

BLUE DRIVE RED BACKGROUND RED BLUE BACKGROUND GREEN BACKGROUND AC FUSE VERT HOLD FOCUS SCREEN

CABINET-REAR VIEW

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

CHANNEL INDICATOR LAMP ACCESSIBILITY

Tuning assembly must be removed. See Disassembly Instructions.

VHF/UHF TUNER

Two buttons are provided for channel scanning

with two buttons provided for channel pre-tuning. See channel pretuning procedure.

HORIZONTAL OSCILLATOR

Adjustment of the horizontal hold is accomplished by the proper setting of the horiz hold control. (See Placement Chart.)

FOCUS

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

AGC

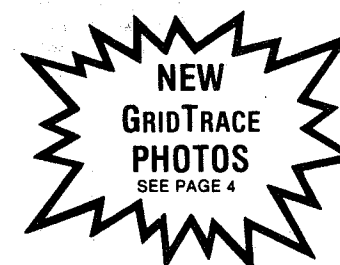
The AGC may be varied by an AGC control. (See Placement Chart.)

FOLDER 2
SET 2132



PHOTOFACT® Folder
with **CIRCUITRACE™**

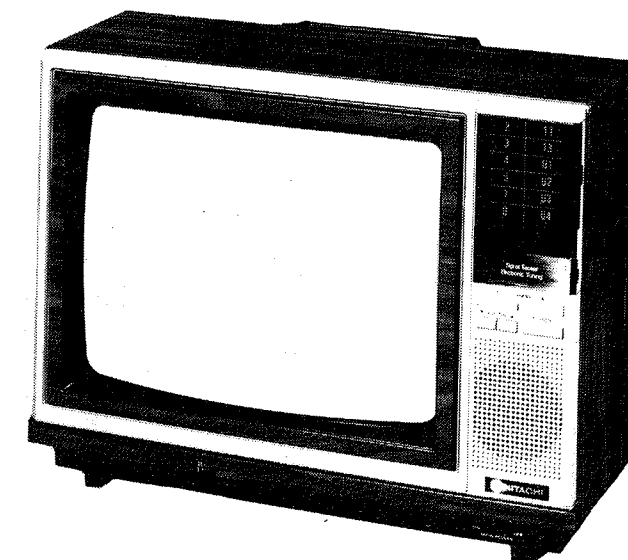
For Supplier Address See PHOTOFACT® Index



HITACHI MODELS
CT13X6, CT1324, CT1326

HITACHI MODELS
CT13X6, CT1324, CT1326

COLOR TV



Model CT1324

SAFETY PRECAUTIONS

See pages 3, 4.

SERVICE INFORMATION

See page 17.

INDEX

	Page		Page
Alignment		Photos (Continued)	
TV.....	5,6	Main Board.....	8,9,10,31,32,33
Block Diagram.....	30	Main Board-Shield Location.....	40
Channel Pretuning.....	38	Selector Boards	
Circuit Description.....	37	(Models CT13X6, CT1326).....	15,26
Convergence Adjustments.....	38	Selector Boards (Model CT1324).....	16,25
Disassembly Instructions.....	39	Placement Chart.....	7
GridTrace Location Guide		Resistance Measurements.....	34
CRT Board.....	29	Safety Precautions.....	3,4
Instructions.....	4	Schematics	
Main Board.....	11	Remote Transmitter, Selector	
High Voltage Hold Down	17,37	Boards (Models CT13X6,	
Miscellaneous Adjustments.....	38	CT1326).....	13,28
Parts List		Selector Boards (Model CT1324).....	14,27
Selector Boards.....	17	TV.....	2
TV.....	18 thru 24	Service Information.....	17
Photos		Servicing in the Field.....	41
Cabinet-Rear View.....	41	Troubleshooting	36,37
CRT Board.....	12,29	Troubleshooting Aid.....	35

HOWARD W. SAMS & CO., INC. Indianapolis, Indiana 46206

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., 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., Inc., by the manufacturers of the particular type of replacement part listed. 83PD01548

Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1983 Howard W. Sams & Co., Inc. Indianapolis, Indiana 46206. Printed in U.S. of America.

HITACHI MODELS
CT13X6, CT1324, CT1326

SET 2132 FOLDER 2

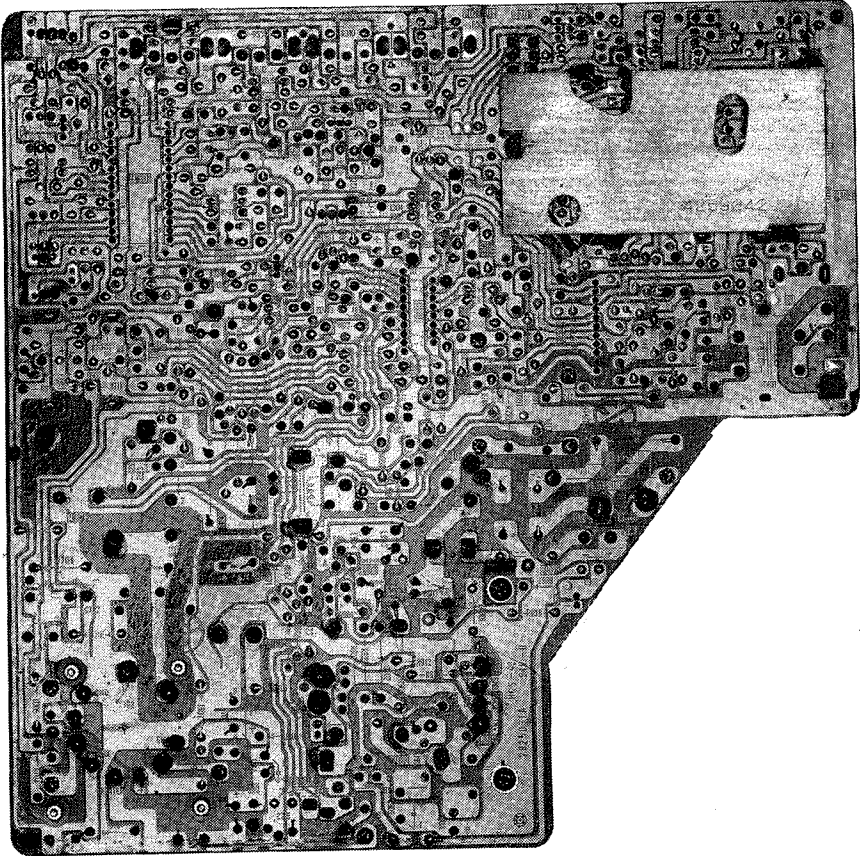
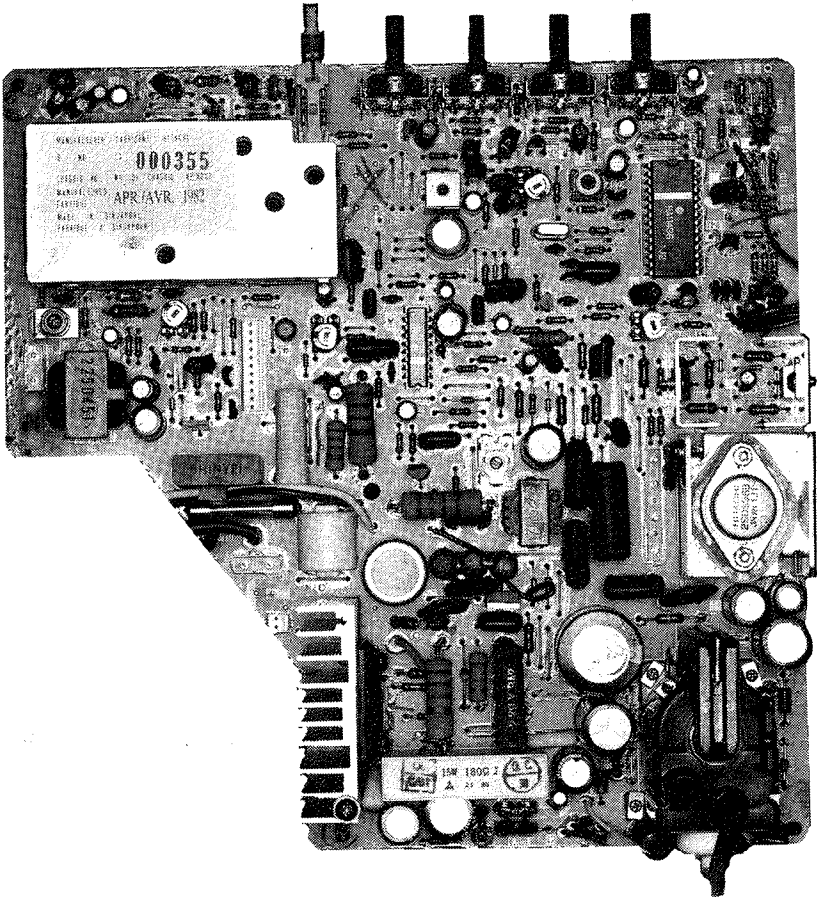
DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

Remove ten screws holding cabinet back and remove back. Disconnect HV anode, CRT socket, deflection yoke connector, degaussing coil connector, speaker connector and ground leads. Remove three screws holding tuning assembly to cabinet front and remove assembly from cabinet. Channel indicators are accessible for servicing. Remove two screws holding tuner assembly and power cord restraint to cabinet bottom and remove assembly and main board from cabinet. Remove two screws holding main power switch to cabinet front and remove control.

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.



MAIN BOARD-SHIELD LOCATION

HITACHI MODELS
CT13X6, CT1324, CT1326

FOLDER 2



BLUE RED
DRIVE

SERVICING IN THE

CRT IMPLSION PROTE
Implosion protection
picture tube, clear
removal.

FUSE DEVICES

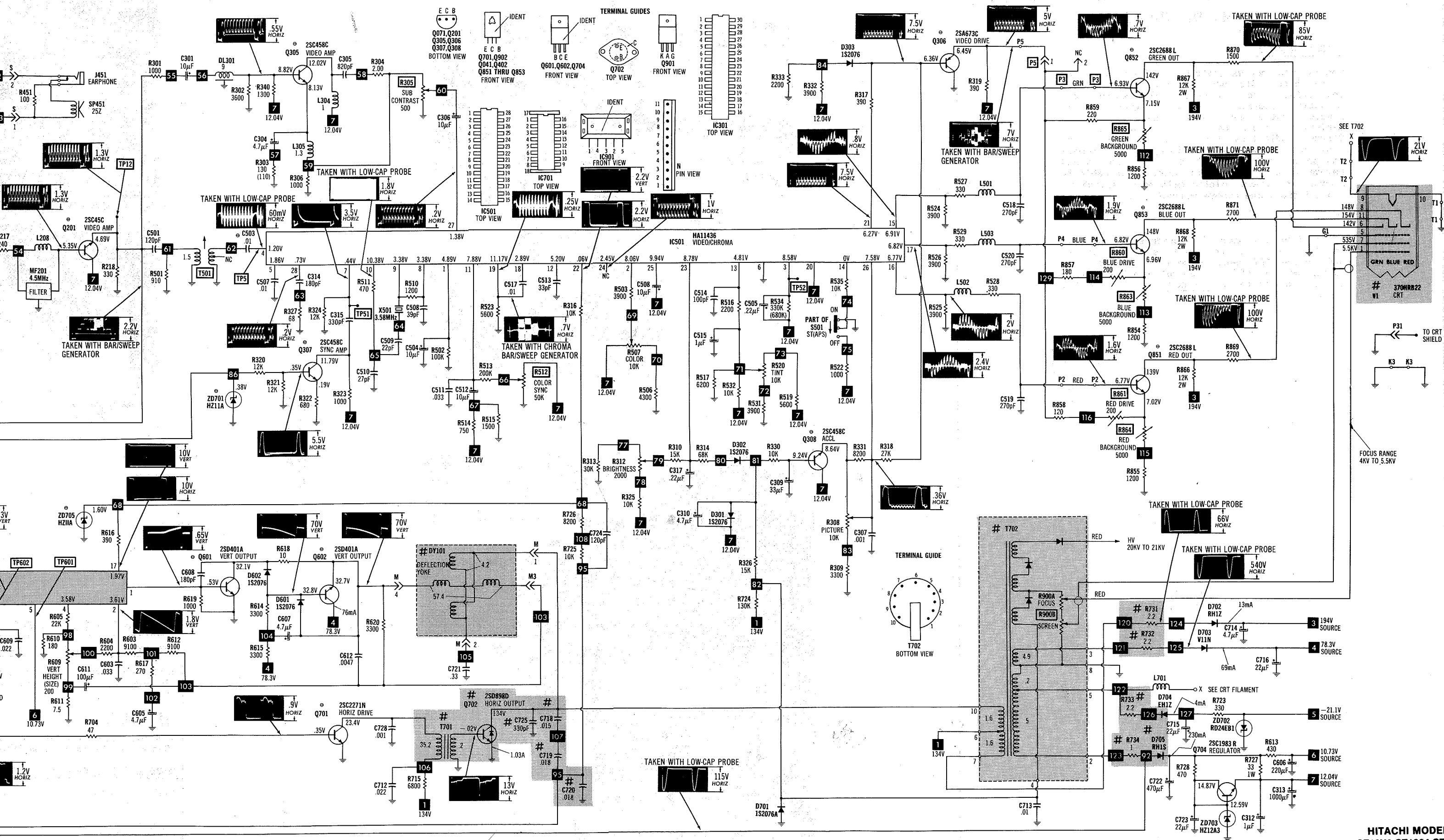
A 4-amp fuse is u
(See photo, Cabinet

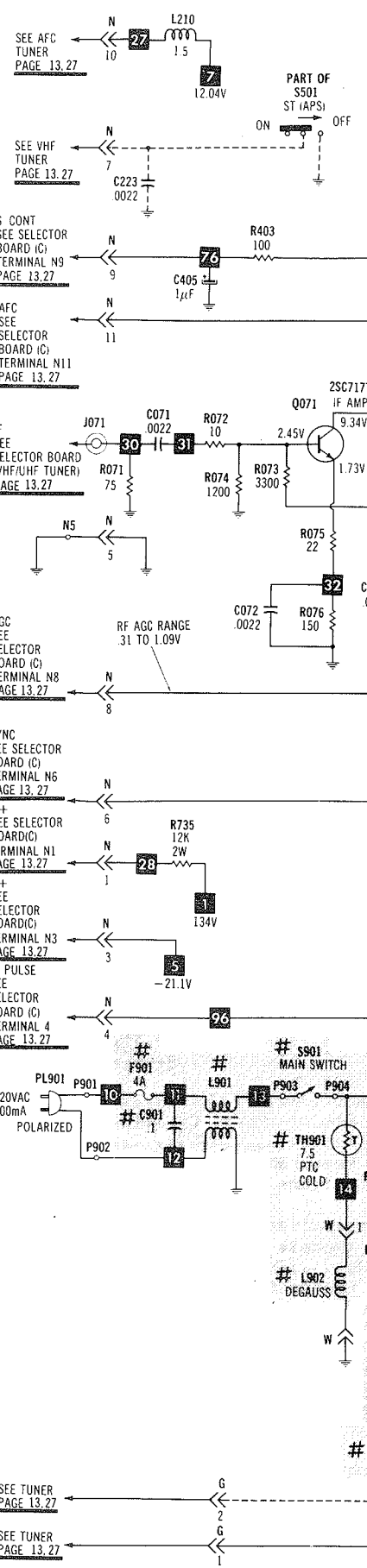
CHANNEL INDICATOR L

Tuning assembly mus
bly Instructions.

