ATARI

CX55™ CARTRIDGE ADAPTOR

FIELD SERVICE MANUAL

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Correspondence regarding this document should be forwarded to Director of Technical Support, Consumer Product Service, Atari, Incorporated, 845 W. Maude Avenue, Sunnyvale, CA 94086.

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont)

List of Illustrations

List of Tables

INTRODUCTION

The Atari CX55 Cartridge Adaptor Field Service Manual is a reference guide for the service technician.

This Field Service Manual is organized in eight Sections:

- **THEORY OF OPERATION** - Overview of how the CX55 works and what its basic assemblies look like.
- **TESTING** - Review of Diagnostic Tests available for diagnosing CX55 problems.
- **DISASSEMBLY/ASSEMBLY** - Detailed procedures for disassembling and assembling the CX55.
- **DIAGNOSTIC FLOWCHARTS** - Aids for troubleshooting the CX55.
- **SYMPTOM CHECKLIST** - Failure information to assist the experienced technician arrive at a rapid diagnosis of CX55 problems.
- **SILKSCREENS AND SCHEMATICS** - Electrical drawings and layouts of the CX55 printed circuit boards.
- **PARTS LIST** - Detailed breakdown of all parts used in the CX55.
- **SERVICE BULLETINS** - Section to be used to hold Field Change Orders, Upgrade Bulletins and Tech Tips.

This manual is designed for use by both the experienced and inexperienced service technician. The Diagnostic Flowcharts (Section 4) provide detailed procedures for technicians not completely familiar with the CX55. The Symptom Checklist (Section 5) provides a rapid reference for the more experienced technician.

SECTION 1

THEORY OF OPERATION

INTRODUCTION

The VCS™ Cartridge Adaptor, model CX55, allows the consumer to play CX2600™ series cartridges on a CX5200™. The unit plugs directly into the cartridge slot of the 5200. It derives its power from the 5200. Video information generated by the Adaptor is transmitted to the TV via the 5200 RF modulator. The unit operates with 2600 compatible controllers.

OVERVIEW

The VCS Cartridge Adaptor is a state-of-the-art microcomputer. It receives instructions for the operation of different games from individual Read-Only-Memory game cartridges and interprets data from the players' hand held controllers. It also allows the game player to select both a specific version of each game and the player difficulty (on a per player basis). Figure 1-1 is a block diagram of the functional flow of the CX55.

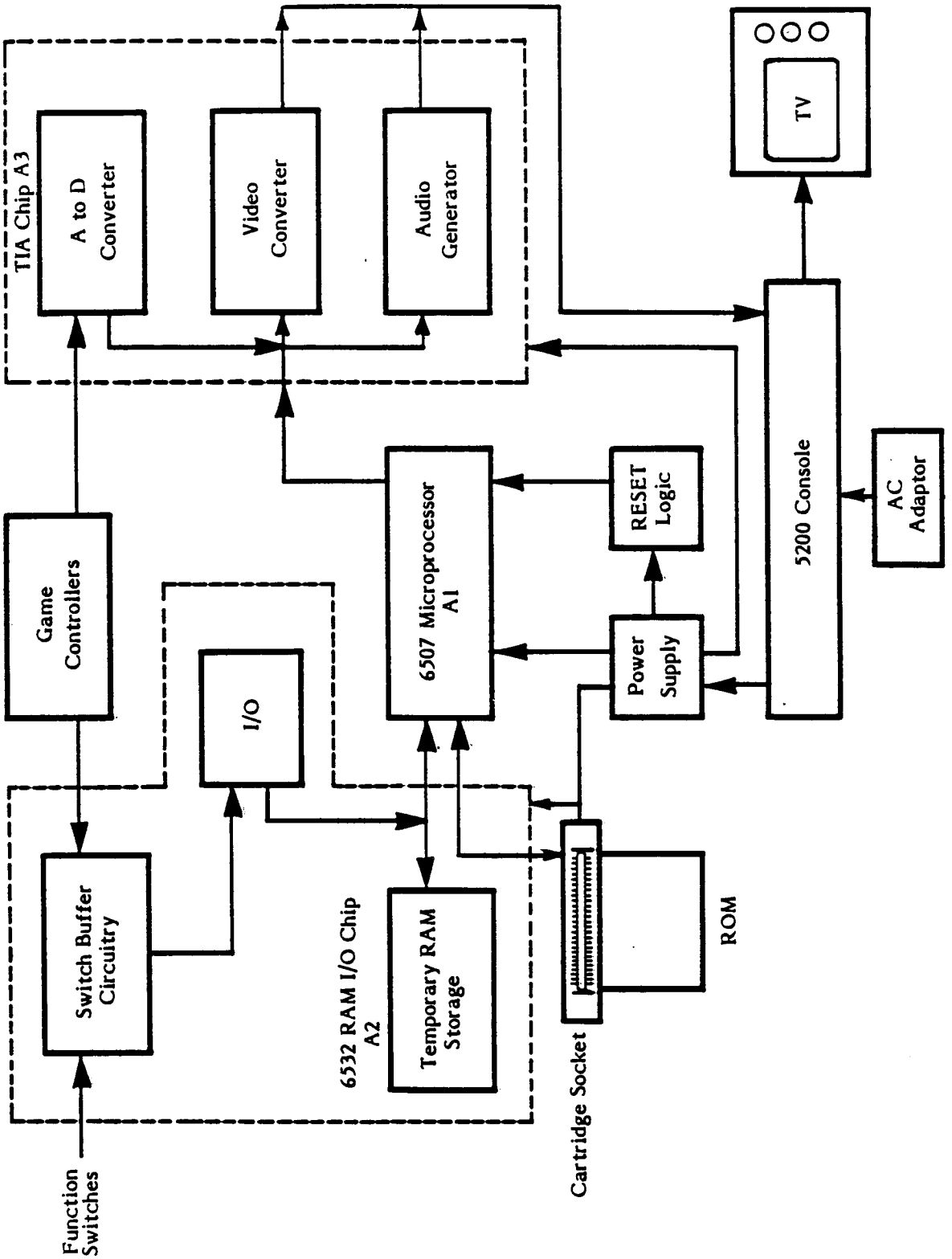


Figure 1-1. CX55 Block Diagram

CX55 CONSOLE

The CX55 console is composed of an outer plastic case which houses the PC Board and it s RF Shield and the cartridge slide mechanism. Figure 1-2 shows the console and its parts.

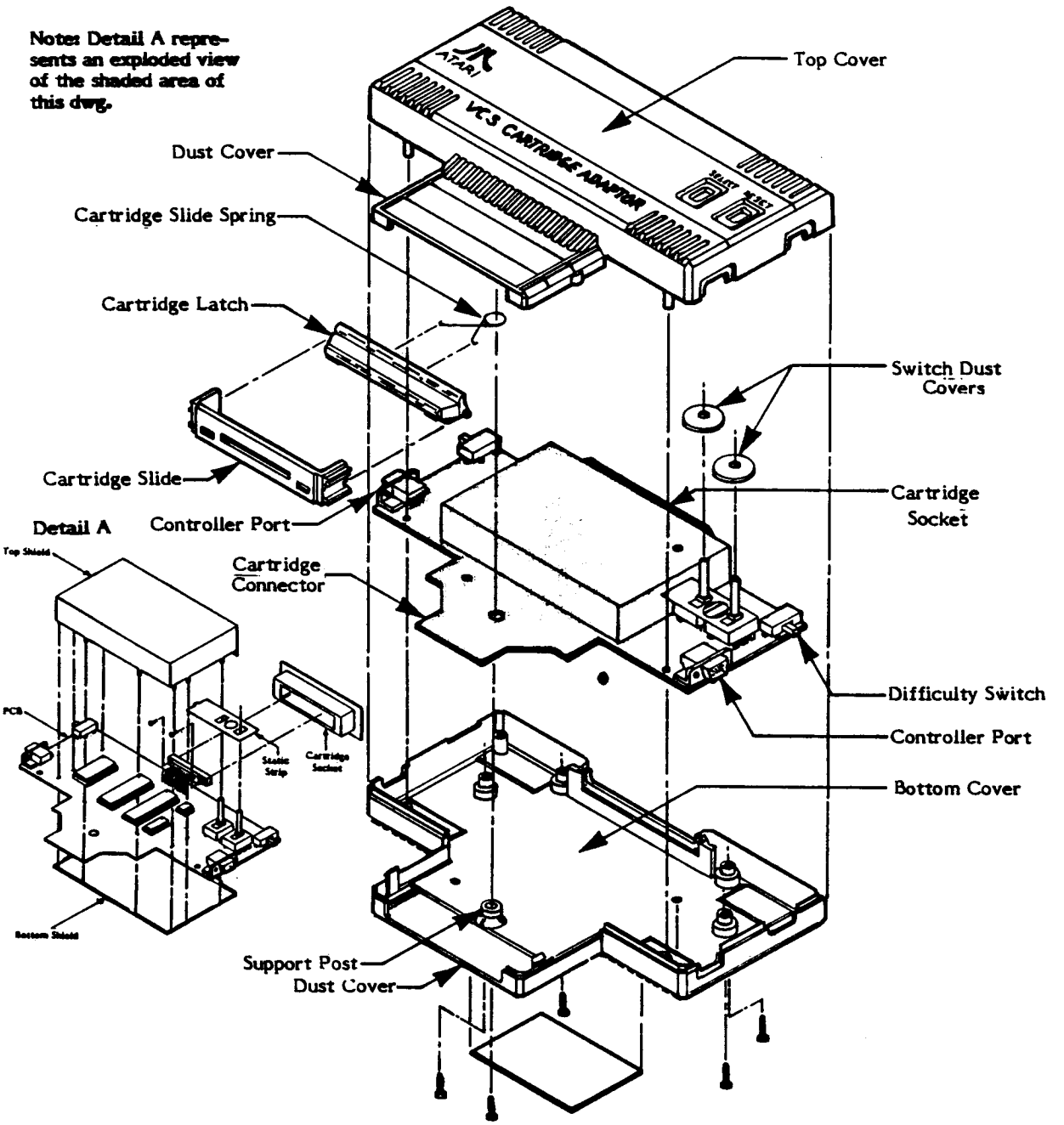


Figure 1-2. Final Assembly

OUTER CASE

The outer case consists of a bottom and a top plastic cover which are held together by five Phillips head screws.

The bottom cover provides:

- Access holes for audio and color adjustment
- Openings in the sides for the two controller ports
- Support post for the cartridge slide spring

The top cover provides:

- Openings for the two difficulty switches and the SELECT and RESET switch.
- Openings in the sides for the two controller ports.

RF SHIELD

An aluminum shield covers the PC Board and prevents the PC Board from generating interference to the T.V. Screen.

PC BOARD

The PC Board consists of:

- Five Integrated Circuit chips
- A 2600 Cartridge socket
- A 5200 Cartridge connector
- A logic controller voltage regulator
- Various discrete components

The Main I.C.'s on the PC Board are:

Microprocessor - A1 (MPU)

The 6507 MPU is an eight-bit microprocessor that coordinates all circuitry in the CX55.

RAM I/O - A2

The 6532 Random Access Memory - Input/Output chip provides temporary storage of data from the MPU. This chip scans the option switch lines and the eight I/O lines for input. It also keeps track of the internal timing of the chips for accurate video coordination.

TIA - A3

This Atari proprietary chip generates the audio and video signals which are transmitted to the television via the 5200 RF Module. The TIA also contains the analog-to-digital convertor circuitry that allows the MPU to understand signals received from the hand-held controllers.

POWER SUPPLY

The power supply consists of a Logic Controlled Voltage Regulator (VR1) and associated filter circuitry. VR1 receives unregulated DC into pin 5 from the 5200 via the cartridge connector. When the power switch of the 5200 is pressed, pin 2 of VR1 is pulled high which turns VR1 on. When VR1 is on, the output at pin 1 is 5VDC.

SECTION 2

TESTING

EQUIPMENT REQUIRED

- A known good 5200 console
- A color Television (properly adjusted)
- A 2.6 Diagnostic cartridge
- Two controller port shorting plugs for use with the 2.6 Diagnostic cartridge
- A Signal Tracing Cartridge (STC)
- A 15 MHz oscilloscope
- A voltmeter
- A frequency meter

TESTING WITH THE 2.6 DIAGNOSTIC CARTRIDGE

All tests are reviewed in this section. If applicable, a flowchart entry point is given for each. If a failure occurs, go to the flowchart indicated and continue troubleshooting.

OVERVIEW OF TESTS

- Color bar
- Diagnostic Matrix
- Audio

INITIALIZATION

To prepare the CX55 for testing, perform the following steps in the order given:

- Connect the known good 5200 console to the T.V.
- Insert the CX55 into the 5200 cartridge slot.
- Set both difficulty switches to the "A" position.
- Insert a 2.6 Diagnostic Cartridge into the CX55.
- Turn the 5200 on.

If a color bars display appears, go to the Color Bars test procedure, page 2-3.

One of the following indicates a failure:

- Blank Screen
- Snowy Screen
- Warped/Ragged Picture
- A large X on the screen

BLANK SCREEN

If a blank screen appears, the unit is suffering either a power or a catastrophic failure. This means that the unit is not functioning well enough to even put up a simple display.

Diagnostic Flowchart Entry Point: If the unit has the LT3105 5-pin logic controlled voltage regulator installed, go to Diagnostic Flowchart B, Page 4-4.

If the unit has voltage regulator PCB #CA023008 installed, go to Diagnostic Flowchart BG, Page 4-10.

SNOWY SCREEN

If, when turned on, the unit displays no modulation on the screen, the failure is probably in the power circuitry.

Diagnostic Flowchart Entry Point: If the unit has the LT3105 5-pin logic controlled voltage regulator installed, go to Diagnostic Flowchart A, Page 4-2.

If the unit has voltage regulator PCB #CA023008 installed, go to Diagnostic Flowchart A1, Page 4-3.

WARPED/RAGGED PICTURE

In this failure the screen appears bent to one side with a ragged edge. The picture may roll or slide down and to the left of the screen. This means that the sync signal broadcast by the TIA is probably not functioning.

Diagnostic Flowchart Entry Point: Flowchart C, Page 4-12.

A LARGE X ON THE SCREEN - RAM FAILURE

If when turned on, the unit displays a large X on the screen, the failure is probably a defective RAM/I/O chip (A2). Another possible cause is the A2 reset circuit.

No Diagnostic Flowchart Entry Point.

COLOR BAR TEST

- Purpose: To test the 6507 MPU and TIA chip and associated output circuitry for correct operation.

- Format: A screen of horizontal color bars displays (See Figure 2-1). The screen should be steady and unchanging. A grey or blue horizontal reference line runs across the screen about three bars from the bottom. This reference line is thinner than the bars around it. R15 should be adjusted so the bars immediately above and below the reference line are essentially the same shade. Proper operation of the unit is indicated by being able to make this adjustment and by consistent color within the entire span of each bar on the screen. Leave this test on for at least ten seconds in order to catch any intermittent problems, such as a bar momentarily changing colors or blanking out.

Diagnostic Flowchart Entry Point: Flowchart E, Page 4-14.

If color bars are OK but the display seems to be weak, refer to diagnostic Flowchart D, Page 4-13.

NOTE: This figure is a black and white representation of a color television screen.

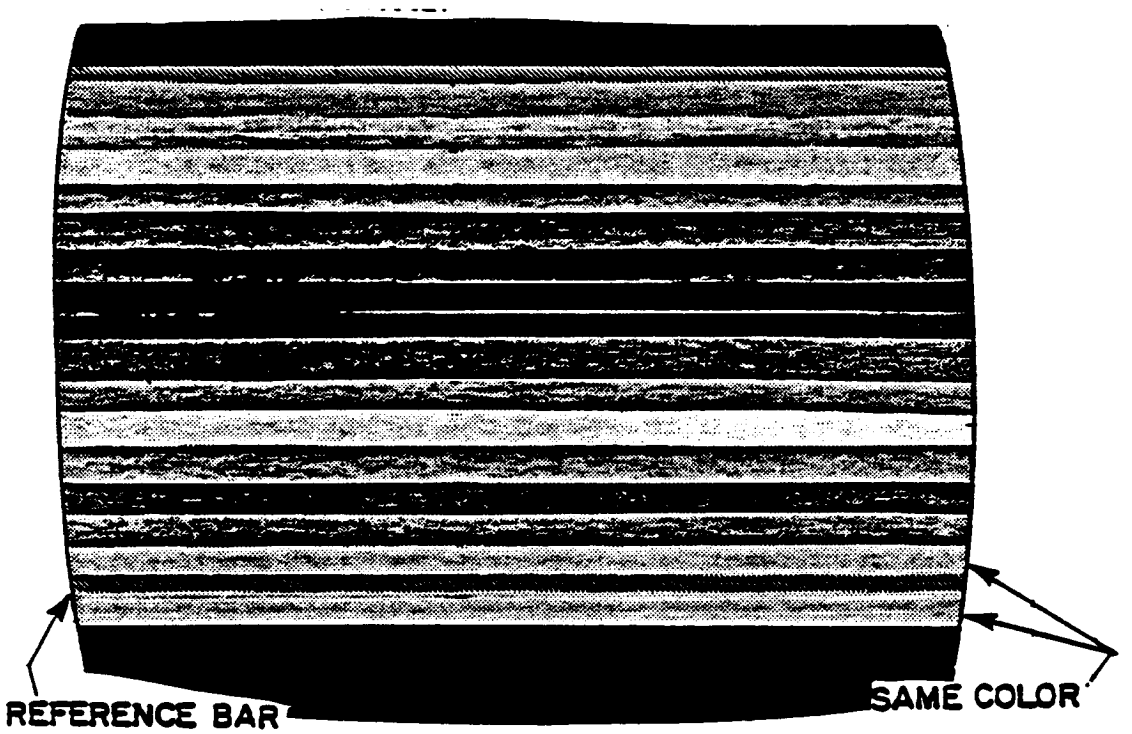


Figure 2-1. Color Bar Screen

DIAGNOSTIC MATRIX TEST

- Purpose: To test the proper function of the Input-Output ports of the VCS unit and the SELECT/RESET switches.
- Format: Set all switches to the initialized position, then move the Left Difficulty switch to the "B" position. The test is performed in two parts:
  - With the blue shorting plugs removed the matrix of nine rectangles on the screen should look like Figure 2-2.
  - The shorting plugs are then inserted and the pattern should look like Figure 2-3.
  - Press the GAME SELECT switch. If the switch is properly functioning, that area of the matrix will black out. Release the GAME SELECT switch and repeat the procedure with the GAME RESET switch.

NOTE: The Matrix jumps once every second.

