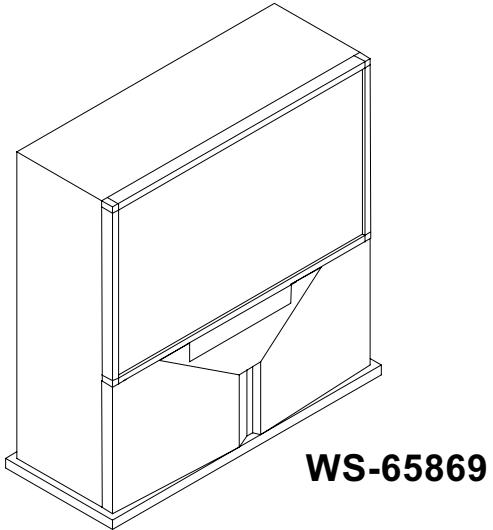


# Service Manual

PROJECTION TELEVISION  
V19 / V19+ CHASSIS



**V19  
MODELS**

**WS-55859  
WS-65869**

**V19+  
MODELS**

**WS-55909  
WS-65909  
WS-73909**

**CAUTION:**

Before servicing this chassis, it is important that the service person read the "SAFETY PRECAUTIONS" and "PRODUCT SAFETY NOTICE" contained in this manual.

## SPECIFICATIONS

- **Power Input** : AC 120V, 60Hz
- **Power Usage** : 300W
- **Frequency Range** : VHF 54 ~ 470MHz  
UHF 470 ~ 806MHz
- **Antenna Input** : VHF/UHF 75Ω unbalanced  
2 - NTSC  
1 - ATV/QAM
- **CRT Size** : [7 inches]  
: [9 inches] WS-73909 only
- **High Voltage** : 32.0kV (at 0A)
- **Speaker** : [WS-55859]  
5" round type, full range 2 pcs. (8Ω 10W)  
: [WS-65869]  
6" round type, full range 2 pcs. (8Ω 10W)  
: [WS-55909 / WS-65909 / WS-73909]  
5" round type, full range 2 pcs. (8Ω 10W)  
2" round type, tweeter 2 pcs. (8Ω 10W)
- **Weight** : [WS-55859] 250 lbs  
: [WS-55909] 256 lbs  
: [WS-65869] 326 lbs  
: [WS-65909] 348 lbs  
: [WS-73909] 405 lbs
- Weight and dimensions shown are approximate.
- Design specifications are subject to change without notice.
- **Cabinet Dimensions** : [Model] (H)x(W)x(D)  
: [WS-55859] 50.3"x50.6"x27.8"  
: [WS-55909] 51.4"x46.9"x28.1"  
: [WS-65869] 61.9"x59"x28.1"  
: [WS-65909] 61.5"x58.2"x28.3"  
: [WS-73909] 65.7"x65.2"x29.8"
- **Input Level** : VIDEO IN JACK (RCA Type)  
1.0Vp-p 75Ω unbalanced  
: AUDIO IN JACK (RCA Type)  
-4.7dBm 43kΩ unbalanced  
: S-VIDEO IN JACK  
(Y/C separate type)  
Y: 1.0 Vp-p C: 0.286Vp-p(BURST)  
75Ω unbalanced  
: COMP / Y, Cr, Cb (RCA Type)  
Y: 1.0 Vp-p Cr, Cb: 700mVp-p  
: ATV / Y(G), Pr(R), Pb(B), H, V  
Y: 1.0Vp-p with sync 75Ω (BNC)  
Pr, Pb: 700mV 75Ω  
H, V: 3.0Vp-p 75Ω  
: VGA / R,G,B,V,H (15 pin D)
- **Output Level** : VIDEO OUT JACK (RCA Type)  
1.0Vp-p 75Ω unbalanced  
: AUDIO OUT JACK (RCA Type)  
-4.7dBm 4.7kΩ unbalanced
- **Digital Interface** : IEEE-1394 I/O Jacks  
: AC-3 Digital Audio Output

**MITSUBISHI DIGITAL ELECTRONICS AMERICA, INC.**

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## **INTRODUCTION**

This service manual provides service instructions for PTV Models WS-55859 and WS-65869 which use the V19 chassis, and PTV Models WS-55909, WS-65909 and WS-73909 which use the V19+ chassis. Service personnel should read this manual thoroughly before servicing these chassis.

This service manual includes:

1. Assembly and disassembly instructions for the front and rear cabinet components.
2. Servicing of the Lenticular Screen and Fresnel Lens.
3. Servicing printed circuit boards (PCBs).
4. CRT replacement procedure.
5. Electrical adjustments.
6. Chip parts replacement procedures.
7. Circuit path diagrams.

The parts list section of this service manual includes:

1. Cabinet and screen parts.
2. Electrical parts.

Schematic and block diagrams of the above listed models are included in this service manual for better understanding of the circuitry. PCB drawings are also included for easy location of parts and test points.

## **PRODUCT SAFETY NOTICE**

Many electrical and mechanical parts in television receivers have special safety related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc.

Replacement parts which have special safety characteristics are identified in this service manual.

Electrical components having such features are identified by shading  on the schematic diagram and by **bold type** in the parts list of this service manual. **The replacement for any safety part should be identical in value and characteristics.**

## SAFETY PRECAUTIONS

**NOTICE:** Observe all cautions and safety related notes located inside the receiver cabinet and on the receiver chassis.

**WARNING:**

1. Operation of this receiver outside the cabinet or with the cover removed presents a shock hazard from the receiver's power supplies. Work on the receiver should not be attempted by anyone who is not thoroughly familiar with the precautions necessary when working on high voltage equipment.
2. Do not install, remove or handle the picture tubes in any manner unless shatterproof goggles are worn. People not so equipped should be kept away while the picture tube is being handled. Keep the picture tube away from the body while handling.
3. When service is required, observe the original lead dress. Extra precaution should be taken to assure correct lead dress in the high voltage area. Where a short-circuit has occurred, replace those components that indicate evidence of overheating.

**X-Radiation warning**

The surface of the cathode ray tubes (CRTs) may generate X-Radiation, so take proper precautions when servicing. It is recommended that a lead apron be used for shielding while handling the CRT. Use this method if possible.

When replacing the CRTs, use only the designated replacement part since it is a critical component with regard to X-Radiation. High voltage must be set as prescribed under the section titled Electrical Adjustments.

**Leakage current check**

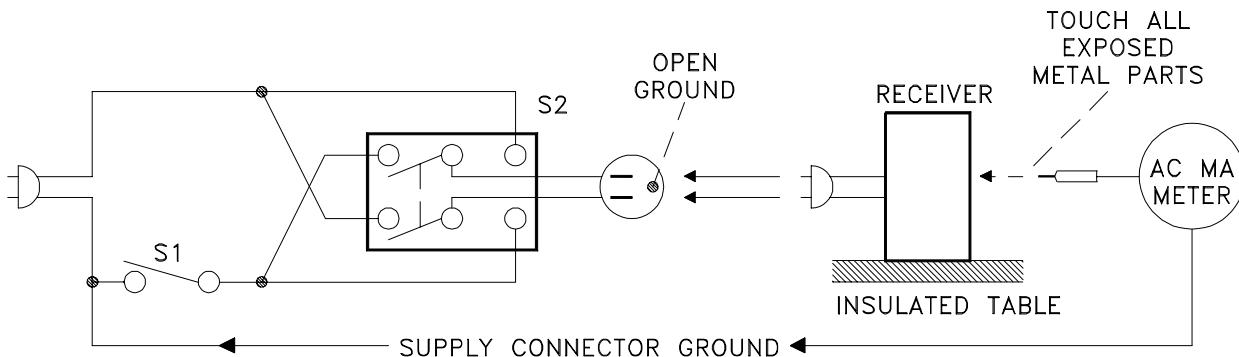
Before returning the receiver to the customer, it is recommended that leakage current be measured according to the following methods.

*1. Cold Check*

With the alternating current (AC) plug removed from the AC source, place a jumper across the two AC plug prongs. Connect one lead of an ohm meter to the AC plug and touch the other lead to each exposed metal part (i.e. antennas, handle bracket, metal cabinet, screw heads, metal overlay, control shafts, etc.), particularly any exposed metal part that has a return path to the chassis. The resistance of the exposed metal parts having a return path to the chassis **should be a minimum of 1Mega Ohm**. Any resistance below this value indicates an abnormal condition and requires corrective action.

*2. Hot Check ...Use the circuit shown below to perform the hot check test.*

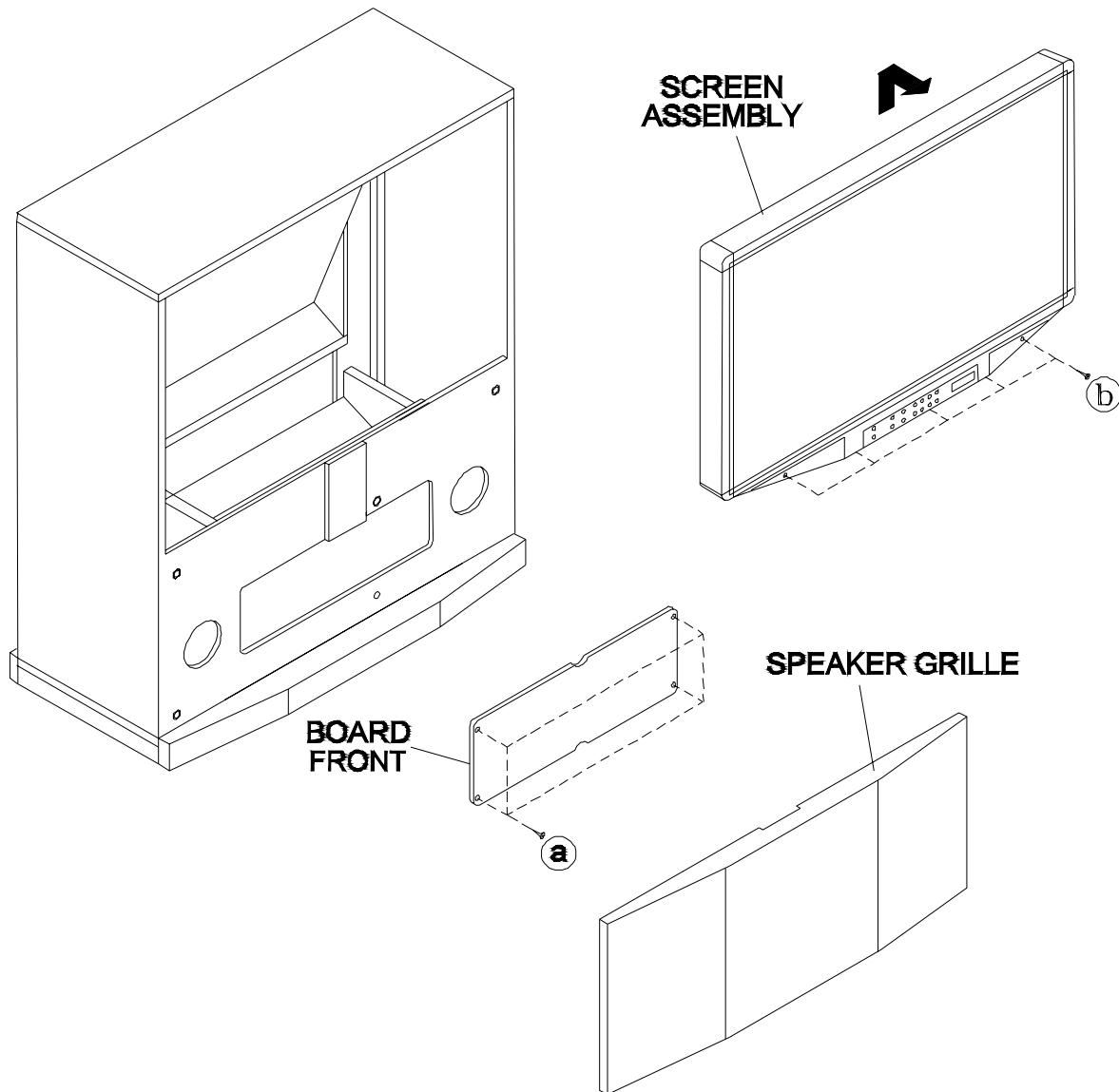
1. Keep switch S1 open and connect the receiver to the measuring circuit. Immediately after connection, and with the switching devices of the receiver in their operating positions, measure the leakage current for both positions of switch S2.
2. Close switch S1, energizing the receiver. Immediately after closing switch S1, and with the switching devices of the receiver in their operating positions, measure the leakage current for both positions of switch S2. Repeat the current measurements of items 1 and 2 after the receiver has reached thermal stabilization. **The leakage current must not exceed 0.5 milliampere (mA).**



## CABINET DISASSEMBLY (FRONT VIEW)

**WS-55859**

\*Refer to the Parts List for Part Numbers



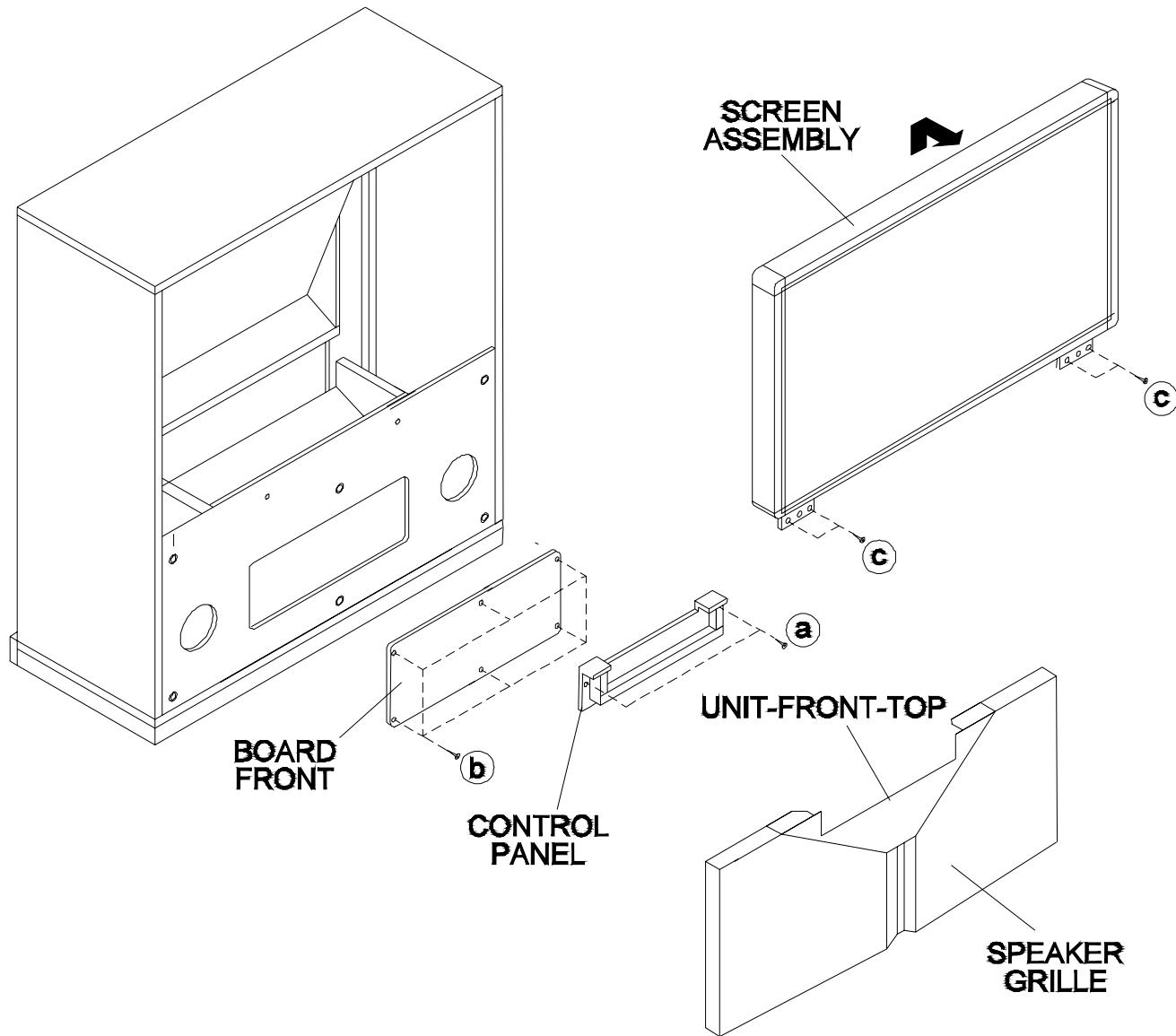
### **1a. Front Cabinet Disassembly**

1. Remove the Speaker Grille by pulling forward.
2. Remove the Board Front by removing 4 screws (a).
3. Remove the 4 screws (b) holding the Screen Assembly.
4. Lift the Screen Assembly up and away from the cabinet.

## CABINET DISASSEMBLY (FRONT VIEW)

**WS-65869**

\*Refer to the Parts List for Part Numbers



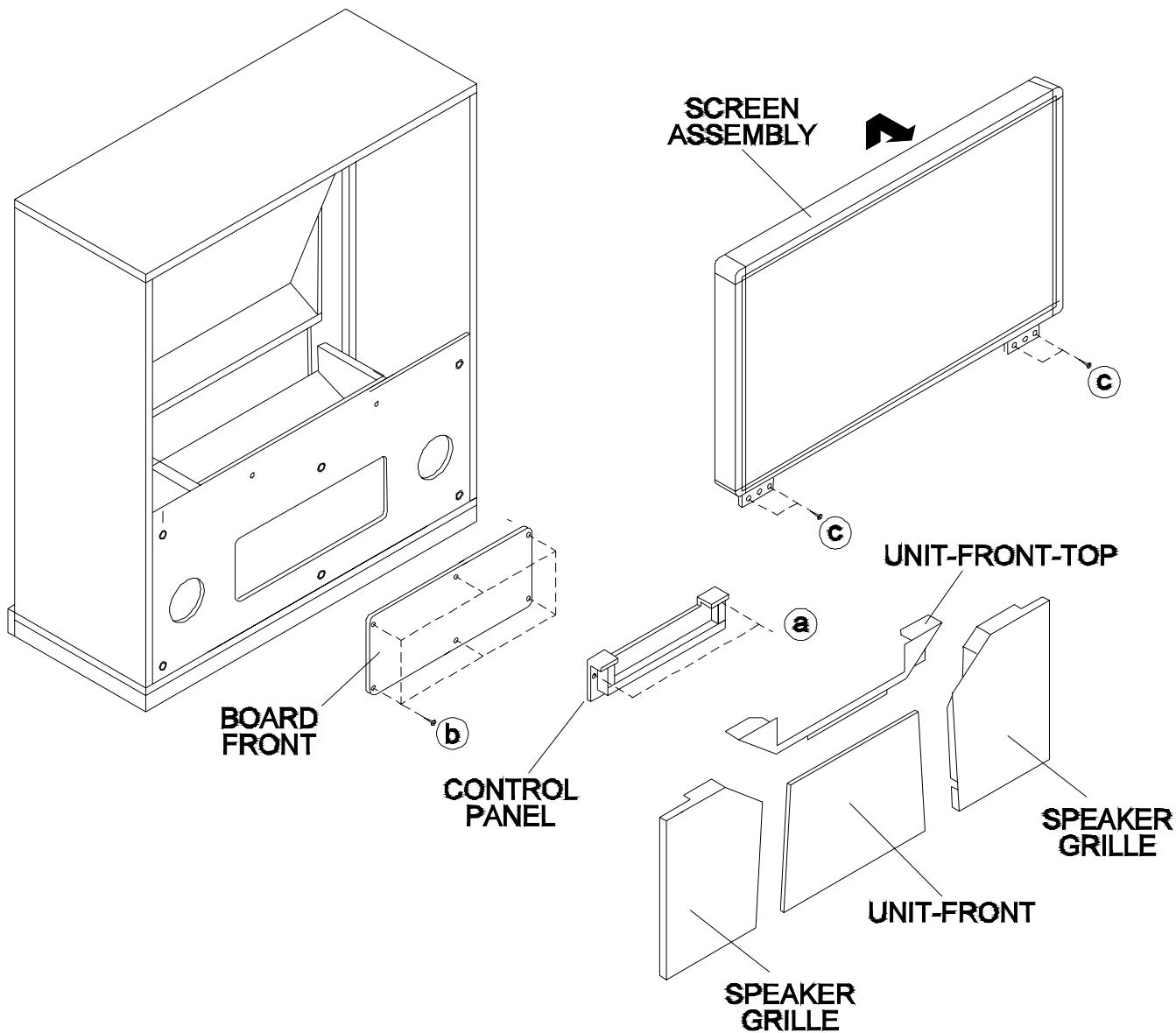
### **1b. Front Cabinet Disassembly**

1. Remove the Speaker Grille by pulling forward.
2. Remove the Board Front by removing screws (b)
3. Remove the Control Panel by removing two screws (a).
4. Remove the four screws (b) holding the Screen Assembly.
5. Lift the Screen Assembly up and away from the cabinet.

CABINET DISASSEMBLY (FRONT VIEW)

WS-55909 / WS-65909 / WS-73909

\*Refer to the Parts List for Part Numbers

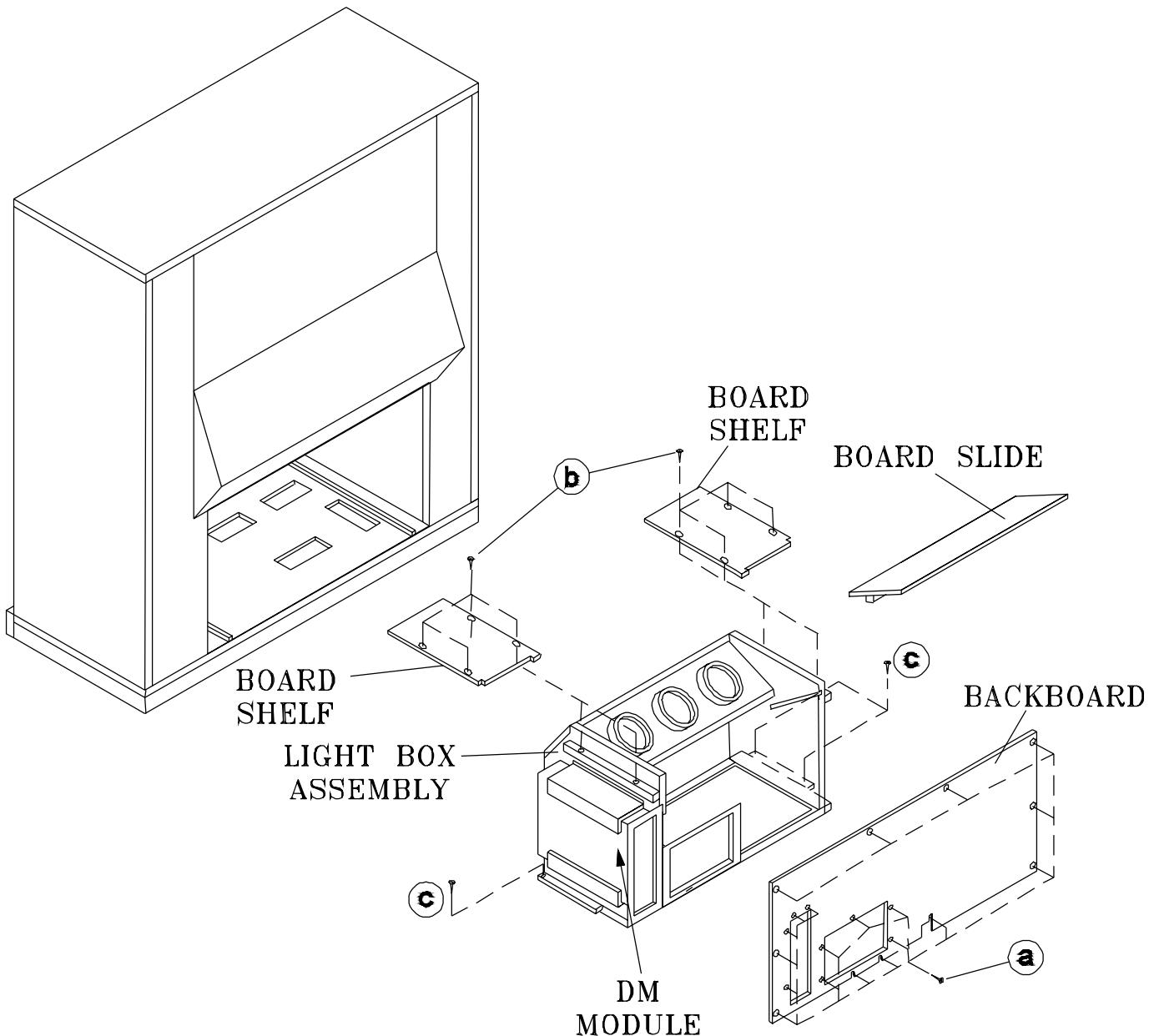
**1c. Front Cabinet Disassembly**

1. Remove the Speaker Grille by pulling forward.
2. Remove 2 screws (a) to remove the Control Panel.
3. Remove the Board Front by removing 4 screws (b).
4. Remove the 4 screws (c) holding the Screen Assembly.
5. Lift the Screen Assembly up and away from the cabinet.

## CABINET DISASSEMBLY (REAR VIEW)

### WS-55859 / WS-55909 / WS-65869 / WS-65909 / WS-73909

\*Refer to the Parts List for Part Numbers



2b. Rear Cabinet Disassembly

1. Remove screws (a) holding the Back Board.
2. Remove the 4 screws (b) holding each Board Shelf.
3. Remove the 4 screws (c) securing the Light Box Assembly.
4. Slide the Light Box out the rear of the Cabinet.

## **SERVICING THE LENTICULAR SCREEN AND FRESNEL LENS**

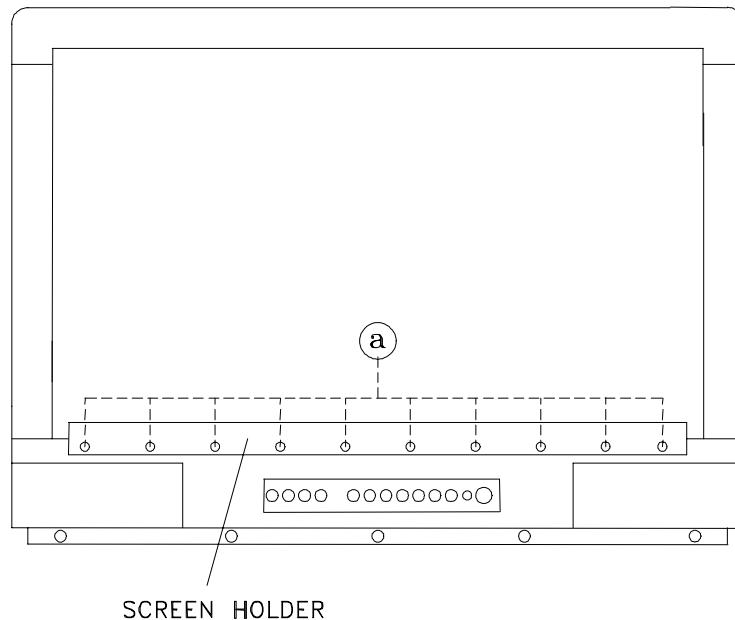
**CAUTION:** **Wear gloves** when handling the Lenticular Screen and Fresnel Lens.  
This prevents cuts and finger prints. **Do not place Fresnel Lens in the sun.**  
This may cause fire and heat related injuries.

### **WS-55859**

#### **1a. Lenticular Screen and Fresnel Lens Removal**

1. Remove the screen assembly shown in the Cabinet Disassembly procedure.
2. Remove the screws (a) securing the Screen Holder.
3. Slide the Lenticular Screen and Fresnel Lens from the Screen Frame.

**Note:** When separating the Lenticular Screen from the Fresnel Lens, use caution while prying the Screen and Lens apart. Use a slot type screw drive, and remove the pressure sensitive double sided tape.



## **SERVICING THE LENTICULAR SCREEN AND FRESNEL LENS**

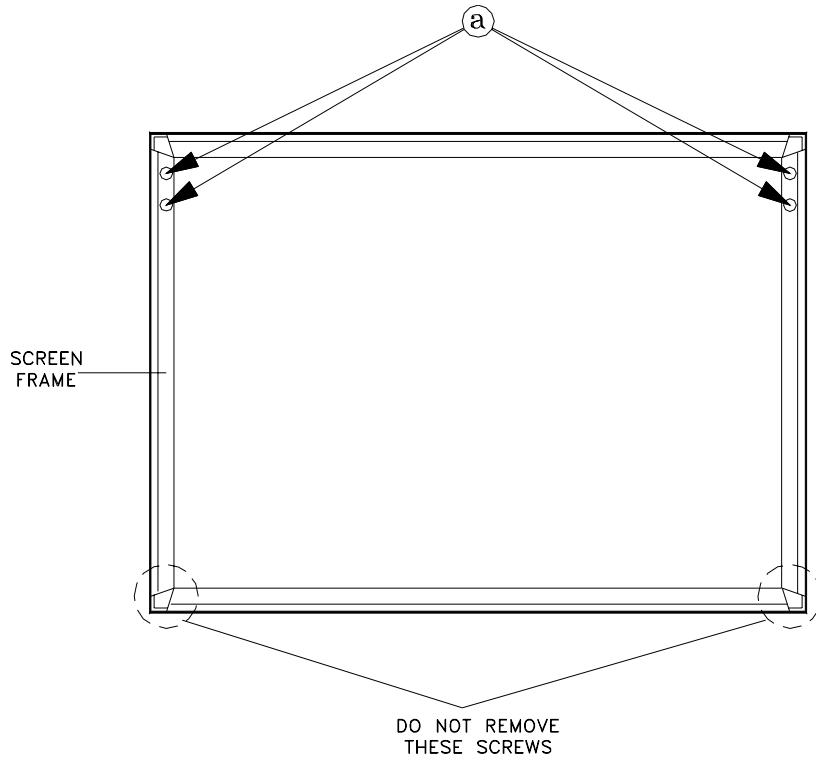
**CAUTION:** **Wear gloves** when handling the Lenticular Screen and Fresnel Lens.  
This prevents cuts and finger prints. **Do not place Fresnel Lens in the sun.**  
This may cause fire and heat related injuries.

**WS-55909 / WS-65869 / WS-65909 / WS-73909**

### **1b. Lenticular Screen and Fresnel Lens Removal**

1. Remove the screen assembly shown in the Cabinet Disassembly procedure.
2. Remove the Screen Frame top section by removing 4 screws (a).
3. Carefully grasp the Lenticular Screen and Fresnel Lens combination and pull upward and out of the Screen Frame Assembly.

**Note:** When separating the Lenticular Screen from the Fresnel Lens, use caution while prying the Screen and Lens apart. Use a slot type screw drive, and remove the pressure sensitive double sided tape.

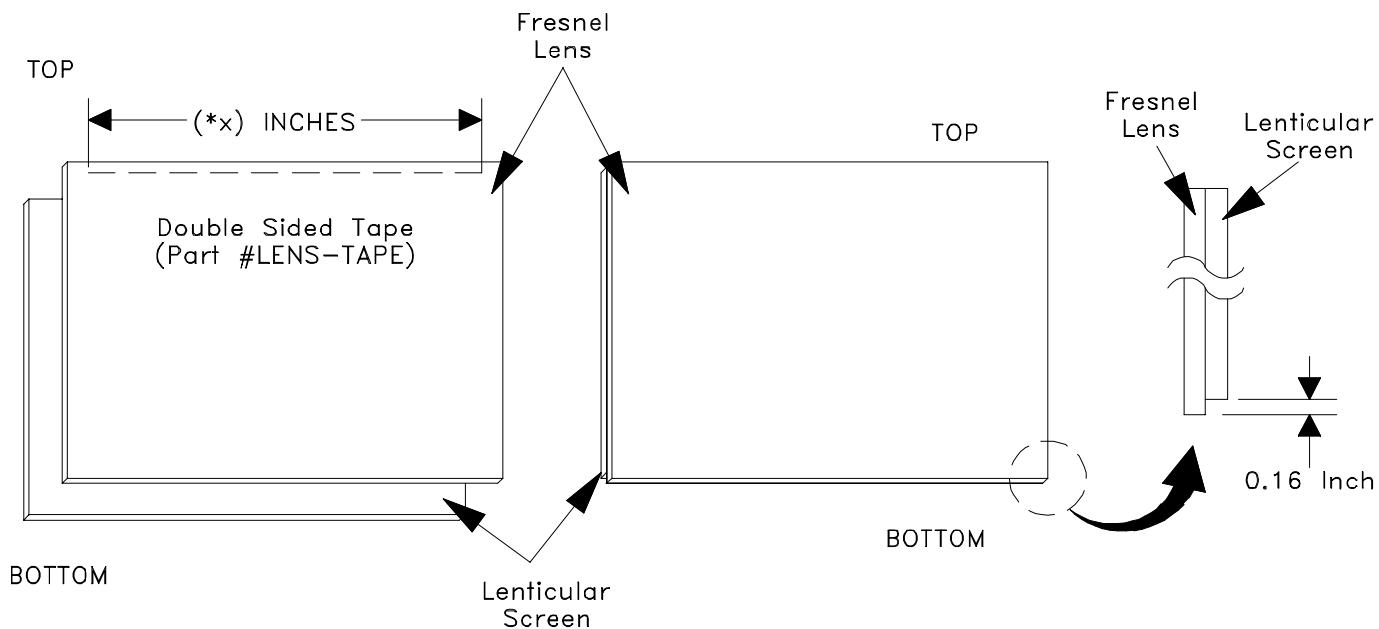


## **SERVICING THE LENTICULAR SCREEN AND FRESNEL LENS**

### **2. Lenticular Screen and Fresnel Lens Installation.**

**Note:** Store the Lenticular Screen and Fresnel Lens in a cool dry place. High humidity may deform the Lenticular Screen and Fresnel Lens.

1. Apply double coated tape (Part # LENS-TAPE) along the top front edge of the Fresnel Lens as shown below. Refer to the Table below for proper tape length.
2. Place the Fresnel Lens on top of the Lenticular Screen and apply pressure at the top edge to bond them together as shown below.

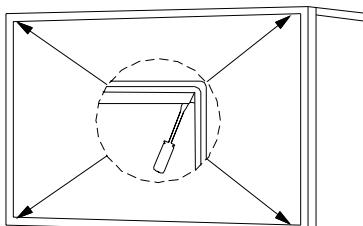


Model	Screen Size	Tape Length
WS-55859	55"	47.8"
WS-55909	55"	47.8"
WS-65869	65"	56.5"
WS-65909	65"	56.5"
WS-73909	73"	63.5"

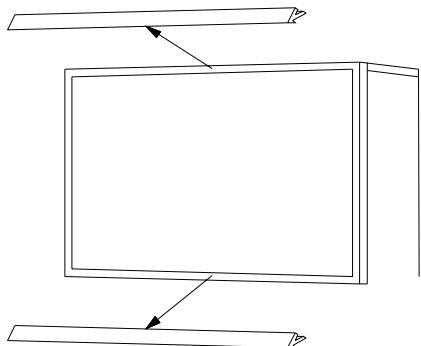
**SERVICING THE DIAMONDSHIELD™****1. DiamondShield™ Removal Procedure**

The location of the DiamondShield™ molding clips varies between models, top and bottom, or sides. Use the appropriate disassembly procedure given below.

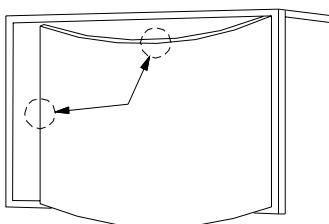
**Note:** *Wear gloves when handling the DiamondShield™ to prevent finger prints.*

**Top & Bottom Molding Clips**

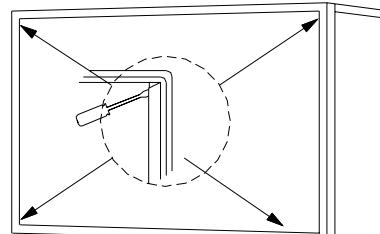
1. Gently insert a small screwdriver between the DiamondShield™ and one end of the clip to pry the clip loose.



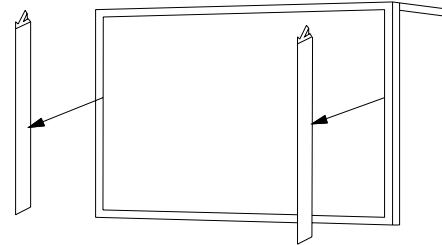
2. Remove both clips by pulling them toward you.



