## Troubleshooting Equipment Requirements

In addition to having good ColecoVision peripherals (power supply, handcontroller, RF switch box, and coax game cable), the following test equipment is required for ColecoVision repair —

—A 35 MHz oscilloscope

—An 80 MHz frequency counter

—An RF preamp capable of amplifying RF signals up to 80 MHz. This unit will be in series with the game and the frequency counter. This combination tests carrier frequency.

—A properly adjusted color television.

—A diagnostic cartridge.

—A ColecoVision Repair Manual.

—A spinner interface tester.

## Diagnostic Cartridge

The cartridge was developed to aid in the testing of ColecoVision. Game cartridges should not be substituted to test the ColecoVision games, as they do not test as much circuitry as the diagnostic software.

This test is to be used in conjunction with the flow charts located at the end of this section. If a malfunction occurs while operating the diagnostic cartridge, refer to flow charts for troubleshooting procedures.

The first portion of the test is to check the internal ROM and RAM. The screen will indicate whether one or both of these tests have passed. If ROM is bad, change U2. If RAM is defective, change U3 or U4.

The video test follows. Simply compare the screen to the color pictures provided on page VI-3. If the screen does not compare with the pictures, follow the directions in the flow charts.

The sound test is the next step. All three of the sound generators are tested first, then the noise generator is tested. The test uses audio tones. Game cartridges do not consistently use all the generators so it is essential that the diagnostic cartridge is used, ensuring a thorough check of the audio portion of the game. If only one sound is missing replace U20.

The final test is the handcontroller test. It indicates each handcontrol function on the screen. Each function will blank out after that function has been selected and is performing correctly. It also provides a method of checking the spinner interface. This is accomplished by plugging the spinner interface tester into player number one, then player number two. After turning the tester on, an arrow should flash. Changing the direction switch will cause the arrow to flash in the opposite direction.

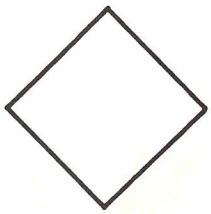
## Explanation of Troubleshooting

This manual is written as a guideline to aid in troubleshooting. It will lead the repair person to a level where individual isolation techniques can take over and diagnose the failure.

At this point, two assumptions have been made; the peripherals (power supply, controllers, RF switch box, RF cord) are good, and the landlines and solder connections are good. The peripherals can be tested by substitution. Faulty landlines and solder connections can be found by a careful visual inspection.

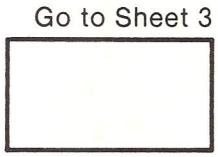
The troubleshooting guide uses flow charts, signal pictures and a list of technical tips. The signal pictures demonstrate how the signals should look in a perfect situation with an explanation and methods of examining each signal.

Following is a description of each symbol used in the flow charts.



**Decision Block** — Carefully read the question inside the block. Answer it by a simple yes or no. Follow the appropriate answer to the next block. Signals to be examined are designated by an IC number, a colon followed by a pin number (U9:38 means U9 Pin 38).

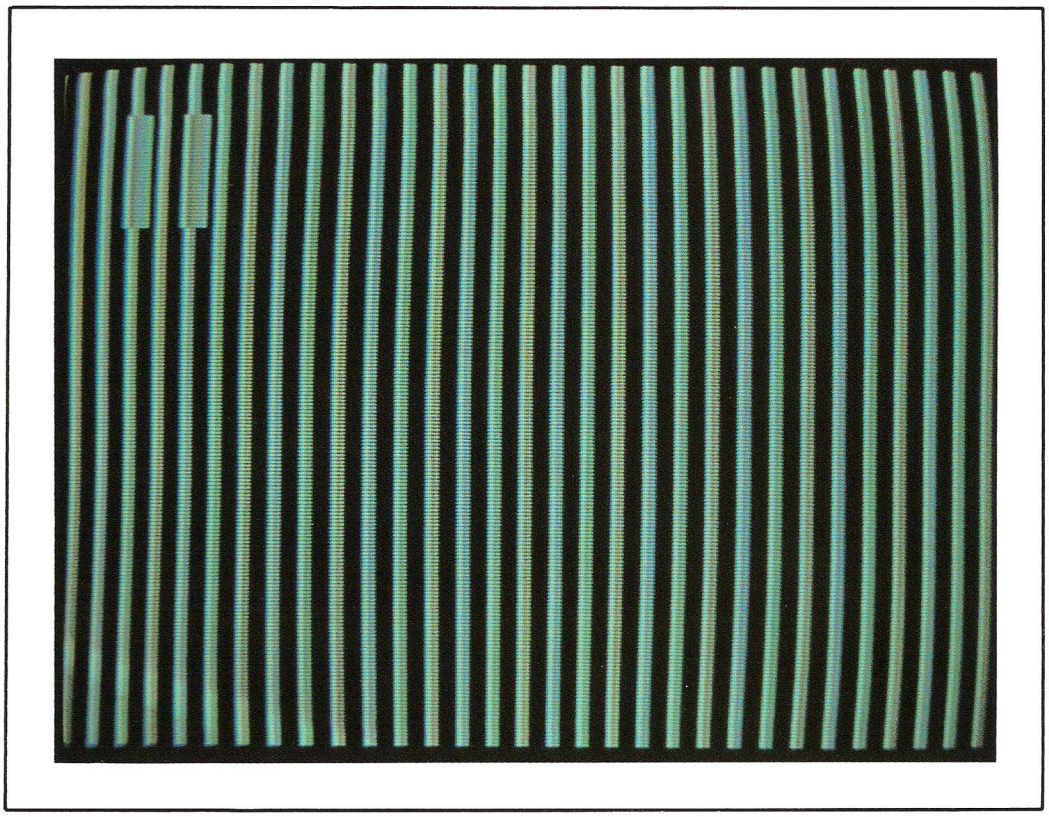
**Process Block** — Perform the operation stated in the block and proceed to the next step.



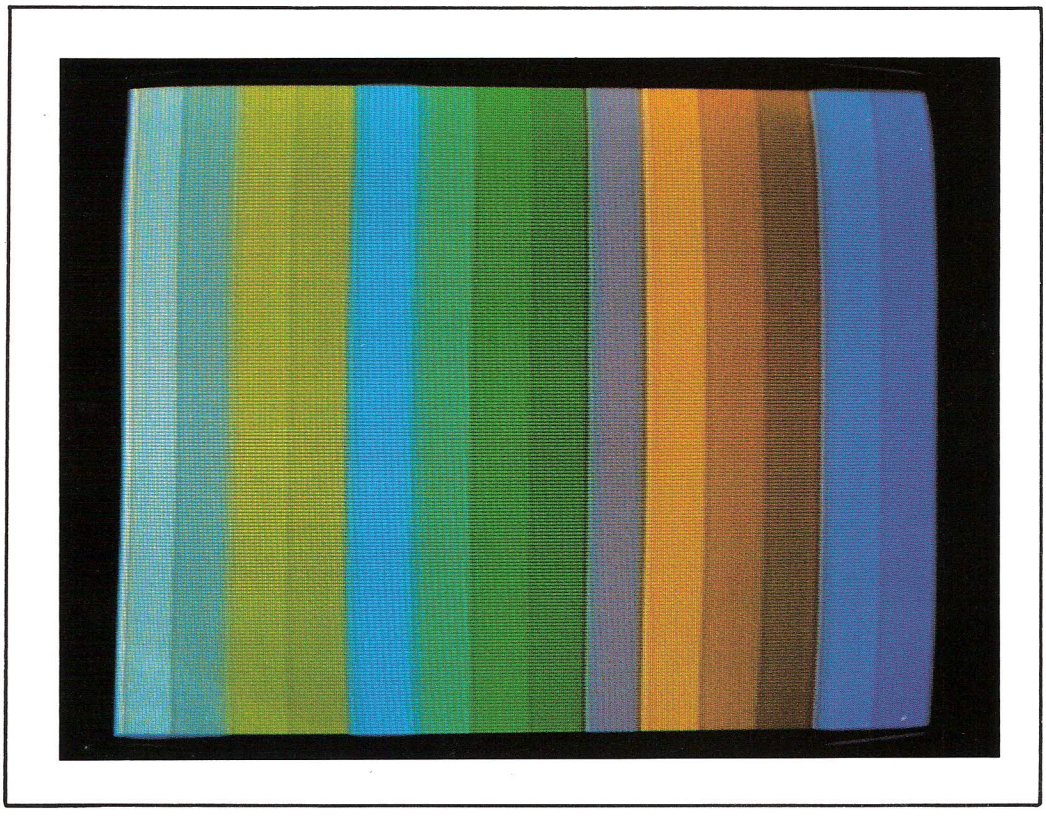

**Subroutine Block** — Follow specific direction, usually directing repair person to proceed onto an additional page for more detailed instructions.

