

SAFETY PRECAUTIONS

SERVICE WARNING

Only qualified service technicians who are familiar with safety checks and guidelines should perform service work. Before replacing parts, disconnect power source to protect electrostatically sensitive parts. Do not attempt to modify any circuit unless so recommended by the manufacturer. When servicing the receiver, use an isolation transformer between the line cord and power receptacle.

SERVICING THE HIGH VOLTAGE AND CRT

Use EXTREME CAUTION when servicing the high voltage circuits. To discharge static high voltage, connect a 10K ohms resistor in series with a test lead between the receiver ground and CRT anode lead. DO NOT lift the CRT by the neck. Always wear shatterproof goggles when handling the CRT to protect eyes in case of implosion.

X-RAY RADIATION AND HIGH VOLTAGE LIMITS

Be aware of the instructions and procedures covering X-ray radiation. In solid-state receivers and monitors, the CRT is the only potential source of X-rays. Keep an accurate high voltage meter available at all times. Check meter calibration periodically. Whenever servicing a receiver, check the high voltage at various brightness levels to be sure it is regulating properly. Keep high voltage at rated value, NO HIGHER. Excessive high voltage may cause X-ray radiation or failure of associated components. DO NOT depend on protection circuits to keep voltage at rated value. When troubleshooting a receiver with excessive high voltage, avoid close contact with the CRT. DO NOT operate the receiver longer than necessary. To locate the cause of excessive high voltage, use a variable AC transformer to regulate voltage. In present receivers, many electrical and mechanical components have safety related characteristics which are not detectable by visual inspection. Such components are identified by a # on both the schematic and the parts list. For SAFETY, use only equivalent replacement parts when replacing these components.

GENERAL GUIDELINES

Perform a final SAFETY CHECK before returning receiver to customer. Check repaired area for poorly soldered connections, and check entire circuit board for solder splashes. Check board wiring for pinched wires or wires contacting any high wattage resistors. Check that all control knobs, shields, covers, grounds, and mounting hardware have been replaced. Be sure to replace all insulators and restore proper lead dress.

The listing of any available replacement part herein in no case constitutes a recommendation, warranty, or guarantee by SAMS Technical Publishing, LLC as to the quality and suitability of such replacement part. The numbers of the listed parts have been compiled from information furnished to SAMS Technical Publishing, LLC by the manufacturers of the specific type of replacement part listed.

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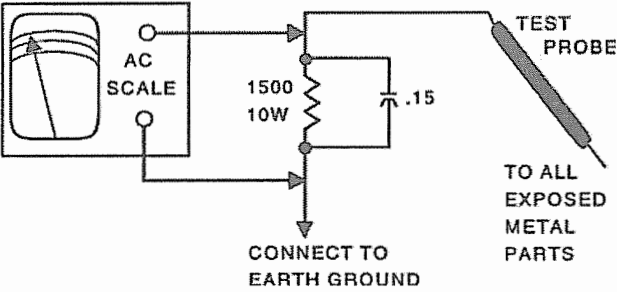
SAFETY CHECKS — FIRE AND SHOCK HAZARD

Cold Leakage Checks for Receivers with Isolated Ground

Unplug the AC cord, connect a jumper across the plug prongs, and turn the power switch on (if applicable). Use an ohmmeter to measure the resistance between the jumped AC plug and any exposed metal cabinet parts such as antenna screw heads, control shafts, or handle brackets. Exposed metal parts with a return path should measure between 1M ohms and 5.2M ohms. Parts without a return path must measure infinity.

Hot Leakage Current Check

Plug the AC cord directly into an AC outlet. DO NOT use an isolation transformer. Use a 1500 ohms, 10W resistor in parallel with a .15µF capacitor to connect between any exposed metal parts on the receiver and a good earth ground. (See figure below.) Use an AC voltmeter with at least 5000 ohms per volt sensitivity to measure the voltage across the resistor. Check all exposed metal parts and measure voltage at each point. Voltage measurements should not exceed .75VAC, 500µA. Any value exceeding this limit constitutes a potential shock hazard and must be corrected. If the AC plug is not polarized, reverse the AC plug and repeat exposed metal part voltage measurement at each point.



PHOTOFACT[®] Technical Service Data
HD
PHILIPS
Model 46PP9302/17 (Chassis DPTV330)

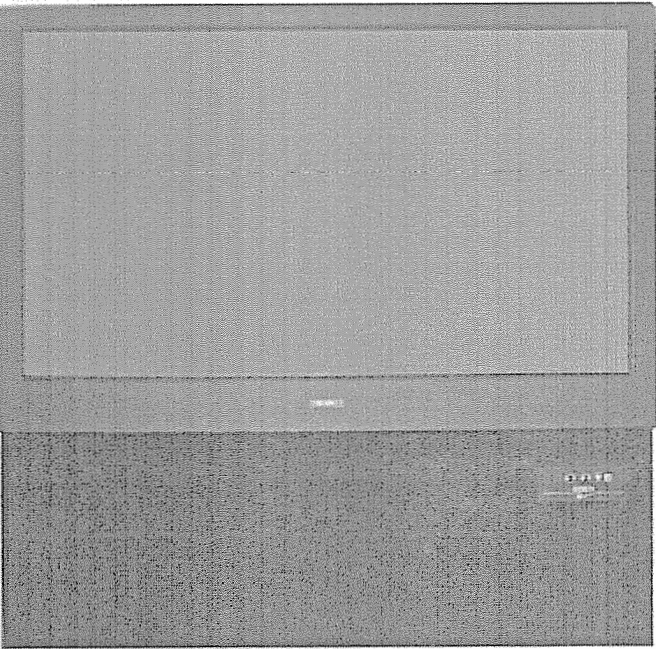
SET 5182

MODEL 46PP9302/17 (CHASSIS DPTV330)

PHILIPS

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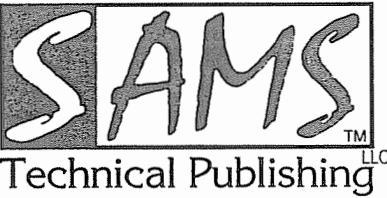


Representative Model
Essential coverage
for servicing a television receiver...

- Schematics
- Component locations
- Parts list

Coverage includes these additional models and chassis:

Models	Chassis
46PP9302H17	DPTV330F
46PP930201	DPTV330
46PP930217F	DPTV330F
46PP930284	DPTV330
46PP930284F	DPTV330F
46PP930299	DPTV330F

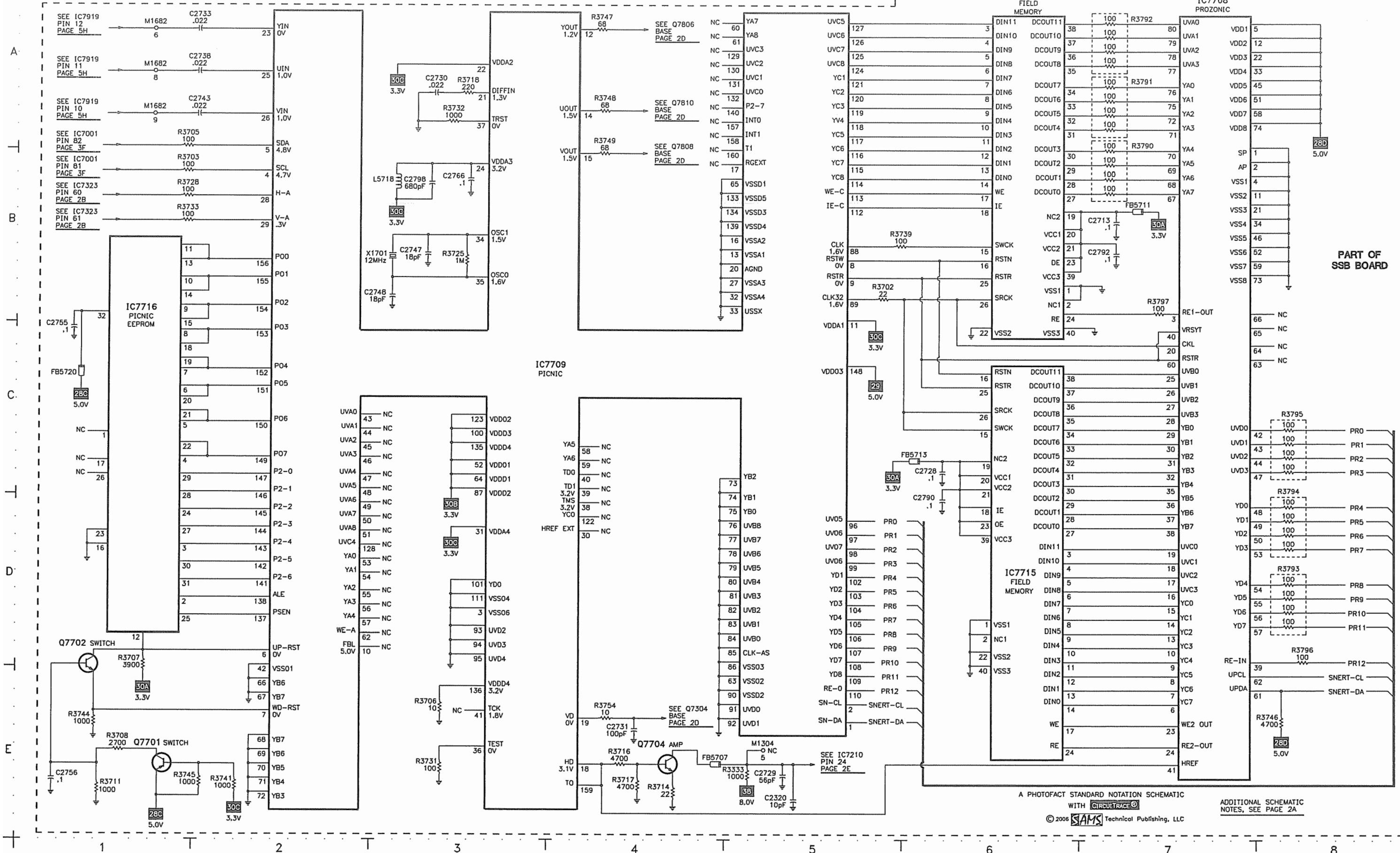


SEPTEMBER 2006 SET 5182

For a Complete List of Manuals,
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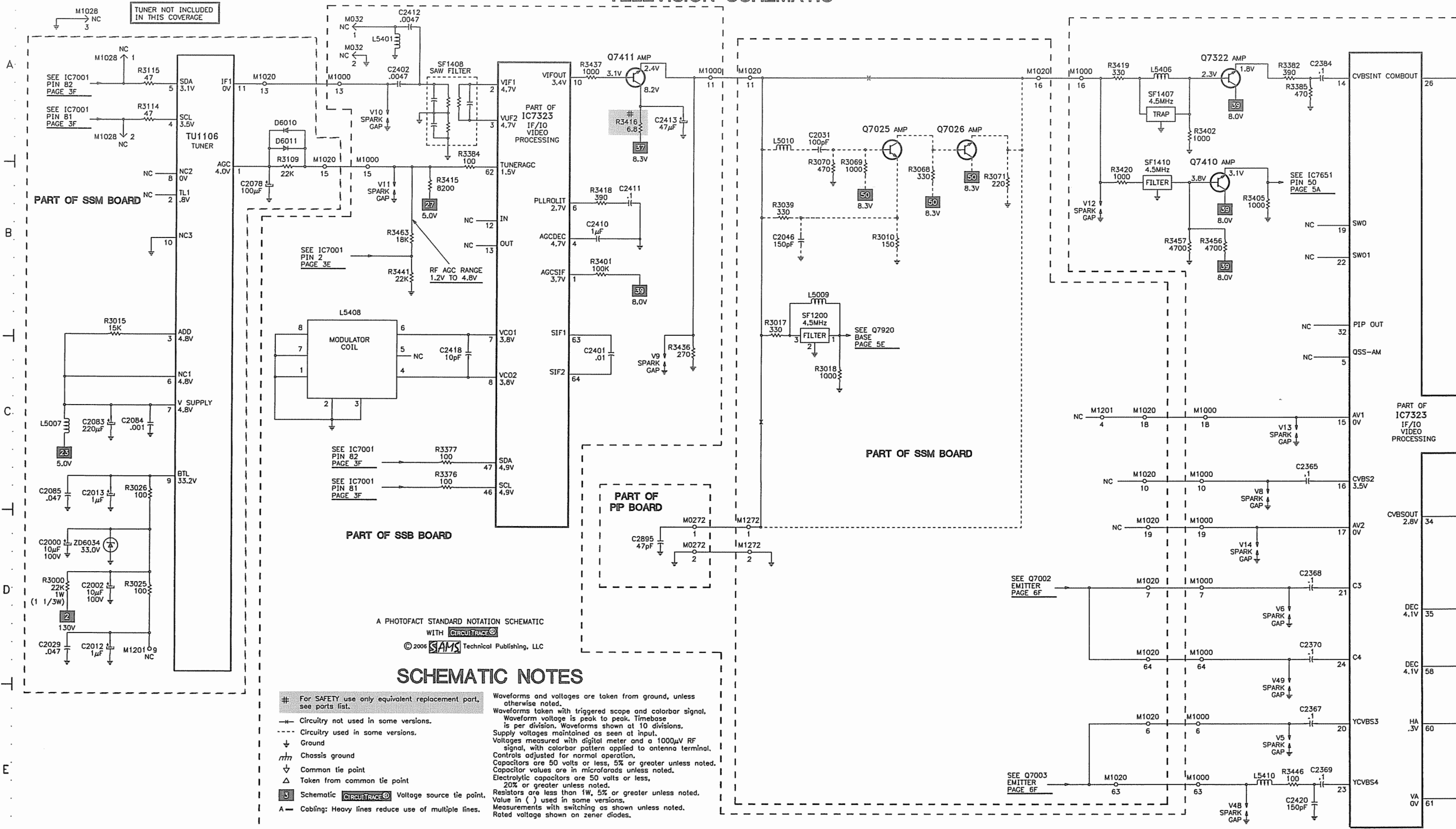
FEATURES SCHEMATIC