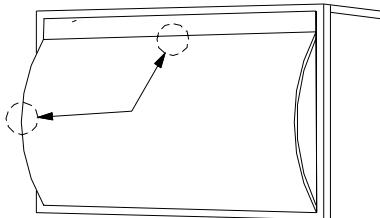
3. Carefully insert a small screwdriver into the gap at the top/center point of the Shield and pull the Shield slightly away from the unit. Place your hands at the points shown and gently bow the Shield toward you and remove from the unit. Then re-install the two clips.

**Side Molding Clips**

1. Gently insert a small screwdriver between the DiamondShield™ and one end of the clip to pry the clip loose.



2. Remove both clips by pulling them toward you.



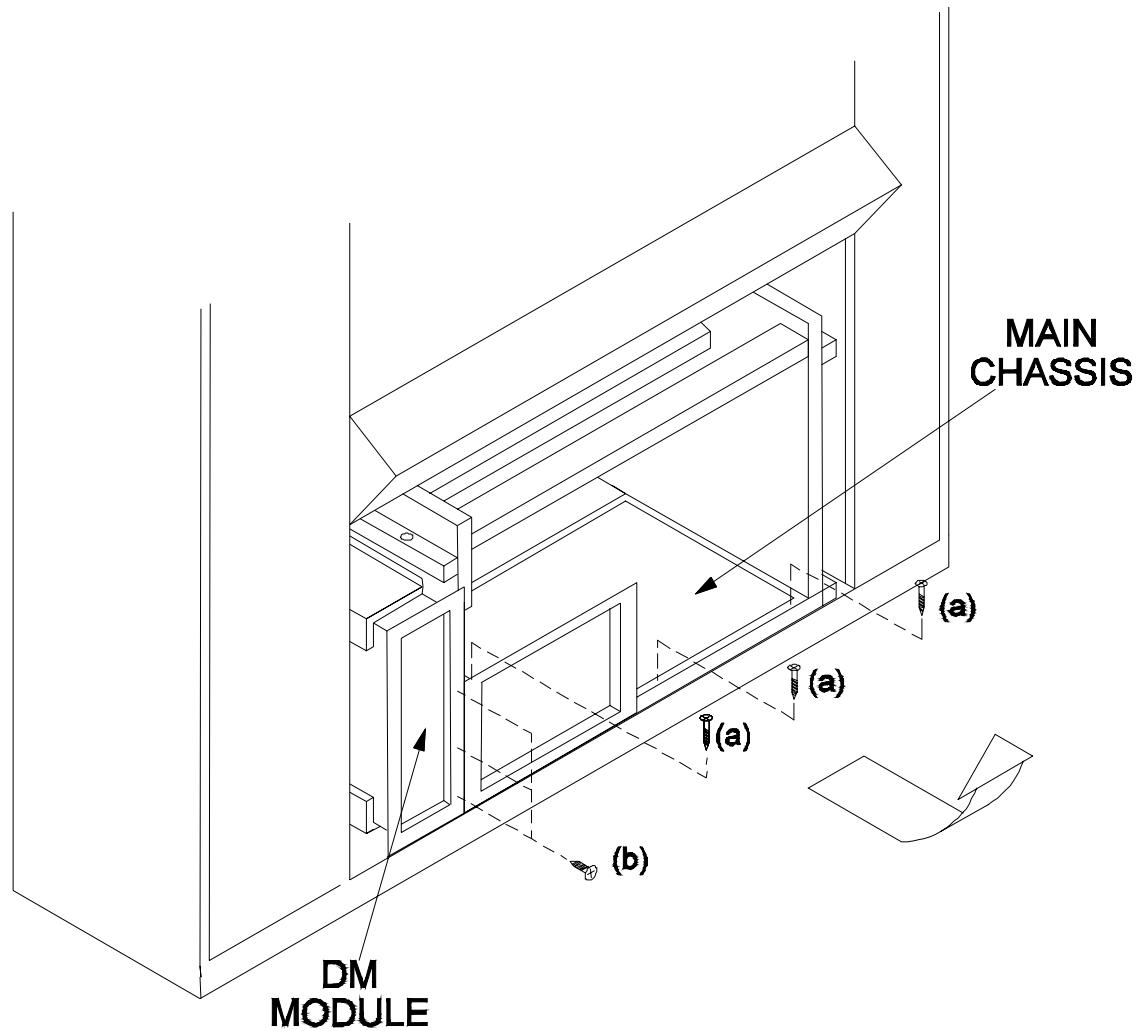
3. Carefully insert a small screwdriver into the gap at the side/center point of the Shield and pull the Shield slightly away from the unit. Place your hands at the points shown and gently bow the Shield toward you and remove from the unit. Then re-install the two clips.

**2. DiamondShield™ Installation Procedure**

*\*(See the Parts List for DiamondShield™ part numbers)*

To install the DiamondShield™, reverse the above Removal Procedure.

## Main Chassis Removal



### **Chassis and DM Module Removal**

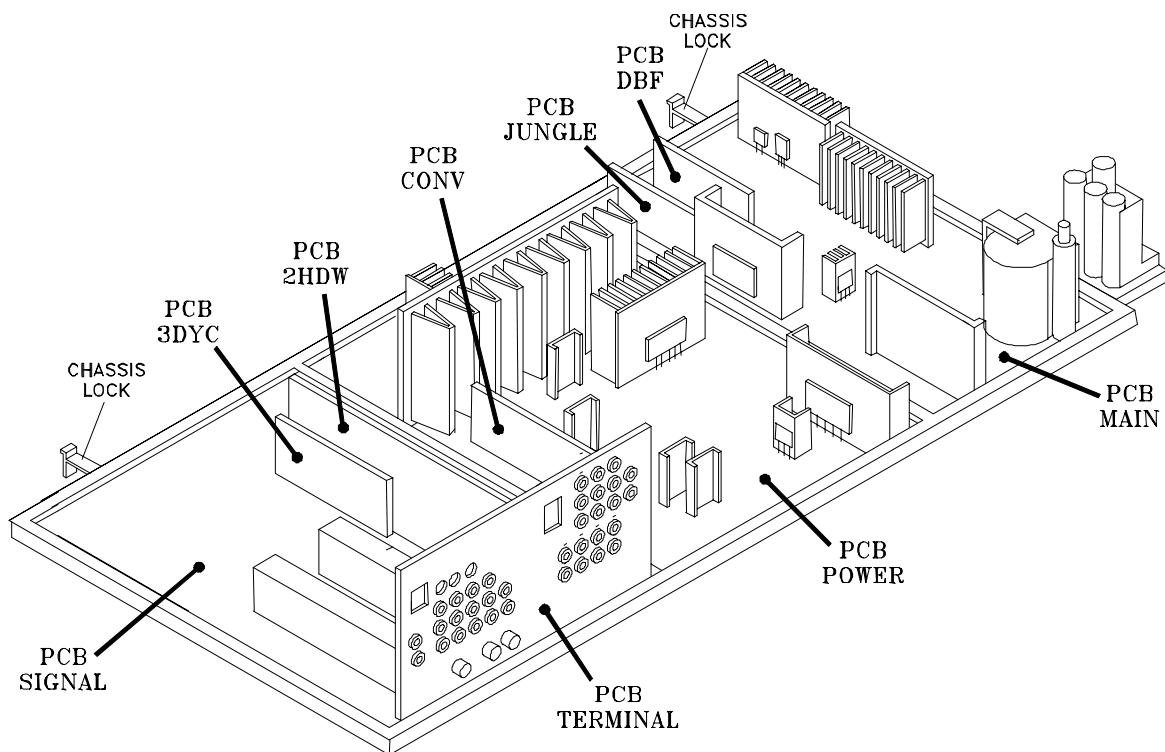
The chassis and DM Module can be removed as a single unit.

1. Undo the cable wire ties to the Front Panel, Speakers, CRTs, etc.
2. Remove 3 screws (a) securing the Main Chassis.
3. Unlatch the two chassis locks on the front of the chassis.
4. Slide the Chassis and DM Module out the rear of the unit.
5. Tilt upward to access the bottom of the main chassis.

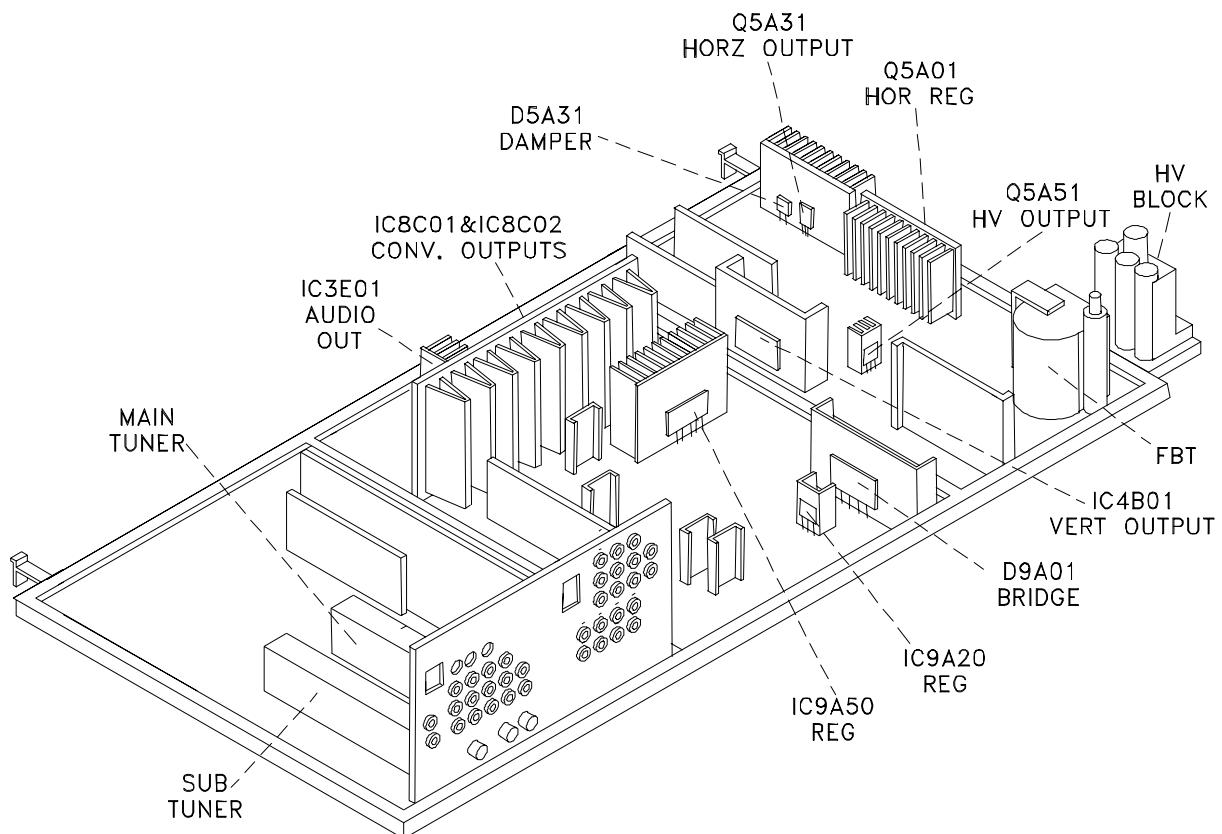
**NOTE:** If the chassis cannot be removed with the DM Module, due to insufficient cable length:

1. Perform Step 1 through 3 above.
2. Remove 3 screws (b).
3. Slide the chassis only out the rear of the unit.

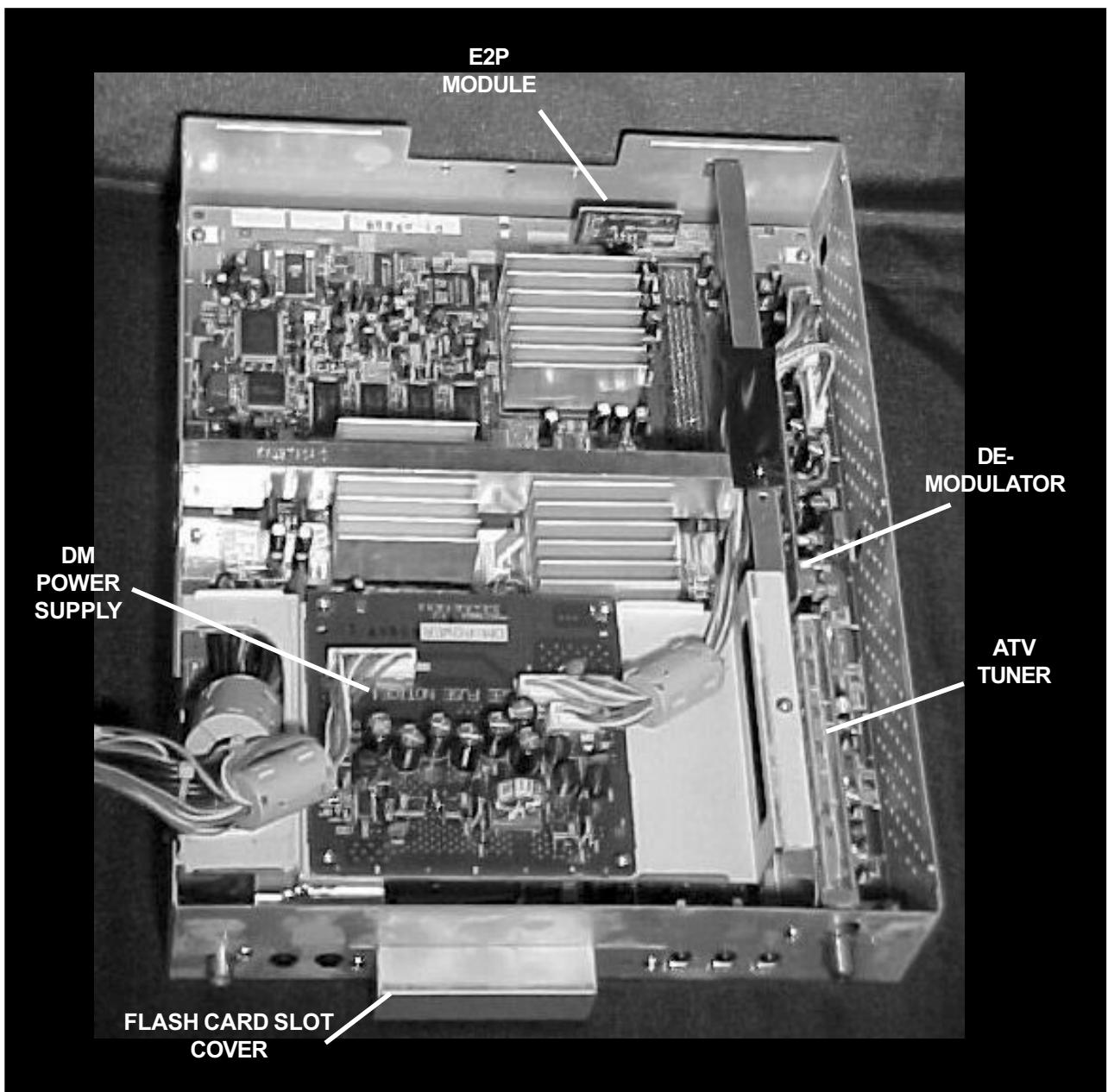
## PCB Locations



## Main Components Location



### **DM Module Main Components Location**



## CRT REPLACEMENT

### 1. Removal of the CRT

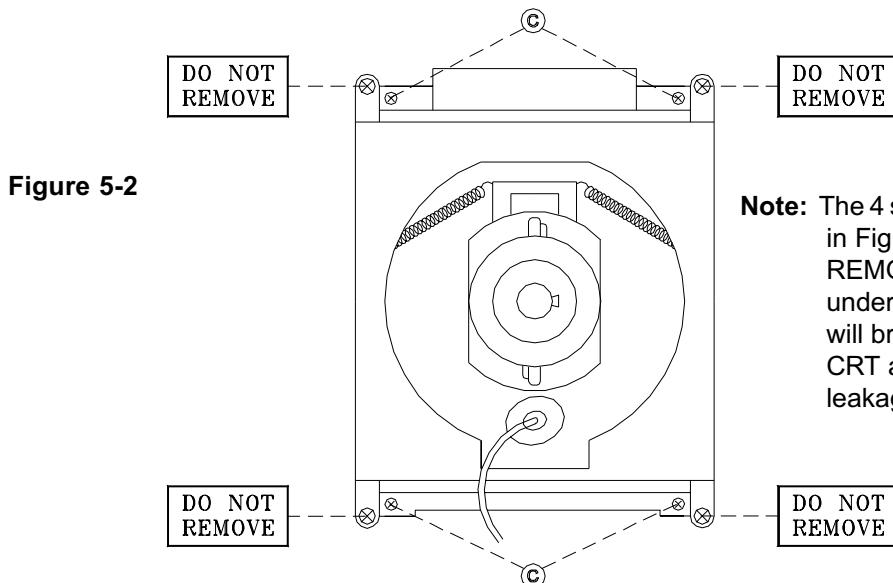
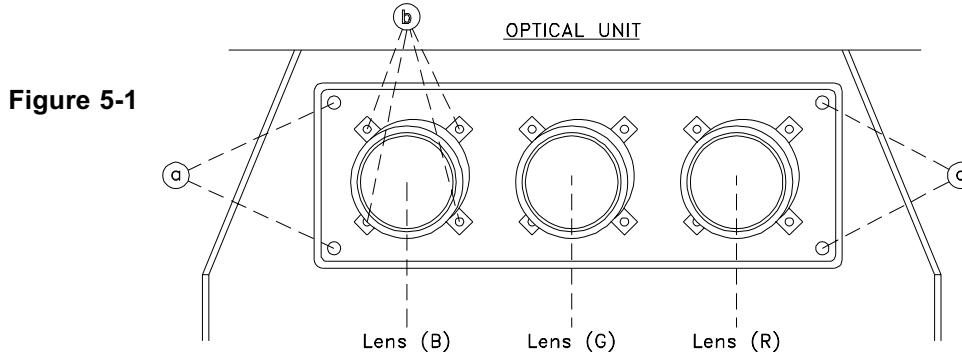
**Caution!** High voltage should be completely discharged prior to CRT removal. Since The CRTs receive high voltage from the HV Block, discharge by shorting the open end of the respective high voltage cable to chassis ground.

**Note:** Refer to the Cabinet Disassembly Procedures when performing steps 1 through 4.

1. Remove the Speaker Grille, Front Board, and Screen Assy.
2. Remove the Back Board.
3. Remove the Anode Lead Wire from the CR Block.
4. Remove the PCB-CRT.
5. Remove 4 hex-screws "a" retaining the Optical Unit. [Figure 5-1]
6. Remove 4 screws "b" retaining the Lens.

**Note:** **DO NOT loosen the RED screws.** Doing so will break the seal between the C-Element and the # 6 Lens, causing leakage of the CRT Coolant.

7. Remove 4 screws "c" retaining the CRT. [Figure 5-2]
8. Remove the Deflection Yoke from the neck of the CRT. [Figure 5-7]



**Note:** The 4 spring-loaded screws shown in Fig 5-2 and labeled as "DO NOT REMOVE", should not be loosened under any circumstance. Doing so will break the seal between the CRT and the CRT-Spacer, causing leakage of the CRT Coolant.

## 2. Installation of the CRT

**Note:** The replacement CRT is supplied as an assembly comprised of the CRT and the Inner Lens with the space between them filled with ethylene glycol. Care should be taken during handling and installation to prevent shock from disrupting the seal or alignment between the CRT and Inner Lens. [Figure 5-3]

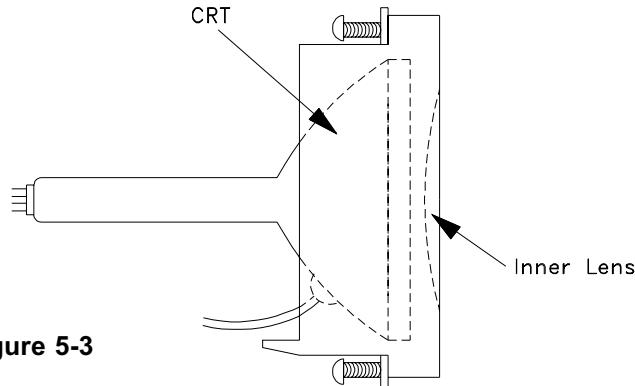


Figure 5-3

**Note:** The CRT fixing screws should not be loosened nor should they be removed. [Figure 5-4]

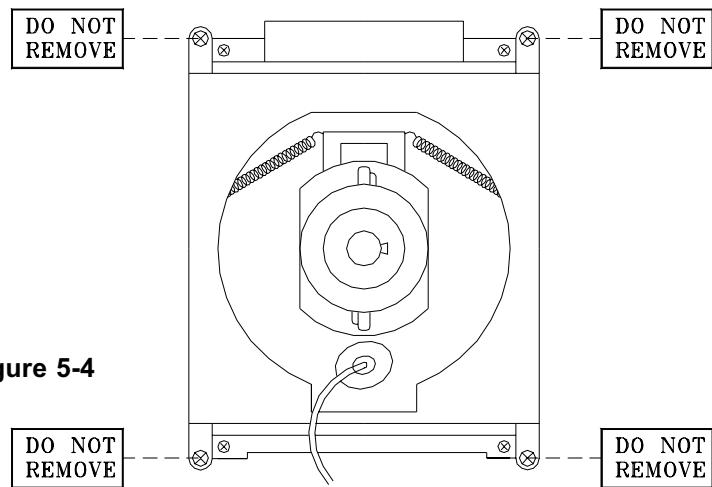


Figure 5-4

1. Carefully position the replacement CRT and fasten in place using 4 screws "d". [Figure 5-6]

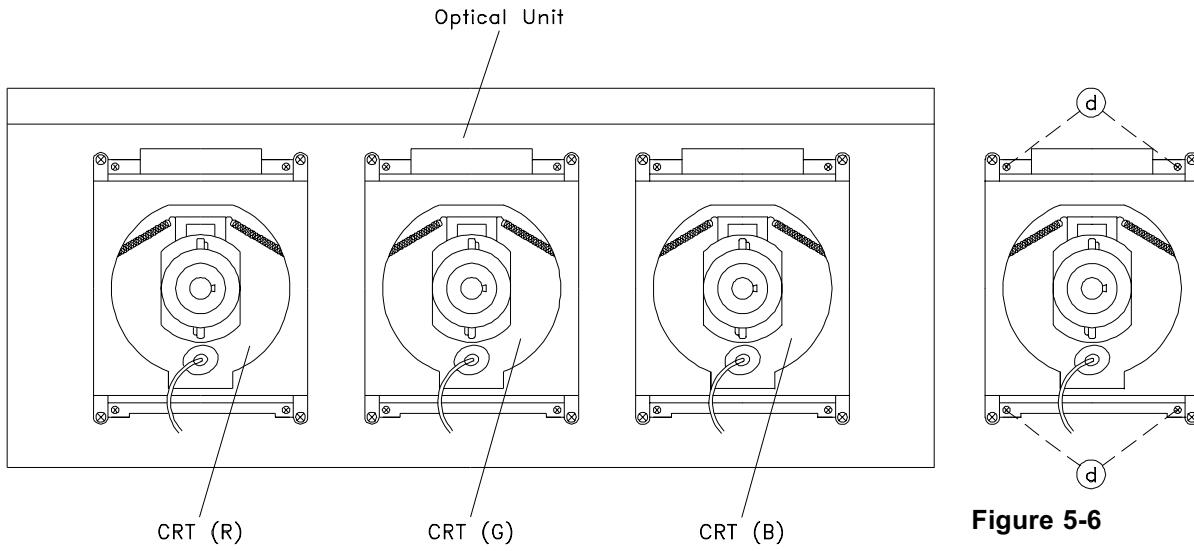


Figure 5-5

Figure 5-6

2. Install the Deflection Yoke on the CRT neck. [Figure 5-7]
3. Install the Lens that was removed in steps 8 and 9 of Removal Of The CRT. [ Figures 5-1 and 5-2 ]
  - a) Position the Lens so that the Label faces the direction shown in Figure 5-8.
  - b) Install the mounting screws. [Figure 5-1]
4. Connect the PCB-CRT.
5. Insert the Optical Unit into the Light Box Assembly.
6. Insert the Anode Lead Wire into the Flyback Transformer.
7. Re-clamp the Lead Wire in its original position.

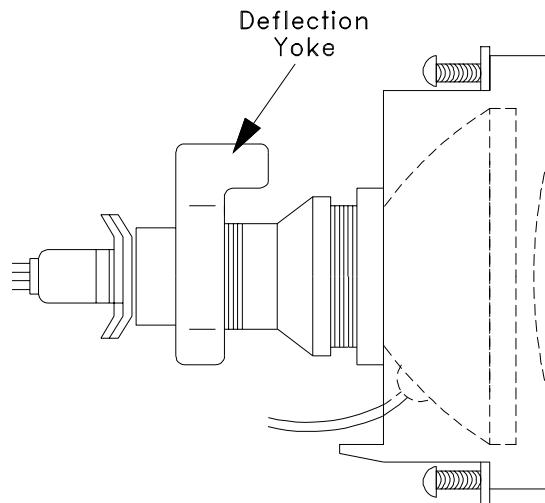


Figure 5-7

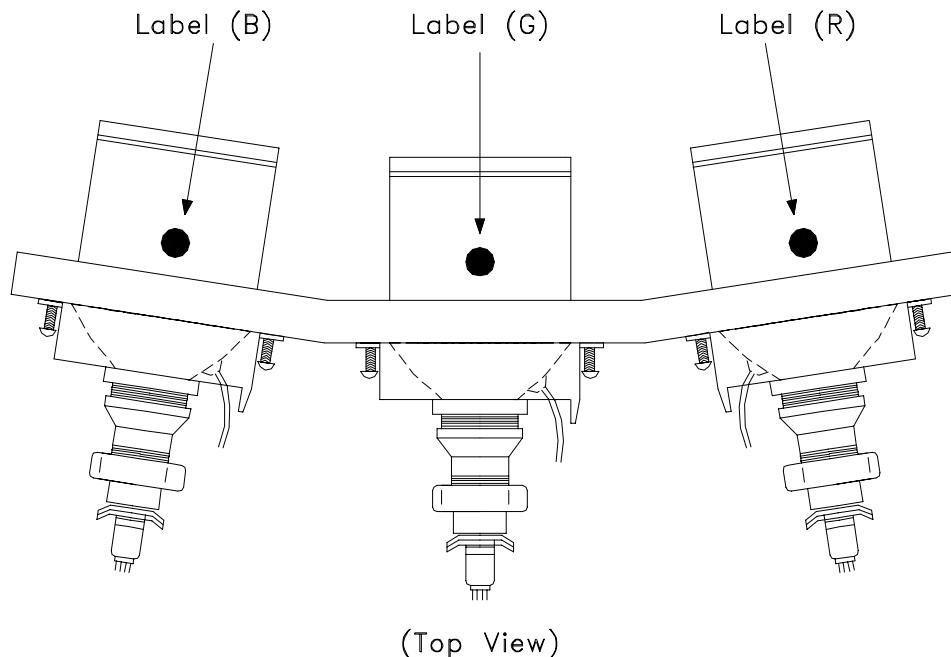


Figure 5-8

#### **Adjustment procedures after replacing the CRT(s)**

- CRT Cut Off / White Balance Adjustment
- Static Convergence Adjustment
- Dynamic Convergence Adjustment

## ELECTRICAL ADJUSTMENTS

**Note:** Perform only the adjustments required.  
Do not attempt an alignment if proper equipment is not available.

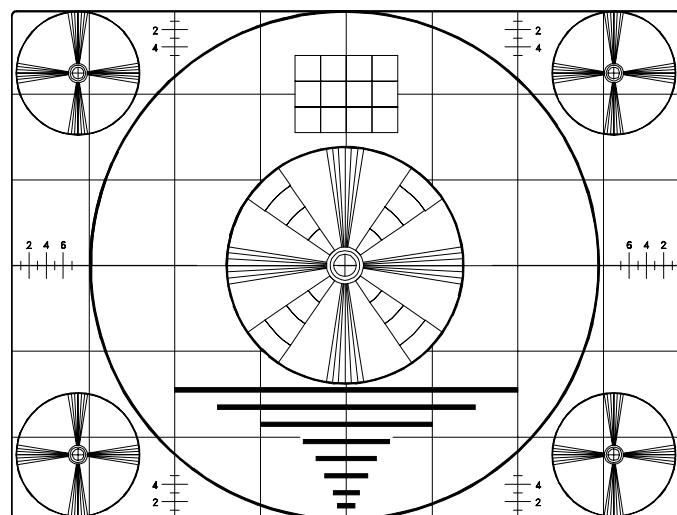
### Test Equipment

- Oscilloscope (Unless otherwise specified, use 10:1 probes)
- Signal Generator (both SD and HD capable)
- Frequency Counter
- Direct Current Voltmeter
- Direct Current Power Supply
- Multiplex Audio Signal Generator
- Direct Current Ampere Meter

### Test Signal

#### A. Monoscope Signal

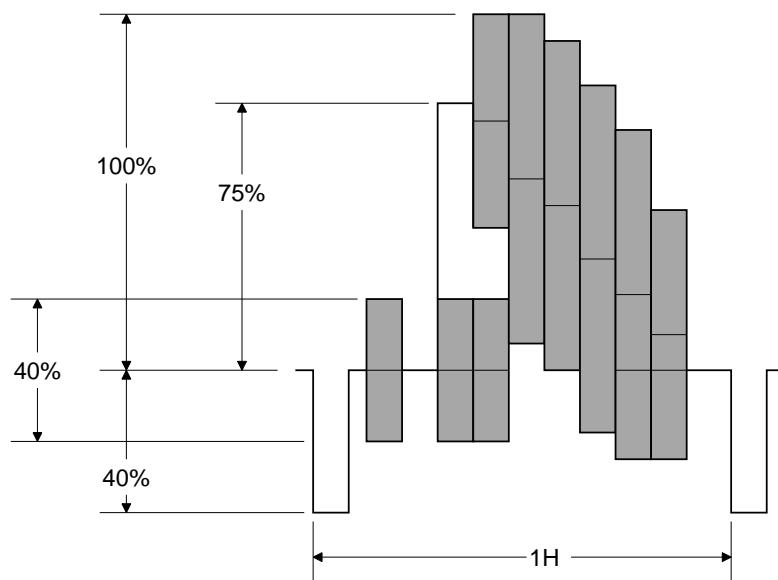
**Note:** If you do not have a monoscope signal source, connect the unit to a VCR and play a Monoscope \*alignment tape.  
(\* Part Number: 859C568060)



Monoscope Signal

#### B. Color Bar Signal

Use the color bar signal shown below, unless otherwise specified in this manual.



Split-Field Color Bars (100% window)

## Initial Setup

### A. Option Menu Setup

Follow the steps below for the initial set-up:

1. Select the "MENU" display by pressing the "MENU" button once.
2. Press the number buttons "0", "1", "7", "0" in sequence to select the "OPTION MENU" display.
3. Press the "ADJUST" button to select "INITIAL."
4. Press "ENTER."

**NOTE:** At this time channel 3 is automatically selected.

(MENU-0-1-7-0)

### OPTION MENU

Initial	
Power restore	:OFF
DTV Port	:Auto

### B. Default Settings

#### MAIN MENU DEFAULT SETTINGS

SETUP		MAIN MENU DEFAULT SETTINGS	
<b>Edit Setup</b>			
Review		Clock Time	N/A
Antenna A		Set Day	N/A
Antenna B		<b>CAPTIONS</b>	
Antenna C		Closed Captions	With Mute
DTV		CC Background	Gray
Input 1		Digital Channel Guide	On
Input 2		<b>V-CHIP PARENT LOCK</b>	
Input 3		V-CHIP	Off
Input 4		TV Rating	TV-PG
Input 5		FV-Fantasy Violence	(✓) Enabled
Component 1		D-Sexual Dialog	(✓) Enabled
Component 2		L-Adult Language	(✓) Enabled
VGA		S-Sexual Situation	(✓) Enabled
Icon Position		V-Violence	(✓) Enabled
Transport Menu		Program not Rated	(✓) Enabled
Language		Movie Rating	PG
<b>ANTENNA</b>		<b>V-CHIP LOCK BY TIME</b>	
Antenna		V-Chip Start Time	12:00 PM
Memorize Channels		V-Chip Stop Time	12:00 PM
Channel		Lock by Time	Off
Memory		Unlock Time	N/A
<b>CLOCK</b>		Front Button Lock	Off
Clock Setting		<b>TIMER</b>	
Time Zone		Timer	Off
Daylight Savings		Set Day	Everyday
		Set Time	12:00PM
		Device	Ant-A
		<b>AUDIO SETTINGS</b>	
		Channel	Ch-3
		Volume	30%
		Bass	50%
		Treble	50%
		Balance	50%
		Surround	Off
		Listen to	Stereo
		Level Sound	Off
		TV Speakers	On
		<b>VIDEO SETTINGS</b>	
		Contrast	100%
		Brightness	50%
		Sharpness	50%
		Color	50%
		Tint	50%
		Color Temp.	High
		Video Noise	Standard
		Image Type	Video
		Video Mute	On
		Black Enhancement	On
		<b>PIP/POP</b>	
		Source	Ant A Ch 3
		PIP Position	Lower Right
		POP Position	Right Half
		Format	Stretched
		PIP/POP Format	Dble. Window

#### A/V RESET DEFAULT SETTINGS (By Input)

A/V Memory	Ant A/B	Ant DTV	Inp-DTV	INPUTS 1/2/3/4/5	Component 1/2	VGA	1394 1/2/3
Contrast	Max.	Max.	Max.	Max.	Max.	Max.	Max.
Brightness	Center	Center	Center	Center	Center	Center	Center
Sharpness	Center	Center	Center	Center	Center	Center	Center
Color	Center	Center	Center	Center	Center	Center	Center
Tint	Center	Center	Center	Center	Center	Center	Center
Color Temp.	High	High	High	High	High	High	High
Video Noise	Standard	N/A	Standard	Standard	Standard	N/A	N/A
Image Type	Video	N/A	Video	Video	Video	N/A	N/A
Bass	Center	Center	Center	Center	Center	Center	Center
Treble	Center	Center	Center	Center	Center	Center	Center
Balance	Center	Center	Center	Center	Center	Center	Center
Surround	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Listen To	Stereo	English	N/A	N/A	N/A	N/A	N/A
Level Sound	OFF	OFF	OFF	OFF	OFF	OFF	OFF

### C. A/V Memory

Each of the external inputs has its' own Audio/Video Memory. A change in an A/V setting at a specific input is stored in memory for that specific input.

#### A/V Reset

1. The front panel AV Reset button initializes all A/V Memories.
2. The AV Reset in the user's menu initializes only the selected input's A/V Memory.

### LED Indicator Diagnostics

The "Power ON LED" provides an indication of the sets operation, and the possible cause of a malfunction.

#### 1. Initial Control Circuitry Check

Immediately after the TV is connected to an AC power source:

LED Indications	Conditions	Probable Cause
Off	After AC is applied	Standy Power Supply or TV µPC not running
Fast Blink for 70 sec.	After AC is applied	Normal - DM µPC is booting up
Fast Blink (doesn't stop)	After AC is applied	TV µPC is running, but DM failed to boot up
Slow Blink	Set is Off	Normal - Timer is set for Automatic Turn ON

#### 2. Error Code Operational Check

Pressing the front panel "DEVICE" and "MENU" buttons at the same time, and holding for 5 seconds, activates the Error Code Mode. The LED flashes denoting a two digit Error Code, or indicating no problem has occurred since the last Initialization.

**Note:** The front panel buttons must be used, NOT those on the Remote Control.

- The number of flashes indicates the value of the MSD (tens digit) of the Error Code.
- The flashing then pauses for approximately 1/2 second.
- The LED then flashes indicating the value of the LSD (ones digit) of the Error Code.
- The Error Code is repeated a total of 5 times.

Example: If the Error Code is "24", the LED will flash two times, pause, and then flash four times.