**Return Block** — Return to beginning of flow charts.

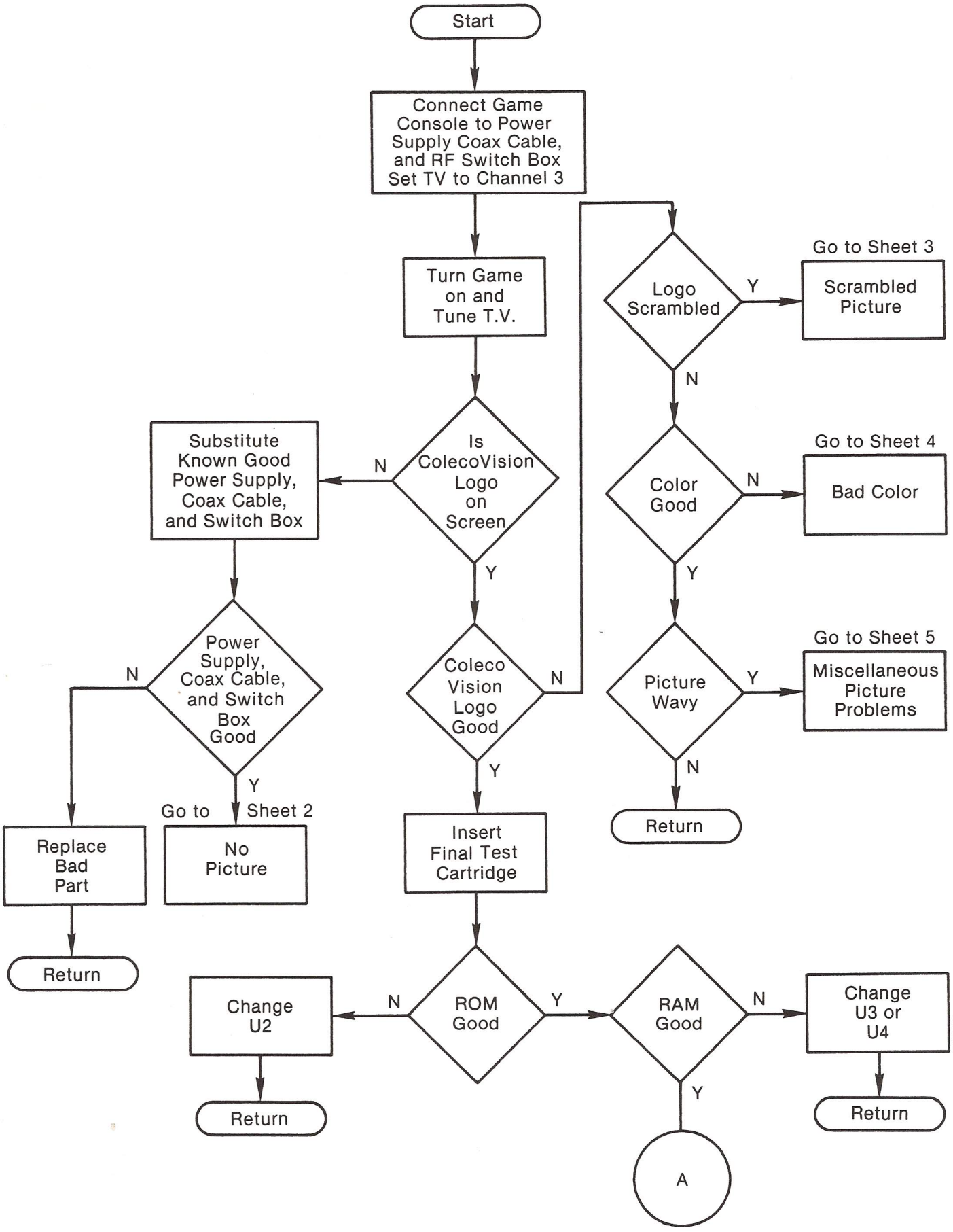
## Video Test

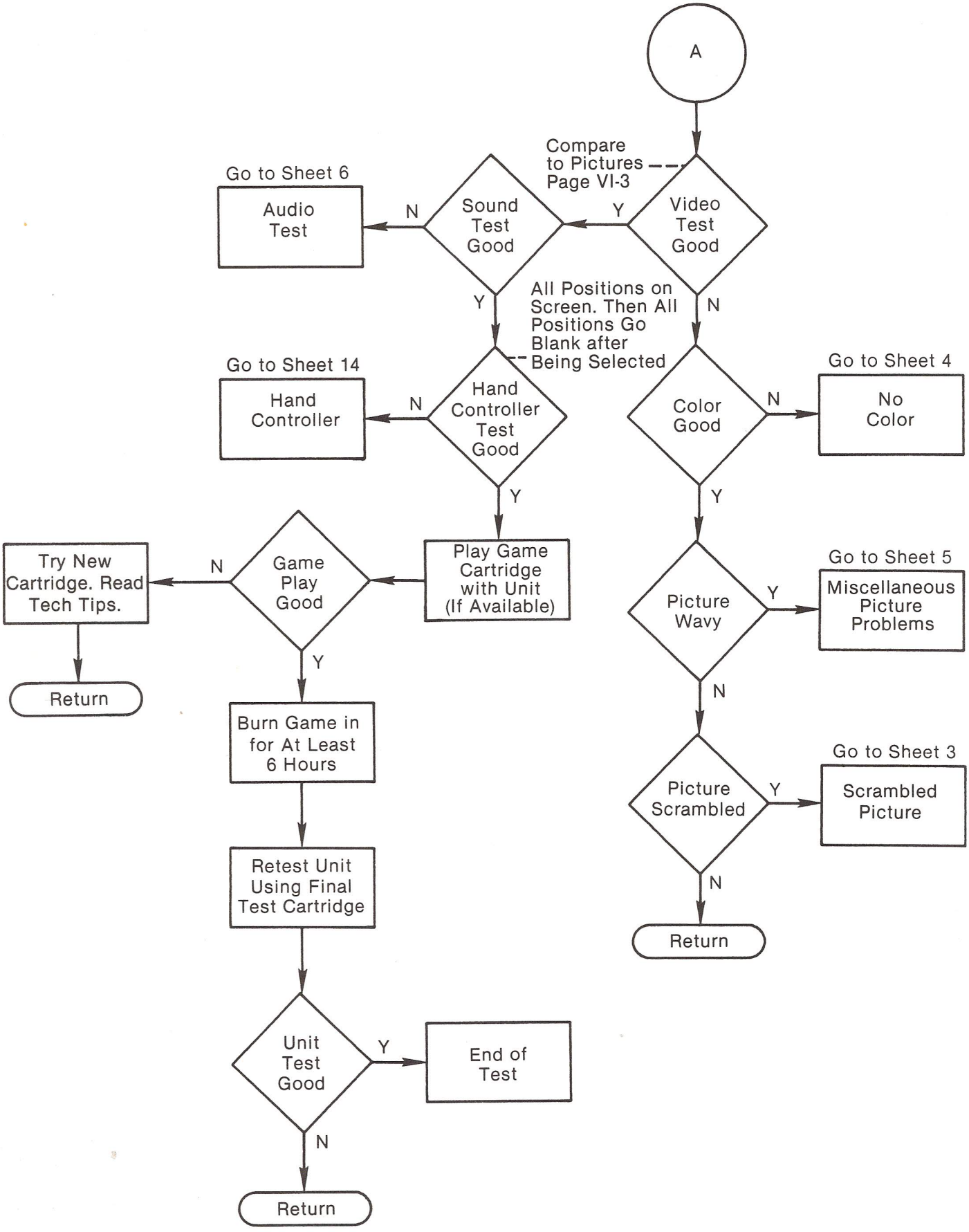


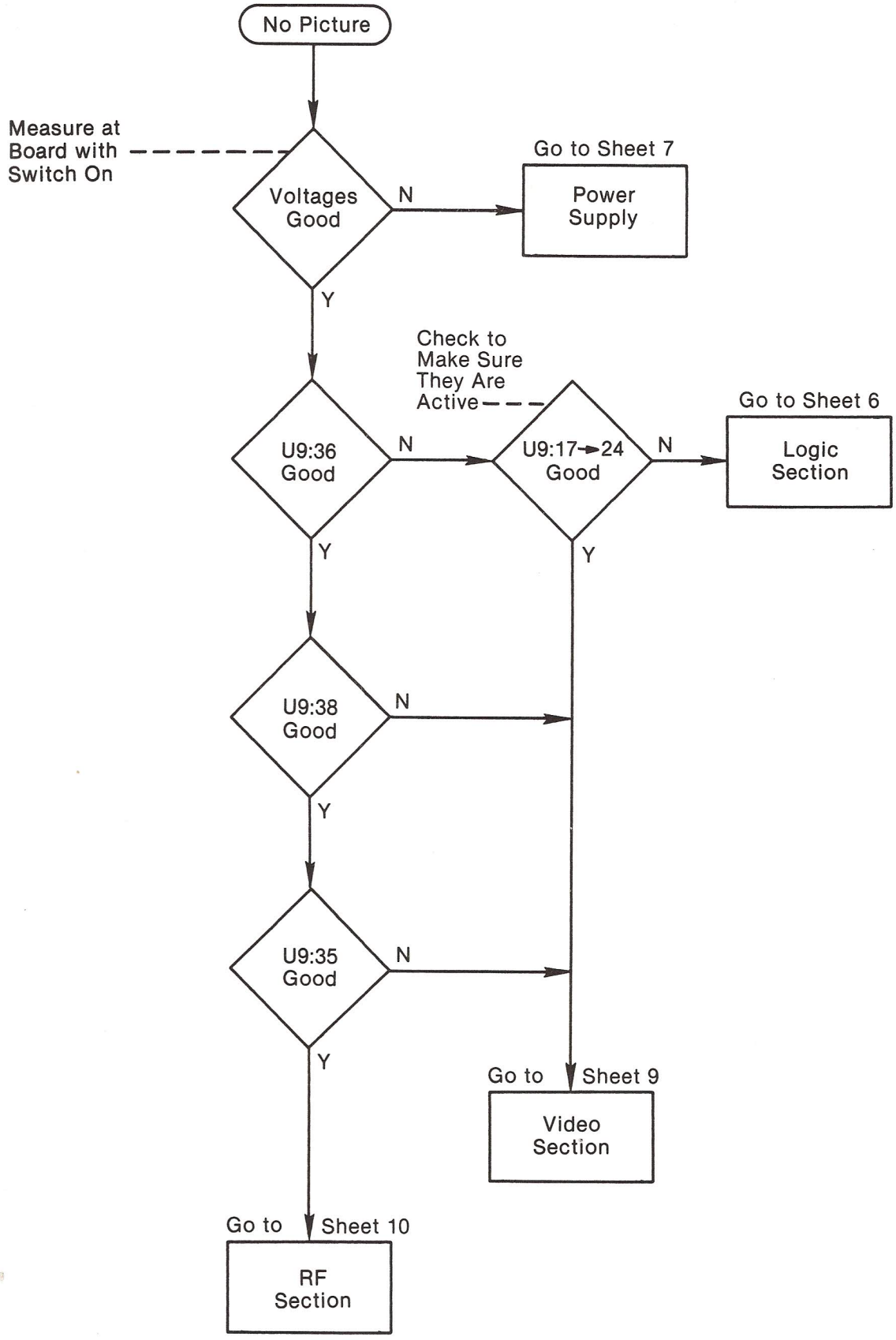
## Color Test

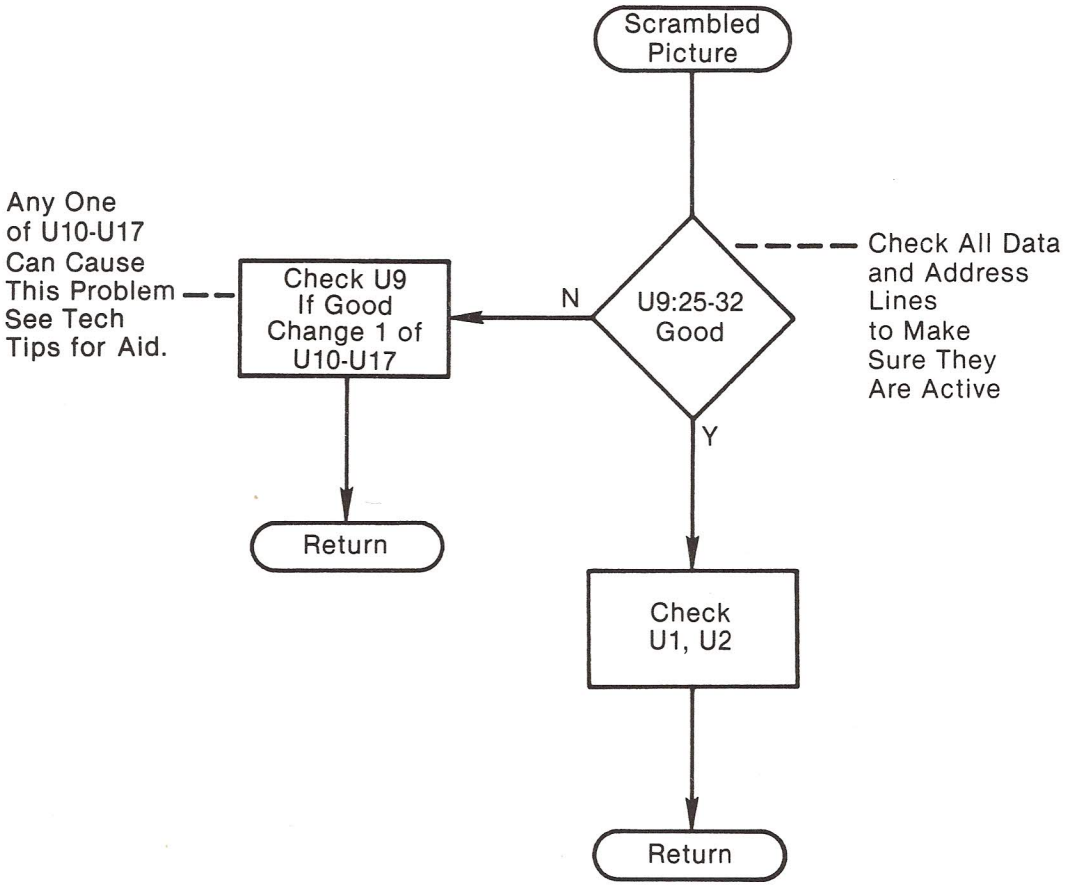


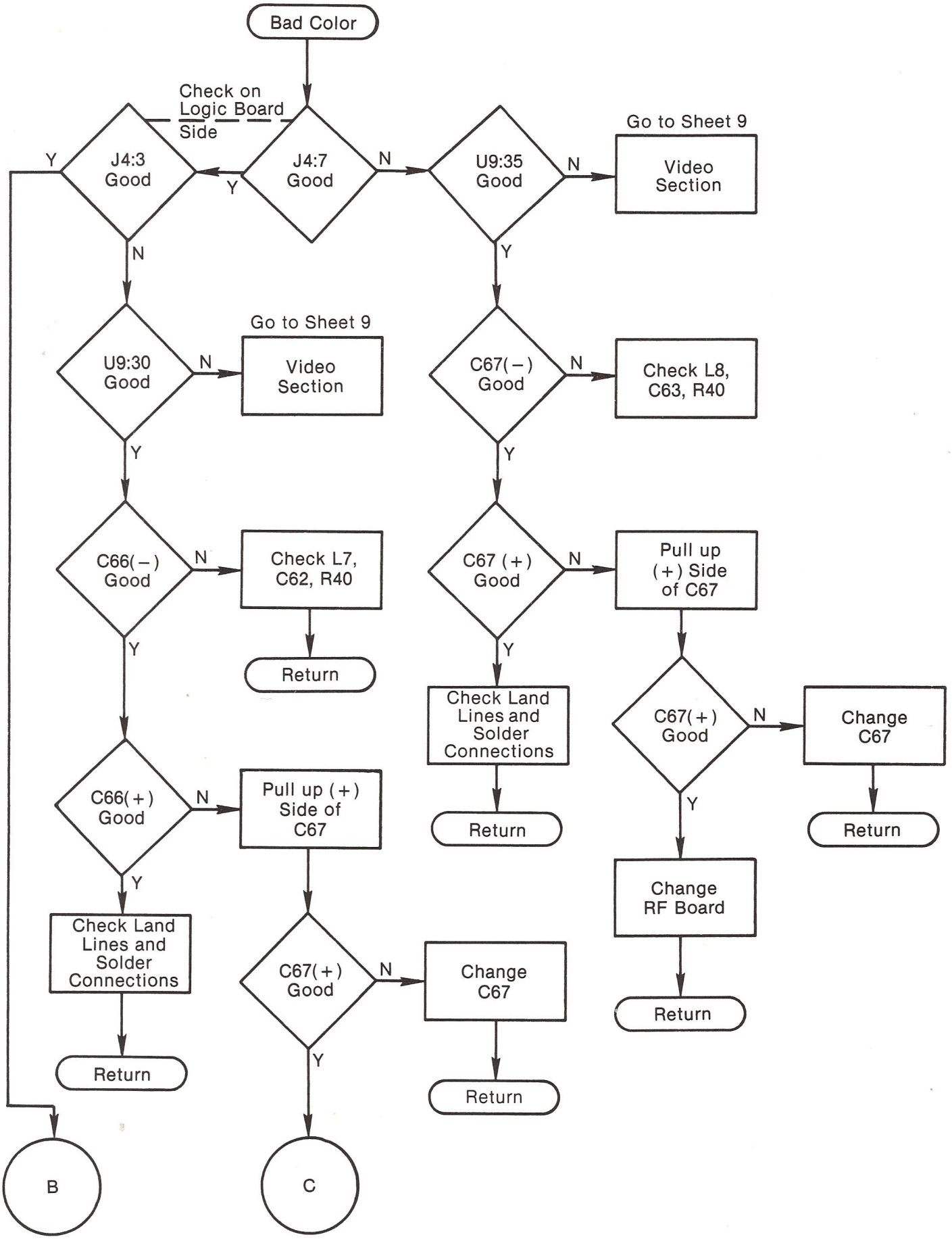
## Troubleshooting Flow Charts

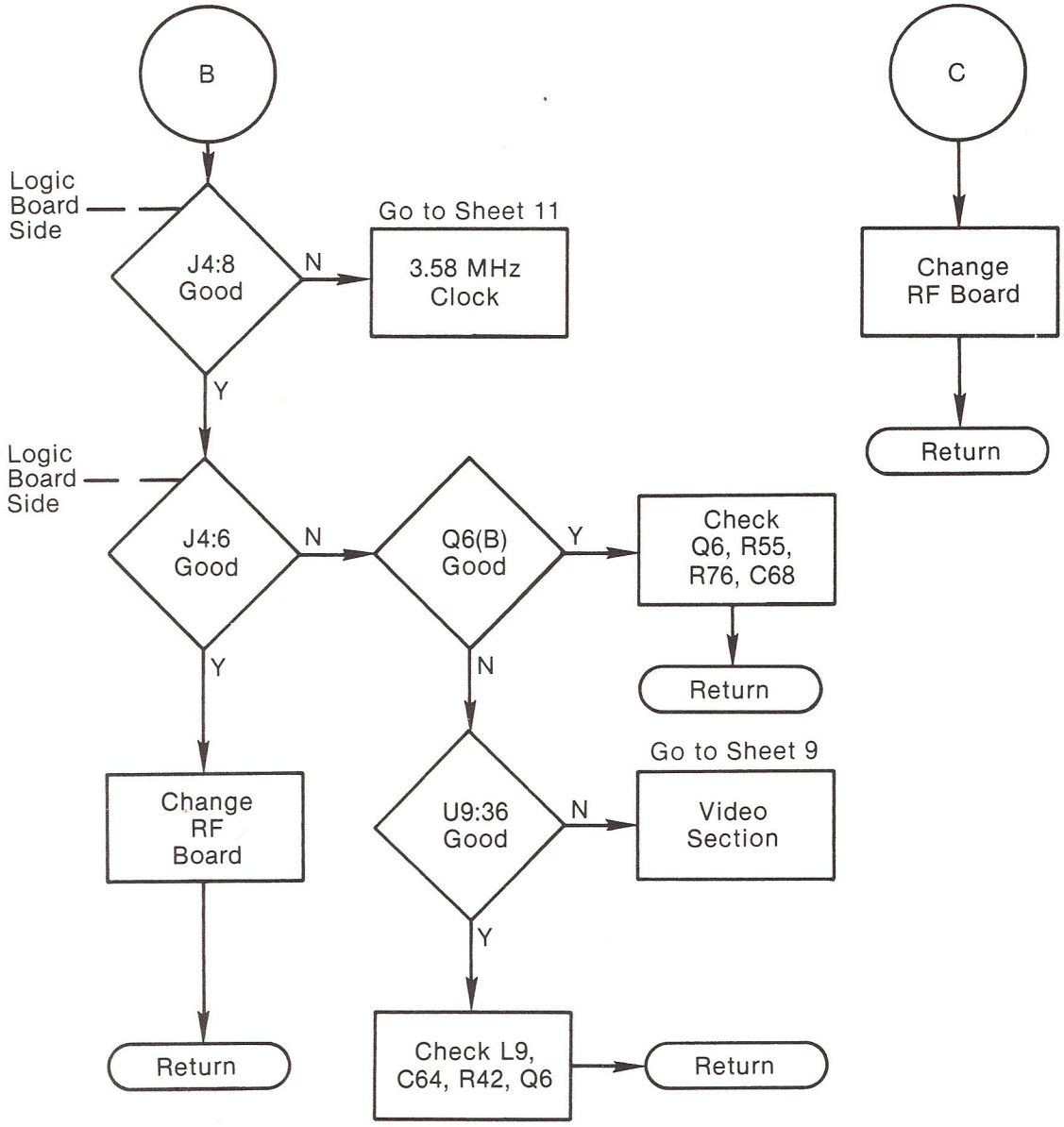

Start
Connect Game Console to Power Supply Coax Cable, and RF Switch Box Set TV to Channel 3
Turn Game on and Tune T.V.
Is ColecoVision Logo on Screen
N
Substitute Known Good Power Supply, Coax Cable, and Switch Box
Y
Power Supply, Coax Cable, and Switch Box Good
N
Replace Bad Part
Return
Y
Go to Sheet 2
No Picture
Coleco Vision Logo Good
N
Y
Insert Final Test Cartridge
ROM Good
N
Change U2
Return
Y
RAM Good
N
Change U3 or U4
Return
Y
A
Logo Scrambled
Y
Go to Sheet 3
Scrambled Picture
N
Color Good
N
Go to Sheet 4
Bad Color
Y
Picture Wavy
Y
Go to Sheet 5
Miscellaneous Picture Problems
N
Return

