

CABINET-REAR VIEW

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

Remove eight screws holding cabinet back and remove back. Disconnect HV anode, CRT socket, Deflection Yoke connector, Degaussing Coil connector, Speaker connector, ground leads, and all required cabling. Remove three screws holding Main board assembly to front of cabinet. Slide Main board assembly out of cabinet frame and cabinet.

CRT REMOVAL

Follow "Chassis Removal" procedure and lay set facedown on a soft protective surface. Loosen and remove CRT neck assemblies. Remove four screws holding CRT to cabinet front and lift CRT out of cabinet. **DO NOT LIFT CRT BY THE NECK.**

SERVICING IN THE FIELD

CRT IMPLOSION PROTECTION AND CLEANING

Implosion protection is an integral part of the picture tube, cleaning accomplished without CRT removal.

FUSE DEVICES

A .8-amp fuse is used for low-voltage power-supply protection. (See photo, Cabinet - Rear View.)

A 4-amp fuse is used for AC line protection. (See photo, Cabinet - Rear View.)

VHF/UHF TUNER

See Miscellaneous Adjustments.

CHANNEL TUNING

Channel Up and Down buttons are provided for channel scanning with ten numbered buttons (on Remote Transmitter) provided for one or two-digit entry direct access channel selection. Fine tuning is automatic.

HIGH VOLTAGE

For high voltage procedure, refer to Miscellaneous Adjustments.

FOCUS

The focus may be varied by a Focus Control. (See photo, Cabinet - Rear View.)

AGC

The AGC may be varied by an AGC Control. (See IF Board - Top View.)

SET 2674 FOLDER 1

SAMS

PHOTOFACT®

For Supplier Address See PHOTOFACT Index

HITACHI
MODELS CT1386B/W



Model CT1386B

SAFETY PRECAUTIONS

See Page 4

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SAMS

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The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co. as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co. by the manufacturers of the particular type of replacement part listed.

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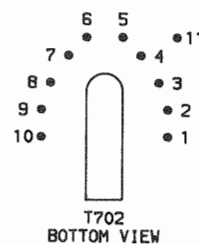
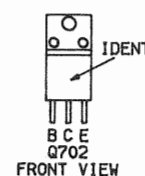
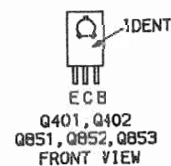
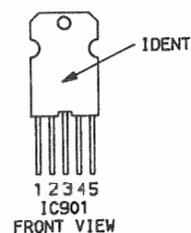
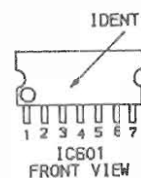
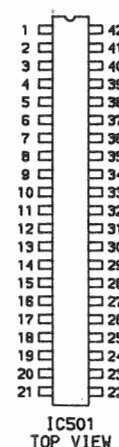
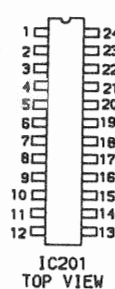
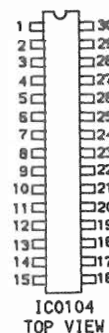
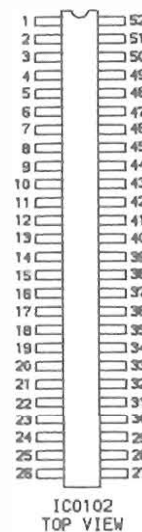
DATE 7-89

SET 2674 FOLDER 1



10 9 8 7 6 5 4 3 2 1 0

TERMINAL GUIDES & NOTES



For SAFETY use only equivalent replacement part, see parts list

--- Circuitry not used in some versions

--- Circuitry used in some versions

See parts list

Nominal value

Ground

Chassis

Common tie point

Waveforms and voltages are taken from ground, unless noted otherwise.

Waveforms: triggered scope, keyed rainbow generator. Item numbers in rectangles appear in the alignment/adjustment instructions.

Supply voltages maintained as shown at input.

Voltages measured with digital meter, no signal.

Controls adjusted for normal operation.

Terminal identification may not be found on unit.

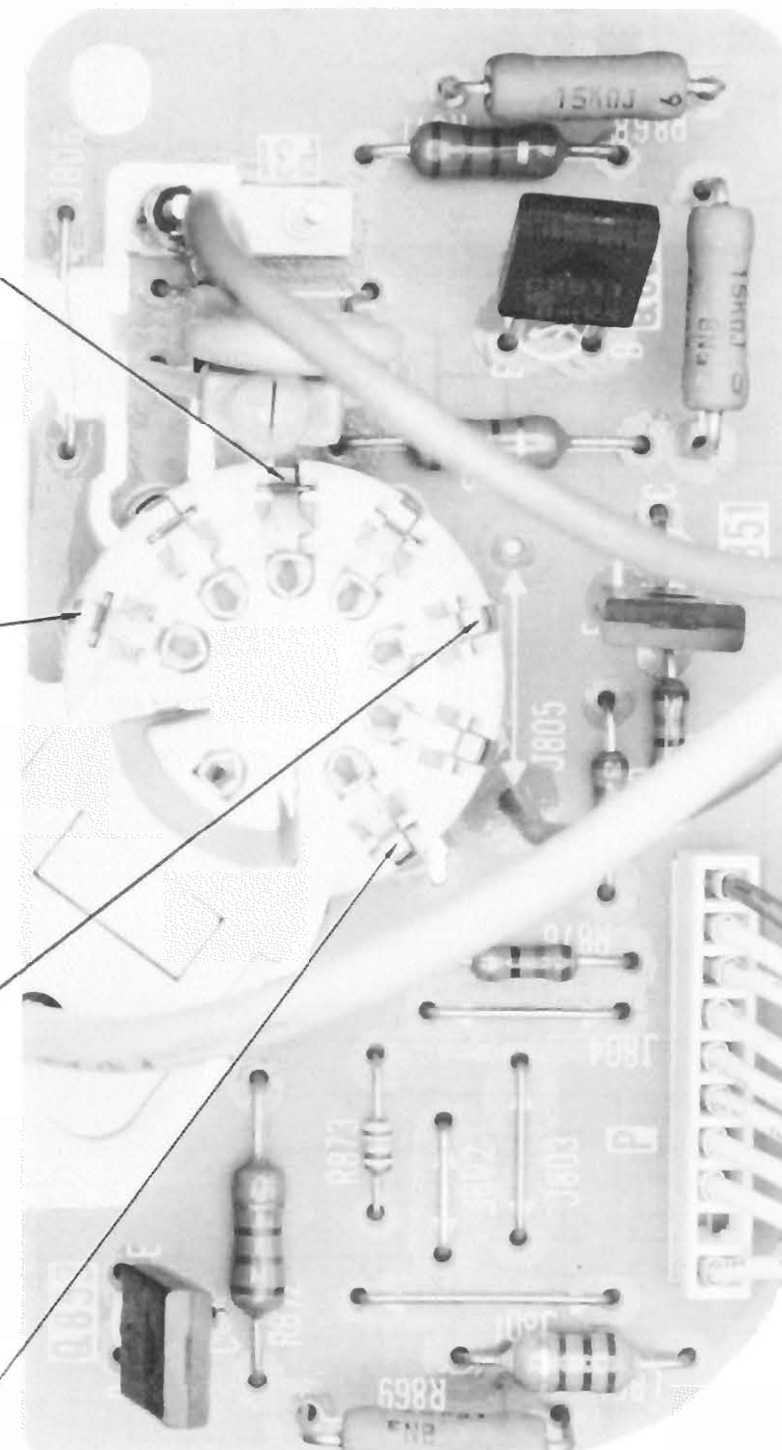
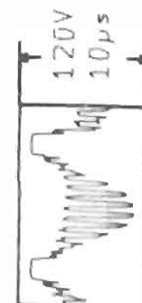
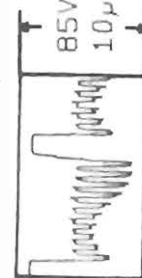
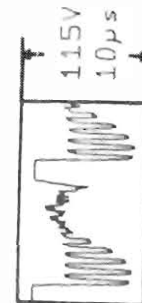
Capacitors are 50 volts or less, 5% unless noted.

Electrolytic capacitors are 50 volts or less, 20% unless noted.

Resistors are 1/2W or less, 5% unless noted.

Value in () used in some versions.

Measurements with switching as shown, unless noted.



DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

Remove eight screws holding remove back. Disconnect HV Deflection Yoke connector, Speaker connector, and all required cabling. holding Main board assembly cabinet. Slide Main board cabinet frame and cabinet.

SERVICING IN THE FIELD

CRT IMPLSION PROTECTION AND

Implsion protection is on the picture tube, cleaning out CRT removal.

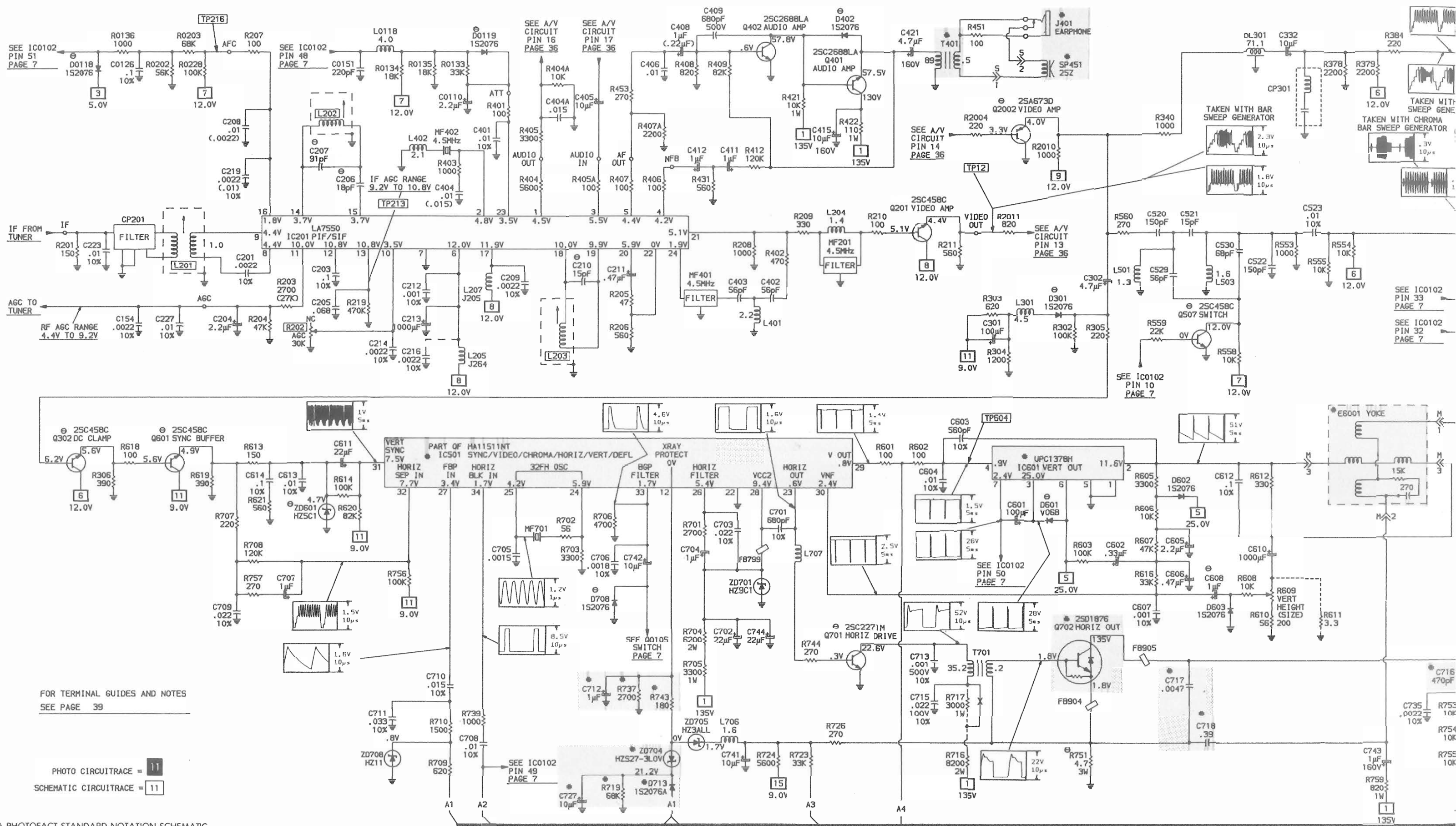
FUSE DEVICES

A .8-amp fuse is used power-supply protection. (See Rear View.)

A 4-amp fuse is used for A (See photo, Cabinet - Rear View.)

VHF/UHF TUNER

See Miscellaneous Adjustments



SAFETY PRECAUTIONS

SERVICE WARNING

Service work should be performed only by qualified service technicians who are familiar with safety checks and guide lines.

- 1. For continued safety, no modification of any circuit should be attempted unless recommended by manufacturer.
- 2. Disconnect power source before replacing parts as some parts may be electrostatic sensitive.
- 3. Use an isolation transformer between the line cord and power receptacle, when servicing chassis.

SERVICING HIGH VOLTAGE AND PICTURE TUBE

When servicing the High Voltage circuits, extreme caution should be used.

- 1. Discharge static High Voltage by connecting a 10 kohms resistor in series with a test lead between chassis and anode lead of picture tube.
- 2. Wear shatter-proof eye protection (goggles) when handling the picture tube in case of implosion.
- 3. DO NOT lift picture tube by the neck.

X-RAY RADIATION AND HIGH VOLTAGE LIMITS

Service personnel should be aware of the procedures and instructions covering x-ray radiation. The only potential source of x-ray in present day solid state receivers and monitors is the picture tube.

