

Philips Consumer Electronics

Technical Service Data

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Electrical Adjustments

REFER TO SAFETY GUIDELINES

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

CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING

E8 CHASSIS SERVICE ADJUSTMENTS

REQUIRED TOOLS FOR SERVICING

Isolation Transformer
Multimeter
Oscilloscope
High Voltage (100:1) Oscilloscope Probe
Sencore VG91 Universal Video Generator

Caution: The E8 chassis incorporates a "hot" ground system. Always use a separate isolation transformer when applying power to the exposed chassis.

Service Adjustment Notes:

Unless Otherwise Specified:

1. All service adjustments are "hot" voltagewise. For maximum safety, ensure the use of properly insulated tools.
2. Refer to the E8 Main Chassis Printed Circuit Board for location of test points and adjustable components.
3. Grid Locations (Ex.: D-3) next to the reference numbers for components refer to the Main Chassis Printed Circuit Board.

Focus Adjustment

1. Tune the set to a local or cable station.
2. Adjust the Focus Control (located on the upper part of the flyback transformer) for best picture details at high light conditions.

Degaussing the Television

1. Position the television so that the screen faces the direction it will be facing when in use.
2. Ensure the set is turned off.
3. Move a degaussing coil in a circular motion slowly around the sides and front of the set.
4. Withdraw the degaussing coil at least six feet from the television before disconnecting it from its power source.

Service Mode

Introduction

1. There are three service modes used in the E8 chassis. They are:
 - a. SDM - Service Default Mode
 - b. SAM - Service Alignment Mode
 - c. CSM - Customer Service Mode
2. The Service Default Mode (SDM) is a technical aid for the service technician. It is used for setting of options, reading error codes, and erasing error codes. This mode displays the Run Timer, Software Version, and current option settings. Service Default Mode (SDM) also establishes a fixed, repeatable setting of controls to allow measurements to be made. On screen display is kept at a minimum to reduce the cluttering of wave forms with unwanted information.
3. The Service Alignment Mode (SAM) is used to make tuning adjustments, align the white tone, adjust the picture geometry, and make sound adjustments.
4. The Customer Service Mode shows error codes and information on the TV operation settings. The servicer can instruct the customer to enter CSM by telephone and read off the information displayed. This helps the servicer to diagnose problems and failures in the TV set before making a service call.
5. When in a service mode, "SDM" (for Service Default Mode) or "SAM" (for Service Alignment Mode) or "CSM" (for Customer Service Mode) will be displayed (in green) in the top right corner of the screen.

- All other On Screen Display (except highlighted items in SDM or SAM) will be in red.
6. It will be memorized in the EEPROM that the TV set is in SDM or SAM. This is necessary because the TV must show up in SDM or SAM again after an ac power interrupt.
 7. When the television is in SAM or SDM, all normal features (such as volume control and direct channel access) are available.

EEPROM Replacement or Defective EEPROM

After replacing a EEPROM (or with a defective/no EEPROM) default settings will be used that enable the set to start up and that allow access to the Service Default Mode and Service Alignment Mode.

Service unfriendly modes

In the service modes, a number of modes/features are ignored since they interfere with diagnosing or repairing a set. These are "service unfriendly modes."

"Ignoring" means that the event that is triggered is not executed; the setting remains unchanged (Example: Timer OFF: 8:00 PM; the set will not switch OFF in service mode at 8:00PM, but the setting will remain).

The service unfriendly modes are:

- (Sleep) timer
- Blue mute
- Auto switch off (when there is no video signal identified)
- Hotel or hospital mode
- Smart lock or blocking by V-chip
- Skipping and/or blanking of "Not Favorite" channels
- Automatic storing of Personal Preset settings
- Automatic user menu time-out (menu switches back or OFF automatically)

Service Default Mode (SDM)

1. The Service Default Mode (SDM), set the option codes and bytes of the set, and display the error codes (the Power LED begins blinking procedure for error code display, if errors are detected). SDM also overrides software protections.

The Service Default Mode (SDM) must be used when taking voltages and waveforms.

2. To enter the Service Default Mode, press the following key sequence on the remote control transmitter:

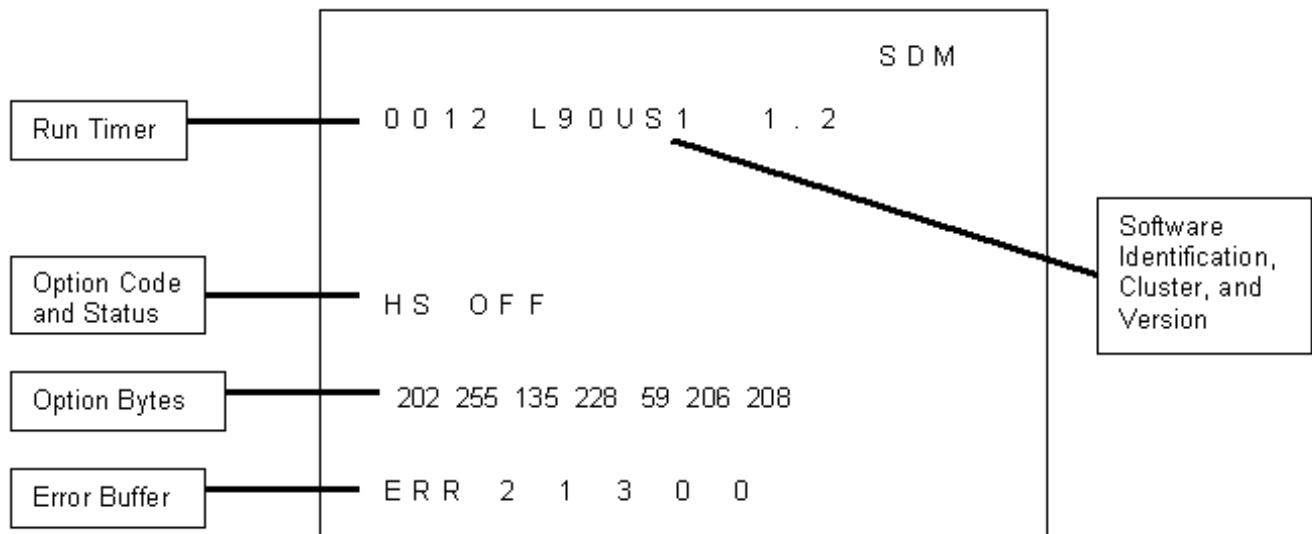
0-6-2-5-9-6-Menu

Do not allow the display to time out between entries while keying the sequence.

SDM can also be entered by pressing the Channel Down and Volume Down keys on the local keyboard simultaneously while in SAM mode.

When Service Default Mode is entered, the text "SDM" will be displayed in the upper right corner of the screen.

3. When Service Default Mode is entered, the Power LED will begin blinking to display any detected error codes, the set automatically tunes to Channel 3 (61.25 MHz), and service unfriendly modes are disabled. All customer controls are set to predetermined values.
4. When the unit is operating in Service Default Mode, all normal on-screen displays are suppressed and replaced by a special service display. A sample SDM display is shown below.



5. To select an option code or option byte in SDM, use the Menu Up or Menu Down keys on the remote control.
6. To change the value of an option code, use the Menu Left or Menu Right keys.
7. To change the value of an option byte, use the Menu Left or Menu Right keys, or enter the new value using the numeric keys on the remote control.
8. Press the Status button on the remote control to toggle the OSD (except "SDM") ON and OFF to prevent the OSD from interfering with measurements and oscilloscope waveforms.
9. Press the Menu button on the remote control while in SDM to switch the software to a Virtual Customer Mode; the text "SDM" will still be displayed in the upper right corner of the screen. In this mode, all customer menu adjustments to the set can be made. From the Virtual Customer Mode, press the Menu button to return to the SDM display.
10. To exit the Service Default Mode and erase the error codes, turn the unit off with the Power button on the remote control, then unplug the ac cord.
11. To exit the Service Default Mode and save the error codes, unplug the ac cord to turn off the set. When the set is turned on again, the Service Default Mode will still be active.

Explanation of Display:

Run Timer

The run timer counts the normal operation hours, not the standby hours. The actual value of the run timer is displayed in SDM and CSM. The run timer displays hours in hexadecimal format. This display will increment based on the amount of time the set has been on. The timer will also be incremented one hour each time the set is turned on.

Software Identification, Cluster, and Version

The software identification, cluster, and version will be shown in the service main menu display.

These numbers consist of the last part of the customer identification printed on the IC package; the screen will show "AAABBC-X.Y". (Example: L90US1 1.2)

- AAA is the engineering project name (Ex: L90 = L9.0).
- BB is a function specification indicating specific functionality or a region (Ex: US). Processors with the same engineering project name and function name are interchangeable, except for the languages they support.
- C is the language cluster number within the "BB" software version (Ex: 1 = English/Spanish/French)
- X is the main version number (Ex: 1)

- Y is the sub version number (Ex: 2)
- the main version number is updated with a major change of specification (incompatible with the previous software version)
- the sub version number is updated with a minor change (backwards compatible with the previous versions)
- if the main version number changes, the new version number is written in the EEPROM
- if the main version number changes, the default settings are loaded
- if the sub version number changes, the new version number is written in the EEPROM
- if the EEPROM is fresh, the software identification, version and cluster will be written to EEPROM
- **Note:** a new micro controller is considered to be compatible if it works instead of the old software and the functionality is not significantly changed.

Error Buffer

Error codes are required to indicate failures in the television. For intermittent complaints, always check the error buffer. A unique error code is available for:

- activated protection (error codes 1, 2, and 3)
 - failing I²C device
 - general I²C error
 - RAM failure (e.g. internal RAM of microprocessor (IC 7600))
- Other error codes are:
- Signal processor (IC 7250) start-up error
 - EEPROM check-sum error

The last five errors, remembered in the EEPROM, are shown in the service menu. This is called the error buffer.

The error that is found last is displayed on the left, except when protection (1 to 3) is active.

Errors 1, 2, and 3 are often shown at the right of the error buffer display whenever they are detected.

Example 1:

Suppose the display shows: 8 – 11 – 2 – 0 – 0

With 2 displayed at the right of the error buffer, high beam current protection is active.

Example 2:

Suppose the display shows: 11 – 4 – 5 – 3 – 0

With 3 displayed at the right of the error buffer, vertical protection is active.

The following error codes have been defined:

Error Code Table

0	= No error
1	= X-Ray / overvoltage protection active
2	= High beam current (BCI) protection active
3	= Vertical protection active
4	= I ² C error while communicating with the sound processor (IC 7803)
5	= Signal processor (IC 7250) start-up error
6	= I ² C error while communicating with the signal processor IC (IC 7250)
7	= General I ² C error *
8	= Internal RAM error micro controller
9	= EEPROM Configuration error (Checksum error)
10	= I ² C error, EEPROM error
11	= I ² C error, PLL tuner

Note: I²C = (SCL/SDA)

- * General I²C error means: no I²C device is responding to the particular I²C bus.
Possible causes: SCL short circuit to GND, SDA short circuit to GND, SCL short circuit to SDA, SDA open circuit (at IC 7600), SCL open circuit (at IC 7600)

Reading Error Codes

Error codes are displayed in the following ways:

1. By SDM display or CSM display
2. By blinking Power LED
1. If the on screen display is working, enter SDM or CSM and read the error buffer display.
2. If the on screen display is not working, do the following:
 - a. Remove ac power
 - b. Use a jumper to connect pin 0224 to pin 0228 at IC 7601 (D-3)
 - c. Apply ac power; read the error codes (see LED Sequence List below)
 - d. If there is no LED indication, take the following steps as needed:

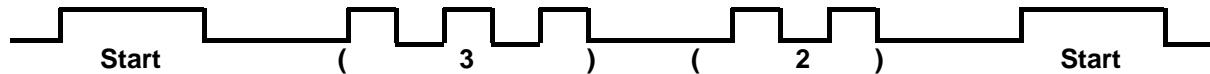
Power on

Press 0–6–2–5–9–6–Menu on the remote control

Note: Some indications take 30 seconds or longer to appear on the LED.

3. LED Sequence List:
 - a. Wait for long LED on (1.5 seconds)
 - b. Count the following on flashes (individual errors are separated by 1.5 seconds LED off)

Example:



4. Displayed error codes are saved by removing the ac power. Displayed error codes are erased by pressing the power button on the remote control or local keyboard.

Option Code and Status

The following options in SDM can be identified:

Note: All options may not be available in some sets.

OPTION	OP	VALUES
System	SY	SS (This option is not used in US models)
Option Byte 1	OB1	Option Bytes 1 through 7 are used to set 8 options simultaneously with one byte (when the option byte is highlighted, the value can be keyed in with the numerical buttons on remote control or changed with the Menu Up/Down keys on the remote control).
Option Byte 2	OB2	
Option Byte 3	OB3	
Option Byte 4	OB4	
Option Byte 5	OB5	Values = 0 – 255
Option Byte 6	OB6	See the Chassis Feature Listing to see the values for Option Bytes 1 through 7. These values can be used to set the option package for a particular model.
Option Byte 7	OB7	
Slider Bar Value Display	DP	OFF/ON
Animated Menu	AM	OFF/ON
Hospital Mode	HS	OFF/ON
Hotel Mode	HT	OFF/ON
Demo Mode	DM	OFF/ON
Games Mode	GM	OFF/ON
Clock (Volatile)	CK	OFF/ON
Child Lock	CL	OFF/ON
V-Chip	VC	OFF/ON
V-Chip Block Unrated	VU	OFF/ON
Block No Rating (V-Chip)	VN	OFF/ON
Smart Sound	SS	OFF/ON
Smart Picture	SP	OFF/ON
Remote Control Type	RC	OFF = RC0702/04 remote control / ON = All other remote controls
Channel Select Time Window	TW	OFF = 2-second time window / ON = 5-second time window
Surf	SF	OFF/ON
Video Mute (Channel Change)	VM	OFF/ON
Tuner Type	TN	OFF = Philips tuner / ON= ALPS tuner
Fine Tuning	FT	OFF/ON
AV1	XT	OFF/ON
AV2	2X	OFF/ON
Auto Cable Detect	CD	OFF/ON
Blue Mute	BM	OFF/ON
No Ident (Auto Standby)	NI	OFF/ON
Noise Reduction	NR	OFF/ON
Contrast Plus	CP	OFF/ON
Color Temperature	CT	OFF/ON
East-West Functions	EW	OFF/ON (This option is not used in US models)
Video Processor Standby	BS	OFF/ON
Video Processor Auto Startup	AS	OFF/ON
Bass/Treble Control/Boost	BT	OFF/ON
Incredible Surround	IS	OFF/ON
Volume Limiter	VL	OFF/ON
Ultra Bass	UB	OFF/ON
Automatic Volume Leveller (AVL)	LV	OFF/ON
SAP - Mono/Stereo	DU	OFF/ON
Audio Out (Fixed/Variable)	AO	OFF/ON
Sound Type	ST	BG/I/DK/M (Should remain on M)
Sound Board	SB	DB = DBX/SAP (BTSC) EC = BTSC stereo (No SAP) MA = Mono All

Sound Board	SB	DB = DBX/SAP (BTSC) EC = BTSC stereo (No SAP) MA = Mono All MS = Bi Sonic (Mono by tuner, stereo by A/V jacks)
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Option SY : System

Function: Set the multi system hardware configuration

Values: SS (This option is not used in US models)

OB 1 – OB 7 : Option Byte 1 – Option Byte 7

Function: Set 8 options simultaneously with one byte

(value can be keyed in with numerical buttons on remote control or changed with the Menu Up/ Down keys on the remote control)

Values: 0 – 255

Option DP : Slider Bar Value Display

Function: Enable/disable slider bar value display in customer menu

Values: OFF = Disable slider bar value display

ON = Enable slider bar value display

Option AM : Animated Menu

Function: Enable/disable animated menu

Values: OFF = Disable animated menu display

ON = Enable animated menu display

Option HS : Hospital Mode

Function: Enable/disable the possibility to enter hospital mode

Values: OFF = Disabled, hospital mode cannot be entered

ON = Enabled, hospital mode can be entered

Option HT : Hotel Mode

Function: Enable/disable the possibility to enter hotel mode

Values: OFF = Disabled, hotel mode cannot be entered

ON = Enabled, hotel mode can be entered

Option DM : Demo Mode

Function: Enable/disable the possibility to enter demo mode

Values: OFF = Disabled, demo mode is not active

ON = Enabled, demo mode is active

Option GM : Games Mode

Function: Enable/disable games function

Values: OFF = Disabled, Games command is ignored

ON = Enabled, Games command is processed

Option CK : Clock (Volatile)

Function: Enable/disable clock function

Values: OFF = Disabled, clock menu not available

ON = Enabled, clock menu available

Option CL : Child Lock

Function: Enable/disable child lock function

Values: OFF = Disabled, child lock menu not available

ON = Enabled, child lock menu available

Option VC : V-Chip

Function: Enable/disable v-chip function (customer menu item Smartlock)

Values: OFF = Disabled, v-chip menu (customer menu item Smartlock) not available

ON = Enabled, v-chip menu (customer menu item Smartlock) available

Option VU : V-Chip Block Unrated

Function: Enable/disable V-Chip block unrated (in Smartlock menu)

Values: OFF = Disabled, V-Chip block unrated (in Smartlock menu) not available

ON = Enabled, V-Chip block unrated (in Smartlock menu) available

Option VN : Block No Rating (V-Chip)

Function: Enable/disable block no rating V-Chip (in Smartlock menu)

Option SS : Smart Sound

Function: Enable/disable smart sound function
Values: OFF = Disabled, Smart Sound command is ignored
ON = Enabled, Smart Sound command is processed

Option SP : Smart Picture

Function: Enable/disable smart picture function
Values: OFF = Disabled, Smart Picture command is ignored
ON = Enabled, Smart Picture command is processed

Option RC : Remote Control Type

Function: Choose the type of remote control to be used
Values: OFF = RC0702/04 remote control
ON = All other remote controls

Note: If changed when using the RC0702/04, this option can only be returned to the original setting by option byte correction.

Option TW : Channel Select Time Window

Function: Select time window for channel selection
Values: OFF = 2-second time window for channel selection
ON = 5-second time window for channel selection

Option SF : Surf

Function: Enable/disable the possibility to enter surf mode
Values: OFF = Disabled, customer menu item Surf not available and A/CH command alternates channels
ON = Enabled, customer menu item Surf available and A/CH command surfs or alternates channels

Option VM : Video Mute (Channel Change)

Function: Enable/disable video mute during channel change
Values: OFF = Disabled, no video mute during channel change
ON = Enabled, video muted during channel change

Option TN : Tuner Type

Function: Choose the tuner type that is configured in the hardware
Values: OFF = Philips tuner (A Philips tuner will have the Philips name embossed on the side)
ON = ALPS tuner (An ALPS tuner will not have the Philips name embossed on the side)

Option FT : Fine Tuning

Function: Enable/disable fine tuning
Values: OFF = Customer menu item fine tuning disabled
ON = Customer menu item fine tuning enabled

Option XT : AV1

Function: Enable/disable external input source 1 (Ext 1)
Values: OFF = Disabled, external input source 1 (Ext 1) not available
ON = Enabled, external input source 1 (Ext 1) available

Option 2X : AV2

Function: Enable/disable external input source 2 (Ext 2)
Values: OFF = Disabled, external input source 2 (Ext 2) not available
ON = Enabled, external input source 2 (Ext 2) available

Option CD : Auto Cable Detect

Function: Enable/disable automatic detection of Cable/Broadcast during autostore.
Values: OFF = Disabled, autostore uses the selected Cable/Broadcast setting
ON = Enabled, autostore will detect and set Cable/Broadcast mode

Option BM : Blue Mute

Function: Enable/disable blue mute when no television station signal is present
Values: OFF = Disabled, no blue mute when no television station signal is present
ON = Enabled, blue mute active when no television station signal is present

Option NI : No Ident (Auto Standby)

Function: Enable/disable automatic switch to standby after 10 minutes when no television station signal is present
Values: OFF = Disabled, no automatic switch to standby
ON = Enabled, set switches to standby after 10 minutes when no television station signal is present

Option NR : Noise Reduction

Function: Enable/disable noise reduction function
Values: OFF = Disabled, customer menu item Noise Reduction not available
ON = Enabled, customer menu item Noise Reduction available

Option CP : Contrast Plus

Function: Enable/disable contrast plus function
Values: OFF = Disabled, customer menu item Contrast Plus not available
ON = Enabled, customer menu item Contrast Plus available

Option CT : Color Temperature

Function: Enable/disable color temperature function
Values: OFF = Disabled, customer menu item Color Temperature not available
ON = Enabled, customer menu item Color Temperature available

Option EW : East-West Functions

Function: Enable/disable east-west control function (This option is not used in US models)
Values: OFF = Disabled, east-west alignment not available in SAM (EWW, EWP, EWC, EWT)
ON = Enabled, east-west alignment available in SAM (EWW, EWP, EWC, EWT)

Option BS : Video Processor Standby

Function: Enable/disable video processor standby
Values: OFF = Disabled, video processor standby is not active
ON = Enabled, video processor standby is active

Option AS : Video Processor Auto Startup

Function: Enable/disable video processor auto-startup
Values: OFF = Enabled, video processor is in auto-startup mode
ON = Disabled, video processor is switched on under control of microcontroller

Option BT : Bass/Treble Control/Boost

Function: Enable/disable bass and treble function
Values: OFF = Disabled, customer menu items Bass and Treble not available
ON = Enabled, customer menu items Bass and Treble available

Option IS : Incredible Surround

Function: Enable/disable incredible surround function
Values: OFF = Disabled, incredible surround function not available
ON = Enabled, incredible surround function available

Option VL : Volume limiter

Function: Enable/disable volume limiter
Values: OFF = Disabled, customer menu item Volume Limiter not available
ON = Enabled, customer menu item Volume Limiter available

Option UB : Ultra Bass

Function: Enable/disable ultra bass function
Values: OFF = Disabled, ultra bass function not available
ON = Enabled, ultra bass function available

Option LV : Automatic Volume Leveller (AVL)

Function: Enable/disable automatic volume leveller function
Values: OFF = Disabled, customer menu item AVL not available
ON = Enabled, customer menu item AVL available

Option DU : SAP

Function: Set SAP configuration (sets with DBX stereo system only)
Values: OFF = Disabled, stereo/SAP not available
ON = Enabled, stereo/SAP available

Option AO : Audio Out (Fixed/Variable)

Function: Set audio output type (where present)

Values: OFF = Fixed audio out

ON = Variable audio out (always on)

Option ST : Sound Type

Function: Set the sound type

Values: BG PAL system

I PAL system

DK PAL system

M Default for USA

Option SB : Sound Board

Function: Set the sound board configuration

Values: DB = DBX/SAP (BTSC)

EC = BTSC stereo (No SAP)

MA = Mono All

MS = BiSonic (Mono from tuner, Stereo from A/V jacks)

Service Alignment Mode (SAM)

1. The Service Alignment Mode (SAM) is used to make tuning adjustments, align the white tone, adjust the picture geometry, and make sound adjustments.
2. To enter the Service Alignment Mode (SAM), press the following key sequence on the remote control transmitter: **0-6-2-5-9-6-Status**

Do not allow the display to time out between entries while keying the sequence.

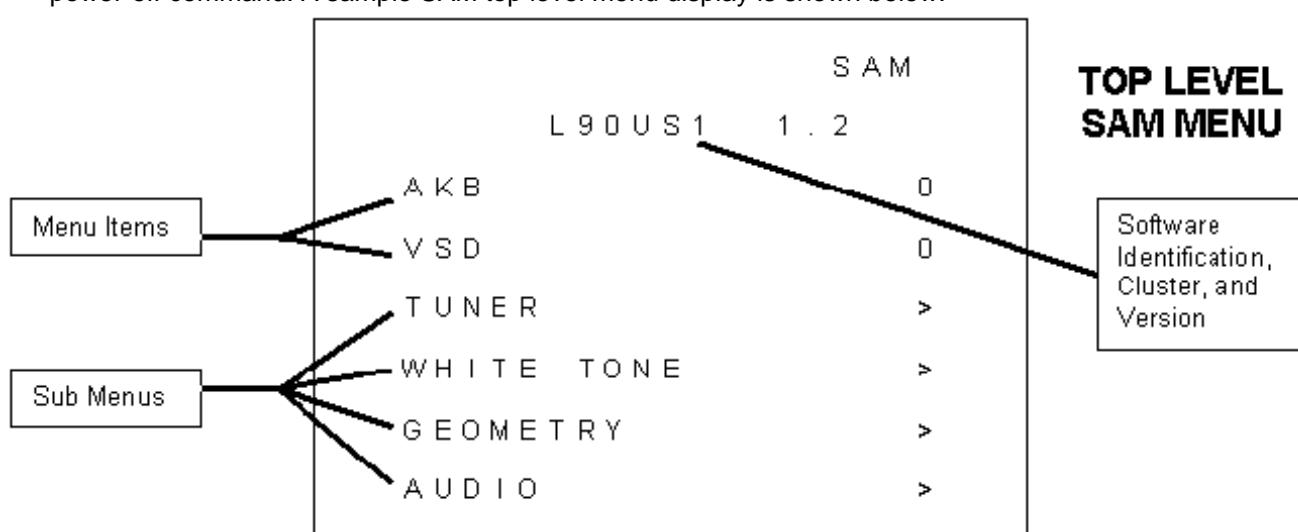
SAM can also be entered by pressing the Channel Down and Volume Down keys on the local keyboard simultaneously while in SDM mode. When Service Alignment Mode is entered, the text "SAM" will be displayed in the top right corner of the screen.

3. When Service Alignment Mode is entered, service unfriendly modes are disabled.

The following volatile SAM item values are set:

- ◆ AKB = 0
- ◆ VSD = 0
- ◆ AFW = 275 kHz
- ◆ SBL = 0

4. When the unit is operating in Service Alignment Mode, all normal on-screen displays are suppressed and replaced by a special service display. The first screen seen upon entering SAM is the "top level SAM menu." The service technician must return to the top level SAM menu before exiting with a power-off command. A sample SAM top level menu display is shown below.



Explanation of top level SAM menu display:

The Software Identification, Cluster, and Version are explained in the Service Default Mode section under "Explanation of Display."

The Menu Items and Sub Menus are explained below.

Note: The "Audio" sub menu will not be seen on screen when Service Alignment Mode is first entered. Use the Menu Up and Menu Down buttons on the remote control to view all menu items and sub menu choices.