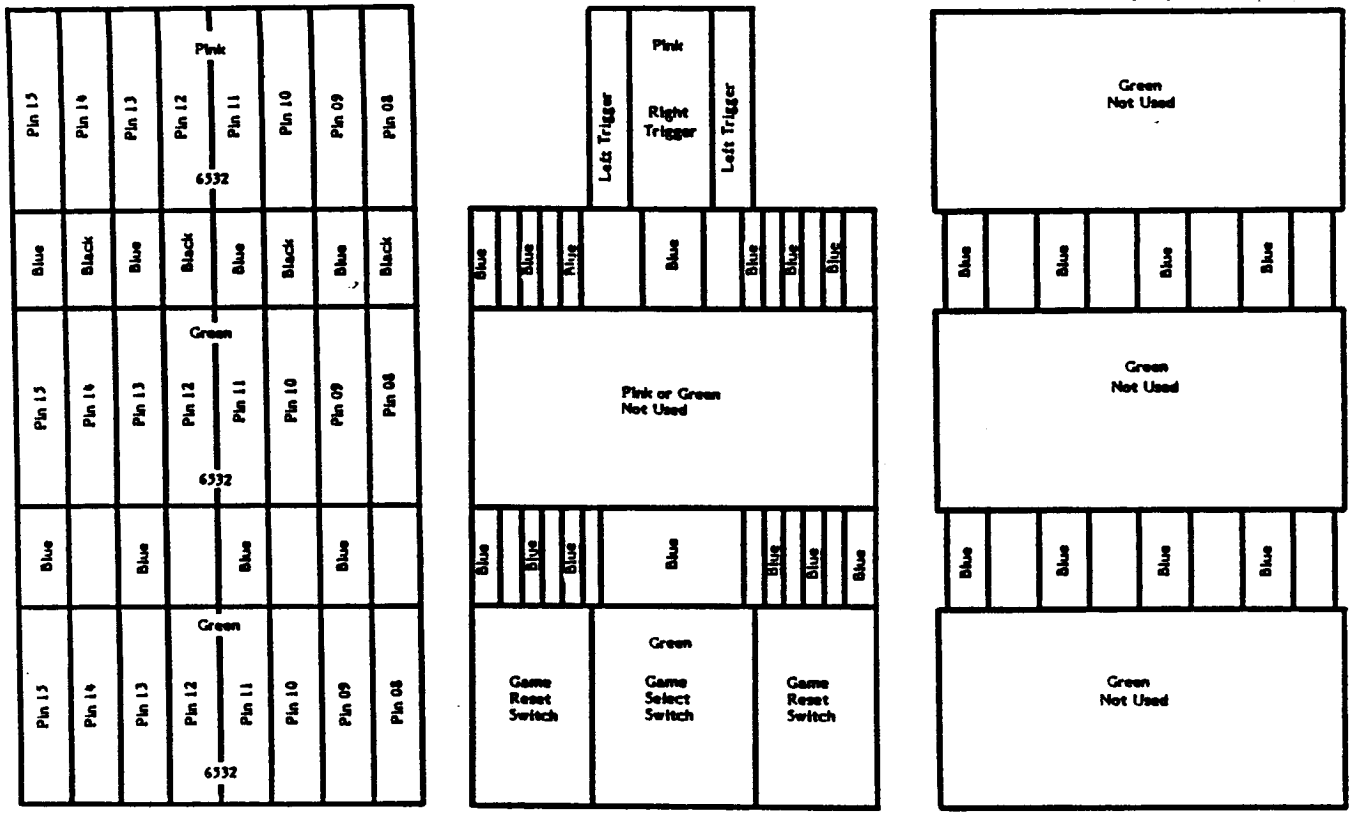


Figure 2-2. Diagnostic Matrix Screen
(Shorting Plugs OUT)

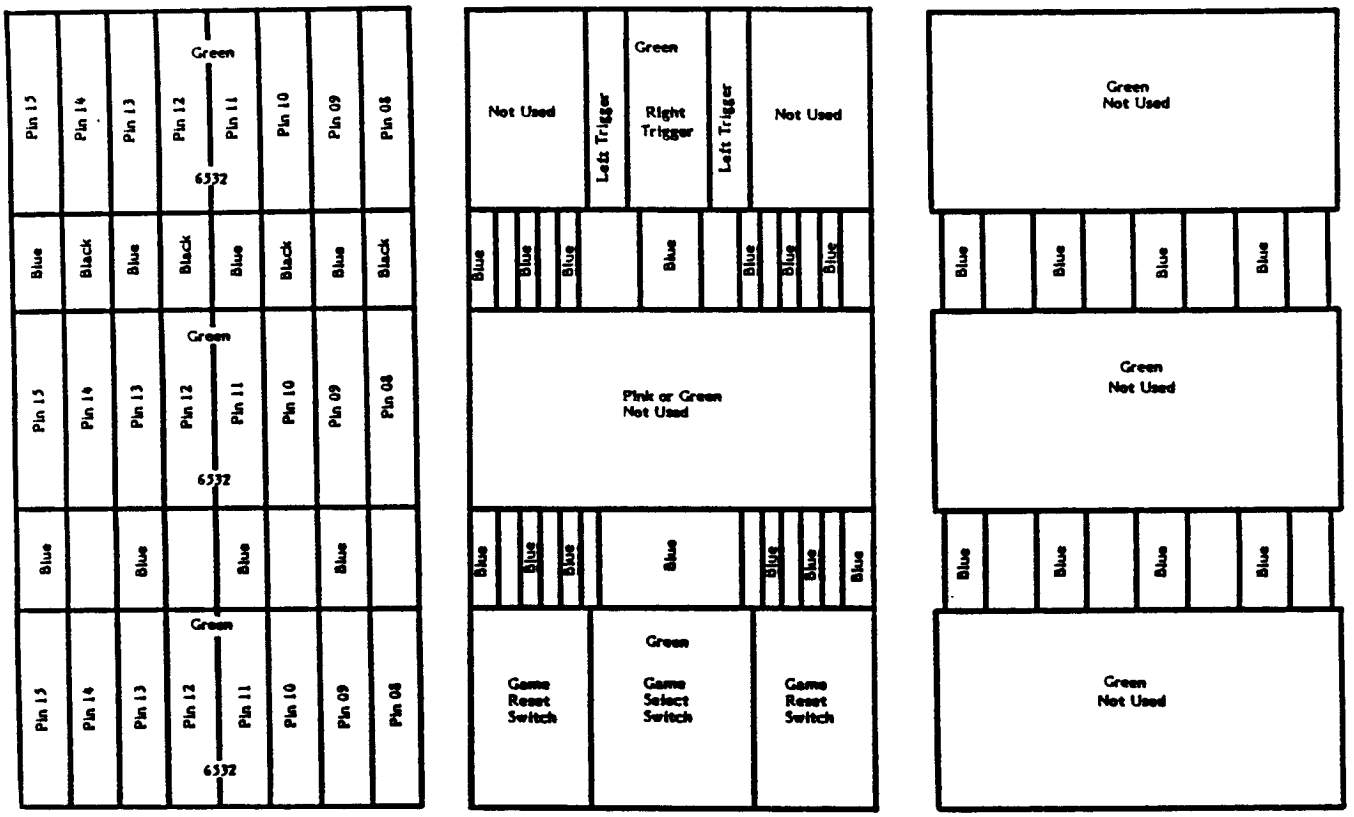


Figure 2-3. Diagnostic Matrix Screen (Shorting Plugs IN)

Diagnostic Flowchart Entry Point: Flowchart F, Page 4-17.

PADDLE CONTROL LINES TEST

- Purpose: To test the proper operation of the Paddle Control Lines by viewing the analog waveforms at the analog-to-digital conversion inputs of the TIA chip. This test is required only if there is a problem with the hand controller lines.

- Format: Pins 37, 38, 39 and 40 of the TIA chip are checked with the oscilloscope with the VCS unit in Diagnostic Matrix mode and with the shorting plugs in place.

Diagnostic Flowchart Entry Point: Flowchart K, Page 4-23.

AUDIO TONES TEST

- Purpose: To test the function of the audio tone generation and modulation circuitry.

- Format: The VCS unit should be in the initialized mode. Move the Right Difficulty switch to the "B" position. The test displays two alternating patterns on the screen (as shown in Figure 2-4) while two alternating tones are heard. The tones change in sync with the screen. This test pattern continues for one full cycle after the Right Difficulty switch has been returned to the initialized position.

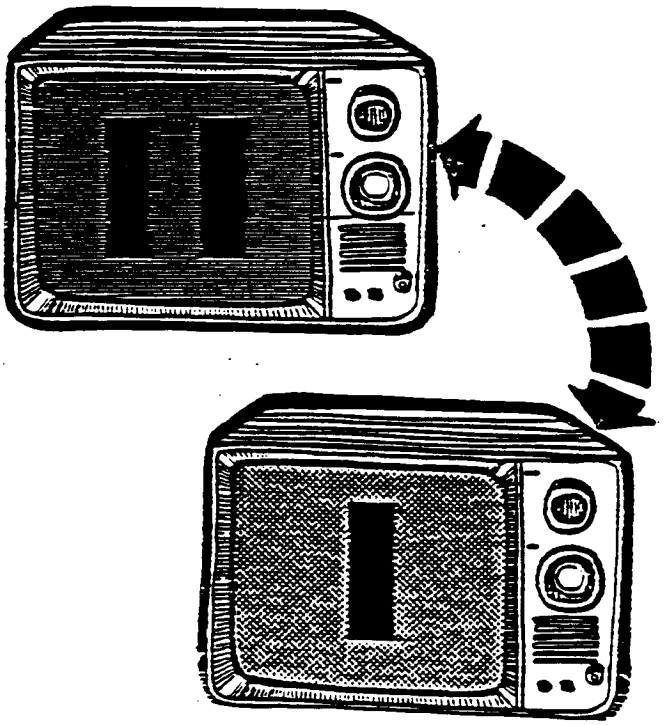


Figure 2-4. Audio Tones Test Screens

Diagnostic Flowchart Entry Point: Flowchart L, Page 4-25.

SECTION 3

DISASSEMBLY/ASSEMBLY

Disassembly

- Remove the five Phillips-head screws from the bottom cover.
- Push the cartridge slide back and expose the PCB edge connector:
  - Insert a pencil or the tip of a screwdriver into one of the two small openings in the cartridge slot.
  - Push the cartridge latch down and at the same time push the cartridge slide away from you.
- Place the top of the unit against your chest, insert fingertips into the dust cover and pry apart.

  WARNING: Do not use any tools to pry apart as this will damage the cover.
- Carefully move your hands to the larger section of the cartridge adaptor and pry apart the top and bottom cover.
- Set the cartridge adaptor on a flat surface (bottom cover up).
- Remove the bottom cover and set it aside. The cartridge latch and cartridge slide lift out at the same time.
- Remove the PCB from the top cover.
- Remove the cartridge slide spring from the support post.
- Remove the RF shield from the PCB:
  - Straighten the ten tabs over the bottom RF shield and remove the bottom RF shield.
  - Peel the static strip off the top RF shield.
  - Lift the top RF shield off the PCB.

Assembly

- Place the RF shield over the PCB as shown in Figure 1-2. Be sure that the shield adjustment hole aligns with the adjustment hole in the PCB. Bend the ten tabs over the bottom RF shield.
- Be sure that the static strip is attached to the switches and the RF shield and that the switch dust covers are in place.

- Place the cartridge latch in the cartridge slide as shown in Figure 1-2.
- Place the cartridge slide assembly (latch and slide from the previous step) in the top cover with the latch closest to the top cover.

NOTE: **Hold the cartridge slide assembly in place during the next steps until the PCB is in place.**

- Insert the cartridge slide spring into the groove in the cartridge latch. Compress the spring then loop the rounded portion over the support post in the top cover.
- Slide the PCB edge connector into the cartridge slide assembly. The bottom shield should be toward you.
- To position the PCB into the top cover, fit the bezel of the cartridge socket into the groove on each side of the cartridge socket opening.

  Three support posts fit into holes in the PCB.
- Place the bottom cover over the top cover and push the two covers together. They will snap in place where there are support posts (see Figure 3-1.
- Replace the five Phillips-head screws in the bottom cover.

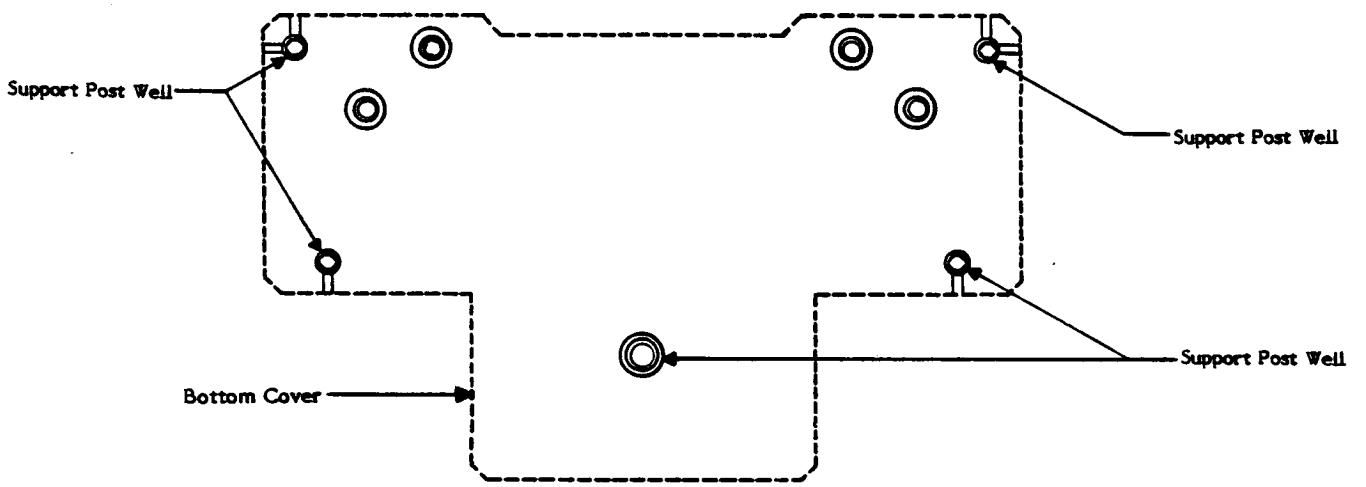


Figure 3-1. Support Post Wells

SECTION 4

DIAGNOSTIC FLOWCHARTS

The Diagnostic Flowchart is intended to be easy to use and the primary aid when troubleshooting the CX55. Follow the prompts in the order presented. When a question is asked, follow the line from the box that best applies to your unit's condition. When that line terminates with a letter inside a circle, locate the letter on a different page and continue the diagnosis. The flowchart leaves nothing to chance, it tells you when to perform a specific test and when to replace components.

SWAP OUT PROCEDURE

At many places in the diagnostic flowchart, a box tells you to "swap out" a component, a chip, or a number of chips in a particular order. The "swap-out" instruction means that you should replace the indicated components (one at a time) with a known-good component of the same type. The unit should then be tested with the new, known-good component in place to see whether the swap out solved the problem being checked. If the swap out did not fix the problem, the known good component should be removed, and the original component reinserted. In this way, you avoid needlessly replacing good components.

REPLACE IN ORDER

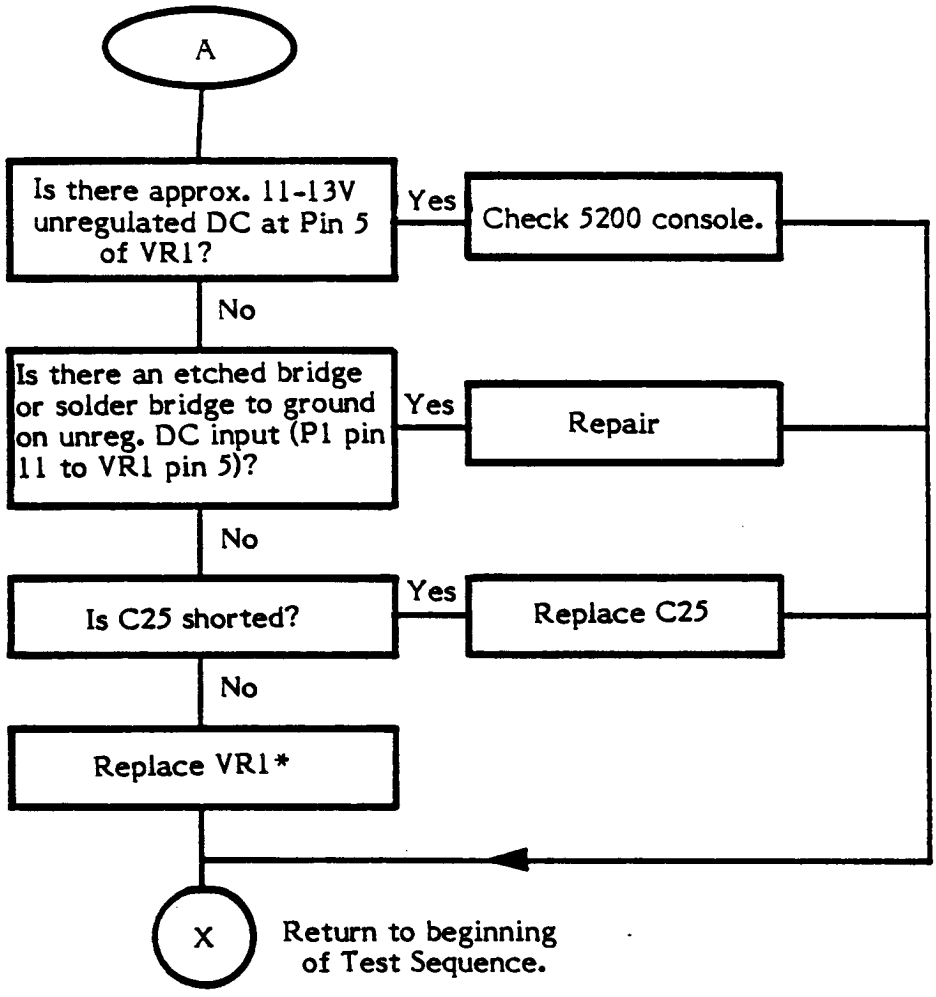
The "replace in order" instruction means that you should replace the components indicated in the order listed until the result called out in the previous block is obtained.

X - Some lines terminate with an **X** inside a circle. When this occurs, return to the beginning of the test sequence, Section 2.