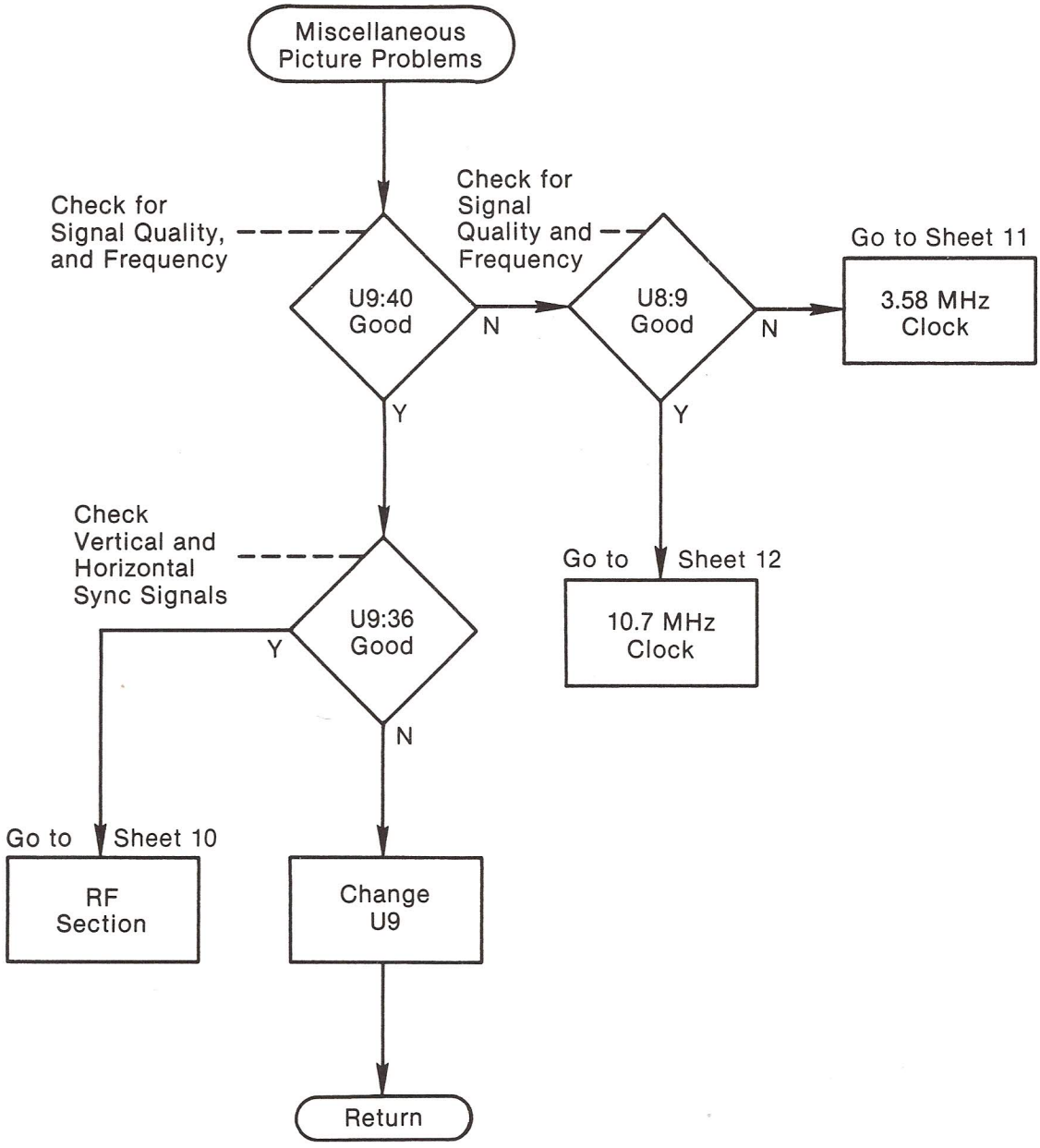

A
Compare to Pictures Page VI-3
Video Test Good
Y
Sound Test Good
N
Go to Sheet 6
Audio Test
Y
All Positions on Screen. Then All Positions Go Blank after Being Selected
N
Color Good
N
Go to Sheet 4
No Color
Y
Picture Wavy
Y
Go to Sheet 5
Miscellaneous Picture Problems
N
Picture Scrambled
Y
Go to Sheet 3
Scrambled Picture
N
Return
Hand Controller Test Good
N
Go to Sheet 14
Hand Controller
Y
Play Game Cartridge with Unit (If Available)
Game Play Good
N
Try New Cartridge. Read Tech Tips.
Return
Y
Burn Game in for At Least 6 Hours
Retest Unit Using Final Test Cartridge
Unit Test Good
Y
End of Test
N
Return

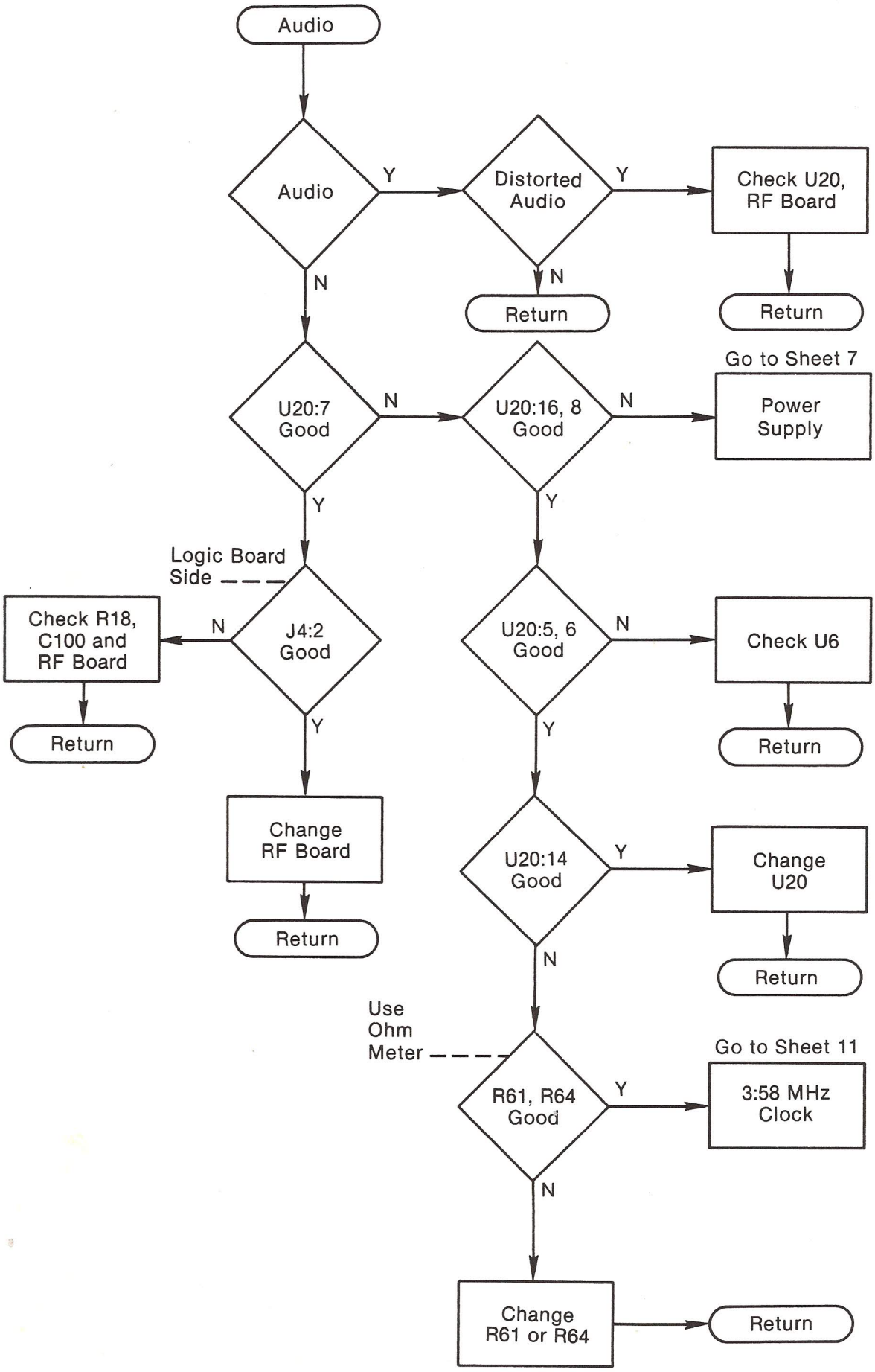

No Picture
Measure at Board with Switch On
Voltages Good
N
Go to Sheet 7
Power Supply
Y
Check to Make Sure They Are Active
U9:36 Good
N
U9:17→24 Good
N
Go to Sheet 6
Logic Section
Y
Y
U9:38 Good
N
Y
U9:35 Good
N
Y
Go to Sheet 9
Video Section
Go to Sheet 10
RF Section