A

B

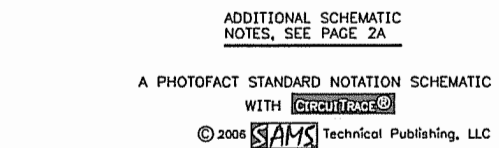
TELEVISION SCHEMATIC



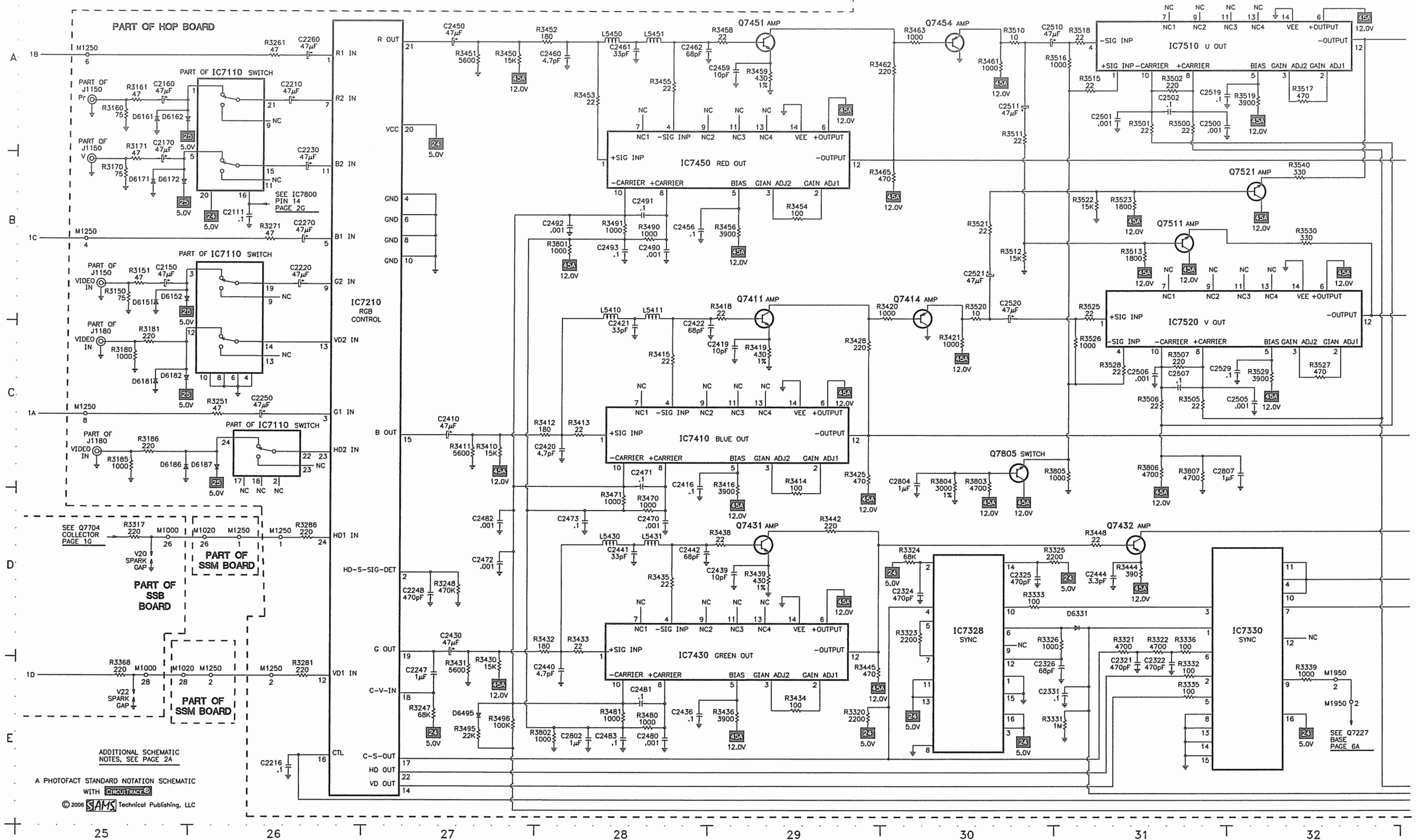
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WITH CIRCUITTRACE[®]
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SCHEMATIC NOTES

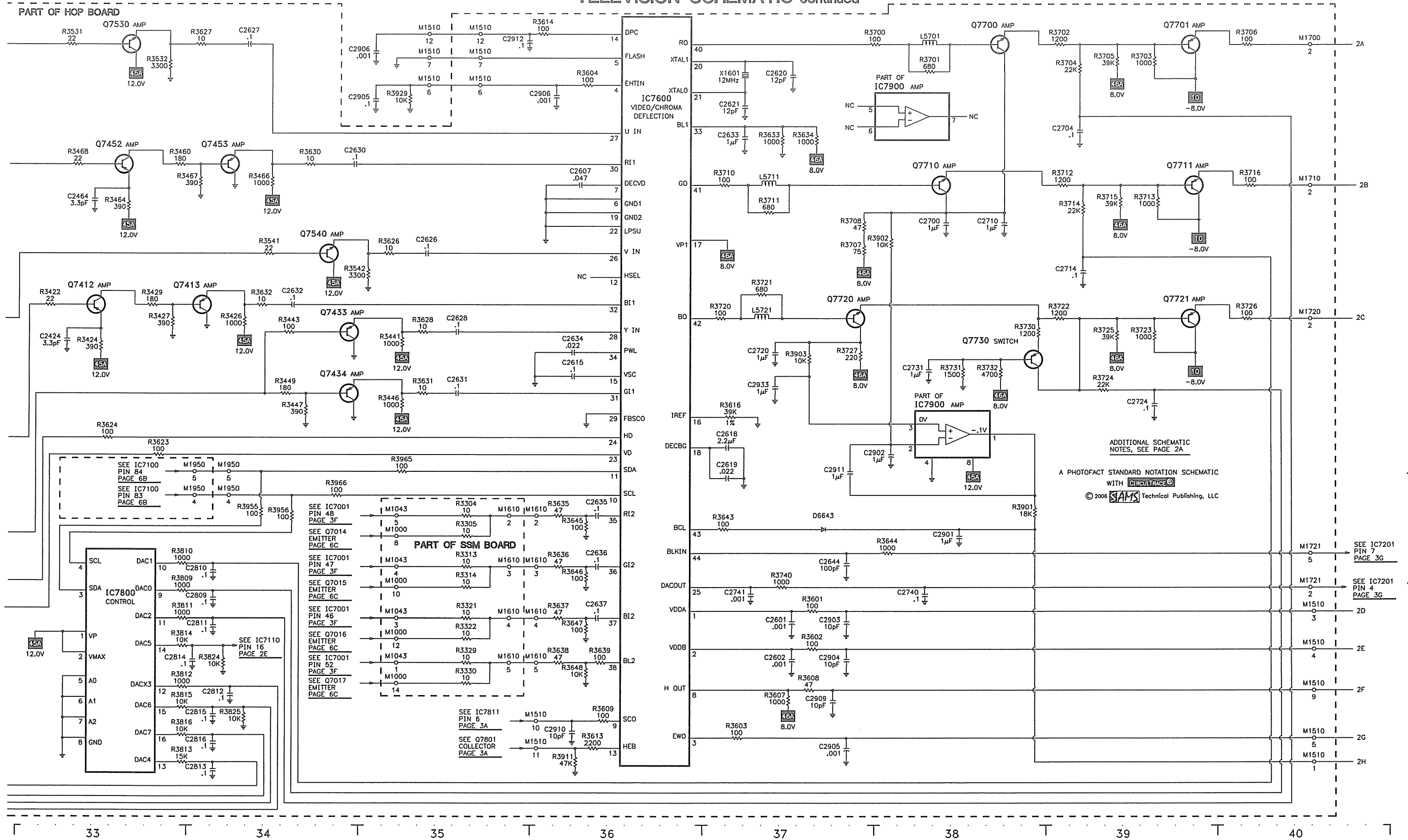
- # For SAFETY use only equivalent replacement part, see parts list.
 - Circuitry not used in some versions.
 - - - Circuitry used in some versions.
 - ⬇ Ground
 - ⏏ Chassis ground
 - ⬇ Common tie point
 - ⬇ Taken from common tie point
 - 3 Schematic CIRCUITTRACE[®] Voltage source tie point.
 - A Cabling: Heavy lines reduce use of multiple lines.
- Waveforms and voltages are taken from ground, unless otherwise noted.
Waveforms taken with triggered scope and colorbar signal.
Waveform voltage is peak to peak. Timebase is per division. Waveforms shown at 10 divisions.
Supply voltages maintained as seen at input.
Voltages measured with digital meter and a 1000μV RF signal, with colorbar pattern applied to antenna terminal.
Controls adjusted for normal operation.
Capacitors are 50 volts or less, 5% or greater unless noted.
Capacitor values are in microfarads unless noted.
Electrolytic capacitors are 50 volts or less, 20% or greater unless noted.
Resistors are less than 1W, 5% or greater unless noted.
Value in () used in some versions.
Measurements with switching as shown unless noted.
Rated voltage shown on zener diodes.



TELEVISION SCHEMATIC continued



TELEVISION SCHEMATIC continued

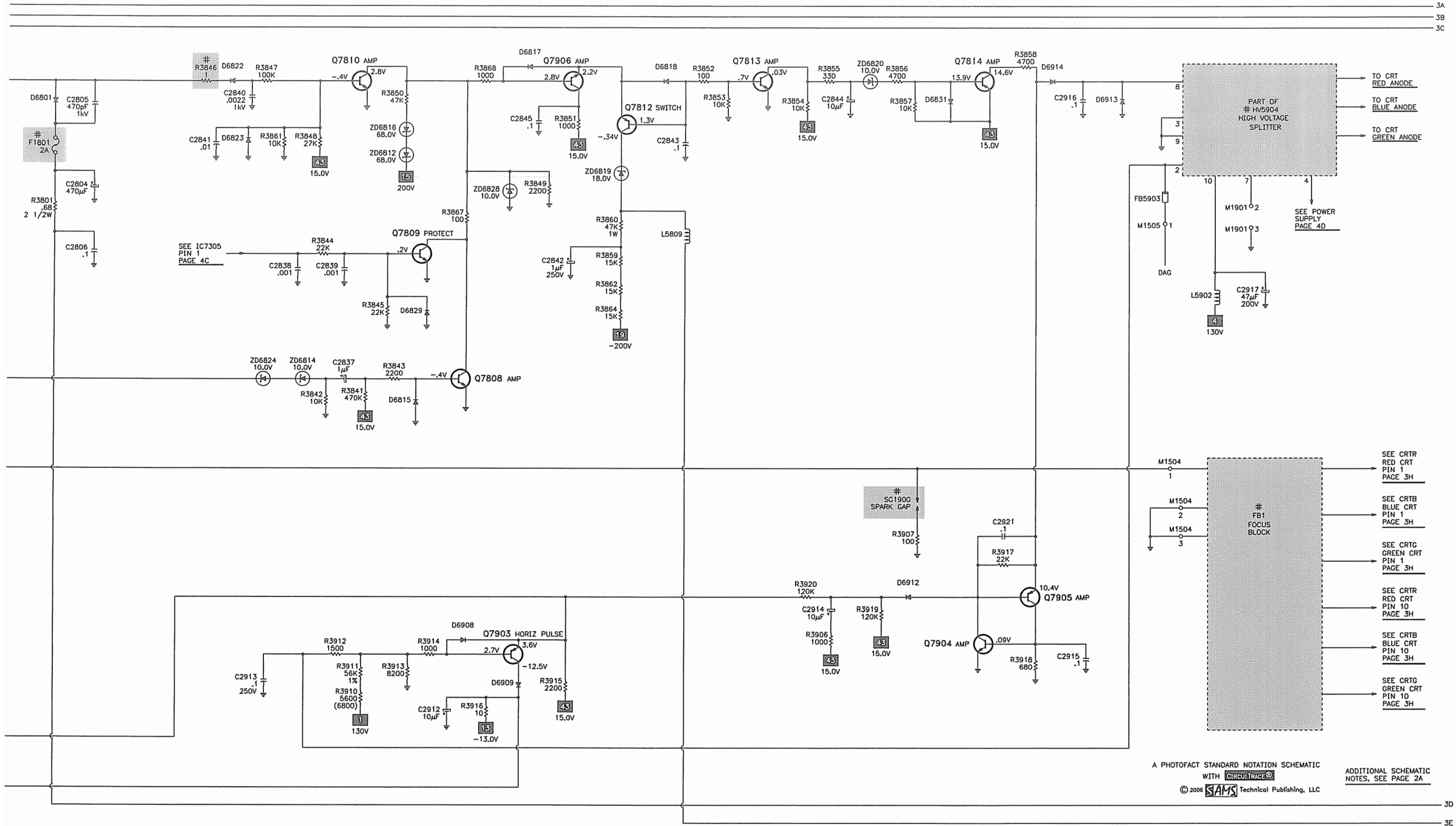


PHILIPS
MODEL 46PP9302/17 (CHASSIS DPTV330)



ADDITIONAL SCHEMATIC
NOTES, SEE PAGE 2A

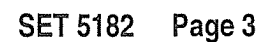
DEFLECTION SCHEMATIC continued



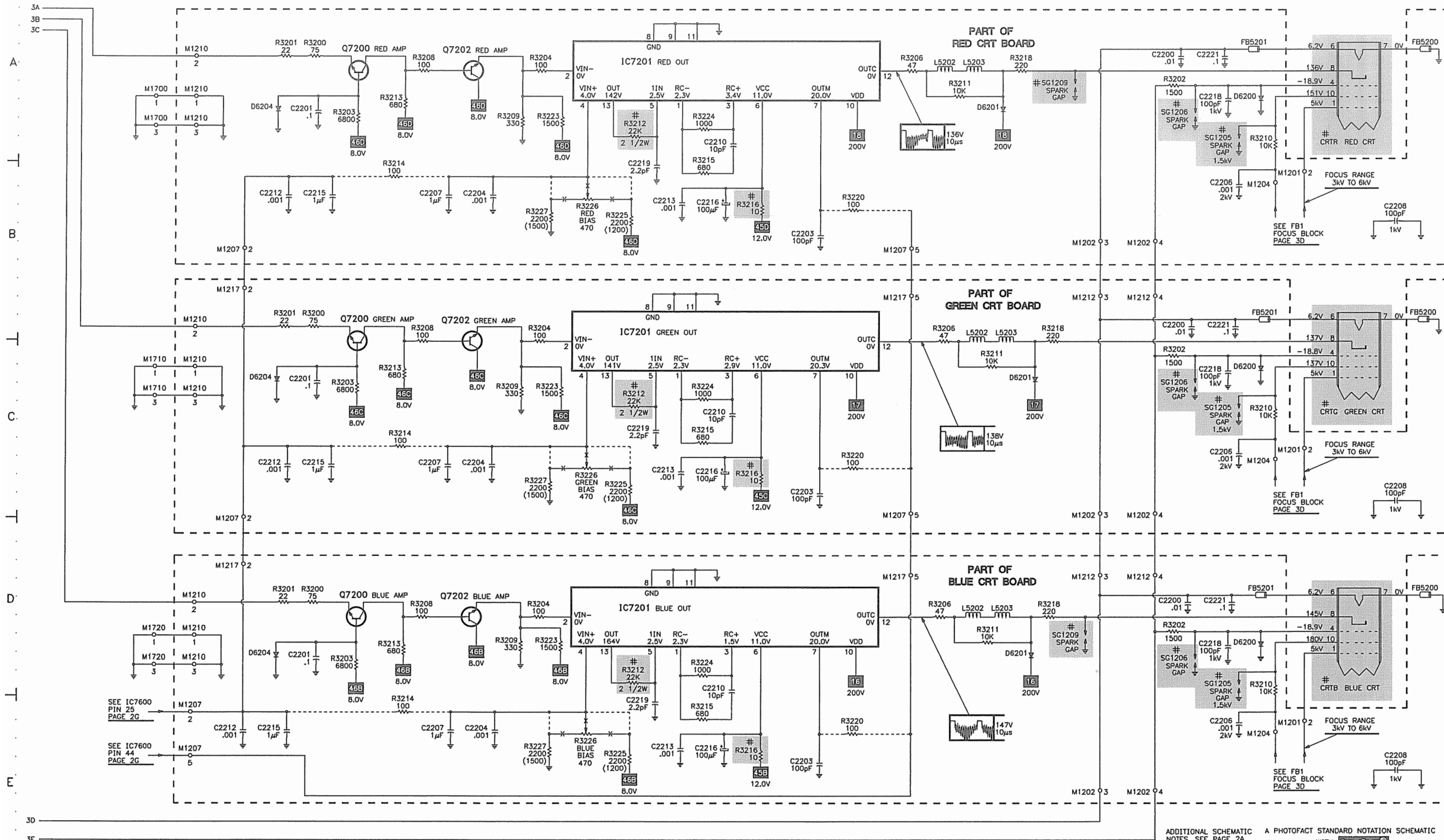
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ADDITIONAL SCHEMATIC
NOTES, SEE PAGE 2A