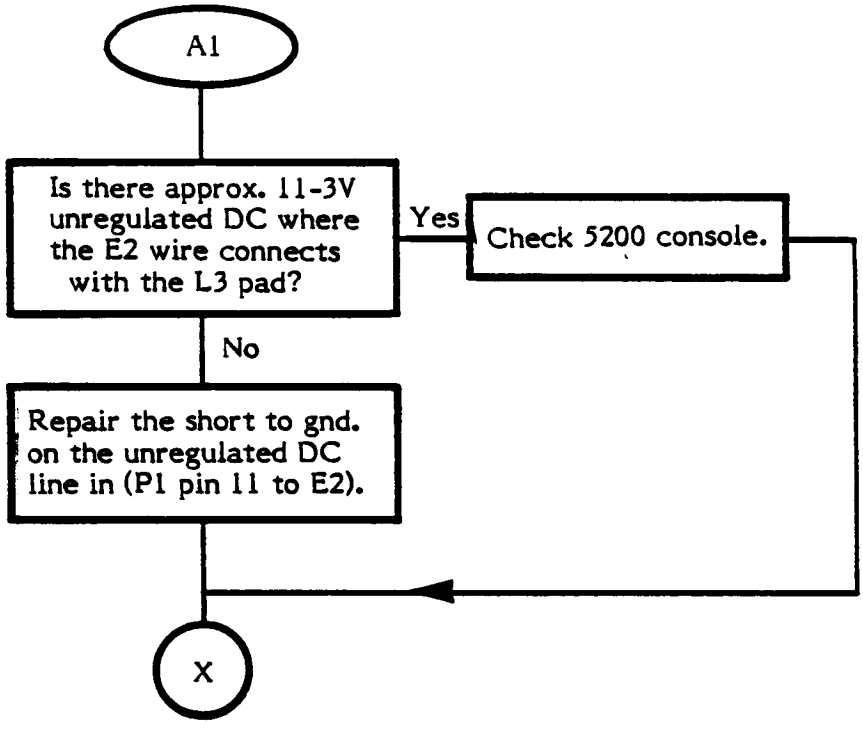
If you have questions or need further assistance, call the Atari Techline Specialist:

Inside California
(800) 672-1466

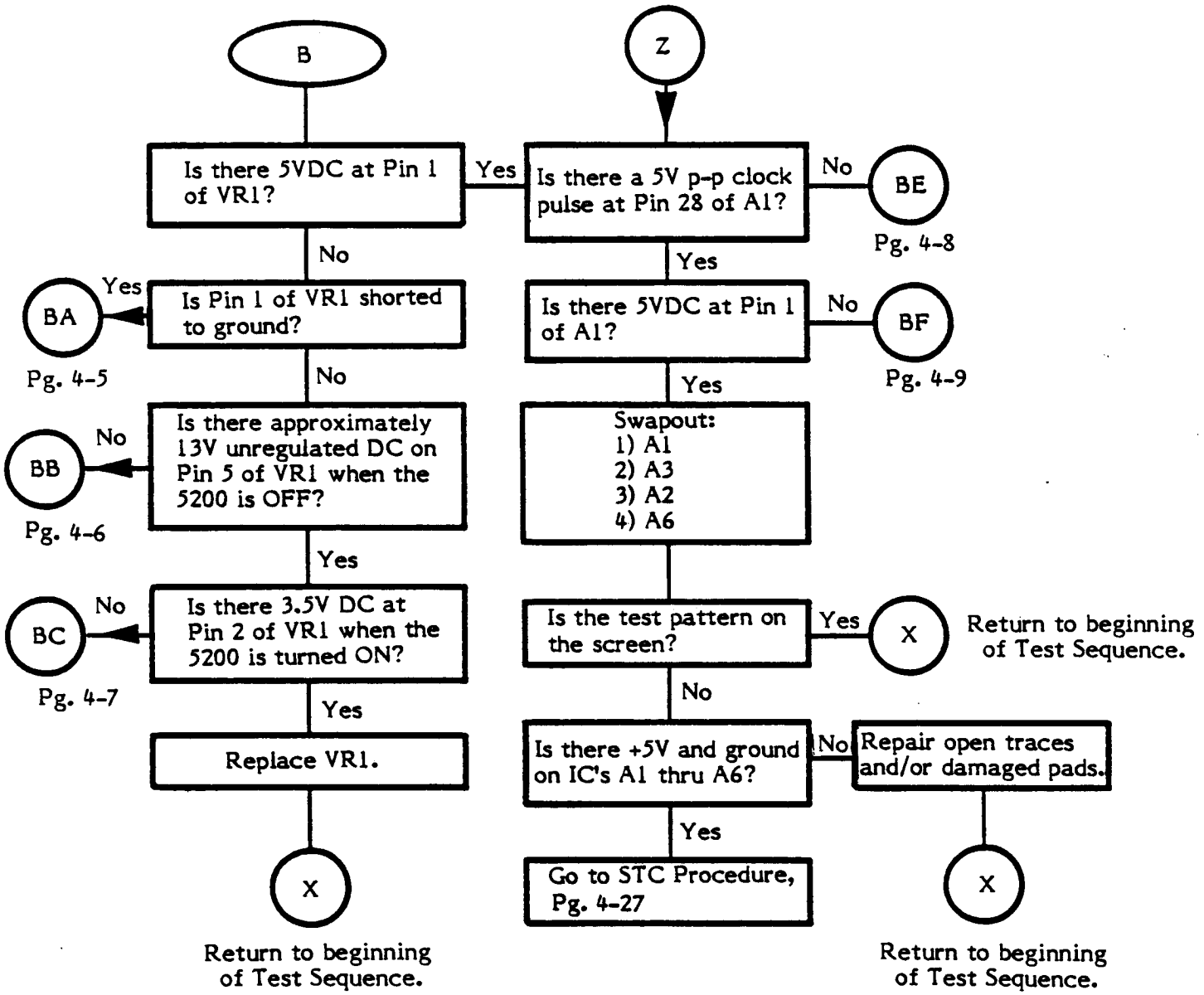
Outside California
(800) 538-1535

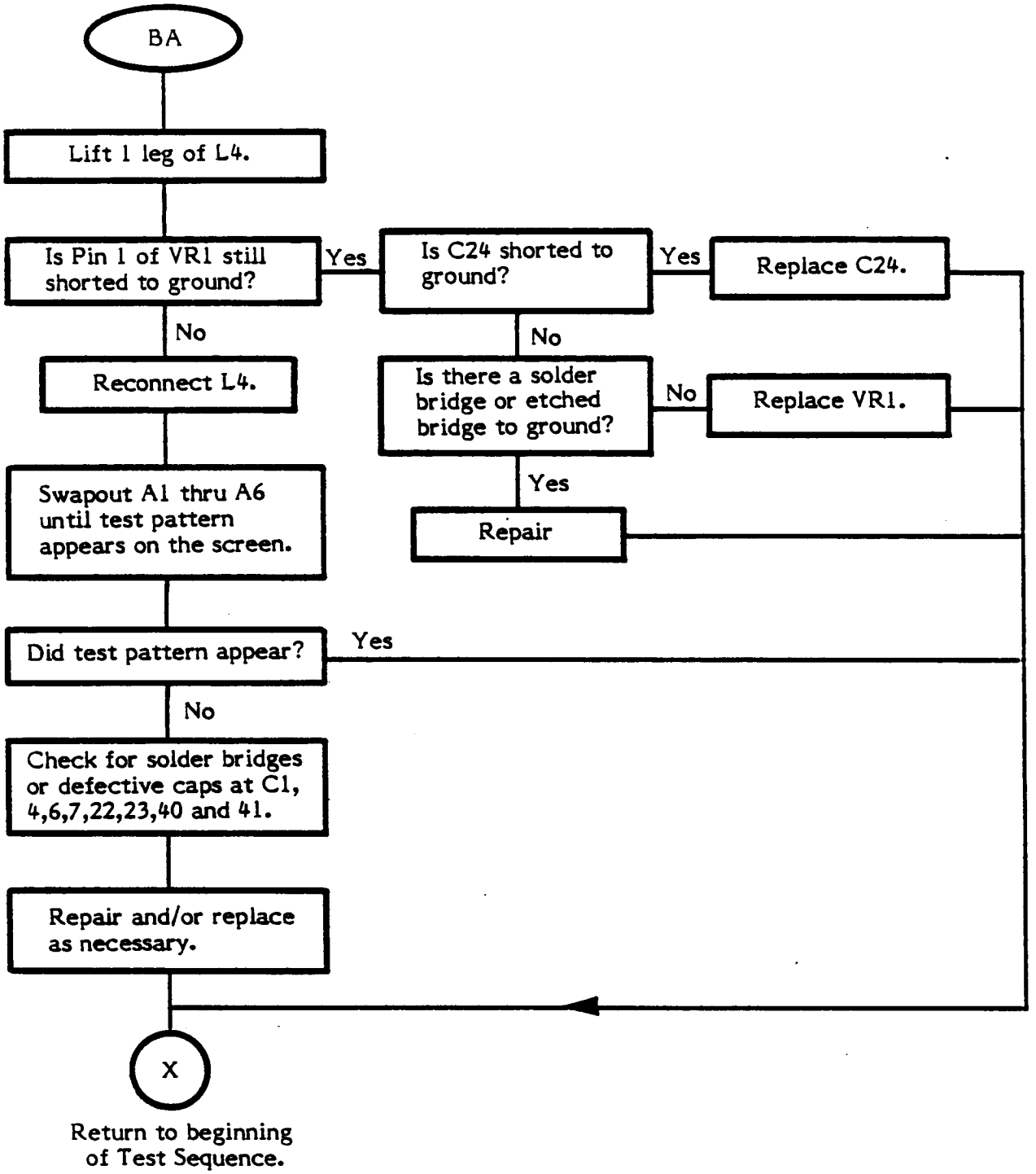


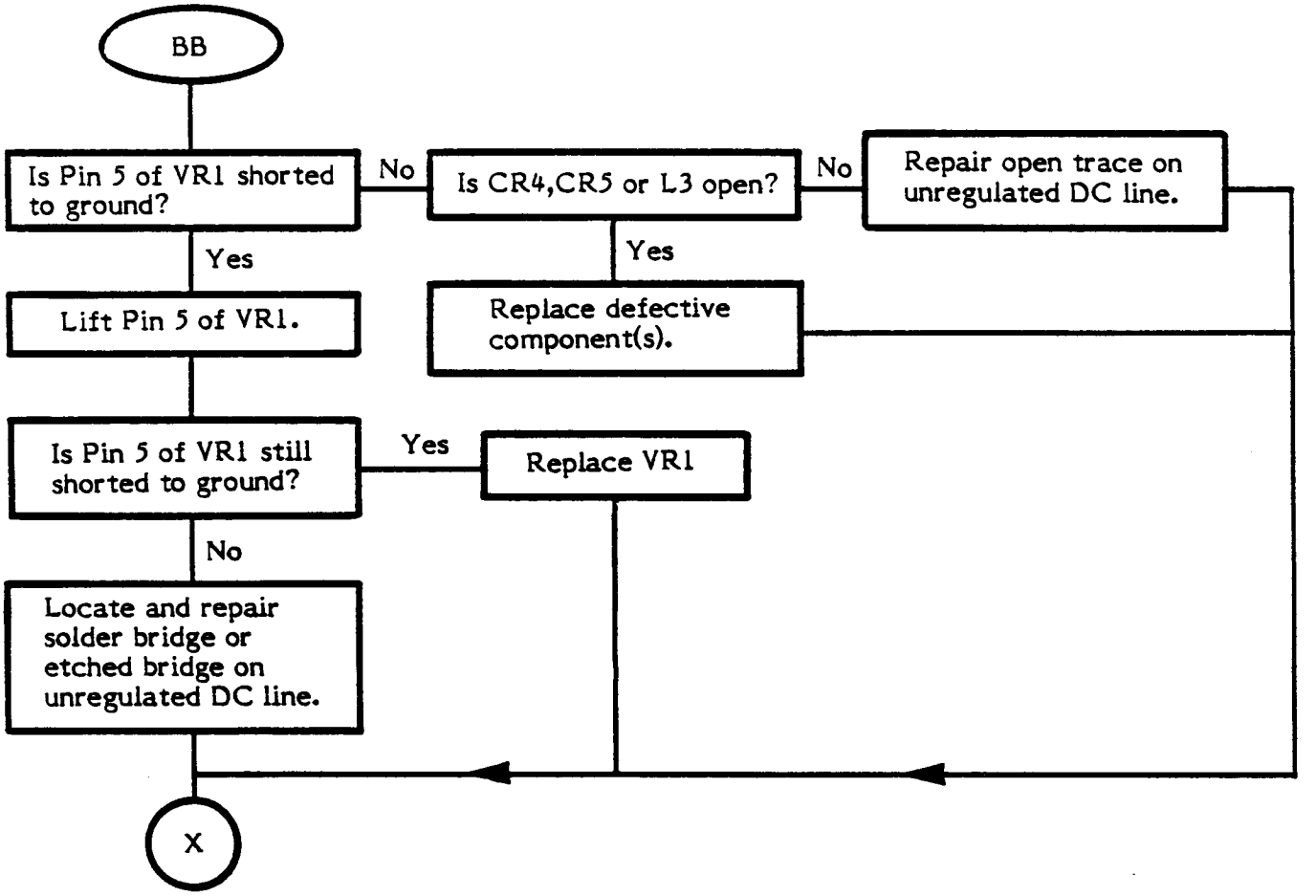
***If Part #C020144 is not available, see the instructions for installing the voltage regulator PCB Part #CA023008, Page 4-30.**

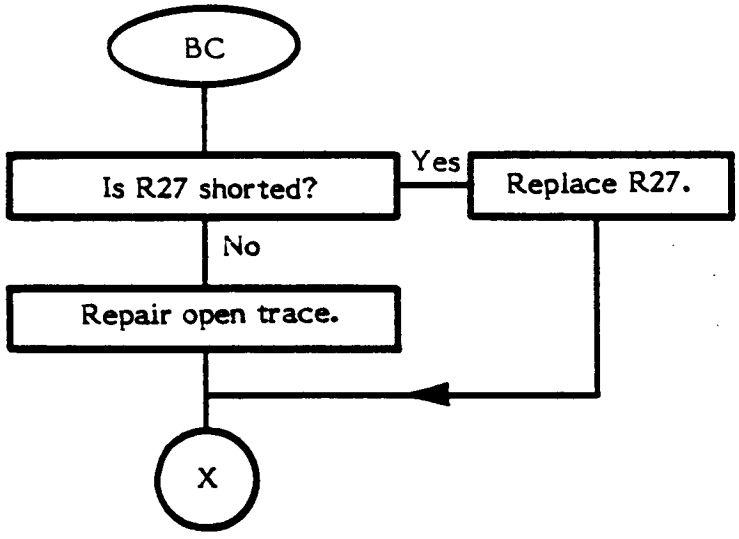

A1
Is there approx. 11-3V unregulated DC where the E2 wire connects with the L3 pad?
Yes
Check 5200 console.
No
Repair the short to gnd. on the unregulated DC line in (P1 pin 11 to E2).
X
Return to beginning of Test Sequence.

Blank Screen Troubleshooting

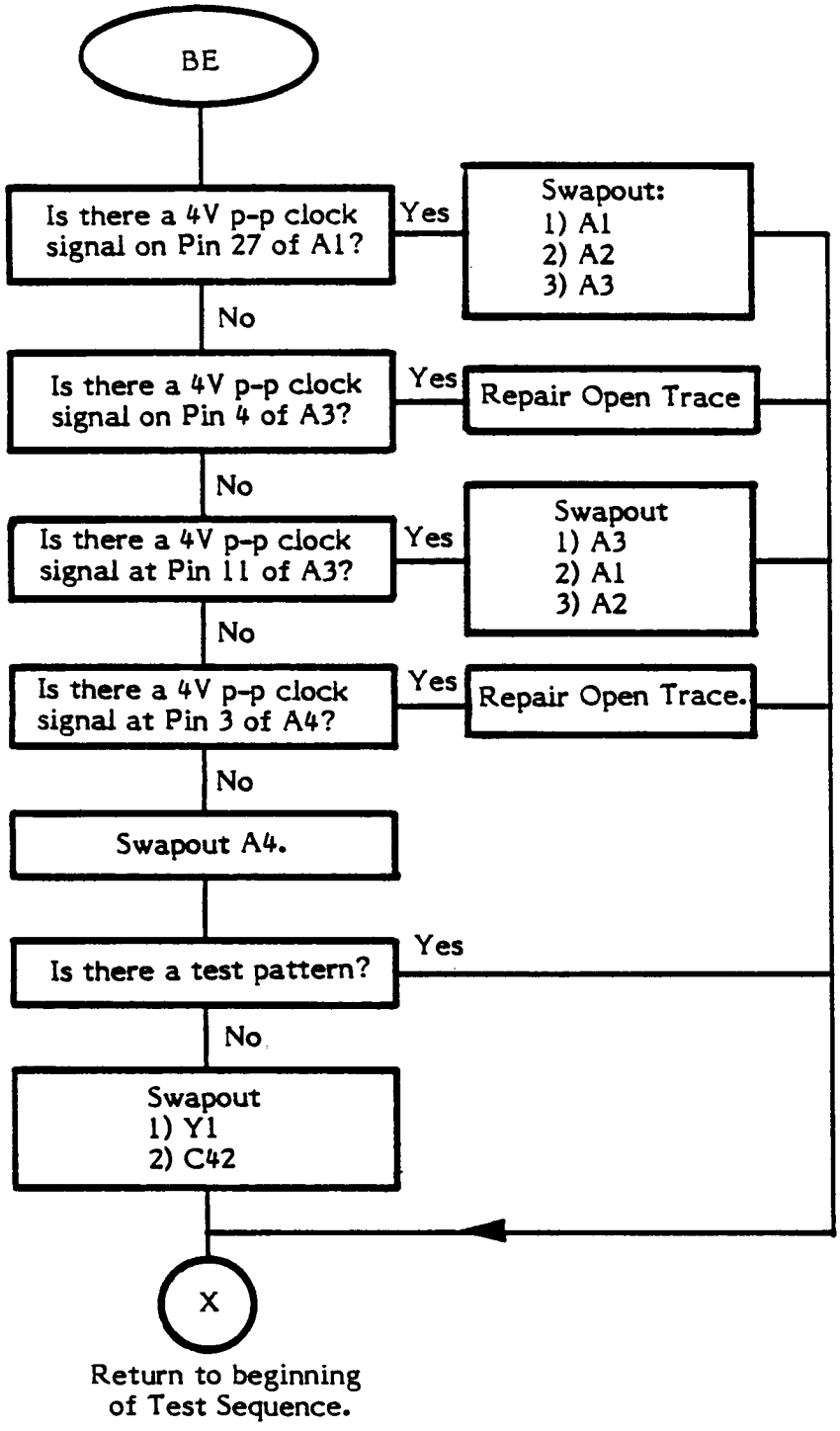



BA
Lift 1 leg of L4.
Is Pin 1 of VR1 still shorted to ground?
Yes
Is C24 shorted to ground?
Yes
Replace C24.
No
No
Reconnect L4.
Is there a solder bridge or etched bridge to ground?
No
Replace VR1.
Yes
Swapout A1 thru A6 until test pattern appears on the screen.
Repair
Did test pattern appear?
Yes
No
Check for solder bridges or defective caps at C1, 4,6,7,22,23,40 and 41.
Repair and/or replace as necessary.
X
Return to beginning of Test Sequence.