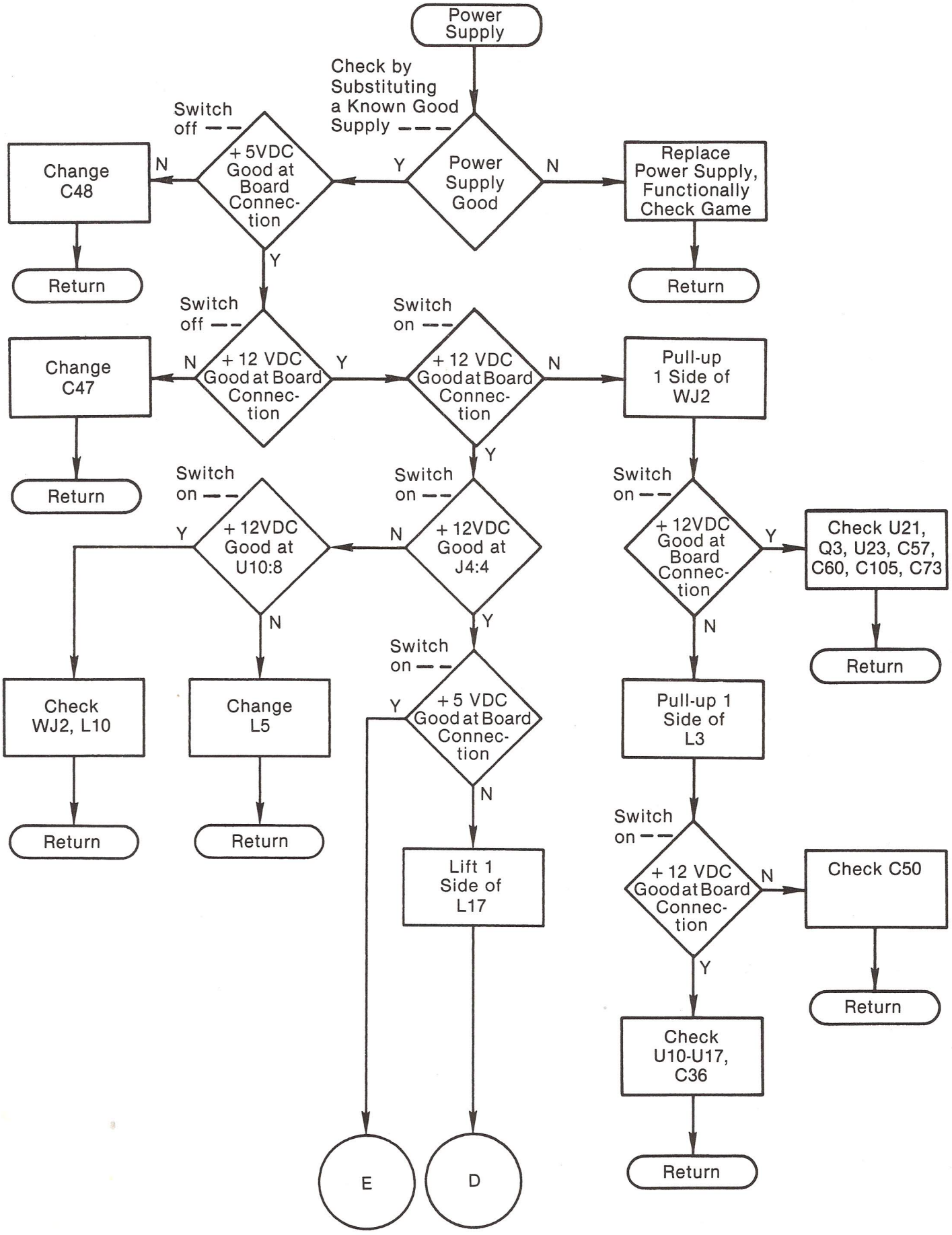

Scrambled Picture
U9:25-32 Good
N
Y
Check All Data and Address Lines to Make Sure They Are Active
Check U9 If Good Change 1 of U10-U17
Any One of U10-U17 Can Cause This Problem See Tech Tips for Aid.
Return
Check U1, U2
Return

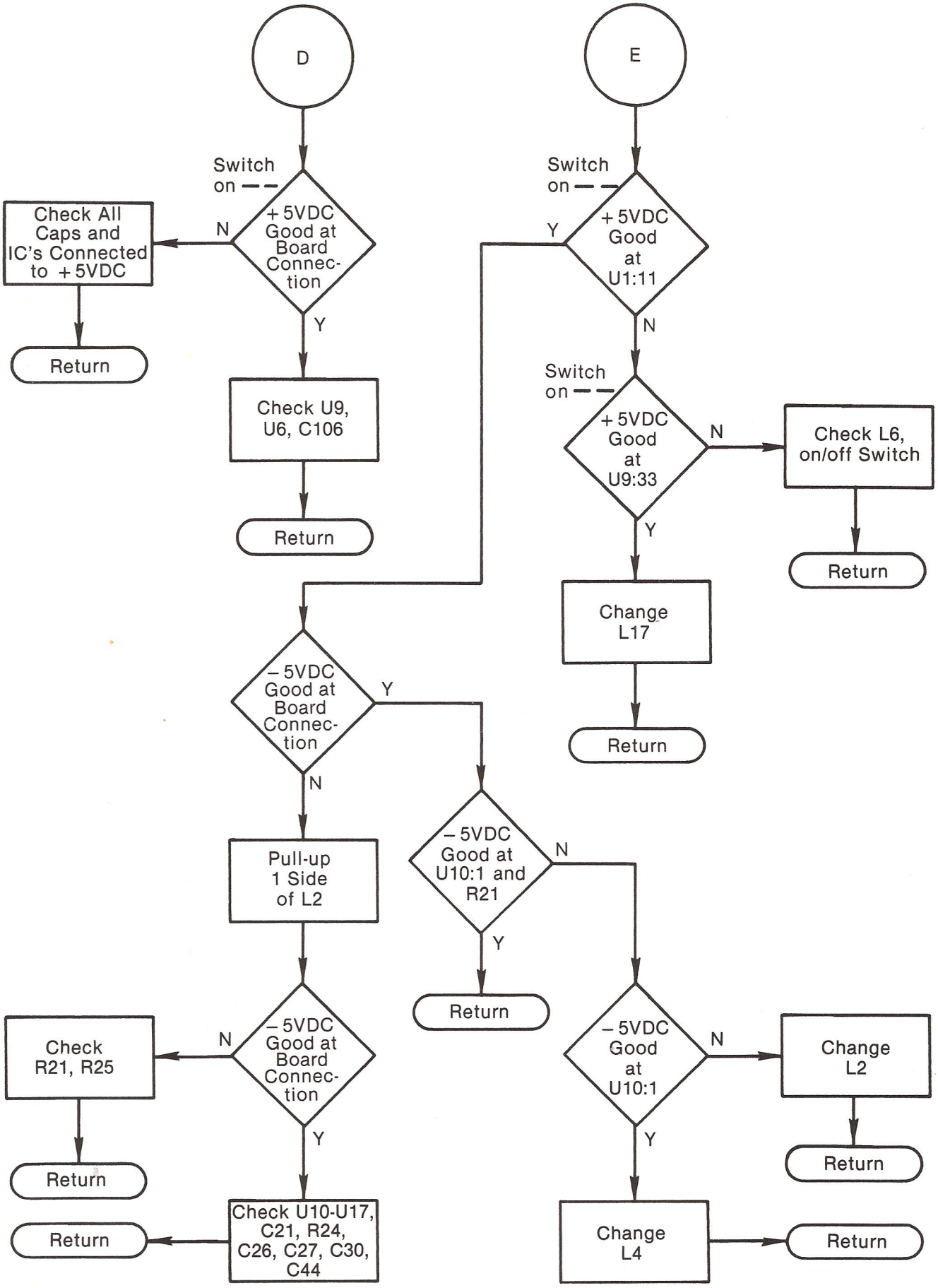

Bad Color
Check on Logic Board Side
J4:7 Good
J4:3 Good
U9:35 Good
Go to Sheet 9
Video Section
U9:30 Good
Go to Sheet 9
Video Section
C67(−) Good
Check L8, C63, R40
C66(−) Good
Check L7, C62, R40
Return
C67 (+) Good
Pull up (+) Side of C67
Check Land Lines and Solder Connections
Return
C66(+) Good
Pull up (+) Side of C67
C67(+) Good
Change C67
Return
Check Land Lines and Solder Connections
Return
C67(+) Good
Change C67
Return
Change RF Board
Return
B
C
Y
N

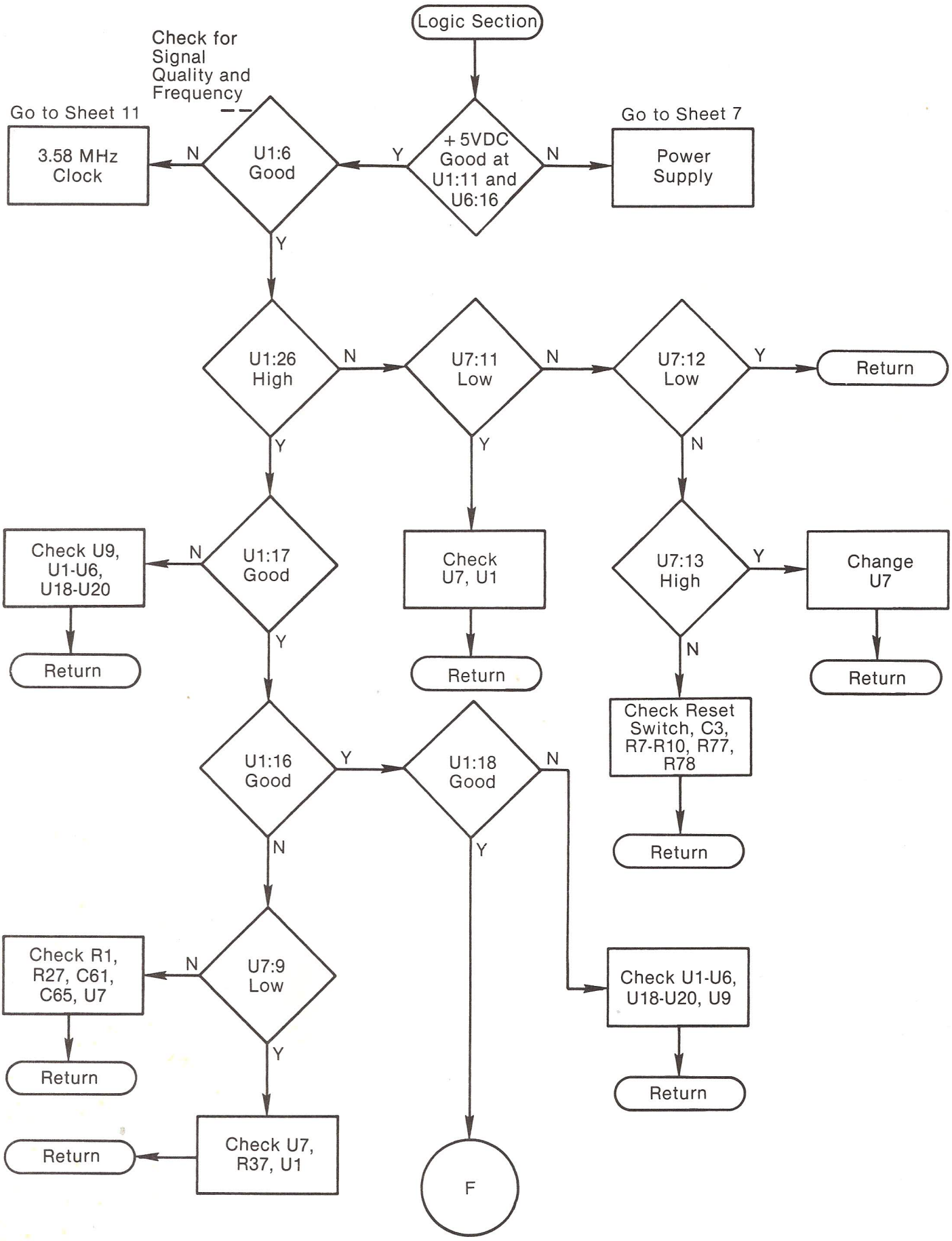

B
C
Logic Board Side
J4:8 Good
N
Go to Sheet 11
3.58 MHz Clock
Y
Change RF Board
Return
Logic Board Side
J4:6 Good
N
Q6(B) Good
Y
Check Q6, R55, R76, C68
Return
Y
N
Go to Sheet 9
Change RF Board
U9:36 Good
N
Video Section
Y
Return
Check L9, C64, R42, Q6
Return

