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THIS MANUAL CONTAINS TROUBLESHOOTING INSTRUCTIONS FOR USE BY QUALIFIED SERVICE PERSONNEL ONLY. TO AVOID PERSONAL INJURY DO NOT PERFORM ANY SERVICING UNLESS YOU ARE QUALIFIED TO DO SO.

PLEASE CHECK FOR CHANGE INFORMATION AT THE REAR OF THIS MANUAL.

7A42
LOGIC TRIGGERED VERTICAL AMPLIFIER
SERVICE (VOLUME 2)
Signature Analysis Tables

For Qualified Service Personnel Only

INSTRUCTION MANUAL

Tektronix, Inc.
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INSTRUMENT SERIAL NUMBERS

Each instrument has a serial number on a panel insert, tag, or stamped on the chassis. The first number or letter designates the country of manufacture. The last five digits of the serial number are assigned sequentially and are unique to each instrument. Those manufactured in the United States have six unique digits. The country of manufacture is identified as follows:

B000000	Tektronix, Inc., Beaverton, Oregon, USA
100000	Tektronix Guernsey, Ltd., Channel Islands
200000	Tektronix United Kingdom, Ltd., London
300000	Sony/Tektronix, Japan
700000	Tektronix Holland, NV, Heerenveen, The Netherlands

TABLE OF CONTENTS

OPERATORS SAFETY SUMMARY

The general safety information in this part of the summary is for both operating and servicing personnel. Specific warnings and cautions will be 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.

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

IN THIS MANUAL


Static-Sensitive Devices


This symbol indicates where applicable cautionary or other information is to be found.

AS MARKING ON EQUIPMENT


DANGER—High voltage


Protective ground (earth) terminal.


ATTENTION—refer to manual.

WARNINGS

POWER SOURCE

This product is intended to operate in a mainframe connected to a power source that will not apply more than 250 volts rms between the supply conductors or between either supply conductor and ground. A protective ground connection by way of the grounding conductor in the power cord is essential for safe operation.

GROUNDING THE PRODUCT

This product is grounded through the grounding conductor of the mainframe power cord. To avoid electric shock, plug the mainframe power cord into a properly wired receptacle before connecting to the product input or output terminals. A protective-ground connection by way of the grounding conductor in the mainframe 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.

DO NOT OPERATE IN EXPLOSIVE ATMOSPHERES

To avoid explosion, do not operate this product in an atmosphere of explosive gasses.

DO NOT REMOVE COVERS OR PANELS

To avoid personal injury, do not remove the product covers or panels. Do not operate the product without the covers and panels properly installed.

DO NOT OPERATE WITHOUT COVERS

To avoid personal injury, do not operate this product without covers or panels installed. Do not apply power to the plug-in via a plug-in extender.

SERVICING SAFETY SUMMARY

FOR QUALIFIED SERVICE PERSONNEL ONLY

Refer also to the preceding Operators 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.

GENERAL INFORMATION

This manual contains signature analysis tables for use with the diagnostic troubleshooting information given in the Maintenance section of the Volume 1 service manual.

The signature analysis method of troubleshooting is most applicable to digital circuits such as the microprocessor or trigger logic; it is not an appropriate method of finding faults in analog circuits such as the power supply, amplifiers, or display control. Conventional troubleshooting methods for these circuits are located in the Maintenance section of the Volume 1 service manual.

TECHNICAL MANUALS

An operators and two service manuals are supplied with your 7A42 as standard accessories. The following information outlines the content of these manuals.

Operators Manual

The Operators Manual contains the following four sections:

Section 1—GENERAL INFORMATION contains content descriptions of the Operators and Service manuals, instrument description, mainframe and plug-in unit compatibility, packaging instructions, and instrument specifications.

Section 2—OPERATING INSTRUCTIONS describes all front-panel controls, connectors, and indicators. The Get-Acquainted Exercises provide a basic operating procedure for the first-time user, followed by a systematic demonstration of all front-panel controls.

Section 3—APPLICATIONS gives examples of how to use the 7A42 to make some difficult measurements.

Section 4—INSTRUMENT OPTIONS contains a description of available options (none were available at this printing).

Service Manual (Volume 1)

WARNING

THE SERVICE MANUAL CONTAINS INSTRUCTIONS FOR USE BY QUALIFIED PERSONNEL ONLY. TO AVOID PERSONAL INJURY, DO NOT PERFORM ANY SERVICING UNLESS YOU ARE QUALIFIED TO DO SO.

Section 1—GENERAL INFORMATION contains content descriptions of the Operators and Service manuals, mainframe and plug-in unit compatibility, packaging instructions, instrument specifications, and operating instructions.

Section 2—THEORY OF OPERATION contains basic and detailed circuit analysis that will be useful when servicing the instrument.

Section 3—MAINTENANCE describes preventive maintenance procedures, conventional and diagnostic troubleshooting procedures, and routine and corrective maintenance procedures with detailed instructions for replacing assemblies, subassemblies, and individual parts.

Section 4—CHECKS AND ADJUSTMENT contains procedures to check the operation and electrical characteristics of the 7A42. Procedures also include methods of adjusting the instrument to meet specifications.

Section 5—INSTRUMENT OPTIONS contains a description of available options (none were available at this printing).

Section 6—REPLACEABLE ELECTRICAL PARTS contains information needed to order replaceable parts and assemblies related to the electrical functions of the 7A42.

Section 7—DIAGRAMS AND CIRCUIT BOARD ILLUSTRATIONS includes detailed schematic diagrams, shows the location of the circuit boards in the instrument, gives voltage and waveform information, and shows locations of parts on the circuit boards.

Section 8—REPLACEABLE MECHANICAL PARTS includes information needed to order replaceable mechanical parts, and shows exploded views to identify assemblies.

Service Manual (Volume 2)
Signature Analysis Tables

WARNING

THIS MANUAL CONTAINS TROUBLE-SHOOTING INSTRUCTIONS FOR USE BY QUALIFIED PERSONNEL ONLY. TO AVOID PERSONAL INJURY DO NOT PERFORM ANY SERVICING UNLESS YOU ARE QUALIFIED TO DO SO.

Section 1—GENERAL INFORMATION contains content descriptions of the Operators and Service manuals and details about how to use the signature tables.

Section 2—SIGNATURE ANALYSIS TABLES contains starting points, setup procedures, and signature tables for troubleshooting the 7A42.

HOW TO USE THE SIGNATURE TABLES

Throughout the following sample procedure refer to Figure 2-1, "Example for Using the Signature Analysis Troubleshooting Tables," which is located at the beginning of section 2. First, let's assume a pattern of Trigger Diagnostic Failure codes were reported that, after comparison with the Trigger Diagnostic Charts, implicates the Boolean Logic circuitry. (The Trigger Diagnostic Charts are located in the Diagnostics and Troubleshooting part of the Maintenance section in the Volume 1 service manual.) Trigger Troubleshooting Tip D1 (in Volume 1) calls for SA Test #23, Starting Point #1, to troubleshoot the problem. Proceed as follows:

1. Find SA Test #23, Starting Point #1. Perform the indicated Setup Procedure, which for this case is #1. Verify that the high-level signature is 8P54. If it is not, double-check the test setup.

2. Proceed to the first IC listed in the SA Test #23 Starting Point List #1 (A6U500). Check that the signature for A6U500 pin 15 is 544F, as specified. Continue checking the signatures listed in Starting Point List #1 until you find an incorrect one. For this example, assume that the second signature on the list (H9C6) does not match the signature at A6U530 pin 15.

3. Locate the signature table for A6U530 in SA Test #23. In this example, part of the table set for SA Test #23 is shown in Figure 2-1.

4. In the row headed OUTPUT PIN, find the column labeled with the number of the pin with the bad signature. In this example, pin 15 is the fifth column from the left.

5. Scan down the column under the OUTPUT SIGNATURE for pin 15 (H9C6, in this case) until you locate the first arrow.

6. Check that the INPUT PIN (pin 12) indicated in this row has a signature (H9C6) that matches the signature in the INPUT SIGNATURE column. Of course, the measurement must be made under the correct setup conditions, as listed in the column headed INPUT SETUP. In this example, we are still in Input Setup 1, as specified previously.

7. If the input pin signature matches the signature (H9C6) given in the table, and there are more arrows in the column under pin 15, proceed downward to the next arrow.

8. Check that the next input pin indicated by an arrow (pin 13) has a signature that matches the entry in the INPUT SIGNATURE column (8P54). In this example we are still using Input Setup #1, as originally specified. If the signature does not match the signature in the table, go to step 10.

9. If the entire list (rows that contain arrows) of contributing inputs is exhausted without finding an input with a bad signature, the output pin (node) under test is at fault.

   The IC that was tested last is probably defective, but you should also check these other possibilities:

   a. The output could be shorted to something.

   b. One of the inputs to which the output connects could have developed a short.

   c. If the output is part of a wired-OR or wired-AND structure, the other participants in that configuration could be at fault. The SA stimulation routines are designed to minimize these situations, but they do not eliminate them.

   This is as far as you can go with signature analysis. The problem is isolated to the node level. Now you must use other techniques. However, it may be helpful to leave the SA stimulation routine running to aid oscilloscope-based troubleshooting. Refer to the Diagnostics and Troubleshooting part of the Maintenance section in Volume 1 for more information.

10. When you find a bad Input Signature, the IC under test is probably operating correctly. In this example, the column headed INPUT'S SOURCE NODE is the designation for the IC output pin or other circuit element that drives the IC under test. Check the

signature on this driving device; if it matches the signature on the bad input, go to step 11. In this example, assume that the signature at A6U530 pin 12 was incorrect (not H9C6). The source node for this input is A6U530 pin 2 (the same IC).

If the signature on the driving node (A6U530) does not match that of the driven node (A6U530 pin 12), proceed as follows:

a. Check for an open run on the board or in a cable, or for a loose connector. Check any cables pertinent to the node in question, then recheck the signatures.

b. Check for noise induced by the high currents caused by shorted signal lines. These currents can produce transients which will affect the signature analyzer's interpretation, depending on where the signature analyzer's probe is grounded and the layout of the circuit board. These problems must be troubleshot by other means.

11. If the signature at the driving node (A6U530 pin 2) matches the incorrect signature at the bad input (A6U530 pin 12), we turn our attention to the driving node. If there is no entry in the REFERENCE? column for this input pin, the signature table for the driving IC can be found among those in the test you are now running (SA Test #23). In this example, the driving IC is a gate in the same package (A6U530).

NOTE

The meaning of the letters Y, N, and P in the REFERENCE? column (next to the INPUT'S SOURCE NODE) is as follows:

Y — Additional troubleshooting information is listed at the bottom of the page. This may be a reference to another signature analysis test, or to other documented troubleshooting procedures.

N — This INPUT'S SOURCE NODE is at the boundary of a major functional block, beyond which signature analysis is not useful. The source may be an analog circuit that is better tested by other means. Refer to the appropriate troubleshooting procedure for that circuit in the Maintenance section of Volume 1.

NOTE

P — This indicates that the INPUT'S SOURCE NODE is a pseudogate, that is, part of a wired-AND or wired-OR structure. A table next to the signature table lists all the components in the structure. All inputs to each gate in the list can affect the output of the pseudogate. Signatures must be checked at the appropriate inputs of each involved gate. A diode can be checked with signature analysis as if it were a gate with one input (anode) and one output (cathode).

12. In this example, the Output Setup given in the signature table for A6U530 is number 1, which was implemented previously. Proceed down the Output Pin 2 column to the first arrow. Ensure that the correct Input Setup (number 1 again) has been made, and check the signatures at each node in the WIREAND 7 list (they should match and be wrong). If wrong and matching signatures are present, locate the signature table for each component in the WIREAND 7 list and check the appropriate inputs to locate the problem. If all the input signatures are good, the Trigger Troubleshooting part of the Maintenance section in Volume 1 outlines some special techniques for troubleshooting pseudogate nodes.

13. If the signature at A6U530 pin 4 is correct (it should be 8P54), check the signature of the next input designated with an arrow, A6U530 pin 5. This input comes from another pseudogate, WIREAND 6. Proceed as before until the problem is solved.

