

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 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.

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

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Indianapolis, IN 46214-2012

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SAFETY CHECKS – FIRE AND SHOCK HAZARD

Cold Leakage Checks for Receivers with Isolated Ground

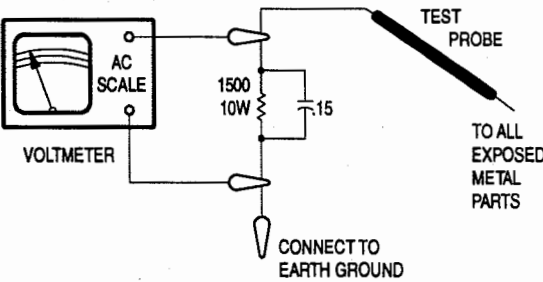
Unplug the AC cord, connect a jumper across the plug prongs, and turn the power switch on (if applicable). Use an ohmmeter to measure the resistance between the jumped AC plug and any exposed metal cabinet parts such as antenna screw heads, control shafts, or handle brackets. Exposed metal parts with 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.

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 inner 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.



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PHOTOFACT® Technical Service Data

SET 3443

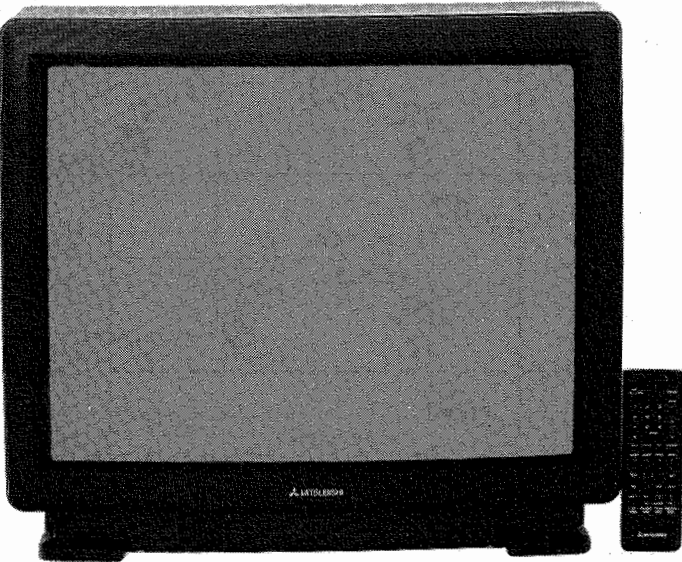
MODELS CS-27201, CS-27303

mitsubishi

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MITSUBISHI
Models CS-27201, CS-27303



Model CS-27303

Essential coverage
for servicing a television receiver...

- Schematics
- Component locations
- Parts list



HOWARD W. SAMS & COMPANY

FEBRUARY 1995 SET 3443

For Supplier Address,
See PHOTOFACT Annual Index

MISCELLANEOUS ADJUSTMENTS

PRETUNING

NOTE: All procedures require an antenna connected and power applied to the receiver.

Auto Memory

- 1. Press the menu button.
- 2. Press the adjust button to select *first time setup* then press the enter button.
- 3. Press the adjust button to select *memorize channels* then press the enter button.
- 4. Press the adjust button to select *cable* or *indoor/outdoor antenna*. Press the enter button. Available channels are scanned and stored into memory.

Initial Setting

The following selections must be completed before performing electrical adjustments.

- 1. Press the menu button on remote to display menu.
- 2. Press buttons 0, 0, and 8 in sequence to select *option menu*.
- 3. Press the adjust button to select *initial* then press the enter button.
- 4. Wait 5 seconds and apply a color bar signal set to channel 3.
- 5. Select *option menu*.
- 6. Using the adjust and enter buttons, set *hotel* to *off*, *sync* to *int*, and *call program* to *use*.
- 7. Press the menu button 2 times to return to normal viewing.

CAUTION: DO NOT select "E2 Reset" and then press the enter button. This will set all data to minimum and all adjustments must be performed.

CHARACTER POSITION

Press the menu button on the remote. Press buttons 0, 0, and 7 in sequence. Press the video down button until "Sub HR" appears on the screen. Press the adjust button to center image on screen.

COMB FILTER

Tune in a color bar pattern. Connect an oscilloscope to the emitter of Q2054. Adjust VR2051 and T2051 for minimum chroma component.

HIGH VOLTAGE SHUTDOWN TEST

Connect a jumper across R521. The receiver should go into shutdown and remain in shutdown even after removing the jumper. To restore normal operation, remove power for 30 seconds.

HIGH VOLTAGE SHUTDOWN

NOTE: Care should be taken in defeating the high voltage shutdown circuit as this may cause excessive X-ray radiation and damage to the CRT or T551. The high voltage is monitored by D582 rectifying pulses from T551 and applying the rectified voltage to D510. When D510 turns on the

voltage at pin 24 of IC200 raises which shuts down the horizontal oscillator. To troubleshoot, remove R521 from the circuit and use a variable power supply for AC voltage. Start at 70.0VAC and troubleshoot to locate the defect. Reconnect R521.

RF AGC

Tune in a picture. Adjust VR100 counterclockwise until snow appears in picture. Then adjust VR100 clockwise until snow just disappears.

SUB COLOR

Press the menu button on the remote. Press buttons 0, 0, and 7 in sequence. Press the video down button until "Sub Color" appears on the screen. Press the adjust button to set the level.

SUB CONTRAST

Tune in a crosshatch pattern. Set brightness and color to minimum and contrast to midrange. Adjust VR200 for a just visible pattern. Set brightness to maximum and check for blooming.

SUB TINT

Press the menu button on the remote. Press buttons 0, 0, and 7 in sequence. Press the video down button until "Sub Tint" appears on the screen. Press the adjust button to set the level.

VERTICAL HEIGHT & LINEARITY

Tune in a crosshatch pattern. Adjust VR401 so the pattern fills 90% of the screen. Adjust VR402 for best linearity. Adjust VR401 for a slight overscan.

VIDEO LEVEL

Tune in a color bar pattern. Connect an oscilloscope to the emitter of Q103. Adjust VR101 for 1.0Vp-p.

CONVERGENCE / COLOR PURITY

CAUTION: Receiver employs a CRT with yoke assembly permanently bonded. Do not attempt to remove this assembly.

COLOR TEMPERATURE

Tune in a crosshatch pattern. Short TPX to ground to produce a service line. Adjust screen control until line is just visible. Note color of line and adjust remaining cutoff controls for a white line. Adjust screen, VR651, and VR652 controls for best white line at low and high brightness levels.

HORIZONTAL WIDTH, LINEARITY, & BALANCE

Supply a crosshatch signal and reset video function. Turn VR5A4 fully clockwise. Set VR5A3 so that the picture fills the screen. Set the screen control to a point where the picture becomes just visible. Adjust VR5A4 so that the picture fills the screen. Adjust VR5A2 so that the left and right lines are straight. Adjust VR5A1 for best pincushion phase. Readjust VR5A3 so that the picture just fills the screen.

STEREO ADJUSTMENTS

NOTE: The following adjustments were made with TV/Stereo generator connected to the antenna terminals.

COMPOSITE LEVEL

Select pilot, 1kHz audio frequency, and L+R modulating signal. Select stereo mode on receiver. Connect an oscilloscope to TP-M0. Adjust VR320 for 2.0Vp-p.

STEREO FILTER

Select SAP, 1kHz audio frequency, and L-R modulating signal. Select SAP mode on receiver. Connect an oscilloscope to TP-M5. Adjust VR351 for minimum.

STEREO VCO

Select pilot, 1kHz audio frequency, and L-R modulating signal. Select stereo mode on receiver. Connect a frequency counter to TP-M1. Place a 100K resistor between TP-L1 and TP-M4. Adjust VR355 for 15.75kHz, ± 0.05 kHz. Remove resistor.

SEPARATION & SPECTRAL

Select pilot, 300Hz audio frequency, and L modulating signal. Select stereo mode on receiver. Connect an oscilloscope to TP-M2. Adjust VR353 for minimum amplitude of waveform. Select 8kHz audio frequency. Adjust VR354 for minimum amplitude of waveform. Repeat adjustments until no further decrease in waveform amplitude occurs.

TEST EQUIPMENT

Test equipment listed by participating manufacturer illustrates typical or equivalent equipment used by Sams engineers to obtain measurements. This equipment is compatible with most types used by field service technicians.

Equipment	Sencore No.	Equipment	Sencore No.
Oscilloscope	SC3100	Isolation Transformer	PR57
Generators		Capacitance Analyzer	LC101, LC102
RGB	CM2000	CRT Analyzer	CR70
Multiburst Signal	VG91	AC Leakage Tester	PR57
Color Bar	VG91	Inductance Analyzer	LC101, LC102
TV Stereo	VG91	Flyback Yoke Tester	TVA92
Digital VOM	SC3100	TV Stereo Power Monitor	SR68, PA81
Frequency Meter	SC3100	Field Strength Meter	SL750
Hi-Voltage Probe	HP200	Transistor Tester	TF46
Accessory Probes	TP212	Video Analyzer	VG91, TVA92

TEST JIG HOOKUP

Function	Chek-A-Color Adapter No.	PC Board Plug	Pin	Color
CRT	B239	DY	1	Red
Yoke	D482		2	Blue
Yoke Setting	YP1A		4	Yellow
Comments	Focus Tap		5	Brown

PIP ADJUSTMENTS

PIP READ CLOCK

Place a color bar signal on the video input. Press the menu button on the remote. Press buttons 0, 0, and 7 in sequence. Press the PIP button on the remote then press the source button until the PIP selects "Ext". Press the video down button until "PIP Trim" appears on the screen. Measure the frequency at TP-RC using the shield case for ground. Adjust LC7101 until the frequency measures 31.30MHz \pm .05MHz. Press the menu button 2 times to exit the adjustment menu screen.

PIP WRITE CLOCK

Place a color bar signal on the video input. Press the menu button on the remote. Press buttons 0, 0, and 7 in sequence. Press the PIP button on the remote then press the source button until the PIP selects "Ext". Press the video down button until "PIP Trim" appears on the screen. Measure the frequency at TP-WC using the shield case for ground. Adjust LC7102 until the frequency measures 13.90MHz \pm .05MHz. Press the menu button 2 times to exit the adjustment menu screen.

PIP SUB VIDEO

Place a color bar signal on the video input. Select "Ext" for both the main and PIP signals. Measure the waveform on connector VP pin 11. Adjust VR7001 on the PIP board until the amplitude of the PIP video component is within 2% of the main video component of the waveform.

PIP SUB CHROMA GAIN

Place a color bar signal on the video input. Select "Ext" for both the main and PIP signals. Measure the waveform on connector VP pin 9. Adjust VR7002 on the PIP board until the amplitude of the PIP chroma component is within 5% of the main chroma component of the waveform.

PIP SUB TINT

Place a color bar signal on the video input. Press the menu button on the remote. Press buttons 0, 0, and 7 in sequence. Press the PIP button on the remote then select "Ext" for both the main and PIP signals. Press the video down button until "PIP Tint" appears on the screen. Press the adjust up/down button until the hue of the PIP window matches the hue of the main screen. Press the menu button 2 times to exit the adjustment menu screen.

PIP Y DELAY READ

Place a color bar signal on the video input. Press the menu button on the remote. Press buttons 0, 0, and 7 in sequence. Press the PIP button on the remote then select "Ext" for both the main and PIP signals. Press the video up button until "PIP Y Delay Read" appears

on the screen. Press the adjust up/down button and hold it until the "05" mark appears. Press the menu button 2 times to exit the adjustment menu screen.

PIP Y DELAY WRITE

Place a color bar signal on the video input. Press the menu button on the remote. Press buttons 0, 0, and 7 in sequence. Press the PIP button on the remote then select "Ext" for both the main and PIP signals. Press the video up button until "PIP Y Delay Write" appears on the screen. Press the adjust up/down button and hold it until the "05" mark appears. Press the menu button 2 times to exit the adjustment screen.

PIP TIMING

Place a color bar signal on the video input. Press the menu button on the remote. Press buttons 0, 0, and 7 in sequence. Press the PIP button on the remote then select "Ext" for both the main and PIP signals. Press the video up button until "PIP Timing" appears on the screen. Press the adjust up/down button and hold it until the "0A" mark appears. Press the menu button 2 times to exit the adjustment screen.

PIP C OUT

Place a color bar signal on the video input. Press the menu button on the remote. Press buttons 0, 0, and 7 in sequence. Press the PIP button on the remote then select "Ext" for both the main and PIP signals. Press the video up button until "PIP C Out" appears on the screen. Press the adjust up/down button to match the main screen color level. Press the menu button 2 times to exit the adjustment screen.

PIP Y OUT

Place a color bar signal on the video input. Press the menu button on the remote. Press buttons 0, 0, and 7 in sequence. Press the PIP button on the remote then select "Ext" for both the main and PIP signals. Press the video up button until "PIP Y Out" appears on the screen. Press the adjust up/down button to match the main screen intensity. Press the menu button 2 times to exit the adjustment screen.

PIP HORIZONTAL POSITION

Place a color bar signal on the video input. Press the menu button on the remote. Press buttons 0, 0, and 7 in sequence. Press the PIP button on the remote then select "Ext" for both the main and PIP signals. Press the video up button until "PIP HOR" appears on the screen. Press the adjust up/down button to select the desired horizontal position. Press the menu button 2 times to exit the adjustment screen.