#### 3. Error Codes

The Error Code designations indicating a malfunction, or no malfunction, are listed below:

Error Code	Probable Cause
12	Normal Operation - No Error Detected
21	X-Ray Protect
22	Short Protect
23	Loss of Horizontal Deflection
24	Loss of Vertical Deflection

### Remote Control Operational Modes

There are two Remote Hand Unit Operational Modes, "Standard" and "NetCommand™". The Remote is initially in the "Standard" mode. The "NetCommand™" mode is used when controlling Home Theater devices using NetCommand™. To change the Remote Operational Mode:

- Set the Remote to the TV Layer
- Point the Remote away from the TV.
- To change to "Netcommand™" ... Hold the "Power" button and press "9-3-5" in sequence.
- To change to "Standard" ... Hold the "Power" button and press "0-0-0" in sequence.

## Circuit Adjustment Mode

Most of the adjustments can only be performed using the remote hand unit. Many of the adjustments must be performed in both the 480i and 1080i modes. Video/Color adjustments must be performed in the 480i and 1080i modes, and data must be preset in the 480P (DVD) and VGA modes.

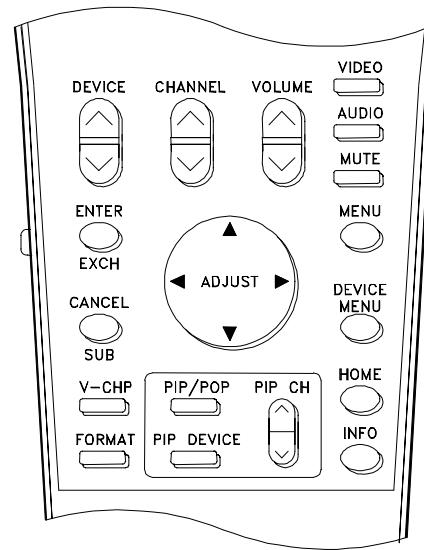
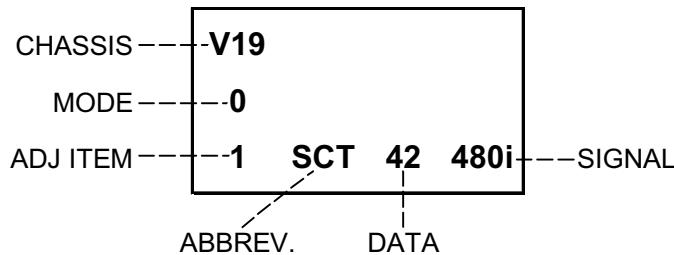
**Note:** Set the Remote Operational Mode to "NetCommandTM". (Hold the "Power" button and press "9-3-5" in sequence.) This slows the remote's response and makes adjustments easier. When adjustments are complete, **set the Remote to its' original Operational Mode.**

### A. Activating the Circuit Adjustment Mode

The current signal source determines if the activated Adjustment Mode is 480i or 1080i.

1. Select the signal source (480i or 1080i).
2. Press the "MENU" button on a remote hand unit.
3. Press the number buttons "0", "1", "5", "7" in sequence. The screen will change to the Adjustment Mode.

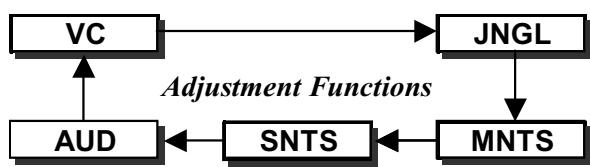
**Note:** Repeat steps 1 and 2 if the circuit adjustment mode does not appear on screen.



### B. Selection of adjustment Functions and Adjustment Items

To select an adjustment item in the circuit adjustment mode, first select the adjustment function that includes the specific adjustment item to be selected. Then select the adjustment item. Refer to the following pages for the listing of adjustment functions and adjustment items.

1. Press the "AUDIO" button on a remote hand unit to select an adjustment function. Each time the button is pressed, the Function changes in the following sequence:



<u>Previous Models</u>	<u>V19 Chassis</u>
Video/Chroma	VC
Jungle	JNGL
Main Matrix	MNTS
Sub Matrix	SNTS
Audio	AUD
<i>Adjustment Function Name Changes</i>	

2. Press the "VIDEO" button to select a specific Adjustment Item. The Item number increases each time the "VIDEO" button is pressed.

### C. Changing Data

After selecting an adjustment item, use the "ADJUST UP/DOWN" button to change data.

- Press "ADJUST DOWN" to decrease the data value.
- Press "ADJUST UP" to increase the data value.

### D. Saving Adjustment Data

Press "ENTER" to save adjustment data in memory. The character display turns red for approximately one second in this step.

**Note:** If the circuit adjustment mode is terminated without pressing "ENTER", changes in adjustment data are not saved.

### **E. Terminating the Circuit Adjustment Mode**

Press the "MENU" button on the remote hand unit twice to terminate the adjustment mode.

**Note:** The circuit adjustment mode can also be terminated by turning power OFF.

### **F. Toggle Between Reception Modes**

Pressing "3" when in the Adjustment Mode VC Function toggles between 480i, 480p, 1080i and VGA.

However data changes are not automatically saved. **Press "ENTER" to save data before pressing "3".**

## **On Screen Display Position Adjust Mode**

### **Activation**

1. Select 480i or 1080i source.
2. Press MENU-0-1-8-8

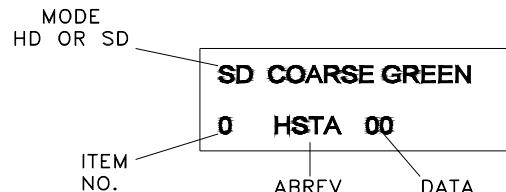
## **Convergence Adjustment Mode**

The Convergence mode is used to perform raster geometry correction, and convergence adjustments. These adjustments must be made in both the SD (NTSC) and HD modes.

**Note:** Before activating the Convergence mode, turn "Video Mute" Off. The internal crosshatch pattern will not be displayed with "Video Mute" On, only a blue background is displayed.

### **A. Convergence Mode Activation**

1. Press MENU-0-1-5-9
2. When the Convergence Mode is activated, this display appears on a Green Crosshatch.



### **B. Selecting the HD or SD Mode**

1. **Select the Signal Source** before entering the Convergence Mode, either an NTSC or HD source.
2. **Enter the Convergence Mode**
  - If the signal source is NTSC, the SD mode is activated.
  - If the signal source is HD, the HD mode is activated.
3. **Activating the HD mode when no HD signal is available**
  - Press the "DEVICE" button.
  - Use the "UP-DOWN-RIGHT-LEFT" direction buttons to select the ANT-DTV, then press "ENTER".
  - Press "MENU-0-1-5-9-5" in sequence to activate the Coarse Green HD Convergence mode.

### **C. Convergence Mode Functions**

In the Convergence Mode there are three main Functions (Categories).

- Pressing "6" activates CONV MISC
- Pressing "5" activates COARSE CONV
- Pressing "4" activates FINE CONV

### **D. CONV MISC (Press 6)**

This mode is used to preset data values controlling the Convergence Generator, and to perform the HV Regulation adjustment.

1. Use the VIDEO button to select an item.
2. Use the ADJUST buttons to change data.

**NOTE:** When Item "1 HVOL" is selected the screen goes black except for the data display. This occurs since a black screen is required when making the HV Regulation adjustment.

**E. COARSE CONV (Press 5)**

There are four Sub Functions in the Coarse mode, COARSE GREEN, COARSE RED, COARSE BLUE and DF.

- COARSE GREEN .... used to make Coarse Raster Geometry Adjustments.
- COARSE RED ... used to make Coarse Red Convergence Adjustments.
- COARSE BLUE ... used to make Coarse Blue Convergence Adjustments.
- DF ... used to preset data values controlling the Dynamic Beam Focus circuit drive signal.

1. Use AUDIO button to select a Sub Function
2. Use the VIDEO button to select an Adjustment Item.
3. Use the ADJUST buttons to change data.

**F. FINE CONV (Press 4)****Sub Functions**

This mode is used to perform Fine Raster Correction, and Fine Red and Blue Convergence Adjustments.

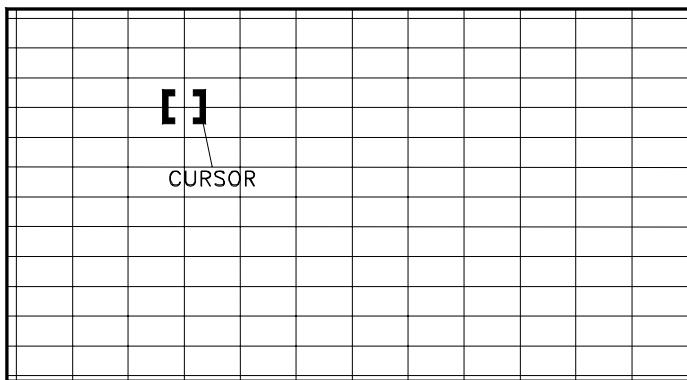
There are three Sub Adjustment Functions, selected with the AUDIO button:

- FINE GREEN .... a Green Crosshatch is displayed, to make Fine Raster Corrections.
- FINE RED .... a White Crosshatch is displayed, to make Fine Red Convergence Adjustments.
- FINE BLUE .... a White Crosshatch is displayed, to make Fine Blue Convergence Adjustments.

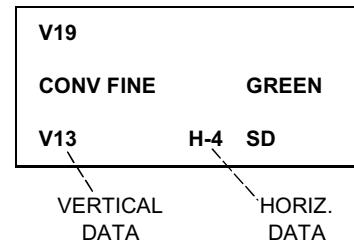
**Cursor**

In the Fine mode a Cursor is added to the Crosshatch. The ENTER button toggles the Cursor between two modes:

- MOVE (blinking Cursor) .... use the ADJUST buttons to select any of 64 points on the Crosshatch.
- ADJUST (Non blinking Cursor) .... the ADJUST buttons adjust the active color at the current Cursor position, horizontally or vertically.

**Display**

The on-screen display changes in the Fine mode, as shown at the right. The display shows the vertical and horizontal data for the current Cursor Position, and the horizontal and vertical coordinates for that position.

**G. Saving Data and Exiting the Convergence Mode**

Press MENU twice to exit the Convergence mode, data is automatically saved.

**E2PROM Replacement**

IC7A01 stores some adjustment data. After replacing the IC, set the data to the values given in the following tables. If good performance is not obtained, perform the Adjustments Procedures given in the Notes column.

**List of Adjustment Items.**

VC Function (Video Color)		Data Range	Initial Data				Notes
			480i	480p	1080i	VGA	
NO.	Abbrev.	Adjustment Description					
1	SCT	Picture Gain (H-Temp)	0~63	42	42	42	42
2	SBRT	Sub Brightness (H-Temp)	0~63	25	25	25	25
3	SCOL	Sub Color (H-Temp)	0~15	3	5	3	3
4	STIN	Sub Tint	0~15	7	8	15	7
5	SCON	Sub Contrast (H-Temp)	0~15	3	3	3	3
6	RDRH	R-Drive (high)	0~63	25	25	25	25
7	GDR	G-Drive	0~63	35	35	35	35
8	BDRH	B-Drive (high)	0~63	25	25	25	25
9	CTRH	R-Cutoff (high)	0~63	20	20	20	20
10	CTGH	G-Cutoff (high)	0~63	55	55	55	55
11	CTBH	B-Cutoff (high)	0~63	20	20	20	20
12	RDRL	R-Drive (low)	0~63	30	30	30	30
13	BDRL	B-Drive (low)	0~63	20	20	20	20
14	CTRL	R-Cutoff (low)	0~63	20	20	20	20
15	CTGL	G-Cutoff (low)	0~63	55	55	55	55
16	CTBL	B-Cutoff (low)	0~63	15	15	15	15
17	SCTL	Picture Gain (L-Temp)	0~63	42	42	42	42
18	SBRL	Sub Brightness (L-Temp)	0~63	25	25	25	25
19	SCLL	Sub Color (L-Temp)	0~15	2	2	2	2
20	SCNL	Color Gain (L-Temp)	0~15	2	2	2	2
23	COL	Color Gain	0~63	31	31	31	31
56	VM	VM level	0~3	2	2	2	0
60	CRO1	CR Offset 1	0~15	10	7	7	7
61	CBO1	CB Offset 1	0~15	10	7	7	7
64	R-YR	R-Y gain of R-Y	0~15	7	7	7	7
65	R-YB	R-Y gain of B-Y	0~15	2	2	2	2
66	G-YR	G-Y gain of R-Y	0~15	8	8	8	8
67	G-YB	G-Y gain of b-y	0~15	11	11	11	11
72	AG-1	White Aging, On/Off	0~1	1	1	1	1

**JNGL Function (Jungle)**

IC4A01

Function Display		Adjustment Description	Data Range	55" Data		65" Data		73" Data		Notes
Item #	Abbrev.			1080i	480i	1080i	480i	1080i	480i	
1	HWID	Horizontal Width	0~63	33	33	33	33	36	33	Width
2	HKEY	Horizontal Keystone	0~63	31	31	31	31	31	31	Preset
3	EWPT	EW-PCC on top	0~63	22	22	22	22	22	16	"
4	EWCT	Corner Pin (top)	0~63	31	28	31	28	31	31	"
5	EWPB	EW-PCC on bottom	0~63	27	31	27	31	27	21	"
6	EWCB	Corner Pin (bottom)	0~63	31	31	31	31	31	27	"
7	VHGT	Vertical Height	0~63	25	27	25	27	32	32	Height
8	VLIN	Vertical Linearity	0~15	9	9	9	9	9	9	Preset
9	VSCN	Vertical S-Correction	0~15	0	0	0	0	0	0	"
10	VLNT	Vertical Lin. (Top)	0~15	0	0	0	0	0	0	"
11	VLNB	Vertical Lin. (Bottom)	0~15	0	0	0	0	0	0	"
14	H-POS	Horizontal Position	0~63	30	37	30	37	30	37	"
20	V-POS	Vertical Position	0~63	31	31	31	31	31	31	"

**MNTS Function (Main Decoder)**

IC2E00

Function Display		Adjustment Description	Data Range	Initial Data		Notes
Item #	Abbrev.			RF	Non RF	
1	TNTM	Main Tint	0~63	27	29	Preset
2	COLM	Main Color	0~63	19	19	"
3	YDRM	Main Gain Control	0~31	9	9	Main Y Level
4	VPDM	Pr Pedestal Adjustment	0~15	7	7	
5	UPDM	Pb Pedestal Adjustment	0~15	7	7	

**SNTS Function (Sub Decoder)**

IC2H00

Function Display		Adjustment Description	Data Range	Initial Data	Notes
Item #	Abbrev.				
1	TNTS	Sub Tint	0~63	29	Preset
2	COLS	Sub Color	0~63	27	"
3	YDRS	Sub Gain Control	0~31	12	Sub Y Level
4	VPDS	Pr Pedestal Adjustment	0~15	7	"
5	UPDS	Pb Pedestal Adjustment	0~15	7	"

**AUDIO Function**

IC3A01

Function Display		Adjustment Description	Data Range	Initial Data	Notes
Item #	Abbrev.				
1	INP	Input Level Alignment	0~15	8	Input Level
2	WDE	Wideband Separator Align.	0~31	3	Separation
3	SPC	Spectral Separator Align.	0~31	3	"

**OSD Horizontal Centering**

(MENU-0-1-8-8)

Abbrev.	Description	Data Range	Initial Data
OSDHD	HD OSD Horizontal Position	0~960	122
OSDSD	SD OSC Horizontal Position	0~960	120

**CONV MISC**

(MENU-0-1-5-9-6)

Item Number	Abbrev. Name	Data		Notes
		SD	HD	
1	HVOL	160		HV Adj.
2	VCNT	29	29	Preset
3	VSTR	0	0	"
4	VOFS	25	0	"
5	STLN	45	34	"
6	FPHS	288	288	"
7	CPHS	15	15	"
8	HOFS	22	22	"
9	DPHS	0	0	"
10	DOFS	63	63	"
11	TPHS	34	36	"
12	TPVD	27	39	"
13	ODEV	200	125	"
14	HRTC	1	1	"
15	DRTC	1	1	"
16	DAC	1	1	"
17	EPWP	0	0	"
18	SCRL	25	25	"
19	SDEL	600	600	"
20	FDEL	3	3	"

\* Do not change "1 HVOL" if it has been previously set.

**DYNAMIC FOCUS**

(MENU-0-1-5-9)

Item Number	Abbrev. Name	Description	Data SD&HD
0	DFH	Dynamic Focus Horizontal	-300
1	DFV	Dynamic Focus Vertical	-100

**CONV GREEN Items**

(MENU-0-1-5-9-5)

No.	Abbrev. Name	Description	WS-55859		WS-55909		WS-65869		WS-65909		WS-73909	
			SD	HD								
1	HSTA*	Horizontal Position	0	0	0	0	0	0	0	0	0	0
2	VSTA*	Vertical Position	0	0	0	0	0	0	0	0	0	0
3	SKEW	Skew (Y axis rotation)	0	0	0	0	0	0	0	0	0	0
4	TILT	Tilt (X axis rotation)	0	0	0	0	0	0	0	0	0	0
5	HWID	Horisontal Width	0	0	0	0	0	0	0	0	0	0
6	HLIN	Horizontal Linearity	0	0	0	0	0	0	0	0	0	0
7	SPCC	Side Pin Cushion Correction	0	0	0	0	0	0	0	0	0	0
8	HKEY	Horizontal Keystone	0	0	0	0	0	0	0	0	0	0
9	TPPC	Top/Bottom PC Correction	-200	-170	-200	-170	-200	-170	-200	-170	-200	-170
10	VKEY	Vertical Keystone	15	15	15	15	15	15	15	15	15	15
11	VWID	Vertical Height	0	0	0	0	0	0	0	0	0	0
12	VLIN	Vertical Linearity.	0	0	0	0	0	0	0	0	0	0

\*HSTA and VSTA must not exceed ±200

**CONV RED Items**

(MENU-0-1-5-9-5)

No.	Abbrev. Name	Description	WS-55859		WS-55909		WS-65869		WS-65909		WS-73909	
			SD	HD								
1	HSTA	Horizontal Position	50	50	50	50	50	50	50	50	50	50
2	VSTA	Vertical Position	0	0	0	0	0	0	0	0	0	0
3	SKEW	Skew (Y axis rotation)	0	0	0	0	0	0	0	0	0	0
4	TILT	Tilt (X axix rotation)	0	0	0	0	0	0	0	0	0	0
5	HLIN	Horisontal Linearity	-150	-150	-150	-150	-150	-150	-150	-150	-200	-150
6	HWID	Horizontal Width	10	10	10	10	10	10	10	10	10	10
7	VKEY	Vertical Keystone Correction	-90	-90	-90	-90	-90	-90	-90	-90	-100	-90
8	VWID	Vertical Height	0	0	0	0	0	0	0	0	0	0
9	VLIN	Vertical Linearity	0	0	0	0	0	0	0	0	0	0
10	TPPC	Top/Bottom PC Correction	20	20	20	20	20	20	20	20	20	20
11	SDBW	Horizontal Side Bow	30	30	30	30	30	30	30	30	30	30

\*HSTA and VSTA must not exceed ±200

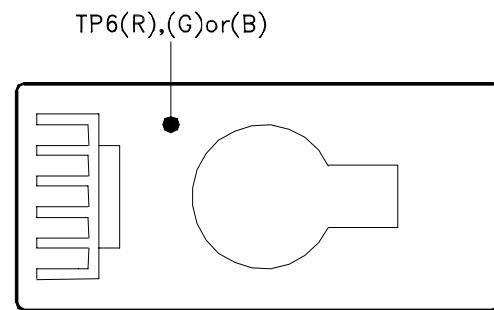
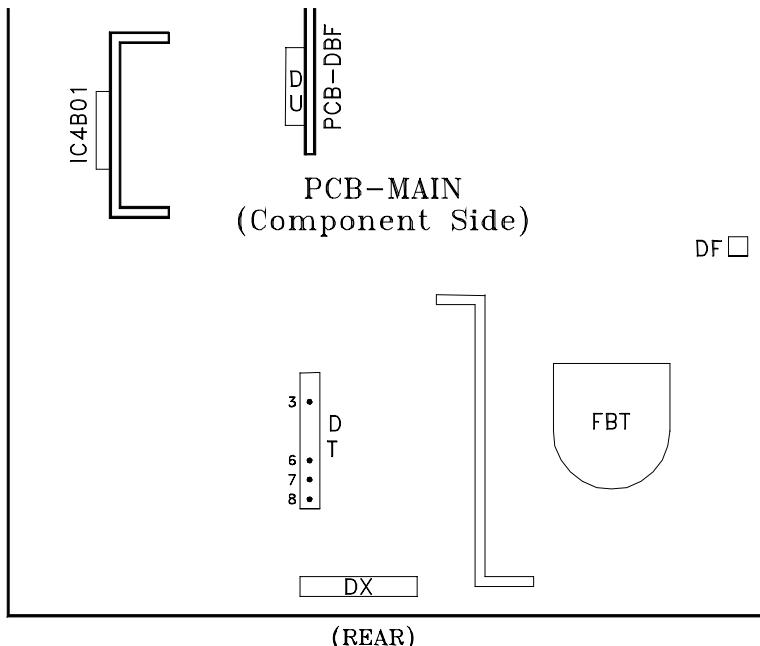
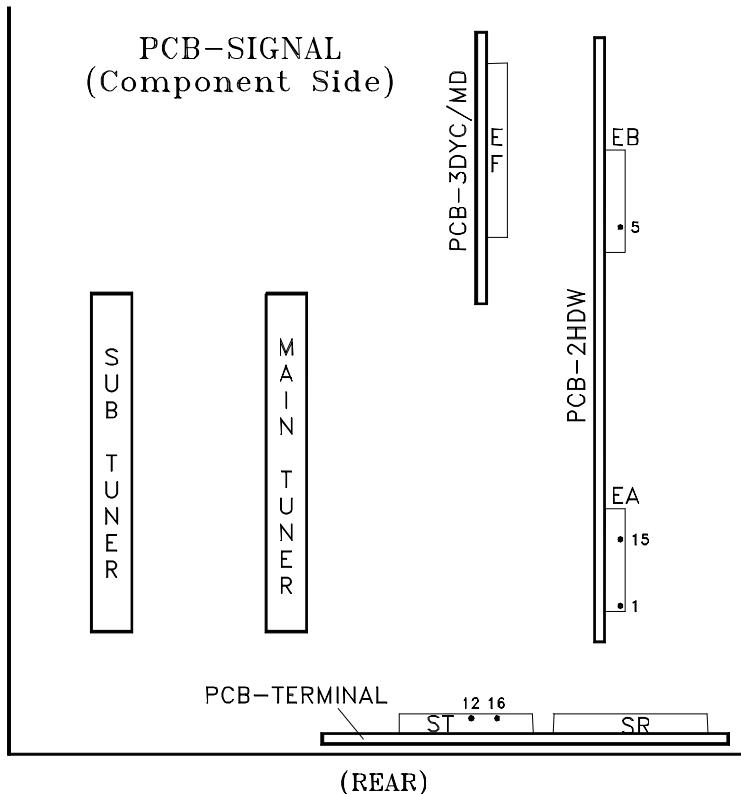
**CONV BLUE Items**

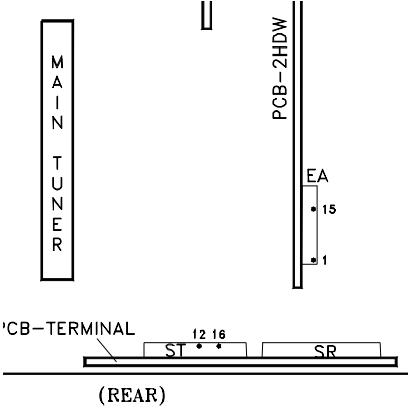
(MENU-0-1-5-9-5)

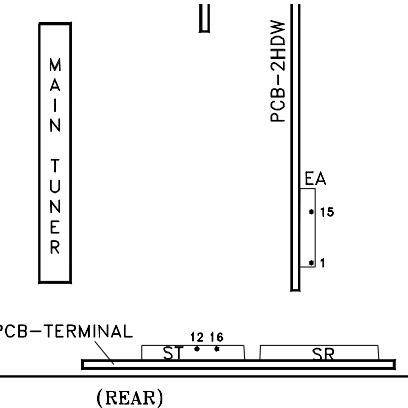
No.	Abbrev. Name	Description	WS-55859		WS-55909		WS-65869		WS-65909		WS-73909	
			SD	HD								
1	HSTA	Horizontal Position	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50
2	VSTA	Vertical Position	0	0	0	0	0	0	0	0	0	0
3	SKEW	Skew (Y axis rotation)	0	0	0	0	0	0	0	0	0	0
4	TILT	Tilt (X axix rotation)	0	0	0	0	0	0	0	0	0	0
5	HLIN	Horisontal Linearity	160	150	160	150	160	150	160	150	220	150
6	HWID	Horizontal Width	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20
7	VKEY	Vertical Keystone Correction	70	70	70	70	70	70	70	70	80	70
8	VWID	Vertical Height	0	0	0	0	0	0	0	0	0	0
9	VLIN	Vertical Linearity	0	0	0	0	0	0	0	0	0	0
10	TPPC	Top/Bottom PC Correction	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20
11	HSBW	Horizontal Side Bow	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30

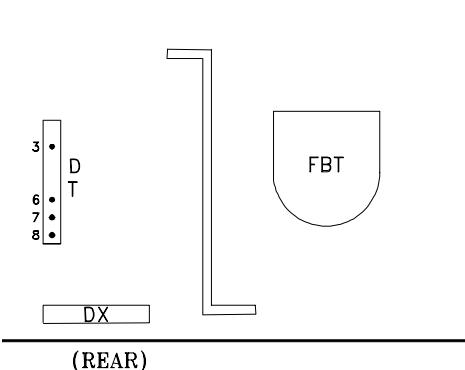
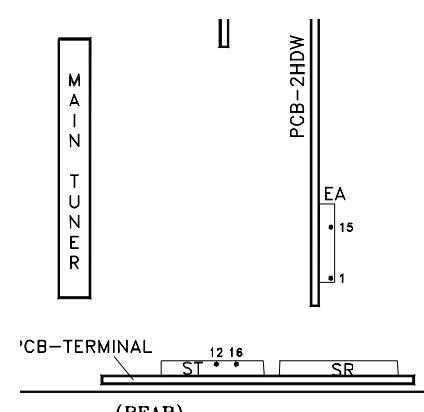
\*HSTA and VSTA must not exceed ±200

## Adjustment Test Point Location



<b>[Audio Circuit]</b>		<b>Purpose:</b> Check the input signal level to the MCS circuit <b>Symptom:</b> Distorted sound during a stereo broadcast.													
<b>1. MCS Input Level</b>															
<table border="1"> <tr> <td><b>Measuring Instrument</b></td><td>Oscilloscope</td></tr> <tr> <td><b>Test Point</b></td><td>Connector ST pins 16&amp;12</td></tr> <tr> <td><b>Ext. Trigger</b></td><td>-----</td></tr> <tr> <td><b>Measuring Range</b></td><td>50mV/Div</td></tr> <tr> <td><b>Input Signal</b></td><td>RF Stereo 300 Hz modulation</td></tr> <tr> <td><b>Input Terminal</b></td><td>RF Input</td></tr> </table>		<b>Measuring Instrument</b>	Oscilloscope	<b>Test Point</b>	Connector ST pins 16&12	<b>Ext. Trigger</b>	-----	<b>Measuring Range</b>	50mV/Div	<b>Input Signal</b>	RF Stereo 300 Hz modulation	<b>Input Terminal</b>	RF Input		
<b>Measuring Instrument</b>	Oscilloscope														
<b>Test Point</b>	Connector ST pins 16&12														
<b>Ext. Trigger</b>	-----														
<b>Measuring Range</b>	50mV/Div														
<b>Input Signal</b>	RF Stereo 300 Hz modulation														
<b>Input Terminal</b>	RF Input														
		<ol style="list-style-type: none"> <li>Supply an RF MCS signal to the Ant A input, 300 Hz at 100% modulation (25 kHz deviation) for right and left channels.</li> <li>Connect the oscilloscope to connector ST pin 16 (Right Audio).</li> <li>Enter the Adjustment Mode and select the Audio Function.</li> <li>Verify that the Audio Function items are set to the data values given the table below.</li> <li>Set the data for Item "1 INP" for 1.56 Vp-p ±0.06V.</li> <li>Connect the oscilloscope to connector ST pin 12 (Left Audio).</li> <li>Confirm that the left audio level at pin 12 of the ST connector is 1.56 Vp-p ±0.06V.</li> </ol>													
		<b>Note:</b> Adjustment 2 (Stereo Separation) must be performed after this adjustment)													
		<p><b>CIRCUIT ADJUST MODE</b></p> <table> <tr><td>Activate .....</td><td>MENU-0-1-5-7</td></tr> <tr><td>Function .....</td><td>AUDIO</td></tr> <tr><td>Item No. ....</td><td>VIDEO</td></tr> <tr><td>Adjust Data .....</td><td>ADJUST</td></tr> <tr><td>Save Data ....</td><td>ENTER</td></tr> <tr><td>Exit .....</td><td>MENU (twice)</td></tr> </table>	Activate .....	MENU-0-1-5-7	Function .....	AUDIO	Item No. ....	VIDEO	Adjust Data .....	ADJUST	Save Data ....	ENTER	Exit .....	MENU (twice)	
Activate .....	MENU-0-1-5-7														
Function .....	AUDIO														
Item No. ....	VIDEO														
Adjust Data .....	ADJUST														
Save Data ....	ENTER														
Exit .....	MENU (twice)														

<b>[Audio Circuit]</b>		<b>Purpose</b> Check stereo separation <b>Symptom:</b> Poor stereo separation													
<b>2. Separation</b>															
<table border="1"> <tr> <td><b>Measuring Instrument</b></td><td>Oscilloscope</td></tr> <tr> <td><b>Test Point</b></td><td>Conector ST pin 16</td></tr> <tr> <td><b>Ext. Trigger</b></td><td>-----</td></tr> <tr> <td><b>Measuring Range</b></td><td>10mV/Div</td></tr> <tr> <td><b>Input Signal</b></td><td>RF Stereo</td></tr> <tr> <td><b>Input Terminal</b></td><td>RF Input</td></tr> </table>		<b>Measuring Instrument</b>	Oscilloscope	<b>Test Point</b>	Conector ST pin 16	<b>Ext. Trigger</b>	-----	<b>Measuring Range</b>	10mV/Div	<b>Input Signal</b>	RF Stereo	<b>Input Terminal</b>	RF Input	<p><b>Note:</b> This adjustment must follow Adjustment 1 (Input Level)</p> <ol style="list-style-type: none"> <li>Supply a RF Stereo Signal (dual tone stereo) to the Ant. A input.           <ul style="list-style-type: none"> <li>Left Channel = 300 Hz modulation</li> <li>Right Channel = no modulation</li> </ul> </li> <li>Connect the oscilloscope to connector ST pin 16 (Right Audio).</li> <li>Enter the Adjustment Mode and select the Audio Function.</li> <li>Set the data for Item "3 WDE" for minimum Right Audio signal.</li> <li>Change the modulation frequency to 3kHz.</li> <li>Adjust the data for Item "4 SPC" for minimum Right Audio signal.</li> </ol>	
<b>Measuring Instrument</b>	Oscilloscope														
<b>Test Point</b>	Conector ST pin 16														
<b>Ext. Trigger</b>	-----														
<b>Measuring Range</b>	10mV/Div														
<b>Input Signal</b>	RF Stereo														
<b>Input Terminal</b>	RF Input														
		<p><b>CIRCUIT ADJUST MODE</b></p> <table> <tr><td>Activate .....</td><td>MENU-0-1-5-7</td></tr> <tr><td>Function .....</td><td>AUDIO</td></tr> <tr><td>Item No. ....</td><td>VIDEO</td></tr> <tr><td>Adjust Data .....</td><td>ADJUST</td></tr> <tr><td>Save Data ....</td><td>ENTER</td></tr> <tr><td>Exit .....</td><td>MENU (twice)</td></tr> </table>	Activate .....	MENU-0-1-5-7	Function .....	AUDIO	Item No. ....	VIDEO	Adjust Data .....	ADJUST	Save Data ....	ENTER	Exit .....	MENU (twice)	
Activate .....	MENU-0-1-5-7														
Function .....	AUDIO														
Item No. ....	VIDEO														
Adjust Data .....	ADJUST														
Save Data ....	ENTER														
Exit .....	MENU (twice)														

<b>[HV Circuit]</b> <b>3. HV Regulation</b>		<b>Purpose:</b> To set the CRT Anode voltage.  <b>Symptom:</b> Dark Picture																		
<b>Measuring Instrument</b> DC Voltmeter <b>Test Point</b> DT connector pins 3 & 6 <b>Ext. Trigger</b> ----- <b>Measuring Range</b> ----- <b>Input Signal</b> Video Signal Monoscope <b>Input Terminal</b> Video Input		<b>Note:</b> This adjustment must be rechecked following Adjustment 9 CRT Cutoff.																		
<ol style="list-style-type: none"> <li>1. Supply a video monoscope signal.</li> <li>2. Set Contrast to maximum, and Brightness to mid position.</li> <li>3. Connect a DC volt meter between pins 3 and 6 of the DT connector. (Positive lead to pin 3)</li> <li>4. Activate the Conv-Misc Mode.</li> <li>5. Select Item "1 HVOL" (screen goes black).</li> <li>6. Adjust Item "1 HVOL" for 15.4V ±0.1V on the meter.</li> <li>7. Save data and exit the Conv-Misc mode.</li> <li>8. Confirm that the voltage does not change more than 0.15V.</li> </ol>		<b>Note:</b> This adjustment must be performed if E2RESET or Convergence E2RESET are activated.																		
 <p>(REAR)</p>		<div style="border: 1px solid black; padding: 5px;"> <p><b>CONVERGENCE MODE</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr><td>Activate .....</td><td>MENU-0-1-5-9</td></tr> <tr><td>Misc. ....</td><td>"6"</td></tr> <tr><td>Coarse.....</td><td>"5"</td></tr> <tr><td>Fine .....</td><td>"4"</td></tr> <tr><td>Color (R,G or B).....</td><td>AUDIO</td></tr> <tr><td>Item No.....</td><td>VIDEO</td></tr> <tr><td>Adjust/Move.....</td><td>ADJUST</td></tr> <tr><td>Cursor Toggle.....</td><td>ENTER</td></tr> <tr><td>Save &amp; Exit.....</td><td>MENU (twice)</td></tr> </table> </div>	Activate .....	MENU-0-1-5-9	Misc. ....	"6"	Coarse.....	"5"	Fine .....	"4"	Color (R,G or B).....	AUDIO	Item No.....	VIDEO	Adjust/Move.....	ADJUST	Cursor Toggle.....	ENTER	Save & Exit.....	MENU (twice)
Activate .....	MENU-0-1-5-9																			
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Color (R,G or B).....	AUDIO																			
Item No.....	VIDEO																			
Adjust/Move.....	ADJUST																			
Cursor Toggle.....	ENTER																			
Save & Exit.....	MENU (twice)																			
<b>[Video Circuit]</b> <b>4. Main/Sub Y Level</b>		<b>Purpose</b> To set picture luminance  <b>Symptom:</b> Excess or insufficient brightness.																		
<b>Measuring Instrument</b> Oscilloscope <b>Test Point</b> EA connector pins 15 & 1 <b>Ext. Trigger</b> ----- <b>Measuring Range</b> ----- <b>Input Signal</b> Color Bars <b>Input Terminal</b> Video Input		<ol style="list-style-type: none"> <li>1. Supply a color bar signal to a Video Input (not an RF input).</li> <li>2. Select the color bar signal for both the main and sub pictures.</li> <li>3. Connect the oscilloscope to connector EA pin 15.</li> <li>4. Activate the Adjustment Mode</li> <li>5. Select Item "3 YDRM" in the MNTS function.</li> <li>6. Adjust the data for 0.7 Vp-p max. - 0.67 Vp-p min. at EA pin 15. (If it cannot be adjusted within this range, set to the lower value)</li> <li>7. Move the oscilloscope to EA pin 1.</li> <li>8. Select Item "3 YDRS" in the Sub Matrix function.</li> <li>9. Adjust the data to equal the MAIN-Y Gain (+0.01V -0.04V).</li> </ol>																		
 <p>(REAR)</p>		<div style="border: 1px solid black; padding: 5px;"> <p><b>CIRCUIT ADJUST MODE</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr><td>Activate .....</td><td>MENU-0-1-5-7</td></tr> <tr><td>Function .....</td><td>AUDIO</td></tr> <tr><td>Item No. ....</td><td>VIDEO</td></tr> <tr><td>Adjust Data .....</td><td>ADJUST</td></tr> <tr><td>Save Data .....</td><td>ENTER</td></tr> <tr><td>Exit .....</td><td>MENU (twice)</td></tr> </table> </div>	Activate .....	MENU-0-1-5-7	Function .....	AUDIO	Item No. ....	VIDEO	Adjust Data .....	ADJUST	Save Data .....	ENTER	Exit .....	MENU (twice)						
Activate .....	MENU-0-1-5-7																			
Function .....	AUDIO																			
Item No. ....	VIDEO																			
Adjust Data .....	ADJUST																			
Save Data .....	ENTER																			
Exit .....	MENU (twice)																			