F



CRT SCHEMATIC



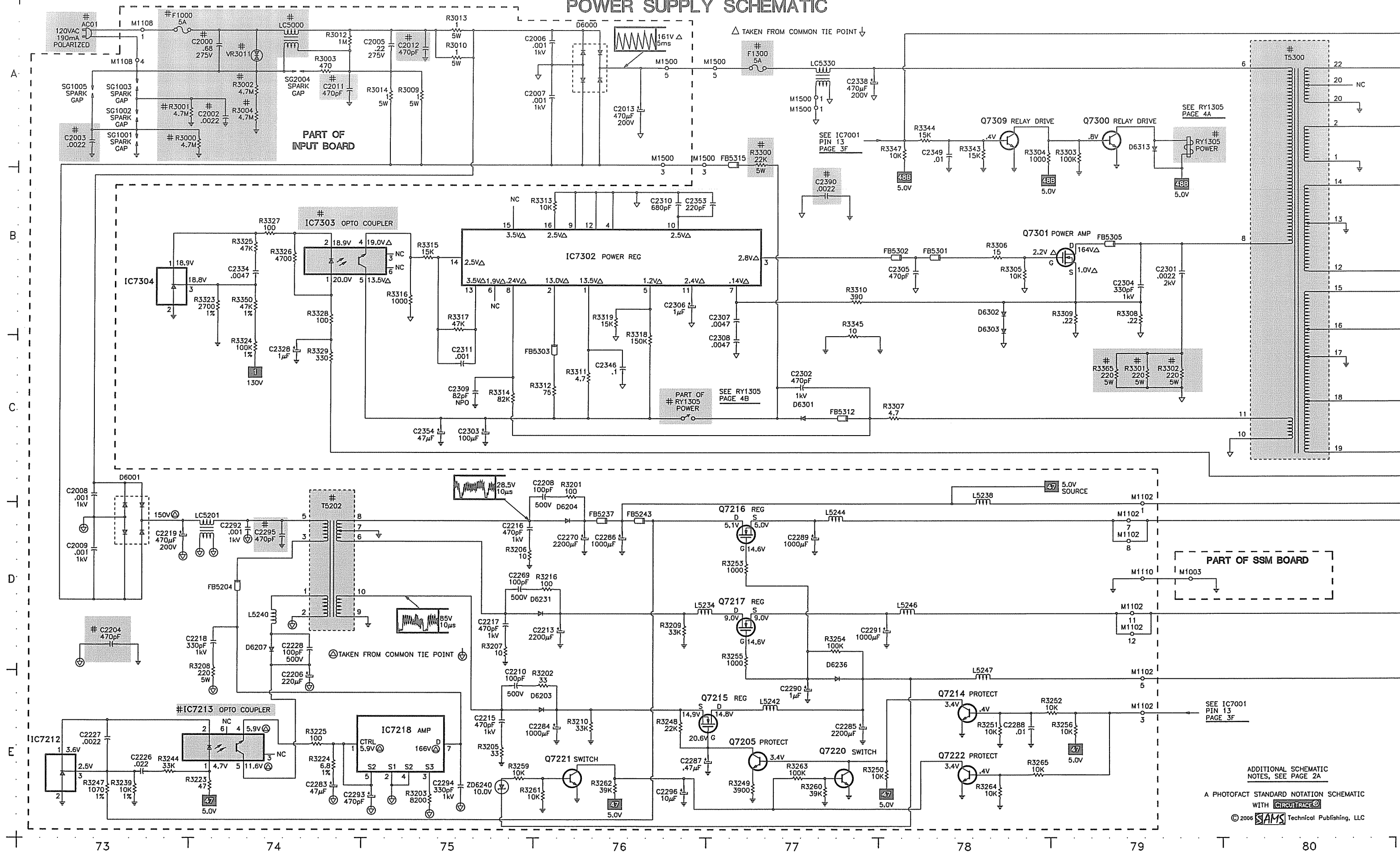
ADDITIONAL SCHEMATIC NOTES, SEE PAGE 2A

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PHILIPS
MODEL 46PP9302/17 (CHASSIS DPTV330)

POWER SUPPLY SCHEMATIC

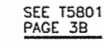


ADDITIONAL SCHEMATIC
NOTES, SEE PAGE 2A

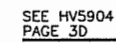
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ADDITIONAL SCHEMATIC
NOTES, SEE PAGE 2A

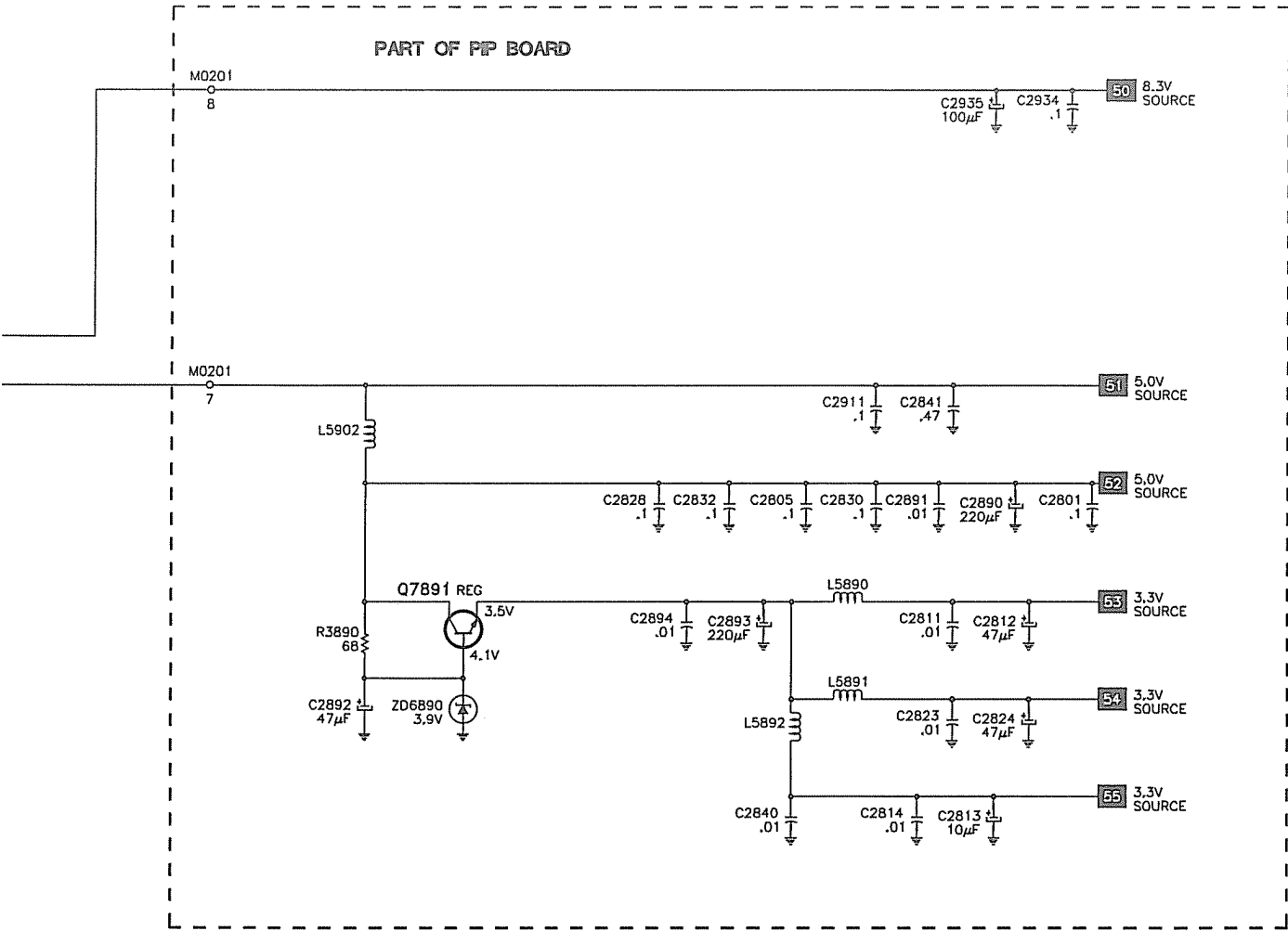


4E

F



G
POWER SUPPLY SCHEMATIC continued

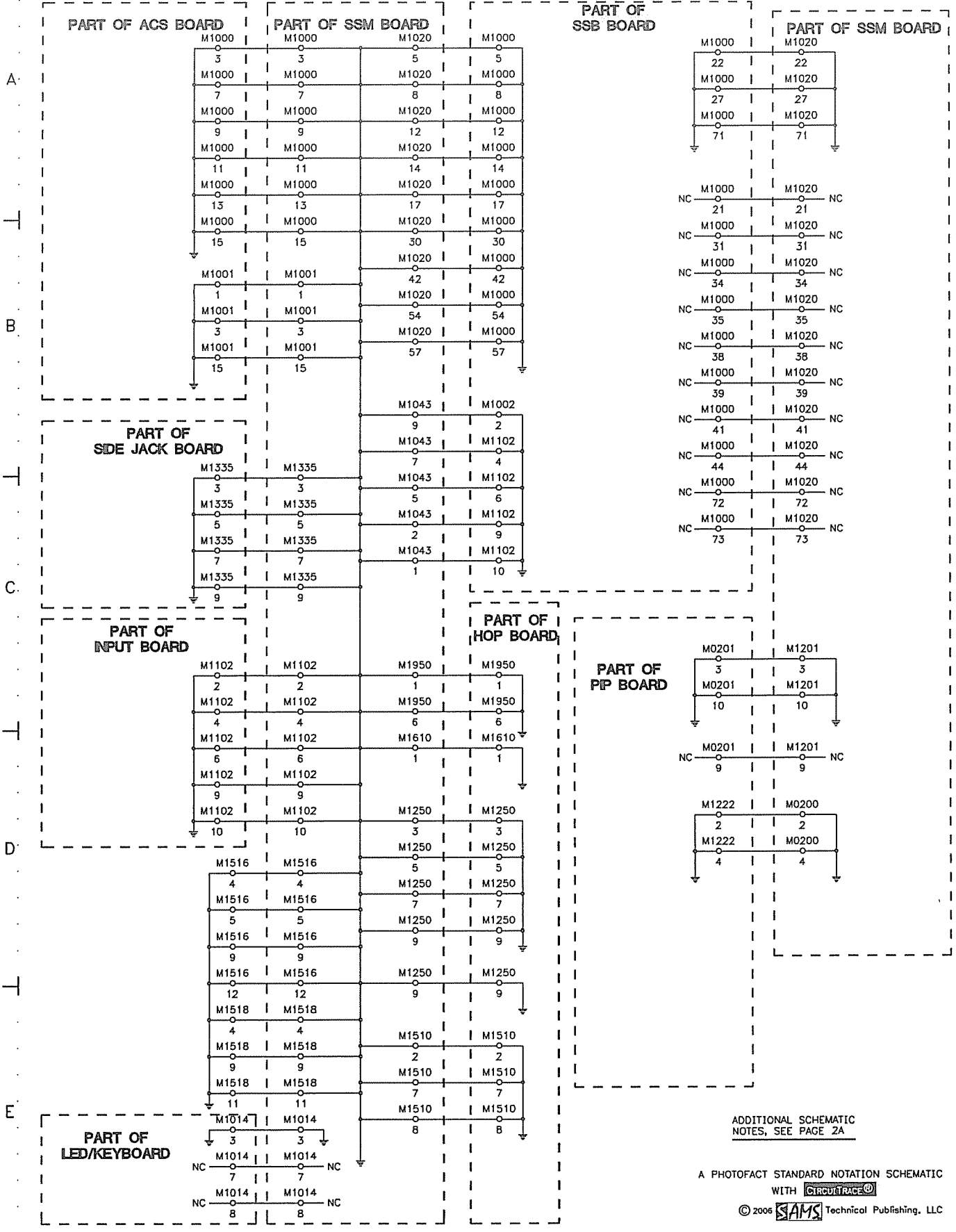


ADDITIONAL SCHEMATIC
NOTES, SEE PAGE 2A

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H
BOARD GROUND SCHEMATIC



ADDITIONAL SCHEMATIC
NOTES, SEE PAGE 2A

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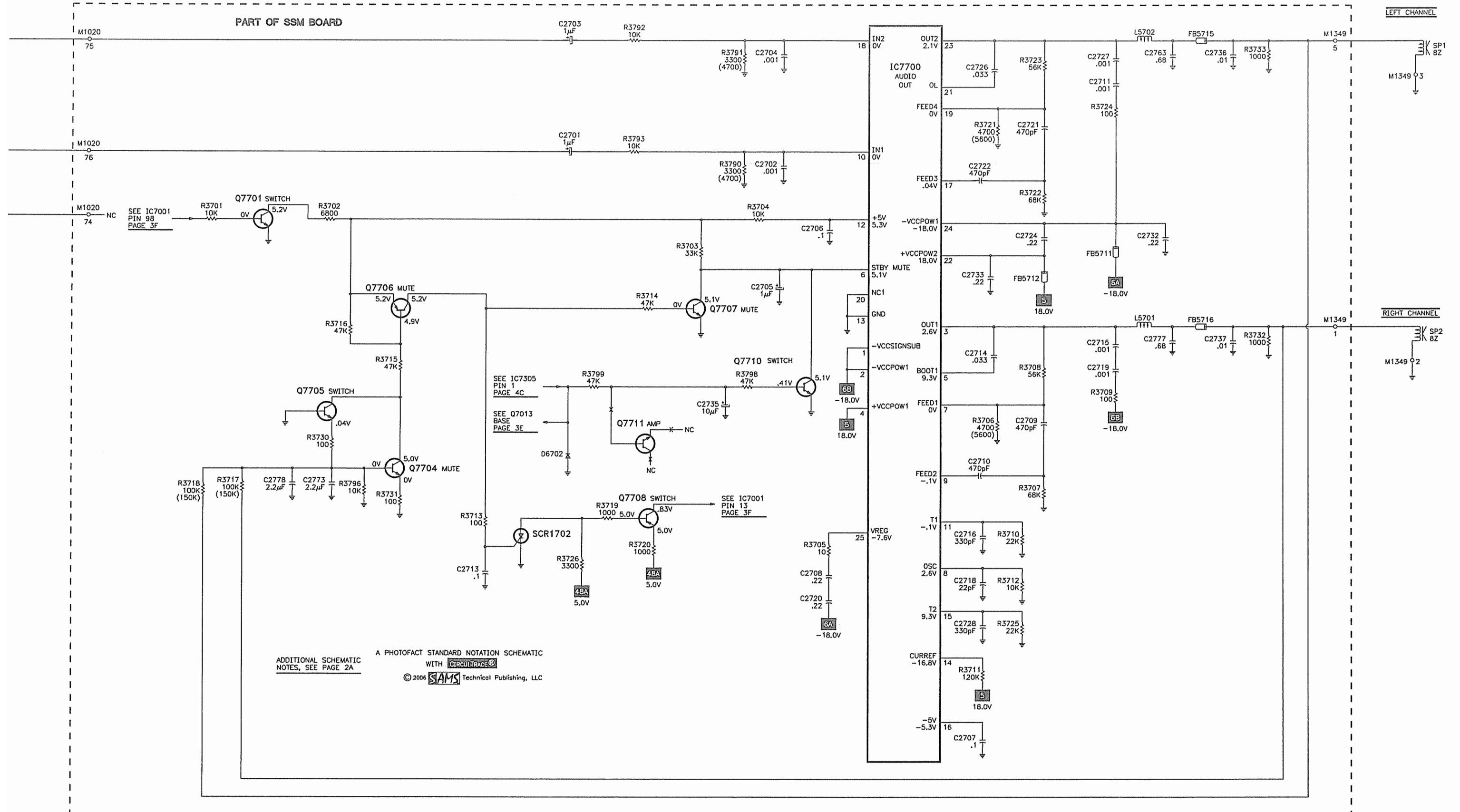
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c

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5.

