The JBL logo is displayed in white, bold, sans-serif capital letters on a black rectangular background. The letters are closely spaced, with the 'J' and 'B' being particularly prominent.

**JBL**

**Professional  
Video  
Products**

# **FIELD SERVICE GUIDE MODEL 6810 AND 6820 VIDEO PROJECTOR**

## **SAFETY NOTICE!**

**ANY PERSON ATTEMPTING TO SERVICE THIS CHASSIS MUST FAMILIARIZE HIMSELF WITH THE CHASSIS AND BE AWARE OF THE NECESSARY SAFETY PRECAUTIONS TO BE USED WHEN SERVICING ELECTONIC EQUIPMENT CONTAINING HIGH VOLTAGES.**

## **CAUTION!**

**USE AN ISOLATION TRANSFORMER WHEN SERVICING THIS UNIT.**

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## Servicing And Safety Precautions

1. Be careful of shock hazard when operating projector with the cover off.
2. Use an isolation transformer when servicing the unit to protect both the set and the test equipment electronics.
3. Always wear safety glasses when servicing CRT's.
4. Do not remove solid state devices from circuits while the set is turned on.
5. Do not operate the set for long periods of time when the shutdown circuit defeated.
6. Be certain that each voltage test is made from the correct ground.
7. Be certain that all grounds, ground straps, and wires are properly connected to protect the set electronics and the user from shock.
8. Always check for shock hazard after completion of chassis repairs. Refer to Service Manual for proper "Safety Check" procedures.

## Introduction

This Service Guide includes instruction for the Model 6810 Projection TV circuitry. It includes adjustment procedures plus symptom and troubleshooting charts to locate either faulty panels, socketed solid state devices, or modules. A signal flow block diagram and panel/module layout diagrams are included.

Before exchanging panels or modules, it is important to make some preliminary checks. These checks include: operation of the customer controls, cable connections and plug seating, accessory connection, antenna connections, and operational mode checks. On sets using on-screen characters, observation of the screen is very useful in troubleshooting. If these checks do not locate the problem, then the Cover must be removed and a visual inspection made of all wiring harnesses and connectors. Look for broken wires, overheated components, open fuses, etc. If the visual check and preliminary inspection does not locate the malfunction, use the Troubleshooting Charts, listed by symptom and page number in the Symptom Index.

**NOTE: Use an isolation transformer when troubleshooting this chassis! The unit has two ground systems. It is very important to use the correct ground for test equipment when making measurements.**

### **Non-serviceable Adjustments**

The following non-serviceable adjustments are critical and should not be adjusted in the field: RP1 B+ Controller and RP2 HV Adjust on the Power Supply Panel, and RP1 Over Voltage Sense on the Deflection Panel. (These adjustments are sealed to prevent mis-adjustment.)

R7	AGC Delay	IF Module
L1	31.5kHz Osc	Horiz. Osc. Module
RP1	RGB Centering	Horiz. Osc. Module
RP2	Height	Horiz. Osc. Module
RP3	V. Linearity	Deflection Panel
C70	Color Osc.	Video Processor
RP1	Luminance Peak	Video Processor
RP4	Sub Brightness	Video Processor
RP5	Peak Contrast	Video Processor

## Using the Troubleshoot Charts

When using the Troubleshooting Charts, determine the symptom by screen observation and control action. Check the Symptom Index and find the symptom that most closely describes the problem. The page indicating that kind of problem has the Troubleshoot Chart dealing with it. The Troubleshoot Charts list adjustments, panels and modules to be checked. If a check results in a symptom change, locate the new symptom in the Index and follow the chart directions.

## Two Ground System

The two ground system used on the Power Supply Panel and Deflection Panel are "AC" or "Hot" ground and "Signal" or "Cold" ground. Test points TP3 and TP9 are measuring equipment grounds used when checking ac line connected circuits. "Signal" or "Cold" ground test points TP1 and all shielding on the signal plugs to panels and modules are used for test equipment grounds when measuring circuits connected to "Signal" ground.

Isolation between "Hot" ground and "Cold" ground is developed by Power Transformer T1, HV Transformer T4, and Optic Coupler IC1 on the Power Supply Panel. Horizontal Drive Transformer T1 and Horizontal Output Transformer T2 provide the isolation on the Deflection Panel.

## Isolation Protection

It is imperative an Isolation Transformer be used on the two-ground system to protect the test and measuring instruments as well as the set electronics from mis-polarized ac line cord plugs.

## TV System Overview

When the Power plug is connected to the ac line, Stand-by voltage is fed to the TS10P Controller, **Figure 1**, and regulated to 5Vdc to keep the Microcomputer alive. A Power-On key press at the Remote Transmitter or on-set Keyboard tunes the set to Channel 3, selects the Antenna RF Input, and places the audio system in the Monaural mode. The TS10P Controller displays on-screen graphics to identify the mode. The Microcomputer accepts all data from the keyboard. If the channel data is incorrect, the TS10P display blinks six times and on the seventh blink reverts to the previous channel number. Incomplete channel numbers revert to the previous channel if the second digit is not entered within eight seconds. Zero cancellation is used on all numbers below 10. Volume is controlled in 64 steps. Sound is muted until the channel is tuned and when the Mute key is pressed on the Remote Transmitter. Press the Remote Transmitter Mute button or Volume Up button to un-mute.

**Figure 2** shows the Panel and module functions, interconnect cables, plugs, and jacks. The heavier lines identify the signal flow from the RF Switcher to the Stereo Speaker terminals and the Red, Green and Blue CRTs. Switching signals, control voltages, and other operational voltages are shown with lighter lines.

## Adjusting a new CRT

After installing a new CRT, check the position of the new CRT raster against the Crosshair pattern of the other two CRTs using the following procedure.

1. Place the alike magnetic ring tabs together.
2. Rotate the yoke to position the crosshair patterns together. If the patterns do not match, adjust the magnetic ring tabs to position the crosshair points together.
3. Use a Crosshatch pattern generator to check the overall convergence, and touch up convergence if necessary.