- 1. It is only when High Voltage is excessive that x-ray radiation is capable of being emitted from shell of picture tube. Be sure the High Voltage is set at specified level.
- 2. An accurate High Voltage meter should be available at all times. Meter calibration should be checked periodically.
- 3. High Voltage should be kept at rated value - NO HIGHER. Higher voltages may cause x-ray radiation or failure of other associated components. DO NOT depend on protection circuit to keep voltages at rated value.
- 4. Every time a chassis is serviced, High Voltage should be checked at various brightness levels to be sure it is regulating properly.
- 5. While troubleshooting a set with excessive High Voltage, avoid being close to picture tube. DO NOT operate longer than it is necessary to locate the cause of excessive High Voltage. Use a variable AC transformer to regulate voltage.

- 6. Many components, electrical and mechanical, in present chassis have safety related characteristics which are not evident with visual inspection. When these components are known, they are identified with a # on the schematic and in the parts list. When replacing these components, for SAFETY, use only an equivalent replacement part.

SAFETY CHECKS-FIRE AND SHOCK HAZARD

Cold Leakage Checks (Sets with isolated ground.)

- 1. Unplug the AC cord and connect a jumper across the two prongs on the plug.
- 2. Turn on power switch.
- 3. Measure the resistance, with an Ohm meter, between the jumpered AC plug and any exposed metal cabinet parts on the set such as: antenna screw heads, control shafts, handle brackets. Exposed metal parts that have a return path should measure between 200 kohms and 5 megohm. Parts without a return path must measure infinity.

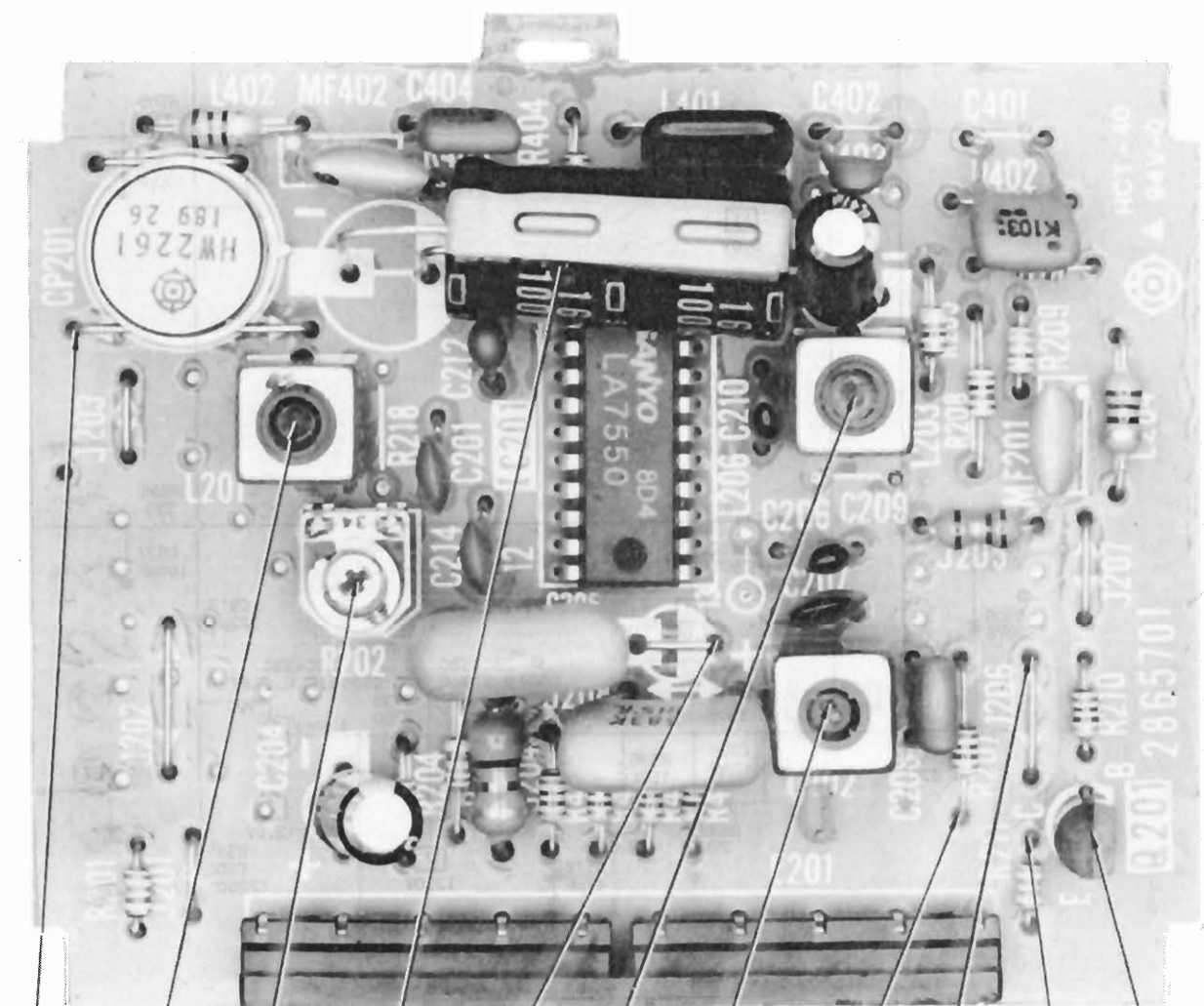
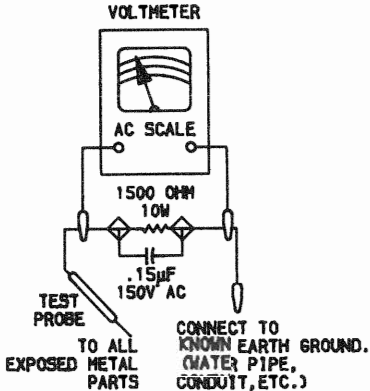
Leakage Current Hot Check

- 1. Plug the AC cord directly into AC outlet. DO NOT use an isolation transformer.
- 2. Connect a 1500 Ohm 10 watt resistor, in parallel with a .15µF 150V AC capacitor, between any exposed metal parts on the set and a good earth ground such as a water pipe. (See Figure below.)
- 3. Using an AC volt meter, with 1000 Ohms per volt or more sensitivity, measure the voltage across the resistor. Check each exposed part and measure voltage at each point.
- 4. Reverse the AC plug and repeat voltage measurement at each point.
- 5. The voltage at any point should not exceed .75 volts RMS. This corresponds to .5 milliamps AC. Any value exceeding this limit constitutes a potential shock hazard and must be corrected.

GENERAL GUIDE LINES

A final SAFETY check before returning the set to customer.

- 1. Check area repaired for poorly soldered or de-soldered connections. Check entire circuit board surface for solder splashes.
- 2. Check interboard wiring for pinched wires or wires contacting any high-wattage resistors.
- 3. Check that all control knobs, shields, covers, grounds and mounting hardware have been replaced. Be sure to replace all insulators.



NOTE: ARROWS ON IC'S INDICATE PIN 1 UNLESS NOTED

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FOLDER 1

I.F. BOARD

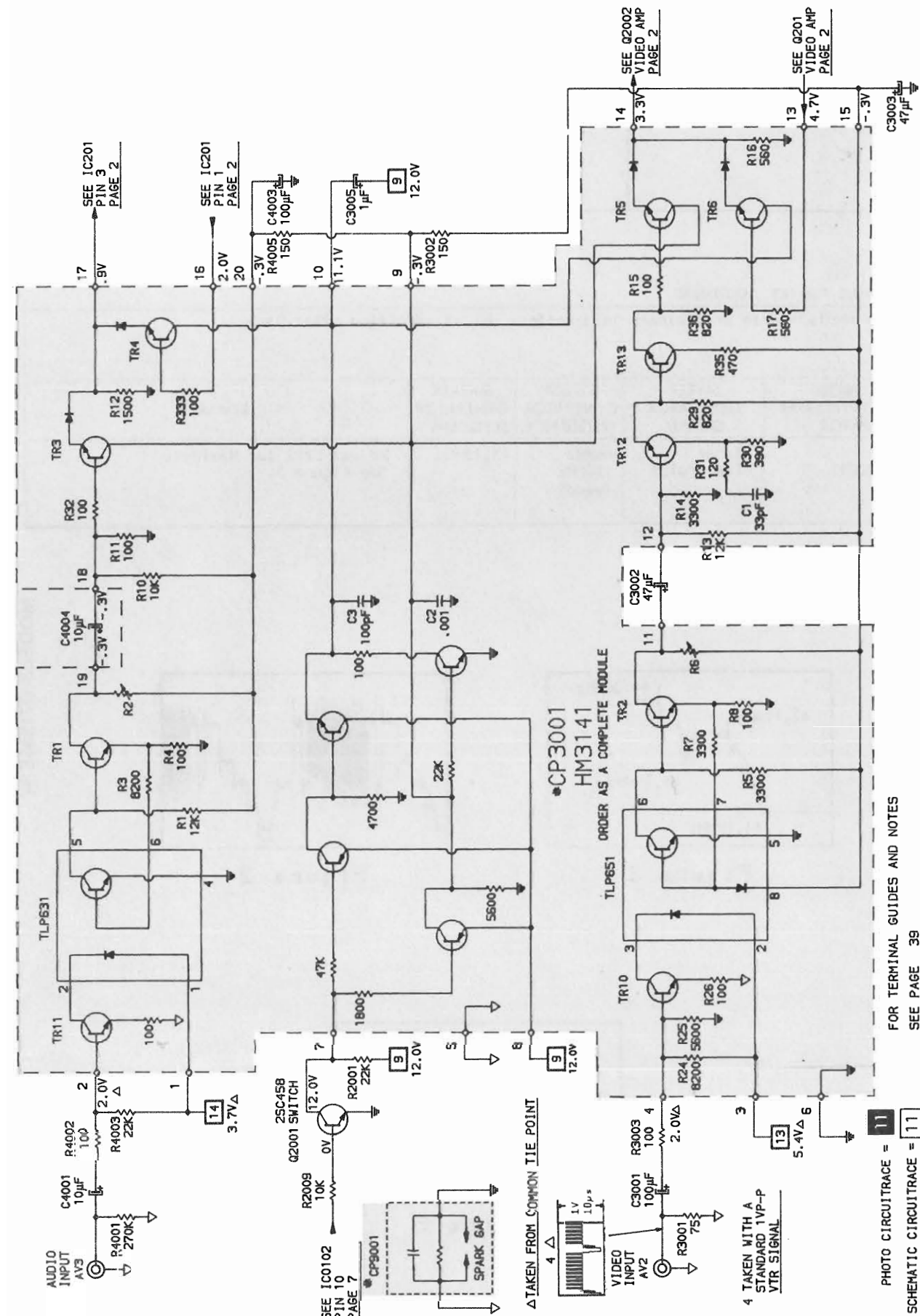


PHOTO CIRCUITRACE = 11
SCHEMATIC CIRCUITRACE = 11

A PHOTOFAC[®] STANDARD NOTATION SCHEMATIC
WITH **CIRCUITRACE[®]**

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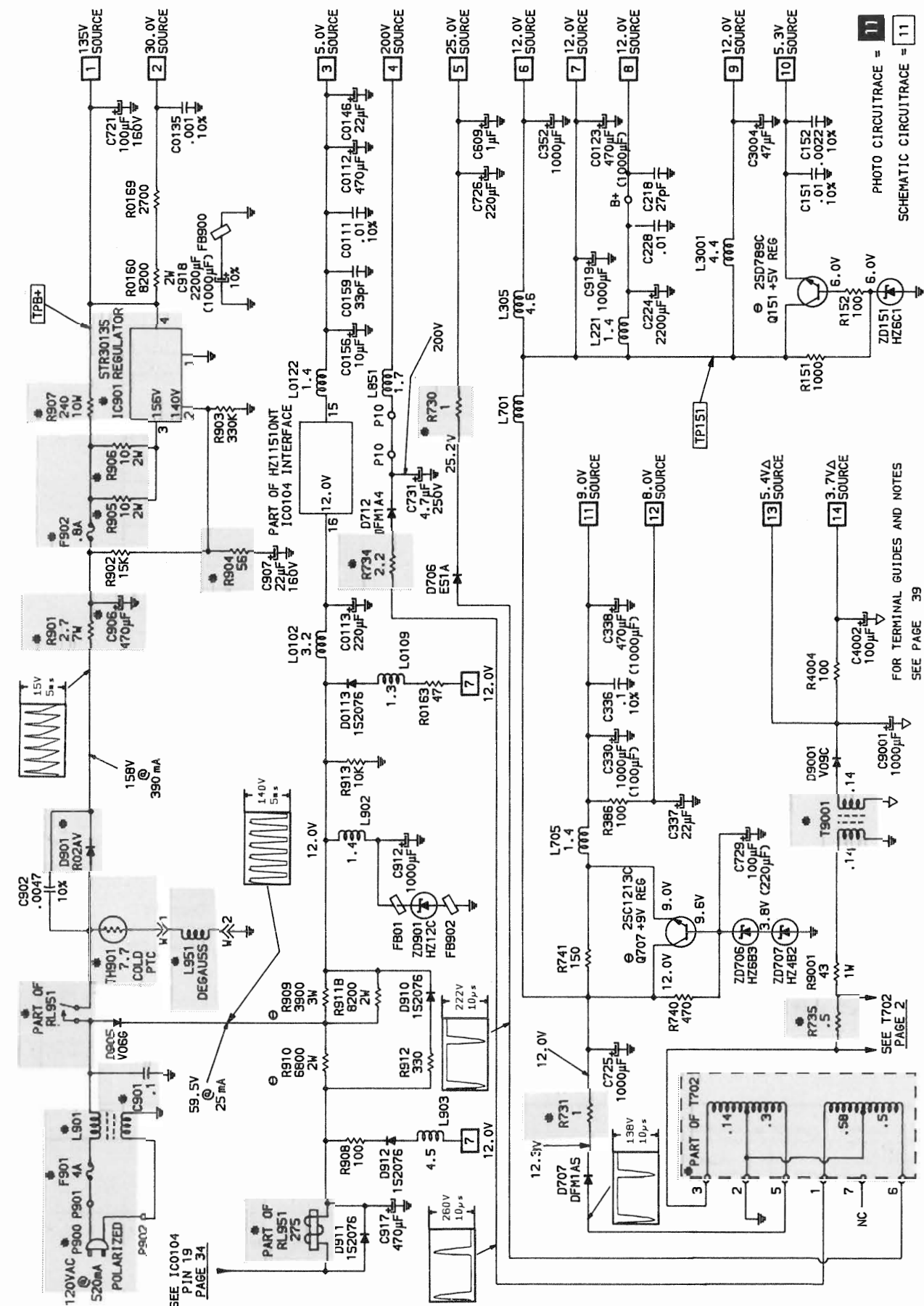


PHOTO CIRCUITRACE = 11

SCHEMATIC CIRCUITRACE = 11

FOR TERMINAL GUIDES AND NOTES
SEE PAGE 39

MODELS CT1386B/W

FOLDER 1

POWER SUPPLY

TEST EQUIPMENT

Test Equipment listed by Manufacturer illustrates typical or equivalent equipment used by SAMS' Engineers to obtain measurements and is compatible with most types used by field service technicians.