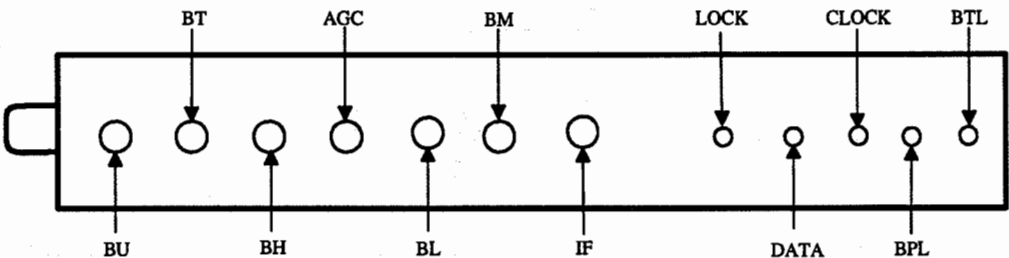
TUNER INFORMATION

TUNER VOLTAGE CHART

Pin	VHF Low Band	VHF High Band	UHF Band	Pin	VHF Low Band	VHF High Band	UHF Band
BTL	31.6V	31.6V	31.6V	AGC	4.4V	4.5V	4.5V
BPL	4.9V	4.9V	4.9V	BH	0V	11.9V	0V
CLOCK	.39V	.39V	.39V	BT	1.3V	4.5V	4.7V
DATA	3.7V	3.7V	3.7V	BU	.1V	.1V	11.9V
LOCK	.25V	.25V	.25V				
IF	0V	0V	0V				
BM	12.0V	12.0V	12.0V				
BL	11.9V	.3V	0V				

NOTE: VHF Low Band voltages taken on channel 2.
VHF High Band voltages taken on channel 7.
UHF Band voltages taken on channel 14.

TUNER TERMINAL GUIDE

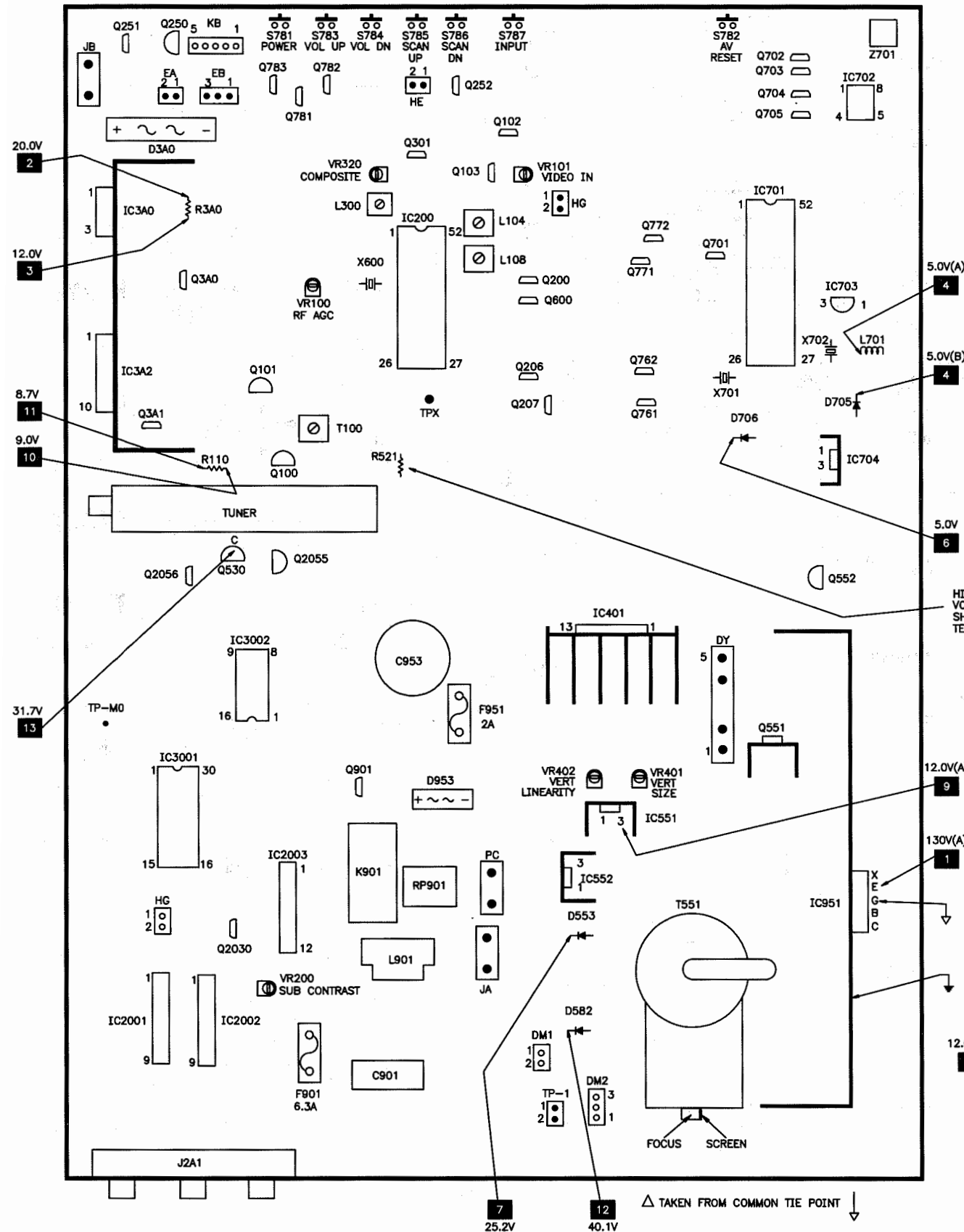


SCHEMATIC NOTES

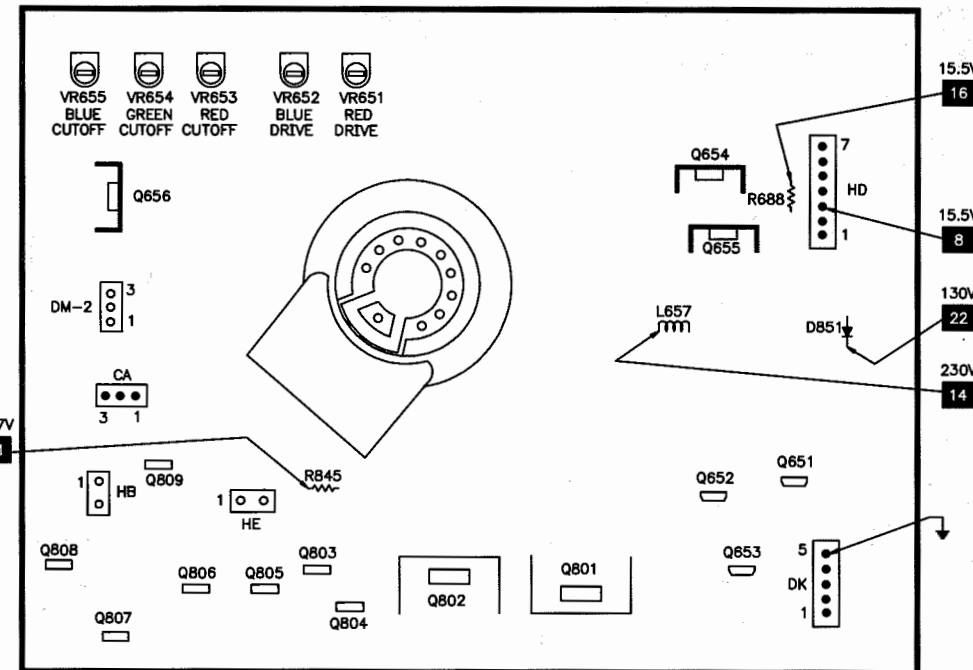
- ⚡ For SAFETY use only equivalent replacement part, see parts list.
- ✖ Circuitry not used in some versions.
- Circuitry used in some versions.
- ⚡ Ground
- ⏏ Chassis ground
- ⚡ Common tie point
- △ Taken from common tie point
- 3 Schematic **CIRCUITRACE**®: Voltage source tie point.
- A— Cabling: Heavy lines reduce use of multiple lines.

Waveforms and voltages are taken from ground, unless noted otherwise.
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 1000 μ V 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. Electrolytic capacitors are 50 volts or less, 20% or greater unless noted. Resistors are 1/2W or less, 5% or greater unless noted. Value in () used in some versions. Measurements with switching as shown, unless noted. Rated voltage shown on zener diodes.

