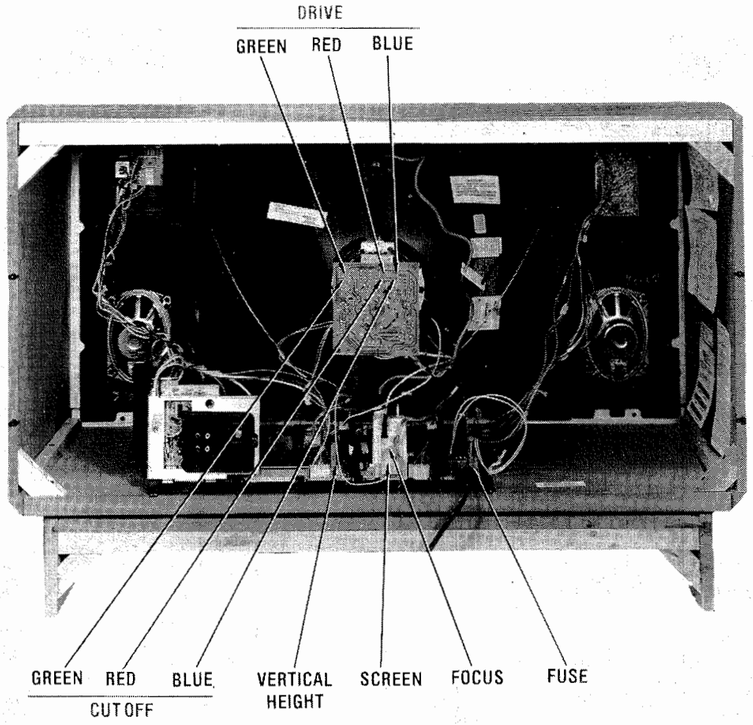


CABINET—REAR VIEW

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

Remove five screws holding cabinet back and remove back. Disconnect speaker and antenna connectors. Channel readout may be removed at this point of disassembly. Remove one screw holding readout to cabinet front and remove assembly from cabinet. Disconnect HV anode, CRT socket, deflection yoke connectors, degaussing coil connector and ground leads. Remove six screws holding main board assembly to cabinet bottom and remove assembly from 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 4-amp fuse is used for AC line protection. (See photo, Cabinet - Rear View.)

CHANNEL TUNING

Channel Up and Down buttons are provided for channel scanning. Add and Delete buttons are provided for channel pretuning. Ten numbered buttons on remote are provided for two-digit entry channel selection.

HORIZONTAL OSCILLATOR

Adjustment of the horizontal hold is accomplished by the proper setting of the Horizontal Frequency Control.

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 Main Board photo.)

CENTERING

Vertical centering is accomplished by proper adjustment of the vertical centering switch. (See Main Board photo.)

SET 2646 FOLDER 1

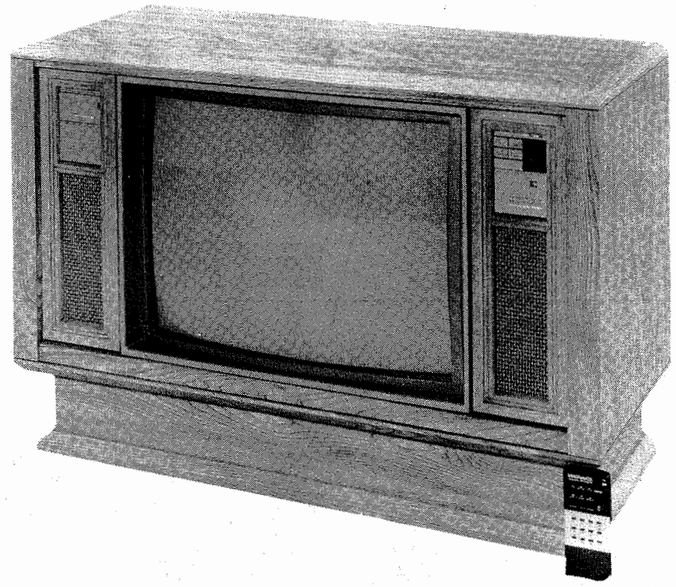
SAMS PHOTOFACT®

MAGNAVOX CHASSIS
25C806/07/08/09/10/16/17/18,26C805/07/08/09/14/16/17

For Supplier Address See PHOTOFACT Index

Models

EMN692PE01
EMN692PE02
RG4474AK01
RG4474AK02
RG4474AK03
RG4549AK01
RG4812AK01
RG4816PE01
RG5940AK01
RG5940AK02
RG5940AK03
RG5946PE01
RG5946PE02
RG5946PE03



Representative Model

MAGNAVOX CHASSIS
25C806/07/08/09/10/16/17/18,26C805/07/08/09/14/16/17

SAFETY PRECAUTIONS

See Page 1

INDEX

SAMS™ Howard W. Sams & Company
2647 Waterfront Parkway, East Drive, Suite 300, Indianapolis, Indiana 46214 U.S.A.

10 9 8 7 6 5 4 3 2

U.S.A. 88PD01580 Printed in U.S. of America

DATE 3-89 SET 2646 FOLDER 1

SET 2646 FOLDER 1

TDA3564
IC640 CHROMA/LUMINANCE

TAKEN WITH BAR SWEEP GENERATOR

TAKEN WITH CHROMA BAR SWEEP GENERATOR

SEE W13, GROUND

SEE W14, BRIGHTNESS CONTROL

SEE W7, PICTURE CONTROL

SEE W9, COLOR CONTROL

SEE W15, SHARPNESS CONTROL

SEE W12, TINT CONTROL

COLOR REF 10K

Y601 7.1590MHz

TP615

TP634

Q26 RED OUTPUT

Q47 BLUE OUTPUT

Q40 GREEN OUTPUT

RED DRIVE 2200

BLUE DRIVE 2200

GRN DRIVE 2200

RED CUTOFF 4700

BLUE CUTOFF 4700

GRN CUTOFF 4700

Q35 BLACK LEVEL BIAS

* PART OF CRT SOCKET

SPARK GAP

SEE T504 PAGE 2

A66AAM03X
* V1 CRT

S.0KV TO 6.2KV FOCUS RANGE

TO CRT SHIELD

PHOTO CIRCUITRACE = 11

SCHEMATIC CIRCUITRACE = 11

FOR TERMINAL GUIDES AND NOTES
SEE PAGE 5

TROUBLESHOOTING (Continued)

Increase and trigger Zener Diodes Z503 and Z504 into conduction. This triggers Over-voltage Shutdown SCR (SCR505) which shuts down the set. To troubleshoot, disconnect Diode D506 from the circuit and check the voltage at TP4. If the voltage is more than 135V, troubleshoot the power supply. If the voltage at TP4 is less than 130V, check the components associated with the collector circuit of the Horizontal Output Transistor (Q501) and SCR505. Return Diode D506 to the circuit.

Voltages Taken In Shutdown

	SCR505	TP4
K	0V	.9V
G	.74V	
A	.9V	

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 AFT circuit. If there is no video on the CRT, check for a video waveform at TP1. If video is present, refer to the "Video" section of this Troubleshooting guide. If there is no video at TP1, apply AGC bias to pin 19 of IF/Sync/Sound IC (IC201). If video is present at TP1, check the voltages and components associated with the AGC circuit at pins 1, 5 and 19 of IC201. If there is no video at TP1, check the voltages, waveforms and components associated with pins 7 thru 10, 17, 18 and 22 of IC201 and IF Preamp Transistor (Q240). 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.

IC201

Pin 1	3.9V
Pin 5	5.2V
Pin 19	4.5V

AUDIO

Select an active TV channel and check for an audio waveform at pin 12 of IF/Sync/Sound IC (IC201). If audio is missing, check voltages, waveforms and components associated with pins 11 thru 15 of IC201. If an audio waveform is present at pin 12 of IC201, check for an audio waveform at pin 2 of the Audio Output IC (IC280). If there is no audio at pin 2 of IC280, check voltages, waveforms and components associated with IC280.

VIDEO

Inject a video signal at TP1 and check for video on the CRT. If video is present, troubleshoot the "IF/AGC" section. If there is no video on the CRT, check for a video waveform at pins 13,14 and 15 of Chroma/Luminance IC (IC640). If there is no video at pins 13,14 and 15 of IC640, check the voltages, waveforms and components associated with pins 1,7 and 9 thru 15 of IC640. If video is present at pins 13,14 and 15 of IC640, check the voltages, waveforms and components associated with the CRT and output Transistors (Q26,Q40 and Q47). If the brightness is inadequate or cannot be controlled, check the voltages and components associated with pins 7 and 12 of IC640 and pin 7 of the CRT.

VERTICAL

Inject a vertical drive signal at pin 3 of IF/Sync/Sound IC (IC201). If vertical deflection is now present, check the voltages, waveforms and components associated with pins 2,3, 4 and 27 of IC201. If there is still no vertical sweep, check the voltages, waveforms and components associated with the Vertical output IC (IC580). Vertical linearity or height problems may be caused by the vertical feedback and bias circuits, check Electrolytics C582,C584 and C585 for defects.

SYNC

Check for a video waveform at TP6. If the video waveform is missing, check the components associated with TP6. If a video waveform is present at TP6 and there is no vertical or horizontal sync, Capacitor C227 or IC201 may be defective.

RASTER

Check the CRT and CRT voltages. If there is no Red, check the voltages and components associated with pin 15 of Chroma/Luminance IC (IC640) and Red Output Transistor (Q26). If there is no Green, check the voltages and components associated with pin 14 of IC640 and Green Output Transistor (Q40). If there is no Blue, check the voltages and components associated with pin 13 of IC640 and Blue output Transistor (Q47). If the raster has a keystone shape, check the Deflection Yoke (DY1). If the raster has height or width problems, refer to the "Vertical", "Horizontal" and "Power Supply" sections of this Troubleshooting guide.