Equipment	B & K Precision Equipment No.	Sencore Equipment No.	Notes
OSCILLOSCOPE	1560, 1564, 1541	SC61	
GENERATORS			
RGB	1249,1260		
MULTIBURST SIGNAL	1251,1260	VA62	
COLOR BAR	1211A,1249,1251,1260	VA62,CG25	
ANALOG VOM	277,111,116		
DIGITAL VOM	2830,2806	DVM37,DVM56,SC61	
FREQUENCY METER	1803,1805	FC71,SC61	
HI-VOLTAGE PROBE	HV-44	HP200	
VOM/DMM			
Accessory probes	PR-28(HV)		
ISOLATION TRANSFORMER	TR110,1604,1653,1655	PR57	
CAPACITANCE ANALYZER	820,810,830	LC53,LC75,LC76,LC77	
CRT ANALYZER	467,470	CR70	
TEMPERATURE PROBE	TP-28,TP-30		
AC LEAKAGE TESTER	1655	PR57	
LOGIC PROBE	DP51,DP21		
LOGIC PULSER	DP101,DP31		
INDUCTANCE ANALYZER	875	LC53,LC75,LC76,LC77	
FLYBACK YOKE TESTER	875	LC53,VA62	
TV STEREO GENERATOR	2009	ST65,ST66	
FIELD STRENGTH METER		FS73,FS74	

TV ALIGNMENT INSTRUCTIONS

Use an isolation transformer and observe power supply polarity. Maintain line voltage at 120V AC. Allow a 20-minute warm-up period for receiver and test equipment.
Suggested Alignment Tools: GC-THORSEN
L201, L202, L203, Tuner IF Coils, L01079440

PRELIMINARY INSTRUCTIONS

Set the channel selector to the highest unused channel. Set scope sweep to external. Connect scope vertical input to scope vertical input on sweep/marker generator. Connect scope external horizontal input to scope horizontal input on sweep/marker generator. Ground test equipment to TV chassis unless specified otherwise. Use only enough generator output to provide a usable indication.
Note: Response may vary slightly from that shown.
Connect a 9.5 volt Bias to TP213.

VIDEO IF ALIGNMENT (SWEEP MARKER GENERATOR)

DIRECT PROBE FROM SWEEP/MARKER GENERATOR	SWEEP GENERATOR OUTPUT	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	REMARKS
TP12	Test Point on VHF tuner.	44MHz (10MHz Sweep)	41.25MHz 42.17MHz 44.00MHz 45.75MHz	Adjust Tuner IF Output Coils and L201 for best symmetry and response of waveform. Adjust L203 to overlap beat frequency over the 45.75MHz marker. See Figure 1.

TV ALIGNMENT INSTRUCTIONS (Continued)

VIDEO IF ALIGNMENT (BAR SWEEP GENERATOR)

BAR SWEEP GENERATOR	SCOPE INPUT	REMARKS
Antenna Terminal	TP12	Perform Video IF Adjustments per SWEEP/MARKER GENERATOR Instructions. See Figure 2.

AUTOMATIC FINE TUNING ALIGNMENT

Connect as explained in preliminary instructions unless specified otherwise.

DIRECT PROBE FROM SWEEP/MARKER GENERATOR	SWEEP GENERATOR OUTPUT	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	REMARKS
TP216 (Pin 16 IC201)	Tuner Test Point	44MHz (10MHz Sweep)	45.75MHz	Adjust L202 for Maximum. See Figure 3.

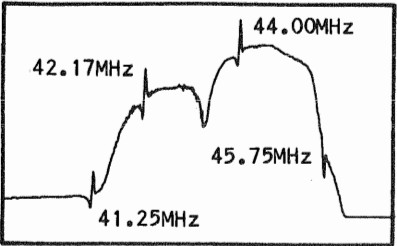


Figure 1

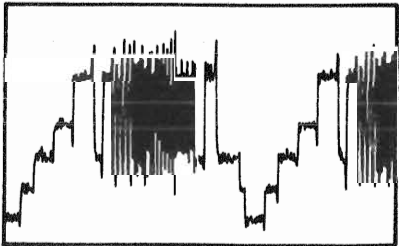


Figure 2

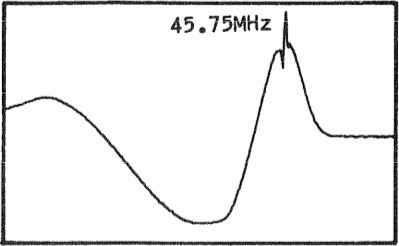
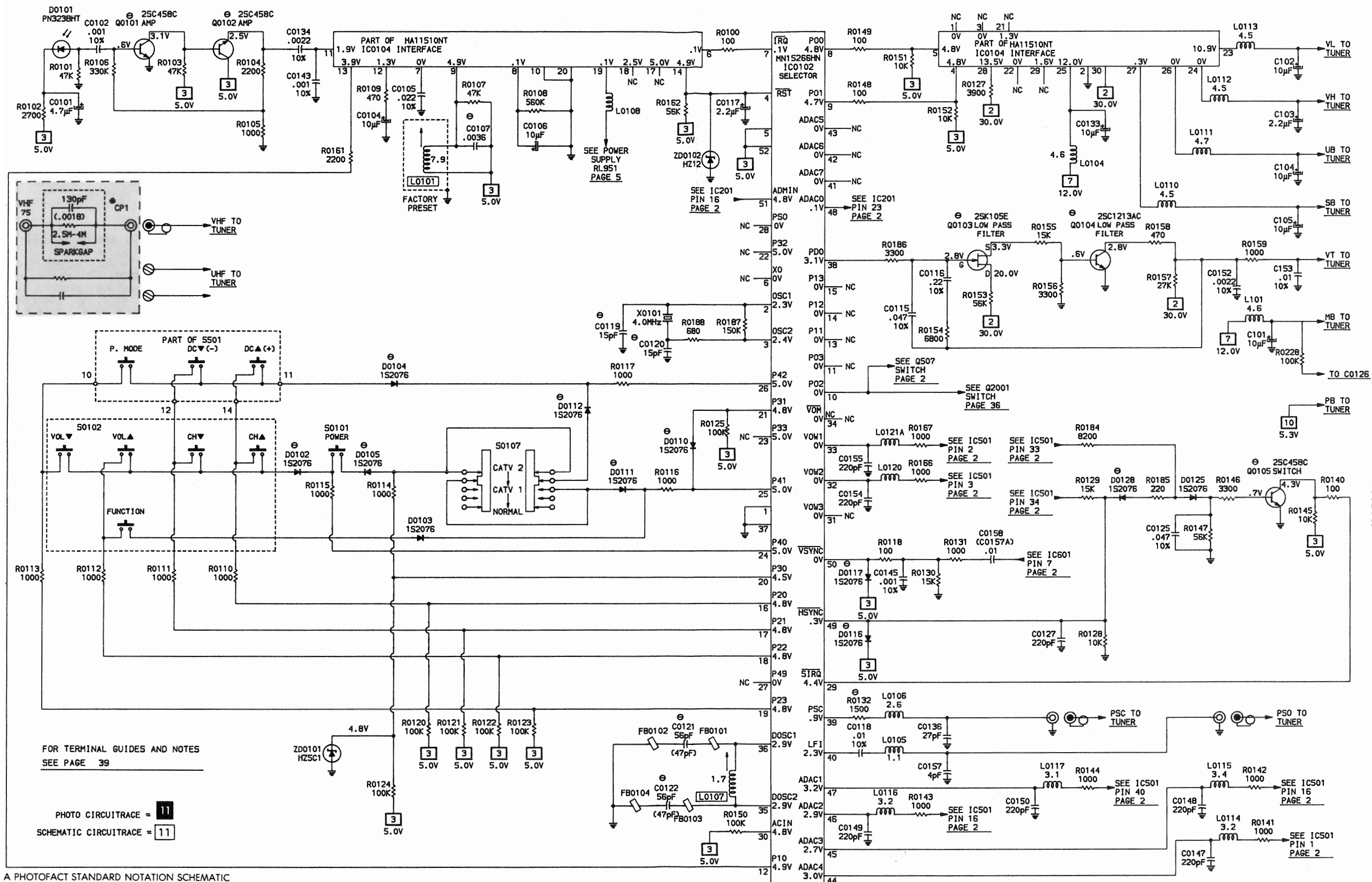


Figure 3

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FOLDER 1



A PHOTOFACT STANDARD NOTATION SCHEMATIC

WITH **Circuitrace**

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TUNER CONTROL

TUNER CONTROL

HITACHI
MODELS CT1386B/W

FOLDER 1

MISCELLANEOUS ADJUSTMENTS

PRETUNE

Off Timer
1. Press the Off-Timer Button. The Off Timer can be set for 30, 60 or 90 minute intervals by pressing the Off-Timer Button.

NOTE: This set employs digital Customer Controls (Part of S501 Control Pack) located on the receiver front panel. Unless otherwise indicated all adjustments were performed with the following settings: Sharpness to Midrange, Signal Tracker to ON, CATV Switch (S0107) to Normal and Picture to Maximum. All others set to RESET on Remote Transmitter.

B+ POWER SUPPLY CHECK

Tune in a picture. With ON-SCREEN display set Picture, Color, and Black Level to MINIMUM. Connect a digital DC voltmeter to TP+B, negative lead to ground. B+ should measure 134VDC ± 1V.

AGC ADJUSTMENT

Tune in a picture. Adjust AGC Control (R202) Counterclockwise until snow appears in picture, then Clockwise until snow disappears.

HIGH VOLTAGE CHECK

Tune in a picture. With ON-SCREEN display set Color, Picture, and Black Level to MINIMUM. Connect a high voltage probe to CRT Anode. High Voltage should read 22.0 to 22.5KV.

SUB BRIGHTNESS LEVEL ADJUSTMENT

Tune in a picture. With ON-SCREEN display set Color, Picture, and Black Level to MINIMUM. Adjust Sub Brightness Level Control (R351) for just visible highlights.

DISPLAY POSITION ADJUSTMENT

Tune in a picture. Press P Mode button until Picture Indicator bar is displayed. Adjust Display Position Coil (L0107) to Center the displayed Bar.

GRAY SCALE ADJUSTMENT

Tune in an unused channel. With ON-SCREEN display set Color, Picture, and Black Level to MINIMUM. Set Red (R864) and Blue (R866) Drive

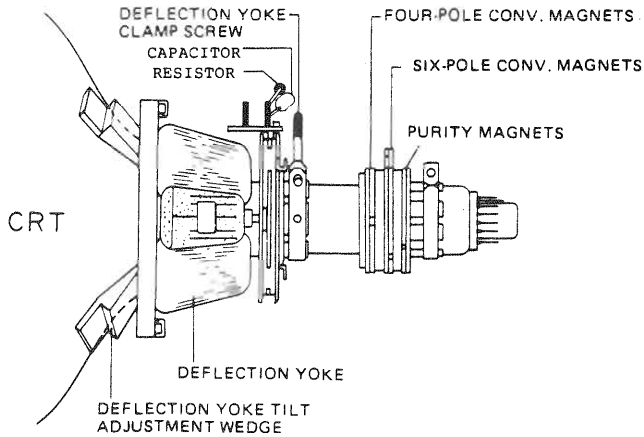
Controls to Midrange. Set Blue (R859), Green (R858) and Red (R857) Background Controls to MINIMUM. Set Screen Control (R799B) to MINIMUM. Connect a Jumper between TP604 (IC601 pin 4) to ground. Advance Blue Background Control 1/4 turn. Advance Screen Control (R799B) until a blue line is just visible. Advance 2 remaining Background Controls until they produce a white line. Remove Jumper. Tune in a picture. Set Picture and Black Level to Maximum. Alternately adjust Red and Blue Drive Controls to produce a normal black and white picture in highlight areas.

PURITY ADJUSTMENT

Use a Degaussing Coil to demagnetize the CRT. Connect a Jumper to TP12, and TP151 (Q151V) to remove video. Turn Red (R857) and Blue (R859) Background controls fully counterclockwise. Turn Green Background Control (R858) clockwise to produce a green raster. Advance Screen Control (R799B) if necessary. Loosen Deflection Yoke and move it back as far as possible. Loosen locking ring and move the purity tabs to center the vertical green band. Slowly slide the Deflection Yoke forward until a uniform green screen is obtained.

CONVERGENCE ADJUSTMENT

Connect a Color Bar Generator to antenna terminals and tune in a dot pattern. Loosen locking ring. Adjust 4 pole magnets to converge the red and blue dots at the center of the screen. Adjust the 6 pole magnets to converge the red/blue dots over the green dots at the center of the screen. NOTE: Rotate the two tabs of each set of magnets equally and opposite to converge vertically and rotate both tabs in the same direction to converge horizontally. Four and six pole magnets interact, repeat adjustment until center convergence is correct. Tighten locking ring. Tune in a crosshatch pattern. Remove rubber wedges between the Deflection Yoke and the CRT. Tilt deflection yoke up or down to converge the vertical lines at the top and bottom of the screen and the vertical lines at the left and right sides of the screen. Repeat convergence procedure if necessary to obtain the best overall convergence. Replace the rubber wedges. Tighten yoke clamp screw.