VHF/UHF TUNER

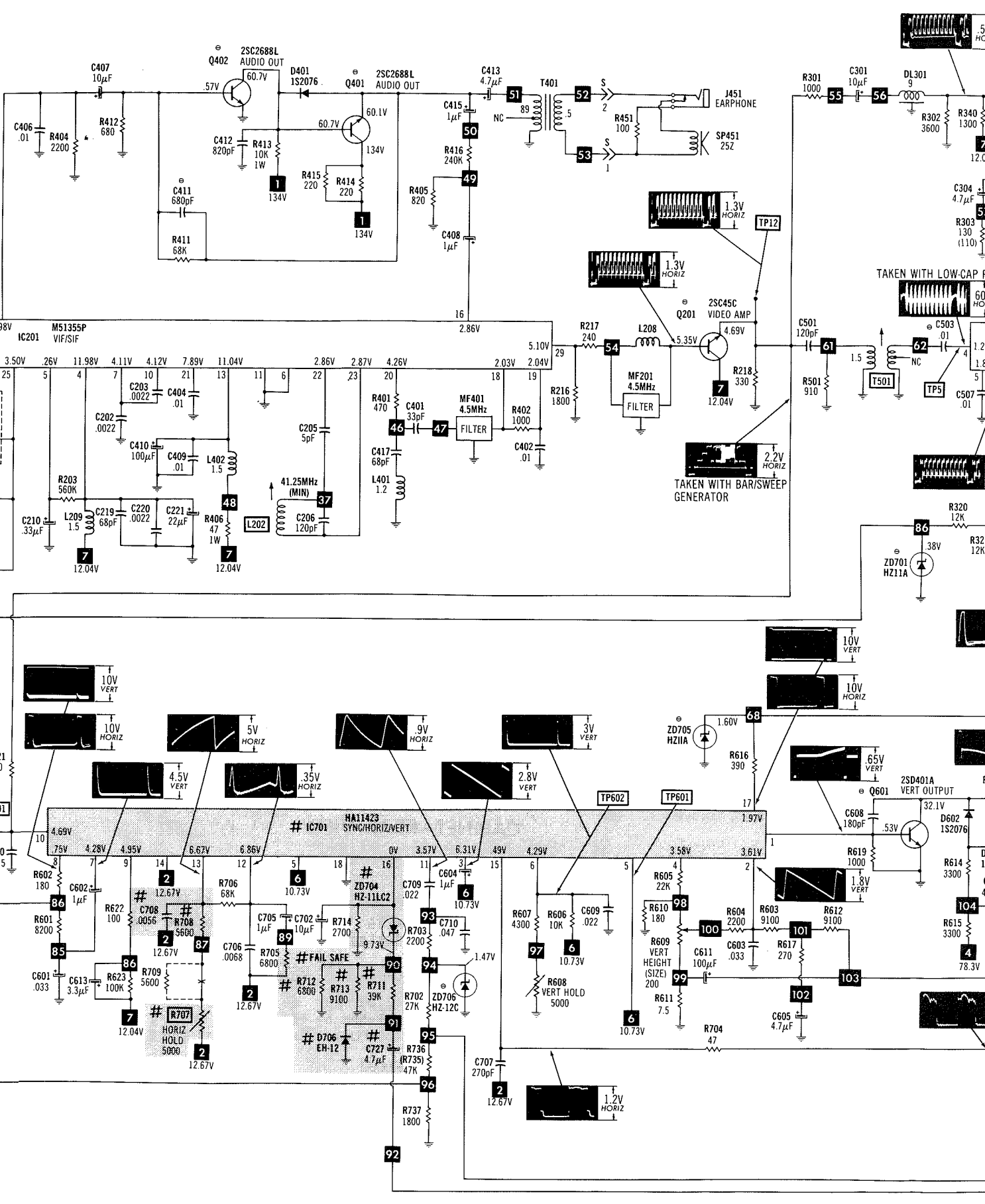
Two buttons are p





For SAFETY use only equivalent replacement part.
- Circuitry not used in some versions
--- Circuitry used in some versions
⊖ See parts list
⊗ Nominal value
⊥ Ground

Waveforms: triggered scope, keyed rainbow generator
Item numbers in rectangles appear in the alignment/adjustment instructions.
Supply voltage 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.
Resistors are 1/2W or less, 5% unless noted.
Value in () used in some versions.



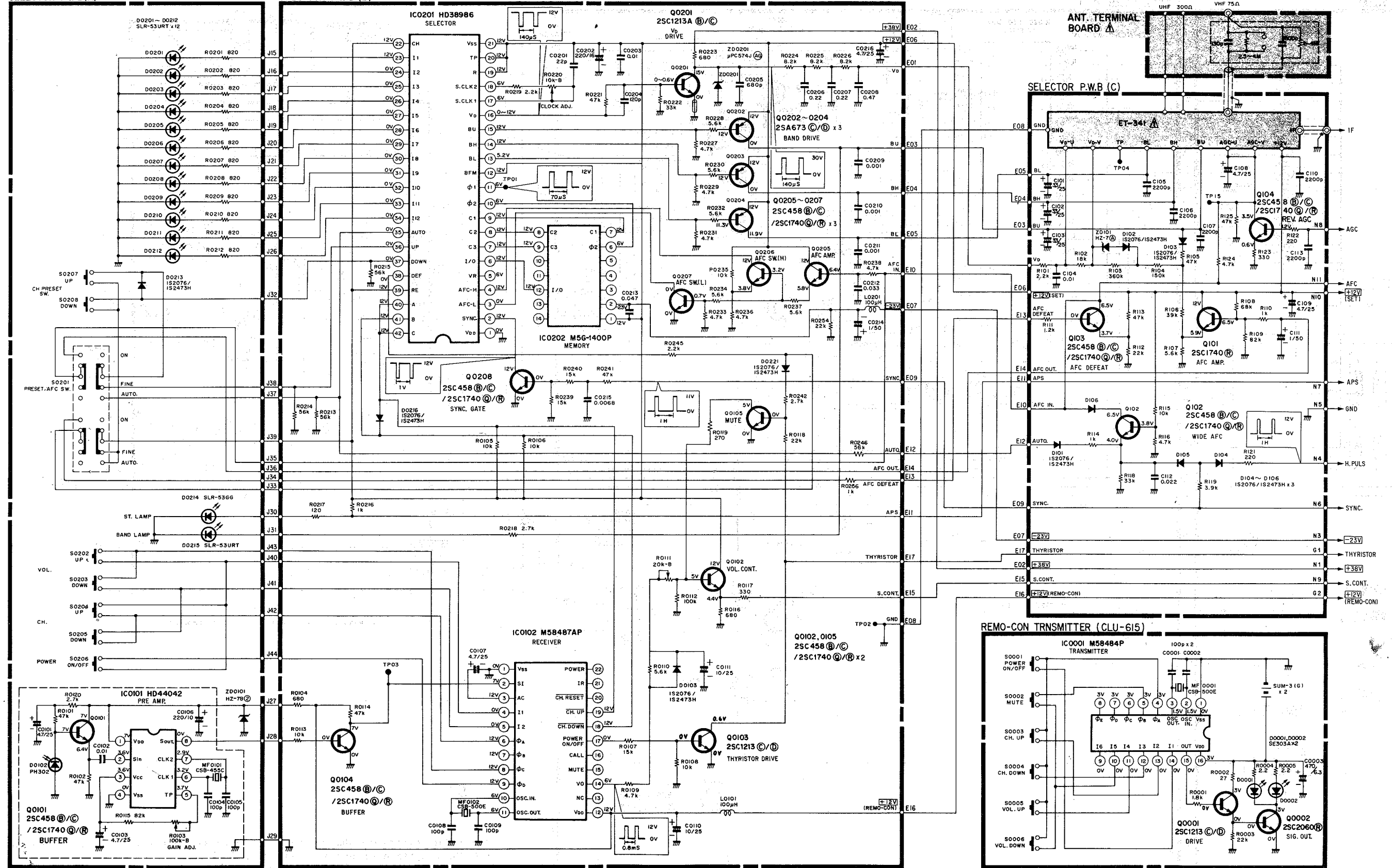
PROGRAM SELECTOR CIRCUIT DIAGRAM (CT1326/CT13X6)

SELECTOR P.W.B(A)

SELECTOR P.W.B (B)

- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.
- All DC voltage to be measured with a tester (100kΩ/V).
- Voltage taken on a complex color bar signal including a standard color bar signal.

PRODUCT SAFETY NOTE: Components marked with a Δ and shaded have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver though improper servicing.



SELECTOR BOARDS (MODELS CT13X6,CT1326)

Courtesy of the Manufacturer

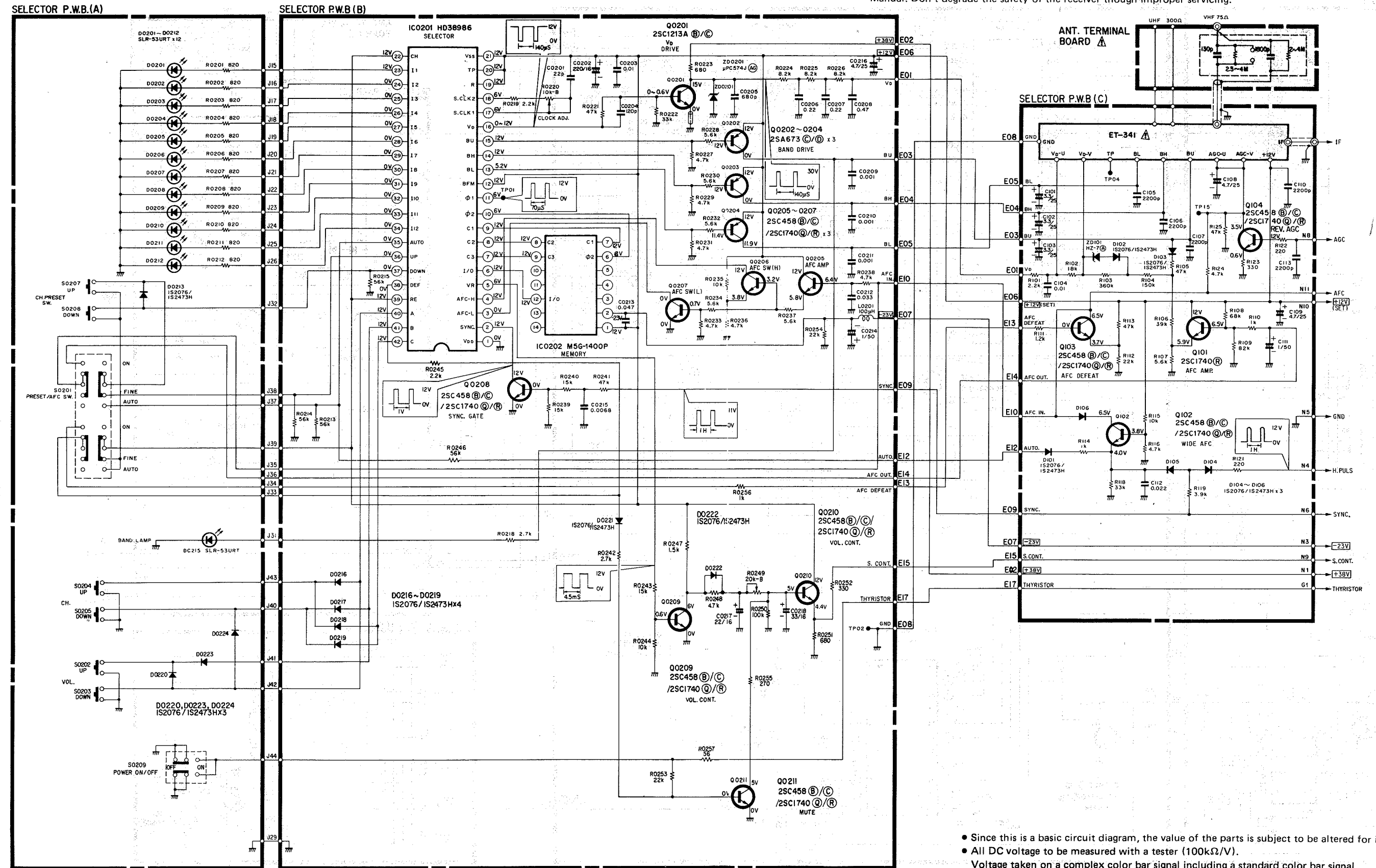
REMOTE TRANSMITTER,
SELECTOR BOARDS (MODELS CT13X6,CT1326)

HITACHI MODELS
CT13X6,CT1324,CT1326

FOLDER 2

PROGRAM SELECTOR CIRCUIT DIAGRAM (CT1324)

PRODUCT SAFETY NOTE: Components marked with a Δ and shaded have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver though improper servicing.



SELECTOR BOARDS (MODEL CT1324)

Courtesy of the Manufacturer

SELECTOR BOARDS (MODEL CT1324)

MISCELLANEOUS ADJUSTMENTS

CHANNEL PRETUNING

1. Connect antenna.
2. Move Main Power Switch to On.
3. Momentarily depress Power Button.
4. Open tuning access door.

AUTO CHANNEL PRETUNING

5. Move Preset/AFC Switch to Auto.
6. Momentarily depress Channel Up or Down Button to select channel position to be preset.
7. Repeat step 6 if necessary to select desired position.
8. Momentarily depress Up or Down Channel Preset Button. Selected channel number will flash during pretuning.
9. Repeat steps 6, 7 and 8 for each channel to be pretuned.

FINE CHANNEL PRETUNING

10. Follow steps 1, 2, 3 and 4.
11. Move Preset/AFC Switch to Fine.
12. Momentarily depress Channel Up or Down Button to select channel position to be pretuned.
13. Repeat steps 12 if necessary to select desired position.
14. Press Channel Preset Up or Down Button to tune for best reception.
15. Repeat steps 12, 13 and 14 for each channel to be pretuned.
16. After completing pretuning procedure, move Preset/AFC Switch to On.

HIGH VOLTAGE CHECK

Tune in a TV station and turn Brightness and Picture Controls to MINIMUM. Connect a high voltage meter to the high voltage anode of the CRT, low side to ground. High voltage should measure less than 27KV.

AGC ADJUSTMENT

Tune in a strong TV station. Adjust AGC Control (R206) fully clockwise, then turn counterclockwise until snow just disappears from the picture.

HORIZONTAL SYNC ADJUSTMENT

Tune in a TV station. Connect a .01 Electrolytic positive to TP701; negative to ground. Adjust Horizontal Hold Control (R707) until picture stops or slowly floats across the screen. Remove Electrolytic.

APC ADJUSTMENT (COLOR SYNC)

Connect a color bar generator to the antenna terminals and tune in a color bar pattern. Connect a .01 capacitor from TP51 to ground. Connect a 270K ohm resistor from TP52 to ground. Adjust Color Sync Control (R512) until color bars stop or slowly float across the screen. Remove capacitor and resistor.

SUB CONTRAST ADJUSTMENT

Tune in a TV station. Set AFC Switch to Off, Picture and Brightness Controls to Midrange. Adjust Sub Contrast Control (R305) for suitable contrast and maintain detail in the picture.

PURITY ADJUSTMENT

Turn TV on and allow 20 minutes warm-up time. Degauss the set if necessary. Disconnect P3 on Main PC Board to produce a magenta raster. Loosen yoke and move it back against the convergence assembly. Adjust the purity tabs to produce a magenta bar in the center of the screen. Push the deflection yoke forward to obtain a uniform magenta raster. Connect P3.

DELAY LINE ADJUSTMENT

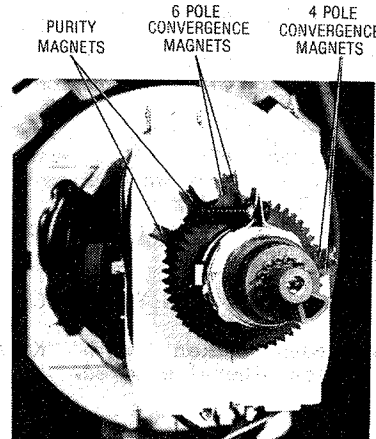
Delay Line (DL301) is factory adjusted.

COLOR TEMPERATURE ADJUSTMENT

Turn TV set on and allow 10 minutes for warm-up. Turn Off ST (APS) Switch, set Picture and Brightness Controls to midrange. Place Red (R861) and Blue (R860) Drive Controls to midrange. Turn Red (R864), Blue (R863), Green (R865) Background Controls and Screen Control (R900B) fully counterclockwise. Disconnect P5. Connect a jumper from TP601 to TP602. Turn Screen Control (R900B) until one of the colors just appears. Adjust the Background Controls for the two remaining colors to produce a white line. Reconnect P5, and remove jumper. Adjust Red (R861) and Blue (R860) Drive Controls for high brightness level and adjust Background Controls for low brightness level to maintain proper white balance.

CONVERGENCE ADJUSTMENT

Connect a color bar generator to the antenna terminals and tune in a dot pattern. Adjust Four-pole Convergence Magnets to converge the red and blue dots at the center of the screen. Adjust Six-pole Convergence Magnets to converge the red/blue dots over the green dots at the center of the screen. Tune in a crosshatch pattern. Remove the rubber wedges between the deflection yoke and CRT. Tilt the deflection yoke up or down to converge the vertical lines at the top and bottom of the screen and the horizontal lines at the right and left sides of the screen. Tilt the deflection yoke to the right or left to converge the horizontal lines at the top and bottom of the screen and the vertical lines at the right and left sides of the screen. Repeat convergence procedure if necessary to obtain the best overall convergence. Replace the rubber wedges.