CHROMA

Check for a chroma waveform at pin 3 of Chroma/Luminance IC (IC640). If the waveform is missing, check the components associated with pin 3. If the chroma waveform is present at pin 3, check for the proper chroma waveforms at pins 13,14 and 15 of IC640. If these waveforms are missing, check the voltages, waveforms and components associated with pins 1 thru 6, 8 and 16 thru 24 of IC640. Check the 7.16MHz oscillator at pins 20 and 22 of IC640. Check the voltages and components associated with the Color Control and pin 6 of IC640. If there is no color sync, check the voltages, waveforms and components associated with pin 8 of IC640. If there is inadequate Tint Range, check the voltages and components associated with the Tint Control and pin 21 of IC640. If the proper chroma waveforms are present at pin 13,14 and 15 of IC640, refer to the "Raster" section of this Troubleshooting guide.

MISCELLANEOUS ADJUSTMENTS

PRETUNING

1. Connect antenna.
2. Open secondary control access door.
3. Slide PRO-NORM Switch to program position.
4. Incrementing from channel two thru sixty-nine, momentarily depress ADD (for wanted channels) or DEL (for unwanted channels) buttons for desired preturning results.
5. Close secondary control access door.

RF AGC ADJUSTMENT

Tune in a station and allow a 15-minute warm-up time. Adjust RF AGC Control (R237) clockwise until snow (noise appears in picture and then counterclockwise until snow just disappears.

130V B+ ADJUSTMENT

Allow a 15-minute warm-up time and maintain line voltage at 120V AC. Connect a digital voltmeter to TP4, low side to chassis ground. Set Volume, Brightness and Picture Controls to MINIMUM. Adjust 130V Adjust Control (R452) for 130V ± 1.0V DC reading on meter.

HORIZONTAL FREQUENCY ADJUSTMENT

Tune in a station and allow a 15-minute warm-up time. Place a short from TP6 to chassis ground. Adjust Horizontal Frequency Control (R233) until picture stops or slowly floats across screen. Remove short from TP6 and check all active channels for proper horizontal lock-in.

HORIZONTAL CENTERING ADJUSTMENT

Tune in a station and allow a 15-minute warm-up time. Adjust Horizontal Centering Control (R247) to position the picture horizontally for best viewing.

BLACK AND WHITE TRACKING

Tune in a station and allow a 15-minute warm-up time. Set Screen Control fully counterclockwise. Set Brightness, Picture and Color Controls to MINIMUM. Adjust Red (R28), Green (R33) and Blue (R45) Drive Controls fully clockwise. Set Red (R29, Green (R41) and Blue (R48) Cut Off Controls to their mechanical center. Place a jumper from TP13 to ground. Advance Screen Control to produce a dim line of one color. Adjust Cut Off Controls of two remaining colors to produce a dim white line. Disconnect the jumper from TP13 and ground. Tune in a station and set Brightness and Picture Controls for sufficient brightness to produce a normal picture. Adjust Red (R28), Green (R33) and Blue (R45) Drive Controls to produce a normal black and white picture. Turn Brightness and Picture Controls to Maximum and check for blooming and/or retrace and adjust Screen Control slightly counterclockwise to eliminate problem.

COMB FILTER ADJUSTMENT

Connect a color bar generator to the antenna terminals and tune in a color bar pattern. Connect oscilloscope to TP615 (Pin 15 of IC640), low side to ground. Adjust Chroma Amp Null Control (R601) and Chroma Phase Null Coil (L600) for MINIMUM Chroma Component in waveform.

COLOR OSCILLATOR ADJUSTMENT

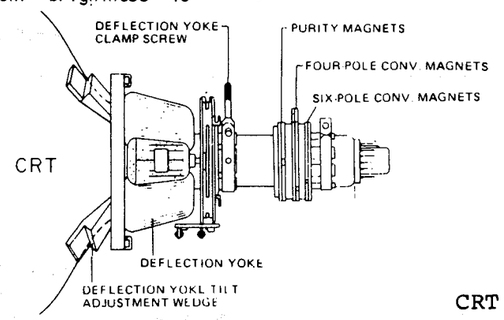
Tune in a color bar signal and allow a 15-minute warm-up time. Connect digital voltmeter to TP634 (Junction R633 and Wiper of R634), low side to ground. Adjust Color Oscillator Control (R634) for 4.0V ± 0.1V DC reading on meter. Disconnect color bar generator and tune in an active channel. Check that the color locks in properly. Check all active channels and adjust Oscillator Control (R634) slightly if lock-in is slow.

PURITY ADJUSTMENT

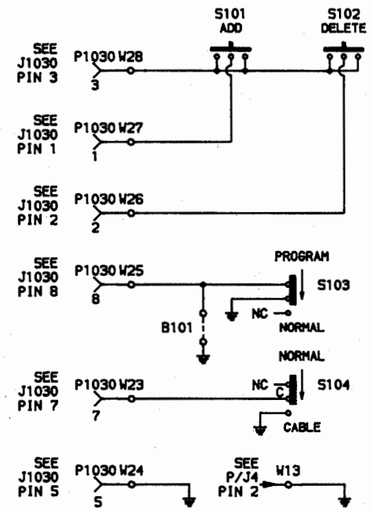
Allow a 15-minute warm-up time. Set Red Cut Off Control (R29) fully clockwise. Set Blue (R48) and Green (R41) Cut Off Controls fully counterclockwise. Loosen deflection yoke and remove rubber wedges. Move yoke assembly forward against the CRT bell. Adjust purity magnets to center the vertical red band on the CRT. Pull deflection yoke back to produce a uniform red screen. Use Cut Off Controls to produce blue and green fields to check purity of blue and green. Tighten deflection yoke, replace rubber wedges and perform Black and White Tracking.

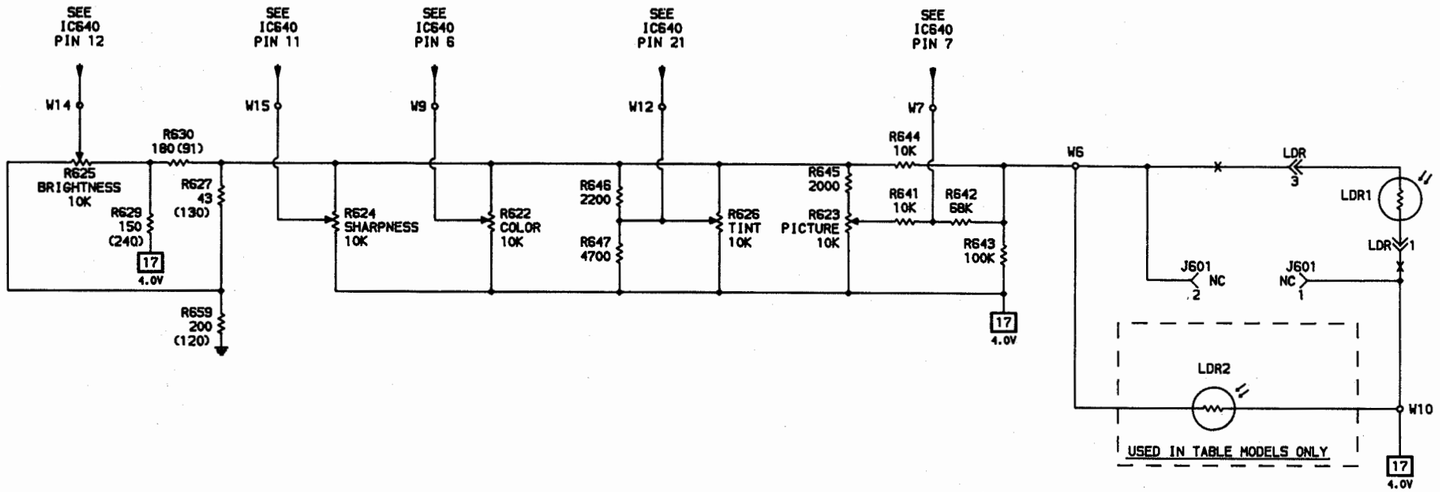
CONVERGENCE ADJUSTMENT

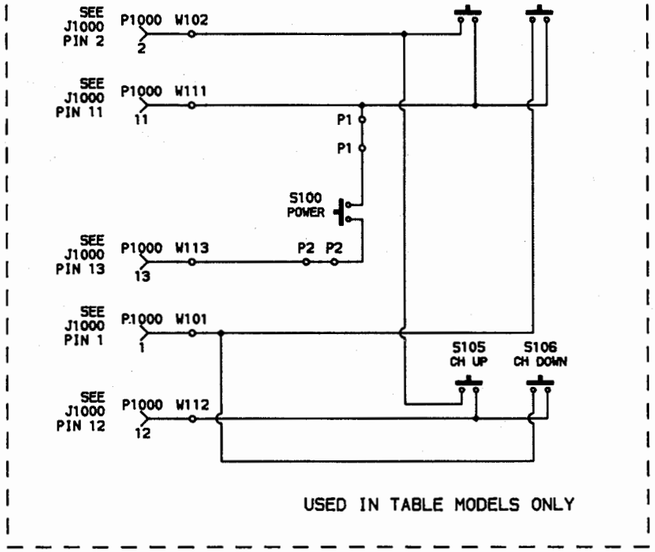
Tune in a crosshatch pattern and allow a 15-minute warm-up time. Spread and rotate the tabs of the 4-pole magnets to converge the red and blue lines at the center of the screen. Spread and rotate the 6-pole magnets to converge the red/blue with the green lines at the center of the screen. Remove wedges between CRT and deflection yoke. Tilt the deflection yoke vertically and horizontally to converge the edges of the screen. Replace rubber wedges.



CRT NECK ASSEMBLY







FOR TERMINAL GUIDES AND NOTES
SEE PAGE 5

PHOTO CIRCUITRACE = 11

SCHEMATIC CIRCUITRACE = 11

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.

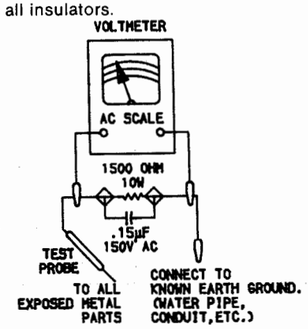
Leakage Current Hot Check

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.



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 VOM/DMM Accessory probes	HV-44 PR-28(HV)	HP200	
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.

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 6.7V Bias to TP210 (Pin 10 IC201).