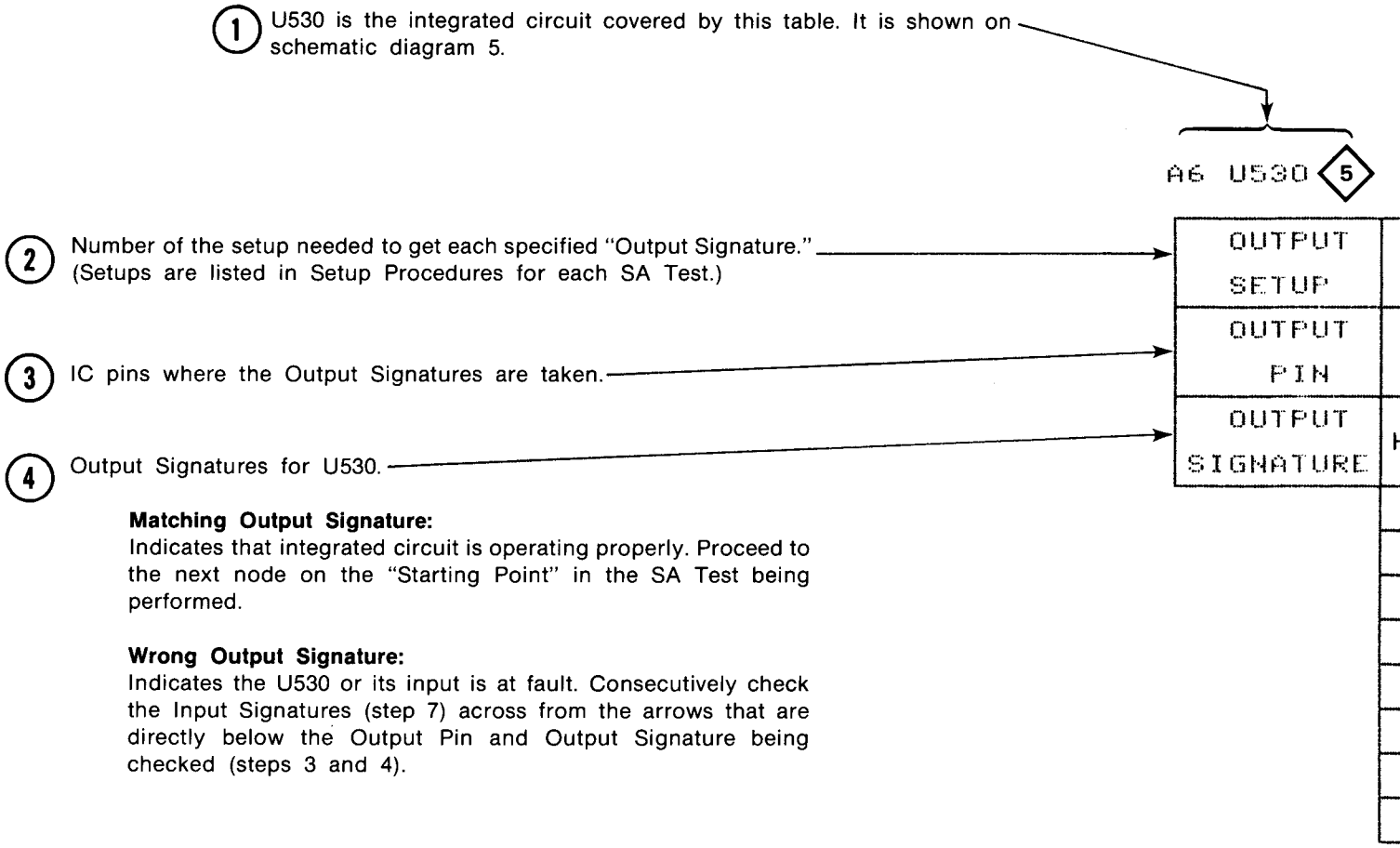

Figure 2-1. Example for using the Signature Analysi

REFER TO "HOW TO USE THE SIGNATURE TABLES," IN THIS SECTION, FOR A STEP-BY-STEP DEMONSTRATION

U530 (5)

OUTPUT SETUP	1	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	3	9	14	15					
OUTPUT SIGNATURE	H9C6	P81A	57P2	1986	H9C6					
	↳					1	4	4C79	WIREAND # 7	P
	↳					1	5	85H7	WIREAND # 6	P
		↳				1	6	2411	A6 U800-15	
		↳				1	7	57P2	A6 U530-9	
				↳		1	10	57P2	A6 U530-9	
				↳		1	11	61U4	A6 U800-14	
			↳		↳	1	12	H9C6	A6 U530-2	
			↳		↳	1	13	8P54	WIRED HIGH	

rce Node signature:

signature is wrong, but matches the signature the subject IC (U530 in this example), perform ng the SA Table for the Input Source IC given 15).

signature does not match that of the input pin, uity between the Input's Source Node and U530.

(9) Denotes the location of the Input Source Signatures, as follows:

Blank space—indicates that the signature tables for the ICs listed under Input's Source Node are located in the SA Test being performed.

Y—designates that the Reference Information for the ICs listed under Input's Source Node is located at the bottom of the page.

P—indicates a wire-AND or wire-OR structure, and the list of gates involved, on the same page.

N—this circuitry is better checked with other troubleshooting methods. Refer to Volume 1 of the Service Manual.

Signature Analysis Troubleshooting Tables.

4654-01

Figure 2-1

SA TEST #1

Examines the microprocessor kernel.

SA TEST #1

STARTING POINT #1

1. Perform Setup #1 as described in the Setup Procedures on the following pages.

2. Check that the +5V (TTL high level) signature is 0001, if it is not double-check the setup.

3. After you obtain the above signature, sequentially check the signatures of all nodes in Starting Point List #1 below. If you find an incorrect signature, proceed to the Signature Tables in this test and follow the example given in Figure 2-1 (pullout page at the end of this section) to isolate the problem.

Starting Point List #1

BOARD	IC	PIN	SIGNATURE
A7	U300	7	4597
A7	U300	9	FCF3
A7	U300	10	52A3
A7	U300	11	A687
A7	U300	12	4A75
A7	U300	13	1A47
A7	U300	14	4497
A7	U300	15	PFCC
A8	U535	12	F2A6
A8	U535	13	PC01
A8	U535	14	12U3
A8	U535	15	4P0A
A8	U610	10	9H31
A8	U610	11	C192
A8	U610	12	3PFA
A8	U610	13	FUPA
A8	U610	14	3P1F
A8	U610	15	CPP9
A8	U630	7	826U
A8	U630	9	603C
A8	U630	10	54F5
A8	U630	11	A711
A8	U630	12	AA6A
A8	U630	13	A3UH
A8	U630	14	H759
A8	U630	15	CA11
A8	U735	4	09H8
A8	U735	5	251A
A8	U735	6	A64U
A8	U735	7	HP49
A8	U735	9	65F9
A8	U735	10	89P6
A8	U735	11	714A
A8	U735	12	UH5U

SA TEST #1

STARTING POINT #2

1. Perform Setup #2 as described in the Setup Procedures on the following pages.

2. Check that the +5V (TTL high level) signature is 1180, if it is not double-check the setup.

3. After you obtain the above signature, sequentially check the signatures of all nodes in Starting Point List #2 below. If you find an incorrect signature, proceed to the Signature Tables in this test and follow the example given in Figure 2-1 (pullout page at the end of this section) to isolate the problem.

Starting Point List #2

BOARD	IC	PIN	SIGNATURE
A8	U145	11	2FH9
A8	U145	12	7933
A8	U145	13	64F4
A8	U145	15	HF6A
A8	U145	16	UFUF
A8	U145	17	F6H3
A8	U145	18	0U5F
A8	U145	19	2438

SA TEST #1

STARTING POINT #3

1. Perform Setup #3 as described in the Setup Procedures on the following pages.

2. Check that the +5V (TTL high level) signature is 1180, if it is not double-check the setup.

3. After you obtain the above signature, sequentially check the signatures of all nodes in Starting Point List #3 below. If you find an incorrect signature, proceed to the Signature Tables in this test and follow the example given in Figure 2-1 (pullout page at the end of this section) to isolate the problem.

Starting Point List #3

BOARD	IC	PIN	SIGNATURE
A8	U245	11	8F54
A8	U245	12	7U51
A8	U245	13	04H8
A8	U245	15	9H51
A8	U245	16	4U91
A8	U245	17	93C4
A8	U245	18	U807
A8	U245	19	6456

SA TEST #1

STARTING POINT #4

1. Perform Setup #4 as described in the Setup Procedures on the following pages.

2. Check that the +5V (TTL high level) signature is 1180, if it is not double-check the setup.

3. After you obtain the above signature, sequentially check the signatures of all nodes in Starting Point List #4 below. If you find an incorrect signature, proceed to the Signature Tables in this test and follow the example given in Figure 2-1 (pullout page at the end of this section) to isolate the problem.

Starting Point List #4

BOARD	IC	PIN	SIGNATURE
A8	U340	11	9F25
A8	U340	12	H09P
A8	U340	13	82P4
A8	U340	15	F5UC
A8	U340	16	FU53
A8	U340	17	A6H0
A8	U340	18	C1CP
A8	U340	19	HAC2

SA TEST #1 : SETUP PROCEDURE #1

a. To gain access to components, the A7 Digital Board should be installed in its extended position. Refer to Extending Circuit Boards for Troubleshooting, in the Maintenance Section of Volume 1 for detailed instructions to do this.

b. Referring to Figure 3-17, connect the Signature Analyzer START, STOP, and CLOCK inputs to the A8 MPU as shown below.

START: falling edge sensitive, A8 TP345 A15
STOP : falling edge sensitive, A8 TP345 A15
CLOCK: rising edge sensitive, A8 TP640 /RD

c. Set the Signature Analyzer Data and Control Probe thresholds to TTL.

d. Configure the 7A42 to Forced Instruction Freerun mode. Refer to Table 3-7 for the proper jumper locations. Table 3-7 is located in What To Do If The 7A42 Does Not Respond To Front Panel Controls, under Forced Instruction Freerun, in Volume 1.

e. With the 7A42 installed on two 067-0616-00 Flexible Extenders, power up the host mainframe.

f. Acquire the +5V (TTL high level) signature.

SA TEST #1 : SETUP PROCEDURE #2

a. Referring to Figure 3-17, connect the Signature Analyzer START, STOP, and CLOCK inputs to the A8 MPU as shown below.

START: falling edge sensitive, A8 TP145 A
STOP : rising edge sensitive, A8 TP145 B
CLOCK: rising edge sensitive, A8 TP640 /RD

b. Set the Signature Analyzer Data and Control Probe thresholds to TTL.

c. Configure the 7A42 to Forced Instruction Freerun mode. Refer to Table 3-7 for the proper jumper locations. Table 3-7 is located in What To Do If The 7A42 Does Not Respond To Front Panel Controls, under Forced Instruction Freerun, in Volume 1.

d. With the 7A42 installed on two 067-0616-00 Flexible Extenders, power up the host mainframe.

e. Acquire the +5V (TTL high level) signature.

SA TEST #1 : SETUP PROCEDURE #3

a. Referring to Figure 3-17, connect the Signature Analyzer START, STOP, and CLOCK inputs to the A8 MPU as shown below.

START:	falling edge sensitive,	A8 TP145 B
STOP :	rising edge sensitive,	A8 TP145 C
CLOCK:	rising edge sensitive,	A8 TP640 /RD

b. Set the Signature Analyzer Data and Control Probe thresholds to TTL.

c. Configure the 7A42 to Forced Instruction Freerun mode. Refer to Table 3-7 for the proper jumper locations. Table 3-7 is located in What To Do If The 7A42 Does Not Respond To Front Panel Controls, under Forced Instruction Freerun, in Volume 1.

d. With the 7A42 installed on two 067-0616-00 Flexible Extenders, power up the host mainframe.

e. Acquire the +5V (TTL high level) signature.

SA TEST #1 : SETUP PROCEDURE #4

a. Referring to Figure 3-17, connect the Signature Analyzer START, STOP, and CLOCK inputs to the A8 MPU as shown below.

START:	falling edge sensitive,	A8 TP145 C
STOP :	rising edge sensitive,	A8 TP145 D
CLOCK:	rising edge sensitive,	A8 TP640 /RD

b. Set the Signature Analyzer Data and Control Probe thresholds to TTL.

c. Configure the 7A42 to Forced Instruction Freerun mode. Refer to Table 3-7 for the proper jumper locations. Table 3-7 is located in What To Do If The 7A42 Does Not Respond To Front Panel Controls, under Forced Instruction Freerun, in Volume 1.

d. With the 7A42 installed on two 067-0616-00 Flexible Extenders, power up the host mainframe.

e. Acquire the +5V (TTL high level) signature.

A7 U300 ◈4

OUTPUT SETUP	1	1	1	1	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	7	9	10	11	12	13	14	15					
OUTPUT SIGNATURE	4597	FCF3	52A3	A687	4A75	1A47	4497	PFCC					
	↳	↳	↳	↳	↳	↳	↳	↳	1	1	2H7O	A8 U305-22	N
	↳	↳	↳	↳	↳	↳	↳	↳	1	2	HPPO	A8 U305-23	N
	↳	↳	↳	↳	↳	↳	↳	↳	1	3	1293	A8 U305-24	N
	↳	↳	↳	↳	↳	↳	↳	↳	1	4	0000	WIRED LOW	
	↳	↳	↳	↳	↳	↳	↳	↳	1	5	0000	WIRED LOW	
	↳	↳	↳	↳	↳	↳	↳	↳	1	6	826P	A8 U635-10	

A8 U145 ◈9

OUTPUT SETUP	2	2	2	2	2	2	2	2	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	11	12	13	15	16	17	18	19					
OUTPUT SIGNATURE	2FH9	7933	64F4	HF6A	UFUF	F6H3	0U5F	2438					
	↳	↳	↳	↳	↳	↳	↳	↳	2	2	H6AA	A8 U305-25	N
	↳	↳	↳	↳	↳	↳	↳	↳	2	3	4PCC	A8 U515-19	N
	↳	↳	↳	↳	↳	↳	↳	↳	2	4	A7A2	A8 U515-16	N
	↳	↳	↳	↳	↳	↳	↳	↳	2	5	108P	A8 U515-2	N
	↳	↳	↳	↳	↳	↳	↳	↳	2	6	5342	A8 U515-5	N
	↳	↳	↳	↳	↳	↳	↳	↳	2	7	1100	A8 U515-15	N
	↳	↳	↳	↳	↳	↳	↳	↳	2	8	0108	A8 U515-12	N
	↳	↳	↳	↳	↳	↳	↳	↳	2	9	052A	A8 U515-6	N
	↳	↳	↳	↳	↳	↳	↳	↳	2	10	0U7U	A8 U515-9	N
	↳	↳	↳	↳	↳	↳	↳	↳	2	20	P254	A8 U535-15	
	↳	↳	↳	↳	↳	↳	↳	↳	2	21	0P0P	A8 U305-23	N
	↳	↳	↳	↳	↳	↳	↳	↳	2	22	P254	A8 U535-15	
	↳	↳	↳	↳	↳	↳	↳	↳	2	23	0F62	A8 U305-24	N
	↳	↳	↳	↳	↳	↳	↳	↳	2	24	5HC4	A8 U305-22	N
	↳	↳	↳	↳	↳	↳	↳	↳	2	25	FF4F	A8 U305-21	N
	↳	↳	↳	↳	↳	↳	↳	↳	2	27	1180	WIRED HIGH	