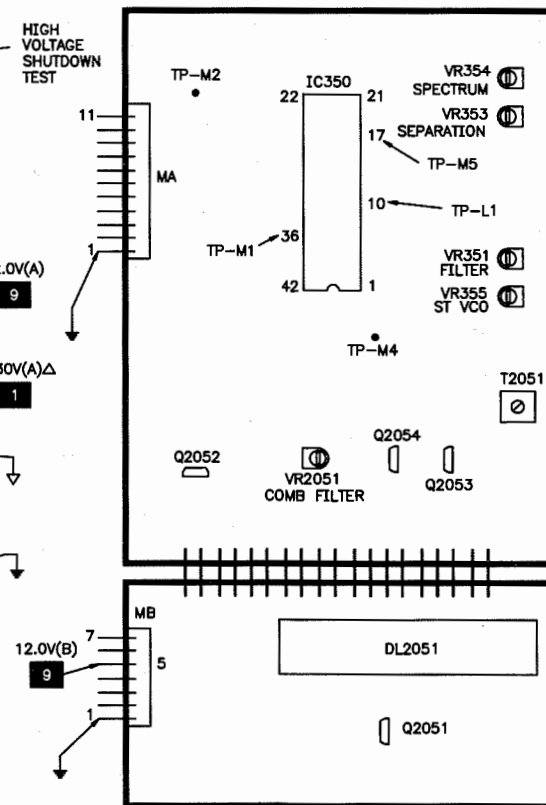
PLACEMENT CHART



CRT BOARD

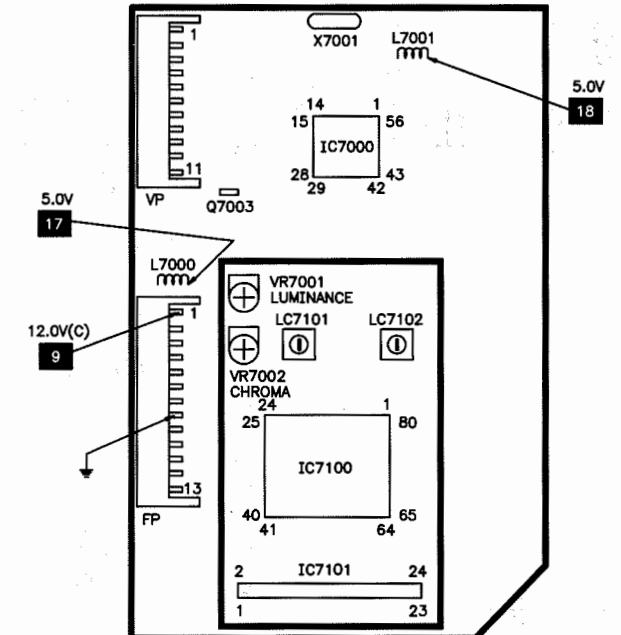


MCS BOARD

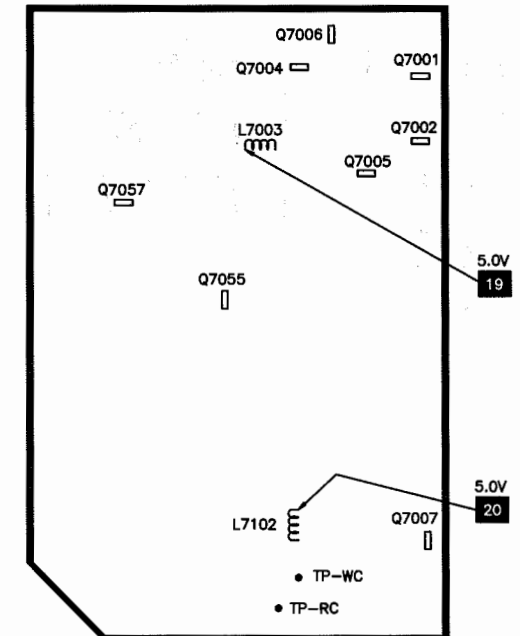


COMB FILTER BOARD

PIP BOARD - TOP VIEW



PIP BOARD - BOTTOM VIEW



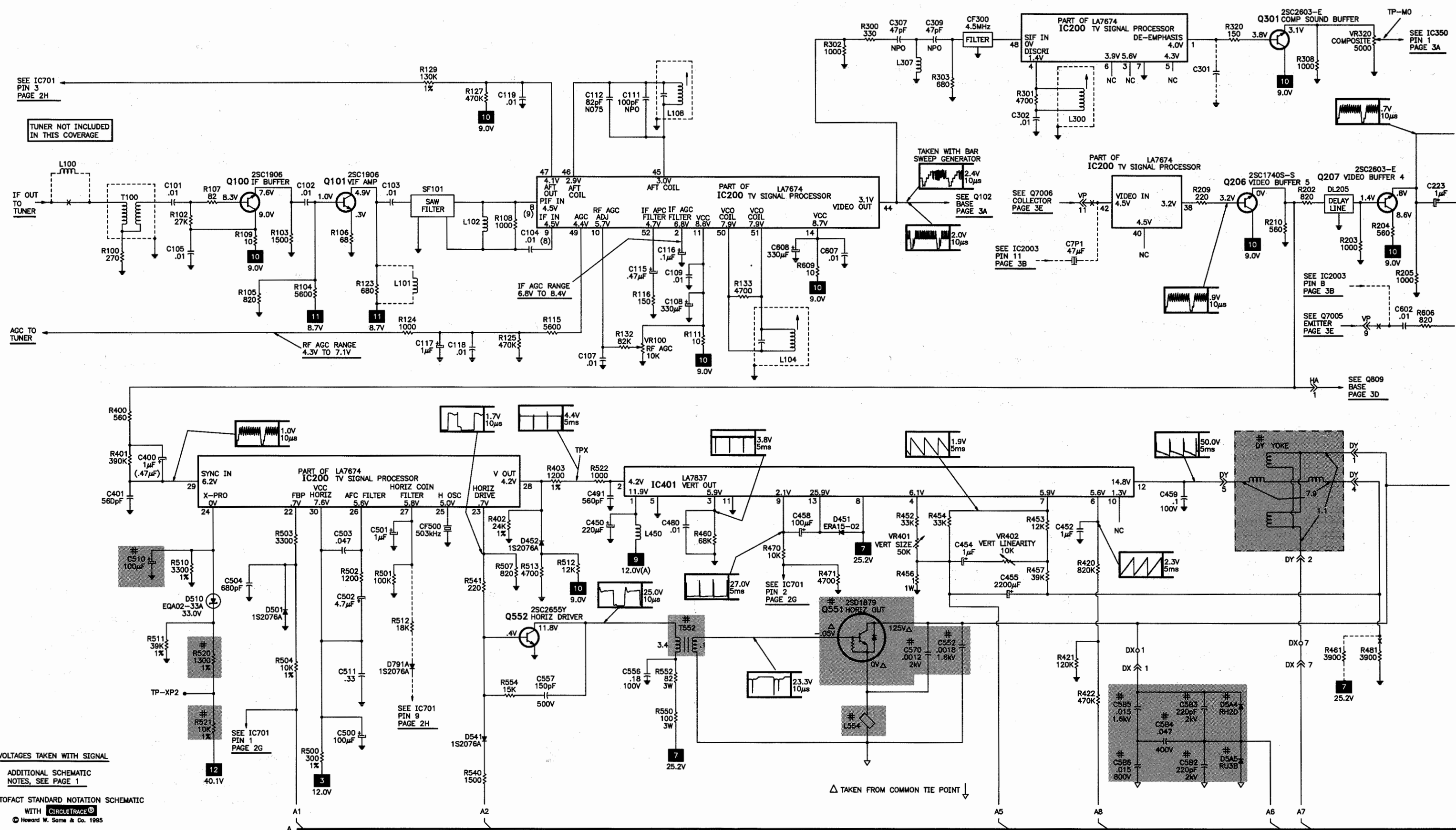
mitsubishi

MODELS CS-27201, CS-27303

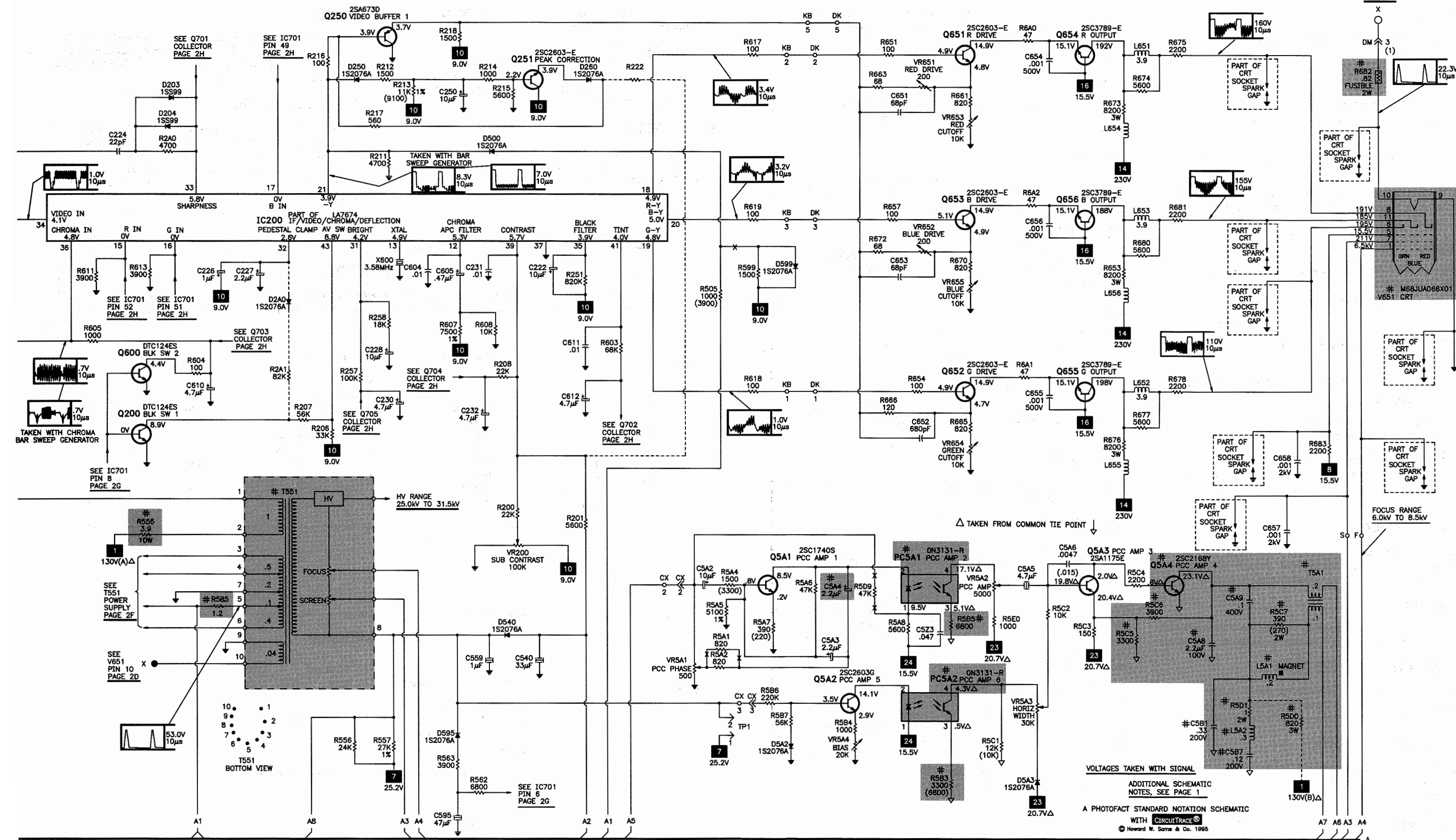
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TELEVISION SCHEMATIC

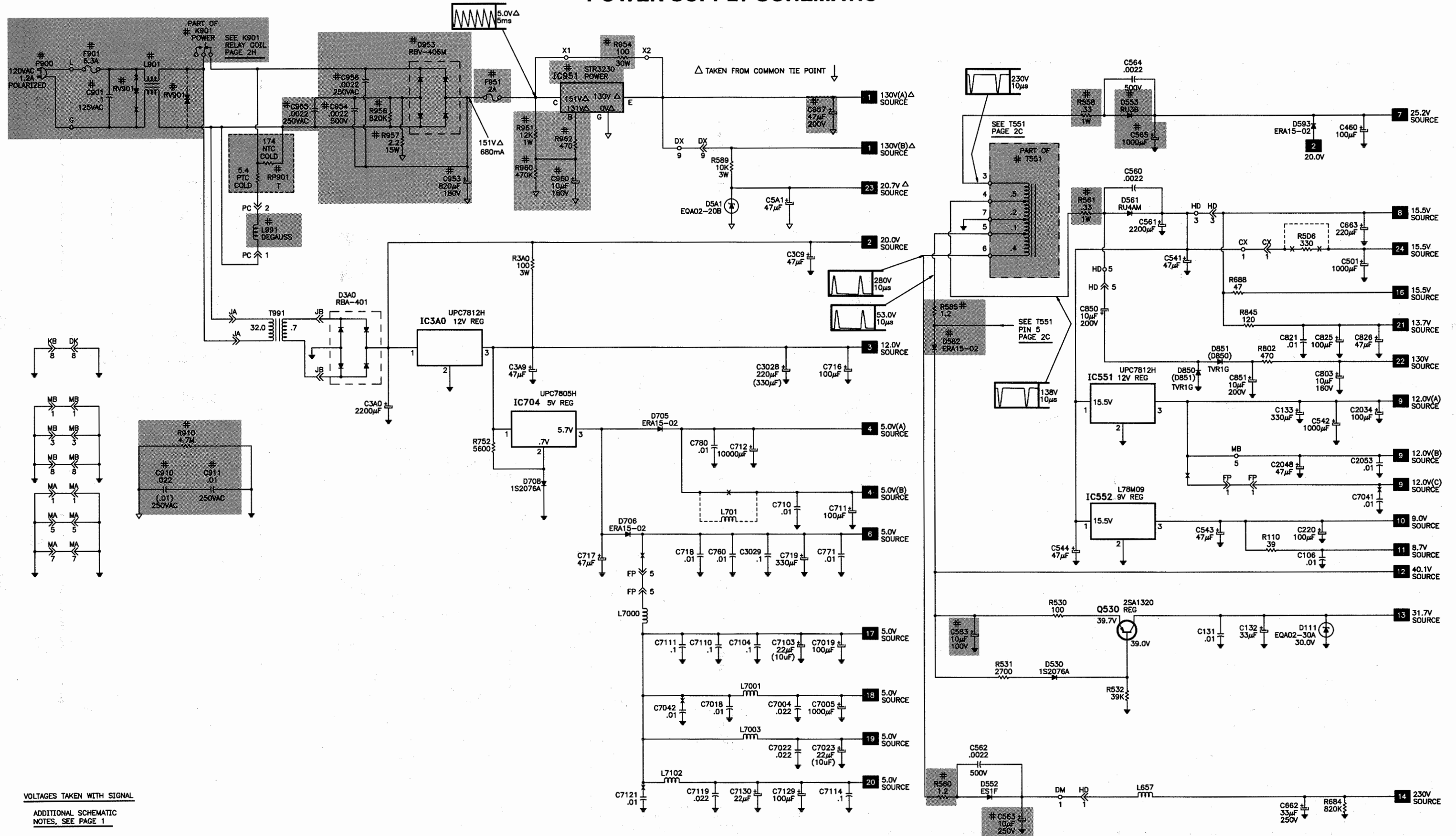
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C



POWER SUPPLY SCHEMATIC

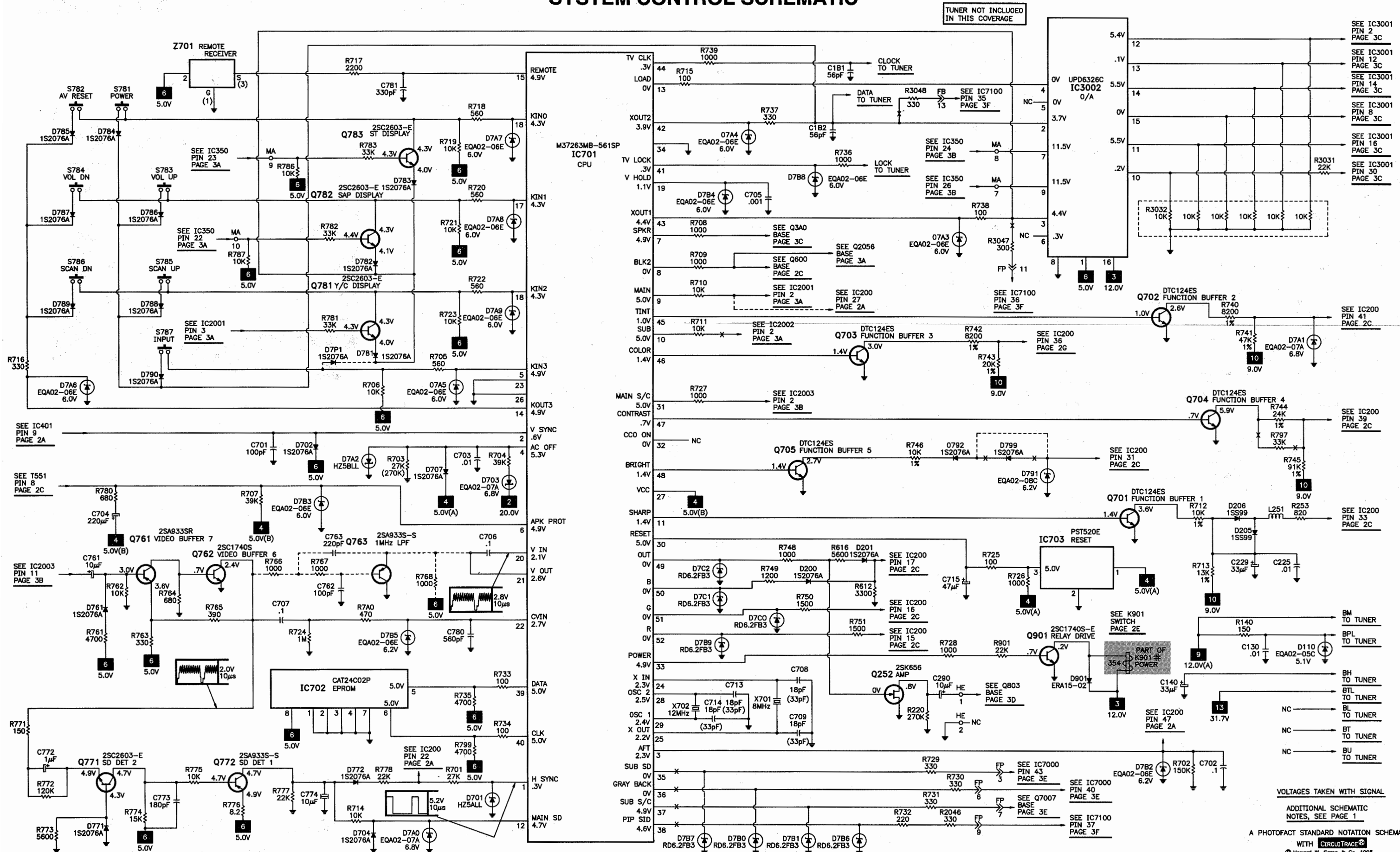


VOLTAGES TAKEN WITH SIGNAL

ADDITIONAL SCHEMATIC
NOTES, SEE PAGE 1

A PHOTOFAC STANDARD NOTATION SCHEMATIC
WITH CIRCUITTRACE®
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SYSTEM CONTROL SCHEMATIC



