.5W	80009	152-0724-01
A12VR038	152-0819-00			SEMICOND DVC,DI:ZEN,SI,2.7V,5%,0.5W	80009	152-0819-00
A12VR039	152-0816-00			SEMICOND DVC,DI:ZEN,SI,12V,5%,0.5W	80009	152-0816-00
A12VR040	152-0217-01			SEMICOND DVC,DI:ZEN,SI,8.2V,5%,0.5W	80009	152-0217-01
A12VR041	152-0821-00			SEMICOND DVC,DI:ZEN,SI,6.8V,5%,0.5W	80009	152-0821-00
A12VR042	152-0724-01			SEMICOND DVC,DI:ZEN,SI,4.7V,5%,0.5W	80009	152-0724-01
A12VR043	152-0820-00			SEMICOND DVC,DI:ZEN,SI,13V,5%,0.5W	80009	152-0820-00
A12VR044	152-0175-02			SEMICOND DVC,DI:ZEN,SI,5.6V,5%,0.5W	80009	152-0175-02
A12VR045	152-0822-00			SEMICOND DVC,DI:ZEN,SI,18V,5%,0.5W	80009	152-0822-00
A12VR046	152-0306-02			SEMICOND DVC,DI:ZEN,SI,9.1V,5%,0.5W	80009	152-0306-02
A12VR058	152-0823-00			SEMICOND DVC,DI:ZEN,SI,6.2V,5%,0.5W	80009	152-0823-00
A12VR068	152-0127-02			SEMICOND DVC,DI:ZEN,SI,7.5V,5%,0.5W	80009	152-0127-02
				CHASSIS PARTS		
B001	119-1648-01			FAN,TUBEAXIAL:12VDC,3-8W,53300 RPM	80009	119-1648-01
F1	159-0032-00			FUSE,CARTRIDGE:3AG,0.5A,250V,SLOW BLOW	71400	MDL 1/2
L150	119-1059-00			COIL,TUBE DEFL:FIXED,DEFLECTION YOKE	80009	119-1059-00
S2	260-1967-00			SWITCH,SLIDE:DPDT 5A/250V 10A/125V MKD	TK0935	4021.0512
V200	154-0887-00			ELECTRON TUBE:	80009	154-0887-00
W002	175-8470-00			WIRE,ELECTRICAL:STRD,18 AWG,600V,BLACK	80009	175-8470-00

DIAGRAMS AND CIRCUIT BOARD ILLUSTRATIONS

Symbols

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

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

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

Abbreviations are based on ANSI Y1.1-1972.

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

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

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

Component Values

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

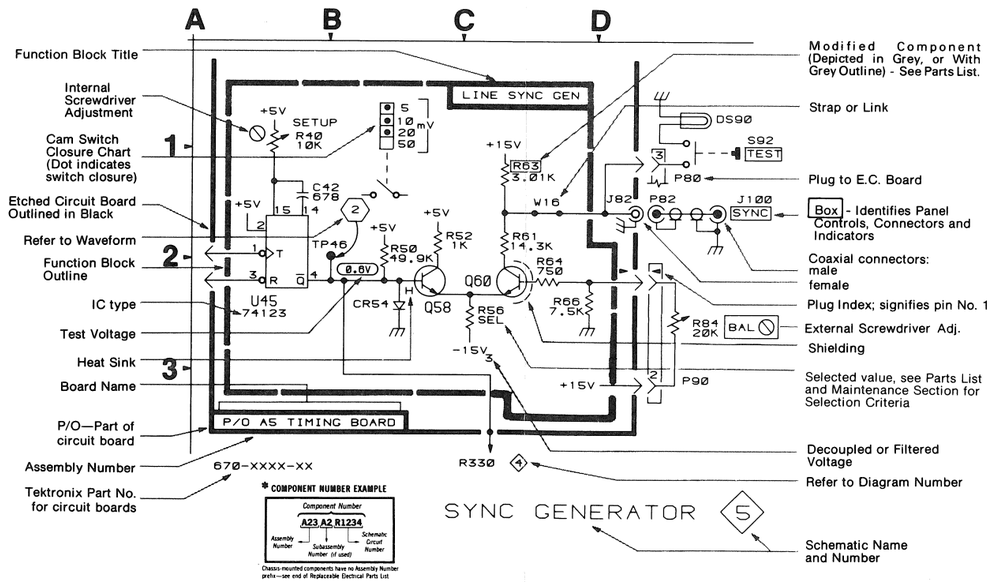
Capacitors = Values one or greater are in picofarads (pF). Values less than one are in microfarads (μF).
Resistors = Ohms (Ω).

The information and special symbols below may appear in this manual.

Assembly Numbers and Grid Coordinates

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

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



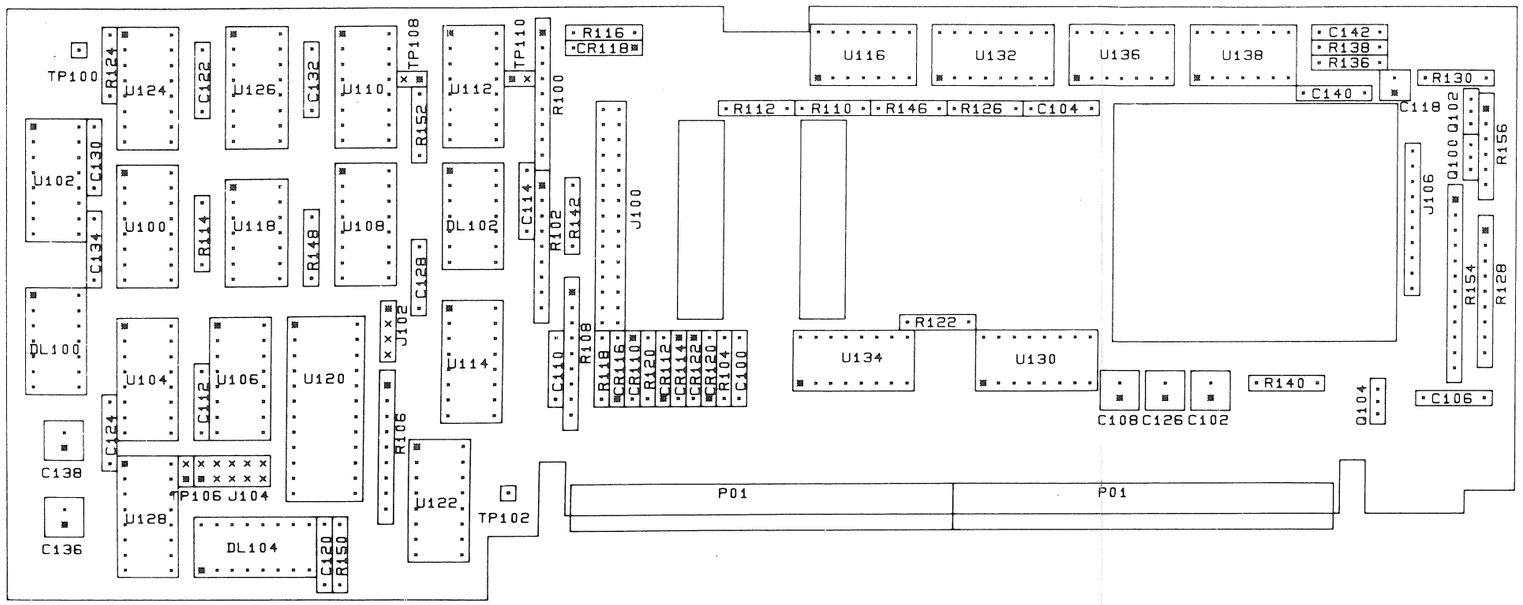
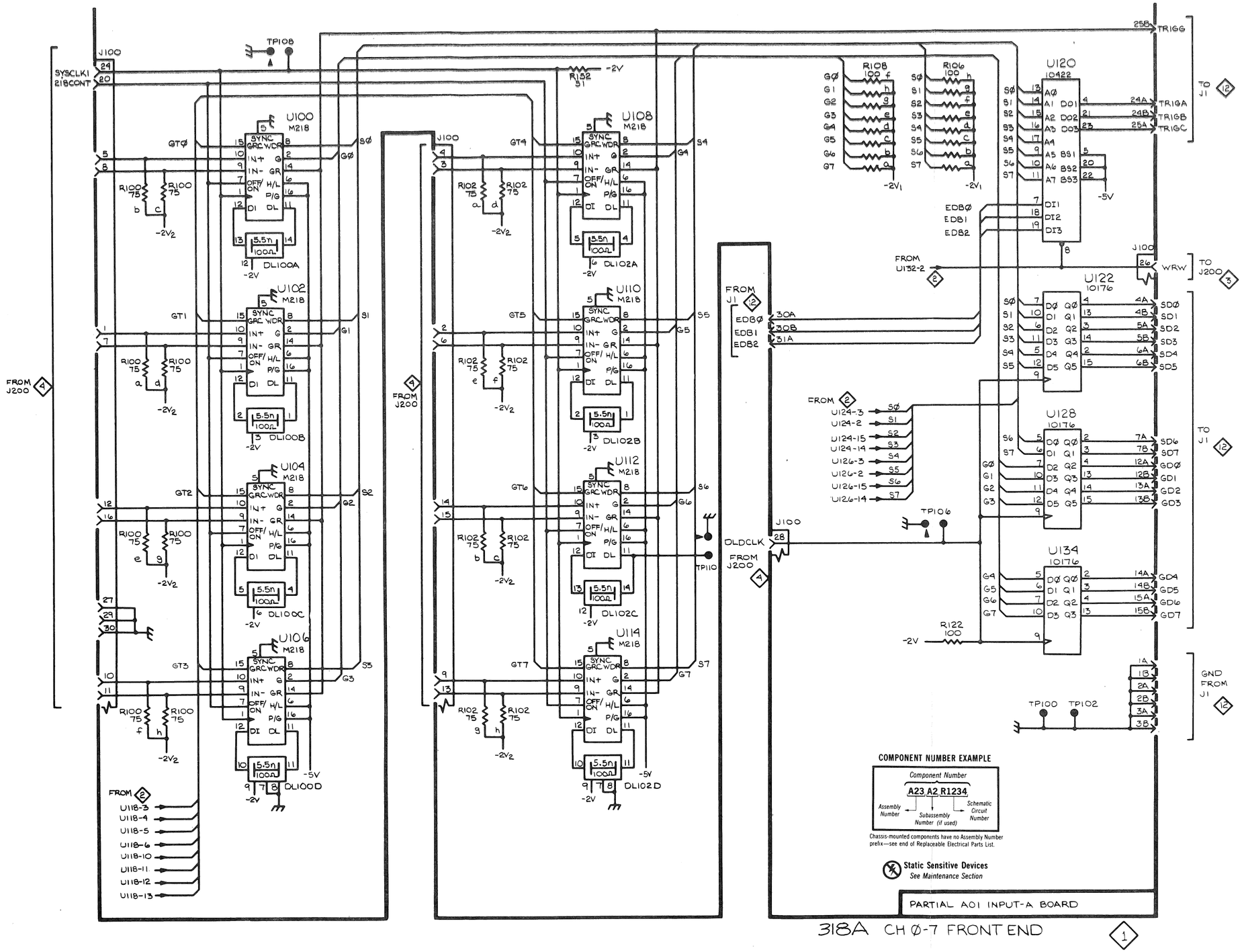
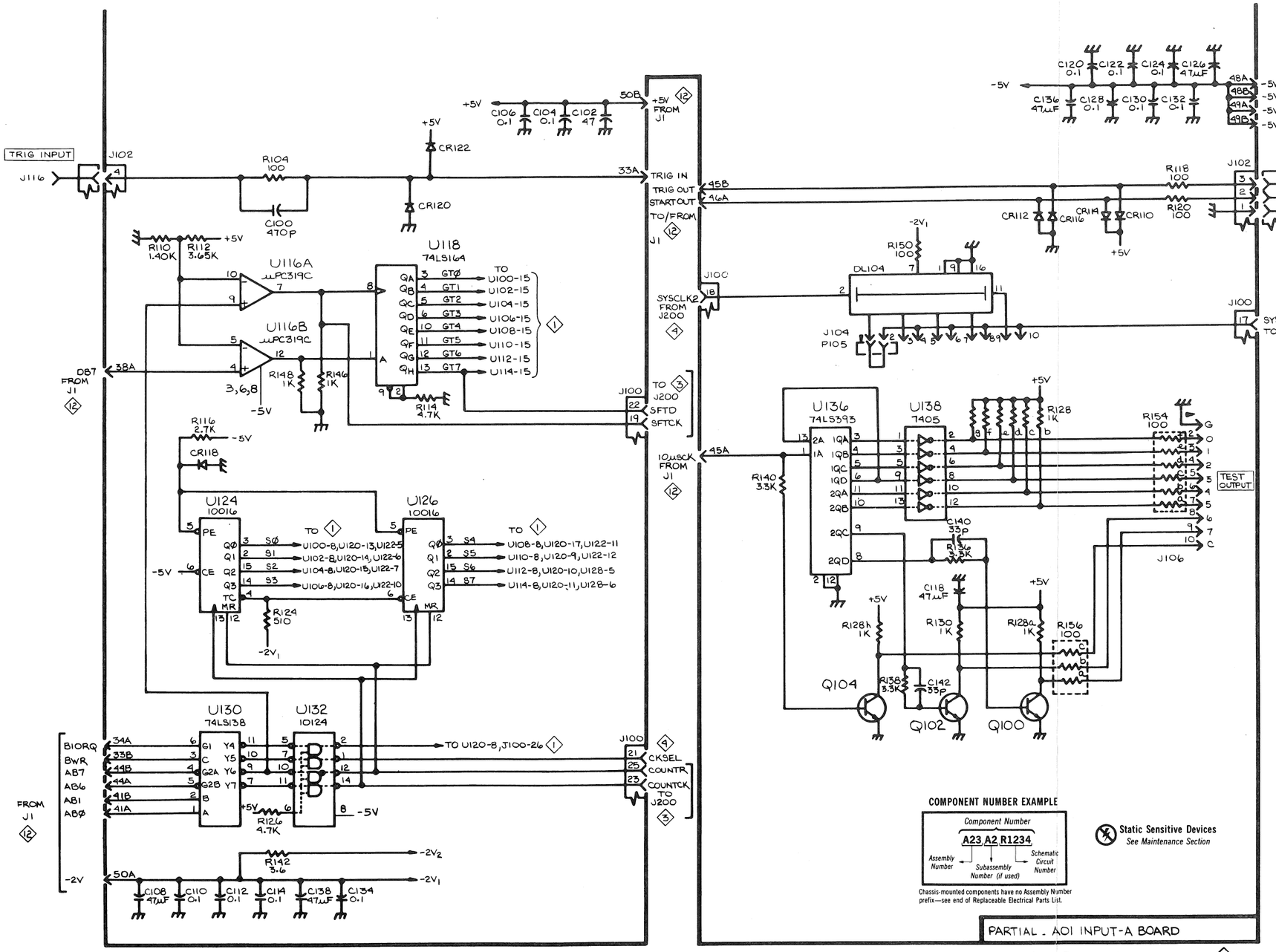


Figure 5-1. 318A A01 Input-A Board Component Locations


J100
SYSCLK1
218CONT
TP108
-2V
R152
51
U100
M218
U102
M218
U104
M218
U106
M218
U108
M218
U110
M218
U112
M218
U114
M218
SYNC
GRC WDR
INT G
IN- GR
OFF/ ON H/L
P/G
DI DL
5.5n
100Ω
DL100A
DL100B
DL100C
DL100D
DL102A
DL102B
DL102C
DL102D
GT0
GT1
GT2
GT3
GT4
GT5
GT6
GT7
S0
S1
S2
S3
S4
S5
S6
S7
G0
G1
G2
G3
G4
G5
G6
G7
R100 75
R102 75
-2V2
-2V
-5V
FROM J200 4
FROM U118-3
U118-4
U118-5
U118-6
U118-10
U118-11
U118-12
U118-13
R108 100
R106 100
-2V1
U120
10422
A0
A1 DO1
A2 DO2
A3 DO3
A4
A5 BS1
A6 BS2
A7 BS3
DI1
DI2
DI3
25B TRIGG
24A TRIGA
24B TRIGB
25A TRIGC
TO J1 12
-5V
EDB0
EDB1
EDB2
FROM U132-2 2
J100
26 WRW
TO J200 3
U122
10176
D0 Q0
D1 Q1
D2 Q2
D3 Q3
D4 Q4
D5 Q5
4A SD0
4B SD1
5A SD2
5B SD3
6A SD4
6B SD5
FROM J1 12
30A
30B
31A
FROM 2
U124-3 S0
U124-2 S1
U124-15 S2
U124-14 S3
U126-3 S4
U126-2 S5
U126-15 S6
U126-14 S7
U128
10176
7A SD6
7B SD7
12A GD0
12B GD1
13A GD2
13B GD3
TP106
J100
28 DLDCLK
FROM J200 A
U139
10176
14A GD4
14B GD5
15A GD6
15B GD7
R122
100
-2V
1A
1B
2A
2B
3A
3B
GND FROM J1 12
TP100
TP102
COMPONENT NUMBER EXAMPLE
Component Number
A23 A2 R1234
Assembly Number
Subassembly Number (if used)
Schematic Circuit Number
Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.
Static Sensitive Devices
See Maintenance Section
PARTIAL A01 INPUT-A BOARD
318A CH Ø-7 FRONT END
1



COMPONENT NUMBER EXAMPLE

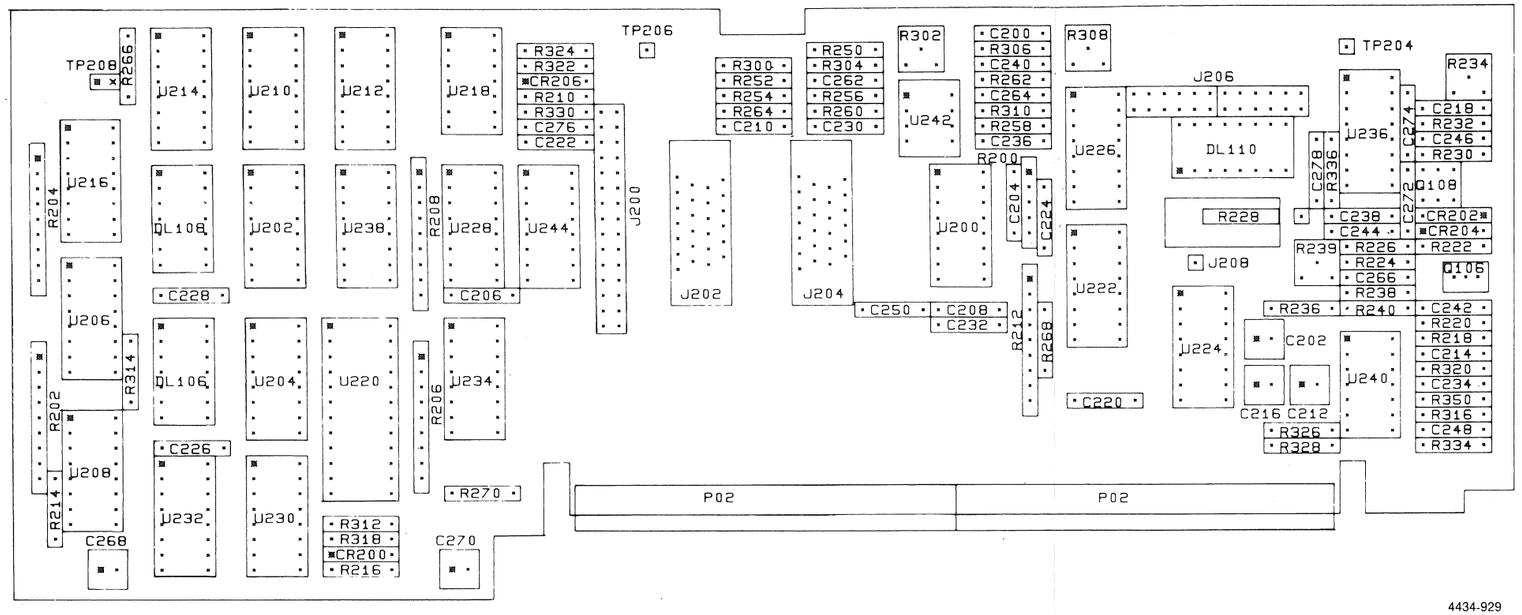
Component Number: A23 A2 R1234
(A23 = Assembly Number; A2 = Subassembly Number (if used); R1234 = Schematic Circuit Number)