5. To select a menu item or a sub menu in SAM, use the Menu Up or Menu Down keys on the remote control to highlight the item or menu you wish to adjust.
6. To change the value of a highlighted SAM menu item (AKB or VSD), use the Menu Left or Menu Right keys on the remote control.
7. To enter a highlighted SAM sub menu, use the Menu Left or Menu Right keys.
After entering the sub menu, use the Menu Up or Menu Down to select an item within the sub menu.
Use the Menu Left or Menu Right keys to change the value of the selected item.
Press the Menu button to return to the top level SAM menu.
8. Press the Menu button on the remote control while in SAM to switch the software to a Virtual Customer Mode; the text "SAM" will still be displayed in the upper right corner of the screen. In this mode, all customer menu adjustments to the set can be made. From the Virtual Customer Mode, press the Menu button to return to the SAM Menu.
9. Press the Status button on the remote control to toggle the OSD (except "SAM") ON and OFF.
10. To exit the Service Alignment Mode, turn the set off with the Power button on the remote control. To turn off the set without exiting SAM (or erasing any stored error codes), unplug the ac cord. When the set is powered on again, the Service Alignment Mode will still be active.

Note: When SAM is exited or a power interrupt occurs, the volatile SAM items AKB, VSD, AFW, and SBL will be reset to their original values.

Main Menu

The SAM main menu contains the following items:

- AKB
- VSD
- Tuner sub menu
- White Tone sub menu
- Geometry sub menu
- Audio sub menu (on stereo chassis)

Menu: MAIN	Values	Remarks
AKB	Black current loop (Auto Kine Bias)	OFF/ON (0/1)
VSD	Vertical scan disable	OFF/ON (0/1)
TUNER	>	
WHITE TONE	>	
GEOMETRY	>	
AUDIO	>	Available only on stereo chassis

Tuner sub menu

The tuner sub menu contains the following items:

- IF-PLL
- AFW
- AGC
- YD
- CL
- AFA and AFB

The items AFA and AFB cannot be selected, they are for monitoring purposes only.

The item values are stored in EEPROM if this sub menu is left.

A sample display of the Tuner sub menu is shown below.

S A M	
L 9 0 U S 1	1 . 2
T U N E R	
I F - P L L	3 2
A F W	2 7 5 k H z
A F A	0
A F B	1

Tuner Adjustment:

Sub Menu: TUNER	Values	Remarks
IF-PLL	IF-PLL alignment	0 – 127 This adjustment is auto-aligned (no action required)
AFW	AFC window	125/275 kHz Always set to 275 kHz
AGC	AGC takeover point	0 – 63 See below
YD	Y-delay adjustment	0 – 15 Always set to 12 (no effect)
CL	Cathode drive level	0 – 7 Always set to 4
AFA		0 / 1 read only, not accessible
AFB		0 / 1 read only, not accessible

AGC Takeover Point (AGC):

1. Enter the Service Alignment Mode (SAM) by pressing the following key sequence on the remote control transmitter:
0-6-2-5-9-6-Status
Do not allow the display to time out between entries while keying the sequence.
2. From the top level SAM menu, use the Menu Up/Down keys to highlight the Tuner sub menu.
3. Use the menu left/right keys to enter the Tuner sub menu.
4. In the Tuner sub menu, use the Menu Up/Down keys to highlight AGC.
5. Use the Menu Right key to raise the value of AGC until snow appears in the picture.
6. Then use the Menu Left/Right keys to reduce AGC value until the snow disappears.
 - a. AGC values between 10 and 20 are nominal.
 - b. Single digit AGC values may cause overload.
7. Upon completion of Tuner adjustment, press the Menu button to return to the top level SAM menu.

White Tone sub menu

The white tone sub menu contains the following items:

- Normal Red
- Normal Green
- Normal Blue
- Delta Cool Red
- Delta Cool Green
- Delta Cool Blue
- Delta Warm Red
- Delta Warm Green
- Delta Warm Blue

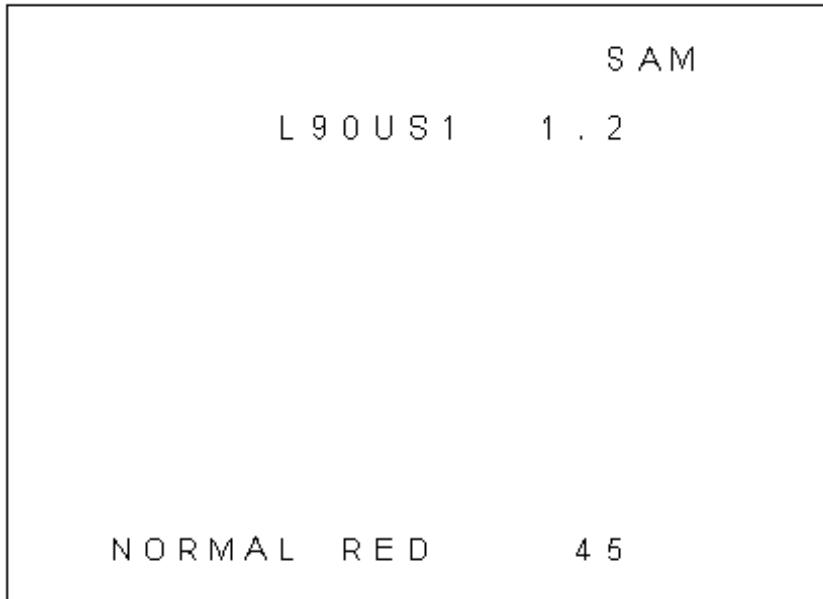
Note: Delta values are only used in models with the item "Color Temperature" in the customer menu.

OSD is kept to a minimum in this menu, in order to make white tone alignment possible.

The item values are stored in EEPROM if this sub menu is left.

The Contrast Plus feature (black stretch) is set to OFF when the White Tone sub menu is entered.

A sample display of the White Tone sub menu is shown below.



Sub Menu: WHITE TONE		Value Range	Remarks
NORMAL			Starting Values:
	NORMAL RED	0 – 63	32
	NORMAL GREEN	0 – 63	23
	NORMAL BLUE	0 – 63	25
COOL		Default Value	
	DELTA COOL RED	0	Delta values are a <u>change</u> of the normal values. These start at the default values, and are set to achieve cool and warm steps of color temperature in the customer menu. Standard factory settings are given as the default values.
	DELTA COOL GREEN	+1	
	DELTA COOL BLUE	+7	
WARM			
	DELTA WARM RED	0	
	DELTA WARM GREEN	-4	
	DELTA WARM BLUE	-12	

White Tone Adjustments:

Note: The following procedure was performed with a Sencore VG91 Universal Video Generator providing grey scale bars.

1. Enter the Service Alignment Mode (SAM) by pressing the following key sequence on the remote control transmitter:

0-6-2-5-9-6-Status

Do not allow the display to time out between entries while keying the sequence.

2. From the top level SAM menu, use the Menu Up/Down keys to highlight the White Tone sub menu.
3. Use the Menu Left/Right keys to enter the White Tone sub menu.
4. Set the VG91 Generator as follows: STD TV Ch. 3, RF-IF Range set to HI, RF-IF Level set to NORMAL (1), Video Pattern = Raster, R-G-B raster controls OFF.
5. Connect the RF output of the generator to the Television Antenna Input, and adjust the VG91 level to remove any snow from the raster.
6. Turn off chroma at generator and leave grey scale bars.
7. From the White Tone sub-menu, use the Menu Up/Down keys to select Normal Red, Normal Green, or Normal Blue. Then use the Menu Left/Right keys to adjust the values to obtain the best white balance.
8. A reasonable starting point for NORMAL is:
Normal Red=37, Normal Green=33, Normal Blue=35
9. After NORMAL is set, use the same method to set DELTA COOL and DELTA WARM as offsets.
A reasonable starting point for DELTA COOL is:
Delta Cool Red=0, Delta Cool Green=+1, Delta Cool Blue=+3
A reasonable starting point for DELTA WARM is:
Delta Warm Red=0, Delta Warm Green=-6, Delta Warm Blue=-5
10. After the values are set, or if no changes are required, press Menu to return to the top level SAM menu.

Geometry sub menu

OSD is kept to a minimum in this sub menu in order to make picture geometry adjustments possible.

The item values are stored in EEPROM if this sub menu is left.

The value of item Service Blanking (SBL) is not stored in EEPROM, and it is set to OFF when the geometry sub menu is exited.

A sample display of the Geometry sub menu is shown below.



The picture geometry sub menu contains the following items:

Sub Menu:	GEOMETRY	Values	Remarks
VAM	Vertical amplitude	0 – 63	
VSL	Vertical slope	0 – 63	
SBL	Service blanking	ON/OFF	
HSH	Horizontal shift	0 – 63	
EWW	E-W width	0 – 63	Not used
EWP	E-W parabola/width	0 – 63	Not used
EWT	E-W trapezium	0 – 63	Not used
EWC	E-W corner parabola	0 – 63	Not used
H60	Delta HSH for 60 Hz	0 – 15	Not used
V60	Delta VAM for 60 Hz	0 – 15	Not used
VSC	Vertical S-Correction	0 – 63	
VSH	Vertical shift	0 – 63	

Geometry Adjustments:

Notes:

1. The following Geometry adjustments were performed with a Sencore VG91 Universal Video Generator.
2. Set the VG91 Generator as follows: STD TV Ch. 3, RF-IF Range set to HI, RF-IF Level set to NORMAL (1), Video Pattern = Raster, R-G-B raster controls OFF, crosshatch or center cross pattern as required.
3. Connect the RF output of the generator to the Television Antenna Input, and adjust the VG91 level to remove any snow from the raster.

Vertical Shift (VSH):

1. Enter the Service Alignment Mode (SAM) by pressing the following key sequence on the remote control transmitter:
0-6-2-5-9-6-Status
Do not allow the display to time out between entries while keying the sequence.
2. From the top level SAM menu, use the Menu Up/Down keys to highlight the Geometry sub menu.
3. Use the Menu Left/Right keys to enter the Geometry sub menu.
4. In the Geometry sub-menu, use the Menu Up/Down buttons to select VAM.
5. Input a center cross pattern to the antenna/cable input terminal.
6. Using the Menu Left/Right keys, adjust VSH so that the horizontal bar is properly centered, top to bottom.
7. If other Geometry adjustments are needed, proceed to the necessary adjustment using the Menu Up/Down buttons.
8. Upon completion of Geometry adjustments, press the Menu button to return to the top level SAM menu.

Vertical Amplitude (VAM):

1. Enter the Service Alignment Mode (SAM) by pressing the following key sequence on the remote control transmitter:
0-6-2-5-9-6-Status
Do not allow the display to time out between entries while keying the sequence.
2. From the top level SAM menu, use the Menu Up/Down keys to highlight the Geometry sub menu.
3. Use the Menu Left/Right keys to enter the Geometry sub menu.
4. In the Geometry sub-menu, use the Menu Up/Down buttons to select VAM.
5. Input a crosshatch pattern to the antenna/cable input terminal.

6. Using the Menu Left button, reduce the value so that the picture does not fill the entire screen.
7. Use the Menu Up/Down keys to select VSH (Vertical Shift) from the Geometry sub-menu and, using the Menu Left/Right keys, center the picture on the screen, top to bottom.
8. Using the cursor up/down keys, select VAM from the Geometry sub-menu, and use the Menu Right key to increase the value to obtain a slight overscan.
9. If other Geometry adjustments are needed, proceed to the necessary adjustment using the Menu Up/Down buttons.
10. Upon completion of Geometry adjustments, press the Menu button to return to the top level SAM menu.

Horizontal Shift (HSH):

Note: This adjustment centers the video on the raster. It does not move the raster.

1. Enter the Service Alignment Mode (SAM) by pressing the following key sequence on the remote control transmitter:

0-6-2-5-9-6-Status

Do not allow the display to time out between entries while keying the sequence.

2. From the top level SAM menu, use the Menu Up/Down keys to highlight the Geometry sub menu.
3. Use the Menu Left/Right keys to enter the Geometry sub menu.
4. In the Geometry sub-menu, use the Menu Up/Down buttons to select HSH.
5. Input a center cross pattern to the antenna/cable input terminal.
6. Using the Menu Left/Right keys, adjust HSH so that the vertical bar is properly centered, left to right.
7. If other Geometry adjustments are needed, proceed to the necessary adjustment using the Menu Up/Down buttons.
8. Upon completion of Geometry adjustments, press the Menu button to return to the top level SAM menu.

Vertical Slope (VSL):

1. Enter the Service Alignment Mode (SAM) by pressing the following key sequence on the remote control transmitter:

0-6-2-5-9-6-Status

Do not allow the display to time out between entries while keying the sequence.

2. From the top level SAM menu, use the Menu Up/Down keys to highlight the Geometry sub menu.
3. Use the Menu Left/Right keys to enter the Geometry sub menu.
4. In the Geometry sub-menu, use the Menu Up/Down buttons to select VSL.
5. Input a crosshatch pattern to the antenna/cable input terminal.
6. Using the Menu Left/Right keys, adjust VSL so that the squares at the bottom of the screen are equal in size to the squares at the top of the screen.
7. If other Geometry adjustments are needed, proceed to the necessary adjustment using the Menu Up/Down buttons.
8. Upon completion of Geometry adjustments, press the Menu button to return to the top level SAM menu.

Vertical S-Correction (VSC):

1. Enter the Service Alignment Mode (SAM) by pressing the following key sequence on the remote control transmitter:

0-6-2-5-9-6-Status

Do not allow the display to time out between entries while keying the sequence.

2. From the top level SAM menu, use the Menu Up/Down keys to highlight the Geometry sub menu.
3. Use the Menu Left/Right keys to enter the Geometry sub menu.
4. In the Geometry sub-menu, use the Menu Up/Down buttons to select VSC.
5. Input a crosshatch pattern to the antenna/cable input terminal.
6. Using the Menu Left/Right keys, adjust VSC so that the squares at the center of the screen are equal in size to the squares at the top and bottom of the screen.
7. If other Geometry adjustments are needed, proceed to the necessary adjustment using the Menu

Up/Down buttons.

8. Upon completion of Geometry adjustments, press the Menu button to return to the top level SAM menu.

Service Blanking (SBL):

Service Blanking provides a straight cutoff line in the center of the raster. It is useful when centering the raster. It can also be used in adjusting the yoke and setting vertical size and linearity.

1. Enter the Service Alignment Mode (SAM) by pressing the following key sequence on the remote control transmitter:

0-6-2-5-9-6-Status

Do not allow the display to time out between entries while keying the sequence.

2. From the top level SAM menu, use the Menu Up/Down keys to highlight the Geometry sub menu.
3. Use the Menu Left/Right keys to enter the Geometry sub menu.
4. In the Geometry sub-menu, use the Menu Up/Down buttons to select SBL.
5. Use the Menu Left/Right keys to toggle SBL ON or OFF.
6. With SBL on, VSH can be used to center the raster on the fiduciary marks (the small notches in the phosphor on the right and left edge of the CRT). These are absolute center.
7. If other Geometry adjustments are needed, proceed to the necessary adjustment using the Menu Up/Down buttons.
8. Upon completion of Geometry adjustments, press the Menu button to return to the top level SAM menu.

Delta HSH for 60Hz (H60):

Note: This adjustment should not be changed from the factory preset value (10).

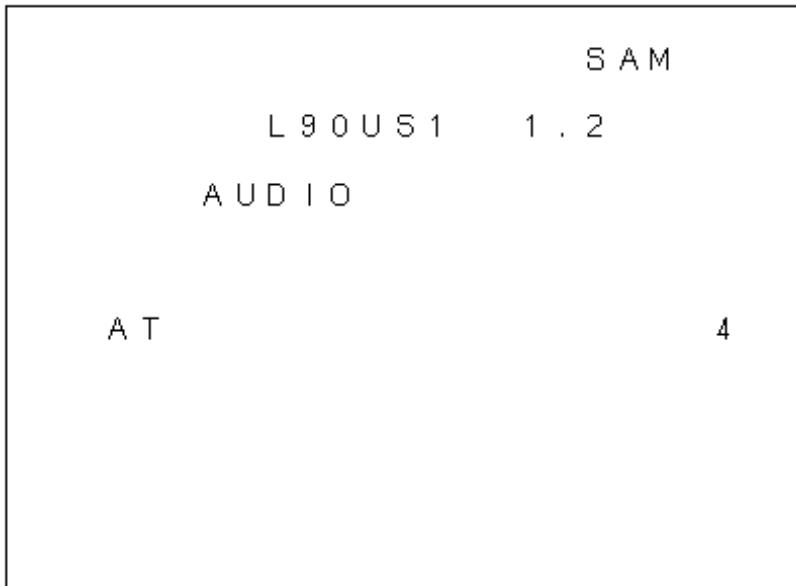
Delta VAM for 60Hz (V60):

Note: This adjustment should not be changed from the factory preset value (5).

Audio sub menu

The audio sub menu item values are stored in EEPROM if this sub menu is left.

A sample display of the Audio sub menu is shown below.



The Audio sub menu contains the following item on stereo chassis:

Sub Menu: AUDIO	Values	Remarks
AT	Attack time at AVL	1 – 4 Normal setting is 4.

Audio Adjustment:

Attack Time at AVL (AT):

1. Enter the Service Alignment Mode (SAM) by pressing the following key sequence on the remote control transmitter:
0-6-2-5-9-6-Status
Do not allow the display to time out between entries while keying the sequence.
2. From the top level SAM menu, use the Menu Up/Down keys to highlight the Audio sub menu.
3. Use the Menu Left/Right keys to enter the Audio sub menu.
4. Use the Menu Left/Right keys to adjust the value of AT.
5. Set the volume of AT to 4.
6. Upon completion of Audio adjustment, press the Menu button to return to the top level SAM menu.

Convergence and Purity Adjustments

Notes:

1. The following adjustments were performed with a Sencore VG91 Universal Video Generator.
2. Set the VG91 Generator as follows: STD TV Ch. 3, RF-IF Range set to HI, RF-IF Level set to NORMAL (1), Video Pattern = Raster, R-G-B raster controls OFF, Mode Switch set to L+R, Audio Frequency set to 300Hz, and 0 Pilot (max. CCW).
3. Connect the RF output of the generator to the Television Antenna Input, and adjust the VG91 level to remove any snow from the raster.

Pre-Convergence Procedure

Note: The degaussing procedure should be performed prior to this adjustment.

1. Place the multi-pole Purity and Convergence Assembly with the 2-Y pole purity rings directly in the gap between the G2 and G3 (focus) grids as shown in the Convergence and Purity Assembly.

(Display the Convergence and Purity Assembly)

2. Enter Service Alignment Mode (refer to Service Alignment Mode section).
3. Apply a center cross or crosshatch pattern to the antenna/cable input terminal.
4. Select the White Tone sub-menu by pressing the Menu Up/Down keys on the remote control so that White Tone is highlighted.
5. Use the Menu Left/Right keys to enter the White Tone sub-menu.
6. Use Menu Up/Down keys to toggle between the options. Be sure to record the values of all options (Normal Red/Green/Blue, Delta Cool Red/Green/Blue, and Delta Warm Red/Green/Blue).
7. Use the Menu Up/Down keys to select Normal Green, and use the Menu Left key to set Normal Green to minimum.
8. Loosen the yoke clamp screw, pull the yoke back, and remove the three yoke wedges.
9. Slide the yoke all the way forward so that it rests against the bell of the CRT.
10. Tighten the yoke clamp screw so that the yoke does not drop away from the bell of the CRT.
11. Slowly spread, and if necessary, rotate the 2-Y pole purity rings so that the red and blue lines are at least parallel and preferably coincide at the 6:00 and 12:00 positions as shown in the following linked graphic "2Y Spread and 2X Rotate".
12. Proceed to the Color Purity Adjustment.

(Display the Convergence and Purity Assembly)

(Display the 2Y Spread and 2X Rotate Graphic)

Color Purity Adjustment

1. Connect a solid white pattern signal to the antenna/cable input terminal.
2. Use the Menu Up/Down keys to select Normal Blue, and use the Menu Left key to set Normal Blue to minimum.
3. Use the Menu Up/Down keys to select Normal Red, and use the Menu Right key to set Normal Red to maximum.
4. Slowly spread the 2-X pole purity rings to center the red portion of the screen, leaving the same amount of green on one side of the screen as blue on the other side.
5. Tighten the yoke clamp screw slightly so that the yoke may be moved with some friction.
6. Proceed to the Static Center Convergence Adjustment.

Static Center Convergence Adjustment

1. Apply a center cross or crosshatch pattern to the antenna/cable input terminal and observe the screen to ensure that the yoke is not tilted. If necessary, rotate the yoke to obtain a level raster.
2. Use the Menu Up/Down keys to select Normal Blue, and use the Menu Right key to set Normal Blue to maximum.
3. Slowly spread, and if necessary, rotate the 4-pole magnetic rings to converge red and blue lines at the center of the screen.
4. Use the Menu Up/Down keys to select Normal Green, and use the Menu Right key to set Normal Green to maximum.
7. Slowly spread, and if necessary, rotate the 6-pole magnetic rings to converge red/blue on green lines at the center of the screen.
8. Repeat steps three and five for optimum performance.
9. Proceed to the Dynamic Edge Convergence Adjustment.

(Display the Convergence and Purity Assembly)

Dynamic Edge Convergence Adjustment

(Display Figures 3a, 3b, 3c, 4a, 4b, & 4c of Wedge Placement Graphic)

Note: To secure the correct position of the deflection yoke, three rubber wedges are used. They are ultimately to be placed as shown in Figure 3c or Figure 4c.

1. Apply a crosshatch pattern to the antenna/cable input terminal.
2. Use the Menu Up/Down keys to select Normal Green, and use the Menu Left key to set Normal Green to minimum.
3. Tilt the yoke up and down to converge the red and blue vertical lines at the 6:00 and 12:00 positions and the red and blue horizontal lines at the 3:00 and 9:00 positions (refer to Figure 5). When the correct position has been found, place a rubber wedge between the yoke and the CRT. If the yoke is tilted up, place wedge one as shown in Figure 3a; if it is tilted down, place wedge one as shown in Figure 4a.
4. Tilt the yoke to the left and right to find the point of best possible convergence of the red and blue lines at the edges, top and bottom of the screen as shown in Figure 6. When the correct position is located, place wedges two and three as shown in Figure 3b or Figure 4b.
5. Remove wedge one and place it in the final position as shown in Figure 3c or Figure 4c.
6. Use the Menu Up/Down keys to select Normal Green, and use the Menu Right key to set Normal Green to maximum.
7. Proceed to the White Balance Setup.

(Display Figures 3a, 3b, 3c, 4a, 4b, & 4c of Wedge Placement Graphic)

(Display Figures 5 &6 of Yoke Tilt Graphic)

Master Screen (VG2)/ White Balance Setup:

1. With the set OFF, rotate VG2 (located on the lower part of the flyback transformer) counter clockwise.
2. Use the Power Button (on the remote control or the local keyboard) to turn the set ON, without a signal, and rotate VG2 clockwise until snow is visible.
3. Enter Service Alignment Mode (refer to Service Alignment Mode section).
4. Enter the Virtual Customer Menu by pressing the Menu button on the remote and set brightness and picture to 31 and color to 0.
5. Apply an NTSC color bar signal to the antenna/cable input terminal and tune to the active channel.
6. Connect an oscilloscope, 20V per division and 10 uSec time base, to pin 6 of the CRT Socket. Observe the stairstep pattern while adjusting VG2.

Hint: Counter clockwise adjustment will compress bottom of stairstep pattern. Clockwise adjustment will compress top of stairstep pattern.

7. Adjust VG2 midway between top and bottom compression.
8. Proceed to White-Tone Adjustments under White Tone sub-menu in the Service Alignment Mode section to complete White Balance Setup.

Customer Service Mode (CSM)

1. The Customer Service Mode (CSM) is used to retrieve data on the TV operation settings and stored error codes.
2. To enter the Customer Service Mode, press and hold the Mute button on the remote control and any key on the local keyboard (except "Power") for more than 4 seconds. When the set is in Customer Service Mode, the text "CSM" is displayed in the top right corner of the screen.
3. To use this system, the customer is instructed to enter CSM and read off the display that appears. This information is useful to gain insights into failures before traveling to the customer's home.
4. This information can also be used to avoid nuisance trips to the home when the problem is an operational error (example: Closed Caption is on or set is in Hospital Mode).
5. When entering CSM, all disruptive functions are turned off, and service unfriendly modes are ignored.

While CSM is active, no changes can be made in settings or functions. When CSM is exited, the TV returns to all prior operational settings.

6. To exit CSM, press any key (on the remote control or local keyboard) except "Channel Up" or "Channel Down."

To exit CSM and return the set to normal operation mode, press any key on the local keyboard or the remote control except Channel Up, Channel Down, or Power.

To exit CSM and turn the set off, press the Power button on either the TV set or the remote control.