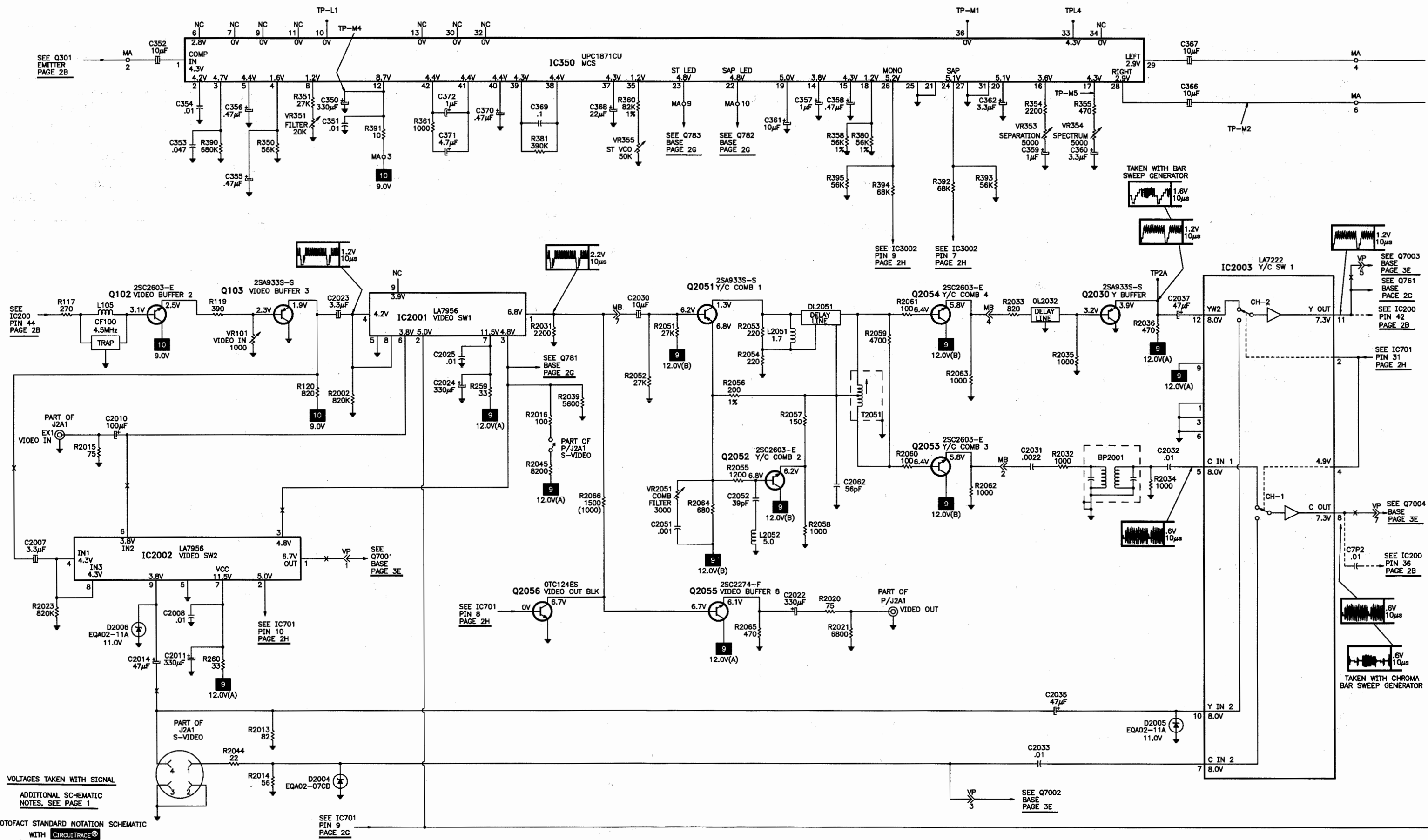
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MODELS CS-27201, CS-27303

VOLTAGES TAKEN WITH SIGNAL
ADDITIONAL SCHEMATIC NOTES, SEE PAGE 1
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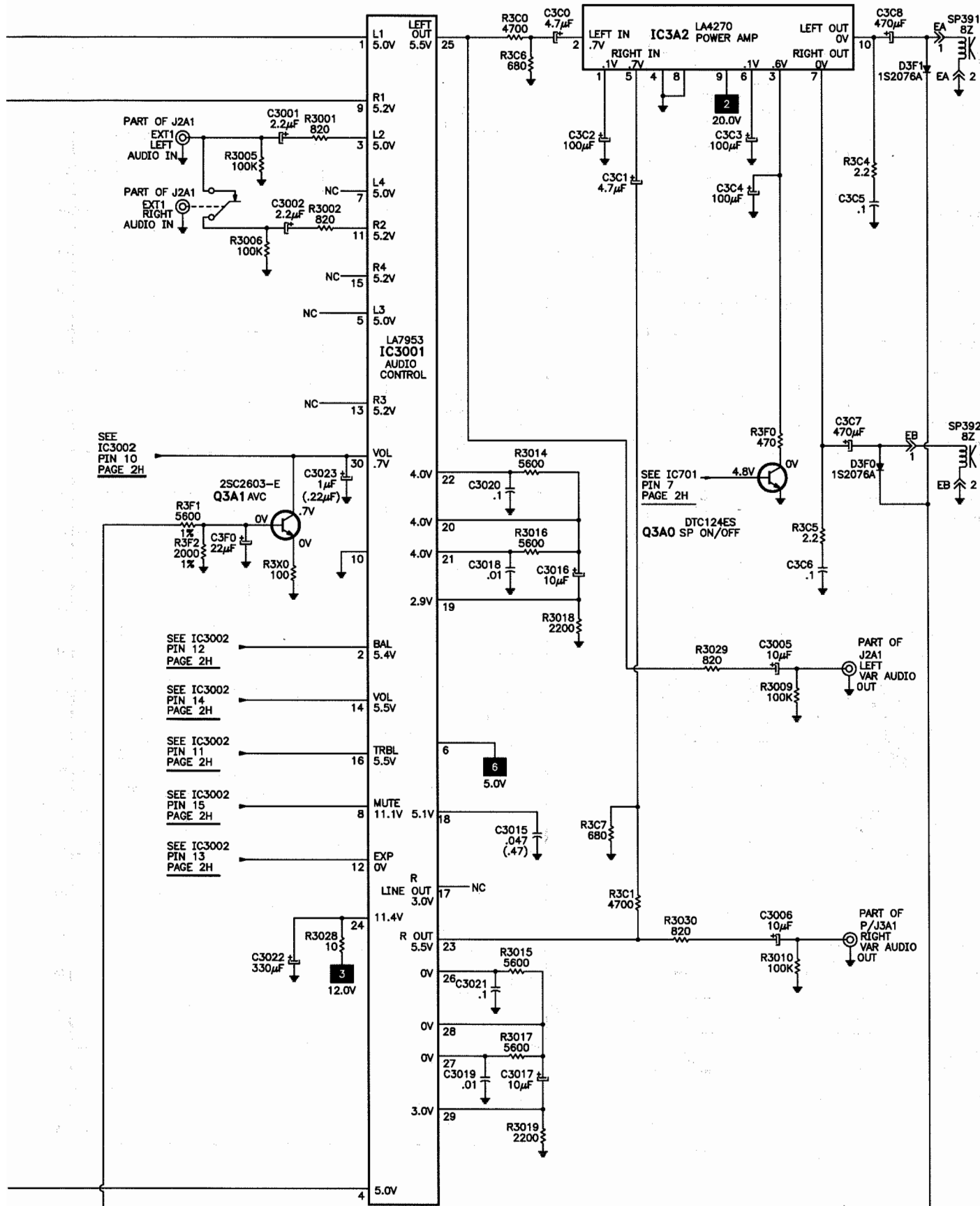
AUDIO & COMB FILTER SCHEMATIC