VIDEO IF ALIGNMENT (SWEEP MARKER GENERATOR)

DIRECT PROBE FROM SWEEP/MARKER GENERATOR	SWEEP GENERATOR OUTPUT	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	REMARKS
TP244 (Emitter of Q244)	TP240 (Base of Q240)	44MHz (10MHz Sweep)	45.75MHz	Adjust L205 for Maximum 45.75MHz marker. See Figure 1.

VIDEO IF ALIGNMENT (BAR SWEEP GENERATOR)

BAR SWEEP GENERATOR	SCOPE INPUT	REMARKS
Antenna Terminals	TP244	Perform Video IF Adjustments per SWEEP/MARKER GENERATOR Instructions above See Figure 2.

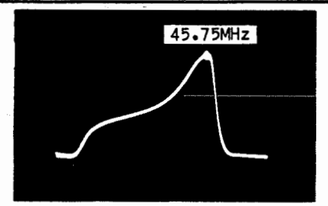


Figure 1

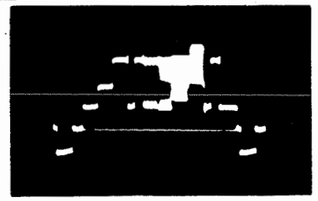


Figure 2

C

D

MONO MODELS ONLY

R380 15 SEE TUNER PIN 4
C350 .1 100V
SEE TUNER PIN 2
C351 .1 100V
SEE TUNER PIN 3
C352 56pF

R245 2200
C246 1µF
R266 10K
R265 10K
C279 .1
C283 100pF
C245 .047
C282 22µF
C278 82pF
C285 .1
C284 .001
C281 1µF
R280 220K
C280 .1
R264 22 1.6W
SEE T401 PIN 21

IC280 AUDIO OUTPUT

C287 220µF P/J11
R263 3.3
C288 .1
P/J11
SP 16Z

L604

Q244 VIDEO BUFFER
L202 4.7
R223 51
L204 1
Y202 4.5MHz FILTER
TP244
J3 J3
R650 22
R605 680
2.4V 10µs
5.0V 10µs
TAKEN WITH BAR SWEEP GENERATOR

Q600 DELAY LINE DRIVER
R603 150
R604 100
R602 560
C601 .0056 10%
C614 10µF
L600
L601
TP1
Y600
R607 100
R610 330
L606 1.8
R600 91
R601 COMB AMP NULL 470
2.5V 10µs
3.0V 10µs
TAKEN WITH BAR SWEEP GENERATOR

Q610 LUMINANCE BUFFER
R608 470
L605 1.5
R609 330 (470)
C603 300pF
C647 150pF

TAKEN WITH BAR SWEEP GENERATOR
3.0V 10µs
2.0V 10µs

C606 150pF
L602 1.5
C607 120pF
R618 1300
R617 750

Q615 LUMINANCE EQUALIZER
L609
L610 1.3
C613 1µF
C609 68pF
C610 330pF
C611 680pF
Q620 PEAKING BUFFER
C612 4.7µF 63V
R620 120 2%
R614 100K (68K)
R619 470
R611 150K
R612 300

Q605 LUMINANCE INVERTER
C605 .01
C602 10pF
R606 1300
C604 82pF
L607 1.7
R668 4700

D220 R217 5600
Z223
R224 2700
D221
11.0V
9 10.5V

DEFLECTION YOKE
DY1
P/J8 4
P/J8 5
P/J9 1
P/J9 3
P/J8 1 P/J8 2
50.0V 5ms
C587 470pF 500V 10%
R587B 390 (270)
R587A 1000
R587 390
8.0
R508 1000 1.6W
L503
C504 .47
R581 680
S580 VERT CENTERING SWITCH
NC
3 31.0V

R514 10 1.6W
L502
C511 .015 100V
R513 10 7W
C503 47µF 250V
1 130V

230V 10µs
120V 10µs
24.0V 10µs
D506
15.2V
Z503
2.0V
Z504
SEE CRT FIL.
C509 100µF
R512 150
5CR505
0V
G
A
K
1 130V

R510 1
T504
HV RANGE 27KV TO 29KV
.74
.22
.02
.02
R635B 62
R635A FOCUS
10.0V 5ms
R509 6800
C506 .15 100V
4 13.0V(A)
R666 6800
P/J10
TO CRT SHIELD

D502 BYD33J
C507 .001 10%
C508 22µF 250V
R511 150K
P/J7 W11
19 177V SOURCE

L517
R502 120K
R501 120K
C505 .011
D500
R500 6800
7 11.8V

D601

Y
X
C510 .022 250V

1
2
3
4
5
6
7

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 (T504). Refer to "Troubleshooting" Power Supply and Horizontal circuits.

NO PIC, NO SOUND, HAS RASTER: Check IF-AGC and source voltages from Horizontal Output Transformer (T504). Refer to "Troubleshooting" IF-AGC and Horizontal circuits.

NO PIC, HAS SOUND, NO RASTER: Check Horizontal Output Transformer (T504) 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 (T504). 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.

TEST JIG HOOKUP

FUNCTION	Chek-A-Color ADAPTER NO.
CRT	B239
YOKE	~~B239~~ 041581
YOKE SETTING	YP1
	Focus Tap

TROUBLESHOOTING

POWER SUPPLY DESCRIPTION

When 120V AC is supplied to the set, 158V* is developed at TP22. The voltage developed at TP22 is simultaneously applied to Switch Mode Regulator Transistor (Q400), Duty Cycle Control Transistors (Q402, Q403) through Resistors and Switched Mode Transformer (T401) to initialize the power supply into operation. After the circuit has been pulsed into operation, its operation is sustained by feedback pulses from Horizontal Output Transformer (T401) and bias voltages from Opto Isolator IC (IC404) and Main Control Amp Transistor (Q406) and Differential Amp Transistor (Q407). The pulses developed by Transformer T401 are rectified by diodes to provide operating voltages for the rest of the set. Diodes D431 and D433 provide a rectified operating voltage for Mode Switch Transistor (Q410), Standby Power Switch Transistors (Q431, Q432) and Voltage Regulator IC (IC309) in Standby mode. In Standby mode the Power Supply is operating at a reduced potential because of the loading provided by Transistors Q410, Q431, Q432, IC309 and the 13.0V applied across Zener Diode Z435. In Standby mode 18.9V is present at TP4; 2.87V at TP5; 4.4V at TP8; 3.8V at TP10; Transistor Q402 E.49, B.51V, C-1.9V; Transistor Q403 E-1.9V, B-1.7V, C-.51V; Transistor Q406 E3.8V, B3.8V, C.99V and Transistor Q407 E1.8V, B.96V, C3.8V. When the Power button is depressed, Transistor Q410 is turned on which turns off Transistor Q432. This action removes the 13.0V across Zener Diode Z435 and the load provided by Transistors Q410, Q431 and Q432, enabling the Power Supply to go to full Power mode, thus providing the proper operating voltages for the rest of the set.

* With respect to isolated ground.

POWER SUPPLY

Check the AC Fuse F400. If fuse is open, check Bridge Rectifier Diodes D404 thru D407, Capacitors C400, C404 thru C407, Thermistor R401, Electrolytic C403 and Switch Mode Regulator Transistor (Q400). Apply 120V AC and check for 155V* at the collector of Transistor Q400. If this voltage is absent, check Line Filter (L400), Thermistor R403 and the winding of Switched Mode Transformer (T401) from pins 5 to pins 7. If 155V* is present at the collector of Transistor Q400, depress the Power Switch and check for 130V at TP4. If this voltage is absent, check the voltages, waveforms and components associated with Transformer T401, Transistor Q400, Duty Cycle Control Transistors (Q402, Q403), Differential Amp Transistor (Q407), Main Amp Control Transistor (Q407), Standby Power Switch Transistors (Q431, Q432) and Mode Switch Transistor (Q410). If 130V is present at TP4, refer to the "Horizontal" section of this Troubleshooting guide. If Transformer T401 is being overloaded by a short or other condition, a very loud high frequency sound will be heard coming from the set.

* With respect to isolated ground.

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 (Q501). If horizontal deflection is now present, check the voltages, waveforms and components associated with pins 7, 23 thru 28 of IF/Sync/Sound IC (IC201) and the Horizontal Driver Transistor (Q500). If there is still no horizontal sweep, check the voltages, waveforms and components associated with Transistor Q501 and the Horizontal Output Transformer (T504). Check Diodes D502, D506 and associated components for defects. The high voltage rectifier is part of Transformer T504 and if defective will affect the performance of the horizontal circuits. If the horizontal oscillator is off frequency, check the voltages, waveforms and components associated with pins 23, 24 and 28 of IC201. Horizontal linearity or width problems may be caused by Capacitors C501, C502, C504 and C505 being defective.

HIGH VOLTAGE SHUTDOWN

The high voltage is monitored by Diode D506 rectifying pulses from the Horizontal Output Transformer (T504) and applying the voltage to the cathode of Zener Diode Z503. Should the high voltage increase, the rectified voltage at the cathode of Zener Diode Z503 will also