7. A sample CSM display is shown below.

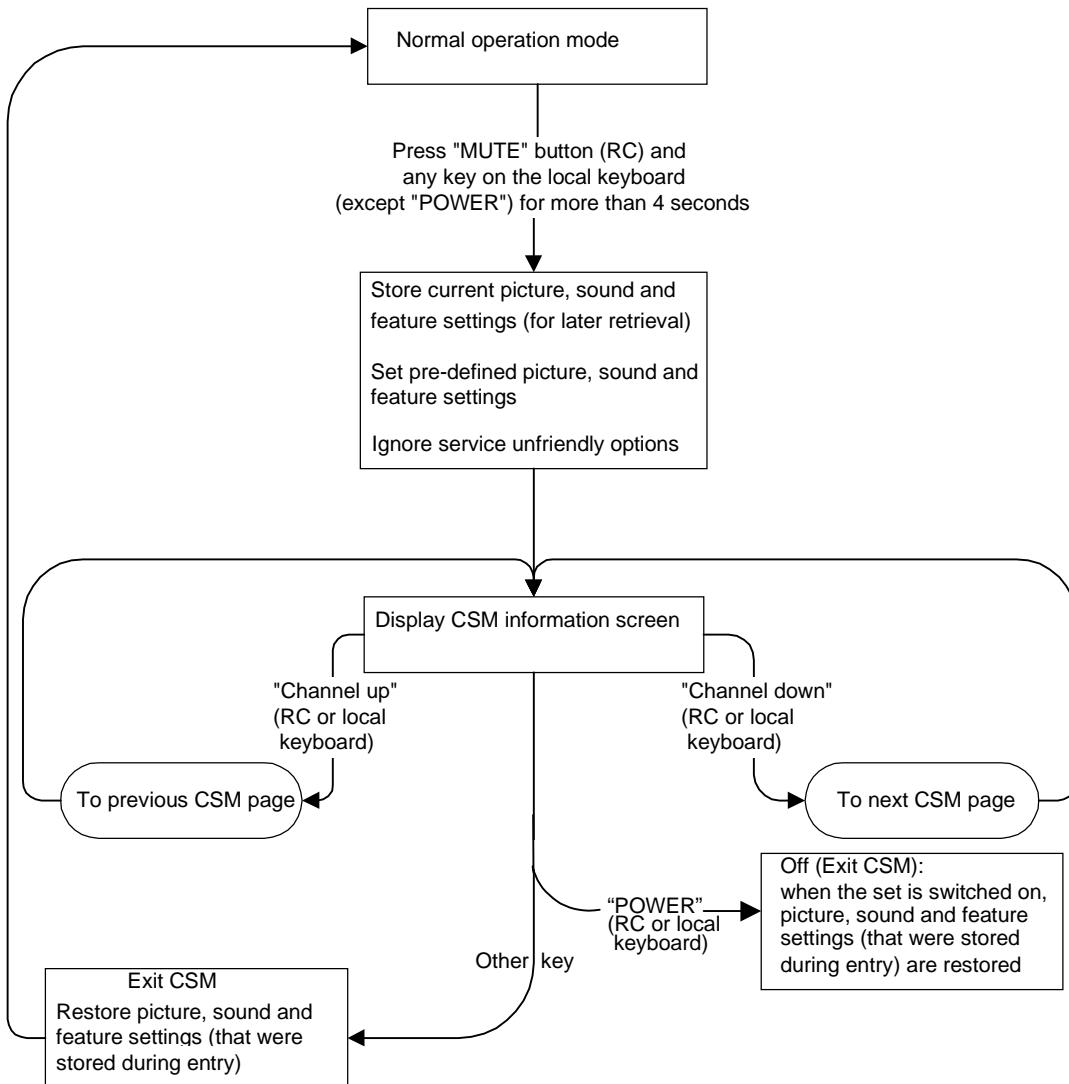
```
CSM  
1 002A L90US1 1.2  
2 CODES      0 0 0 0 0  
3 OP 202 255 135 228 59 206 208  
4 SYS:  
5 NOT TUNED  
6  
7  
8  
9 VOL LIM   255
```

Explanation of CSM Display Screen

The following information is displayed on screen:

- Text "CSM" on the first line
- Line number for every line (to make CSM language independent)
- To view multiple CSM pages (such as lines 8 and 9), use the Channel Up or Channel Down keys
- For more information on lines 1, 2, and 3, see SDM section "Explanation of Display"
- Line 1 displays the run timer and the software identification, cluster, and version
- Line 2 displays the error buffer contents (the word "error" is not used on this screen, instead "codes" is used)
- Line 3 displays the option code information
- Line 4 displays SYS: (This is not used)
- Lines 5 through 8 display information on active service unfriendly modes
- Line 5 displays the text "NOT TUNED" if no television station is tuned
- Line 6 displays the text "TIMER" if the sleep timer or "on" timer is active
- Line 7 displays the text "LOCKED" if one or more channels or presets is locked via child lock
- Line 8 displays the text "HOSPITAL" if hospital mode is active, or "HOTEL" if hotel mode is active
- If the volume limiter is active, line 9 displays the text "VOL LIM" and the set value of the volume limiter. If the volume limiter is inactive, the displayed value will be 255 (the maximum volume allowed).

CSM Flow Chart



Chassis to Parts Usage Matrix

[\(Display Part Usage Matrix\)](#)

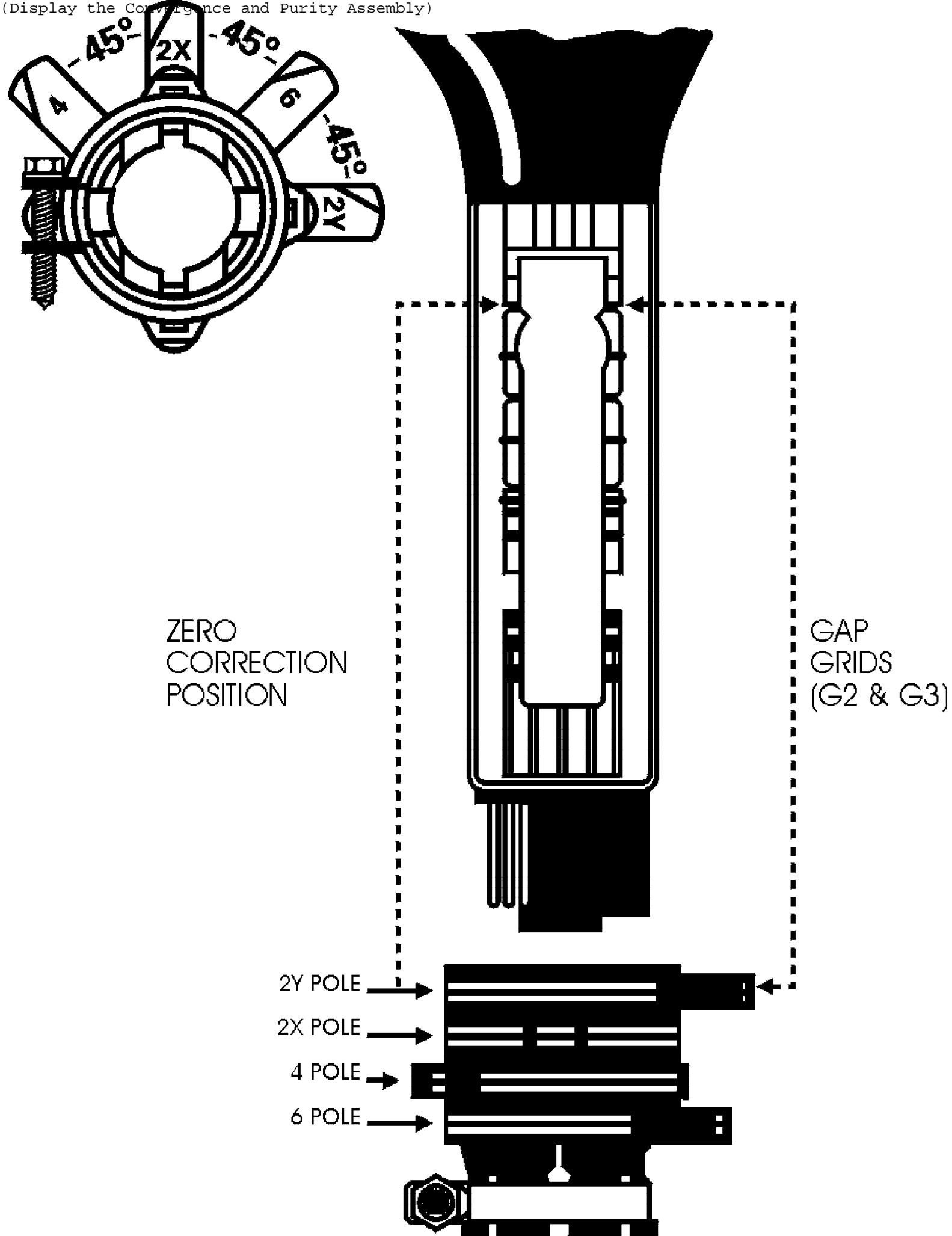
CHASSIS FEATURE LISTINGS

[\(Display USA/Canadian Chassis Listings\)](#)

[\(Display Latin American Chassis Listings\)](#)

[\(Display Industrial Chassis Listings\)](#)

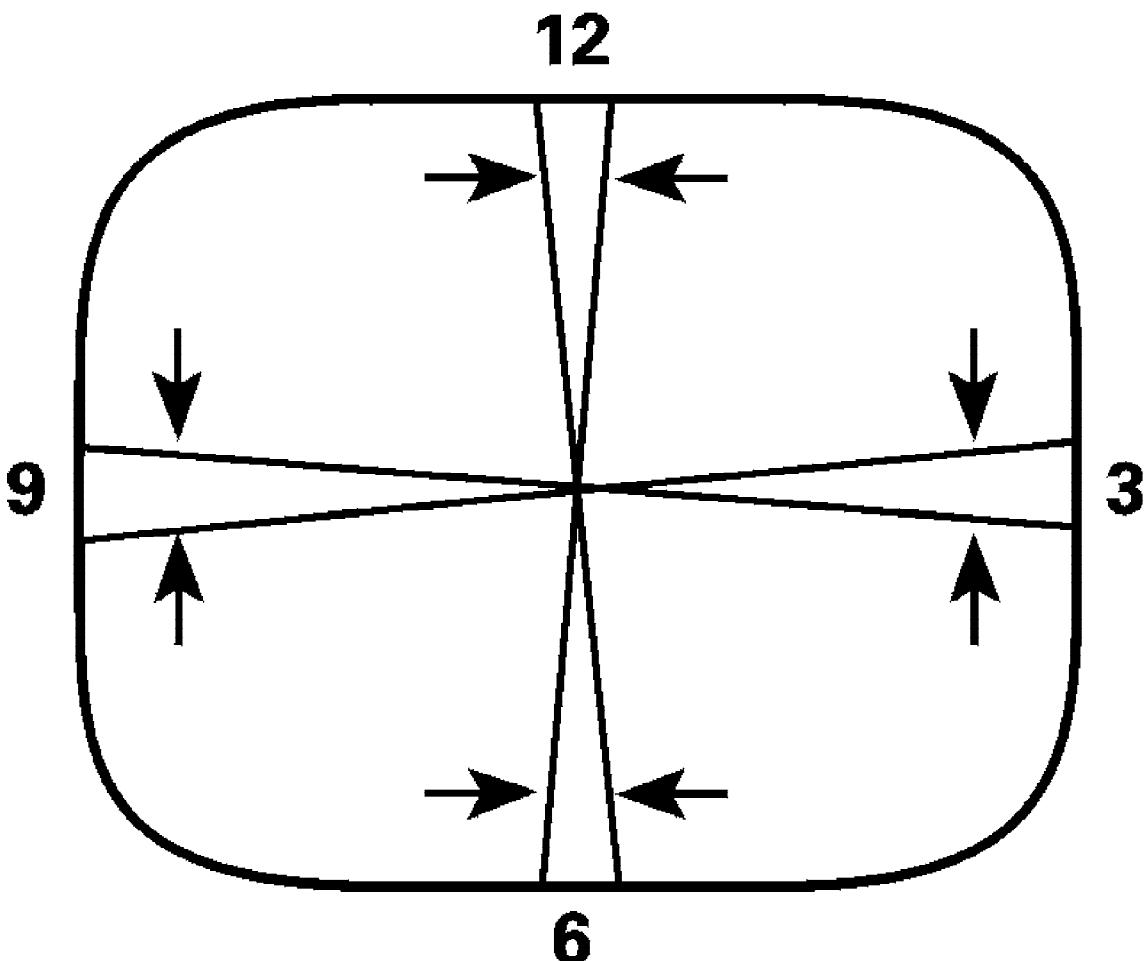
(Display the Convergence and Purity Assembly)



CONVERGENCE & PURITY ASSEMBLY

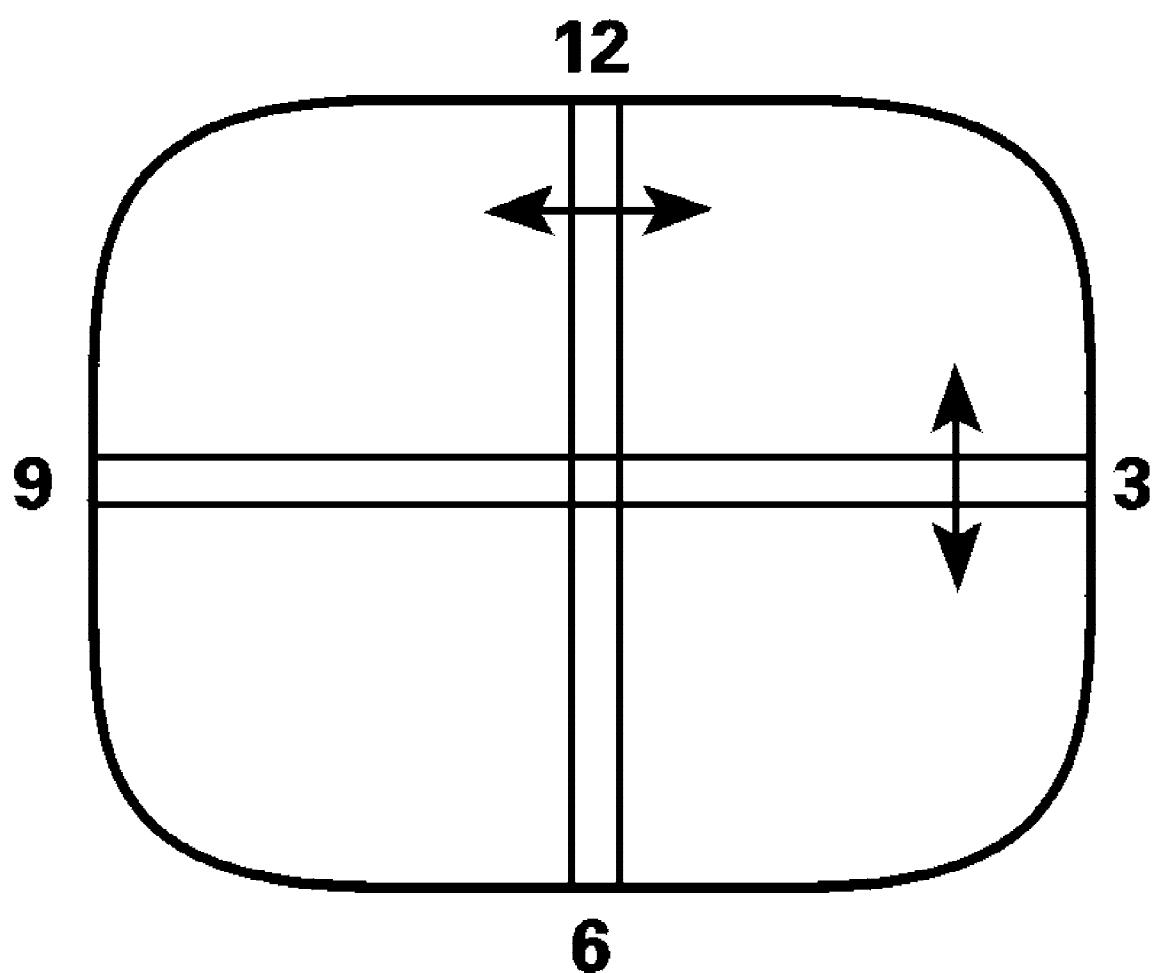
(Display the 2Y Spread and 2X Rotate Graphs)

2Y SPREAD



2X
SPREAD

2Y ROTATE



2X
ROTATE

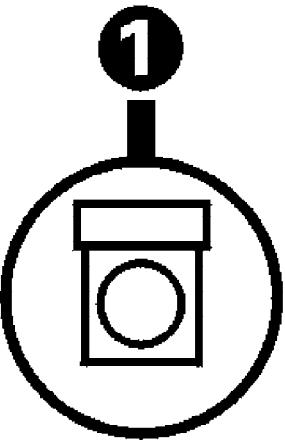


Fig. 3a

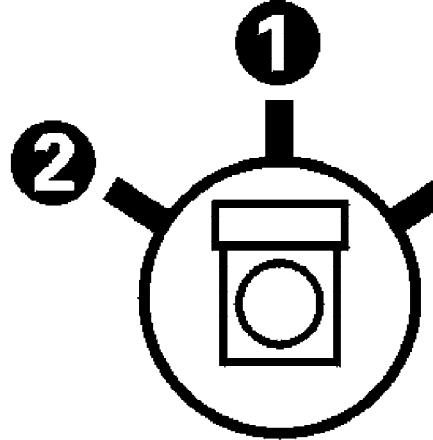


Fig. 3b

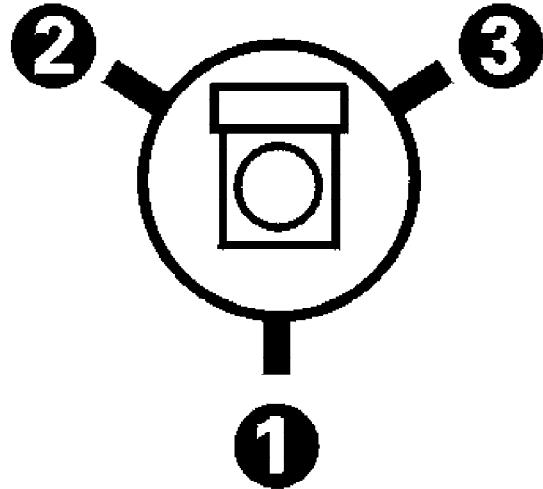


Fig. 3c

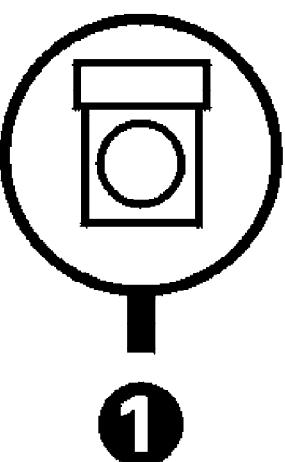


Fig. 4a

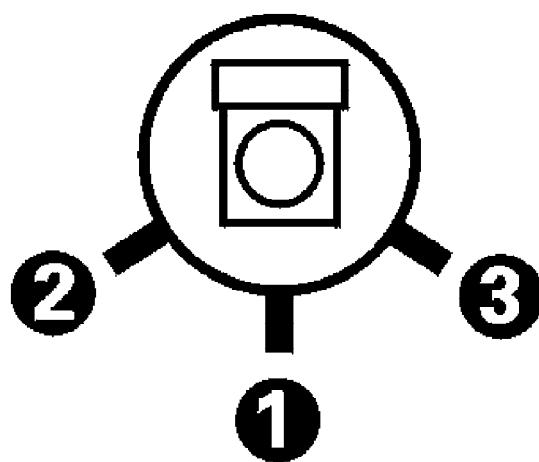


Fig. 4b

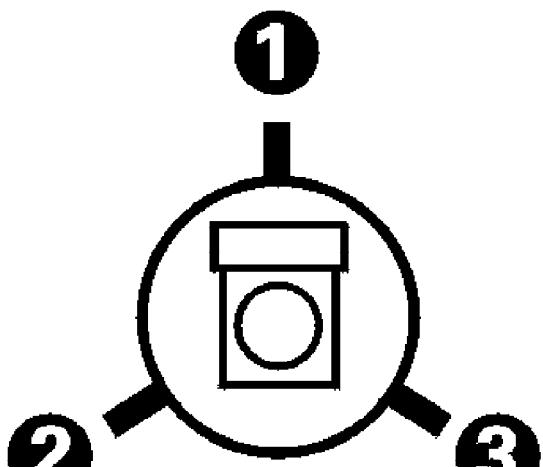


Fig. 4c

12

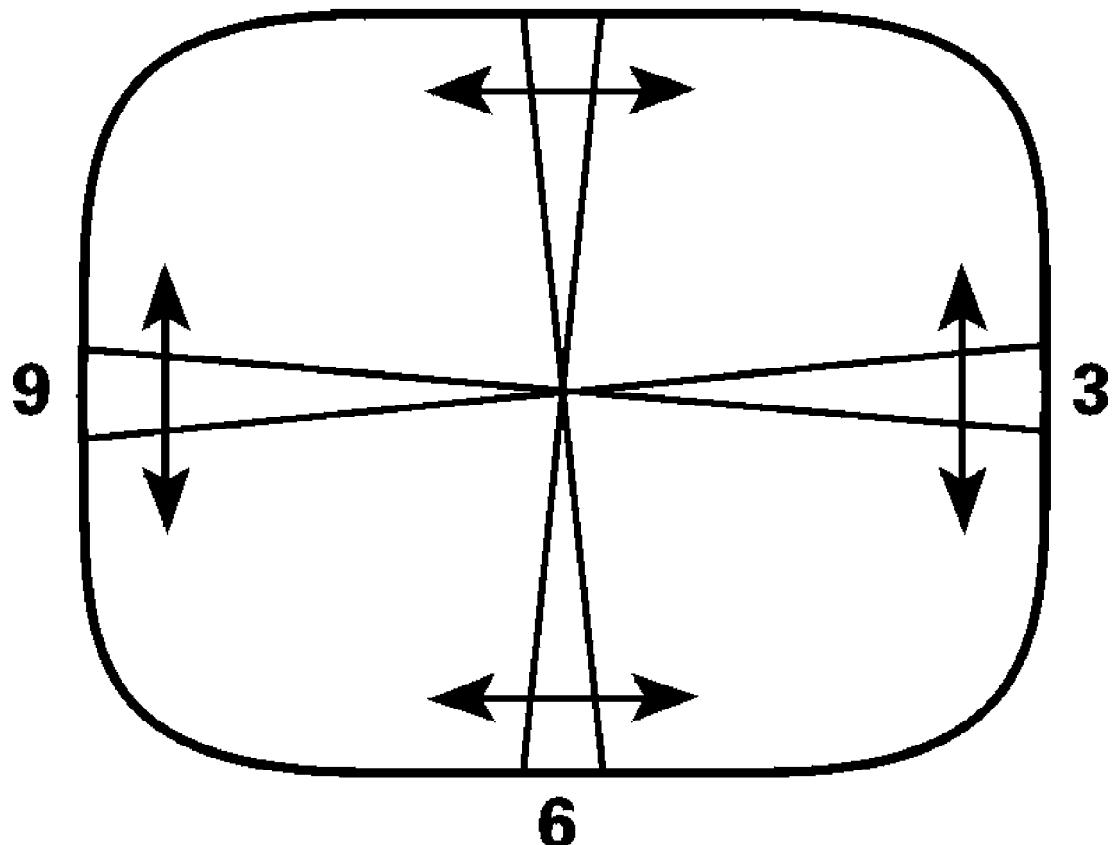


Figure 5

12

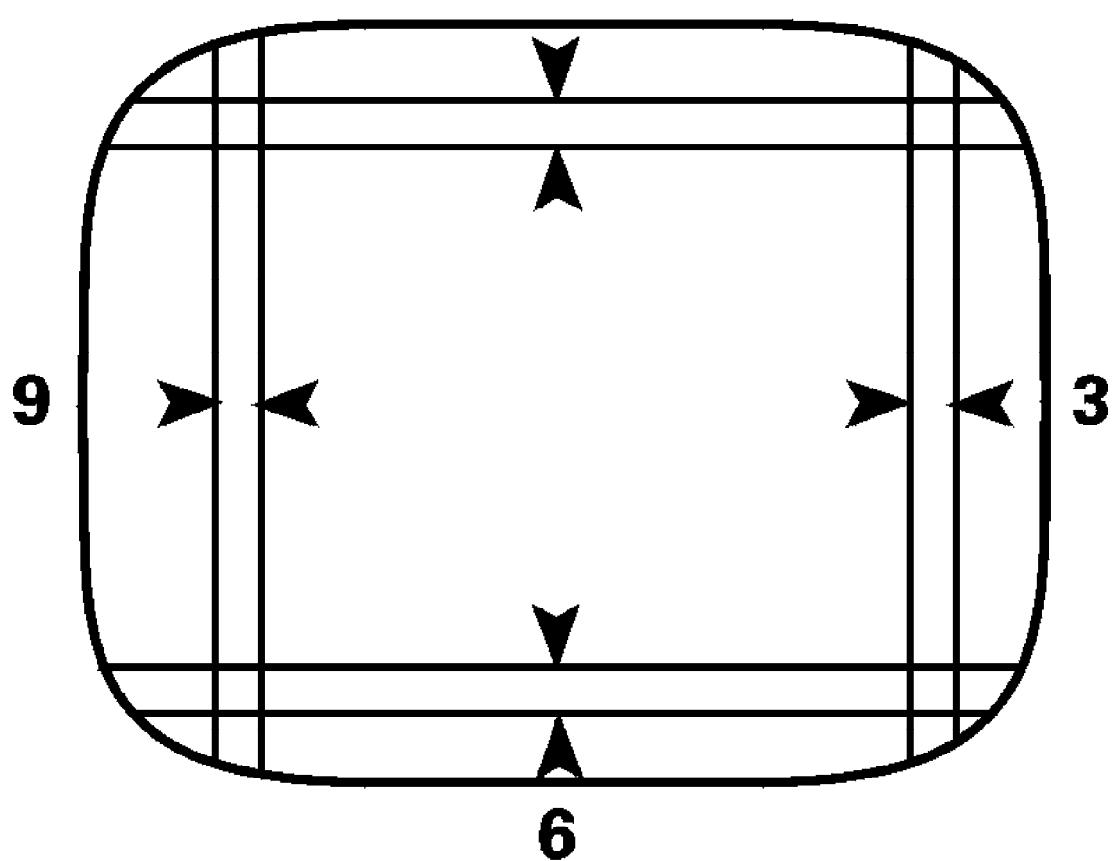


Figure 6

12

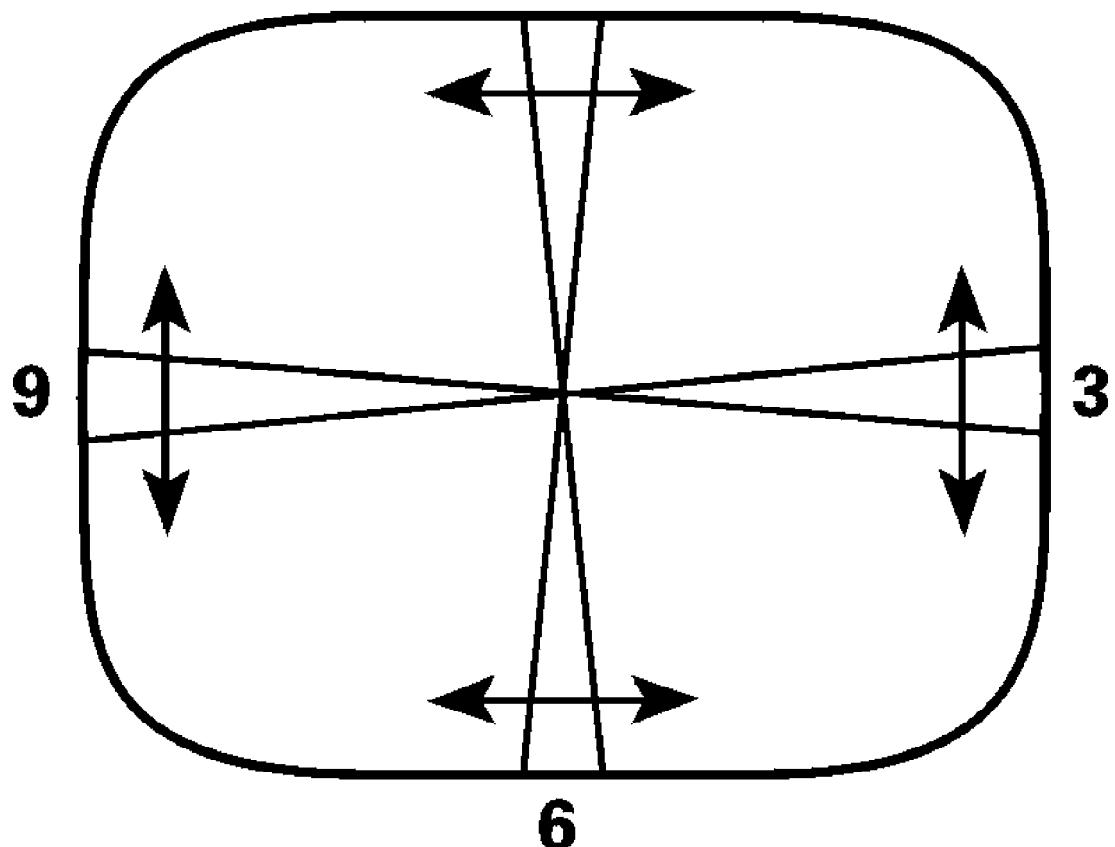


Figure 5

12

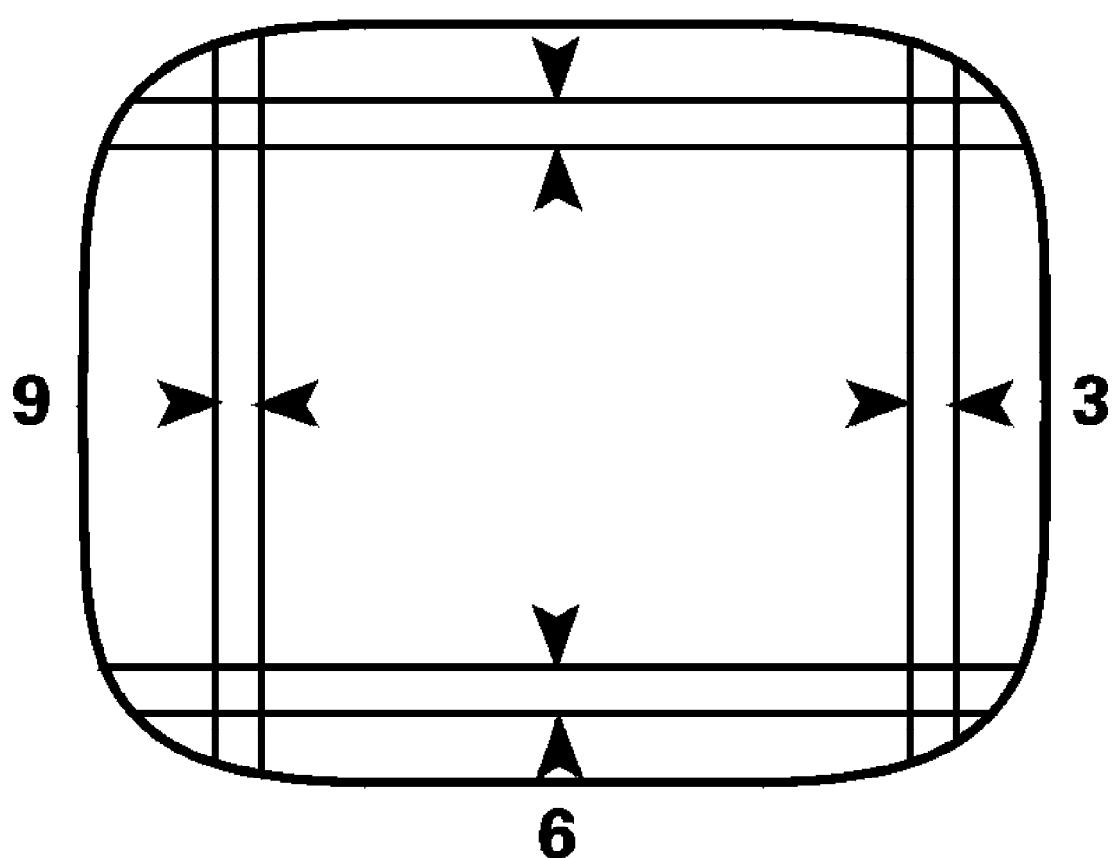


Figure 6

Philips Consumer Electronics

Technical Service Data

Service and Quality
Service Publications Dept.
One Philips Drive
P.O. Box 14810
Knoxville, TN 37914