A8 U245 ⑨

OUTPUT SETUP	3	3	3	3	3	3	3	3	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	11	12	13	15	16	17	18	19					
OUTPUT SIGNATURE	8F54	7U51	04H8	9H51	4U91	93C4	U807	6456					
	↳	↳	↳	↳	↳	↳	↳	↳	3	2	H6AA	A8 U305-25	N
	↳	↳	↳	↳	↳	↳	↳	↳	3	3	4PCC	A8 U515-19	N
	↳	↳	↳	↳	↳	↳	↳	↳	3	4	A7A2	A8 U515-16	N
	↳	↳	↳	↳	↳	↳	↳	↳	3	5	108P	A8 U515-2	N
	↳	↳	↳	↳	↳	↳	↳	↳	3	6	5342	A8 U515-5	N
	↳	↳	↳	↳	↳	↳	↳	↳	3	7	1100	A8 U515-15	N
	↳	↳	↳	↳	↳	↳	↳	↳	3	8	0108	A8 U515-12	N
	↳	↳	↳	↳	↳	↳	↳	↳	3	9	052A	A8 U515-6	N
	↳	↳	↳	↳	↳	↳	↳	↳	3	10	0U7U	A8 U515-9	N
	↳	↳	↳	↳	↳	↳	↳	↳	3	20	P254	A8 U535-14	
	↳	↳	↳	↳	↳	↳	↳	↳	3	21	0P0P	A8 U305-23	N
	↳	↳	↳	↳	↳	↳	↳	↳	3	22	P254	A8 U535-14	
	↳	↳	↳	↳	↳	↳	↳	↳	3	23	0F62	A8 U305-24	N
	↳	↳	↳	↳	↳	↳	↳	↳	3	24	5HC4	A8 U305-22	N
	↳	↳	↳	↳	↳	↳	↳	↳	3	25	FF4F	A8 U305-21	N
	↳	↳	↳	↳	↳	↳	↳	↳	3	27	1180	WIRED HIGH	

A8 U340 ⑨

OUTPUT SETUP	4	4	4	4	4	4	4	4	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	11	12	13	15	16	17	18	19					
OUTPUT SIGNATURE	9F25	H09P	82P4	F5UC	FU53	A6H0	C1CP	HAC2					
	↳	↳	↳	↳	↳	↳	↳	↳	4	2	H6AA	A8 U305-25	N
	↳	↳	↳	↳	↳	↳	↳	↳	4	3	4PCC	A8 U515-19	N
	↳	↳	↳	↳	↳	↳	↳	↳	4	4	A7A2	A8 U515-16	N
	↳	↳	↳	↳	↳	↳	↳	↳	4	5	108P	A8 U515-2	N
	↳	↳	↳	↳	↳	↳	↳	↳	4	6	5342	A8 U515-5	N
	↳	↳	↳	↳	↳	↳	↳	↳	4	7	1100	A8 U515-15	N
	↳	↳	↳	↳	↳	↳	↳	↳	4	8	0108	A8 U515-12	N
	↳	↳	↳	↳	↳	↳	↳	↳	4	9	052A	A8 U515-6	N
	↳	↳	↳	↳	↳	↳	↳	↳	4	10	0U7U	A8 U515-9	N
	↳	↳	↳	↳	↳	↳	↳	↳	4	20	P254	A8 U535-13	
	↳	↳	↳	↳	↳	↳	↳	↳	4	21	0P0P	A8 U305-23	N
	↳	↳	↳	↳	↳	↳	↳	↳	4	22	P254	A8 U535-13	
	↳	↳	↳	↳	↳	↳	↳	↳	4	23	0F62	A8 U305-24	N
	↳	↳	↳	↳	↳	↳	↳	↳	4	24	5HC4	A8 U305-22	N
	↳	↳	↳	↳	↳	↳	↳	↳	4	25	FF4F	A8 U305-21	N
	↳	↳	↳	↳	↳	↳	↳	↳	4	27	1180	WIRED HIGH	

A8 U535 ◈9

OUTPUT SETUP	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	12	13	14	15					
OUTPUT SIGNATURE	F2A6	PC01	12U3	4P0A					
	↳	↳	↳	↳	1	1	3C96	A8 U305-26	N
	↳	↳	↳	↳	1	2	3827	A8 U305-27	N
	↳	↳	↳	↳	1	3	0000	WIRED LOW	
	↳	↳	↳	↳	1	4	0000	A8 U305-32	N
	↳	↳	↳	↳	1	5	755U	A8 U305-28	N
	↳	↳	↳	↳	1	6	0001	WIRED HIGH	

A8 U610 ◈9

OUTPUT SETUP	1	1	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	10	11	12	13	14	15					
OUTPUT SIGNATURE	9H31	C192	3PFA	FUPA	3P1F	CPP9					
	↳	↳	↳	↳	↳	↳	1	1	2H70	A8 U305-22	N
	↳	↳	↳	↳	↳	↳	1	2	HPP0	A8 U305-23	N
	↳	↳	↳	↳	↳	↳	1	3	1293	A8 U305-24	N
	↳	↳	↳	↳	↳	↳	1	4	A711	A8 U630-11	
	↳	↳	↳	↳	↳	↳	1	5	0000	A8 U730-2	N
	↳	↳	↳	↳	↳	↳	1	6	0001	WIRED HIGH	

A8 U630 ◈9

OUTPUT SETUP	1	1	1	1	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	7	9	10	11	12	13	14	15					
OUTPUT SIGNATURE	826U	603C	54F5	A711	AA6A	A3UH	H759	CA11					
	↳	↳	↳	↳	↳	↳	↳	↳	1	1	HAP7	A8 U305-25	N
	↳	↳	↳	↳	↳	↳	↳	↳	1	2	3C96	A8 U305-26	N
	↳	↳	↳	↳	↳	↳	↳	↳	1	3	3827	A8 U305-27	N
	↳	↳	↳	↳	↳	↳	↳	↳	1	4	0000	WIRED LOW	
	↳	↳	↳	↳	↳	↳	↳	↳	1	5	0000	WIRED LOW	
	↳	↳	↳	↳	↳	↳	↳	↳	1	6	755U	A8 U305-28	N

A8 U635 ◇9◇

OUTPUT SETUP	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	10					
OUTPUT SIGNATURE	826P					
	↳	1	8	826U	A8 U630-7	
	↳	1	9	0000	A8 U730-2	N

A8 U735 ◇9◇

OUTPUT SETUP	1	1	1	1	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	4	5	6	7	9	10	11	12					
OUTPUT SIGNATURE	09H8	251A	A64U	HP49	65F9	89P6	714A	UH5U					
	↳	↳	↳	↳	↳	↳	↳	↳	1	1	0001	A8 U730-12	N
	↳	↳	↳	↳	↳	↳	↳	↳	1	2	54F5	A8 U630-10	
	↳	↳	↳	↳	↳	↳	↳	↳	1	3	1293	A8 U305-24	N
	↳	↳	↳	↳	↳	↳	↳	↳	1	13	HPP0	A8 U305-23	N
	↳	↳	↳	↳	↳	↳	↳	↳	1	14	603C	A8 U630-9	
	↳	↳	↳	↳	↳	↳	↳	↳	1	15	0000	A8 U730-2	N

SA TEST #2

Examines the external bus.

SA TEST #2

STARTING POINT #1

1. Perform Setup #1 as described in the Setup Procedures on the following pages.

2. Check that the +5V (TTL high level) signature is O1H6, if it is not double-check the setup.

3. After you obtain the above signature, sequentially check the signatures of all nodes in Starting Point List #1 below. If you find an incorrect signature, proceed to the Signature Tables in this test and follow the example given in Figure 2-1 (pullout page at the end of this section) to isolate the problem.

Starting Point List #1

BOARD	IC	PIN	SIGNATURE
A7	U420	2	78FH
A7	U420	5	CPU1
A7	U420	6	U40H
A7	U420	9	H889
A7	U420	12	251C
A7	U420	15	CF9A
A7	U420	16	C20H
A7	U420	19	FOPF
A7	U421	2	3H5C
A7	U421	5	HP45
A7	U421	6	UC3C
A7	U421	9	6H79
A7	U421	12	13C0
A7	U421	15	HU77
A7	U421	16	583C
A7	U421	19	P076
A7	U500	2	C906
A7	U500	5	88P0
A7	U500	6	PPP5
A7	U500	9	8AF0
A7	U500	12	6656
A7	U500	15	AA28
A7	U500	16	0763
A7	U500	19	9U08
A7	U700	2	9063
A7	U700	5	U3AU
A7	U700	6	5F69
A7	U700	9	9423
A7	U700	12	4H0U
A7	U700	15	3F6C
A7	U700	16	39UA
A7	U700	19	H5U2

SA TEST #2

STARTING POINT #2

1. Perform Setup #1 as described in the Setup Procedures on the following pages.

2. Check that the +5V (TTL high level) signature is 01H6, if it is not double-check the setup.

3. After you obtain the above signature, sequentially check the signatures of all nodes in Starting Point List #2 below. If you find an incorrect signature, proceed to the Signature Tables in this test and follow the example given in Figure 2-1 (pullout page at the end of this section) to isolate the problem.

Starting Point List #2

BOARD	IC	PIN	SIGNATURE
A7	U330	3	24FH
A7	U330	4	CF94
A7	U330	5	C20H
A7	U330	6	251C
A7	U330	11	01H6
A7	U330	14	01H6
A7	U430	3	U5HC
A7	U430	4	CF94
A7	U430	5	C20H
A7	U430	6	H889
A7	U430	11	U40H
A7	U430	14	H95U
A7	U431	3	791C
A7	U431	4	CF94
A7	U431	5	C20H
A7	U431	6	78FH
A7	U431	11	CPU1
A7	U431	14	CU27
A7	U520	3	3H5C
A7	U520	4	F13A
A7	U520	5	FOPF
A7	U520	6	HU77
A7	U520	11	P076
A7	U520	14	UC3C
A7	U531	3	13C0
A7	U531	4	F13A
A7	U531	5	FOPF
A7	U531	6	6H79
A7	U531	11	HP45
A7	U531	14	583C

SA TEST #2: SETUP PROCEDURE #1

a. To gain access to components, the A7 Digital Board should be installed in its extended position. Refer to Extending Circuit Boards for Troubleshooting, in the Maintenance Section of Volume 1 for detailed instructions to do this.

b. Referring to Figure 3-17, connect the Signature Analyzer START, STOP, CLOCK and GND inputs to the pins on the A8 MPU Board labeled STR, STP, /XWR, and GND, respectively. Set the STOP, and CLOCK inputs to rising edge sensitivity, the START input to falling edge sensitivity.

c. Set the Signature Analyzer Data and Control Probe thresholds to TTL.

d. Configure the 7A42 in XBUXS mode. Refer to Table 3-7 for the proper jumper locations. Table 3-7 is located in What To Do If The 7A42 Does Not Respond To Front Panel Controls, under Forced Instruction Freerun, in Volume 1.

e. Install the /RTI jumper, P930 on the A8 MPU Board, and the RELN jumper, P401 on the A7 Digital Board. Figures 3-7 and 3-8 in the section What To Do If The 7A42 Does Not Respond To Front Panel Controls, under Forced Instruction Freerun, in Volume 1, illustrate the location of these jumpers.

f. With the 7A42 installed on two 067-0616-00 Flexible Extenders, power up the host mainframe.

g. Acquire the +5V (TTL high level) signature.

A7 U330 ◇2

The outputs of U330 are not compatible with a signature analyzer.
Begin with the input pins.

INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
1	3	24FH	A7 U530-2	
1	4	CF94	A7 U420-15	
1	5	C20H	A7 U420-16	
1	6	251C	A7 U420-12	
1	11	01H6	WIRED HIGH	
1	14	01H6	WIRED HIGH	

A7 U420 ◇2

OUTPUT SETUP	1	1	1	1	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	5	6	9	12	15	16	19					
OUTPUT SIGNATURE	78FH	CPU1	U40H	H889	251C	CF94	C20H	FOPF					
	↳	↳	↳	↳	↳	↳	↳	↳	1	1	0000	WIRED LOW	
	↳								1	3	4702	A8 U300-2	
		↳							1	4	F833	A8 U300-5	
			↳						1	7	772A	A8 U300-19	
				↳					1	8	5600	A8 U300-16	
	↳	↳	↳	↳	↳	↳	↳	↳	1	11	2HAH	A7 U300-14	Y
					↳				1	13	32C2	A8, U300-6	
						↳			1	14	5144	A8 U300-9	
							↳		1	17	U722	A8 U300-15	
								↳	1	18	3C18	A8 U300-12	

Reference List

A7 U300-14: use SA TEST #1, Starting Points #1 through #4

A7 U421 ◇2

OUTPUT SETUP	1	1	1	1	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	5	6	9	12	15	16	19					
OUTPUT SIGNATURE	3H5C	HP45	UC3C	6H79	13C0	HU77	583C	P076					
	↳	↳	↳	↳	↳	↳	↳	↳	1	1	0000	A8 U900-5	N
	↳								1	3	4702	A8 U300-2	
		↳							1	4	F833	A8 U300-5	
			↳						1	7	772A	A8 U300-19	
				↳					1	8	5600	A8 U300-16	
	↳	↳	↳	↳	↳	↳	↳	↳	1	11	97PC	A7 U300-15	Y
					↳				1	13	32C2	A8 U300-6	
						↳			1	14	5144	A8 U300-9	
							↳		1	17	U722	A8 U300-15	
								↳	1	18	3C18	A8 U300-12	

Reference List

A7 U300-15: use SA TEST #1, Starting Points #1 through #4

A7 U430 ◇2

The outputs of U430 are not compatible with a signature analyzer. Begin with the input pins.

INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
1	3	U5HC	A7 U530-8	
1	4	CF94	A7 U420-15	
1	5	C20H	A7 U420-16	
1	6	H889	A7 U420-9	
1	11	U40H	A7 U420-6	
1	14	H95U	A7 U530-6	

A7 U431 ②

The outputs of U431 are not compatible with a signature analyzer.
Begin with the input pins.

INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
1	3	791C	A7 U530-10	
1	4	CF94	A7 U420-15	
1	5	C20H	A7 U420-16	
1	6	78FH	A7 U420-2	
1	11	CPU1	A7 U420-5	
1	14	CU27	A7 U530-12	

A7 U500 ④

OUTPUT SETUP	1	1	1	1	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	5	6	9	12	15	16	19					
OUTPUT SIGNATURE	C906	88P0	PPP5	8AF0	6656	AA28	0763	9U08					
	↳	↳	↳	↳	↳	↳	↳	↳	1	1	0000	WIRED LOW	
	↳								1	3	F833	A8 U300-5	
		↳							1	4	4702	A8 U300-2	
			↳						1	7	772A	A8 U300-19	
				↳					1	8	5600	A8 U300-16	
	↳	↳	↳	↳	↳	↳	↳	↳	1	11	620U	A7 U300-9	Y
					↳				1	13	32C2	A8 U300-6	
						↳			1	14	5144	A8 U300-9	
							↳		1	17	3C18	A8 U300-12	
								↳	1	18	U722	A8 U300-15	

Reference List

A7 U300-9: use SA TEST #1, Starting Points #1 through #4

A7 U520 ◇2

The outputs of U520 are not compatible with a signature analyzer.
Begin with the input pins.

INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
1	3	3H5C	A7 U421-2	
1	4	F13A	A7 U530-4	
1	5	FOPF	A7 U420-19	
1	6	HU77	A7 U421-15	
1	11	PO76	A7 U421-19	
1	14	UC3C	A7 U421-6	

A7 U530 ◇2

OUTPUT SETUP	1	1	1	1	1	1
OUTPUT PIN	2	4	6	8	10	12
OUTPUT SIGNATURE	24FH	F13A	H95U	U5HC	791C	CU27

INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
1	1	251C	A7 U420-12	
1	3	FOPF	A7 U420-19	
1	5	U40H	A7 U420-6	
1	9	H889	A7 U420-9	
1	11	78FH	A7 U420-2	
1	13	CPU1	A7 U420-5	

A7 U531 ◇2

The outputs of U531 are not compatible with a signature analyzer.
Begin with the input pins.

INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
1	3	13C0	A7 U421-12	
1	4	F13A	A7 U530-4	
1	5	FOPF	A7 U420-19	
1	6	6H79	A7 U421-9	
1	11	HP45	A7 U421-5	
1	14	583C	A7 U421-16	

A7 U700 ◈4◈

OUTPUT SETUP	1	1	1	1	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	5	6	9	12	15	16	19					
OUTPUT SIGNATURE	9063	U3AU	5F69	9423	4HOU	3F6C	39UA	H5U2					
	↳	↳	↳	↳	↳	↳	↳	↳	1	1	0000	WIRED LOW	
	↳								1	3	4702	A8 U300-2	
		↳							1	4	F833	A8 U300-5	
			↳						1	7	772A	A8 U300-19	
				↳					1	8	5600	A8 U300-16	
	↳	↳	↳	↳	↳	↳	↳	↳	1	11	F664	A7 U300-7	Y
					↳				1	13	32C2	A8 U300-6	
						↳			1	14	U722	A8 U300-15	
							↳		1	17	3C18	A8 U300-12	
								↳	1	18	5144	A8 U300-9	

Reference List

A7 U300-7: use SA TEST #1, Starting Points #1 through #4

A8 U300 ◈9◈

OUTPUT SETUP	1	1	1	1	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	5	6	9	12	15	16	19					
OUTPUT SIGNATURE	4702	F833	32C2	5144	3C18	U722	5600	772A					
	↳	↳	↳	↳	↳	↳	↳	↳	1	1	0000	A8 U635-4	Y
	↳								1	3	4702	A8 U305-12	Y
		↳							1	4	F833	A8 U305-13	Y
			↳						1	7	32C2	A8 U305-16	Y
				↳					1	8	5144	A8 U305-17	Y
	↳	↳	↳	↳	↳	↳	↳	↳	1	11	01H6	A8 U635-13	Y
					↳				1	13	3C18	A8 U305-19	Y
						↳			1	14	U722	A8 U305-18	Y
							↳		1	17	5600	A8 U305-15	Y
								↳	1	18	772A	A8 U305-14	Y

Reference List

A8 U305: use SA TEST #1, Starting Points #1 through #4

A8 U635: use SA TEST #1, Starting Points #1 through #4

SA TEST #5

Examines the RAM.

SA TEST #5

STARTING POINT #1

1. Perform Setup #1 as described in the Setup Procedures on the following pages.

2. Check that the +5V (TTL high level) signature is 826P, if it is not double-check the setup.

3. After you obtain the above signature, sequentially check the signatures of all nodes in Starting Point List #1 below. If you find an incorrect signature, proceed to the Signature Tables in this test and follow the example given in Figure 2-1 (pullout page at the end of this section) to isolate the problem.

Starting Point List #1

BOARD	IC	PIN	SIGNATURE
A8	U615	11	P6HH
A8	U615	12	145U
A8	U615	13	AP47
A8	U615	14	P676

SA TEST #5

STARTING POINT #2

1. Perform Setup #1 as described in the Setup Procedures on the following pages.

2. Check that the +5V (TTL high level) signature is 826P, if it is not double-check the setup.

3. After you obtain the above signature, sequentially check the signatures of all nodes in Starting Point List #2 below. If you find an incorrect signature, proceed to the Signature Tables in this test and follow the example given in Figure 2-1 (pullout page at the end of this section) to isolate the problem.

Starting Point List #2

BOARD	IC	PIN	SIGNATURE
A8	U710	11	5753
A8	U710	12	0UF1
A8	U710	13	2388
A8	U710	14	A091

SA TEST #5: SETUP PROCEDURE #1

a. Referring to Figure 3-17, connect the Signature Analyzer START, STOP, and GND inputs to the pins on the A8 MPU Board Labeled STR, STP, and GND, respectively. Connect the Signature Analyzer CLOCK input to MPU Board A8 U805 pin 3. Set the START, STOP, and CLOCK inputs to rising edge sensitivity.

b. Set the Signature Analyzer Data and Control Probe thresholds to TTL.

c. Configure the 7A42 in Extended Test mode. Refer to Table 3-7 for the proper jumper locations. Table 3-7 is located in What To Do If The 7A42 Does Not Respond To Front Panel Controls, under Forced Instruction Freerun, in Volume 1.

d. With the 7A42 installed on two 067-0616-00 Flexible Extenders, power up the host mainframe.

e. Select Extended Test #5 by pressing the DISPLAY button. Verify that the desired test is executing by observing the number in the SWITCHING THRESHOLD VOLTS display.

f. Acquire the +5V (TTL high level) signature.

A8 U615 ◈9◈

OUTPUT SETUP	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	11	12	13	14					
OUTPUT SIGNATURE	P6HH	145U	AP47	P676					
	↳	↳	↳	↳	1	1	7C47	A8 U515-16	Y
	↳	↳	↳	↳	1	2	3319	A8 U515-2	Y
	↳	↳	↳	↳	1	3	8P3U	A8 U515-5	Y
	↳	↳	↳	↳	1	4	C133	A8 U515-15	Y
	↳	↳	↳	↳	1	5	7P25	A8 U515-9	Y
	↳	↳	↳	↳	1	6	2A1F	A8 U515-6	Y
	↳	↳	↳	↳	1	7	A206	A8 U515-12	Y
	↳	↳	↳	↳	1	8	0000	A8 Q830-8	N
	↳	↳	↳	↳	1	10	826P	A8 U730-2	N
	↳	↳	↳	↳	1	15	7A70	A8 U305-22	Y
	↳	↳	↳	↳	1	16	5H21	A8 U305-21	Y
	↳	↳	↳	↳	1	17	C25F	A8 U515-19	Y

A8 U710 ◈9◈

OUTPUT SETUP	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	11	12	13	14					
OUTPUT SIGNATURE	5753	OUF1	2388	A091					
	↳	↳	↳	↳	1	1	7C47	A8 U515-16	Y
	↳	↳	↳	↳	1	2	3319	A8 U515-2	Y
	↳	↳	↳	↳	1	3	8P3U	A8 U515-5	Y
	↳	↳	↳	↳	1	4	C133	A8 U515-15	Y
	↳	↳	↳	↳	1	5	7P25	A8 U515-9	Y
	↳	↳	↳	↳	1	6	2A1F	A8 U515-6	Y
	↳	↳	↳	↳	1	7	A206	A8 U515-12	Y
	↳	↳	↳	↳	1	8	0000	A8 Q830-8	N
	↳	↳	↳	↳	1	10	826P	A8 U730-2	N
	↳	↳	↳	↳	1	15	7A70	A8 U305-22	Y
	↳	↳	↳	↳	1	16	5H21	A8 U305-21	Y
	↳	↳	↳	↳	1	17	C25F	A8 U515-19	Y

Reference List

A8 U305: use SA TEST #1, Starting Point #1

A8 U515: use SA TEST #1, Starting Point #1

SA TEST #11

Examines the Display Control circuitry.

SA TEST #11

STARTING POINT #1

1. Perform Setup #1 as described in the Setup Procedures on the following pages.

2. Check that the +5V (TTL high level) signature is 4U17, if it is not double-check the setup.

3. After you obtain the above signature, sequentially check the signatures of all nodes in Starting Point List #1 below. If you find an incorrect signature, proceed to the Signature Tables in this test and follow the example given in Figure 2-1 (pullout page at the end of this section) to isolate the problem.

Starting Point List #1

BOARD	IC	PIN	SIGNATURE
A7	U800	14	70C7
A7	U800	19	0000
A7	U900	3	H9FC
A7	U900	6	03U3
A7	U900	8	0F69
A7	U900	11	7291

SA TEST #11: SETUP PROCEDURE #1

a. To gain access to components, the A7 Digital Board should be installed in its extended position. Refer to Extending Circuit Boards for Troubleshooting, in the Maintenance Section of Volume 1 for detailed instructions to do this.

b. Referring to Figure 3-17, connect the Signature Analyzer START, STOP, CLOCK and GND inputs to the pins on the A8 MPU Board labeled STR, STP, SACK, and GND, respectively. Set the START, STOP, and CLOCK inputs to rising edge sensitivity.

c. Set the Signature Analyzer Data and Control Probe thresholds to TTL.

d. Configure the 7A42 in Extended Test mode. Refer to Table 3-7 for the proper jumper locations. Table 3-7 is located in What To Do If The 7A42 Does Not Respond To Front Panel Controls, under Forced Instruction Freerun, in Volume 1.

e. With the 7A42 installed on two 067-0616-00 Flexible Extenders, power up the host mainframe.

f. Select Extended Test #11 by pressing the CH1 button. Verify that the desired test is executing by observing the number in the SWITCHING THRESHOLD VOLTS display.

g. Acquire the +5V (TTL high level) signature.

A7 U800 ◈4

OUTPUT SETUP	1	1	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	14	15	16	17	18	19					
OUTPUT SIGNATURE	70C7	416H	CHF4	5HA2	11U5	0000					
	↳	↳	↳	↳	↳	↳	1	1	0000	A7 U800-19	
	↳	↳	↳	↳	↳	↳	1	2	5PP2	A7 U700-2	Y
	↳	↳	↳	↳	↳	↳	1	3	CHF4	A7 U700-5	Y
	↳	↳	↳	↳	↳	↳	1	4	7C89	A7 U700-6	Y
	↳	↳	↳	↳	↳	↳	1	5	U713	A7 U700-9	Y
	↳	↳	↳	↳	↳	↳	1	6	C89H	A7 U700-15	Y
	↳	↳	↳	↳	↳	↳	1	7	4U17	A7 U500-2	Y
	↳	↳	↳	↳	↳	↳	1	8	0000	A7 U500-5	Y
	↳	↳	↳	↳	↳	↳	1	9	75P5	A7 Q811-C	N
	↳	↳	↳	↳	↳	↳	1	11	0000	WIRED LOW	

Reference List

A7 U500: use SA TEST #2, Starting Point #1

A7 U700: use SA TEST #2, Starting Point #1

A7 U900 ◈4

OUTPUT SETUP	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	11	8	3	6					
OUTPUT SIGNATURE	7291	0F69	H9FC	03U3					
				↳	1	4	CHF4	A7 U800-16	
				↳	1	5	416H	A7 U800-15	
			↳		1	1	11U5	A7 U800-18	
			↳		1	2	5HA2	A7 U800-17	
		↳			1	9	11U5	A7 U800-18	
		↳			1	10	CHF4	A7 U800-16	
	↳				1	12	416H	A7 U800-15	
	↳				1	13	5HA2	A7 U800-17	

SA TEST #13

Examines the Readout circuitry.