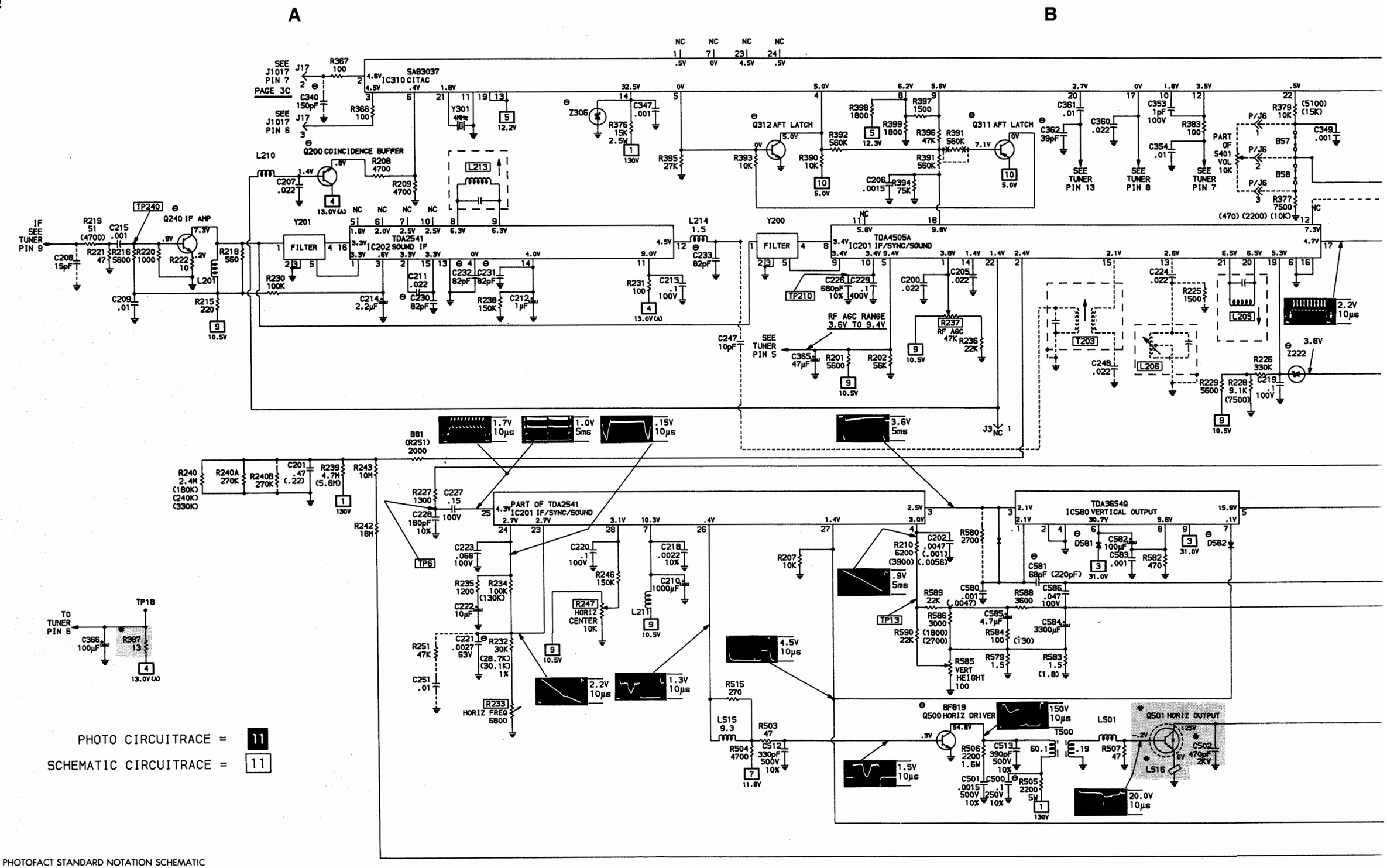


PHOTO CIRCUITRACE = 11

SCHEMATIC CIRCUITRACE = 11

A PHOTOFACT STANDARD NOTATION SCHEMATIC WITH CIRCUITRACE™

A

B

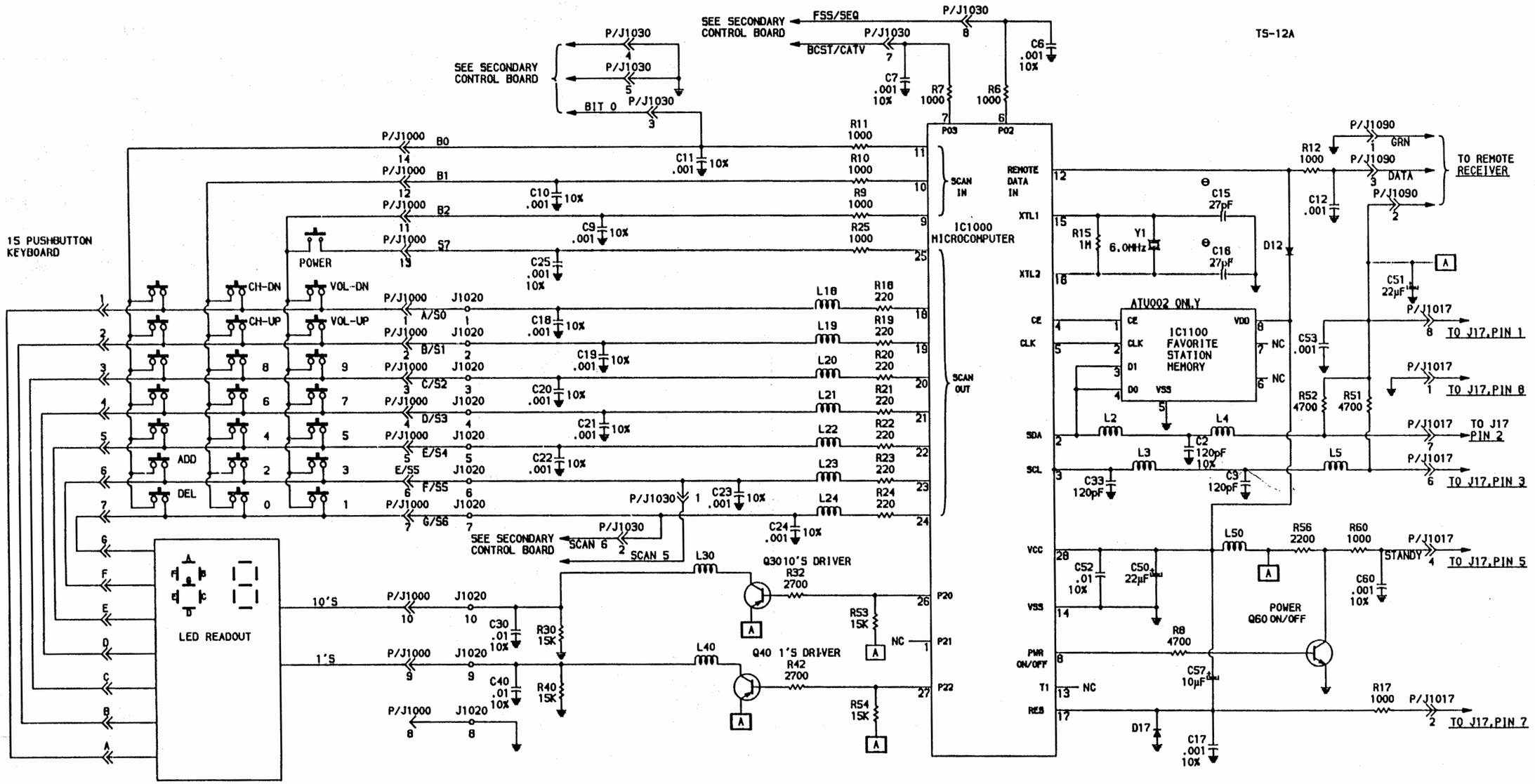
FOR TERMINAL GUIDES AND NOTES
SEE PAGE 5