CRT NECK ASSEMBLY

SAFETY PRECAUTIONS

NOTICE: Comply with all cautions and safety related notes located on or inside the cabinet and on the chassis or picture tube.

WARNING: Since the chassis of this receiver is connected to one side of AC power supply during operation, whenever the receiver is plugged in, service should not be attempted by anyone unfamiliar with the precautions necessary when working on this type of receiver.

The following precautions should be observed:

1. Do not install, remove, or handle the picture tube in any manner unless shatterproof goggles are worn. People not so equipped should be kept away while picture tubes are handled. Keep picture tube away from the body while handling.
2. When service is required, an isolation transformer should be inserted between power line and the receiver before any service is performed on a "HOT" chassis receiver.
3. When replacing a chassis in the receiver, all the protective devices must be put back in place, such as barriers, non-metallic knobs, adjustment and compartment cover-shields, isolation resistor-capacitor, etc.
4. When service is required, observe the original lead dress. Extra precaution should be taken to assure correct lead dress in the high voltage circuitry area.
5. Always use the manufacturer's replacement components. Especially critical components as indicated on the circuit diagram should not be replaced by other manufacture's. Furthermore where a short circuit has occurred, replace those components that indicate evidence of overheating.
6. Before returning a serviced receiver to the customer, the service technician must thoroughly test the unit to be certain that it is completely safe to operate without danger of electrical shock, and be sure that no protective device built into the receiver by the manufacturer has become defective, or inadvertently defeated during servicing.

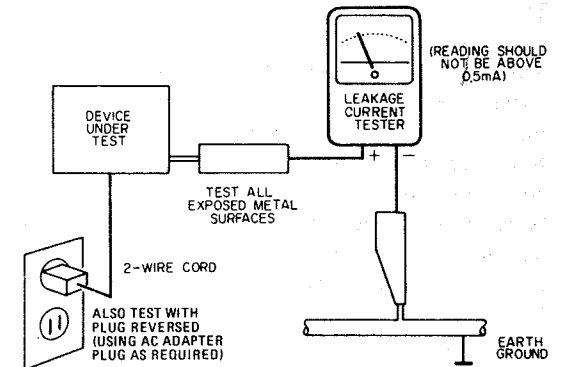
Therefore, the following checks should be performed for the continued protection of the customer and service technician.

Leakage Current Cold Check

With the AC plug removed from the AC120V, 60Hz source, place a jumper across the two plug prongs. Turn the AC power switch on. Using an insulation tester (DC500V), connect one lead to the jumpered AC plug and touch the other lead to each exposed metal part (antennas, screwheads, metal overlays, control shafts, etc.), particularly any exposed metal part having a return path to the chassis. Exposed metal parts having a return path to the chassis should have a minimum resistor reading of 0.3MΩ and a maximum resistor reading of 5MΩ. Any resistor value below or above this range indicates an abnormality which requires corrective action. Exposed metal parts not having a return path to the chassis will indicate an open circuit.

Leakage Current Hot Check

Plug the AC line cord directly into a AC120V, 60Hz outlet (do not use an isolation transformer for this check). Turn the AC power switch on. Using a "leakage Current Tester (Simpson Model 229 equivalent)", Measure for current from all exposed metal parts of the cabinet (antennas, screwheads, metal overlays, control shaft, etc.), particularly any exposed metal part having a return path to the chassis, to a known earth ground (water pipe, conduit, etc.). Any current measured must not exceed 0.5mA.



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE RECEIVER TO THE CUSTOMER.

High Voltage

This receiver is provided with a hold down circuit for clearly indicating that voltage has increased in excess of a predetermined value. Comply with all notes described in this Service Manual regarding this hold down circuit when servicing, so that this hold down circuit may correctly be operated.

Serviceman warning

With minimum Brightness and Picture, operating high voltage in this receiver is lower than 27.0KV. In case any component having influence on high voltage is replaced, confirm that high voltage with minimum Brightness and Picture is lower than 27.0KV. To measure H.V. use a high impedance H.V. meter. Connect (-) to chassis earth and (+) to the CRT anode button. (See the following connection diagram).

NOTE: Turn power switch off without fail before the connection with Anode button is made.

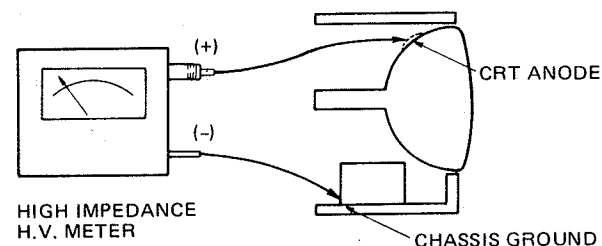
Courtesy of the Manufacturer

SET 2132 FOLDER 2

HITACHI MODELS
CT13X6, CT1324, CT1326

FOLDER 2

SAFETY PRECAUTIONS (Continued)



X-radiation

TUBE: The primary source of X radiation in this receiver is the picture tube. The tube utilized for the above mentioned function in this chassis is specially constructed to limit X radiation emissions.

For continued X radiation protection, the replacement tube must be the same type as the original, HITACHI approved type.

When trouble shooting and making test measurements in a receiver with a problem of excessive high voltage, avoid being unnecessarily close to the picture tube and the high voltage component.

Do not operate the chassis longer than is necessary to locate the cause excessive voltage.

PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in HITACHI television receiver have special safetyrelated characteristics. These are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by making with a # on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the HITACHI recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, X-radiation, or other hazards.

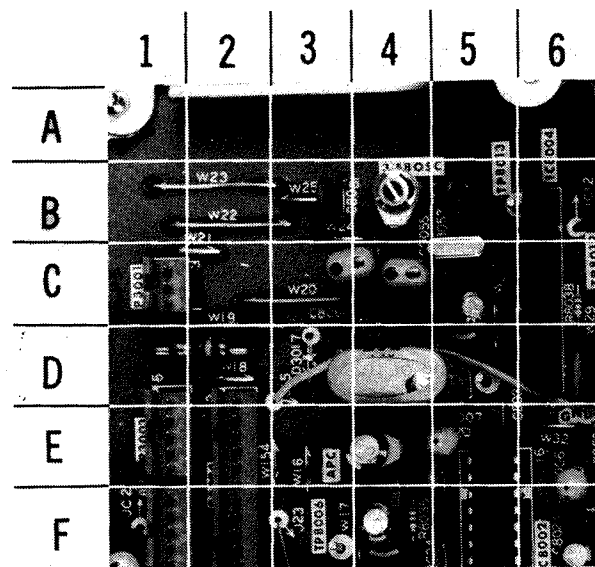
Courtesy of the Manufacturer

GRIDTRACE INSTRUCTIONS

1. Locate item numbers and grid coordinates on GridTrace location guide.
2. Locate component on GridTrace photo using grid coordinates.
3. Item numbers on PC Board are used for positive identification of components.

GRIDTRACE LOCATION GUIDE

C8022	F-6	D3017	D-3
C8024	F-6	IC8002	F-5
C8025	F-6	IC8004	B-6
C8028	D-6	L8006	E-6
C8030	E-4	L8007	E-5
C8031	D-4	L8011	C-3
C8032	E-5	L8012	C-4
C8033	F-4	P3001	C-1
C8034	F-4	P3003	E-1
C8035	E-4	P3006	E-2
C8050	C-4	R3212	D-2
C8051	C-5	R8032	F-6
C8053	B-5	R8036	F-4
C8054	B-5	TP8006	F-3
C8055	B-4	TP8013	B-5
C8056	B-4	X8001	D-4
C8061	B-3	X8002	C-5



A Howard W. Sams GRIDTRACE™ Photo

TROUBLESHOOTING (Continued)

VERTICAL

Check for a vertical waveform at pin 1 of the Sync/Horizontal/Vertical IC (IC701). Check voltage at pins 1 thru 8 and pin 17 of IC701. If vertical waveform is not present, inject a vertical signal at the base of Vertical Output Transistor (Q601). If vertical deflection returns, check voltages and waveforms on IC701 and check associated components. If no vertical deflection, check Vertical Output Transistors (Q601 and Q602), Diodes D601 and D602, Electrolytics C611 and C607, the vertical winding on the Deflection Yoke (DY101) and associated circuitry. For vertical foldover and vertical linearity, check the vertical feedback and bias circuits, check Electrolytics C602, C604, C606, C605, C607 and C611, check Diodes D601, D602 and associated circuitry.

SYNC

Check voltages and waveforms at pins 8, 9, 10 of the Sync/Horizontal/Vertical IC (IC701). Check for the proper vertical waveform at pin 7 of IC701. Check for the proper horizontal waveform at pins 11 and 12 of IC701 and check Sync Amp Transistor (Q307) and associated circuitry.

RASTER

If there is a missing color or cannot set up B & W, check the CRT and the CRT voltages and waveforms. Check the voltages and waveforms on Blue, Green and Red Output Transistors (Q853, Q852 and Q851) and at pins 17, 15 and 16 of the Video/Chroma IC (IC501). No blue, check

voltages and waveforms on pin 17 of IC501, pin 11 of the CRT and Transistor Q853. No green, check voltages and waveforms on pin 15 of IC501, pin 6 of the CRT and Transistor Q852. No red, check voltages and waveforms on pin 16 of IC501, pin 8 of the CRT and Transistor Q851.

CHROMA

If there is no color, check for 11.17V at pin 19 of the Video/Chroma IC (IC501), check voltages and waveforms at pins 2, 4, 7 and 10 of IC501 and check associated components. No color sync, check the adjustment on the Color Sync Control (R512), check voltages and waveforms at pins 5, 7, 8, 9 and 10 of IC501 and check 3.58MHz Crystal (X501). Wrong color, incorrect hue (tint), check voltages at pins 12, 13, 14, 15, 16, 17 and 18 of IC501 and check associated components.

CIRCUIT DESCRIPTION

HIGH VOLTAGE HOLD DOWN

If the high voltage exceeds 29.0KV, the voltage at the cathode of Zener Diode ZD704 will rise over 9.9V, Zener Diode ZD704 will conduct, voltage at pin 16 of Sync/Horizontal/Vertical IC (IC701) will be almost 10V, Hold Down circuit inside IC701 will shutdown the Horizontal Oscillator which will cause the horizontal circuit to shutdown the set. See High Voltage Hold Down Voltage Chart, these voltages are just momentarily at shutdown and then go down to zero volts.

HIGH VOLTAGE HOLD DOWN VOLTAGE CHART

NOTE: Voltages taken with Keyed-Rainbow generator unless otherwise noted.

ITEM	VOLTAGE
Pin 16 of IC701	1.12V
Cathode of ZD704	10.19V

TROUBLESHOOTING

POWER SUPPLY

Check the AC Line Fuse (F901). If the fuse is bad, check for possible shorts to ground at the Power Switch SCR (Q901), the Power Regulator IC (IC901), the Horizontal Output Transistor (Q702) and the Vertical Output Transistors (Q601 and Q602). Apply 120V AC and check for 120V AC at the anode of Diode D901. If 120V AC is absent, check the Main On-Off Switch (S901) and Line Choke (L901). Check for 106V at the cathode of Diode D901. If 106V is absent, check Diode D901 and Capacitor C902. Check for 157V at the cathode (K) of SCR Q901. If 157V is not present, check the voltages and components associated with SCR Q901, SCR Drive Transistor (Q902), check Plug G and Power On-Off Switch (S0209). Check for a regulated 135V at pin 2 of IC901. If 135V is absent, check the voltages and components associated with IC901. Check the B+ Sources that are developed from the Horizontal Output Transformer (T702) and rectified by Diodes D702 thru D705. Check for 12.04V at the emitter of the 12V Regulator Transistor (Q704). If 12.04V isn't present, check Zener Diode ZD703 and check the voltages and components associated with Transistor Q704.

HORIZONTAL

Check for 134V at the collector of the Horizontal Output Transistor (Q702). Check for a horizontal waveform at the base of Transistor Q702. If no signal, inject a horizontal signal at the base of Transistor Q702. If high voltage returns, check the Horizontal Drive Transistor (Q701), check voltages on pins 11 thru 16 of the Sync/Horizontal/Vertical IC (IC701). Check the hold down circuit, it may be activated, check voltage at pin 16 of IC701. If high voltage is still not present, check Transistor Q702, Capacitors C725, C718, C719, C720 and C721. If these components check out as normal, check the Horizontal Output Transformer (T702). The HV rectifier is part of Transformer T702 and may be defective. Check for shorted sources rectified by Diodes D702 thru D705. Poor horizontal linearity or foldover may be caused by the condition of Capacitors C725, C718, C719, C720, C721 and associated components.

NOTE: In case of a TV shutdown by excessive high voltage, care should be taken by using an Isolation transformer for AC power supply with stepdown control, to troubleshoot the set while it is working on low AC power supply such as 70 or 80V AC. Monitor the high voltage while doing this procedure of troubleshooting.

IF-AGC

Inject a IF signal at IF Input and check for picture information on the CRT. If picture is present, check tuner, tuner AGC circuit and B+ 12V on the tuner. If picture is not present, check for 9.34V at the collector of IF Amp Transistor (Q071), and check for 11.04V at pin

13 and 11.98V at pin 4 of VIF/SIF IC (IC201), check for a video waveform at pin 29 of IC201. If video waveform is present, refer to the "Video" section of this Troubleshooting guide. If video waveform is not present, inject the IF signal at pin 8 of IC201. If video waveform is present, troubleshoot Transistor Q071. If the video waveform is still not present, apply AGC bias at pin 2 of IC201. If the video waveform is still not present, troubleshoot IC201 and associated circuitry. A defective AGC circuit can cause overloaded picture, excessive snow or loss of picture and sound. See AGC Voltage Chart for AGC voltages with signal.

AGC VOLTAGE CHART

NOTE: Voltages measured while using a Keyed-Rainbow generator unless otherwise noted.

IC201	VOLTAGE
Pin 1	4.97V
Pin 2	4.99V
Pin 3	4.99V

AUDIO

Inject an audio signal at pin 17 of the VIF/SIF IC (IC201). If no sound appears at the speaker, check the Speaker (SP451), Earphone Jack (J451), Plug S, Audio Output Transformer (T401) and check the voltages and components associated with the Audio Output Transistors (Q401 and Q402). Check the Volume Control voltage at pin 9 of Plug N while the volume is varied from MINIMUM to Maximum volume. The voltage should vary from about .51V to 8.80V. If the Volume Control voltage is absent, troubleshoot the Volume Control circuits (IC201, Q0209 and Q0210) on the Selector (B) board. Set the volume to Maximum and inject a sound IF signal at pin 20 of IC201. If no sound is present at the speaker check the voltages and components associated with pins 12 thru 21 of IC201.

VIDEO

Check voltages and waveforms on the CRT and check the CRT. Inject a video signal at the base of the Video Amp Transistor (Q201) and check for information on the CRT. If there is no video on the CRT, check for video waveform at the base of the Video Drive Transistor (Q306). If there is no video waveform, check voltages and waveforms on pins 4, 5, 15, 16, 17, 20, 21, 22, 23, 25, 26, 27 and 28 of the Video/Chroma IC (IC501), check Video Amp Transistor (Q305), check ACCL Transistor (Q308) and check associated circuitry. If there is a video waveform at the base of Transistor Q306 and still no video on the CRT, check Transistor Q306, check the Blue Output Transistor (Q853), the Green Output Transistor (Q852), the Red Output Transistor (Q851) and associated circuitry. Check for vertical and horizontal blanking waveform at pin 22 of IC501, check Zener Diodes ZD705 and ZD706.

TV ALIGNMENT INSTRUCTIONS

Use an isolation transformer, or observe polarity, and maintain line voltage at 120VAC. Allow a 20-minute warm-up period for receiver and test equipment. Suggested Alignment Tools: GC ELECTRONICS L202, L204, L205, T501.....9296, 9297, 9300 CP401, VHF Tuner IF Output Coil.....9440

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 +4.2V Bias to TP1. Set AFC Switch to Off. Connect a 22 ohm resistor from TP2 to TP3.