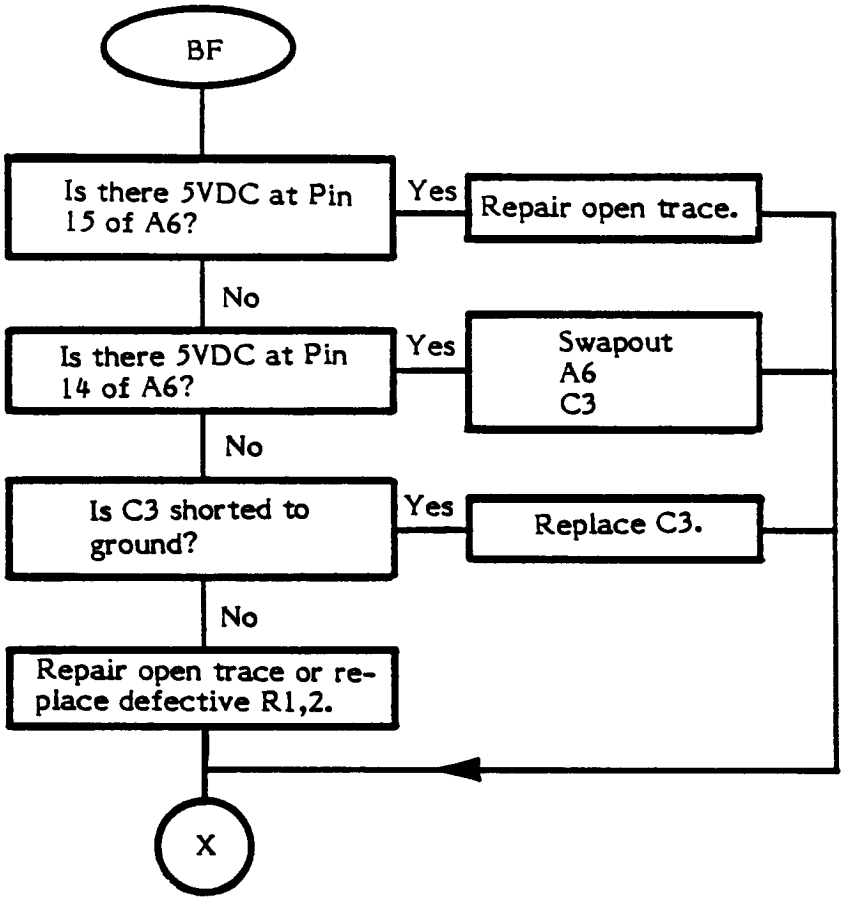

BB
Is Pin 5 of VR1 shorted to ground?
No
Is CR4,CR5 or L3 open?
No
Repair open trace on unregulated DC line.
Yes
Yes
Lift Pin 5 of VR1.
Replace defective component(s).
Is Pin 5 of VR1 still shorted to ground?
Yes
Replace VR1
No
Locate and repair solder bridge or etched bridge on unregulated DC line.
X
Return to beginning of Test Sequence.

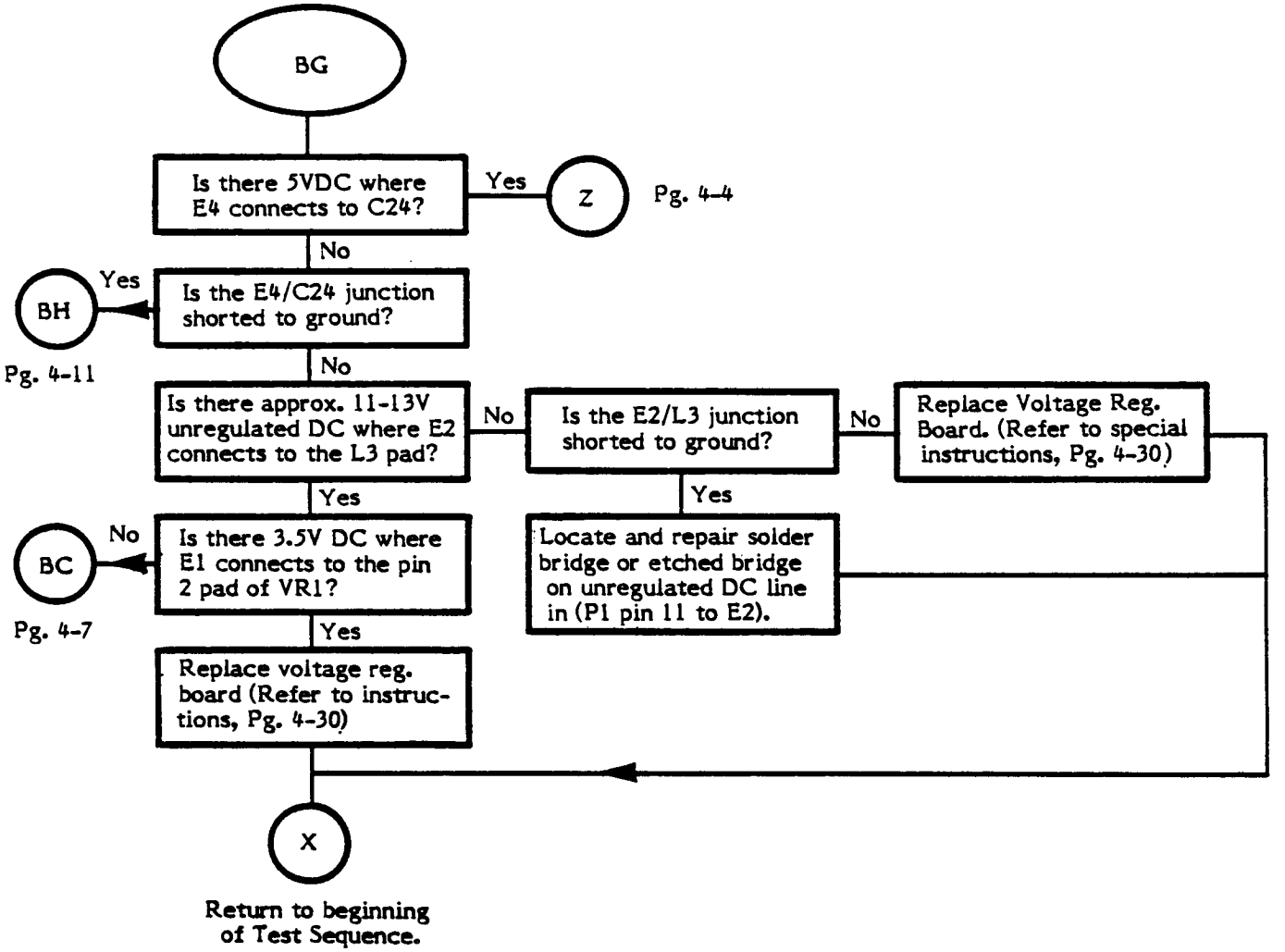


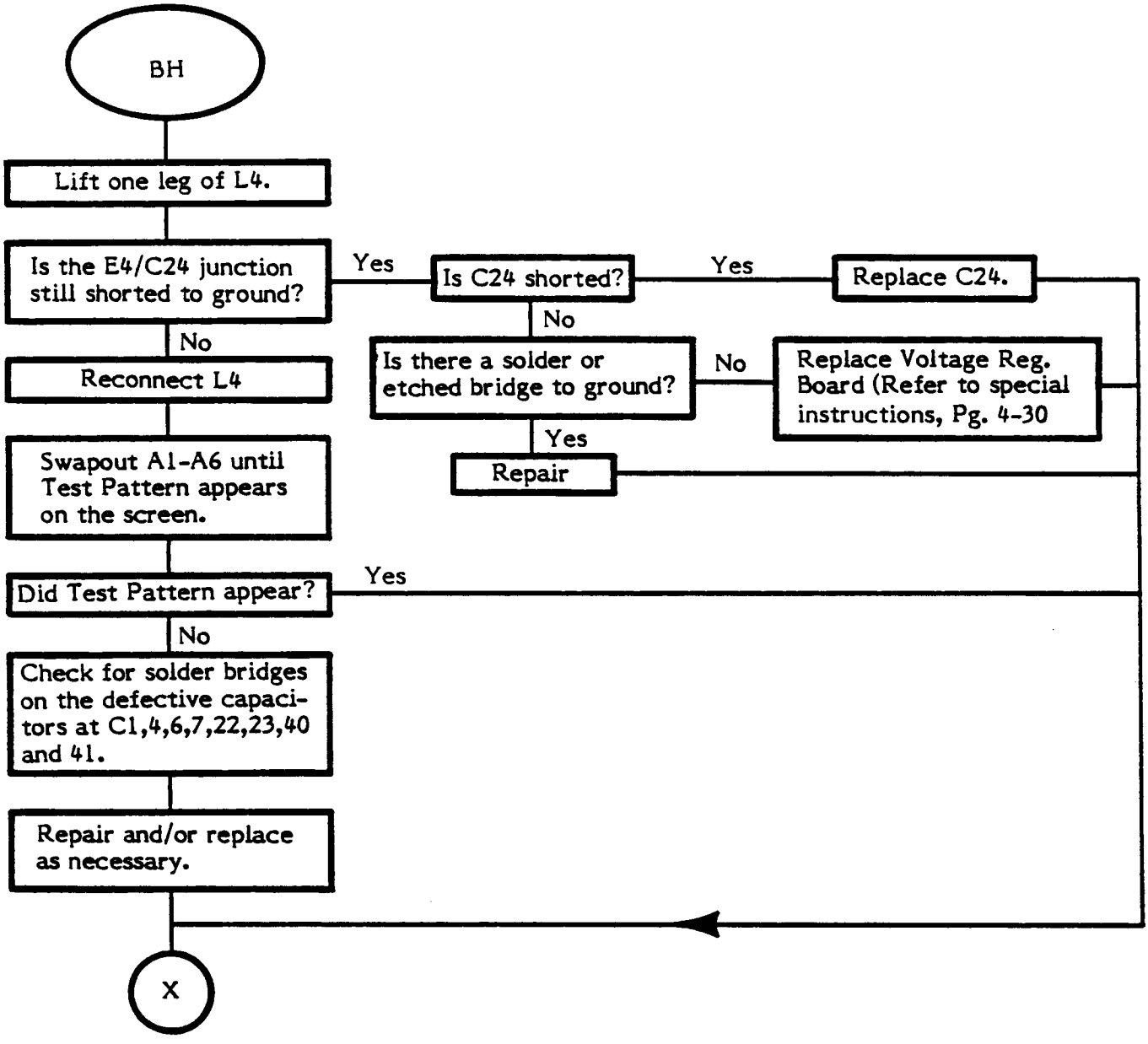
Return to beginning
of Test Sequence

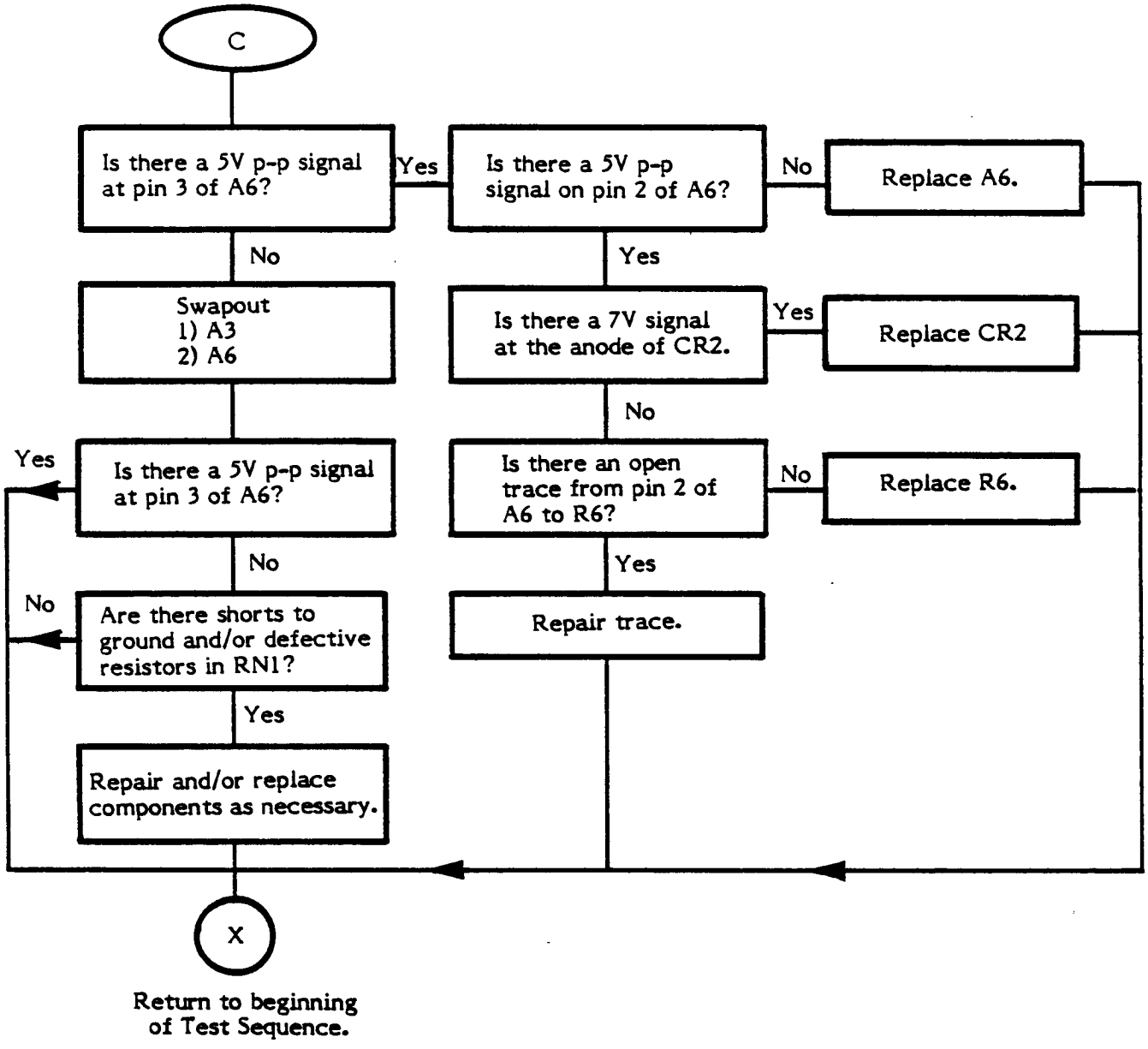


Return to beginning of Test Sequence.

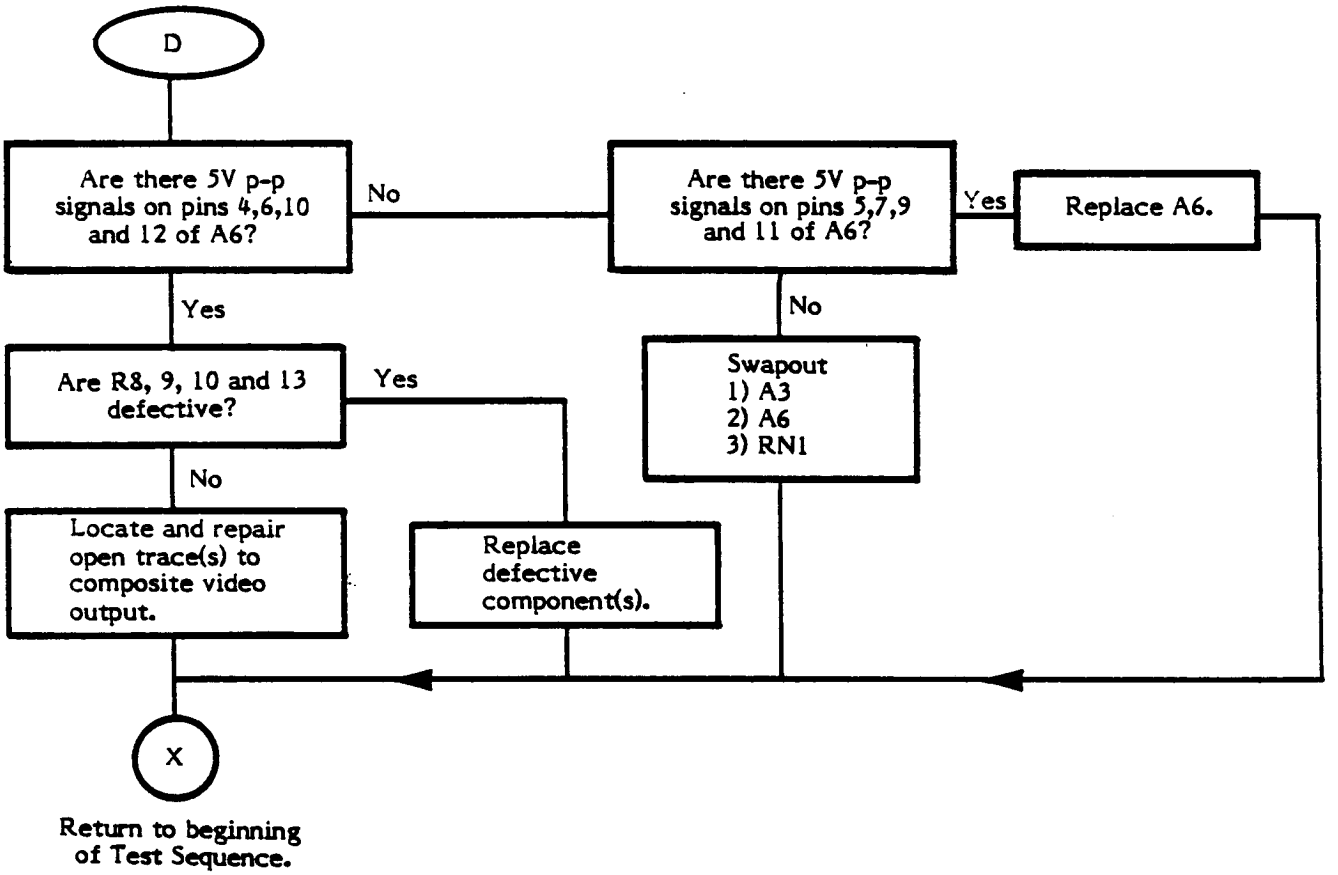

BF
Is there 5VDC at Pin 15 of A6?
Yes
Repair open trace.
No
Is there 5VDC at Pin 14 of A6?
Yes
Swapout A6 C3
No
Is C3 shorted to ground?
Yes
Replace C3.
No
Repair open trace or replace defective R1,2.
X
Return to beginning of Test Sequence.