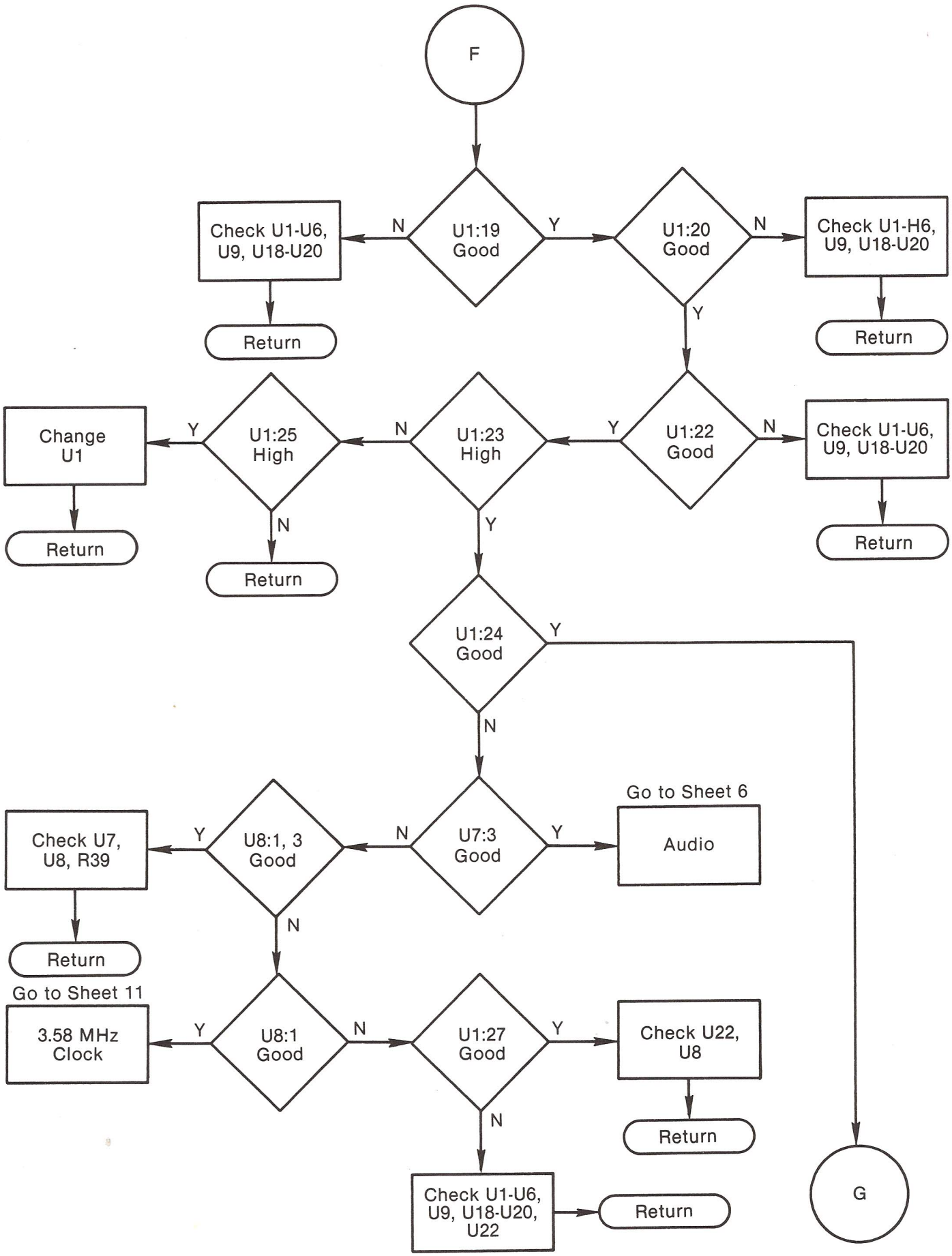

Miscellaneous Picture Problems
Check for Signal Quality, and Frequency
U9:40 Good
N
Check for Signal Quality and Frequency
U8:9 Good
N
Go to Sheet 11
3.58 MHz Clock
Y
Y
Check Vertical and Horizontal Sync Signals
U9:36 Good
Y
N
Go to Sheet 12
10.7 MHz Clock
Go to Sheet 10
RF Section
Change U9
Return

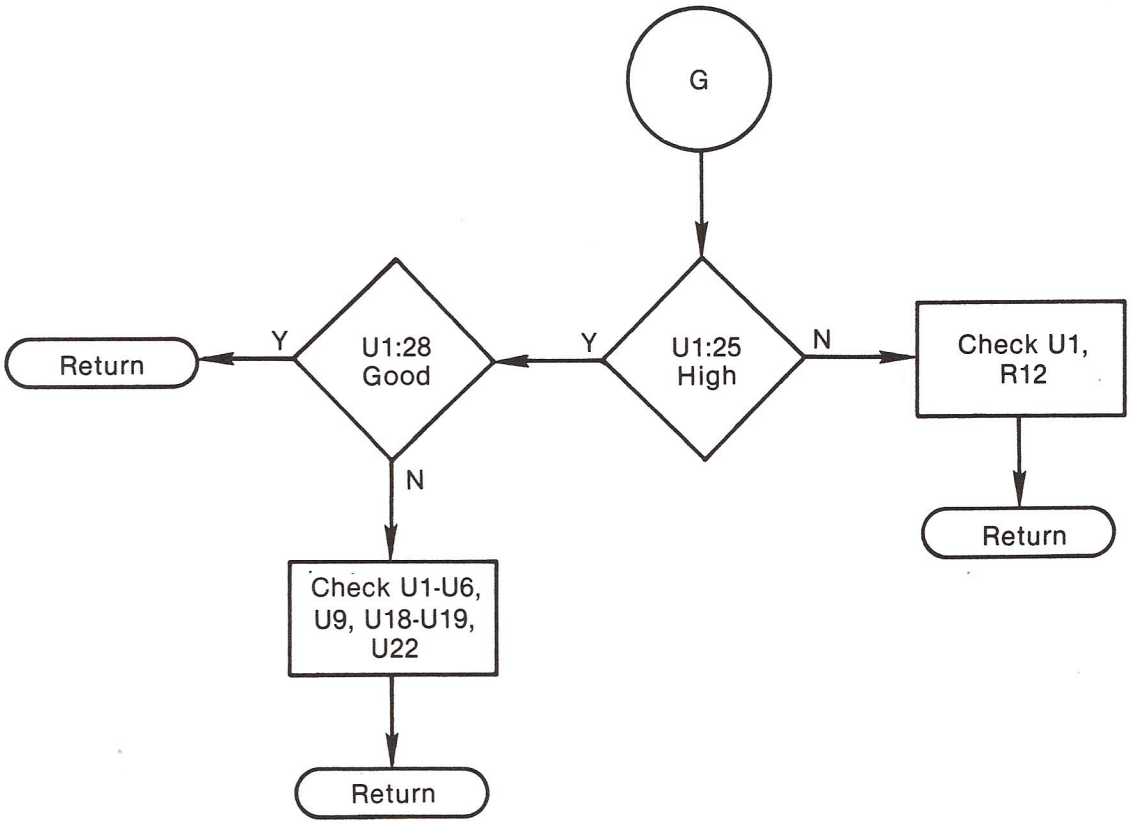

Audio
Audio
Y
Distorted Audio
Y
Check U20, RF Board
N
N
Return
Return
Go to Sheet 7
U20:7 Good
N
U20:16, 8 Good
N
Power Supply
Y
Y
Logic Board Side
Check R18, C100 and RF Board
N
J4:2 Good
U20:5, 6 Good
N
Check U6
Return
Y
Y
Return
Change RF Board
U20:14 Good
Y
Change U20
Return
N
Use Ohm Meter
Go to Sheet 11
R61, R64 Good
Y
3:58 MHz Clock
N
Change R61 or R64
Return

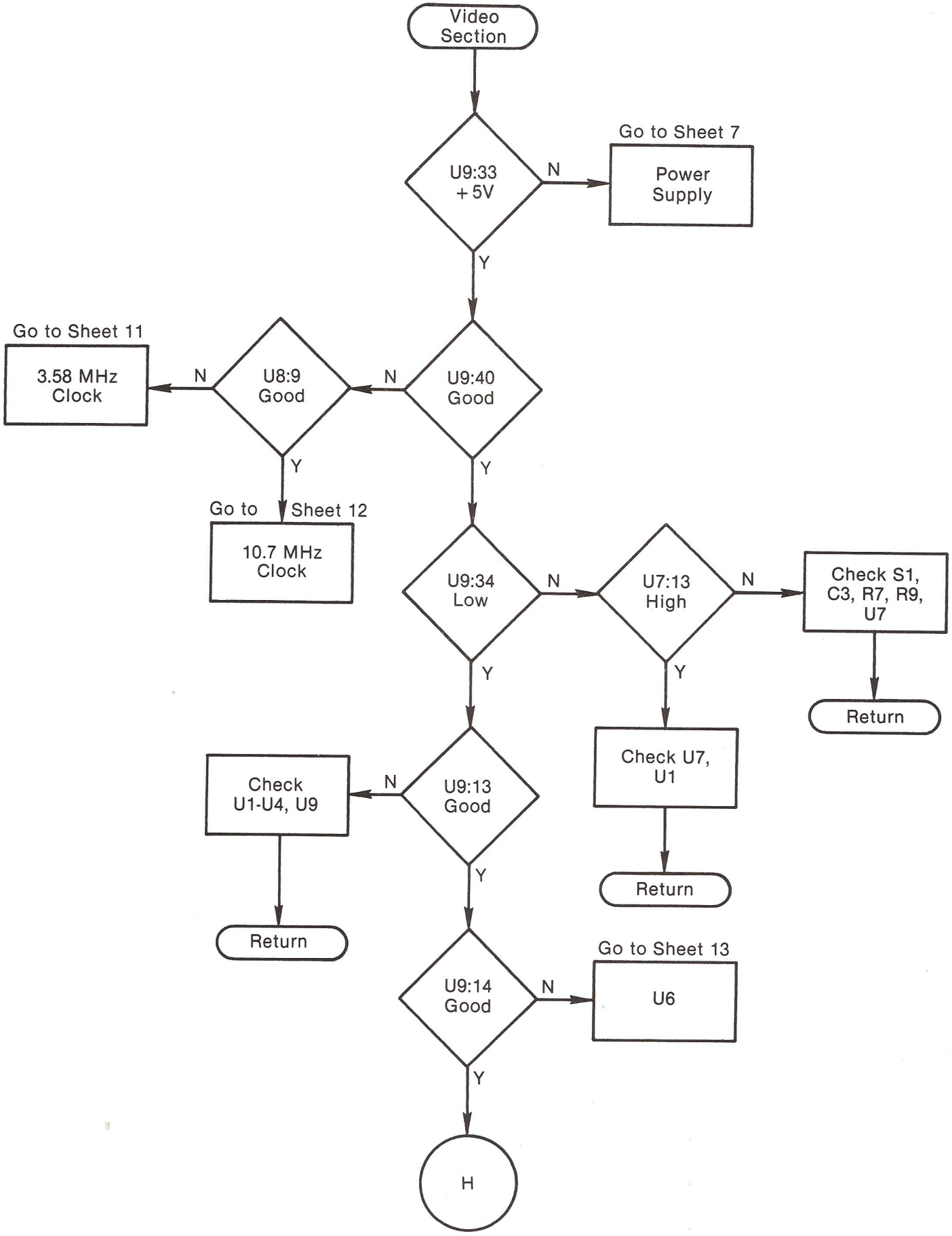

Power Supply
Check by Substituting a Known Good Supply
Power Supply Good
Y
N
Replace Power Supply, Functionally Check Game
Return
Switch off
+ 5VDC Good at Board Connec-tion
N
Change C48
Return
Y
Switch off
+ 12 VDC Good at Board Connec-tion
N
Change C47
Return
Y
Switch on
+ 12 VDC Good at Board Connec-tion
N
Pull-up 1 Side of WJ2
Y
Switch on
+ 12VDC Good at U10:8
Y
Check WJ2, L10
Return
N
Change L5
Return
Switch on
+ 12VDC Good at J4:4
N
Y
Switch on
+ 5 VDC Good at Board Connec-tion
Y
N
Lift 1 Side of L17
Switch on
+ 12VDC Good at Board Connec-tion
Y
Check U21, Q3, U23, C57, C60, C105, C73
Return
N
Pull-up 1 Side of L3
Switch on
+ 12 VDC Good at Board Connec-tion
N
Check C50
Return
Y
Check U10-U17, C36
Return
E
D