VIDEO IF ALIGNMENT (SWEEP MARKER GENERATOR)

DIRECT PROBE FROM SWEEP/MARKER GENERATOR	SWEEP GENERATOR OUTPUT	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	REMARKS
To TP12	To TP04 on VHF tuner.	44MHz (10MHz Sweep)	41.25MHz	Adjust L202 for MINIMUM. See Figure 1.
"	"	"	44.00MHz (Modulated)	NOTE: Use 44.00MHz modulated marker for this adjustment. Adjust VHF Tuner IF Output Coil for Maximum. See Figure 2. Remove 22 ohm resistor.
"	"	"	45.75MHz (Modulated)	NOTE: Use 45.75MHz modulated marker for this adjustment. Adjust L204 for Maximum. See Figure 2.

VIDEO IF ALIGNMENT (BAR SWEEP GENERATOR)

BAR SWEEP GENERATOR	SCOPE INPUT	REMARKS
To TP04 on VHF tuner.	To TP12	Perform Video IF Adjustments per SWEEP/MARKER GENERATOR instructions above. See Figure 3

SOUND IF ALIGNMENT

Tune in a station and adjust CP401 for maximum sound. Reduce signal strength at the antenna terminals until distortion appears. Continue to reduce the signal while aligning for undistorted output by adjusting CP401.

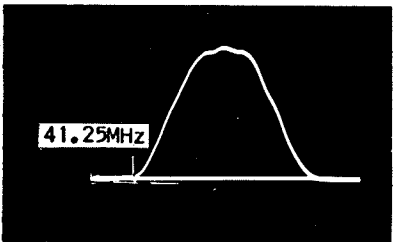


Figure 1

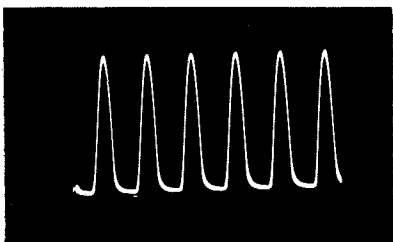


Figure 2

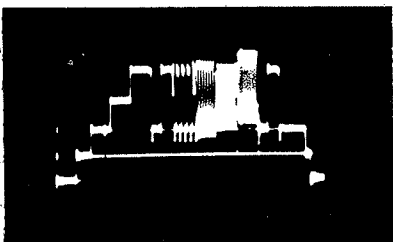


Figure 3

HITACHI MODELS
CT13X6, CT1324, CT1326

FOLDER 2

TV ALIGNMENT INSTRUCTIONS (Continued)

AUTOMATIC FINE TUNING ALIGNMENT

Connect as explained in preliminary instructions unless specified otherwise.
Remove 22 ohm resistor.
Place AFC Switch to Off.
Set Bias at TP1 to +5.8V.

DIRECT PROBE FROM SWEEP/MARKER GENERATOR	SWEEP GENERATOR OUTPUT	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	REMARKS
To TP4	To TP04 on VHF tuner.	44MHz (10MHz Sweep)	45.75MHz	Adjust L205 to place 45.75MHz marker at crossover as shown. See Figure 4.

CHROMA BANDPASS ALIGNMENT (SWEEP MARKER GENERATOR)

Connect as explained in preliminary instructions. Set color control to maximum, tint control to midrange.

DETECTOR PROBE FROM SWEEP/MARKER GENERATOR	SWEEP GENERATOR OUTPUT	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	REMARKS
To TP5	To TP04 on VHF tuner.	44MHz (10MHz Sweep)	3.08MHz 3.58MHz 4.08MHz	Adjust T501 for Maximum. gain and symmetry of response. See Figure 5.

CHROMA BANDPASS ALIGNMENT (BAR SWEEP GENERATOR)

BAR SWEEP GENERATOR	SCOPE INPUT	REMARKS
To TP04 on VHF Tuner PC Board	To TP5	Perform CHROMA BANDPASS Adjustments per SWEEP/MARKER GENERATOR instructions above. See Figure 6.

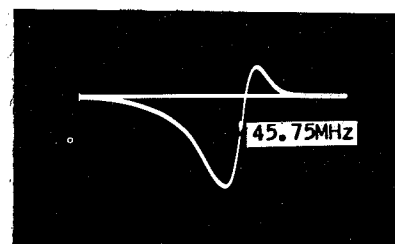


Figure 4

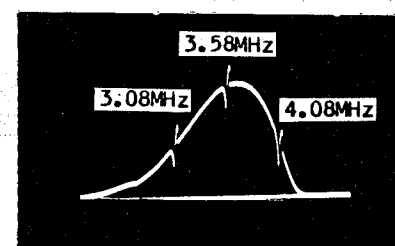


Figure 5



Figure 6

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 supplies generated from Horizontal Output Transformer (T702). Refer to "Troubleshooting" Power Supply and Horizontal circuits.

NO PIC, NO SOUND, HAS RASTER: Check IF-AGC and supply 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) and Horizontal circuit. 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.

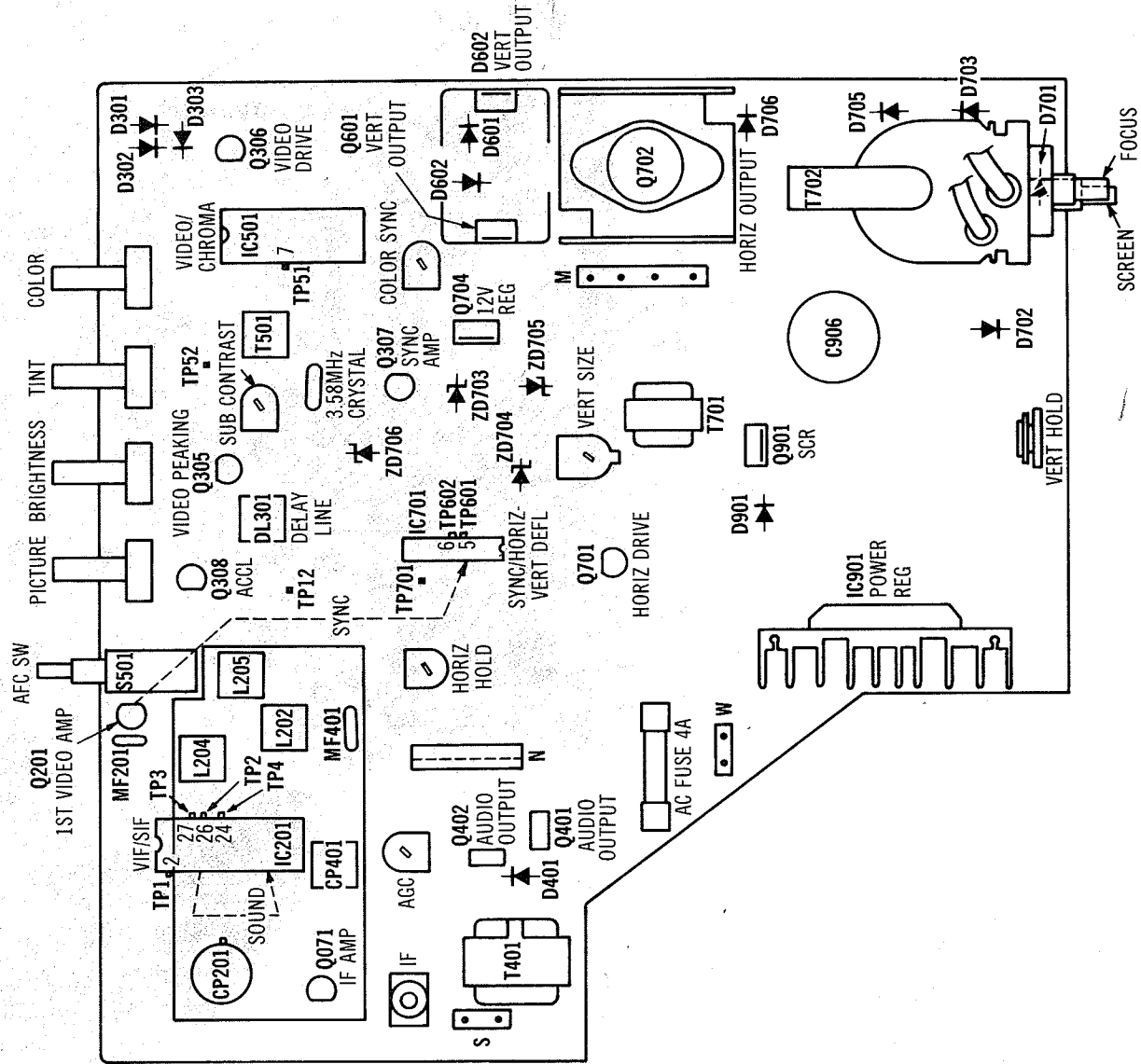
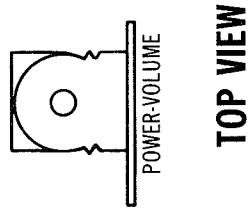
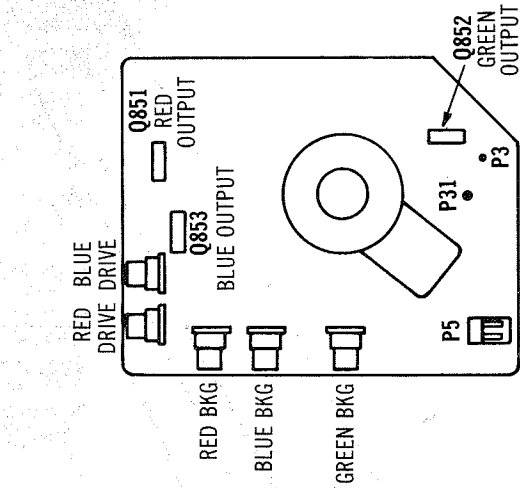
NO RED: Check Chroma and Red Output circuits. Refer to "Troubleshooting" Raster circuit.

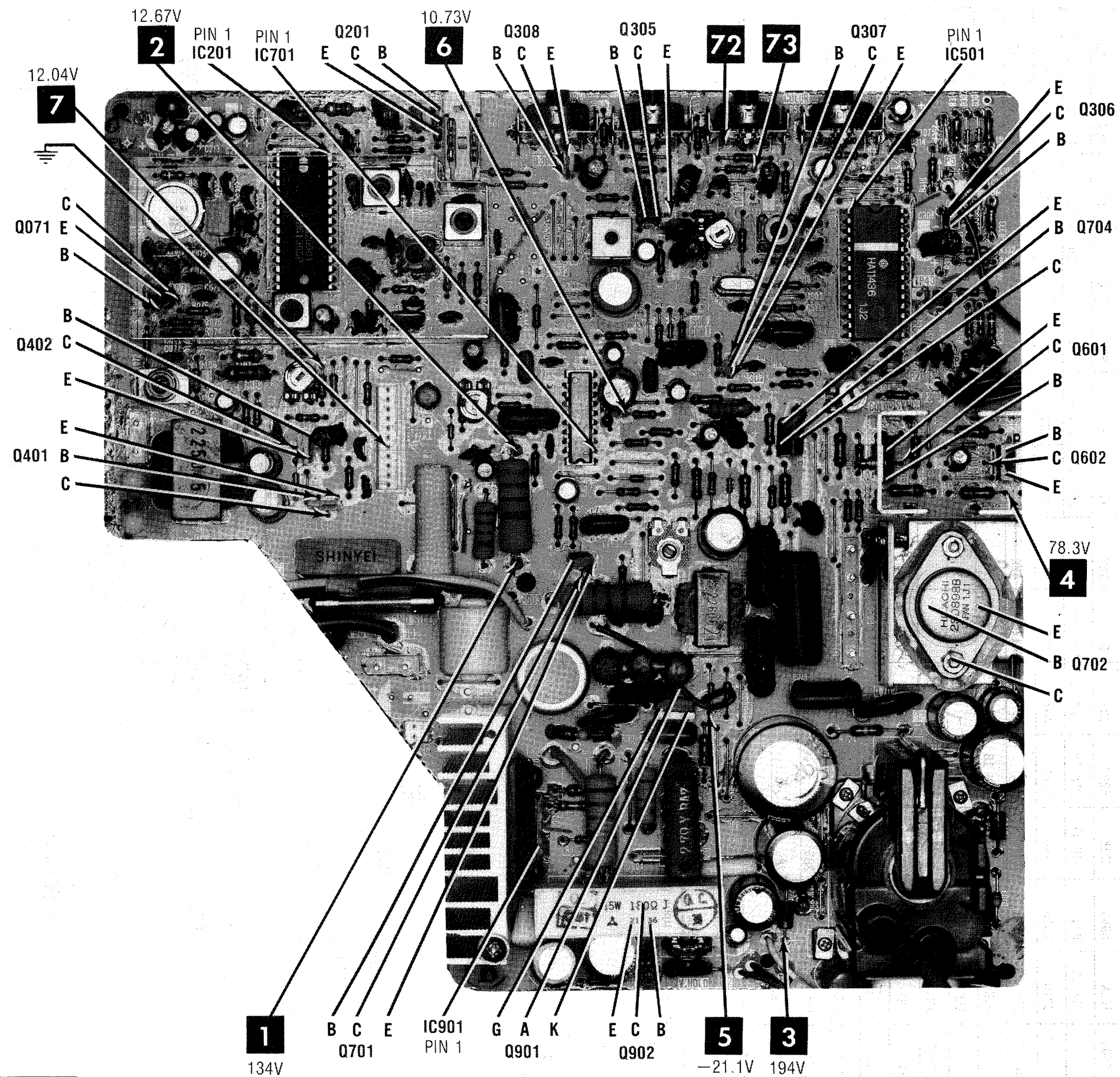
INCORRECT HUE (TINT): Refer to "Troubleshooting" Chroma circuit.