AUDIO SCHEMATIC continued



VIDEO SWITCHING/PIP SCHEMATIC

A

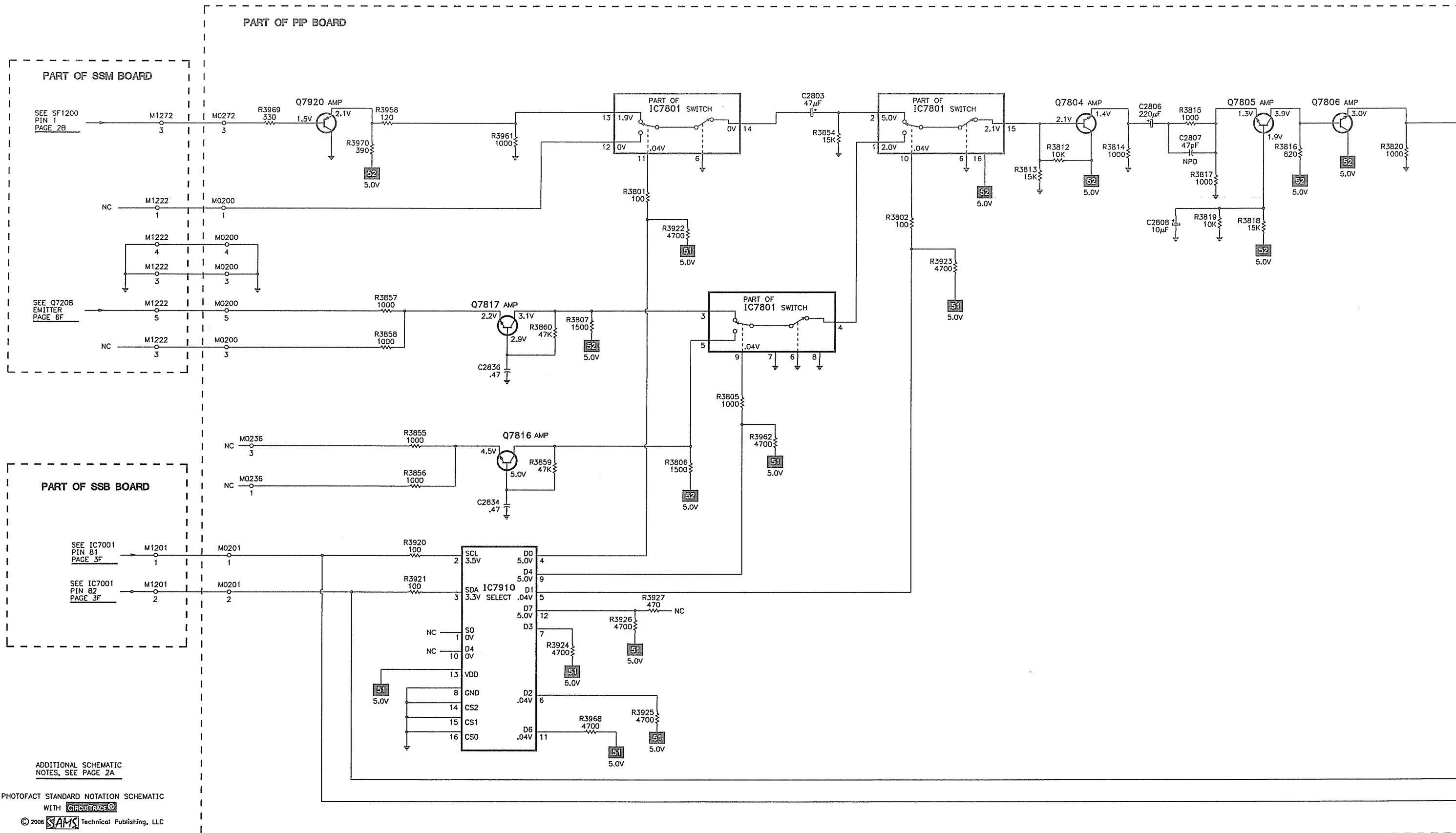
B

C

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E

F



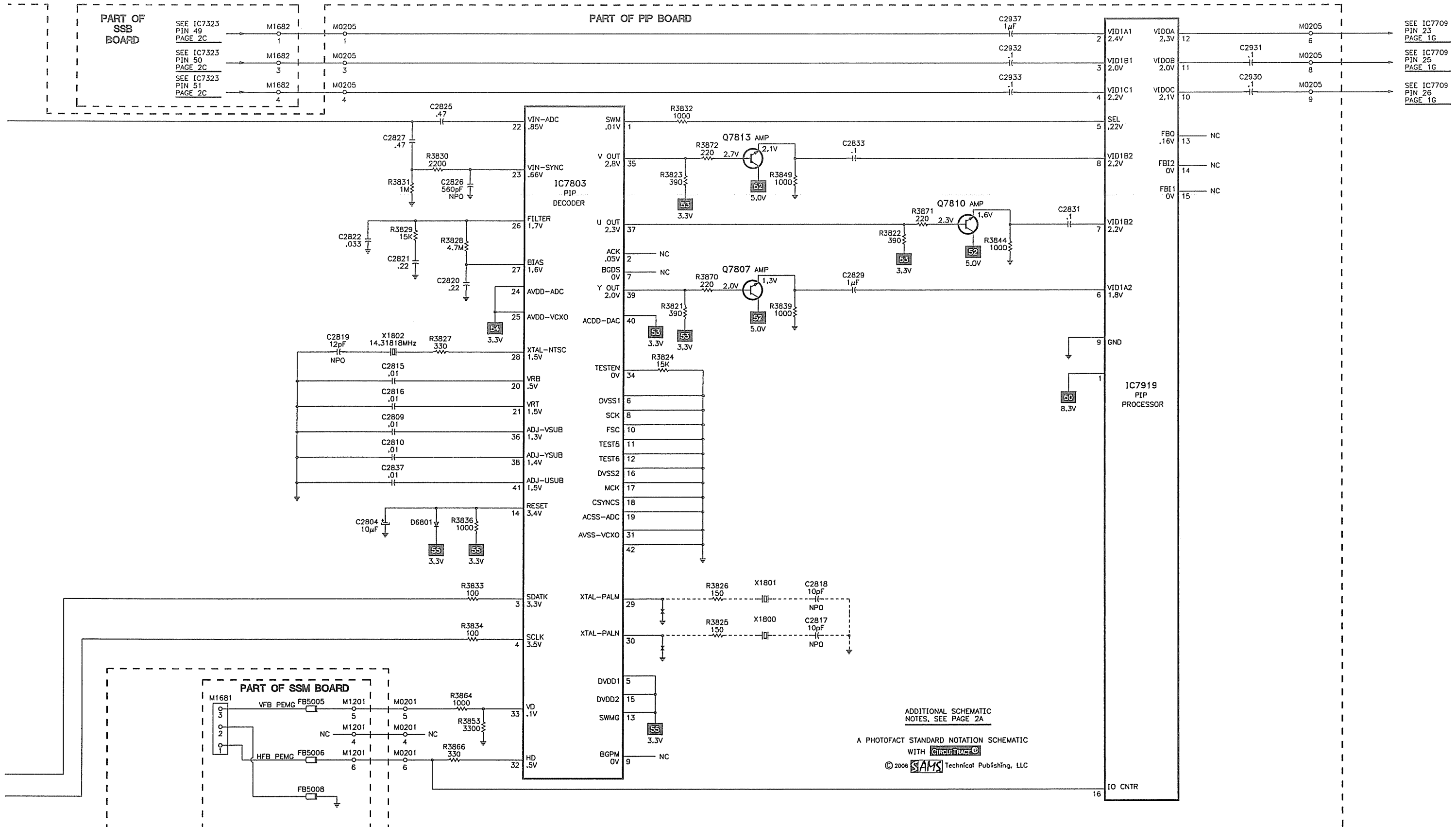
ADDITIONAL SCHEMATIC NOTES, SEE PAGE 2A

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G

PIP SCHEMATIC continued

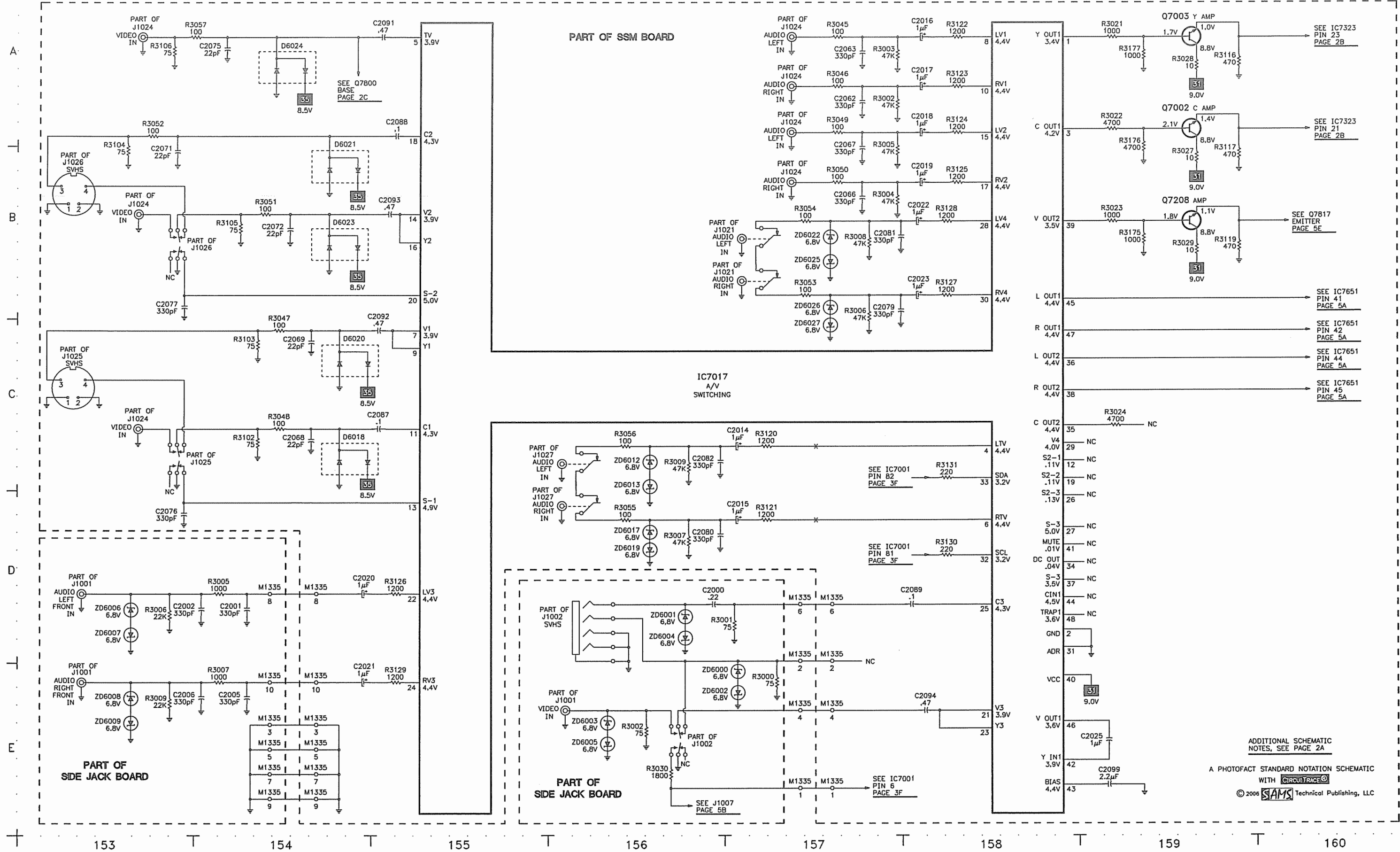
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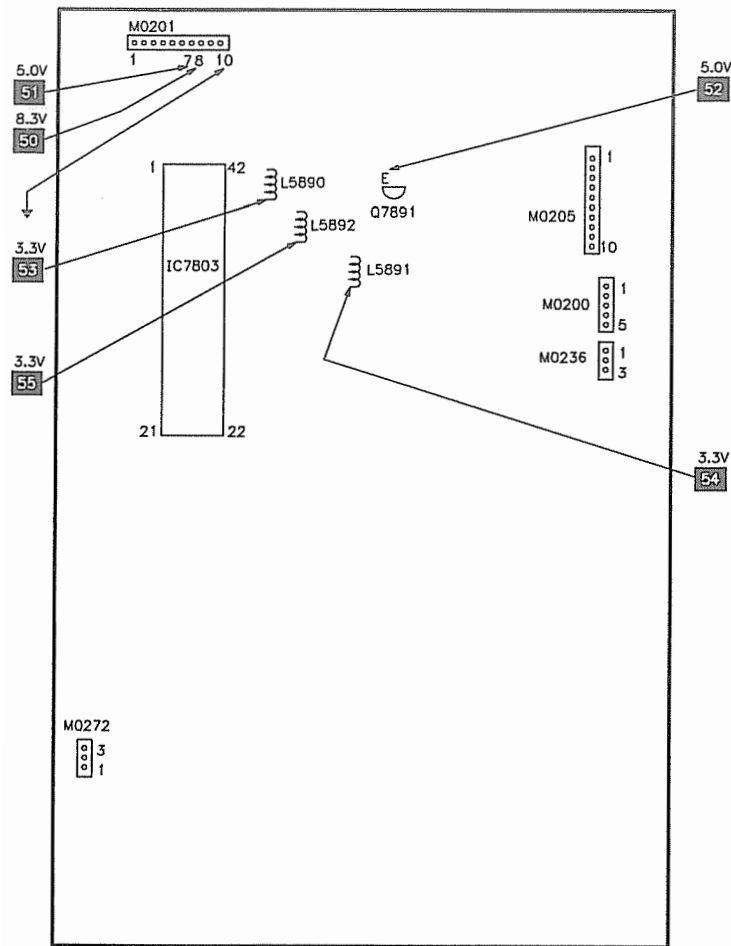