<b>[Video Circuit]</b>		<b>Purpose:</b> To match the sub picture color to that of the main picture.												
<b>5. Side by Side Sub Picture Tint</b>		<b>Symptom:</b> Main and sub pictures colors differ.												
<b>Measuring Instrument</b>		-----												
<b>Test Point</b>		-----												
<b>Ext. Trigger</b>		-----												
<b>Measuring Range</b>		-----												
<b>Input Signal</b>		NTSC												
<b>Input Terminal</b>		Video												
<p style="text-align: center;"><b>CIRCUIT ADJUST MODE</b></p> <table border="0" style="margin-left: auto; margin-right: auto;"> <tr><td>Activate .....</td><td>MENU-0-1-5-7</td></tr> <tr><td>Function .....</td><td>AUDIO</td></tr> <tr><td>Item No. ....</td><td>VIDEO</td></tr> <tr><td>Adjust Data .....</td><td>ADJUST</td></tr> <tr><td>Save Data .....</td><td>ENTER</td></tr> <tr><td>Exit .....</td><td>MENU (twice)</td></tr> </table>			Activate .....	MENU-0-1-5-7	Function .....	AUDIO	Item No. ....	VIDEO	Adjust Data .....	ADJUST	Save Data .....	ENTER	Exit .....	MENU (twice)
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Function .....	AUDIO													
Item No. ....	VIDEO													
Adjust Data .....	ADJUST													
Save Data .....	ENTER													
Exit .....	MENU (twice)													

<b>[Video Circuit]</b>		<b>Purpose</b> To set the sub picture color level.												
<b>6. Side by Side Sub Color</b>		<b>Symptom:</b> Main and sub pictures color levels differs.												
<b>Measuring Instrument</b>		Oscilloscope												
<b>Test Point</b>		EB connector pin 5												
<b>Ext. Trigger</b>		-----												
<b>Measuring Range</b>		200mV/div 20usec/div												
<b>Input Signal</b>		Color Bars												
<b>Input Terminal</b>		Video Input												
<p><b>Note:</b> Let the set run for at least one minute before making this adjustment.</p> <ol style="list-style-type: none"> <li>Supply a color bar signal.</li> <li>Select the color bar signal as the source for both the main and sub picture.</li> <li>Connect an oscilloscope to pin 5 of the EB connector.</li> <li>Activate the Side by Side mode.</li> <li>Activate the Service Mode</li> <li>Select Item "2 COLS" in the SNTS function.</li> <li>Adjust data so the amplitude of the Sub signal equals that of the main signal.</li> </ol> <p style="text-align: center;">MAIN PICTURE                          SUB PICTURE</p>														
<p><b>CIRCUIT ADJUST MODE</b></p> <table border="0" style="margin-left: auto; margin-right: auto;"> <tr><td>Activate .....</td><td>MENU-0-1-5-7</td></tr> <tr><td>Function .....</td><td>AUDIO</td></tr> <tr><td>Item No. ....</td><td>VIDEO</td></tr> <tr><td>Adjust Data .....</td><td>ADJUST</td></tr> <tr><td>Save Data .....</td><td>ENTER</td></tr> <tr><td>Exit .....</td><td>MENU (twice)</td></tr> </table>			Activate .....	MENU-0-1-5-7	Function .....	AUDIO	Item No. ....	VIDEO	Adjust Data .....	ADJUST	Save Data .....	ENTER	Exit .....	MENU (twice)
Activate .....	MENU-0-1-5-7													
Function .....	AUDIO													
Item No. ....	VIDEO													
Adjust Data .....	ADJUST													
Save Data .....	ENTER													
Exit .....	MENU (twice)													

<b>[CRT Circuit]</b> <b>7. CRT Cutoff</b>		<b>Purpose:</b> To set the cutoff point for all three CRTs. <b>Symptom:</b> Monochrome has a color tint, or incorrect brightness.																													
<table border="1"> <tr> <td><b>Measuring Instrument</b></td><td>Oscilloscope</td></tr> <tr> <td><b>Test Point</b></td><td>TP6R, TP6G, TP6B</td></tr> <tr> <td><b>Ext. Trigger</b></td><td>-----</td></tr> <tr> <td><b>Measuring Range</b></td><td>50V/Div. 2msec/Div.</td></tr> <tr> <td><b>Input Signal</b></td><td>None</td></tr> <tr> <td><b>Input Terminal</b></td><td>Video Input</td></tr> </table>		<b>Measuring Instrument</b>	Oscilloscope	<b>Test Point</b>	TP6R, TP6G, TP6B	<b>Ext. Trigger</b>	-----	<b>Measuring Range</b>	50V/Div. 2msec/Div.	<b>Input Signal</b>	None	<b>Input Terminal</b>	Video Input																		
<b>Measuring Instrument</b>	Oscilloscope																														
<b>Test Point</b>	TP6R, TP6G, TP6B																														
<b>Ext. Trigger</b>	-----																														
<b>Measuring Range</b>	50V/Div. 2msec/Div.																														
<b>Input Signal</b>	None																														
<b>Input Terminal</b>	Video Input																														
		<b>Note:</b> Use the <b>Expand mode (full screen)</b> <ol style="list-style-type: none"> <li>Select an External Input with no signal.</li> <li>Enter the Adjustment Mode, VC Function.</li> <li>Press "1", automatically blanks the screen and sets COL to 0.</li> <li>Set the data to the values given in the table below.</li> <li>Connect the oscilloscope to TP6R.</li> <li>Adjust the Red Screen VR so the black level is 190V, as shown below, or 198.5V ±1VDC using an DC Voltmeter.</li> <li>Repeat Steps 4 and 5 to set the Blue and Green Screen VRs, using TP6G and TP6B.</li> </ol>																													
		<b>Note:</b> White Balance must be performed after this adjustment.																													
<b>Cutoff Preset VC Data</b> <table border="1"> <thead> <tr> <th>Item</th><th>Abbr</th><th>Data</th></tr> </thead> <tbody> <tr><td>1</td><td>SCT</td><td>42</td></tr> <tr><td>2</td><td>SBRT</td><td>25</td></tr> <tr><td>5</td><td>SCON</td><td>3</td></tr> <tr><td>6</td><td>RDRH</td><td>25</td></tr> <tr><td>7</td><td>GDR</td><td>35</td></tr> <tr><td>8</td><td>BDRH</td><td>25</td></tr> <tr><td>9</td><td>CTRH</td><td>20</td></tr> <tr><td>10</td><td>CTGH</td><td>55</td></tr> <tr><td>11</td><td>CTBH</td><td>20</td></tr> </tbody> </table>		Item	Abbr	Data	1	SCT	42	2	SBRT	25	5	SCON	3	6	RDRH	25	7	GDR	35	8	BDRH	25	9	CTRH	20	10	CTGH	55	11	CTBH	20
Item	Abbr	Data																													
1	SCT	42																													
2	SBRT	25																													
5	SCON	3																													
6	RDRH	25																													
7	GDR	35																													
8	BDRH	25																													
9	CTRH	20																													
10	CTGH	55																													
11	CTBH	20																													
		<p>PCB-CRT(R),(G)or(B)</p> <p><b>CIRCUIT ADJUST MODE</b></p> <ul style="list-style-type: none"> <li>Activate ..... MENU-0-1-5-7</li> <li>Function ..... AUDIO</li> <li>Item No. ..... VIDEO</li> <li>Adjust Data ..... ADJUST</li> <li>Save Data ..... ENTER</li> <li>Exit ..... MENU (twice)</li> </ul>																													

<b>[CRT Circuit]</b> <b>8. White Balance (NTSC)</b>		<b>Purpose</b> To set the CRTs white level in the NTSC mode. <b>Symptom:</b> Monochrome has a color tint.												
<table border="1"> <tr> <td><b>Measuring Instrument</b></td><td>DC Voltmeter</td></tr> <tr> <td><b>Test Point</b></td><td>-----</td></tr> <tr> <td><b>Ext. Trigger</b></td><td>-----</td></tr> <tr> <td><b>Measuring Range</b></td><td>-----</td></tr> <tr> <td><b>Input Signal</b></td><td>NTSC White Raster</td></tr> <tr> <td><b>Input Terminal</b></td><td>RF or Video</td></tr> </table>		<b>Measuring Instrument</b>	DC Voltmeter	<b>Test Point</b>	-----	<b>Ext. Trigger</b>	-----	<b>Measuring Range</b>	-----	<b>Input Signal</b>	NTSC White Raster	<b>Input Terminal</b>	RF or Video	
<b>Measuring Instrument</b>	DC Voltmeter													
<b>Test Point</b>	-----													
<b>Ext. Trigger</b>	-----													
<b>Measuring Range</b>	-----													
<b>Input Signal</b>	NTSC White Raster													
<b>Input Terminal</b>	RF or Video													
		<b>Note:</b> Use the "FORMAT" button to activate the <b>Expand mode (full screen)</b> .												
		<ol style="list-style-type: none"> <li>Supply a full White Raster Signal</li> <li>Activate the Service Mode, VC function.</li> <li>Set the data for Item "23 COL" to 0.</li> <li>Adjust Items "6 RDRH" and "8 BDRH" for optimum white at the center of the screen.</li> <li>Reduce the input luminance level to 30%.</li> <li>Adjust Items "9 CTRH" and "11 CTBH" for optimum white.</li> <li>Insert a Milliammeter in series with each CRT Cathode. The maximum allowable current for each CRT is given in the table below.</li> <li>Set the white raster to 100% and adjust Items "12 RDRL" and "13 BDRL" for optimum white at the center of the screen.</li> <li>Reduce the luminance level to 30%.</li> <li>Adjust Item "14 CTRL" and "16 CTBL" for optimum white.</li> <li>Set the data for Item "23 COL" back to 31.</li> </ol>												
<b>CIRCUIT ADJUST MODE</b> <ul style="list-style-type: none"> <li>Activate ..... MENU-0-1-5-7</li> <li>Function ..... AUDIO</li> <li>Item No. ..... VIDEO</li> <li>Adjust Data ..... ADJUST</li> <li>Save Data ..... ENTER</li> <li>Exit ..... MENU (twice)</li> </ul>		<b>Maximum CRT Current</b> <table border="1"> <thead> <tr> <th>CRT</th><th>55" &amp; 65" CURRENT</th><th>73" CURRENT</th></tr> </thead> <tbody> <tr><td>RED</td><td>580 uA</td><td>900 uA</td></tr> <tr><td>GREEN</td><td>580 uA</td><td>900 uA</td></tr> <tr><td>BLUE</td><td>580 uA</td><td>900 uA</td></tr> </tbody> </table>	CRT	55" & 65" CURRENT	73" CURRENT	RED	580 uA	900 uA	GREEN	580 uA	900 uA	BLUE	580 uA	900 uA
CRT	55" & 65" CURRENT	73" CURRENT												
RED	580 uA	900 uA												
GREEN	580 uA	900 uA												
BLUE	580 uA	900 uA												

<b>[CRT Circuit]</b> <b>9. White Balance (HD)</b>		<b>Purpose:</b> To set the CRTs white level in the HD mode. <b>Symptom:</b> Monochrome pictures have a color tint.												
<b>Measuring Instrument</b> ----		1. Supply an HD Full White Raster signal to the DTV Inputs.												
<b>Test Point</b> ----		2. Select the DTV Inputs (Input button)												
<b>Ext. Trigger</b> -----		3. Activate the Adjustment mode, VC Function.												
<b>Measuring Range</b> ----		4. Set Item "23 COL" to 0.												
<b>Input Signal</b> HD White Raster		5. Adjust Items "6 RDRH" and "8 BDRH" for optimum white at the center of the screen.												
<b>Input Terminal</b> DTV Inputs		6. Reduce the input signal luminance to 30%.												
7. Adjust Items "9 CTRH" and "11 CTBH" for optimum white.		8. Set the data for Item "23 COL" back to 31.												
<p><b>CIRCUIT ADJUST MODE</b></p> <table border="0"> <tr><td>Activate .....</td><td>MENU-0-1-5-7</td></tr> <tr><td>Function .....</td><td>AUDIO</td></tr> <tr><td>Item No. ....</td><td>VIDEO</td></tr> <tr><td>Adjust Data .....</td><td>ADJUST</td></tr> <tr><td>Save Data .....</td><td>ENTER</td></tr> <tr><td>Exit .....</td><td>MENU (twice)</td></tr> </table>			Activate .....	MENU-0-1-5-7	Function .....	AUDIO	Item No. ....	VIDEO	Adjust Data .....	ADJUST	Save Data .....	ENTER	Exit .....	MENU (twice)
Activate .....	MENU-0-1-5-7													
Function .....	AUDIO													
Item No. ....	VIDEO													
Adjust Data .....	ADJUST													
Save Data .....	ENTER													
Exit .....	MENU (twice)													

<b>[CRT Circuit]</b> <b>10. Cb, Cr Offset</b>		<b>Purpose</b> To set Cb and Cr color signal level. <b>Symptom:</b> Incorrect colors.												
<b>Measuring Instrument</b> ----		1. Supply an NTSC White Raster (30% luminance) signal to a Video Input.												
<b>Test Point</b> ----		2. Activate the Adjust Mode, VC Function												
<b>Ext. Trigger</b> -----		3. Set Item "23 COL" data to 63.												
<b>Measuring Range</b> ----		4. Adjust Items "60 CRO1" and "61 CBO1" for optimum white.												
<b>Input Signal</b> White Raster (HD&NTSC)		5. Set Item "23 COL" data to 31.												
<b>Input Terminal</b> Video & DTV Inputs		6. Save data and Exit the Service Mode.												
<p><b>CIRCUIT ADJUST MODE</b></p> <table border="0"> <tr><td>Activate .....</td><td>MENU-0-1-5-7</td></tr> <tr><td>Function .....</td><td>AUDIO</td></tr> <tr><td>Item No. ....</td><td>VIDEO</td></tr> <tr><td>Adjust Data .....</td><td>ADJUST</td></tr> <tr><td>Save Data .....</td><td>ENTER</td></tr> <tr><td>Exit .....</td><td>MENU (twice)</td></tr> </table>			Activate .....	MENU-0-1-5-7	Function .....	AUDIO	Item No. ....	VIDEO	Adjust Data .....	ADJUST	Save Data .....	ENTER	Exit .....	MENU (twice)
Activate .....	MENU-0-1-5-7													
Function .....	AUDIO													
Item No. ....	VIDEO													
Adjust Data .....	ADJUST													
Save Data .....	ENTER													
Exit .....	MENU (twice)													

<b>[Video Circuit]</b> <b>11. Black Level</b>		<b>Purpose:</b> To set the black level of the picture. <b>Symptom:</b> Excess or insufficient brightness.
Measuring Instrument	-----	1. Supply a Monoscope signal to a Video Input. 2. Activate the Adjust Mode, VC Function. 3. Adjust Item "2 SBRT" so the 0% and 10% black levels on the gradation scale are the same. 4. Press ENTER to save data. 7. Exit the Service Mode.
Test Point	-----	
Ext. Trigger	-----	
Measuring Range	-----	
Input Signal	Monoscope	
Input Terminal	Video Input	

**CIRCUIT ADJUST MODE**

Activate .....	MENU-0-1-5-7
Function .....	AUDIO
Item No. ....	VIDEO
Adjust Data .....	ADJUST
Save Data ....	ENTER
Exit .....	MENU (twice)

40%	30%	20%	10%
50%	0%	0%	0%
60%	70%	80%	90%

GRADATION SCALE

The diagram illustrates the front panel of a CRT monitor. It features a large central circular dial with a grid pattern, labeled 'GRADATION SCALE'. Surrounding this central dial are several smaller circular knobs, each with a crosshair-like pointer and numerical markings (e.g., 2, 4, 6). Below the central dial, there are horizontal bars of varying lengths, also labeled 'GRADATION SCALE'.

<b>[Video Circuit]</b> <b>12. Sub Contrast</b>		<b>Purpose</b> To set overall beam current to its' optimum level. <b>Symptom:</b> Excess or insufficient contrast.
Measuring Instrument	DC ma meter	<b>Note: Activate the Expand mode (full screen).</b>
Test Point	DT connector pins 7 & 8	1. Supply a Grayscale signal to a RF Input. 2. Activate the Adjust Mode, VC Function. 3. Select Item "1 SCT", signal level automatically reduces. 4. Connect a 3ma DC meter between DT connector pins 7 and 8. Positive lead to pin 7. 5. Adjust Item "1 SCT" for $615\mu A \pm 10\mu A$ ( $645\mu A \pm 10\mu A$ on the WS-73909). 6. Remove the meter. 7. Save data and Exit the Service Mode.
Ext. Trigger	-----	
Measuring Range	-----	
Input Signal	Grayscale	
Input Terminal	RF Input	

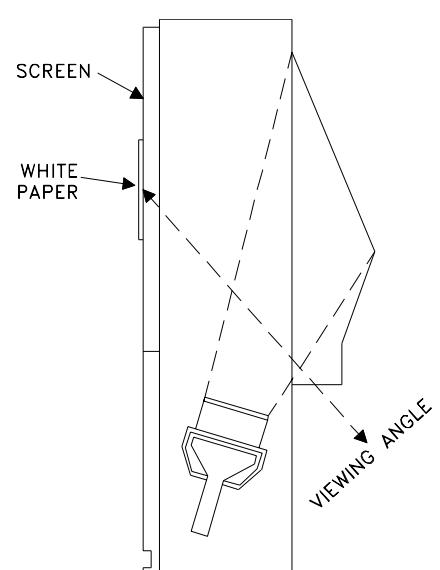
**CIRCUIT ADJUST MODE**

Activate .....	MENU-0-1-5-7
Function .....	AUDIO
Item No. ....	VIDEO
Adjust Data .....	ADJUST
Save Data ....	ENTER
Exit .....	MENU (twice)

The diagram shows the rear panel of a CRT monitor. On the left, there is a vertical row of four pins labeled 3, 6, 7, and 8 from top to bottom. Next to these pins are the letters D and T. To the right of the pins is a vertical line that splits into two, forming a U-shape. At the end of this U-shaped line is a small rectangular cutout containing the letters DX. To the right of the U-shaped line is a larger, irregularly shaped opening labeled FBT.

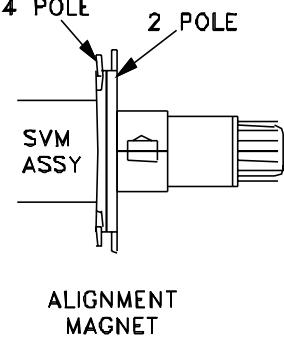
(REAR)

<b>[Focus Circuit]</b> <b>13. Dynamic Focus Preset</b>		<b>Purpose:</b> To improve edge focus. <b>Symptom:</b> Poor focus at the edges of the screen.																		
Measuring Instrument		1. Supply a Monoscope signal to a Video Input																		
Test Point		2. Activate the Convergence Mode.																		
Ext. Trigger		3. Select the DF Function under the Conv. Coarse Mode.																		
Measuring Range		4. Set Items "0 DFH" and "1 DFV" to the data values given in the DF Table.																		
Input Signal		5. Press "6" to activate CONV-MISC																		
Input Terminal		6. Set "0 FPHS" and "1 DPHS" to data values given in the CONV-MISC Table.																		
		5. Exit the Conv. Mode.																		
<b>CONVERGENCE MODE</b> Activate .....MENU-0-1-5-9 Misc. ...."6" Coarse....."5" Fine ....."4" Color (R, G or B).....AUDIO Item No.....VIDEO Adjust/Move.....ADJUST Cursor Toggle.....ENTER Save & Exit.....MENU (twice)		<b>DF</b> (MENU-0-1-5-9-5) <table border="1"> <thead> <tr> <th>Item</th> <th>Abbr.</th> <th>Data</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>DFH</td> <td>-300</td> </tr> <tr> <td>1</td> <td>DFV</td> <td>-100</td> </tr> </tbody> </table> <b>CONV MISC</b> (MENU-0-1-5-9-6) <table border="1"> <thead> <tr> <th>Item</th> <th>Abbr.</th> <th>Data</th> </tr> </thead> <tbody> <tr> <td>9</td> <td>DPHS</td> <td>0</td> </tr> <tr> <td>10</td> <td>DOFS</td> <td>63</td> </tr> </tbody> </table>	Item	Abbr.	Data	0	DFH	-300	1	DFV	-100	Item	Abbr.	Data	9	DPHS	0	10	DOFS	63
Item	Abbr.	Data																		
0	DFH	-300																		
1	DFV	-100																		
Item	Abbr.	Data																		
9	DPHS	0																		
10	DOFS	63																		

<b>[Video Circuit]</b> <b>14. Lens Focus</b>		<b>Purpose</b> To set the Lens position for optimum focus. <b>Symptom:</b> Poor focus
Measuring Instrument		<b>Note:</b> This adjustment must be done before Electrostatic Focus. Perform this adjustment for RED, GREEN, and BLUE monochrome pictures.
Test Point		1. Supply a VIDEO signal (Monoscope).
Ext. Trigger		2. Cover the Red and Blue Lens (producing a green raster).
Measuring Range		3. Adjust the Green Lens for best focus at the center of the Monoscope pattern.
Input Signal		<b>Note:</b> Attach a white paper to the screen center. During adjustment, observe the picture on the screen from inside for easier adjustment.
Input Terminal		4. Repeat Steps 2 and 3 for the Red and Blue monochrome pictures.
		

<b>[CRT Circuit]</b>		<b>Purpose:</b> To set electrostatic focus to the optimum point. <b>Symptom:</b> Poor focus.
<b>15. Electrostatic Focus &amp; (Alignment Magnet)</b>		
Measuring Instrument	-----	<p><b>Note:</b> This adjustment must be performed after the Sub Contrast adjustment.</p> <p><b>Alignment Magnet Adjustment (WS-55909, WS-65909 and WS-73909 Only)</b> This adjustment must be performed before Static Focus Adjustment</p> <ol style="list-style-type: none"> <li>Supply a Crosshatch with Center Dot signal to a Video Input.</li> <li>Select a Green raster using the table below.</li> <li>Roughly adjust Green Focus VR.</li> <li>Rotate Green Focus VR CCW so the center dot is about 10mm diameter.</li> <li>Adjust the Green 4 Pole Magnet for the roundest center dot.</li> <li>Set the Green Focus VR for optimum focus.</li> <li>Repeat the procedure with a Red raster and adjust the Red 4 Pole Magnet.</li> <li>Use silicon to lock the magnets in place.</li> </ol>
Test Point	-----	
Ext. Trigger	-----	
Measuring Range	-----	
Input Signal	Monscope & Crosshatch	
Input Terminal	Video Input	



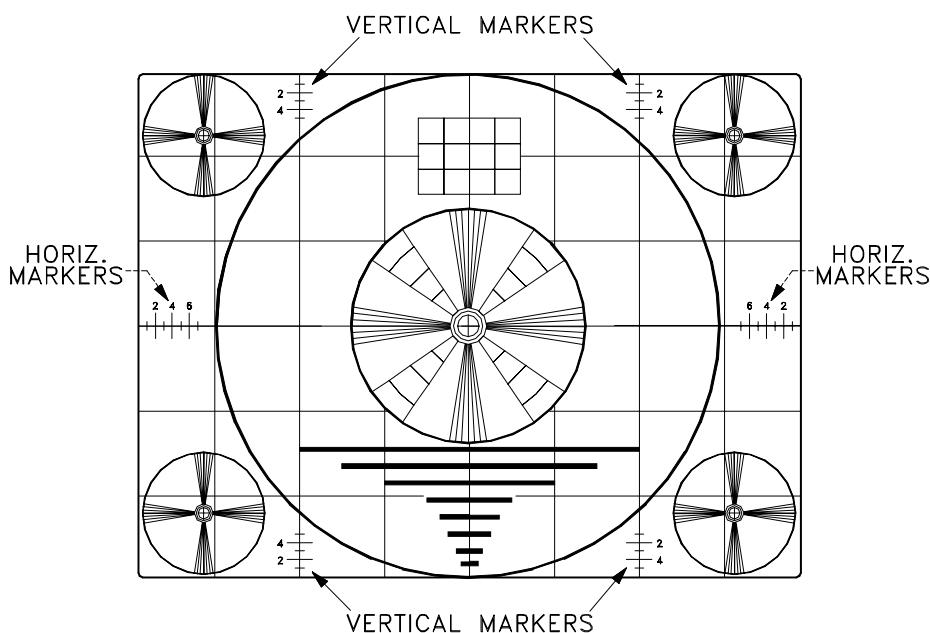
**Static Focus Adjustment (All Models)**

- Supply a Monoscope signal to a Video Input
- Activate A/V Reset
- Select Red, Green or Blue rasters using the table below.
- Set the Red, Green and Blue Focus VRs for optimum focus at the top center of the picture..

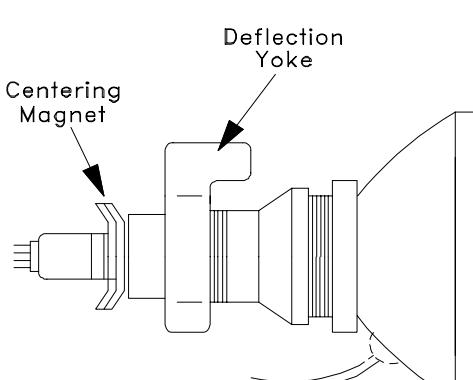
Color Raster	Activation Code
Red	MENU-0-1-5-9-1
Green	MENU-0-1-5-9-2
Blue	MENU-0-1-5-9-3

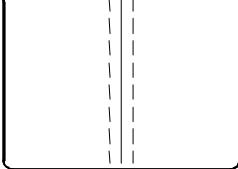
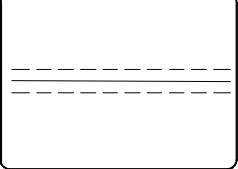
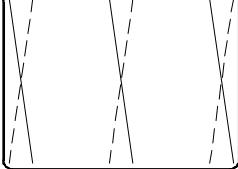
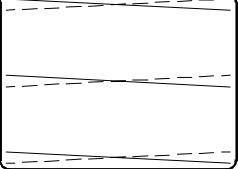
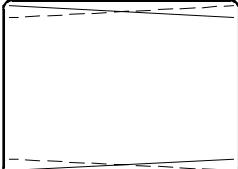
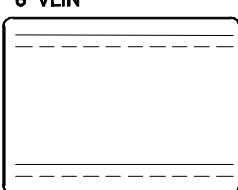
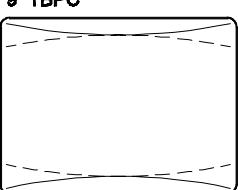
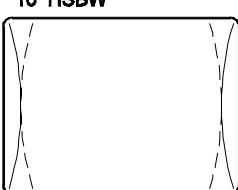
<b>[On Screen Display]</b>		<b>Purpose</b> To position the character display horizontally.
<b>16.Character Position</b>		<b>Symptom:</b> Incorrect display position
Measuring Instrument	-----	<ol style="list-style-type: none"> <li>Supply an NTSC signal to Ant-A and select Ant-A as the source.</li> <li>Enter the OSD Position Mode, press "MENU-0-1-8-8".</li> <li>Adjust "OSDSD" to center the OSD horizontally.</li> <li>Press "MENU" to save data and exit the mode.</li> <li>Supply a HD signal to the DTV inputs and select the DTV Inputs as the source.</li> <li>Enter the OSD Position Mode, press "MENU-0-1-8-8".</li> <li>Adjust "OSDHD" to center the OSD horizontally.</li> <li>Press "MENU" to save data and exit the mode.</li> </ol>
Test Point	-----	
Ext. Trigger	-----	
Measuring Range	-----	
Input Signal	Video Signal (HD/NTSC)	
Input Terminal	ANT-A/DTV	

<b>[Conv/Defl]</b> <b>17. Geometry Preset</b>		<b>Purpose:</b> To preset data controlling raster geometry <b>Symptom:</b> Raster distortion.																																																																																																														
Measuring Instrument	-----																																																																																																															
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Input Signal	NTSC & HD																																																																																																															
Input Terminal	Video & DTV Inputs																																																																																																															
<b>CIRCUIT ADJUST MODE</b> Activate ..... MENU-0-1-5-7 Function .....AUDIO Item No. ....VIDEO Adjust Data .....ADJUST Save Data .....ENTER Exit .....MENU (twice)		<b>Note:</b> This procedure is usually only necessary if an E2PROM is replaced in the TV Control, DM or Convergence circuits.																																																																																																														
<b>CONVERGENCE MODE</b> Activate .....MENU-0-1-5-9 Misc. ......."6" Coarse....."5" Fine ....."4" Color (R,G or B).....AUDIO Item No. ....VIDEO Adjust/Move.....ADJUST Cursor Toggle.....ENTER Save & Exit....MENU (twice)		<b>Procedure</b> In the Circuit Adjustment and Coarse Convergence Modes pre-set the data to the values given in the Tables below.																																																																																																														
<b>DEFL JUNGLE (MENU-0-1-5-7)</b>		<table border="1"> <thead> <tr> <th rowspan="2">Item #</th> <th rowspan="2">Abbrev.</th> <th colspan="2">55"&amp;65" Data</th> <th colspan="2">73" Data</th> </tr> <tr> <th>NTSC</th> <th>HD</th> <th>NTSC</th> <th>HD</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>HWID</td> <td>33</td> <td>33</td> <td>33</td> <td>36</td> </tr> <tr> <td>2</td> <td>HKEY</td> <td>31</td> <td>31</td> <td>31</td> <td>31</td> </tr> <tr> <td>3</td> <td>EWPT</td> <td>22</td> <td>22</td> <td>16</td> <td>22</td> </tr> <tr> <td>5</td> <td>EWPB</td> <td>31</td> <td>27</td> <td>21</td> <td>27</td> </tr> <tr> <td>7</td> <td>VHGT</td> <td>27</td> <td>25</td> <td>32</td> <td>32</td> </tr> <tr> <td>8</td> <td>VLIN</td> <td>9</td> <td>13</td> <td>9</td> <td>9</td> </tr> <tr> <td>9</td> <td>VSCN</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>20</td> <td>VPOS</td> <td>31</td> <td>31</td> <td>31</td> <td>31</td> </tr> </tbody> </table>	Item #	Abbrev.	55"&65" Data		73" Data		NTSC	HD	NTSC	HD	1	HWID	33	33	33	36	2	HKEY	31	31	31	31	3	EWPT	22	22	16	22	5	EWPB	31	27	21	27	7	VHGT	27	25	32	32	8	VLIN	9	13	9	9	9	VSCN	0	0	0	0	20	VPOS	31	31	31	31																																																				
Item #	Abbrev.	55"&65" Data			73" Data																																																																																																											
		NTSC	HD	NTSC	HD																																																																																																											
1	HWID	33	33	33	36																																																																																																											
2	HKEY	31	31	31	31																																																																																																											
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5	EWPB	31	27	21	27																																																																																																											
7	VHGT	27	25	32	32																																																																																																											
8	VLIN	9	13	9	9																																																																																																											
9	VSCN	0	0	0	0																																																																																																											
20	VPOS	31	31	31	31																																																																																																											
<b>CONV GREEN (MENU-0-1-5-9-5)</b>		<table border="1"> <thead> <tr> <th rowspan="2">Item #</th> <th rowspan="2">Abbrev.</th> <th colspan="2">55" Data</th> <th colspan="2">65" Data</th> <th colspan="2">73" Data</th> </tr> <tr> <th>SD</th> <th>HD</th> <th>SD</th> <th>HD</th> <th>SD</th> <th>HD</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>HSTA</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>1</td> <td>VSTA</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>2</td> <td>SKEW</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>3</td> <td>TILT</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>4</td> <td>HWID</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>5</td> <td>HLIN</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>6</td> <td>SPCC</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>7</td> <td>HKEY</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>8</td> <td>TBPC</td> <td>-200</td> <td>-170</td> <td>-200</td> <td>-170</td> <td>-200</td> <td>-170</td> </tr> <tr> <td>9</td> <td>VKEY</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>10</td> <td>VWID</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>11</td> <td>VLIN</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </tbody> </table>	Item #	Abbrev.	55" Data		65" Data		73" Data		SD	HD	SD	HD	SD	HD	0	HSTA	0	0	0	0	0	0	1	VSTA	0	0	0	0	0	0	2	SKEW	0	0	0	0	0	0	3	TILT	0	0	0	0	0	0	4	HWID	0	0	0	0	0	0	5	HLIN	0	0	0	0	0	0	6	SPCC	0	0	0	0	0	0	7	HKEY	0	0	0	0	0	0	8	TBPC	-200	-170	-200	-170	-200	-170	9	VKEY	0	0	0	0	0	0	10	VWID	0	0	0	0	0	0	11	VLIN	0	0	0	0	0	0
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1	VSTA	0	0	0	0	0	0																																																																																																									
2	SKEW	0	0	0	0	0	0																																																																																																									
3	TILT	0	0	0	0	0	0																																																																																																									
4	HWID	0	0	0	0	0	0																																																																																																									
5	HLIN	0	0	0	0	0	0																																																																																																									
6	SPCC	0	0	0	0	0	0																																																																																																									
7	HKEY	0	0	0	0	0	0																																																																																																									
8	TBPC	-200	-170	-200	-170	-200	-170																																																																																																									
9	VKEY	0	0	0	0	0	0																																																																																																									
10	VWID	0	0	0	0	0	0																																																																																																									
11	VLIN	0	0	0	0	0	0																																																																																																									
<b>CONV BLUE (MENU-0-1-5-9)</b>		<table border="1"> <thead> <tr> <th rowspan="2">Item #</th> <th rowspan="2">Abbrev.</th> <th colspan="2">55" Data</th> <th colspan="2">65" Data</th> <th colspan="2">73" Data</th> </tr> <tr> <th>SD</th> <th>HD</th> <th>SD</th> <th>HD</th> <th>SD</th> <th>HD</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>HSTA</td> <td>-50</td> <td>-50</td> <td>-50</td> <td>-50</td> <td>-50</td> <td>-50</td> </tr> <tr> <td>1</td> <td>VSTA</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>2</td> <td>SKEW</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>3</td> <td>TILT</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>4</td> <td>HLIN</td> <td>160</td> <td>150</td> <td>160</td> <td>150</td> <td>220</td> <td>150</td> </tr> <tr> <td>5</td> <td>HWID</td> <td>-20</td> <td>-20</td> <td>-20</td> <td>-20</td> <td>-20</td> <td>-20</td> </tr> <tr> <td>6</td> <td>VKEY</td> <td>70</td> <td>70</td> <td>70</td> <td>70</td> <td>80</td> <td>70</td> </tr> <tr> <td>7</td> <td>VWID</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>8</td> <td>VLIN</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>9</td> <td>TBPC</td> <td>-20</td> <td>-20</td> <td>-20</td> <td>-20</td> <td>-20</td> <td>-20</td> </tr> <tr> <td>10</td> <td>HSBW</td> <td>-30</td> <td>-30</td> <td>-30</td> <td>-30</td> <td>-30</td> <td>-30</td> </tr> </tbody> </table>	Item #	Abbrev.	55" Data		65" Data		73" Data		SD	HD	SD	HD	SD	HD	0	HSTA	-50	-50	-50	-50	-50	-50	1	VSTA	0	0	0	0	0	0	2	SKEW	0	0	0	0	0	0	3	TILT	0	0	0	0	0	0	4	HLIN	160	150	160	150	220	150	5	HWID	-20	-20	-20	-20	-20	-20	6	VKEY	70	70	70	70	80	70	7	VWID	0	0	0	0	0	0	8	VLIN	0	0	0	0	0	0	9	TBPC	-20	-20	-20	-20	-20	-20	10	HSBW	-30	-30	-30	-30	-30	-30								
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<b>[Deflection Circuit]</b> <b>18: Deflection Geometry Height &amp; Width Adjustment</b>		<b>Purpose:</b> To set the height, width and linearity of the raster. <b>Symptom:</b> Incorrect height, width and/or linearity.	
Measuring Instrument	-----	<b>Preliminary:</b> <ol style="list-style-type: none"> <li>1. <u>DO NOT</u> change the initial values for "#8 VLIN" in the Defl. Jungle Function.</li> <li>2. <u>DO NOT</u> exceed the following VHGT adjustment ranges: NTSC ... from -4 to +10 HD ... from -10 TO +5</li> </ol>	
Test Point			
Ext. Trigger			
Measuring Range			
Input Signal		Monoscope (NTSC & HD)	
Input Terminal		Video & DTV Inputs	
<b>CIRCUIT ADJUST MODE</b> Activate ..... MENU-0-1-5-7 Function .....AUDIO Item No. ....VIDEO Adjust Data .....ADJUST Save Data ....ENTER Exit .....MENU (twice)		<b>NTSC Mode</b> <ol style="list-style-type: none"> <li>1. Supply an NTSC Monoscope signal to a Video Input.</li> <li>2. Select the Monoscope as the signal source.</li> <li>3. Activate the Adjustment Mode, JNGL Function.</li> <li>4. Select and adjust each of the following items. <ul style="list-style-type: none"> <li>• "7 VHGT" ... so the vertical marker sum = 4</li> <li>• "1 HWD" ... so the horizontal marker sum = 7</li> </ul> </li> <li>5. Save data and Exit the Service Mode.</li> </ol> <b>HD Mode</b> <ol style="list-style-type: none"> <li>1. Supply an HD Monoscope signal to the DTV HD Inputs.</li> <li>2. Select the DTV Inputs as the signal source (Input button)</li> <li>3. Activate the Service Mode, Defl. Jungle Function.</li> <li>4. Select and adjust each of the following items. <ul style="list-style-type: none"> <li>• "7 VHGT" ... so the vertical marker sum = 2</li> <li>• "1 HWD" ... so the horizontal marker sum = 5</li> </ul> </li> <li>5. Save data and Exit the Service Mode.</li> </ol>	
			