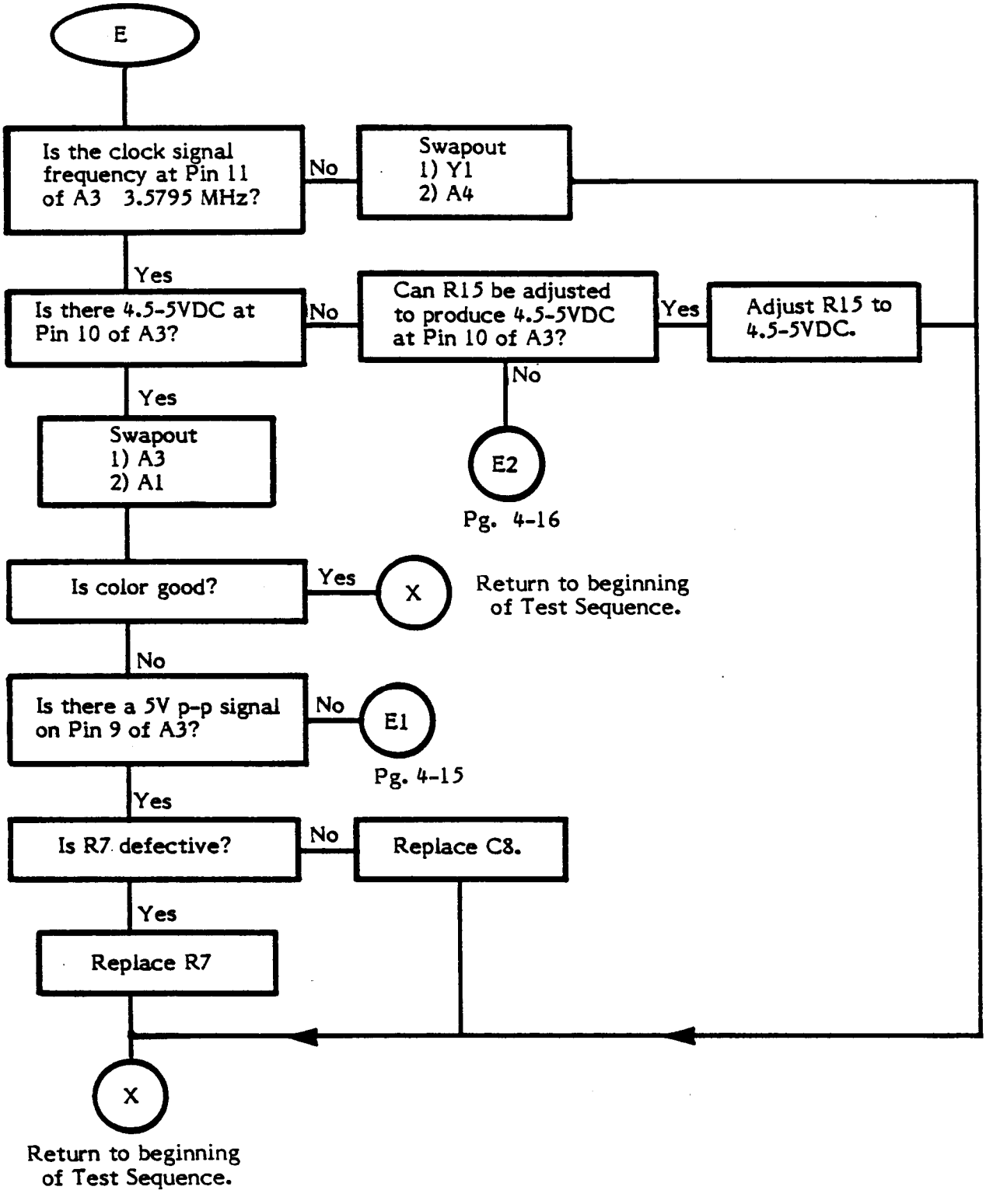

BG
Is there 5VDC where E4 connects to C24?
Yes
Z
Pg. 4-4
No
Yes
BH
Pg. 4-11
Is the E4/C24 junction shorted to ground?
No
Is there approx. 11-13V unregulated DC where E2 connects to the L3 pad?
No
Is the E2/L3 junction shorted to ground?
No
Replace Voltage Reg. Board. (Refer to special instructions, Pg. 4-30)
Yes
Yes
No
BC
Pg. 4-7
Is there 3.5V DC where E1 connects to the pin 2 pad of VR1?
Locate and repair solder bridge or etched bridge on unregulated DC line in (P1 pin 11 to E2).
Yes
Replace voltage reg. board (Refer to instructions, Pg. 4-30)
X
Return to beginning of Test Sequence.


BH
Lift one leg of L4.
Is the E4/C24 junction still shorted to ground?
Yes
Is C24 shorted?
Yes
Replace C24.
No
Reconnect L4
No
Is there a solder or etched bridge to ground?
No
Replace Voltage Reg. Board (Refer to special instructions, Pg. 4-30
Yes
Repair
Swapout A1-A6 until Test Pattern appears on the screen.
Did Test Pattern appear?
Yes
No
Check for solder bridges on the defective capacitors at C1,4,6,7,22,23,40 and 41.
Repair and/or replace as necessary.
X
Return to beginning of Test Sequence.

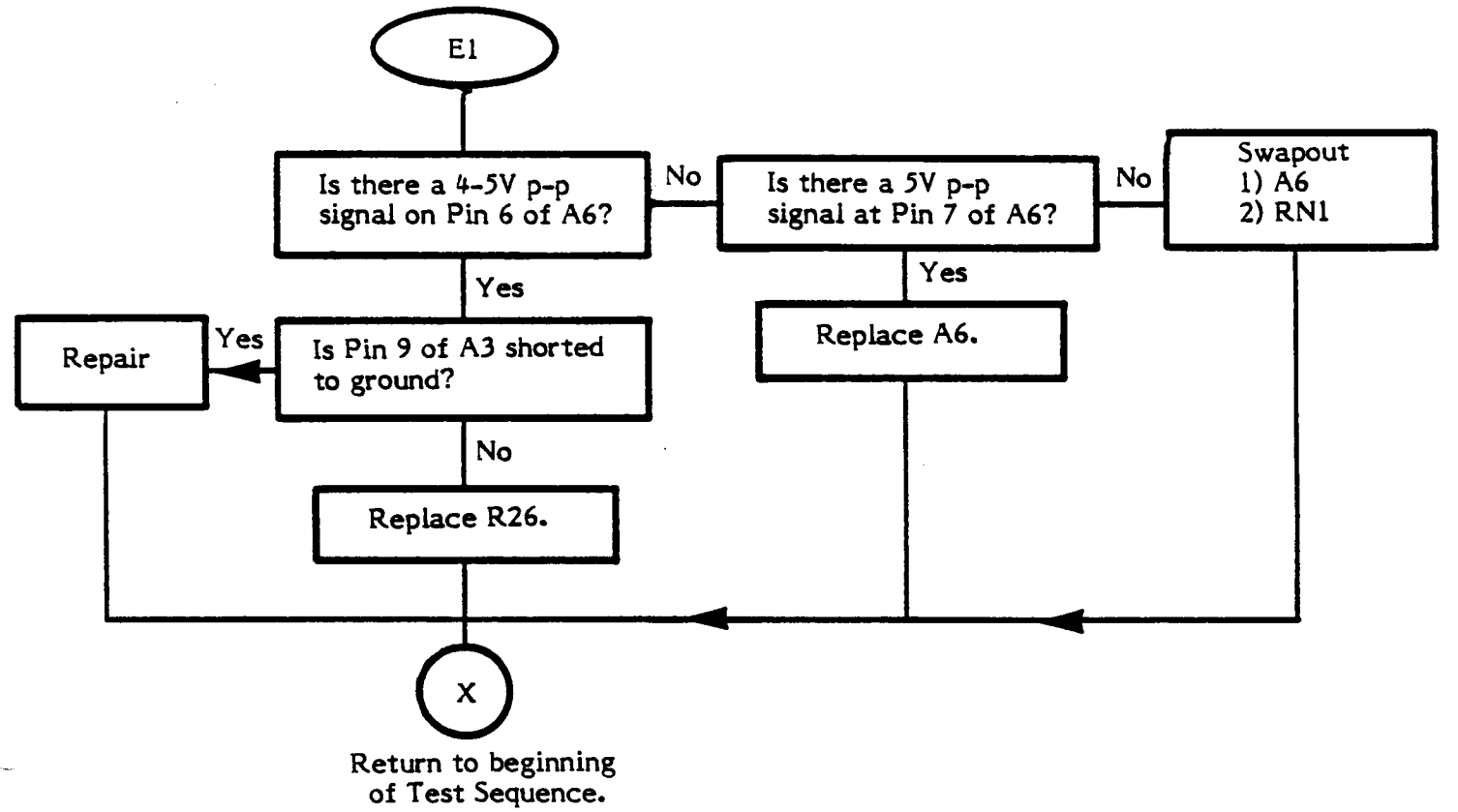

C
Is there a 5V p-p signal at pin 3 of A6?
Yes
Is there a 5V p-p signal on pin 2 of A6?
No
Replace A6.
No
Yes
Swapout
1) A3
2) A6
Is there a 7V signal at the anode of CR2.
Yes
Replace CR2
No
Yes
Is there a 5V p-p signal at pin 3 of A6?
Is there an open trace from pin 2 of A6 to R6?
No
Replace R6.
No
Yes
No
Are there shorts to ground and/or defective resistors in RN1?
Repair trace.
Yes
Repair and/or replace components as necessary.
X
Return to beginning of Test Sequence.

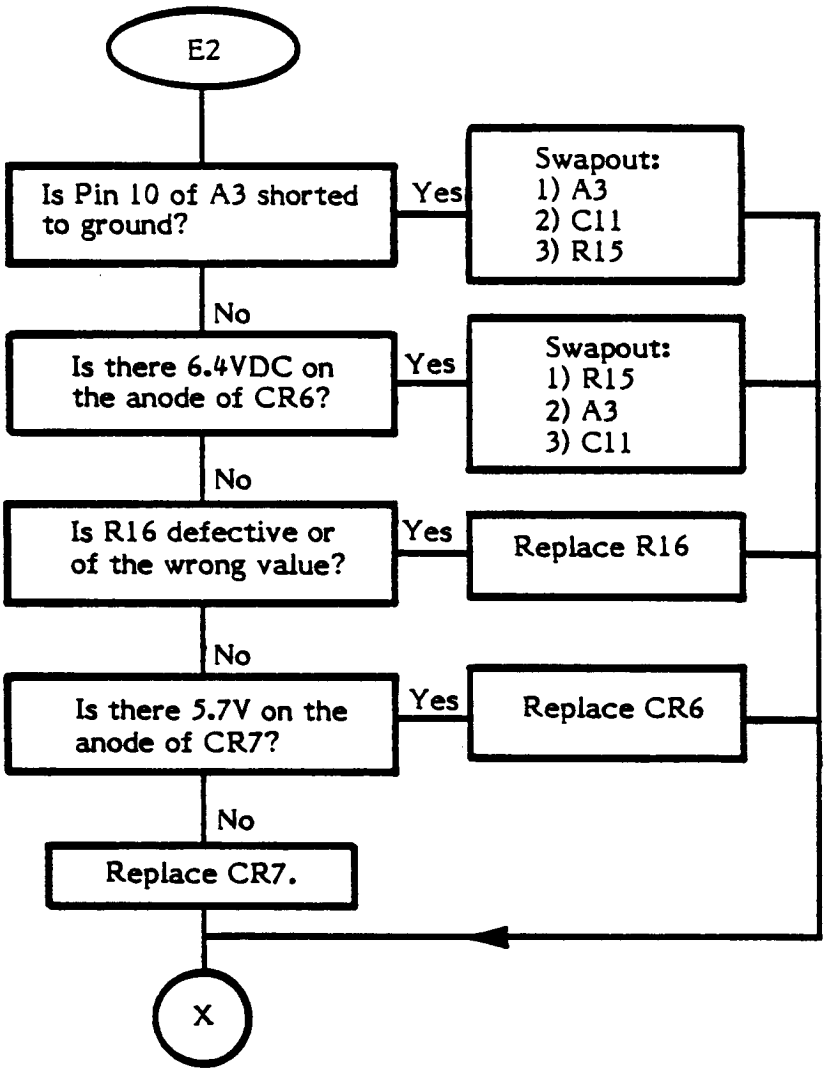
Weak Video Troubleshooting



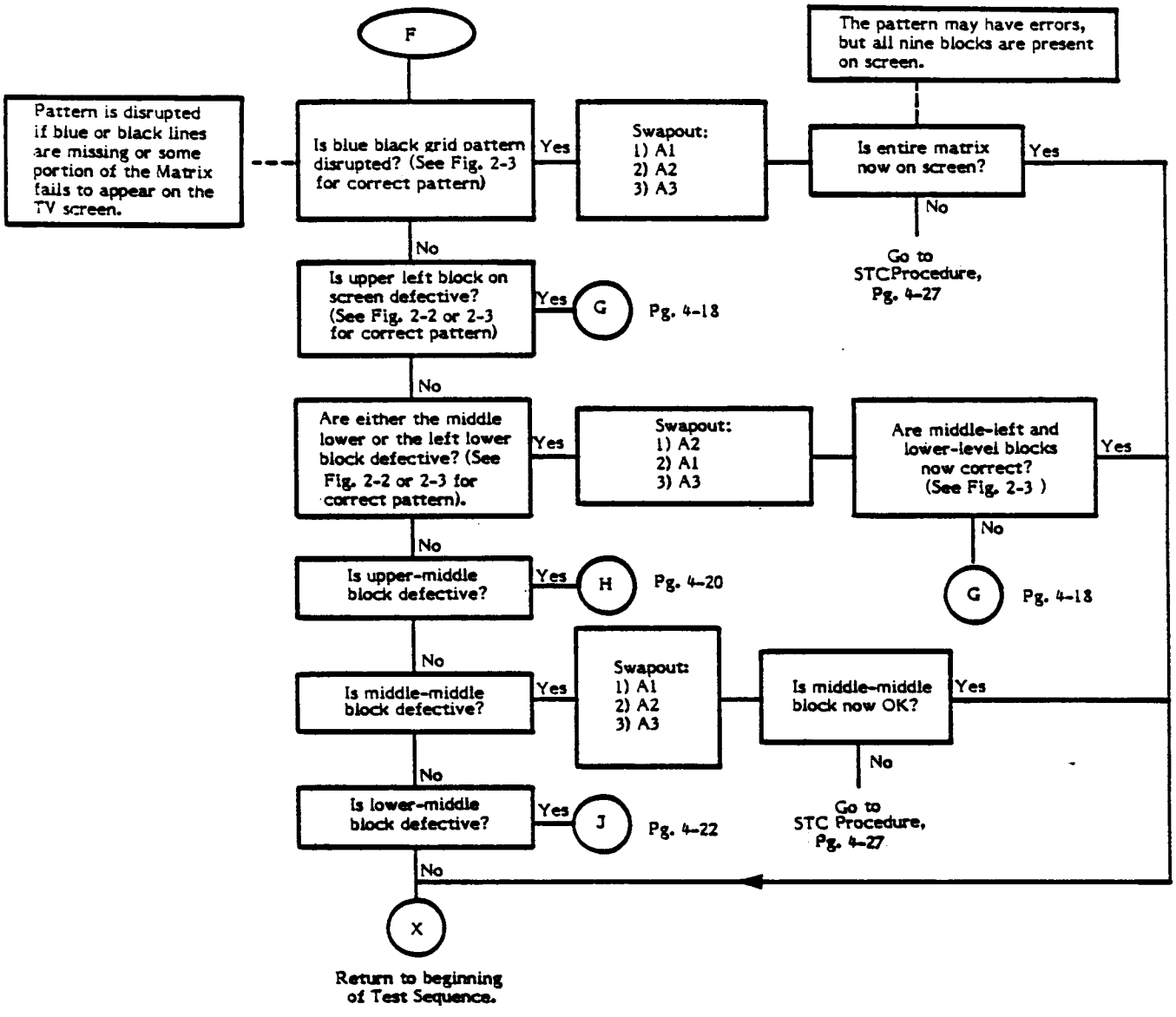

E
Is the clock signal frequency at Pin 11 of A3 3.5795 MHz?
No
Swapout
1) Y1
2) A4
Yes
Is there 4.5-5VDC at Pin 10 of A3?
No
Can R15 be adjusted to produce 4.5-5VDC at Pin 10 of A3?
Yes
Adjust R15 to 4.5-5VDC.
No
E2
Pg. 4-16
Yes
Swapout
1) A3
2) A1
Is color good?
Yes
X
Return to beginning of Test Sequence.
No
Is there a 5V p-p signal on Pin 9 of A3?
No
E1
Pg. 4-15
Yes
Is R7 defective?
No
Replace C8.
Yes
Replace R7
X
Return to beginning of Test Sequence.

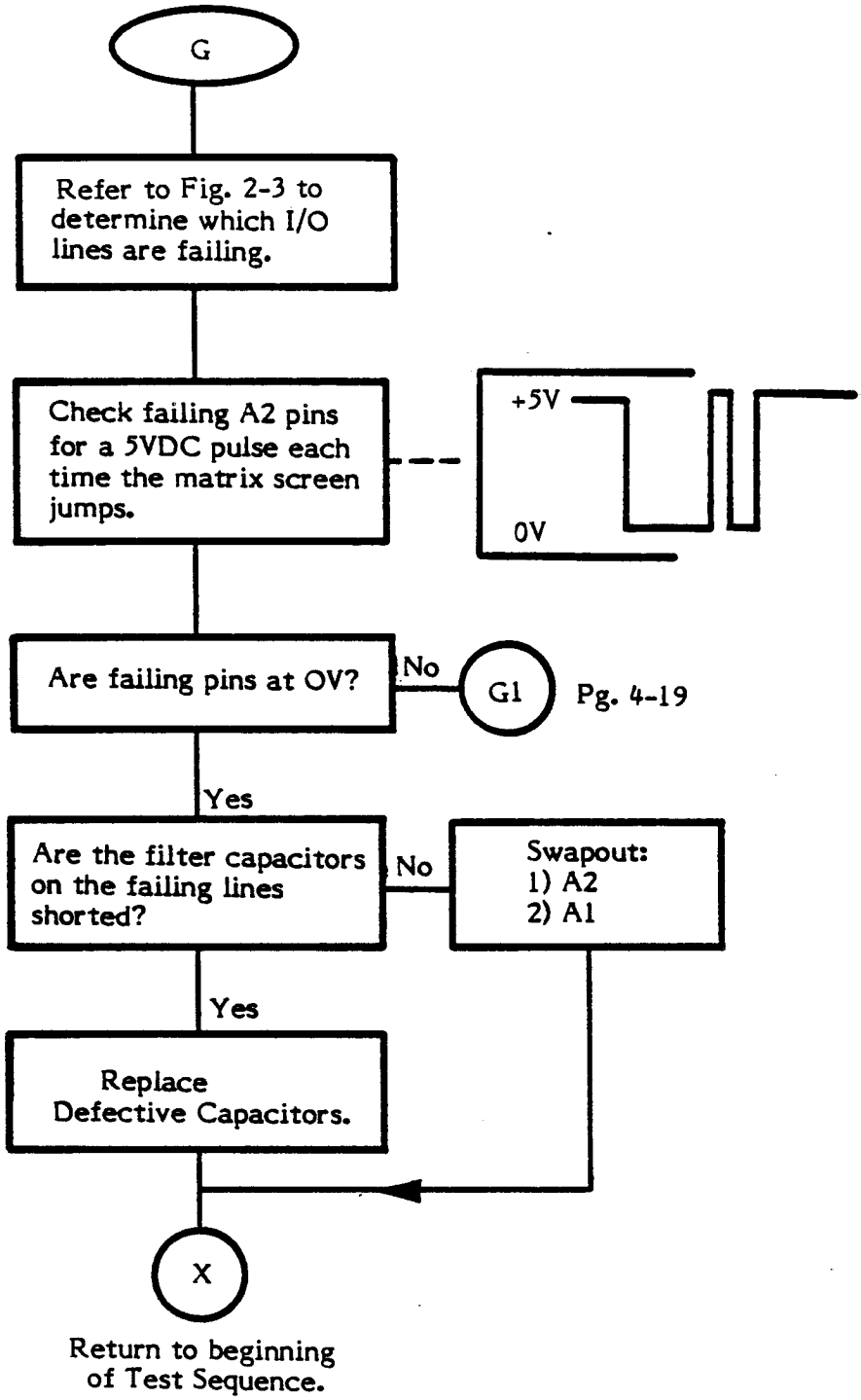
Bad Color Troubleshooting (Cont.)