A/V SWITCHING SCHEMATIC

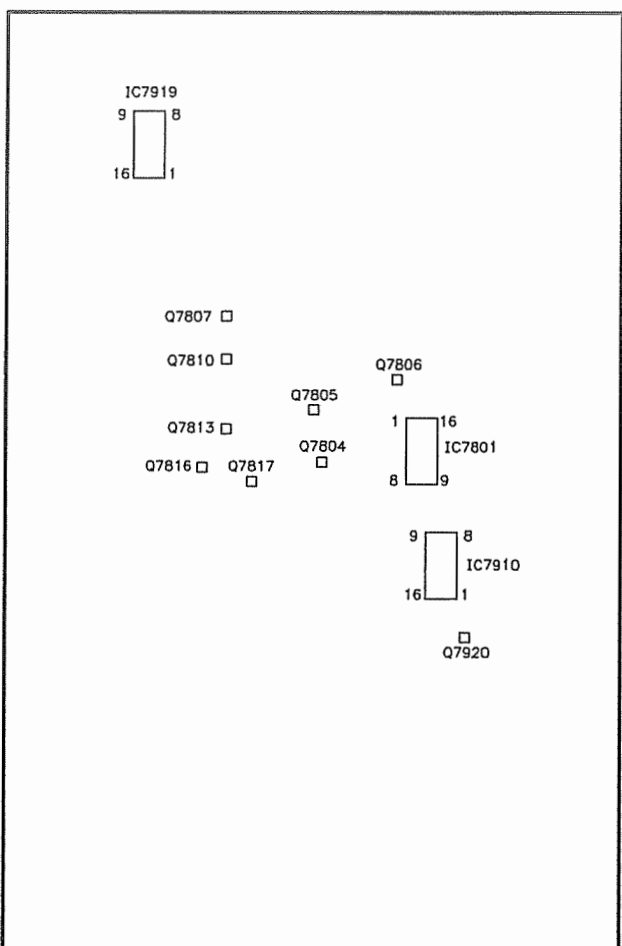


PLACEMENT CHART

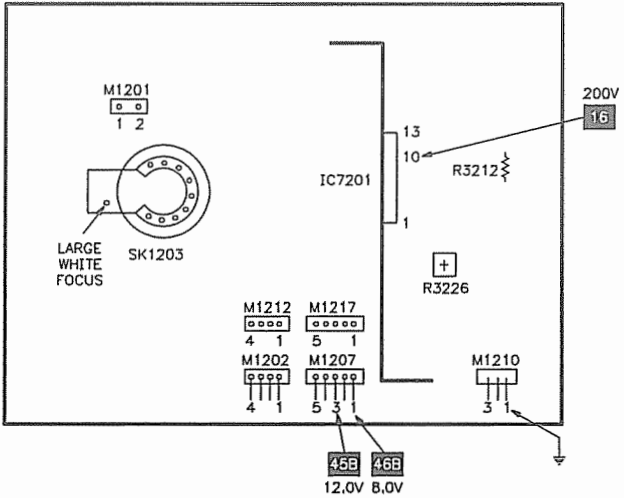
PIP BOARD - TOP VIEW



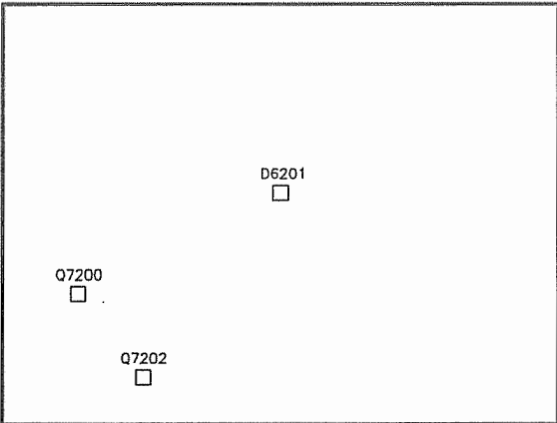
PIP BOARD - BOTTOM VIEW



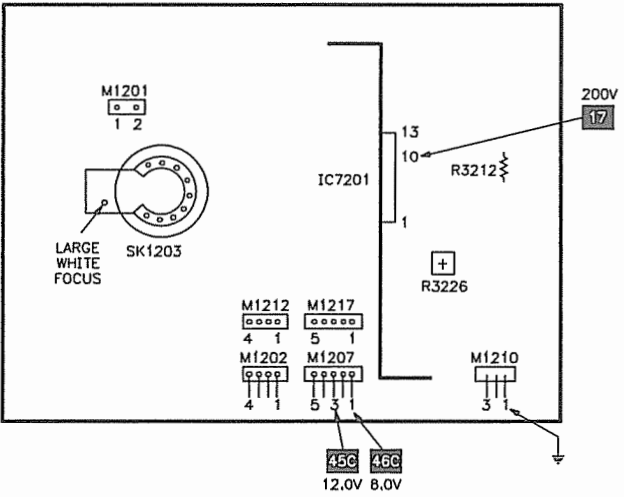
BLUE CRT BOARD - TOP VIEW



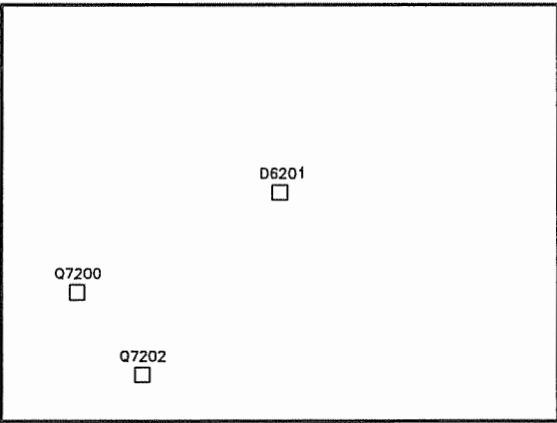
BLUE CRT BOARD - BOTTOM VIEW



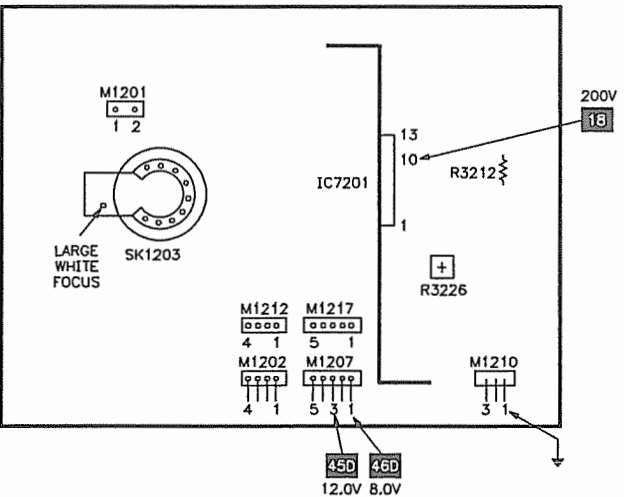
GREEN CRT BOARD - TOP VIEW