CRT NECK ASSEMBLY

TROUBLESHOOTING (Continued)

If Video is present at pin 38 of IC501, check for Video at pin 9 of IC501. If there is no Video at pin 9 of IC501, check voltages, waveforms and components associated with pins 1 and 37 thru 42 of IC501. If video is present at pin 9 of IC501, check voltages, waveforms and components associated with Video Buffer Transistor (Q313), Video Out Transistor (Q312) and Red, Green, Blue Output Transistors (Q851, Q852, Q853). If the brightness is inadequate or cannot be controlled, check voltages, waveforms and components associated with pins 1 and 40 of IC501.

VERTICAL

Inject a vertical drive signal at pin 29 of Sync/Video/Chroma/Horiz/Vert/Defl IC (IC501). If vertical deflection is now present, check voltages, waveforms and components associated with pins 28 thru 31 of IC501. If there is still no vertical sweep, check voltages, waveforms and components associated with Vertical Out IC (IC601) and Deflection Yoke (DY601). Vertical linearity or foldover problems may be caused by vertical feedback and bias circuits, check Electrolytics C601, C602, C605, C606, C608 and C610 for defects.

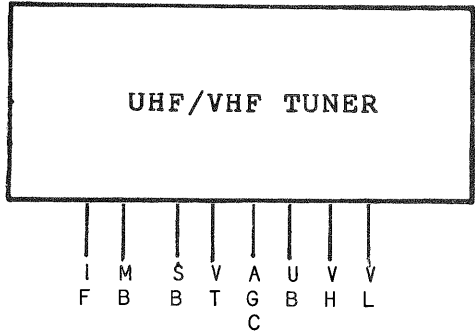
SYNC

If there is no vertical or horizontal sync, check voltages, waveforms and components associated with pins 28, 31 and 32 of Sync/Video/Chroma/Horiz/Vert/Defl IC (IC501). If there is no vertical sync, check voltages, waveforms and components associated with 29 of IC501. If there is no horizontal sync, check voltages and components associated with pin 23 of IC501.

TUNER VOLTAGE CHART

	VL	VH	UB	AGC	VT	SB	MB
VHF Low Band	10.7V	0V	0V	9.2V	3.4V	.3V	12.0V
VHF High Band	.7V	11.3V	0V	9.2V	10.4V	1.3V	12.0V
UHF Band	.3V	.8V	12.0V	9.2V	1.4V	.3V	12.0V

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



RASTER

Check CRT and CRT voltages. If there is no Red, check voltages and components associated with pin 6 of Sync/Video/Chroma/Horiz/Vert/Defl IC (IC501) and Red Output Transistor (Q851). If there is no Green, check voltages, and components associated with pin 7 of IC501 and Green Output Transistor (Q852). If there is no Blue, check voltages and components associated with pin 8 of IC501 and Blue Output Transistor (Q853). If the raster has a key-stone shape, check Deflection Yoke (DY601). If the raster has height or width problems, refer to "Vertical", "Horizontal" and "Power" sections of this Troubleshooting guide.

CHROMA

Check for a chroma waveform at pin 36 of Sync/Video/Chroma/Horiz/Vert/Defl IC (IC501). If the waveform is missing, check components associated with pin 36 of IC501. If a chroma waveform is present at pin 36, check for proper chroma waveforms at pins 2, 6, 7 and 8 of IC501. If these waveforms are missing, check voltages, waveforms and components associated with pins 6, 7, 8, 10 and 17 of IC501. Check the 3.58MHz oscillator at pin 17 of IC501. Check voltages and components associated with Color control circuit and pin 16 of IC501. If there is inadequate tint range, check voltages, waveforms and components associated with Tint control circuit and pin 18 of IC501. If the proper chroma waveforms are present at pins 6, 7, 8 of IC501, refer to "Raster" section of this Troubleshooting guide.

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FOLDER 1

TROUBLESHOOTING

POWER SUPPLY

Check AC Fuse (F901) and DC Fuse (F902). If Fuse F901 is open, check Rectifier Diode D901, Capacitors C901, C902 and Electrolytic C906. If Fuse F902 is open, check Regulator IC (IC901) and Horizontal Output Transistor (Q702). Apply 120VAC and check for 158V at the cathode of Diode D901. If this voltage is missing, check Line Filter (L901), and Relay (RL951). If 158V is present, check for 135V at TP+B. If 135V is not present at TP+B check the voltages and components associated with IC901 and Q702. If voltage is present at TP+B refer to the "Horizontal" section of this Troubleshooting guide. If the voltage at TP+B is 171V and the voltage at pin 12 of Sync/Video/Chroma/ Horiz/Vert/Defl IC (IC501) is .6 volts or more the set may be in shutdown. Refer to the "High Voltage Shutdown" section of this Troubleshooting guide.

HORIZONTAL

Determine if the TV is in shutdown, refer to the "High Voltage Shutdown" section, of this Troubleshooting guide. If the TV is not in shutdown, inject a horizontal signal at the base of the Horizontal Output Transistor (Q702). If horizontal deflection is now present, check the voltages, waveforms and components associated with Horizontal Drive Transistor (Q701) and pins 12, 23, 24, 25 and 28 of Sync/Video/Chroma/ Horiz/Vert/Defl IC (IC501). If there is no horizontal sweep, check the voltages, waveforms and components associated with Q702 and Horizontal Output Transformer (T702). Check Rectifier Diodes D706, D707, D712, D713 and associated components for defects. The high voltage rectifier is part of Transformer T702 and if defective will affect the performance of the horizontal circuits. If the Horizontal Sweep is off frequency, check the voltages, waveforms and components associated with pins 24 and 25 of IC501. Horizontal linearity or foldover problems may be caused by Capacitors C716, C717, C718, C722 and C745 and Coil L705 being defective.

HIGH VOLTAGE SHUTDOWN

The high voltage is monitored by Diode D713, rectifying pulses from the Horizontal Output Transformer (T702). Should the high voltage increase, the rectified voltage at cathode of Zener Diodes ZD704 and ZD705 will also increase and trigger set into shutdown. To troubleshoot, short pin 12 of Sync/Video/Chroma/ Horiz/Vert/Defl IC (IC501) to ground. Use a Variac, starting at 100VAC, increase as necessary to locate the fault. Remove the short from pin 12 of IC501.

NOTE: Care should be taken in defeating the high voltage shutdown circuit, as this may cause excessive X-radiation and damage to the CRT, Horizontal Output Transformer (T702) and associated components. Monitor the high voltage and troubleshoot.

Voltages Taken With TV In Shutdown	
IC501	TP+B
	171V
Pin 12	.7V

HIGH VOLTAGE SHUTDOWN TEST

Apply 120V AC, turn set On, set all customer controls for normal operation and connect a 30 volt Bias to cathode of ZD704 thru an isolation diode. Set should lose Raster and Sound. If set does not lose Raster and Sound, the shutdown circuit should be repaired. To resume normal operation, remove AC Power and wait 30 seconds then turn set On.

IF-AGC

Inject a video IF signal at the IF input and check for video on the CRT. If video is present, check the tuner, tuner control and tuner AFC circuits. If there is no video on the CRT, check for a video waveform at TP12. If video is present at TP12, refer to the "Video" section of this Troubleshooting guide. If there is no video at TP12, apply AGC bias to pin 13 of PIF/SIF IC (IC201). If video is now present at TP12 check voltages, waveforms and components associated with pins 10 thru 13 of IC201. If there is still no video at TP12, check the voltages, waveforms and components associated with pins 8, 9, 14 thru 22 of IC201 and Video Amp Transistor (Q201). A defective AGC circuit can cause an overloaded picture, excessive snow or loss of audio and video. See the AGC Voltage Chart for AGC voltages with signal.

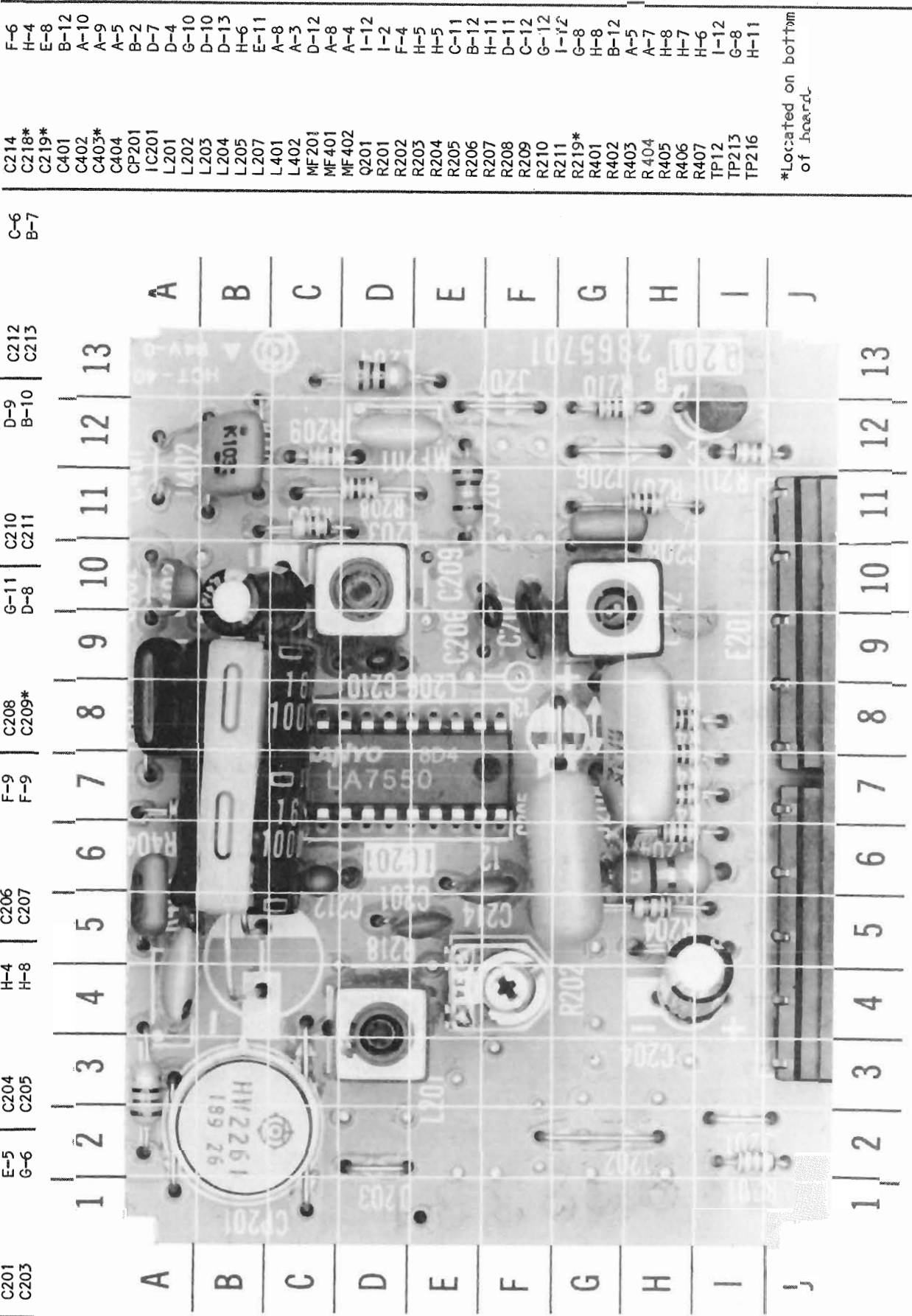
AGC VOLTAGE CHART	
IC201	
Pin 11	6.4V
Pin 12	9.4V
Pin 13	9.4V

AUDIO

Select an active TV channel and check for an audio waveform at pin 1 of PIF/SIF IC (IC201). If there is no audio, check the voltages, waveforms and components associated with pins 1, 2 and 24 of IC201. If audio is present at pin 1 of IC201, check for audio at emitter of Audio Amp Transistor (Q401). If audio is missing check the voltages, waveforms and components associated with pins 3, 4, 5 and 23 of IC201, pins 16, 17 of Audio/Video Board and Transistors Q401 and Q402. Check the voltage at pin 23 of IC201, it should measure .2V at mute and 5.8V at Maximum volume.

VIDEO

Inject a video signal at TP12 and check for video on CRT. If video is present, refer to "IF-AGC" section of this Troubleshooting guide. If there is no video on CRT, check for a video waveform at pin 38 of Sync/Video/Chroma/ Horiz/Vert/Defl IC (IC501). If there is no video at pin 38 of IC501 check voltages, waveforms and components associated with pins 13 and 14 of Audio/Video Board, Video Amp Transistor (Q2002) and Video Tone Transistor (Q303).