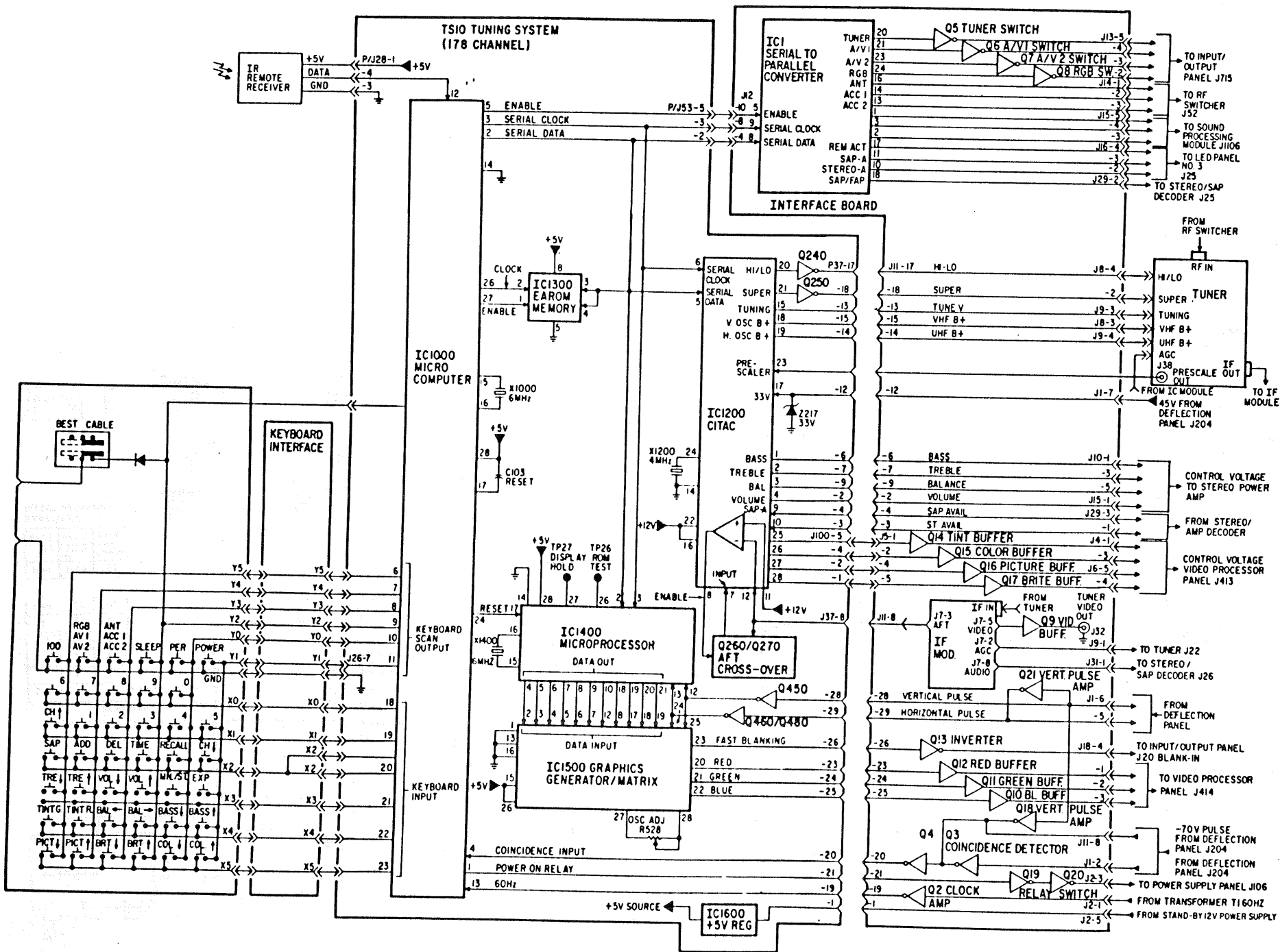


Figure 1 - TS10 Tuning System Block Diagram

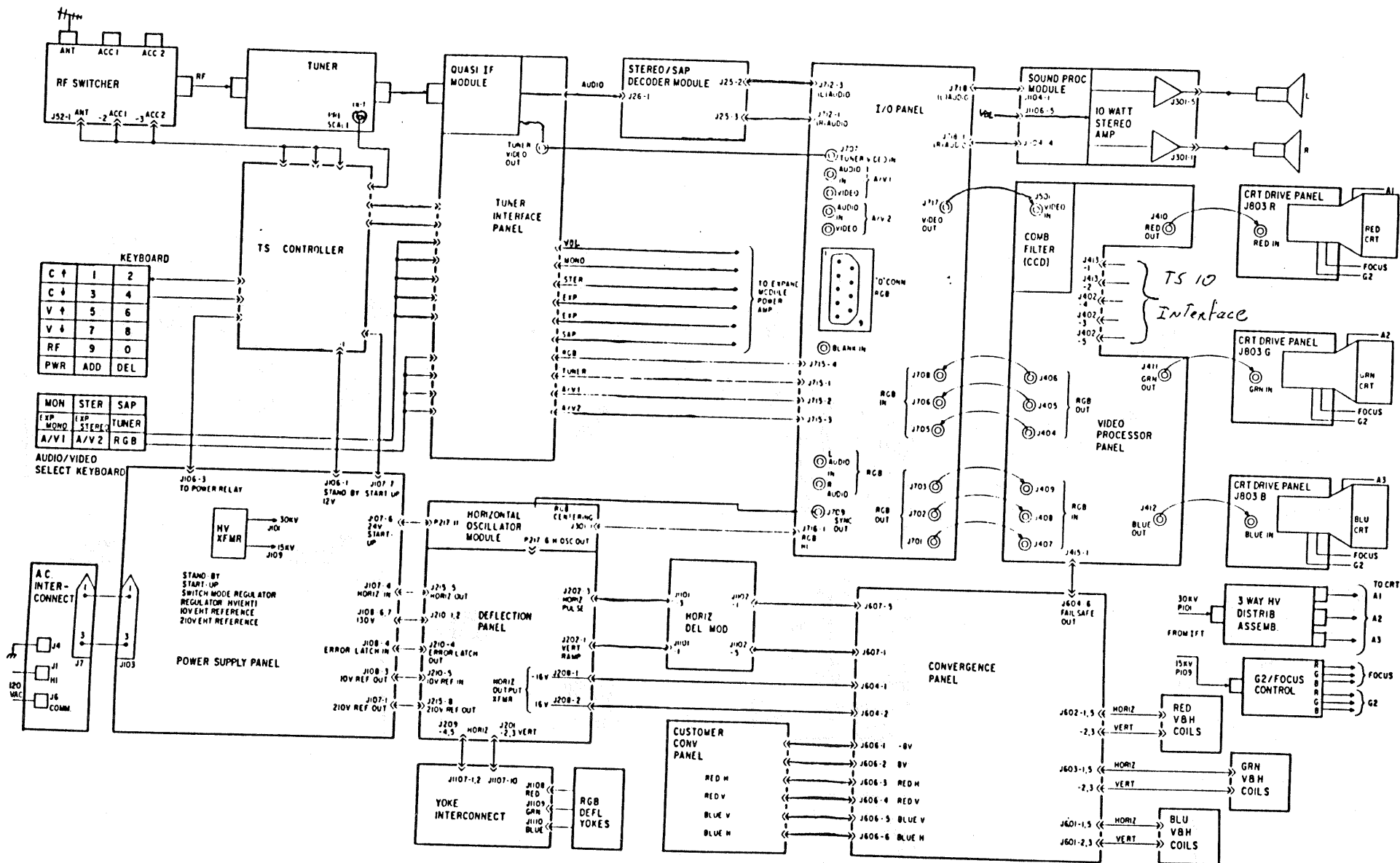


Figure 2 - Signal Flow Block Diagram

## **Electro/Mechanical Focusing Procedure**

1. Set the Brightness, Picture, and Color controls for best picture.
2. Loosen the wing nuts on each lens.
3. Adjust the electrical Focus control to each CRT for sharpest scan lines viewed on the tube faceplate through the lens.
4. Mechanically focus each lens for sharpest picture viewed on the screen.

## **Adjustment Procedures**

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### **Non-serviceable Areas**

The non-serviceable areas found on the Power Supply Panel and Deflection Panel are circuits, components and controls which are not to be repaired nor adjusted. Should a malfunction occur in these areas, the fault is repaired by replacing the panel.

### **Horizontal Oscillator**

The 31.5kHz Oscillator on the Horizontal Oscillator Module is adjusted as follows:

1. Jumper the two pins at TP301. The picture will roll vertically and horizontally.
2. Adjust oscillator coil L1 until the picture rolls slightly or stands still.
3. Remove the jumper from TP301. The picture should lock. If the picture does not lock, check the symptom index for the troubleshooting chart describing the condition viewed on the screen.

### **AGC**

The AGC control is located inside the IF Module. It is accessed through the hole in the top of the module identified as Delayed AGC. Use a plastic hex alignment tool to reach the AGC control shaft.

1. Tune the set to a strong TV channel.
2. Rotate the control while watching the screen.
3. At the point when the picture becomes noisy, rotate the control in the opposite direction until the noise disappears.
4. Check the other strong channel for noise, and readjust AGC as required.

### **Vertical Height**

The Vertical Height control (RP2) is located on the Horizontal Oscillator Module. The Vertical Linearity control (RP3) is located below RP1 on the Horizontal Oscillator Module.

1. With a crosshatch or picture adjust the Height control to fill out the picture area.
2. Adjust the Vertical Linearity control to correct nonlinearity in the pattern or picture.
3. Readjust both controls as required for best picture linearity.

### **Computer Text Centering**

If the computer text area is off-center, lift the convergence board to access the Horizontal Oscillator Module. The RGB Centering adjustment (RP1) is located on the lower right.

1. Plug the computer cable into the RGB "D" Connector, located in the Jack Plate.
2. Select the computer input with the RGB button on the customer control panel.

3. Observe the viewing screen and adjust RP1 to center the text on the raster.

### **White Balance/Gray Scale Tracking**

The CRT Drive Controls (RP1 on the CRT Drive Panels) and Screen or G2 Controls (on the G2/Focus Assembly between the red and green lenses) are adjusted using the following steps.

1. Set the Picture, Sharpness, and Brightness controls at midrange.
2. Turn the Color fully down.
3. Set all CRT Drive Controls to maximum (CW) and the Screens to minimum (CCW).
4. Tune the set to a snowy channel.
5. Move Service Plug J216 on the Deflection Panel to the service Set-Up position.
6. Adjust each G2 control to obtain a faint line (which appears white with all three colors).
7. Return the Service Plug to the normal position.
8. Check gray scale tracking. Adjust the Brightness control from maximum to minimum, watching for possible color shift.
9. Re-adjust the CRT Drive controls for best high to low light gray scale.

### **Video Processor Panel Controls**

1. Set all customer controls to midrange.
2. Insert a bar pattern from an NTSC generator.
3. Set RP5 (Peak contrast) to full CCW.
4. Adjust RP4 (Subbrightness) until the last line is black.
5. Adjust RP2 (Black level) until the first bar is white.
6. Adjust RP3 (Subpicture) for a sharp, uniform division between bars.
7. View a picture with bright white highlights. Check for blooming in the white areas or raster edge. Readjust RP2 and/or RP4 until blooming disappears.

NOTE: If a bar pattern generator is not available, the adjustments may be made on a high white level picture. Begin with RP2 and RP4 set fully CCW. RP5 should always be set fully CCW. Set RP3 to 75% rotation towards CCW. Begin rotating RP2 CW until minimum blooming in the white areas is observed. If the overall picture brightness is below proper viewing level before this occurs, turn RP4 CW slightly and begin procedure again with RP2 full CCW. Repeat until picture has bright whites, proper black level and acceptable contrast with no blooming or raster bounce.