PHOTO CIRCUITRACE = 11

SCHEMATIC CIRCUITRACE = 11

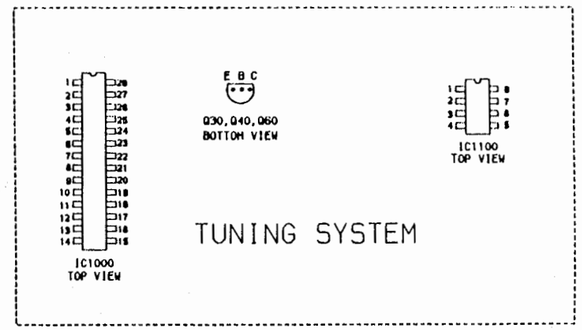
POWER SUPPLY

A PHOTOFACT STANDARD NOTATION SCHEMATIC
WITH CIRCUITRACE™

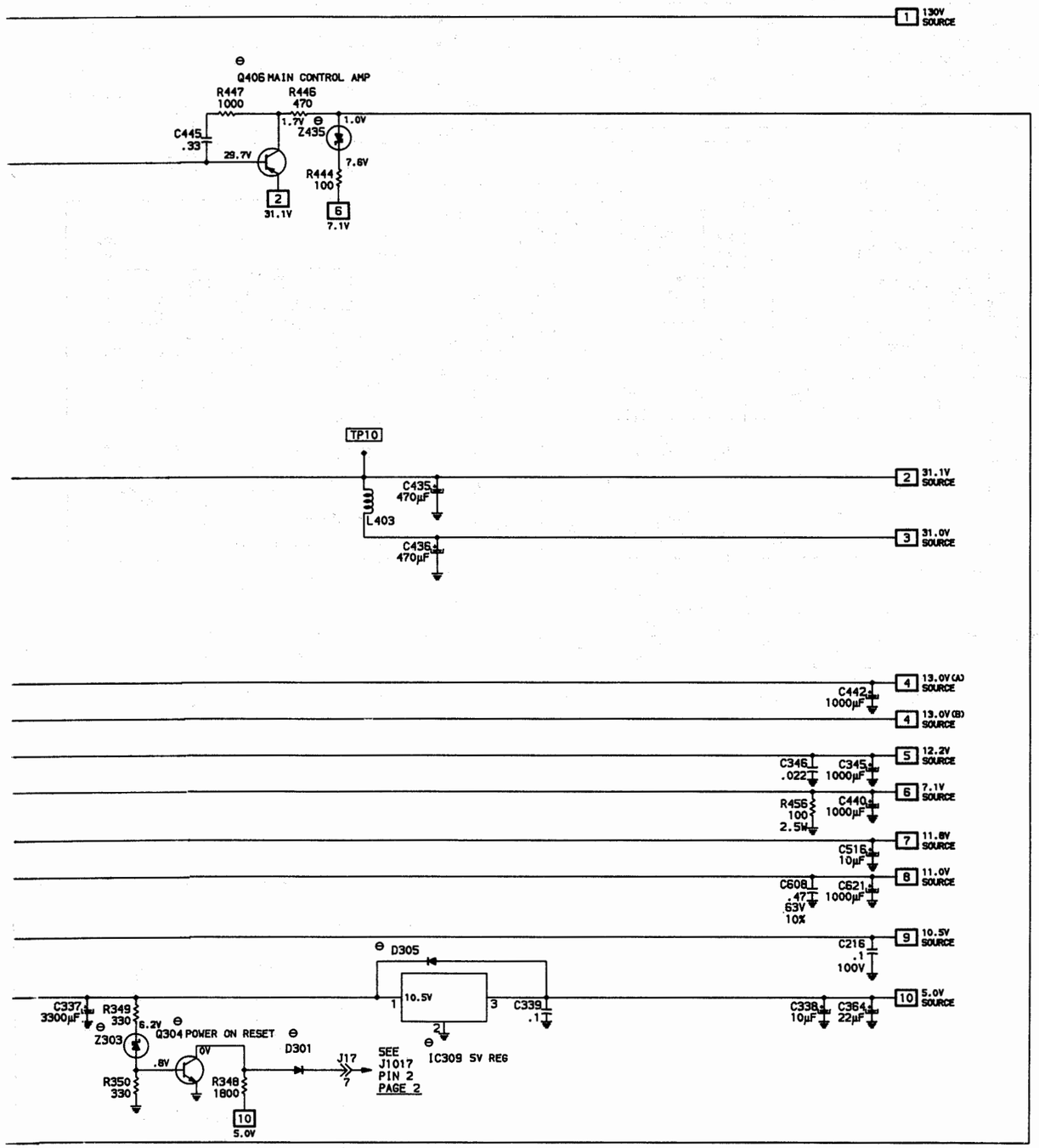


A PHOTOFACT STANDARD NOTATION SCHEMATIC WITH CIRCUITRACE™

TUNING SYSTEM - TS-12A

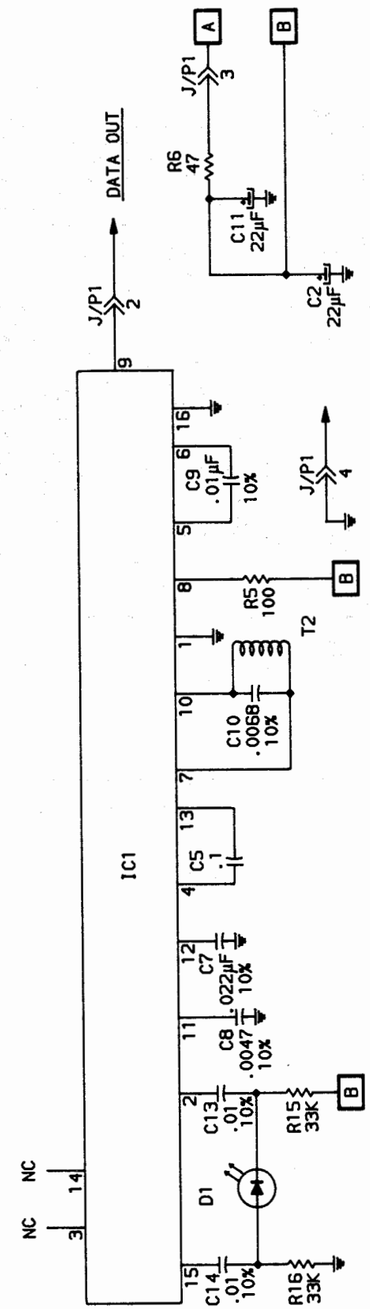


C



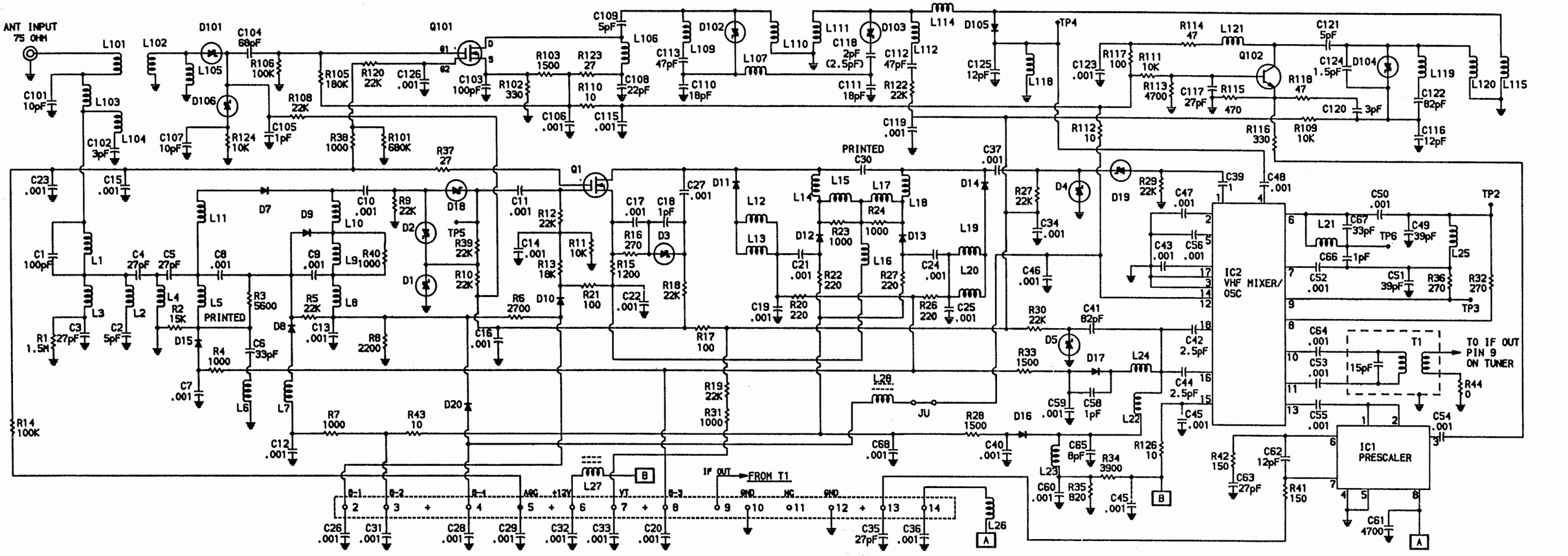
POWER SUPPLY

D

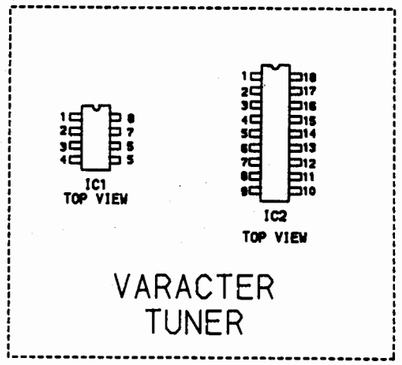


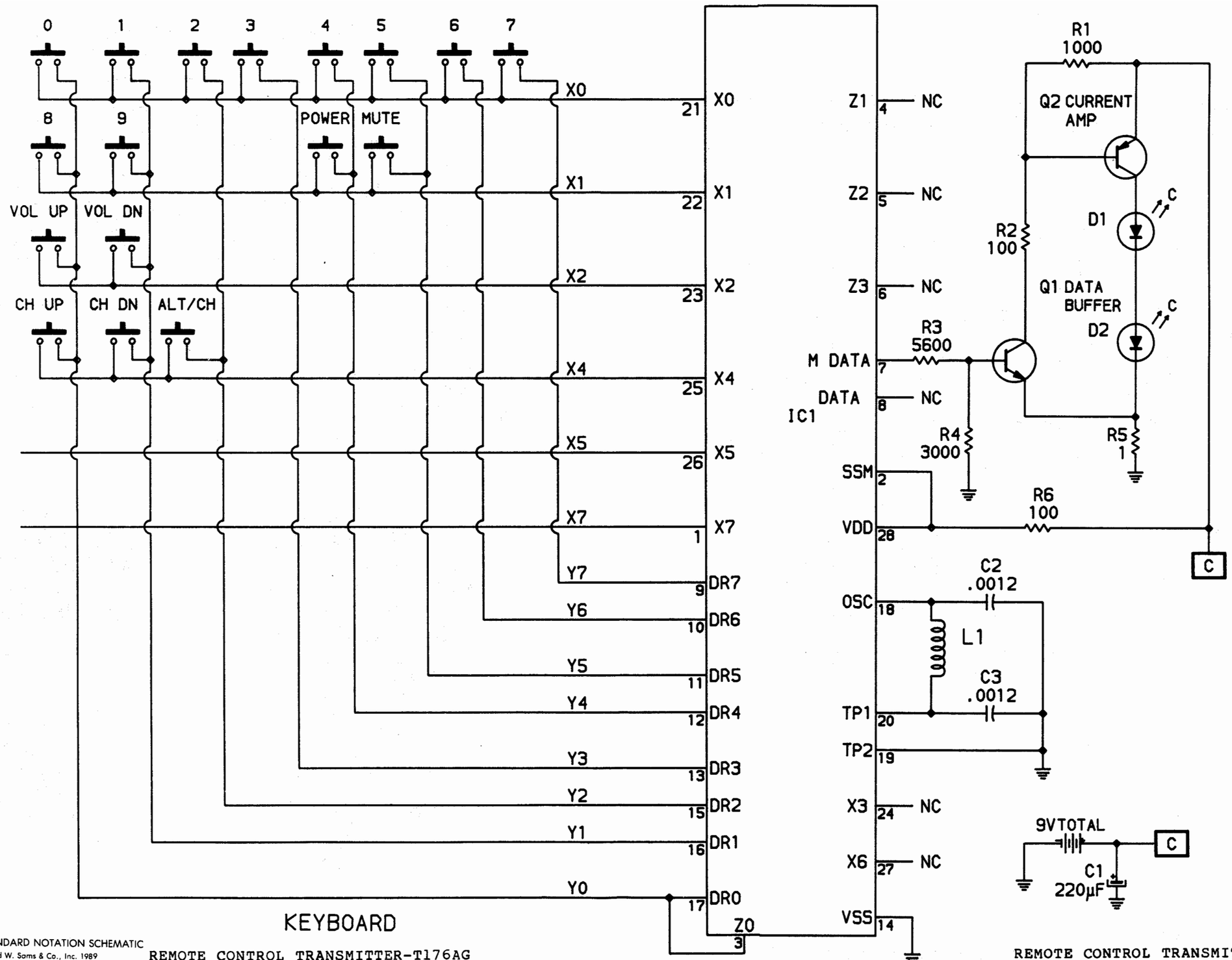
A PHOTOFACT STANDARD NOTATION SCHEMATIC

REMOTE CONTROL RECEIVER-ARR002



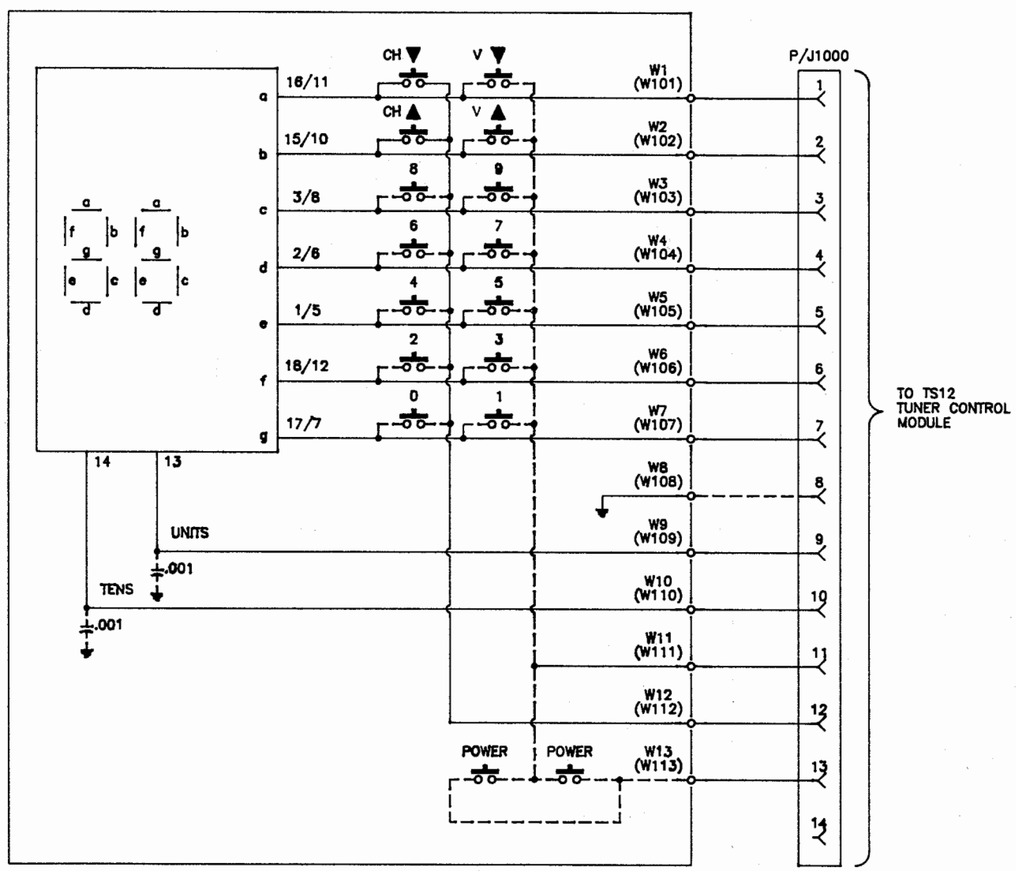
UHF/VHF TUNER 340293