<b>[Convergence Circuit]</b> <b>19. Convergence Geometry Adjustment</b>		<b>Purpose:</b> To set the Convergence circuit geometry adjustments. <b>Symptom:</b> Raster distortion at the top, bottom or sides of the picture.	
Measuring Instrument	----		
Test Point	----		
Ext. Trigger	----		
Measuring Range	----		
Input Signal	NTSC -- None HD -- HD sync		
Input Terminal	Video & DTV Inputs		
		<b>Note:</b> Deflection Circuit Geometry must be performed before this adjustment.	
		<b>NTSC mode</b> 1. Select a Video Input with no signal. 2. Activate the Convergence Mode, Coarse Green. 3. Adjust the Coarse Green Items shown below for straight crosshatch lines. 4. Select the Fine Green Mode, a Cursor is displayed on the crosshatch. 5. Use the Cursor to adjust for straight crosshatch lines. 6. Exit the Convergence Mode.	
		<b>HD mode</b> 1. Supply horizontal and vertical HD sync to the DTV Inputs and select the DTV Inputs as the source. <b>Note:</b> If an HD signal is not available, select Ant-DTV, with no signal, as the source. 2. Enter the Convergence Mode, Coarse Green. 3. Repeat NTSC Steps 3 through 6 in the HD mode.	
<b>CONVERGENCE MODE</b> Activate .....MENU-0-1-5-9 Misc. ...."6" Coarse....."5" Fine ....."4" Color (R,G or B).....AUDIO Item No.....VIDEO Adjust/Move.....ADJUST Cursor Toggle.....ENTER Save & Exit.....MENU (twice)			
<b>COARSE GREEN ADJUSTMENTS</b>			
<b>2 SKEW</b>	<b>3 TILT</b>	<b>5 HLIN</b>	<b>6 SPCC</b>
<b>7 HKEY</b>	<b>8 TBPC</b>	<b>9 VKEY</b>	<b>11 VLIN</b>

<b>[Convergence Circuit]</b> <b>20. Centering and Static Convergence</b>		<b>Purpose:</b> To converge red, green and blue at the center of the screen <b>Symptom:</b> Color edging over the entire picture.									
Measuring Instrument	-----										
Test Point	-----										
Ext. Trigger	-----										
Measuring Range	-----										
Input Signal	NTSC -- Monoscope HD -- Monoscope										
Input Terminal	Video & DTV Inputs										
<b>CONVERGENCE MODE</b> Activate .....MENU-0-1-5-9 Misc. ......."6" Coarse....."5" Fine ....."4" Color (R,G or B).....AUDIO Item No.....VIDEO Adjust/Move.....ADJUST Cursor Toggle.....ENTER Save & Exit.....MENU (twice)		<b>Preliminary</b> Degauss the shield cover and bracket unit of the CRT assembly and chassis. <b>DO NOT</b> degauss the CPM Assemblies.									
<b>HD mode</b> <ol style="list-style-type: none"> <li>Supply an HD Monoscope signal to the DTV Inputs.</li> <li>Select the DTV Inputs as the signal source (Input button).</li> <li>Enter the Convergence Coarse mode.</li> <li>Set the data for the "HSTA" and "VSTA" items to:               <table style="margin-left: 40px;"> <tr> <td><b>GREEN</b></td> <td><b>RED</b></td> <td><b>BLUE</b></td> </tr> <tr> <td>HSTS = 0</td> <td>HSTA = 50</td> <td>HSTA = -50</td> </tr> <tr> <td>VSTA = 0</td> <td>VSTA = 0</td> <td>VSTA = 0</td> </tr> </table> </li> <li>In the Coarse Green mode:               <ul style="list-style-type: none"> <li>Center the Green Raster using the Green Centering Magnet.</li> <li>Rotate the Green Deflection Yoke to correct any tilt.</li> </ul> </li> <li>In the Coarse Red mode, use the Red Centering Magnet to converge red on the green at the center of screen. Correct any red tilt with the Red Deflection Yoke.</li> <li>In the Coarse Blue mode, repeat Step 6 using the Blue Centering magnet and the Blue Deflection Yoke.</li> <li>Exit the Convergence mode.</li> </ol> <b>SD mode</b> <ol style="list-style-type: none"> <li>Supply an NTSC Monoscope signal to a Video Input.</li> <li>Select the Monoscope as the signal source (Input button).</li> <li>Enter the Convergence Coarse Green mode.</li> <li>Confirm that the Green Raster is centered.</li> </ol>			<b>GREEN</b>	<b>RED</b>	<b>BLUE</b>	HSTS = 0	HSTA = 50	HSTA = -50	VSTA = 0	VSTA = 0	VSTA = 0
<b>GREEN</b>	<b>RED</b>	<b>BLUE</b>									
HSTS = 0	HSTA = 50	HSTA = -50									
VSTA = 0	VSTA = 0	VSTA = 0									
 <p>The diagram illustrates the internal structure of a CRT's electron gun. It shows a central cylindrical tube with a flared end. A 'Centering Magnet' is positioned at the base of the tube. Above it, a 'Deflection Yoke' is attached, which has two sets of coils wound around it. The yoke is angled to provide horizontal and vertical magnetic fields for beam deflection. The tube itself is part of the electron枪 assembly, which also includes the gun structure and the neck of the CRT.</p>											

<b>[Convergence Circuit]</b> <b>21. Coarse Convergence</b>		<b>Purpose:</b> To converge red and blue on green at the edges of the screen. <b>Symptom:</b> Color edging at the top, bottom and sides of the screen.	
<b>Measuring Instrument</b> ----- <b>Test Point</b> ----- <b>Ext. Trigger</b> ----- <b>Measuring Range</b> ----- <b>Input Signal</b> NTSC -- None HD -- HD sync <b>Input Terminal</b> Video & HD Inputs		<b>SD mode</b> 1. Select an External Input with no signal. 2. Activate the Convergence Mode, Coarse Red. 3. Adjust the Items shown below to converge the red on the green. 4. Select Coarse Blue mode. 5. Adjust the Items shown below to converge the blue on the green. <b>Note:</b> If center convergence shifts, use red and blue items "0 HSTA" and "1 VSTA" to correct the shift. 6. Exit the Convergence Mode.	
		<b>HD mode</b> 1. Supply horizontal and vertical HD sync to the DTV Inputs and select the DTV Inputs as the source. <b>Note:</b> If an HD signal is not available, select Ant-DTV, with no signal, as the source. 2. Repeat SD Steps 2 through 5 in the HD mode. 3. Exit the Convergence mode.	
<b>CONVERGENCE MODE</b> Activate .....MENU-0-1-5-9 Misc. ...."6" Coarse....."5" Fine ....."4" Color (R,G or B).....AUDIO Item No.....VIDEO Adjust/Move.....ADJUST Cursor Toggle.....ENTER Save & Exit.....MENU (twice)			
<b>COARSE CONVERGENCE RED &amp; BLUE ADJUSTMENTS</b>			
<b>0 HSTA*</b> 	<b>1 VSTA*</b> 	<b>2 SKEW</b> 	<b>3 TILT</b> 
<b>4 HLIN</b> 	<b>5 HWID</b> 	<b>6 VKEY</b> 	<b>7 VWID</b> 
<b>8 VLIN</b> 	<b>9 TBPC</b> 	<b>10 HSBW</b> 	
<small>* Data should not exceed ±100</small>			

<b>[Convergence Circuit]</b> <b>22. Fine Convergence</b>		<p><b>Purpose:</b> To converge red, green and blue at the edges of the screen</p> <p><b>Symptom:</b> Color edging at the edges of the picture.</p>
Measuring Instrument	-----	<b>SD Fine Adjustment</b>
Test Point	-----	<ol style="list-style-type: none"> <li>1. Select an External Input, no signal.</li> <li>2. Activate the Convergence Mode, Fine Red.</li> <li>3. Use the Cursor to converge red on the green.</li> <li>4. Select the Fine Blue mode.</li> <li>5. Use the Cursor to converge blue on the green.</li> <li>6. Exit the Convergence mode.</li> </ol>
Ext. Trigger	-----	
Measuring Range	-----	
Input Signal	NTSC -- None HD -- HD sync	<b>HD Fine Adjustment</b>
Input Terminal	Video & DTV Inputs	<ol style="list-style-type: none"> <li>1. Supply an HD signal (sync only) to the DTV inputs and select DTV with the "Audio" button. <b>Note:</b> If an HD signal is not available, select Ant-DTV, with no signal, as the source.</li> <li>2. Repeat SD Fine Adjustment Steps 2 through 6, in the HD mode.</li> </ol>

**CONVERGENCE MODE**

Activate .....MENU-0-1-5-9  
 Misc. ...."6"  
 Coarse....."5"  
 Fine ....."4"  
 Color (R,G or B).....AUDIO  
 Item No.....VIDEO  
 Adjust/Move.....ADJUST  
 Cursor Toggle.....ENTER  
 Save & Exit.....MENU (twice)

## CHIP PARTS REPLACEMENT

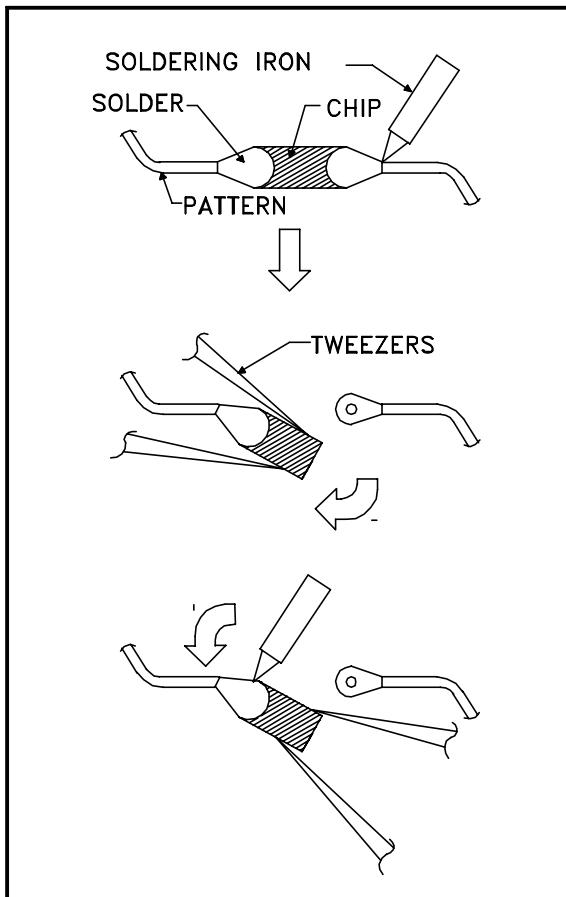
Some resistors, shorting jumpers (0 Ohm resistors), ceramic capacitors, transistors and diodes are chip parts. The following precautions should be taken when replacing these parts.

**Cautions:**

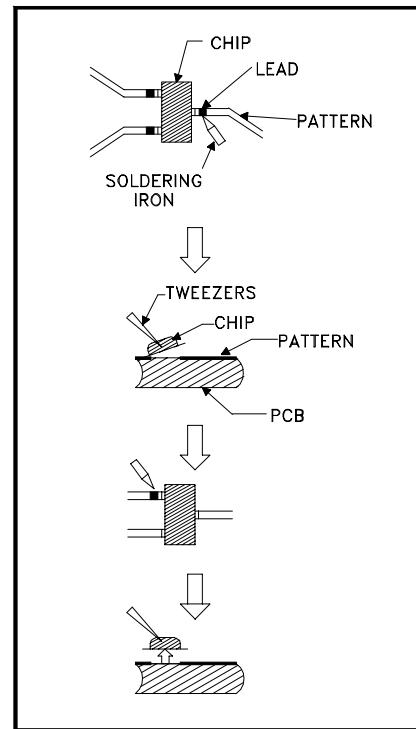
1. Use a fine tipped, well insulated soldering iron (approximately 30 watts), and tweezers.
2. Melt the solder and remove the chip parts carefully so as not to tear the copper foil from the printed circuit board.
3. Discard removed chips; do not reuse them.
4. Do not apply heat for more than 3 (three) seconds to new chip parts.
5. Avoid using a rubbing stroke when soldering.
6. Take care not to scratch, or damage the chip parts when soldering.
7. Supplementary cementing is not required.

**Chip Parts Removal (Resistors, Capacitors, etc.)**

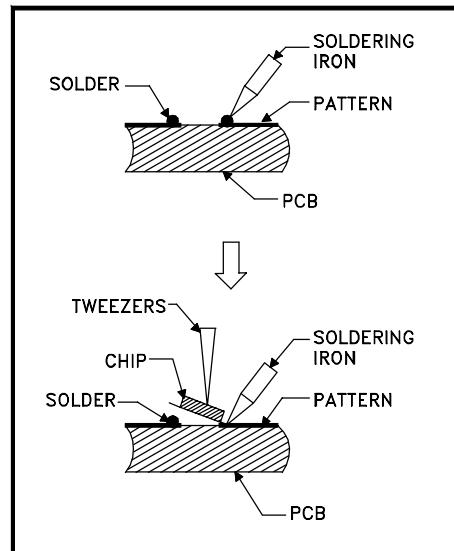
1. Grasp the part with tweezers. Melt the solder at both sides alternately, and remove one side of the part with a twisting motion.
2. Melt the solder at the other side and remove the part.


**Chip Parts Removal (Transistors)**

1. Melt the solder of one lead and lift the side of that lead upward.
2. Simultaneously melt the solder of the other two leads and lift the part from the PCB.


**Replacement**

1. Presolder the contact points on the circuit pattern.
2. Press the part downward with tweezers and apply the soldering iron as shown.



## REPLACEMENT PARTS

### **Parts Ordering**

To expedite delivery of replacement parts orders, specify the following:

1. Model Number/Serial Number
2. Part Number and description
3. Quantity

**Note:** Unless complete information is supplied, delay in processing of orders will result.

### **Critical and Warranty Parts Designation**

**Critical Electrical Components** are indicated by **Bold Type** in the Parts List, and in the schematic diagrams by shading. 

**Warranty Return Parts** are indicated in the Parts List with an (\*).

### **Parts Tolerance Codes**

Refer to the following chart for tolerance characteristics of electrical components.

<b>MARK</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>F</b>	<b>G</b>	<b>J</b>	<b>K</b>
Tolerance %	$\pm 0.1$	$\pm 0.25$	$\pm 0.5$	$\pm 1$	$\pm 2$	$\pm 5$	$\pm 10$

<b>MARK</b>	<b>M</b>	<b>N</b>	<b>V</b>	<b>X</b>	<b>Z</b>	<b>P</b>	<b>Q</b>
Tolerance %	$\pm 20$	$\pm 30$	$\pm 10$	+ 40 -20	+ 80 -20	+ 100 - 0	+ 30 -10

<b>MARK</b>	<b>M</b>	<b>N</b>	<b>V</b>	<b>X</b>	<b>Z</b>
Tolerance (pF)	$\pm 0.1$	$\pm 0.25$	$\pm 0.5$	$\pm 1$	$\pm 2$

## QUICK REFERENCE FOR COMMON REPLACEMENT PARTS

**CRT ASSEMBLIES**

MODEL	ASSY-CRT-RED	ASSY-CRT-GREEN	ASSY-CRT-BLUE
WS-55859	251C213040	251C213050	251C213060
WS-55909	251C214010	251C214020	251C214030
WS-65869	251C213070	251C213080	251C213090
WS-65909	251C214040	251C214050	251C214060
WS-73909	251C214070	251C214080	251C214090

**REMOTE CONTROL**

290P106010      REMOTE CONTROL

**HIGH VOLTAGE / DEFLECTION COMPONENTS**

Q5A31	261P071010	HORIZ-OUT 2SC5418 RL	
Q5A51	261P082010	HV-OUT 2SK2771-O1R	
T5A51	334P278010	TRANS-FLYBACK	
	920P016010	HV-BLOCK	
	129P059050	VR-FOCUS	
	338P046030	SVM COIL - G&B	All
	338P051010	SVM COIL - GREEN	WS-55909 / WS-65869 / WS-65909 / WS-73909
	330P276010	DEFL-YOKE	
	453B035010	CAP-ANODE-SHORT-RED	WS-55859 / WS-55909 / WS-65869 / WS-65909
	453B035020	CAP ANODE-LONG-G&B	WS-55859 / WS-55909 / WS-65869 / WS-65909
	453B035030	CAP-ANODE-SHORT-RED	WS-73909
	453B035040	CAP ANODE-LONG-G&B	WS-73909

**MISCELLANEOUS**

MODEL	MIRROR	LENTICULAR SCREEN	FRESNEL LENS
WS-55859	767D055040	491P103010	491P104010
WS-55909	767D055040	491P103010	491P104010
WS-65869	767D048090	491P105010	491P106010
WS-65909	767D048090	491P105010	491P106010
WS-73909	767C031010	491P085020	491P086020

**MODELS: WS-55859 / WS-55909 / WS-65869 / WS-65909 / WS-73909**

[#] Model Legend: (1) WS-55859, (2) WS-55909, (3) WS-65869, (4) WS-65909, (5) WS-73909

Ref #	Part #	Part Name & Description	[#]
<b>TUBES</b>			
251C213040	ASSY-CRT-RED		1
251C213050	ASSY-CRT-GREEN		1
251C213060	ASSY-CRT-BLUE		1
251C213070	ASSY-CRT-RED		3
251C213080	ASSY-CRT-GREEN		3
251C213090	ASSY-CRT-BLUE		3
251C214010	ASSY-CRT-RED		2
251C214020	ASSY-CRT-GREEN		2
251C214030	ASSY-CRT-BLUE		2
251C214040	ASSY-CRT-RED		4
251C214050	ASSY-CRT-GREEN		4
251C214060	ASSY-CRT-BLUE		4
251C214070	ASSY-CRT-RED		5
251C214080	ASSY-CRT-GREEN		5
251C214090	ASSY-CRT-BLUE		5
<b>INTEGRATED CIRCUITS</b>			
IC2A00	270P870010	IC - CXA2151Q	
IC2A60	272P938010	IC - M52055FP	
IC2B00	270P870010	IC - CXA2151Q	
IC2C00	275P496010	IC-C-MOS - UPD64082GF-3BA	
IC2C01	275P531010	IC-C-MOS - MSM54V16258B-45TS-K	
IC2D01	272P379020	IC - LM1881MX (NSC)	
IC2E00	270P658030	IC - CXA2019AQ/T4	
IC2F50	272P379020	IC - LM1881MX (NSC)	
IC2F60	272P379020	IC - LM1881MX (NSC)	
IC2F70	275P718010	IC-C-MOS - TC74HC4053FT	
IC2F80	275P718010	IC-C-MOS - TC74HC4053FT	
IC2H00	270P658030	IC - CXA2019AQ/T4	
IC2K00	270P623010	IC - CXA2069Q	
IC2L00	270P623010	IC - CXA2069Q	
IC2V00	270P663020	IC - CXA2101AQ	
IC2V90	275P419010	IC-C-MOS - SN74AHCT1G126DBV	
IC2Y01	270P526020	IC - MM111XF	
IC3A01	270P467010	IC - TDA9855	
<b>IC3E01</b>	<b>270P750010</b>	<b>IC - LA4663</b>	
IC4A01	270P664010	IC - CXA2102Q	
IC4A02	270P575030	IC - NJM78M09DLA-TE1	
IC4A03	263P384010	IC-C-MOS - TC74HC221AF-EL	
IC4B01	270P261020	IC - TDA8177	
<b>IC5A00</b>	<b>267P143020</b>	<b>KIC - MSPAD101</b>	
<b>IC5A01</b>	<b>272P237010</b>	<b>IC - LA6324N</b>	
<b>IC5A02</b>	<b>266P154010</b>	<b>IC - UPC393C</b>	
<b>IC5A03</b>	<b>270P704010</b>	<b>IC - LM4040BIZ-10.0</b>	
IC5A05	270P816010	IC - NJM431L	
IC5F00	263P479010	IC-C-MOS - TC74HC123AF	
<b>IC6B01</b>	<b>270P667010</b>	<b>IC - TDA6120Q</b>	
<b>IC6G01</b>	<b>270P667010</b>	<b>IC - TDA6120Q</b>	
<b>IC6R01</b>	<b>270P667010</b>	<b>IC - TDA6120Q</b>	
IC7A00	275P770010	IC-C-MOS, MICROCOMPU - M306V0ME-110FP	
IC7A01	275P533010	IC-C-MOS - M24C64WM6T	
IC7A02	270P706010	IC - MAX823	
IC7A03	270P873010	IC - SN74CBT1G125DBVR	
IC7A04	270P873010	IC - SN74CBT1G125DBVR	
IC7B00	274P901010	IC-C-MOS - TC74HCT7007AF-EL	
IC7B80	263P154010	IC-C-MOS - SN74HC132DB	
IC7C30	275P419010	IC-C-MOS - SN74AHCT1G126DBV	
IC7D00	275P451010	IC-C-MOS - TC74HC4066AFN-ELP	

Ref #	Part #	Part Name & Description	[#]
<b>TRANSISTORS</b>			
IC7D01	275P560010	IC - ADS931E A2D CONVERTER	
IC7D02	275P560010	IC - ADS931E A2D CONVERTER	
IC7D03	275P560010	IC - ADS931E A2D CONVERTER	
IC7D10	275P535010	IC-C-MOS - TC74AC157FN-ELP	
IC7D11	275P535010	IC-C-MOS - TC74AC157FN-ELP	
IC7E00	275P451010	IC-C-MOS - TC74HC4066AFN-ELP	
IC7E01	275P560010	IC - ADS931E A2D CONVERTER	
IC7E02	275P560010	IC - ADS931E A2D CONVERTER	
IC7E03	275P560010	IC - ADS931E A2D CONVERTER	
IC7E10	275P535010	IC-C-MOS - TC74AC157FN-ELP	
IC7E11	275P535010	IC-C-MOS - TC74AC157FN-ELP	
IC7G01	275P247010	IC-C-MOS - MB40C958VPFV	
IC7G04	275P534010	IC-C-MOS - TC74HCT574AFW-ELP	
IC7G05	275P534010	IC-C-MOS - TC74HCT574AFW-ELP	
IC7H00	275P716010	IC-C-MOS - uPD4516161AG5-A10-9NF	
IC7H01	275P716010	IC-C-MOS - uPD4516161AG5-A10-9NF	
IC7H02	275P436030	IC-C-MOS - TMC57127PPM	
IC7H03	275P439030	IC-C-MOS - MSM534031E-*TS-K	
IC7H04	270P506010	IC - M51957BFP	
IC7H05	263P384010	IC-C-MOS - TC74HC221AF-EL	
IC7H06	270P348010	IC - TLC2932IPW	
IC7H07	275P437020	IC - SLA4028	
IC7H08	270P348010	IC - TLC2932IPW	
IC7H09	274P901010	IC-C-MOS - TC74HCT7007AF-EL	
IC7H11	275P535010	IC-C-MOS - TC74AC157FN-ELP	
IC7H12	275P535010	IC-C-MOS - TC74AC157FN-ELP	
IC7H13	275P535010	IC-C-MOS - TC74AC157FN-ELP	
IC7H14	275P535010	IC-C-MOS - TC74AC157FN-ELP	
IC7K21	270P831010	IC-C-MOS - OPA2350PA	
IC7V01	275P362010	IC-C-MOS - Z86130	
IC800	275P595010	IC-C-MOS - CM0022AF	
IC801	275P615010	IC-C-MOS - AT24C32N-10SI	
IC802	270P751010	IC - TL084CD	
IC803	270P751010	IC - TL084CD	
IC804	270P751010	IC - TL084CD	
<b>IC8C01</b>	<b>267P155010</b>	<b>HIC - STK393-110</b>	
IC8E01	270P817010	IC - L4931CDT33-TR	
IC8E02	272P603010	IC - LM78L05ACZ/NJM78L05A	
IC8E03	275P721010	IC-C-MOS - CD0031AM	
<b>IC9A20</b>	<b>267P159010</b>	<b>HIC - STR-G6623</b>	
<b>IC9A21</b>	<b>270P816010</b>	<b>IC - NJM431L</b>	
IC9A22	267P076030	HIC - SI-3050C	
<b>IC9A50</b>	<b>267P140020</b>	<b>HIC - STR-F6628</b>	
<b>IC9A51</b>	<b>267P062050</b>	<b>HIC - SE110N</b>	
IC9C00	270P472060	IC - NJM7805FA	
IC9C01	270P210010	IC - NJM7809FA/AN7809F	
IC9C02	270P210010	IC - NJM7809FA/AN7809F	
IC9C03	270P575030	IC - NJM78M09DLA-TE1	
IC9C20	267P131010	HIC - SI-3033C	
IC9C40	267P076030	HIC - SI-3050C	
IC9C50	270P817010	IC - L4931CDT33-TR	

TR-CHIP Type (Listed by Generic Number)

Type	Part No.	Description
PNP	260P817010	2SA1037K-Q
PNP	260P817020	2SA1037K-R
PNP	260P817030	2SA1037K-S

**MODELS: WS-55859 / WS-55909 / WS-65869 / WS-65909 / WS-73909**

[#] Model Legend: (1) WS-55859, (2) WS-55909, (3) WS-65869, (4) WS-65909, (5) WS-73909

Ref #	Part #	Part Name & Description	[#]	Ref #	Part #	Part Name & Description	[#]
<b>Type</b>	<b>Part #</b>	<b>Description</b>					
NPN	260P818010	2SC2412K-Q		D2J91	264P485060	DIODE - RD7.5FB2	
NPN	260P818030	2SC2412K-S		D2M22	264P822010	D-CHIP - HSM2838	
NPN	260P835030	2SC2413K-Q		D2V44	264P828010	D-CHIP - DAN202U/MA142WK	
PNP	261P801010	2SA1252-5,6		D2W01	264P828010	D-CHIP - DAN202U/MA142WK	
<b>Conventional Transistors (By Ref #)</b>							
<b>Ref #</b>	<b>Part No.</b>	<b>Description</b>		D2W02	264P828010	D-CHIP - DAN202U/MA142WK	
Q4B01	260P559030	TR - 2SC1740S-S		D2W04	264P828010	D-CHIP - DAN202U/MA142WK	
Q5A01	260P788010	TR - 2SC4690-O		D2W05	264P828010	D-CHIP - DAN202U/MA142WK	
Q5A02	260P561020	TR - 2SA1371-E		D2W06	264P828010	D-CHIP - DAN202U/MA142WK	
Q5A03	260P386010	TR - 2SC2230-GR		D4B01	264D056020	DIODE - S5500D/EM1Z/ERB12-02RK	
Q5A04	260P559030	TR - 2SC1740S-S		D4B04	264P045040	DIODE - 1S24710M	
Q5A05	260P560040	TR - 2SA933S-S		D54K0	264P808010	DIODE-CHIP - DAN202K	
<b>Q5A06</b>	<b>260P560040</b>	<b>TR - 2SA933S-S</b>		D5A01	264P045040	DIODE - 1S24710M	
Q5A07	261P123010	TRANSISTOR - UNR4113-S		D5A02	264D056020	DIODE - S5500D/EM1Z/ERB12-02RK	
Q5A08	260P325030	TR - 2SC2655-Y		D5A12	264P045040	DIODE - 1S24710M	
Q5A10	260P603010	TR - DTA124ES/UN4112		D5A13	264P483070	DIODE - RD5.1FB1	
Q5A31	261P071010	TR - 2SC5418 RL		D5A14	264P045040	DIODE - 1S24710M	
Q5A32	260P587040	TR - 2SC2333-M,L		D5A31	262P032010	DIODE - FMV-G2GS	
Q5A33	260P559030	TR - 2SC1740S-S		D5A34	264P483070	DIODE - RD5.1FB1	
Q5A34	260P561020	TR - 2SA1371-E		D5A35	264P045040	DIODE - 1S24710M	
Q5A35	260P386010	TR - 2SC2230-GR		D5A36	264P045040	DIODE - 1S24710M	
Q5A36	260P630010	TR - 2SD2012		D5A37	264P521040	DIODE - EU1A	
Q5A37	260P559030	TR - 2SC1740S-S		D5A51	262P039010	DIODE - BYW96E/20	
Q5A38	260P559030	TR - 2SC1740S-S		D5A52	264P899010	DIODE - BYV26E	
<b>Q5A51</b>	<b>261P082010</b>	<b>TR - 2SK2771-01R</b>		D5A53	264P489010	DIODE - RD16FB1	
Q5H05	260P559050	TR - 2SC1740S-E		D5A54	264P724010	DIODE - STF14	
Q5H06	260P560040	TR - 2SA933S-S		D5A55	264P724010	DIODE - STF14	
Q5H08	260P559050	TR - 2SC1740S-E		D5A56	264P045040	DIODE - 1S24710M	
Q5H09	260P559050	TR - 2SC1740S-E		D5A57	264P521040	DIODE - EU1A	
Q5H10	260P560040	TR - 2SA933S-S		D5A58	264P045040	DIODE - 1S24710M	
Q5H11	260P573020	TR - 2SB940A-P		D5A59	264P045040	DIODE - 1S24710M	
Q5H12	260P574020	TR - 2SD1264A-P		D5A60	264P489010	DIODE - RD16FB1	
Q5K00	260P664030	TR - 2SC4636		D5F00	264P828010	D-CHIP - DAN202U/MA142WK	
Q5K01	260P664030	TR - 2SC4636		D5F01	264P828010	D-CHIP - DAN202U/MA142WK	
Q5K02	260P559050	TR - 2SC1740S-E		D5F02	264P828010	D-CHIP - DAN202U/MA142WK	
Q5K03	260P560040	TR - 2SA933S-S		D5H01	264P045040	DIODE - 1S24710M	
Q6B01	260P560040	TR - 2SA933S-S		D5H02	264P045040	DIODE - 1S24710M	
Q6B02	260P560040	TR - 2SA933S-S		D5H03	264P045040	DIODE - 1S24710M	
Q6G01	260P560040	TR - 2SA933S-S		D5H04	264P045040	DIODE - 1S24710M	
Q6R01	260P560040	TR - 2SA933S-S		D5K01	264P528030	DIODE - RP1H	
Q7C31	261P114010	TR - 2SA1585STPR		D5K02	264P543010	DIODE - EG01	
Q7K21	260P559030	TR - 2SC1740S-S		D5K03	264P543010	DIODE - EG01	
<b>Q9A20</b>	<b>261P101010</b>	<b>TR - PHP21N06T</b>		D5K10	264P528030	DIODE - RP1H	
Q9A21	260P559030	TR - 2SC1740S-S		D5K11	264P528030	DIODE - RP1H	
Q9A22	260P559030	TR - 2SC1740S-S		D6G02	264P501090	DIODE - HZ4CLL	
Q9A50	260P416030	TR - 2SC2274-F,K-F		D6G03	264P457080	DIODE - RD3.3EB1	
Q9A51	260P559030	TR - 2SC1740S-S		D7H01	264P828010	D-CHIP - DAN202U/MA142WK	
Q9A53	260P559030	TR - 2SC1740S-S		D7K21	268P100010	PHOTO DIODE - SFH235FA	
Q9A54	260P559030	TR - 2SC1740S-S		D7K22	264P045040	DIODE - 1S24710M	
Q9B00	261P118010	TR - ITF86130SK8T		D7L20	264P485060	DIODE - RD7.5FB2	
Q9B01	261P118010	TR - ITF86130SK8T		D7L21	264P212020	D-LED - LN31GPH	
Q9B02	261P117010	TR - HUF76112SK8		D8C01	264P045040	DIODE - 1S24710M	
<b>Diodes</b>							
D2J04	264P485060	DIODE - RD7.5FB2		D8C02	264P045040	DIODE - 1S24710M	
D2J05	264P485060	DIODE - RD7.5FB2		D8G00	264P486060	DIODE - RD9.1FB3	
				D8G01	264P486060	DIODE - RD9.1FB3	
				D9A01	262P031010	DIODE - D6SB80	
				D9A20	264P358040	DIODE - RU 4A	
				D9A21	264P899010	DIODE - BYV26E	
				D9A22	264P045040	DIODE - 1S24710M	
				D9A23	264P045040	DIODE - 1S24710M	
				D9A24	264P045040	DIODE - 1S24710M	

**MODELS: WS-55859 / WS-55909 / WS-65869 / WS-65909 / WS-73909**

[#] Model Legend: (1) WS-55859, (2) WS-55909, (3) WS-65869, (4) WS-65909, (5) WS-73909

Ref #	Part #	Part Name & Description	[#]
D9A25	264P045040	DIODE - 1S24710M	
D9A26	264P045040	DIODE - 1S24710M	
D9A27	264P045040	DIODE - 1S24710M	
D9A28	264P045040	DIODE - 1S24710M	
D9A29	264P483070	DIODE - RD5.1FB1	
D9A31	264P045040	DIODE - 1S24710M	
D9A32	264P045040	DIODE - 1S24710M	
D9A33	264P628010	DIODE - FMB-G14L	
D9A34	264P470080	DIODE - EQA02-32C/RD33EB4	
D9A35	264P469090	DIODE - EQA02-28C/RD30EB2	
D9A50	264P045040	DIODE - 1S24710M	
D9A52	264P045040	DIODE - 1S24710M	
D9A53	264P045040	DIODE - 1S24710M	
D9A54	264P045040	DIODE - 1S24710M	
D9A55	264P045040	DIODE - 1S24710M	
D9A56	264P566010	DIODE - FMP-G12S	
D9A57	264P899010	DIODE - BYV26E	
D9A58	264P588010	DIODE - FML-G16S	
D9A64	264P045040	DIODE - 1S24710M	
D9A65	264P045040	DIODE - 1S24710M	
D9A66	264P045040	DIODE - 1S24710M	
D9B01	264P718010	DIODE - FR155	
D9B04	264P458050	DIODE - RD3.9EB1	
D9B05	264P484040	DIODE - RD5.6FB3	
D9C00	264D056020	DIODE - S5500D/EM1Z/ERB12-02RK	