### **Luminance Peaking Control**

The Luminance Peaking adjustment is made using the internal Crosshair pattern and the tuner on a live channel. RP1, Peak Luminance control, is located on the Video Processor Panel next to the Comb Filter.

1. Set the Picture control to midrange.
2. Set the Brightness control to midrange.
3. Set the Sharpness control to full CW.
4. Adjust RP1 until minimum ringing occurs at the left edge of the vertical line.

NOTE: These troubleshooting charts can not be all inclusive. They are meant to be a service guide only. There are several safety and/or protection circuits in the set which, if activated, can resemble or mask the actual defect. One such circuit is the vertical failsafe circuit which can cause a loss of video. Use of the service manual will be needed to resolve this type of problem.



<b>Symptom</b>	<b>Page</b>
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No Audio - Chart 3	18
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## Power Supply Panel

The Power Supply Panel, Figure 3, is not to be repaired or adjusted. It has nonsocketed devices, and service adjustments in the NONSERVICE areas are sealed by metal covers. However there are some checks in the Troubleshooting Charts that show if the panel needs replacing. Check the Symptom Index.

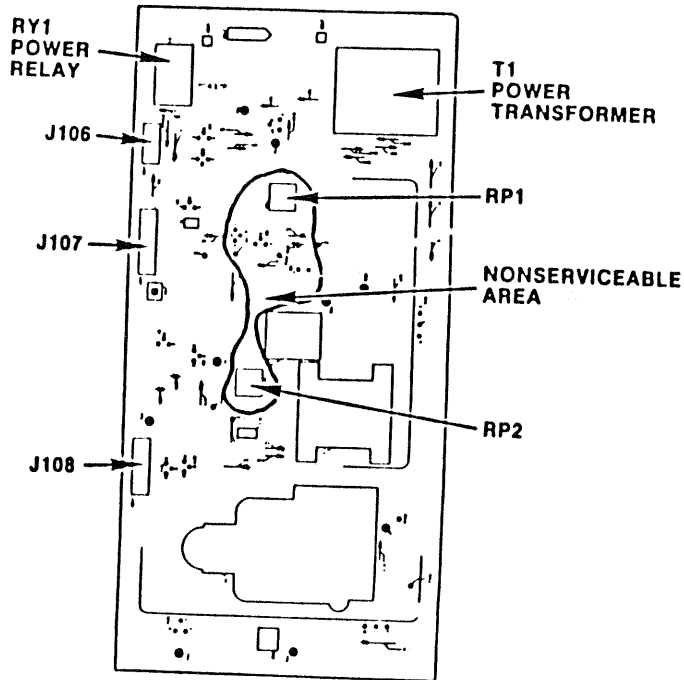


Figure 3 — Power Supply Panel

POWER SUPPLY PANEL	
Voltages	Test Points
• 12Vdc Stand-by	J106-1
• 24Vdc Start-up	TP2, J107-7
• 305Vdc	TP6
130Vdc	TP7, J108-6
6.8Vdc	TP5

## Deflection Panel

The Deflection Panel, Figure 4, uses one socketed IC in the vertical circuit. IC3 is the Vertical Ramp Amp, which drives the Vertical Waveform Amp IC4 on the Convergence Panel. Should service be necessary in other circuits, the Deflection Panel is replaced.

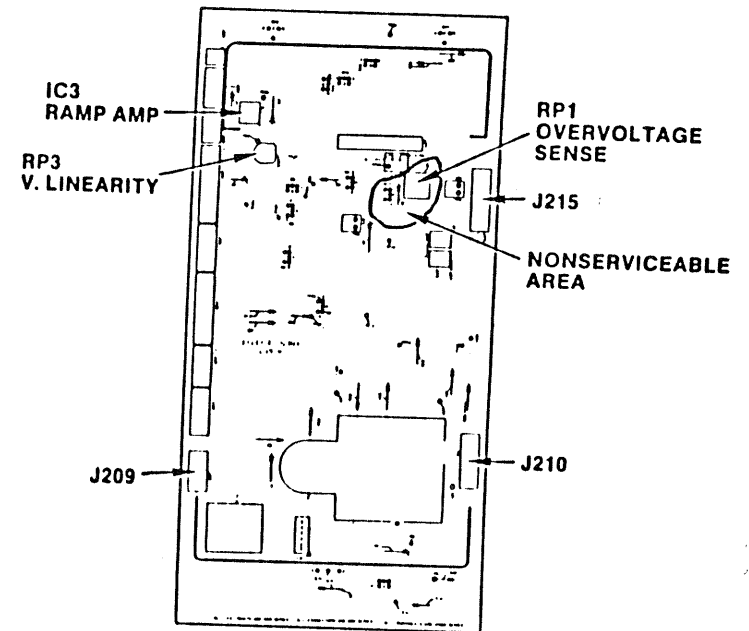


Figure 4 — Deflection Panel

DEFLECTION PANEL	
Voltages	Test Points
24Vdc Start-up	J215-2, J217-11
130Vdc	J210-1, TP11
16Vdc Derived	TP12, J208-2
-16Vdc Derived	TP13, J208-1
	J206-8
24Vdc Derived	TP14, J206-7
	J204-1, J205-4
	J215-3
13Vdc Derived	TP15, J206-1
	J205-6, J207-5
	J204-2, TP11
	J203-3, J202-5
200Vdc Derived	TP16, J205-1
45Vdc Derived	TP17
40Vdc Derived	J204-4
210Vdc Derived	J215-8
10Vdc Derived	J108-3

## All Band Tuner

The All Band Tuner, Figure 5, is interconnected to the Controller by plugs P/J21 and P/J22. There are no service adjustments or plug-in components. Malfunctions are serviced by replacing the tuner. Refer to page 42 for P/J21 and P/J22 voltages.

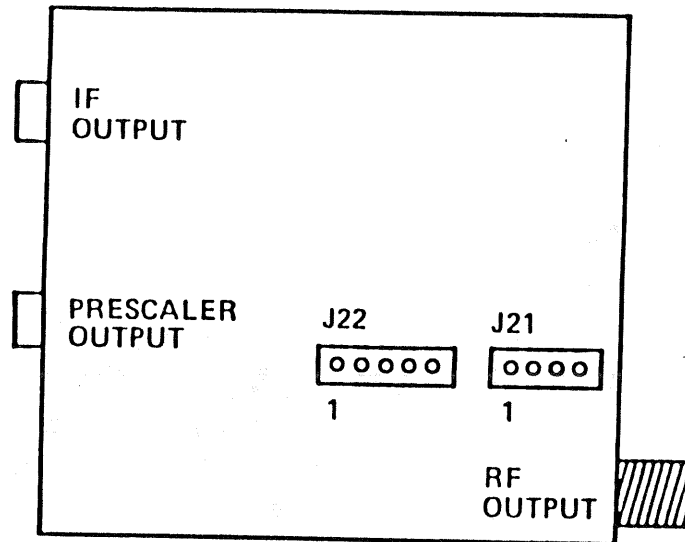


Figure 5 — All Band Tuner

## TS10P Tuner Interface Panel

The plug-in devices on the TS10P Interface Panel, Figure 6, are: IF Module, Controller, and Serial/Parallel Converter IC1 which outputs switching voltages for selecting RF and Accessory Inputs, and sound processing modes. Malfunctions in the remaining circuits are serviced by replacing the panel.