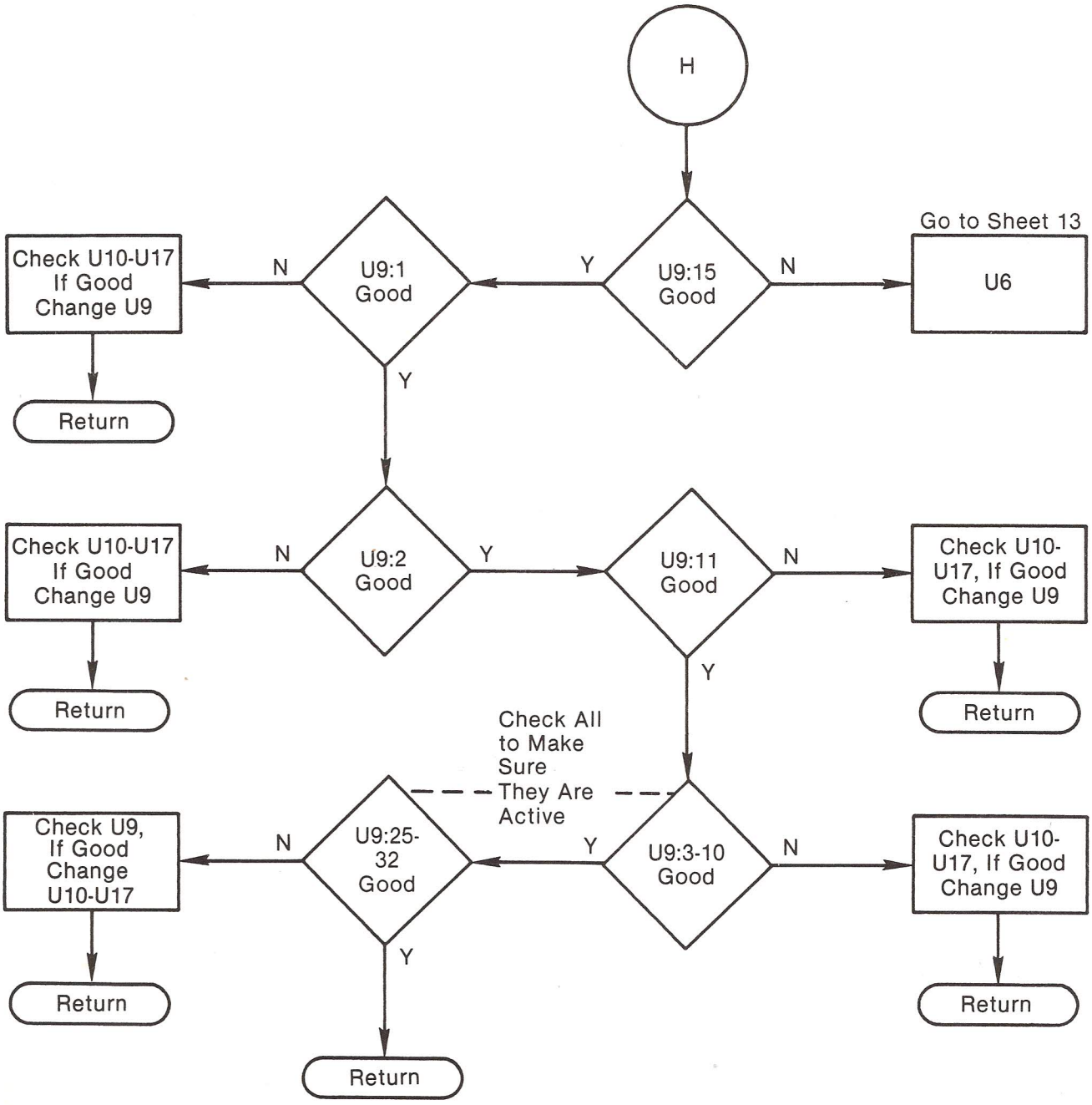

D
E
Switch on
+5VDC Good at Board Connection
N
Y
Check All Caps and IC's Connected to +5VDC
Return
Check U9, U6, C106
Return
Switch on
+5VDC Good at U1:11
Y
N
Switch on
+5VDC Good at U9:33
N
Y
Check L6, on/off Switch
Return
Change L17
Return
-5VDC Good at Board Connection
Y
N
Pull-up 1 Side of L2
-5VDC Good at U10:1 and R21
N
Y
Return
Check R21, R25
N
-5VDC Good at Board Connection
Y
Return
Return
Check U10-U17, C21, R24, C26, C27, C30, C44
-5VDC Good at U10:1
N
Y
Change L2
Return
Change L4
Return

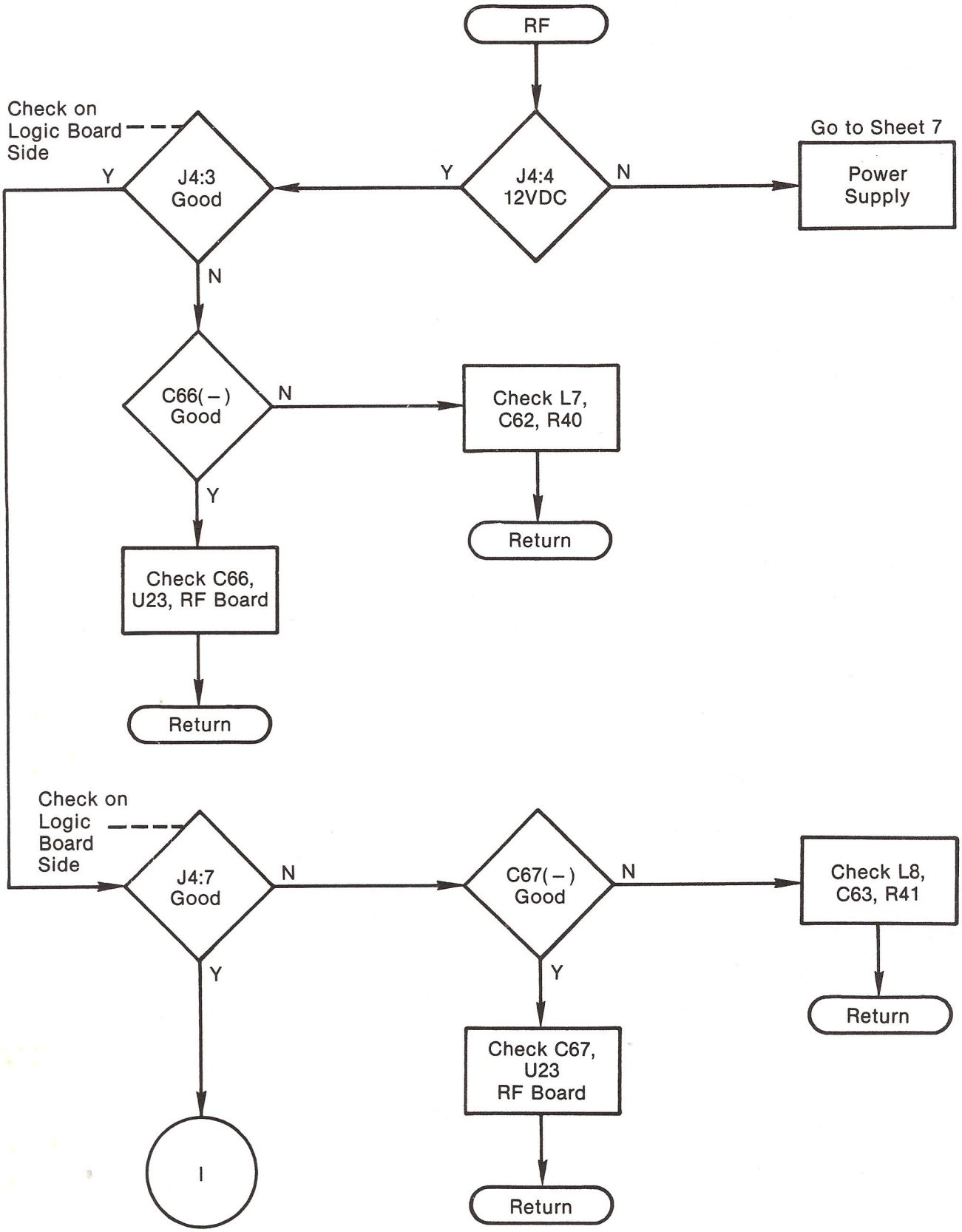

Logic Section
Check for Signal Quality and Frequency
+5VDC Good at U1:11 and U6:16
Y
N
Go to Sheet 7
Power Supply
Go to Sheet 11
3.58 MHz Clock
U1:6 Good
N
Y
U1:26 High
N
U7:11 Low
N
U7:12 Low
Y
Return
Y
Y
N
Check U9, U1-U6, U18-U20
N
U1:17 Good
Check U7, U1
U7:13 High
Y
Change U7
Return
Return
Return
Y
N
Check Reset Switch, C3, R7-R10, R77, R78
Return
U1:16 Good
Y
U1:18 Good
N
N
Y
Check R1, R27, C61, C65, U7
N
U7:9 Low
Check U1-U6, U18-U20, U9
Return
Return
Y
Return
Check U7, R37, U1
F

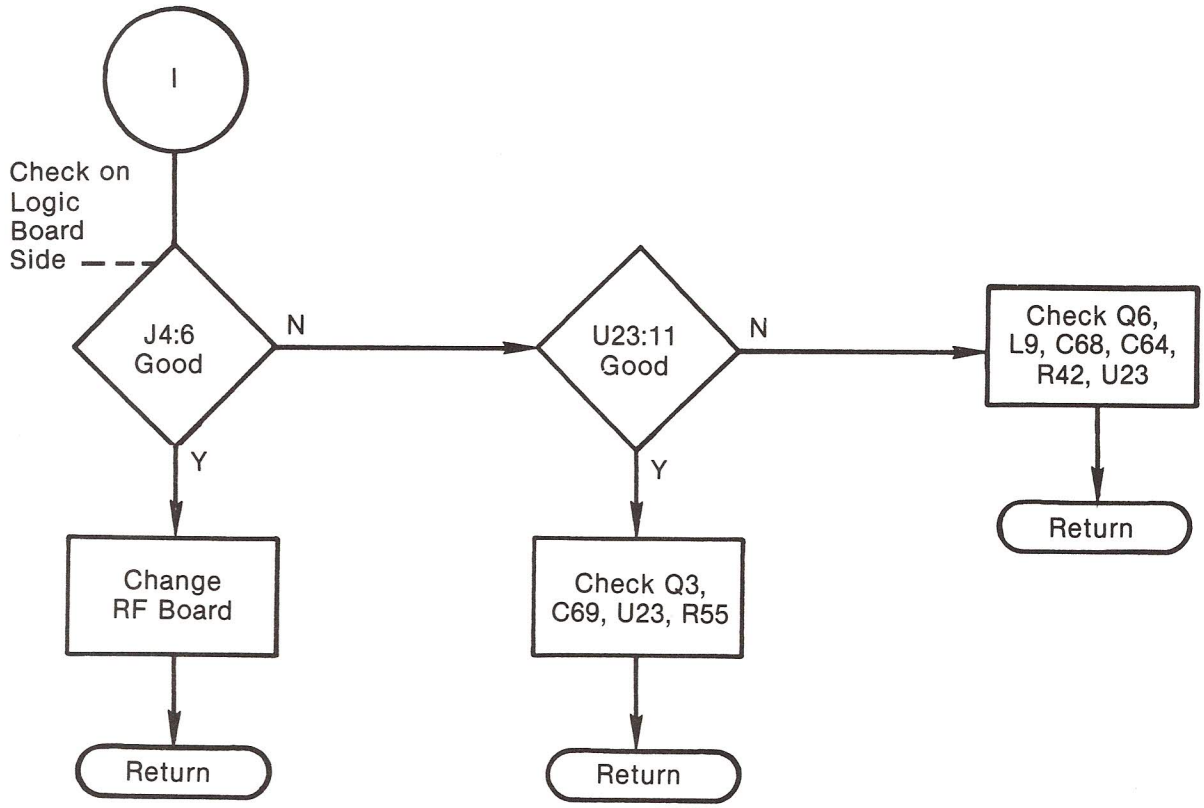

F
U1:19 Good
N
Check U1-U6, U9, U18-U20
Return
Y
U1:20 Good
N
Check U1-H6, U9, U18-U20
Return
Y
U1:22 Good
N
Check U1-U6, U9, U18-U20
Return
Y
U1:23 High
N
Return
Y
U1:25 High
N
Change U1
Return
Y
U1:24 Good
Y
G
N
U7:3 Good
N
Y
Audio
Go to Sheet 6
U8:1, 3 Good
N
Check U7, U8, R39
Return
Y
U8:1 Good
N
3.58 MHz Clock
Go to Sheet 11
Y
U1:27 Good
N
Check U22, U8
Return
Y
Check U1-U6, U9, U18-U20, U22
Return
N