SA TEST #13

STARTING POINT #1

1. Perform Setup #1 as described in the Setup Procedures on the following pages.

2. Check that the +5V (TTL high level) signature is 03U9, if it is not double-check the setup.

3. After you obtain the above signature, sequentially check the signatures of all nodes in Starting Point List #1 below. If you find an incorrect signature, proceed to the Signature Tables in this test and follow the example given in Figure 2-1 (pullout page at the end of this section) to isolate the problem.

Starting Point List #1

BOARD	IC	PIN	SIGNATURE
A7	U920	2	02AP
A7	U920	3	019A
A7	U920	4	03B1
A7	U920	5	007U
A7	U930	2	0255
A7	U930	3	036A
A7	U930	4	03B5
A7	U930	5	03U9
A7	U1020	2	01A8
A7	U1020	3	02C6
A7	U1020	4	03F5
A7	U1020	5	03UA
A7	U1030	2	022H
A7	U1030	3	03C1
A7	U1030	4	03F5
A7	U1030	5	0378

SA TEST #13: SETUP PROCEDURE #1

a. To gain access to components, the A7 Digital Board should be installed in its extended position. Refer to Extending Circuit Boards for Troubleshooting, in the Maintenance Section of Volume 1 for detailed instructions to do this.

b. Connect the Signature Analyzer START line to the A7 P620 pin labeled SID. Connect the STOP line to A7 U630 pin 1 (also the SID signal). Connect the CLOCK line to A7 U830 pin 3. Connect the Signature Analyzer GND line to any available ground test point. Set the START and STOP inputs to rising edge and the CLOCK input to falling edge sensitivity.

c. Set the Signature Analyzer Data and Control Probe thresholds to TTL.

d. Configure the 7A42 in Extended Test mode. Refer to Table 3-7 for the proper jumper locations. Table 3-7 is located in What To Do If The 7A42 Does Not Respond To Front Panel Controls, under Forced Instruction Freerun, in Volume 1.

e. Install the /RTI and /RSTRT jumpers, P930 and P405 on the A8 MPU board. Figure 3-7 in the section What To Do If The 7A42 Does Not Respond To Front Panel Controls, under Forced Instruction Freerun, in Volume 1, illustrate the location of these jumpers.

f. With the 7A42 installed on two 067-0616-00 Flexible Extenders, power up the host mainframe.

g. Select the Display Readout Characters circuit exercise by pressing the A ThеN B button.

h. Acquire the +5V (TTL high level) signature.

A7 U400 ◈10◈

OUTPUT SETUP	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	6	7	9	10					
OUTPUT SIGNATURE	03U9	0385	036A	0255					
			↳		1	1	03C1	A8 U300-9	Y
		↳			1	2	03F5	A8 U300-15	Y
	↳				1	3	0378	A8 U300-12	Y
	↳	↳	↳	↳	1	4	0205	A7 Q720-11	N
	↳	↳	↳	↳	1	5	0157	A7 U630-9	
	↳	↳	↳	↳	1	11	0000	WIRED LOW	
	↳	↳	↳	↳	1	12	03U9	A7 U300-11	Y
	↳	↳	↳	↳	1	13	0205	A7 U500-15	Y
	↳	↳	↳	↳	1	14	02AP	A7 U630-8	
				↳	1	15	022H	A8 U300-6	Y

A7 U401 ◈10◈

OUTPUT SETUP	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	6	7	9	10					
OUTPUT SIGNATURE	007U	0381	019A	02AP					
			↳		1	1	02C6	A8 U300-5	Y
		↳			1	2	03F5	A8 U300-19	Y
	↳				1	3	03UA	A8 U300-16	Y
	↳	↳	↳	↳	1	4	0205	A7 Q720-11	N
	↳	↳	↳	↳	1	5	0157	A7 U630-9	
	↳	↳	↳	↳	1	11	0000	WIRED LOW	
	↳	↳	↳	↳	1	12	03U9	A7 U300-11	Y
	↳	↳	↳	↳	1	13	0205	A7 U500-15	Y
	↳	↳	↳	↳	1	14	02AP	A7 U630-8	
				↳	1	15	01A8	A8 U300-2	Y

Reference List

A7 U300-11: use SA TEST #1, Starting Point #1

A7 U500-15: use SA TEST #2, Starting Point #1

A8 U300: use SA TEST #2, Starting Point #1

A7 U600 ◈10

OUTPUT SETUP	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	6	7	9	10					
OUTPUT SIGNATURE	0378	03F5	03C1	022H					
			↳		1	1	03C1	A8 U300-9	Y
		↳			1	2	03F5	A8 U300-15	Y
	↳				1	3	0378	A8 U300-12	Y
	↳	↳	↳	↳	1	4	0205	A7 Q720-11	N
	↳	↳	↳	↳	1	5	0157	A7 U630-9	
	↳	↳	↳	↳	1	11	0000	WIRED LOW	
	↳	↳	↳	↳	1	12	03U9	A7 U300-10	Y
	↳	↳	↳	↳	1	13	0205	A7 U500-15	Y
	↳	↳	↳	↳	1	14	02AP	A7 U630-8	
				↳	1	15	022H	A8 U300-6	Y

A7 U601 ◈10

OUTPUT SETUP	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	6	7	9	10					
OUTPUT SIGNATURE	03UA	03F5	02C6	01A8					
			↳		1	1	02C6	A8 U300-5	Y
		↳			1	2	03F5	A8 U300-19	Y
	↳				1	3	03UA	A8 U300-16	Y
	↳	↳	↳	↳	1	4	0205	A7 Q720-11	N
	↳	↳	↳	↳	1	5	0157	A7 U630-9	
	↳	↳	↳	↳	1	11	0000	WIRED LOW	
	↳	↳	↳	↳	1	12	03U9	A7 U300-10	Y
	↳	↳	↳	↳	1	13	0205	A7 U500-15	Y
	↳	↳	↳	↳	1	14	02AP	A7 U630-8	
				↳	1	15	01A8	A8 U300-2	Y

Reference List

A7 U300-11: use SA TEST #1, Starting Point #1

A7 U500-15: use SA TEST #2, Starting Point #1

A8 U300: use SA TEST #2, Starting Point #1

A7 U630 ◈10

OUTPUT SETUP	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	6	8	9					
OUTPUT SIGNATURE	01UF	02AP	0157					
	↳			1	1	0205	A7 Q720-11	N
	↳			1	2	0000	WIRED LOW	
	↳			1	3	0000	WIRED LOW	
	↳			1	4	0000	WIRED LOW	
		↳	↳	1	10	03U9	WIRED HIGH	
		↳	↳	1	11	03U9	A7 U830-3	N
		↳	↳	1	12	02AP	A7 U630-8	
		↳	↳	1	13	01UF	A7 U630-6	

A7 U920 ◈10

INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
1	2	02AP	A7 U401-10	
1	3	019A	A7 U401-9	
1	4	0381	A7 U401-7	
1	5	007U	A7 U401-6	
1	16	03U9	WIRED HIGH	

A7 U930 ◈10

INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
1	2	0255	A7 U400-10	
1	3	036A	A7 U400-9	
1	4	0385	A7 U400-7	
1	5	03U9	A7 U400-6	
1	16	03U9	WIRED HIGH	

SA TEST #14

Examines the Trigger Control shift registers.

SA TEST #14

STARTING POINT #1

1. Perform Setup #1 as described in the Setup Procedures on the following pages.

2. Check that the +5V (TTL high level) signature is 1FA8, if it is not double-check the setup.

3. After you obtain the above signature, sequentially check the signatures of all nodes in Starting Point List #1 below. If you find an incorrect signature, proceed to the Signature Tables in this test and follow the example given in Figure 2-1 (pullout page at the end of this section) to isolate the problem.

Starting Point List #1

BOARD	IC	PIN	SIGNATURE
A6	U828	3	H7C8
A6	U912	3	5U0P
A6	U838	3	7AH0
A6	U818	3	U965
A6	U922	3	40AH
A6	U932	3	0H17
A6	U828	4	7921
A6	U912	4	3H7A
A6	U838	4	2U94
A6	U818	4	PP4U
A6	U922	4	2057
A6	U932	4	9477
A6	U828	5	2P6F
A6	U912	5	0F41
A6	U838	5	8537
A6	U818	5	U727
A6	U922	5	102A
A6	U932	5	FA3A
A6	U828	6	85FA
A6	U912	6	8621
A6	U838	6	429A
A6	U818	6	7C93
A6	U922	6	1AP9
A6	U932	6	77P1
A6	U828	10	42P5
A6	U912	10	F311
A6	U838	10	C3C1
A6	U818	10	2U34
A6	U922	10	0H75
A6	U932	10	3CU1

Starting Point List #1, continued

A6	U828	11	C38P
A6	U912	11	U374
A6	U838	11	FC24
A6	U818	11	0566
A6	U922	11	06CC
A6	U932	11	0U05
A6	U828	12	59F7
A6	U912	12	PC47
A6	U838	12	P593
A6	U818	12	02C2
A6	U922	12	11A1
A6	U932	12	957U
A6	U828	13	CP1P
A6	U912	13	U5A3
A6	U838	13	U2F9
A6	U818	13	8159
A6	U922	13	1A2F
A6	U932	13	FACP
A6	Q1014	C	H616

SA TEST #14

STARTING POINT #2

1. Perform Setup #2 as described in the Setup Procedures on the following pages.

2. Check that the GND (ECL high level) signature is 1FA8, if it is not double-check the setup.

3. After you obtain the above signature, sequentially check the signatures of all nodes in Starting Point List #2 below. If you find an incorrect signature, proceed to the Signature Tables in this test and follow the example given in Figure 2-1 (pullout page at the end of this section) to isolate the problem.

Starting Point List #2

BOARD	IC	PIN	SIGNATURE
A6	U510	2	U8P1
A6	U510	3	C4UH
A6	U510	14	5062
A6	U510	15	H64A

SA TEST #14: SETUP PROCEDURE #1

a. To gain access to components, the A6 Trigger Board should be installed in its extended position. Refer to Extending Circuit Boards for Troubleshooting, in the Maintenance Section of Volume 1 for detailed instructions to do this.

b. Referring to Figure 3-17, connect the Signature Analyzer START, STOP, CLOCK and GND inputs to the pins on the A8 MPU Board labeled STR, STP, SACK, and GND, respectively. Set the START, STOP, and CLOCK inputs to rising edge sensitivity.

c. Set the Signature Analyzer Data and Control Probe thresholds to TTL.

d. Configure the 7A42 in Extended Test mode. Refer to Table 3-7 for the proper jumper locations. Table 3-7 is located in What To Do If The 7A42 Does Not Respond To Front Panel Controls, under Forced Instruction Freerun, in Volume 1.

e. Connect pins 1 and 2 of TP620 on the A7 Digital Board with a link-plug jumper. The location of TP620 is illustrated in Figure 3-8, in the section What To Do If The 7A42 Does Not Respond To Front Panel Controls, under Forced Instruction Freerun, in Volume 1.

f. With the 7A42 installed on two 067-0616-00 Flexible Extenders, power up the host mainframe.

g. Select Extended Test #14 by pressing the TRIG VIEW button. Verify that the desired test is executing by observing the number in the SWITCHING THRESHOLD VOLTS display.

h. Acquire the +5V (TTL high level) signature.

SA TEST #14: SETUP PROCEDURE #2

a. To gain access to components, the A6 Trigger Board should be installed in its extended position. Refer to Extending Circuit Boards for Troubleshooting, in the Maintenance Section of Volume 1 for detailed instructions to do this.

b. Referring to Figure 3-17, connect the 7A42 Signature Analyzer TTL-to-ECL Converter (Tektronix Part 670-8210-00) to the pins on the A8 MPU Board labeled STR, STP, SACK, and GND, respectively. Connect the Signature Analyzer START, STOP, CLOCK, and GND leads to the respective pins on the 670-8210-00. Set the Signature Analyzer START, STOP, and CLOCK inputs to rising edge sensitivity.

c. Set the Signature Analyzer Data and Control Probe thresholds to ECL levels (-1.30V). If the Data probe has dual threshold capability, set the upper threshold to -1.15V and the lower threshold to -1.45V.

d. Configure the 7A42 in Extended Test mode. Refer to Table 3-7 for the proper jumper locations. Table 3-7 is located in What To Do If The 7A42 Does Not Respond To Front Panel Controls, under Forced Instruction Freerun, in Volume 1.

e. Connect pins 1 and 2 of TP620 on the A7 Digital Board with a link-plug jumper. The location of TP620 is illustrated in Figure 3-8, in the section What To Do If The 7A42 Does Not Respond To Front Panel Controls, under Forced Instruction Freerun, in Volume 1.

f. With the 7A42 installed on two 067-0616-00 Flexible Extenders, power up the host mainframe.

g. Check that the 7A42 TRIGGER FILTER control is in the OFF (CCW detent) position.

h. Select Extended Test #14 by pressing the TRIG VIEW button. Verify that the desired test is executing by observing the number in the SWITCHING THRESHOLD VOLTS display.

i. Acquire the GND (ECL high level) signature.