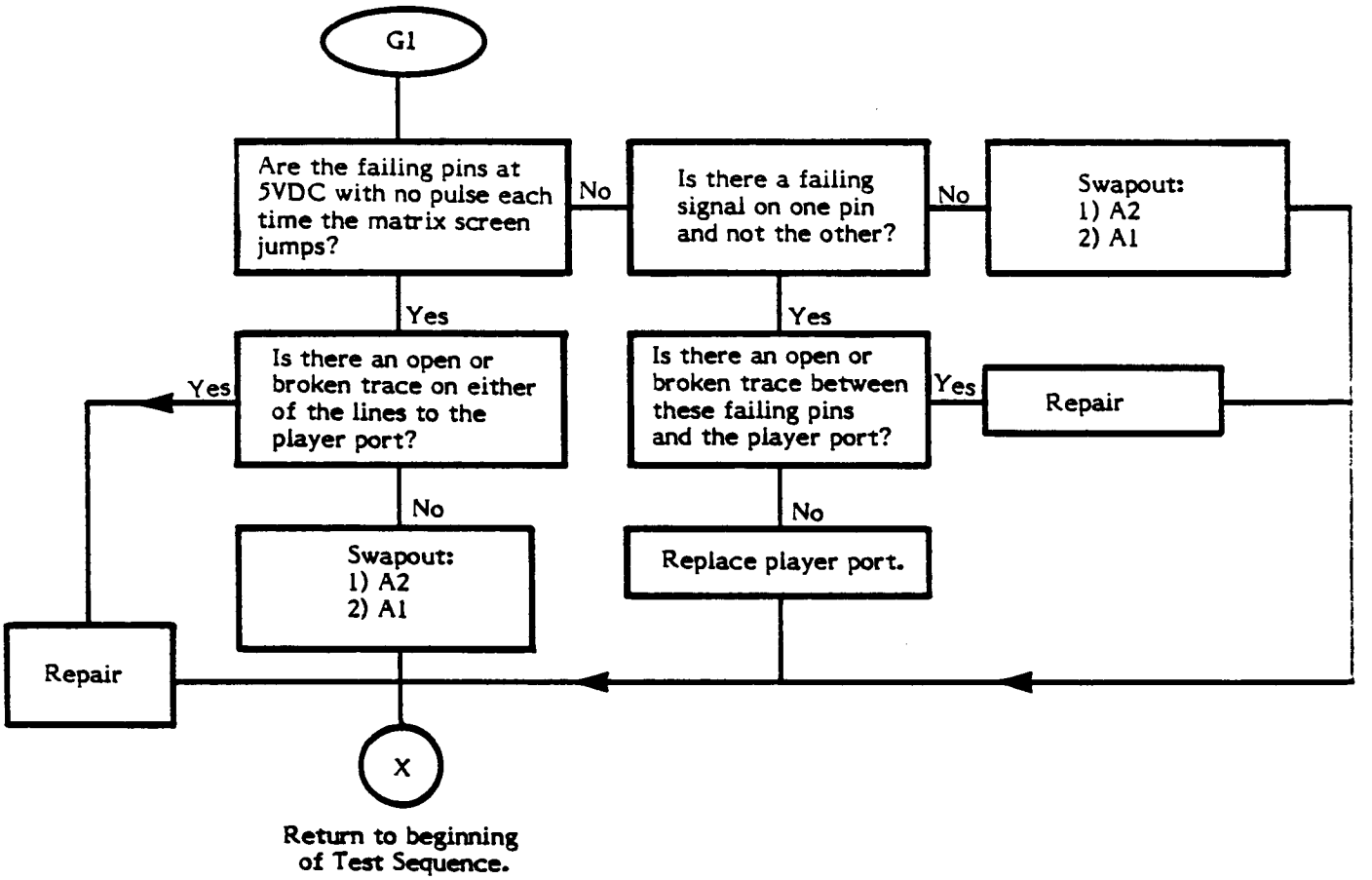



E2
Is Pin 10 of A3 shorted to ground?
Yes
Swapout:
1) A3
2) C11
3) R15
No
Is there 6.4VDC on the anode of CR6?
Yes
Swapout:
1) R15
2) A3
3) C11
No
Is R16 defective or of the wrong value?
Yes
Replace R16
No
Is there 5.7V on the anode of CR7?
Yes
Replace CR6
No
Replace CR7.
X
Return to beginning of Test Sequence.

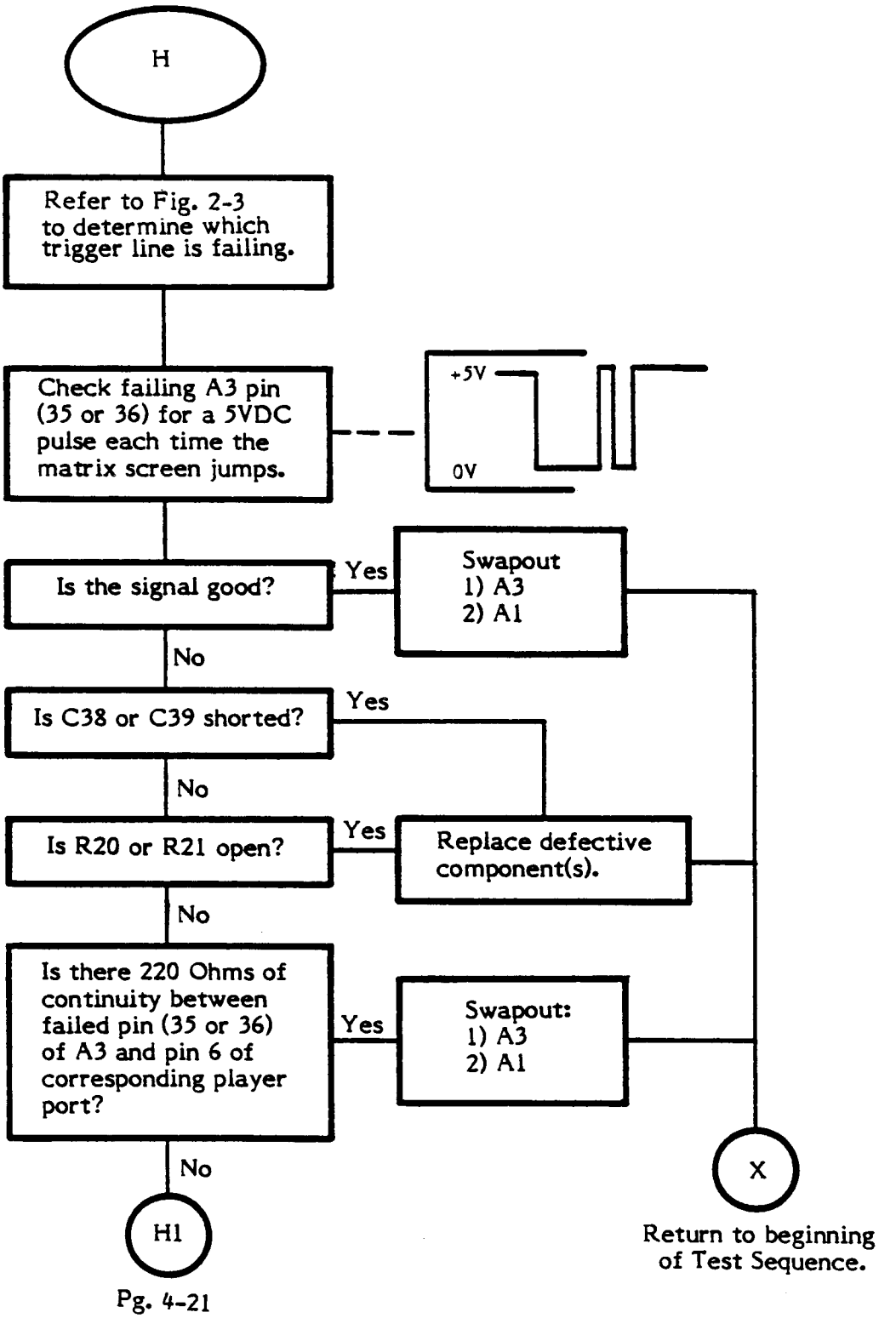
Defective Matrix Troubleshooting

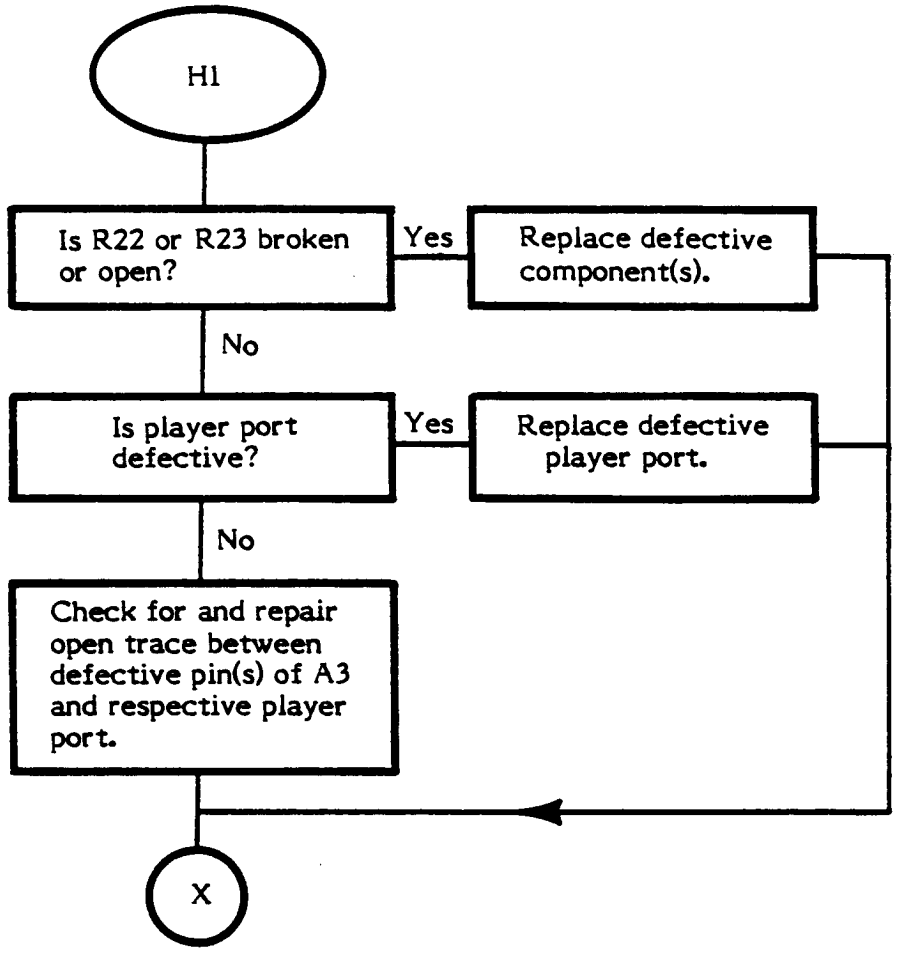



G
Refer to Fig. 2-3 to determine which I/O lines are failing.
Check failing A2 pins for a 5VDC pulse each time the matrix screen jumps.
+5V
0V
Are failing pins at OV?
No
G1
Pg. 4-19
Yes
Are the filter capacitors on the failing lines shorted?
No
Swapout:
1) A2
2) A1
Yes
Replace Defective Capacitors.
X
Return to beginning of Test Sequence.

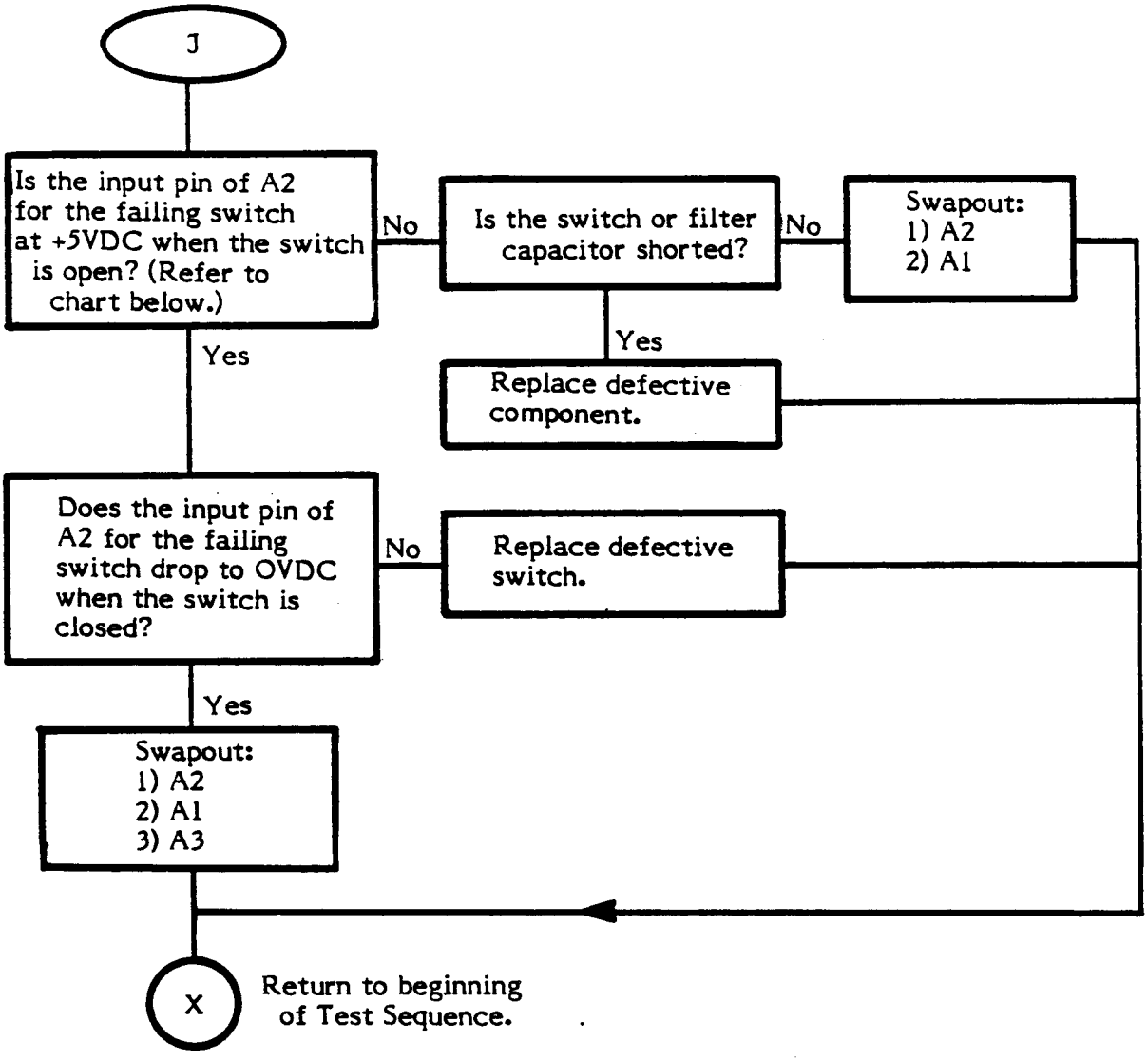

G1
Are the failing pins at 5VDC with no pulse each time the matrix screen jumps?
No
Is there a failing signal on one pin and not the other?
No
Swapout:
1) A2
2) A1
Yes
Yes
Is there an open or broken trace on either of the lines to the player port?
Yes
Is there an open or broken trace between these failing pins and the player port?
Yes
Repair
No
No
Swapout:
1) A2
2) A1
Replace player port.
Repair
X
Return to beginning of Test Sequence.

Trigger Line Troubleshooting



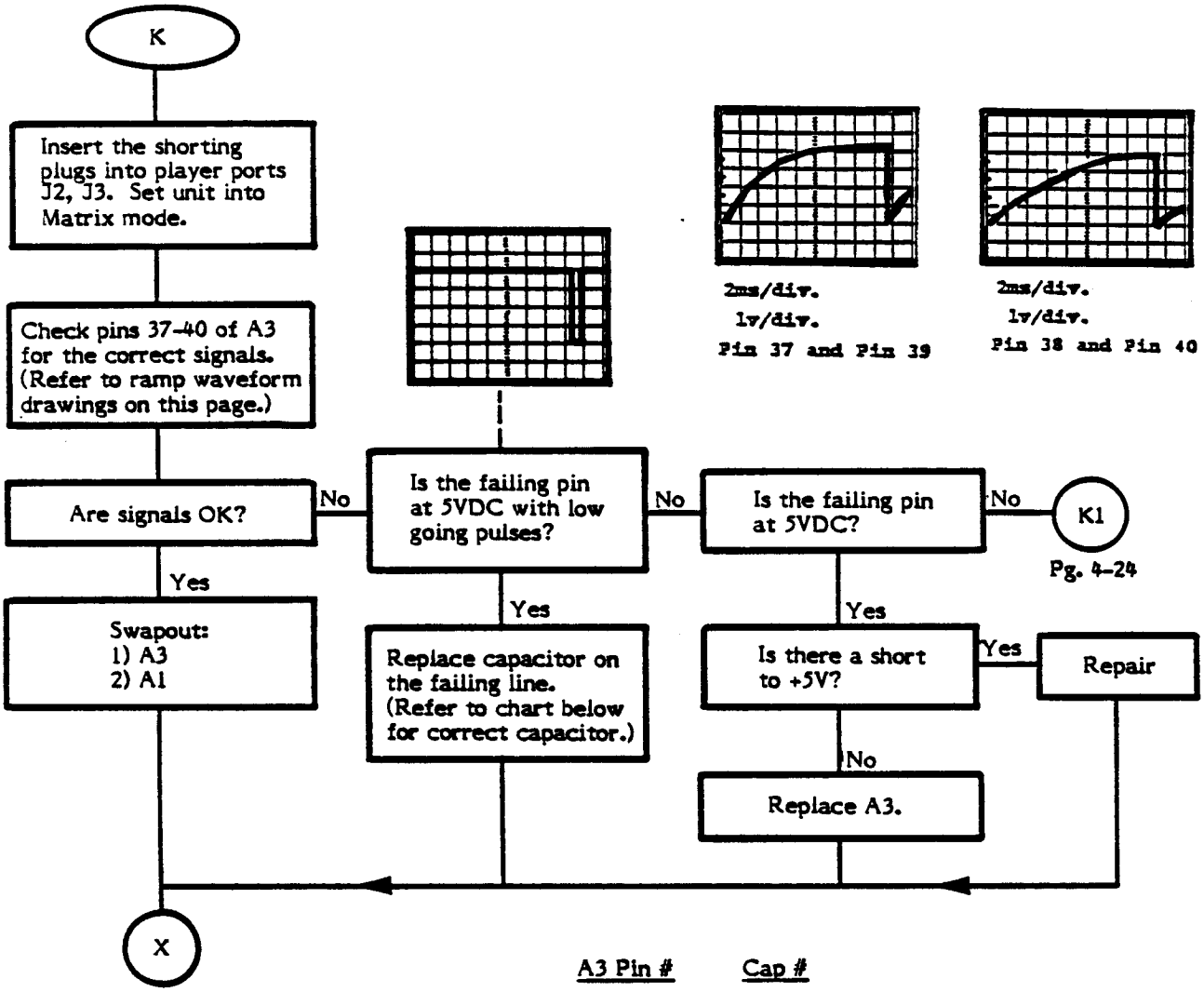

H1
Is R22 or R23 broken or open?
Yes
Replace defective component(s).
No
Is player port defective?
Yes
Replace defective player port.
No
Check for and repair open trace between defective pin(s) of A3 and respective player port.
X
Return to beginning of Test Sequence.