Manual 7584

Model no.: PS1966C122

First Publish: 4-16-1999

Rev. Date: 5-5-1999

Print Date: 18/11/2005

Troubleshooting

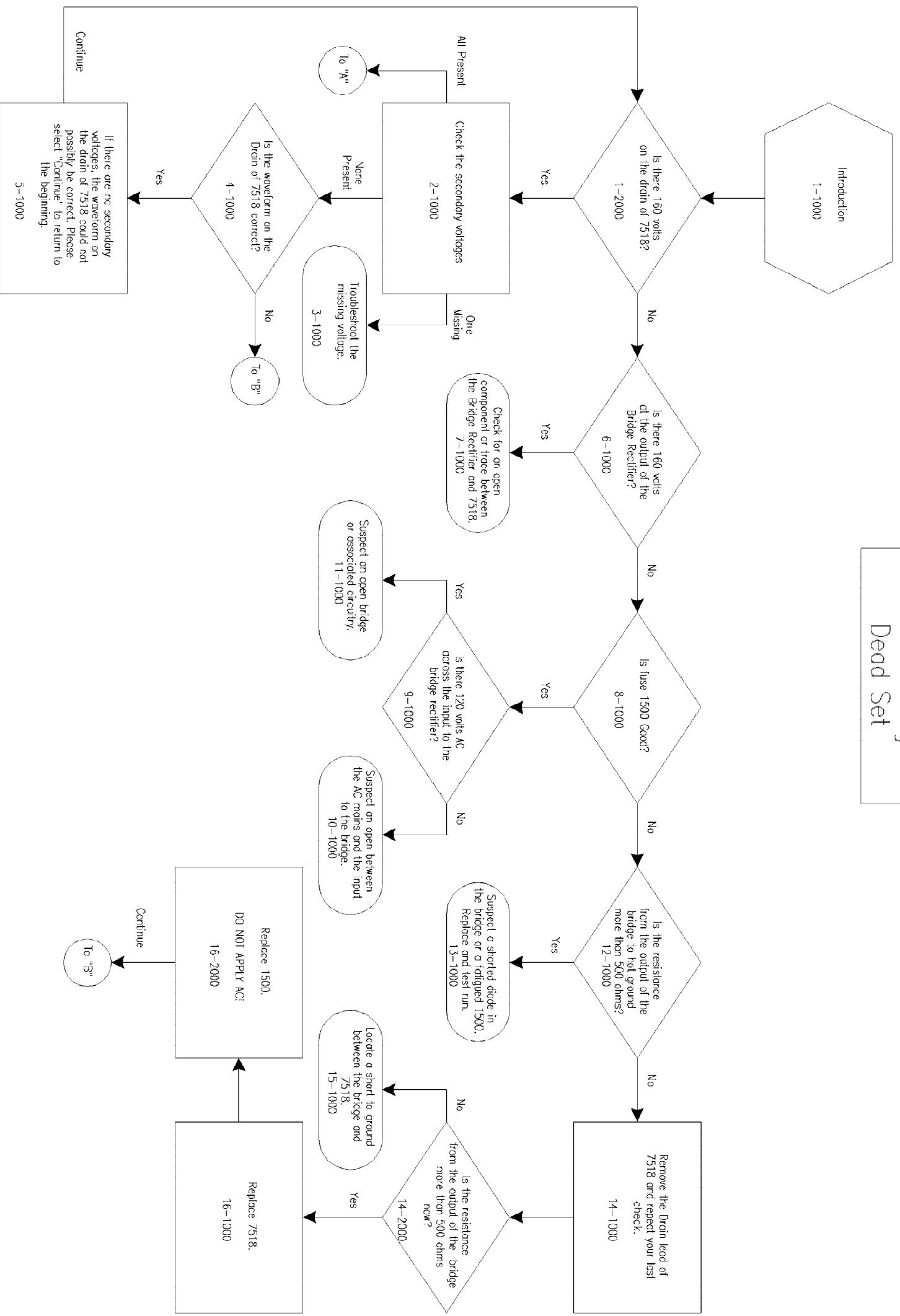
REFER TO SAFETY GUIDELINES

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

CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING

E8 Troubleshooting Dead Set

Introduction
1-1000



E8

Troubleshooting Dead Set - 2

Troubleshoot the low
or missing voltage.
24-1000

"B"

THIS TEST WILL
PREVENT PREMATURE
DESTRUCTION OF THE
PARTS THAT HAVE
JUST BEEN CHANGED
AND WILL ALLOW
OBSERVATION OF THE
POWER SUPPLY
WITHOUT APPLYING
AC VOLTAGE.
17-1000

Apply an external DC
power supply between
the cathode of 6540 and
"hot" ground (positive
lead to the cathode).
Slowly increase the
output of the power
supply until you have
approximately 14 volts
being applied to the
cathode. At this point,
7520 should be putting
out a pulse train of pin
3.
17-2000

Is there a waveform
on the gate of 7518?
17-3000

Are all of the
secondary voltages
approximately 50%
of normal levels?
21-1000

Remove the external DC
power supply. Set a variac
at 70V AC. Plug the AC main
into the variac and check the
secondary voltages.
DO NOT TURN ON SET YET!
23-1000

Are all secondary
voltages measuring
full "Standby" voltage?
23-2000

Slowly increase the voltage
from 70V to 120V AC while
alternately checking the
variacs ammeter to insure
there is not an excessive
current drain.
25-1000

Suspect 7520 or associated
components.
19-1000

Suspect an open
between pin 3 and the
gate of 7518.
20-1000

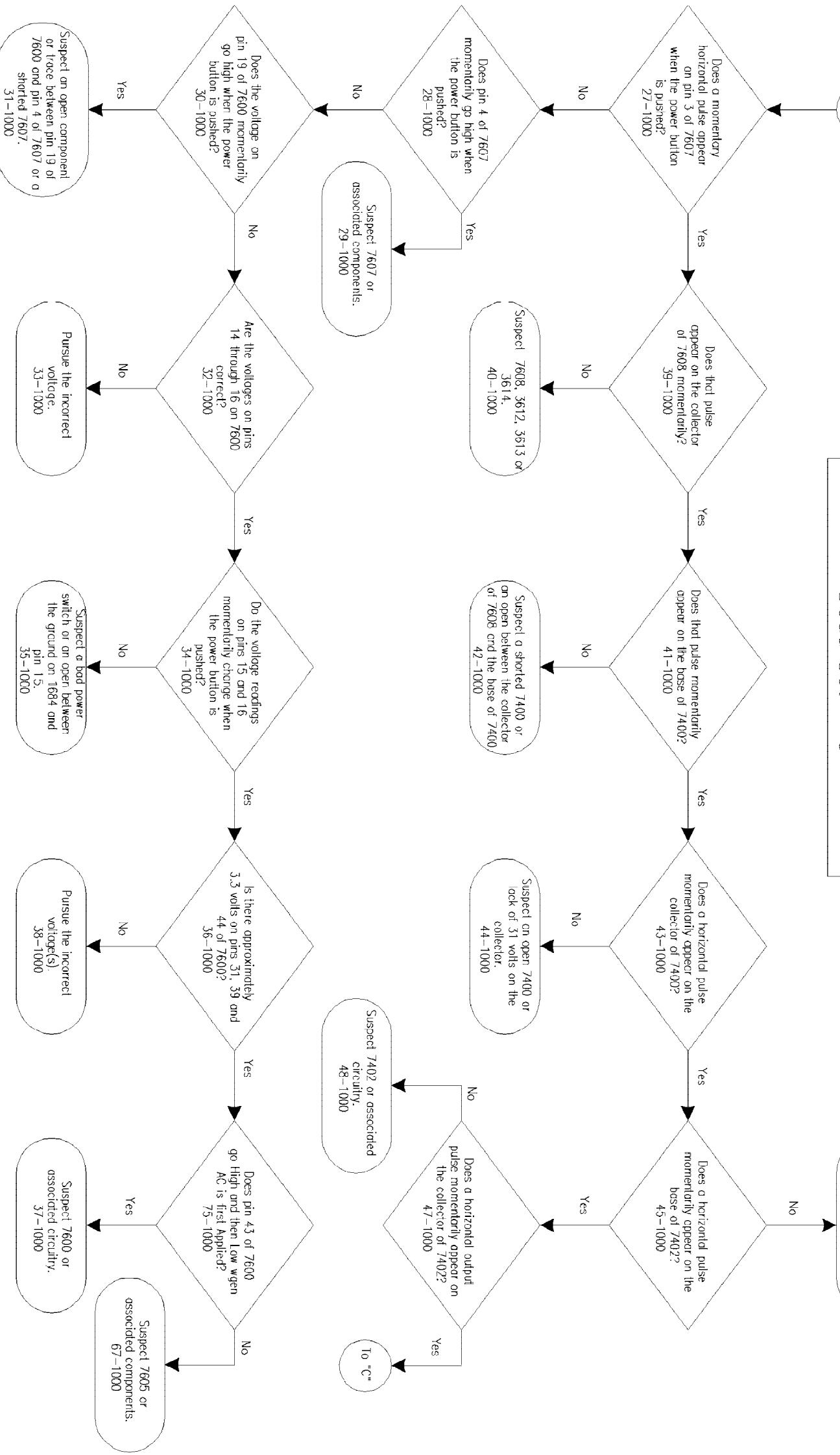
Turn the set on, observe the
picture, listen to the audio,
then SET ASIDE FOR A TEST
RUN.
26-1000

At this point we have found
the power supply to be OK.
If you were confirming a
repair in the power supply,
select "Yes". If you are
troubleshooting a problem
that did not cause a power
supply repair, select "No".
25-1000

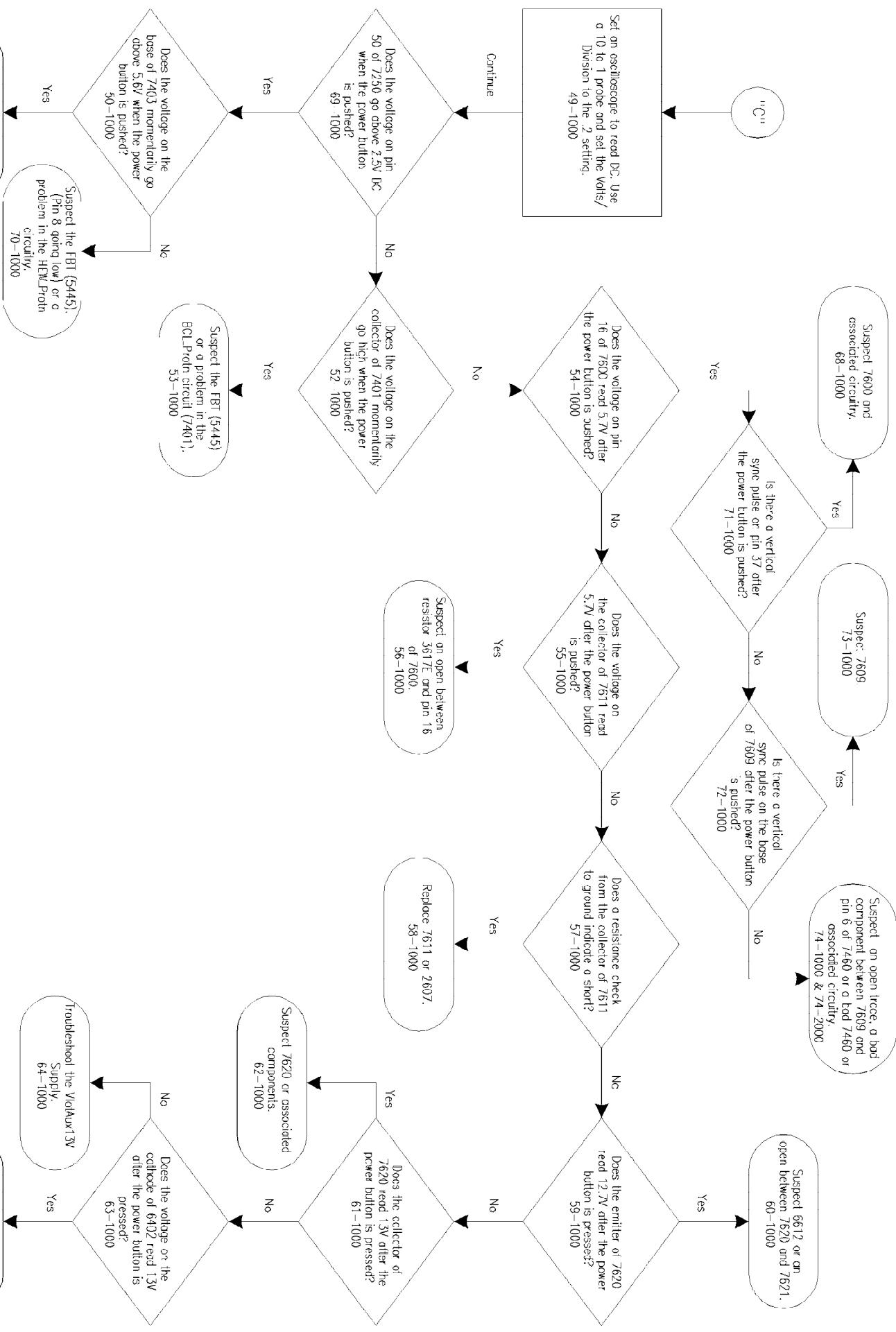
To "A"

E8
Troubleshooting
Dead Set - 3

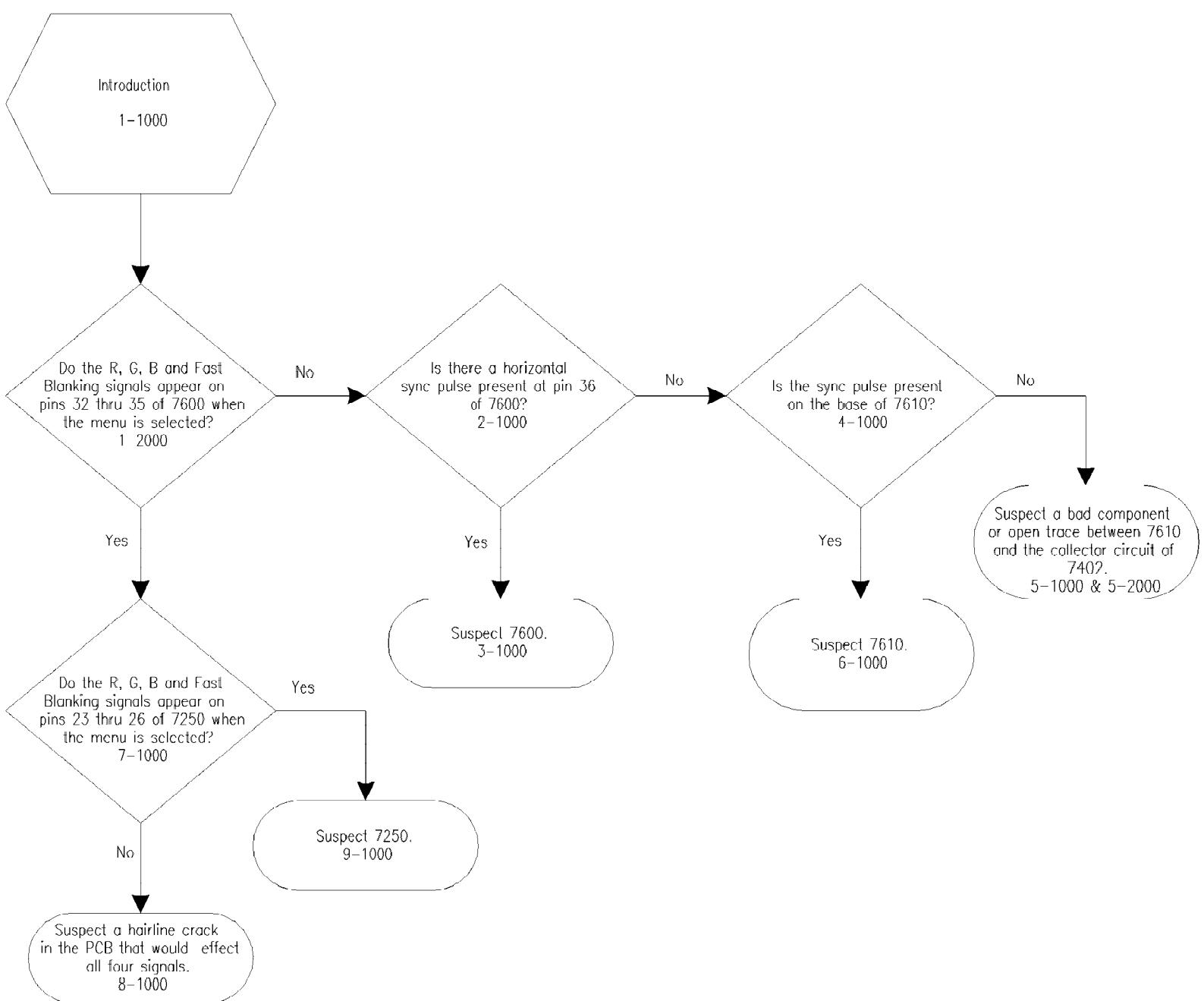
Suspect transformer 5444
 or a shorted 7402.
 46-1000