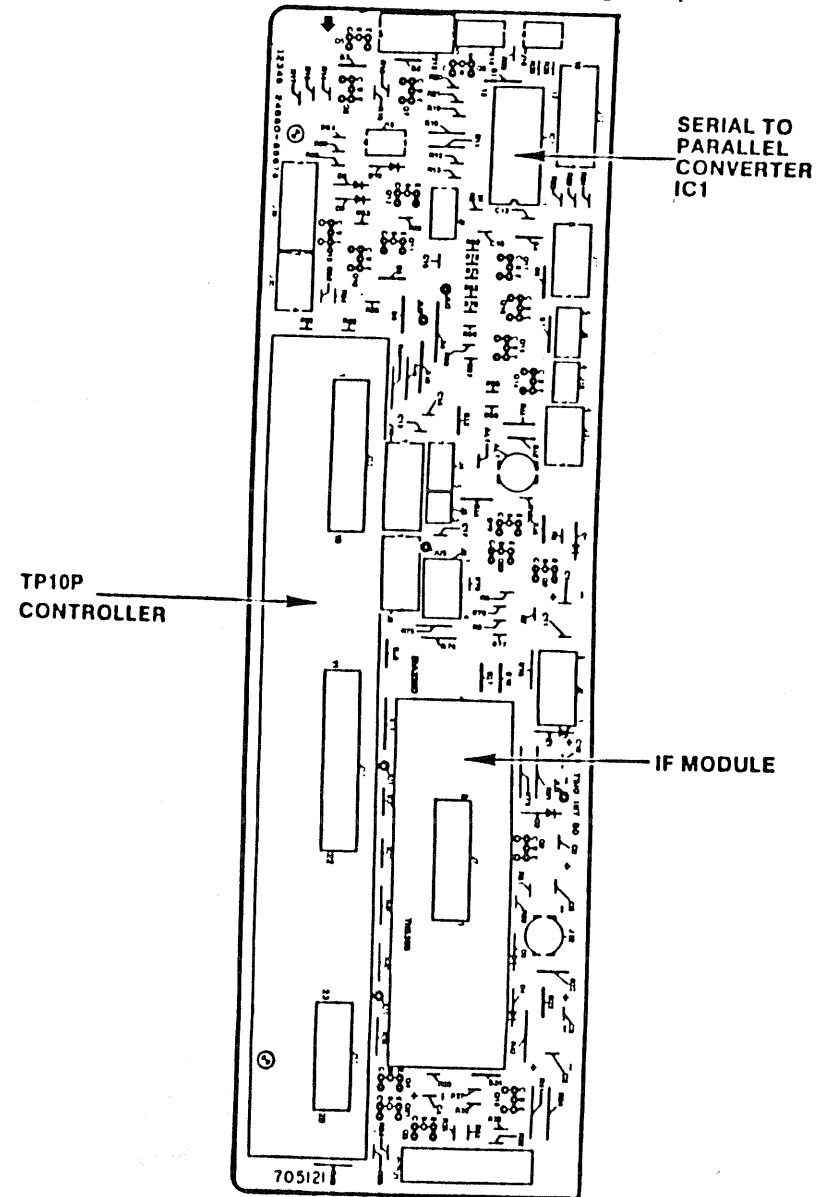


Figure 6 — TS10P Tuner Interface Panel

## TS10P Controller

The plug-in devices on the TS10P Controller, Figure 7, are: Microcomputer IC1000, CITAC IC1200, and Microcomputer IC1400. The Controller is replaced if a malfunction is in the remaining circuitry.

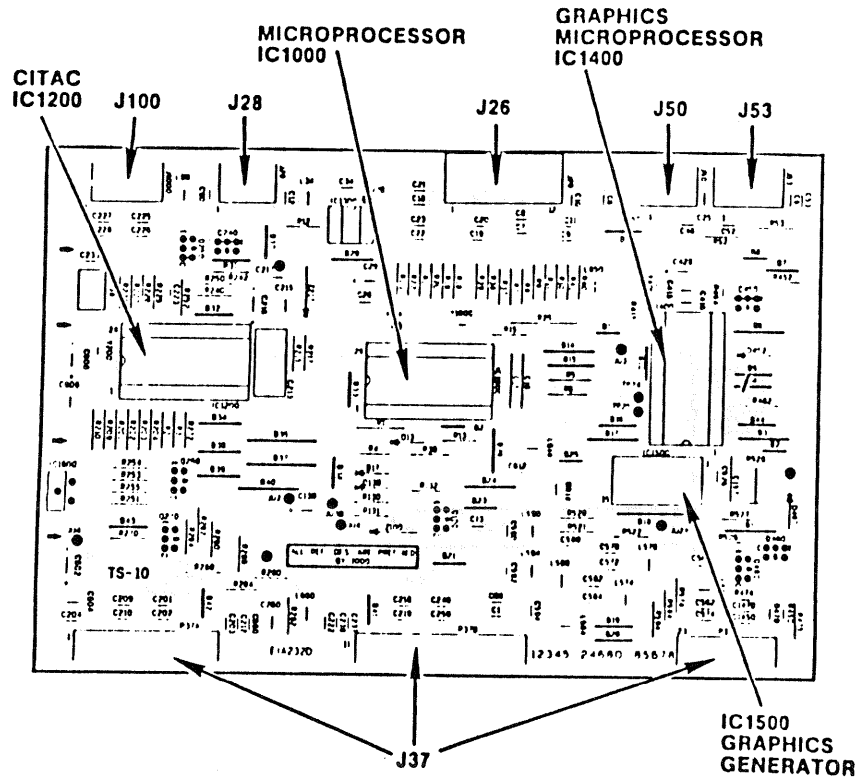


Figure 7 — TS10P Controller

## Audio/Video Input/Output Panel

Video, Sync, Audio, and RGB Video switching is done by five socketed Bilateral Switch ICs. A sixth device, not socketed, is the Sync Corrector IC6. Malfunctions in the Sync Corrector and other nonsocketed device circuits are serviced by panel replacement, Figure 8.

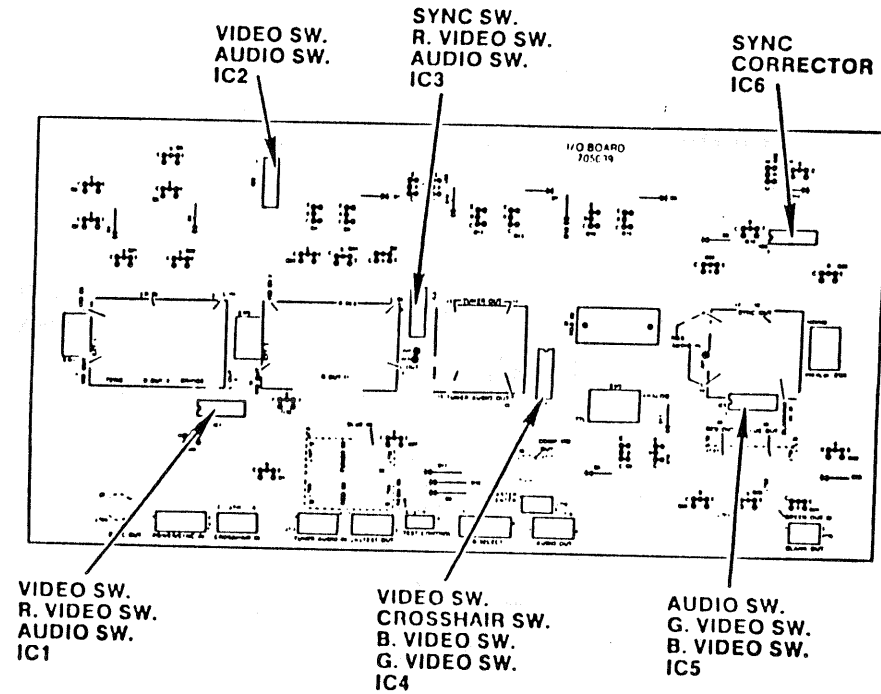


Figure 8 — Input/Output Panel

### Stereo/SAP Decoder Module

All solid state devices are nonsocketed. Monaural, Stereo or SAP audio malfunctions are serviced by Decoder Module replacement, Figure 9 .

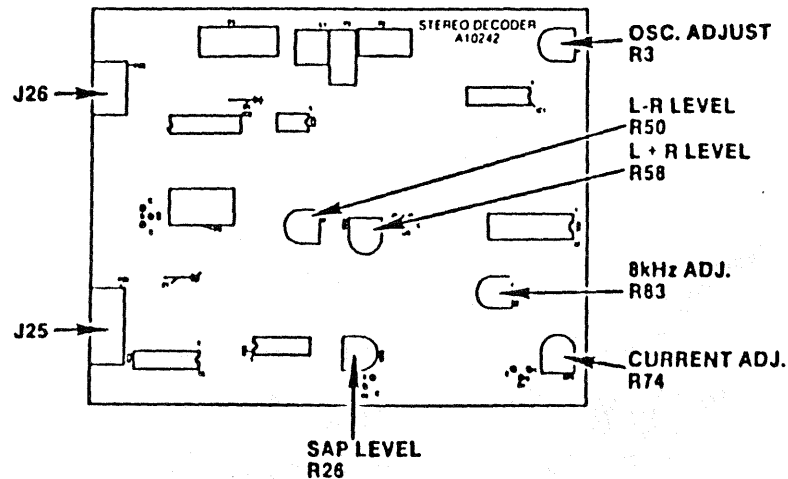


Figure 9 — Stereo/SAP Decoder Module

### Sound Processing Module

The Sound Processing Module, Figure 10, plugs into the Stereo Power Amp and has one Sound Processing IC socketed. This module is serviced by replacing Sound Processing chip IC2 or Sound Processing Module.

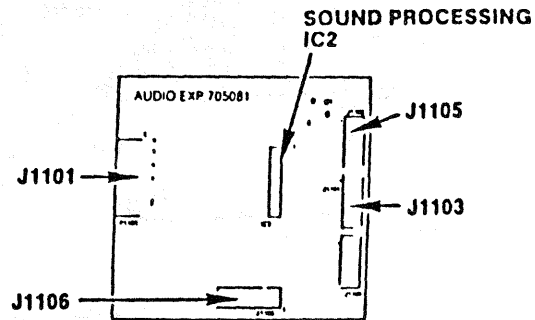


Figure 10 — Sound Processing Module

### Stereo Power Amplifier

All solid state devices on the Stereo Power Amp are nonsocketed. Any malfunction is serviced by replacing the Stereo Power Amp.