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

Static Sensitive Devices
See Maintenance Section

PARTIAL - A01 INPUT-A BOARD

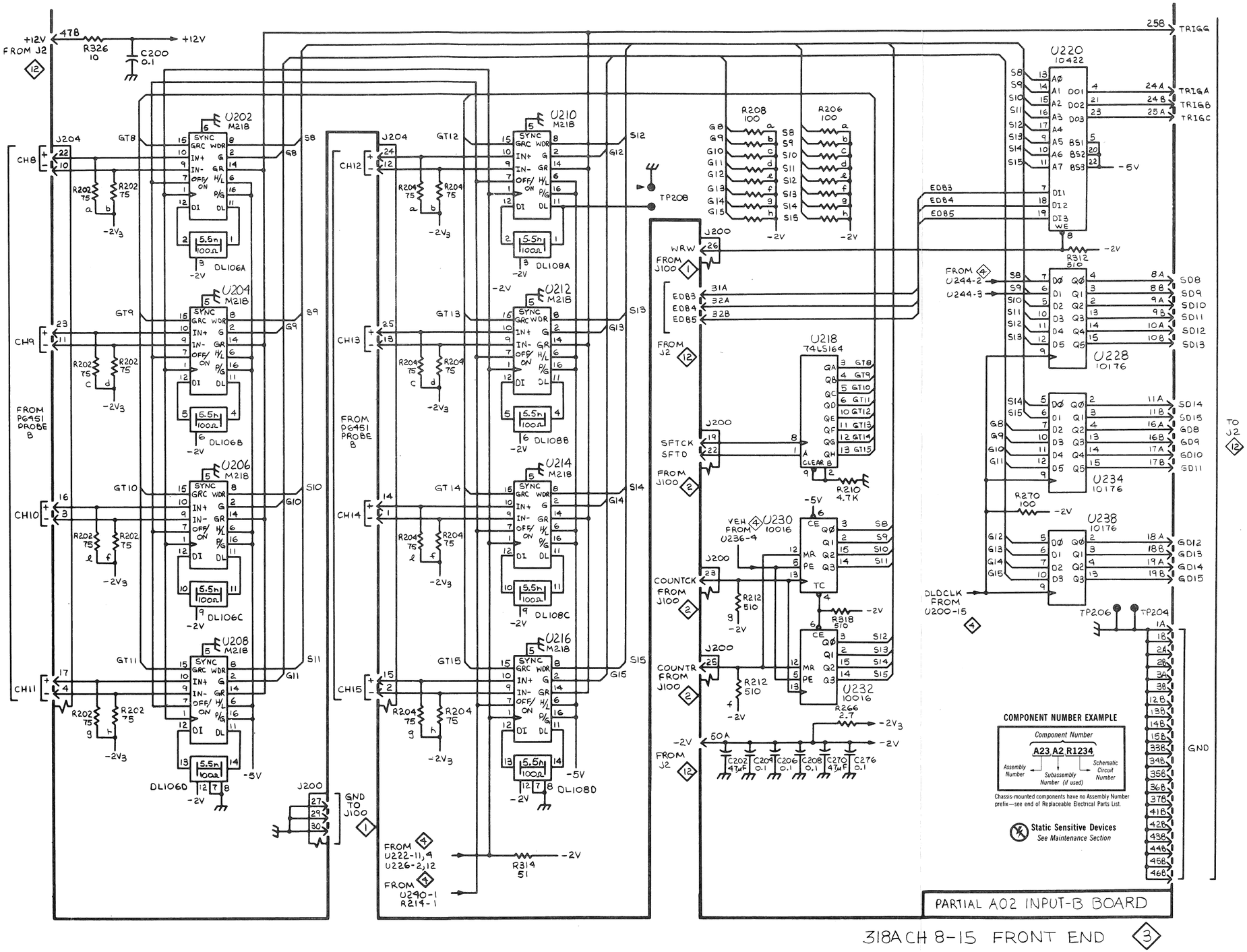
318A INPUT CONTROL (2)

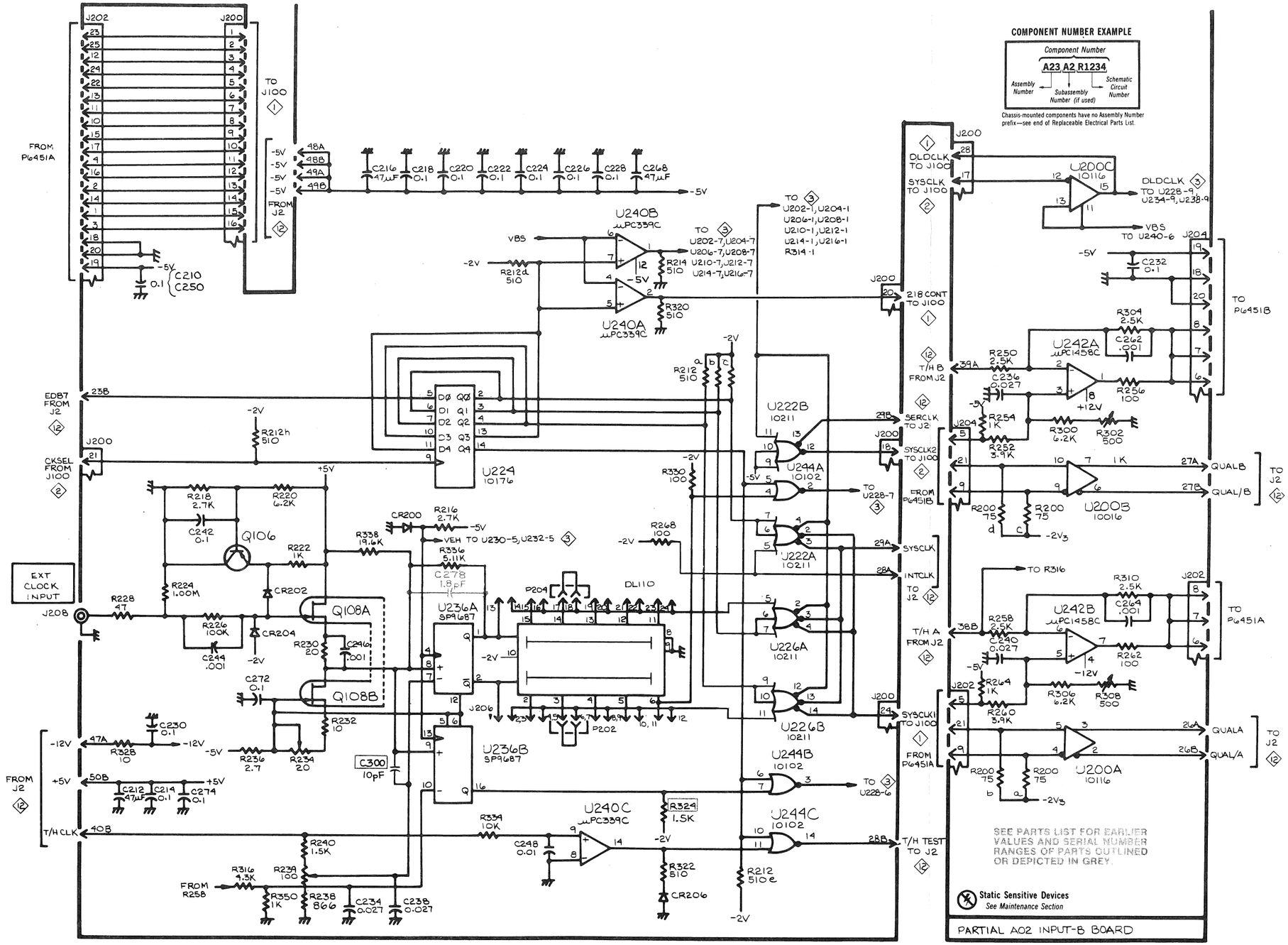


4434-929

4434-929

Figure 5-2. 318A A02 Input-B Board Component Locations


+12V FROM J2
12
47Ω R326 10
+12V
C200 0.1
J204
CH8
CH9
CH10
CH11
GT8
GT9
GT10
GT11
R202 75
-2V3
U202 M218
U204 M218
U206 M218
U208 M218
SYNC GRC WDR IN+ G IN- GR OFF/ ON H/L P/G DI DL
5.5n 100Ω
DL106A
DL106B
DL106C
DL106D
-2V
-5V
S8
S9
S10
S11
G8
G9
G10
G11
FROM PG451 PROBE B
J204
CH12
CH13
CH14
CH15
GT12
GT13
GT14
GT15
R204 75
U210 M218
U212 M218
U214 M218
U216 M218
DL108A
DL108B
DL108C
DL108D
S12
S13
S14
S15
G12
G13
G14
G15
TP208
J200
GND TO J100
1
FROM 4 U222-11,9 U226-2,12
FROM 4 U290-1 R214-1
R314 51
R208 100
R206 100
WRW
FROM J100
EDB3
EDB4
EDB5
31A
32A
32B
FROM J2
12
U218 74LS164
QA QB QC QD QE QF QG QH
GT8 GT9 GT10 GT11 GT12 GT13 GT14 GT15
CLEAR
R210 4.7K
SFTCK
SFTD
FROM J100
2
VEH 4 U230 10016
U232 10016
CE MR PE TC Q0 Q1 Q2 Q3
COUNTCK
COUNTR
FROM J100
R212 510
R318 510
R266 2.7
-2V3
50A
C202 47μF
C204 0.1
C206 0.1
C208 0.1
C270 47μF
C276 0.1
FROM J2
12
U220 10422
A0 A1 A2 A3 A4 A5 A6 A7 DO1 DO2 DO3 BS1 BS2 BS3 DI1 DI2 DI3 WE
R312 510
EDB3
EDB4
EDB5
25B
TRIGC
TRIGB
TRIGA
24A
24B
25A
FROM 4 U244-2 U244-3
U228 10176
U234 10176
U238 10176
D0 D1 D2 D3 D4 D5 Q0 Q1 Q2 Q3 Q4 Q5
SD8
SD9
SD10
SD11
SD12
SD13
SD14
SD15
GD8
GD9
GD10
GD11
GD12
GD13
GD14
GD15
R270 100
DLDCLK FROM U200-15
4
TP206
TP209
GND
TO J2
12
COMPONENT NUMBER EXAMPLE
Component Number
A23 A2 R1234
Assembly Number
Subassembly Number (if used)
Schematic Circuit Number
Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.
Static Sensitive Devices
See Maintenance Section
PARTIAL A02 INPUT-B BOARD
318A CH 8-15 FRONT END
3



318A EXT CLOCK CIRCUIT 4

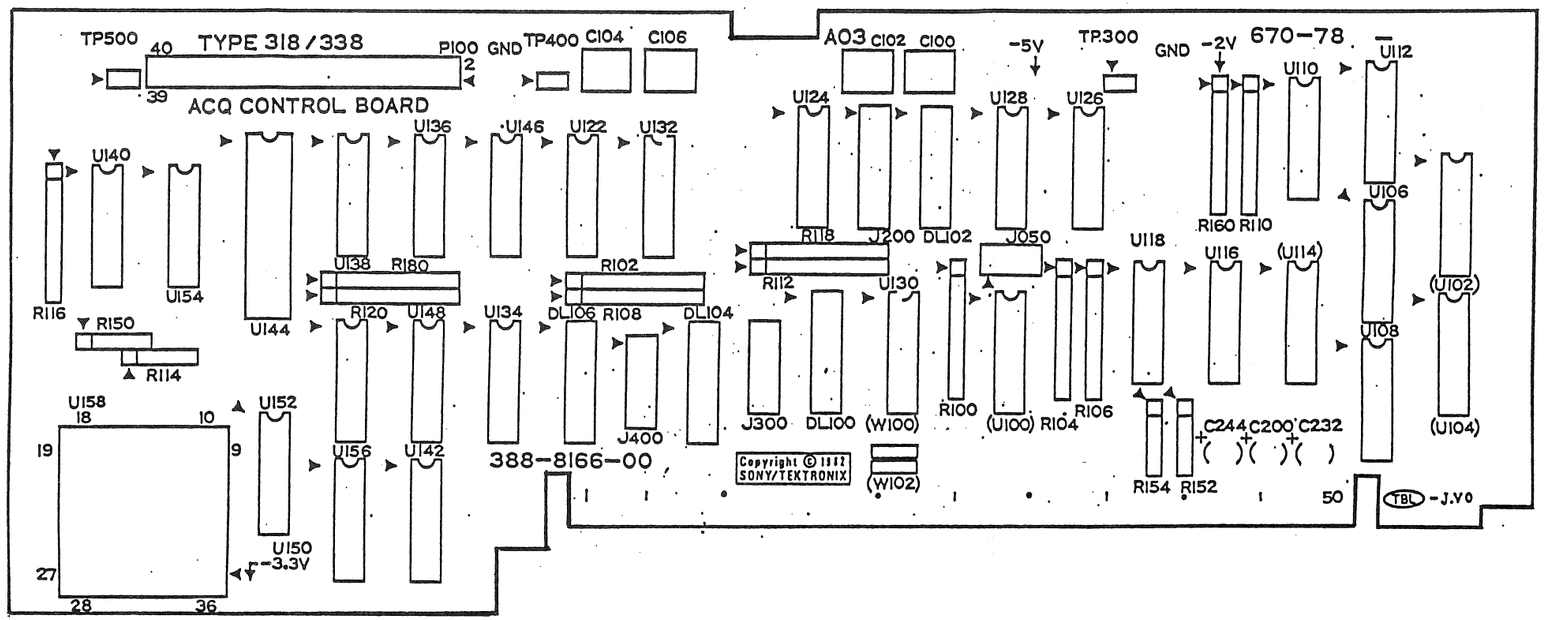
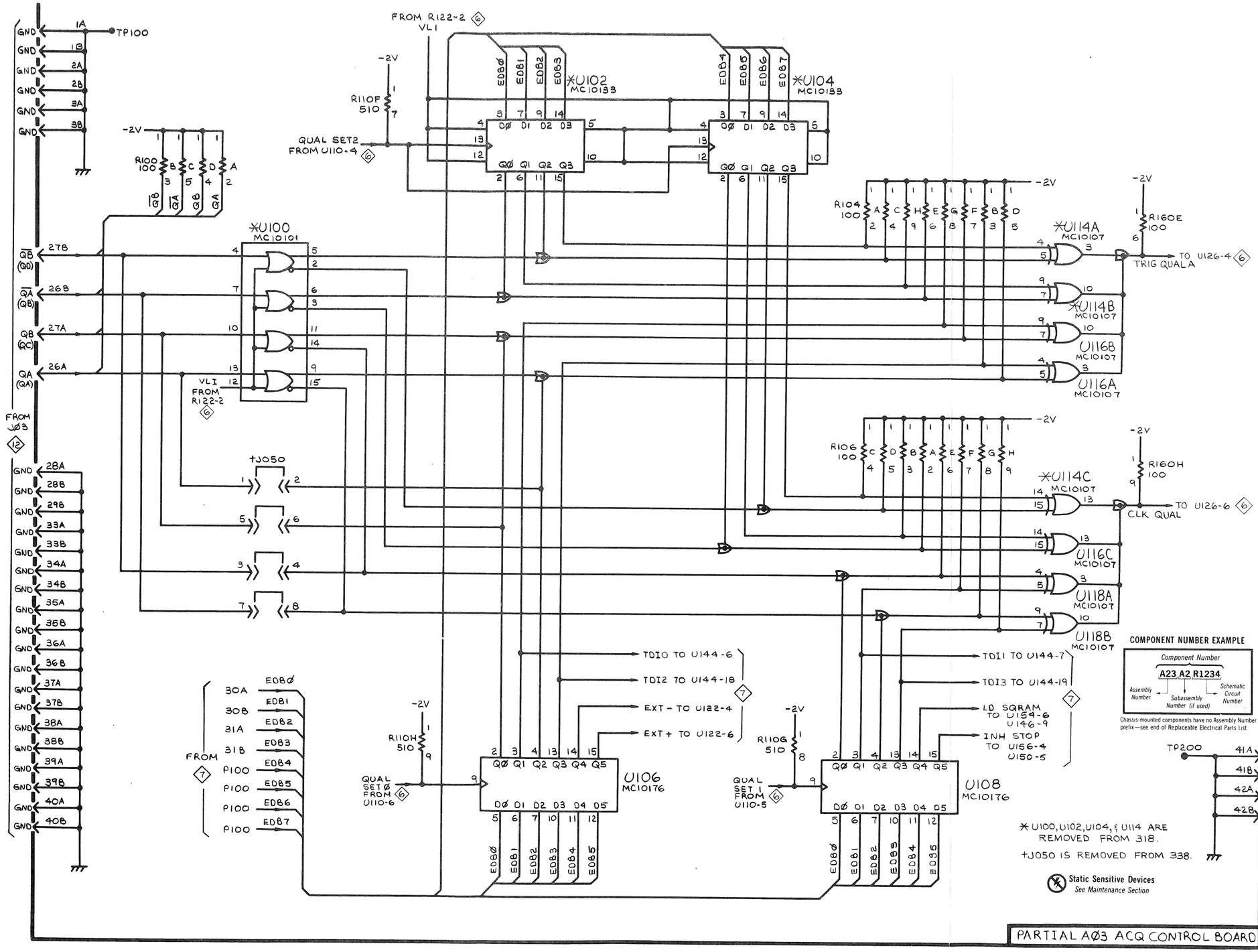
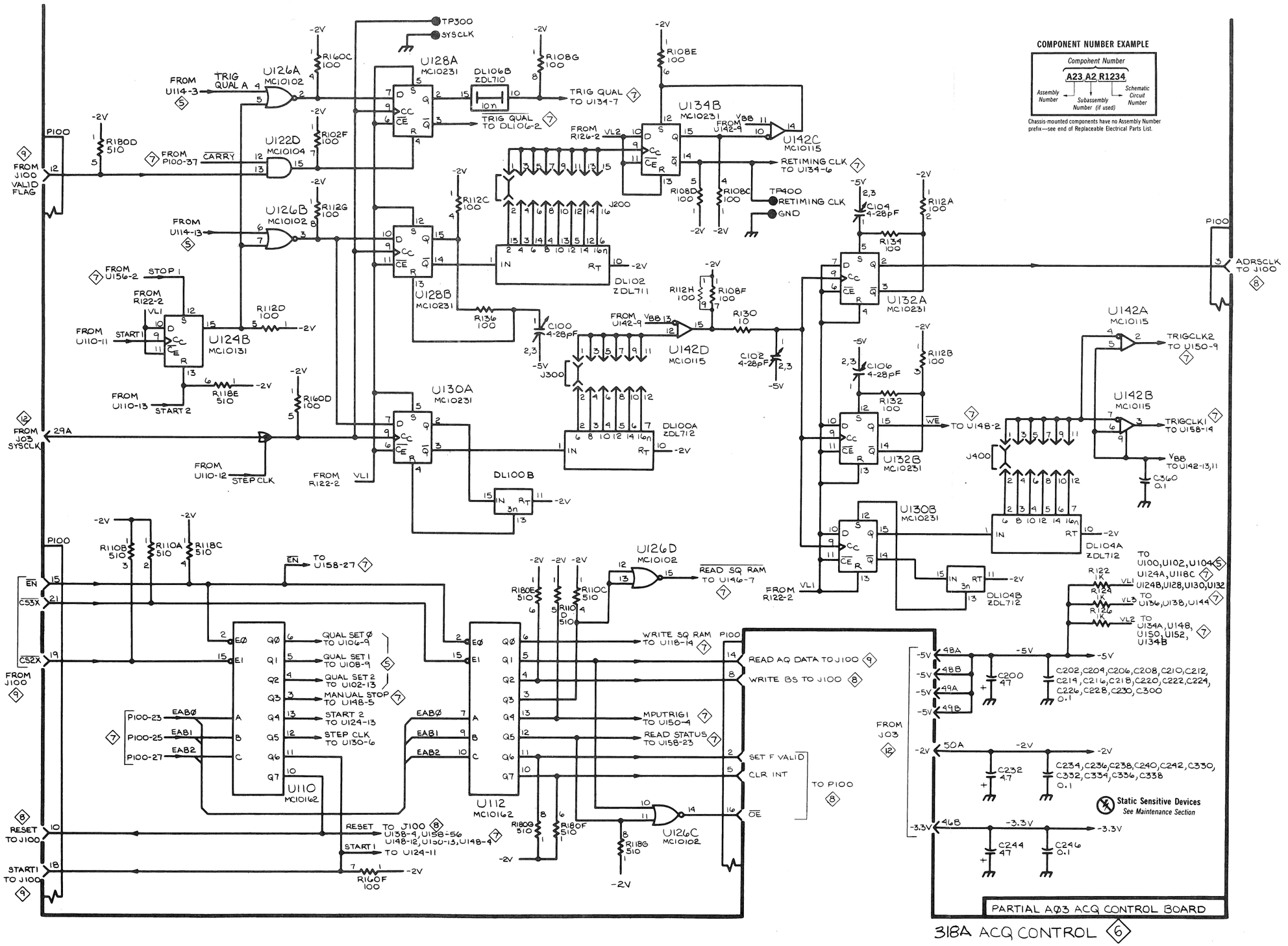