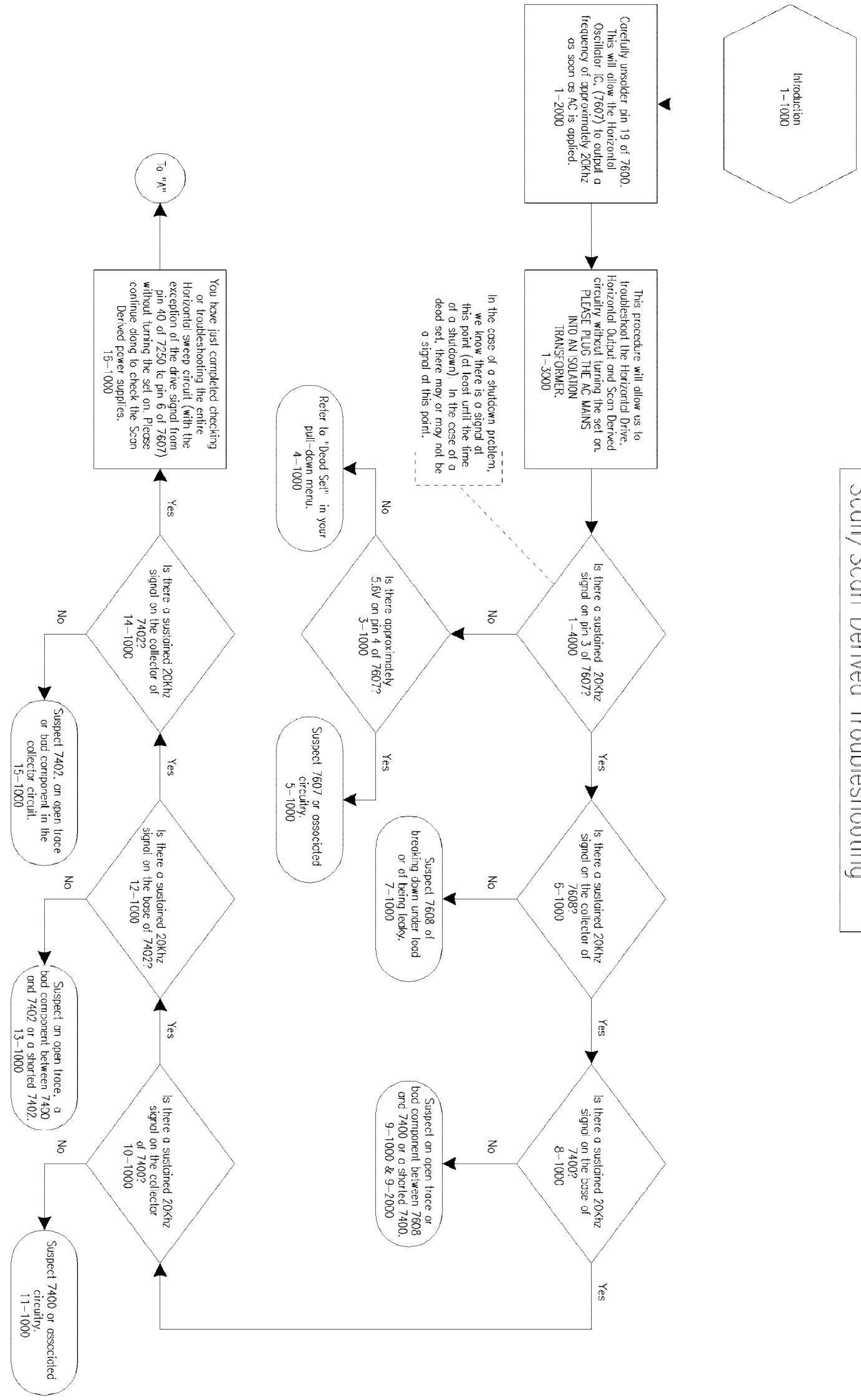
E8 Troubleshooting Dead Set - 4



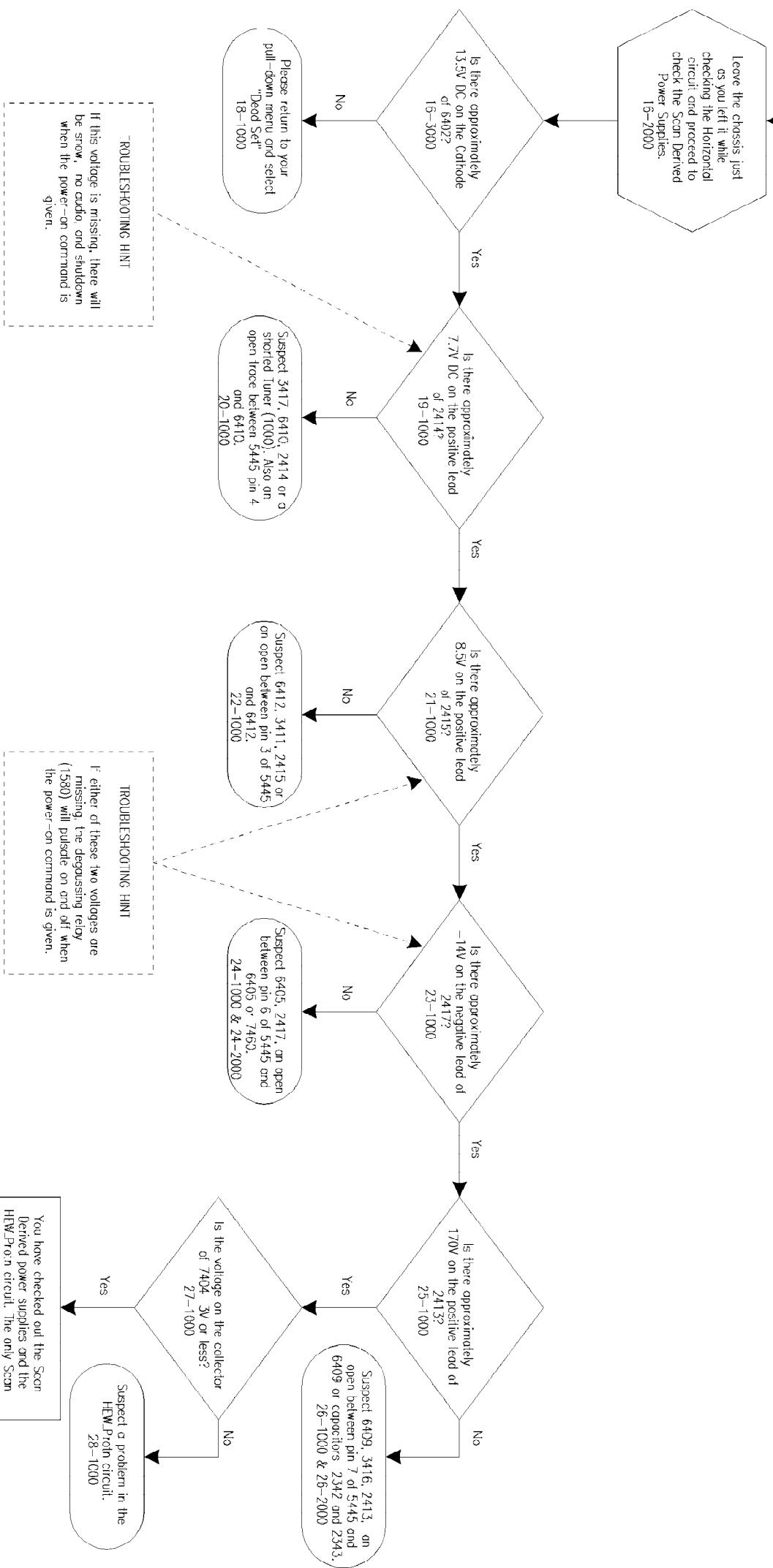
E8 Troubleshooting No OSD



Scan/Scan Derived Troubleshooting



E8 Scan/Scan Derived Troubleshooting #2

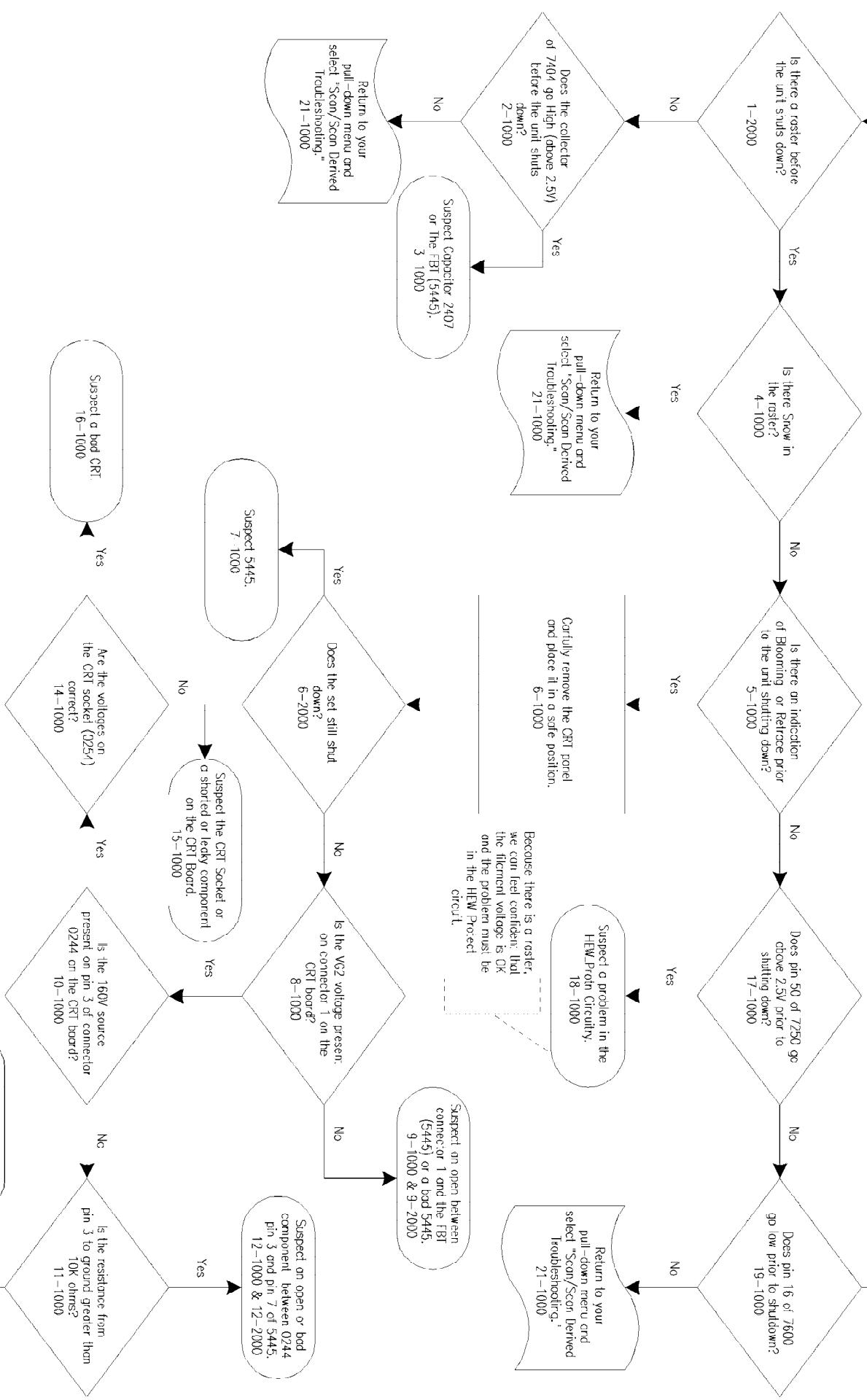


Troubleshooting

Shuts Down

Introduction
1-1000

Suspect a problem in
the BCL_Pair circuitry.
20-1000



Contents of Known Faults for: 19E8

1. - BELLY CLOCK IN MODEL 13PT30
2. - DEAD OR INTERMITTENT DEAD
3. - DOTS AND SWIRLS USING RABBIT EARS
4. - ERROR CODE 12
5. - FACTORY MODE LETTER F ON SCREEN
6. - INTERMITTENT COLOR
7. - NEW SERVICE JUMPERS, NEW WAY TO READ ERRORS
8. - OPTIONS FOR 13PT30
9. - OSD SWITCHES FROM STEREO TO MONO
10. - SAVE SERVICE MODE CHANGES
11. - SKIPPED CHANNEL NOT TUNED
12. - STEREO WITH VCR OR SET TOP BOX
13. - USE CORRECT MICRO-P (7600)
14. - VERTICAL JITTER ON PREMIUM CABLE
15. - VOLUME GOES DOWN BY IT SELF

No. 1 *****

Manual Number: 7584
BELLY CLOCK IN MODEL 13PT30

SYMPTOMS:

- A) The analog clock on the front of the TV is not matching it's time display to the on-screen clock.
- B) Incorrect analog clock operation after plug-in to AC power.

CURE: Replace R 3632 on the interface panel PWB with 22K, 1/10 watt SMD, Service Code 4835 111 37441

All units built after August 11, 2000 have this correction.

No. 2 *****

Manual Number: 7584
DEAD OR INTERMITTENT DEAD

Symptom:

Dead set, or intermittently dead when set is moved.

Cause:

Fractured lead on Horizontal Output transistor, 7402 in E8,

Resolution:

Replace Horizontal Output transistor using
Service Code 9340 552 58127 in E8 (13/19/20")
and 9340 170 50127 in F8 (25/27").

Applies To:

13E8, 13PR19C121, 13PT30L121, 13PT30L601, 13PT30L699, 14LL190121, 14LL191121,
14LW192221, 14LW193221, 14LX190321, 19E8, 19PR19C121, 19PR19C122, 19PR19C125,
19PS56C121, 19PS56C122, 19PS56C125, 19PT10C125, 20LL290122, 20LL290125,
20LL291125, 20LW292222, 20LW292225, 20LW293225, 20LX290322, 20LX290325, 20PT30B1,
21LW392221, 21LW393221, CH1919C125, HC9913C121, HC9919C1, PA9019C121,
PC9219C1, PC9219PKIT, PL9119C125, PR1305C121, PR1319C121, PR1390C121,
PR1391X121, PR1903C121, PR1903C122, PR1903C125, PR1920C121, PR1920C122,
PR1920C125, PR1920C601, PR1920C699, PS1946C121, PS1946C122, PS1946C125,
PS1956C121, PS1956C122, PS1956C125, PS1966C121, PS1966C122, PS1966C125,
SEC919C125, TL9119C125, XR1305C121, XR1391C121, XR1903C121, XR1903C122,
XR1903C125, XS1956C121, XS1956C122, XS1956C125

No. 3 *****

Manual Number: 7584

DOTS AND SWIRLS USING RABBIT EARS

SYMPTOM: Dots and swirls of dots when operating on rabbit ear antenna.
Most often on channels 2 to 6.

CAUSE: Switch Mode Power Supply (SMPS) noise.

IMPROVEMENT: Replace as follows:

Resistor 3525 change from 22R to 33R, Service Code 2306 204 03339

Capacitor 2518 change from 470p to 220p, Service Code 3198 019 62210

No. 4 *****

Manual Number: 7584

ERROR CODE 12

CTV E8 ERROR CODE 12

SYMPTOM: Error code 12 appears in Service Mode.
This code is not on the Error Code list in the manual.

CAUSE: Black Current Loop Instability Protection
(protection means "shutdown")

CURE: Resolve Black Current Loop problem.

Circuit extends from 7313/23/33 collectors on the CRT
socket to pin 5 of header 0245. From there to header 0243
on the chassis, through resistor 3260 to pin 18 of IC 7250.

First look for solder/copper defects. After that measure 3260 and then suspect 7313/23/33 on the CRT module. Last is IC 7250.

Note: A slow warm up CRT may give this error.

No. 5 *****

Manual Number: 7584
FACTORY MODE LETTER F ON SCREEN

Symptom:
Letter F in top corner of screen,
will not respond to commands and powers on
when AC is applied.

Cause:
Stuck in Factory Mode

Resolution:
Press and hold 5 seconds:

Volume DOWN and Channel DOWN at the on-set keyboard

Applies To:
13E8, 13PR19C121, 13PT30L121, 13PT30L601, 13PT30L699, 14LL190121, 14LL191121,
14LW192221, 14LW193221, 14LX190321, 19E8, 19PR19C121, 19PR19C122, 19PR19C125,
19PS56C121, 19PS56C122, 19PS56C125, 19PT10C125, 20LL290122, 20LL290125,
20LL291125, 20LW292222, 20LW292225, 20LW293225, 20LX290322, 20LX290325, 20PT30B1,
21LW392221, 21LW393221, CH1919C125, HC9913C121, HC9919C1, PA9019C121,
PC9219C1, PC9219PKIT, PL9119C125, PR1305C121, PR1319C121, PR1390C121,
PR1391X121, PR1903C121, PR1903C122, PR1903C125, PR1920C121, PR1920C122,
PR1920C125, PR1920C601, PR1920C699, PS1946C121, PS1946C122, PS1946C125,
PS1956C121, PS1956C122, PS1956C125, PS1966C121, PS1966C122, PS1966C125,
SEC919C125, TL9119C125, XR1305C121, XR1391C121, XR1903C121, XR1903C122,
XR1903C125, XS1956C121, XS1956C122, XS1956C125

No. 6 *****

Manual Number: 7584
INTERMITTENT COLOR

Symptom:
On some signals or channels, with some or all programs there is no color.

Cause:
The frequency of the received color signal is outside the pull-in range of the color oscillator in the TV set.

Resolution:

Replace as follows:

In the E8 (13-19-20") change 2248 to 18pf, 3198 016 01890

In the F8 (25-27") change 2220 to 18pf, 3198 016 01890

In both chassis this part is originally 15pf. F8 chassis produced August 9 1999 or after have this change. E8 Chassis produced after August 13 1999 have this change.

Applies To:

13E8, 13PR19C121, 13PT30L121, 13PT30L601, 13PT30L699, 14LL190121, 14LL191121, 14LW192221, 14LW193221, 14LX190321, 19E8, 19PR19C121, 19PR19C122, 19PR19C125, 19PS56C121, 19PS56C122, 19PS56C125, 19PT10C125, 20LL290122, 20LL290125, 20LL291125, 20LW292222, 20LW292225, 20LW293225, 20LX290322, 20LX290325, 20PT30B1, 21LW392221, 21LW393221, CH1919C125, HC9913C121, HC9919C1, PA9019C121, PC9219C1, PC9219PKIT, PL9119C125, PR1305C121, PR1319C121, PR1390C121, PR1391X121, PR1903C121, PR1903C122, PR1903C125, PR1920C121, PR1920C122, PR1920C125, PR1920C601, PR1920C699, PS1946C121, PS1946C122, PS1946C125, PS1956C121, PS1956C122, PS1956C125, PS1966C121, PS1966C122, PS1966C125, SEC919C125, TL9119C125, XR1305C121, XR1391C121, XR1903C121, XR1903C122, XR1903C125, XS1956C121, XS1956C122, XS1956C125

No. 7 *****

Manual Number: 7584

NEW SERVICE JUMPERS, NEW WAY TO READ ERRORS

INFORMATION: Due to parts availability there will be a change in the layout and operation of the E8 and F8 chassis. This change can be identified by the location of the Service Jumper pins.

Service Default Mode pins have been in coordinates D-3 since production start.

The pins are close to the memory IC 7601 (8 pin DIP). The pins are marked 0224/0228 in the E8 chassis and M24/M25 in the early F8 chassis. Later F8 use the same marking as the E8.

To Use:

Remove AC power and short the pins together.

Apply AC power.

A TV in shutdown (protect mode) will self-start and flash error codes on the power LED.

Count the on flashes after the long flash and look up the error in the service manual.

SDM Pins moved to front of chassis (C-2 in E8, C-1 in F8).

The pins are close to the Micro-P IC 7600 (52 pin DIP). The pins are marked 0225/0226 in the E8 and M28/M29 in the early F8 chassis. Later F8 use 0025 and 0026 for these points.

To Use:

Remove AC power and short the pins together.

Apply AC power.

When the power LED is lit steady, remove the jumper.

A TV in shutdown (protect mode) will self-start and flash error codes on the power LED.

Count the on flashes after the long flash and look up the error in the service manual.

It is important to remember that the change of position of the Service Mode pins indicates a change in Memory IC Service Code and Micro-P program and Service Code.

TIP: The old memory IC will continue to be shipped (9322 097 23682) as it will work with old or new Micro-P. The new memory IC will only work with the new Micro-P.

For All E8 and F8 except 13PT30, 20PT30, PR/XR1305, PR/XR1903, HD2511 and TR/XR2503 and ITV (commercial) the new Service Code is 9352 670 96112 (7600, micro-P). Until the new code is available the current code (9352 645 55112) is shipped.

For PR/XR1305, PR/XR1903, HD2511 and TR/XR2503 the new Service Code is 9352 671 01112

(7600, micro-P). Until the new code is available the current code (9352 653 70112) is shipped.

For 13PT30 use 9352 641 28112 as 7600 (no change).

For 20PT30 use 9352 653 73112 (no change).

No. 8 *****

Manual Number: 7584

OPTIONS FOR 13PT30

INFORMATION: The Option Bytes for the 13PT30 (EME810)
are 230 255 135 229 058 134 216

No. 9 *****

Manual Number: 7584

OSD SWITCHES FROM STEREO TO MONO

SYMPTOM: The on-screen display will switch to monaural
on a stereo signal.

CURE: Replace capacitor 2003 with 470uf, 16 volt lytic,
Service Code 4835 124 47043.

2003 is at E6 coordinates in the E8 chassis and at E7 in the F8
chassis.

No. 10 *****

Manual Number: 7584

SAVE SERVICE MODE CHANGES

INFORMATION: When making adjustments or changes in SAM remember to
always use the MENU command to return to the TOP MENU. The TOP MENU is

the first menu you see when you enter SAM. Then you may exit SAM by a remote power command and changes will be saved.

The options of the D7 and G7 also require a STORED command before return to the TOP MENU.

By doing this you insure the save of any changes you have made.

No. 11 *****

Manual Number: 7584
SKIPPED CHANNEL NOT TUNED

Symptom:

After auto programming, the "skipped" channels will not tune to offset signals. This may include a VCR when there is no signal on the VCR channel. Using channel edit to add the channel will not resolve the problem.

Cause:

The micro-P program "locks" skipped channels to the normal (nominal) frequency. This is a software bug.

Resolution:

1. The product is shipped with all channels saved, none skipped. Do not auto program. Used the add/delete function to "skip" unneeded channels. All remaining channels will allow offset tuning capture.
2. Correct the offset source (VCR, etc.) or Auto Program again with the new signal (re: cable) present.

This is expected to resolved with a software update as a running change

Applies To:

13E8, 13PR19C121, 13PT30L121, 13PT30L601, 13PT30L699, 14LL190121, 14LL191121, 14LW192221, 14LW193221, 14LX190321, 19E8, 19PR19C121, 19PR19C122, 19PR19C125, 19PS56C121, 19PS56C122, 19PS56C125, 19PT10C125, 20LL290122, 20LL290125, 20LL291125, 20LW292222, 20LW292225, 20LW293225, 20LX290322, 20LX290325, 20PT30B1, 21LW392221, 21LW393221, CH1919C125, HC9913C121, HC9919C1, PA9019C121, PC9219C1, PC9219PKIT, PL9119C125, PR1305C121, PR1319C121, PR1390C121, PR1391X121, PR1903C121, PR1903C122, PR1903C125, PR1920C121, PR1920C122, PR1920C125, PR1920C601, PR1920C699, PS1946C121, PS1946C122, PS1946C125, PS1956C121, PS1956C122, PS1956C125, PS1966C121, PS1966C122, PS1966C125, SEC919C125, TL9119C125, XR1305C121, XR1391C121, XR1903C121, XR1903C122, XR1903C125, XS1956C121, XS1956C122, XS1956C125

No. 12 *****

Manual Number: 7584

STEREO WITH VCR OR SET TOP BOX**GENERAL INFORMATION:**

There is some misunderstanding about TV broadcast stereo and how it can be received by a TV set.

VCR**TO TV ANTENNA INPUT:**

When the VCR is connected to the antenna (coax) connector on the TV, stereo can only be received by the TV if the VCR is in the "TV" mode. This is the mode that allows the TV to use its channel selector. In the TV mode of the VCR the station signal is bypassed around the VCR circuits and the original (antenna or cable) signal goes to the TV channel selector. In this mode of operation (TV selects channels) the TV will receive stereo if the station is transmitting stereo.

If the VCR is set to the "VCR" mode the VCR selects the TV channel and NO stereo is passed to the TV antenna (coax) connector. The process of the TV signal in the VCR erases the stereo portion of the signal when the VCR is in the "VCR" mode.

Playing a stereo tape on a stereo VCR will not deliver stereo to the TV antenna (coax) connector, only to the A/V jacks.

TO AUDIO/VIDEO JACKS ON TV:

TV broadcast stereo may be heard by the using TV A/V jacks if two conditions are met.

- 1) The VCR has a stereo decoder built in. Only a few older VCR's have this. This decoder is called MCTS (Multi Channel Television Sound) or BTSC (Broadcast Television Systems Committee).
- 2) The TV (or cable) channel selected is transmitting stereo.

SET TOP CABLE BOX

These will not send a stereo signal to the antenna (coax) connector of the TV set. If (rare case) the set top cable box has A/V output it might be able to supply video and stereo audio to the TV A/V jacks. Check with the cable company.

SET TOP HIGH DEFINITION BOX

These HD boxes can only supply stereo via A/V cables to the TV, not by the TV antenna (coax) connector.

SATELLITE RECEIVERS

A satellite receiver can only supply stereo via A/V cables to the TV, not by the TV antenna (coax) connector.

No. 13 *****

Manual Number: 7584
USE CORRECT MICRO-P (7600)

Subject: CTV E8 F8 MICRO SERVICE CODES

CHASSIS: E8 F8
MANUAL 7584 7583

INFORMATION: Late changes of the microprocessor (7600) in the E8 and F8 chassis result in the following information.

For PR1305, XR1305 (EME800)
PR1903, XR1903 (EME830-EME840)
TR2503, XR2503, HD2511 (EMF801)
Use only 4835 310 57476

For all other versions of the E8 and F8 EXCEPT Philips model 20PT30 (EME838) and model 13PT30 (EME810), use 4835 310 57477.

For the Philips 20PT30 (EME838) use 9352 653 73112.
For the Philips 13PT30 (EME810) use 9352 641 28112

No. 14 *****

Manual Number: 7584
VERTICAL JITTER ON PREMIUM CABLE

SYMPTOM: Vertical bounce/jitter on Premium Decoded (scrambled) cable channels.

CAUSE: Non-standard decoded sync output by cable box.

CURE: Replace Micro-P 7600 with special IC that has option VS available. VS is an available option in the SAM tuner sub menu in this new IC. Turn VS on. The special IC is a One Time Programmable part with Service Code 4835 310 57488. It is now available.

This IC is for all E8/F8 except models 13PT30, 20PT30 and ITV (commercial).

No. 15 *****

Manual Number: 7584
VOLUME GOES DOWN BY IT SELF

Resistor 3682 is missing from KB1 line.

Replace with 3198 011 08220

Philips Consumer Electronics

Technical Service Data

Service and Quality
Service Publications Dept.
One Philips Drive
P.O. Box 14810
Knoxville, TN 37914

Manual 7584

Model no.: PS1966C122

First Publish: 4-16-1999

Rev. Date: 5-5-1999

Print Date: 18/11/2005

Parts List

REFER TO SAFETY GUIDELINES

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

CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING

1102	Crystal Resonator, 32 MHz.	2422	543 00056	S AC06	CRT, A48JLL40X46(M) (C122)	4835	131 27173
1237	4 Pin Board Connector.	2422	025 12479	S AC06	CRT, A48KRD89X03 (C125)	4835	131 27174
2111	47uF., 20%, 25V, Electrol.	3198	025 34790	S AC06	CRT, A48EJP03X110 (C121)	9301	826 80361
2113	Battery, 3V.	2422	526 01206	S AC07	Degaussing Coil.	3139	128 23691
3110	10k, 5%, 1/10W, Metal Fil.	4835	111 37216	AC08	Degaussing Coil Spring	3139	121 26231
3111	2.7k, 5%, 1/10W, Metal Fi.	3198	021 52720	AC09	Light Guide.	3139	124 27501
3116	10k, 5%, 1/10W, Metal Fil.	4835	111 37432	AC10	Power Button.	3139	124 27632
3117	10k, 5%, 1/10W, Metal Fil.	4835	111 37432	AC11	Speaker (2 Used).	2422	264 00328
5104	Fixed Coil, 6.8uH.	3198	018 26880	S AC12	Yoke (C121).	3306	133 24791
6110	Diode, BAS216.	4835	130 37905	S AC12	Yoke (C125).	4835	150 17145
7110	IC, MK41T56N-00.	4835	209 17438	S AC12	Yoke (C122).	4835	150 17146
				AC13	Chassis Guide, Right.	4835	432 17938
				AC16	Remote Transmitter, RC2524/04.	3139	228 81592
				AC17	Batteries For Remote Transmitter.	9299	000 10137
				AC18	Owner's Manual.	3135	015 10471

ASD049 & ASD051 DBX 2X3 Watt & ASD052 DBX 2X1 Watt Stereo Module

ASD049 & ASD051 DBX 2X3 Watt & ASD052 D

BX 2X1 Watt Stereo Module

0239	17 Pin Board Connector	2422	025 16267
0240	17 Pin Board Connector	2422	025 16267
0246	4 Pin Board Connector	2422	025 12479
0247	5 Pin Board Connector	2422	025 04853
117	Heatsink, Stereo	3135	011 01411
139	Spring	4835	290 47003
1801	Crystal Resonator, 18.432MHz	2422	543 00842
2801	22pF., 5%, 50V, Ceramic.	3198	016 02290
2804	12pF., 5%, 50V, Ceramic.	3198	016 01290
2805	1.5pF., 17%, 50V, Ceramic.	3198	016 01580
2806	1.5pF., 17%, 50V, Ceramic.	3198	016 01580
2807	0.22uF., 25V, Ceramic.	3198	023 22240
2808	0.22uF., 25V, Ceramic.	3198	023 22240
2809	0.22uF., 25V, Ceramic.	3198	023 22240
2810	0.22uF., 25V, Ceramic.	3198	023 22240
2814	0.1uF., 50V, Ceramic	3198	023 21040
2815	47pF., 5%, 50V, Ceramic.	3198	016 04790
2820	10uF., 20%, 50V, Electrolytic.	3198	025 51090
2821	0.1uF., 50V, Ceramic	3198	023 21040
2822	10uF., 20%, 50V, Electrolytic.	3198	025 51090
2823	0.1uF., 50V, Ceramic	3198	023 21040
2824	10uF., 20%, 50V, Electrolytic.	3198	025 51090
2825	0.1uF., 50V, Ceramic	3198	023 21040
2827	4.7uF., 20%, 50V, Electrolytic	3198	025 54780
2828	1000pF., 5%, 50V, Ceramic.	3198	016 01020
2829	4.7uF., 20%, 50V, Electrolytic	3198	025 54780
2830	1000pF., 5%, 50V, Ceramic.	3198	016 01020
2831	10uF., 20%, 50V, Electrolytic.	3198	025 51090
2835	0.1uF., 50V, Ceramic	3198	023 21040
2836	0.1uF., 50V, Ceramic	3198	023 21040
2837	47pF., 5%, 50V, Ceramic.	3198	016 04790
2838	47pF., 5%, 50V, Ceramic.	3198	016 04790
2841	100uF., 25V, Electrolytic.	3198	025 31010
2842	100uF., 25V, Electrolytic.	3198	025 31010
2950	22uF., 20%, 50V, Electrolytic.	3198	025 52290
2951	10uF., 20%, 50V, Electrolytic.	3198	025 51090
2952	3300pF., 10%, 50V, Ceramic.	3198	017 03320
2953	0.22uF., 25V, Ceramic.	3198	023 22240
2955	470uF., 25V, Electrolytic.	3198	026 34710
2957	0.22uF., 25V, Ceramic.	3198	023 22240
2962	3300pF., 10%, 50V, Ceramic.	3198	017 03320
2963	0.22uF., 25V, Ceramic.	3198	023 22240
2965	0.22uF., 25V, Ceramic.	3198	023 22240
3807	100 ohm, 5%, 1/6W, Carbon Film	3198	011 01010
3808	100 ohm, 5%, 1/6W, Carbon Film	3198	011 01010
3809	47k, 5%, 1/10W, Metal Film	4835	111 37445
3810	100 ohm, 5%, 1/10W, Metal Film	4835	111 37432
3811	100 ohm, 5%, 1/10W, Metal Film	4835	111 37432
3812	6.8 ohm, 5%, 1/3W, Metal Film	2306	204 03688
3950	27k, 5%, 1/10W, Metal Film	4835	111 37442
3953	3.3k, 5%, 1/10W, Metal Film	4835	111 37247
4801	Zero ohm, "Chip" Jumper.	4835	111 27056
4802	Zero ohm, "Chip" Jumper.	4835	111 27056
4805	Zero ohm, "Chip" Jumper.	4835	111 27056
4806	Zero ohm, "Chip" Jumper.	4835	111 27056
4990	Zero ohm, "Chip" Jumper.	4835	111 27056
5801	Fixed Coil, 22uH., 10%	3198	018 22290
5811	Fixed Coil, 10uH., 10%	3198	018 21090
5812	Fixed Coil, 10uH., 10%	3198	018 21090
5813	Fixed Coil, 10uH., 10%	3198	018 21090
5814	Fixed Coil, 4.7uH., 10%	3198	018 24780
6801	Diode, 1N4148.	4835	130 37048
6802	Zener Diode, 8.2 Volt, BZX79-F8V2.	4835	130 37918
6953	Zener Diode, 3.3 Volt, BZX79-C3V3.	3198	010 23380
7803	IC, MSP3435G-PP-A4	9322	136 54682
7954	IC, TDA7053A/N2.	4822	209 13706
7956	Transistor, BC85	5322	130 60508