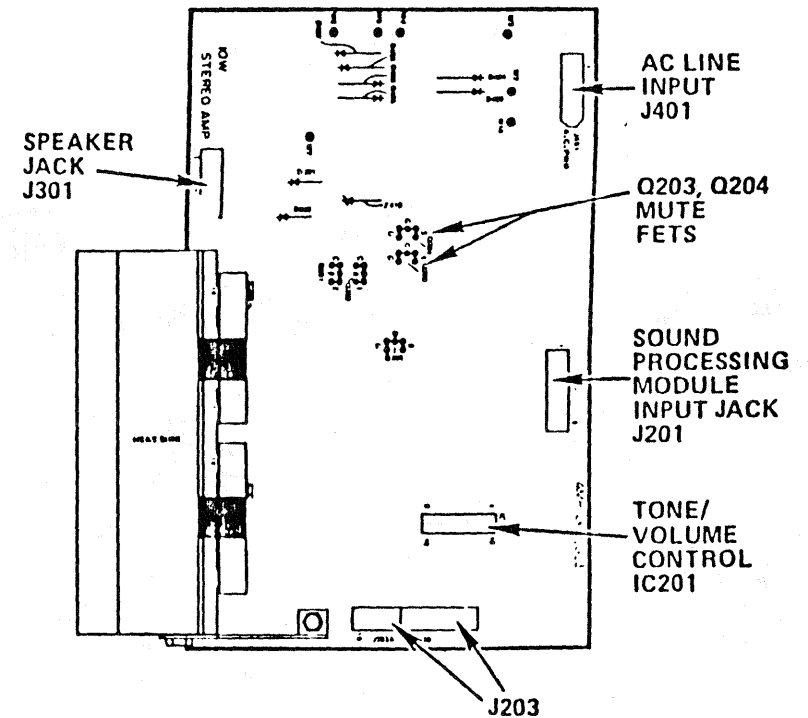


Figure 11 — Stereo Power Amplifier

## Video Processor Panel

The socketed ICs are: Video Processor IC2, Figure 12, RGB Processor IC4, Sand Castle Generator IC5 and RGB Buffer IC6. These ICs are replaceable. Malfunctions in the remaining circuits are resolved by panel replacement. There are five controls that adjust the composite video signal references and limits. These controls are referred to in the Panel and Module Adjustment procedures on the Content page.

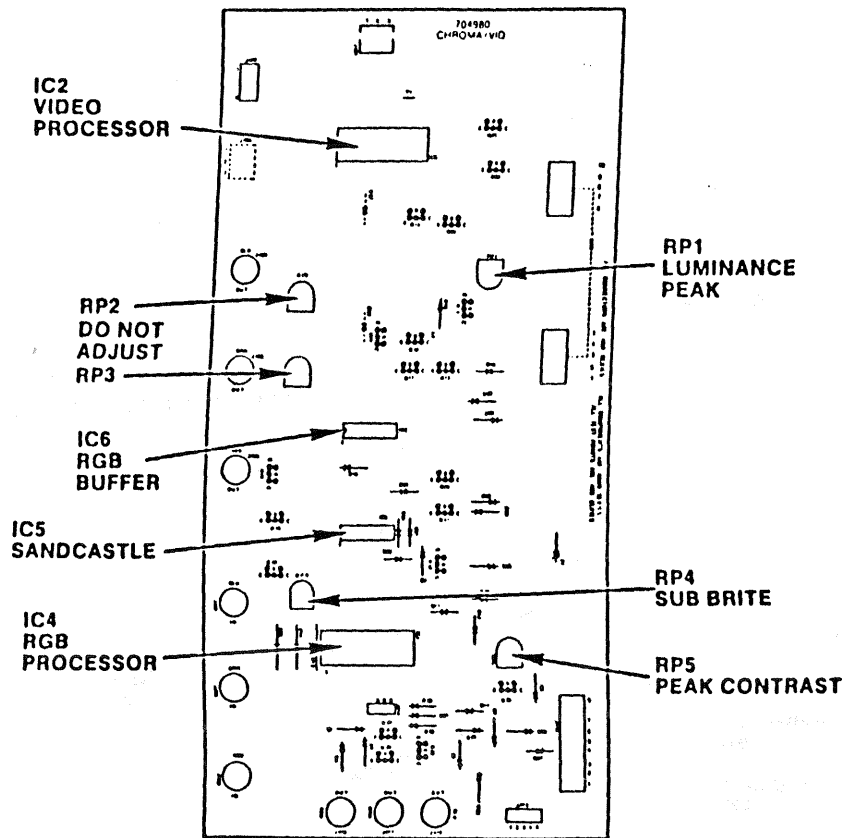


Figure 12— Video Processor Panel

## Comb Filter Module

The Comb Filter is a module, which is nonserviceable. It has no socketed solid state devices, and all controls are factory adjustments. Should this module require servicing, it is done with a replacement module, Figure 13.

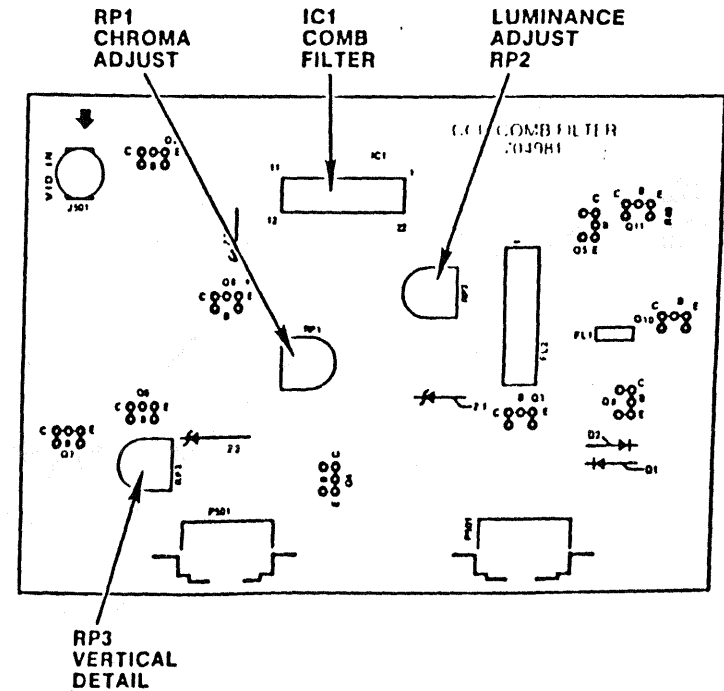


Figure 13— Comb Filter Module

## CRT Drive Panels

The Red, Green, and Blue CRTs are driven by identical panels, Figure 14. All solid state devices on the CRT Drive Panels are nonsocketed. Malfunctions on these panels are serviced by panel replacement.

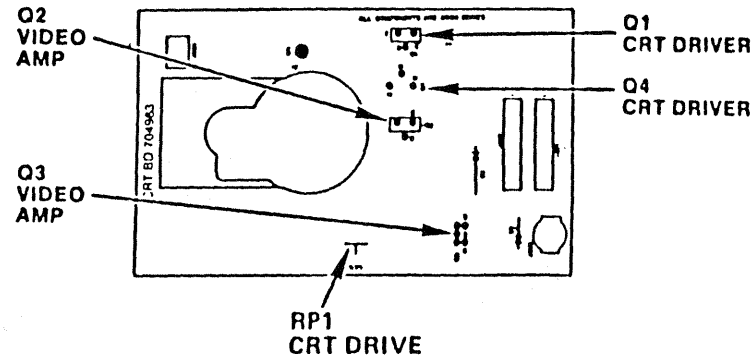


Figure 14 — CRT Drive Panel

## Horizontal Delay Module

The Horizontal Delay module, Figure 15, has all nonsocketed solid state devices. Malfunctions are serviced by adjustment or module replacement.