Figure 5-3. 318A A03 ACQ Control Board Component Locations


FROM R122-2 VL1
-2V
R110F 510
QUAL SET2 FROM U110-4
*U102 MC10133
*U104 MC10133
ED80 ED81 ED82 ED83 ED84 ED85 ED86 ED87
D0 D1 D2 D3 Q0 Q1 Q2 Q3
R100 100
*U100 MC10101
GND 1A TP100
GND 1B
GND 2A
GND 2B
GND 3A
GND 3B
QB (QD) 27B
QA (QB) 26B
QB (QC) 27A
QA (QA) 26A
VL1 FROM R122-2
FROM J03
28A 28B 29B 33A 33B 34A 34B 35A 35B 36A 36B 37A 37B 38A 38B 39A 39B 40A 40B
+J050
R104 100
*U114A MC10107
*U114B MC10107
U116B MC10107
U116A MC10107
R160E 100
TO U126-4
TRIG QUAL A
R106 100
*U114C MC10107
U116C MC10107
U118A MC10107
U118B MC10107
R160H 100
TO U126-6
CLK QUAL
COMPONENT NUMBER EXAMPLE
Component Number
A23 A2 R1234
Assembly Number
Subassembly Number (if used)
Schematic Circuit Number
Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List
30A 30B 31A 31B P100 ED80 ED81 ED82 ED83 ED84 ED85 ED86 ED87
FROM
R110H 510
QUAL SET0 FROM U110-6
U106 MC10176
TDI0 TO U144-6
TDI2 TO U144-18
EXT- TO U122-4
EXT+ TO U122-6
R110G 510
QUAL SET1 FROM U110-5
U108 MC10176
TDI1 TO U144-7
TDI3 TO U144-19
LD SQRAM TO U154-6 U146-9
INH STOP TO U156-4 U150-5
TP200
41A 41B 42A 42B GND
FROM J03
*U100, U102, U104, & U114 ARE REMOVED FROM 318.
+J050 IS REMOVED FROM 338.
Static Sensitive Devices
See Maintenance Section
PARTIAL AØ3 ACQ CONTROL BOARD
318A ACQ CONTROL 5


COMPONENT NUMBER EXAMPLE
Component Number
A23 A2 R1234
Assembly Number
Subassembly Number (if used)
Schematic Circuit Number
Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.
U126A MC10102
U122D MC10104
U126B MC10102
U128A MC10231
U128B MC10231
U124B MC10131
U130A MC10231
U134B MC10231
U142C MC10115
U142D MC10115
U132A MC10231
U132B MC10231
U130B MC10231
U142A MC10115
U142B MC10115
U126D MC10102
U126C MC10102
U110 MC10162
U112 MC10162
DL102 ZDL711
DL100A ZDL712
DL100B
DL106B ZDL710
DL104A ZDL712
DL104B ZDL712
TRIG QUAL A
CARRY
STOP 1
START 1
START 2
STEP CLK
TRIG QUAL TO U134-7
TRIG QUAL TO DL106-2
RETIMING CLK TO U134-6
TP400 RETIMING CLK
GND
ADRSCLK TO J100
WE TO U148-2
TRIGCLK2 TO U150-9
TRIGCLK1 TO U158-19
READ SQ RAM TO U146-7
WRITE SQ RAM TO U118-14
READ AQ DATA TO J100
WRITE BS TO J100
MPUTRIG1 TO U150-4
READ STATUS TO U158-23
SET F VALID
CLR INT
OE
RESET TO J100
START1 TO J100
EN TO U158-27
QUAL SET Ø TO U106-9
QUAL SET 1 TO U108-9
QUAL SET 2 TO U102-13
MANUAL STOP TO U148-5
START 2 TO U124-13
STEP CLK TO U130-6
RESET TO J100 U138-9,U158-56 U148-12,U150-13,U148-9
START 1 TO U124-11
TO U100,U102,U104 U124A,U118C
TO U124B,U128,U130,U132
TO U136,U138,U144
TO U134A,U148, U150,U152, U134B
C202,C204,C206,C208,C210,C212, C214,C216,C218,C220,C222,C224, C226,C228,C230,C300 0.1
C234,C236,C238,C240,C242,C330, C332,C334,C336,C338 0.1
C244 47
C246 0.1
C232 4.7
C200 47
C360 0.1
Static Sensitive Devices
See Maintenance Section
PARTIAL AØ3 ACQ CONTROL BOARD
318A ACQ CONTROL 6

COMPONENT NUMBER EXAMPLE

Component Number: A23 A2 R1234
- A23 — Assembly Number
- A2 — Subassembly Number (if used)
- R1234 — Schematic Circuit Number

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

PARTIAL AØ3 ACQ CONTROL BOARD

318A ACQ CONTROL 7

Static Sensitive Devices — See Maintenance Section

*W100, W102 ARE REMOVED FROM 338.

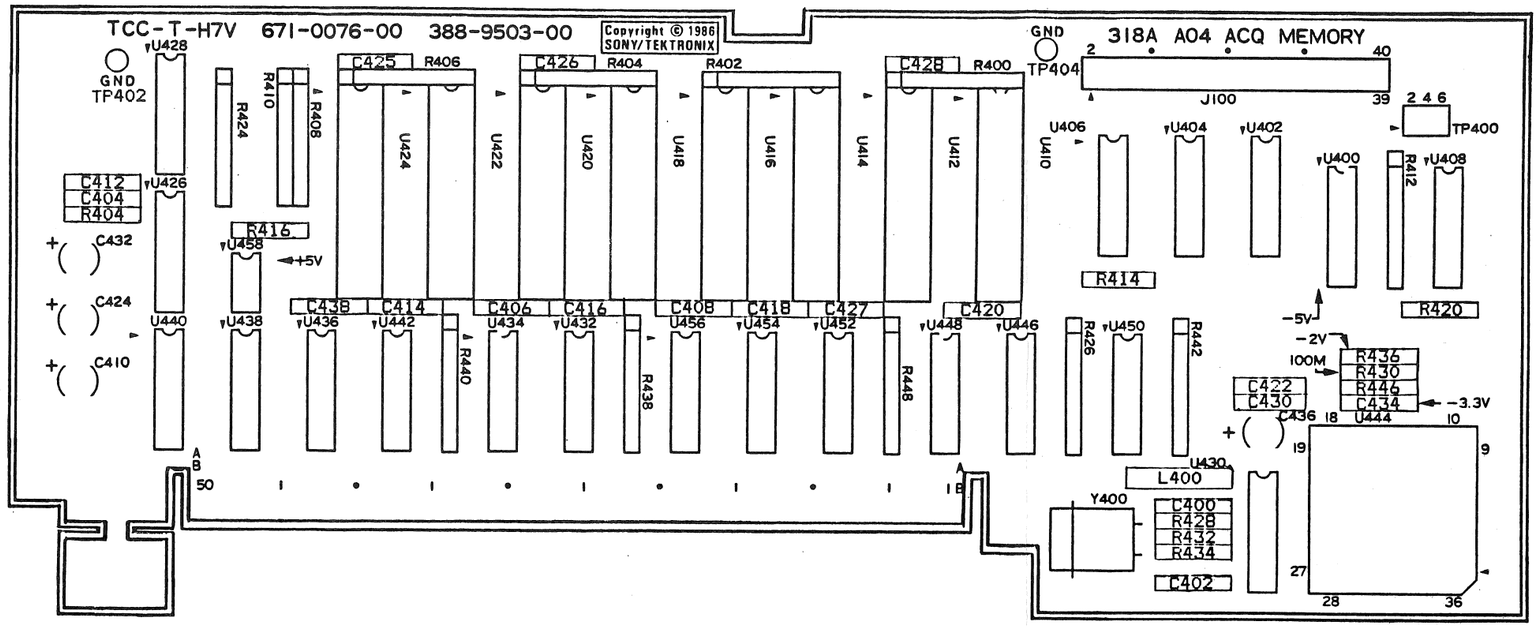
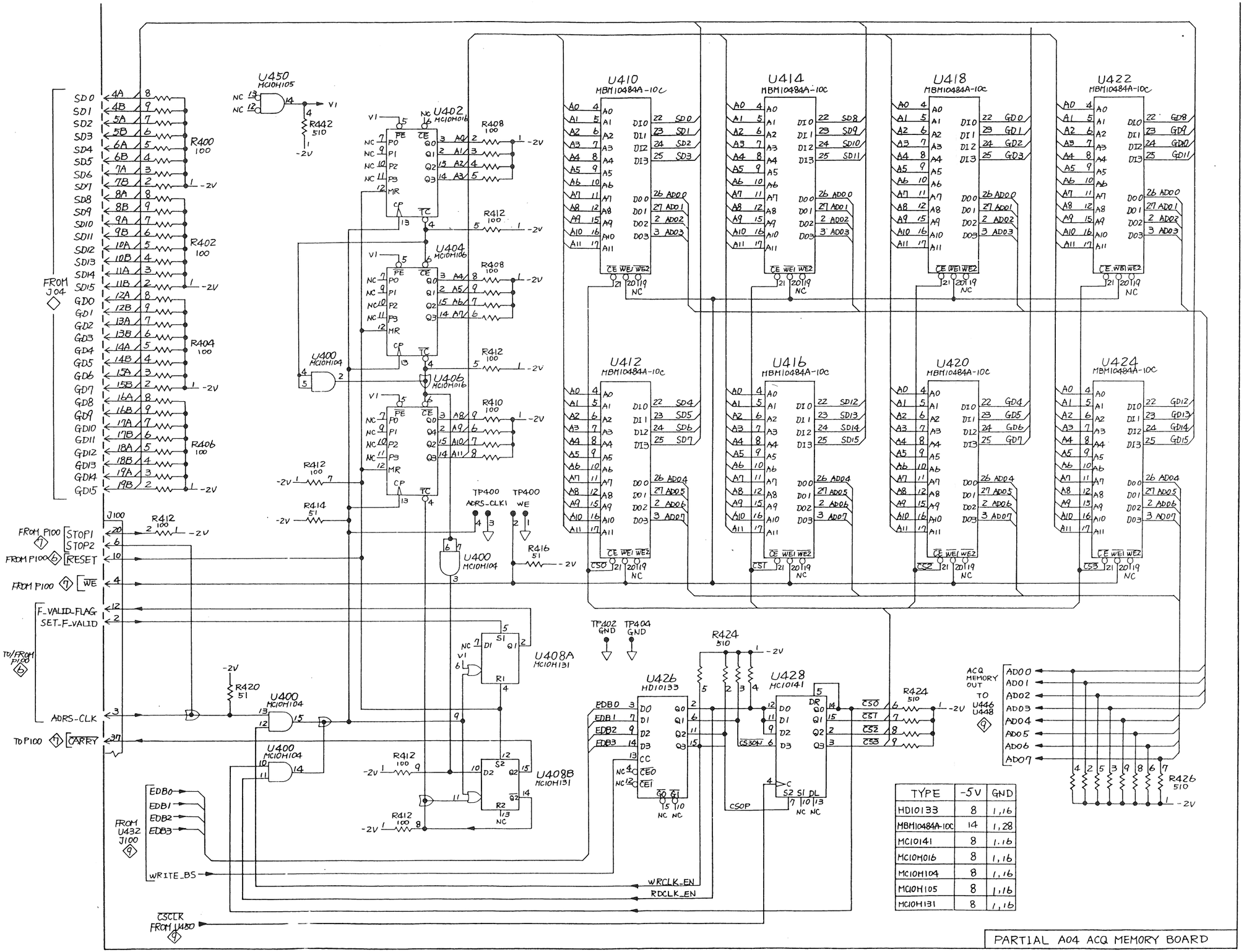
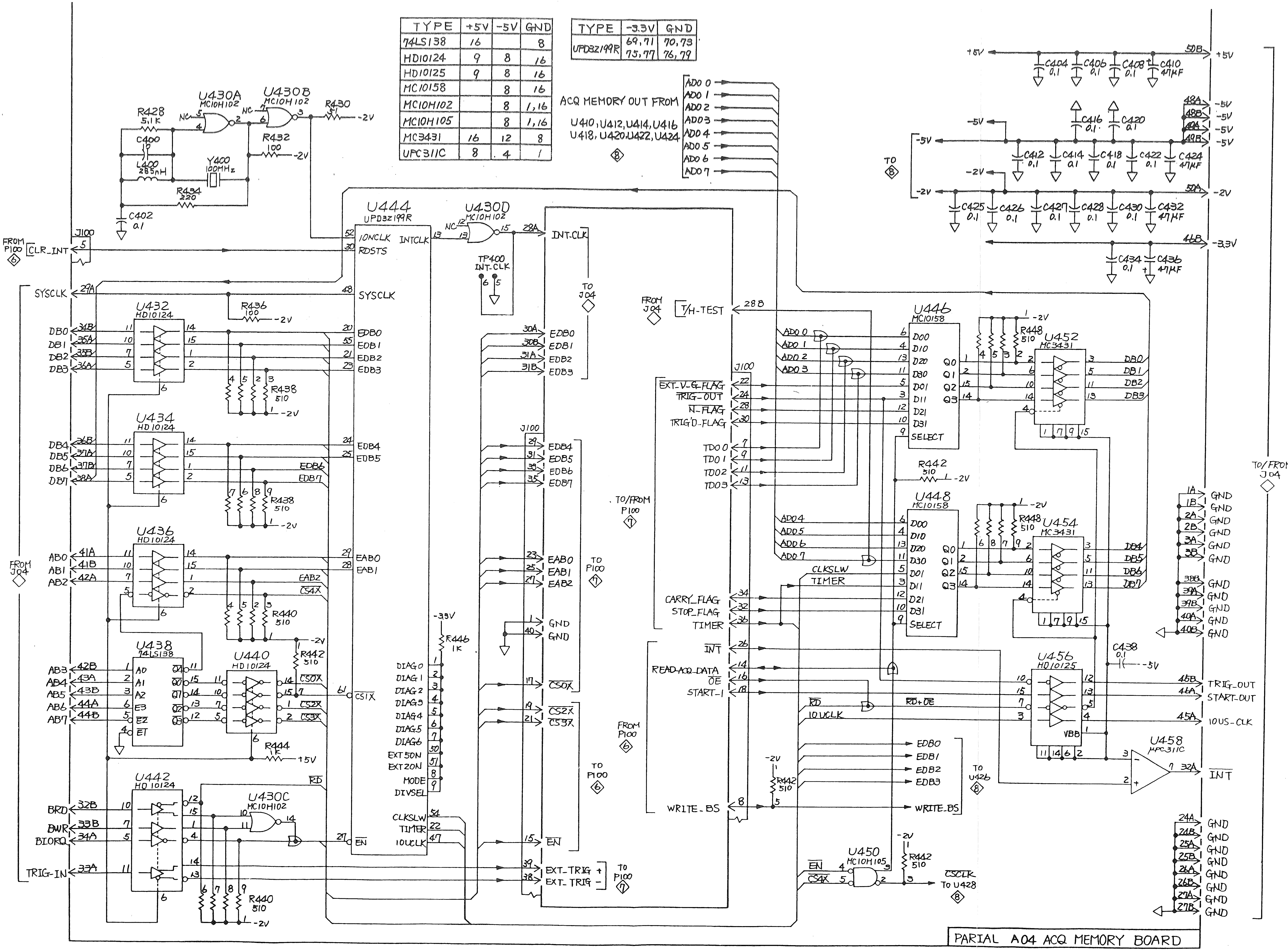


Figure 5-4. 318A A04 ACQ Memory Board Component Locations



TYPE	-5V	GND
HD10133	8	1,16
MBM10484A-10C	14	1,28
MC10141	8	1,16
MC10H016	8	1,16
MC10H104	8	1,16
MC10H105	8	1,16
MC10H131	8	1,16



TYPE	+5V	-5V	GND
74LS138	16		8
HD10124	9	8	16
HD10125	9	8	16
MC10158		8	16
MC10H102		8	1,16
MC10H105		8	1,16
MC3431	16	12	8
UPC311C	8	4	1

TYPE	-3.3V	GND
UPD3Z199R	69,71 75,77	70,73 76,79

PARIAL A04 ACQ MEMORY BOARD

318A TIME BASE & CPU BUS INTERFACE (9)