Model XS1956C121, C122, C125 Cabinet Parts

A10811	L9 Event Timer.	0000	000 000CBA
ASD049 & ASD051 DBX 2X3 Watt & ASD052 D	BX 2X1 Watt Stereo Module.	0000	000 000CBA
REMOTE	Remote Transmitter, RC2524/04.	3139	228 81592

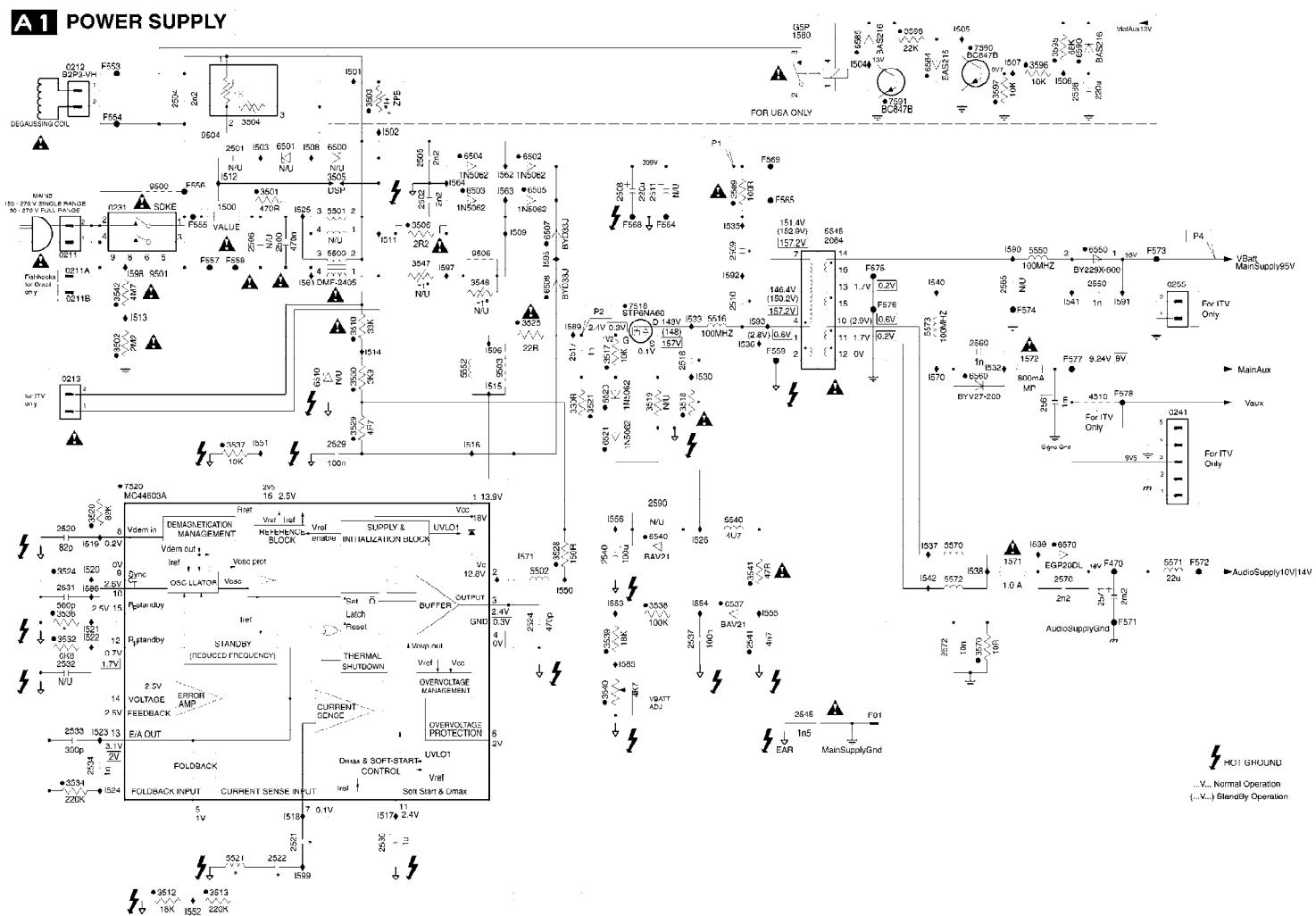
Model PS1966C121, C122, C125 Cabinet Parts

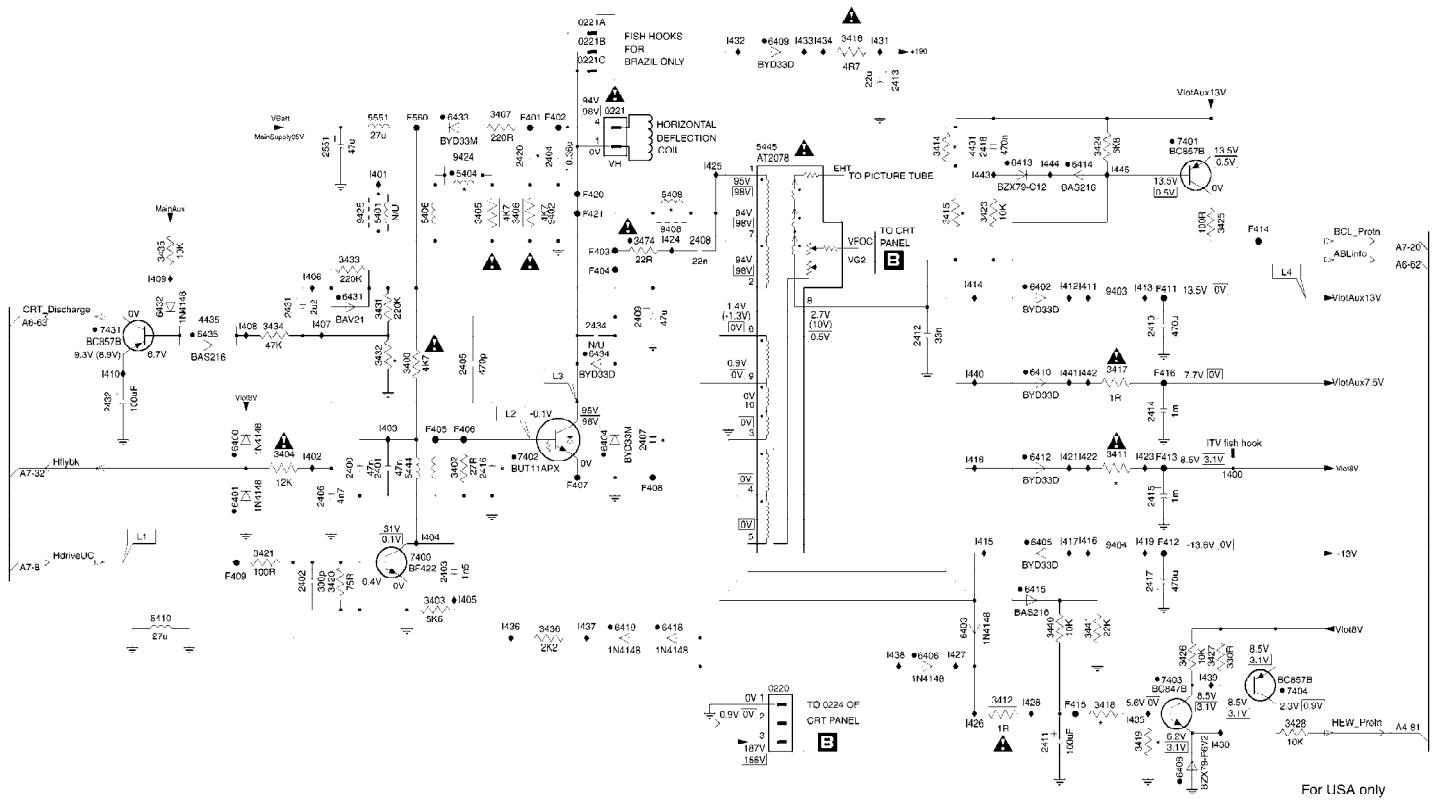
Model PS1966C121, C122, C125 Cabinet Pa

rts

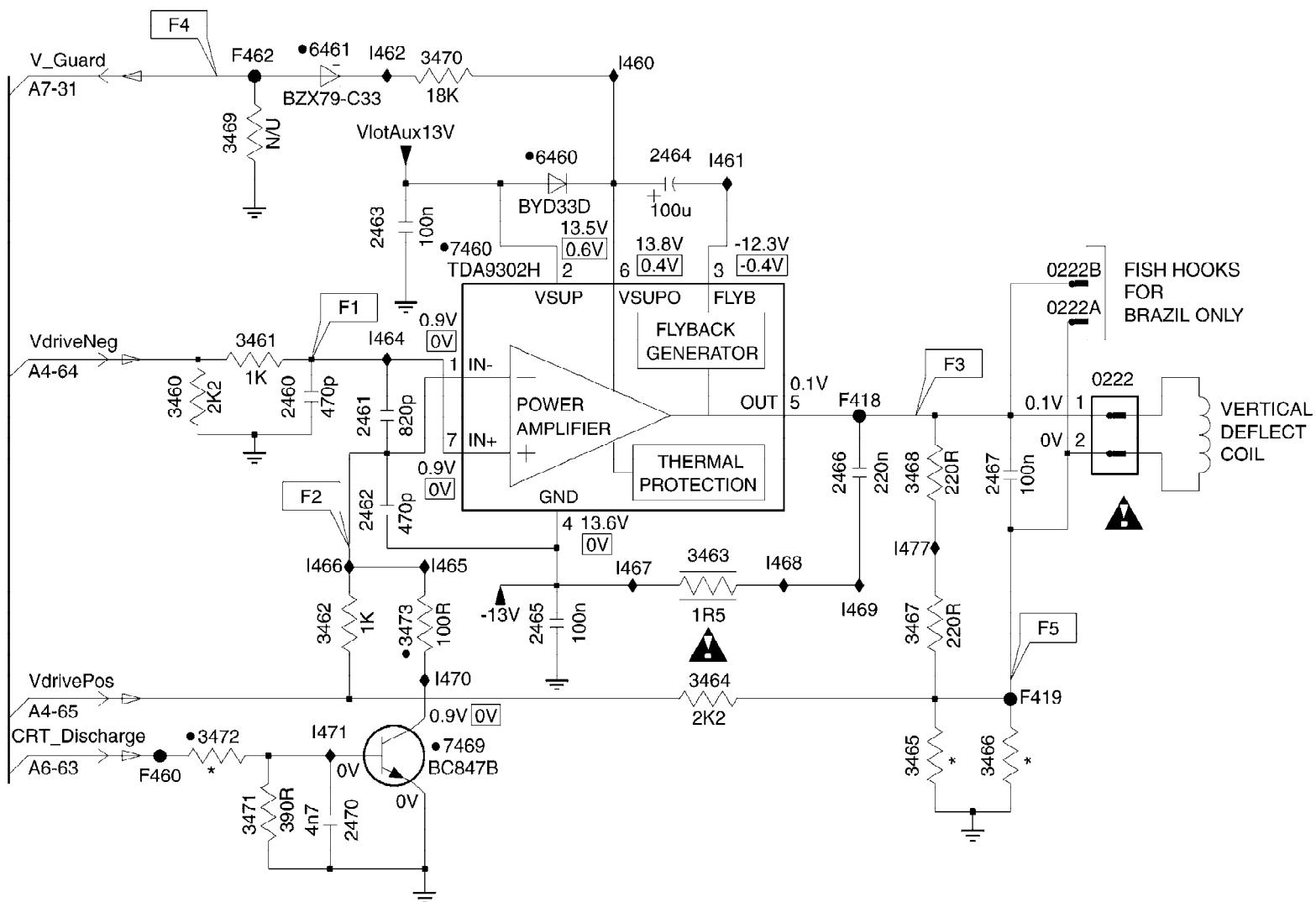
S AC01	AC Power Cord.	3135	010 04771
AC02	Cabinet Back.	3139	124 28861
AC03	Cabinet Front.	3139	137 59461
AC04	Control Buttons.	3139	124 27341
S AC05	Convergence and Purity Assembly (C122)	4835	150 27007
S AC05	Convergence and Purity Assembly (C121 & C125)	4835	150 27008

S = Safety Part Be sure to use exact replacement part.