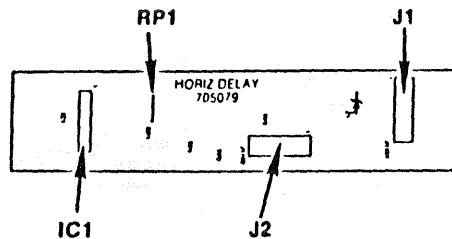


Figure 15 — Horizontal Delay Module

## Convergence Panel

All ICs are socketed on this panel except IC10 through IC15. Malfunctions created by circuitry other than ICs are serviced by panel replacement, Figure 16

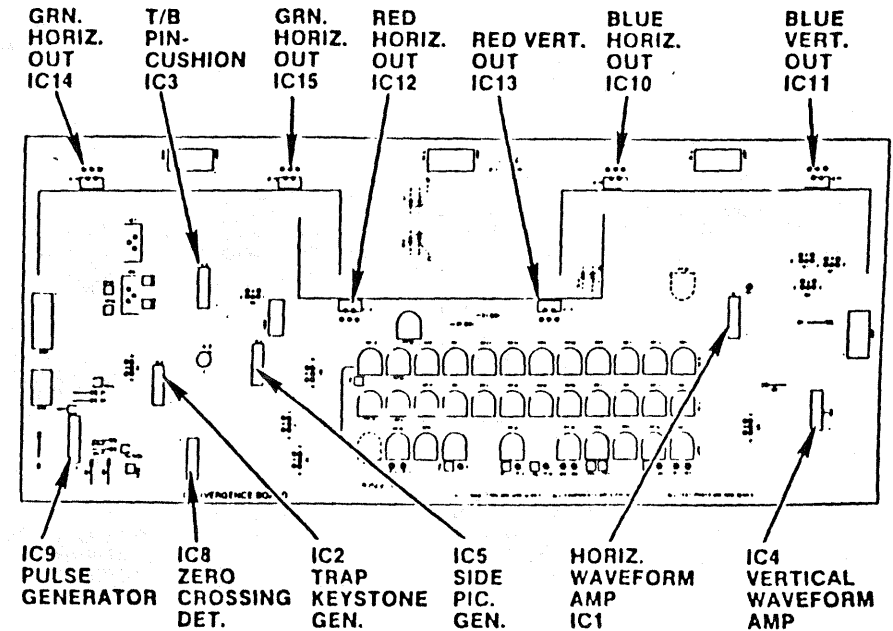
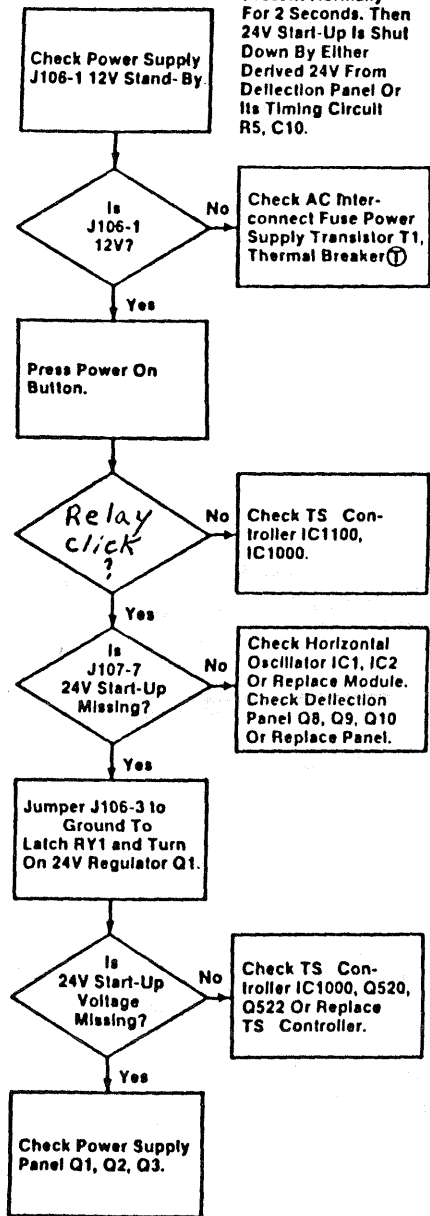
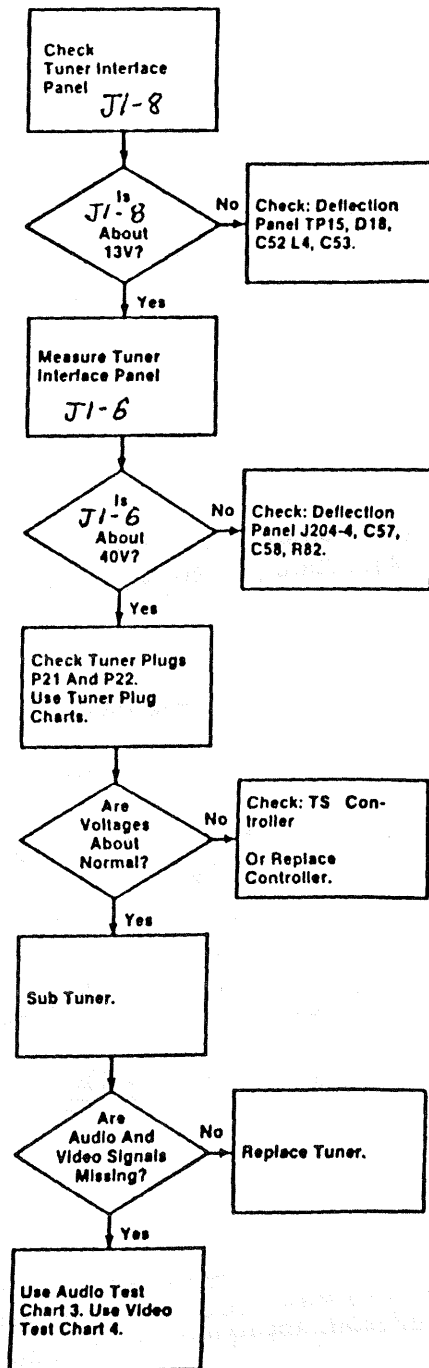