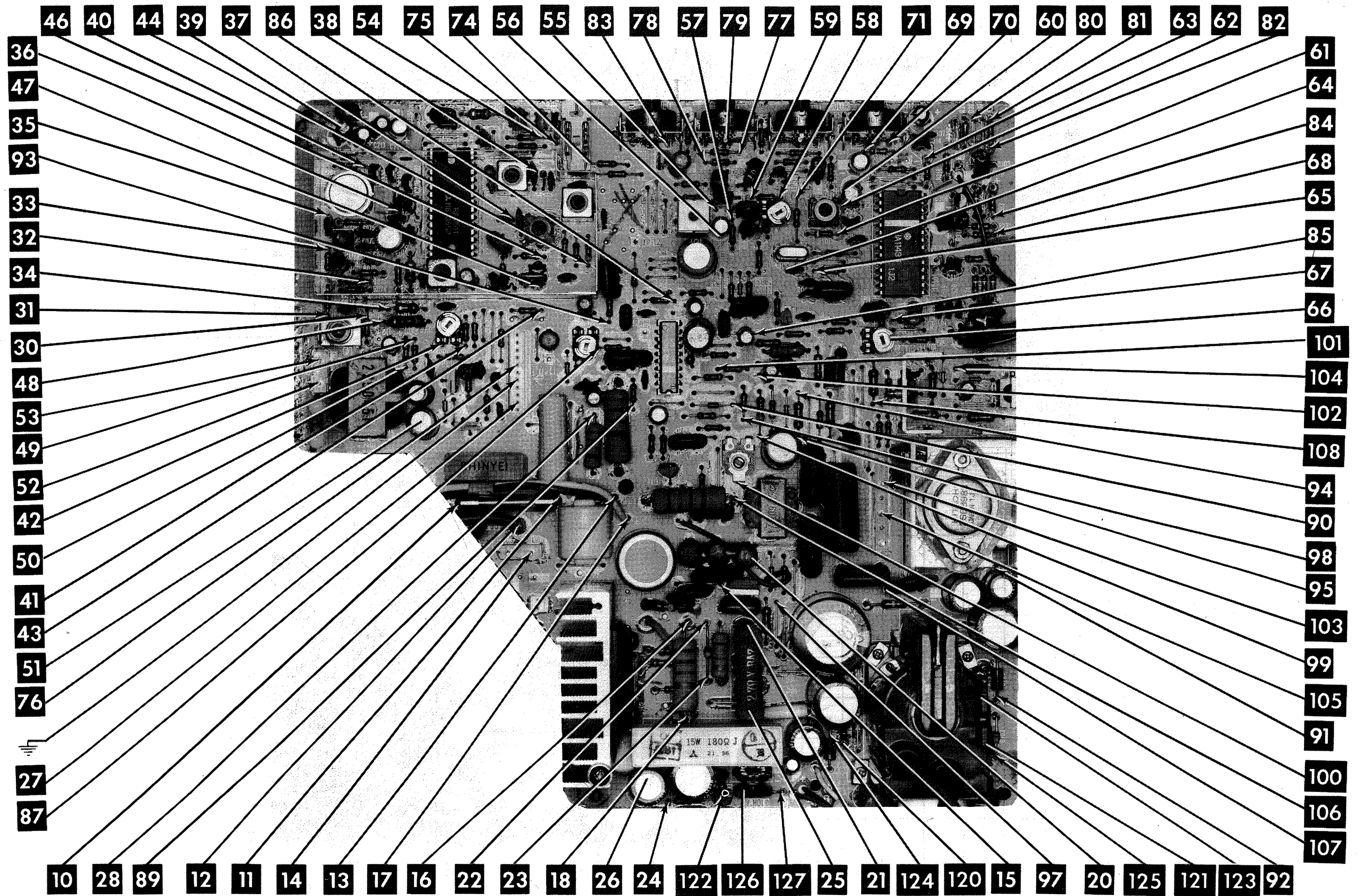
RESISTANCE MEASUREMENTS

MEASUREMENTS BELOW TAKEN WITH METER HAVING .08V MAX BETWEEN PROBE TIPS														
ITEM	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9	PIN 10	PIN 11	PIN 12	PIN 13	PIN 14
IC201	3680	12K	9770	285	11K	0	INF	INF	INF	INF	0	3230	331	INF
	PIN 15	PIN 16	PIN 17	PIN 18	PIN 19	PIN 20	PIN 21	PIN 22	PIN 23	PIN 24	PIN 25	PIN 26	PIN 27	PIN 28
	INF	INF	2190	INF	INF	7750	7370	1890	1890	38K	12K	INF	INF	12K
	PIN 29	PIN 30												
	1810	6210												
IC501	102K	6950	331K	6280	INF	0	12K	17K	16K	8320	14K	13K	3640	9940
	PIN 15	PIN 16	PIN 17	PIN 18	PIN 19	PIN 20	PIN 21	PIN 22	PIN 23	PIN 24	PIN 25	PIN 26	PIN 27	PIN 28
	3910	4010	3940	8060	4070	285	34K	INF	23K	7380	INF	6230	14K	900
IC701	751	2270	INF	22K	717	4170	42K	2690	100K	646	INF	87K	19K	6630
	PIN 15	PIN 16	PIN 17	PIN 18										
	INF	2710	INF	0										
IC901	12K	12K	0	17K										
V1	INF	NC	NC	NC	0	INF	8M	INF	FIL	FIL	INF	NC		
ITEM	E	B	C		ITEM	E	B	C		ITEM	E	B	C	
Q071	172	9080	470		Q401	68K	22K	12K		Q704	285	792	318	
Q201	324	2070	285		Q402	0	677	22K		Q851	632	4340	INF	
Q305	330	1108	286		Q601	0	752	22K		Q852	672	4240	INF	
Q306	495	33K	0		Q602	22K	1.3M	1.3M		Q853	681	4320	INF	
Q307	678	6690	1285		Q701	0	INF	19K		Q901	12K	15K	1.9M(1)	
Q308	6290	150K	285		Q702	0	.40	12K		Q902	0	759	1.9M(1)	

(1) Reading depends upon polarity of meter connections.







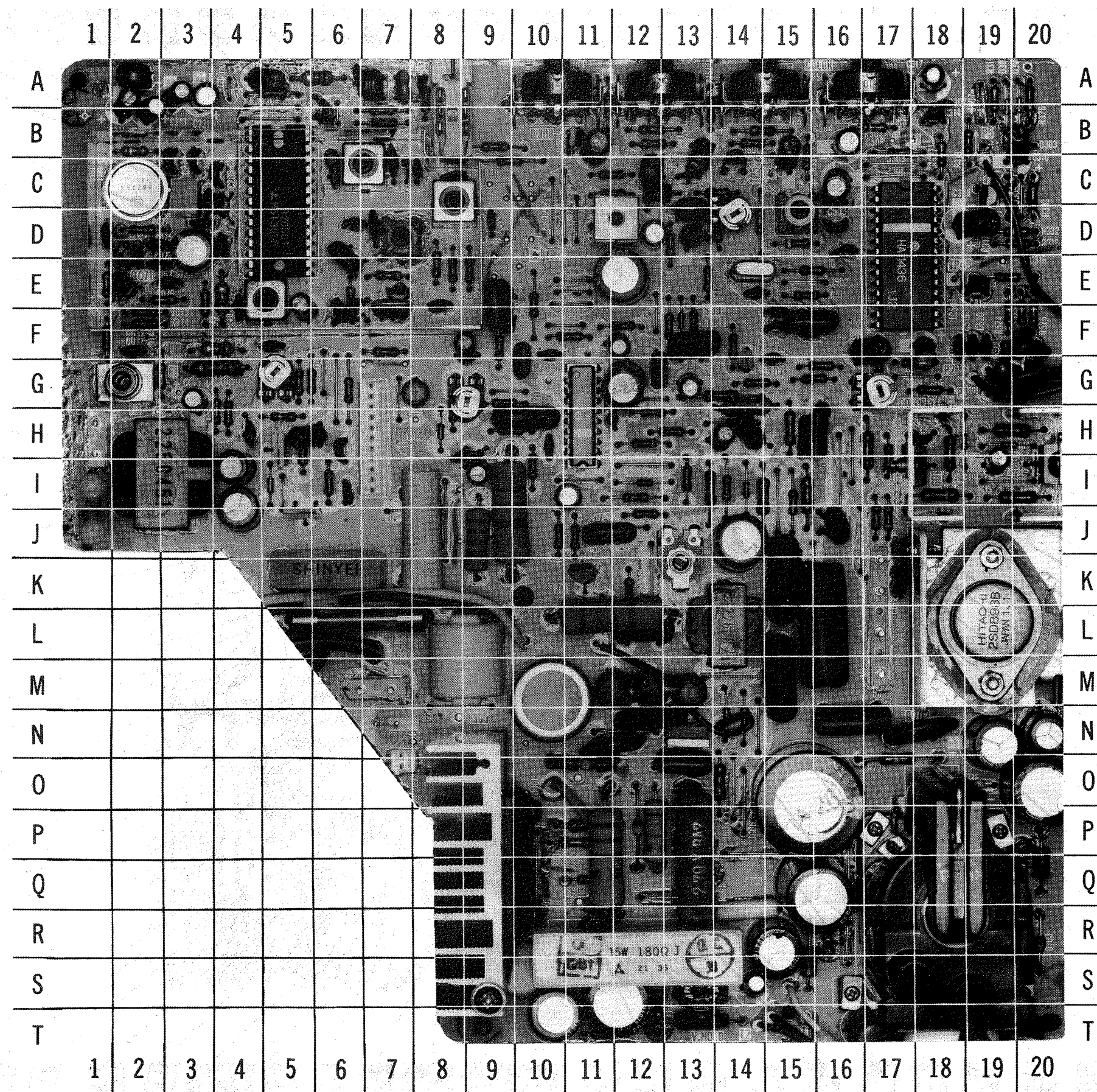
HITACHI MODELS
CT13X6, CT1324, CT1326

FOLDER 2

MAIN BOARD

A Howard W. Sams CIRCUITRACE® Photo

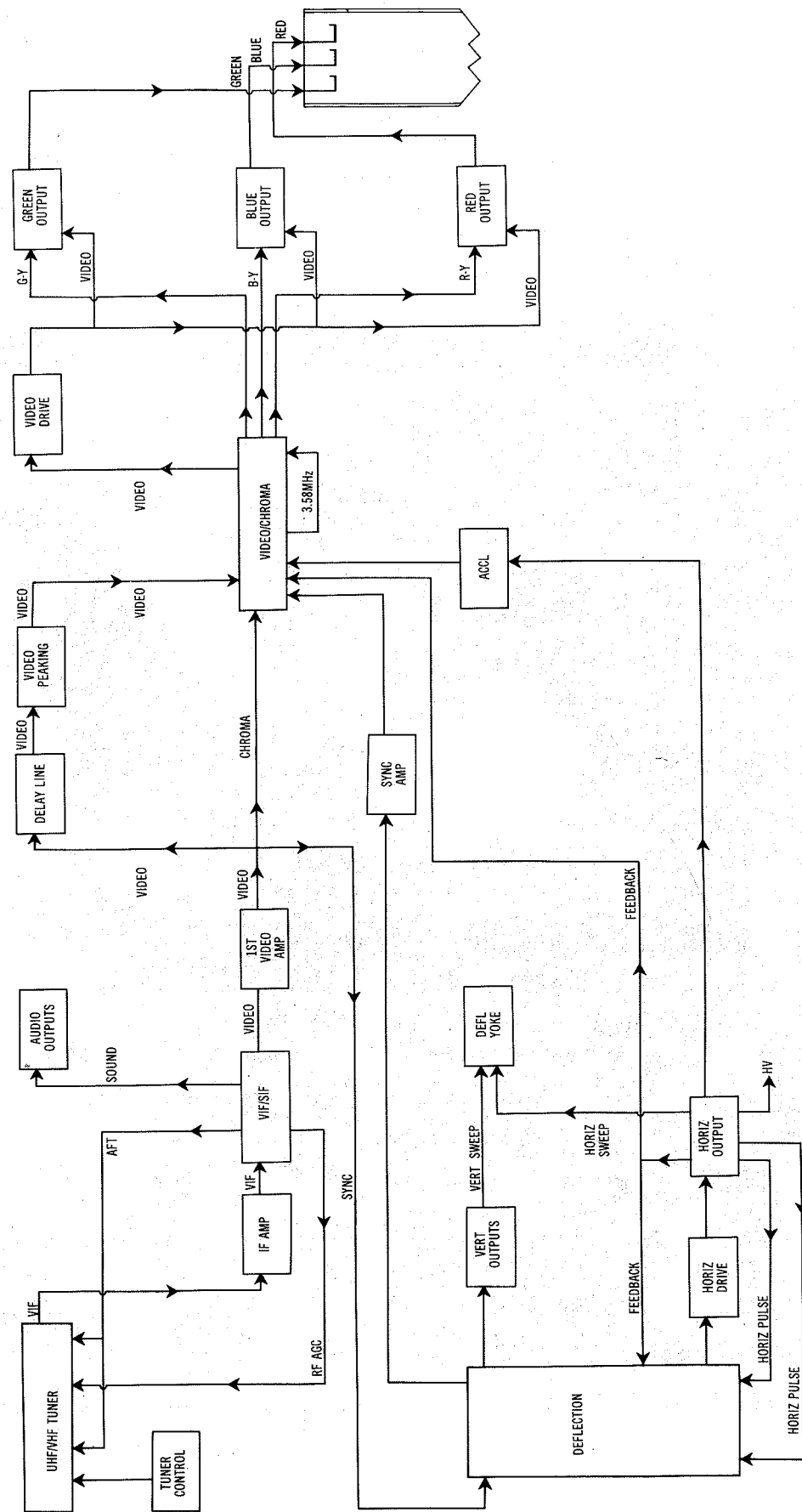
MAIN BOARD



MAIN BOARD

A Howard W. Sams GRIDTRACE™ Photo

MAIN BOARD

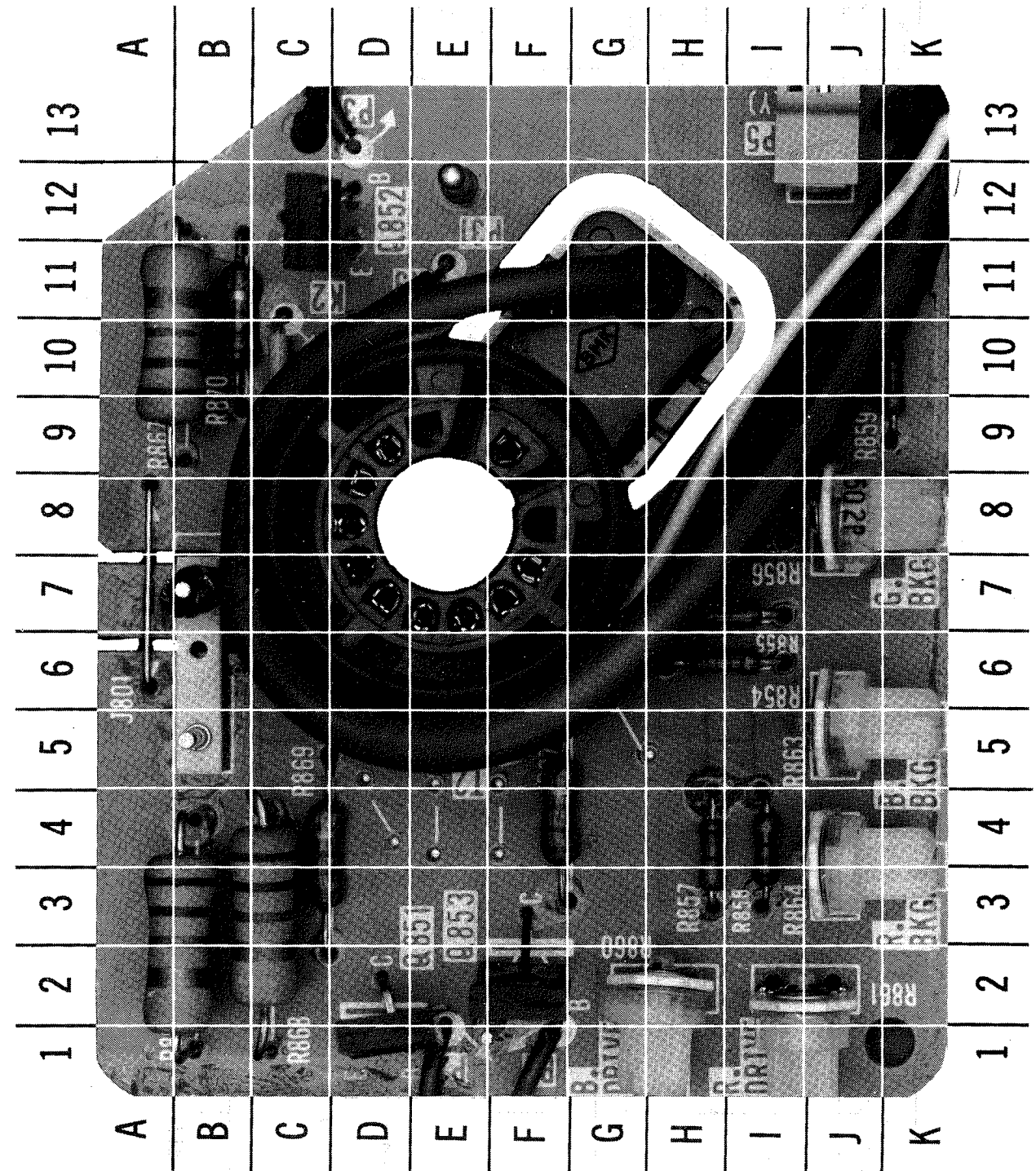
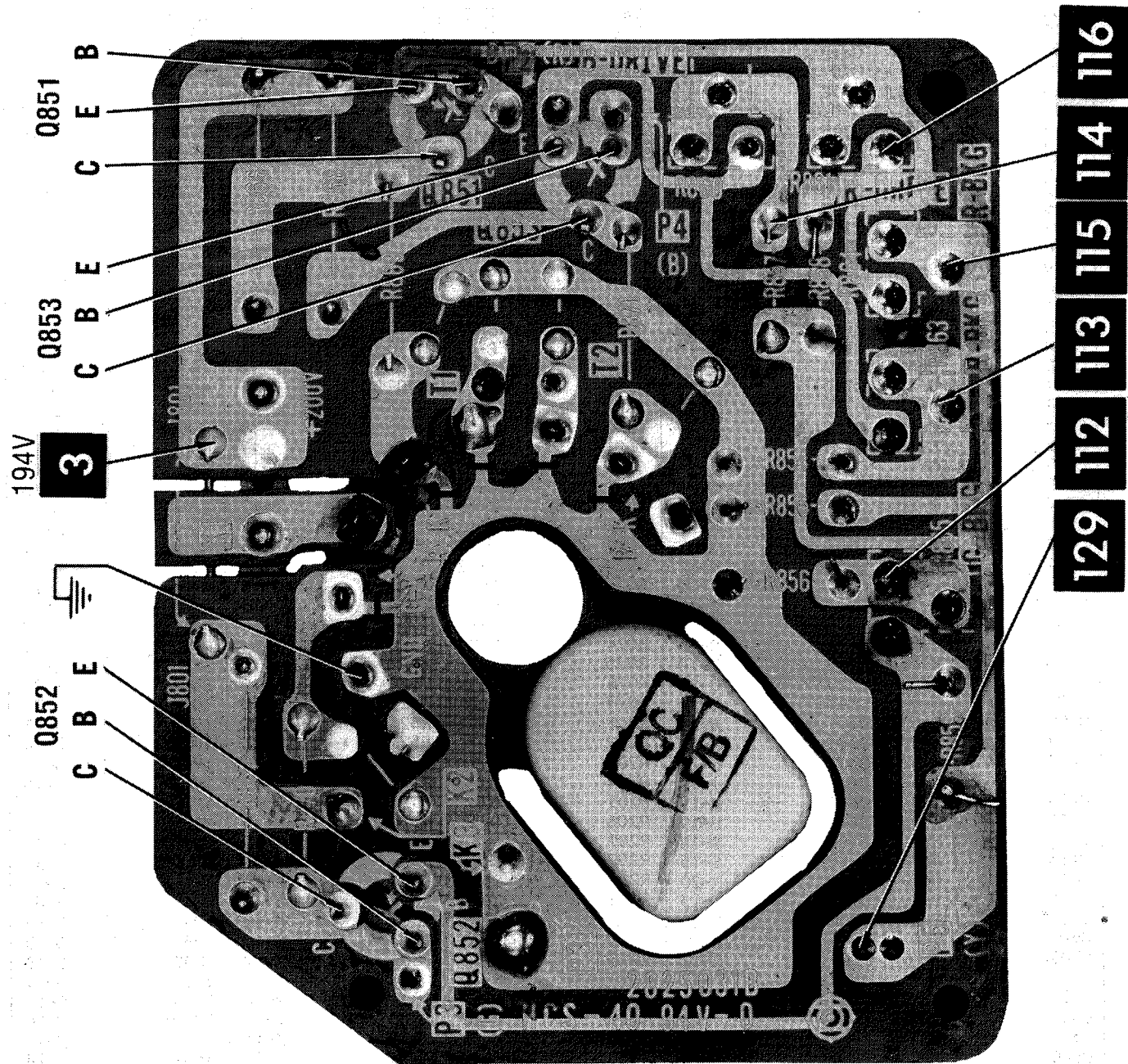