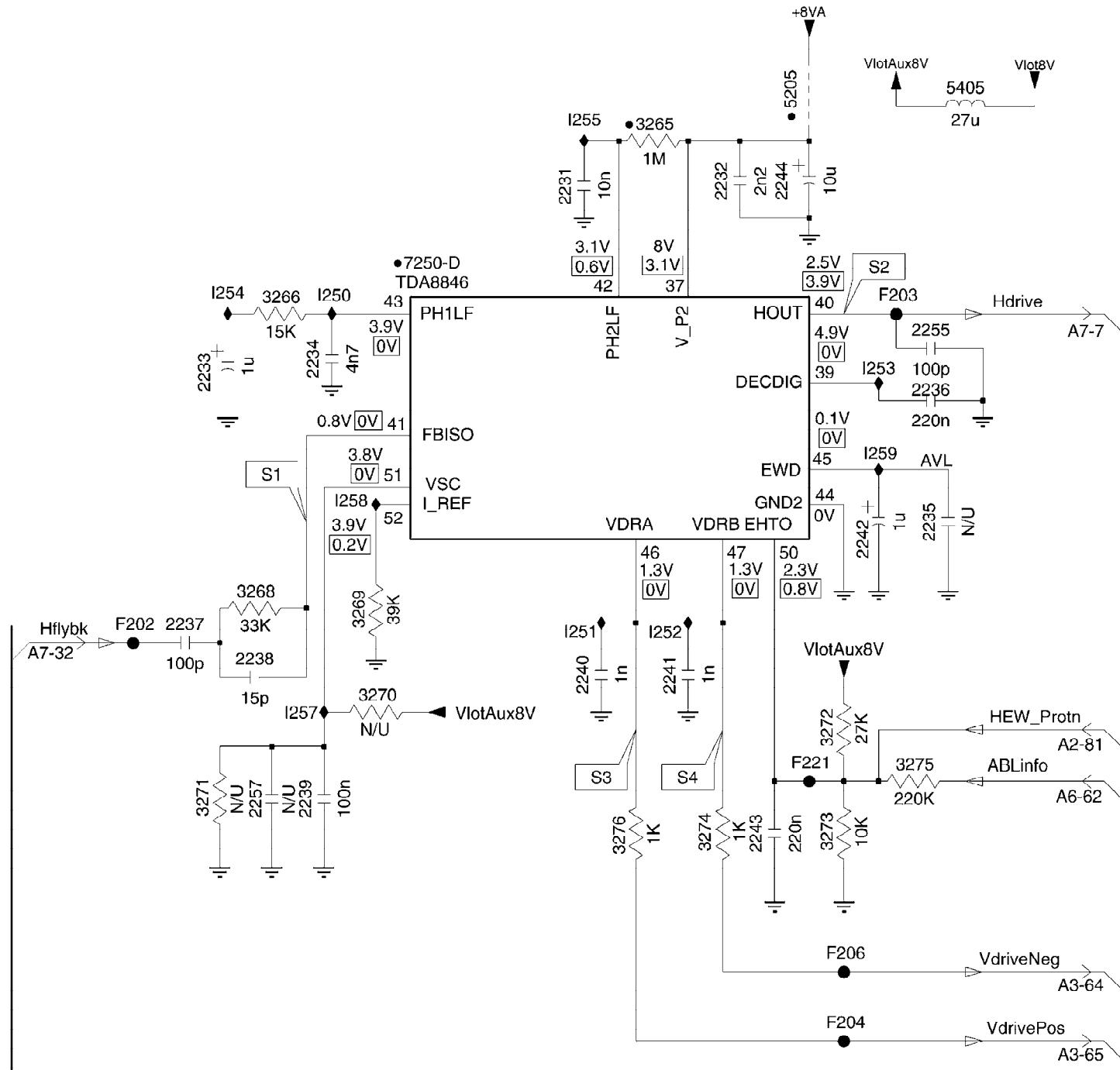
A 1 POWER SUPPLY

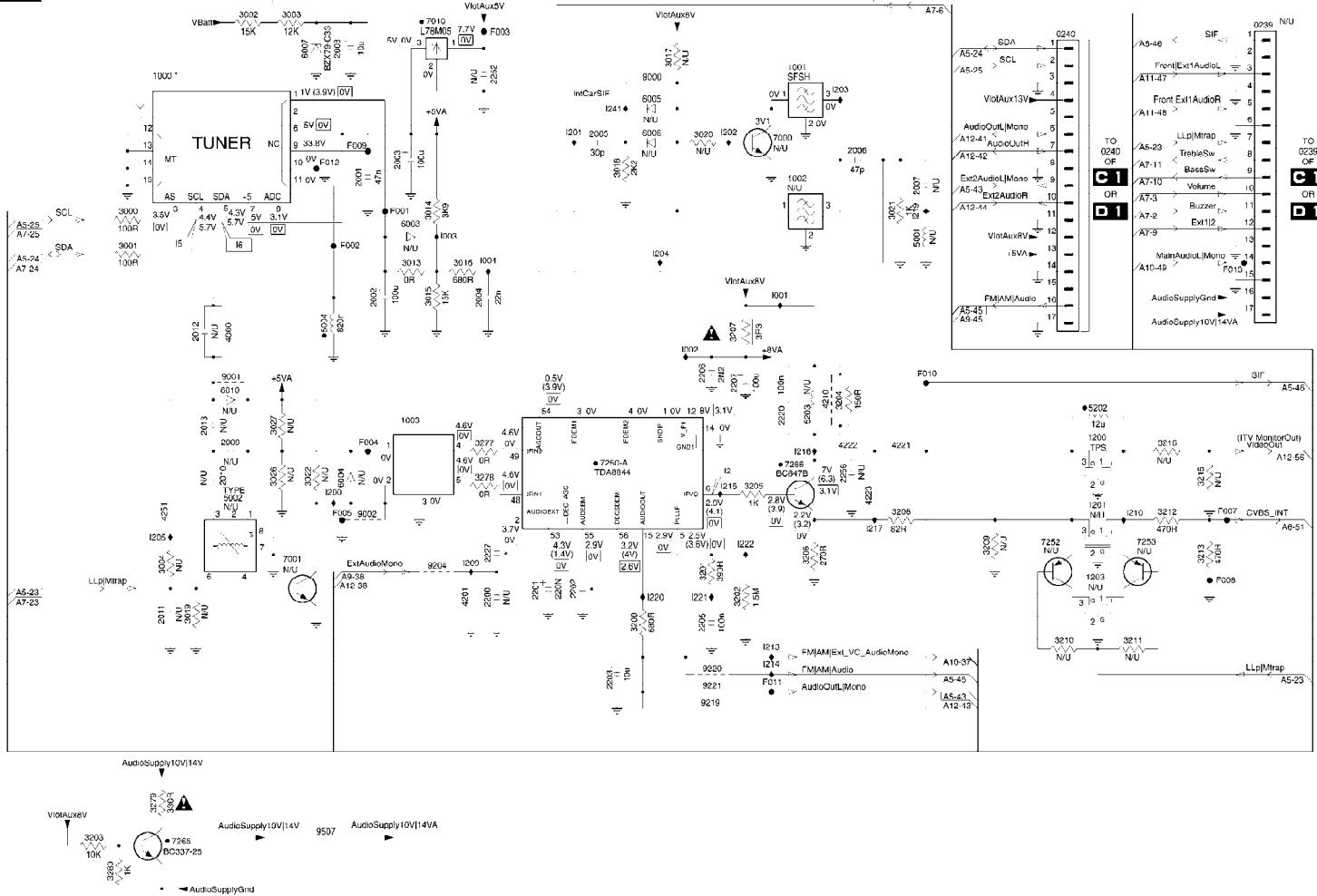
A2 LINE DEFLECTION

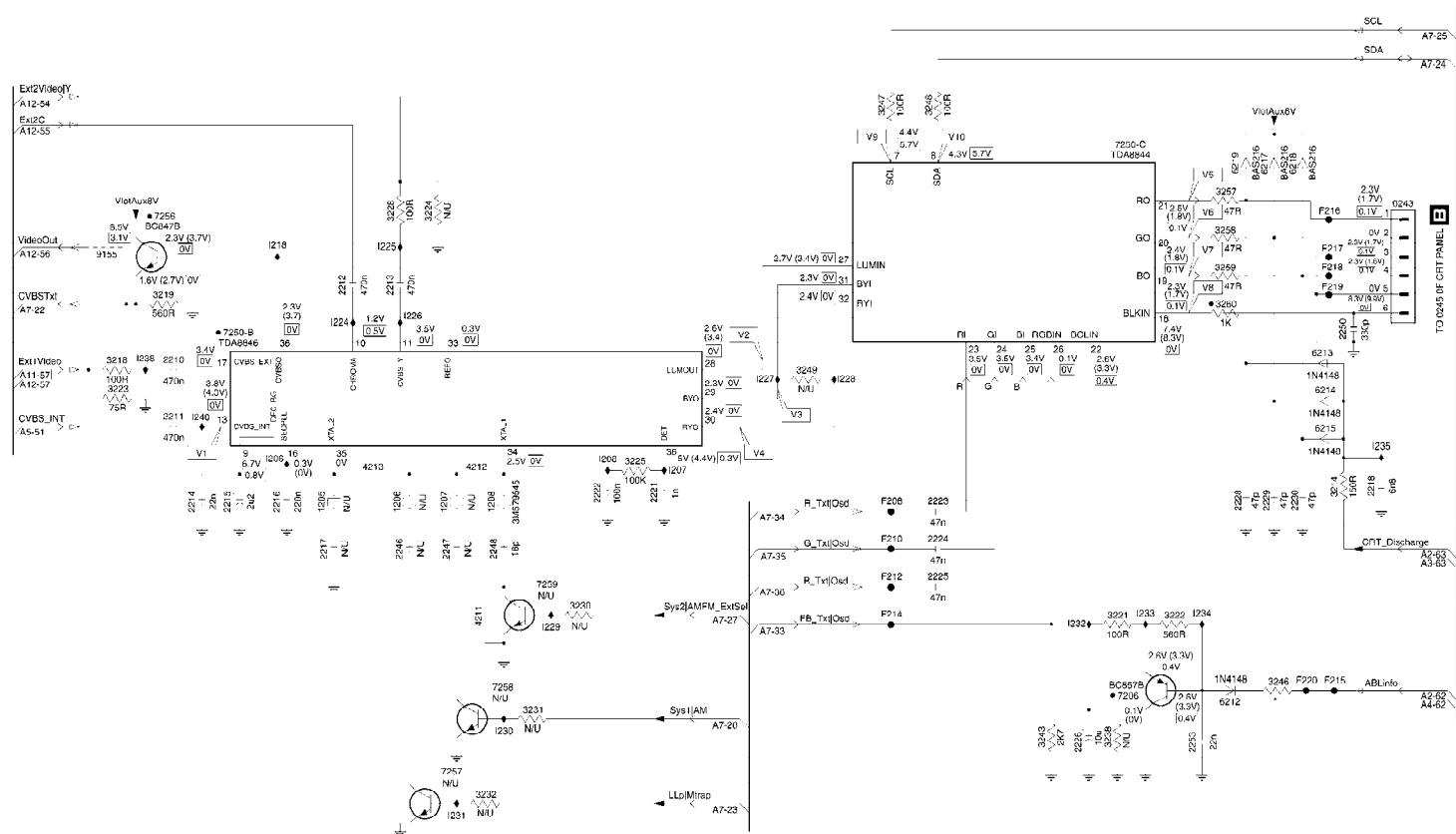
A3 FRAME DEFLECTION

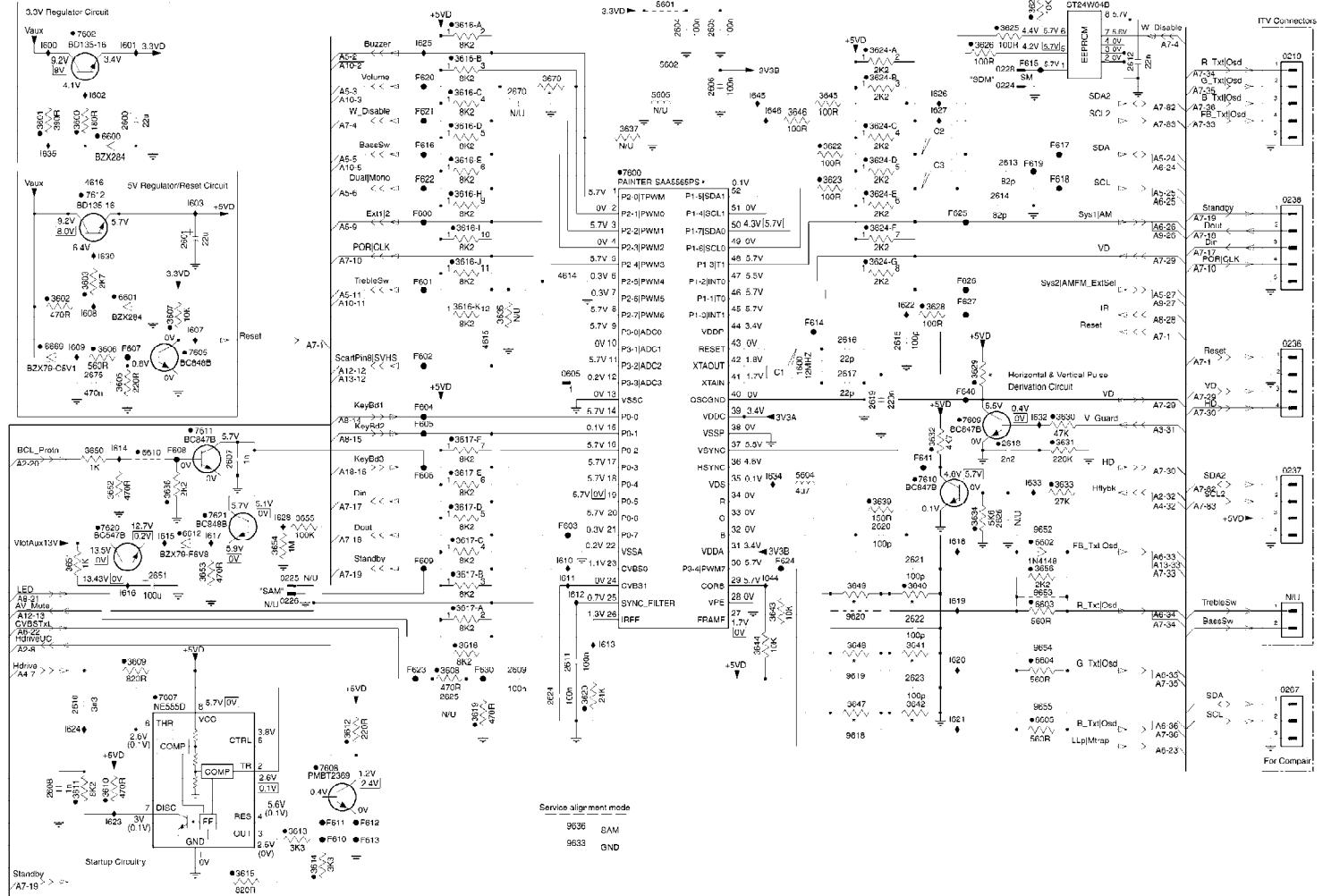


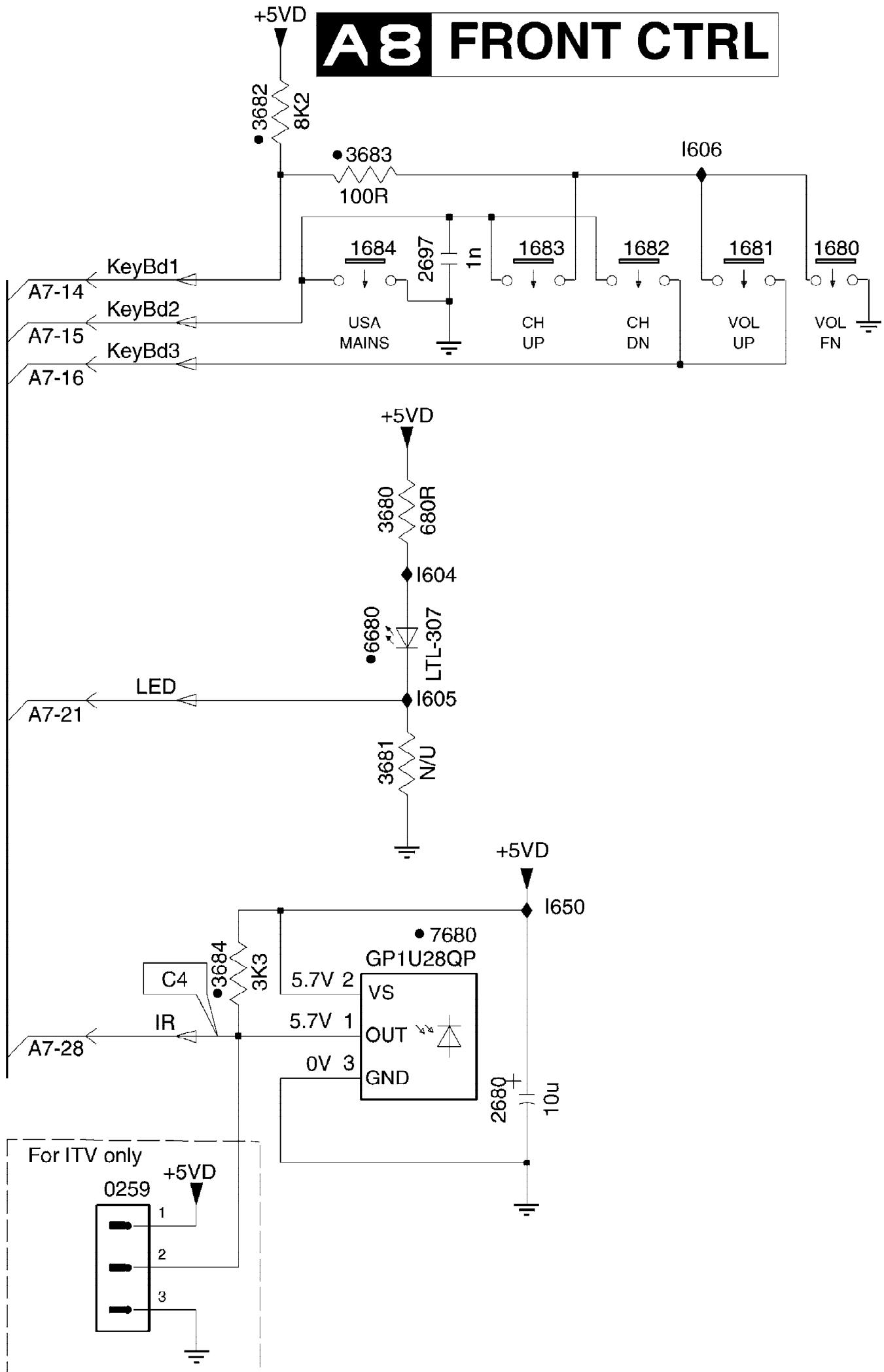
A4 SYNCHRONIZATION

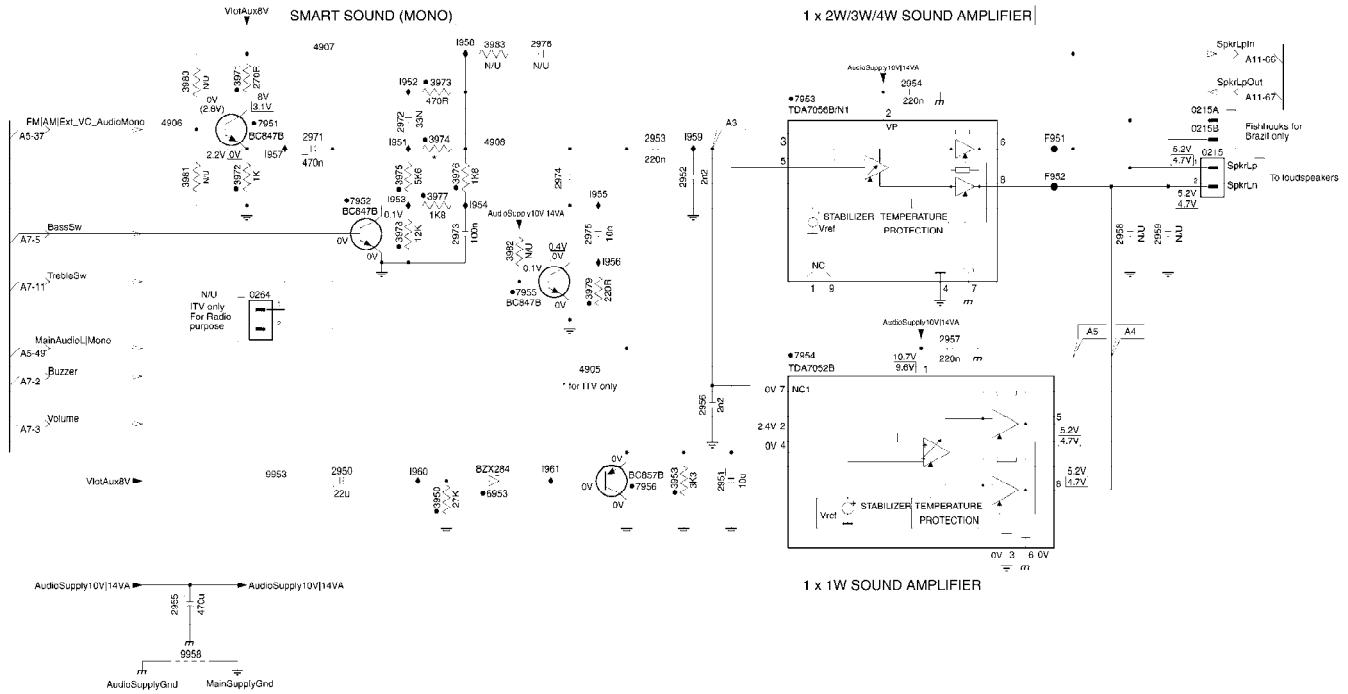


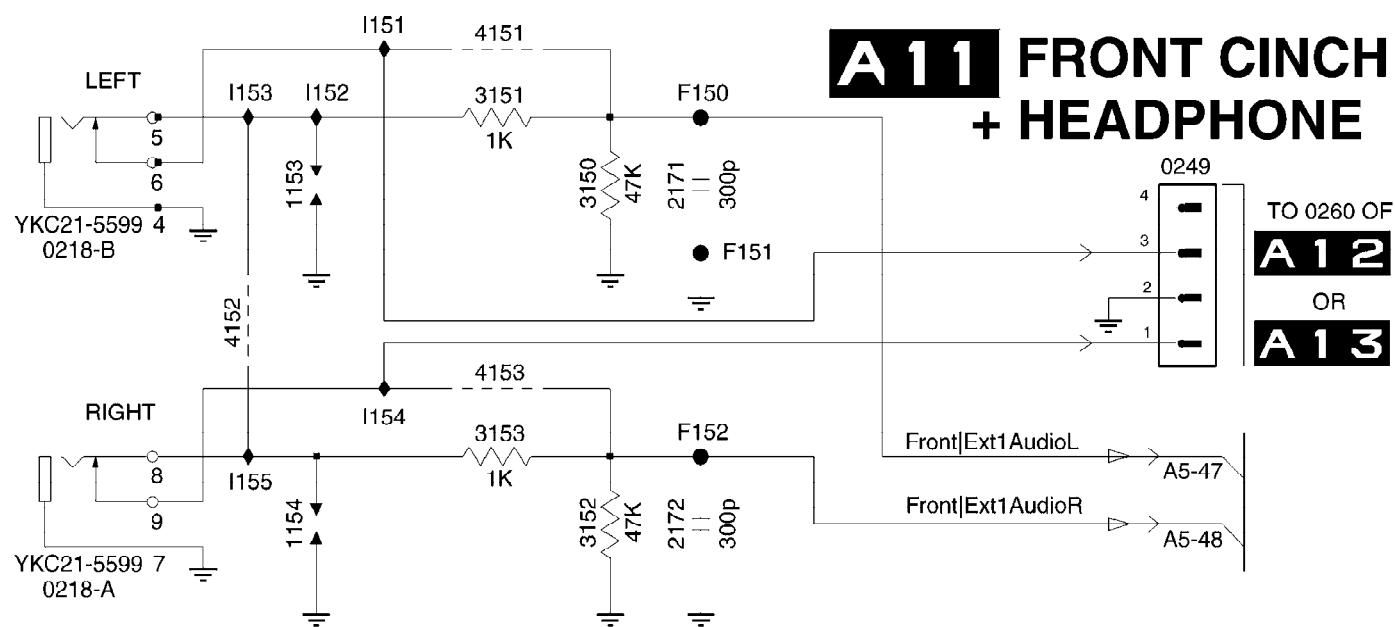
A5 TUNER VIDEO IF (A/P)

A6 VIDEO PROCESSING A/P

A7 CONTROL



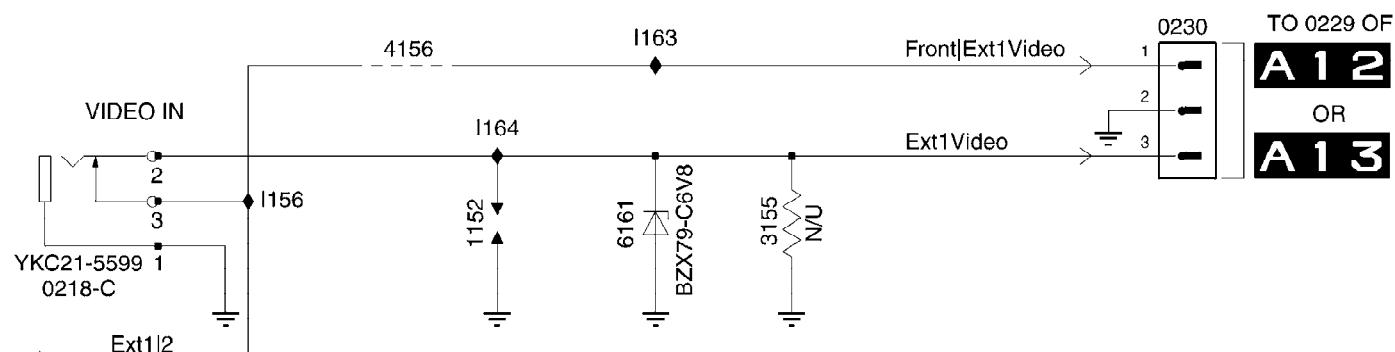
A1 Ø SOUND CONTROL + SOUND AMPLIFIER (MONO)



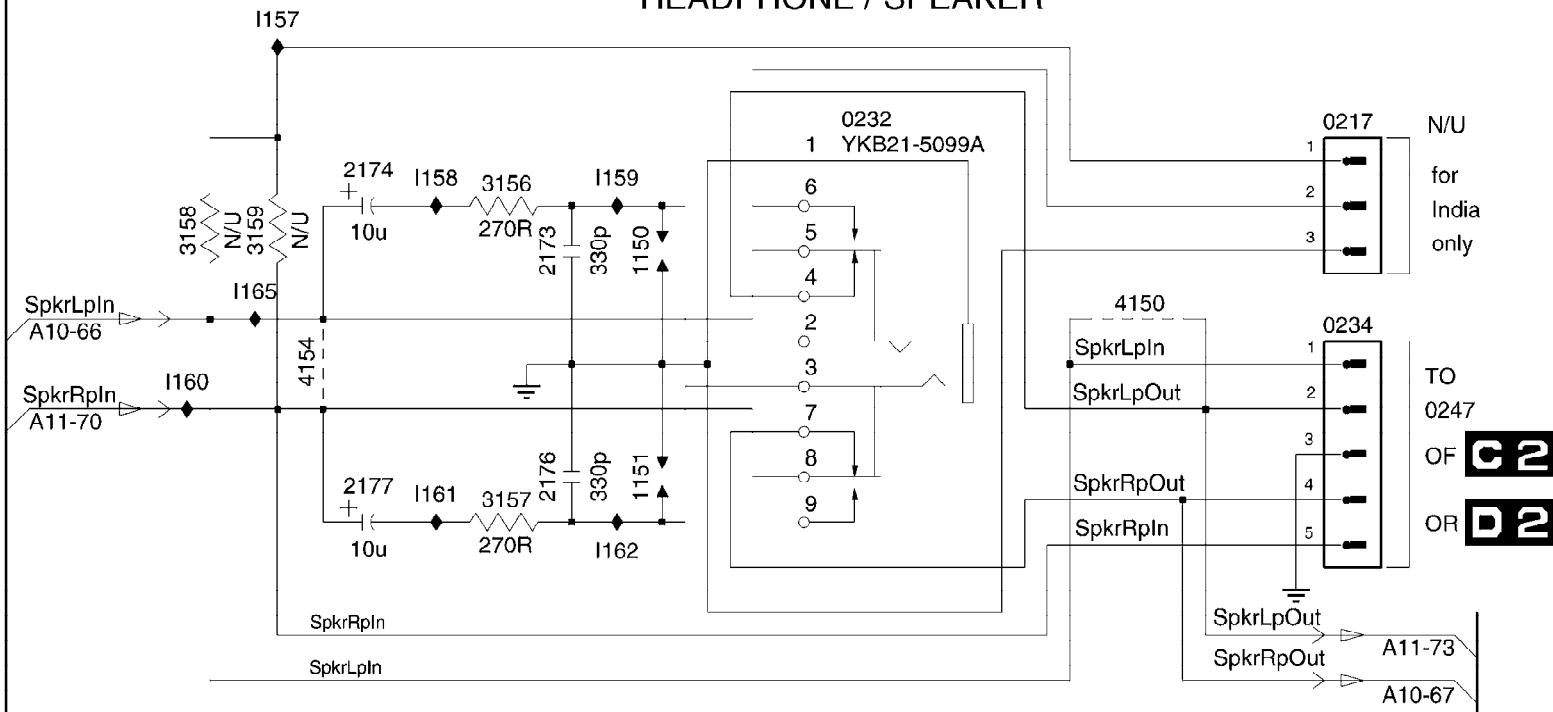
4151,4153 for stereo set without front cinch

9122 for mono set without front cinch

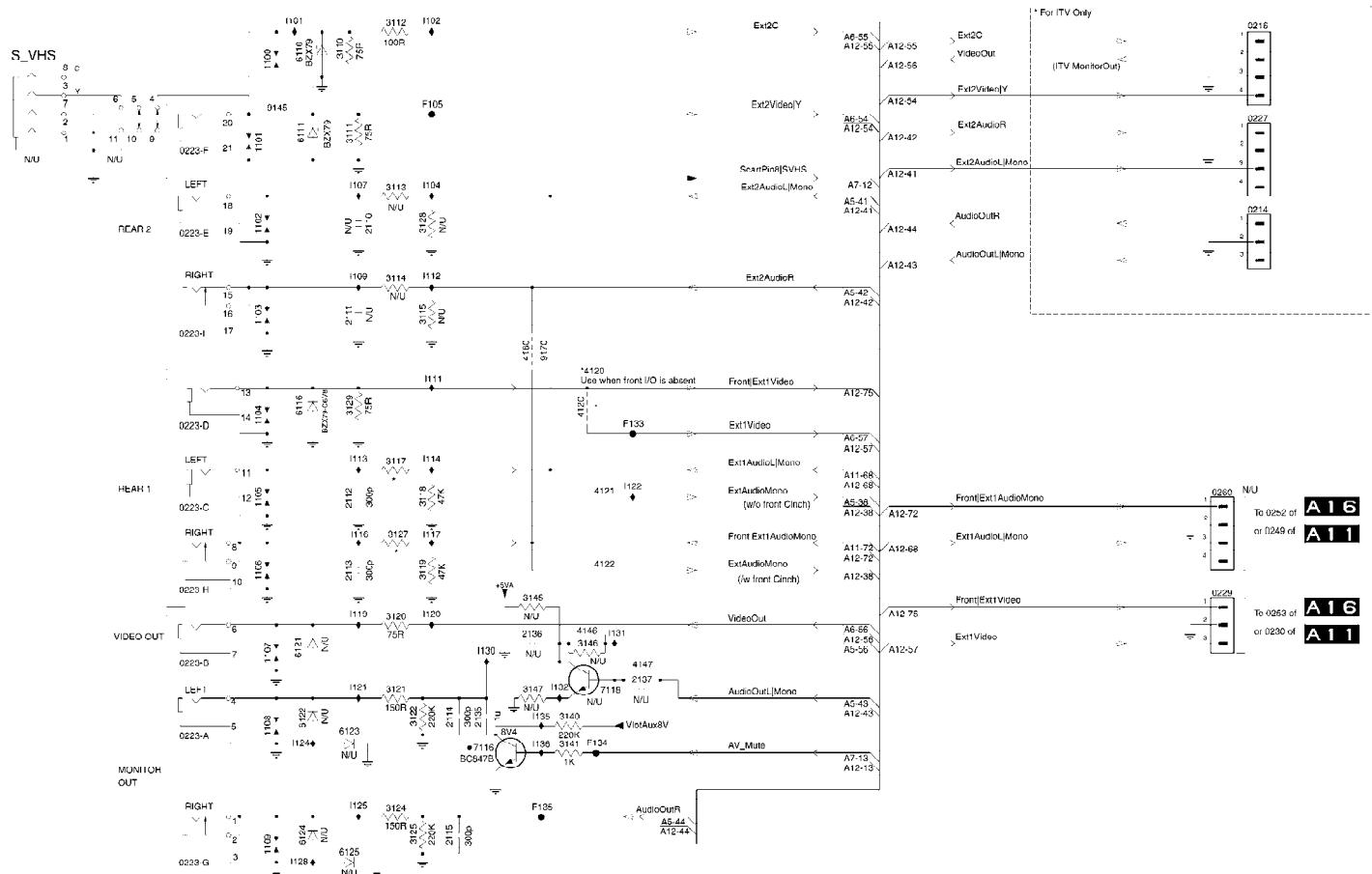
4152 For Mono set Only

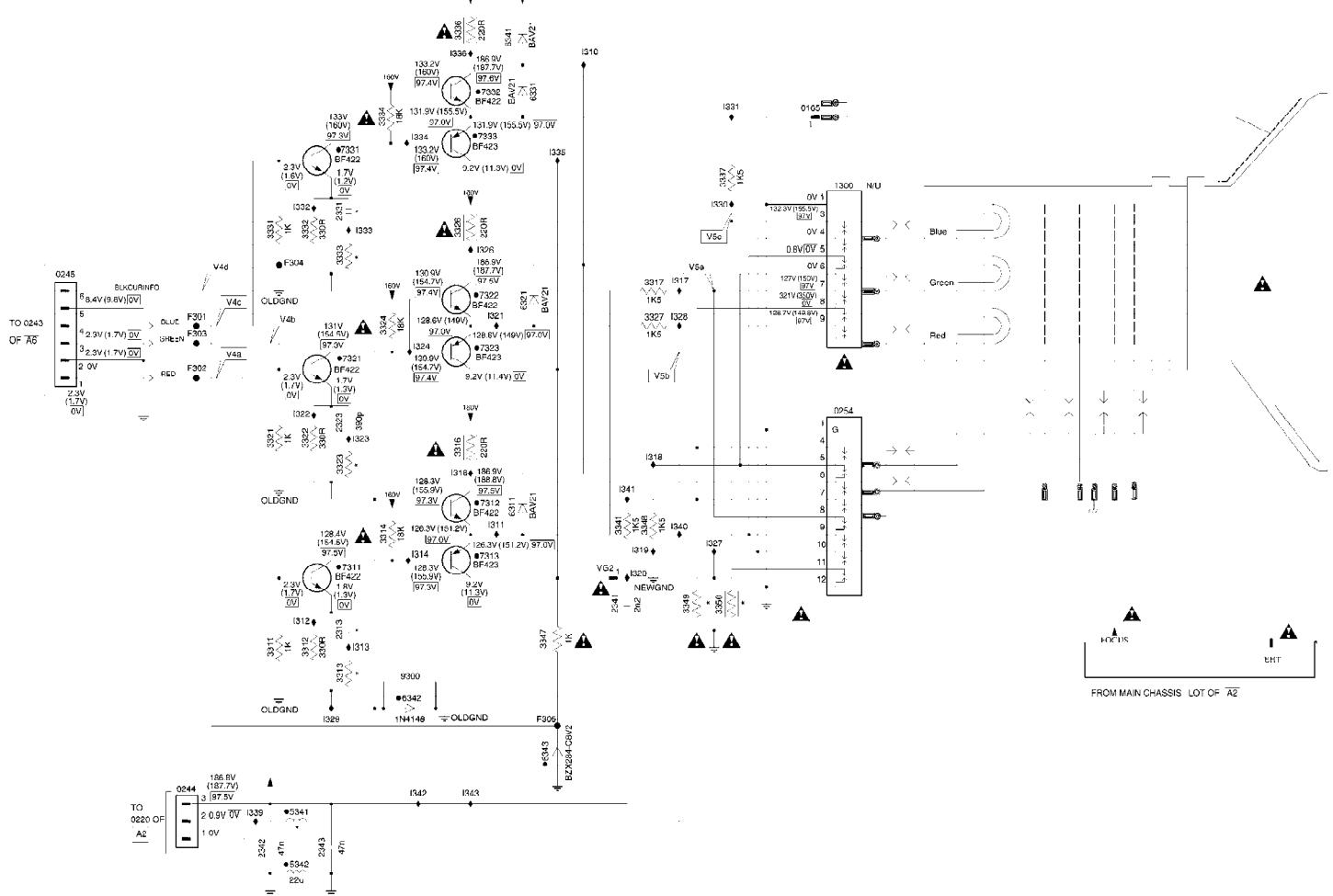


HEADPHONE / SPEAKER

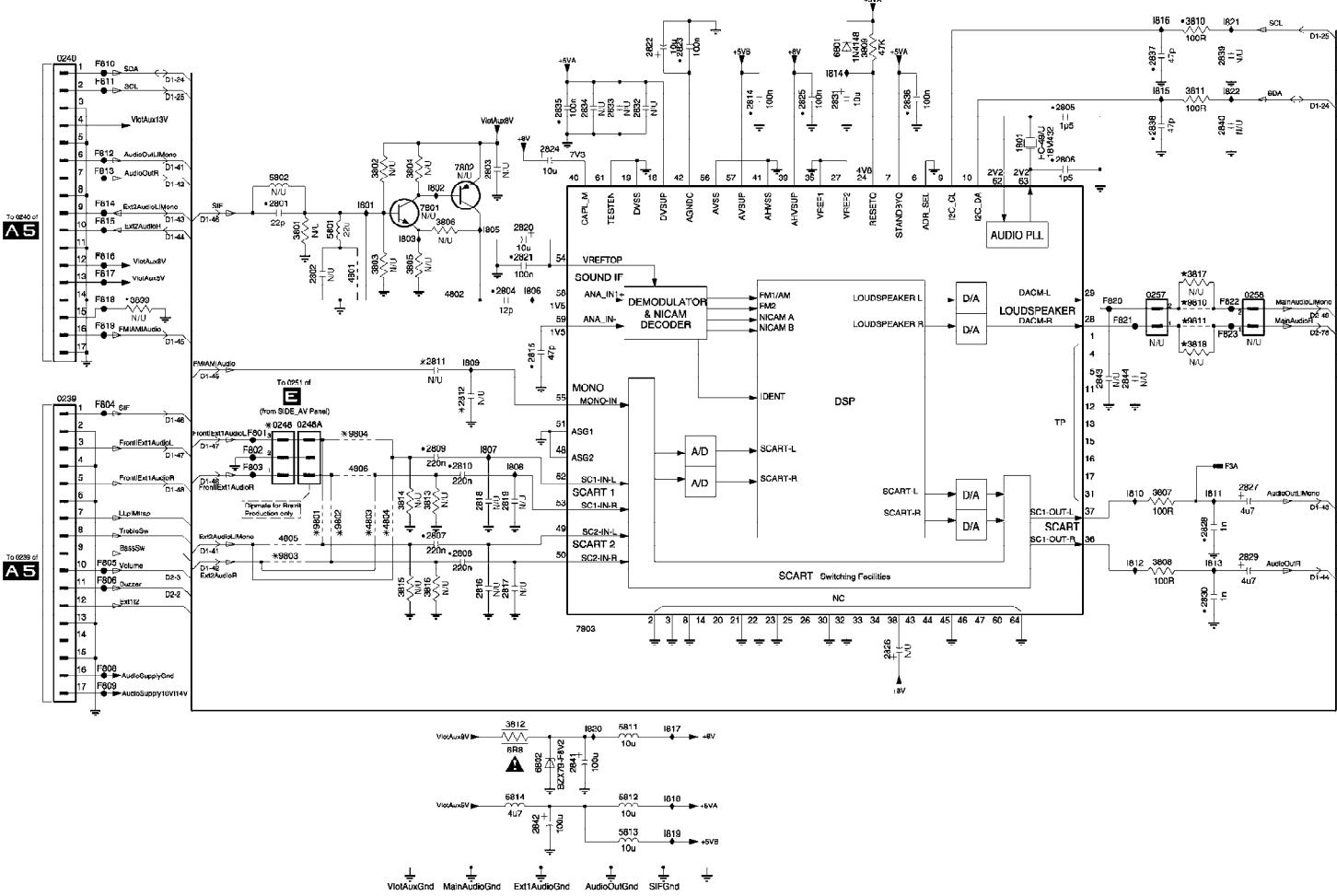


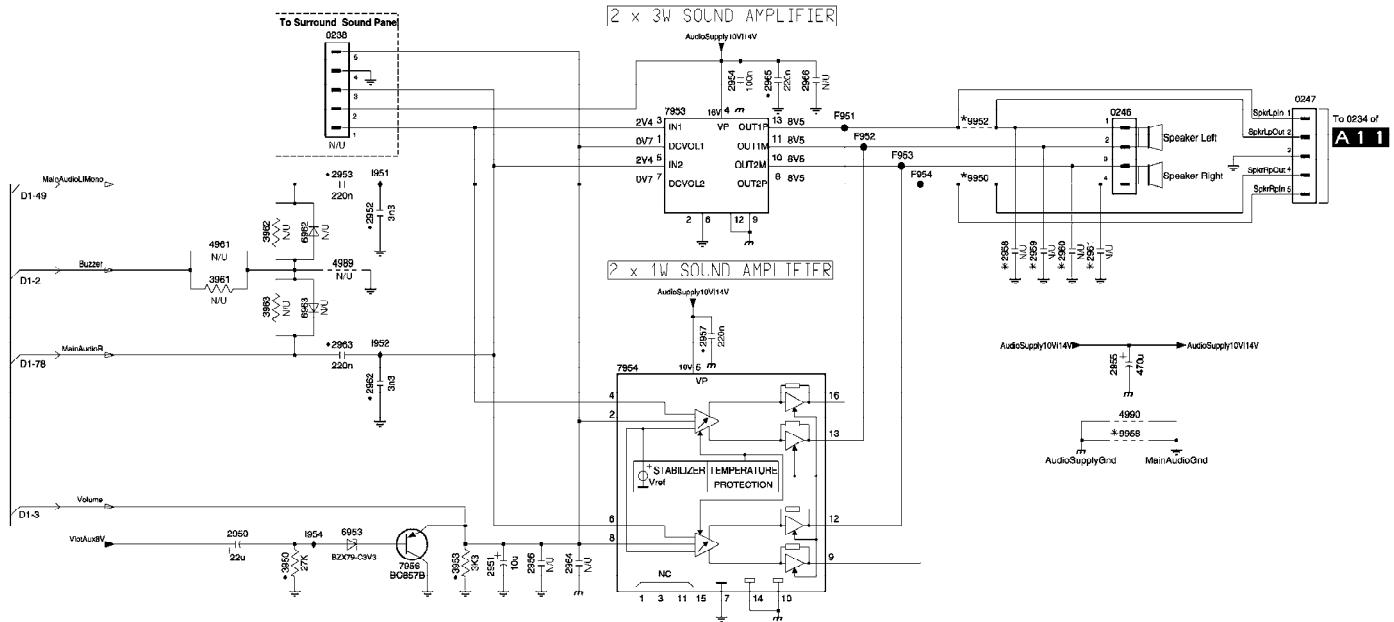
NOTE : 0191 use 242202604471 for INDIA only for other regions use 242202604747