B

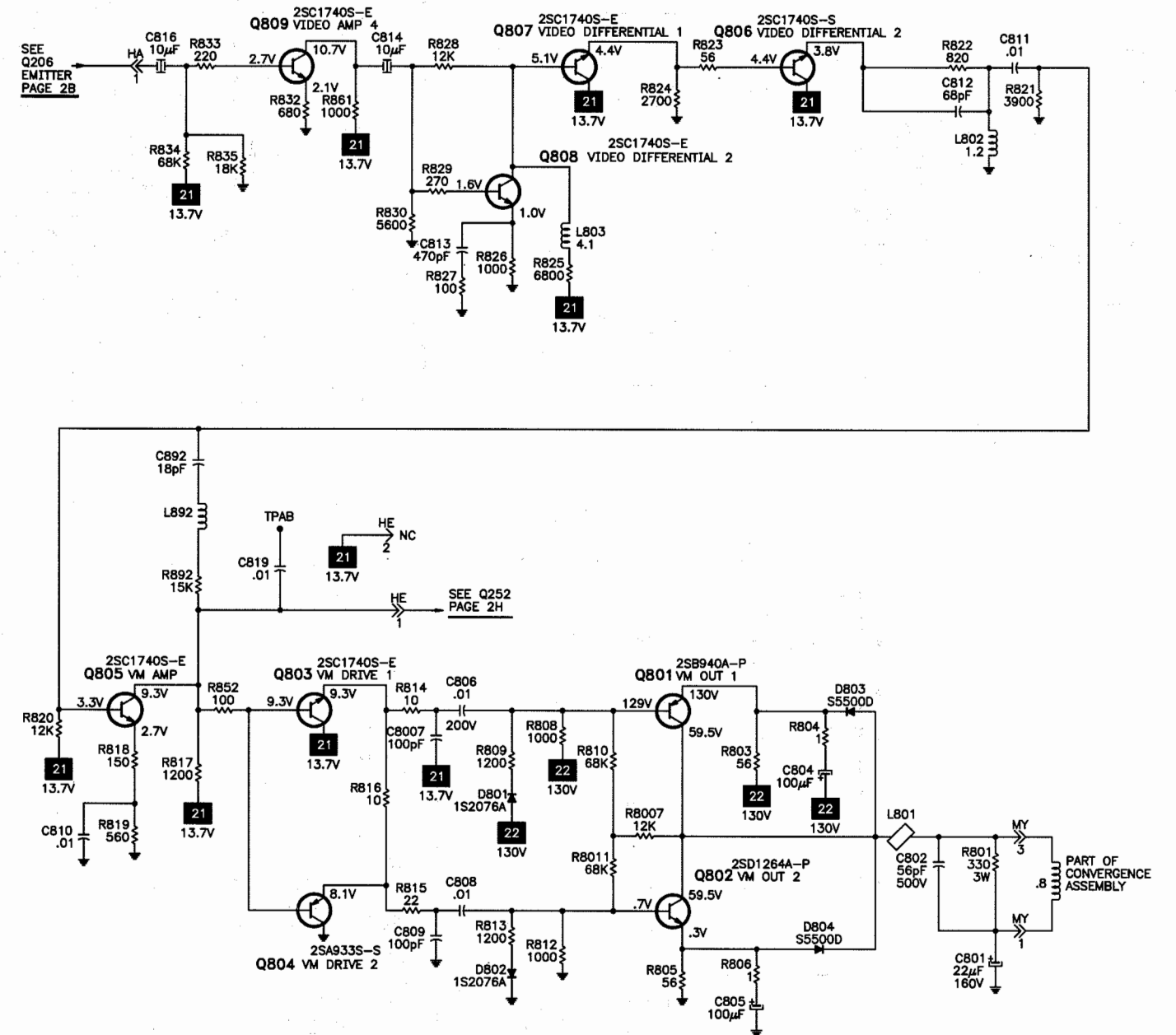


VOLTAGES TAKEN WITH SIGNAL
ADDITIONAL SCHEMATIC
NOTES, SEE PAGE 1

C AUDIO SCHEMATIC



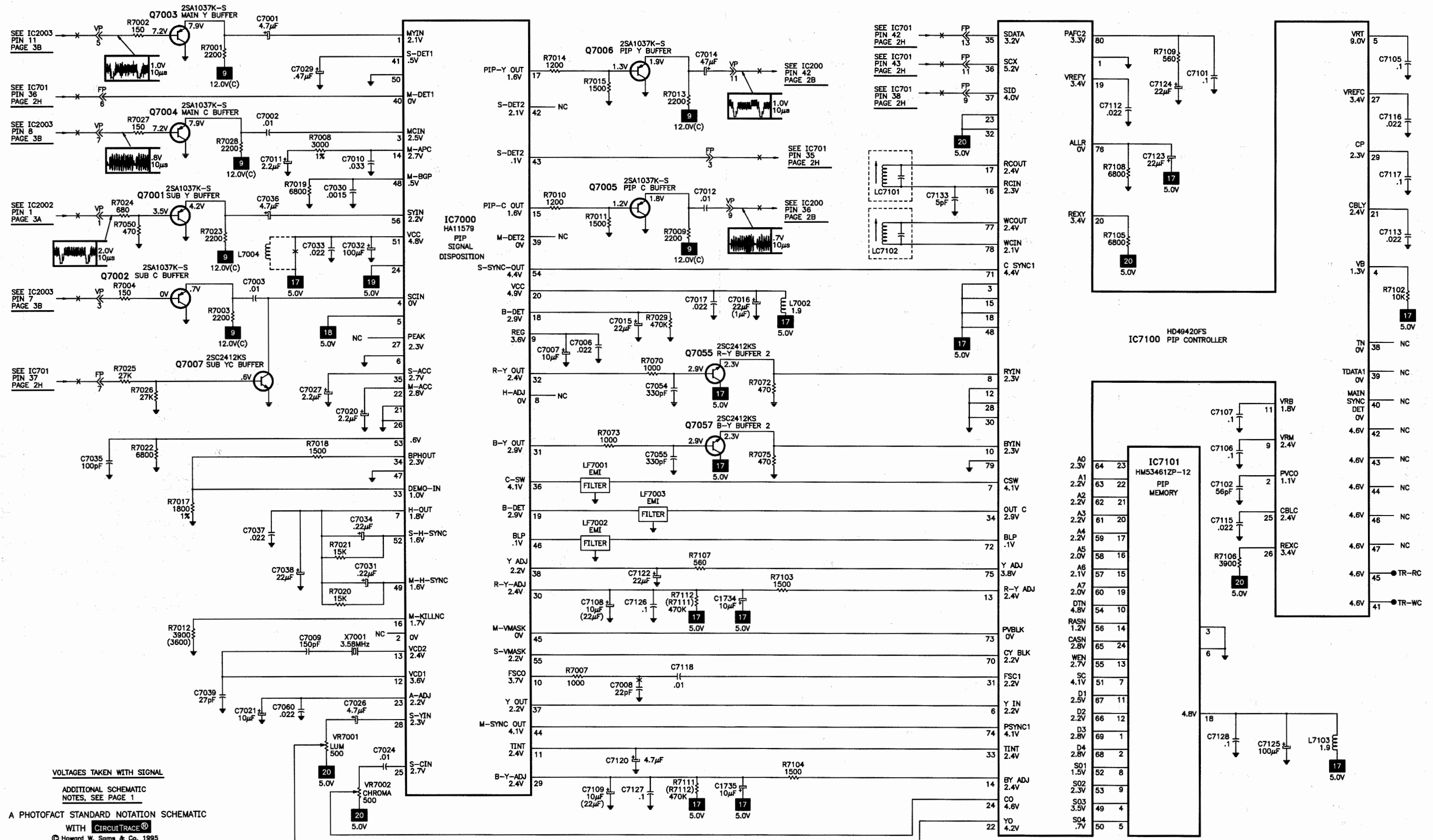
D VELOCITY MODULATOR SCHEMATIC



VOLTAGES TAKEN WITH SIGNAL

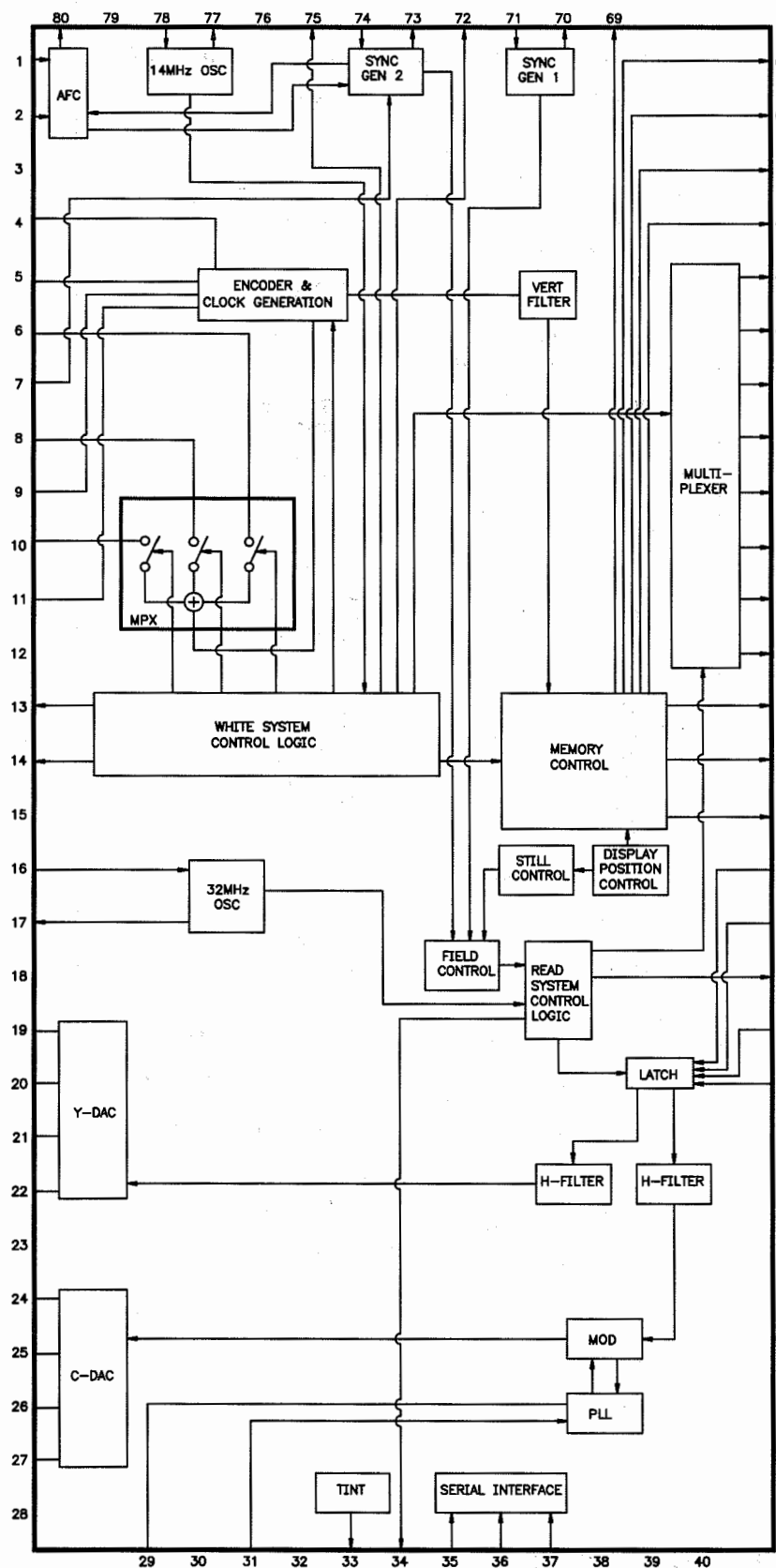
ADDITIONAL SCHEMATIC
NOTES, SEE PAGE 1

PIP SCHEMATIC

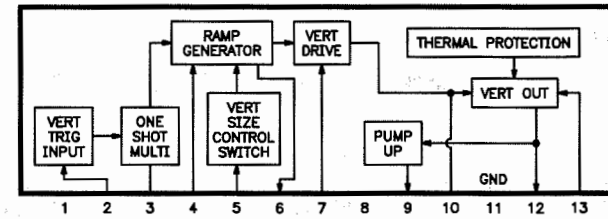


IC FUNCTIONS

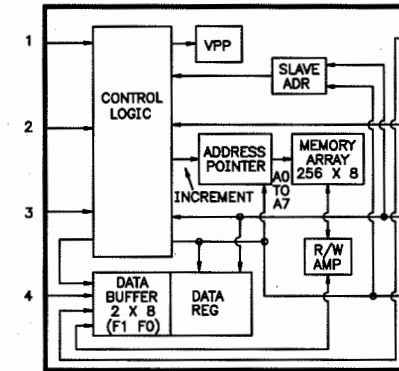
IC7100
HD49420FS



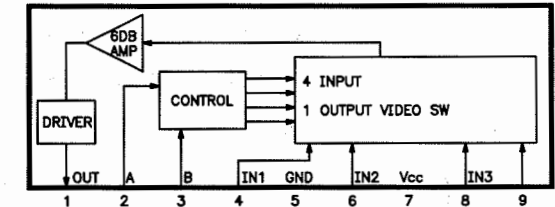
IC401
LA7837



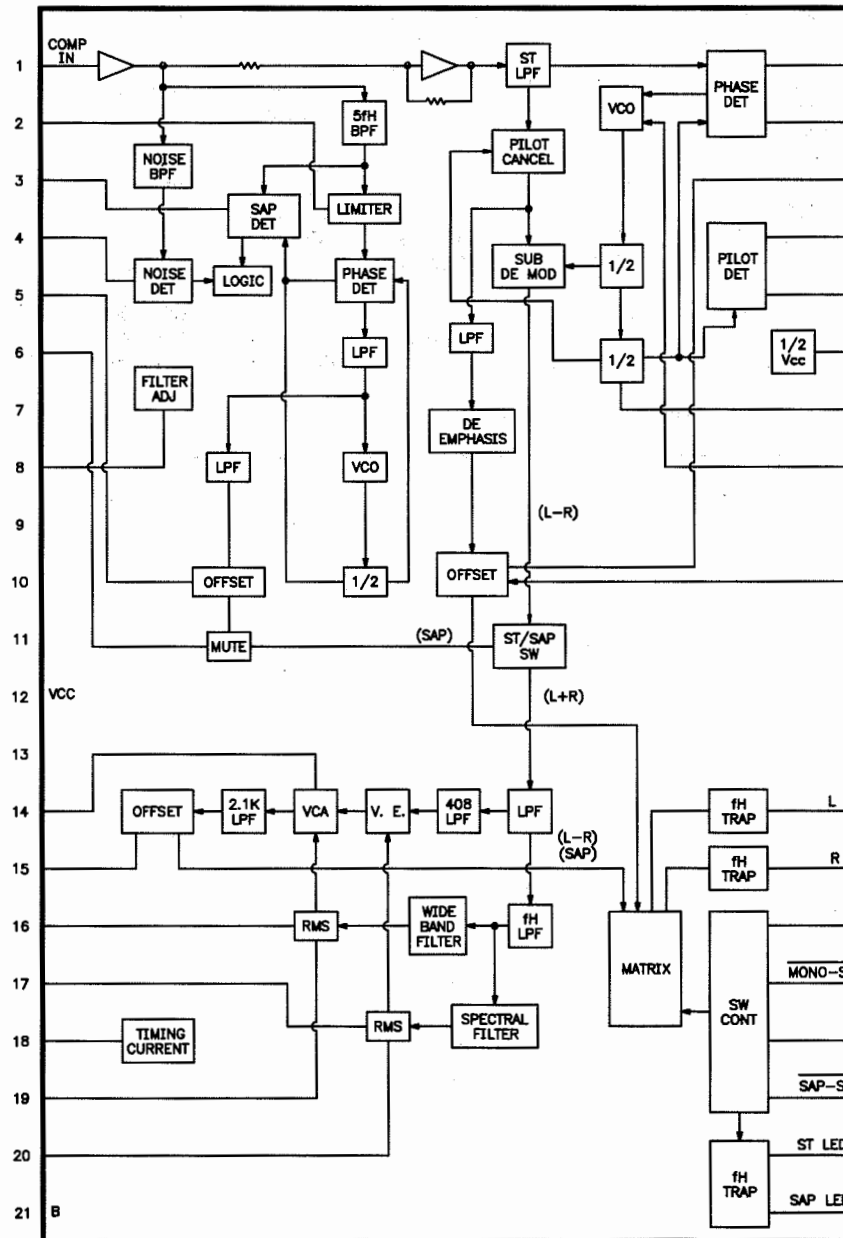
IC702
CAT24C02P



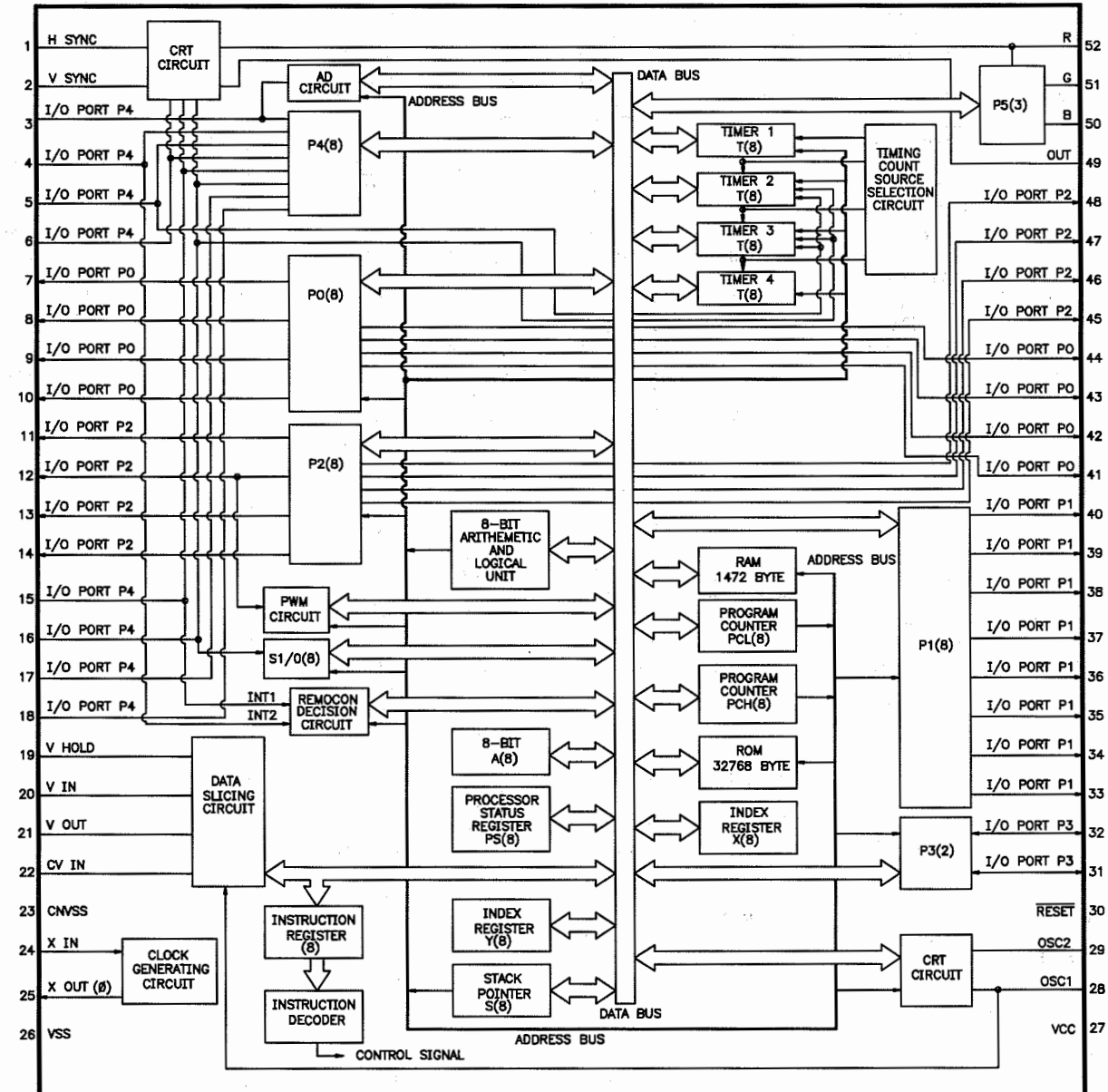
IC2001
LA7956



IC350
UPC1871CU

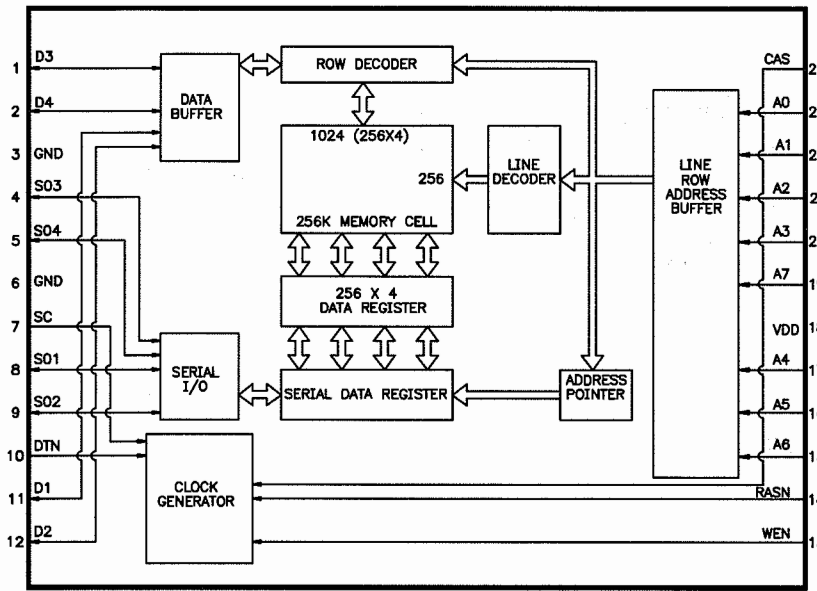


IC701
M37263MB-561SP

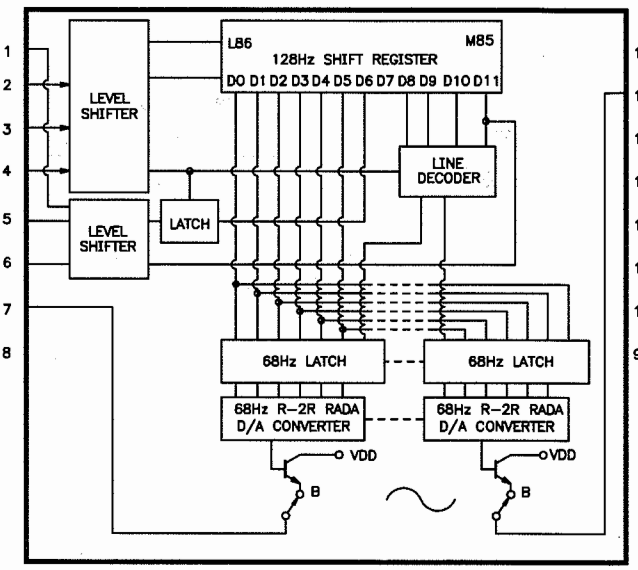