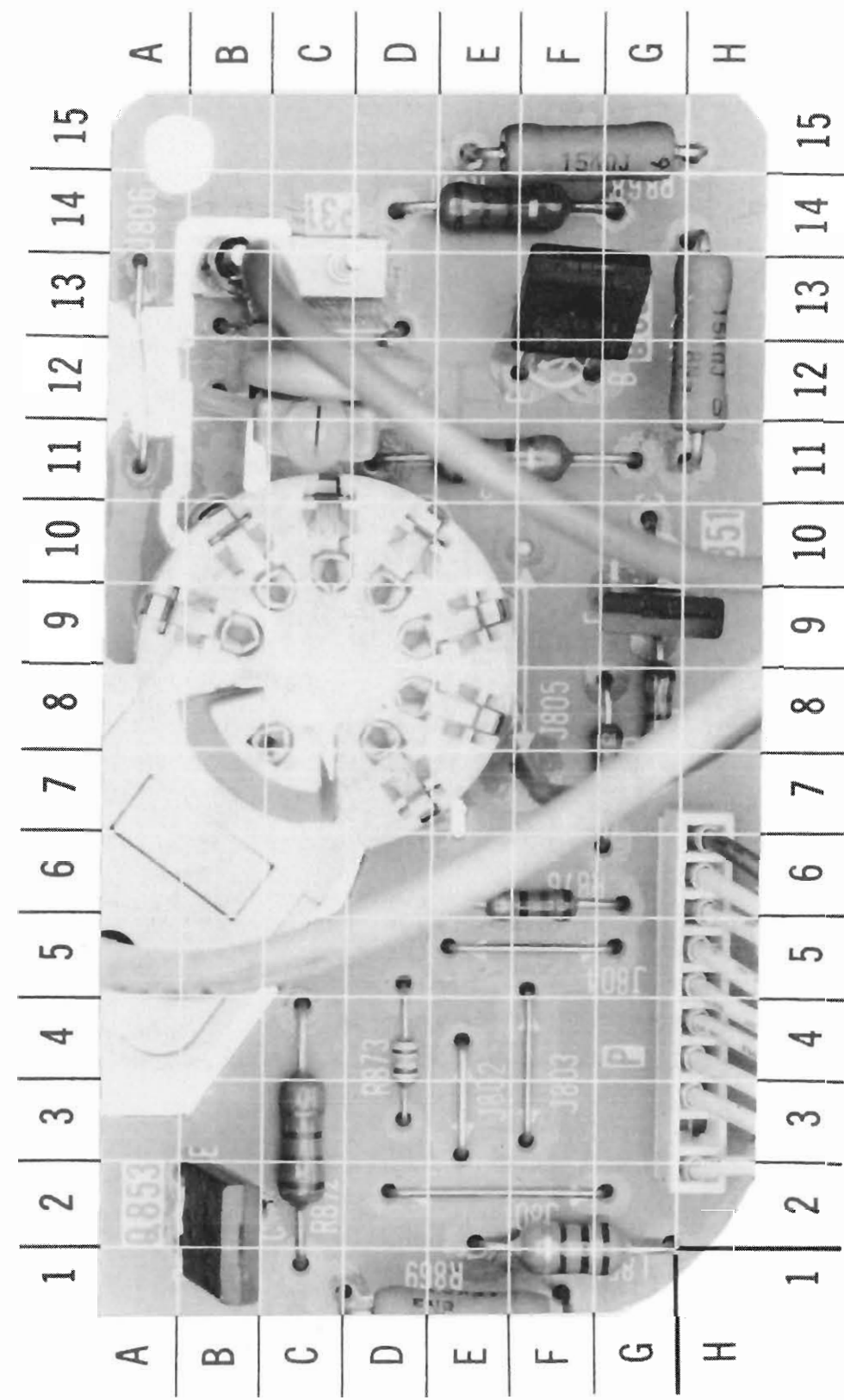


A Howard W. Sams GRIDTRACE™ Photo

IF BOARD

FOLDER 1

C861	C-12	Q851	G-9	R867	H-13	R870	E-11	R873	D-4	R876	F-6
L851	F-1	Q852	F-13	R868	F-15	R871	E-14	R874	G-8	SG851	C-11
P31	C-13	Q853	B-2	R869	E-1	R872	C-3	R875	G-8		



TROUBLESHOOTING AID

Note: Waveforms taken with triggered scope, Keyed-Rainbow generator. Schematic voltages measured with digital meter, no signal. Controls adjusted for normal operation.

PICTURE or SOUND

NO PIC, NO SOUND, NO RASTER: Check AC power supply and sources generated from Horizontal Output Transformer (T702). Refer to "Troubleshooting" Power Supply and Horizontal circuits.

NO PIC, NO SOUND, HAS RASTER: Check IF-AGC and source voltages from Horizontal Output Transformer (T702). Refer to "Troubleshooting" IF-AGC and Horizontal circuits.

NO PIC, HAS SOUND, NO RASTER: Check Horizontal Output Transformer (T702) sources and Video circuit. Refer to "Troubleshooting" Horizontal and Video circuits.

NO PIC, HAS SOUND, HAS RASTER: Refer to "Troubleshooting" Video circuit.

HAS PIC, NO SOUND: Refer to "Troubleshooting" Audio circuit.

OVERLOADED PICTURE: Refer to "Troubleshooting" IF-AGC circuit.

LOW OR EXCESSIVE BRIGHTNESS: Check Video and Luminance circuits. Refer to "Troubleshooting" Video circuit.

SWEEP

NO RASTER, HAS SOUND: Check HV rectifier, Part of Horizontal Output Transformer (T702). Refer to "Troubleshooting" Horizontal circuit.

NO RASTER, NO SOUND: Refer to "Troubleshooting" Horizontal circuit.

NO VERT DEFLECTION: Refer to "Troubleshooting" Vertical circuit.

POOR VERT LIN OR FOLDOVER: Refer to "Troubleshooting" Vertical circuit.

POOR HORIZ LIN OR FOLDOVER: Refer to "Troubleshooting" Horizontal circuit.

NARROW PICTURE: Refer to "Troubleshooting" Horizontal circuit.

VERT OFF FREQUENCY: Refer to "Troubleshooting" Vertical circuit.

HORIZ OFF FREQUENCY: Refer to "Troubleshooting" Horizontal circuit.

SYNC

NO VERT/HORIZ SYNC: Refer to "Troubleshooting" Sync circuit.

RASTER

YELLOW (NO BLUE): Check Chroma and Blue Output circuits. Refer to "Troubleshooting" Raster circuit.

CYAN (NO RED): Check Chroma and Red Output circuits. Refer to "Troubleshooting" Raster circuit.

MAGENTA (NO GREEN): Check Chroma and Green Output circuits. Refer to "Troubleshooting" Raster circuit.

COLOR (B/W operating normally)

NO COLOR: Refer to "Troubleshooting" Chroma circuit.

WEAK COLOR: Refer to "Troubleshooting" Chroma circuit.

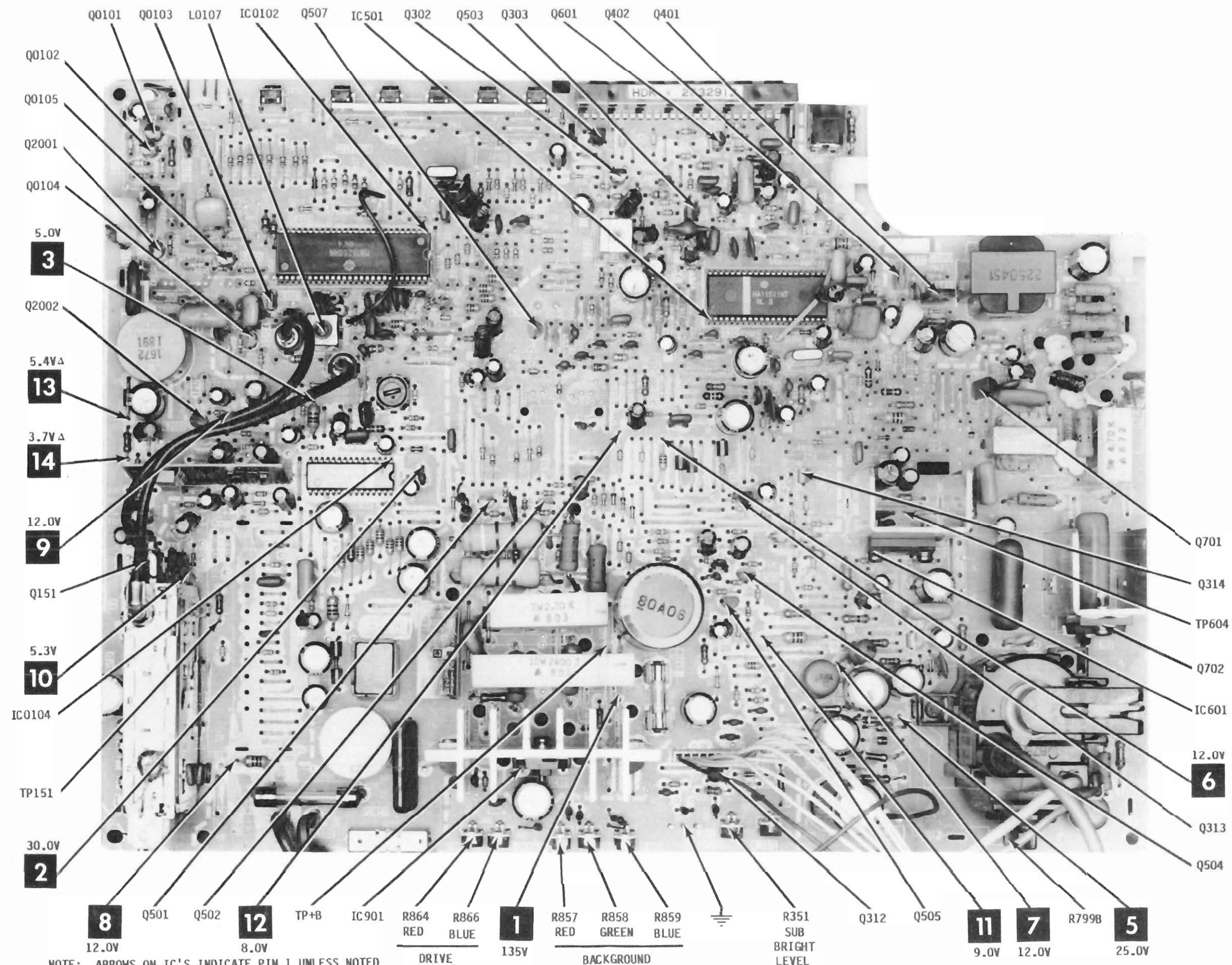
NO COLOR SYNC: Refer to "Troubleshooting" Chroma circuit.

NO GREEN: Check Chroma and Green Output circuits. Refer to "Troubleshooting" Raster circuit.

NO BLUE: Check Chroma and Blue Output circuits. Refer to "Troubleshooting" Raster circuit.

NO RED: Check Chroma and Red Output circuits. Refer to "Troubleshooting" Raster circuit.

INCORRECT HUE (TINT): Refer to "Troubleshooting" Chroma circuit.