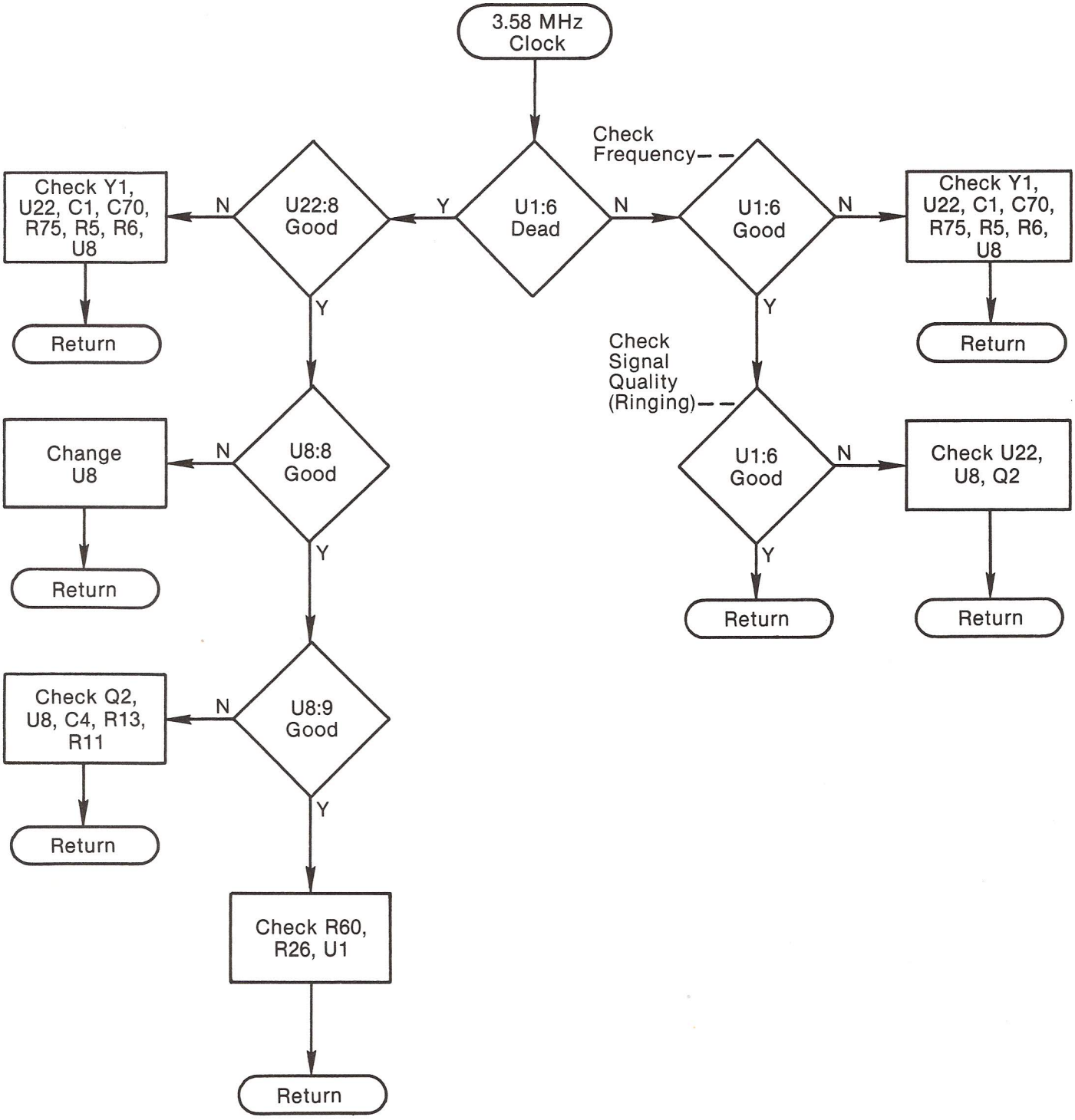

G
U1:25 High
Y
U1:28 Good
Y
Return
N
Check U1, R12
Return
N
Check U1-U6, U9, U18-U19, U22
Return

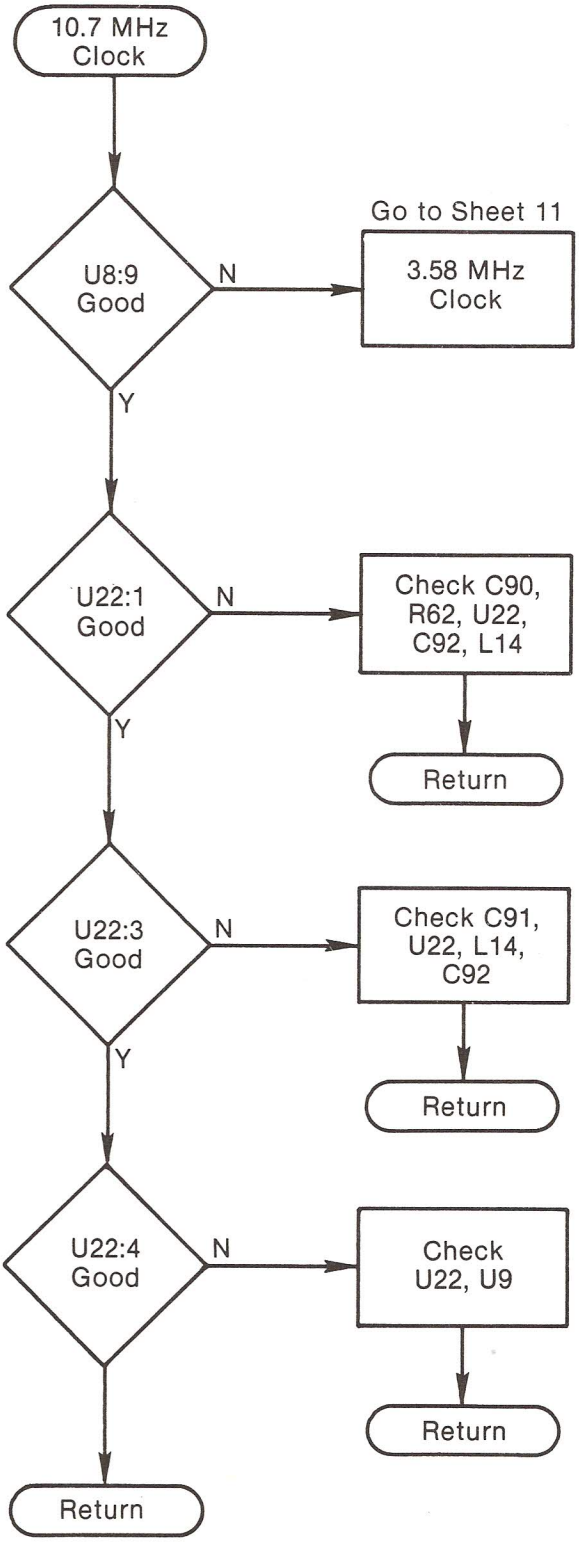

Video Section
U9:33 +5V
N
Go to Sheet 7
Power Supply
Y
Go to Sheet 11
3.58 MHz Clock
N
U8:9 Good
N
U9:40 Good
Y
Y
Go to Sheet 12
10.7 MHz Clock
U9:34 Low
N
U7:13 High
N
Check S1, C3, R7, R9, U7
Return
Y
Y
Check U7, U1
Return
Check U1-U4, U9
N
U9:13 Good
Return
Y
U9:14 Good
N
Go to Sheet 13
U6
Y
H

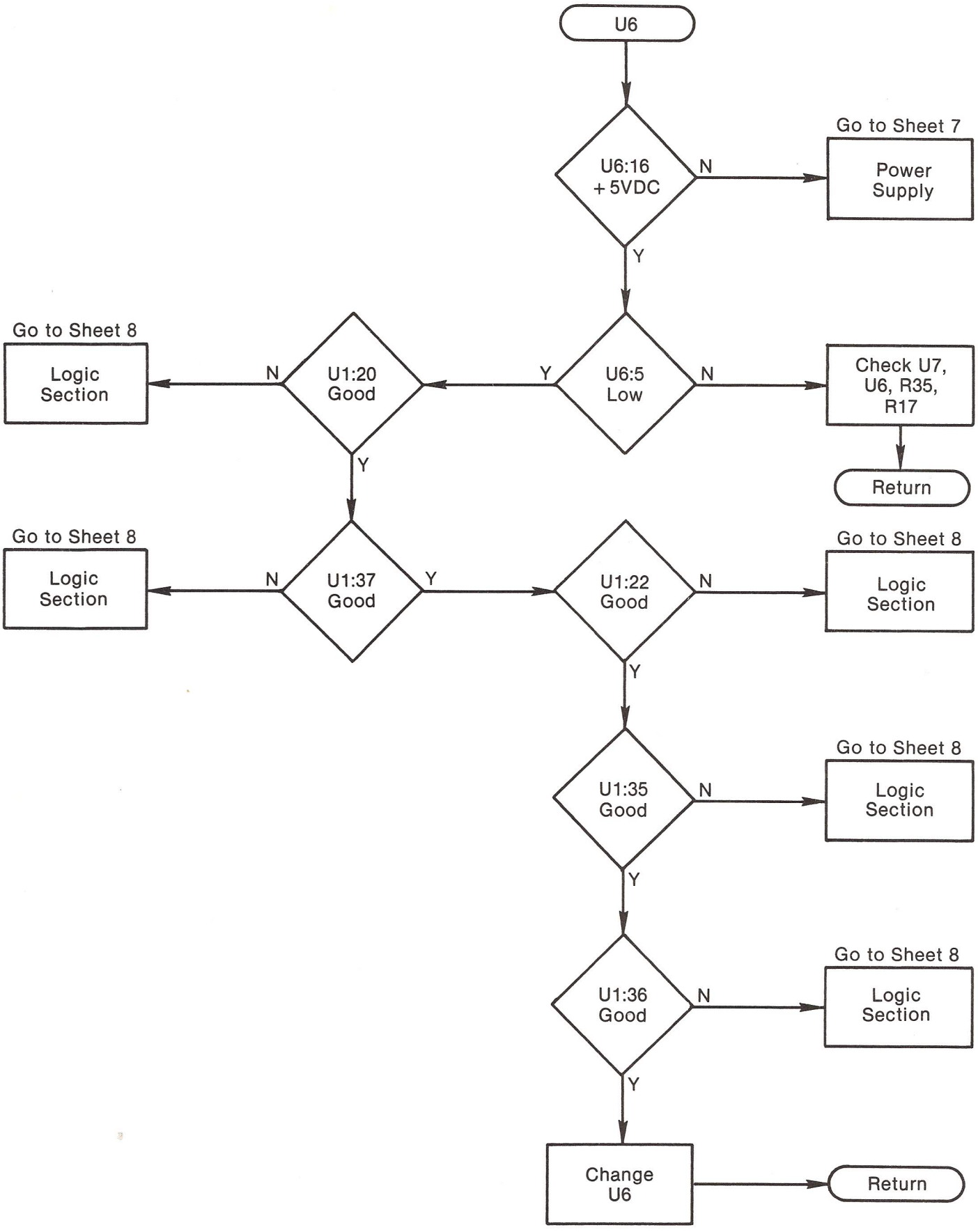

H
U9:15 Good
Y
N
Go to Sheet 13
U6
U9:1 Good
N
Check U10-U17 If Good Change U9
Return
Y
U9:2 Good
N
Check U10-U17 If Good Change U9
Return
Y
U9:11 Good
N
Check U10-U17, If Good Change U9
Return
Y
Check All to Make Sure They Are Active
U9:3-10 Good
N
Check U10-U17, If Good Change U9
Return
Y
U9:25-32 Good
N
Check U9, If Good Change U10-U17
Return
Y
Return