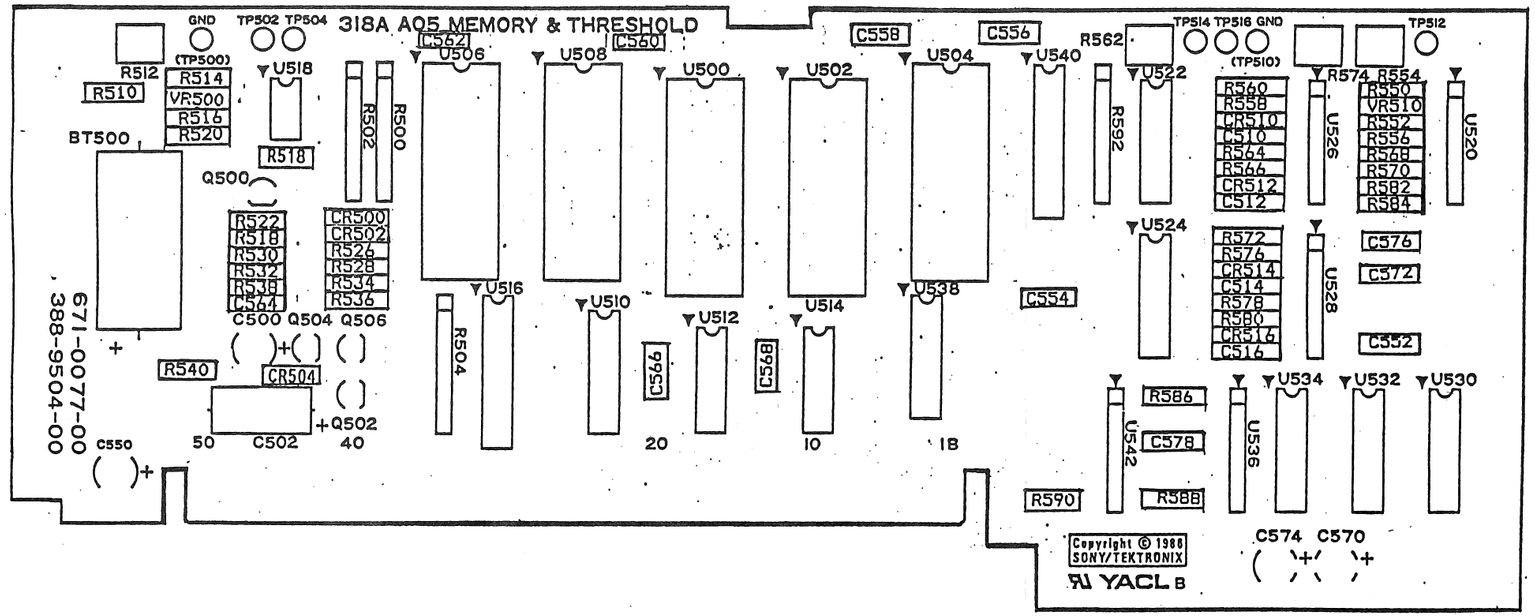
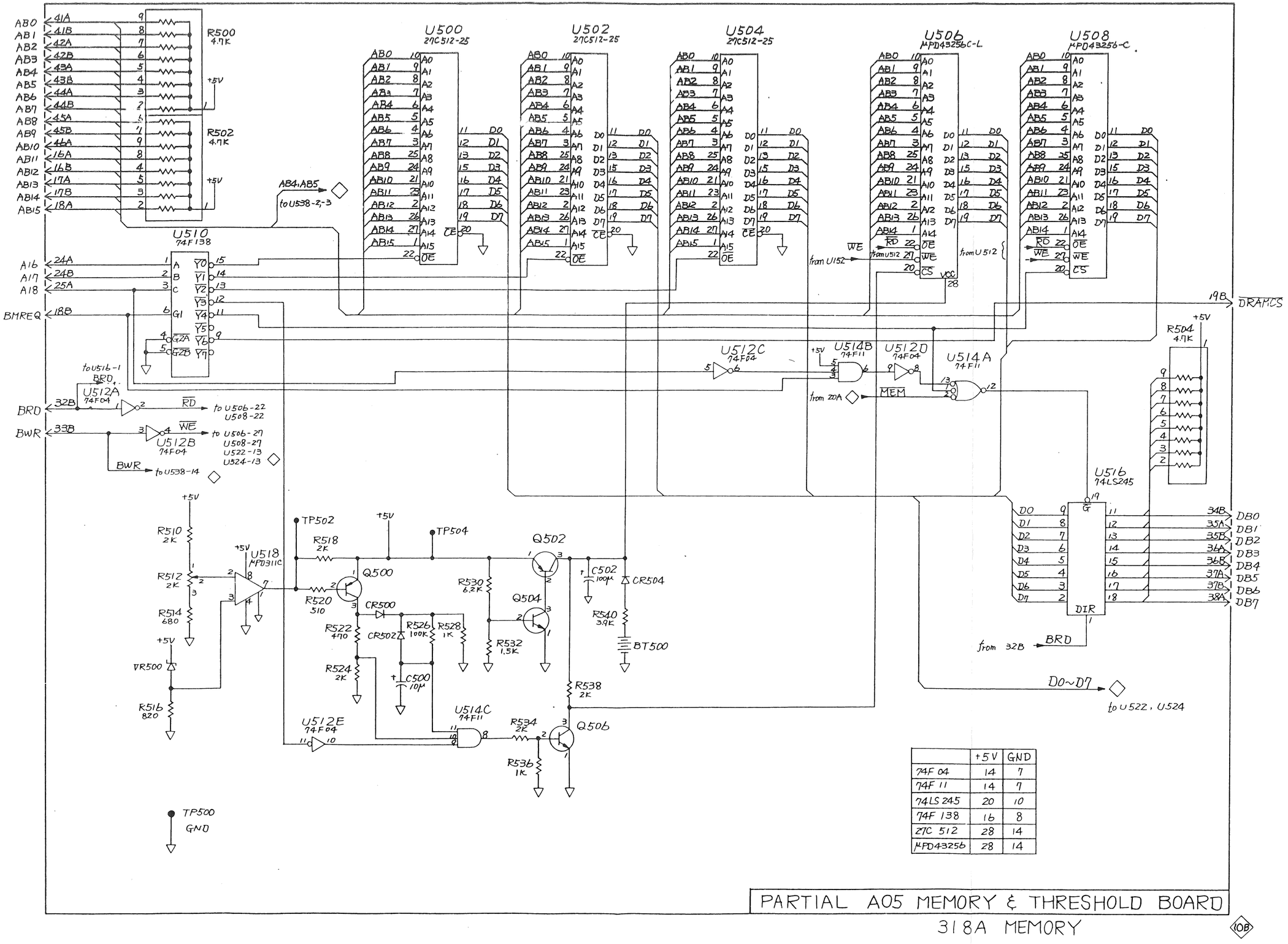


Figure 5-5. 318A A05 Memory & Threshold Board Component Locations

TYPE	+5V	GND
4052BP	16	8
74F139	16	8
AD7524	14	3
74LS273	20	10

PARTIAL A05 MEMORY & THRESHOLD BOARD

318A THRESHOLD 10A



	+5V	GND
74F 04	14	7
74F 11	14	7
74LS 245	20	10
74F 138	16	8
27C 512	28	14
μPD43256	28	14

PARTIAL A05 MEMORY & THRESHOLD BOARD

318A MEMORY

10B

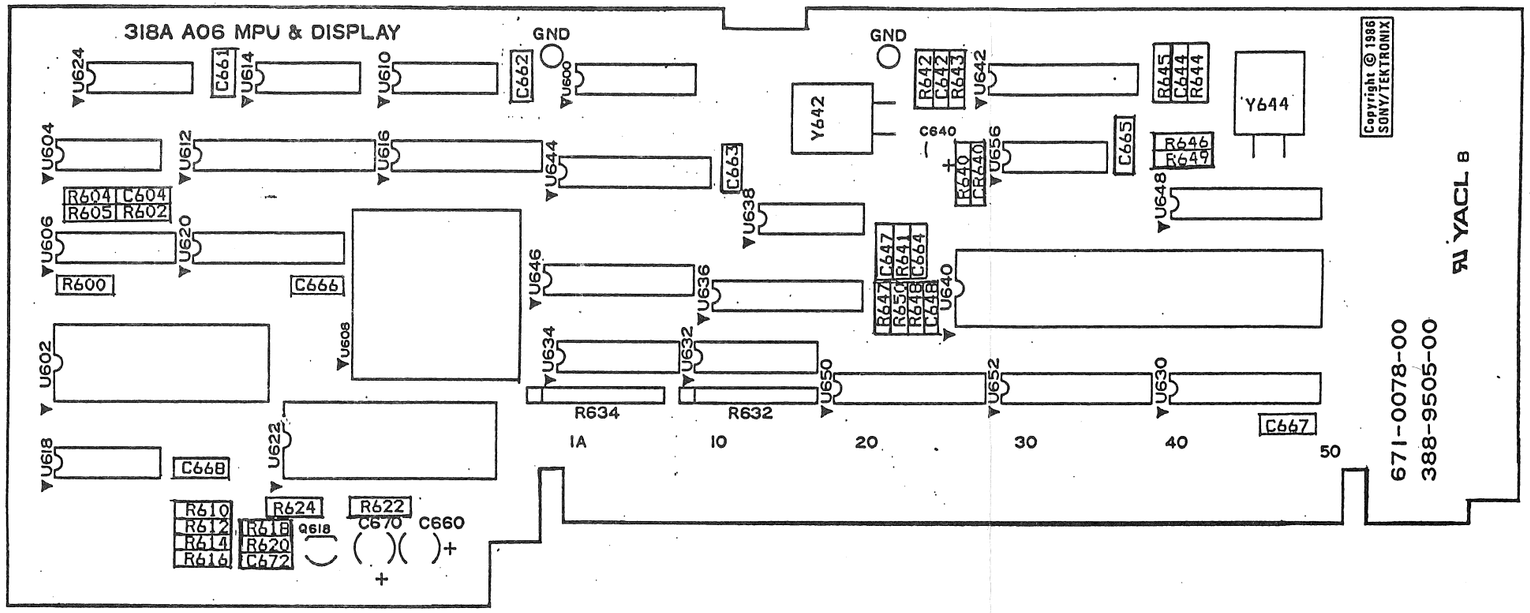


Figure 5-6. 318A A06 MPU & Display Board Component Locations

TYPE	+5V	GND
PAL16R4	20	10
PAL16R8	20	10
PAL16L8	20	10
74HC14	14	7
68008	13	15,35
4532BP	16	8
74F74	14	7
74HCT245	20	10
74LS245	20	10

U630 74LS245 DIR DB0 DB1 DB2 DB3 DB4 DB5 DB6 DB7 34B 35A 35B 36A 36B 37A 37B 38A D0 D1 D2 D3 D4 D5 D6 D7 from U644-12 GATE from U616 D0~D7

U632 4532BP EIN KBY0 KBY1 KBY2 KBY3 KBY4 KBY5 10B 10A 9B 9A 8B 8A R632 100K

U634 4532BP EIN KBX0 KBX1 KBX2 KBX3 KBX4 KBX5 6B 6A 5B 5A 4B 4A R634 100K

U636 74HCT245 DIR

U638A 74F74 R/W

U638B 74F74

U640 68008-8 CLK DS R/W AS BR BERR VPA IPL2 IPL1 HALT RESET DTACK FC0 FC1 FC2 A19~A1 D0~D7

R641 4.7K

R642 4.7K Y642 15MHz C642 47P

U642 PAL16L8A R645 82 BWR to U624-9 BRD to U624-12 32B BRD 33B BWR 34A BIORQ 18B BMRQ 20CLK to U600-1,-12 R643 82

C644 47P R644 4.7K Y644 10.2272MHz

U644 PAL16R4A-4 A19 OPT MEM GATE to U630-19 DTACK WATT from U608-46 46B OPT 20A MEM

U646 PAL16R8A-4 VD from U606-15 R647 100K

U648 PAL16L8A-4 INT KBMSK SERINT STOP

U650 74LS245 A18 A17 A16 AB15 AB14 AB13 AB12 AB11 AB10 AB9 AB8

U652 74LS245 AB7 AB6 AB5 AB4 AB3 AB2 AB1 AB0

U656A 74HC14 C647 0.1µ

U656B 74HC14 U656C 74HC14 U656D 74HC14

R646 10K R648 100K C648 0.1µ R649 2K R650 1K

R640 47K CR640 C640 10µ

GND 40B 11B 14B 15B

32A 21B 39A 11A 21A 19B KBCS DRAMCS DRAMCS to U608-1 A0~A10 to U608 30B BRESET

PARTIAL A06 MPU & DISPLAY BOARD

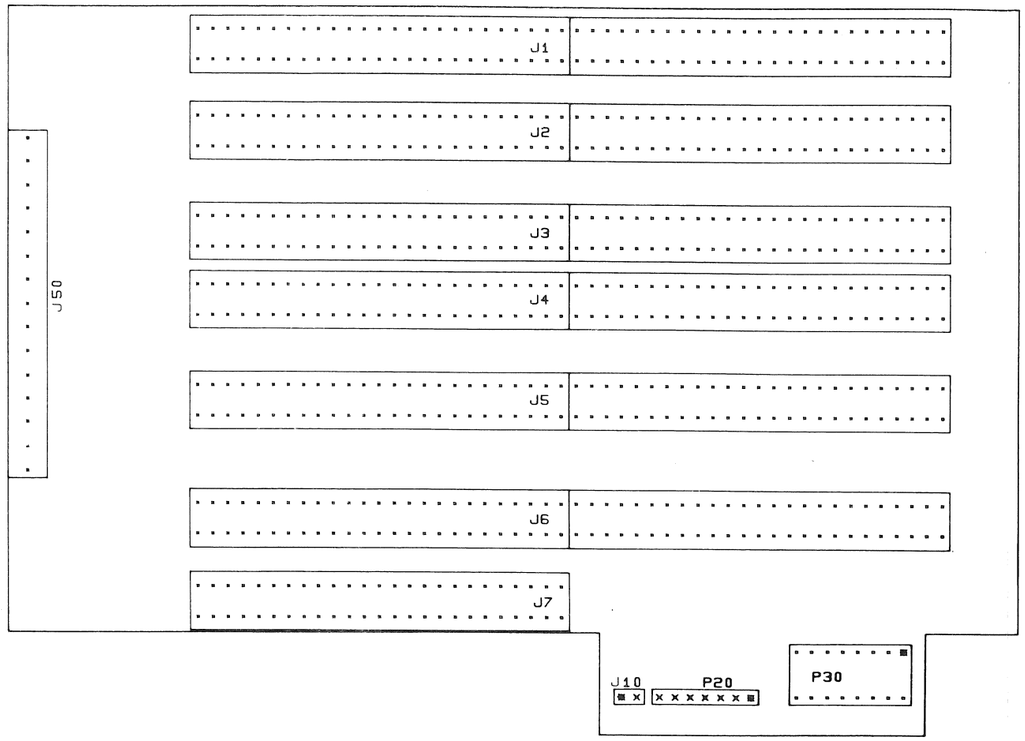
318A MPU

11A

TYPE	+5V	GND
74LS390	16	8
HD44007A	14	28
40H174	16	8
MB62110	47	40,54
4069BP	14	7
74LS04	14	7
74LS05	14	7
74LS00	14	7
74HCT245	20	10
74LS273	20	10
27128	28	14
MB8416ASK	24	12