KEYBOARD

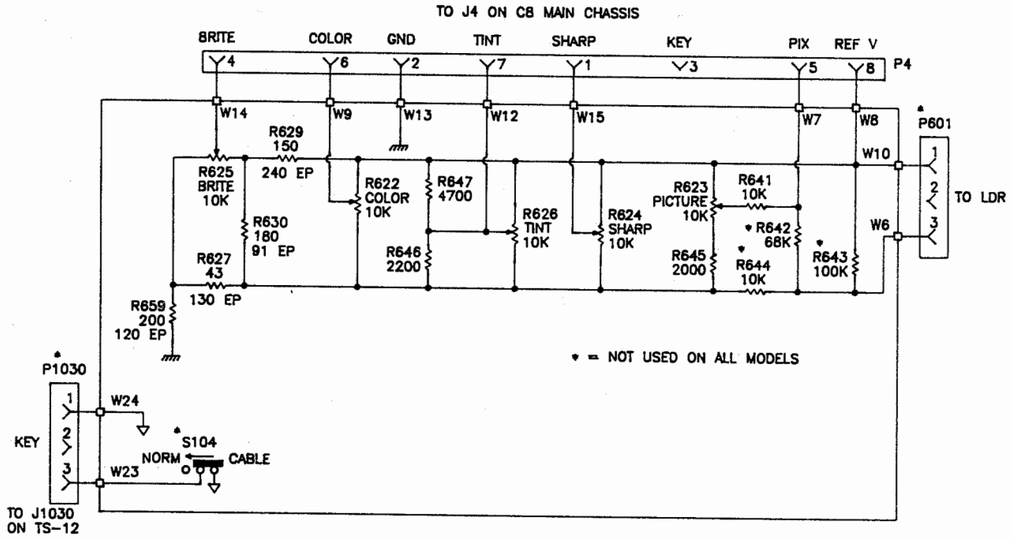
ADP020,ADP022,ADP024,ADP025,ADP026 & ADP027
CHANNEL SELECT/DISPLAY MODULE
SCHEMATIC DIAGRAM



A PHOTOFACT STANDARD NOTATION SCHEMATIC

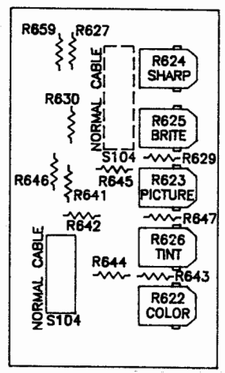
CHANNEL SELECT/DISPLAY MODULE

ASC184,ASC197,ASC198,ASC199 & ASC201
SCHEMATIC DIAGRAM

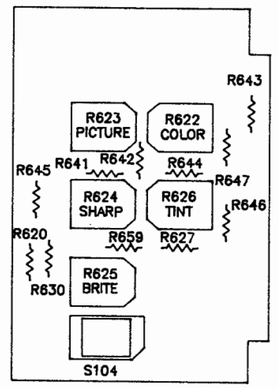


A PHOTOFACT STANDARD NOTATION SCHEMATIC

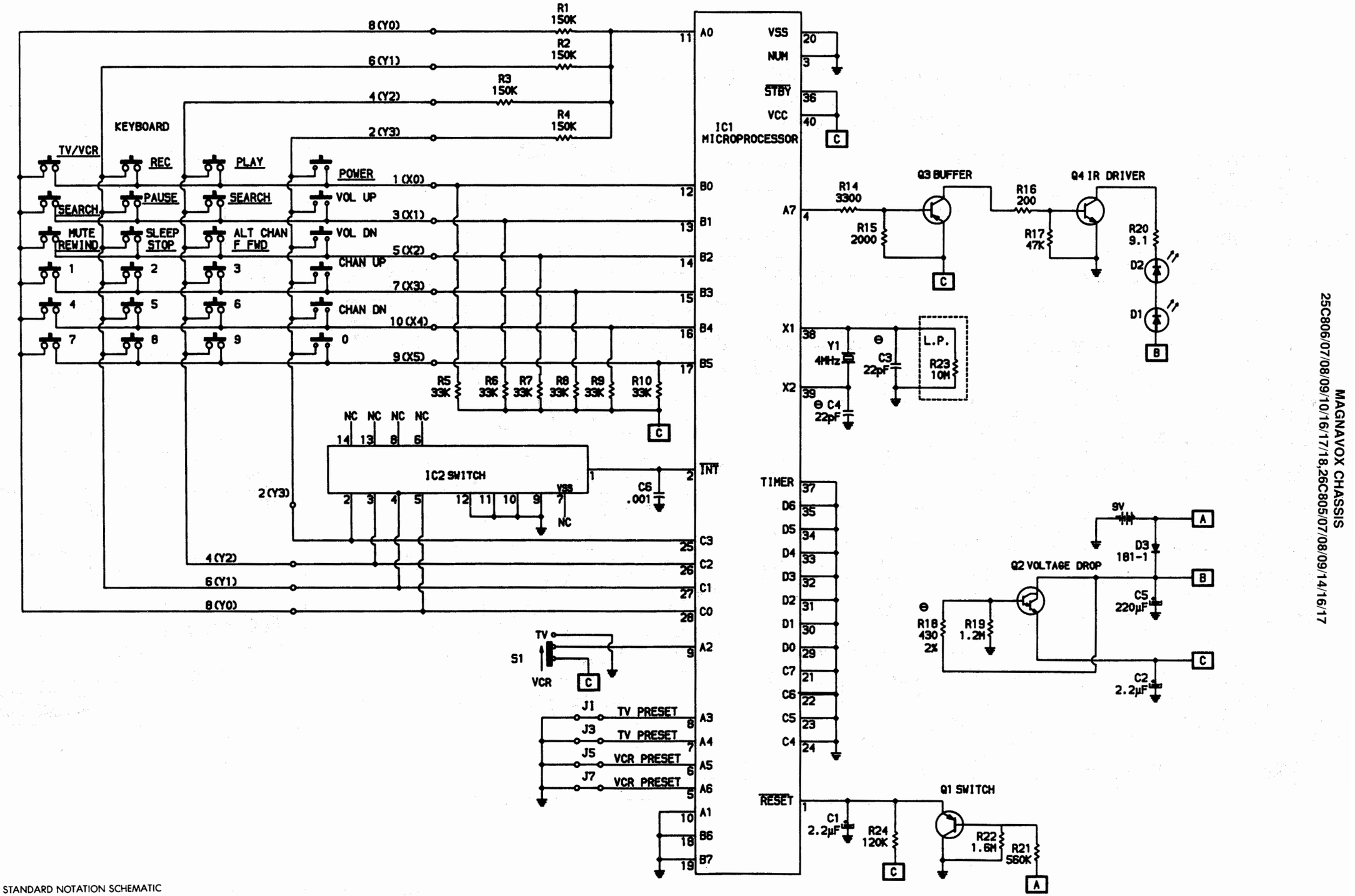
ASC184,ASC198, ASC199 & ASC201 SECONDARY CONTROL MODULE P.C. BOARD OVERLAY (COMPONENT VIEW)



ASC197 SECONDARY CONTROL MODULE P.C. BOARD OVERLAY (COMPONENT VIEW)