A6 Q1014 ◈8◈

OUTPUT SETUP	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	C					
OUTPUT SIGNATURE	H616					
	↳	1	**	FACP	A6 U932-13	

A6 R732 ◈8◈

OUTPUT SETUP	2	2	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	9	13					
OUTPUT SIGNATURE	CP1P	85FA					
		↳	1	4	85FA	A6 U828-6	
	↳		1	8	CP1P	A6 U828-13	

A6 R808 ◈8◈

OUTPUT SETUP	2	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	16					
OUTPUT SIGNATURE	8159					
	↳	1	1	8159	A6 U818-13	

A6 R814 ◈8◈

OUTPUT SETUP	2	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	16					
OUTPUT SIGNATURE	7C93					
	↳	1	1	7C93	A6 U818-6	

A6 U510 ◇6

OUTPUT SETUP	2	2	2	2	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	3	14	15					
OUTPUT SIGNATURE	U8P1	C4UH	5062	H64A					
	↳				2	4	AUF8	A6 U620-3	
	↳				2	5	8159	A6 U700-3	
		↳			2	6	AUF8	A6 U620-3	
		↳			2	7	7C93	A6 U700-2	
			↳		2	10	AUF8	A6 U620-3	
			↳		2	11	CP1P	A6 U700-14	
				↳	2	12	AUF8	A6 U620-3	
				↳	2	13	85FA	A6 U700-15	

A6 U620 ◇7

OUTPUT SETUP	2	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	3					
OUTPUT SIGNATURE	AUF8					
	↳	2	4	1FA8	A6 U520-9	N
	↳	2	5	C360	A6 Q1012-C	N

A6 U700 ◈6◈

NOTE: This table is valid only with the TRIGGER FILTER control in the ON (out of detent) position.

OUTPUT SETUP	2	2	2	2	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	3	14	15					
OUTPUT SIGNATURE	7C93	8159	CP1P	85FA					
	↳				2	4	1FA8	A6 Q1000-C	N
		↳			2	6	1FA8	A6 Q1000-C	N
			↳		2	10	1FA8	A6 Q1000-C	N
				↳	2	12	1FA8	A6 Q1000-C	N

IMPORTANT – Return the TRIGGER FILTER control to the OFF (CCW detent) position before proceeding.

A6 U700 (TRIGGER FILTER in the OFF position) ◈6◈

OUTPUT SETUP	2	2	2	2	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	3	14	15					
OUTPUT SIGNATURE	7C93	8159	CP1P	85FA					
	↳				2	4	1FA8	A6 Q1000-C	N
	↳				2	5	7C93	A6 U800-2	
		↳			2	6	1FA8	A6 Q1000-C	N
		↳			2	7	8159	A6 U800-3	
			↳		2	10	1FA8	A6 Q1000-C	N
			↳		2	11	CP1P	A6 U800-15	
				↳	2	12	1FA8	A6 Q1000-C	N
				↳	2	13	85FA	A6 U800-14	

A6 U800 ◈6◈

OUTPUT SETUP	2	2	2	2	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	3	14	15					
OUTPUT SIGNATURE	7C93	8159	85FA	CP1P					
	↳				2	4	1FA8	A6 U610-14	N
	↳				2	5	7C93	A6 R814-16	
		↳			2	6	1FA8	A6 U610-14	N
		↳			2	7	8159	A6 R808-16	
			↳		2	10	1FA8	A6 U610-14	N
			↳		2	11	85FA	A6 R732-13	
				↳	2	12	1FA8	A6 U610-14	N
				↳	2	13	CP1P	A6 R732-9	

A6 U818 ◈8

OUTPUT SETUP	1	1	1	1	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	3	4	5	6	10	11	12	13					
OUTPUT SIGNATURE	U965	PP4U	U727	7C93	2U34	0566	02C2	8159					
	↳	↳	↳	↳	↳	↳	↳	↳	1	1	U2F9	A6 U838-13	
	↳	↳	↳	↳	↳	↳	↳	↳	1	2	1FA8	WIRED HIGH	
	↳	↳	↳	↳	↳	↳	↳	↳	1	8	1FA8	A6 TP804	Y
	↳	↳	↳	↳	↳	↳	↳	↳	1	9	1FA8	WIRED HIGH	

A6 U828 ◈8

OUTPUT SETUP	1	1	1	1	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	3	4	5	6	10	11	12	13					
OUTPUT SIGNATURE	H7C8	7921	2P6F	85FA	42P5	C38P	59F7	CP1P					
	↳	↳	↳	↳	↳	↳	↳	↳	1	2	1FA8	WIRED HIGH	
	↳	↳	↳	↳	↳	↳	↳	↳	1	8	1FA8	A6 TP804	Y
	↳	↳	↳	↳	↳	↳	↳	↳	1	9	1FA8	WIRED HIGH	

A6 U838 ◈8

OUTPUT SETUP	1	1	1	1	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	3	4	5	6	10	11	12	13					
OUTPUT SIGNATURE	7AH0	2U94	8537	429A	C3C1	FC24	P593	U2F9					
	↳	↳	↳	↳	↳	↳	↳	↳	1	1	U5A3	A6 U912-13	
	↳	↳	↳	↳	↳	↳	↳	↳	1	2	1FA8	WIRED HIGH	
	↳	↳	↳	↳	↳	↳	↳	↳	1	8	1FA8	A6 TP804	Y
	↳	↳	↳	↳	↳	↳	↳	↳	1	9	1FA8	WIRED HIGH	

Reference List

A6 TP804: use SA TEST #1, Starting Point #1, or Trigger Board Troubleshooting Tip A3

A6 U912 ◈8

OUTPUT SETUP	1	1	1	1	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	3	4	5	6	10	11	12	13					
OUTPUT SIGNATURE	5U0P	3H7A	0F41	8621	F311	U374	PC47	U5A3					
	↳	↳	↳	↳	↳	↳	↳	↳	1	1	CP1P	A6 U828-13	
	↳	↳	↳	↳	↳	↳	↳	↳	1	2	1FA8	WIRED HIGH	
	↳	↳	↳	↳	↳	↳	↳	↳	1	8	1FA8	A6 TP804	Y
	↳	↳	↳	↳	↳	↳	↳	↳	1	9	1FA8	WIRED HIGH	

A6 U922 ◈8

OUTPUT SETUP	1	1	1	1	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	3	4	5	6	10	11	12	13					
OUTPUT SIGNATURE	40AH	2057	102A	1AP9	0H75	06CC	11A1	1A2F					
	↳	↳	↳	↳	↳	↳	↳	↳	1	1	8159	A6 U818-13	
	↳	↳	↳	↳	↳	↳	↳	↳	1	2	1FA8	WIRED HIGH	
	↳	↳	↳	↳	↳	↳	↳	↳	1	8	1FA8	A6 TP804	Y
	↳	↳	↳	↳	↳	↳	↳	↳	1	9	1FA8	WIRED HIGH	

A6 U932 ◈8

OUTPUT SETUP	1	1	1	1	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	3	4	5	6	10	11	12	13					
OUTPUT SIGNATURE	0H17	9477	FA3A	77P1	3CU1	0U05	957U	FACP					
	↳	↳	↳	↳	↳	↳	↳	↳	1	1	1A2F	A6 U922-13	
	↳	↳	↳	↳	↳	↳	↳	↳	1	2	1FA8	WIRED HIGH	
	↳	↳	↳	↳	↳	↳	↳	↳	1	8	1FA8	A6 TP804	Y
	↳	↳	↳	↳	↳	↳	↳	↳	1	9	1FA8	WIRED HIGH	

Reference List

A6 TP804: use SA TEST #1, Starting Point #1, or Trigger Board Troubleshooting Tip A3

SA TEST #23

Examines the Boolean Logic.

SA TEST #23

STARTING POINT #1

1. Perform Setup #1 as described in the Setup Procedures on the following pages.

2. Check that the GND (ECL high level) signature is 8P54, if it is not double-check the setup.

3. After you obtain the above signature, sequentially check the signatures of all nodes in Starting Point List #1 below. If you find an incorrect signature, proceed to the Signature Tables in this test and follow the example given in Figure 2-1 (pullout page at the end of this section) to isolate the problem.

Starting Point List #1

BOARD	IC	PIN	SIGNATURE
A6	U500	15	544F
A6	U530	15	H9C6

SA TEST #23

STARTING POINT #2

1. Perform Setup #1 as described in the Setup Procedures on the following pages.

2. Check that the GND (ECL high level) signature is 8P54, if it is not double-check the setup.

3. After you obtain the above signature, sequentially check the signatures of all nodes in Starting Point List #2 below. If you find an incorrect signature, proceed to the Signature Tables in this test and follow the example given in Figure 2-1 (pullout page at the end of this section) to isolate the problem.

Starting Point List #2

BOARD	IC	PIN	SIGNATURE
A6	U402	2	3F3A
A6	U412	2	3F3A
A6	U422	2	F854
A6	U432	2	F854

SA TEST #23

STARTING POINT #3

1. Perform Setup #1 as described in the Setup Procedures on the following pages.

2. Check that the GND (ECL high level) signature is 8P54, if it is not double-check the setup.

3. After you obtain the above signature, sequentially check the signatures of all nodes in Starting Point List #3 below. If you find an incorrect signature, proceed to the Signature Tables in this test and follow the example given in Figure 2-1 (pullout page at the end of this section) to isolate the problem.

Starting Point List #3

BOARD	IC	PIN	SIGNATURE
A6	U800	2	PAU4
A6	U800	3	C36P
A6	U800	14	61U4
A6	U800	15	2411

SA TEST #23

STARTING POINT #4

1. Perform Setup #1 as described in the Setup Procedures on the following pages.

2. Check that the GND (ECL high level) signature is 8P54, if it is not double-check the setup.

3. After you obtain the above signature, sequentially check the signatures of all nodes in Starting Point List #4 below. If you find an incorrect signature, proceed to the Signature Tables in this test and follow the example given in Figure 2-1 (pullout page at the end of this section) to isolate the problem.

Starting Point List #4

BOARD	IC	PIN	SIGNATURE
A6	U700	2	PAU4
A6	U700	3	C36P
A6	U700	14	2411
A6	U700	15	61U4

Now, set the 7A42 TRIGGER FILTER control to the ON (out of detent) position and check the signatures below. If you find an incorrect signature, use the special A6 U700 Signature Table that applies only when the TRIGGER FILTER is in the ON position. If all the signatures in the list below are correct, return the TRIGGER FILTER control to the OFF (CCW detent) position before proceeding.

A6	U700	2	0000
A6	U700	3	0000
A6	U700	14	0000
A6	U700	15	0000

SA TEST #23

STARTING POINT #5

1. Perform Setup #1 as described in the Setup Procedures on the following pages.

2. Check that the GND (ECL high level) signature is 8P54, if it is not double-check the setup.

3. After you obtain the above signature, sequentially check the signatures of all nodes in Starting Point List #5 below. If you find an incorrect signature, proceed to the Signature Tables in this test and follow the example given in Figure 2-1 (pullout page at the end of this section) to isolate the problem.

Starting Point List #5

BOARD	IC	PIN	SIGNATURE
A6	U310	15	6A9H
A6	U312	15	3313
A6	U320	15	8A39
A6	U322	15	A460

SA TEST #23

STARTING POINT #6

1. Perform Setup #1 as described in the Setup Procedures on the following pages.

2. Check that the GND (ECL high level) signature is 8P54, if it is not double-check the setup.

3. After you obtain the above signature, sequentially check the signatures of all nodes in Starting Point List #6 below. If you find an incorrect signature, proceed to the Signature Tables in this test and follow the example given in Figure 2-1 (pullout page at the end of this section) to isolate the problem.

Starting Point List #6

BOARD	IC	PIN	SIGNATURE
A6	U610	9	C26P
A6	U610	15	3F3A

SA TEST #23

STARTING POINT #7

1. Perform Setup #1 as described in the Setup Procedures on the following pages.

2. Check that the GND (ECL high level) signature is 8P54, if it is not double-check the setup.

3. After you obtain the above signature, sequentially check the signatures of all nodes in Starting Point List #7 below. If you find an incorrect signature, proceed to the Signature Tables in this test and follow the example given in Figure 2-1 (pullout page at the end of this section) to isolate the problem.

Starting Point List #7

BOARD	IC	PIN	SIGNATURE
A6	U620	12	C26P
A6	U620	13	3F3A

SA TEST #23

STARTING POINT #8

1. Perform Setup #1 as described in the Setup Procedures on the following pages.

2. Check that the GND (ECL high level) signature is 8P54, if it is not double-check the setup.

3. After you obtain the above signature, sequentially check the signatures of all nodes in Starting Point List #8 below. If you find an incorrect signature, proceed to the Signature Tables in this test and follow the example given in Figure 2-1 (pullout page at the end of this section) to isolate the problem.

Starting Point List #8

BOARD	IC	PIN	SIGNATURE
A6	U620	10	3F3A
A6	U620	11	C26P

SA TEST #23: SETUP PROCEDURE #1

a. To gain access to components, the A6 Trigger Board should be installed in its extended position. Refer to Extending Circuit Boards for Troubleshooting, in the Maintenance Section of Volume 1 for detailed instructions to do this.

b. Referring to Figure 3-17, connect the 7A42 Signature Analyzer TTL-to-ECL Converter (Tektronix Part 670-8210-00) to the pins on the A8 MPU Board labeled STR, STP, SACK, and GND, respectively. Connect the Signature Analyzer START, STOP, CLOCK, and GND leads to the respective pins on the 670-8210-00. Set the Signature Analyzer START, STOP, and CLOCK inputs to rising edge sensitivity.

c. Set the Signature Analyzer Data and Control Probe thresholds to ECL levels (-1.30V). If the Data probe has dual threshold capability, set the upper threshold to -1.15V and the lower threshold to -1.45V.

d. Configure the 7A42 in Extended Test mode. Refer to Table 3-7 for the proper jumper locations. Table 3-7 is located in What To Do If The 7A42 Does Not Respond To Front Panel Controls, under Forced Instruction Freerun, in Volume 1.

e. Connect pins 1 and 2 of TP620 on the A7 Digital Board with a link-plug jumper. The location of TP620 is illustrated in Figure 3-8, in the section What To Do If The 7A42 Does Not Respond To Front Panel Controls, under Forced Instruction Freerun, in Volume 1.

f. With the 7A42 installed on two 067-0616-00 Flexible Extenders, power up the host mainframe.

g. Check that the 7A42 TRIGGER FILTER control is in the OFF (CCW detent) position.

h. Select Extended Test #23 by pressing the THRESH button. Verify that the desired test is executing by observing the number in the SWITCHING THRESHOLD VOLTS display.

i. Acquire the GND (ECL high level) signature.