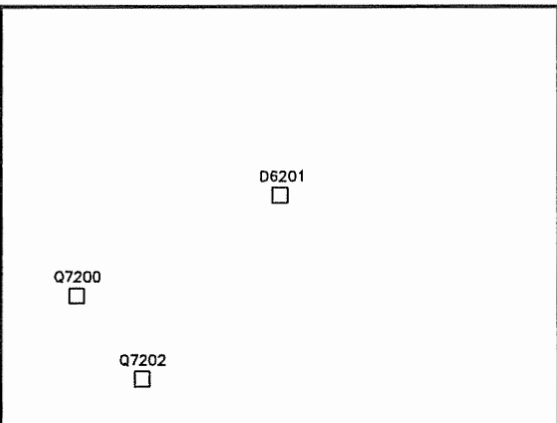
GREEN CRT BOARD - BOTTOM VIEW

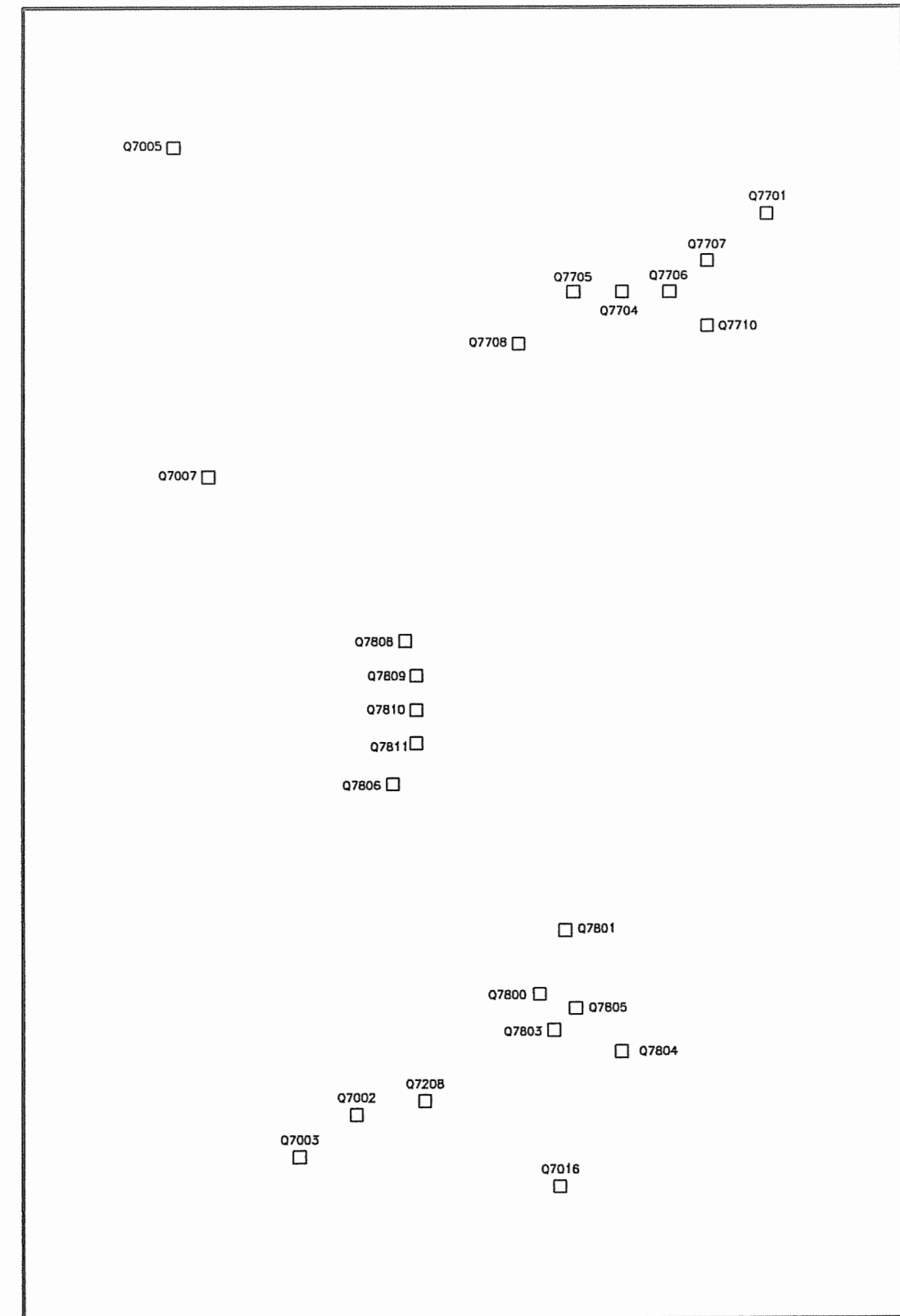


RED CRT BOARD - TOP VIEW

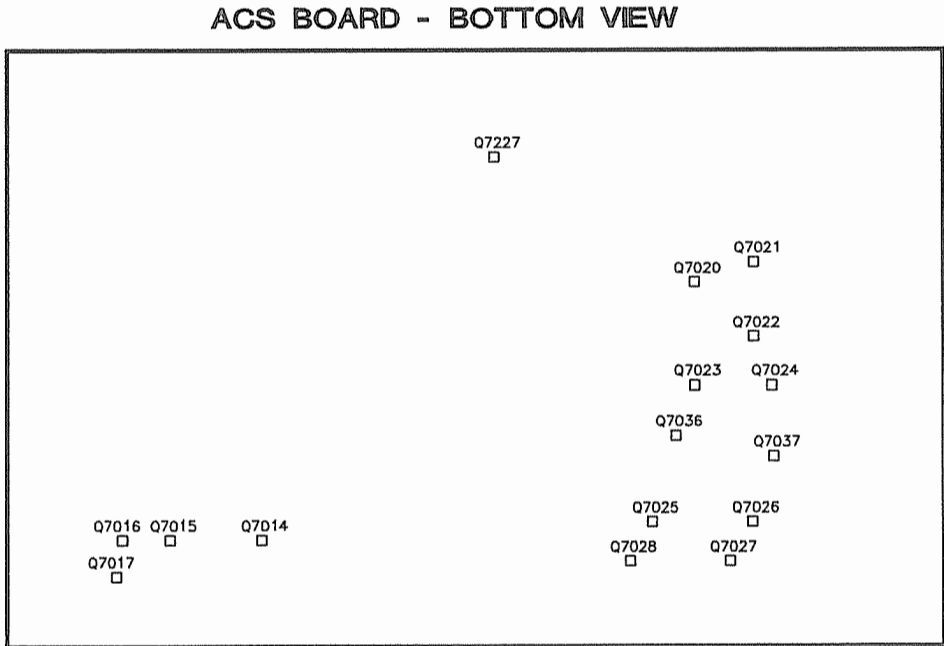
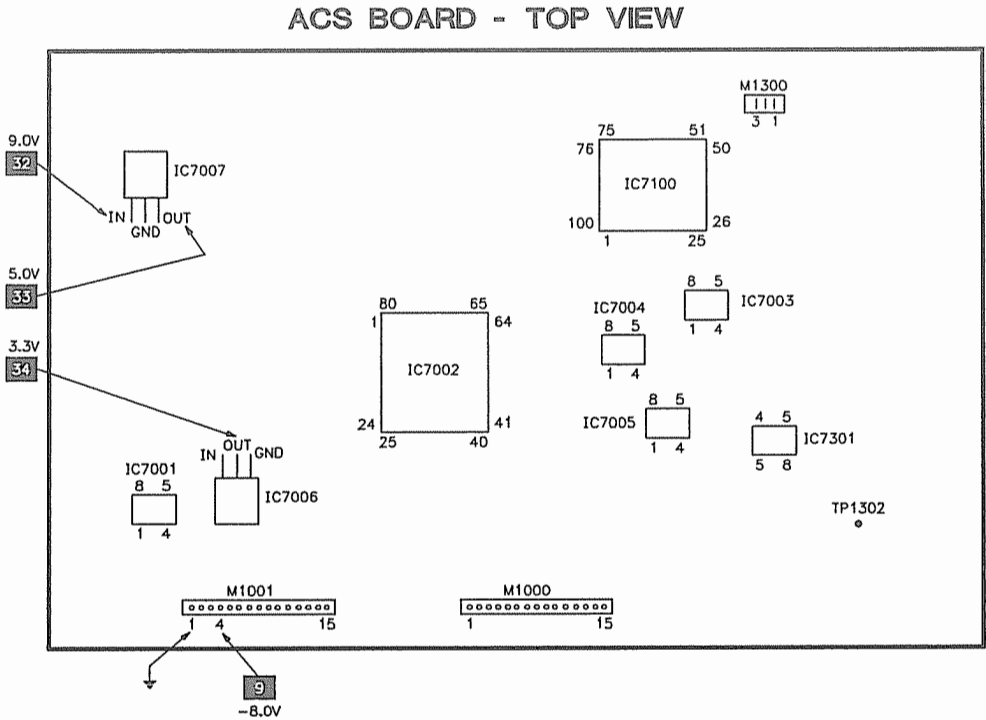
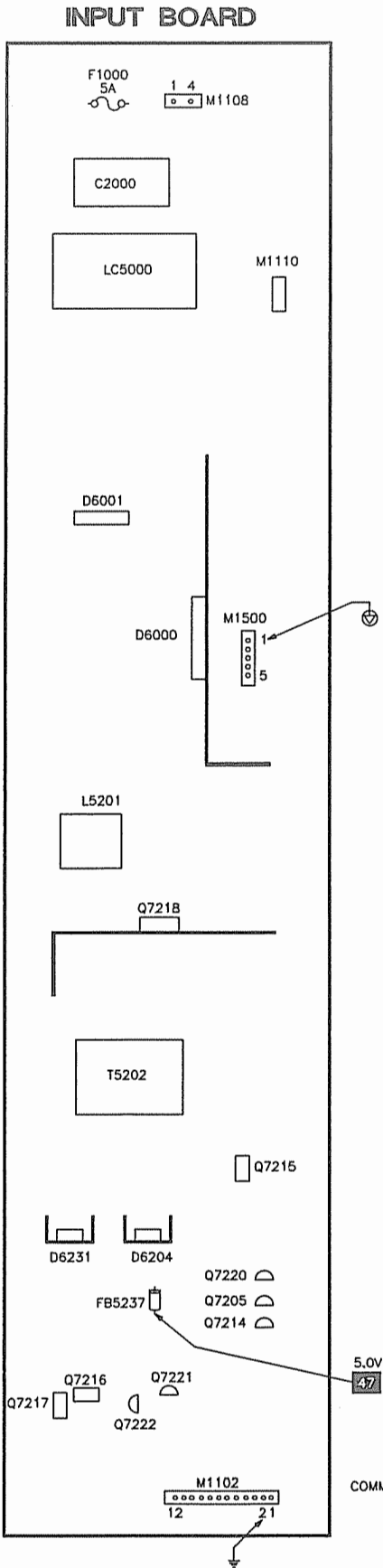
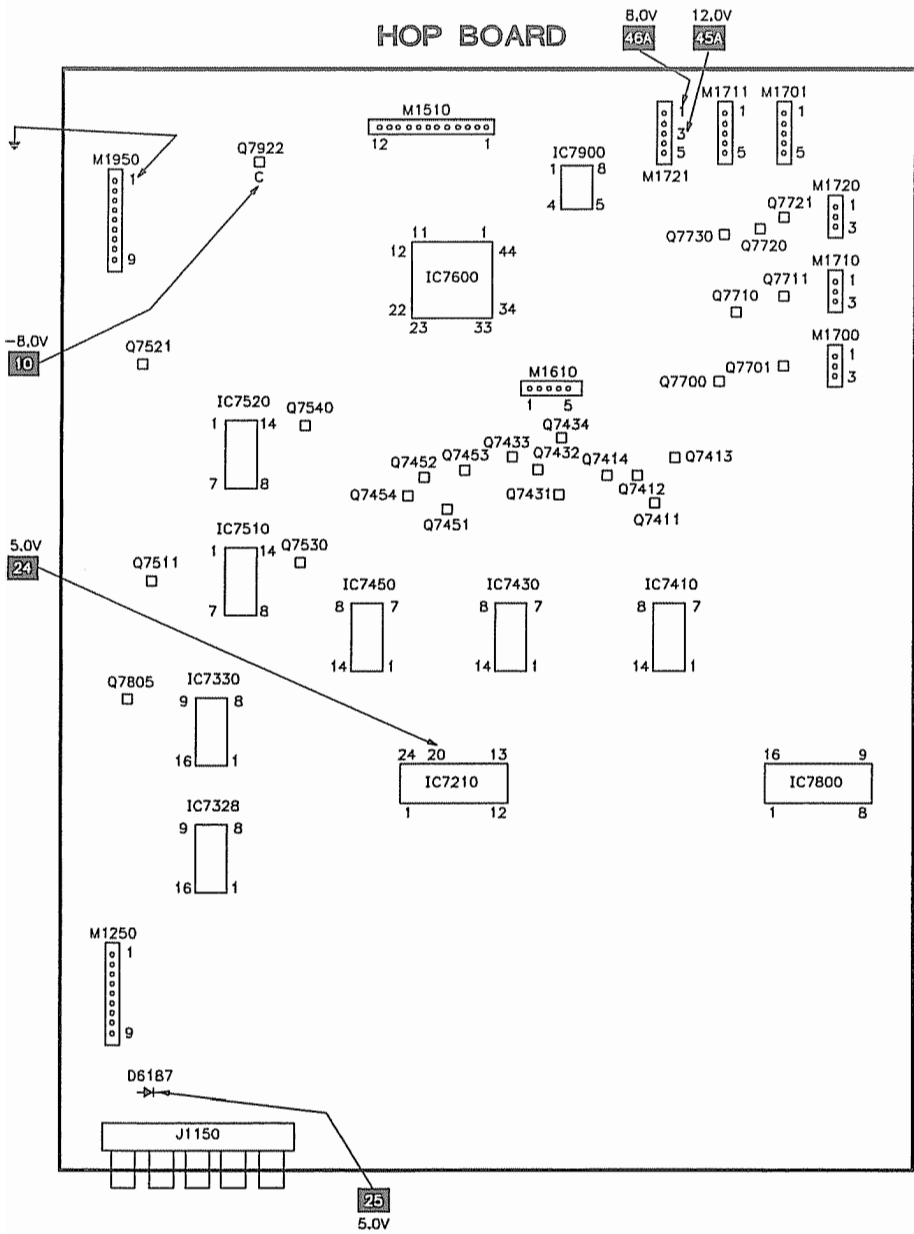


RED CRT BOARD - BOTTOM VIEW

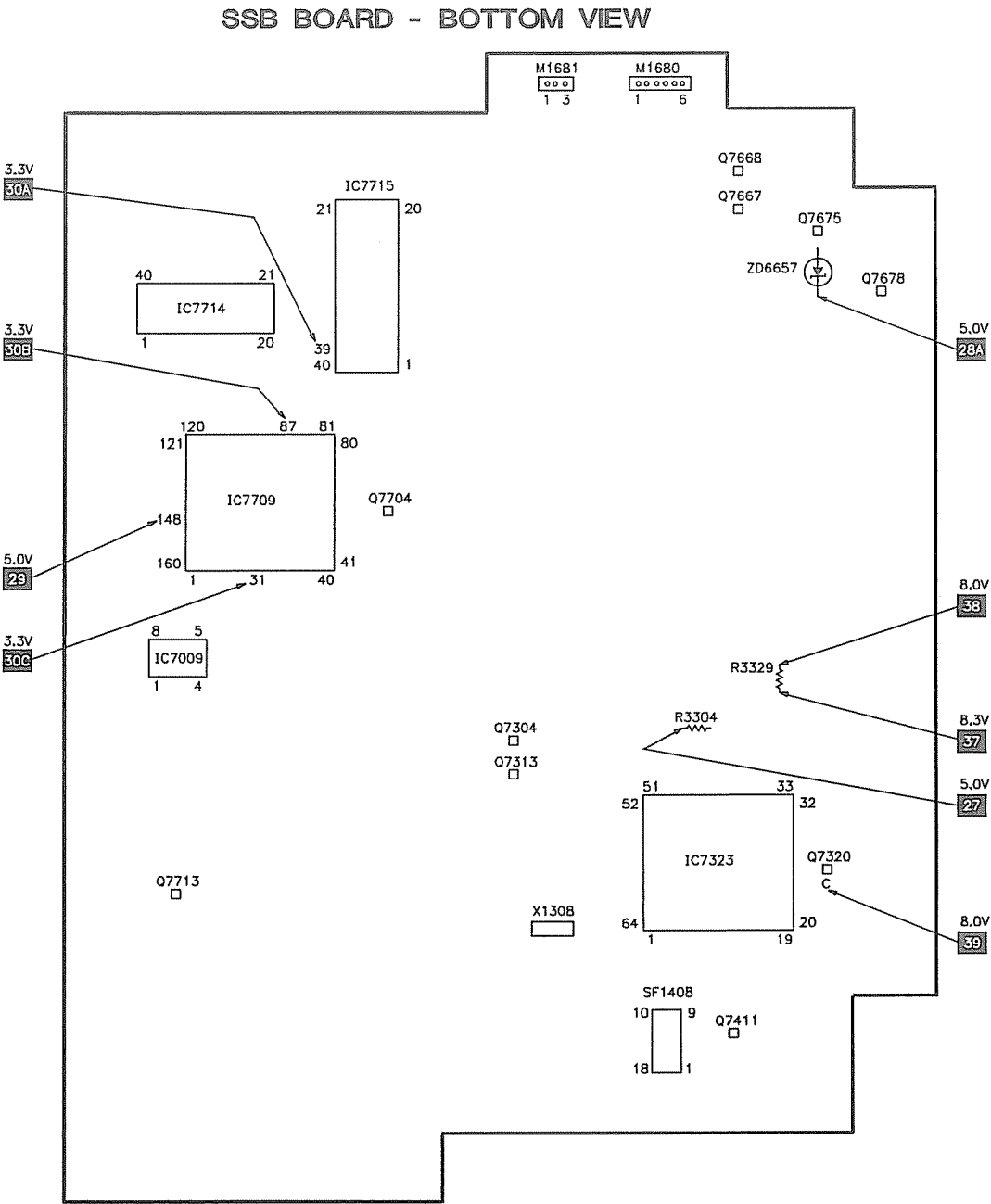
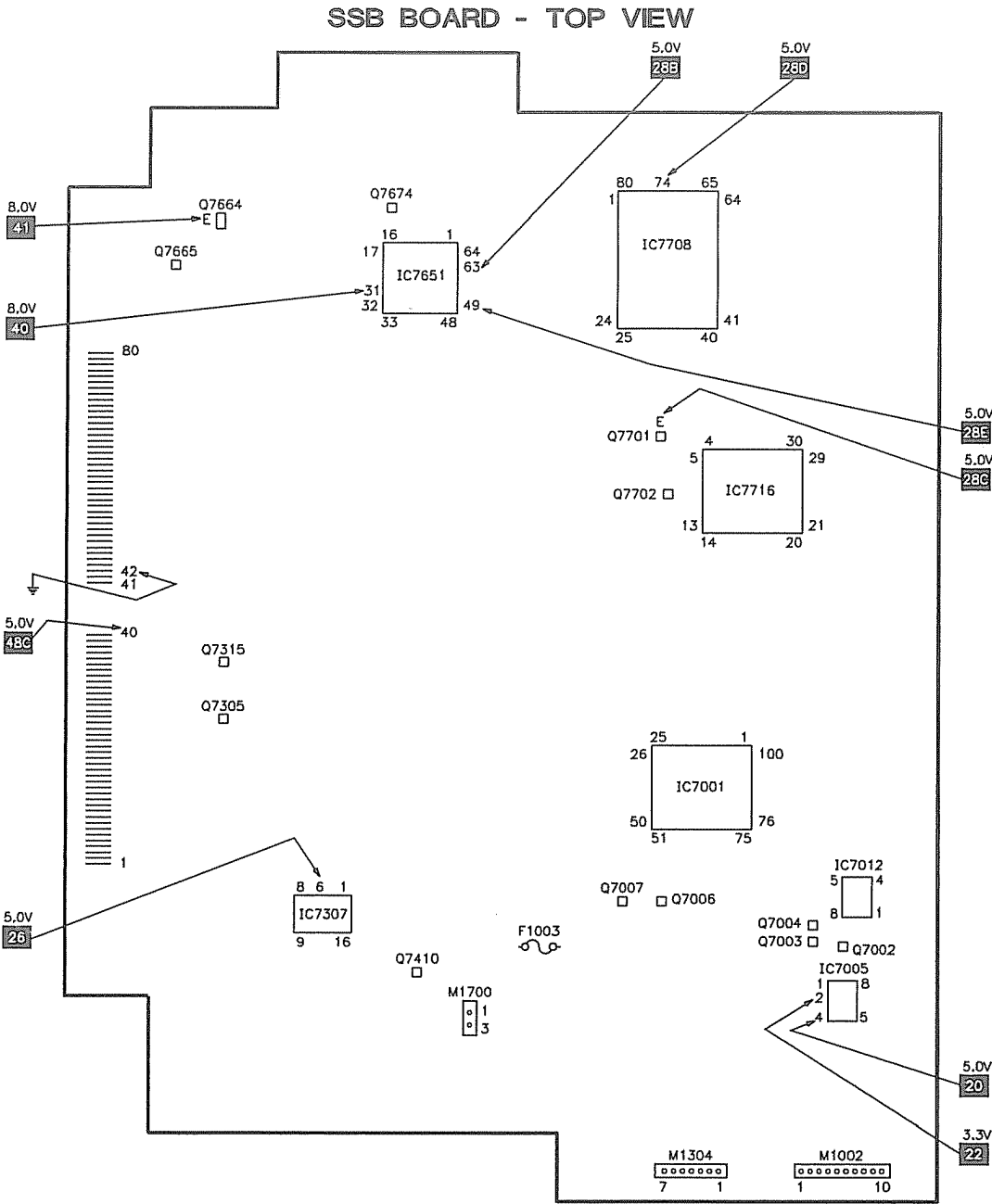