Figure 16 — Convergence Panel

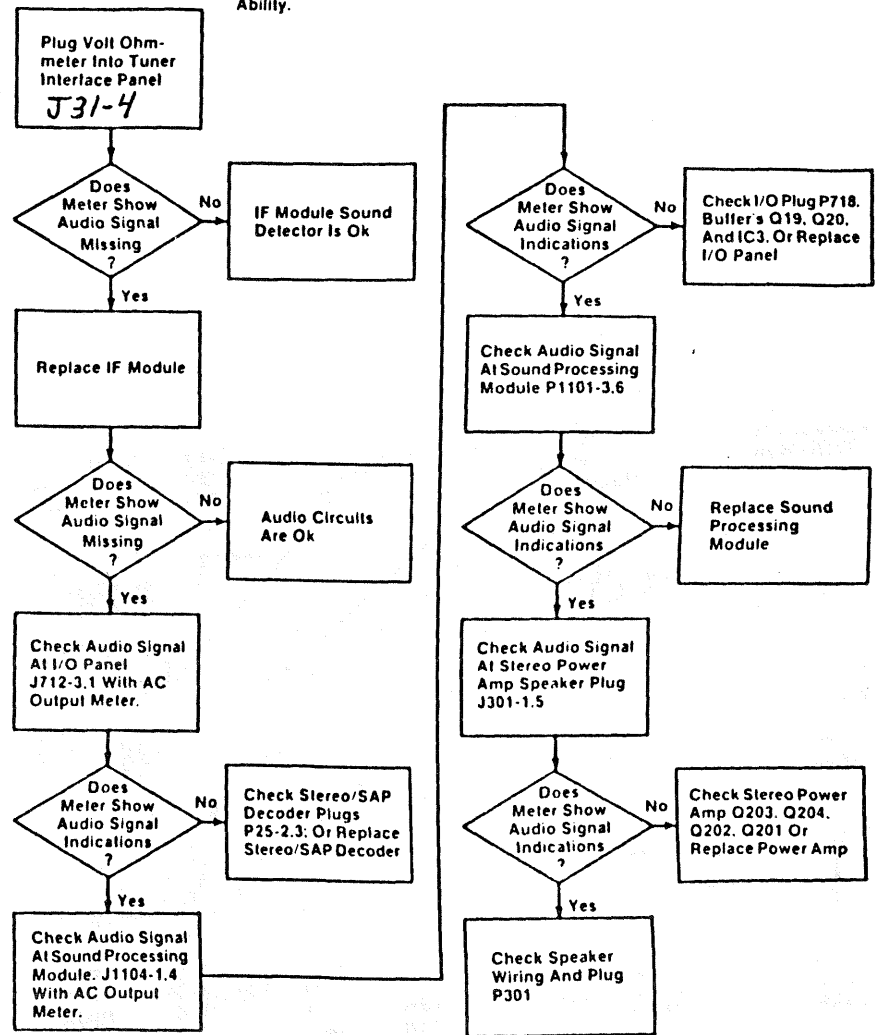
**Chart 1**  
Symptom:  
Dead Set



**Chart 2**  
Symptom:  
No Audio, No Video

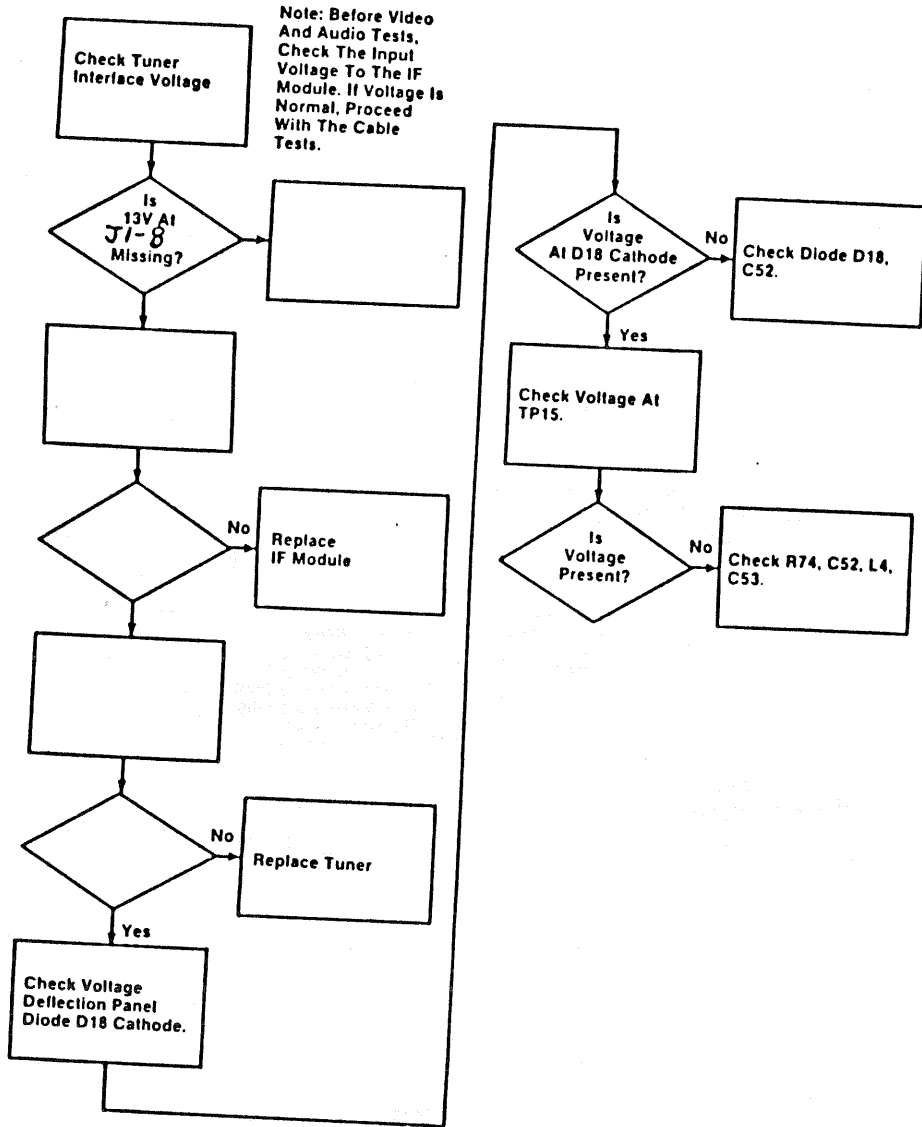


**Chart 3**  
Symptom:  
No Audio

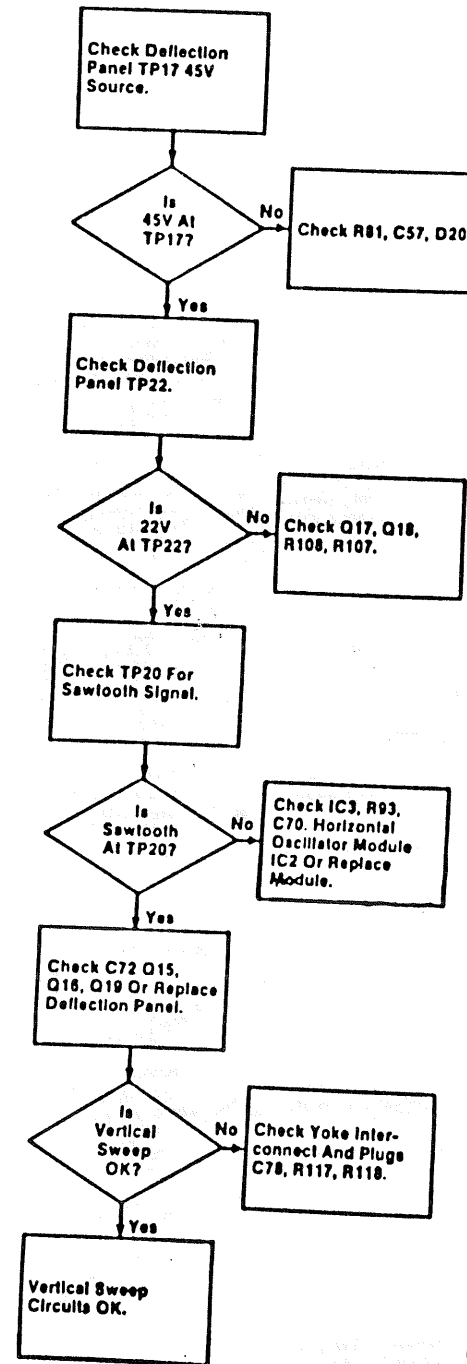




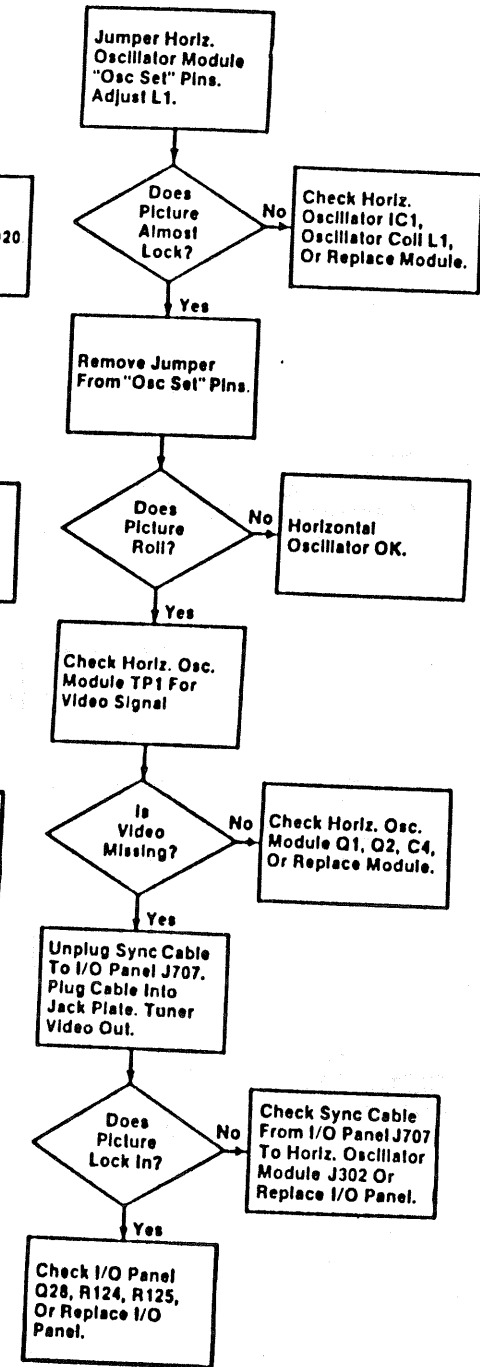
**Chart 4**  
Symptom:  
No Audio, No Video



**Chart 5**  
Symptom:  
No Vertical Deflection

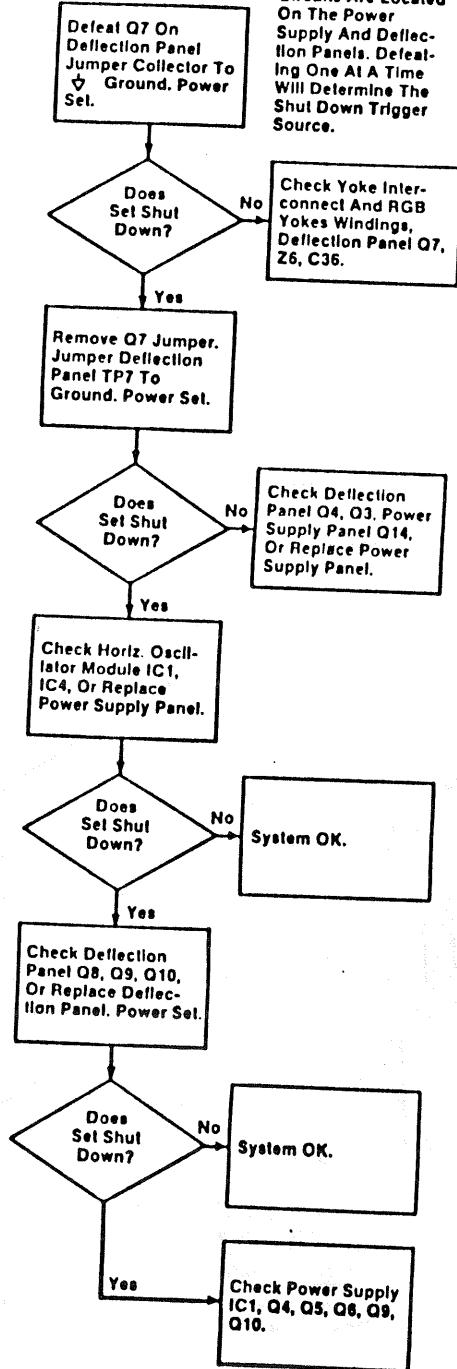


**Chart 6**  
Symptom:  
Picture Rolls



**Chart 7**  
Symptom:  
Set Shuts Down

Note: Shut Down Circuits Are Located On The Power Supply And Deflection Panels. Defeating One At A Time Will Determine The Shut Down Trigger Source.