IC FUNCTIONS continued

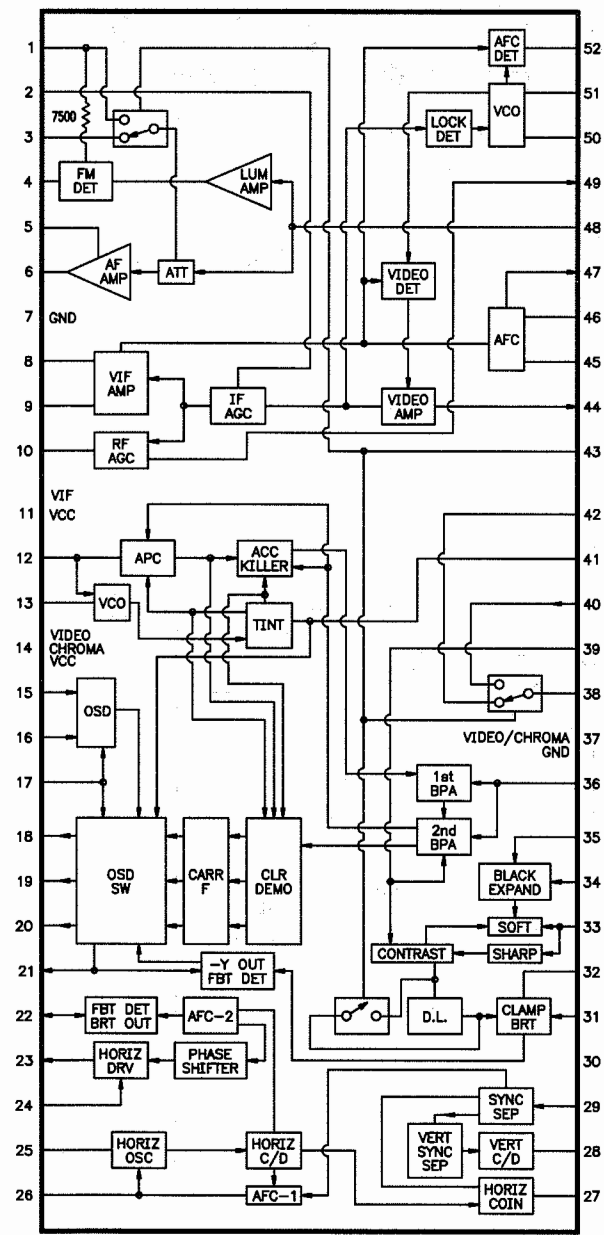
IC7101
HM53461ZP-12



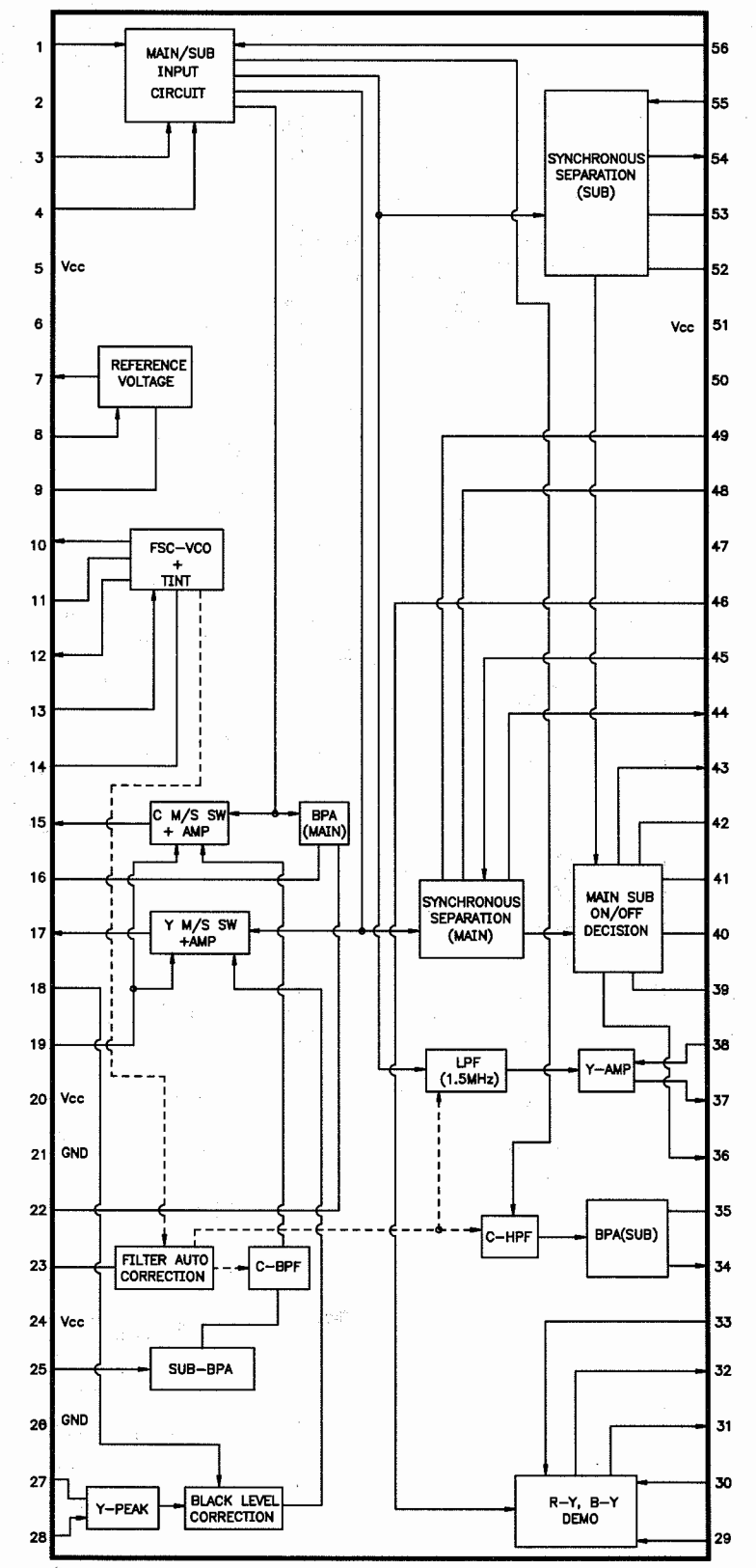
IC3002
UPD6326C



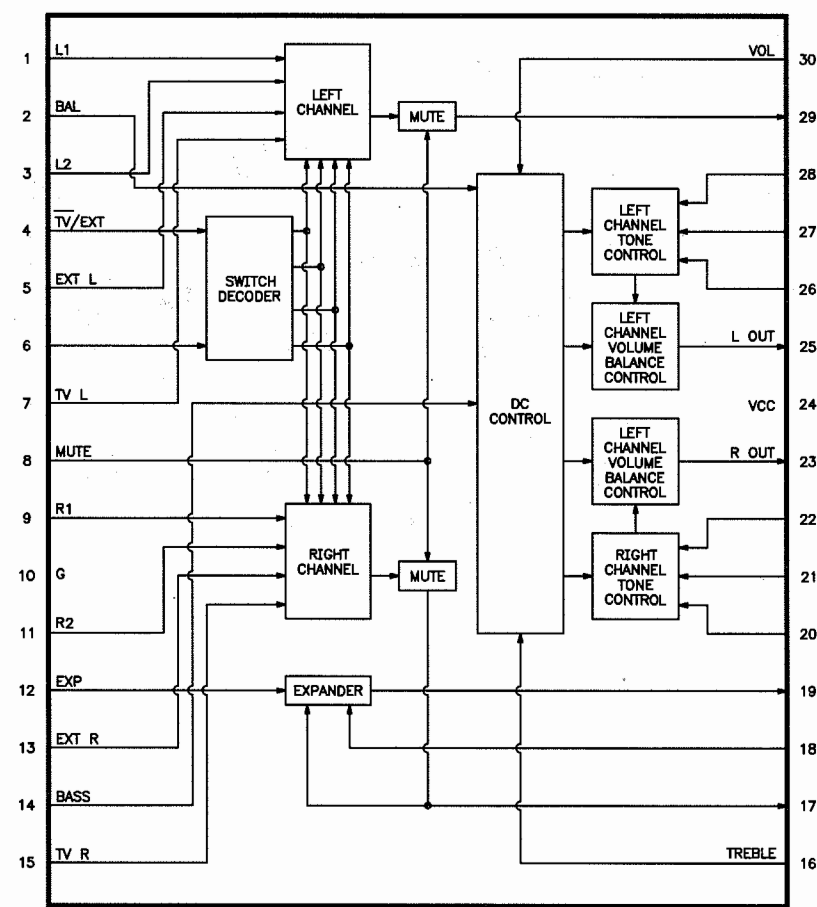
IC200
LA7674



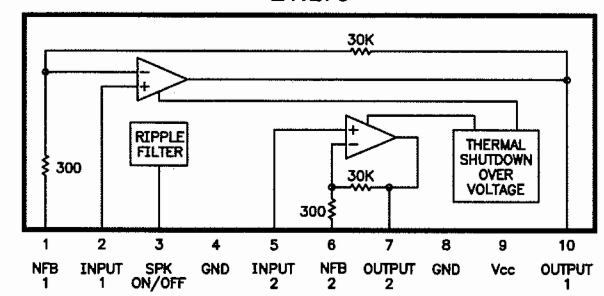
IC7000
HA11579



IC3001
LA7953



IC3A2
LA4270



PARTS LIST

Important Parts Information

- The parts listed here are those not usually available from a well-stocked supply cabinet or bin.
- Where items may be replaced with equivalent parts, several alternates are shown from participating vendors.
- On the parts lists, safety items are marked with a # to remind you that only exact replacements are recommended for these items.
- When ordering parts, state the model number, part number, and description.