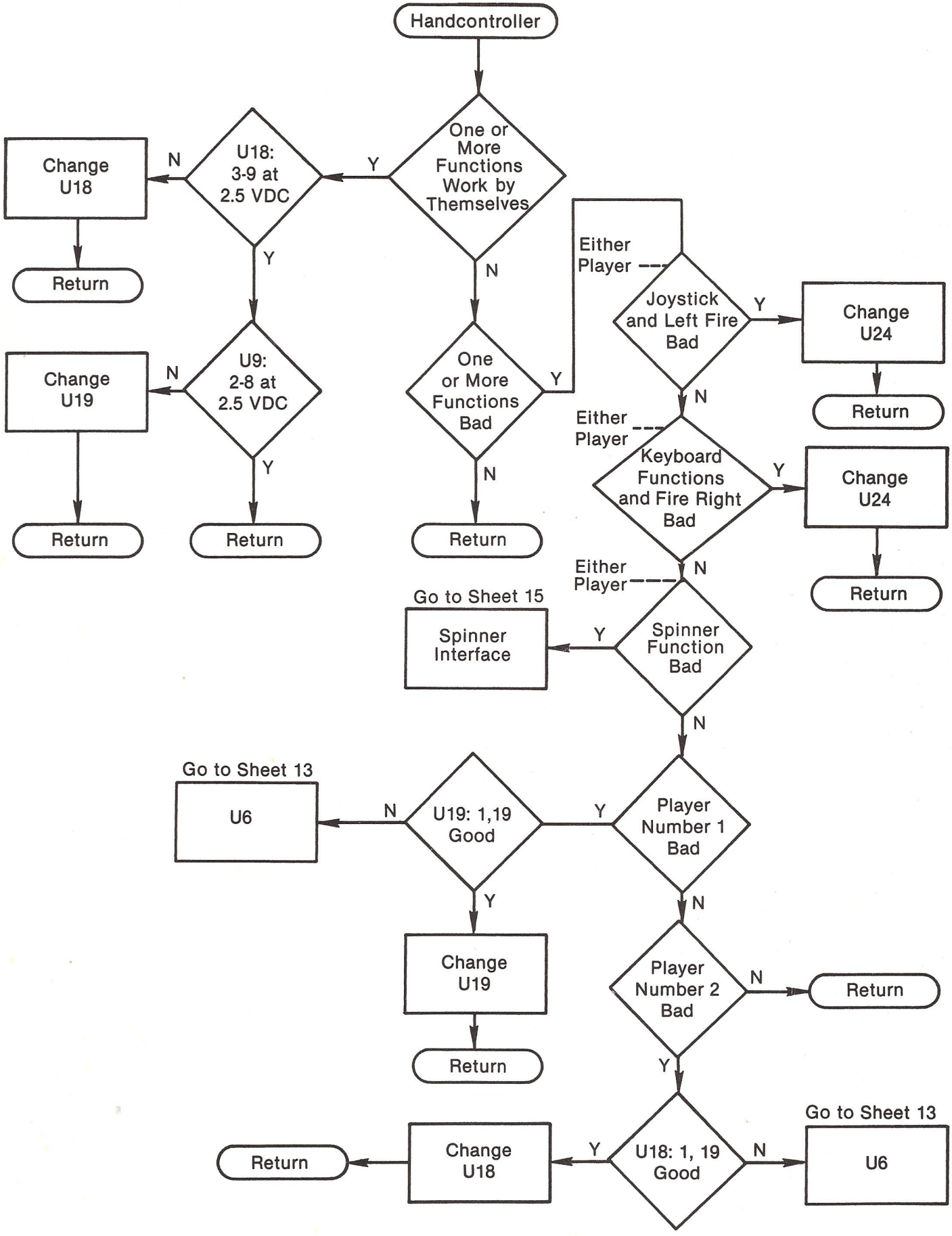

RF
J4:4 12VDC
Y
N
Go to Sheet 7
Power Supply
Check on Logic Board Side
J4:3 Good
Y
N
C66(–) Good
N
Check L7, C62, R40
Return
Y
Check C66, U23, RF Board
Return
Check on Logic Board Side
J4:7 Good
N
C67(–) Good
N
Check L8, C63, R41
Return
Y
Y
Check C67, U23 RF Board
Return
I

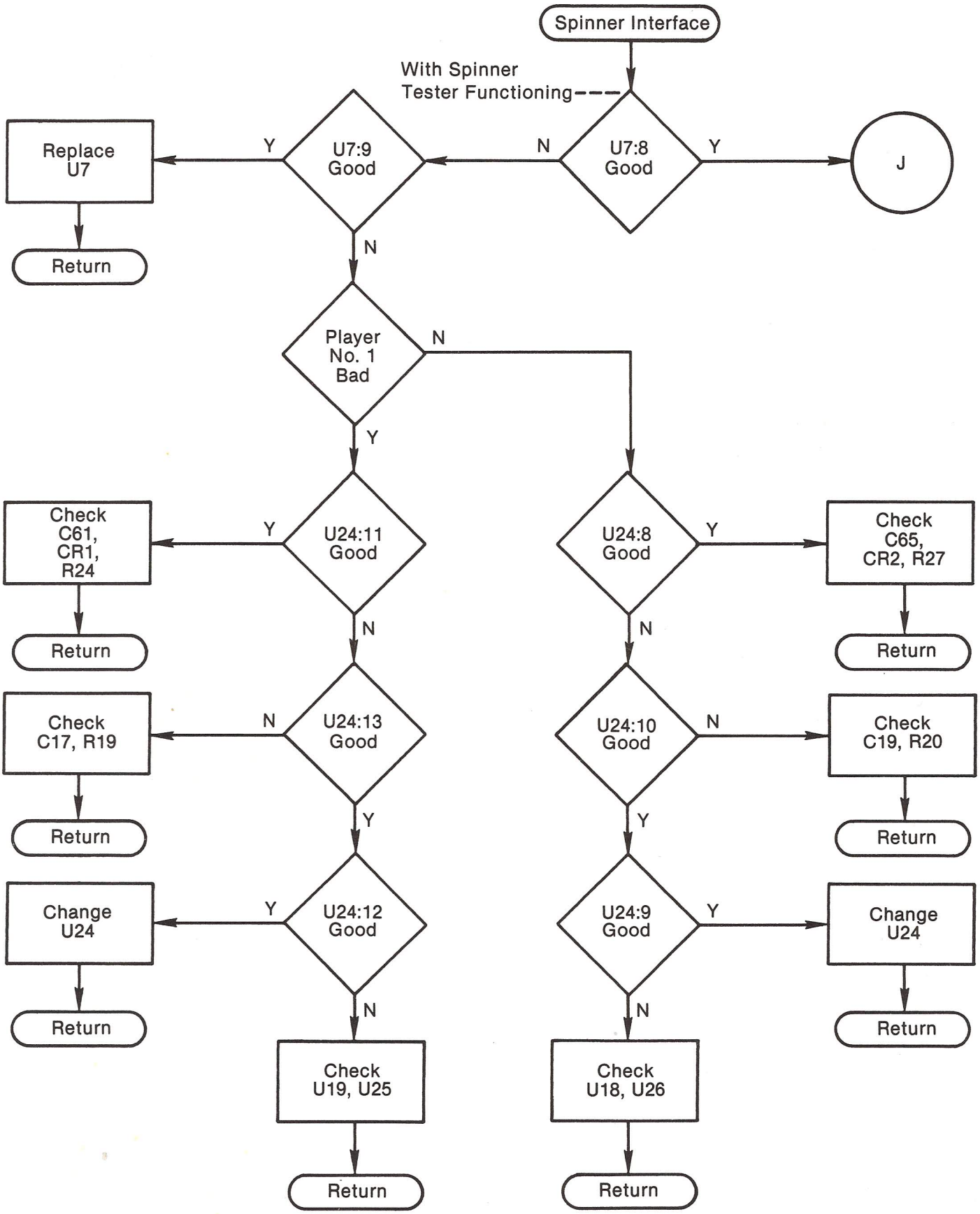

I
Check on Logic Board Side
J4:6 Good
N
U23:11 Good
N
Check Q6, L9, C68, C64, R42, U23
Y
Y
Change RF Board
Check Q3, C69, U23, R55
Return
Return
Return

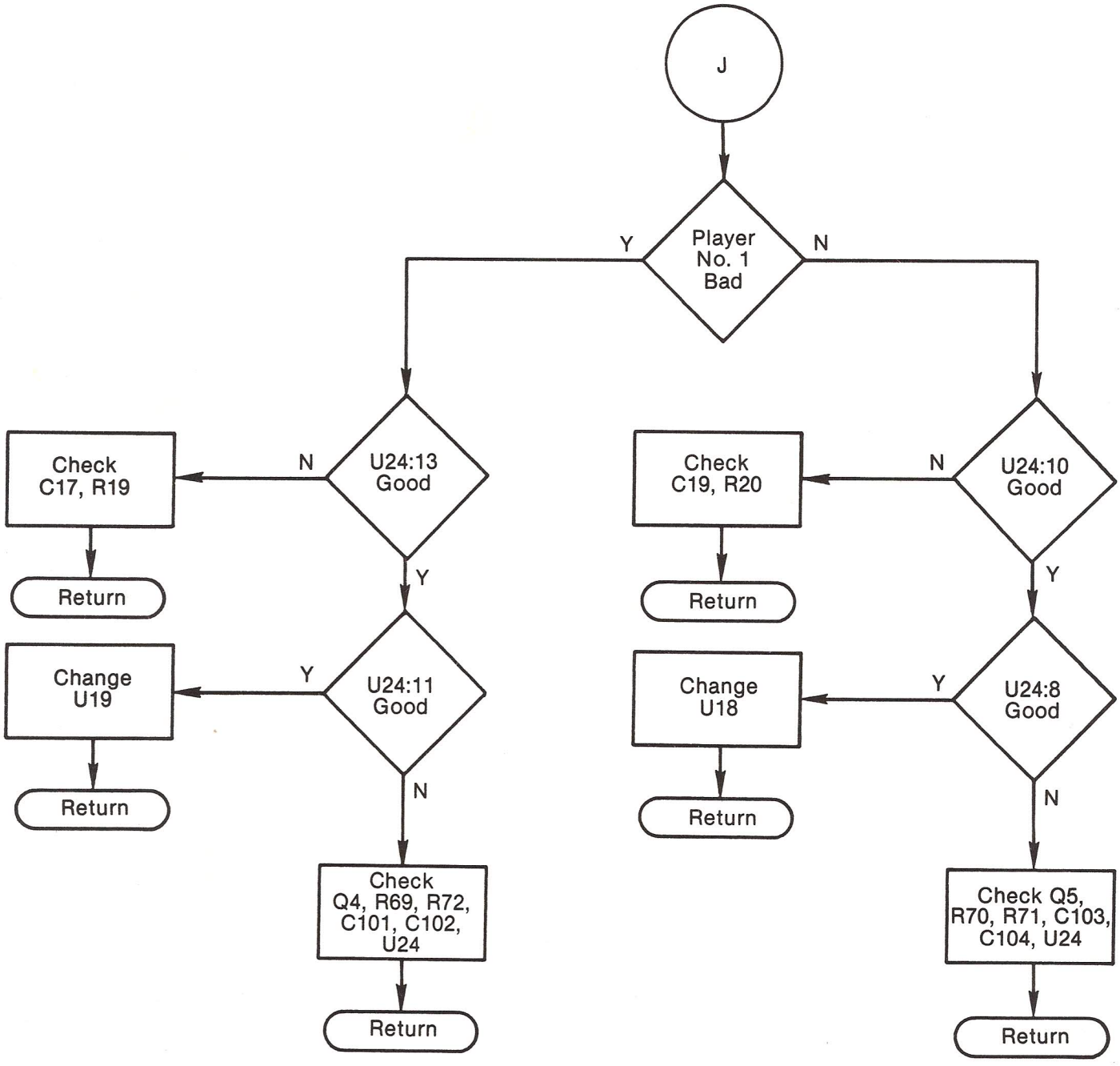

3.58 MHz Clock
U1:6 Dead
Y
N
U22:8 Good
N
Check Y1, U22, C1, C70, R75, R5, R6, U8
Return
Y
U8:8 Good
N
Change U8
Return
Y
U8:9 Good
N
Check Q2, U8, C4, R13, R11
Return
Y
Check R60, R26, U1
Return
Check Frequency
U1:6 Good
N
Check Y1, U22, C1, C70, R75, R5, R6, U8
Return
Y
Check Signal Quality (Ringing)
U1:6 Good
N
Check U22, U8, Q2
Return
Y
Return


10.7 MHz Clock
U8:9 Good
N
Go to Sheet 11
3.58 MHz Clock
Y
U22:1 Good
N
Check C90, R62, U22, C92, L14
Return
Y
U22:3 Good
N
Check C91, U22, L14, C92
Return
Y
U22:4 Good
N
Check U22, U9
Return
Return


U6
U6:16
+5VDC
N
Go to Sheet 7
Power
Supply
Y
U6:5
Low
Y
N
Check U7,
U6, R35,
R17
Return
U1:20
Good
N
Go to Sheet 8
Logic
Section
Y
U1:37
Good
N
Go to Sheet 8
Logic
Section
Y
U1:22
Good
N
Go to Sheet 8
Logic
Section
Y
U1:35
Good
N
Go to Sheet 8
Logic
Section
Y
U1:36
Good
N
Go to Sheet 8
Logic
Section
Y
Change
U6
Return


Handcontroller
One or More Functions Work by Themselves
Y
U18: 3-9 at 2.5 VDC
N
Change U18
Return
Y
U9: 2-8 at 2.5 VDC
N
Change U19
Return
Y
Return
N
One or More Functions Bad
Y
N
Return
Either Player
Joystick and Left Fire Bad
Y
Change U24
Return
N
Either Player
Keyboard Functions and Fire Right Bad
Y
Change U24
Return
N
Either Player
Spinner Function Bad
Y
Go to Sheet 15
Spinner Interface
N
Player Number 1 Bad
Y
U19: 1,19 Good
N
Go to Sheet 13
U6
Y
Change U19
Return
N
Player Number 2 Bad
N
Return
Y
U18: 1, 19 Good
Y
Change U18
Return
N
Go to Sheet 13
U6


Spinner Interface
With Spinner Tester Functioning
U7:8 Good
Y
J
N
U7:9 Good
Y
Replace U7
Return
N
Player No. 1 Bad
N
Y
U24:11 Good
Y
Check C61, CR1, R24
Return
N
U24:13 Good
N
Check C17, R19
Return
Y
U24:12 Good
Y
Change U24
Return
N
Check U19, U25
Return
U24:8 Good
Y
Check C65, CR2, R27
Return
N
U24:10 Good
N
Check C19, R20
Return
Y
U24:9 Good
Y
Change U24
Return
N
Check U18, U26
Return


J
Player No. 1 Bad
Y
N
U24:13 Good
N
Check C17, R19
Return
Y
U24:11 Good
Y
Change U19
Return
N
Check Q4, R69, R72, C101, C102, U24
Return
U24:10 Good
N
Check C19, R20
Return
Y
U24:8 Good
Y
Change U18
Return
N
Check Q5, R70, R71, C103, C104, U24
Return