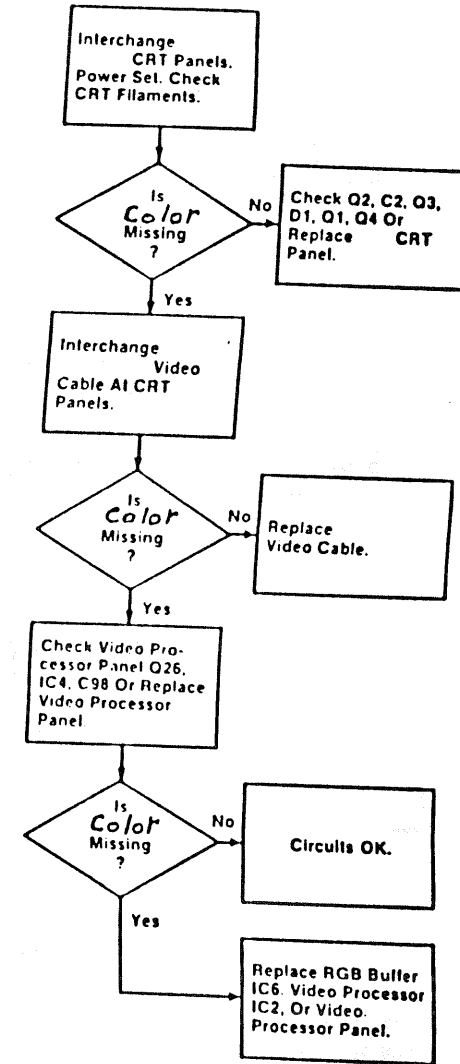


**Chart 8**  
Tuner Voltages

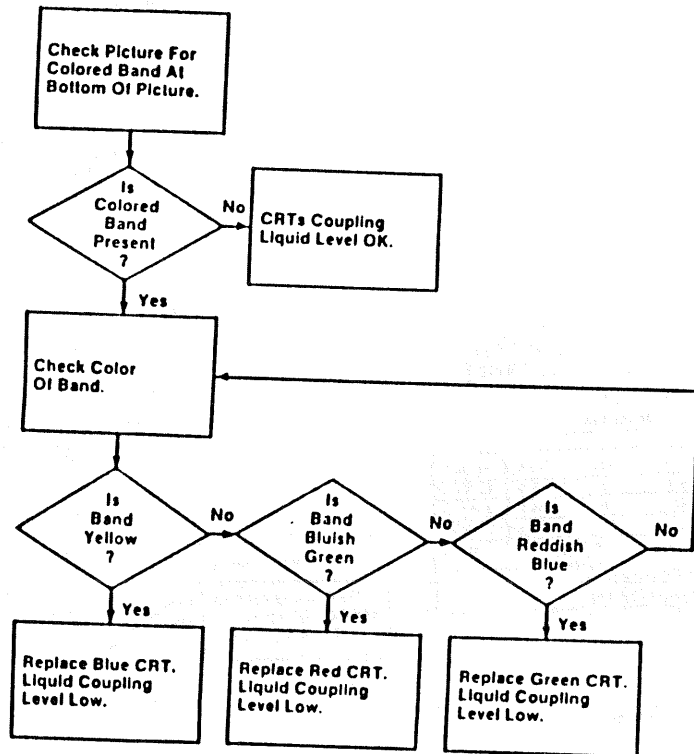
ALL BAND TUNER Plug P/J22 Voltages					
Band	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5
Lo Ch 3	5.5V	0V	4V	24V	12V
Hi Ch 7	5.5V	0V	12V	24V	12V
Cap 14	5.5V	12V	6.5V	24V	12V
UHF 14	5.5V	12V	6.5V	24V	12V

ALL BAND TUNER Plug P/J21 Voltages				
Band	Pin 1	Pin 2	Pin 3	Pin 4
Lo Ch 3	-15V	12V	-15V	NC
Hi Ch 7	12V	12V	-15V	NC
Cap 14	12V	12V	-15V	NC
UHF 14	12V	0V	-15V	NC

**Chart 9**  
Symptom: one color missing

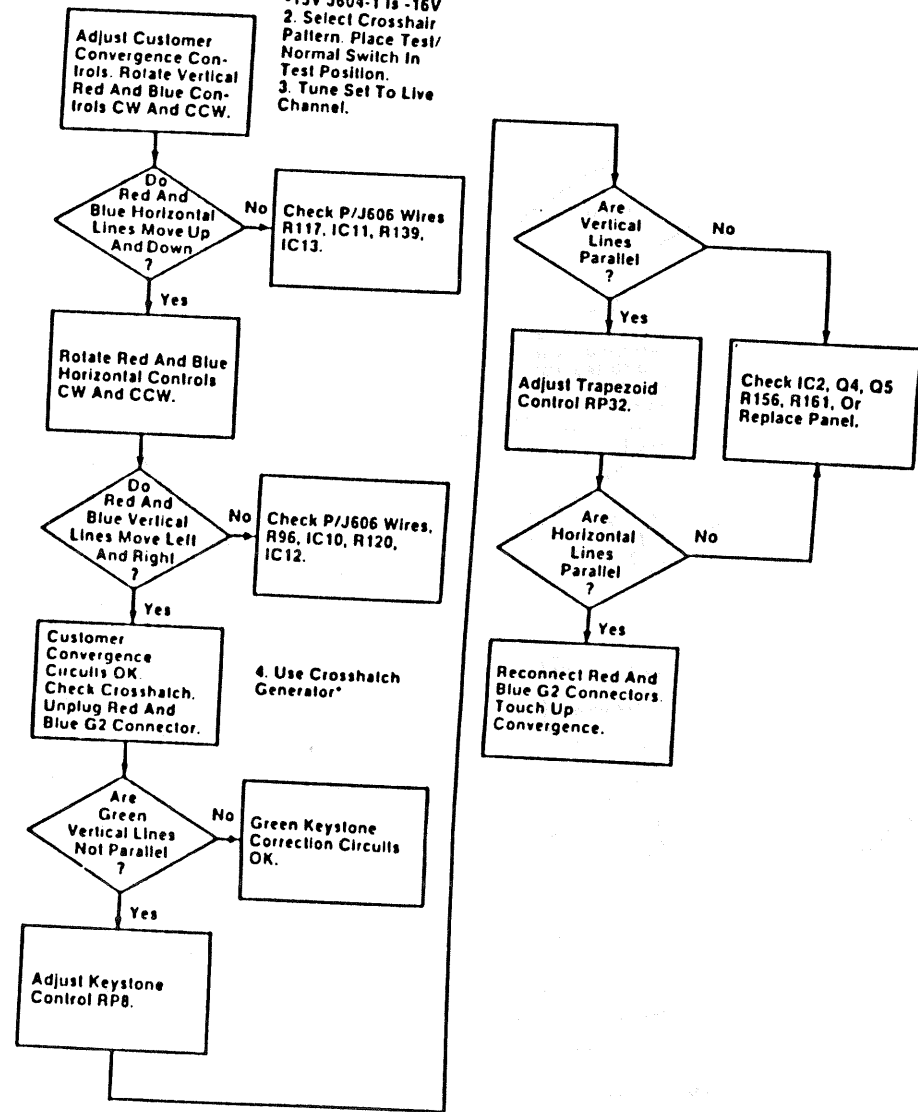


**Chart 10**  
Symptom:  
Color Band at Bottom  
Of Picture



**Chart 11**  
Symptom:  
Set Does Not  
Converge

**Check**  
1. Voltage Sources  
TP16 Is 8V TP18 Is  
15V J604-2 Is 16V  
TP17 Is -8V TP19 Is  
-15V J604-1 Is -16V  
2. Select Crosshair  
Pattern. Place Test/  
Normal Switch In  
Test Position.  
3. Tune Set To Live  
Channel.



**Chart 12**  
**Symptom:**  
**Pincushion Error**  
**Top/Bottom And Side**