Obtaining Parts

Many of these parts are available from your local Sams authorized distributor or the manufacturer of the equipment. Call Sams for the name of your nearest distributor:

800-428-7267

Or consult the Sams *Annual Index* for the address of the original equipment manufacturer.

Participating Vendors

Information on test equipment and replacement parts is listed in these pages for the following participating vendors. Consult the Sams *Annual Index* for their current address.

- Custom Components Corporation (Chek-A-Color)
- NTE Electronics, Inc. (NTE)
- Philips ECG Company (ECG)
- PTS Electronics Corporation (PTS)
- Sencore, Inc.
- Thomson Consumer Electronics, Inc. (SK, TCE)

SEMICONDUCTORS

(Select the replacement that gives the best results.)

Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
D2A0	1S2076A	-	NTE519	ECG519	SK3100
	1S2471	264P045040	NTE519	ECG519	SK3100
D3A0	RBA-401	264P613010	-	-	-
D3F0, F1	1S2076A	-	NTE519	ECG519	SK3100
	1S2471	264P045040	NTE519	ECG519	SK3100
D5A1	EQA02-20B	-	NTE5029A	ECG5029A	SK20A
	RD22FB1	264P490040	-	-	-
D5A2, A3	1S2076A	-	NTE519	ECG519	SK3100
	1S2471	264P045040	NTE519	ECG519	SK3100
# D5A4	RH2D	-	NTE588	ECG588	SK9938
	RH-2FS	264P157040	NTE558	ECG558	SK3998
# D5A5	RU3B	264P102020	NTE552	ECG552	SK3318A
D7A0, A1	EQA02-07A	-	NTE5014A	ECG5014A	SK6A8
	RD6.8FB2	264P485020	-	-	-
D7A2	HZ5BLL	264P502020	-	-	-
D7A3 Thru					
D7A9	EQA02-06E	-	NTE5013A	ECG5013A	SK6A2
	RD6.2FB3	264P484080	-	-	-
D7B0, B1 (1)	RD6.2FB3	264P484080	-	-	-
D7B2 Thru					
D7B4	EQA02-06E	-	NTE5013A	ECG5013A	SK6A2
	RD6.2FB3	264P484080	-	-	-
D7B5	EQA02-06E	-	NTE5013A	ECG5013A	SK6A2
	RD6.2FB3	264P484080	-	-	-
D7B6	EQA02-06E	-	NTE5013A	ECG5013A	SK6A2
	RD6.2FB3	264P484080	-	-	-
D7B7 (1)	EQA02-06E	-	NTE5013A	ECG5013A	SK6A2
	RD6.2FB3	264P484080	-	-	-
D7B8	EQA02-06E	-	NTE5013A	ECG5013A	SK6A2
	RD6.2FB3	264P484080	-	-	-
D7B9	EQA02-06E	-	NTE5013A	ECG5013A	SK6A2
	RD6.2FB3	264P484080	-	-	-
D7C0	EQA02-06E	-	NTE5013A	ECG5013A	SK6A2
	RD6.2FB3	264P484080	-	-	-
D7C1, C2 (1)	EQA02-06E	-	NTE5013A	ECG5013A	SK6A2
	RD6.2FB3	264P484080	-	-	-
D7P1	1S2076A	-	NTE519	ECG519	SK3100
	1S2471	264P045040	NTE519	ECG519	SK3100
D110	EQA02-05C	-	NTE5010A	ECG5010A	SK5A1
	RD5.1FB1	264P483070	NTE135A	ECG135A	SK5V1
D111	EQA02-30A	-	NTE5035A	ECG5035A	SK30A
	RD30FB3	264P491090	NTE5084A	ECG5084A	SK30V
D200, 01	1S2076A	-	NTE519	ECG519	SK3100
	1S2471	264P045040	NTE519	ECG519	SK3100
D203 Thru					
D206	1SS99	264P389010	NTE112	ECG112	SK3089
D250	1S2076A	-	NTE519	ECG519	SK3100
	1S2471	264P045040	NTE519	ECG519	SK3100
D260	1S2076A	-	NTE519	ECG519	SK3100
	1S2471	264P045040	NTE519	ECG519	SK3100
D451	ERA15-02	264P825010	NTE552	ECG552	SK9000
D452	1S2076A	-	NTE519	ECG519	SK3100
	1S2471	264P045040	NTE519	ECG519	SK3100
D500, 01	1S2076A	-	NTE519	ECG519	SK3100
	1S2471	264P045040	NTE519	ECG519	SK3100
D510	EQA02-33A	-	NTE5036A	ECG5036A	SK33A
	RD36EB1	264P471010	NTE5037A	ECG5037A	SK36A

For SAFETY use only equivalent replacement part.
(1) Used in some versions

SEMICONDUCTORS continued

(Select the replacement that gives the best results.)

Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
D530	1S2076A	-	NTE519	ECG519	SK3100
	1S2471	264P045040	NTE519	ECG519	SK3100
D540, 41	1S2076A	-	NTE519	ECG519	SK3100
	1S2471	264P045040	NTE519	ECG519	SK3100
D552	ES1F	264P295030	NTE558	ECG558	SK3998
# D553	RU3B	264P102020	NTE552	ECG552	SK3318A
D561	RU4AM	264P358070	NTE580	ECG580	SK5036
# D582	ERA15-02	264P825010	NTE552	ECG552	SK9000
D593	ERA15-02	264P825010	NTE552	ECG552	SK9000
D595, 99	1S2076A	-	NTE519	ECG519	SK3100
	1S2471	264P045040	NTE519	ECG519	SK3100
D701	HZ5ALL	264P502010	-	-	-
D702	1S2076A	-	NTE519	ECG519	SK3100
	1S2471	264P045040	NTE519	ECG519	SK3100
D703	EQA02-07A	-	NTE5014A	ECG5014A	SK6A8
	RD6.8FB2	264P485020	-	-	-
D704	1S2076A	-	NTE519	ECG519	SK3100
	1S2471	264P045040	NTE519	ECG519	SK3100
D705, 06	ERA15-02	264P825010	NTE552	ECG552	SK9000
D707, 08	1S2076A	-	NTE519	ECG519	SK3100
	1S2471	264P045040	NTE519	ECG519	SK3100
D761	1S2076A	-	NTE519	ECG519	SK3100
	1S2471	264P045040	NTE519	ECG519	SK3100
D771, 72	1S2076A	-	NTE519	ECG519	SK3100
	1S2471	264P045040	NTE519	ECG519	SK3100
D781 Thru					
D789	1S2076A	-	NTE519	ECG519	SK3100
	1S2471	264P045040	NTE519	ECG519	SK3100
D790	1S2076A	-	NTE519	ECG519	SK3100
	1S2471	264P045040	NTE519	ECG519	SK3100
D791	EQA02-08C	-	NTE5016A	ECG5016A	SK8A2
	RD6.2FB3	264P484080	-	-	-
D791A (1)	1S2076A	-	NTE519	ECG519	SK3100
	1S2471	264P045040	NTE519	ECG519	SK3100
D792, 99	1S2076A	-	NTE519	ECG519	SK3100
	1S2471	264P045040	NTE519	ECG519	SK3100
D801, 02	1S2076A	-	NTE519	ECG519	SK3100
	1S2471	264P045040	NTE519	ECG519	SK3100
D803, 04	S5500D	264P285010	NTE116	ECG116	SK3313
D850, 51	TVR1G	-	NTE552	ECG552	SK9000
	ES1C	264P295020	NTE552	ECG552	SK9000
D901	ERA15-02	264P825010	NTE552	ECG552	SK9000
# D953	RBV-406M	264P512040	NTE5330	ECG5330	SK9972
D2004	EQA02-07CD	-	NTE5014A	ECG5014A	SK6A8
	RD7.5FB2	264P485060	NTE138A	ECG138A	SK7V5
D2005, 06	EQA02-11A	-	NTE5020A	ECG5020A	SK11A
	RD11FB3	264P487050	-	-	-
IC3A0	UPC7812H	266P934020	NTE966	ECG966	SK3592
IC3A2	LA4270	272P140010	NTE1798	ECG1798	SK9745
IC200	LA7674	272P630020	-	-	-
IC350	UPC1871CU	272P351020	-	-	-
IC401	LA7837	272P239030	-	-	-
IC551	UPC7812H	266P934020	NTE966	ECG966	SK3592
IC552	L78M09	266P931010	NTE1902	ECG1902	SK3962
IC701	M37263MB-561SP	274P383010	-	-	-
IC702	CAT24C02P	263D002010	-	-	-
IC703	PST520E	266P130030	-	-	-
IC704	UPC7805H	266P934060	NTE960	ECG960	SK3591
# IC951	STR3230	267P911090	NTE1742	ECG1742	SK9995

For SAFETY use only equivalent replacement part.
(1) Used in some versions



Created with pride by the employees of Howard W. Sams & Company.

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PARTS LIST continued

SEMICONDUCTORS continued

(Select the replacement that gives the best results.)

Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
IC2001	LA7956	272P394010	-	-	-
IC2002	LA7956	272P394010	-	-	-
IC2003	LA7222	272P184010	NTE7066	ECG7066	-
IC3001	LA7953	272P139010	-	-	-
IC3002	UPD6326C	263P869010	-	-	-
IC7000	HA11579	272P860030	-	-	-
IC7100	HD49420FS	274P177030	-	-	-
IC7101	HM53461ZP-12	263P548010	-	-	-
# PC5A1	ON3131-R	268P058010	-	-	-
# PC5A2	ON3131-R	268P058010	-	-	-
Q3A0	DTC124ES	260P632010	NTE2357	ECG2357	SK9742
Q3A1	2SC1740S-S/R	260P559030	NTE85	ECG85	SK3122
	2SC2603-E/F	-	NTE289A	ECG289A	SK9137
Q5A1	2SC1740S-E	260P559050	NTE85	ECG85	SK3122
	2SC2603-F/E	-	NTE289A	ECG289A	SK9137
Q5A2	2SC2603-G	260P338050	NTE289A	ECG289A	SK9137
Q5A3	2SA1175-E/F	260P254010	NTE2362	ECG2362	SK3114A
# Q5A4	2SC2168-Y/O	260P428020	NTE375	ECG375	SK3929
	2SC2073-B/C	-	NTE375	ECG375	SK3929
	2SD386A-D/E	-	NTE375	ECG375	SK9118
	2SD401A-K/L	-	NTE375	ECG375	SK3929
Q100, 01	2SC1906	260P356010	NTE107	ECG107	SK3293
Q102	2SC1740S-S/R	260P559030	NTE85	ECG85	SK3122
	2SC2603-E/F	-	NTE289A	ECG289A	SK9137
Q103	2SA933S-S/R	260P560040	NTE290A	ECG290A	SK9132
	2SA1115-E/F	-	NTE290A	ECG290A	SK9138
Q200	DTC124ES	260P632010	NTE2357	ECG2357	SK9742
Q206, 07	2SC1740S-S/R	260P559030	NTE85	ECG85	SK3122
	2SC2603-E/F	-	NTE289A	ECG289A	SK9137
Q250	2SA950-Y	260P255040	NTE290A	ECG290A	SK3841
	2SA673D	-	NTE290A	ECG290A	SK9132
Q251	2SC1740S-S/R	260P559030	NTE85	ECG85	SK3122
	2SC2603-E/F	-	NTE289A	ECG289A	SK9137
Q252	2SK656	260P582010	-	-	-
Q301	2SC1740S-S/R	260P559030	NTE85	ECG85	SK3122
	2SC2603-E/F	-	NTE289A	ECG289A	SK9137
Q530	2SA1320	260P469020	NTE288*	ECG288*	SK3434*
# Q551	2SD1879	260P608010	NTE2331	ECG2331	SK10088
Q552	2SC2655-Y	260P325030	NTE293	ECG293	SK3849
Q600	DTC124ES	260P632010	NTE2357	ECG2357	SK9742
Q651, 52, 53	2SC1740S-S/R	260P559030	NTE85	ECG85	SK3122
	2SC2603-E/F	-	NTE289A	ECG289A	SK9137
Q654, 55, 56	2SC3789-E/D	260P571010	NTE157	ECG157	SK3747
Q701 Thru					
Q705	DTC124ES	260P632010	NTE2357	ECG2357	SK9742
Q761	2SA933S-S/R	260P560040	NTE290A	ECG290A	SK9132
	2SA1115-E/F	-	NTE290A	ECG290A	SK9138
Q762	2SC1740S-S/R	260P559030	NTE85	ECG85	SK3122
	2SC2603-E/F	-	NTE289A	ECG289A	SK9137
Q763 (1)	2SA933S-S/R	260P560040	NTE290A	ECG290A	SK9132
	2SA1115-E/F	-	NTE290A	ECG290A	SK9138
Q771	2SC1740S-S/R	260P559030	NTE85	ECG85	SK3122
	2SC2603-E/F	-	NTE289A	ECG289A	SK9137
Q772	2SA933S-S/R	260P560040	NTE290A	ECG290A	SK9132
	2SA1115-E/F	-	NTE290A	ECG290A	SK9138
Q781, 82, 83	2SC1740S-S/R	260P559030	NTE85	ECG85	SK3122
	2SC2603-E/F	-	NTE289A	ECG289A	SK9137

For SAFETY use only equivalent replacement part.

* Lead configuration may vary from original.

(1) Used in some versions

SEMICONDUCTORS continued

(Select the replacement that gives the best results.)

Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
Q801	2SB940A-P	260P573020	NTE398	ECG398	SK9363
Q802	2SD1264A-P	260P574020	NTE375	ECG375	SK9118
Q803	2SC1740S-E	260P559050	NTE85	ECG85	SK3122
	2SC2603-F/E	-	NTE289A	ECG289A	SK9137
Q804	2SA933S-S/R	260P560040	NTE290A	ECG290A	SK9132
	2SA1115-E/F	-	NTE290A	ECG290A	SK9138
Q805	2SC1740S-E	260P559050	NTE85	ECG85	SK3122
	2SC2603-F/E	-	NTE289A	ECG289A	SK9137
Q806	2SC1740S-S/R	260P5559030	NTE85	ECG85	SK3122
	2SC2603-F/E	-	NTE289A	ECG289A	SK9137
Q807, 08	2SC1740S-E/S	260P559050	NTE85	ECG85	SK3122
	2SC2603-F/E	-	NTE289A	ECG289A	SK9137
Q809	2SC1740S-E/S	260P559050	NTE85	ECG85	SK3122
	2SC2603-F/E	-	NTE289A	ECG289A	SK9137
Q901	2SC1740S-E/R	260P559050	NTE85	ECG85	SK3122
	2SC2603-F/E	-	NTE289A	ECG289A	SK9137
Q2030, 51	2SA933S-S/R	260P560040	NTE290A	ECG290A	SK9132
	2SA1115-E/F	-	NTE290A	ECG290A	SK9138
Q2052, 53	2SC1740S-S/R	260P559030	NTE85	ECG85	SK3122
	2SC2603-E/F	-	NTE289A	ECG289A	SK9137
Q2054	2SC1740S-S/R	260P559030	NTE85	ECG85	SK3122
	2SC2603-E/F	-	NTE289A	ECG289A	SK9137
Q2055	2SC2274-F	260P416030	NTE289A	ECG289A	SK3124A
Q2056	DTC124ES	260P632010	NTE2357	ECG2357	SK9742
Q7001 Thru					
Q7006	2SA1037K-S	260P817030	NTE2409	ECG2409	SK10100
Q7007, 55	2SC2412KS	260P818030	NTE2408	ECG2408	SK10099
Q7057	2SC2412KS	260P818030	NTE2408	ECG2408	SK10099

For SAFETY use only equivalent replacement part.

COILS & TRANSFORMERS

Item No.	Function/Rating	Mfr. Part No.	On-Unit No.
BP2001	Chroma Bandpass	349P198010	-
# DY (3)	Yoke 110°	-	YG-29GQAH
	Horiz .96mH		
	Vert 18mH		
# L5A1	Horizontal Linearity	333P012070	012-7
# L5A2	180µH	409P252020	-
L100 (1)	.22µH	-	-
L101 (1)	1.8µH	-	-
L102	1.8µH	325C120040	-
L104	VIF 45MHz	323P111020	-
L105	15µH	325C161050	-
L108	VIF 45.75MHz	323P171010	-
L251	100µH	325C162050	-
L300	SIF	327P073020	-
L307	18µH	325C121060	-
L450	1000µH	325C108070	-
# L554	Ferrite Bead	411P001010	-
L651 Thru			
L653	68µH	325C202030	-
L654 Thru			
L656	68µH	325C207030	-
L657	15µH	325C306050	-
L701 (1)	10µH	-	-
L801	Ferrite Bead	411D009020	-
L802	18µH	325C106060	-
L803	220µH	325C107090	-
L892	100µH	325C307050	-
# L901	Line Filter	351P090020	-
# L991	Degaussing	409B108020	-
L2051	15µH	325C121050	-
L2052	56µH	325C122020	-
L7000	10µH	321C031040	-
L7001	100µH	325C107050	-
L7002	10µH SMT	325C141030	-
L7003	10µH SMT	325C141030	-
L7004 (1)	10µH	-	-
L7102	10µH SMT	325C141030	-
L7103	10µH SMT	325C141030	-
LC7101	Filter	409P771010	-
LC7102	Clock	409P736010	-
# T5A1	Side Pincushion	349P145050	349P14505
T100	Trap	320P026030	-
# T551 (2)	Horizontal Output	334P212030	334P21203
# T552	Horizontal Drive	336P012040	P01204
T991	Power	350P439020	350P43902
T2051	Matching (Delay Line)	409P750010	-

For SAFETY use only equivalent replacement part.

(1) Used in some versions.

(2) Focus and screen controls are part of T551.

(3) Part of CRT.

PARTS LIST continued

CONTROLS & RESISTORS

Item No.	Function/Rating	Mfr. Part No.	NTE Part No.
R3A0	100 5% 3W	-	3W110
R3F1	5600 1%	-	-
R3F2	2000 1% 1/4W	-	-
R5A5	5100 1%	-	-
# R5B3	3300 5% 1/4W	-	QW233
	6800 5% 1/4W	103P713050	QW268
# R5B5	6800 5% 1/4W	103P413050	QW268
# R5C5	3300 5% 1/4W	103P413010	QW233
# R5C6	3900 5% 1/2W	103P143020	HW239
# R5C7	390 5% 2W	103C182000	2W139
	270 5% 2W	-	2W127
# R5D0 (1)	820 3W	-	-
# R5D1	1 5% 2W	103C188000	2W1D0
R129	130K 1% 1/4W	-	-
R213	11K 1% 1/4W	-	-
	9100 1% 1/4W	-	-
R358	56K 1% 1/4W	-	-
R360	82K 1% 1/4W	-	-
R380	56K 1% 1/4W	-	-
R402	24K 1% 1/4W	-	-
R403	1200 1% 1/4W	-	-
R500	300 1% 1/4W	-	-
R504	10K 1% 1/4W	-	-
R510	3300 1% 1/4W	-	-
R511	39K 1% 1/4W	-	-
# R520	1300 1% 1/4W	103P462080	-
# R521	10K 1% 1/4W	103P464090	-
R522	82 5% 3W	-	3W082
R550	100 5% 3W	-	3W110
# R555	3.9 10% 10W Wirewound	109D075040	10W3D9
R556	24K 1% 1/4W	-	-
R557	27K 1% 1/4W	-	-
# R558	.33 5% 1W	103C177040	1WD33
# R560	1.2 5% 1/4W	103P338010	QW1D2
# R561	.33 5% 1W	103C177040	1WD33
# R585	1.2 5% 1/4W	103P338010	QW1D2
R589	10K 5% 3W	-	3W310
R607	7500 1%	-	-
R653	8200 5% 3W	-	3W282
R673	8200 5% 3W	-	3W282
R676	8200 5% 3W	-	3W282
# R682	.82 5% 2W Fusible	103P437090	-
R712	10K 1% 1/4W	-	-
R713	13K 1% 1/4W	-	-
R740	8200 1% 1/4W	-	-
R741	47K 1% 1/4W	-	-
R742	8200 1% 1/4W	-	-
R743	20K 1% 1/4W	-	-
R744	24K 1% 1/4W	-	-
R745	91K 1% 1/4W	-	-
R746	10K 1% 1/4W	-	-
R801	330 5% 3W	-	3W133
# R910	4.7M 10% 1/2W	109D036020	HW547
# R954	100 10% 30W Wirewound	109D105020	-
# R956	820K 10% 1/2W	101P824030	HW482
# R957	2.2 10% 15W	109D044080	-
# R960	470K 5% 1/4W	103P415070	QW447
# R961	12K 5% 1W	103C173080	1W312
# R962	470 5% 1/4W	103P412010	QW147
R2056	200 1%	-	-

For SAFETY use only equivalent replacement part.
(1) Used in some versions.

CONTROLS & RESISTORS continued

Item No.	Function/Rating	Mfr. Part No.	NTE Part No.
R3032	10K 5% X 6 Network	103P563070	-
R7008	3000 1% 1/10W SMT	103P473060	-
R7017	1800 1% 1/10W SMT	103P473010	-
# RP901	5.4 PTC / 174 NTC Cold	265P071040	-
# RV901	Varistor (ERZ-C10DK271)	265P084020	-
VR5A1	500 PCC Phase	127C080030	-
VR5A2	5000 PCC Amp	127C080070	-
VR5A3	30K Horizontal Width	127C091000	-
VR5A4	20K Bias	127C080090	-
VR100	10K RF AGC	127C080080	-
VR101	1000 Video Input	127C080040	-
VR200	100K Sub Contrast	127C081020	-
VR2051	3000 Comb Filter	127C090060	-
VR320	5000 Composite	127C080070	-
VR351	20K Filter	127C180090	-
VR353	5000 Separation	127C180070	-
VR354	5000 Spectrum	127C180070	-
VR355	50K Stereo VCO	127C191010	-
VR401	50K Vertical Size	127C091010	-
VR402	10K Vertical Linearity	127C080080	-
VR651	200 Red Drive	127C020010	-
VR652	200 Blue Drive	127C020010	-
VR653	10K Red Cutoff	127C020080	-
VR654	10K Green Cutoff	127C020080	-
VR655	10K Blue Cutoff	127C020080	-
VR7001	500 Luminance	127C090030	-
VR7002	500 Chroma	127C090030	-

For SAFETY use only equivalent replacement part.

CABINET PARTS

Item	Part No.
Model CS-27201	
# Cabinet Back	700C175010
Cabinet Front Assembly	701D100060
Speaker Grille	702A324010
Model CS-27303	
# Cabinet Back	700C176030
Cabinet Front Assembly	701D100060
Speaker Grille	702A324010

For SAFETY use only equivalent replacement part.

CAPACITORS & ELECTROLYTICS

Item No.	Rating	Mfr. Part No.
# C5A4	2.2µF 20% 50V	181P355020
C5A5	4.7µF 20% 25V NP	-
# C5A8	2.2µF 10% 100V	189D062030
# C5A9	.1 5% 400V	172P083000
# C5B1	.33 5% 200V	189P071050
# C5B2	220pF 10% 2kV	154P231060
# C5B3	220pF 10% 2kV	154P231060
# C5B4	.047 5% 400V	172P152070
# C5B5	.015 5% 1.6kV	172P171050
# C5B6	.015 5% 800V	189P063090
# C5B7	.12 5% 200V	189P071040
C7P1 (1)	47µF 16V NP	-
C111	100pF 10% 50V NPO	-
C112	82pF 10% 50V N075	-
C307	47pF 10% 50V NPO	-
C309	47pF 10% 50V NPO	-
C352	10µF 20% 50V NP	-
C366	10µF 20% 50V NP	-
C367	10µF 20% 50V NP	-
# C510	100µF 10V	-
C540	33µF 20% 16V NP	-
# C552	.0018 5% 1.6kV	172P170040
C559	1µF 20% 50V NP	-
# C563	10µF 20% 250V	181P194000
# C565	1000µF 20% 35V	181P186050
# C570	.0012 10% 2kV	154P251090
# C583	10µF 20% 100V	181P187040
C595	47µF 20% 20V NP	-
C657	.001 10% 2kV	-
C658	.001 10% 2kV	-
C774	10µF 20% 25V NP	-
C816	10µF 20% 25V NP	-
# C901	.1 20% 125VAC	189P033050
# C910	.022 20% 250VAC	189P133020
	.01 20% 250VAC	-
# C911	.01 20% 250VAC	189P133010
# C953	820µF 20% 180V	185D063030
# C954	.0022 500V	142P014000
# C955	.0022 250VAC	189P060060
# C956	.0022 250VAC	189P060060
# C957	47µF 20% 200V	181P189080
# C960	10µF 20% 160V	181P188060
C2007	3.3µF 20% 50V NP	-
C2023	3.3µF 20% 50V NP	-
C2030	10µF 20% 100V	-

For SAFETY use only equivalent replacement part.

(1) Used in some versions.

MISCELLANEOUS

Item No.	Description	Mfr. Part No.	Notes
CF100	Trap	296P024020	4.5MHz
CF300	Filter	296P067010	4.5MHz
CF500	Resonator	299P154010	503kHz
DL205	Delay Line	337P190010	-
DL2032	Delay Line	337P189010	-
DL2051	Delay Line	337P188010	-
# F901	Fuse	283D060030	6.3Amp
# F951	Fuse	283D076040	2Amp, Fast Acting
# K901	Relay	287P049030	Power
LF7001	Filter	409P402030	EMI
LF7002	Filter SMT	409P777020	EMI
LF7003	Filter	409P402020	EMI
# P900	Line Cord	242C499040	AC, Polarized
S781	Switch	432P066070	Power
S782	Switch	432P066070	AV Reset
S783	Switch	432P066070	Volume Up
S784	Switch	432P066070	Volume Down
S785	Switch	432P066070	Scan Up
S786	Switch	432P066070	Scan Down
S787	Switch	432P066070	Input
SF101	Filter	296P096030	SAW
SP391	Speaker	480P013020	3", 8 Ohms, 3W
SP392	Speaker	480P013020	3", 8 Ohms, 3W
# V651	CRT	255P935020	M68JUA068X01
X600	Crystal	285P029050	3.58MHz
X701	Crystal	285P039020	8MHz
X702	Crystal	285P139030	12MHz
X7001	Crystal	285P066010	3.58MHz
Z701	Receiver	939P296090	Remote
	PC Board (1)	920D502010	Comb Filter
	PC Board (1)	930C473007	CRT
	PC Board (1)(2)	930C473006	CRT
	PC Board (1)	920A408007	Main
	PC Board (1)(2)	920A408006	Main
	PC Board (1)	920D501010	MCS
	PC Board (1)	930C322080	PCC
	PC Board (1)	930B552012	PIP
	Socket	449C081020	CRT
	Transmitter	290P005040	Remote
	Transmitter (2)	290P005060	Remote
	Tuner (1)	295P269030	UHF/VHF, ENV-568F9G3

For SAFETY use only equivalent replacement part.

(1) Contact PTS Electronics Corporation for replacement; order by manufacturer's part number.
(2) Used in model CS-27201.

MITSUBISHI

MODELS CS-27201, CS-27303