PLACEMENT CHART continued

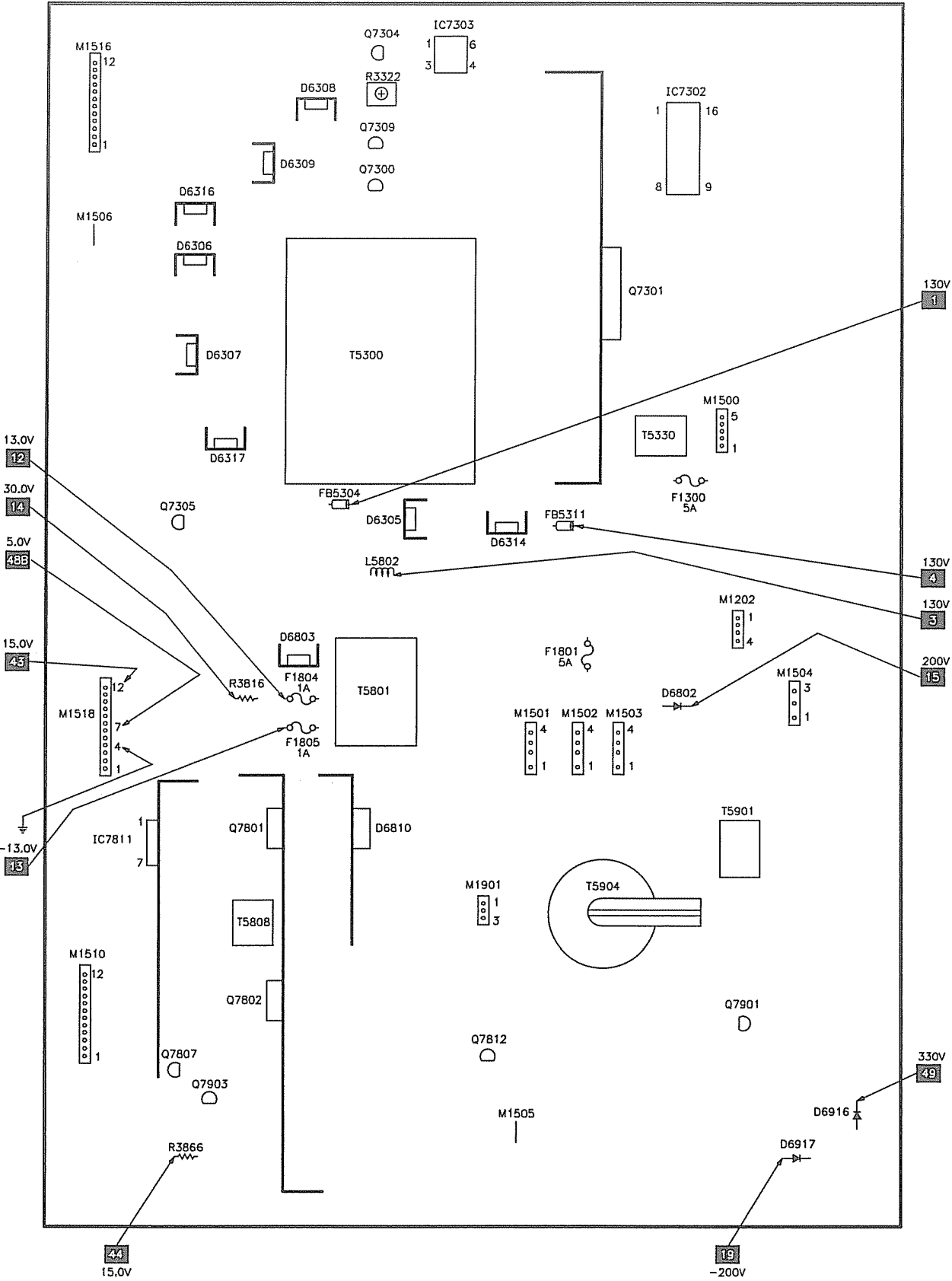


PLACEMENT CHART continued

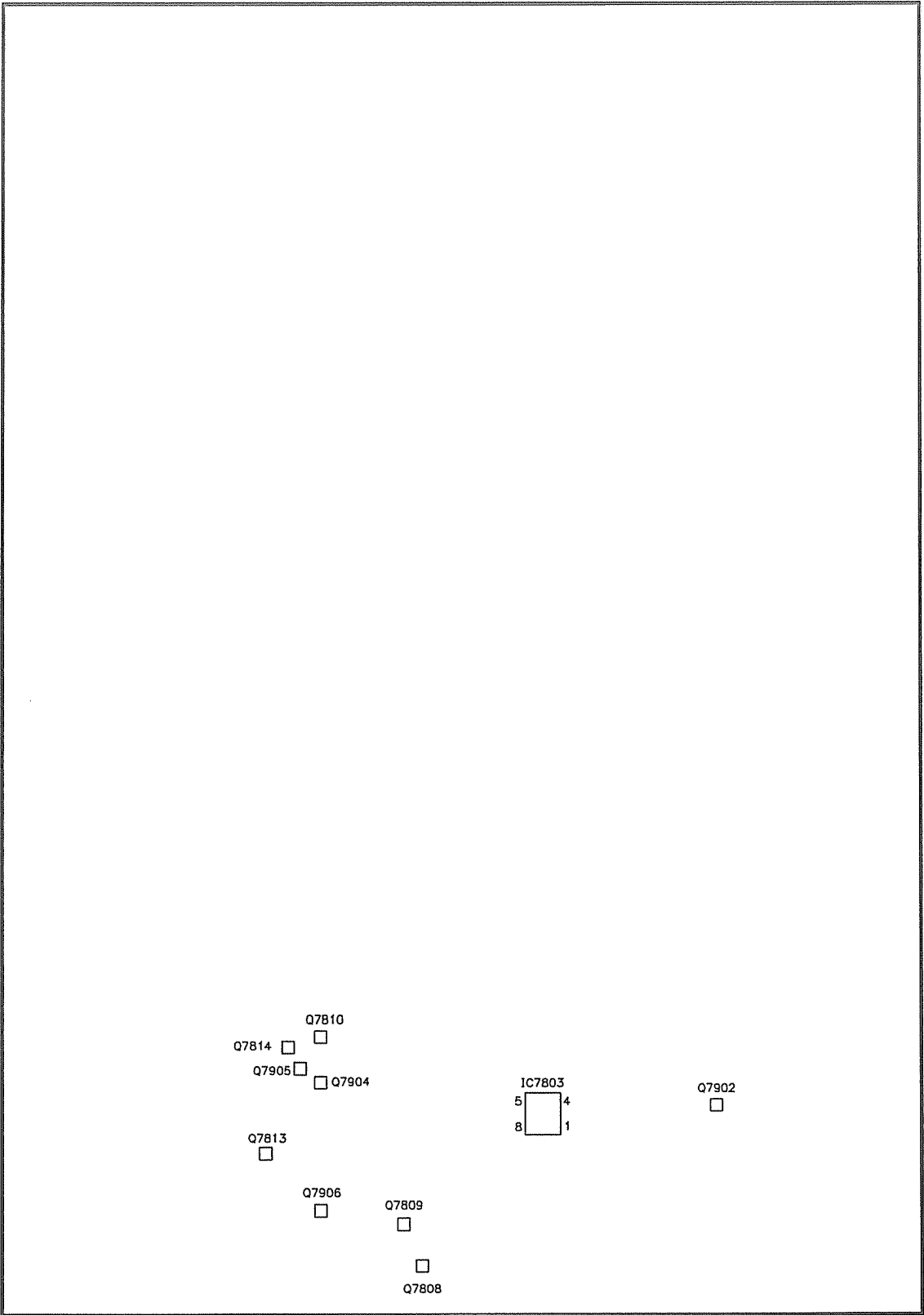


PLACEMENT CHART continued

LSB BOARD - TOP VIEW



LSB BOARD - BOTTOM VIEW



MISCELLANEOUS ADJUSTMENTS

Measurements should be performed under the following conditions: Video: color bar signal and Audio: 3kHz left, 1kHz right.

SERVICE DEFAULT MODE (SDM)

The Service Default Mode (SDM) is a technical aid for the service technician. The SDM establishes fixed, repeatable settings of customer controls, which allow for consistent measurements. The SDM places the set in the following pre-defined conditions: tuning frequency set to channel 3; volume level set to 25% of the maximum volume level; other picture and sound settings set to 50%. The following functions are turned off while in SDM: timer and sleep timer. The following functions are disabled during SDM and enabled after leaving SDM: parental lock; blue mute; hospitality mode; and No IdentTimer, normally the set is automatically switched off when no video signal (IDENT) is received for 15 minutes. Remaining other controls will operate normally.

Entering Service Default Mode (SDM)

To enter the Service Default Mode (SDM), press the following button sequence on the remote: 0, 6, 2, 5, 9, 6, and menu buttons. Do not allow the display to time out between entries while keying the sequence. Upon entry into SDM, the letters SDM will be displayed at the upper right corner of the screen.

Service Default Mode (SDM) Screen Display

SDM									
HRS:	0279	SWID:	2US1-TTR-2-2.045						
ERR:	0	0	0	0	0	0	0	0	0

Service Default Mode (SDM) Functions

The menu button on the remote switches between the Service Default Mode (SDM) and the normal user menus, with the SDM still active in the background. The status button on the remote is used to toggle the OSD, except SDM, on and off to prevent the OSD from interfering with measurements and oscilloscope waveforms. To access the Service Alignment Mode (SAM) while in SDM, press volume + and volume – buttons on the set simultaneously for at least 4 seconds.

Exiting Service Default Mode (SDM)

To exit the Service Default Mode (SDM), press the power button. To save the error codes, unplug the AC power without turning off the set. When the power is turned back on, the SDM will still be active.

SERVICE ALIGNMENT MODE (SAM)

The Service Alignment Mode (SAM) is used to align the set, adjust the option settings, and to display or clear the error code buffer values.

Entering Service Alignment Mode (SAM)

To enter the Service Alignment Mode (SAM), press the following button sequence on the remote: 0, 6, 2, 5, 9, 6, and status. Do not allow the display to time out between entries while keying the sequence. It is also possible to enter SAM by pressing volume + and volume - buttons on the set simultaneously for at least 4 seconds when the set is in SDM.

Service Alignment Mode (SAM) Menu Functions

Menu items may be selected using the cursor up or down buttons. Selected item will be highlighted. Pressing the cursor up or down buttons on the remote will display the next or previous menu items, when applicable. With the cursor left or right buttons, it is possible to: activate or deactivate the selected menu item; change the value of the selected menu item; and activate the selected submenu.

Pressing the menu button on the remote switches between SAM and the normal user menus, with SAM active in the background. Pressing the menu button in a submenu will return the screen to the previous menu.

Exiting Service Alignment Mode (SAM)

To exit the Service Alignment Mode (SAM), press the power button. To save the error codes, unplug the AC power without turning off the set. When the power is turned back on, the SAM will still be active.

Service Alignment Mode (SAM) Screen Display

SAM									
HRS:	0279	SWID:	2US1-TTR-2-2.045						
ERR:	0	0	0	0	0	0	0	0	0
OPT:	254	122	247	173	40	0	0	0	0

CLEAR ERRORS	>
OPTIONS	>
TUNER	>
SMART SETTINGS	>
GDE SAM	>

Clear Errors

Select CLEAR ERRORS while in SAM to clear error code buffer. The error code buffer contains all errors detected since the last time the buffer was erased. The buffer is written from left to right. When an error occurs that is not yet in the error code buffer, the error code will appear at the left side and all other errors shift one position to the right. The error code buffer will be cleared in the following cases: when activating CLEAR ERRORS in SAM menu; when exiting SDM or SAM with the standby command on the remote; or upon automatic reset when content has not changed for 50 consecutive hours. By leaving SDM or SAM via the power switch, the error buffer will not be reset.

To erase the contents of the error buffer, select the CLEAR ERRORS menu item and press the cursor left or right button. The contents of the error buffer are then cleared.

In case of non-intermittent faults, clear the error buffer before starting the repair. If possible check the entire content of the error buffers. In some situations an error code is only the result of another error code. A fault in the protection detection circuitry can also lead to a protection.

Options

Select OPTIONS while in SAM. Values for 2US1.

Item	Value
SBNP	1
CVI	1
C169	1
E149	1
SMCK	1
AV3	1
CBFL	1
IPIX	0
OB1	254
IPMU	0
VDBY	1
PLST	1
SOSD	1
PIPC	1
PIPT	0
PIPF	1
VS LC	0
OB2	122
SURF	1
CCAP	1
TIME	1
AAVL	1
FUNN	0
SPKC	1
VCBK	1
VBNR	1
OB3	247
BNUM	1
TMWIN	0
AOUT	1
INCF	0
APC	1
PAGC	1
WSCR	0
INIT TIMEOUT	1
OB4	173
I AM ALIVE MSG	0
ACS	0
MCS	1
AV5	0
WDT	1
-	0
-	0
-	0
OB5	40
OB6	0
OB7	0
OB8	0

Tuner

Select TUNER while in SAM.

Item	Range	On Unit
IF-PLL OFFSET	0 ~ 127	87
AGC	0 ~ 63	22
AFA	0, 1 (Read Only)	1
AFB	0, 1 (Ready Only)	1

Smart Settings

Select SMART SETTINGS while in SAM.

PERSONAL Item	Range	On Unit
MOVIE BGT	0 ~ 99	50
MOVIE COL	0 ~ 99	50
MOVIE PIC	0 ~ 99	50
MOVIE SHP	0 ~ 99	84
MOVIE TINT	0 ~ 99	0
MOVIE 2FH SHP	0 ~ 99	84
SPORT BGT	0 ~ 99	50
SPORT COL	0 ~ 99	59
SPORT PIC	0 ~ 99	54
SPORT SHP	0 ~ 99	70
SPORT TINT	0 ~ 99	0
SPORT 2FH SHP	0 ~ 99	70
WEAK BGT	0 ~ 99	50
WEAK COL	0 ~ 99	40
WEAK PIC	0 ~ 99	40
WEAK SHP	0 ~ 99	28
WEAK TINT	0 ~ 99	0
WEAK 2FH SHP	0 ~ 99	28
MULTI BGT	0 ~ 99	50
MULTI COL	0 ~ 99	40
MULTI PIC	0 ~ 99	40
MULTI SHP	0 ~ 99	70
MULTI TINT	0 ~ 99	0
MULTI 2FH SHP	0 ~ 99	70

MISCELLANEOUS ADJUSTMENTS continued

GDE SAM	
Select GED SAM while in SAM.	
SWID: GDE 1.02	GDE SAM
ERR:	INPUT 480P
DISPLAY MODE	480P
SERV BLANK	OFF
GEOMETRY	>
PICTURE	>
WHITE TONE	>
CLAMP PULSE	NORMAL
CONV PROC	ENABLED

In this menu, the DISPLAY MODE can be selected. If the input signal is NTSC, the selection should be 480p. The selection SERV BLANK causes the bottom half of the screen to blank. This selection is useful when adjusting the Yoke rotation. The CONV PROC selection allows for the disabling of the Convergence drive.

Default settings should be entered when the SSB board has been changed. When the CRTs have been changed, the display should be centered using the centering rings on the CRT. The center point can be found by placing a string from corner to corner or by using the center point on the convergence template. In the 4x3 aspect ratio sets, there are three geometry settings, and in the 16x9 aspect ratio sets, there are two geometry settings. Make sure the set is in the mode that is being adjusted and that the correct signal is applied.

GDE SAM Defaults Table

GDE SAM Register Name	Default Value 480p	Default Value 1080i	Default Value 1080i, Comp
SERV BLANK	OFF	OFF	OFF
GEOMETRY			
WIDE BLANK	7	7	7
HOR SHIFT	23	21	21
HOR. PARALLEL	8	8	8
EW. WIDTH	29	42	42
EW. PARA	36	36	31
EW. TRAP	31	31	31
HOR. BOW	7	7	7
VER. SLOPE	40	36	38
VER. AMPL	38	37	11
S CORR	31	31	31
VER. SHIFT	31	31	31
FAST BLANK	0	0	0
PICTURE			
BRIGHTNESS	31	31	31
PICTURE	31	31	31
COLOR	31	31	31
TINT	31	31	31
SHARPNESS	31	31	31
SUB-BRIGHT	31	31	31

GDE SAM Register Name	Default Value 480p	Default Value 1080i	Default Value 1080i, Comp
WHITE TONE			
NORMAL CUTOFF RED	35	35	35
NORMAL CUTOFF GREEN	34	34	34
NORMAL CUTOFF BLUE	31	31	31
NORMAL DRIVE RED	20	20	20
NORMAL DRIVE GREEN	43	43	43
NORMAL DRIVE BLUE	31	31	31
COOL CUTOFF RED	0	0	0
COOL CUTOFF GREEN	0	0	0
COOL CUTOFF BLUE	0	0	0
COOL DRIVE RED	-7	-7	-7
COOL DRIVE GREEN	-6	-6	-6
COOL DRIVE BLUE	0	0	0
WARM CUTOFF RED	0	0	0
WARM CUTOFF GREEN	0	0	0
WARM CUTOFF BLUE	0	0	0
WARM DRIVE RED	+7	+7	+7
WARM DRIVE GREEN	+4	+4	+4
WARM DRIVE BLUE	-6	-6	-6
CLAMP PULSE	NORMAL	HDTV	HDTV
CONV PROC	ENABLED	ENABLED	ENABLED

CONVERGENCE AND GEOMETRY

The set should be allowed to warm up for at least 20 minutes before any adjustments are made. This set incorporates a digital convergence system using 208 adjustment points. The convergence processor is located on the ACS (Automatic Convergence System) board. The convergence drive circuits are located on the SSP (Small Signal Panel) board. Data for the convergence settings are stored in the EEPROM located on the ACS board. Data for geometry is stored in the EEPROM located on the SSB (Small Signal Board) board. If the CRTs, the LSP (Large Signal Panel) board, or the SSB board are changed, a complete geometry and convergence alignment will be necessary. If the ACS board, the SSP, or CRTs are changed, a complete convergence alignment will be necessary. To obtain the correct geometry during convergence, a template must be used.