BLOCK DIAGRAM

MAIN BOARD GridTrace LOCATION GUIDE

C071	F-2	C602	G-13	L203	C-6	R318	B-19	R622	F-11
C072	E-3	C603	J-11	L204	C-7	R319	C-19	R623	F-12
C073	E-3	C604	G-12	L205	C-8	R320	F-14	R701	I-9
C074	D-1	C605	H-14	L206	A-2	R321	E-13	R702	I-15
C075	D-2	C606	G-12	L208	A-7	R322	G-14	R703	F-9
C201	D-3	C607	I-19	L209	A-6	R323	G-16	R704	J-11
C202	C-4	C608	H-18	L210	G-8	R324	G-16	R705	I-9
C203	C-4	C609	G-12	L304	C-12	R325	B-12	R706	H-9
C205	D-6	C610	F-10	L305	D-13	R326	A-20	R707	G-9
C206	D-7	C611	J-14	L401*	E-8	R327	B-18	R708	H-9
C207	C-8	C612	K-17	L402	E-4	R330	A-11	R711	I-18
C208	C-7	C613	F-12	L501	G-19	R331	A-10	R712	J-17
C209	C-8	C701	F-9	L502	F-20	R332	D-20	R713	J-17
C210	A-5	C702	I-11	L503	G-20	R333	C-20	R714	J-10
C211	A-2	C703	Q-16	L701	T-17	R340	C-12	R715	L-12
C212	B-2	C705	I-9	L901	N-12	R401	E-7	R723	O-14
C213	A-3	C706	H-9	L902	P-12	R402	E-6	R725	K-15
C214	F-5	C707	H-10	L903	O-11	R403	E-3	R726	H-17
C215	B-6	C708	H-10	M	L-17	R404	G-6	R727	G-14
C216	H-6	C709	G-10	MF201	A-7	R405	G-4	R728	H-15
C217	D-9	C710	E-9	MF401	F-7	R406	G-4	R731	R-16
C218	E-8	C712	L-12	N	H-7	R411	I-6	R732	R-20
C219	B-3	C713	T-19	P3	G-19	R412	H-5	R733	T-12
C220	B-3	C714	R-15	Q071	E-2	R413	J-8	R734	Q-20
C221	A-3	C715	S-14	Q201	A-8	R414	J-8	R736	I-15
C222	A-6	C716	O-20	Q305	C-13	R415	J-8	R737	I-15
C224*	C-6	C718	N-16	Q306	C-19	R416	G-14	R901	Q-13
C225*	B-6	C719	M-15	Q307	G-14	R501	D-15	R902	P-12
C301	D-12	C720	K-15	Q308	B-11	R502	B-17	R903	O-11
C304	D-13	C721	L-16	Q401	J-5	R503	B-17	R904	O-13
C305	C-13	C722	N-19	Q402	H-5	R506	A-17	R905	T-11
C306	C-16	C723	H-14	Q601	I-18	R507	A-17	R906	P-11
C307	B-18	C724	J-16	Q602	I-20	R510	E-16	R908	O-8
C309	B-11	C725	N-18	Q701	K-11	R511	E-15	R909	Q-13
C310	B-20	C727	N-20	Q702	L-19	R512	G-17	R910	Q-13
C312	F-18	C728	K-12	Q703	H-16	R513	G-17	R911	P-13
C313	E-12	C901	K-6	Q901	M-13	R515	G-18	R912	P-11
C314	B-18	C902	N-11	Q902	S-12	R516	D-14	R913	P-11
C315	F-15	C903	N-12	R071	G-3	R517	B-14	R914	S-10
C317	A-18	C904	O-13	R072	F-1	R519	B-14	R915	S-12
C400	E-7	C905	T-12	R073	E-1	R520	A-15	R916	P-13
C401	F-6	C906	O-15	R074	F-2	R522	A-8	R917	R-14
C403	E-4	C908	T-10	R075	F-2	R523	E-19	S	H-1
C404	D-6	CP201	C-2	R076	E-3	R524	F-19	S501	A-8
C405	G-3	CP401	E-5	R077	D-2	R525	F-20	T401	I-3
C406	F-6	D301	A-20	R201	C-3	R526	F-19	T501	D-15
C407	H-5	D302	A-19	R202	C-7	R527	F-20	T701	L-14
C408	E-5	D303	B-20	R203	A-5	R528	G-20	T702	Q-19
C409	D-4	D401	I-5	R204	B-2	R529	F-19	TH901	M-10
C410	D-3	D601	H-19	R205	G-5	R531	A-15	TP1	B-4
C411	I-6	D602	H-19	R206	G-5	R532	B-15	TP2	C-6
C412	H-4	D701	S-18	R207	H-5	R534	C-15	TP3	B-6
C413	J-5	D702	S-15	R209	F-7	R535	B-9	TP4	C-5
C414	I-4	D703	R-20	R210	G-6	R601	F-13	TP5	D-17
C415	I-4	D704	T-13	R211	E-9	R602	F-13	TP12	A-8
C417*	E-8	D705	Q-20	R212	E-8	R603	H-12	TP43	E-18
C501	C-4	D706	N-19	R213	E-8	R604	K-12	TP51	G-15
C503	C-16	D901	N-12	R216	B-7	R605	J-12	TP52	C-15
C504	B-16	D902	P-12	R217	B-7	R606	H-12	TP601	G-11
C505	B-15	D903	O-11	R218	C-9	R607	N-14	TP602	G-11
C507	D-16	DL301	D-12	R301	C-12	R608	S-13	TP701	G-10
C508	D-16	F901	L-7	R302	C-12	R609	K-13	W	M-7
C509	E-14	FB901	O-11	R303	D-13	R610	I-13	X501	E-14
C510	F-15	FB902	O-11	R304	C-14	R611	I-13	ZD701	H-8
C511	F-16	G	O-7	R305	D-14	R612	I-14	ZD702	N-14
C512	F-17	IC201	C-5	R306	D-14	R613	G-14	ZD703	H-14
C513	F-15	IC501	E-17	R308	A-10	R614	H-20	ZD704	I-12
C514	F-15	IC701	H-11	R309	A-11	R615	I-20	ZD705	I-14
C515	C-13	IC901	Q-10	R310	A-13	R616	I-16	ZD706	F-13
C517	E-19	J071	G-2	R312	A-12	R617	H-13		
C518	F-18	L071	D-2	R313	B-12	R618	H-18		
C519	F-19	L072	F-4	R314	A-19	R619	H-17		
C520	F-19	L201	C-3	R316	D-20	R620	K-18		
C601	F-13	L202	D7	R317	D-19	R621	E-10		

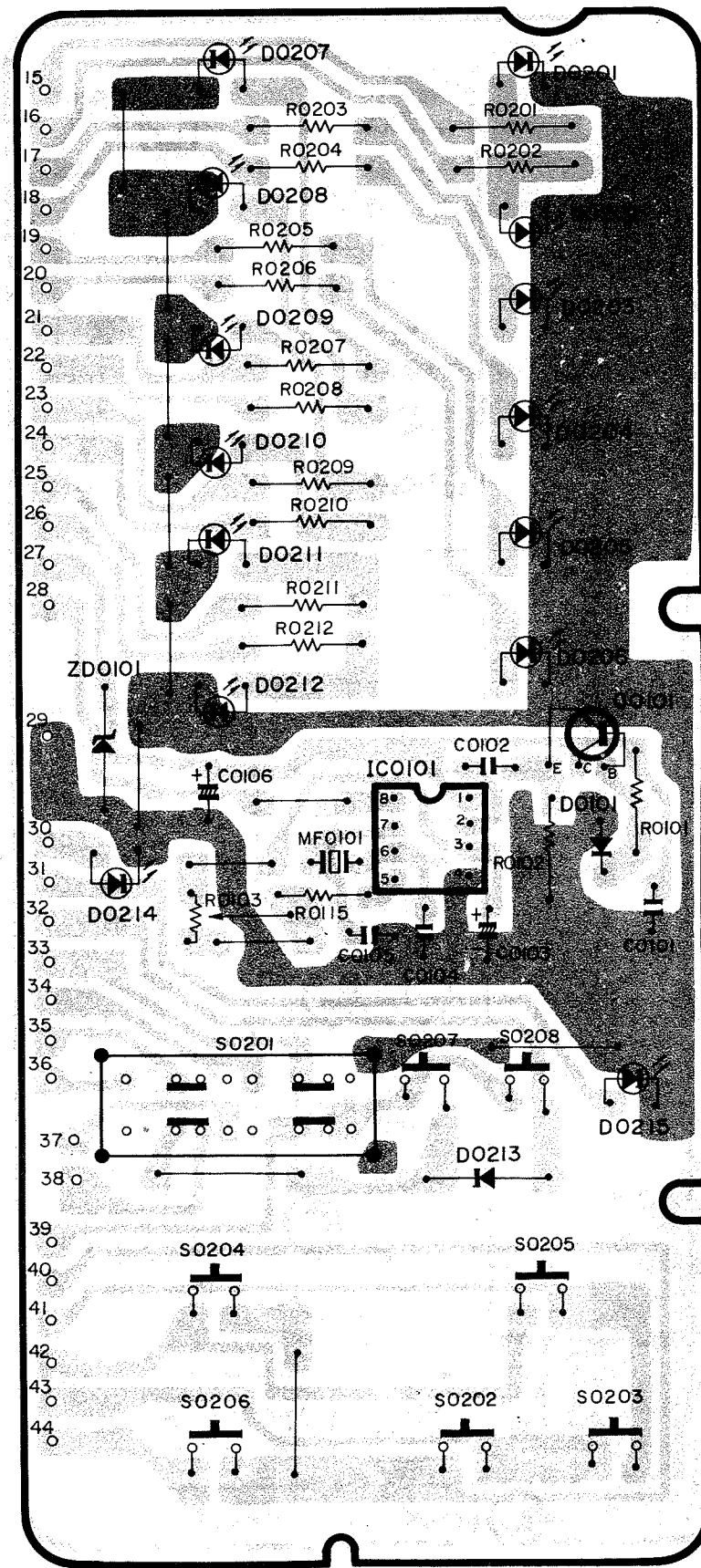
* Located on other side of board.



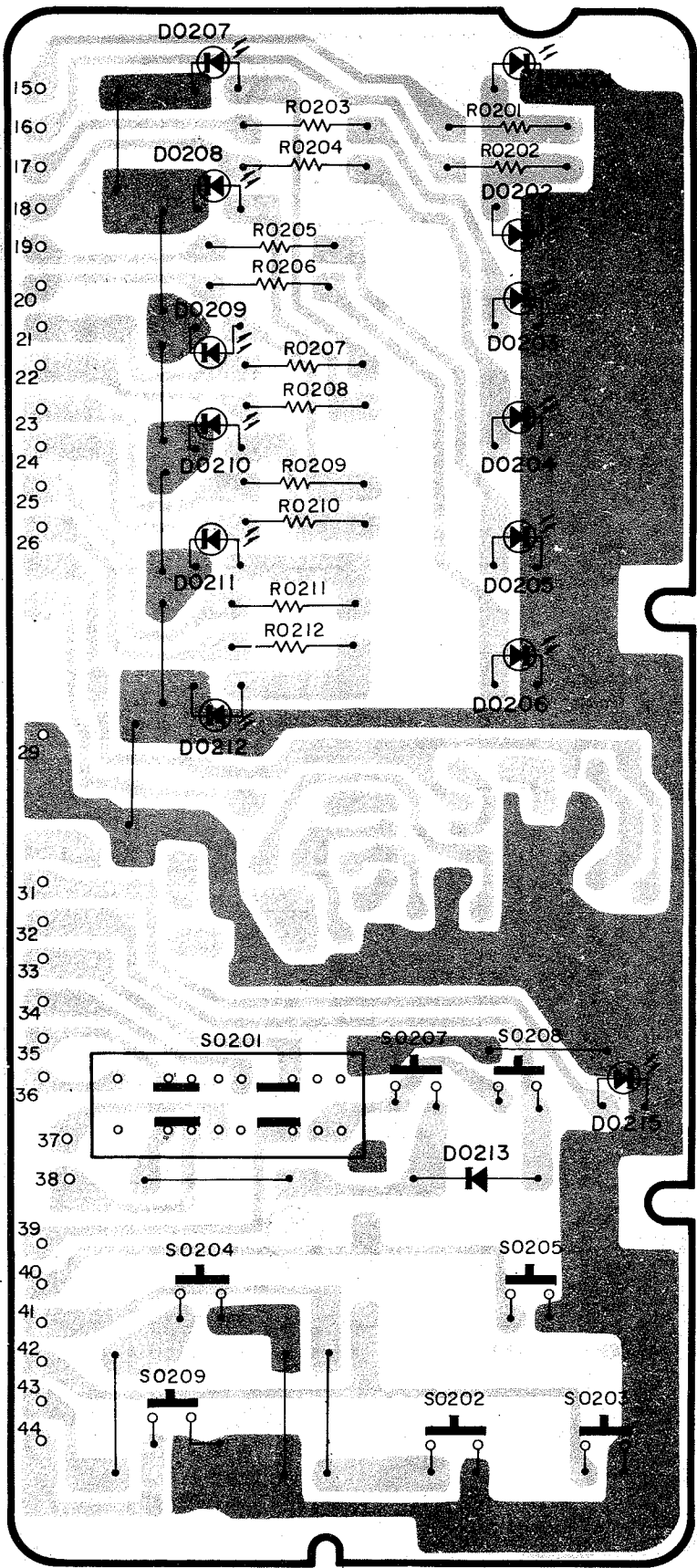
CRT BOARD
Gridtrace
LOCATION GUIDE

P3	D-13
P5	J-13
Q851	D-1
Q852	C-12
Q853	F-2
R854	H-6
R855	I-7
R856	I-8
R857	H-4
R858	I-4
R859	K-10
R860	H-2
R861	J-2
R863	J-5
R864	J-3
R865	J-8
R866	B-3
R867	A-10
R868	C-3
R869	C-4
R870	B-11
R871	F-4

SELECTOR P.W.BOARD (A) (CT1326/CT13X6)