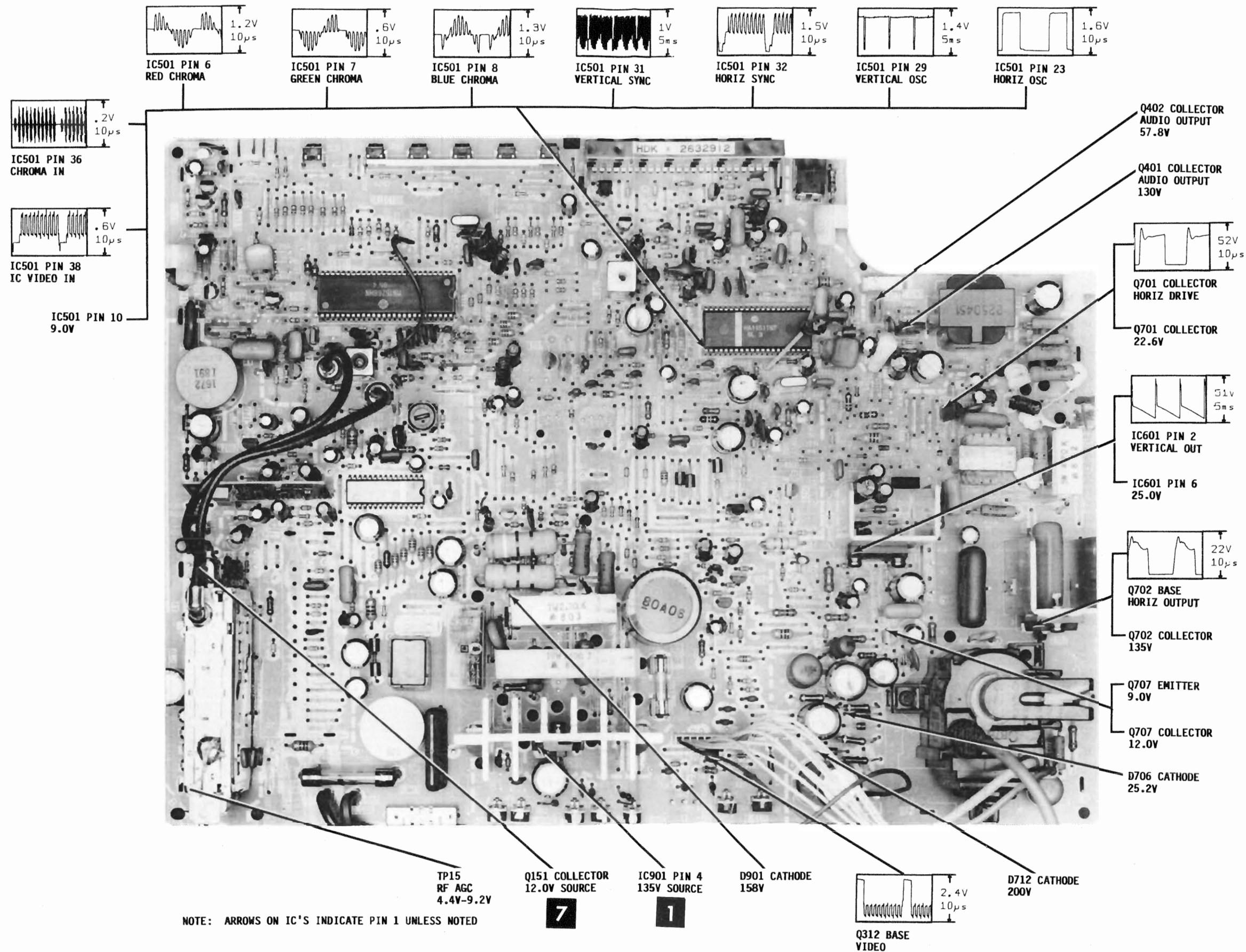


MAIN BOARD

HITACHI
MODELS CT1386B/W

FOLDER 1

MAIN BOARD



NOTE: ARROWS ON IC'S INDICATE PIN 1 UNLESS NOTED

7

1

HITACHI
MODELS CT1386B/W

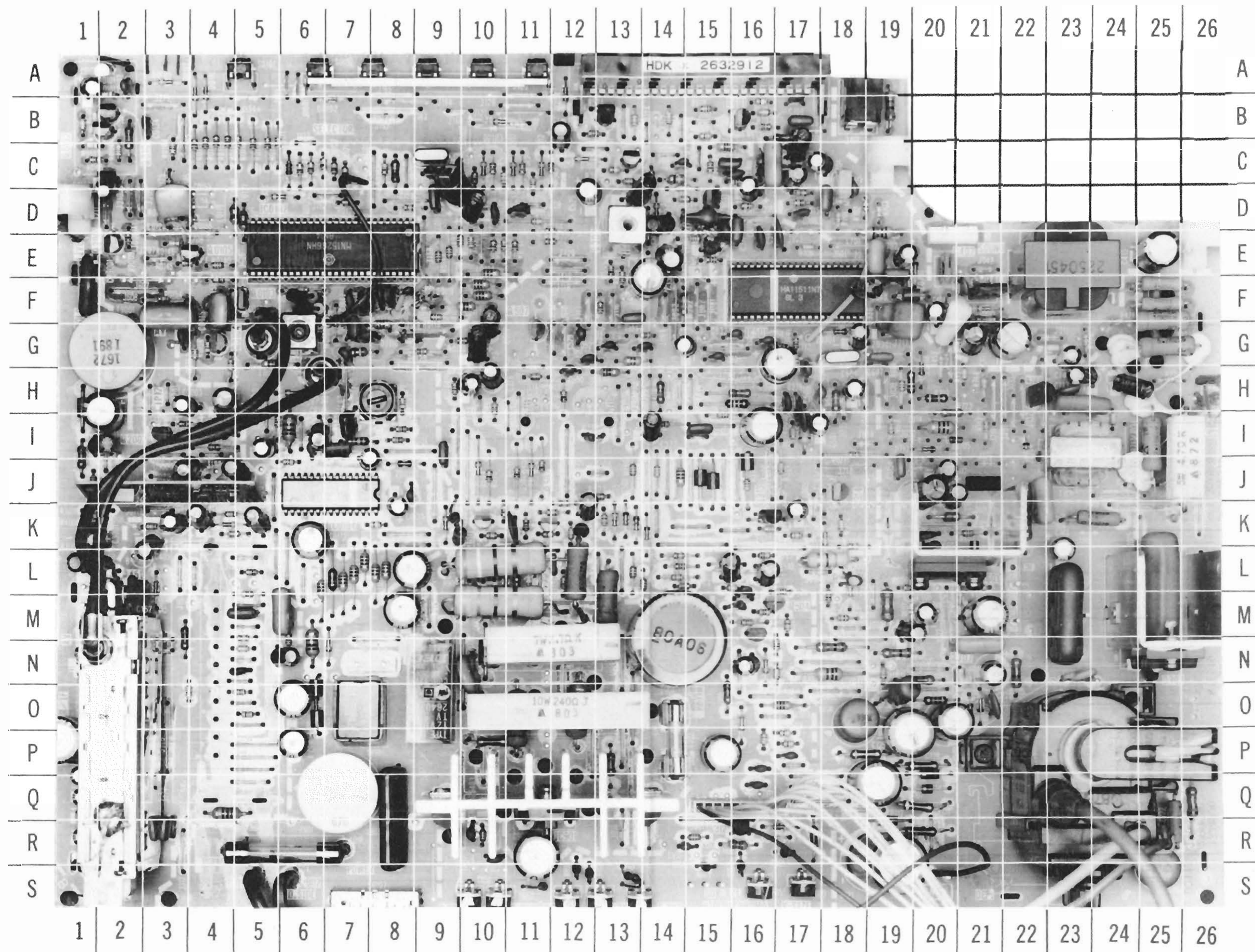
FOLDER 1

MAIN BOARD-GridTrace LOCATION GUIDE

AV	M-1	C354	G-16	C729	N-21	F901	R-6	Q401	F-21	R0167	E-12	R518	K-10	R736	Q-26	ZD501	K-13
C0101	A-1	C404A	M-5	C731	Q-19	F902	P-14	Q402	E-20	R0169	K-11	R519	K-11	R737	H-21	ZD502	K-13
C0102	A-2	C405	K-3	C735	O-21	FB0101	F-6	Q501	K-10	R0184	C-3	R520	J-11	R739	I-14	ZD503	K-14
C0104	I-5	C406	N-5	C736	N-21	FB0102	F-6	Q502	K-11	R0185	D-3	R521	K-12	R740	O-20	ZD601	A-17
C0105	I-7	C408	F-20	C741	H-24	FB0103	F-6	Q503	B-13	R0186	F-6	R522	K-12	R741	N-20	ZD701	E-20
C0106	J-7	C409	F-21	C742	B-12	FB0104	F-6	Q504	M-17	R0187	C-8	R523	K-12	R743	I-21	ZD704	I-22
C0107	I-7	C411	G-21	C743	K-23	FB597	J-15	Q505	M-16	R0188	C-8	R524	B-13	R744	H-21	ZD705	I-21
C0110	K-5	C412	N-6	C744	G-23	FB598	J-15	Q507	G-11	R0202	M-5	R526	K-13	R751	I-26	ZD706	O-21
C0111	D-9	C415	E-25	C854	R-10	FB599	J-16	Q601	B-16	R0203	N-5	R527	J-13	R753	N-22	ZD707	O-21
C0112	C-9	C421	G-22	C855	R-15	FB799	F-20	Q701	H-22	R0228	N-6	R528	L-14	R754	N-19	ZD708	H-20
C0113	K-6	C501	I-18	C856	R-10	FB900	P-6	Q702	N-25	R151	M-3	R529	L-14	R755	N-18	ZD901	O-6
C0115	F-4	C502	H-17	C901	Q-8	FB901	O-6	Q707	N-21	R152	M-2	R530	L-14	R756	D-17	*Located on bottom of board.	
C0116	F-3	C503	H-17	C902	N-10	FB902	O-6	Q2001	E-2	R302	C-14	R531	L-13	R757	C-17		
C0117	D-10	C504	H-18	C906	N-14	IC0102	E-7	Q2002	I-3	R303	E-14	R533	L-14	R759	K-24		
C0118	G-7	C505	H-18	C907	R-11	IC0104	J-7	R0100	E-9	R304	E-15	R534	L-16	R854	S-12		
C0119	C-9	C506	H-17	C912	O-6	IC501	F-17	R0101	A-2	R305	C-13	R535	L-16	R855	S-12		
C0120	C-9	C507	G-18	C917	M-8	IC601	L-20	R0102	B-1	R306	C-13	R536	M-16	R856	S-13		
C0121	F-6	C511	E-17	C918	P-6	IC901	Q-11	R0103	C-1	R340	F-13	R537	M-16	R857	S-12		
C0122	F-6	C512	F-10	C919	P-15	J401	B-18	R0104	C-2	R341	C-15	R538	M-16	R858	S-13		
C0123	L-8	C513	G-10	C3001	K-1	L0101	H-8	R0105	C-1	R348	H-10	R539	L-17	R859	S-13		
C0125	D-3	C515	K-11	C3002	J-3	L0102	L-6	R0106	B-2	R349	C-12	R540	L-16	R861	R-10		
C0126	M-6	C516	K-12	C3003	H-3	L0104	L-7	R0107	H-8	R350	R-17	R541	M-17	R862	R-15		
C0127	F-8	C517	L-16	C3004	K-3	L0105	G-7	R0108	I-7	R351	S-16	R542	N-17	R863	S-11		
C0133	K-8	C518	L-16	C3005	K-4	L0106	G-5	R0109	J-6	R352	S-16	R543	N-17	R864	S-10		
C0134	B-3	C519	N-16	C4001	L-1	L0107	G-6	R0110	B-5	R353	K-17	R544	L-14	R865	S-15		
C0135	J-8	C520	G-12	C4002	I-2	L0108	L-7	R0111	B-5	R354	K-16	R553	G-14	R866	S-10		
C0136	F-5	C521	G-13	C4003	H-4	L0109	K-9	R0112	B-5	R355	R-17	R554	E-13	R901	N-12		
C0143	I-6	C522	G-14	C4004	J-4	L0110	L-8	R0113	B-5	R357	N-19	R555	E-13	R902	O-13		
C0145	I-9	C523	F-13	C9001	H-2	L0111	L-8	R0114	B-4	R358	J-14	R558	H-12	R903	P-13		
C0146	I-6	C524	L-16	CP301	D-15	L0112	L-7	R0115	B-4	R359	K-18	R559	D-11	R904	P-10		
C0147	F-7	C525	D-12	CP3001	J-4	L0113	L-7	R0116	B-4	R360	K-18	R560	H-11	R905	P-11		
C0148	F-7	C526	Q-16	CP9001	F-1	L0114	E-10	R0117	B-4	R361	H-14	R561	H-18	R906	P-12		
C0149	F-7	C527	P-16	D0101	A-2	L0115	F-10	R0118	F-9	R362	F-14	R562	K-11	R907	O-12		
C0150	F-8	C528	P-17	D0102	B-7	L0116	F-10	R0120	D-7	R364	G-17	R563	I-17	R908	O-15		
C0151	G-7	C529	G-12	D0103	B-10	L0117	F-10	R0121	C-7	R365	J-16	R564	B-12	R909	L-10		
C0152	G-3	C530	H-12	D0104	A-12	L0118	F-8	R0122	C-7	R366	I-15	R565	J-11	R910	M-10		
C0154	D-11	C531	G-15	D0105	A-3	L0120	D-4	R0123	C-6	R369	C-11	R601	H-19	R911	L-12		
C0155	D-10	C532	G-16	D0110	D-5	L0121	D-5	R0124	C-6	R375	B-14	R602	K-21	R912	L-11		
C0156	C-2	O601	J-20	D0111	A-4	L0122	I-6	R0125	C-6	R376	A-15	R603	K-20	R913	L-12		
C0157	G-7	O602	J-20	D0112	A-4	L101	O-1	R0127	K-8	R377	B-13	R605	L-21	R2001	J-3		
C0158	J-19	O603	K-20	D0113	K-9	L221	Q-4	R0128	I-5	R378	D-15	R606	L-19	R2004	J-4		
C0159	F-8	O604	K-20	D0116	G-8	L301	D-14	R0129	G-9	R379	D-14	R607	M-19	R2009	E-2		
C101	N-1	O605	M-20	D0117	F-9	L302	C-14	R0130	G-10	R380	D-15	R608	M-18	R2010	I-3		
C102	R-1	O606	M-19	D0118	F-9	L303	C-15	R0131	I-18	R382	B-15	R609	S-17	R2011	M-5		
C103	Q-1	O607	G-19	D0119	K-4	L305	J-14	R0132	F-7	R383	C-16	R610	M-18	R3001	K-1		
C104	Q-1	O608	L-18	D0125	C-3	L306	R-16	R0133	K-4	R384	D-14	R611	M-19	R3002	I-4		
C105	Q-1	O609	J-21	D0128	H-6	L501	H-13	R0134	K-4	R385	C-14	R612	K-22	R3003	K-1		
C151	L-2	O610	M-21	D301	D-14	L503	G-13	R0135	K-3	R386	J-13	R613	B-16	R4001	L-1		
C152	L-2	O611	C-17	D308	K-16	L701	O-19	R0136	I-5	R387	D-16	R614	C-17	R4002	K-1		
C153	P-1	O612	J-22	D309	K-18	L702	S-25	R0140	E-4	R389	I-12	R616	I-19	R4003	J-1		
C154*	Q-2	O613	B-17	D312	C-11	L704	O-18	R0141	E-11	R390	E-15	R618	B-15	R4004	I-1		
C223*	P-4	O614	C-16	D402	F-21	L705	N-18	R0142	E-10	R404A	L-5	R619	B-16	R4005	I-4		
C224	P-1	C701*	E-18	D501	C-10	L706	I-20	R0143	E-10	R407A	O-5	R620	D-17	R9001	L-18		
C227	R-3	C702	E-19	D502	C-11	L707	E-19	R0144	H-9	R408	F-21	R621	C-16	RL951	O-9		
C301	E-14	C703	D-18	D503	J-11	L901	Q-7	R0145	E-3	R409	G-21	R701	D-18	S	D-20		
C302	D-13	C704	C-18	D504	J-10	L902	N-6	R0146	E-3	R412	F-21	R702	D-18	S0101	A-5		
C315	C-16	C705	C-18	D505	K-13	L903	O-17	R0147	D-3	R421	F-25	R703	D-19	S0102	A-9		
C317	D-16	C706	D-17	D506	L-15	L3001	I-4	R0148	E-9	R422	F-25	R704	G-25	S0107	S-8		
C318	D-15	C707	C-17	D507	N-16	M	L-22	R0149	E-9	R431	O-5	R705	F-25	S501	A-15		
C320	E-16	C708	I-15	D601	K-20	MF701	C-18	R0150	F-4	R451	B-19	R706	E-17	T401	E-23		
C326	K-17	C709	B-17	D602	M-21	P	Q-16	R0151	I-8	R453	G-20	R707	B-16	T701	I-23		
C327	I-14	C710	E-19	D603	L-18	PSC	G-5	R0152	I-8	R501	J-17	R708	B-17	T702	P-24		
C328	H-10	C711	E-19	D706	Q-20	PSO	H-6	R0153	G-4	R502	I-17	R709	H-20	T9001	G-2		
C330	I-16	C712	F-19	D707	Q-20	Q0101	B-2	R0154	F-3	R503	P-17	R710	H-19	TH901	O-7		
C331	G-15	C713	H-23	D708	C-12	Q0102	B-2	R0155	F-4	R504	P-16	R715	R-25	TP+B	N-13		
C332	D-14	C715	H-23	D712	R-19	Q0103	F-5	R0156	F-4	R505	P-17	R716	I-25	TP151	N-3		
C333	C-14	C716	N-23	D713	I-20	Q0104	G-4	R0157	G-4	R510	H-16	R719	I-24	TP604	K-20		
C334	C-15	C717	M-23	D901	N-10	Q0105	E-4	R0158	G-4	R511	H-16	R723	I-20	X0101	C-9		
C336	F-19	C718	L-25	D905	N-10	Q151	L-2	R0159	F-3	R512	C-10	R724	G-23	X501	G-18		
C337	H-10	C721	S-19	D910	L-11	Q302	C-13	R0160	M-13	R513	C-11	R726	H-25	ZD0101	C-6		
C338	G-17	C722	R-25	D911	N-7	Q303	D-15	R0161	E-10	R514	C-10	R730	P-20	ZD0102	J-8		
C339	E-15	C725	P-19	D912	O-16	Q312	R-16	R0162	D-8	R515	C-10	R731	Q-20	ZD151	L-3		
C352	E-14	C726	O-20	D9001	H-1	Q313	K-16	R0163	K-9	R516	J-10	R734	R-20	ZD303	R-17		
C353	C-16	C727	H-23	DL301	D-13	Q314	J-18	R0166	D-12	R517	K-10	R735	P-19	ZD304	G-18		