SECONDARY CONTROL BOARD



A PHOTOFACT STANDARD NOTATION SCHEMATIC

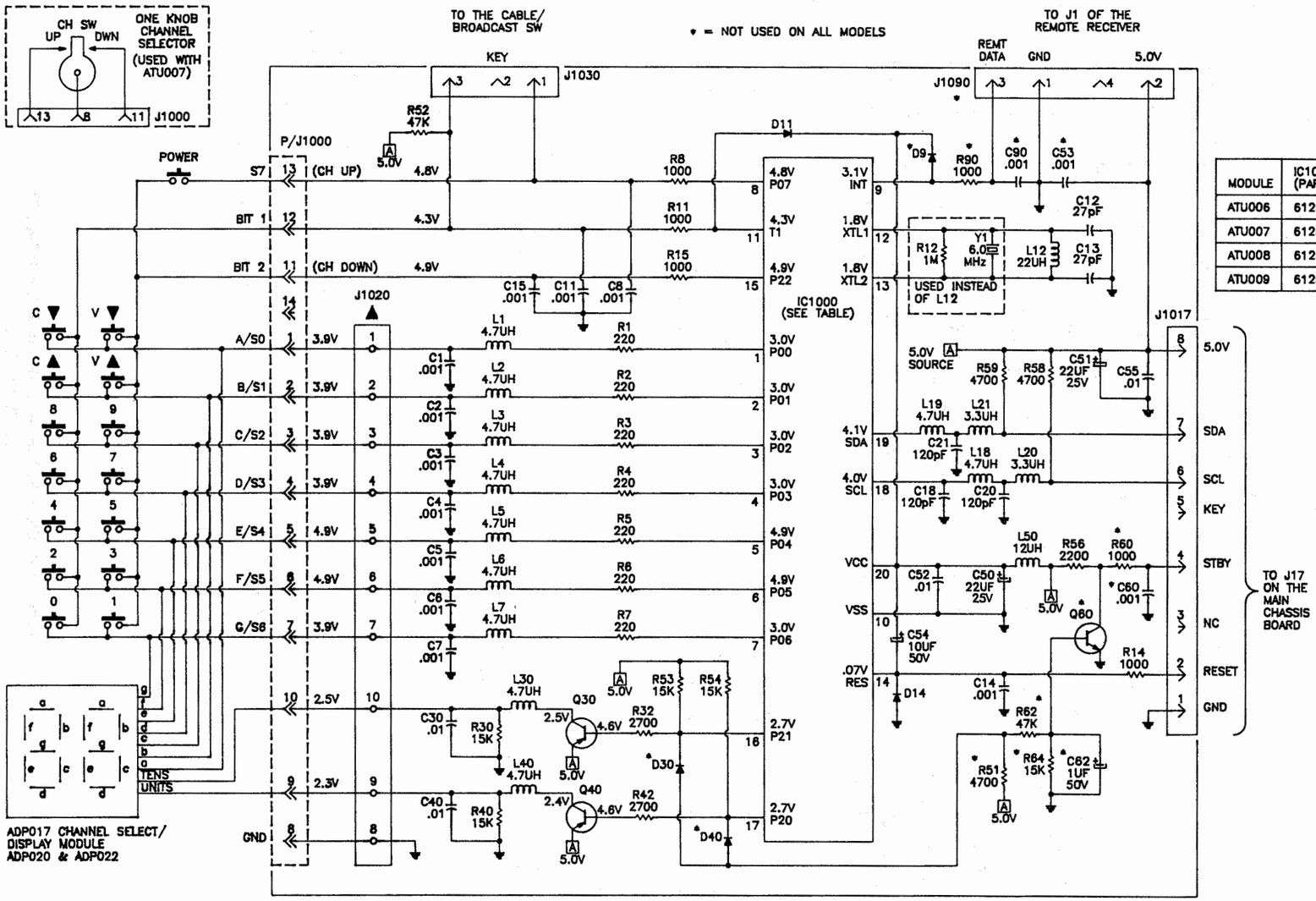
REMOTE CONTROL TRANSMITTER-TUMA5G

G

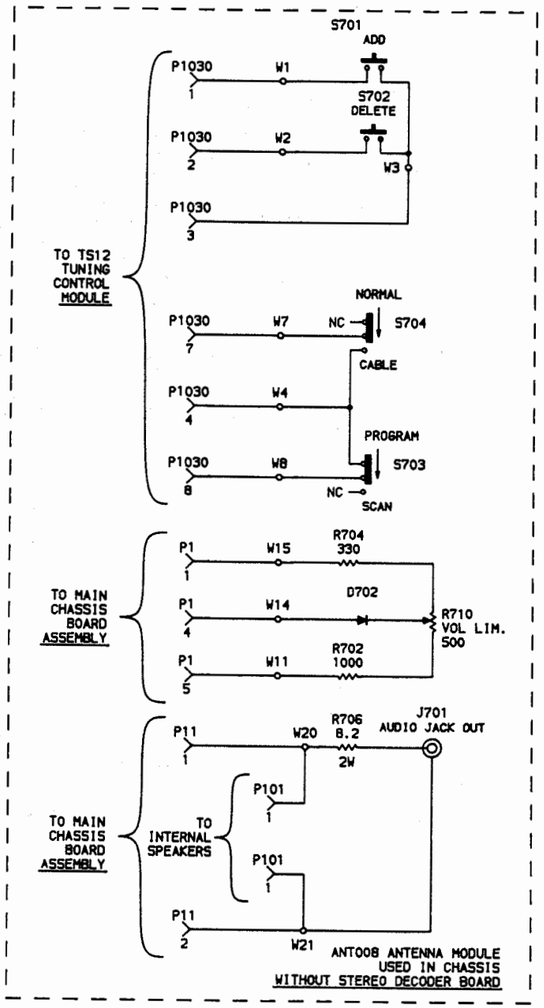
REMOTE CONTROL TRANSMITTER-TUMA5G

H

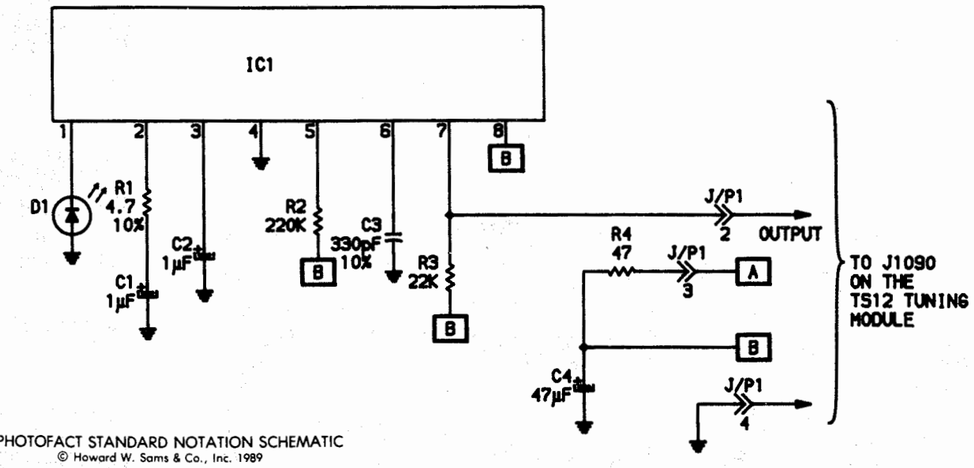
ATU006,ATU007,ATU008 & ATU009 (TS12B/C)
SCHEMATIC DIAGRAM
(–A001 VERSIONS)



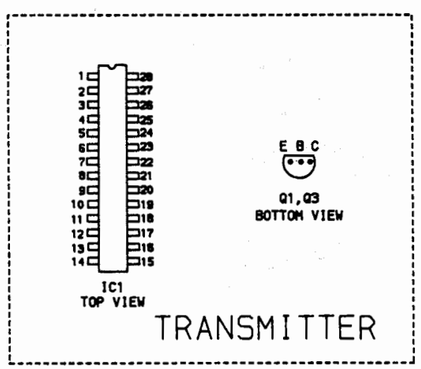
MODULE	IC1000 (PART NO.)
ATU006	6125710001
ATU007	6125780001
ATU008	6125710001
ATU009	6125760001