SA TEST #23: SETUP PROCEDURE #2

a. To gain access to components, the A6 Trigger Board should be installed in its extended position. Refer to Extending Circuit Boards for Troubleshooting, in the Maintenance Section of Volume 1 for detailed instructions to do this.

b. Referring to Figure 3-17, connect the Signature Analyzer START, STOP, CLOCK and GND inputs to the pins on the A8 MPU Board labeled STR, STP, SACK, and GND, respectively. Set the START, STOP, and CLOCK inputs to rising edge sensitivity.

c. Set the Signature Analyzer Data and Control Probe thresholds to TTL.

d. Configure the 7A42 in Extended Test mode. Refer to Table 3-7 for the proper jumper locations. Table 3-7 is located in What To Do If The 7A42 Does Not Respond To Front Panel Controls, under Forced Instruction Freerun, in Volume 1.

e. Connect pins 1 and 2 of TP620 on the A7 Digital Board with a link-plug jumper. The location of TP620 is illustrated in Figure 3-8, in the section What To Do If The 7A42 Does Not Respond To Front Panel Controls, under Forced Instruction Freerun, in Volume 1.

f. With the 7A42 installed on two 067-0616-00 Flexible Extenders, power up the host mainframe.

g. Select Extended Test #23 by pressing the THRESH button. Verify that the desired test is executing by observing the number in the SWITCHING THRESHOLD VOLTS display.

h. Acquire the +5V (TTL high level) signature.

A6 CR520 ⑦

OUTPUT SETUP	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	K					
OUTPUT SIGNATURE	57C3					
	↳	1	A	58C5	A6 Q620-C	Y

A6 CR521 ⑦

OUTPUT SETUP	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	K					
OUTPUT SIGNATURE	57A7					
	↳	1	A	58C5	A6 Q620-C	Y

A6 CR622 ⑦

OUTPUT SETUP	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	K					
OUTPUT SIGNATURE	8P54					
	↳	1	A	58C5	A6 Q620-C	Y

Reference List

A6 Q620-C: use Trigger Board Troubleshooting Tip A2

A6 R732 ◈8◈

OUTPUT SETUP	1	1	1	1	1	1	1	1
OUTPUT PIN	9	10	11	12	13	14	15	16
OUTPUT SIGNATURE	2411	HAHP	4FPF	44F7	61U4	H66H	38AU	C5CF
								↳
							↳	
						↳		
					↳			
				↳				
			↳					
		↳						
	↳							

INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
2	1	C5CF	A6 U828-11	Y
2	2	38AU	A6 U838-13	Y
2	3	H66H	A6 U922-5	Y
2	4	61U4	A6 U828-6	Y
2	5	44F7	A6 U912-13	Y
2	6	4FPF	A6 U922-13	Y
2	7	HAHP	A6 U828-12	Y
2	8	2411	A6 U828-13	Y

Reference List

A6 U828: use SA TEST #14, Starting Point #1

A6 U838: use SA TEST #14, Starting Point #1

A6 U912: use SA TEST #14, Starting Point #1

A6 U922: use SA TEST #14, Starting Point #1

A6 R808 ⑧

OUTPUT SETUP	1	1	1	1	1	1	1	1
OUTPUT PIN	9	10	11	12	13	14	15	16
OUTPUT SIGNATURE	7PUA	2C60	358P	007A	59C7	6U08	U57A	C36P

INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
2	1	C36P	A6 U818-13	Y
2	2	U57A	A6 U818-10	Y
2	3	6U08	A6 U932-3	Y
2	4	59C7	A6 U922-3	Y
2	5	007A	A6 U912-4	Y
2	6	358P	A6 U838-4	Y
2	7	2C60	A6 U932-10	Y
2	8	7PUA	A6 U932-4	Y

A6 R814 ⑧

OUTPUT SETUP	1	1	1	1	1	1	1	1
OUTPUT PIN	9	10	11	12	13	14	15	16
OUTPUT SIGNATURE	8P2C	1F57	4715	33C3	55C8	5FFP	36P7	PAU4

INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
2	1	PAU4	A6 U818-6	Y
2	2	36P7	A6 U912-11	Y
2	3	5FFP	A6 U932-11	Y
2	4	55C8	A6 U838-11	Y
2	5	33C3	A6 U922-11	Y
2	6	4715	A6 U818-5	Y
2	7	1F57	A6 U818-3	Y
2	8	8P2C	A6 U818-4	Y

Reference List

A6 U818: use SA TEST #14, Starting Point #1

A6 U838: use SA TEST #14, Starting Point #1

A6 U912: use SA TEST #14, Starting Point #1

A6 U922: use SA TEST #14, Starting Point #1

A6 U932: use SA TEST #14, Starting Point #1

A6 R824 ⑧

OUTPUT SETUP	1	1	1	1	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	9	10	11	12	13	14	15	16					
OUTPUT SIGNATURE	4454	A22A	5115	99H9	U984	1C73	P3A2	2P67					
								↳	2	1	2P67	A6 U932-12	Y
							↳		2	2	P3A2	A6 U838-12	Y
						↳			2	3	1C73	A6 U912-12	Y
					↳				2	4	U984	A6 U828-10	Y
				↳					2	5	99H9	A6 U922-12	Y
			↳						2	6	5115	A6 U828-5	Y
		↳							2	7	A22A	A6 U828-4	Y
	↳								2	8	4454	A6 U828-3	Y

A6 R834 ⑧

OUTPUT SETUP	1	1	1	1	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	9	10	11	12	13	14	15	16					
OUTPUT SIGNATURE	HP4H	3U7H	1AF7	003H	56F0	PC36	F41H	4960					
								↳	2	1	4960	A6 U912-6	Y
							↳		2	2	F41H	A6 U838-6	Y
						↳			2	3	PC36	A6 U922-6	Y
					↳				2	4	56F0	A6 U932-6	Y
				↳					2	5	003H	A6 U912-5	Y
			↳						2	6	1AF7	A6 U838-5	Y
		↳							2	7	3U7H	A6 U932-5	Y
	↳								2	8	HP4H	A6 U932-13	Y

Reference List

A6 U828: use SA TEST #14, Starting Point #1

A6 U838: use SA TEST #14, Starting Point #1

A6 U912: use SA TEST #14, Starting Point #1

A6 U922: use SA TEST #14, Starting Point #1

A6 U932: use SA TEST #14, Starting Point #1

A6 R902 ◈8◈

OUTPUT SETUP	1	1	1	1	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	1	2	3	4	5	6	7	8					
OUTPUT SIGNATURE	9208	6C1H	U420	7ACH	AFHC	AC70	6HFP	U59C					
								↳	2	9	U59C	A6 U922-10	Y
							↳		2	10	6HFP	A6 U912-10	Y
						↳			2	11	AC70	A6 U838-10	Y
					↳				2	12	AFHC	A6 U922-4	Y
				↳					2	13	7ACH	A6 U818-11	Y
			↳						2	14	U420	A6 U818-12	Y
		↳							2	15	6C1H	A6 U838-3	Y
	↳								2	16	9208	A6 U912-3	Y

Reference List

A6 U818: use SA TEST #14, Starting Point #1

A6 U838: use SA TEST #14, Starting Point #1

A6 U912: use SA TEST #14, Starting Point #1

A6 U922: use SA TEST #14, Starting Point #1

A6 U300 ◇5◇

OUTPUT SETUP	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	3	14	15					
OUTPUT SIGNATURE	2A88	5048	3CU0	6AH6					
	↳				1	4	H7C8	A6 U200-8	N
	↳				1	5	6U08	A6 R808-14	
		↳			1	6	H7C8	A6 U200-8	N
		↳			1	7	59C7	A6 R808-13	
			↳		1	10	H7C8	A6 U200-8	N
			↳		1	11	6C1H	A6 R902-2	
				↳	1	12	H7C8	A6 U200-8	N
				↳	1	13	9208	A6 R902-1	

A6 U302 ◇5◇

OUTPUT SETUP	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	3	14	15					
OUTPUT SIGNATURE	HF3A	A824	9HU8	UF15					
	↳				1	4	22A2	A6 U210-8	N
	↳				1	5	7PUA	A6 R808-9	
		↳			1	6	22A2	A6 U210-8	N
		↳			1	7	AFHC	A6 R902-5	
			↳		1	10	22A2	A6 U210-8	N
			↳		1	11	358P	A6 R808-11	
				↳	1	12	22A2	A6 U210-8	N
				↳	1	13	007A	A6 R808-12	

A6 U310 ◈6◈

OUTPUT SETUP	1
OUTPUT PIN	15
OUTPUT SIGNATURE	6A9H

	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
↳	1	2	C36P	A6 R808-16	
↳	1	3	88A8	A6 U230-8	N
↳	1	4	1151	A6 U220-8	N
↳	1	5	22A2	A6 U210-8	N
↳	1	6	H7C8	A6 U200-8	N
↳	1	7	U57A	A6 R808-15	
↳	1	9	7ACH	A6 R902-4	
↳	1	10	U420	A6 R902-3	
↳	1	11	06UF	A6 U230-7	N
↳	1	12	9U05	A6 U220-7	N
↳	1	13	AFU6	A6 U210-7	N
↳	1	14	59PF	A6 U200-7	N

A6 U312 ◈6◈

OUTPUT SETUP	1
OUTPUT PIN	15
OUTPUT SIGNATURE	3313

	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
↳	1	2	PAU4	A6 R814-16	
↳	1	3	88A8	A6 U230-8	N
↳	1	4	1151	A6 U220-8	N
↳	1	5	22A2	A6 U210-8	N
↳	1	6	H7C8	A6 U200-8	N
↳	1	7	1F57	A6 R814-10	
↳	1	9	8P2C	A6 R814-9	
↳	1	10	4715	A6 R814-11	
↳	1	11	06UF	A6 U230-7	N
↳	1	12	9U05	A6 U220-7	N
↳	1	13	AFU6	A6 U210-7	N
↳	1	14	59PF	A6 U200-7	N

A6 U320 ◇6

OUTPUT SETUP	1
OUTPUT PIN	15
OUTPUT SIGNATURE	8A39

	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
↳	1	2	2411	A6 R732-9	
↳	1	3	88A8	A6 U230-8	N
↳	1	4	1151	A6 U220-8	N
↳	1	5	22A2	A6 U210-8	N
↳	1	6	H7C8	A6 U200-8	N
↳	1	7	U984	A6 R824-13	
↳	1	9	C5CF	A6 R732-16	
↳	1	10	HAHP	A6 R732-10	
↳	1	11	06UF	A6 U230-7	N
↳	1	12	9U05	A6 U220-7	N
↳	1	13	AFU6	A6 U210-7	N
↳	1	14	59PF	A6 U200-7	N

A6 U322 ◇6

OUTPUT SETUP	1
OUTPUT PIN	15
OUTPUT SIGNATURE	A460

	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
↳	1	2	61U4	A6 R732-13	
↳	1	3	88A8	A6 U230-8	N
↳	1	4	1151	A6 U220-8	N
↳	1	5	22A2	A6 U210-8	N
↳	1	6	H7C8	A6 U200-8	N
↳	1	7	4454	A6 R824-9	
↳	1	9	A22A	A6 R824-10	
↳	1	10	5115	A6 R824-11	
↳	1	11	06UF	A6 U230-7	N
↳	1	12	9U05	A6 U220-7	N
↳	1	13	AFU6	A6 U210-7	N
↳	1	14	59PF	A6 U200-7	N

A6 U330 ◇5

OUTPUT SETUP	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	3	14	15					
OUTPUT SIGNATURE	770P	AA09	277P	3U05					
	↳				1	4	88A8	A6 U230-8	N
	↳				1	5	56F0	A6 R834-13	
		↳			1	6	88A8	A6 U230-8	N
		↳			1	7	PC36	A6 R834-14	
			↳		1	10	88A8	A6 U230-8	N
			↳		1	11	F41H	A6 R834-15	
				↳	1	12	88A8	A6 U230-8	N
				↳	1	13	4960	A6 R834-16	

A6 U332 ◇5

OUTPUT SETUP	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	3	14	15					
OUTPUT SIGNATURE	PP1H	5412	4PUF	7P0A					
	↳				1	4	1151	A6 U220-8	N
	↳				1	5	3U7H	A6 R834-10	
		↳			1	6	1151	A6 U220-8	N
		↳			1	7	H66H	A6 R732-14	
			↳		1	10	1151	A6 U220-8	N
			↳		1	11	1AF7	A6 R834-11	
				↳	1	12	1151	A6 U220-8	N
				↳	1	13	003H	A6 R834-12	

A6 U400 ◇5

OUTPUT SETUP	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	3	14	15					
OUTPUT SIGNATURE	572F	U8A5	85H7	4C79					
	↳				1	4	2A88	A6 U300-2	
	↳				1	5	2C60	A6 R808-10	
		↳			1	6	5048	A6 U300-3	
		↳			1	7	U59C	A6 R902-8	
			↳		1	10	3CU0	A6 U300-14	
			↳		1	11	AC70	A6 R902-6	
				↳	1	12	6HFP	A6 R902-7	
				↳	1	13	6AH6	A6 U300-15	