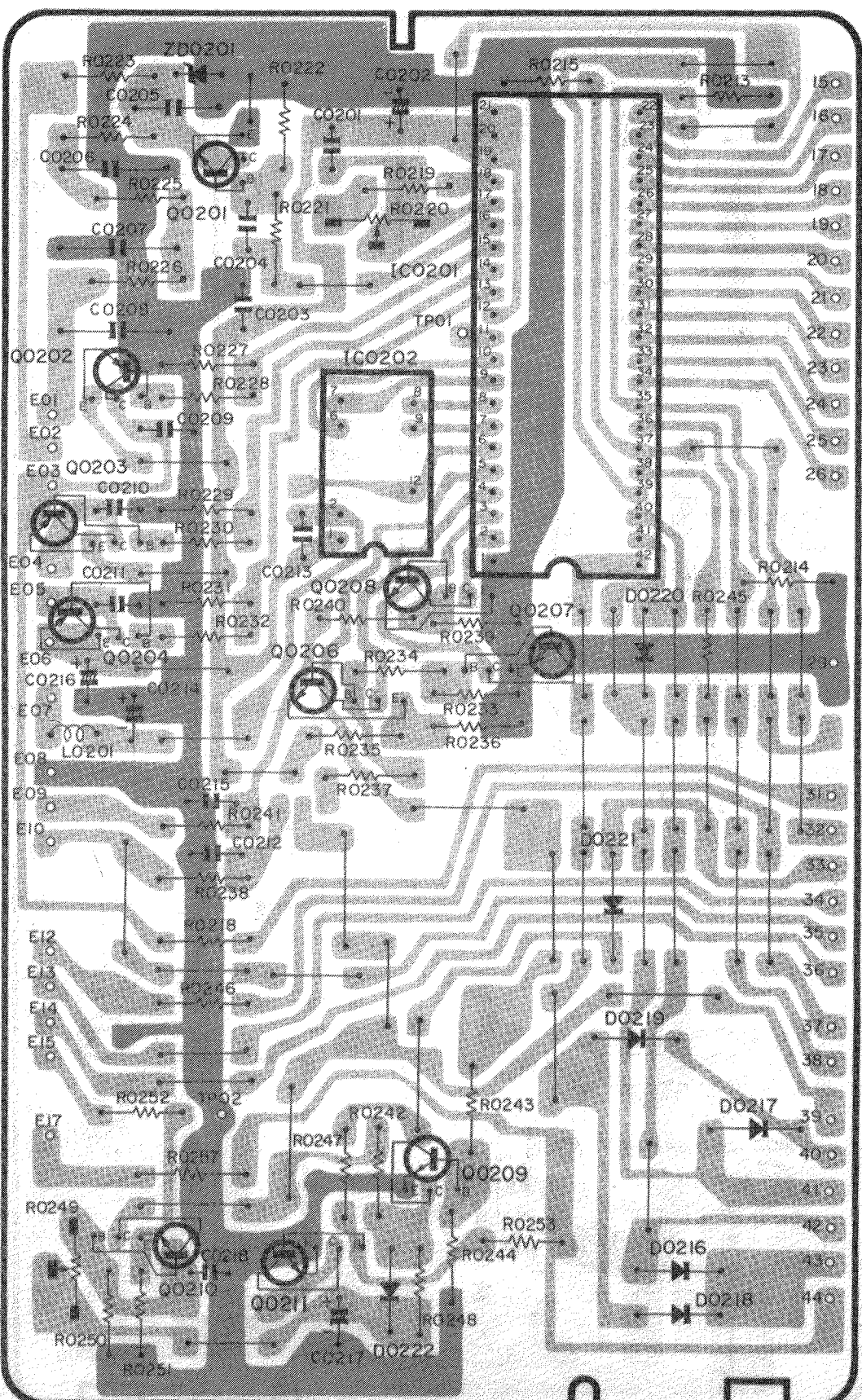


SELECTOR P.W.BOARD (A) (CT1324)



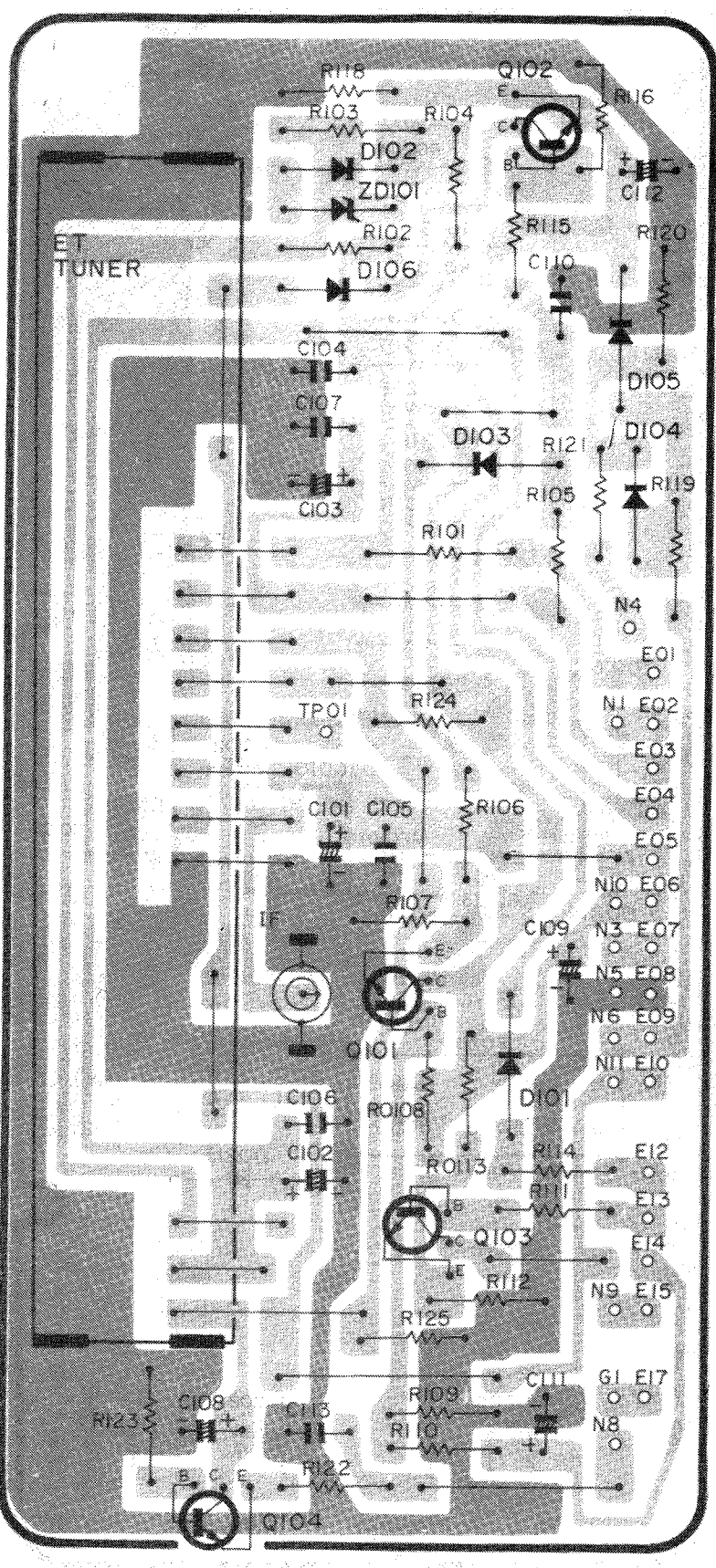
SELECTOR BOARDS (MODEL CT1324)

SELECTOR P.W.BOARD (B) (CT1324)



Courtesy of the Manufacturer

SELECTOR P.W.BOARD (C) (CT1324)



SELECTOR BOARDS (MODEL CT1324)

HITACHI MODELS
CT13X6, CT1324, CT1326

FOLDER 2

PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

Replacement parts shown may be superseded by the availability of newly introduced replacements. Have your local distributor check Sams COUNTER FACTS for the most up-to-date replacement.

MISCELLANEOUS

ITEM No.	PART NAME	MFG. PART No.	NOTES
CP201	SAW Filter		HW2063
DL301	Delay Line	2162991	
FB901	Ferrite Bead	2771891	
FB902	Ferrite Bead	2771891	
J071	Jack		IF Input
J451	Jack	2670751	Earphone
# L902	Degaussing Coil	2162412	
MF201	Ceramic Filter	2142241	4.5MHz
MF401	Ceramic Filter	2142601	4.5MHz
PL901	AC Cord	2742553	Polarized
S501	Switch	2630582	ST (APS) (On-Off)
# S901	Switch	2610661	Power AC
# V1	CRT	370HRB22	
X501	Crystal	2790442	3.58MHz
	Antenna UHF	2760524	RUSSELL Replacement Antenna BOW-1H
	Antenna VHF	2750011	RUSSELL Replacement Assembly COM-14H (2 used)
	Antenna Terminal Board	3328794	Assembly
	Socket	2658893	CRT
	Transmitter	2582011	CLU-610
	UHF/VHF Tuner	2423456 (ET-341)	PTS Replacement Part No. 2423456 (ET-341)

For SAFETY use only equivalent replacement part.

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

ITEM	PART No.	ITEM	PART No.
Back Cover	3455312	Knob-Channel (A)	3771431
Door Assembly (Model CT1324)	3772211	Knob-Channel (B)	3771441
Door Assembly (Models CT13X6, CT1326)	3772213	Knob-Volume (A)	3771451
Knob-ST (APS)	3262441	Knob-Volume (B)	3771461
Knob-Color, Tint, Brightness	3263391	Knob-Preset	3771501
Picture (5 used)		Knob-Power (Model CT1324)	3771521
Knob-Main Assembly	3264861	Channel Number Sheet	4259301

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. 8528 (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

SERVICE INFORMATION

TECHNICAL CAUTIONS

[CHECK OF HIGH VOLTAGE HOLD DOWN CIRCUIT]

Checking of the high voltage hold down circuit operation

1. Turn the switch of the set OFF.
2. Connect a high voltage voltmeter between the CRT anode and the anode of D701 as shown in Fig. 1.
3. Short R915 using a shorting lead wire as shown in Fig. 2.
4. Set Brightness/Picture controls to max.
5. Turn the switch of the set ON after setting the AC input voltage to 0V, and then gradually increase the AC input voltage and check that the picture disappears when the high voltage is less than 29.0KV.
6. Turn the switch of the set OFF immediately after checking that the picture disappears.
7. Remove the adjusting jig and the voltmeter.

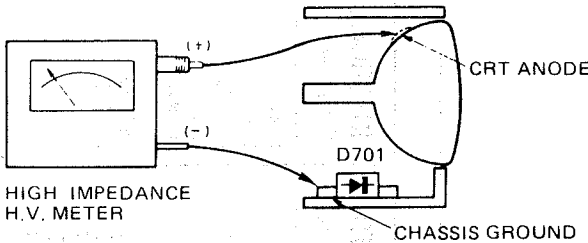


Fig. 1 Connection of H.V. Meter

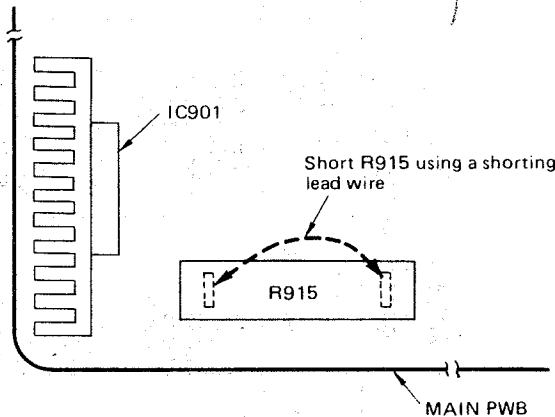


Fig. 2

PRODUCT SAFETY NOTE: Components marked with a Δ have special characteristics important to safety. Before replacing any of these components, read carefully, the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.

SYMBOL NO.	PARTS NO.	DESCRIPTION	SYMBOL NO.	PARTS NO.	DESCRIPTION	SYMBOL NO.	PARTS NO.	DESCRIPTION
R0103	0150041	VR, 100Kohm-B	S0201	2620611	Slide switch		3772461	Remote control case (A)
R0111	0151255	VR, 20Kohm-B	S0202	2630631	Switch-key		3772471	Remote control case (B)
R0220	0151267	VR, 10Kohm	S0203	2630631	Switch-key		3772481	Battery cover for R/C transmitter
R0249	0151255	VR, 20Kohm-B	S0204	2630631	Switch-key		3772621	Remote control filter
L0101	2121706	Peaking coil	S0205	2630631	Switch-key		3772731	Case for R/C transmitter
L0201	2121706	Peaking coil	S0206	2630631	Switch-key			
M0001	2790751	Ceramic filter CSB-500E	S0207	2631721	Key switch			
M0101	2790321	Ceramic filter CSB-455A/C	S0208	2631721	Key switch			
M0102	2790751	Ceramic filter CSB-500E						

PARTS LIST AND DESCRIPTION

(When ordering parts, state Model, Part Number, and Description.)
Replacement parts shown may be superseded by the availability of newly introduced replacements.
Have your local distributor check Sams COUNTER FACTS for the most up-to-date replacement.

SEMICONDUCTORS (Select replacement transistor for best results)

REPLACEMENT DATA									
ITEM No.	TYPE No.	MFGR. PART No.	GENERAL ELECTRIC PART No.	TCG PART No.	RCA PART No.	ECG PART No.	WORKMAN PART No.	ZENITH PART No.	MOTOROLA PART No.
D301	1S2076	2330351	GE-514	TCG519	SK3100/519	ECG519	WEP925/519	103-131	1N4935
D302	1S2076	2330351	GE-514	TCG519	SK3100/519	ECG519	WEP925/519	103-131	1N4935
D303	1S2076	2330351	GE-514	TCG519	SK3100/519	ECG519	WEP925/519	103-131	1N4935
D401	1S2076	2330351	GE-514	TCG519	SK3100/519	ECG519	WEP925/519	103-131	1N4935
D601	1S2076	2330351	GE-514	TCG519	SK3100/519	ECG519	WEP925/519	103-131	1N4935
D602	1S2076	2330351	GE-514	TCG519	SK3100/519	ECG519	WEP925/519	103-131	1N4935
D701	1S2076A	2330352	GE-514	TCG519	SK3100/519	ECG519	WEP925/519	103-131	1N4935
D702	RH1Z	2332141	GE-511	TCG552	SK9000/552	ECG552	WEP152/552	103-287	
D703	V11N	2330564	GE-511	TCG552	SK9000/552	ECG552	WEP152/552	103-287	
D704	EH1Z	2332851	GE-511	TCG552	SK9000/552	ECG552	WEP152/552	103-287	
D705	RH1S	2332251	GE-511	TCG552	SK9000/552	ECG552	WEP152/552	103-287	
D706	EH1Z	2332851	GE-511	TCG552	SK9000/552	ECG552	WEP152/552	103-287	
D901	RM10B	2332331	GE-510	TCG125	SK3081/125	ECG125	WEP170/125	212-Z9000	1N4007
D902	V06C	2330251	GE-511	TCG552	SK9000/552	ECG552	WEP152/552	103-287	
D903	V06G	2330253	GE-511	TCG552	SK9000/552	ECG552	WEP152/552	103-287	
IC201	M51359P	2366151							
IC501	HA11436	2365061							
IC701	HA11423	2364181							
IC901	STR3035	2366201							
Q071	2SC717TM	2320143	GE-17*	TCG1471	SK9194/1471	ECG1471		121-522*	MPSH34*
Q201	2SC458C		GE-210	TCG107	SK3132	ECG107	WEP1717		
Q305	2SC458B	0573480	GE-210	TCG85	SK3124/289	ECG85	WEP458	121-972*	2N4401*
	2SC1740Q,R		GE-62	TCG85	SK3124/289	ECG85	WEP458	121-972*	2N4401*
	2SC458C		GE-210	TCG85	SK3122	ECG85	WEP736/123A*	121-Z9065	2N4401*
	2SC458B	0573480	GE-210	TCG85	SK3124/289	ECG85	WEP458	121-972*	2N4401*
	2SC1740Q,R		GE-62	TCG85	SK3122	ECG85	WEP736/123A*	121-Z9065	2N4401*
Q306	2SA673B,C,D	2320637	GE-269	TCG290A	SK9132	ECG290A	WEP911/290	121-Z9003*	2N4403*
Q307	2SC458C		GE-210	TCG85	SK3124/289	ECG85	WEP458	121-972*	2N4401*
	2SC458B	0573480	GE-210	TCG85	SK3124/289	ECG85	WEP458	121-972*	2N4401*
	2SC1740Q,R		GE-62	TCG85	SK3122	ECG85	WEP736/123A*	121-Z9065	2N4401*
Q308	2SC458C		GE-210	TCG85	SK3124/289	ECG85	WEP458	121-972*	2N4401*
	2SC458B	0573480	GE-210	TCG85	SK3124/289	ECG85	WEP458	121-972*	2N4401*
	2SC1740Q,R		GE-62	TCG85	SK3122	ECG85	WEP736/123A*	121-Z9065	2N4401*

PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

Replacement parts shown may be superseded by the availability of newly introduced replacements.
Have your local distributor check Sams COUNTER FACTS for the most up-to-date replacement.