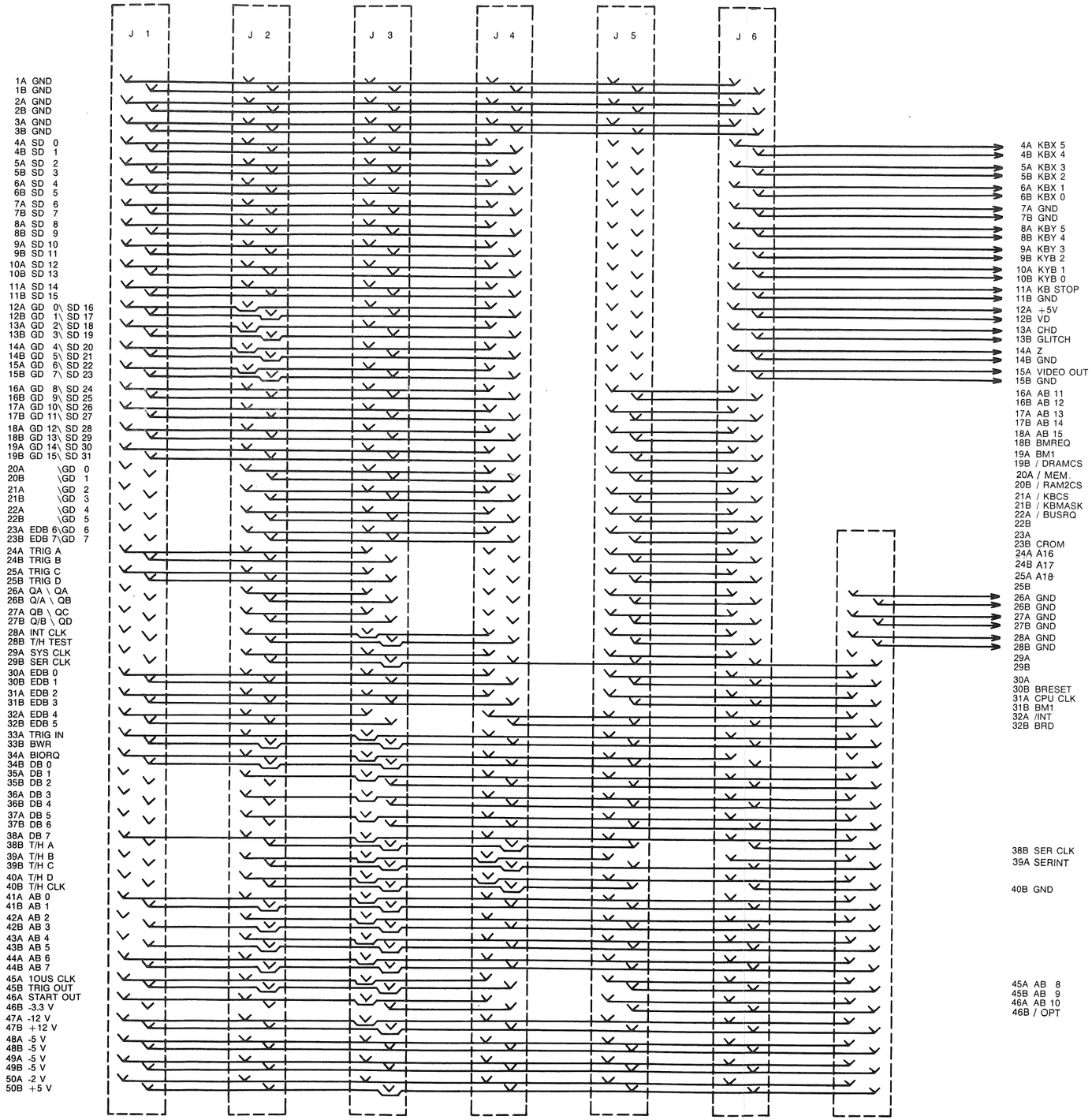
PARTIAL A06 MPU & DISPLAY BOARD

318A DISPLAY 11B



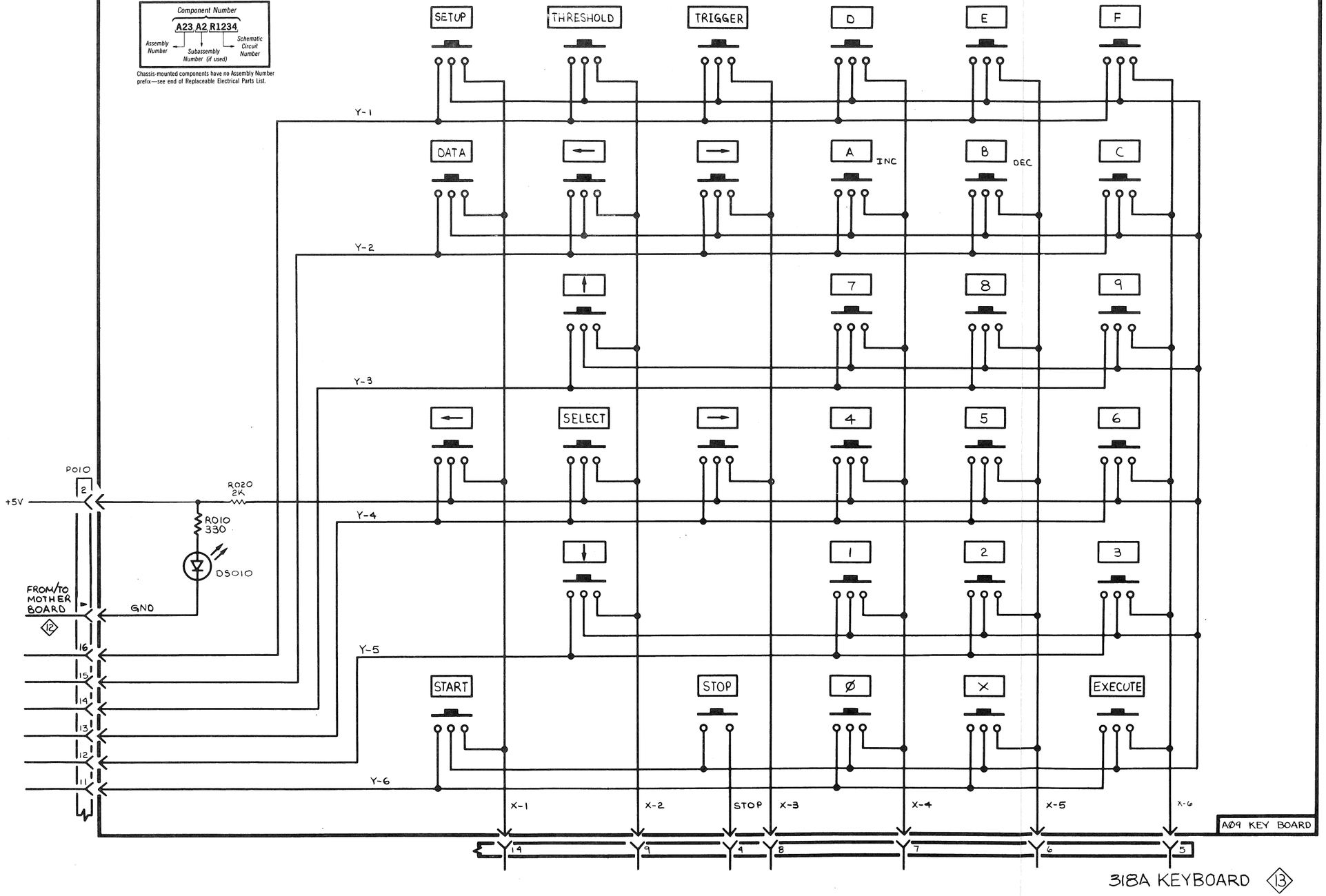
4434-934

Figure 5-7. 318A A08 Mother Board Component Locations

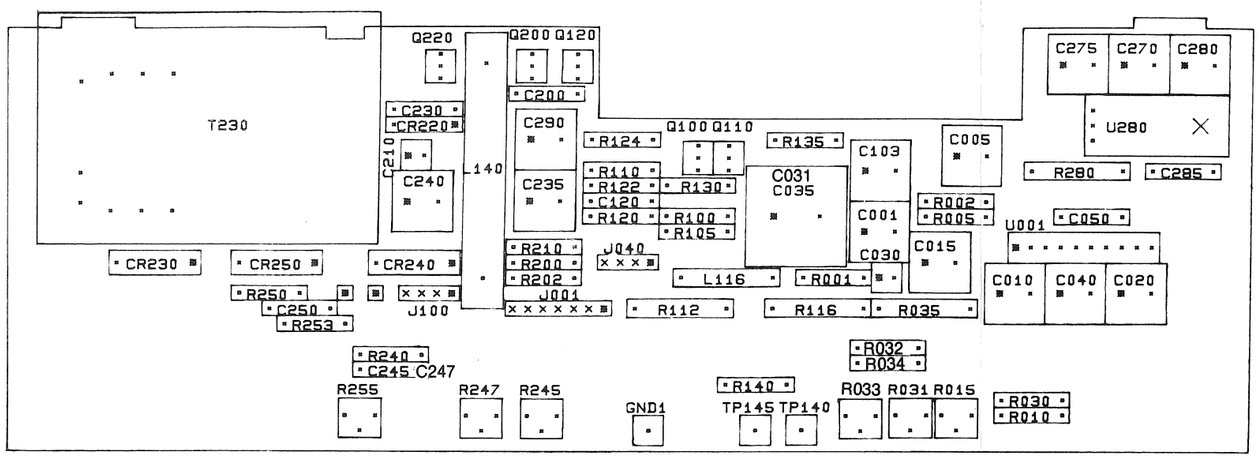

J 1
J 2
J 3
J 4
J 5
J 6
1A GND
1B GND
2A GND
2B GND
3A GND
3B GND
4A SD 0
4B SD 1
5A SD 2
5B SD 3
6A SD 4
6B SD 5
7A SD 6
7B SD 7
8A SD 8
8B SD 9
9A SD 10
9B SD 11
10A SD 12
10B SD 13
11A SD 14
11B SD 15
12A GD 0\ SD 16
12B GD 1\ SD 17
13A GD 2\ SD 18
13B GD 3\ SD 19
14A GD 4\ SD 20
14B GD 5\ SD 21
15A GD 6\ SD 22
15B GD 7\ SD 23
16A GD 8\ SD 24
16B GD 9\ SD 25
17A GD 10\ SD 26
17B GD 11\ SD 27
18A GD 12\ SD 28
18B GD 13\ SD 29
19A GD 14\ SD 30
19B GD 15\ SD 31
20A \GD 0
20B \GD 1
21A \GD 2
21B \GD 3
22A \GD 4
22B \GD 5
23A EDB 6\GD 6
23B EDB 7\GD 7
24A TRIG A
24B TRIG B
25A TRIG C
25B TRIG D
26A QA \ QA
26B Q/A \ QB
27A QB \ QC
27B Q/B \ QD
28A INT CLK
28B T/H TEST
29A SYS CLK
29B SER CLK
30A EDB 0
30B EDB 1
31A EDB 2
31B EDB 3
32A EDB 4
32B EDB 5
33A TRIG IN
33B BWR
34A BIORQ
34B DB 0
35A DB 1
35B DB 2
36A DB 3
36B DB 4
37A DB 5
37B DB 6
38A DB 7
38B T/H A
39A T/H B
39B T/H C
40A T/H D
40B T/H CLK
41A AB 0
41B AB 1
42A AB 2
42B AB 3
43A AB 4
43B AB 5
44A AB 6
44B AB 7
45A 1OUS CLK
45B TRIG OUT
46A START OUT
46B -3.3 V
47A -12 V
47B +12 V
48A -5 V
48B -5 V
49A -5 V
49B -5 V
50A -2 V
50B +5 V
4A KBX 5
4B KBX 4
5A KBX 3
5B KBX 2
6A KBX 1
6B KBX 0
7A GND
7B GND
8A KBY 5
8B KBY 4
9A KBY 3
9B KYB 2
10A KYB 1
10B KYB 0
11A KB STOP
11B GND
12A +5V
12B VD
13A CHD
13B GLITCH
14A Z
14B GND
15A VIDEO OUT
15B GND
16A AB 11
16B AB 12
17A AB 13
17B AB 14
18A AB 15
18B BMREQ
19A BM1
19B / DRAMCS
20A / MEM
20B / RAM2CS
21A / KBCS
21B / KBMASK
22A / BUSRQ
22B
23A
23B CROM
24A A16
24B A17
25A A18
25B
26A GND
26B GND
27A GND
27B GND
28A GND
28B GND
29A
29B
30A
30B BRESET
31A CPU CLK
31B BM1
32A /INT
32B BRD
38B SER CLK
39A SERINT
40B GND
45A AB 8
45B AB 9
46A AB 10
46B / OPT

COMPONENT NUMBER EXAMPLE

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



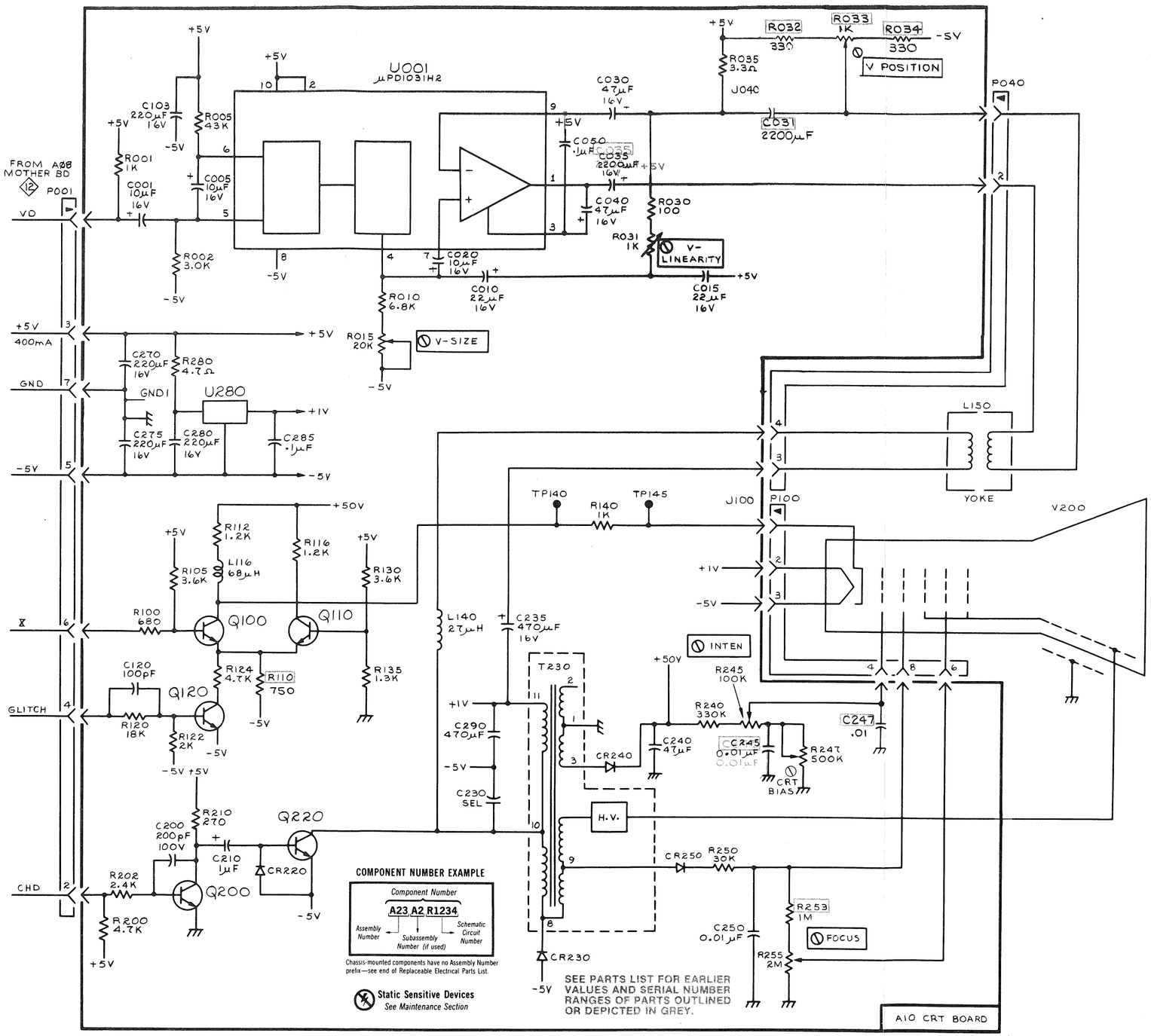
318A KEYBOARD 13



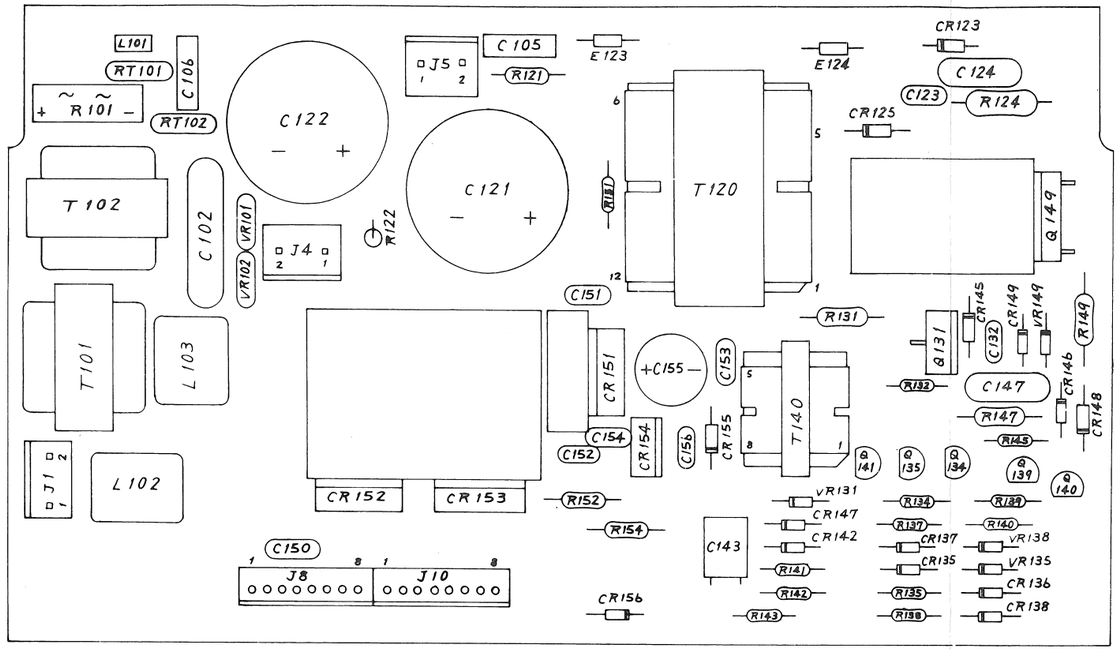
4434-935

Figure 5-8. 318A A10 CRT Board Component Locations

4434-935

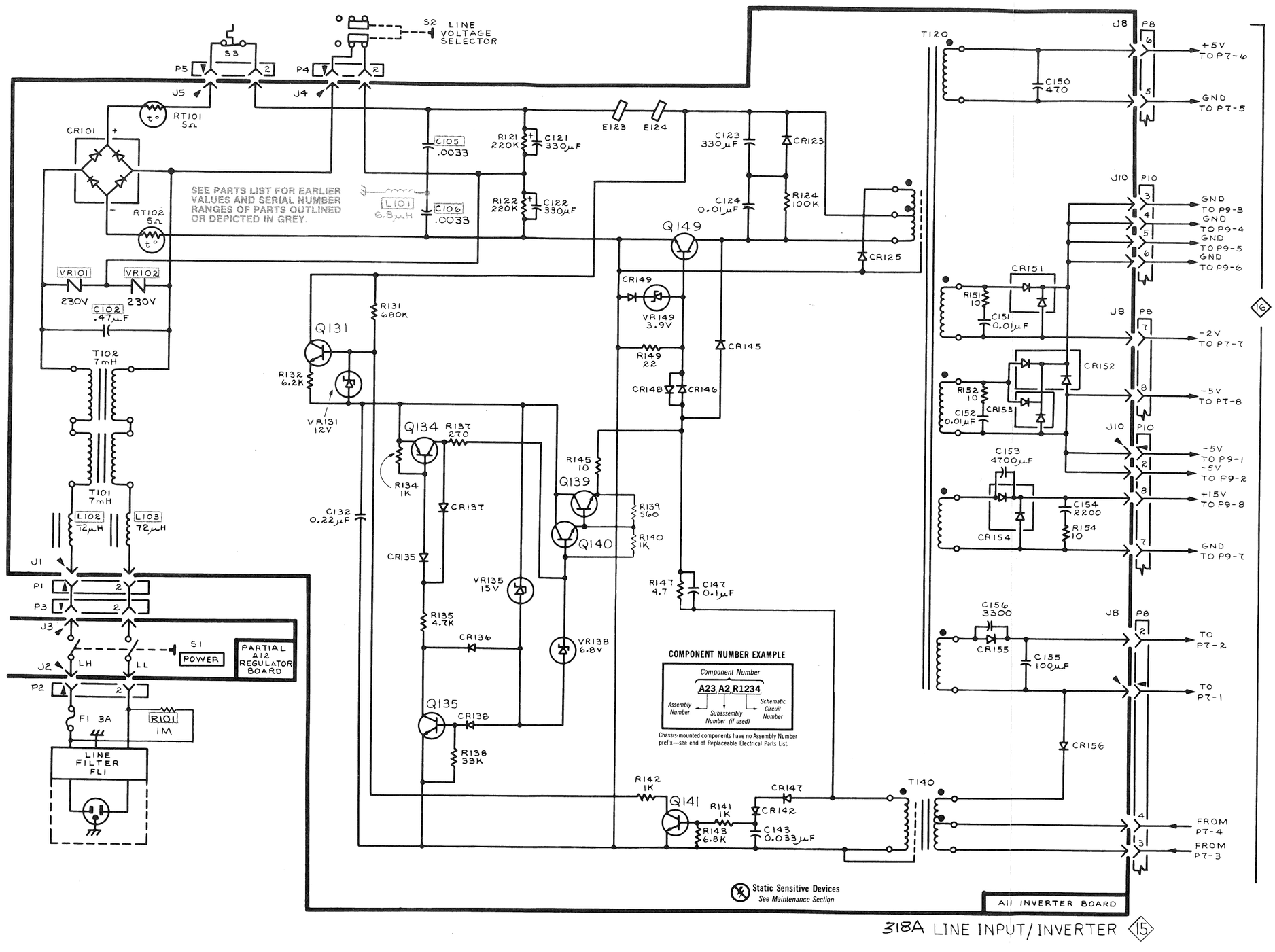


318A CRT CIRCUIT 14



4434-936

Figure 5-9. 318A A11 Inverter Board Component Locations



318A LINE INPUT/INVERTER 15

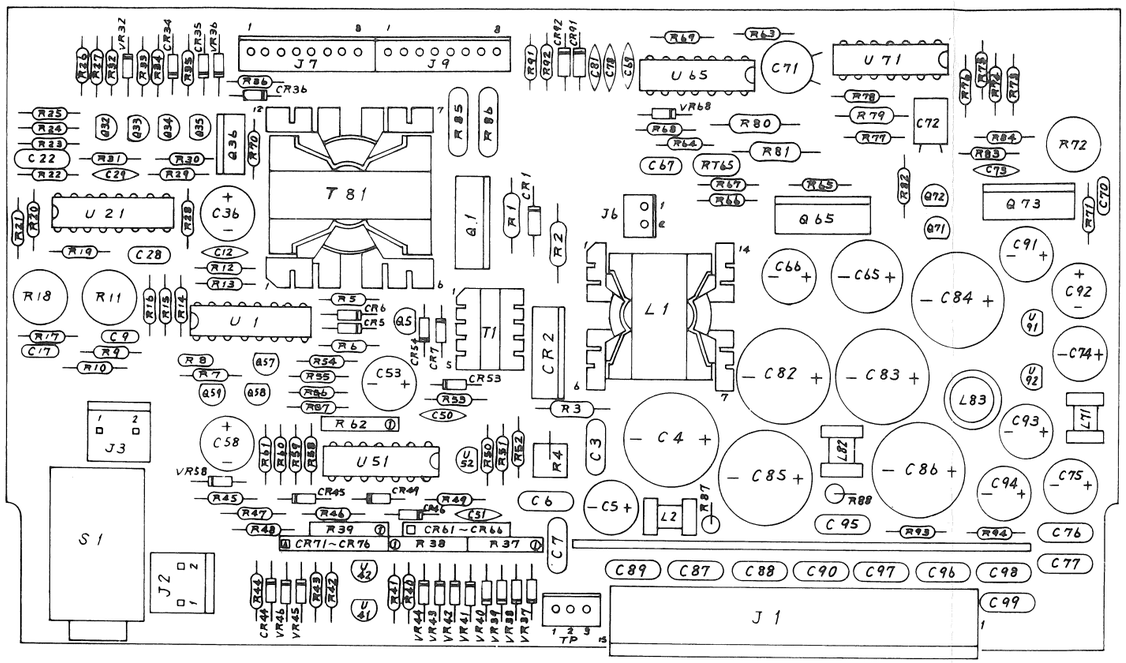


Figure 5-10. 318A A12 Regulator Board Component Locations

COMPONENT NUMBER EXAMPLE

Component Number: A23 A2 R1234
- A23 — Assembly Number
- A2 — Subassembly Number (if used)
- R1234 — Schematic Circuit Number

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

Static Sensitive Devices
See Maintenance Section

PARTIAL A12 REGULATOR BOARD

318A INVERTER CONTROL/REGULATOR 16

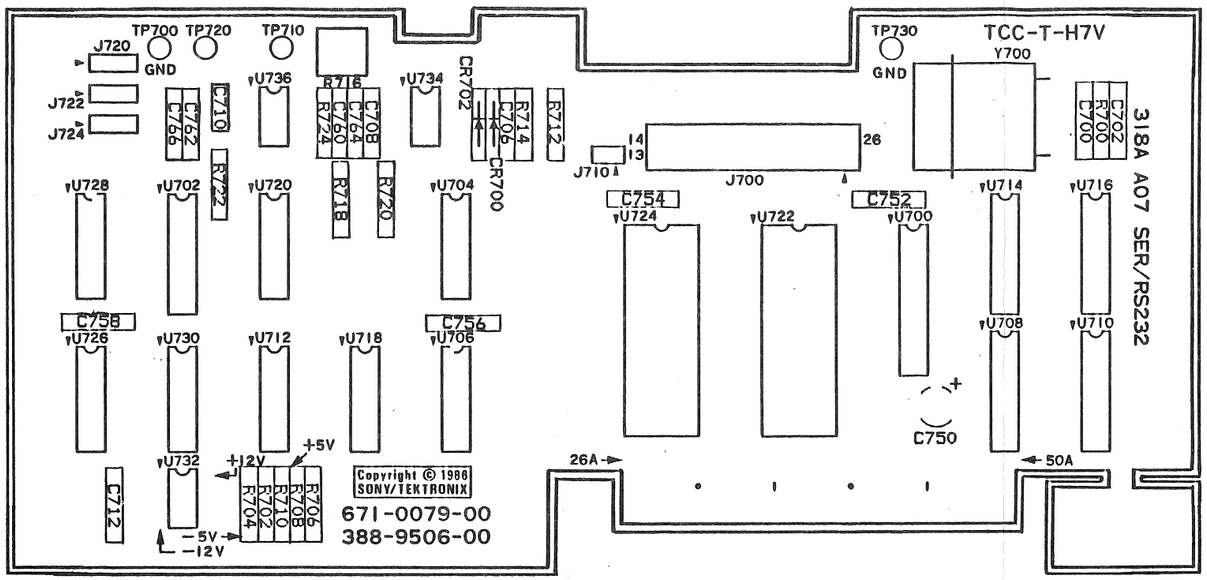


Figure 5-11. 318A A07 Serial/RS-232C Board Component Locations

TYPE	+5V	GND
74LS245	20	10
74LS174	16	8
4702	16	8
74F04	14	7
74LS32	14	7
74LS139	16	8
74LS02	14	7
74LS86	14	7
MB89251A	26	4
74LS125	14	7
1489	14	7

A07SER/RS-232 BOARD

318A SER/RS-232

REPLACEABLE MECHANICAL PARTS

PARTS ORDERING INFORMATION

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

Changes to Tektronix instruments are sometimes made to accommodate improved components as they become available, and to give you the benefit of the latest circuit improvements developed in our engineering department. It is therefore important, when ordering parts, to include the following information in your order: Part number, instrument type or number, serial number, and modification number if applicable.