A6 U402 ◇5 ◇6

OUTPUT SETUP	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	3	14	15					
OUTPUT SIGNATURE	3F3A	3H3A	57A7	C36P					
	↳				1	4	572F	WIREAND # 3	P
	↳				1	5	3H3A	A6 U402-3	
		↳			1	6	C36P	A6 U402-15	
		↳			1	7	P475	A6 U500-3	
			↳		1	10	6A9H	WIREOR # 8	P
			↳		1	11	C36P	A6 U700-3	
				↳	1	12	57A7	WIREOR #10	P
				↳	1	13	6A9H	WIREOR # 8	P

WIRE-AND #3
(Signature: 572F)
A6 U400-2
A6 U410-2
A6 U420-2
A6 U430-2

WIRE-OR #8
(Signature: 6A9H)
A6 U310-15
A6 U510-2

WIRE-OR #10
(Signature: 57A7)
A6 U402-14
A6 CR521-K

A6 U410 ◇5◇

OUTPUT SETUP	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	3	14	15					
OUTPUT SIGNATURE	572F	U8A5	85H7	4C79					
	↳				1	4	HF3A	A6 U302-2	
	↳				1	5	5FFP	A6 R814-14	
		↳			1	6	A824	A6 U302-3	
		↳			1	7	33C3	A6 R814-12	
			↳		1	10	9HU8	A6 U302-14	
			↳		1	11	55C8	A6 R814-13	
				↳	1	12	36P7	A6 R814-15	
				↳	1	13	UF15	A6 U302-15	

A6 U412 ◇5◇ ◇6◇

OUTPUT SETUP	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	3	14	15					
OUTPUT SIGNATURE	3F3A	64A0	57C3	PAU4					
	↳				1	4	U8A5	WIREAND # 4	P
	↳				1	5	64A0	A6 U412-3	
		↳			1	6	PAU4	A6 U412-15	
		↳			1	7	8C62	A6 U500-14	
			↳		1	10	PAU4	A6 U700-2	
			↳		1	11	3313	WIREOR # 9	P
				↳	1	12	57C3	WIREOR #13	P
				↳	1	13	3313	WIREOR # 9	P

WIRE-AND #4
(Signature: U8A5)
A6 U400-3
A6 U410-3
A6 U420-3
A6 U430-3

WIRE-OR #9
(Signature: 3313)
A6 U312-15
A6 510-3

WIRE-OR #13
(Signature: 57C3)
A6 U412-14
A6 CR520-K

A6 U420 ◇5◇

OUTPUT SETUP	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	3	14	15					
OUTPUT SIGNATURE	572F	U8A5	85H7	4C79					
	↳				1	4	PP1H	A6 U332-2	
	↳				1	5	2P67	A6 R824-16	
		↳			1	6	5412	A6 U332-3	
		↳			1	7	99H9	A6 R824-12	
			↳		1	10	4PUF	A6 U332-14	
			↳		1	11	P3A2	A6 R824-15	
				↳	1	12	1C73	A6 R824-14	
				↳	1	13	7P0A	A6 U332-15	

A6 U422 ◇5◇ ◇6◇

OUTPUT SETUP	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	3	14	15					
OUTPUT SIGNATURE	F854	AA45	046H	2411					
	↳				1	4	85H7	WIREAND # 6	P
	↳				1	5	AA45	A6 U422-3	
		↳			1	6	2411	A6 U422-15	
		↳			1	7	P81A	A6 U530-3	
			↳		1	10	8A39	WIREOR #11	P
			↳		1	11	2411	A6 U700-14	
				↳	1	12	046H	A6 U422-14	
				↳	1	13	8A39	WIREOR #11	P

WIRE-AND #6
(Signature: 85H7)
A6 U400-14
A6 U410-14
A6 U420-14
A6 U430-14

WIRE-OR #11
(Signature: 8A39)
A6 U320-15
A6 U510-14

A6 U430 ◇5◇

OUTPUT SETUP	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	3	14	15					
OUTPUT SIGNATURE	572F	U8A5	85H7	4C79					
	↳				1	4	770P	A6 U330-2	
	↳				1	5	HP4H	A6 R834-9	
		↳			1	6	AA09	A6 U330-3	
		↳			1	7	4FPF	A6 R732-11	
			↳		1	10	277P	A6 U330-14	
			↳		1	11	38AU	A6 R732-15	
				↳	1	12	44F7	A6 R732-12	
				↳	1	13	3U05	A6 U330-15	

A6 U432 ◇5◇ ◇6◇

OUTPUT SETUP	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	3	14	15					
OUTPUT SIGNATURE	F854	PUA0	4CF0	61U4					
	↳				1	4	4C79	WIREAND # 7	P
	↳				1	5	PUA0	A6 U432-3	
		↳			1	6	61U4	A6 U432-15	
		↳			1	7	1986	A6 U530-14	
			↳		1	10	A460	WIREOR #12	P
			↳		1	11	61U4	A6 U700-15	
				↳	1	12	4CF0	A6 U432-14	
				↳	1	13	A460	WIREOR #12	P

WIRE-AND #7
(Signature: 4C79)
A6 U400-15
A6 U410-15
A6 U420-15
A6 U430-15

WIRE-OR #12
(Signature: A460)
A6 U322-15
A6 U510-15

A6 U500 ◇5

OUTPUT SETUP	1	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	3	9	14	15					
OUTPUT SIGNATURE	544F	P475	HA18	8C62	544F					
	↳					1	4	572F	WIREAND # 3	P
	↳					1	5	U8A5	WIREAND # 4	P
		↳				1	6	C36P	A6 U800-3	
		↳				1	7	HA18	A6 U500-9	
				↳		1	10	HA18	A6 U500-9	
				↳		1	11	PAU4	A6 U800-2	
			↳		↳	1	12	544F	A6 U500-2	
			↳		↳	1	13	8P54	WIRED HIGH	

WIRE-AND #3
(Signature: 572F)
A6 U400-2
A6 U410-2
A6 U420-2
A6 U430-2

WIRE-AND #4
(Signature: U8A5)
A6 U400-3
A6 U410-3
A6 U420-3
A6 U430-3

A6 U510 ◇6

OUTPUT SETUP	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	3	14	15					
OUTPUT SIGNATURE	6A9H	3313	8A39	A460					
	↳				1	4	8P54	A6 U620-3	
	↳				1	5	C36P	A6 U700-3	
		↳			1	6	8P54	A6 U620-3	
		↳			1	7	PAU4	A6 U700-2	
			↳		1	10	8P54	A6 U620-3	
			↳		1	11	2411	A6 U700-14	
				↳	1	12	8P54	A6 U620-3	
				↳	1	13	61U4	A6 U700-15	

A6 U520 ⑦

OUTPUT SETUP	1	1	1	1
OUTPUT PIN	2	3	9	14
OUTPUT SIGNATURE	C26P	0000	8P54	3F3A

				INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE?
↳				1	4	0000	A6 U520-3	
↳				1	5	3F3A	WIREOR # 2	P
	↳			1	6	8P54	A6 Q1010-C	Y
	↳			1	7	0000	WIRED LOW	
			↳	1	10	8P54	WIREOR #14	P
			↳	1	11	8P54	A6 Q1010-C	Y
		↳		1	12	8P54	A6 Q1002-C	Y
		↳		1	13	0000	R733	N

WIRE-OR #2
(Signature: 3F3A)
A6 U600-3
A6 U600-14

WIRE-OR #14
(Signature: 8P54)
A6 Q1004-C
A6 CR622-C

Reference List

A6 Q1002-C: use Trigger Board Troubleshooting Tip A2

A6 Q1010-C: use Trigger Board Troubleshooting Tip A2

A6 U530 ◇5

OUTPUT SETUP	1	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	3	9	14	15					
OUTPUT SIGNATURE	H9C6	P81A	57P2	1986	H9C6					
	↳					1	4	4C79	WIREAND # 7	P
	↳					1	5	85H7	WIREAND # 6	P
		↳				1	6	2411	A6 U800-15	
		↳				1	7	57P2	A6 U530-9	
				↳		1	10	57P2	A6 U530-9	
				↳		1	11	61U4	A6 U800-14	
			↳		↳	1	12	H9C6	A6 U530-2	
			↳		↳	1	13	8P54	WIRED HIGH	

WIRE-AND #6
(Signature: 85H7)
A6 U400-14
A6 U410-14
A6 U420-14
A6 U430-14

WIRE-AND #7
(Signature: 4C79)
A6 U400-15
A6 U410-15
A6 U420-15
A6 U430-15

A6 U600 ◇7

OUTPUT SETUP	1	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	3	9	14	15					
OUTPUT SIGNATURE	3F3A	3F3A	8P54	3F3A	0000					
	↳					1	4	3F3A	WIREOR # 1	P
	↳					1	5	C26P	A6 U610-3	
		↳				1	6	3F3A	WIREOR # 1	P
		↳				1	7	8P54	WIREOR #14	P
				↳		1	10	3F3A	WIREOR # 1	P
				↳		1	11	F854	WIREOR # 5	P
			↳		↳	1	12	3F3A	WIREOR # 1	P
			↳		↳	1	13	C26P	A6 U520-2	

WIRE-OR #1
(Signature: 3F3A)
A6 U402-2
A6 U412-2
A6 U520-14
A6 U600-2

WIRE-OR #5
(Signature: F854)
A6 U422-2
A6 U432-2

WIRE-OR #14
(Signature: 8P54)
A6 Q1004-C
A6 CR622-C

A6 U610 ◇7

OUTPUT SETUP	1	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	3	9	14	15					
OUTPUT SIGNATURE	0000	C26P	C26P	8P54	3F3A					
	↳					1	4	0000	R715	N
	↳					1	5	0000	A6 U600-15	
		↳				1	6	8P54	A6 Q720-C	Y
		↳				1	7	C26P	A6 U520-2	
				↳		1	10	8P54	A6 Q720-C	Y
				↳		1	11	8P54	A6 Q1002-C	Y
			↳		↳	1	12	8P54	A6 Q720-C	Y
			↳		↳	1	13	3F3A	WIREOR # 2	P

WIRE-OR #2
(Signature: 3F3A)
A6 U600-3
A6 U600-14

Reference List

A6 Q720-C: use Trigger Board Troubleshooting Tip A2

A6 Q1002-C: use Trigger Board Troubleshooting Tip A2

A6 U620 ◇7

OUTPUT SETUP	1	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	3	10	11	12	13					
OUTPUT SIGNATURE	8P54	3F3A	C26P	C26P	3F3A					
	↳					1	4	8P54	A6 U520-9	
	↳					1	5	0000	A6 Q1012-C	Y
		↳	↳			1	7	0000	A6 U610-2	
		↳	↳			1	9	3F3A	A6 U610-15	
				↳	↳	1	14	3F3A	A6 U630-14	
				↳	↳	1	15	0000	WIRED LOW	

Reference List

A6 Q1012-C: use Trigger Board Troubleshooting Tip A2

A6 U630 ◇7◇

OUTPUT SETUP	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	14					
OUTPUT SIGNATURE	3F3A					
	↳	1	7	0000	WIRED LOW	
	↳	1	9	8P54	A6 Q1002-C	Y
	↳	1	11	3F3A	A6 U610-15	

Reference List

A6 Q1002-C: use Trigger Board Troubleshooting Tip A2

A6 U700 ◇6◇

NOTE: This table is valid only with the TRIGGER FILTER control in the ON (out of detent) position.

OUTPUT SETUP	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	3	14	15					
OUTPUT SIGNATURE	0000	0000	0000	0000					
	↳				1	4	0000	A6 Q1000-Q	Y
	↳				1	5	PAU4	A6 U800-2	
		↳			1	6	0000	A6 Q1000-C	Y
		↳			1	7	C36P	A6 U800-3	
			↳		1	10	0000	A6 Q1000-C	Y
			↳		1	11	2411	A6 U800-15	
				↳	1	12	0000	A6 Q1000-C	Y
				↳	1	13	61U4	A6 U800-14	

IMPORTANT - Return the TRIGGER FILTER control to the OFF (CCW detent) position before proceeding.

A6 U700 (TRIGGER FILTER in the OFF position) ◇6◇

OUTPUT SETUP	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	3	14	15					
OUTPUT SIGNATURE	PAU4	C36P	2411	61U4					
	↳				1	4	8P54	A6 Q1000-C	Y
	↳				1	5	PAU4	A6 U800-2	
		↳			1	6	8P54	A6 Q1000-C	Y
		↳			1	7	C36P	A6 U800-3	
			↳		1	10	8P54	A6 Q1000-C	Y
			↳		1	11	2411	A6 U800-15	
				↳	1	12	8P54	A6 Q1000-C	Y
				↳	1	13	61U4	A6 U800-14	

Reference List

A6 Q1000-C: use Trigger Board Troubleshooting Tip A2

A6 U800 ◇6

OUTPUT SETUP	1	1	1	1	INPUT SETUP	INPUT PIN	INPUT SIGNATURE	INPUT'S SOURCE NODE	REFERENCE ?
OUTPUT PIN	2	3	14	15					
OUTPUT SIGNATURE	PAU4	C36P	61U4	2411					
	↳				1	4	8P54	A6 U610-14	
	↳				1	5	PAU4	A6 R814-16	
		↳			1	6	8P54	A6 U610-14	
		↳			1	7	C36P	A6 R808-16	
			↳		1	10	8P54	A6 U610-14	
			↳		1	11	61U4	A6 R732-13	
				↳	1	12	8P54	A6 U610-14	
				↳	1	13	2411	A6 R732-9	

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