Defective Switch Troubleshooting



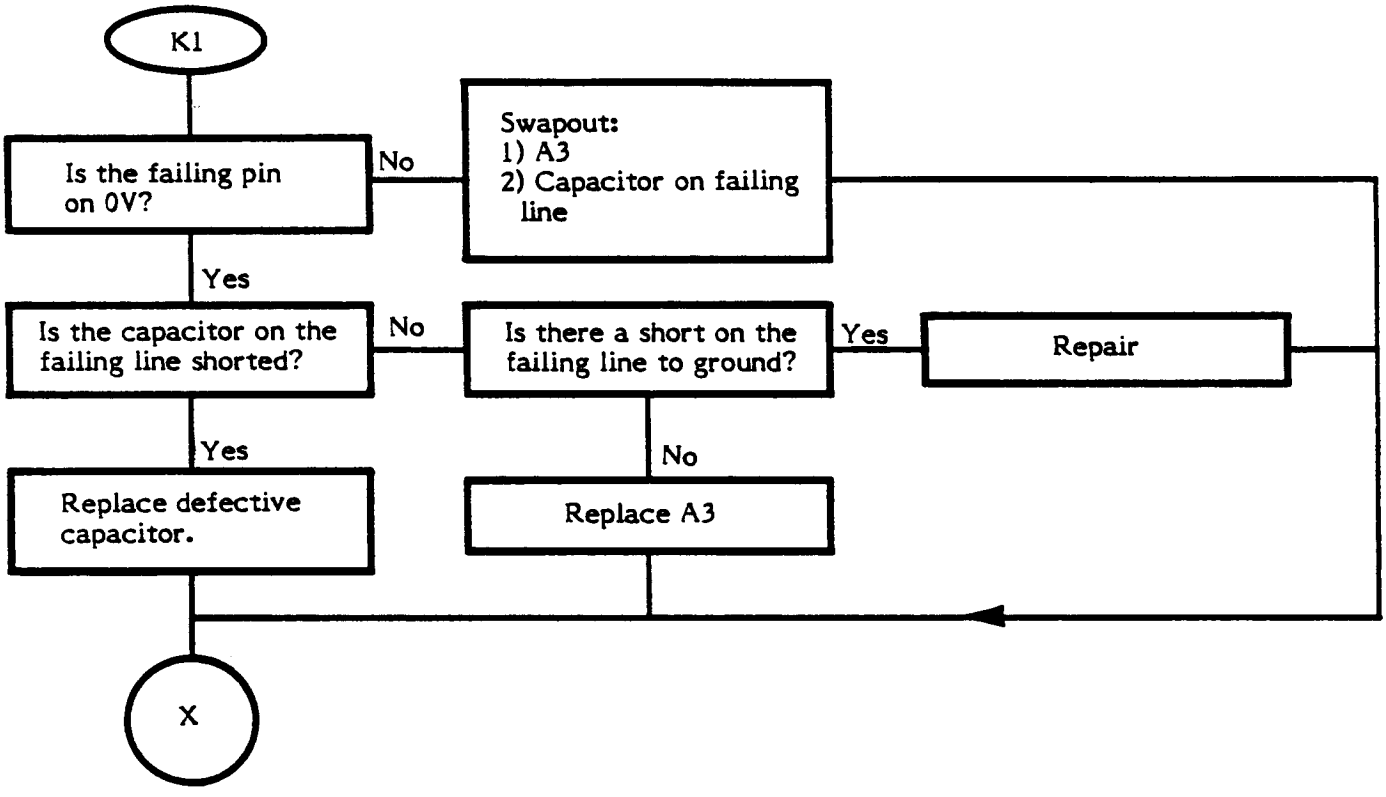
Switch		Input Pin A2	Filter Capacitor
Rt. Difficulty	S2	16	C26
Lt. Difficulty	S3	17	C27
SELECT	S4	23	C28
RESET	S5	24	C29

Defective Paddle Line Troubleshooting

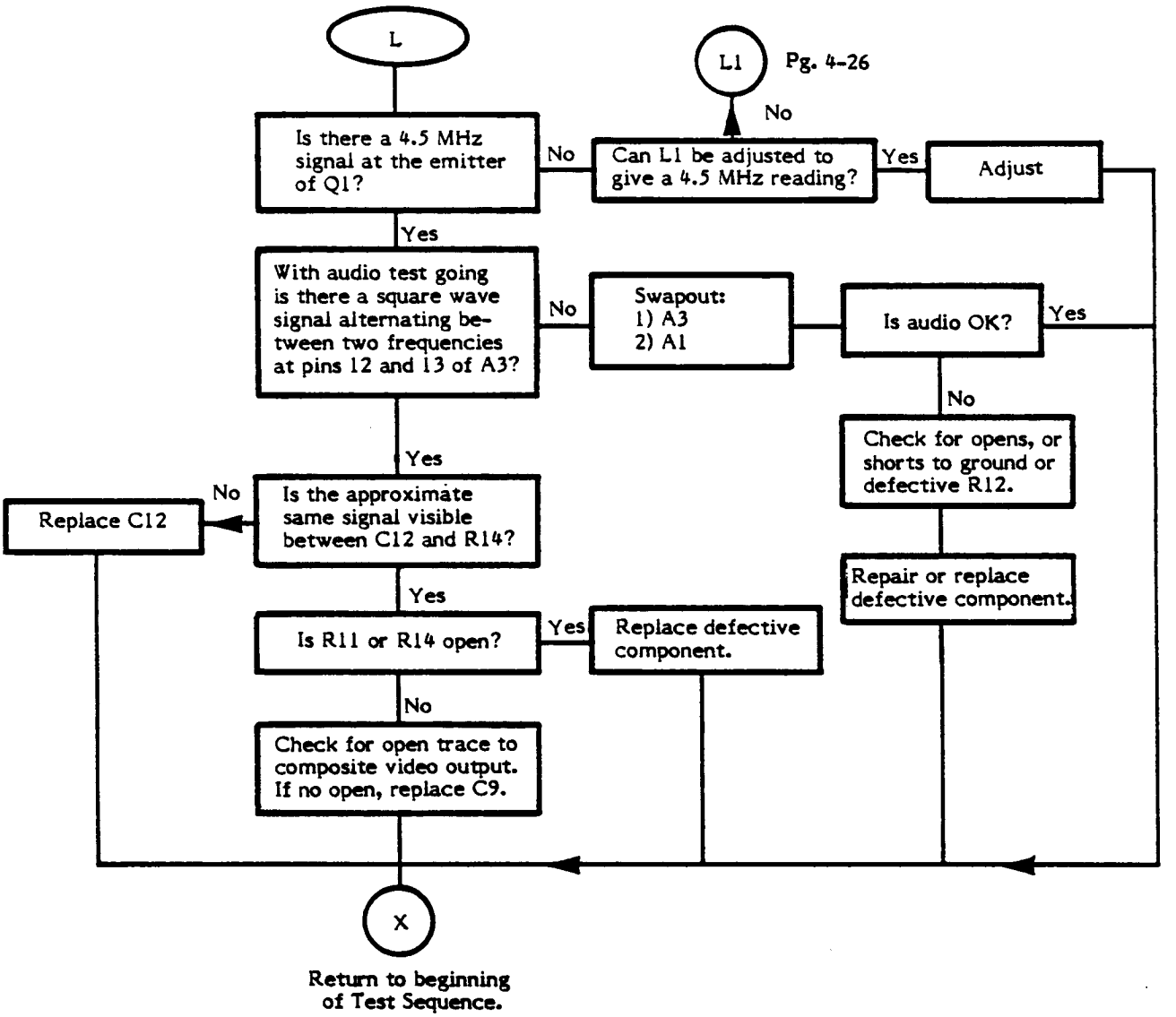


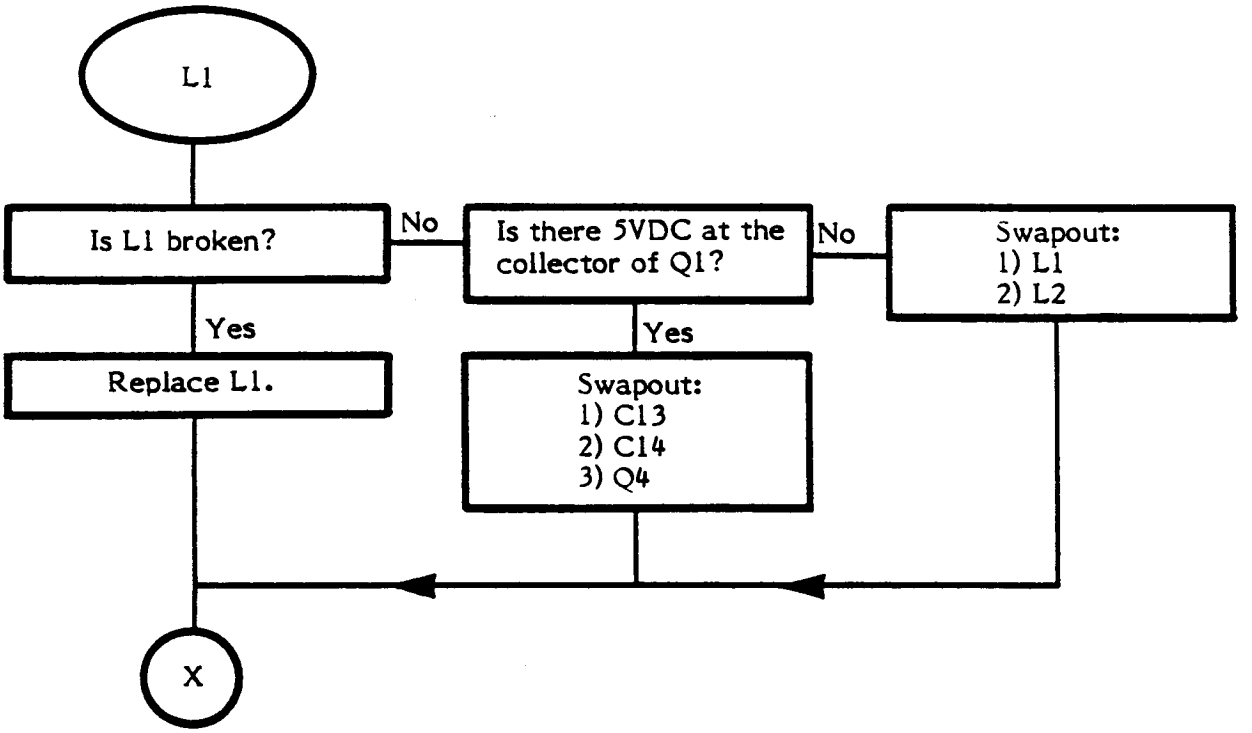
A3 Pin #	Cap #
37	20
38	19
39	18
40	17

Defective Paddle Line Troubleshooting (Cont.)



Return to beginning of Test Sequence.


L
L1
Pg. 4-26
No
Is there a 4.5 MHz signal at the emitter of Q1?
No
Can L1 be adjusted to give a 4.5 MHz reading?
Yes
Adjust
Yes
With audio test going is there a square wave signal alternating between two frequencies at pins 12 and 13 of A3?
No
Swapout:
1) A3
2) A1
Is audio OK?
Yes
No
Check for opens, or shorts to ground or defective R12.
Repair or replace defective component.
Yes
Is the approximate same signal visible between C12 and R14?
No
Replace C12
Yes
Is R11 or R14 open?
Yes
Replace defective component.
No
Check for open trace to composite video output. If no open, replace C9.
X
Return to beginning of Test Sequence.


L1
Is L1 broken?
No
Is there 5VDC at the collector of Q1?
No
Swapout:
1) L1
2) L2
Yes
Yes
Replace L1.
Swapout:
1) C13
2) C14
3) Q4
X
Return to beginning of Test Sequence.

SIGNAL TRACING CARTRIDGE (KLUGE) PROCEDURE

The Signal Tracing Cartridge (STC) is used to locate easily open or shorted traces in the address and data lines of the CX55. The STC causes the 6507 microprocessor (A1) to cycle through the entire memory space while executing "no operation" instructions. This is valuable because it puts a known signal on each address and data line. Then the signal can be traced through to the J1 connector, the TIA and RAM-I/O chips.

Since the STC procedure is not easily reduced to a flowchart, it is presented as a series of written instructions and illustrations on the following pages.

CAUTION: The STC procedure requires three known-good chips and a working clock circuit. The STC should only be used after all other procedures have been tried.

GETTING STARTED

Insert the STC into the CX55. Turn on the unit. The television screen should be gray or black. If it is "snowy" it indicates that you should return to the start of the Diagnostic Flowchart. Set the scope sweep to 2 milisec./division and set the vertical to 1 volt/division.

ADDRESS LINES AB$\emptyset$- AB12

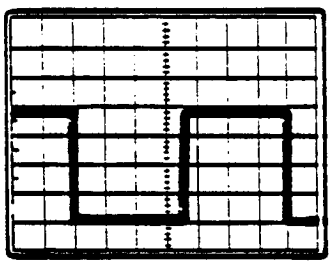
Check the address lines at the microprocessor (A1). Check address lines, starting with pin 5. A signal with a waveform similar to those shown in Figure 4-1 should be seen on the address lines, with each succeeding address line's waveform having a frequency half that of the line before it. For example, A1 should be half the frequency of A$\emptyset$. If one or more of the address lines shows no signal, it is likely that the line is either open or shorted to ground or +5v. Check all traces and pins for shorts.

If all address lines have signals, trace those signals to the J1 and the other chips. Table 4-1 illustrates which address lines connect to which pins on J1, 6532, and the TIA. The signal present on each address line of the microprocessor should also be present on each pin of J1, 6532, and the TIA connected to that line. If the same signal is not found, the trace line and/or solder joints between the microprocessor and the dead pin(s) is (are) broken. Check the trace lines carefully to locate the break.

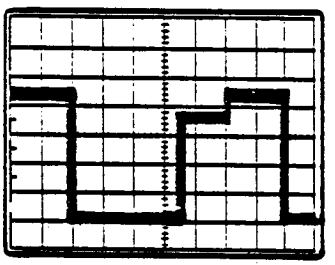
DATA LINES DB$\emptyset$-7

The data lines are tested very much like the address lines. The only difference is that the waveform seen on the data lines is different. The signals you should see are illustrated in Figure 4-2. If any data lines are completely inactive (simply remaining a constant voltage), it probably means that the line is either open or shorted to ground or +5v. Check the traces and pins for shorts. If none are found, one of the three chips or the STC itself probably has an internal short. Try swapping out the 6532, TIA, and the microprocessor. Also carefully check J1 for shorts between pins.

If all data lines have signals, trace those signals to J1 and the other chips. Table 4-1 illustrates which lines connect to which pins of J1, 6532 and the TIA. The signal present on each data line of the microprocessor should also be present on each pin of J1, 6532 and the TIA connected to that line. If the same signal is not found, the trace line and/or solder joints between the microprocessor and the dead pin(s) is(are) broken. Check the trace lines carefully to locate the break.

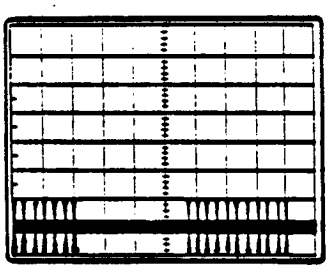


Address lines Φ, 7-12
1v/division

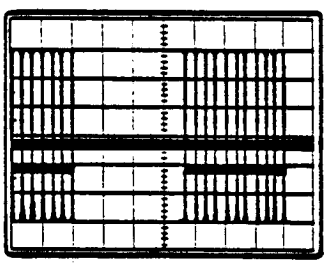


Address Lines 1-6
1v/division

Figure 4-1. STC Address Line Waveforms



Data Lines 0,2, and 4
2v/division
2ms./division



Data Lines 1,3,5-7
2v/division
2ms./division

Figure 4-2. STC Data Line Waveforms

TABLE 4-1

Connected Pins on CX55

ADDRESS LINES	A1 (MPU)	A3 (TIA)	A2 (RAM)	J1 Connector
AB0	5	32	7	8
AB1	6	31	6	7
AB2	7	30	5	6
AB3	8	29	4	5
AB4	9	28	3	4
AB5	10	27	2	3
AB6	11	—	40	2
AB7	12	21 (CS3)	38 (CS1)	1
AB8	13	—	—	22
AB9	14	—	36 (RS)	21
AB10	15	—	—	19
AB11	16	—	—	20
AB12	17	24 (CS0)	37 (CS0)	18
DATA LINES:				
DB0	25	14	33	9
DB1	24	15	32	10
DB2	23	16	31	11
DB3	22	17	30	13
DB4	21	18	29	14
DB5	20	19	28	15
DB6	19	33	27	16
DB7	18	34	26	17

— Indicates no connection on that line

INSTALLATION OF VOLTAGE REGULATOR PCB PART #CA023008

1) Remove VR1 Part #C020144.
2) Remove Heatsink Part #C021748.
3) Remove L3, C25, CR5, R27.
4) Install a jumper in place of CR5 (22 GA. Hookup wire).
5) Install the voltage regulator PCB/Heatsink assembly.
6) Refer to Silkscreen,Detail B,for proper connection of wires E1-E4.

REPLACING VOLTAGE RGULATOR PCB PART #CA023008 WITH VOLTAGE REGULATOR (VR1) PART #C020144

1) Disconnect wires E1-E4.
2) Remove Voltage Regulator PCB only. Leave Heatsink installed.
3) Remove wire jumper at CR5 location.
4) Install voltage regulator (VR1).
5) Install L3, C25, CR5, R27.