COILS (RF-IF)

ITEM No.	FUNCTION	MFGR. PART No.	ITEM No.	FUNCTION	MFGR. PART No.
CP401	Scund Detector	2142671	L304	RF Choke	2121699
DL301	Delay Line	2162991	L305	RF Choke (85uH)	2121704
L071	Peaking	2141776	L401	RF Choke (68uH)	2122251
L072	RF Choke (100uH)	2122253	L402	RF Choke (100uH)	2122253
L201	RF Choke (1.2uH)	2162981	L501	Peaking (8.2uH)	2122238
L202	41.25MHz Trap	2142661	L502	Peaking (8.2uH)	2122238
L203	RF Choke (.82uH)	2122298	L503	Peaking (8.2uH)	2122238
L204	Video IF	2142015	L701	RF Choke (39uH)	2122091
L205	AFC	2142015	L901	AC Line Filter	2122711
L206	RF Choke (68uH)	2121703	L903	RF Choke (390uH)	2120483
L208	Peaking (12uH)	2121693	L904	RF Choke (390uH)	2120483
L209	RF Choke	2122253	L905	RF Choke (390uH)	2120483
L210	RF Choke (100uH)	2120482	T501	Chroma Bandpass	2141619

For SAFETY use only equivalent replacement part.

COILS & TRANSFORMERS (Sweep Circuits)

ITEM No.	FUNCTION	REPLACEMENT DATA		
		MFGR. PART No.	OTHER IDENTIFICATION	THORDARSON PART No.
# DY101	Yoke Horiz 3.58mH 90° Vert 129mH	2441311		
# T701	Horiz Driver	2260021		
# T702	Horiz Output	2433171		

For SAFETY use only equivalent replacement part.

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA		NOTES
	PRI.	SEC.	MFGR. PART No.	THORDARSON PART No.	
# T401	1806	25	2250451		

For SAFETY use only equivalent replacement part.

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP451	3" PM 25 Ohms	2410682	30A05Z25R	

FUSE DEVICES

ITEM No.	DESCRIPTION	REPLACEMENT DATA						
		MFG. PART No.			BUSS PART No.			NOTES
		DEVICE	HOLDER		DEVICE	HOLDER		
# F901	4A @ 125V Slow-Blow	2720587			MDX- 4	1A1907-02		

For SAFETY use only equivalent replacement part.

PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

Replacement parts shown may be superseded by the availability of newly introduced replacements. Have your local distributor check Sams COUNTER FACTS for the most up-to-date replacement.

CAPACITORS (cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA	
			SPRAGUE PART No.	
			Q-LINE	GENERAL LINE
# C725	330 2.5KV 10%	0243837		
C728	.001 500V 10%			10TS-D10
# C901	.1 125V 5%	0279832		
# C902	.0047 125VAC 5%	0249150		
C903	.01 500V 10%		QCP-6160-01	1FT-S10
C904	.047 50V 10%		QCP-6211-01	1FT-S47

For SAFETY use only equivalent replacement part.

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

ITEM No.	FUNCTION	RESISTANCE	MFR. PART No.	REPLACEMENT DATA	NOTES
				TRW PART No.	
R206	AGC	5000	0150037	U260R502B	
R305	Sub Contrast	500	0150034	U260R501B	
R308	Picture	10K	0159704		
R312	Brightness	2000	0159556		
R507	Color	10K	0159704		
R512	Color Sync	50K	0150040	U260R503B	
R520	Tint	10K	0159704		
R608	Vert Hold	5000	0151327	X201R502B	
R609	Vert Height (Size)	200	0151279	X201R251B (3)	
# R707	Horiz Hold	5000	0150037		
R860	Blue Drive	200	0150001		
R861	Red Drive	200	0150001		
R863	Blue Background	5000	0151716	X260R502B	
R864	Red Background	5000	0151716	X260R502B	
R865	Green Background	5000	0151716	X260R502B	
# R900A	Focus		(18)		
# B	Screen				

For SAFETY use only equivalent replacement part.

(3) For horizontal mounting, bend the two outside terminals to fit P.C. board. Use jumper to connect center terminal to P.C. board.

(18) R900A and R900B is part of Horizontal Output Transformer Part Number 2433171.

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		
		MFR. PART No.	SPRAGUE/ Q-LINE PART No.	WORKMAN PART No.
# R701	8300 5% 3W Metal Oxide	0110367		
R708	5600 5% 1/8W Carbon Film	0100083		
# R709	5600 5% 1/8W Carbon Film	0100083		
# R711	39K 5% 1/2W Carbon Film	0113789		
# R712	9100 5% 1/8W Carbon Film	0100085		
# R713	9100 5% 1/8W Carbon Film	0100088		
R715	6800 5% 3W Metal Oxide	0110365		
# R731	2.2 5% 1/4W Fusible	0119505		
# R732	2.2 5% 1/4W Fusible	0119505		
# R733	2.2 5% 1/4W Fusible	0119505		
# R734	1 5% 1/4W Fusible	0119512		
R901	2.7 5% 4W WW	0141072		
# R906	12K 5% 3W Metal Oxide	0110371		
	1000 5% 3W Metal Oxide	0110345		
# R907	2400 5% 3W Metal Oxide	0110354		
# R909	10 5% 1/4W Fusible	0119514		
# R910	10 5% 1/4W Fusible	0119514		
# R911	10 5% 1/4W Fusible	0119514		
# R914	560 5% 1/4W Fusible	0119508		
R915	180 5% 15W WW	0141092		
# R916	10 5% 1/4W Fusible	0119514		
# R917	1 5% 1/4W Fusible	0119512		
TH901	PTC 7.5 Cold	2340263		FR605

For SAFETY use only equivalent replacement part.

PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

Replacement parts shown may be superseded by the availability of newly introduced replacements.

Have your local distributor check Sams COUNTER FACTS for the most up-to-date replacement.

SEMICONDUCTORS (Select replacement transistor for best results) (cont)

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA							REMARKS
			GENERAL ELECTRIC PART No.	TCG PART No.	RCA PART No.	ECG PART No.	WORKMAN PART No.	ZENITH PART No.	MOTOROLA PART No.	
Q401	2SC2688K,L	2322562	GE-232	TCG157	SK3747/157	ECG157	WEP61/157	121-Z9016	MJE340	
Q402	2SC2688K,L	2322562	GE-232	TCG157	SK3747/157	ECG157	WEP61/157	121-Z9016	MJE340	
Q601	2SD401A	2321306		TCG375	SK3929	ECG375	WEP63/375	121-Z9106		
	2SD401			TCG375	SK3929	ECG375	WEP63/375	121-Z9106		
Q602	2SD401A	2321306		TCG375	SK3929	ECG375	WEP63/375	121-Z9106		
	2SD401			TCG375	SK3929	ECG375	WEP63/375	121-Z9106		
Q701	2SC2271M,N	2321992	GE-224*	TCG399	SK9352/399	ECG399	WEP68/287*	121-Z9045*	MPSA42*	
Q702	2SD898B	2323021		TCG89	SK9119/89	ECG89		121-Z9085	TIP101	
Q704	2SC1983-O, Q,R,Y	2323432		TCG56		ECG56				
Q851 Thru Q853	2SC2688H, K,L,M,N	2322561	GE-232	TCG157	SK3747/157	ECG157	WEP61/157	121-Z9016	MJE340	
Q901	TF320M-AZ 3P2MH	2322163		TCG5465	SK3687/5465	ECG5465	WEP6255/5465	185-Z9010	C12D1	
Q902	2SC2271M,N	2321992	GE-224*	TCG399	SK9352/399	ECG399	WEP68/287*	121-Z9045*	MPSA42*	
ZD701	HZ11A,B,C	2331161	GEZD-11	TCG5020A	SK3786/5020A	ECG5020A	WEP1421/5020	103-279-20	1N5241B	
ZD702	RD24EB1	2334282	GEZD-24	TCG5031A	SK3797/5031A	ECG5031A	WEP1433/5031	103-212	1N5252B	
ZD703	HZ12A3	2331843	GEZD-5.6	TCG5021T1	SK3777/5011A	ECG5021T1	WEP1412/5011	103-Z9007	1N5232B	
ZD704	HZ11C2L	2332841	GEZD-11	TCG5020A	SK3786/5020A	ECG5020A	WEP1421/5020	103-279-20	1N5241B	
ZD705	HZ11A,B,C	2331161	GEZD-11	TCG5020A	SK3786/5020A	ECG5020A	WEP1421/5020	103-279-20	1N5241B	
ZD706	HZ12A,B,C	2331154	GEZD-12	TCG5021T1	SK3787/5021A	ECG5021T1	WEP1423/5021	103-279-21	1N5242B	
ZD901	HZ12AC	2331842	GEZD-12	TCG5021T1	SK3787/5021A	ECG5021T1	WEP1423/5021	103-279-21	1N5242B	

For SAFETY use only equivalent replacement part.

* Lead configuration may vary from original.

PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

Replacement parts shown may be superseded by the availability of newly introduced replacements.
Have your local distributor check Sams COUNTER FACTS for the most up-to-date replacement.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA		NOTES
			SPRAGUE PART No.		
			Q-LINE	GENERAL LINE	
C210	.33 50V	0252807			
C211	1 50V	0252811	QCP-3107-01	EV-1615	
C212	1 50V	0252811	QCP-3107-01	EV-1615	
C213	.1 50V	0252805			
C221	22 16V	0252522	QCP-3137-01	EV-1224	
C301	10 25V	0252621	QCP-3132-01	EV-1422	
C304	4.7 25V	0252615	QCP-3122-01	EV-1419	
C306	10 25V	0252621	QCP-3132-01	EV-1422	
C308	10 25V	0252621	QCP-3132-01	EV-1422	
C309	33 16V	0252523	QCP-3146-01	EV-1325	
C310	4.7 25V	0252615	QCP-3122-01	EV-1419	
C312	1 50V	0252811	QCP-3107-01	EV-1615	
C313	1000 16V	0253054	QCP-3195-01	EV-1261	
C317	.22 50V	0252806			
C405	1 50V	0252811	QCP-3107-01	EV-1615	
C407	10 25V	0252621			
C408	1 50V	0252811	QCP-3107-01	EV-1615	
C410	100 16V	0252531	QCP-3168-01	EV-1231	
C413	4.7 160V	0257537			
C415	1 160V	0257535			
C504	10 25V	0252621	QCP-3132-01	EV-1422	
C505	.22 50V	0252806			
C512	10 25V	0252621	QCP-3132-01	EV-1422	
C515	1 50V	0252811	QCP-3107-01	EV-1615	
C602	1 50V	0253082	QCP-3107-01	EV-1615	
C604	1 25V	0292706	QCP-3107-01	EV-1615	
C605	4.7 25V	0253065	QCP-3122-01	EV-1419	
C606	220 16V	0252532	QCP-3175-01	EV-1240	
C607	4.7 50V	0253085	QCP-3122-01	EV-1619.1	
C611	100 50V	0252861	QCP-3168-01	EV-1530	
C613	3.3 50V	0253084	QCP-3118-01	EV-1618.1	
C701	10 25V	0253066	QCP-3132-01	EV-1422	
C702	10 25V	0253066	QCP-3132-01	EV-1422	
C703	33 160V	0258586			
C705	1 50V	0253082	QCP-3107-01	EV-1615	
C714	4.7 250VAC	0259842			
C715	22 25V	0253067	QCP-3137-01	EV-1424	
C716	22 160V	0258590			
C722	470 25V	0253073	QCP-3187-01	EV-1451	
C723	22 25V	0253067	QCP-3137-01	EV-1424	
C727	4.7 160V	0257537			
C905	22 160V	0258590			
C906	470 200V	0259976			
C907	220 16V	0253051	QCP-3175-01	EV-1240	
C908	10 160V	0258584			

For SAFETY use only equivalent replacement part.

PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

Replacement parts shown may be superseded by the availability of newly introduced replacements.
Have your local distributor check Sams COUNTER FACTS for the most up-to-date replacement.

CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA			
			SPRAGUE PART No.			
			Q-LINE	GENERAL LINE		
C071	.0022 50V 10%	0246415		10TS-D22		
C072	.0022 50V 10%			10TS-D22		
C073	15 50V 5%			10TCC-Q15		
C074	.0022 50V 10%			10TS-D22		
C075	.0022 50V 10%			10TS-D22		
C201	.0022 50V 10%			10TS-D22		
C202	.0022 50V 10%			10TS-D22		
C203	.0022 50V 10%			10TS-D22		
C205	5pF 50V ±.25			10TCC-V50		
C206	120 50V 5%			10TCC-T12		
C207	2pF 50V 5%	0246463		10TCC-V22		
C208	100 50V 5%			10TCC-T10		
C209	91 50V 5%					
C214	.0022 50V 10%			10TS-D22		
C215	.0022 50V 10%			10TS-D22		
C216	.0022 50V 10%			10TS-D22		
C217	.0022 50V 10%			10TS-D22		
C218	.0022 50V 10%			10TS-D22		
C219	68 50V 5%			10TCC-Q68		
C220	.0022 50V 10%			10TS-D22		
C222	.001 50V 10%	0241889		10TS-D10		
C223	.0022 50V 10%			10TS-D22		
C224	.5pF 50V 5%					
C305	820 50V 10%			10TS-T82		
C307	.001 50V 10%			10TS-D10		
C314	180 50V 10%			10TCC-T18		
C315	30 50V 10%			10TS-T33		
C401	33 50V 5%			10TCC-Q33		
C402	.01 50V			QCP-5194-01	TG-S10	
C403	12 50V 5%				10TCC-Q12	
C404	.01 50V 10%	0243511	QCP-6160-01	1FT-S10		
C406	.01 50V		QCP-5194-01	TG-S10		
C409	.01 50V		QCP-5194-01	TG-S10		
C411	680 50V 5%					
C412	820 500V 10%			10TS-T82		
C417	68 50V 5%			10TCC-Q68		
C501	120 50V 5%			10TCC-T12		
C503	.01 50V			QCP-5194-01	TG-S10	
C507	.01 50V			QCP-5194-01	TG-S10	
C508	39 50V 5%				10TCC-Q39	
C509	22 50V 5%			10TCC-Q22		
C510	27 50V 5%			10TCC-Q27		
C511	.033 50V 10%		QCP-6193-01	1FT-S33		
C513	33 50V 5%			10TCC-Q33		
C514	100 50V 5%			10TCC-T10		
C517	.01 50V		QCP-5194-01	TG-S10		
C518	270 50V 10%			10TS-T27		
C519	270 50V 10%			10TS-T27		
C520	270 50V 10%			10TS-T27		
C601	.033 50V 10%		QCP-6193-01	1FT-S33		
C603	.033 50V 10%		QCP-6193-01	1FT-S33		
C608	180 500V 10%			10TCC-T18		
C609	.022 50V 10%		QCP-6181-01	1FT-S22		
C610	.0015 50V 10%			10TS-D15		
C612	.0047 500V		QCP-5180-01	5GA-D47		
C706	.0068 50V 10%	0244111				
C707	270 50V 10%	0299978		10TCC-T27		
C708	.0056 630V 5%					
C709	.022 50V 10%		QCP-6181-01	1FT-S22		
C710	.047 50V 10%		QCP-6211-01	1FT-S47		
C712	.022 100V 10%		QCP-6181-01	1FT-S22		
C713	.1 200V 10%			2PB-P10		
C718	.015 630V 10%		0299624			
C719	.018 630V 10%		0299993			
C720	.018 630V 10%		0299993			
C721	.33 200V 10%		0299932		6PS-P33	
C724	120 500V 10%			10TCC-T12		