### COILS

L1A06	409P923060	EMI-F-CHIP - BLM21B272S
L1A07	409P923060	EMI-F-CHIP - BLM21B272S
L1A09	325C146030	COIL-CHIP - 10MH-J
L1A13	409P923060	EMI-F-CHIP - BLM21B272S
L1A50	325C146030	COIL-CHIP - 10MH-J
L1A51	321C114010	COIL-RF - 2200MH-J
L1B06	409P923060	EMI-F-CHIP - BLM21B272S
L1B07	409P923060	EMI-F-CHIP - BLM21B272S
L1B09	325C146030	COIL-CHIP - 10MH-J
L1B13	409P923060	EMI-F-CHIP - BLM21B272S
L1B50	325C146030	COIL-CHIP - 10MH-J
L1B51	321C114010	COIL-RF - 2200MH-J
L2A00	325C241030	COIL-CHIP - 10MH-K
L2A60	325C241030	COIL-CHIP - 10MH-K
L2B00	325C241030	COIL-CHIP - 10MH-K
L2C01	325C146050	COIL-CHIP - 15MH-J
L2C03	409P777080	EMI-F-CHIP - BLM21P221S
L2C05	409P777080	EMI-F-CHIP - BLM21P221S
L2C06	409P777080	EMI-F-CHIP - BLM21P221S
L2D01	325C146030	COIL-CHIP - 10MH-J
L2D03	325C146030	COIL-CHIP - 10MH-J
L2D08	409P777080	EMI-F-CHIP - BLM21P221S
L2D20	325C146030	COIL-CHIP - 10MH-J
L2E03	409P777080	EMI-F-CHIP - BLM21P221S
L2E25	409P777080	EMI-F-CHIP - BLM21P221S
L2F50	409P923060	EMI-F-CHIP - BLM21B272S
L2F60	409P777080	EMI-F-CHIP - BLM21P221S
L2F70	409P923060	EMI-F-CHIP - BLM21B272S
L2F80	409P923060	EMI-F-CHIP - BLM21B272S
L2H60	325C146030	COIL-CHIP - 10MH-J
L2H61	325C146030	COIL-CHIP - 10MH-J
L2J30	409P777050	EMI-F-CHIP - BLM21B201S
L2J31	409P777050	EMI-F-CHIP - BLM21B201S

Ref #	Part #	Part Name & Description	[#]
L2J32	409P777050	EMI-F-CHIP - BLM21B201S	
L2J33	409P777050	EMI-F-CHIP - BLM21B201S	
L2J34	409P777050	EMI-F-CHIP - BLM21B201S	
L2J35	409P777050	EMI-F-CHIP - BLM21B201S	
L2K42	409P777080	EMI-F-CHIP - BLM21P221S	
L2L42	409P777080	EMI-F-CHIP - BLM21P221S	
L2M00	409P777080	EMI-F-CHIP - BLM21P221S	
L2M20	409P777080	EMI-F-CHIP - BLM21P221S	
L2V06	409P923060	EMI-F-CHIP - BLM21B272S	
L2V72	409P923060	EMI-F-CHIP - BLM21B272S	
L2V90	409P923060	EMI-F-CHIP - BLM21B272S	
L2V95	409P923060	EMI-F-CHIP - BLM21B272S	
L2W01	409P923060	EMI-F-CHIP - BLM21B272S	
L2W02	409P923060	EMI-F-CHIP - BLM21B272S	
L2W03	409P923060	EMI-F-CHIP - BLM21B272S	
L2W04	409P923060	EMI-F-CHIP - BLM21B272S	
L2W05	409P923060	EMI-F-CHIP - BLM21B272S	
L2X30	409P923060	EMI-F-CHIP - BLM21B272S	
L2Y00	409P923060	EMI-F-CHIP - BLM21B272S	
L2Y10	409P923060	EMI-F-CHIP - BLM21B272S	
L2Y30	409P923060	EMI-F-CHIP - BLM21B272S	
L3A37	409P923060	EMI-F-CHIP - BLM21B272S	
L4A02	325C461030	COIL-PEAKING - 10MH-K	
L4A03	409P777080	EMI-F-CHIP - BLM21P221S	
L4B01	321C130010	COIL-RF - 2MH	
L4B02	321C130090	COIL-RF - 10MH-K	
L5A31	411P001010	LEAD-FERRITE	
L5A33	333P052030	COIL-HORIZ-LIN	
L5A34	321C130010	COIL-RF - 2MH	
L5A51	321C141030	COIL-RF - 10MH-K	
L5A52	321C141030	COIL-RF - 10MH-K	
L5A53	321C141010	COIL-RF - 6.8MH-M	
L5A54	411D009020	CORE-FERRITE	
L5A55	411D009020	CORE-FERRITE	
L5F00	409P923060	EMI-F-CHIP - BLM21B272S	
L5H41	325C110090	COIL-PEAKING - 4.7MH-K	
L6B01	411P012010	BEAD-FERRITE	
L6B02	411P012010	BEAD-FERRITE	
L6G01	411P012010	BEAD-FERRITE	
L6G02	411P012010	BEAD-FERRITE	
L6R01	411P012010	BEAD-FERRITE	
L6R02	411P012010	BEAD-FERRITE	
L6R04	321C141010	COIL-RF - 6.8MH-M	
L7A30	409P923060	EMI-F-CHIP - BLM21B272S	
L7A99	409P923060	EMI-F-CHIP - BLM21B272S	
L7B00	409P923060	EMI-F-CHIP - BLM21B272S	
L7B76	409P923060	EMI-F-CHIP - BLM21B272S	
L7B80	409P923060	EMI-F-CHIP - BLM21B272S	
L7C00	325C146030	COIL-CHIP - 10MH-J	
L7C10	409P923060	EMI-F-CHIP - BLM21B272S	
L7C20	409P777050	EMI-F-CHIP - BLM21B201S	
L7C24	409P777050	EMI-F-CHIP - BLM21B201S	
L7C25	409P777050	EMI-F-CHIP - BLM21B201S	
L7D01	325C241030	COIL-CHIP - 10MH-K	
L7D11	325C242010	COIL-CHIP - 47MH-K	
L7D12	409P777020	EMI-F-CHIP - BLM21A05	
L7D13	325C241030	COIL-CHIP - 10MH-K	
L7D14	325C241030	COIL-CHIP - 10MH-K	
L7D15	325C241030	COIL-CHIP - 10MH-K	
L7E01	325C241030	COIL-CHIP - 10MH-K	

**MODELS: WS-55859 / WS-55909 / WS-65869 / WS-65909 / WS-73909**

[#] Model Legend: (1) WS-55859, (2) WS-55909, (3) WS-65869, (4) WS-65909, (5) WS-73909

Ref #	Part #	Part Name & Description	[#]	Ref #	Part #	Part Name & Description	[#]
L7E11	325C242010	COIL-CHIP - 47MH-K		L9A60	321C141070	COIL-RF - 22MH-K	
L7E12	409P777020	EMI-F-CHIP - BLM21A05		L9A62	321C141010	COIL-RF - 6.8MH-M	
L7E13	325C241030	COIL-CHIP - 10MH-K		L9A63	321C141010	COIL-RF - 6.8MH-M	
L7E14	325C241030	COIL-CHIP - 10MH-K		L9A64	321C130090	COIL-RF - 10MH-K	
L7E15	325C241030	COIL-CHIP - 10MH-K		L9A65	321C141010	COIL-RF - 6.8MH-M	
L7G00	325C242050	COIL-CHIP - 100MH-K		L9A66	321C141070	COIL-RF - 22MH-K	
L7G10	325C242050	COIL-CHIP - 100MH-K		L9A67	321C130090	COIL-RF - 10MH-K	
L7G11	325C241030	COIL-CHIP - 10MH-K		L9B01	321C140060	COIL-RF - 2.7MH-M 9X9.5	
L7G12	325C241030	COIL-CHIP - 10MH-K		L9B02	321C141070	COIL-RF - 22MH-K	
L7H10	325C241030	COIL-CHIP - 10MH-K		L9B03	321C140060	COIL-RF - 2.7MH-M 9X9.5	
L7H11	409P777080	EMI-F-CHIP - BLM21P221S		L9B04	321C140060	COIL-RF - 2.7MH-M 9X9.5	
L7H12	325C241030	COIL-CHIP - 10MH-K		<b>L9D00</b>	<b>351P222010</b>	<b>LINE FILTER - ELF24V050A</b>	
L7H13	325C241030	COIL-CHIP - 10MH-K		<b>L9D01</b>	<b>351P222010</b>	<b>LINE FILTER - ELF24V050A</b>	
L7H14	325C241030	COIL-CHIP - 10MH-K		LC2J01	409P876060	EMI-F-CHIP - CNF20R102S/CKD510JB1H102S	
L7H15	325C241030	COIL-CHIP - 10MH-K		LC2J02	409P876060	EMI-F-CHIP - CNF20R102S/CKD510JB1H102S	
L7H16	325C241030	COIL-CHIP - 10MH-K		LC2J03	409P876060	EMI-F-CHIP - CNF20R102S/CKD510JB1H102S	
L7H17	325C241030	COIL-CHIP - 10MH-K		LC2J04	409P876060	EMI-F-CHIP - CNF20R102S/CKD510JB1H102S	
L7H19	409P777080	EMI-F-CHIP - BLM21P221S		LC2J05	409P876060	EMI-F-CHIP - CNF20R102S/CKD510JB1H102S	
L7H20	325C241030	COIL-CHIP - 10MH-K		LC7D02	409P875090	EMI-F-CHIP - ELKE103FA	
L7H30	325C241030	COIL-CHIP - 10MH-K		LC7D05	409P875090	EMI-F-CHIP - ELKE103FA	
L7H31	325C241030	COIL-CHIP - 10MH-K		LC7D10	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
L7H32	409P777080	EMI-F-CHIP - BLM21P221S		LC7D11	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
L7H38	325C241030	COIL-CHIP - 10MH-K		LC7D12	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
L7H40	325C241030	COIL-CHIP - 10MH-K		LC7D13	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
L7H41	409P777080	EMI-F-CHIP - BLM21P221S		LC7D14	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
L7H42	409P777080	EMI-F-CHIP - BLM21P221S		LC7E10	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
L7H50	409P777080	EMI-F-CHIP - BLM21P221S		LC7E11	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
L7H60	325C241030	COIL-CHIP - 10MH-K		LC7E12	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
L7H70	325C241030	COIL-CHIP - 10MH-K		LC7E13	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
L7H80	325C241030	COIL-CHIP - 10MH-K		LC7E14	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
L7K01	325C121030	COIL-PEAKING - 10MH-K		LC7G01	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
L7V01	409P923060	EMI-F-CHIP - BLM21B272S		LC7G02	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
L80	325C140050	COIL-CHIP - 2.2MH-M/K/J		LC7G03	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
L8C01	321C141070	COIL-RF - 22MH-K		LC7G04	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
L8C02	321C141070	COIL-RF - 22MH-K		LC7G05	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
L8D01	409P777080	EMI-F-CHIP - BLM21P221S		LC7G06	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
L8D02	409P777080	EMI-F-CHIP - BLM21P221S		LC7G07	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
L8D03	409P777080	EMI-F-CHIP - BLM21P221S		LC7G08	409P875090	EMI-F-CHIP - ELKE103FA	
L8D04	409P777080	EMI-F-CHIP - BLM21P221S		LC7G09	409P875090	EMI-F-CHIP - ELKE103FA	
L8D05	409P777080	EMI-F-CHIP - BLM21P221S		LC7G10	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
L8D06	409P777080	EMI-F-CHIP - BLM21P221S		LC7G11	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
L8D07	409P777080	EMI-F-CHIP - BLM21P221S		LC7G12	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
L8G00	409P777080	EMI-F-CHIP - BLM21P221S		LC7G13	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
L8G01	409P777080	EMI-F-CHIP - BLM21P221S		LC7G14	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
<b>L9A02</b>	<b>351P223010</b>	<b>LINE FILTER - SLF15N0601</b>		LC7G15	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
L9A20	411D009020	CORE-FERRITE		LC7J03	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
L9A21	411D009020	CORE-FERRITE		LC7J04	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
L9A22	321C141020	COIL-RF - 8.2MH		LC7J05	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
L9A23	321C141020	COIL-RF - 8.2MH		LC7J10	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
L9A24	321C141070	COIL-RF - 22MH-K		LC7J13	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
L9A50	411D009020	CORE-FERRITE		LC7J14	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
L9A51	411D009020	CORE-FERRITE		LC7J15	409P876020	EMI-F-CHIP - CNF20C470S/CKD510JB1H470S	
L9A52	411D009020	CORE-FERRITE		LF56A1	409P900010	LP-FILTER - 7MHZ SMD	
L9A53	321C141010	COIL-RF - 6.8MH-M		LF7D00	409P901010	LP-FILTER - 14MHZ SMD	
L9A54	411D009020	CORE-FERRITE		LF7D01	409P901010	LP-FILTER - 14MHZ SMD	
L9A55	321C142030	COIL-RF - 68MH-K		LF7D02	409P901010	LP-FILTER - 14MHZ SMD	
L9A56	411D009020	CORE-FERRITE		LF7E00	409P901010	LP-FILTER - 14MHZ SMD	
L9A57	321C141070	COIL-RF - 22MH-K		LF7E01	409P901010	LP-FILTER - 14MHZ SMD	
L9A58	321C141070	COIL-RF - 22MH-K		LF7E02	409P901010	LP-FILTER - 14MHZ SMD	
L9A59	321C141070	COIL-RF - 22MH-K		LF7G00	409P901010	LP-FILTER - 14MHZ SMD	

[#] Model Legend: (1) WS-55859, (2) WS-55909, (3) WS-65869, (4) WS-65909, (5) WS-73909

Ref #	Part #	Part Name & Description	[#]
LF7G01	409P901010	LP-FILTER - 14MHZ SMD	
LF7G02	409P901010	LP-FILTER - 14MHZ SMD	
<b>TRANSFORMERS</b>			
T5A31	349P216010	TRANS-HORIZ	
T5A32	336P040010	TRANS-HORIZ-DRIVE	
T5A51	334P278010	TRANS-FLYBACK	
T9A20	350P766020	TRANS-POWER	
T9A50	350P765010	TRANS-POWER	
<b>VARIABLE RESISTORS</b>			
129P059050		VR-FOCUS - MHF116-50W	
RV9D00	265P100010	VARISTOR - ERZV10D271/ERZVEAV271	
<b>RESISTORS</b>			
R-M-CHIP Type Resistors (Listed by Value)			
Value	Part No.	Value	Part No.
1/16W 0OHM	103P509050	1/16W 2.2K-F	103P493030
1/10W 10-J	103P400010	1/16W 2.2K-J	103P502090
1/16W 10-J	103P500010	1/16W 2.4K-F	103P493040
1/16W 15-J	103P500030	1/16W 2.7K-J	103P503000
1/10W 22-J	103P400050	1/16W 3K-F	103P493060
1/16W 22-J	103P500050	1/16W 3.3K-F	103P493070
1/16W 33-J	103P500070	1/16W 3.3K-J	103P503010
1/16W 47-J	103P500090	1/16W 3.3M-J	103P506070
1/10W 56-J	103P401000	1/16W 3.9K-F	103P493090
1/16W 56-D	103P844030	1/16W 3.9K-J	103P503020
1/16W 56-J	103P501000	1/16W 4.7K-F	103P494010
1/4W 75-J	103P489090	1/16W 4.7K-J	103P503030
1/16W 100-J	103P501030	1/16W 5.1K-F	103P494020
1/16W 120-J	103P501040	1/16W 5.6K-J	103P503040
1/16W 150-D	103P810050	1/16W 6.2K-D	103P814040
1/16W 150-J	103P501050	1/16W 6.2K-F	103P494040
1/16W 160-F	103P490060	1/16W 6.8K-F	103P494050
1/10W 180-F	103P470070	1/16W 6.8K-J	103P503050
1/16W 180-J	103P501060	1/16W 8.2K-F	103P494070
1/16W 220-J	103P501070	1/16W 8.2K-J	103P503060
1/16W 240-F	103P491000	1/16W 10K-F	103P494090
1/16W 300-F	103P491020	1/16W 10K-J	103P503070
1/10W 330-J	103P401090	1/16W 12K-J	103P503080
1/16W 330-F	103P491030	1/16W 13K-F	103P495020
1/16W 330-J	103P501090	1/16W 15K-J	103P503090
1/16W 360-F	103P491040	1/16W 16K-F	103P495040
1/16W 390-F	103P491050	1/16W 18K-J	103P504000
1/16W 390-J	103P502000	1/16W 22K-F	103P495070
1/16W 470-J	103P502010	1/16W 22K-J	103P504010
1/4W 470-J	103P482010	1/16W 24K-F	103P495080
1/16W 510-F	103P491080	1/16W 27K-F	103P495090
1/16W 560-F	103P491090	1/16W 27K-J	103P504020
1/16W 560-J	103P502020	1/16W 33K-J	103P504030
1/16W 620-F	103P492000	1/16W 39K-J	103P504040
1/16W 680-F	103P492010	1/16W 47K-F	103P496050
1/16W 680-J	103P502030	1/16W 47K-J	103P504050
1/16W 820-J	103P502040	1/16W 56K-J	103P504060
1/16W 1K-J	103P502050	1/16W 68K-J	103P504070
1/16W 1K-F	103P492050	1/16W 75K-J	103P509090
1/16W 1.2K-F	103P492070	1/16W 82K-J	103P504080
1/16W 1.2K-J	103P502060	1/16W 100K-F	103P497030
1/16W 1.3K-F	103P492080	1/16W 100K-J	103P504090

Ref #	Part #	Part Name & Description	[#]
Value	Part No.	Value	Part No.
1/10W 1.5K-F	103P472090	1/16W 120K-J	103P505000
1/10W 1.5K-J	103P402070	1/16W 150K-J	103P505010
1/16W 1.5K-F	103P492090	1/16W 330K-J	103P505050
1/16W 1.5K-J	103P502070	1/16W 560K-J	103P505080
1/16W 1.6K-F	103P493000	1/16W 680K-J	103P505090
1/16W 1.8K-F	103P493010	1/16W 820K-J	103P506000
1/16W 1.8K-J	103P502080	1/16W 1M-J	103P506010
1/16W 2K-F	103P493020		
<b>Conventional Resistors (By Ref #)</b>			
Ref #	Part #	Description	[#]
R2M01	103P711080	R-CARBON - 1/4W 270-J	
R2M06	103P711080	R-CARBON - 1/4W 270-J	
R2M10	103P711080	R-CARBON - 1/4W 270-J	
R3E02	103P712080	R-CARBON - 1/4W 1.8K-J	
R3E04	103P712080	R-CARBON - 1/4W 1.8K-J	
R3E05	103P714060	R-CARBON - 1/4W 56K-J	
R3E06	103P713070	R-CARBON - 1/4W 10K-J	
R3E15	103P713050	R-CARBON - 1/4W 6.8K-J	
R3E16	103P713050	R-CARBON - 1/4W 6.8K-J	
R4B05	103P713090	R-CARBON - 1/4W 15K-J	
R4B10	103C188050	R-METAL - 2W 2.7-J	
R4B12	103C188040	R-METAL - 2W 2.2-J	
R4B17	103P712010	R-CARBON - 1/4W 470-J	
R4B20	103P711090	R-CARBON - 1/4W 330-J	
R4B22	103P712090	R-CARBON - 1/4W 2.2K-J	
R4B23	103P711070	R-CARBON - 1/4W 220-J	
R4B24	103P712050	R-CARBON - 1/4W 1K-J	
R4B25	103P712050	R-CARBON - 1/4W 1K-J	
R4B26	103P713000	R-CARBON - 1/4W 2.7K-J	
R4B27	103P714080	R-CARBON - 1/4W 82K-J	
R4B28	103P464040	R-METAL - 1/4W 2.4K-F	
R5290	103C188040	R-METAL - 2W 2.2-J	
R54E4	103C180020	R-METAL - 2W 12-J	
R54E5	103C180020	R-METAL - 2W 12-J	
R5A01	103P712050	R-CARBON - 1/4W 1K-J	
R5A02	103P712090	R-CARBON - 1/4W 2.2K-J	
R5A03	103P713010	R-CARBON - 1/4W 3.3K-J	
R5A04	103P713090	R-CARBON - 1/4W 15K-J	
R5A05	103P713070	R-CARBON - 1/4W 10K-J	
R5A06	103P713070	R-CARBON - 1/4W 10K-J	
R5A07	103P714030	R-CARBON - 1/4W 33K-J	
R5A08	103C194010	R-METAL - 3W 22K-J	
R5A09	103P714040	R-CARBON - 1/4W 39K-J	
R5A10	103P714040	R-CARBON - 1/4W 39K-J	
R5A11	103P713070	R-CARBON - 1/4W 10K-J	
R5A12	103P712050	R-CARBON - 1/4W 1K-J	
R5A15	103P713010	R-CARBON - 1/4W 3.3K-J	
R5A16	103P713090	R-CARBON - 1/4W 15K-J	
R5A17	103P712050	R-CARBON - 1/4W 1K-J	
R5A18	103P711030	R-CARBON - 1/4W 100-J	
R5A19	103P461070	R-METAL - 1/4W 470-F	
R5A20	103P714050	R-CARBON - 1/4W 47K-J	
R5A21	103P713000	R-CARBON - 1/4W 2.7K-J	
R5A22	103P714010	R-CARBON - 1/4W 22K-J	
R5A23	103P713030	R-CARBON - 1/4W 4.7K-J	
R5A24	103P714070	R-CARBON - 1/4W 68K-J	
R5A25	103P712010	R-CARBON - 1/4W 470-J	
R5A26	103P712090	R-CARBON - 1/4W 2.2K-J	

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**MODELS: WS-55859 / WS-55909 / WS-65869 / WS-65909 / WS-73909**

[#] Model Legend: (1) WS-55859, (2) WS-55909, (3) WS-65869, (4) WS-65909, (5) WS-73909

Ref #	Part #	Part Name & Description	[#]	Ref #	Part #	Part Name & Description	[#]
R5A29	103P714010	R-CARBON - 1/4W 22K-J		R5H03	103P715000	R-CARBON - 1/4W 120K-J	
R5A30	103C181060	R-METAL - 2W 180-J		R5H04	103P712010	R-CARBON - 1/4W 470-J	
R5A31	103P711030	R-CARBON - 1/4W 100-J		R5H05	103P712060	R-CARBON - 1/4W 1.2K-J	
R5A34	103P711010	R-CARBON - 1/4W 68-J		R5H06	103P712060	R-CARBON - 1/4W 1.2K-J	
R5A36	103C393020	R-METAL-P - 3W 3.9K-J		R5H22	103P712010	R-CARBON - 1/4W 470-J	
R5A37	103C393010	R-METAL-P - 3W 3.3K-J		R5H40	103P712020	R-CARBON - 1/4W 560-J	
R5A38	103C397070	R-METAL-P - 3W 0.56-K		R5H41	103P712060	R-CARBON - 1/4W 1.2K-J	
R5A39	103C170050	R-METAL - 1W 22-J		R5H42	103P711050	R-CARBON - 1/4W 150-J	
R5A40	103P714090	R-CARBON - 1/4W 100K-J		R5H47	103C170090	R-METAL - 1W 47-J	
R5A41	103P714040	R-CARBON - 1/4W 39K-J		R5H48	103P712060	R-CARBON - 1/4W 1.2K-J	
R5A42	103P713030	R-CARBON - 1/4W 4.7K-J		R5H49	103P714070	R-CARBON - 1/4W 68K-J	
R5A43	103P714010	R-CARBON - 1/4W 22K-J		R5H50	103P714070	R-CARBON - 1/4W 68K-J	
R5A45	103C393080	R-METAL-P - 3W 12K-J		R5H51	103P712060	R-CARBON - 1/4W 1.2K-J	
R5A46	103C391050	R-METAL-P - 3W 150-J		R5H53	103P715000	R-CARBON - 1/4W 120K-J	
R5A47	103P714030	R-CARBON - 1/4W 33K-J		R5H55	103P141000	R-CARBON - 1/2W 56-J	
R5A49	103P713050	R-CARBON - 1/4W 6.8K-J		R5H56	103P141000	R-CARBON - 1/2W 56-J	
R5A50	103P712090	R-CARBON - 1/4W 2.2K-J		R5H59	103C181030	R-METAL - 2W 100-J	
<b>R5A51</b>	<b>102P107000</b>	<b>R-WIRE - 2W 0.15-K</b>		R5H60	103C178080	R-METAL - 1W 4.7-J	
<b>R5A52</b>	<b>103P712010</b>	<b>R-CARBON - 1/4W 470-J</b>		R5H84	103P713040	R-CARBON - 1/4W 5.6K-J	
<b>R5A53</b>	<b>103P711000</b>	<b>R-CARBON - 1/4W 56-J</b>		R5K09	103P762020	R-FUSE - 1/2W 560-J	
R5A54	103C190090	R-METAL - 3W 47-J		R5K10	103P711010	R-CARBON - 1/4W 68-J	
<b>R5A55</b>	<b>103P712050</b>	<b>R-CARBON - 1/4W 1K-J</b>		<b>R5K12</b>	<b>103P760060</b>	<b>R-FUSE - 1/2W 27-J</b>	
<b>R5A56</b>	<b>103P715060</b>	<b>R-CARBON - 1/4W 390K-J</b>		R5K19	103P464000	R-METAL - 1/4W 4.3K-F	
R5A57	103P711030	R-CARBON - 1/4W 100-J		R5K20	103P712060	R-CARBON - 1/4W 1.2K-J	
<b>R5A59</b>	<b>103P461030</b>	<b>R-METAL - 1/4W 330-F</b>		R5K21	103P713070	R-CARBON - 1/4W 10K-J	
<b>R5A60</b>	<b>103P463010</b>	<b>R-METAL - 1/4W 1.8K-F</b>		R5K25	103P713040	R-CARBON - 1/4W 5.6K-J	
<b>R5A61</b>	<b>103P713060</b>	<b>R-CARBON - 1/4W 8.2K-J</b>		R5K31	103P711030	R-CARBON - 1/4W 100-J	
R5A62	103P711030	R-CARBON - 1/4W 100-J		<b>R5K34</b>	<b>103P760060</b>	<b>R-FUSE - 1/2W 27-J</b>	
R5A63	103P713090	R-CARBON - 1/4W 15K-J		R5K46	103P712010	R-CARBON - 1/4W 470-J	
<b>R5A64</b>	<b>103P714090</b>	<b>R-CARBON - 1/4W 100K-J</b>		R5K50	103P762050	R-FUSE - 1/2W 1K-J	
<b>R5A65</b>	<b>103P141030</b>	<b>R-CARBON - 1/2W 100-J</b>		R6B01	103P711030	R-CARBON - 1/4W 100-J	
R5A68	103P463040	R-METAL - 1/4W 2.4K-F	5	R6B02	103P714010	R-CARBON - 1/4W 22K-J	
R5A68	103P463080	R-METAL - 1/4W 2.4K-F	14	R6B03	103P714010	R-CARBON - 1/4W 22K-J	
R5A69	103P460090	R-METAL - 1/4W 220-F		R6B06	103P462010	R-METAL - 1/4W 680-F	
R5A70	103P463040	R-METAL - 1/4W 2.4K-F	5	R6B07	103P711030	R-CARBON - 1/4W 100-J	
R5A71	103P713070	R-CARBON - 1/4W 10K-J		R6B09	103P711030	R-CARBON - 1/4W 100-J	
R5A72	103P461070	R-METAL - 1/4W 470-F		R6B10	103P711030	R-CARBON - 1/4W 100-J	
R5A73	103P714080	R-CARBON - 1/4W 82K-J		R6B11	103C194010	R-METAL - 3W 22K-J	
R5A74	103P713070	R-CARBON - 1/4W 10K-J		R6B15	103P711030	R-CARBON - 1/4W 100-J	
R5A75	103P713070	R-CARBON - 1/4W 10K-J		R6B18	103P711030	R-CARBON - 1/4W 100-J	
R5A76	103P713070	R-CARBON - 1/4W 10K-J		R6B21	103P712060	R-CARBON - 1/4W 1.2K-J	
R5A78	103P714010	R-CARBON - 1/4W 22K-J		R6B22	103P711030	R-CARBON - 1/4W 100-J	
R5A81	103P711030	R-CARBON - 1/4W 100-J		R6G01	103P711030	R-CARBON - 1/4W 100-J	
R5A82	103P370090	R-FUSE - 1/4W 47-J		R6G02	103P714010	R-CARBON - 1/4W 22K-J	
R5A83	103P464070	R-METAL - 1/4W 8.2K-F		R6G03	103P714010	R-CARBON - 1/4W 22K-J	
R5A84	103P464070	R-METAL - 1/4W 8.2K-F		R6G06	103P462020	R-METAL - 1/4W 750-F	
R5A85	103P711010	R-CARBON - 1/4W 68-J		R6G07	103P711030	R-CARBON - 1/4W 100-J	
R5A87	103P711030	R-CARBON - 1/4W 100-J		R6G09	103P711030	R-CARBON - 1/4W 100-J	
R5A88	103P464000	R-METAL - 1/4W 4.3K-F		R6G10	103P711030	R-CARBON - 1/4W 100-J	
R5A89	103P463050	R-METAL - 1/4W 2.7K-F		R6G11	103C194010	R-METAL - 3W 22K-J	
R5A90	103P713030	R-CARBON - 1/4W 4.7K-J		R6G21	103P712060	R-CARBON - 1/4W 1.2K-J	
R5A91	103P714090	R-CARBON - 1/4W 100K-J		R6R01	103P711030	R-CARBON - 1/4W 100-J	
<b>R5A92</b>	<b>103P713070</b>	<b>R-CARBON - 1/4W 10K-J</b>		R6R02	103P714010	R-CARBON - 1/4W 22K-J	
R5A96	103P713070	R-CARBON - 1/4W 10K-J		R6R03	103P714010	R-CARBON - 1/4W 22K-J	
<b>R5A97</b>	<b>103P711030</b>	<b>R-CARBON - 1/4W 100-J</b>		R6R06	103P462040	R-METAL - 1/4W 910-F	
R5A98	103C197090	R-METAL - 3W 0.82-J	14	R6R07	103P711030	R-CARBON - 1/4W 100-J	
R5A98	103C198010	R-METAL - 3W 1.2-J	5	R6R09	103P711030	R-CARBON - 1/4W 100-J	
R5A99	103P714020	R-CARBON - 1/4W 27K-J		R6R10	103P711030	R-CARBON - 1/4W 100-J	
R5B01	103P712010	R-CARBON - 1/4W 470-J		R6R11	103C194010	R-METAL - 3W 22K-J	
R5H02	103P750010	R-FUSE - 1/4W 10-J		R6R19	103P464050	R-METAL - 1/4W 6.8K-F	

**MODELS: WS-55859 / WS-55909 / WS-65869 / WS-65909 / WS-73909**

[#] Model Legend: (1) WS-55859, (2) WS-55909, (3) WS-65869, (4) WS-65909, (5) WS-73909

Ref #	Part #	Part Name & Description	[#]
R6R21	103P712060	R-CARBON - 1/4W 1.2K-J	
R6R22	103P711030	R-CARBON - 1/4W 100-J	
R7C34	103C178010	R-METAL - 1W 1.2-J	
R7K01	103P712050	R-CARBON - 1/4W 1K-J	
R7K02	103P713010	R-CARBON - 1/4W 3.3K-J	
R7K21	103P711080	R-CARBON - 1/4W 270-J	
R7K22	103P715030	R-CARBON - 1/4W 220K-J	
R7K23	103P713080	R-CARBON - 1/4W 12K-J	
R7K24	103P713080	R-CARBON - 1/4W 12K-J	
R7K25	103P713080	R-CARBON - 1/4W 12K-J	
R7K26	103P715030	R-CARBON - 1/4W 220K-J	
R7K27	103P713070	R-CARBON - 1/4W 10K-J	
R7K28	103P711050	R-CARBON - 1/4W 150-J	
R7K29	103P712060	R-CARBON - 1/4W 1.2K-J	
R7K30	103P713070	R-CARBON - 1/4W 10K-J	
R7K31	103P715030	R-CARBON - 1/4W 220K-J	
R7K32	103P713030	R-CARBON - 1/4W 4.7K-J	
R7K34	103P713000	R-CARBON - 1/4W 2.7K-J	
R7K35	103P711030	R-CARBON - 1/4W 100-J	
R7L26	103P462090	R-METAL - 1/4W 1.5K-F	
R7L29	103P464030	R-METAL - 1/4W 5.6K-F	
R7L32	103P466070	R-METAL - 1/4W 56K-F	
R8C03	103P711090	R-CARBON - 1/4W 330-J	
R8C07	103C391050	R-METAL-P - 3W 150-J	
R8C11	103P711090	R-CARBON - 1/4W 330-J	
R8C15	103C391050	R-METAL-P - 3W 150-J	
R8C19	103P711090	R-CARBON - 1/4W 330-J	
R8C23	103C391050	R-METAL-P - 3W 150-J	
R8C27	103P711090	R-CARBON - 1/4W 330-J	
R8C31	103C391050	R-METAL-P - 3W 150-J	
R8C35	103P711090	R-CARBON - 1/4W 330-J	
R8C39	103C391050	R-METAL-P - 3W 150-J	
R8C43	103P711090	R-CARBON - 1/4W 330-J	
R8C47	103C391050	R-METAL-P - 3W 150-J	
R8C60	103C191090	R-METAL - 3W 330-J	
R8C61	103C191090	R-METAL - 3W 330-J	
R8C62	103P713010	R-CARBON - 1/4W 3.3K-J	
R8C63	103P713010	R-CARBON - 1/4W 3.3K-J	
R8C64	103P713010	R-CARBON - 1/4W 3.3K-J	
R8C65	103P713010	R-CARBON - 1/4W 3.3K-J	
R8C66	103P713010	R-CARBON - 1/4W 3.3K-J	
R8C67	103P713010	R-CARBON - 1/4W 3.3K-J	
R9A02	102P338040	R-CEMENT-WIRE - 15W 2.2-K	
R9A03	109C010010	R-COMPOSITION - 1/2W 1M-K	
R9A05	109C010010	R-COMPOSITION - 1/2W 1M-K	
R9A06	109C010010	R-COMPOSITION - 1/2W 1M-K	
R9A10	103P713040	R-CARBON - 1/4W 5.6K-J	
R9A12	103P713030	R-CARBON - 1/4W 4.7K-J	
R9A20	103P713010	R-CARBON - 1/4W 3.3K-J	
R9A21	103C393090	R-METAL-P - 3W 15K-J	
R9A22	103C183070	R-METAL - 2W 10K-J	
R9A24	103P713040	R-CARBON - 1/4W 5.6K-J	
R9A25	103P713010	R-CARBON - 1/4W 3.3K-J	
R9A26	103P712030	R-CARBON - 1/4W 680-J	
R9A27	103C187050	R-METAL - 2W 0.39-J	
R9A28	103P711070	R-CARBON - 1/4W 220-J	
R9A29	103C187050	R-METAL - 2W 0.39-J	
R9A30	103P712090	R-CARBON - 1/4W 2.2K-J	
R9A31	103P712050	R-CARBON - 1/4W 1K-J	
R9A32	103P713070	R-CARBON - 1/4W 10K-J	

Ref #	Part #	Part Name & Description	[#]
R9A33	103P711030	R-CARBON - 1/4W 100-J	
R9A35	103P715010	R-CARBON - 1/4W 150K-J	
R9A36	103P714090	R-CARBON - 1/4W 100K-J	
R9A37	103P712090	R-CARBON - 1/4W 2.2K-J	
R9A38	103P713030	R-CARBON - 1/4W 4.7K-J	
R9A39	103P711030	R-CARBON - 1/4W 100-J	
R9A40	103P712010	R-CARBON - 1/4W 470-J	
R9A41	103P712050	R-CARBON - 1/4W 1K-J	
R9A42	103P712050	R-CARBON - 1/4W 1K-J	
R9A44	103P463050	R-METAL - 1/4W 2.7K-F	
R9A51	103P715050	R-CARBON - 1/4W 330K-J	
R9A53	103P712030	R-CARBON - 1/4W 680-J	
R9A54	102P107000	R-WIRE - 2W 0.15-K	
R9A55	102P106090	R-WIRE - 2W 0.12-K	
R9A56	103P713010	R-CARBON - 1/4W 3.3K-J	
R9A57	103P713010	R-CARBON - 1/4W 3.3K-J	
R9A60	103P714050	R-CARBON - 1/4W 47K-J	
R9A61	103P713040	R-CARBON - 1/4W 5.6K-J	
R9A62	103P713070	R-CARBON - 1/4W 10K-J	
R9A63	103P713020	R-CARBON - 1/4W 3.9K-J	
R9A66	103P713070	R-CARBON - 1/4W 10K-J	
R9A68	103C180050	R-METAL - 2W 22-J	
R9A69	103C180050	R-METAL - 2W 22-J	
R9A75	103P714090	R-CARBON - 1/4W 100K-J	
R9A77	103P714090	R-CARBON - 1/4W 100K-J	
R9A78	103P711030	R-CARBON - 1/4W 100-J	
R9A79	103P711030	R-CARBON - 1/4W 100-J	
R9A84	103P715050	R-CARBON - 1/4W 330K-J	
R9A85	103P714080	R-CARBON - 1/4W 82K-J	
R9C00	103C188080	R-METAL - 2W 4.7J	
R9C01	103C398020	R-METAL-P - 3W 1.5-K	
R9C20	103C398020	R-METAL-P - 3W 1.5-K	
R9C21	103C398050	R-METAL-P - 3W 2.7-K	
R9D00	109D036020	R-COMPOSITION - 1/2W 4.7M-K	