SECTION 5

SYMPTOM CHECKLIST

SYMPTOM	POSSIBLE CAUSES	FLOWCHART ENTRY POINT
Blank Screen	VR1,A1-4,A6,Y1	B, Page 4-4
Snowy Screen	VR1,C25, short to gnd on unreg. DC in.	A, Page 4-2
Warped/Ragged Screen	A3, A6, CR2	C, Page 4-12
Large X on the screen - RAM failure	A2, C21, R24	No Flowchart Entry Point
Weak Video	A3, A6, RN1	D, Page 4-13
Bad Color	Y1, A1, A3, A4	E, Page 4-14
Defective Matrix	A1-3	F, Page 4-17
Defective I/O lines (Joystick failure or Paddle trigger failure)	A1, A2, C30-C37	G, Page 4-18
Trigger failure (Joystick firebutton)	A1, A3, C38, C39	H, Page 4-20
Defective Switch	S2-S5, A2, C26-C29	J, Page 4-22
Paddle Failures	A1, A3, C17-C20	K, Page 4-23
Audio Failures	A1, A3, Q1, C13, C14, C12	L, Page 4-25

SECTION 6

SILKSCREENS AND SCHEMATICS

Attached to the front cover are representative silkscreens and schematics for the CX55. Remove them and place them in this section. Minor variations in design may be encountered depending on the production date of the unit, but these schematics provide all details required for an in-depth understanding of all CX55 units.

SECTION 7

PARTS LIST

ITEM	LOCATOR	DESCRIPTION	PART NUMBER
1		CX55 Cartridge Adaptor Final Assy	CA020971-01
2		Top Housing P S A	C020972
3		Bottom Housing PSA	C020973
4		Final PCB Assy	CA021948
5	A1	IC, CPU 6507	C010745
6	A2	IC, RIOT 6532	C010750
7	A3	IC, Custom (TIA)	C010444
8	A4	IC, VCM	C019248
9	A6	IC, CMOS 4050B	C010816
10		Cartridge Socket	C020974
11		RF Shield, Top	C020975
12		RF Shield, Bottom	C020976
13	S2,S3	Switch Slide, SPDT Right Angle	C019702-XX
14	S4,S5	Switch Slide, Spring Return	C010388-01
15		Static Strip	C017297
16	R1	Res. Car. 1/4W, 470K Ohm	14-5474
17	R2	Res. Car. 1/4W. 100K Ohm	14-5104
18	R3	Res. Car. 1/4W, 1M Ohm	14-5105
19	R4, R27	Res. Car. 1/4W, 4.7K Ohm	14-5472
20	R5,R12,R26	Res. Car. 1/4W, 1K Ohm	14-5102
21	R6,R8,R20,R21	Res. Car. 1/4W, 10K Ohm	14-5103
22	R7	Res. Car. 1/4W, 7.5K Ohm	14-5752
23	R9	Res. Car. 1/4W, 20K Ohm	14-5203
24	R10	Res. Car. 1/4W, 39K Ohm	14-5393
25	R11	Res. Car. 1/4W, 510 Ohm	14-5511
26	R13	Res. Car. 1/4W, 820 Ohm	14-5821
27	R14	Res. Car. 1/4W, 18K Ohm	14-5183
28	R15	Potentiometer 500K Ohm	19-411504
29	R16,R25	Res. Car. 1/4W, 1.5K Ohm	14-5152
30	R17	Res. Car. 1/4W, 9.1K Ohm	14-5912
31	R22,R23	Res. Car. 1/4W, 220 Ohm	14-5221
32	R24	Res. Car. 1/4W, 24K Ohm	14-5243
33	RN1	Resistor Network (SIP) 1/8W, 4.7K Ohm	C021992-04
34	C1	Cap, Elec. Radial Lead	C015505
35	C3,C6,C7,C12 C21-24	Cap. Cer. Axial .1uf Z5U 25V	C014181-03
36	C4	Cap, Cer. Axial .22uf	C014180-20
37	C8	Cap. Cer. Axial 22pf NPO, 50V	C014179-01
38	C9	Cap. Cer. Axial 47pf NPO, 50V	C014179-05
39	C11,C40,C41	Cap. Cer. Axial .01uf Z5U, 25V	C014181-02
40	C14,C13	Cap Polystrene, 820pf	C018261
41	C17,C18,C19,C20	Cap Polyester Radial .068uf	C014353
42	C25	Cap Polyester Radial, .1uF 100V	C017885
43	C26-37	Cap. Cer. Axial .001uf Z5U, 25V	C014181-01
44	C38,C39	Cap. Cer. Axial 470pf,X7R 50V	C014180-07
45	C42	Cap. Cer. Axial 33pf, NPO, 50V	C014179-04
		Cap, Polystyrene, 820pf, Alternate for Item #40	C010821

SECTION 7

PARTS LIST

ITEM	LOCATOR	DESCRIPTION	PART NUMBER
46	L1-L4	Ferrite Bead	C014384
47	L5	Inductor, 1.8uh	C015752
48	L6	Inductor, 12½ Turn	C010823
49	CR1-CR2,CR6,CR7	Diode, Signal 1N914	31-1N914
50	CR4,CR5	Diode, Rectifier 1N4001	31-1N4001
51	VR1	Logic Controlled Voltage Regulator LT3105	C020144
52	Q1	Transistor, 2N3563	34-2N3563
53	Y1	Crystal, 3.579575 MHz	C015510
54	J1	Cartridge Connector	C020504
55		Spring - Slide Cartridge	C010782
56		Cartridge Latch	C018155
57		Cartridge Slide	C018154
58	J2,J3	9-Pin Right Angle "D" Connector	C019062
59	XA1	28 Pin IC Socket	C014386-08
60	XA2,XA3	40 Pin IC Socket	C014386-09
61	XA4	8 Pin IC Socket	C014386-01
62	XA6	16 Pin IC Socket	C014386-03
63		Voltage Regulator PCB/ Heatsink Assy (Alternate for item #51 see installation instructions, Pg. 4-30	CA023008
64		Heatsink	C021748

SECTION 8

SERVICE BULLETINS

This section is to be used by you to file the three classifications of service bulletins that are periodically released by the Director of Technical Support.

The following are brief descriptions of each classification:

FIELD CHANGE ORDER

A Field Change Order describes mandatory hardware or software changes to ATARI Computer products and instructs how to implement these changes. The changes must be performed on all units serviced or repaired.

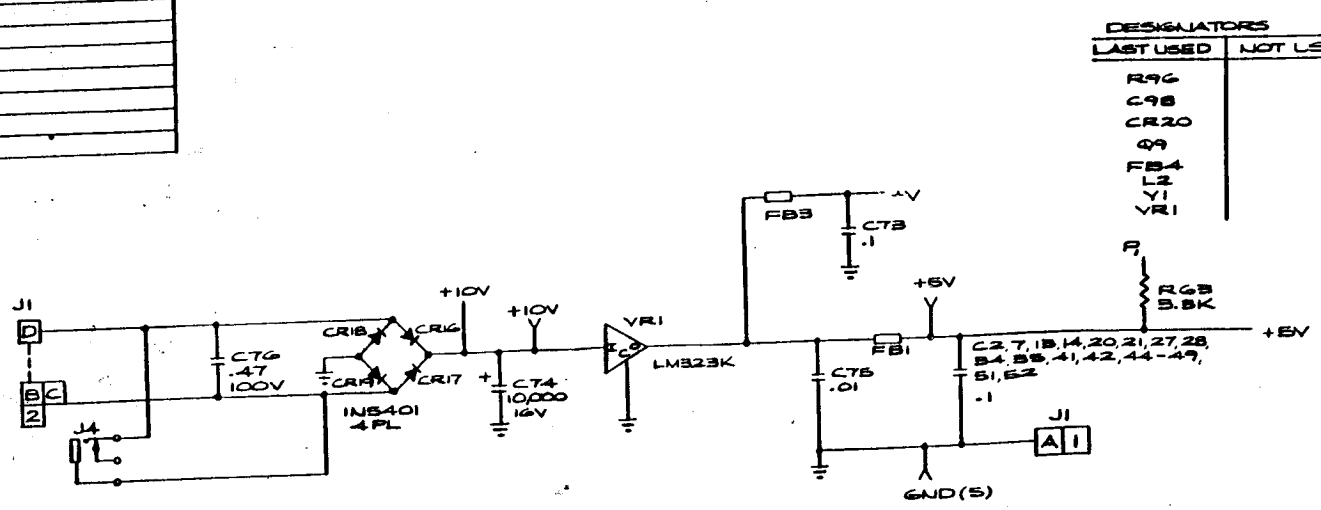
UPGRADE BULLETIN

An Upgrade Bulletin describes product improvements or modifications that the consumer may wish to purchase. These bulletins allow you to modify the customer's unit to add capabilities which may not have been available when the unit was originally manufactured.

TECH TIP

A Tech Tip is a document of a general nature which transmits routine service or repair information. By communicating methods developed since you attended training classes, Tech Tips aid to continuously improve repair skills and increase knowledge of ATARI Computer Products.

Other times, Tech Tips alert you to units that have been modified and are now standard for ATARI Manufacturing, but are different from many existing units and require different repair techniques.



DESIGNATORS	
LAST USED	NOT USED
R96	
C98	
CR20	
Q9	
FB4	
L2	
V1	
VR1	

NOTES:

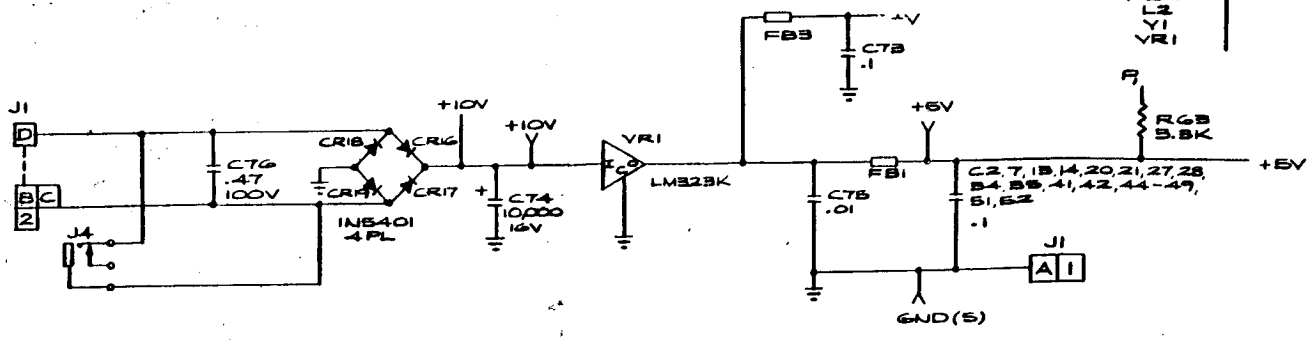
- □ = J1 44 PIN CONNECTOR
- ○ = 50 PIN TEST CONNECTOR
- □ = J5 24 PIN CONNECTOR
- □ = J2 & J3 9 PIN CONNECTOR

CONNECTORS J2 AND J3 ARE NOT LOADED

8	7	6	5	4	3	2

IC CHART

TYPE	VOLTAGE / PIN NO GND	+5	+10	UNUSED GATES
74LS00	7	14		E8
74LS04	7	14		F8
7406	7	14		
74LS11	7	14		
74LS42	8	16		
74LS74	7	14		
74LS20	7	14		
74C244	10	20		
74LS273	10	20		
4584B	7	14		C/D8
74LS02	7	14		D8
4044B	8	16		
MMB2132	12	24		
G532A	1	20		
G507	2	4		
T9A	1	20		
74LS166	8	16		
4050B	8	1		
74LS367	8	16		B7, B7



DESIGNATORS

LAST USED	NOT USED
R96	
C98	
CR20	
Q9	
FB4	
L2	
Y1	
VR1	

NOTES

□ - J

○ = S

□ - J

□ = J

CONNE
NOT L

8	7	6	5	4	3	2

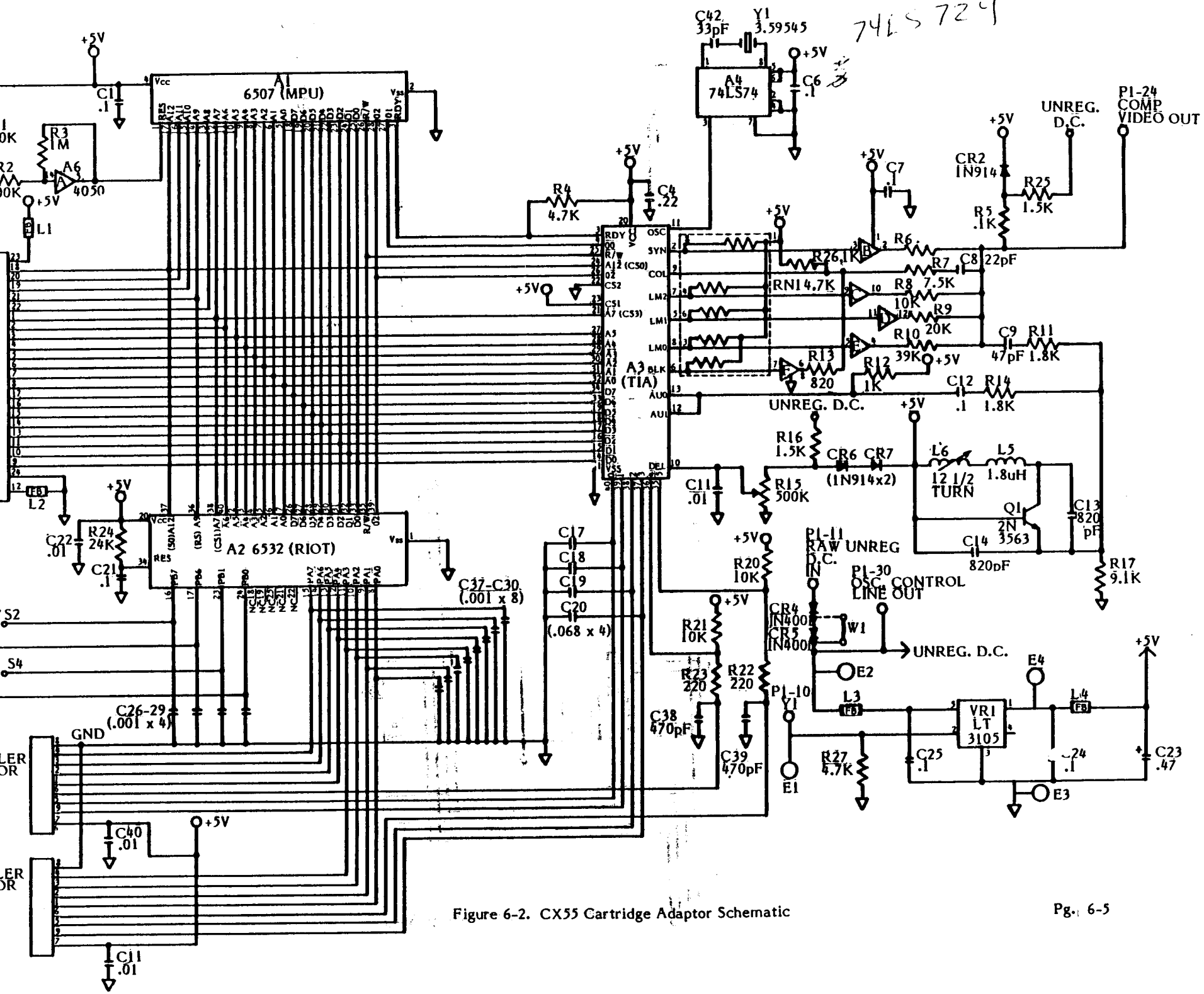


Figure 6-2. CX55 Cartridge Adaptor Schematic

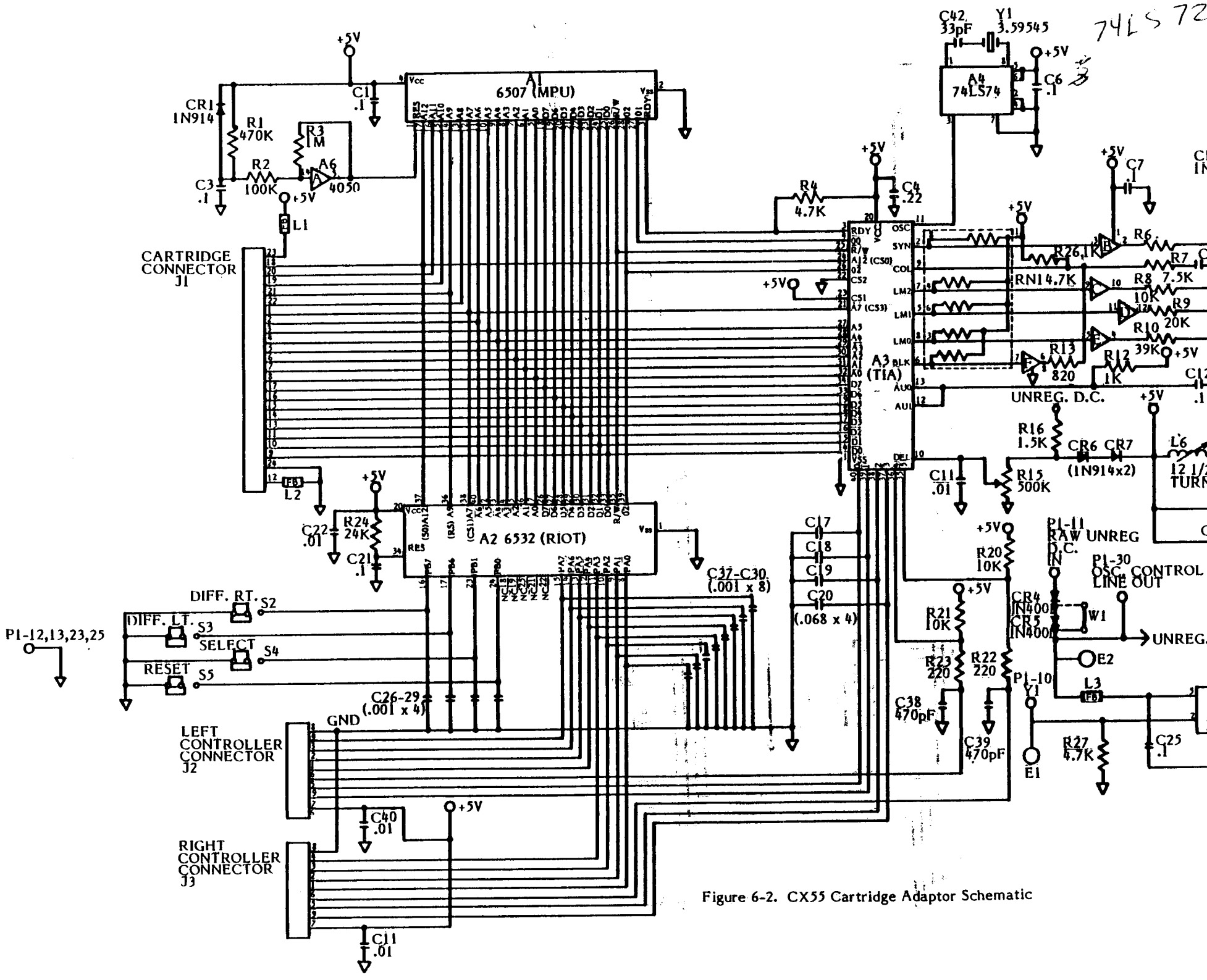


Figure 6-2. CX55 Cartridge Adaptor Schematic