HITACHI
MODELS CT1386B/W

FOLDER 1



HITACHI
MODELS CT1386B/W

FOLDER 1

When ordering parts, state Model, Part Number, and Description

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFGR. PART No./TYPE No.	NTE PART No.	ECG PART No.	TCE PART No.	NOTES
D0102 THRU D0105	1S2076	NTE519	ECG519	SK3100/519	
	1S2473H	NTE519	ECG519	SK3100/519	
	2331351	NTE519	ECG519	SK3100/519	
	1S2076	NTE519	ECG519	SK3100/519	
D0110 THRU D0113	1S2473H	NTE519	ECG519	SK3100/519	
	2331351	NTE519	ECG519	SK3100/519	
	1S2076	NTE519	ECG519	SK3100/519	
	1S2473H	NTE519	ECG519	SK3100/519	
D0116 THRU D0119	2331351	NTE519	ECG519	SK3100/519	
	1S2076	NTE519	ECG519	SK3100/519	
	1S2473H	NTE519	ECG519	SK3100/519	
	2331351	NTE519	ECG519	SK3100/519	
D0125,8	1S2076	NTE519	ECG519	SK3100/519	
	1S2473H	NTE519	ECG519	SK3100/519	
	2331351	NTE519	ECG519	SK3100/519	
	1S2076	NTE519	ECG519	SK3100/519	
D301,8,9	1S2473H	NTE519	ECG519	SK3100/519	
	2331351	NTE519	ECG519	SK3100/519	
	1S2076	NTE519	ECG519	SK3100/519	
	1S2473H	NTE519	ECG519	SK3100/519	
D312	2331351	NTE519	ECG519	SK3100/519	
	1S2076	NTE519	ECG519	SK3100/519	
	1S2473H	NTE519	ECG519	SK3100/519	
	2331351	NTE519	ECG519	SK3100/519	
D402	1S2076	NTE519	ECG519	SK3100/519	
	1S2473H	NTE519	ECG519	SK3100/519	
	2331351	NTE519	ECG519	SK3100/519	
	1S2076	NTE519	ECG519	SK3100/519	
D501 THRU D507	1S2473H	NTE519	ECG519	SK3100/519	
	2331351	NTE519	ECG519	SK3100/519	
	1S2076	NTE519	ECG519	SK3100/519	
	1S2473H	NTE519	ECG519	SK3100/519	
D601	W06B	NTE116	ECG116	SK3311	
	W0-6B	NTE116	ECG116	SK3311	
	2331201	NTE116	ECG116	SK3311	
	1S2076	NTE519	ECG519	SK3100/519	
D602,3	1S2473H	NTE519	ECG519	SK3100/519	
	2331351	NTE519	ECG519	SK3100/519	
	1S2076	NTE519	ECG519	SK3100/519	
	1S2473H	NTE519	ECG519	SK3100/519	
D706	ES1A	NTE551	ECG551	SK3125A/551	
	ES-1A	NTE551	ECG551	SK3125A/551	
	2334581	NTE551	ECG551	SK3125A/551	
	1S2076	NTE519	ECG519	SK3100/519	

PARTS LIST AND DESCRIPTION (Continued)

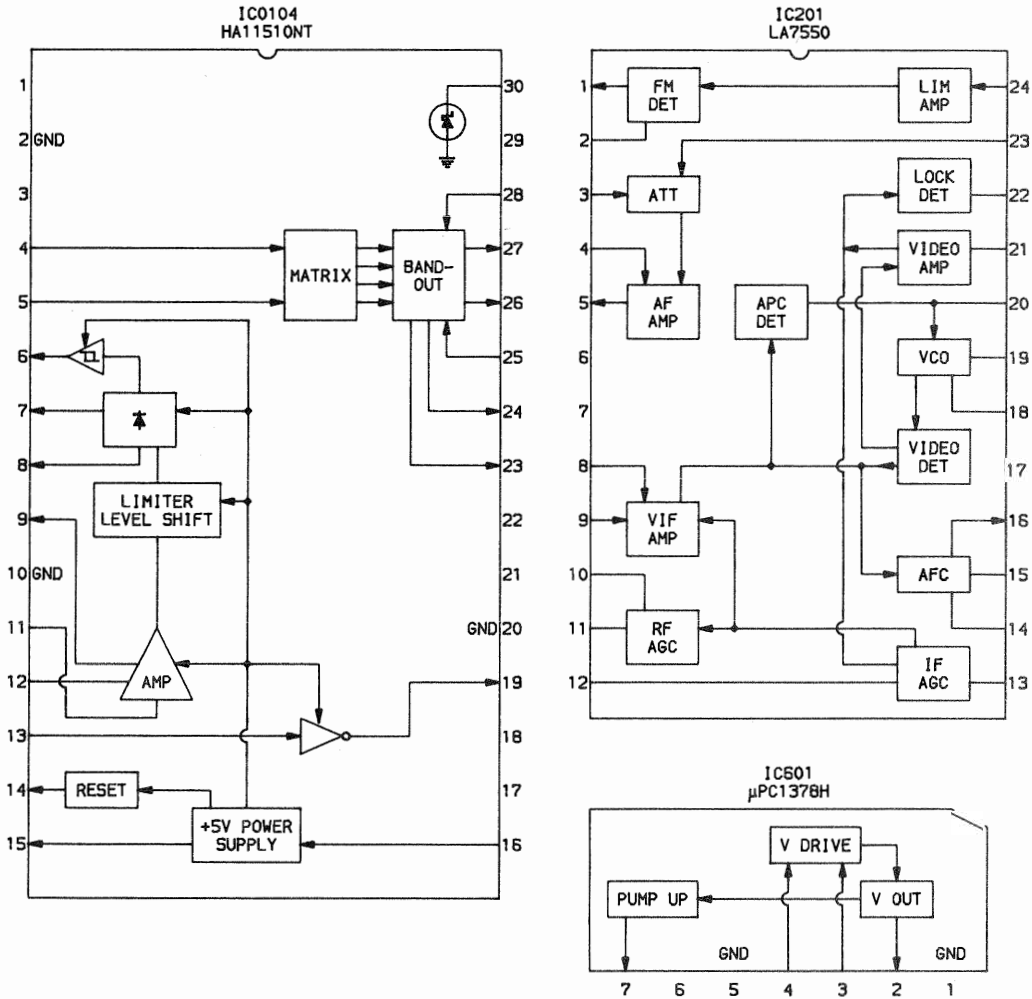
When ordering parts, state Model, Part Number, and Description

CABINETS & CABINET PARTS (When ordering specify model, chassis & color)

ITEM	PART No.	ITEM	PART No.
Frame, Assembly	3015363		
Back, Cover	3015365 (1)		
Button, Assembly, Includes: Power, Channel Up, Channel Down, Volume Up, Volume Down, Function	3460953		
Door, Control Section	3268063		
	3707383		

(1) Used In Model CT1386W.

IC FUNCTIONS



HITACHI
MODELS CT1386B/W

PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

MISCELLANEOUS

ITEM No.	PART NAME	MFGR. PART No.	NOTES
# CP1	Capristor		130pF (.0018)/2.5M-4M Antenna Terminal Network SAW
CP201	Filter	2300471	
CP301	Compound Component	2161511	
# CP3001	Module	2372001	
# CP9001	Compound Component	2790291	
DL301	Delay Line	2163296	
# E001	Box	2981504	Antenna
E201	Terminal	2981812	
E801	Cover	2784331	CRT Socket Focus
E802	Focus Insulation	2950472	
# E902	Holder	2720221	Fuse
E903	Plate	2787531	Mica
# E2002	Adaptor	2687951	VHF
E2005	Antenna	2750644	Loop
E3001	Transmitter	2970292	Remote Control
E3002	Antenna	2750661	Telescopic
# F901	Fuse	2720587	4 Amp @ 125VAC Fast Acting
# F902	Fuse	2720812	.8 Amp @ 125VDC Fast Acting
FB0101	Ferrite Bead	2771891	
FB0104			
FB597	Ferrite Bead	2771891	
FB599	Ferrite Bead	2771891	
FB799	Ferrite Bead	2771891	
FB900	Ferrite Bead	2771891	
FB901	Ferrite Bead	2771892	
FB902			
# J401	Jack	2672032	Earphone
J801	Socket	2950461	CRT
# L951	Coil	2163581	Degaussing
MF201	Filter	2143591	4.5MHz
MF401	Filter	2142621	4.5MHz
MF402	Filter	2143571	4.5MHz
MF701	Oscillator	2786683	
N102	Ferrite Beads	2771892	
# P900 (E901)	Cord	2742553	AC Line, Polarized
# RL951	Relay	2640336	
S0101	Switch	2632901	Power
S0102	Switch	2632851	Volume Up/Down/Channel Up, Down, Function
S0107	Switch	2620801	CATV1/2/NORMAL
S501	Switch	2632912	DC Function ,DC Down,DC Up
SG851	Spark GAP	2340037	
# U0101	Tuner	2426725	
# V1	CRT	A34JLN60X	
X0101	Crystal	2787521	4.0MHz
X501	Crystal Holder	2790444	3.58MHz
		3767111	Antenna

For SAFETY use only equivalent replacement part.

WIRING DATA

High Voltage Lead	Use BELDEN No. 9867 (30 KV)
Shielded Hook-up Wire	Use BELDEN No. 8401 or 8421 (Single-Conductor) 8208 (Two-Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8529 (Solid) Available in 13 Colors 8522 (Stranded) Available in 13 Colors
300-Ohm Tuner Input Lead	Use BELDEN No. 8225
75-Ohm Tuner Input Lead	Use BELDEN No. 8241
300-Ohm Antenna Lead-In	Use BELDEN No. 8275 (Foam Core) or 8285 (Foam Jacketed)
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) 4-Conductor 8485 (Round) 5-Conductor 8488 (Round) 8-Conductor

PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFGR. PART No./ TYPE No.	NTE PART No.	ECG PART No.	TCE PART No.	NOTES
D707	RH1S	NTE552	ECG552	SK9000/552	
D708	2332251	NTE552	ECG552	SK9000/552	
	1S2076	NTE519	ECG519	SK3100/519	
	1S2473H	NTE519	ECG519	SK3100/519	
	2331351	NTE519	ECG519	SK3100/519	
D712	DFM1A4	NTE552	ECG552	SK9000/552	
D713	2338162	NTE552	ECG552	SK9000/552	
	1S2076A	NTE519	ECG519	SK3100/519	
	2330352	NTE519	ECG519	SK3100/519	
D901	RO2AV	NTE125	ECG125	SK3081/125	
D905	2331991	NTE125	ECG125	SK3081/125	
	V06G	NTE125	ECG125	SK3081/125	
	2330253	NTE125	ECG125	SK3081/125	
D910 THRU D912	1S2076	NTE519	ECG519	SK3100/519	
D9001	2330351	NTE519	ECG519	SK3100/519	
	V06C	NTE116	ECG116	SK3311	
	2330551	NTE552	ECG552	SK5002	
IC0102	MN15266HN				
IC0104	2917222				
	HA1151ONT				
IC201	2914961				
IC501	LA7550				
	2916681				
	HA11511NT				
	2916631				
IC601	UPC1378H	NTE1676	ECG1676	SK7653/1676	
	2368501	NTE1676	ECG1676	SK7653/1676	
IC901	UPC1378H1				
	2912175				

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When ordering parts, state Model, Part Number, and Description

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFGR. PART No./ TYPE No.	NTE PART No.	ECG PART No.	TCE PART No.	NOTES
Q0101,2	C458C 2SC458B 2SC458C 2SC458D 2320598	NTE85 NTE85 NTE85 NTE85	ECG85 ECG85 ECG85 ECG85	SK3124A/289A SK3124A/289A SK3124A/289A SK3124A/289A	
Q0103	K105E 2SK105E 2SK105F 2324084	NTE459 NTE459 NTE459 NTE459	ECG459 ECG459 ECG459 ECG459	SK9149/459 SK9149/459 SK9149/459 SK9149/459	
Q0104	C1213AC 2SC1213AC 2320663	NTE289A NTE289A NTE289A	ECG289A ECG289A ECG289A	SK3122 SK3122 SK3122	
Q0105	C458C 2SC458B 2SC458C 2SC458D 2320598	NTE85 NTE85 NTE85 NTE85 NTE85	ECG85 ECG85 ECG85 ECG85 ECG85	SK3124A/289A SK3124A/289A SK3124A/289A SK3124A/289A SK3124A/289A	
Q151	D789C 2SD789B 2SD789C 2323521	NTE315 NTE315 NTE315 NTE315	ECG315 ECG315 ECG315 ECG315	SK9137/382 SK9137/382 SK9137/382 SK9137/382	
Q201	C458C 2SC458B 2SC458C 2SC458D 2320598	NTE85 NTE85 NTE85 NTE85 NTE85	ECG85 ECG85 ECG85 ECG85 ECG85	SK3124A/289A SK3124A/289A SK3124A/289A SK3124A/289A SK3124A/289A	
Q302,3	C458C 2SC458B 2SC458C 2SC458D 2320598	NTE85 NTE85 NTE85 NTE85 NTE85	ECG85 ECG85 ECG85 ECG85 ECG85	SK3124A/289A SK3124A/289A SK3124A/289A SK3124A/289A SK3124A/289A	

PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		
		MFGR. PART No.	NTE PART No.	
# R905	10 5% 2W Metal Film	0110197	2W010	
# R906	10 5% 2W Metal Film	0110197	2W010	
# R907	240 5% 10W WW	0141130		
R909	3900 5% 3W Metal Film	0110359	3W239	
R910	6800 5% 3W Metal Film	0110365	3W268	
# TH901	7.7 Cold PTC	2340521		

For SAFETY use only equivalent replacement part.