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

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

ITEM NAME

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

FIGURE AND INDEX NUMBERS

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

INDENTATION SYSTEM

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

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

Attaching Parts always appear in the same indentation as the item it mounts, while the detail parts are indented to the right. Indented items are part of, and included with, the next higher indentation. The separation symbol - - - * - - - indicates the end of attaching parts.

ABBREVIATIONS

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

CROSS INDEX - MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip Code
01536	TEXTRON INC CAMCAR DIV SEMS PRODUCTS UNIT	1818 CHRISTINA ST	ROCKFORD IL 61108
07416	NELSON NAME PLATE CO	3191 CASITAS	LOS ANGELES CA 90039
09922	BURNDY CORP	RICHARDS AVE	NORWALK CT 06852
12327	FREEWAY CORP	9301 ALLEN DR	CLEVELAND OH 44125
13511	AMPHENOL CADRE DIV BUNKER RAMO CORP		LOS GATOS CA
16428	BELDEN CORP ELECTRONIC DIV	2200 US HWY 27 SOUTH P O BOX 1980	RICHMOND IN 47374
22526	DU PONT E I DE NEMOURS AND CO INC DU PONT CONNECTOR SYSTEMS	30 HUNTER LANE	CAMP HILL PA 17011
24931	SPECIALTY CONNECTOR CO INC	2620 ENDRESS PLACE P O BOX D	GREENWOOD IN 46142
70903	BELDEN CORP	2000 S BATAVIA AVE	GENEVA IL 60134
71279	MIDLAND-ROSS CORP CAMBION DIV	ONE ALEWIFE PLACE	CAMBRIDGE MA 02138
73743	FISCHER SPECIAL MFG CO	446 MORGAN ST	CINCINNATI OH 45206
77900	SHAKEPROOF DIV OF ILLINOIS TOOL WORKS	SAINT CHARLES RD	ELGIN IL 60120
78189	ILLINOIS TOOL WORKS INC SHAKEPROOF DIVISION	ST CHARLES ROAD	ELGIN IL 60120
80009	TEKTRONIX INC	4900 S W GRIFFITH DR P O BOX 500	BEAVERTON OR 97077
83385	MICRODOT MANUFACTURING INC GREER-CENTRAL DIV	3221 W BIG BEAVER RD	TROY MI 48098
86928	SEASTROM MFG CO INC	701 SONORA AVE	GLENDALE CA 91201
93907	TEXTRON INC CAMCAR DIV	600 18TH AVE	ROCKFORD IL 61101
98159	RUBBER TECK, INC.	19115 HAMILTON AVE., P O BOX 389	GARDENA, CA 90247
S3109	FELLER ASA ADOLF AG C/O PANEL COMPONENTS CORP	355 TESCONI CIRCLE	SANTA ROSA CA 95401
S3629	SCHURTER AG H C/O PANEL COMPONENTS CORP	2015 SECOND STREET	BERKELEY CA 94170
TK0060	WRIGHT ENGINEERED PLASTICS	10350 OLD REDWOOD HIGHWAY	WINDSOR CA 95492
TK0433	PORTLAND SCREW CO	6520 N BASIN	PORTLAND OR 97217
TK0435	LEWIS SCREW CO	4114 S PEORIA	CHICAGO IL 60609
TK0861	H SCHURTER AG DIST PANEL COMPONENTS	2015 SECOND STREET	BERKELEY CA 94170
TK1373	PATELEC-CEM (ITALY)	10156 TORINO	VAICENTALLO 62/45S ITALY

Fig. & Index No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
1-1	016-0408-01			1	COVER,PROT:FRONT PANEL	80009	016-0408-01
-2	390-0886-00			1	CAB.,WRAPAROUND:COLOR	80009	390-0886-00
					(ATTACHING PARTS)		
-3	211-0503-00			1	SCREW,MACHINE:6-32 X 0.188,PNH,STL	TK0435	ORDER BY DESCR
					(END ATTACHING PARTS)		
-4	348-0080-01			4	FOOT,CABINET:CHARCOAL GRAY,POLYURETHANE	80009	348-0080-01
-5	334-4913-00			1	PLATE,IDENT:MKD 318 LOGIC ANALYZER	80009	334-4913-00
-6	200-1342-01			2	COVER,HANDLE:35.5MM OD X 14MM H,PLASTIC	80009	200-1342-01
-7	386-3936-00			2	PLATE,MOUNTING:HANDLE,STEEL	80009	386-3936-00
					(ATTACHING PARTS)		
-8	212-0033-00			2	SCREW,MACHINE:8-32 X 0.75,PNH,STL	TK0435	ORDER BY DESCR
-9	210-0008-00			2	WASHER,LOCK:#8 INTL,0.02 THK,STL	77900	1208-00-00-0541C
					(END ATTACHING PARTS)		
-10	386-2182-00			4	PLATE,FRICTION:17MM ID X 32 OD X 1MM THK	80009	386-2182-00
-11	367-0203-00			1	HANDLE,CARRYING:BLACK VINYL	80009	367-0203-00
-12	343-0757-00			2	RETAINER,HANDLE:	80009	343-0757-00

FIG. 1 CABINET

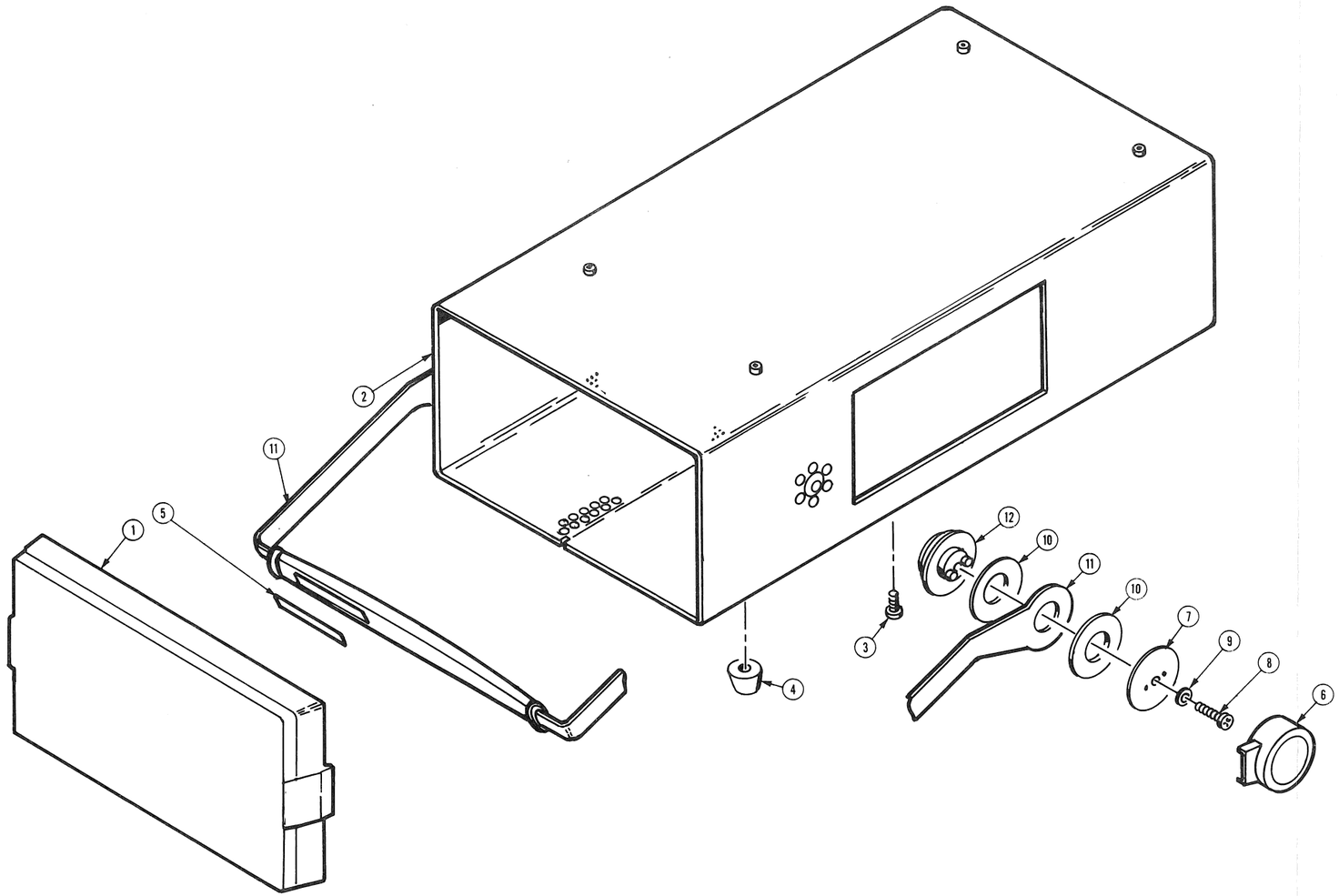


FIG. 2 CIRCUIT BOARDS

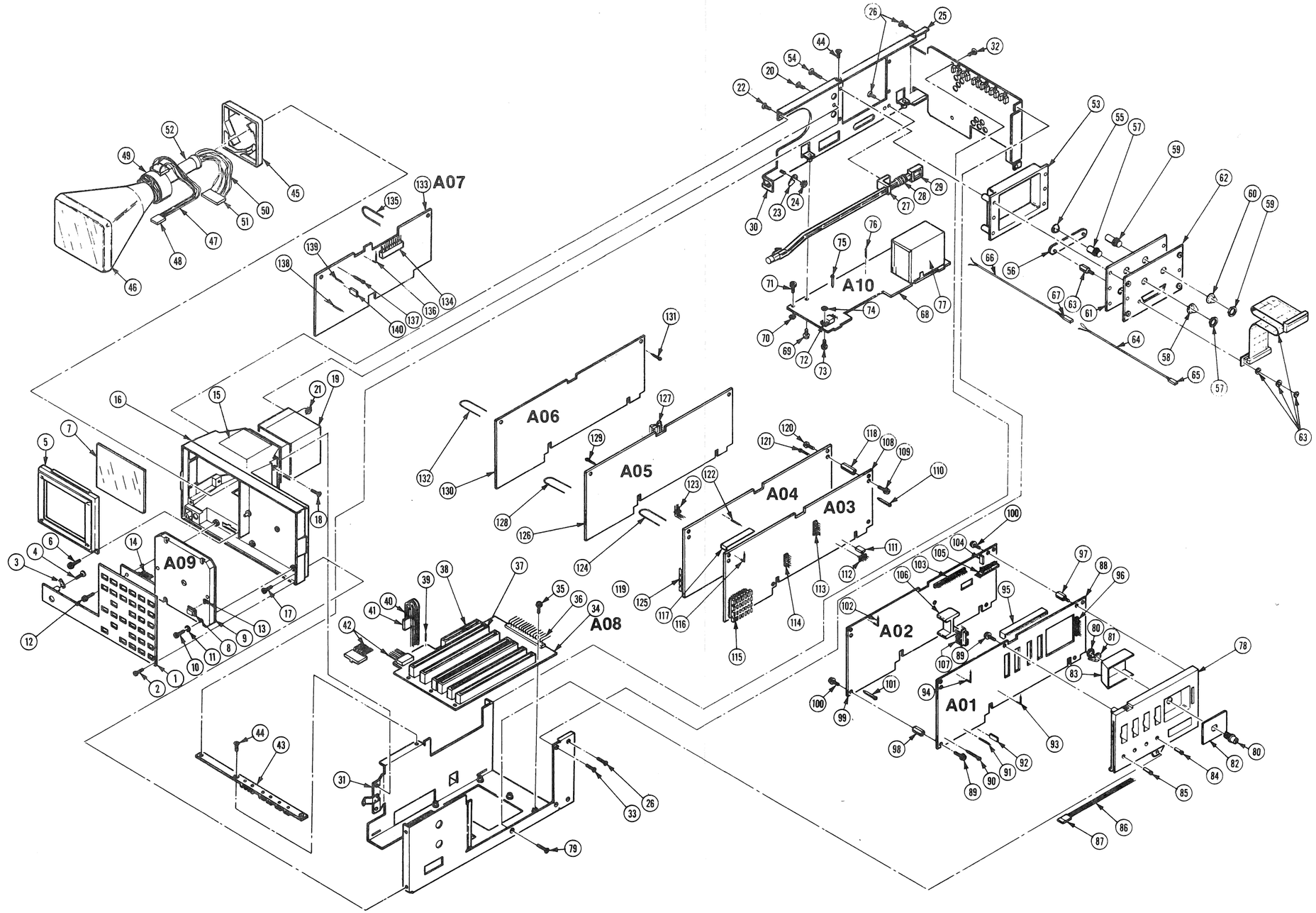


Fig. & Index No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
2-1	333-2999-01			1	PANEL,FRONT:	80009	333-2999-01
					(ATTACHING PARTS)		
-2	211-0342-00			4	SCREW,CAP:2-56 X 0.177,HEX SKT,STL CRM PL	80009	211-0342-00
	361-1266-00			4	SPACER,RING:0.7 L X 2.4 ID MM	80009	361-1266-00
					(END ATTACHING PARTS)		
	198-5297-00			1	WIRE SET,ELEC:	80009	198-5297-00
-3	210-0202-00			1	TERMINAL,LUG:0.146 ID,LOCKING,BRZ TIN PL	86928	A-373-158-2
					(ATTACHING PARTS)		
-4	211-0503-00			1	SCREW,MACHINE:6-32 X 0.188,PNH,STL	TK0435	ORDER BY DESCR
					(END ATTACHING PARTS)		
-5	343-0787-03			1	RETAINER,CRT:	80009	343-0787-03
	348-0818-00			1	CUSHION,RUBBER:RIGHT	80009	348-0818-00
	348-0817-00			1	CUSHION,RUBBER:LEFT	80009	348-0817-00
					(ATTACHING PARTS)		
-6	211-0661-00			2	SCR,ASSEM WSHR:4-40 X 0.25,PNH,STL,POZ	01536	821-01655-024
					(END ATTACHING PARTS)		
-7	337-2600-00			1	SHIELD,CRT:	80009	337-2600-00
-8	366-2032-01			1	PUSH BUTTON:IVORY GRAY,1	TK0060	ORDER BY DESCR
	366-2032-02			1	PUSH BUTTON:IVORY GRAY,2	TK0060	ORDER BY DESCR
	366-2032-03			1	PUSH BUTTON:IVORY GRAY,3	TK0060	ORDER BY DESCR
	366-2032-04			1	PUSH BUTTON:IVORY GRAY,4	TK0060	ORDER BY DESCR
	366-2032-05			1	PUSH BUTTON:IVORY GRAY,5	TK0060	ORDER BY DESCR
	366-2032-06			1	PUSH BUTTON:IVORY GRAY,6	TK0060	ORDER BY DESCR
	366-2032-07			1	PUSH BUTTON:IVORY GRAY,7	TK0060	ORDER BY DESCR
	366-2032-08			1	PUSH BUTTON:IVORY GRAY,8	TK0060	ORDER BY DESCR
	366-2032-09			1	PUSH BUTTON:IVORY GRAY,9	TK0060	ORDER BY DESCR
	366-2032-10			1	PUSH BUTTON:IVORY GRAY,0	TK0060	ORDER BY DESCR
	366-2032-11			1	PUSH BUTTON:IVORY GRAY,A	TK0060	ORDER BY DESCR
	366-2032-12			1	PUSH BUTTON:IVORY GRAY,B	TK0060	ORDER BY DESCR
	366-2032-13			1	PUSH BUTTON:IVORY GRAY,C	TK0060	ORDER BY DESCR
	366-2032-14			1	PUSH BUTTON:IVORY GRAY,D	TK0060	ORDER BY DESCR
	366-2032-15			1	PUSH BUTTON:IVORY GRAY,E	TK0060	ORDER BY DESCR
	366-2032-16			1	PUSH BUTTON:IVORY GRAY,F	TK0060	ORDER BY DESCR
	366-2032-17			1	PUSH BUTTON:IVORY GRAY,X	TK0060	ORDER BY DESCR
	366-2029-00			6	PUSH BUTTON:DOVE GY,0.45 X 0.275 X 0.175 H	TK0060	ORDER BY DESCR
	366-2029-20			4	PUSH BUTTON:DOVE GRAY,UP ARROW	TK0060	ORDER BY DESCR
	366-2029-21			2	PUSH BUTTON:DOVE GRAY,RIGHT ARROW	TK0060	ORDER BY DESCR
	366-2031-00			2	PUSH BUTTON:SLATE GY,0.45 X 0.275 X 0.175 H	TK0060	ORDER BY DESCR
-9	----- -----			1	SW PB ASSY:KEYBOARD(SEE A09 REPL)		
					(ATTACHING PARTS)		
-10	211-0012-00			5	SCREW,MACHINE:4-40 X 0.375,PNH,STL	TK0435	ORDER BY DESCR
-11	210-0054-00			5	WASHER,LOCK:#4 SPLIT,0.025 THK STL	78189	ORDER BY DESCR
-12	211-0661-00			1	SCR,ASSEM WSHR:4-40 X 0.25,PNH,STL,POZ	01536	821-01655-024
					(END ATTACHING PARTS)		
-13	----- -----			1	.SWITCH ASSY:		
-14	----- -----			1	.CONNECTOR:(SEE A09J010 REPL)		
	198-5297-00			1	.WIRE SET,ELEC:	80009	198-5297-00
-15	334-3360-00			1	MARKER,IDENT:MARKED WARNING	80009	334-3360-00
-16	386-4962-00			1	SUBPANEL,FRONT:	80009	386-4962-00
					(ATTACHING PARTS)		
-17	211-0105-00			2	SCREW,MACHINE:4-40 X 0.188,FLH,100 DEG	TK0435	ORDER BY DESCR
-18	211-0538-00			2	SCREW,MACHINE:6-32 X 0.312,FLH,100 DEG,STL	93907	ORDER BY DESCR
					(END ATTACHING PARTS)		
-19	337-2599-00			1	SHIELD,CRT:	80009	337-2599-00
					(ATTACHING PARTS)		
-20	211-0101-00			1	SCREW,MACHINE:4-40 X 0.25,FLH,100 DEG,STL	TK0435	ORDER BY DESCR
-21	210-0586-00			1	NUT,PL,ASSEM WA:4-40 X 0.25,STL CD PL	78189	211-041800-00
-22	211-0538-00			2	SCREW,MACHINE:6-32 X 0.312,FLH,100 DEG,STL	93907	ORDER BY DESCR
					(END ATTACHING PARTS)		
-23	210-0202-00			1	TERMINAL,LUG:0.146 ID,LOCKING,BRZ TIN PL	86928	A-373-158-2
					(ATTACHING PARTS)		
-24	210-0457-00			1	NUT,PL,ASSEM WA:6-32 X 0.312,STL CD PL	78189	511-061800-00
					(END ATTACHING PARTS)		
-25	441-1662-01			1	CHAS,LGC ANALY:LEFT	80009	441-1662-01
					(ATTACHING PARTS)		
-26	211-0105-00			5	SCREW,MACHINE:4-40 X 0.188,FLH,100 DEG	TK0435	ORDER BY DESCR
					(END ATTACHING PARTS)		
-27	351-0705-00			1	GUIDE,EXT SHAFT:	80009	351-0705-00