### CAPACITORS AND TRIMMERS

#### C-CER-CHIP Capacitors (By Value)

Value	Part #	Value	Part #
50V 2P-C	154P350040	50V 3300P-K	141P141050
CJ50V 3P-C	154P340040	50V 4700P-K	141P141070
50V 10P-C	154P341010	50V 5600P-J	154P329030
50V 15P-J	154P341050	50V 6800P-K	141P141090
50V 15P-J	154P351060	50V 8200P-K	141P142000
50V 22P-J	154P341090	16V 0.01M-J	172P391030
50V 27P-J	154P352020	50V 0.01M-K	141P142010
50V 33P-J	154P352040	50V 0.01M-Z	141P143080
50V 33P-J	154P342030	50V 0.012M-K	141P142020
50V 39P-J	154P342050	50V 0.015M-K	141P142030
50V 47P-J	154P342070	25V 0.033M-K	141P142070
50V 47P-J	154P352080	25V 0.047M-K	141P142090
50V 56P-J	154P353000	50V 0.047M-Z	141P144010
50V 82P-J	154P343030	16V 0.068M-J	172P392030
50V 100P-J	154P343050	25V 0.068M-K	141P143010
50V 100P-J	154P353060	16V 0.1M-J	172P392050
50V 120P-J	154P343070	16V 0.1M-K	141P143030
50V 150P-J	154P354000	25V 0.1M-Z	141P144020
50V 150P-J	154P343090	50V 0.1M-Z	141P134090
50V 220P-J	154P344030	25V 0.15M-K	141P139050
50V 220P-K	141P140010	16V 0.22M-K	141P139070

**MODELS: WS-55859 / WS-55909 / WS-65869 / WS-65909 / WS-73909**

[#] Model Legend: (1) WS-55859, (2) WS-55909, (3) WS-65869, (4) WS-65909, (5) WS-73909

Ref #	Part #	Part Name & Description	[#]	Ref #	Part #	Part Name & Description	[#]
<b>Value</b>	<b>Part #</b>	<b>Value</b>	<b>Part #</b>	C2X00	181P352040	C-ELEC - 16V 100M-M	
50V 270P-J	154P344050	50V 2.2M-M 105C	181P526020	C2Y01	181P352030	C-ELEC - 16V 47M-M	
50V 330P-J	154P344070	16V 0.47M-K	141P139090	C2Y11	181P352030	C-ELEC - 16V 47M-M	
50V 390P-K	141P140040	16V 0.47M-Z	141P144050	C2Y30	181P352030	C-ELEC - 16V 47M-M	
50V 470P-J	154P345010	16V 1M-K	141P134070	C3A11	181P352040	C-ELEC - 16V 100M-M	
50V 470P-J	154P325020	16V 1M-Z	141P144060	C3A15	181P124020	C-ELEC-NP - 50V 4.7M-M NP	
50V 470P-K	141P140050	16V 1M-Z	141P135070	C3A27	181P352060	C-ELEC - 16V 330M-M	
25V 560P-J	154P345030	16V 1M-Z	141P144060	C3A30	181P352040	C-ELEC - 16V 100M-M	
50V 560P-K	141P140060	50V 1M-M 105C	181P526010	C3A38	181P124020	C-ELEC-NP - 50V 4.7M-M NP	
25V 680P-J	154P345050	16V 10M-M	181P502030	C3E09	172P262050	C-M-POLY - 50V 0.1M-J	
25V 1000P-J	154P345090	16V 22M-M	181P502040	C3E11	172P262050	C-M-POLY - 50V 0.1M-J	
50V 1000P-J	172P390010	6.3V 22M-M	181P500010	C3E12	172P262050	C-M-POLY - 50V 0.1M-J	
50V 1000P-K	141P140090	6.3V 22M-M 105C	181P520010	C3E14	172P262050	C-M-POLY - 50V 0.1M-J	
50V 1000P-Z	141P143050	16V 47M-M 105C	181P522060	C4A04	172P262050	C-M-POLY - 50V 0.1M-J	
50V 1500P-K	141P141010	6.3V 47M-M	181P500030	C4A05	172P262050	C-M-POLY - 50V 0.1M-J	
50V 2200P-K	141P141030	6.3V 47M-M 105C	181P520030	C4A10	181P352030	C-ELEC - 16V 47M-M	
50V 2700P-J	154P337040	6.3V 100M-M 105C	181P520040	C4A14	181P352030	C-ELEC - 16V 47M-M	
C4A34	181P352030	C-ELEC - 16V 47M-M		C4A35	172P262090	C-M-POLY - 50V 0.22M-J	
C4B01	172P262050	C-M-POLY - 50V 0.1M-J		C4B02	181P358000	C-ELEC - 35V 1000M-M	
C4B13	172P262020	C-M-POLY - 50V 0.056M-J		<b>C5A03</b>	<b>142P020050</b>	<b>C-CER - B50V 470P-K</b>	
C5A13	181P352040	C-ELEC - 16V 100M-M		C5A21	172P262050	C-M-POLY - 50V 0.1M-J	
C5A31	172P580050	C-M-PLA-PP - 1800V 1500P-J		C5A32	172P581030	C-M-PLA-PP - 1800V 3300P-J	
C5A33	172P581030	C-M-PLA-PP - 1800V 3300P-J		C5A34	154P262000	C-CER - R2KV 220P-K	
C5A35	142P011070	C-CER - B500V 2200P-K		C5A39	142P011000	C-CER - B500V 560P-K	
C5A40	142P011000	C-CER - B500V 560P-K		C5A42	181P352030	C-ELEC - 16V 47M-M	
C5A51	<b>154P260010</b>	<b>C-CER - R1KV 220P-K</b>		<b>C5A52</b>	<b>172P460010</b>	<b>C-M-PLA-PP - 2000V 1000P-J</b>	
C5A53	<b>172P460030</b>	<b>C-M-PLA-PP - 2000V 1200P-J</b>		C5A54	185D120010	C-ELEC - H160V 330M-M 105C	
C5A55	172P088060	C-PLAST-PP - 630V 6800P-J		<b>C5A60</b>	<b>172P262050</b>	<b>C-M-POLY - 50V 0.1M-J</b>	
C5A64	181P352010	C-ELEC - 16V 22M-M		C5A70	172P384030	C-M-POLY - 100V 3.3M-K	
C5A71	172P262060	C-M-POLY - 50V 0.12M-J		C5A71	172P262060	C-M-POLY - 50V 0.12M-J	
C5H01	181P352060	C-ELEC - 16V 330M-M		C5H16	172P186030	C-PLAST-PP - 200V 0.01M-K	
C5H20	181P352040	C-ELEC - 16V 100M-M		C5H24	181P192060	C-ELEC - 200V 22M-M	
C5H24	181P192060	C-ELEC - 200V 22M-M		C5K03	181P352040	C-ELEC - 16V 100M-M	
C5K12	181P352040	C-ELEC - 16V 100M-M		C5K14	181P352030	C-ELEC - 16V 47M-M	
C5K14	181P352030	C-ELEC - 16V 47M-M		C6B02	181P195050	C-ELEC - 350V 1M-M	
C6B05	181P352030	C-ELEC - 16V 47M-M		C6B05	181P352030	C-ELEC - 16V 47M-M	
C6B16	154P260050	C-CER - R1KV 1000P-K		C6G02	181P195050	C-ELEC - 350V 1M-M	135
C6G05	181P352030	C-ELEC - 16V 47M-M		C6G05	181P352030	C-ELEC - 16V 47M-M	
C6G16	154P260050	C-CER - R1KV 1000P-K		C6R02	181P195050	C-ELEC - 350V 1M-M	
C6R05	181P352030	C-ELEC - 16V 47M-M		C6R05	181P352030	C-ELEC - 16V 47M-M	
C7A31	181P352030	C-ELEC - 16V 47M-M		C7A99	181P352030	C-ELEC - 16V 47M-M	
C7B76	181P352030	C-ELEC - 16V 47M-M		C7B76	181P352030	C-ELEC - 16V 47M-M	

**MODELS: WS-55859 / WS-55909 / WS-65869 / WS-65909 / WS-73909**

[#] Model Legend: (1) WS-55859, (2) WS-55909, (3) WS-65869, (4) WS-65909, (5) WS-73909

Ref #	Part #	Part Name & Description	[#]
C7C00	181P352040	C-ELEC - 16V 100M-M	
C7C31	181P352050	C-ELEC - 16V 220M-M	
C7K01	181P352030	C-ELEC - 16V 47M-M	
C7K23	181P352030	C-ELEC - 16V 47M-M	
C7K25	172P262050	C-M-POLY - 50V 0.1M-J	
C7K26	172P262050	C-M-POLY - 50V 0.1M-J	
C7L22	172P262050	C-M-POLY - 50V 0.1M-J	
C8C03	181P184010	C-ELEC - 50V 1000M-M 105C	
C8C05	181P184010	C-ELEC - 50V 1000M-M 105C	
C8C43	142P020080	C-CER - B50V 820P-K	
C8C44	142P020080	C-CER - B50V 820P-K	
C8C45	142P020080	C-CER - B50V 820P-K	
C8C46	142P020080	C-CER - B50V 820P-K	
C8C47	142P020080	C-CER - B50V 820P-K	
C8C48	142P020080	C-CER - B50V 820P-K	
C8D16	181P352030	C-ELEC - 16V 47M-M	
C8D19	181P352030	C-ELEC - 16V 47M-M	
C8D20	181P352030	C-ELEC - 16V 47M-M	
C8D21	181P352030	C-ELEC - 16V 47M-M	
C8D22	181P352030	C-ELEC - 16V 47M-M	
C8D30	181P352030	C-ELEC - 16V 47M-M	
C8D31	181P352030	C-ELEC - 16V 47M-M	
C8D33	181P352030	C-ELEC - 16V 47M-M	
C8D35	172P262040	C-M-POLY - 50V 0.082M-J	
C8D36	181P352030	C-ELEC - 16V 47M-M	
C8D39	181P352030	C-ELEC - 16V 47M-M	
C8D40	181P352030	C-ELEC - 16V 47M-M	
C8E01	181P352030	C-ELEC - 16V 47M-M	
C8E03	181P352030	C-ELEC - 16V 47M-M	
C8E05	181P352030	C-ELEC - 16V 47M-M	
C8E07	181P352030	C-ELEC - 16V 47M-M	
C8E09	181P352030	C-ELEC - 16V 47M-M	
C8E12	181P352030	C-ELEC - 16V 47M-M	
C8E14	181P352030	C-ELEC - 16V 47M-M	
C8E16	181P352030	C-ELEC - 16V 47M-M	
C8G00	181P352030	C-ELEC - 16V 47M-M	
C8G01	181P352030	C-ELEC - 16V 47M-M	
C8G03	181P352020	C-ELEC - 16V 33M-M	
C8G05	181P352030	C-ELEC - 16V 47M-M	
C8G06	181P352030	C-ELEC - 16V 47M-M	
C8G09	181P352030	C-ELEC - 16V 47M-M	
C8G55	181P352030	C-ELEC - 16V 47M-M	
<b>C9A05</b>	<b>189P185070</b>	<b>C-CER - 250VAC 1000P-M</b>	
<b>C9A06</b>	<b>189P185070</b>	<b>C-CER - 250VAC 1000P-M</b>	
<b>C9A07</b>	<b>189P153040</b>	<b>C-M-POLY - 250VAC 0.1M-M</b>	
<b>C9A08</b>	<b>189P185090</b>	<b>C-CER - 250VAC 2200P-M</b>	
<b>C9A09</b>	<b>189P185090</b>	<b>C-CER - 250VAC 2200P-M</b>	
<b>C9A10</b>	<b>189P185090</b>	<b>C-CER - 250VAC 2200P-M</b>	
<b>C9A11</b>	<b>189P185090</b>	<b>C-CER - 250VAC 2200P-M</b>	
<b>C9A12</b>	<b>185D122050</b>	<b>C-ELEC - H200V 1000M-M 105C</b>	
<b>C9A13</b>	<b>189P152070</b>	<b>C-M-POLY - 250VAC 0.01M-M</b>	
<b>C9A14</b>	<b>189P152070</b>	<b>C-M-POLY - 250VAC 0.01M-M</b>	
<b>C9A15</b>	<b>189P185090</b>	<b>C-CER - 250VAC 2200P-M</b>	
<b>C9A20</b>	<b>189P152070</b>	<b>C-M-POLY - 250VAC 0.01M-M</b>	
<b>C9A22</b>	<b>154P260050</b>	<b>C-CER - R1KV 1000P-K</b>	
<b>C9A24</b>	<b>142P020050</b>	<b>C-CER - B50V 470P-K</b>	
<b>C9A35</b>	<b>181P352040</b>	<b>C-ELEC - 16V 100M-M</b>	
<b>C9A40</b>	<b>181P352040</b>	<b>C-ELEC - 16V 100M-M</b>	
<b>C9A42</b>	<b>181P352040</b>	<b>C-ELEC - 16V 100M-M</b>	
<b>C9A50</b>	<b>142P020050</b>	<b>C-CER - B50V 470P-K</b>	

Ref #	Part #	Part Name & Description	[#]
C9A53	185D122050	C-ELEC - H200V 1000M-M 105C	
C9A54	154P260080	C-CER - R1KV 3300P-K	
C9A56	181P186000	C-ELEC - 50V 100M-M 105C	
C9A58	185D163020	C-ELEC - H50V 4700M-M 105C	
C9A59	185D122050	C-ELEC - H200V 1000M-M 105C	
C9A62	181P195080	C-ELEC - 350V 47M-M/Q	2&4
C9A63	185D121020	C-ELEC - H180V 470M-M 105C	
C9A69	181P358030	C-ELEC - 35V 4700M-M	
C9A73	181P358030	C-ELEC - 35V 4700M-M	
C9B01	181P182030	C-ELEC - 16V 1000M-M 105C	
C9B02	181P182030	C-ELEC - 16V 1000M-M 105C	
C9B03	181P182030	C-ELEC - 16V 1000M-M 105C	
C9B13	181P182030	C-ELEC - 16V 1000M-M 105C	
C9B14	181P182030	C-ELEC - 16V 1000M-M 105C	
C9B17	181P182030	C-ELEC - 16V 1000M-M 105C	
C9B18	181P182030	C-ELEC - 16V 1000M-M 105C	
C9C00	181P350010	C-ELEC - 16V 4700M-M	
C9C02	181P352030	C-ELEC - 16V 47M-M	
C9C05	181P352030	C-ELEC - 16V 47M-M	
C9C10	181P352030	C-ELEC - 16V 47M-M	
C9C12	181P352030	C-ELEC - 16V 47M-M	
C9C20	181P352030	C-ELEC - 16V 47M-M	
C9C24	181P352030	C-ELEC - 16V 47M-M	
C9C26	181P352030	C-ELEC - 16V 47M-M	
C9C40	181P352030	C-ELEC - 16V 47M-M	
C9C42	181P352030	C-ELEC - 16V 47M-M	
C9C52	181P352030	C-ELEC - 16V 47M-M	
<b>C9D00</b>	<b>189P153040</b>	<b>C-M-POLY - 250VAC 0.1M-M</b>	
<b>C9D01</b>	<b>189P153040</b>	<b>C-M-POLY - 250VAC 0.1M-M</b>	
CF2E00	299P128010	CERAMIC-OSC - CSB500F2	
CF2H01	299P128010	CERAMIC-OSC - CSB500F2	
CF3A01	299P208010	CERAMIC-OSC - C5B503F58	
<b>SWITCHES</b>			
S7L20	432P089010	SW-KEY-BOARD - PUSH SWITCH	
S7L21	432P089010	SW-KEY-BOARD - PUSH SWITCH	
S7L22	432P089010	SW-KEY-BOARD - PUSH SWITCH	
S7L23	432P089010	SW-KEY-BOARD - PUSH SWITCH	
S7L24	432P089010	SW-KEY-BOARD - PUSH SWITCH	
S7L25	432P089010	SW-KEY-BOARD - PUSH SWITCH	
S7L26	432P089010	SW-KEY-BOARD - PUSH SWITCH	
S7L27	432P089010	SW-KEY-BOARD - PUSH SWITCH	
S7L28	432P089010	SW-KEY-BOARD - PUSH SWITCH	
S7L29	432P089010	SW-KEY-BOARD - PUSH SWITCH	
<b>MISCELLANEOUS</b>			
242D483020	IR-MOUSE		
246C351030	AC-POWER-CORD		
299P254010	IR-EMITTER, 4-HEAD - T-IR-0		
305P702020	RF-SW - YAA41-0126G		
<b>330P276010</b>	<b>DEFL-YOKE</b>		
338P046030	SVM COIL - G&B		
338P051010	SVM COIL - GREEN		2-5
411D023010	CORE-FERRITE		
411D024020	CORE-FERRITE - ZCAT2132-1130		
411D033010	CORE-FERRITE		
411D044010	CORE-FERRITE		
<b>449C141030</b>	<b>SOCKET-CRT</b>		
453B035010	CAP-ANODE - SHORT - RED		1-4

**MODELS: WS-55859 / WS-55909 / WS-65869 / WS-65909 / WS-73909**

[#: Model Legend: (1) WS-55859, (2) WS-55909, (3) WS-65869, (4) WS-65909, (5) WS-73909]

Ref #	Part #	Part Name & Description	[#]	Ref #	Part #	Part Name & Description	[#]				
	453B035020	CAP-ANODE - LONG - G&B	14	PJ2J08	440C385040	PIN-JACK-B0ARD-6P	245				
	453B035030	CAP-ANODE - SHORT - RED	5	PJ2J09	440C261050	PIN-JACK-BOARD-2P	135				
	453B035040	CAP-ANODE - LONG - G&B	5	PJ2J09	440C383020	PIN-JACK-BOARD-2P	245				
	453C021030	LEAD-ANODE - FBT-HV		PJ2J11	440C231010	JACK-3PIN - FRONT A/V INPUT	183				
	480P053010	SPEAKER	1	PJ2J11	440C384010	PIN-JACK-BOARD-3P-1S	245				
	480P057010	SPEAKER - LARGE	245	PJ7C01	451C129010	JACK-MINI - AV NET/IR BLAST					
	480P058010	SPEAKER - SMALL	245	PJ7C02	451C129010	JACK-MINI - AV NET/IR BLAST					
	480P063010	SPEAKER	3	TU1A01	295P500010	TUNER-RF - ENG26515G					
	490P174070	LENS - RED	183	TU1B01	295P500010	TUNER-RF - ENG26515G					
	490P174080	LENS - GREEN	183	X2A20	285P029030	QUARTZ-CRYST - HC-49 MHZ					
	490P174090	LENS - BLUE	14	X2B20	285P029030	QUARTZ-CRYST - HC-49 MHZ					
	490P195010	LENS - ALL COLORS	5	X2C31	285P374050	QUARTS-CRYST - 20.000MHZ					
	490P212010	LEN-BARREL-RED	2&4	X2E26	285P374020	QUARTZ-CRYST - 3.579545MHZ					
	490P212020	LEN-BARREL-GREEN	2&4	X2H26	285P066010	QUARTZ-CRYST - 3.579545MHZ					
	589C062010	CASTER		X7A13	285P374040	QUARTZ-CRYST - 10.000MHZ					
	597D843010	STIFFENER-MIRROR - 3/4"X3/4" TUBING	3&4	X7H00	285P335040	QUARTZ-CRYST - 60.000MHZ					
	622B009010	TRAY, COOLANT - PS 94V-0	14	X7H01	285P335050	QUARTZ-CRYST - 80.000MHZ					
	622C067010	CRT-TRAY	5	Z5900	283P128050	FUSE-CHIP - AC125V/100V 4A					
	622D928010	TREE-LOK-PANEL	245	Z5901	283P128050	FUSE-CHIP - AC125V/100V 4A					
	642C340010	BOARD-MIRROR	3&4	Z7K01	939P617010	UNIT-PREAMP - GP1U283Q					
	642C352010	CLIP-MIRROR	1&2	<b>PRINTED CIRCUIT BOARDS</b>							
	669D514070	SCREW-MIRROR BOARD	134	930B866010	ASSY-PWB-MAIN	14					
	767C031010	MIRROR - 73"	5	930B866011	ASSY-PWB-MAIN	5					
	767D048090	MIRROR - 65"	3&4	930B879001	ASSY-PWB-POWER						
	767D055040	MIRROR - 55"	1&2	930B880001	ASSY-PWB-SIGNAL	183					
	920P016010	HV-BLOCK - MSC102		930B880002	ASSY-PWB-SIGNAL	245					
	955C230001	ASSY-DM		935C965001	ASSY-PWB-CRT						
AG5K00	224D019040	AIR-GAP - 2.0+-0.5KV S.LEAD		935C966001	ASSY-PWB-2HDW						
AG6B01	224D019090	AIR-GAP - 1.5+-0.5KV S.LEAD		935C967001	ASSY-PWB-TTERMINAL	135					
AG6G01	224D019090	AIR-GAP - 1.5+-0.5KV S.LEAD		935C967002	ASSY-PWB-TTERMINAL	245					
AG6R01	224D019090	AIR-GAP - 1.5+-0.5KV S.LEAD		935C974001	ASSY-PWB-DEMOD-B						
F5A00	283P043060	FUSE - LF251 3A		935C978001	ASSY-PWB-E2P						
F5A01	283P043060	FUSE - LF251 3A		935C979002	ASSY-PWB-DEMOD						
F9A01	283P044020	FUSE - LF251 10A		935C986001	ASSY-PWB-DM POWER						
F9A02	283P044020	FUSE - LF251 10A		935D521005	ASSY-PWB-DBF						
F9A03	283P043090	FUSE - LF251 5A		935D581001	ASSY-PWB-PREAMP						
F9A04	283P043090	FUSE - LF251 5A		935D583001	ASSY-PWB-JUNGLE						
F9A05	283P043090	FUSE - LF251 5A		935D584001	ASSY-PWB-SVM						
F9A06	283P043090	FUSE - LF251 5A		935D585001-55	ASSY-PWB-CONV-GENE-55	182					
F9D00	283D131040	FUSE - S10A 125A		935D585001-65	ASSY-PWB-CONV-GENE-65	3&4					
K9A50	287P049080	RELAY-POWER - DG12D1-0(M)		935D585001-73	ASSY-PWB-CONV-GENE-73	5					
PC9A20	268P058020	PHOTO-COUPLED - ON3131-R/ON3161-R		935D586001	ASSY-PWB-3DYC/MD						
PC9A21	268P058020	PHOTO-COUPLED - ON3131-R/ON3161-R		935D587001	ASSY-PWB-CONTROL 2						
PC9A50	268P058020	PHOTO-COUPLED - ON3131-R/ON3161-R		935D588001	ASSY-PWB-FRONT	183					
PC9A51	268P058020	PHOTO-COUPLED - ON3131-R/ON3161-R		935D588002	ASSY-PWB-FRONT	245					
PJ2J00	440C386010	PIN-JACK-BOARD	135	935D605001	ASSY-PWB-CROSS OVER	245					
PJ2J00	440C386030	PIN-JACK-BOARD-6P-2S	245	<b>COSMETIC PARTS</b>							
PJ2J01	440C386010	PIN-JACK-BOARD	135	669D514080	SCREW	285					
PJ2J01	440C386030	PIN-JACK-BOARD-6P-2S	245	702A398020	COVER-CONTROL	3					
PJ2J02	440C402010	PIN-JACK-BOARD-5P-S	135	702A399020	TERMINAL-BOARD						
PJ2J02	440C402020	PIN-JACK-BOARD-5P-S	245	702A400020	DM TERMINAL-BOARD						
PJ2J03	440C385010	PIN-JACK-BOARD-6P	135	702A401010	COVER CONTROL	245					
PJ2J03	440C385030	PIN-JACK-BOARD-6P	245	702A403010	CONTROL PANEL	1					
PJ2J04	440C261070	PIN-JACK-BOARD-2P	135	703B031020	DOOR - FRONT A/V IN COVER	1					
PJ2J04	440C383040	PIN-JACK-BOARD-2P	245	761A159040	GRILLE-SP - 55"	1					
PJ2J05	440C261050	PIN-JACK-BOARD-2P	135	761A174030	GRILLE-SP-LEFT - 55"	2					
PJ2J05	440C383020	PIN-JACK-BOARD-2P	245	761A174040	GRILLE - SP - RIGHT - 55"	2					
PJ2J07	440C261070	PIN-JACK-BOARD-2P	135								
PJ2J07	440C383040	PIN-JACK-BOARD-2P	245								
PJ2J08	440C385020	PIN-JACK-BOARD-6P	135								

[#] Model Legend: (1) WS-55859, (2) WS-55909, (3) WS-65869, (4) WS-65909, (5) WS-73909

Ref #	Part #	Part Name & Description	[#]
	752A001020	UNIT-FRONT-TOP	2
	762B358040	UNIT-FRONT	2
	761A173030	GRILLE-SPEAKER	3
	752A003020	UNIT-FRONT-TOP	4&5
	761A175010	GRILLE-SP-LEFT - 65"	4
	761A175020	GRILLE-SP-RIGHT - 65"	4
	762B358020	UNIT-FRONT	4
	761A186010	GRILLE-SP-LEFT - 73"	5
	761A186020	GRILLE-SP-RIGHT - 73"	5
	762B358030	UNIT-FRONT	5
	803B878010	CUSHION	245

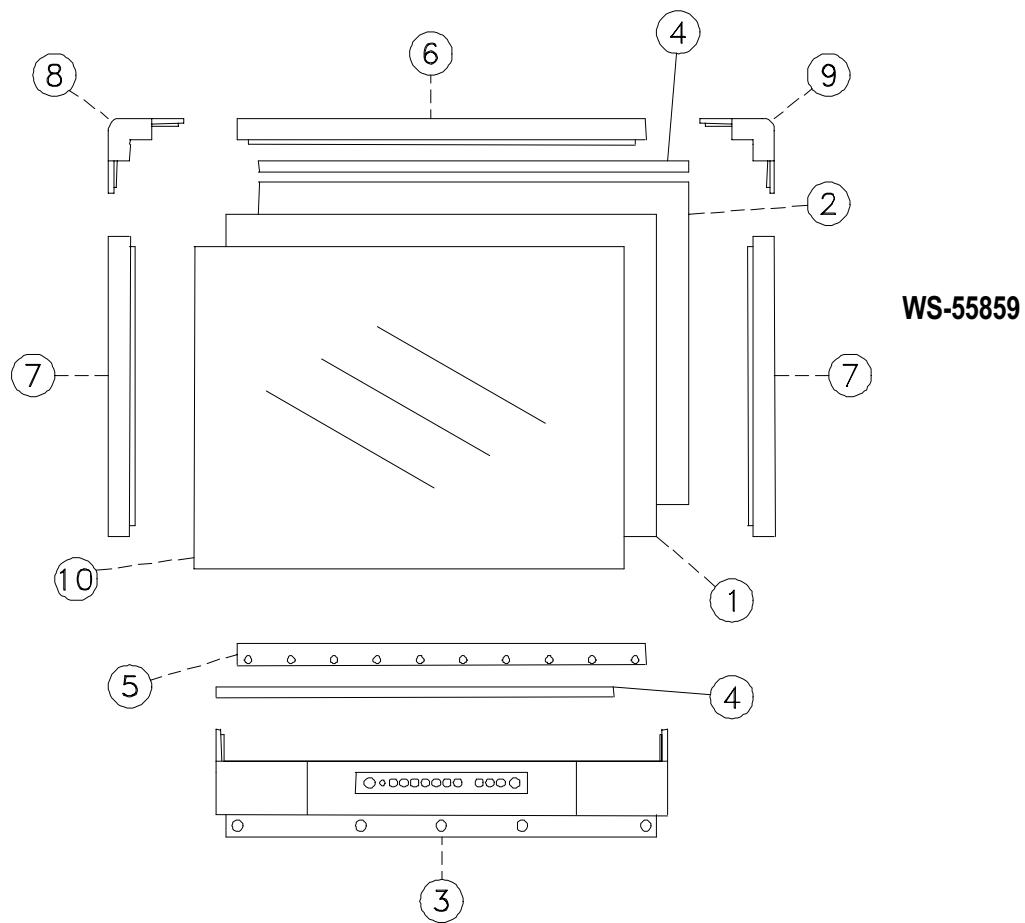
**ACCESSORIES**

290P106010	REMOTE CONTROL	
I/G V19	NET COMMAND GUIDE - BOOK	
852B087010	NET COMMAND CONFIGURATION FOLD	1235
853B291010	REGISTRATION-CARD	
I/SEP GUIDE65869	CABINET SEPARATION GUIDE	3

Ref #	Part #	Part Name & Description	[#]

[#] Model Legend: (1) WS-55859, (2) WS-55909, (3) WS-65869, (4) WS-65909, (5) WS-73909

Ref #	Part #	Part Name & Description	[#]
<b>SCREEN ASSEMBLY PARTS (<i>Figure 1</i>)</b>			
<b>WS-55859 (<i>Figure 1</i>)</b>			
(1)	491P103010	SCREEN-LENTICULAR	
(2)	491P104010	LENS-FRESNEL	
(3)	702A403010	CONTROL PANEL	
(4)	622C060040	CLIP-SCREEN-TOP/BOT	
(5)	622C063040	HOLDER-SCREEN-BOT	
(6)	701B400080	FRAME-SCREEN-TOP - 60"	
(7)	701B417010	FRAME-SCREEN-SIDE - 55"	
(8)	702A388030	CAP-CORNER-LEFT	
(9)	702A388040	CAP-CORNER-RIGHT	
(10)	760D627060	DIAMOND SHIELD	

**Figure 1: Screen Assembly Parts**

[#] Model Legend: (1) WS-55859, (2) WS-55909, (3) WS-65869, (4) WS-65909, (5) WS-73909

Ref #	Part #	Part Name & Description	[#]	Ref #	Part #	Part Name & Description	[#]
<b>SCREEN ASSEMBLY PARTS (Figure 2)</b>							
<b>WS-55909 (Figure 2)</b>							
(1)	491P103010	SCREEN-LENTICULAR			491P105010	SCREEN-LENTICULAR	
(2)	491P104010	LENS-FRESNEL		(2)	491P106010	LENS-FRESNEL	
(3)	622D746080	CLIP-SCREEN-SIDES		(3)	622D746020	CLIP-SCREEN-SIDES	
(4)	711C029040	FRAME-SCREEN-TOP - 55"		(4)	711C026040	FRAME-SCREEN-TOP - 65"	
(5)	711C029050	FRAME-SCREEN-SIDES - 55"		(5)	711C026050	FRAME-SCREEN-SIDES - 65"	
(6)	711C029060	FRAME-SCREEN-BOTTOM - 55"		(6)	711C026060	FRAME-SCREEN-BOTTOM - 65"	
(7)	768C065010	CAP-CORNER		(7)	768C065010	CAP-CORNER	
(8)	760D635010	DIAMOND SHIELD		(8)	760D635020	DIAMOND SHIELD	
					802B816010	SCREEN PAD	
<b>WS-65869 (Figure 2)</b>							
(1)	491P105010	SCREEN-LENTICULAR		(1)	491P085020	SCREEN-LENTICULAR	
(2)	491P106010	LENS-FRESNEL		(2)	491P086020	LENS-FRESNEL	
(9)	622C071020	CLIP-SCREEN-TOP/BOT		(3)	622D746010	CLIP-SCREEN-SIDES	
(4)(6)	701B429020	SCREEN-FRAME-TOP/BOT - 65"		(4)	711C029070	FRAME-SCREEN-TOP - 73"	
(5)	701B430020	SCREEN-FRAME SIDES - 65"		(5)	711C029080	FRAME-SCREEN-SIDES - 73"	
(7)	702A396010	CAP-CORNER		(6)	711C029090	FRAME-SCREEN-BOTTOM - 73"	
(8)	760D627070	DIAMOND SHIELD		(7)	768C065010	CAP-CORNER	
	802B816010	SCREEN PAD		(8)	760D635030	AR DIAMOND SHIELD	
<b>WS-73909 (Figure 2)</b>							