A12 REAR I/O CINCH

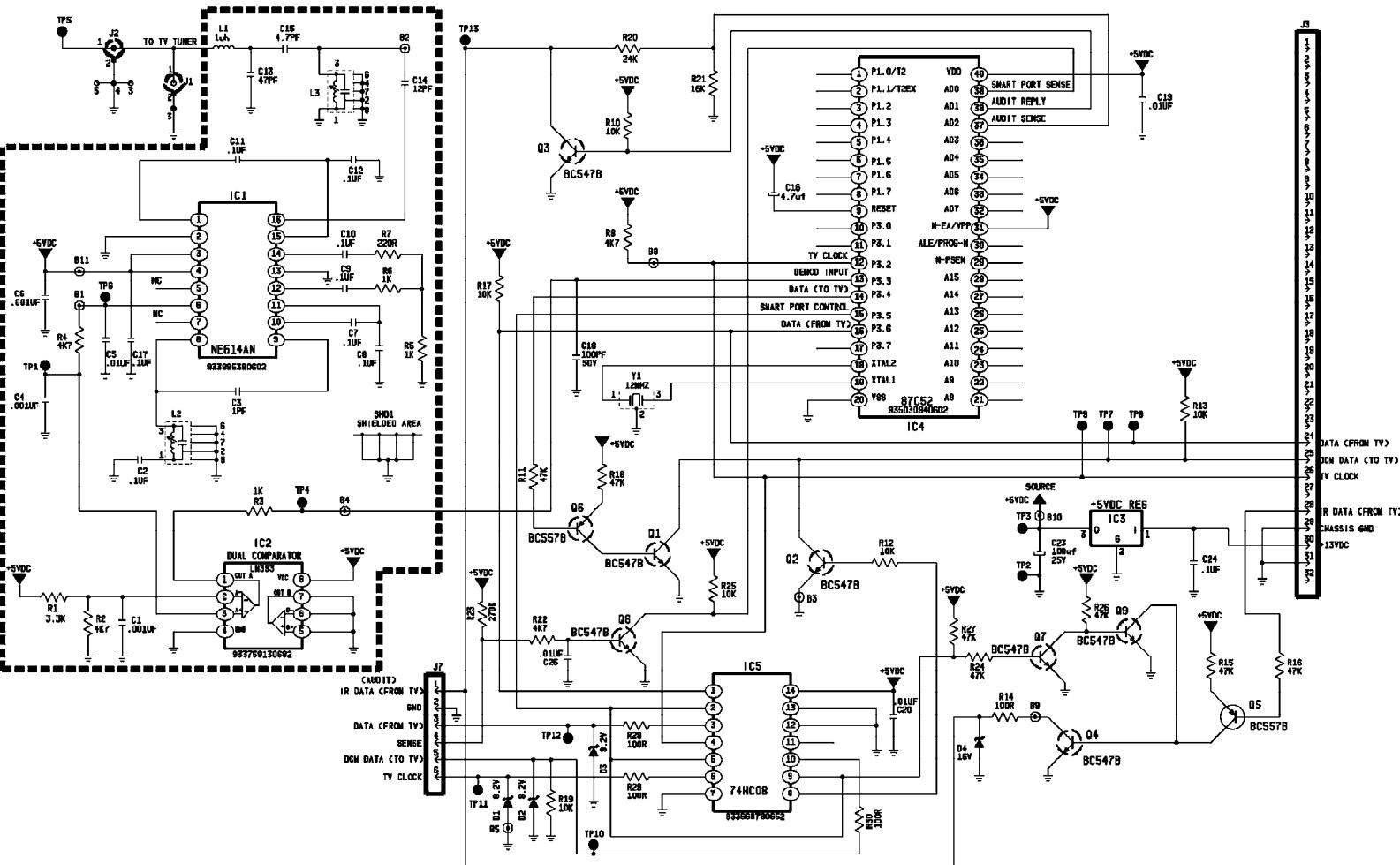
B CRT PANEL

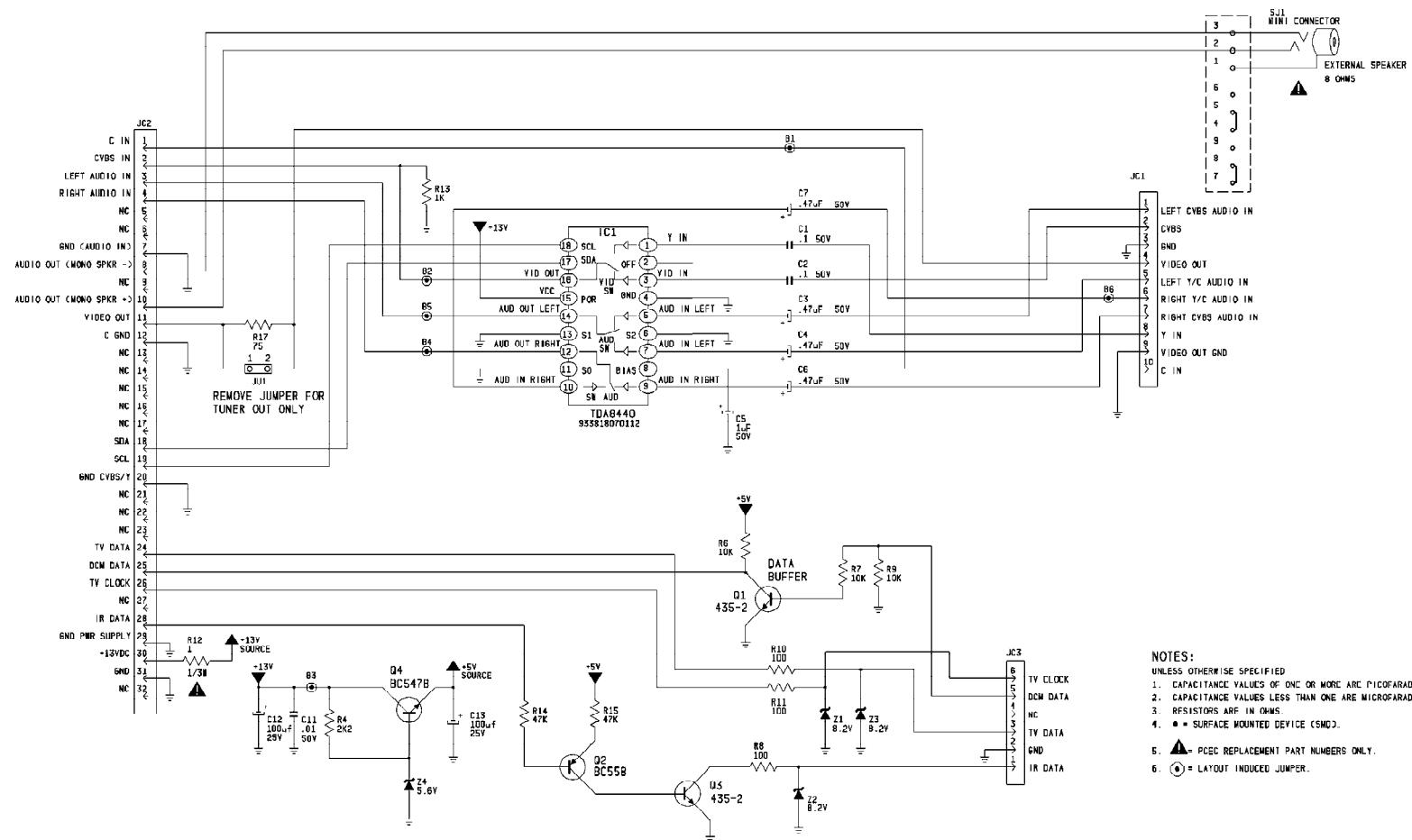
D 1 MSP/BSP PNL: AUDIO DECODING + SOURCE SELECT + SOUND PROCESSING

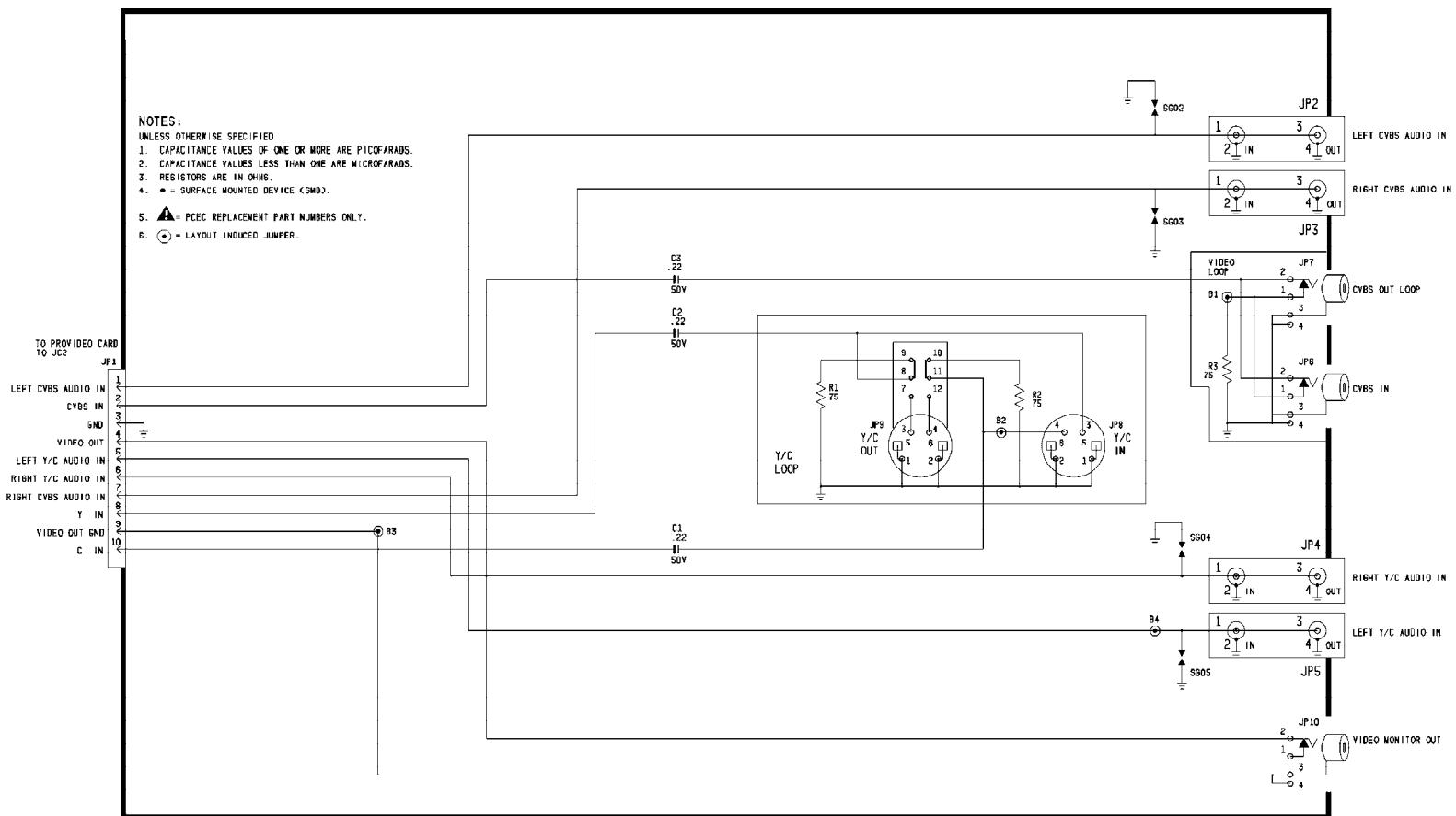


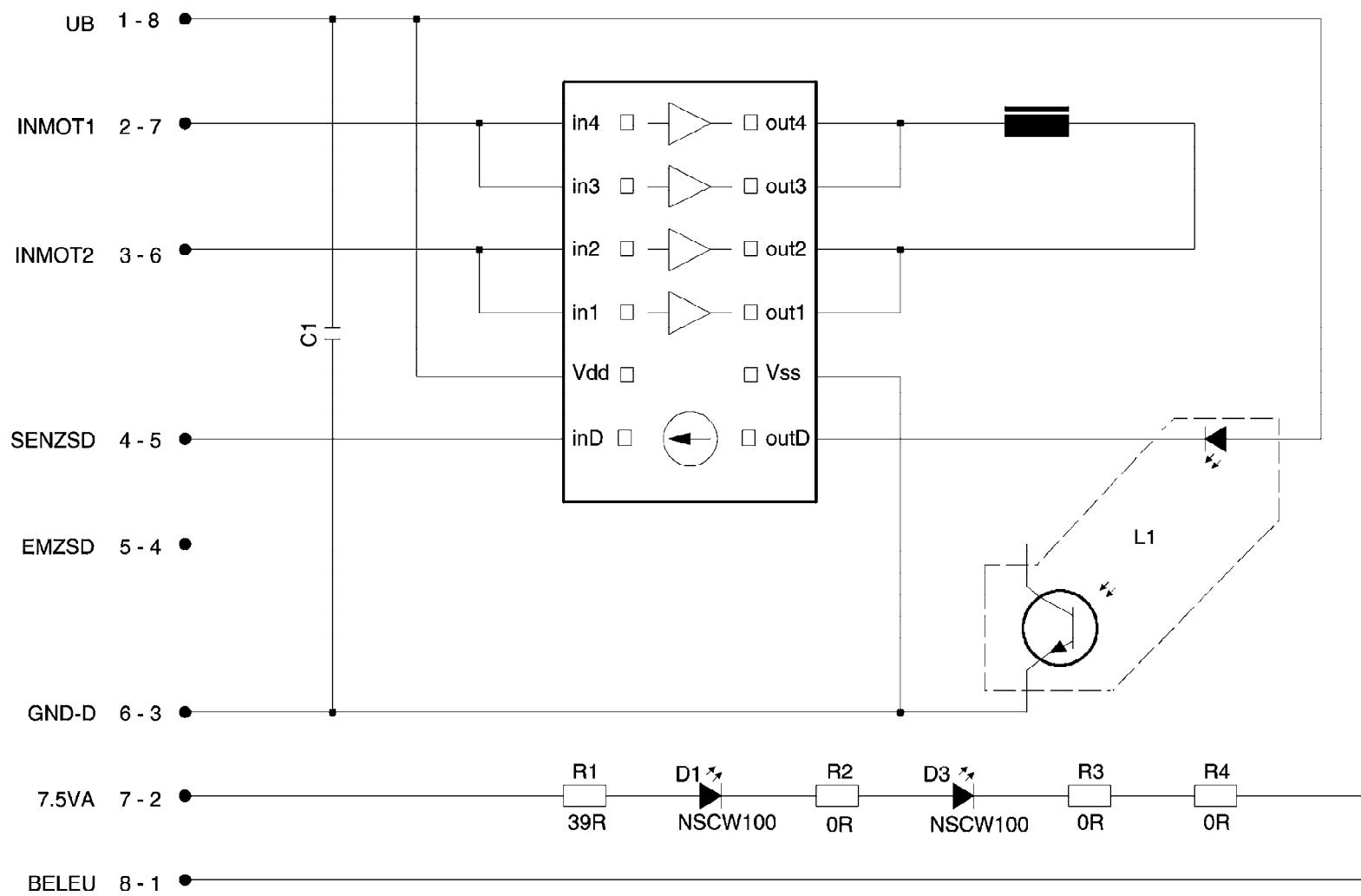
D2 MSP/BSP PNL: AUDIO AMPLIFIER

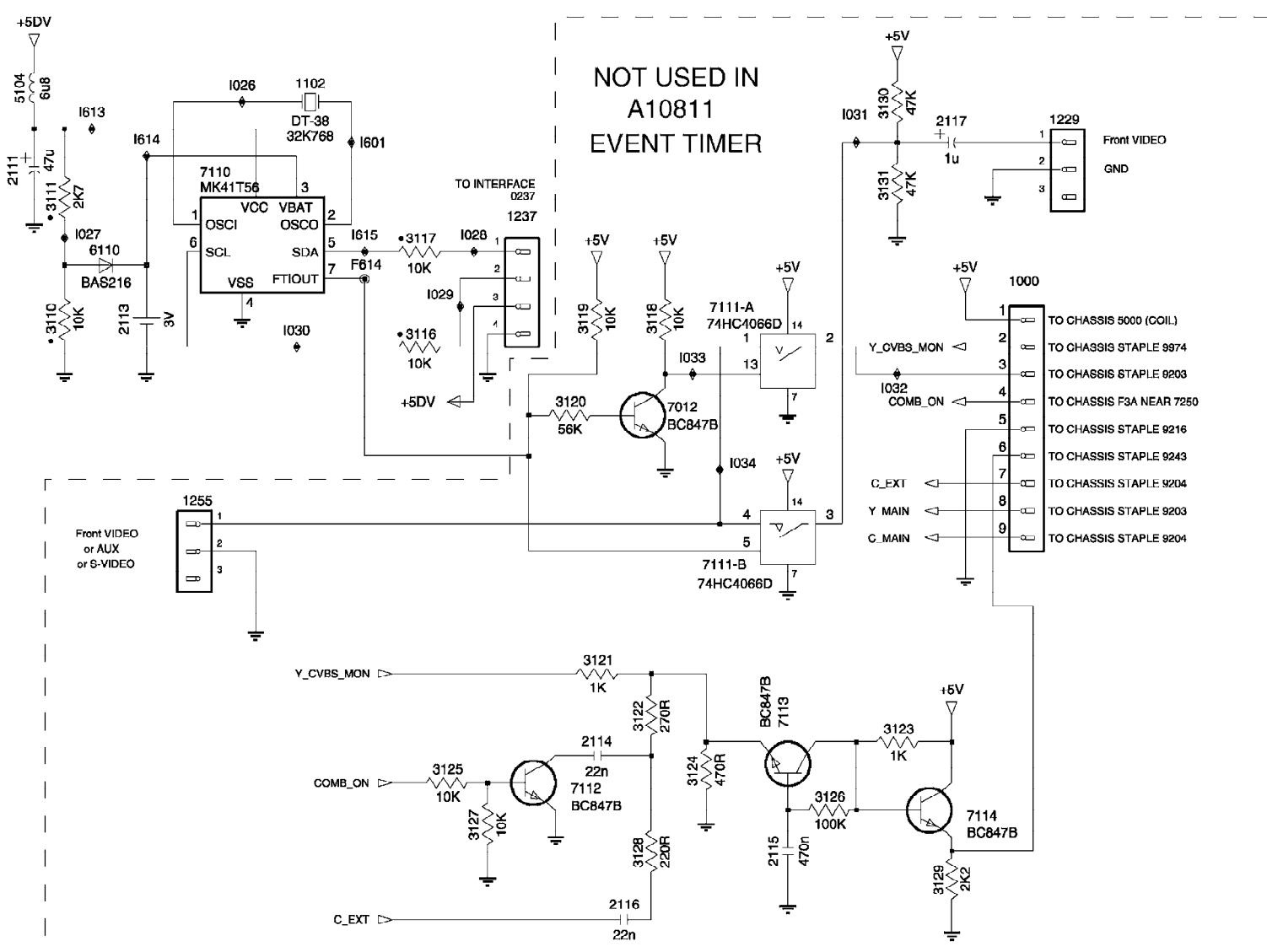
A10680 Channel One Card Schematic Diagram

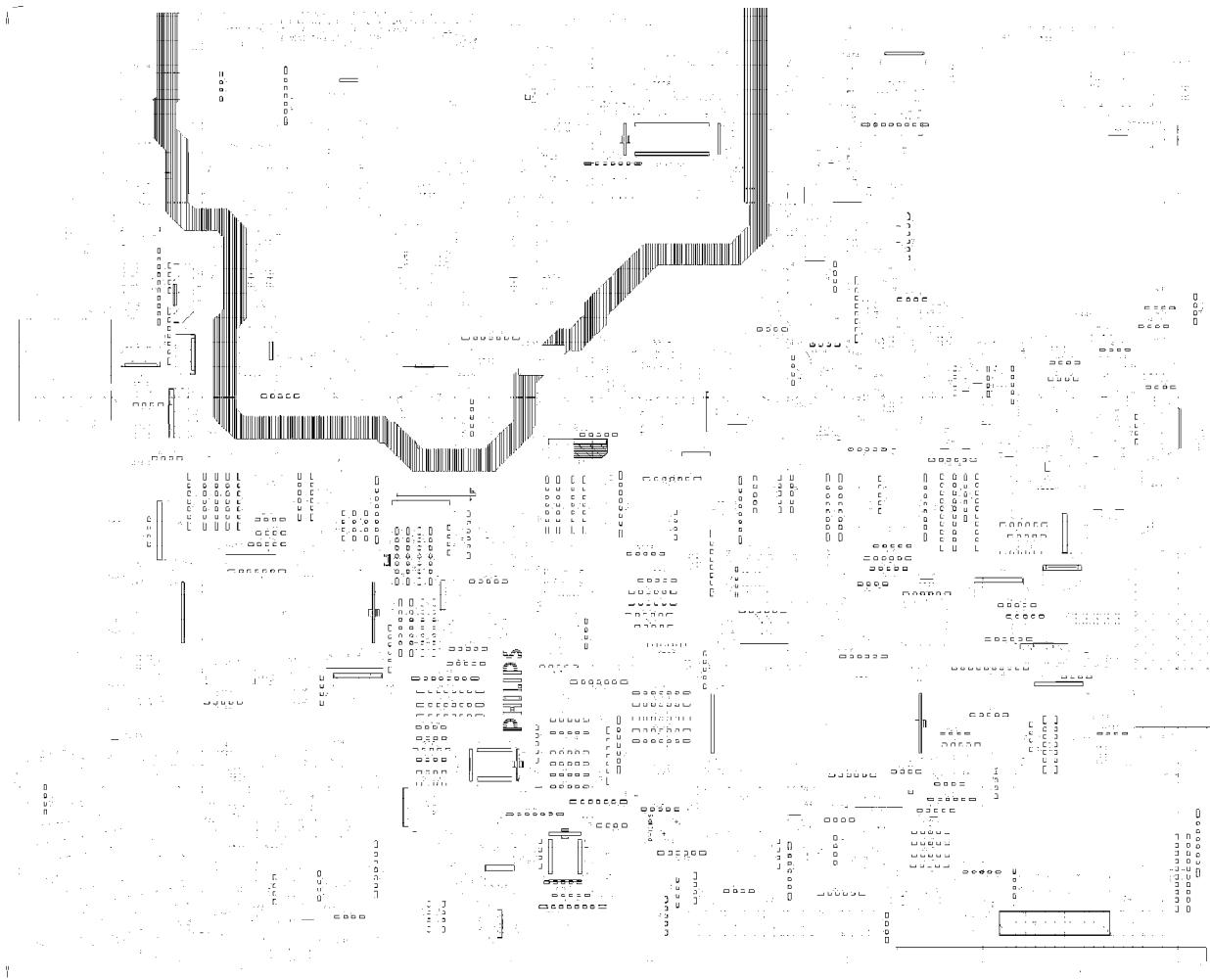






J CLOCK



**Main Chassis
CBA (Top)**

**Main Chassis
CBA (Bottom)**