Fig. & Index No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
2-28	214-3420-00			1	SPRING,HLCPS:10.0MM OD X 9.5MM L,CLE,SST	80009	214-3420-00
-29	384-1660-00			1	EXTENSION SHAFT:248.9MM L X 12.0MM OD,PC	80009	384-1660-00
-30	366-1767-01			1	PUSH BUTTON:BLACK,GREEN INDICATOR	80009	366-1767-01
-31	441-1661-00			1	CHAS,LGC ANALY:RIGHT	80009	441-1661-00
					(ATTACHING PARTS)		
-32	211-0101-00			2	SCREW,MACHINE:4-40 X 0.25,FLH,100 DEG,STL	TK0435	ORDER BY DESCR
-33	211-0105-00			2	SCREW,MACHINE:4-40 X 0.188,FLH,100 DEG	TK0435	ORDER BY DESCR
					(END ATTACHING PARTS)		
-34	----- -----			1	CKT BOARD ASSY:MOTHER(SEE A08 REPL)		
					(ATTACHING PARTS)		
-35	211-0661-00			7	SCR,ASSEM WSHR:4-40 X 0.25,PNH,STL,POZ	01536	821-01655-024
					(END ATTACHING PARTS)		
					CKT BOARD ASSY INCLUDES:		
-36	----- -----			2	.CONNECTOR:(SEE A08J050,A08J051 REPL)		
-37	----- -----			6	.CONN,RCPT,ELEC:(SEE A08J001,J002,J003,		
					.J004,J005,J006 REPL)		
-38	----- -----			1	.CONN,RCPT,ELEC:(SEE A08J007 REPL)		
-39	131-0608-00			2	.TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL	22526	48283-036
-40	198-5292-00			1	WIRE SET,ELEC:	80009	198-5292-00
-41	352-0165-01			1	.HLDR,TERM CONN:7 WIRE,BROWN	80009	352-0165-01
-42	175-0049-00			1	CA ASSY,SP,ELEC:16,28 AWG,20CM	80009	175-0049-00
-43	386-4965-00			1	PLATE,HOLDER:CIRCUIT BOARD	80009	386-4965-00
					(ATTACHING PARTS)		
-44	211-0101-00			3	SCREW,MACHINE:4-40 X 0.25,FLH,100 DEG,STL	TK0435	ORDER BY DESCR
					(END ATTACHING PARTS)		
-45	386-4059-00			1	SUPPORT,CRT:BLACK PLASTIC	80009	386-4059-00
-46	----- -----			1	ELECTRON TUBE:(SEE V200 REPL)		
-47	198-5293-00			1	WIRE SET,ELEC:	80009	198-5293-00
-48	352-0162-00			1	.HLDR,TERM CONN:4 WIRE,BLACK	80009	352-0162-00
-49	----- -----			1	TUBE DEFL:(SEE L150 REPL)		
-50	198-5294-00			1	WIRE SET,ELEC:	80009	198-5294-00
-51	352-0166-00			1	.HLDR,TERM CONN:8 WIRE,BLACK	80009	352-0166-00
-52	136-0777-00			1	SKT,PL-IN ELEK:CRT,6 PIN,BLACK	80009	136-0777-00
-53	386-4963-00			1	SUBPANEL,SIDE:LEFT	80009	386-4963-00
					(ATTACHING PARTS)		
-54	211-0109-00			4	SCREW,MACHINE:4-40 X 0.875,FLH,100 DEG,STL	TK0433	ORDER BY DESCR
					(END ATTACHING PARTS)		
-55	134-0170-00			1	BUTTON,PLUG:12.7MM DIA,POLYCARBONATE	80009	134-0170-00
					(STANDARD ONLY)		
-56	134-0171-00			1	BUTTON,PLUG:56.6MM DIA,POLYCARBONATE	80009	134-0171-00
					(STANDARD ONLY)		
-57	131-0955-00			2	CONN,RCPT,ELEC:BNC,FEMALE	13511	31-279
					(OPTION 01 ONLY)		
-58	210-0255-00			2	TERMINAL,LUG:0.391 ID,LOCKING,BRS CD PL	12327	ORDER BY DESCR
					(OPTION 01 ONLY)		
	210-0255-00			2	TERMINAL,LUG:0.391 ID,LOCKING,BRS CD PL	12327	ORDER BY DESCR
					(STANDARD ONLY)		
-59	131-0955-00			2	CONN,RCPT,ELEC:BNC,FEMALE	13511	31-279
-60	210-0255-00			1	TERMINAL,LUG:0.391 ID,LOCKING,BRS CD PL	12327	ORDER BY DESCR
					(STANDARD ONLY)		
-61	386-4960-00			1	PANEL,SIDE:LEFT	80009	386-4960-00
-62	386-4964-00			1	PLATE,ELEC SHLD:LEFT	80009	386-4964-00
-63	175-0142-00			1	CA ASSY,SP,ELEC:26,28 AWG,20CM	80009	175-0142-00
-64	198-5295-00			1	WIRE SET,ELEC:	80009	198-5295-00
-65	352-0169-00			1	.HLDR,TERM CONN:2 WIRE,BLACK	80009	352-0169-00
-66	198-5298-00			1	WIRE SET,ELEC:	80009	198-5298-00
					(OPTION 01 ONLY)		
-67	352-0169-00			1	.HLDR,TERM CONN:2 WIRE,BLACK	80009	352-0169-00
					(OPTION 01 ONLY)		
-68	----- -----			1	CKT BOARD ASSY:CRT(SEE A10 REPL)		
					(ATTACHING PARTS)		
-69	211-0661-00			3	SCR,ASSEM WSHR:4-40 X 0.25,PNH,STL,POZ	01536	821-01655-024
					(END ATTACHING PARTS)		
					CKT BOARD ASSY INCLUDES:		
-70	352-0686-00			2	.HOLDER,CKT BD:BRASS	80009	352-0686-00
					.(ATTACHING PARTS)		
-71	211-0661-00			2	.SCR,ASSEM WSHR:4-40 X 0.25,PNH,STL,POZ	01536	821-01655-024
					.(END ATTACHING PARTS)		

Fig. & Index No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
2-72	----- -----			1	.MICROCIRCUIT,LI:(SEE A10U280 REPL)		
					.(ATTACHING PARTS)		
-73	211-0244-00			1	.SCR,ASSEM WSHR:4-40 X 0.312,PNH STL	01536	ORDER BY DESCR
-74	210-0551-00			1	.NUT,PLAIN,HEX:4-40 X 0.25,ST CD PL	TK0435	ORDER BY DESCR
					.(END ATTACHING PARTS)		
-75	----- -----			3	.TERM,TEST POINT:(SEE A10TP140,TP145,		
					.GND001 REPL)		
-76	131-0608-00			17	.TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL	22526	48283-036
-77	----- -----			1	.TRANSFORMER:(SEE A10T230 REPL)		
-78	386-4966-00			1	SUBPANEL,SIDE:RIGHT	80009	386-4966-00
					(ATTACHING PARTS)		
-79	211-0101-00			1	SCREW,MACHINE:4-40 X 0.25,FLH,100 DEG,STL	TK0435	ORDER BY DESCR
					(END ATTACHING PARTS)		
-80	131-0955-00			1	CONN,RCPT,ELEC:BNC,FEMALE	13511	31-279
-81	210-0255-00			1	TERMINAL,LUG:0.391 ID,LOCKING,BRS CD PL	12327	ORDER BY DESCR
-82	386-4961-00			1	PANEL,SIDE:RIGHT	80009	386-4961-00
-83	337-3083-00			1	SHIELD,ELEC:EMI	80009	337-3083-00
-84	136-0387-01			1	JACK,TIP:U/W 0.04 DIA PIN,BLACK	71279	4504252010310
-85	136-0387-00			1	JACK,TIP:U/W 0.04 DIA PIN,GRAY	71279	4504352010318
-86	198-5296-00			1	WIRE SET,ELEC:	80009	198-5296-00
-87	352-0162-00			1	.HLDR,TERM CONN:4 WIRE,BLACK	80009	352-0162-00
-88	----- -----			1	CKT BD ASSY:DATA INPUT-A(SEE A01 REPL)		
					(ATTACHING PARTS)		
-89	211-0661-00			4	SCR,ASSEM WSHR:4-40 X 0.25,PNH,STL,POZ	01536	821-01655-024
					(END ATTACHING PARTS)		
					CKT BOARD ASSY INCLUDES:		
-90	----- -----			4	.TERM,TEST PT:(SEE A01TP100,TP102,TP104,		
					.TP106 REPL)		
-91	131-0608-00			12	.TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL	22526	48283-036
-92	131-0993-00			1	.BUS,CONDUCTOR:SHUNT ASSEMBLY,BLACK	22526	65474-005
-93	131-0589-00			4	.TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ	22526	48283-029
-94	131-0589-00			4	.TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ	22526	48283-029
-95	----- -----			1	.CONNECTOR:(SEE A01J100 REPL)		
-96	----- -----			1	.CONNECTOR:(SEE A01J106 REPL)		
-97	129-0996-00			3	.SPACER,POST:18.9MM,4-40,BRASS,4.775 HEX	80009	129-0996-00
-98	129-0995-00			2	SPACER,POST:12.9MM,4-40,BRASS,4.775 HEX	80009	129-0995-00
-99	----- -----			1	CKT BD ASSY:DATA INPUT-B(SEE A02 REPL)		
					(ATTACHING PARTS)		
-100	211-0661-00			4	SCR,ASSEM WSHR:4-40 X 0.25,PNH,STL,POZ	01536	821-01655-024
					(END ATTACHING PARTS)		
					CKT BOARD ASSY INCLUDES:		
-101	----- -----			4	.TERM,TEST POINT:(SEE A02TP200,TP202,		
					.TP204,TP206 REPL)		
-102	131-0589-00			2	.TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ	22526	48283-029
-103	----- -----			1	.CONNECTOR,:(SEE A02J200 REPL)		
-104	131-0993-00			2	.BUS,CONDUCTOR:SHUNT ASSEMBLY,BLACK	22526	65474-005
-105	----- -----			1	.CONNECTOR:(SEE A02J206 REPL)		
-106	361-0955-00			1	.SPACER,CONN:0.433 THK,POLYCARBONATE	80009	361-0955-00
-107	----- -----			4	.CONN:(SEE A02J200,J202,J204,J206 REPL)		
-108	----- -----			1	CKT BOARD ASSY:ACQ CONTROL(SEE A03 REPL)		
					(ATTACHING PARTS)		
-109	211-0661-00			4	SCR,ASSEM WSHR:4-40 X 0.25,PNH,STL,POZ	01536	821-01655-024
					(END ATTACHING PARTS)		
					CKT BOARD ASSY INCLUDES:		
-110	----- -----			2	.TERM,TEST PT:(SEE A03TP100,TP200 REPL)		
-111	131-0993-00			7	.BUS,CONDUCTOR:SHUNT ASSEMBLY,BLACK	22526	65474-005
-112	----- -----			1	.CONNECTOR:(SEE A03J050 REPL)		
-113	----- -----			1	.CONNECTOR:(SEE A03J200 REPL)		
-114	----- -----			2	.CONNECTOR:(SEE A03J300,J400 REPL)		
-115	214-3419-00			1	.HEAT SINK:MSL	80009	214-3419-00
-116	131-0589-00			6	.TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ	22526	48283-029
-117	131-2939-01			1	.CONN,RCPT,ELEC:FEMALE,2 X 20	80009	131-2939-01
-118	129-0997-00			4	SPACER,POST:9.8MM W 4-40 THD,BRASS,4.76 HEX	80009	129-0997-00
-119	----- -----			1	CKT BOARD ASSY:ACQ MEMORY(SEE A04 REPL)		
					(ATTACHING PARTS)		
-120	211-0661-00			4	SCR,ASSEM WSHR:4-40 X 0.25,PNH,STL,POZ	01536	821-01655-024
					(END ATTACHING PARTS)		
					CKT BOARD ASSY INCLUDES:		

Fig. & Index No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
2-121	----- -----			2	.TERM,TEST PT:(SEE A04TP110,TP111 REPL)		
-122	131-0589-00			40	.TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ	22526	48283-029
-123	----- -----			1	.CONNECTOR:(SEE A04J100 REPL)		
-124	346-0032-00			1	.STRAP,RETAINING:0.075 DIA X 4.0 L	98159	2829-75-4
-125	214-3419-00			1	.HEAT SINK:MSL	80009	214-3419-00
-126	----- -----			1	CKT BD ASSY:MEM/THRSHLD(SEE A05 REPL)		
-127	136-0755-00			1	.SKT,PL-IN ELEK:MICROCIRCUIT,28 DIP	09922	DILB28P-108
-128	346-0032-00			1	.STRAP,RETAINING:0.075 DIA X 4.0 L	98159	2829-75-4
-129	----- -----			7	.TERM,TEST PT(SEE A05TP500,TP502,TP504,TP510 .TP512,TP514,TP516 REPL)		
-130					CKT BD ASSY:MPU & DISPLAY(SEE A06 REPL)		
-131	----- -----			2	.TERM,TEST POINT:(A06TP600,TP610 REPL)		
-132	346-0032-00			1	.STRAP,RETAINING:0.075 DIA X 4.0 L	98159	2829-75-4
-133	----- -----			1	CKT BD ASSY:SER/RS232C(SEE A07 REPL) (OPTION 01 ONLY)		
-134	----- -----			1	.CONNECTOR:(SEE A07J700 REPL)		
-135	346-0032-00			1	.STRAP,RETAINING:0.075 DIA X 4.0 L	98159	2829-75-4
-136	131-2935-00			2	.CONN,RCPT,ELEC:HEADER,ANGLE,1 X 2	80009	131-2935-00
-137	----- -----			4	.TERM,TEST POINT:(SEE A07TP700,TP710,TP720, .TP730 REPL)		
-139	131-0608-00			1	.TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL	22526	48283-036
-140	131-0993-00			1	.BUS,CONDUCTOR:SHUNT ASSEMBLY,BLACK	22526	65474-005

Fig. & Index No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
3-1	441-1663-01			1	CHAS,PWR SUPPLY:318/338	80009	441-1663-01
-2	334-3379-00			1	MARKER,IDENT:MARKED GROUND SYMBOL	07416	ORDER BY DESCR
-3	210-0202-00			1	TERMINAL,LUG:0.146 ID,LOCKING,BRZ TIN PL	86928	A-373-158-2
					(ATTACHING PARTS)		
-4	210-0457-00			1	NUT,PL,ASSEM WA:6-32 X 0.312,STL CD PL	78189	511-061800-00
					(END ATTACHING PARTS)		
-5	361-1235-00			1	SPACER,FILTER:4.6MM THK,POLYCARBONATE	80009	361-1235-00
-6	----- -----			1	FILTER:(SEE FL1 REPL)		
					(ATTACHING PARTS)		
-7	210-0586-00			2	NUT,PL,ASSEM WA:4-40 X 0.25,STL CD PL	78189	211-041800-00
					(END ATTACHING PARTS)		
-8	----- -----			1	SWITCH,SLIDE:(SEE S2 REPL)		
					(ATTACHING PARTS)		
-9	210-0406-00			2	NUT,PLAIN,HEX:4-40 X 0.188,BRS CD PL	73743	12161-50
-10	210-0004-00			2	WASHER,LOCK:#4 INTL,0.015 THK,STL	77900	1204-00-00-0541C
					(END ATTACHING PARTS)		
-11	200-2264-00			1	CAP,FUSEHOLDER:3AG FUSES	S3629	FEK 031 1666
-12	204-0833-00			1	BODY,FUSEHOLDER:3AG & 5 X 20MM FUSES	TK0861	031 1653 (FEU)
-13	210-1039-00			1	WASHER,LOCK:0.521 ID,INT,0.025 THK,SST	24931	ORDER BY DESCR
-14	200-2820-00			1	COVER,FAN:COPPER	80009	200-2820-00
-15	----- -----			1	FAN ASSY:(SEE B001 REPL)		
					(ATTACHING PARTS)		
-16	211-0020-00			4	SCREW,MACHINE:4-40 X 1.125,PNH,STL	TK0435	ORDER BY DESCR
-17	210-0004-00			4	WASHER,LOCK:#4 INTL,0.015 THK,STL	77900	1204-00-00-0541C
					(END ATTACHING PARTS)		
-18	352-0371-00			1	.HLDR,TERM CONN:2,FEMALE	80009	352-0371-00
-19	200-2822-00			1	COVER,PWR SPLY:BOTTOM	80009	200-2822-00
					(ATTACHING PARTS)		
-20	211-0105-00			1	SCREW,MACHINE:4-40 X 0.188,FLH,100 DEG	TK0435	ORDER BY DESCR
					(END ATTACHING PARTS)		
-21	342-0627-00			1	INSULATOR,PLATE:BOTTOM,POLYCARBONATE	80009	342-0627-00
-22	200-2821-00			1	COVER,PWR SPLY:TOP	80009	200-2821-00
					(ATTACHING PARTS)		
-23	211-0105-00			1	SCREW,MACHINE:4-40 X 0.188,FLH,100 DEG	TK0435	ORDER BY DESCR
					(END ATTACHING PARTS)		
-24	342-0628-00			1	INSULATOR,PLATE:TOP,POLYCARBONATE	80009	342-0628-00
-25	333-2969-01			1	PANEL,REAR:	80009	333-2969-01
-26	211-0510-00			2	SCREW,MACHINE:6-32 X 0.375,PNH,STL	83385	ORDER BY DESCR
					(END ATTACHING PARTS)		
-27	334-4911-00			1	MARKER,IDENT:MKD CAUTION	80009	334-4911-00
-28	----- -----			1	CKT BOARD ASSY:INVERTER(SEE A11 REPL)		
					(ATTACHING PARTS)		
-29	211-0661-00			4	SCR,ASSEM WSHR:4-40 X 0.25,PNH,STL,POZ	01536	821-01655-024
					(END ATTACHING PARTS)		
					CKT BOARD ASSY INCLUDES:		
-30	352-0686-00			2	.HOLDER,CKT BD:BRASS	80009	352-0686-00
					.(ATTACHING PARTS)		
-31	211-0661-00			2	.SCR,ASSEM WSHR:4-40 X 0.25,PNH,STL,POZ	01536	821-01655-024
					.(END ATTACHING PARTS)		
-32	----- -----			1	.DIODE:(SEE A11CR151 REPL)		
					.(ATTACHING PARTS)		
-33	211-0121-00			1	.SCR,ASSEM WSHR:4-40 X 0.438,PNH,BRS	TK0435	ORDER BY DESCR
					.(END ATTACHING PARTS)		
-34	214-2063-00			1	.HEAT SINK,DIODE:(2),ALUMINUM	80009	214-2063-00
					.(ATTACHING PARTS)		
-35	211-0661-00			2	.SCR,ASSEM WSHR:4-40 X 0.25,PNH,STL,POZ	01536	821-01655-024
					.(END ATTACHING PARTS)		
-36	----- -----			1	.DIODE:(SEE A11CR153 REPL)		
					.(ATTACHING PARTS)		
-37	211-0121-00			1	.SCR,ASSEM WSHR:4-40 X 0.438,PNH,BRS	TK0435	ORDER BY DESCR
					.(END ATTACHING PARTS)		
-38	----- -----			1	.DIODE:(SEE A11CR152 REPL)		
					.(ATTACHING PARTS)		
-39	211-0121-00			1	.SCR,ASSEM WSHR:4-40 X 0.438,PNH,BRS	TK0435	ORDER BY DESCR
					.(END ATTACHING PARTS)		
-40	214-2048-00			1	.HEAT SINK,DIODE:(1),ALUMINUM	80009	214-2048-00
					.(ATTACHING PARTS)		
-41	211-0661-00			2	.SCR,ASSEM WSHR:4-40 X 0.25,PNH,STL,POZ	01536	821-01655-024