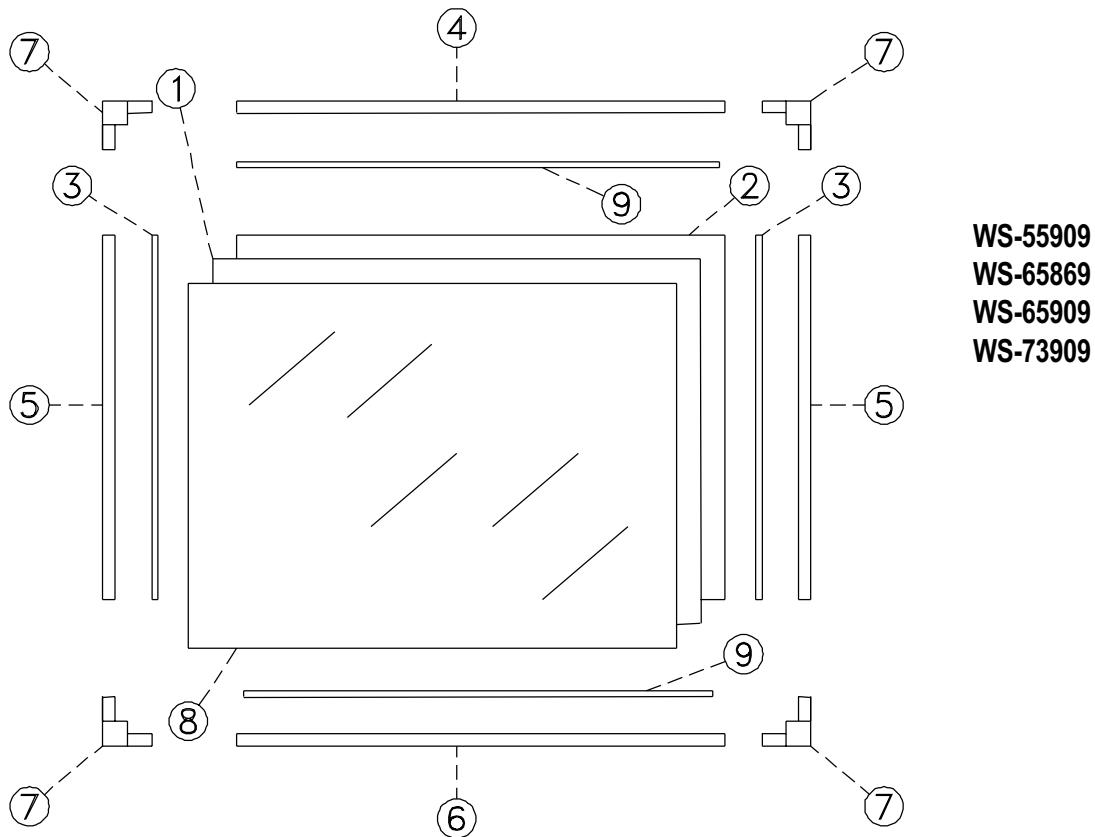
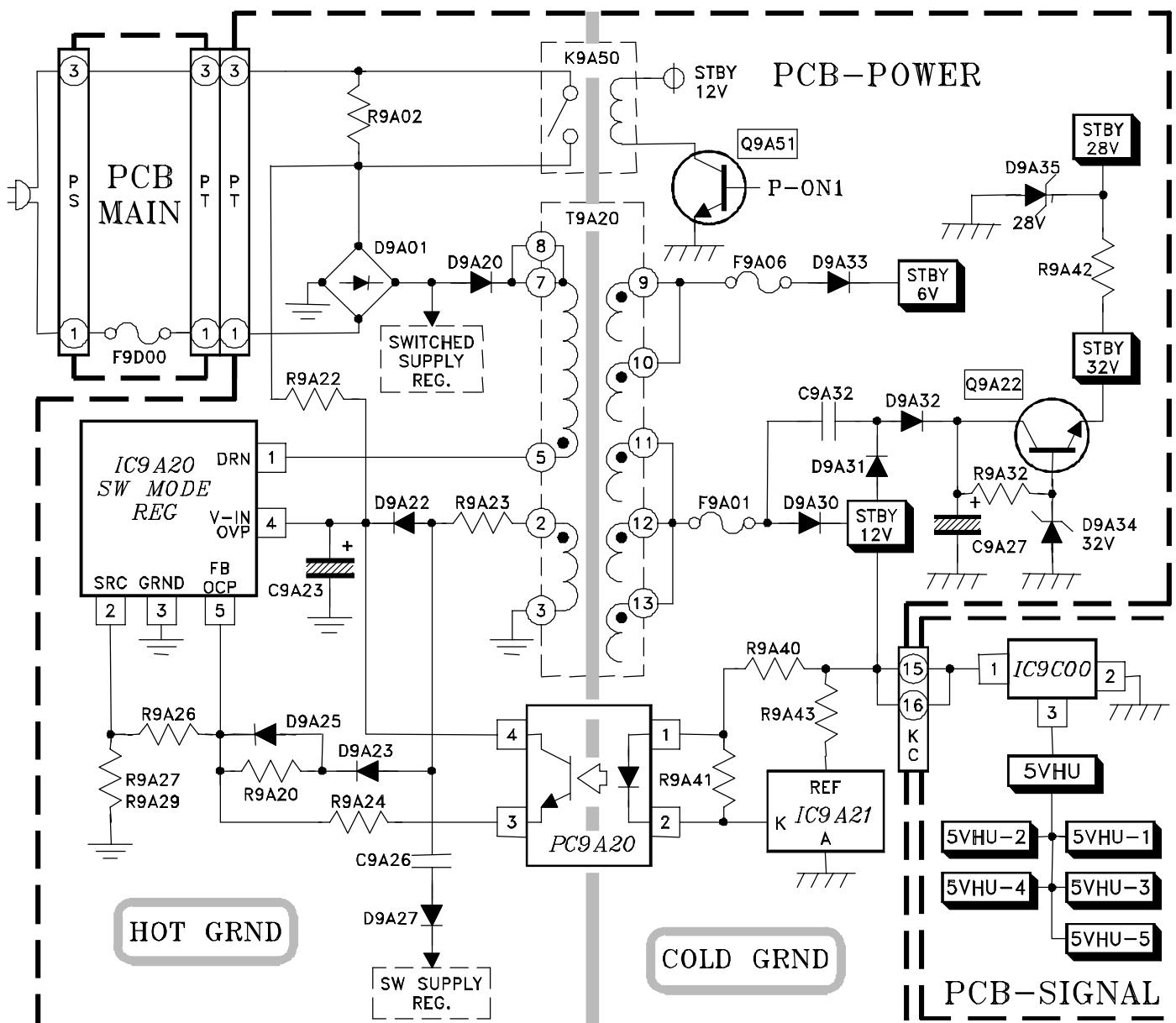
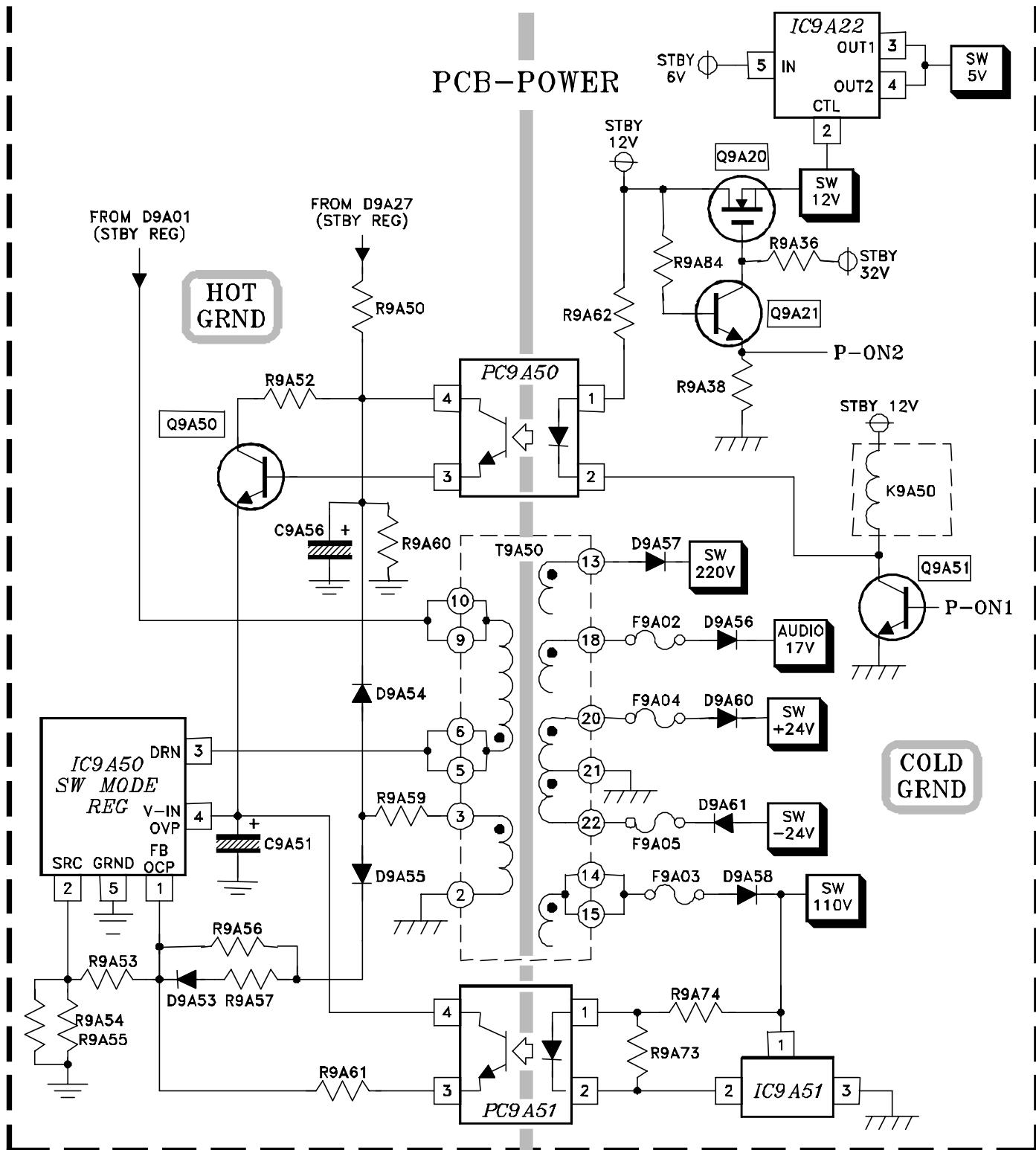


Figure 2: Screen Assembly Parts

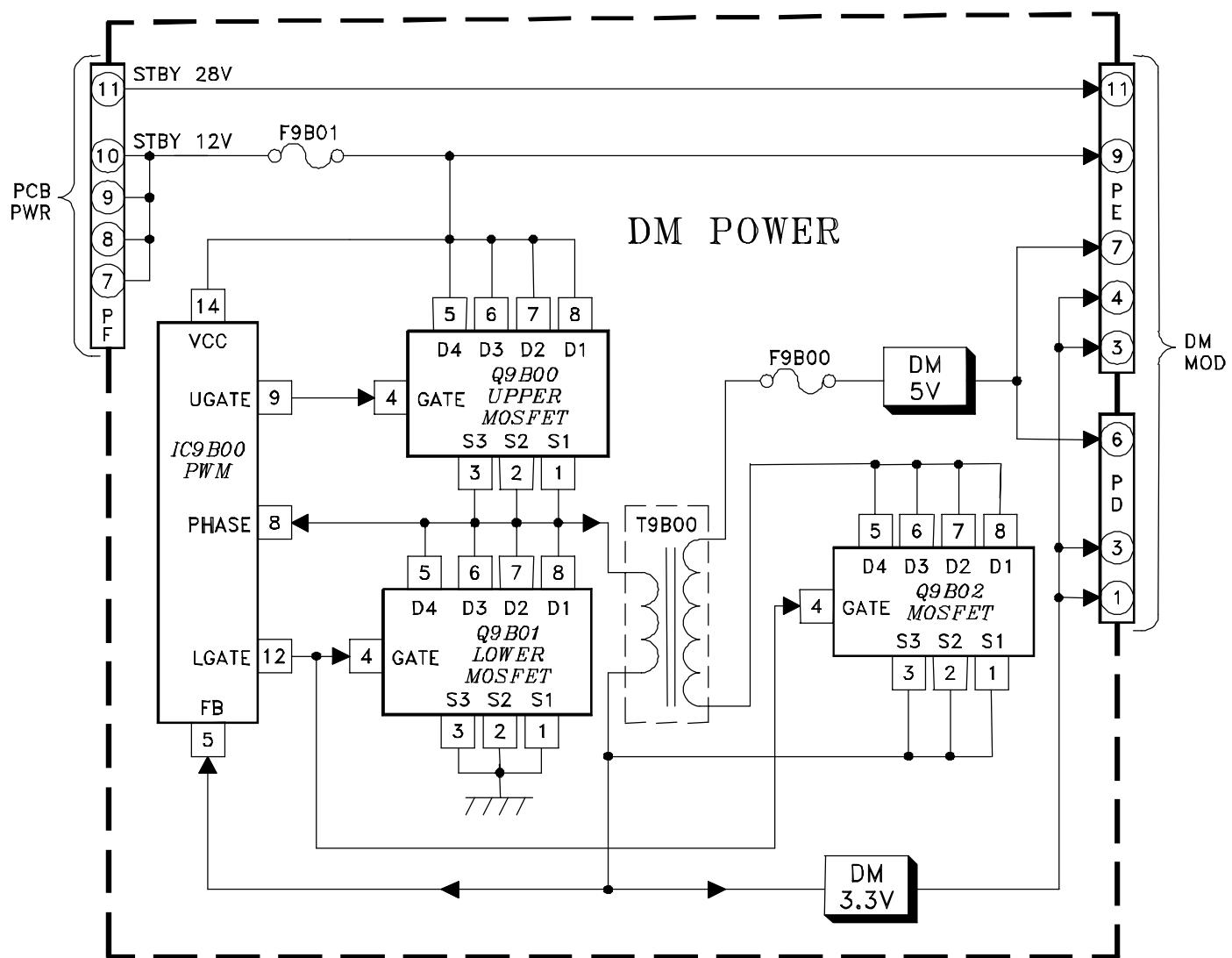
## STANDBY SUPPLIES REGULATOR



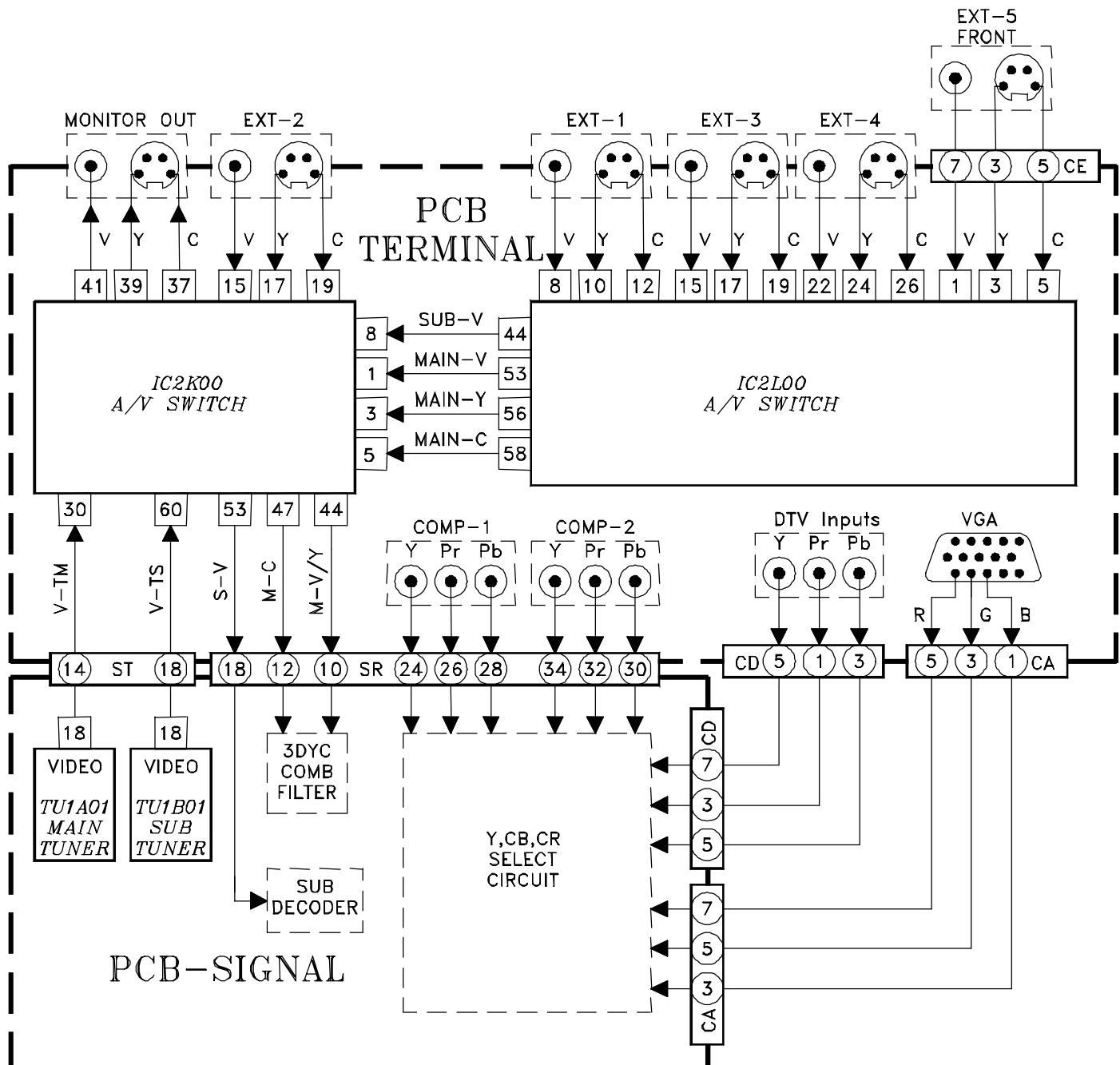
# SWITCHED SUPPLIES REGULATOR



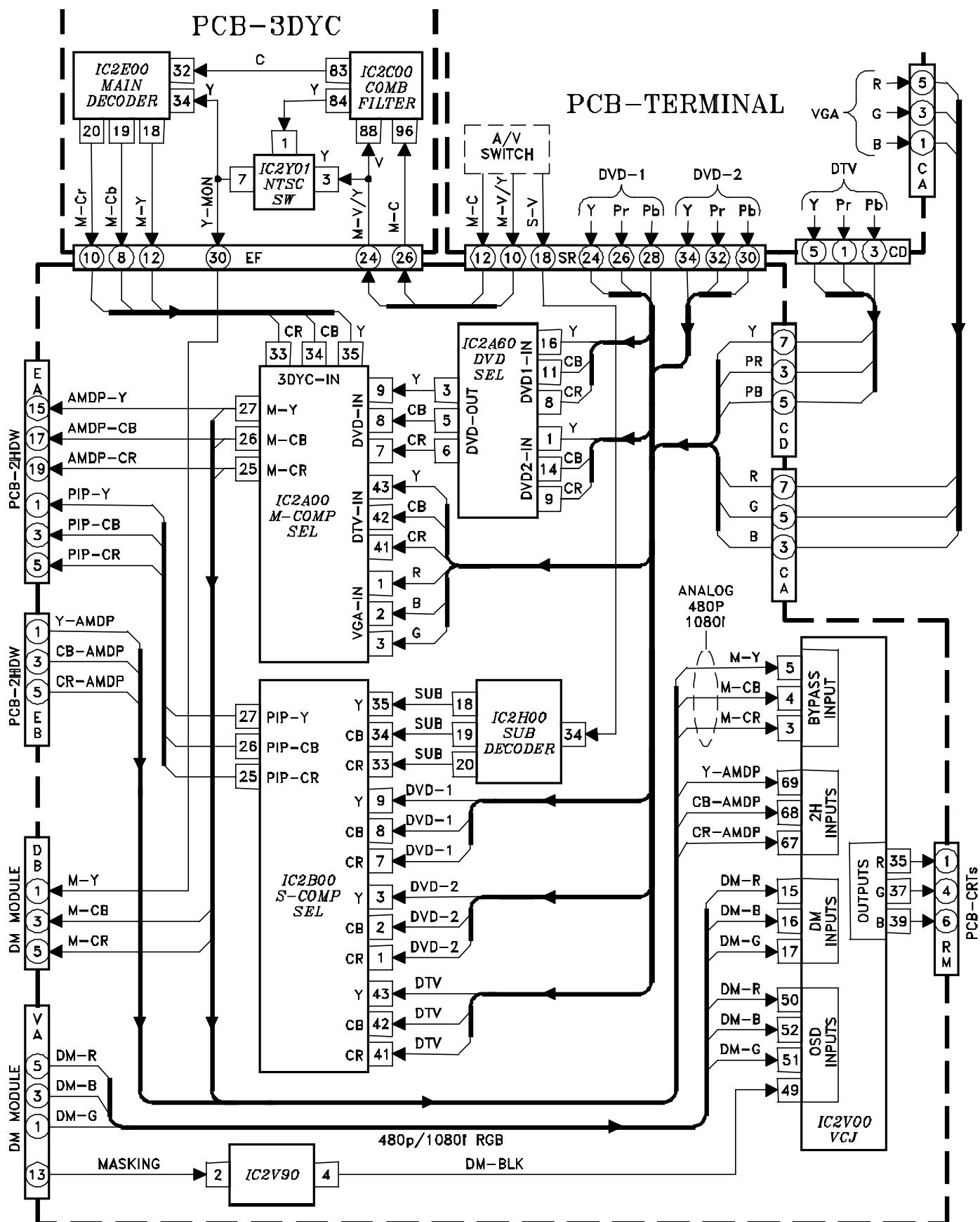
**DM  
POWER  
SUPPLY**

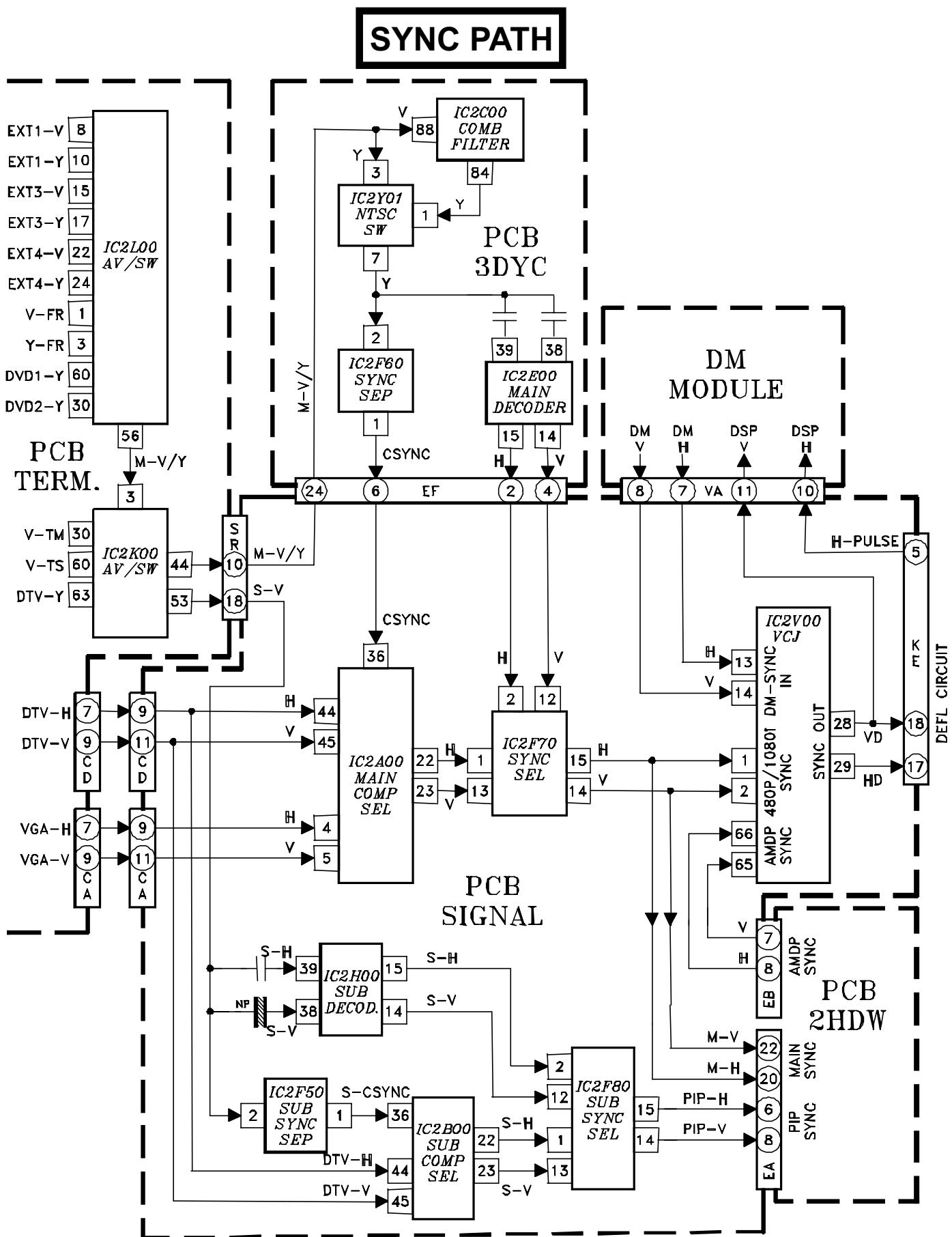


**VIDEO/COLOR  
A/V SWITCH CIRCUIT**

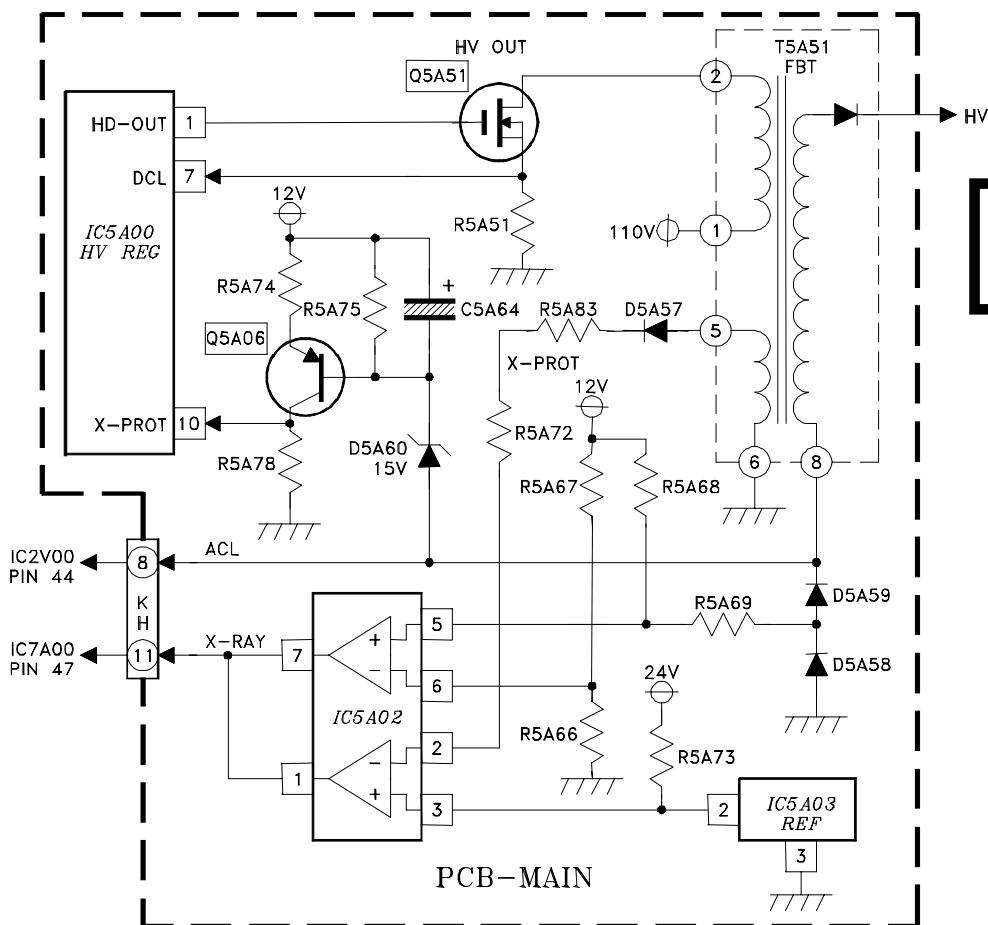
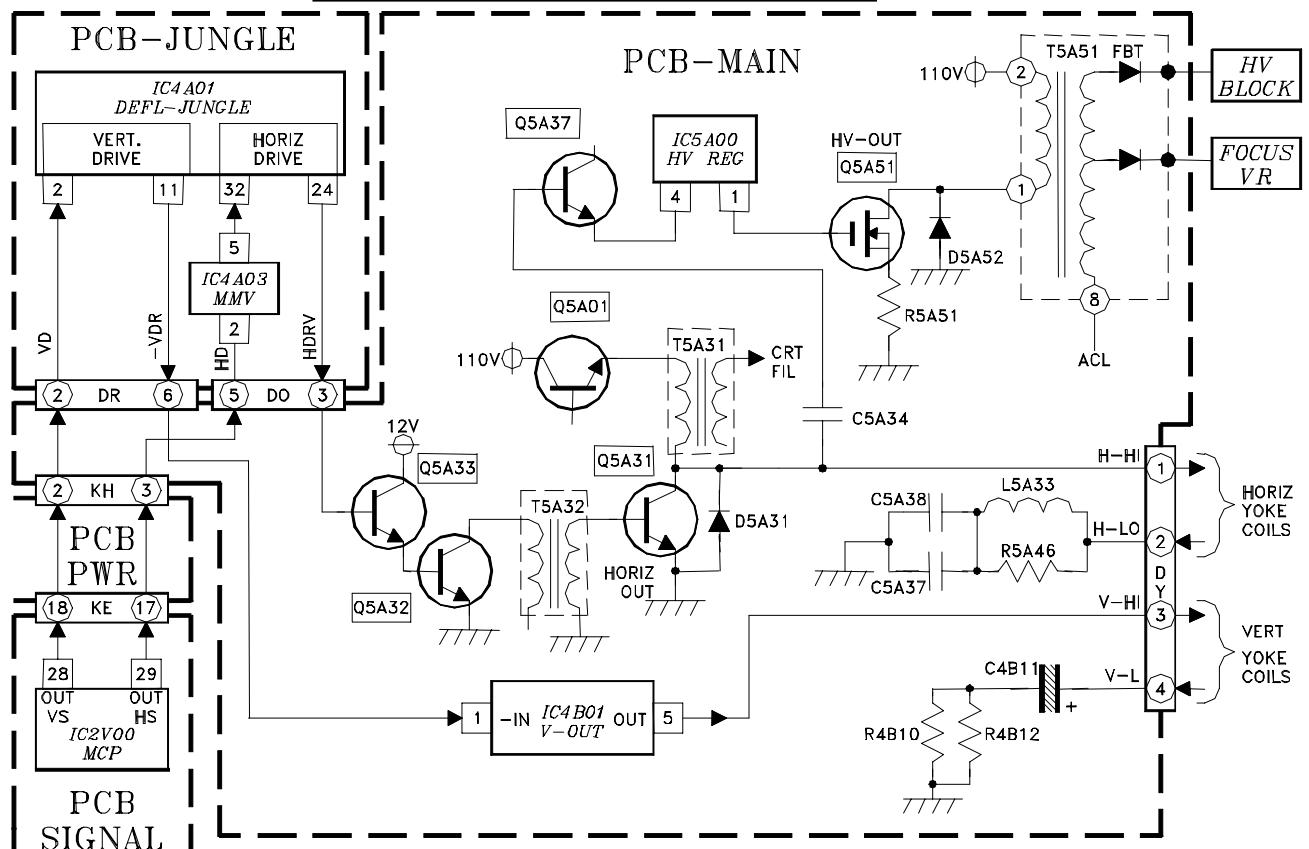


## PCB-SIGNAL Y/C PATH

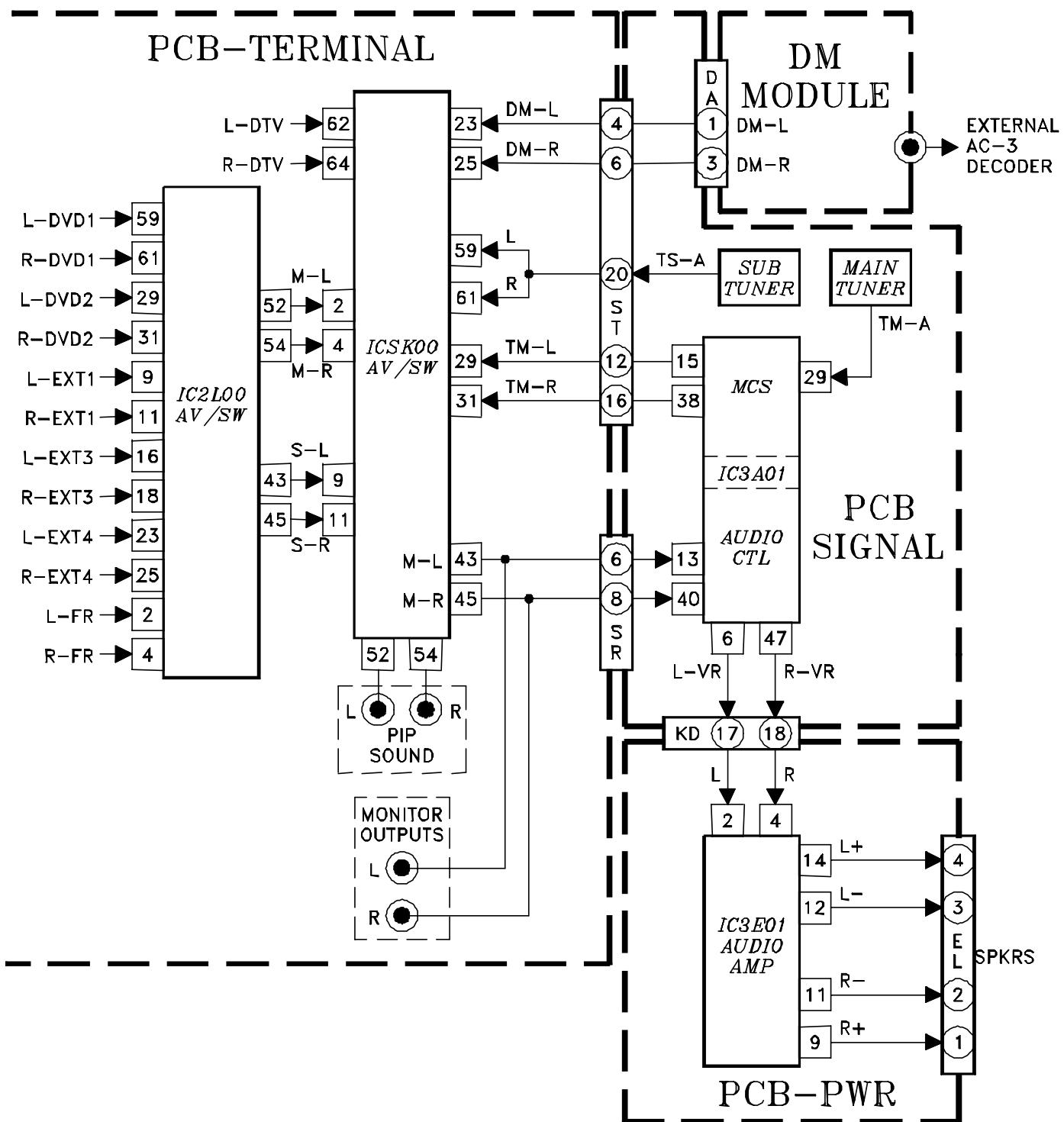




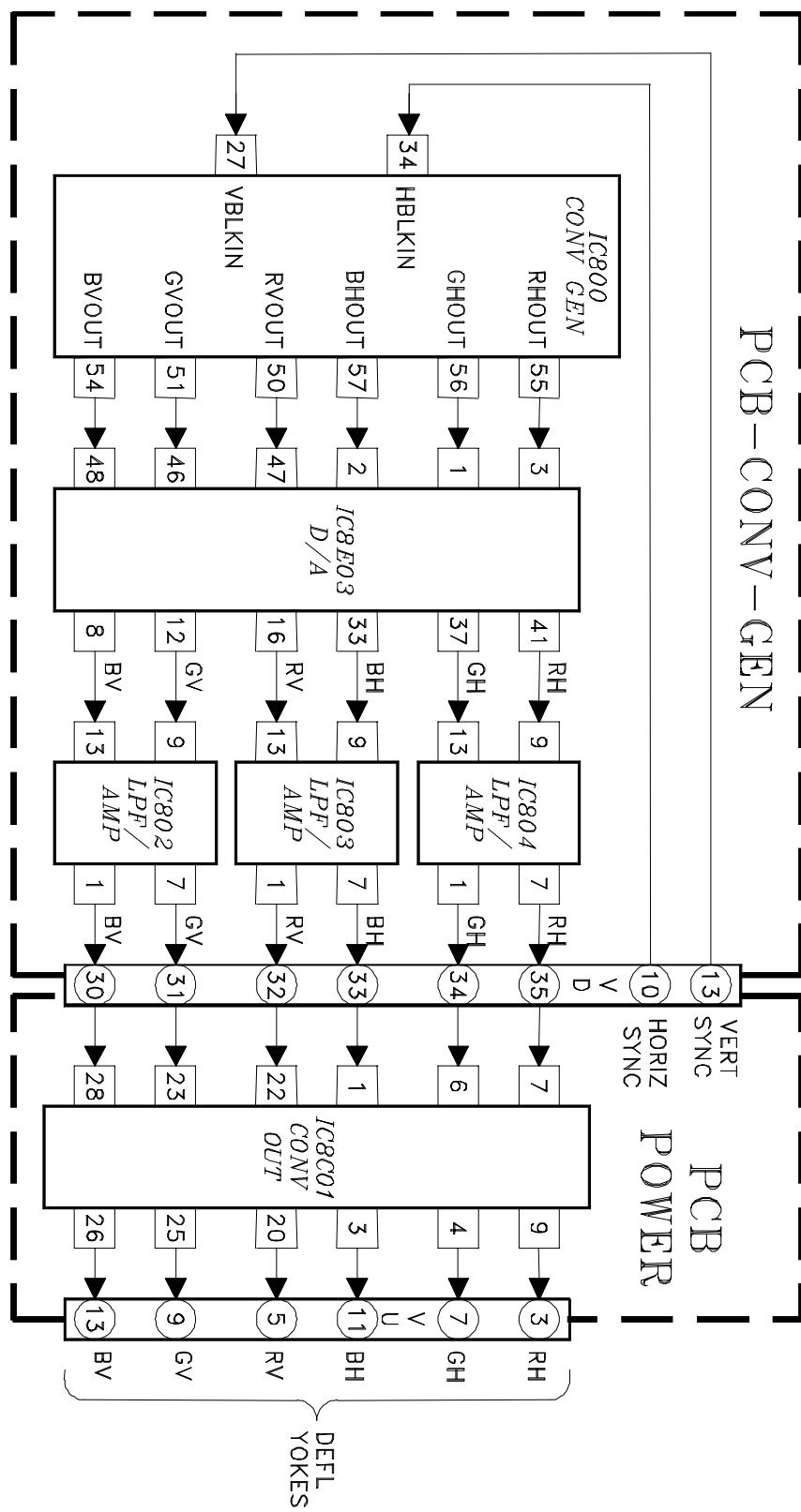
# DEFLECTION CIRCUIT



## SOUND CIRCUIT



# CONVERGENCE CIRCUIT



# CONTROL CIRCUIT