Sets with 4x3 aspect ratio have three convergence and geometry settings. Sets with 16x9 aspect ratio sets have two convergence and geometry settings. Sets with 4x3 aspect ratio have a 480p mode and a 1080i full screen mode. There are geometry and convergence settings for each mode.

There are two chassis versions: basic and core. The core version has an Automatic Convergence System called Intellisense. The Intellisense system makes minor changes in the convergence to compensate for changes in the magnetic field from one location to another. In the convergence procedure, both versions have the setup for the Intellisense sensors. If TEST SENSORS is selected in the basic version a message will appear on the screen indicating that the sensors are not working. In the basic version, the results of the sensor test are not applicable.

When performing convergence or geometry alignments, correct signal must be applied to the set. This is necessary to provide the correct horizontal and vertical sync to the convergence circuits. Failure to do so will result in an out of convergence picture. An NTSC signal should be used when adjusting the 480p mode. A 1080i signal should be applied to the set when using the HD mode. The HD should have a horizontal frequency of

33.75kHz and a vertical frequency of 60Hz. There are two geometry and convergence alignments in the HD mode for the 4x3 aspect ratio set. The two modes are a full screen mode 4x3 and a 16x9 compressed mode. Select these in the customer menu.

This adjustment procedure is divided into the following sections: Screen Centering; Geometry; Convergence; and Grey Scale Alignment.

If the ACS board has been replaced, the following adjustments should be performed in the following order: Geometry; Convergence; and Grey Scale.

If the LSB board has been changed, the following adjustments should be performed in the following order: Screen Centering; Geometry; and Convergence.

If the CRTs have been changed, the following adjustments should be performed in the following order: Screen Centering; Geometry; Convergence; and Grey Scale.

If the SSM board has been changed, the Convergence should be performed.

Geometry Alignment

The Geometry alignment data is stored in the NVM located on the ACS module. Whenever the ACS board or the LSB board has been changed, a geometry alignment will be needed. The geometry alignment is performed in the SAM GDE alignment mode. To enter the SAM mode, press 0, 6, 2, 5, 9, 6, and status buttons on the remote. Be sure the set is in the mode in which you wish to align before entering the SAM mode. Use the AV button on the remote to select the input with a signal applied after entering the SAM mode. The following will appear on screen after entering the SAM mode. Press the cursor down button on the remote to view SMART SETTINGS and GDE SAM.

SAM	
HRS: 0279	SWID: 2US1-TTR-2-2.045
ERR:	0 0 0 0 0 0 0 0
OPT:	254 122 247 173 40 0 0 0

CLEAR ERRORS	>
OPTIONS	>
TUNER	>
SMART SETTINGS	>
GDE SAM	>

Select GED SAM while in SAM.	
SWID: GDE 1.02	GDE SAM
ERR:	INPUT 480P
DISPLAY MODE	480P
SERV BLANK	OFF
GEOMETRY	>
PICTURE	>
WHITE TONE	>
CLAMP PULSE	NORMAL
CONV PROC	ENABLED

If the CRTs have been replaced, screen centering adjustment will be necessary. Apply a crosshatch pattern to the set. Select CONV PROC in the menu. This will disable the convergence drive. Select GEOMETRY in the menu and enter the following default values for the mode being adjusted. Other mode values can be entered by selecting a different DISPLAY MODE in the menu. Most times, no additional adjustment will be necessary.

Geometry Default Values

Item	Default Value Mode 1 480p	Default Value Mode 2 1080i	Default Value Mode 3 1080i, Comp
Wide Blank	7	7	7
Hor. Shift	24	21	21
Hor. Parallel	8	8	8
EW Width	31	44	44
EW Para	45	45	45
EW Trap	31	31	31
Hor. Bow	7	7	7
Ver Slope	40	33	33
Vertical Ampl	40	40	12
S Corr	31	31	31
Vert Shift	31	31	31
Fast Blank	0	1	1

To exit the Service Alignment Mode (SAM), press the menu button to return to the main SAM menu. Then turn the set off.

CONVERGENCE

Enter the Convergence Alignment mode, by pressing 0, 6, 2, 5, 9, 7, and index buttons on the remote. Listed below is a map of the convergence menus. Be sure that a signal is applied to the set for the mode being adjusted. Be sure that the set is in the mode you wish to adjust before entering the Convergence Alignment mode.

Display Convergence Menu Flow Diagram

Use the cursor up or down button to highlight the selection. Press the cursor right button to make the selection. In the second menu, MANUAL CONVERGENCE Without VIDEO means the screen behind the adjustment grid will be blank. MANUAL CONVERGENCE With VIDEO displays the applied video behind the adjustment grid. RESTORE FACTORY loads the values from the last saved convergence alignment. RESTORE DEFAULT loads values from the ROM on the ACS Microprocessor. If the ACS board has been changed, there may not be data in the NVM for RESTORE FACTORY. The RESTORE DEFAULT settings will then be loaded. Loading default values will overwrite all of the Convergence modes.

Internally generated grid will be displayed in the convergence mode. Shaded area is the screen area. Horizontal lines A and M are displayed on the top and bottom edge of the visible screen area. Lines 1 and 15 are also displayed on the left and right edge of the visible screen area. Vertical line 0 is adjustable, but not visible.

Green Geometry

The green geometry must first be done when performing a complete convergence alignment. A screen template is needed to obtain the correct geometry. Failure to use the screen template or misalignment of the convergence will result in reduced life of the convergence amplifiers.

Place the screen template on the screen. Select GREEN in selection menu. The cursor will appear in the center of the screen.

When the ACS board has been replaced and default settings have been loaded, the following procedure should be used to adjust the convergence. Or use the cursor up or down and right or left buttons to navigate to the area to be adjusted. Press the menu button to adjust then use the cursor buttons to move the green cross onto the screen template. The adjustment of the cross has two step sizes, large and small. Use the menu button to toggle between the two. After a point has been adjusted, press index button to return to navigate. When default settings have been loaded, the leftmost line that is not visible should be adjusted first. Adjust the vertical line 0 while observing line 1 to make line 1 parallel with the left edge of the screen. The adjustment should be made in small steps. Do not adjust any one point more than a quarter of the distance of one grid. After the left most line is adjusted, start at the center left of the screen and work to the right, aligning the horizontal line. When adjusting the horizontal lines, best results are obtained when working from left to right. After the center line is adjusted, go to the next line down until all of the lines have been adjusted. Work from the center up to adjust the horizontal lines. Using the same method, work from center out to adjust the vertical lines. A minimum of three passes will be necessary to complete the alignment. Press the index button to return to the selection menu.

When the green geometry is complete store the data. Remove the screen template from the screen and select red to green in the selection menu. Use the same method that was used to adjust the green grid to the screen template, adjust the red grid onto the green grid.

When the red to green is complete, select the blue to green and use the same alignment method. Each time data is stored the Intellisense circuit will recalculate the position of the four sensors in the set.

Repeat the adjustment for each of the remaining modes as necessary.

GRAY SCALE

- Place the input to the RGB (Aux 5) or YPb Pr (Aux 4) mode. Connect a computer or computer monitor generator to the Aux 5 input or a component generator to Aux 4.
- Preset G2 controls counterclockwise.
- Turn green G2 clockwise to make the menu visible.
- Enter SAM mode by entering 0, 6, 2, 5, 9, 6, and index buttons on the remote. Select the GDE SAM mode and select WHITE TONE.
- Set the brightness, picture, and sharpness to their center position. Select a black raster pattern on the computer or computer monitor generator.
- Place a scope set to measure DC on each cathode to determine the dominant, lowest, color.
- Adjust the SUB BRIGHTNESS control to set the black level equal to 180V on the scope.
- Move the probe to the remaining cathodes and adjust the corresponding cutoff registers to make the black part of the waveform at 180V.
- Set the corresponding G2 control to just make cutoff for the black part of the waveform for that CRT.
- Remove the scope.
- Apply a grayscale pattern to the set.

- Adjust the drive controls to achieve proper white balance.
- Press the menu button to return to the SAM menu. Exit the Service mode by turning the set off.

WHITE TONE

Name	On Unit Value
Normal Cutoff Red	3F
Normal Green Cutoff	3F
Normal Blue Cutoff	3F
Normal Red Drive	3F
Normal Green Drive	3F
Normal Blue Drive	3F
Cool Cutoff Red	0
Cool Cutoff Green	0
Cool Cutoff Blue	0
Cool Drive Red	-7
Cool Drive Green	-6
Cool Drive Blue	0
Warm Cutoff Red	0
Warm Cutoff Green	0
Warm Cutoff Blue	0
Warm Drive Red	+7
Warm Drive Green	+4
Warm Drive Blue	-6

ELECTRICAL FOCUS

Before starting the following adjustment procedures set the picture, sharpness, brightness, and tint controls to midrange and the color control to minimum.

- Remove the back cover of the set and the light shield, turn the set on and apply an NTSC crosshatch pattern signal into the antenna terminal. The crosshatch pattern will appear clearer if the front of the screen is covered with a dark cloth.
- Cover two of the CRT output lenses with cardboard pieces, or other non-conductive opaque material, to observe the magnified reflection of the other CRT on the back side of the viewing screen.
- Adjust the CRT's focus control, located on the focus block, for the sharpest raster image.
- Confirm correct focus by viewing the screen from the front of the set.
- Repeat steps 2 through 4 to adjust the focus of the remaining CRT's.

OPTICAL FOCUS

Before starting the following adjustment procedures set the picture, sharpness, brightness, and tint controls to midrange and the customer color control to minimum.

- Remove back cover of the set and the light shield, turn the set on and apply an NTSC crosshatch pattern signal into the antenna terminal. The crosshatch pattern will appear clearer if the front of the screen is covered with a dark cloth.
- Cover two of the CRT output lenses with cardboard pieces, or other non-conductive opaque material, and observe the magnified reflection of the other CRT on the back side of the viewing screen.
- Loosen the lens retaining wing nuts on the CRT focus assembly.
- Move the wing nut in the slot of the uncovered lens to locate the optimum optical focus, viewing the picture from the back side of the screen, re-tighten the wing nut.
- Confirm correct focus by viewing the screen from the front of the set.
- Repeat steps 2 through 5 to adjust the focus of the remaining CRT's.

CUSTOMER SERVICE MODE (CSM)

All HDRPTV sets are equipped with the Customer Service Mode (CSM). CSM is a special service mode that can be activated and deactivated by the customer, by request of the service technician/dealer in order to identify the status of the set. This CSM is a read only mode, and modifications in this mode are not possible.

Entering Customer Service Mode (CSM)

To enter the Customer Service Mode (CSM) press the mute button on the remote and any button on the keyboard (channel up, channel down, volume up, volume down) on the set simultaneously for at least 4 seconds. When CSM is entered, CSM may flash or may stay constant in the upper right corner. Once the CSM is activated picture and sound settings are set to nominal levels and modes that interfere with the behavior of the set are switched off (sleep timer, auto standby, etc.).

Changing System Preset Setting

Press the menu button on the remote. Select the INSTALL sub menu. Select the MANUAL STORE sub menu. Select and change the SYSTEM setting until picture and sound are correct. Select the STORE menu item.

Exiting Customer Service Mode (CSM)

To exit the Customer Service Mode (CSM) press any button on the remote except channel up or channel down buttons. Switch off the set by pressing the power button on the remote or the set. Exiting CSM resets the set back to its initial values.

Customer Service Mode (CSM) Screen Display

Upon entry into the Customer Service Mode (CSM) the following screen will appear.

	CSM
1	HRS: 0279 SWID: 2US1-TTR-2-2.045
	ERR: 0 0 0 0 0 0 0
2	CODES: 0 0 0 0 0 0 0
3	OPT: 254 122 247 173 40 0 0 0
4	
5	NO SIGNAL
6	
7	
8	NOT PREFERED
9	
10	SOURCE: 96
11	SOUND: MONO
12	VOLUME: 0
13	BALANCE: 1
14	TINT: 50
15	COLOR: 41
16	BRIGHTNESS 50
17	PICTURE 41

The Customer Service Mode (CSM) shows the following information:

Line 1 HRS: nnnn and SWID: 2US1-TTR-2-2.045. HRS: indicates the accumulated total of operational hours in hexadecimal format, standby hours are not counted as operating hours. SWID: indicates software

identification of the main microcontroller. 2US1-TTR-2-2.045. US1 indicates the software type and the supported languages, US is NAFTA region, 1 is the main software language version number and 2.045 is the subversion number.

Line 2 CODES: is the error code buffer and displays the last 7 errors.

Line 3 OPT: option bits control software and hardware functionality. An option byte or option number represents 8 of those bits. Each option number is displayed as a number between 0 and 255. The set may not work correctly when an incorrect option code is set.

Line 4: SYSTEM : AUTO. Indicates which color and sound system is installed for this preset: NTSC, PAL, or SECAM.

Line 5: NO SIGNAL. Indicates that the set is not receiving an ident signal on the selected source. This may be caused by: absent or bad antenna signal or antenna not connected; no preset channel is stored at this program number; or the tuner is faulty. If the tuner is the problem line 2: CODES will contain number 13 or 16; check the tuner and replace or repair if necessary.

Line 6: TIMER ON. Indicates that the on/off timer is running. The following may be caused by the activation of the sleep timer: the set may turn on from standby or may switch to a different channel without using either the remote or the set. To switch off the activation timer: select TIMER in the FEATURE menu; select ACTIVATE in the TIMER menu. Set to OFF with the left or right cursor button.

Line 7: CHANNEL BLOCKED. Indicates that all channels are locked except the selected channel. The following may be generated due to locked channels: set cannot be switched on from standby with the set buttons; or channel up and channel down buttons on the set do not function. Use remote to disable the LOCK feature: select FEATURE menu; select LOCK; and set to OFF.

Line 8: NOT PREFERED. Indicates that at least one channel is deleted as a preferred channel, by default, all channels are skipped. SKIPPED will always be displayed in CSM unless all the channels are not skipped. To add a channel as a selected channel to the list of preferred channels: select INSTALL menu; CHANNEL EDIT; ADD/DELETE; and set to ADD with the left or right cursor buttons.

Line 9: HOTELMODE ON. The Hotel mode has been activated.

Line 10: SOURCE. Indicates which SOURCE is installed for this preset: AV1; AV2; SVHS2; or channel number (8).

Line 11: SOUND. Indicates which sound mode is installed for this preset: Mono; Stereo; SAP; NICAM; L1; L2; Virtual; or Digital.

Line 12: VOLUME. Value indicates level at CSM entry.

Line 13: BALANCE. Value indicates level at CSM entry.

Line 14: TINT. Value indicates level at CSM entry.

Line 15: COLOR. Value indicates level at CSM entry.

Line 16: BRIGHTNESS. Value indicates level at CSM entry.

Line 17: PICTURE. Value indicates level at CSM entry.