Fig. & Index No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
3-					.(END ATTACHING PARTS)		
-42	----- -----			1	.TRANSISTOR:(SEE A11Q149 REPL)		
					.(ATTACHING PARTS)		
-43	211-0121-00			1	.SCR,ASSEM WSHR:4-40 X 0.438,PNH,BRS	TK0435	ORDER BY DESCR
					.(END ATTACHING PARTS)		
-44	----- -----			1	.THERMOSTATIC:(SEE A11S003 REPL)		
					.(ATTACHING PARTS)		
-45	211-0661-00			2	.SCR,ASSEM WSHR:4-40 X 0.25,PNH,STL,POZ	01536	821-01655-024
					.(END ATTACHING PARTS)		
-46	214-2064-00			1	.HEAT SINK,XSTR:TO-218,ALUMINUM	80009	214-2064-00
					.(ATTACHING PARTS)		
-47	211-0661-00			2	.SCR,ASSEM WSHR:4-40 X 0.25,PNH,STL,POZ	01536	821-01655-024
					.(END ATTACHING PARTS)		
-48	----- -----			3	.CONNECTOR:(SEE A11J004,J005,J011 REPL)		
-49	----- -----			2	.CONNECTOR:(SEE A11J008,J010 REPL)		
-50	----- -----			1	CKT BOARD ASSY:REGULATOR(SEE A12 REPL)		
					(ATTACHING PARTS)		
-51	211-0661-00			4	SCR,ASSEM WSHR:4-40 X 0.25,PNH,STL,POZ	01536	821-01655-024
					(END ATTACHING PARTS)		
					CKT BOARD ASSY INCLUDES:		
-52	----- -----			2	.CONNECTOR:(SEE A12J007,J009 REPL)		
-53	----- -----			1	.CONNECTOR:(SEE A12J006 REPL)		
-54	----- -----			3	.TERM,TEST PT:(SEE A12TP001,TP002,		
					.TP003 REPL)		
-55	131-2994-00			1	.BUS,CONDUCTOR:5 CONDUCTOR,73 MM L	80009	131-2994-00
-56	----- -----			1	.CONNECTOR:(SEE A12J001 REPL)		
-57	----- -----			2	.CONNECTOR:(SEE A12J002,J003 REPL)		
	175-8753-00			1	CA ASSY,SP,ELEC:ECB PWR SUPPLY	80009	175-8753-00
-58	175-8464-00			2	.CA ASSY,SP,ELEC:8,22 AWG,105 MM L,RIBBON	80009	175-8464-00
-59	175-8748-00			1	.CA ASSY,SP,ELEC:2,18 AWG,14 CM,0-N,9-N	80009	175-8748-00
-60	352-0370-00			2	..HLDR,TERM CONN:2,FEMALE	80009	352-0370-00
-61	175-8749-00			1	.LEAD ASSY,ELEC:1,18 AWG,7 CM,9-N & 3,26 AWG	80009	175-8749-00
					.,12 CM,RB		
-62	175-8750-00			1	.LEAD ASSY,ELEC:2,20 AWG,13 CM,9-N,2-N	80009	175-8750-00
-63	352-0370-00			1	..HLDR,TERM CONN:2,FEMALE	80009	352-0370-00
-64	175-8751-00			1	.LEAD ASSY,ELEC:2,20 AWG,13 CM,9-N,2-N	80009	175-8751-00
-65	352-0370-00			1	..HLDR,TERM CONN:2,FEMALE	80009	352-0370-00
	175-8752-00			1	CA ASSY,SP,ELEC:3,18 AWG,14 CM,4-5,2-N,0-N	80009	175-8752-00

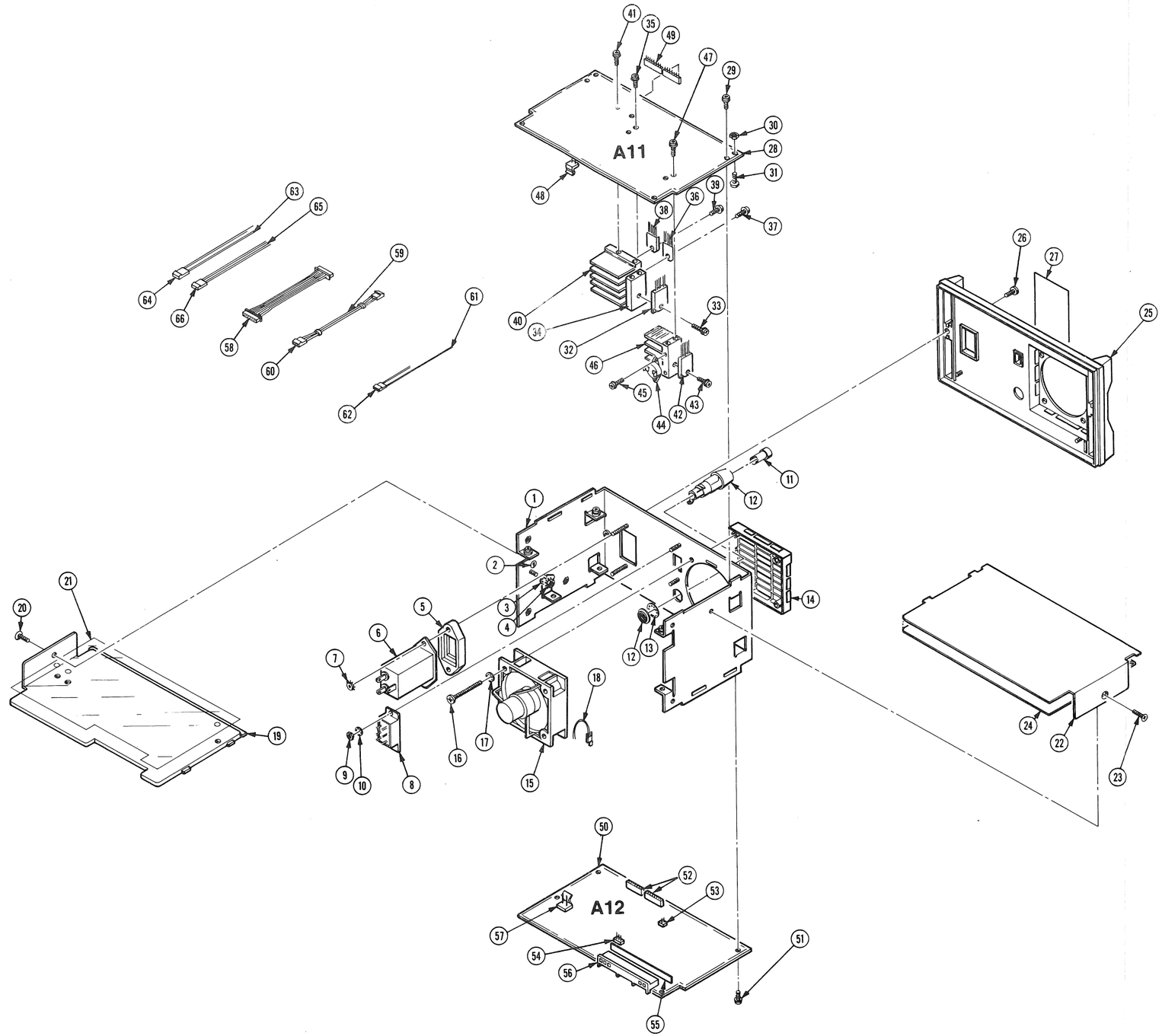
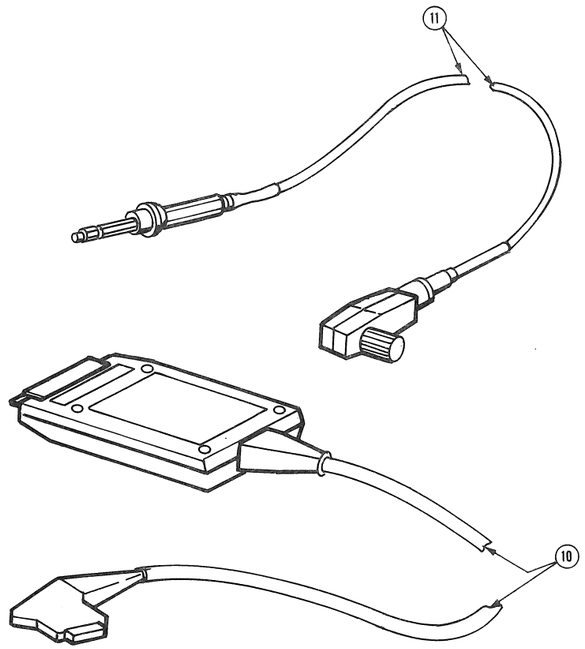
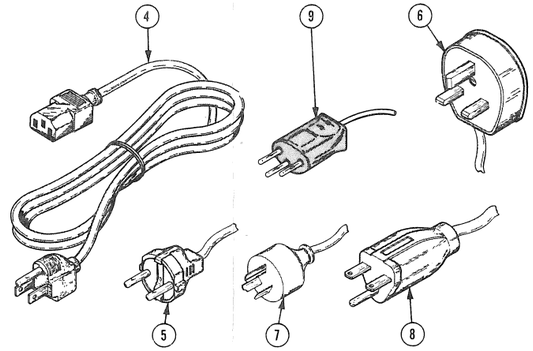


FIG. 3 REAR

FIG. 4 ACCESSORIES





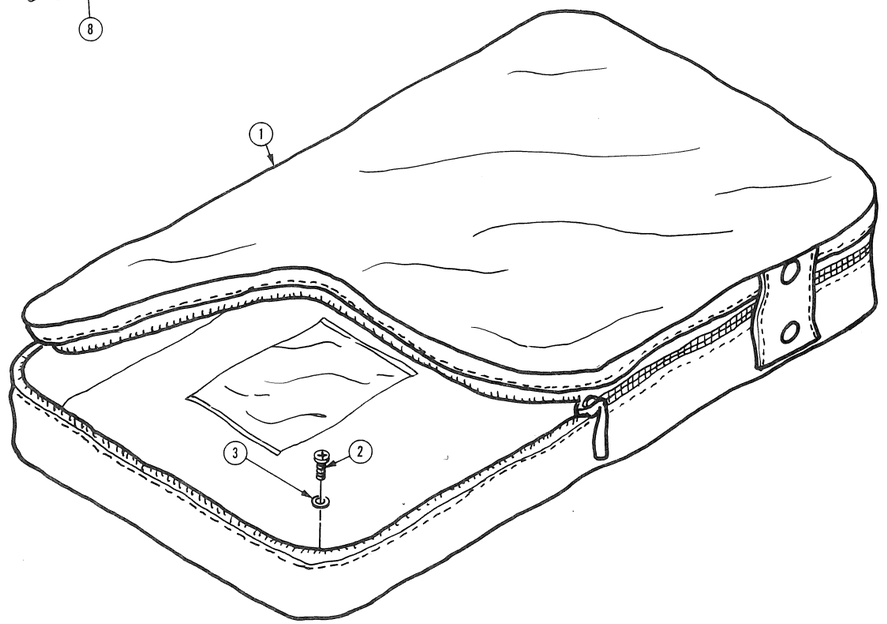


Fig. & Index No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
4-					STANDARD ACCESSORIES		
	070-6635-00			1	MANUAL,TECH:OPERATORS	80009	070-6635-00
	070-6636-00			1	MANUAL,TECH:REFERENCE GUIDE	80009	070-6636-00
-1	016-0697-00			1	ACCESSORY POUCH: (ATTACHING PARTS)	80009	016-0697-00
-2	211-0007-00			4	SCREW,MACHINE:4-40 X 0.188,PNH,STL	TK0435	ORDER BY DESCR
-3	210-0851-00			4	WASHER,FLAT:0.119 ID X 0.375 OD X 0.025,STL (END ATTACHING PARTS)	12327	ORDER BY DESCR
-4	161-0104-11			1	CABLE ASSY,PWR,:3 WIRE,98.0 L,W/RT ANGLE (STANDARD ONLY)	16428	CH8352
-5	161-0104-10			1	CABLE ASSY,PWR,:3 WIRE,2.5M L,220V (OPTION A1-EUROPEAN ONLY)	80009	161-0104-10
-6	161-0104-07			1	CABLE ASSY,PWR,:3 X 0.75MM SQ,240V,98.0 L (OPTION A2-UNITED KINGDOM ONLY)	TK1373	A25UK-RA
-7	161-0104-05			1	CABLE ASSY,PWR,:3,18 AWG,240V,98.0 L (OPTION A3-AUSTALIAN ONLY)	S3109	ORDER BY DESCR
-8	161-0104-08			1	CABLE ASSY,PWR,:3,18 AWG,240V,98.0 L (OPTION A4-NORTH AMERICAN ONLY)	70903	ORDER BY DESCR
-9	161-0154-00			1	CABLE ASSY,PWR,:3,0.75MM SQ,240V,6A,2.5M L (OPTION A5-SWITZERLAND ONLY)	S3109	86515000
-10	010-6451-07			2	PROBE,DATA ACQ:P6451,2 METER W/ACCESSORIES	80009	010-6451-07
-11	010-6107-03			1	PROBE,VOLTAGE:P6107,10X,2 METER,W/ACCESS	80009	010-6107-03
					OPTIONAL ACCESSORIES		
	067-1159-00			1	FIXTURE,CAL:SERVICE MAINTENANCE	80009	067-1159-00
	070-6637-00			1	MANUAL,TECH:SERVICE	80009	070-6637-00
	012-0530-00			1	CABLE,INTCON:	70903	IH09970
	175-1178-00			1	CABLE ASSY,RF:50 OHM COAX,20.0 L	80009	175-1178-00
	013-0173-01			1	ADAPTER ASSY:SELF TEST	80009	013-0173-01

APPENDIX A
(ACQUISITION AND PROMPT MESSAGES)

The following table lists the error and acquisition status messages that may appear on the screen. The messages are listed in alphabetical order.

Table A-1
ACQUISITION AND PROMPT MESSAGES

COMM ERR:CD COMM ERR:CTS COMM ERR:DSR	REMOTE MODE message. These messages appear when the 318A detects modem or communication line errors.
<SETUP CHANGED>	This message appears when you change the hardware setup while acquiring data.
NO RESPONSE	REMOTE MODE message. Link message timed out.
REMOTE START REMOTE STOP	REMOTE MODE message. Communication link is complete and remote control is started. Remote mode is terminated.
PRESS STOP	In some fields it is necessary to press the STOP key before performing new operations during data acquisition.
USE SELECT USE EXECUTE USE INCR/DECR USE 0–1,X USE 0–7,X USE 0–9,X USE 0–F,X USE A,B,X USE 0–D,X	These messages appear when you use the wrong key while trying to select a field value. The messages list the valid keys.
<SLOW CLOCK>	This message appears when external or internal is longer than 25 ms.
<ST:SETUP CHANGED> <ST:NO TRIG> <ST:T=125W> <ST:NO ACQ>	These messages, except for <ST:NO ACQ>, appear when you press the STOP key during data acquisition. <ST:NO ACQ> appears when you press the STOP key while setting up hardware in single acquisition or the first cycle of repeat acquisition.
<T=7W> <T=100>	These messages appear when the 318A is finished acquiring data and the numbers included in these messages indicate the trigger position. A "W" means it was internally triggered and an "O" means glitch or Ext. Trig.
TRYING TO LINK	REMOTE MODE message. The 318A is waiting for the link message from the terminal.
<WAITING TRIG>	This appears just before the 318A starts an acquisition and continues until trigger occurs.
<TRIG'D>	This message indicates that the instrument has triggered yet continues to acquire data.

APPENDIX B (ERROR CODES)

Table B-1
ERROR CODES IN SELF TEST

Code	Description
ROM ERROR:	Three sets of information displayed. First four-digit number represents middle four numbers of the ROM part number. Refer to the EPL to determine defective ROM (U500, U502, or U504). Second is checksum calculated. Third is checksum expected.
RAM ERROR: FLAGS	System flags area (3E600 to 3FBFF) may be damaged.
RAM ERROR: STACK	System stack area (3FC00 to 3FFFF) may be damaged.
RAM ERROR: DATA	Area (40000 to 47FFF) where acquired data, reference data, and glitch data are stored may be damaged.
RAM ERROR: DISPLAY	Display RAM (60000 to 607FF) may be damaged.
KBD	Some keys may be depressed.
TIME BASE	Timer or system clock may be damaged.
T/H	Errors are detected in V3 = (V1 + V2)/2 test.
WR	Word Recognizer RAMS (WR0 and WR1) may be damaged.
ACQ	High-speed RAM may be damaged.
SQRAM	Sequencer RAM may be damaged.
NDL	Event/Delay carry flag is not set.
SEQ	Some flags for trigger sequence may be damaged.
SER	SI0 for serial acquisition may be damaged.
RMT	SI0 for remote control may be damaged.
NVM	Non-volatile memory may be damaged.

Table B-2
ERROR CODES FOR PARALLEL TESTS IN DIAGNOSTICS MENU

Code	Description
20	Cannot write word "55" into WR0, or cannot read data from high-speed RAM.
21	Cannot write word "AA" into WR0, or cannot read data from high-speed RAM.
22	Cannot write word "55" into WR1, or cannot read data from high-speed RAM.
23	Cannot write word "AA" into WR1, or cannot read data from high-speed RAM.
30	Cannot write "55H" into high-speed RAM, or cannot read data from high-speed RAM.
31	Address counter carry flag is not set.
32	Cannot write "0AAH" into high-speed RAM, or cannot read data from high-speed RAM.
33	Address counter carry flag is not set.
40	Cannot write "55H" into SQRAM, or cannot read data from high-speed RAM.
41	Cannot write "0AAH" into SQRAM, or cannot read data from high-speed RAM.
50	N-flag is not set.
51	TRIG'D flag is not set.
52	Stop flag is not set.
53	Acquired data is not equal to expected data.

Table B-3
ERROR CODES FOR SERIAL TESTS IN DIAGNOSTICS MENU

Code	Description
B4	Serial status register read error.
B5	Serial receive ready not off.
B6	Serial error register read error.
B7	Serial framing-error bit not off.
B8	Serial overrun-error bit not off.
B9	Serial parity-error bit not off.
BA	EXT TRIG bit not off.
BB	EXT TRIG bit not on.
BC	Data loop-back test error at 75 baud (from RS-232 output to serial input).
BD	Data loop-back test error at 200 baud.
BE	Data loop-back test error at 2400 baud.
BF	Data loop-back test error at 1800 baud.
C0	Data loop-back test error at 1200 baud.
C1	Data loop-back test error at 4800 baud.
C2	Data loop-back test error at 110 baud.
C3	Data loop-back test error at 9600 baud.

Table B-4
ERROR CODES FOR REMOTE TESTS IN DIAGNOSTICS MENU

Code	Description
9E	RS-232 status register read error.
9F	RS-232 receive ready flag not off.
A0	RS-232 transmit empty flag not on.
A2	RS-232 error register read error.
A3	RS-232 framing error flag not off.
A4	RS-232 overrun error flag not off.
A5	RS-232 parity error flag not off.
AA	Increment pattern data loop-back test error at 110 baud (from RS-232 output to RS-232 input).
AB	Increment pattern data loop-back test error at 150 baud (from RS-232 output to RS-232 input).
AC	Increment pattern data loop-back test error at 300 baud (from RS-232 output to RS-232 input).
AD	Increment pattern data loop-back test error at 600 baud (from RS-232 output to RS-232 input).
AE	Increment pattern data loop-back test error at 1200 baud (from RS-232 output to RS-232 input).
AF	Increment pattern data loop-back test error at 2400 baud (from RS-232 output to RS-232 input).
B0	Increment pattern data loop-back test error at 4800 baud (from RS-232 output to RS-232 input).
B1	Increment pattern data loop-back test error at 9600 baud (from RS-232 output to RS-232 input).
B2	Interrupt mode data loop-back test error at 9600 baud.

Table B-5
ERROR CODES FOR NVM TESTS IN DIAGNOSTICS MENU

Code	Description
C8	Data error when data pattern is FF.
C9	Data error when data pattern is 00.
CA	Data error when data pattern is 01.
CB	Data error when data pattern is 02.
CC	Data error when data pattern is 04.
CD	Data error when data pattern is 08.
CE	Data error when data pattern is 10.
CF	Data error when data pattern is 20.
D0	Data error when data pattern is 40.
D1	Data error when data pattern is 80.
D2	Data error when data pattern is marching pattern.
D3	Data error when data pattern is incrementing pattern.