COILS (RF-IF)

ITEM No.	FUNCTION	MFGR. PART No.	ITEM No.	FUNCTION	MFGR. PART No.
L0101	Sensitivity	2161992	L205	RF Choke (8.2uH)	2122238
L0102	RF Choke (100uH)	2122956	L207	RF Choke	2122921
L0104	RF Choke (100uH)	2122956	L221	RF Choke	2122253
L0105	Peaking (3.9uH)	2122937	L301	RF Choke (100uH)	2122956
L0106	Peaking (33uH)	2122949	L302	RF Choke (39uH)	2122951
L0107	Display Position	2164362	L303	Peaking (150uH)	2122958
L0108	Peaking (100uH)	2122956	L305	RF Choke (100uH)	2122956
L0109	RF Choke	2122253	L306	Peaking (2.2uH)	2122934
L0110	Peaking (100uH)	2122956	L401	RF Choke (27uH)	2122948
L0111	Peaking (100uH)	2122956	L402	RF Choke (22uH)	2122947
L0112	Peaking (100uH)	2122956	L501	RF Choke (12uH)	2122944
L0113	Peaking (100uH)	2122956	L503	RF Choke (8.2uH)	2122942
L0114	Peaking (100uH)	2122956	L701	RF Choke (100uH)	2120482
L0115	Peaking (100uH)	2122956	L702	RF Choke (33uH)	2122096
L0116	Peaking (100uH)	2122956	L704	RF Choke (33uH)	2122096
L0117	Peaking (100uH)	2122956	L705	RF Choke	2122253
L0118	Peaking (100uH)	2122956	L706	Peaking	2122253
L0120	Peaking (2.2uH)	2122934	L707	Peaking (2.2uH)	2122231
L0121	Peaking (2.2uH)	2122934	L851	RF Choke (120uH)	2122254
L0122	RF Choke	2122253	# L901	Line Filter	2121670
L101	RF Choke (100uH)	2122956	L902	RF Choke	2122253
L201	Video IF	2143292	L903	RF Choke (100uH)	2122956
L202	AFT	2142445	# L3001	RF Choke (100uH)	2122956
L203	Video IF	2143291		Filter	2121672
L204	Peaking (15uH)	2122945			

For SAFETY use only equivalent replacement part.

COILS & TRANSFORMERS

ITEM No.	FUNCTION	MFGR. PART No.	OTHER IDENTIFICATION	NOTES
# E6001	Yoke 90° Horiz 4.19mh Vert 22.9mh	2442472	(1)	
# T401	Sound Out	2250451	(1)	
T701	Horiz Driver	2260021	(1)	
# T702	Horiz Out	2435002	(1)	

For SAFETY use only equivalent replacement part.

(1) Number on unit.

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
# SP451	2 3/8" x 3 1/2" PM 25 Ohm	2412571		

For SAFETY use only equivalent replacement part.

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PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	MFGR. PART No.	ITEM No.	RATING	MFGR. PART No.
# C608	1 20V	0292716	# C727	10 25V	0252960
C712	1 50V	0252974	C906	470 200V	0259976

For SAFETY use only equivalent replacement part.
 Items not listed are normally available at local distributors.

CAPACITORS

ITEM No.	RATING	MFGR. PART No.	ITEM No.	RATING	MFGR. PART No.
C0107	.0036 100V 2%	0299014	C206	18 NPO 50V 5%	0246446
C0119	15 NPO 50V 5%	0246444	C207	91 NPO 50V 5%	0246463
C0120	15 NPO 50V 5%	0246444	C210	15 NPO 50V 5%	0246444
C0121	56 NPO 50V 5%	0246456	C716	470 2.5KV 10%	0244202
C0122	47 50V 5%		C717	.0047 1.6KV	0299728
	56 NPO 50V 5%	0246456	C718	.33 200V 10%	0299932
	47 50V 5%		C901	.1 125V 10%	0279718
C0136	27 NPO 50V 5%	0246450			

For SAFETY use only equivalent replacement part.
 Items not listed are normally available at local distributors.

CONTROLS (All wattages 1/2 watt, or less, unless listed)

ITEM NO.	FUNCTION	RESISTANCE	MFGR. PART NO.	NOTES
R202	RF AGC	30K	0150158	
R351	Sub Bright Level	10K	0150114	
R609	Vert Height (size)	200	0150109	
# R799A	Focus		(1)	
# R799B	Screen		(1)	
R857	R Bkg	5000	0150113	
R858	G Bkg	5000	0150113	
R859	B Bkg	5000	0150113	
R864	R Drive	200	0150109	
R866	B Drive	200	0150109	
S501	Sharpness	10K	(2)	

For SAFETY use only equivalent replacement part.
 (1) Part of Horizontal Output Transformer T702, Part Number 2435002.
 (2) Part of Key Switch Assembly S501, Part Number 2632912.

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		
		MFGR. PART No.	NTE PART No.	
# R719	68K 5% 1/16W Carbon Film	0187109		
# R730	1 5% 1/4W Metal Film	0119512	QW1D0	
# R731	1 5% 1/4W Metal Film	0119512	QW1D0	
# R734	2.2 5% 1/4W Fuse Resistor	0119505		
# R735	.5 5% 1/4W Fuse Resistor	0119838		
# R737	2700 5% 1/16W Carbon Film	0187075		
# R743	180 5% 1/16W Carbon Film	0187047		
R751	4.7 10% 5W WW	0141137	5W4D7	
# R901	2.7 10% 7W WW	0141133		
# R904	56 5% 1/4W Fuse Resistor	0119508		

PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFGR. PART No./ TYPE No.	NTE PART No.	ECG PART No.	TCE PART No.	NOTES
Q312	C458D 2SC458D 2320595	NTE85 NTE85 NTE85	ECG85 ECG85 ECG85	SK3124A/289A SK3124A/289A SK3124A/289A	
Q313	A673D 2SA673C 2SA673D 2320637	NTE290A NTE290A NTE290A NTE290A	ECG290A ECG290A ECG290A ECG290A	SK9132 SK9132 SK9132 SK9132	
Q314	C458C 2SC458B 2SC458C 2SC458D 2320598	NTE85 NTE85 NTE85 NTE85 NTE85	ECG85 ECG85 ECG85 ECG85 ECG85	SK3124A/289A SK3124A/289A SK3124A/289A SK3124A/289A SK3124A/289A	
Q401,2	C2688LA 2SC2688K 2SC2688L 2SC2688M 2322562	NTE157 NTE157 NTE157 NTE157 NTE157	ECG157 ECG157 ECG157 ECG157 ECG157	SK3747/157 SK3747/157 SK3747/157 SK3747/157 SK3747/157	
Q501 THRU Q505	C458C 2SC458B 2SC458C 2SC458D 2320598	NTE85 NTE85 NTE85 NTE85 NTE85	ECG85 ECG85 ECG85 ECG85 ECG85	SK3124A/289A SK3124A/289A SK3124A/289A SK3124A/289A SK3124A/289A	
Q507	C458C 2SC458B 2SC458C 2SC458D 2320598	NTE85 NTE85 NTE85 NTE85 NTE85	ECG85 ECG85 ECG85 ECG85 ECG85	SK3124A/289A SK3124A/289A SK3124A/289A SK3124A/289A SK3124A/289A	
Q501	C458C 2SC458B 2SC458C 2SC458D 2320598	NTE85 NTE85 NTE85 NTE85 NTE85	ECG85 ECG85 ECG85 ECG85 ECG85	SK3124A/289A SK3124A/289A SK3124A/289A SK3124A/289A SK3124A/289A	

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PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFGR. PART No./ TYPE No.					NOTES
		NTE PART No.	ECG PART No.	TCE PART No.		
Q701	C2271M 2SC2271M 2SC2271N 2321992	NTE399	ECG399	SK9352/399	#	
		NTE399	ECG399	SK9352/399		
		NTE399	ECG399	SK9352/399		
		NTE399	ECG399	SK9352/399		
Q702	D1876 2SD1876 2327504	NTE289A NTE289A NTE289A	ECG289A ECG289A ECG289A	SK3122 SK3122 SK3122		
Q707	C1213C 2SC1213B 2SC1213C	NTE157 NTE157 NTE157	ECG157 ECG157 ECG157	SK3747/157 SK3747/157 SK3747/157		
Q851, 2, 3	C2611 2SC2611 2SC2688	NTE85 NTE85 NTE85	ECG85 ECG85 ECG85	SK3124A/289A SK3124A/289A SK3124A/289A		
Q2001	C458C 2SC458B 2SC458C	NTE85 NTE85 NTE85	ECG85 ECG85 ECG85	SK3124A/289A SK3124A/289A SK3124A/289A		
Q2002	2320598 A673D 2SA673C	NTE85 NTE290A NTE290A	ECG85 ECG290A ECG290A	SK3124A/289A SK9132 SK9132		
ZD0101, 2	2320637 HZ12(A) HZ12(B)	NTE290A NTE5021A NTE5021A	ECG290A ECG5021A ECG5021A	SK9132 SK9132 SK9132		
ZD151	HZ12(C) 2331154 HZ6C1	NTE5021A NTE5021A NTE5012A	ECG5021A ECG5021A ECG5012A	SK12A/5021A SK12A/5021A SK6A0/5012A		
ZD301	2331807 HZ9C1 HZ9(C)1	NTE5012A NTE5018A NTE5018A	ECG5012A ECG5018A ECG5018A	SK6A0/5012A SK9A1/5018A SK9A1/5018A		USED SOME VERSIONS

PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFGR. PART No./ TYPE No.					NOTES
		NTE PART No.	ECG PART No.	TCE PART No.		
ZD303	HZ12C HZ-12(C) 2331155	NTE5021A	ECG5021A	SK12A/5021A	#	
		NTE5021A	ECG5021A	SK12A/5021A		
		NTE5021A	ECG5021A	SK12A/5021A		
		NTE5021A	ECG5021A	SK12A/5021A		
ZD304	HZ12(A) HZ12(B) HZ12(C)	NTE5021A	ECG5021A	SK12A/5021A		
		NTE5021A	ECG5021A	SK12A/5021A		
		NTE5021A	ECG5021A	SK12A/5021A		
		NTE5021A	ECG5021A	SK12A/5021A		
ZD501, 2, 3	2331154 HZ9C1 HZ9(C)1	NTE5021A	ECG5021A	SK12A/5021A		
		NTE5018A	ECG5018A	SK9A1/5018A		
		NTE5018A	ECG5018A	SK9A1/5018A		
		NTE5018A	ECG5018A	SK9A1/5018A		
ZD601	2331827 HZ5C1 2331797	NTE5010T1	ECG5010T1	SK9A1/5018A		
		NTE5010T1	ECG5010T1	SK9A1/5018A		
		NTE5010T1	ECG5010T1	SK9A1/5018A		
		NTE5010T1	ECG5010T1	SK9A1/5018A		
ZD701	HZ9C1 HZ9(C)1 2331827	NTE5018A	ECG5018A	SK9A1/5018A		
		NTE5018A	ECG5018A	SK9A1/5018A		
		NTE5018A	ECG5018A	SK9A1/5018A		
		NTE5018A	ECG5018A	SK9A1/5018A		
ZD704	HZS24-1L 2339211 HZ3ALL	NTE5031A	ECG5031A	SK24A/5031A		
		NTE5031A	ECG5031A	SK24A/5031A		
		NTE5031A	ECG5031A	SK24A/5031A		
		NTE5031A	ECG5031A	SK24A/5031A		
ZD705	2339991 HZ6B3 HZ6(B)3	NTE5003A	ECG5003A	SK2A8/5003A		
		NTE5003A	ECG5003A	SK2A8/5003A		
		NTE5003A	ECG5003A	SK2A8/5003A		
		NTE5003A	ECG5003A	SK2A8/5003A		
ZD706	2331806 HZ4B2 2331785	NTE5012A	ECG5012A	SK6A0/5012A		
		NTE5012A	ECG5012A	SK6A0/5012A		
		NTE5012A	ECG5012A	SK6A0/5012A		
		NTE5012A	ECG5012A	SK6A0/5012A		
ZD707	2331806 HZ4B2 2331785	NTE5007A	ECG5007A	SK3A9/5007A		
		NTE5007A	ECG5007A	SK3A9/5007A		
		NTE5007A	ECG5007A	SK3A9/5007A		
		NTE5007A	ECG5007A	SK3A9/5007A		
ZD708	HZ11(A) HZ11(B) HZ11(C)	NTE5019T1	ECG5019T1	SK9A1/5018A		
		NTE5019T1	ECG5019T1	SK9A1/5018A		
		NTE5019T1	ECG5019T1	SK9A1/5018A		
		NTE5019T1	ECG5019T1	SK9A1/5018A		
ZD901	2331161 HZ12C HZ-12C	NTE5020A	ECG5020A	SK11A/5020A		
		NTE5021A	ECG5021A	SK12A/5021A		
		NTE5021A	ECG5021A	SK12A/5021A		
		NTE5021A	ECG5021A	SK12A/5021A		

For SAFETY use only equivalent replacement part.

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