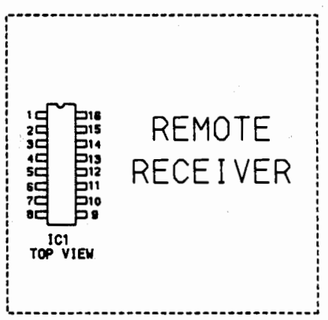


ARR007 REMOTE RECEIVER MODULE



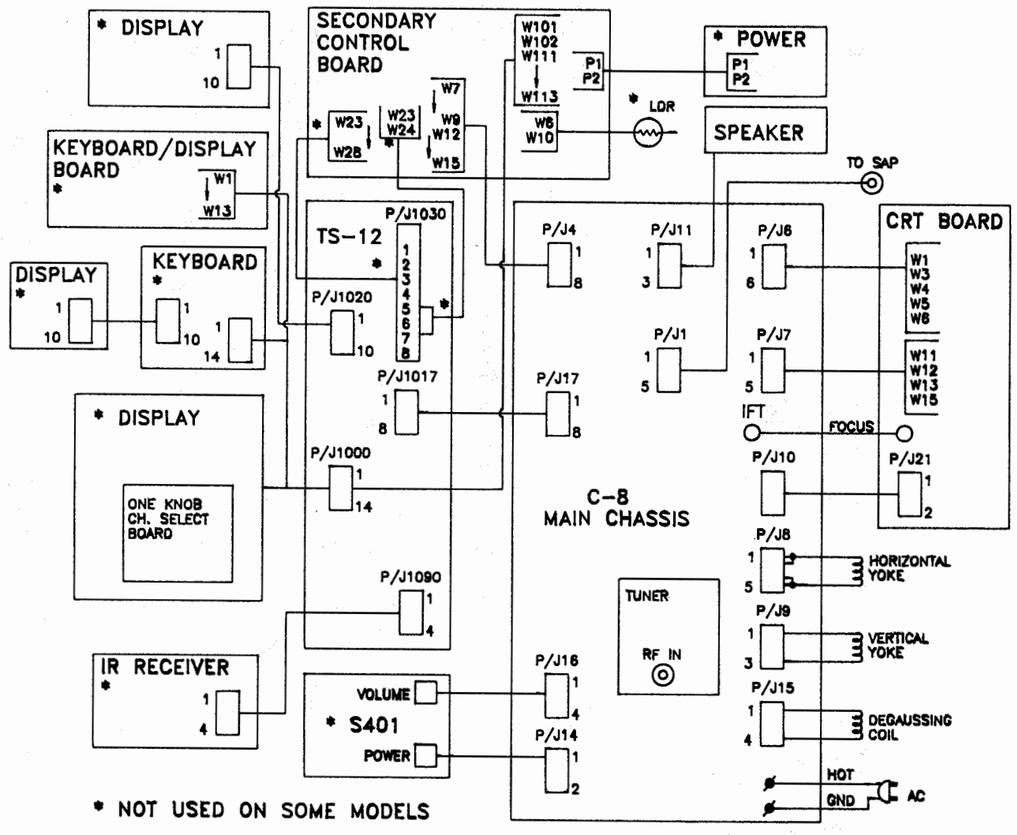
REMOTE CONTROL RECEIVER-ARRØØ7



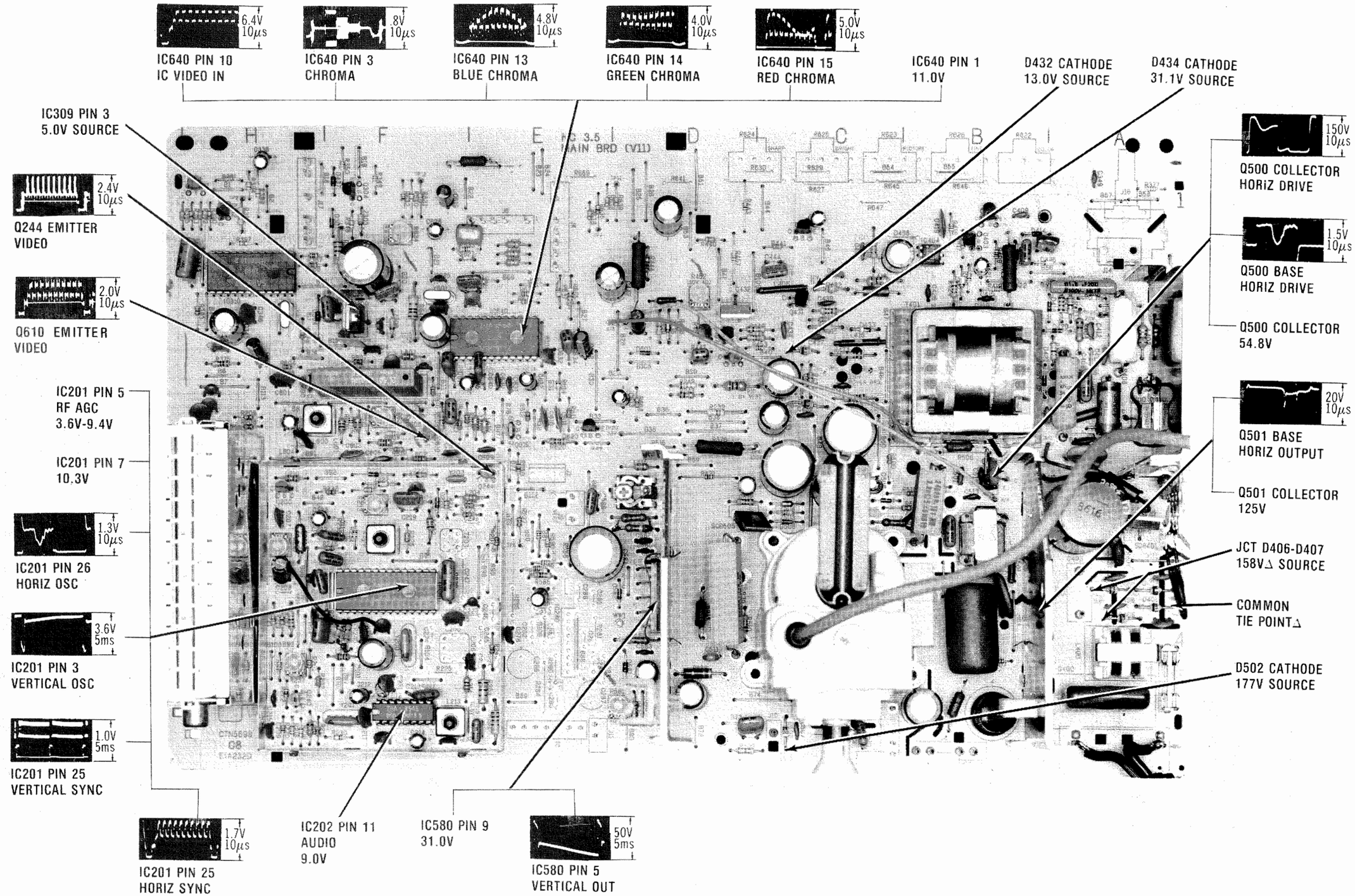


TERMINAL GUIDES

EL3727 INTERCONNECT WIRING DIAGRAM

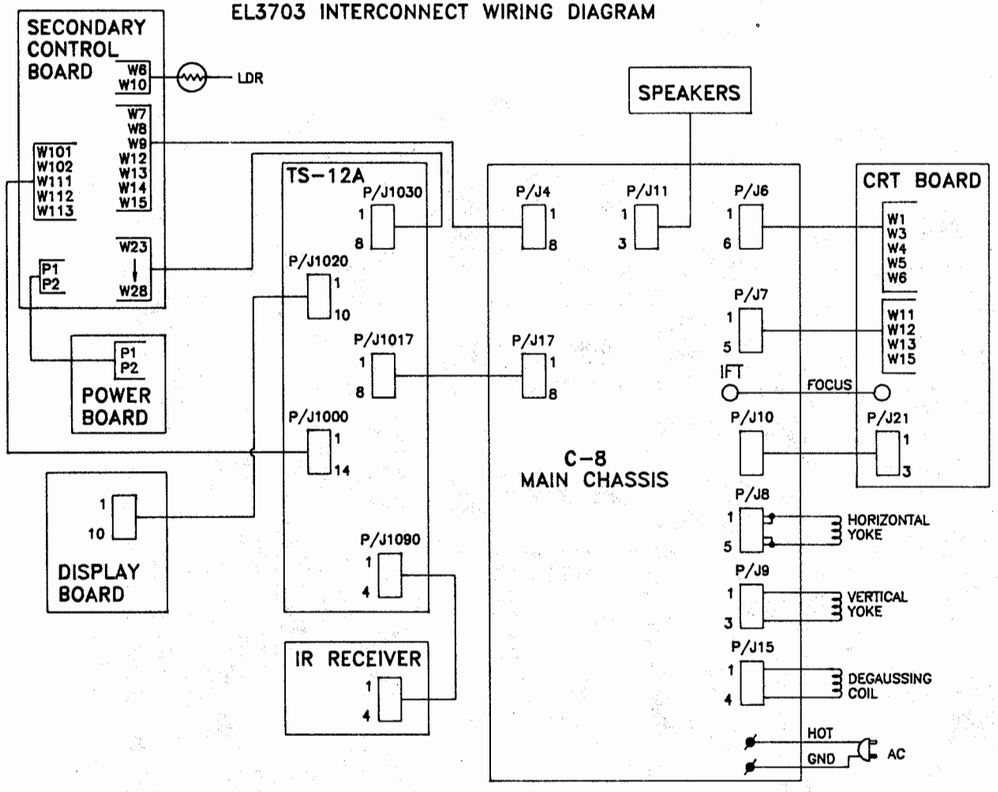


INTERCONNECT WIRING DIAGRAM EL3727



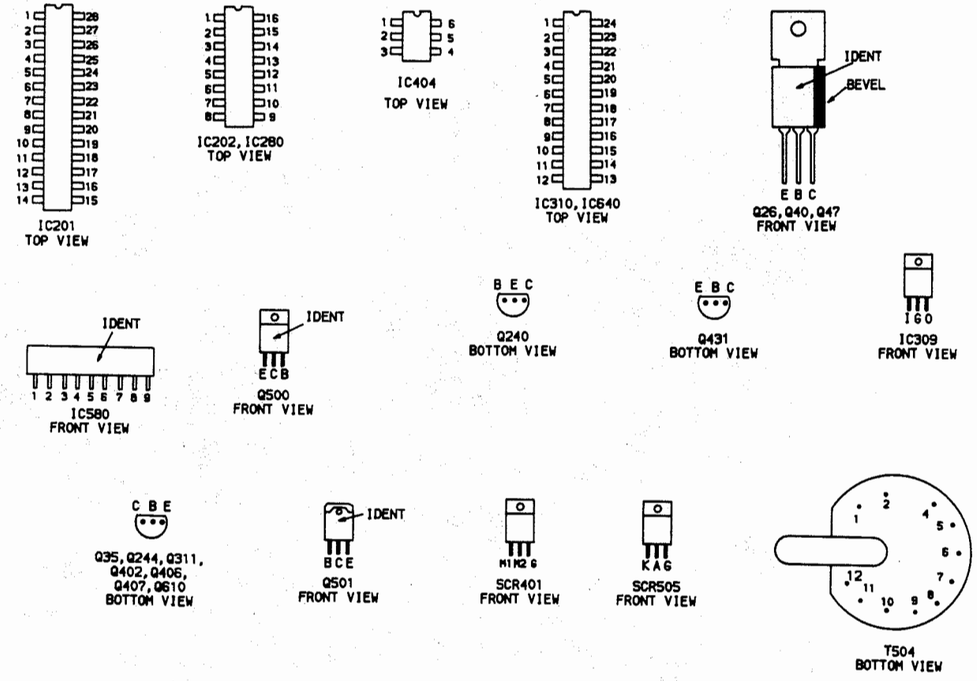
MAIN BOARD

EL3703 INTERCONNECT WIRING DIAGRAM



INTERCONNECT WIRING DIAGRAM EL3703

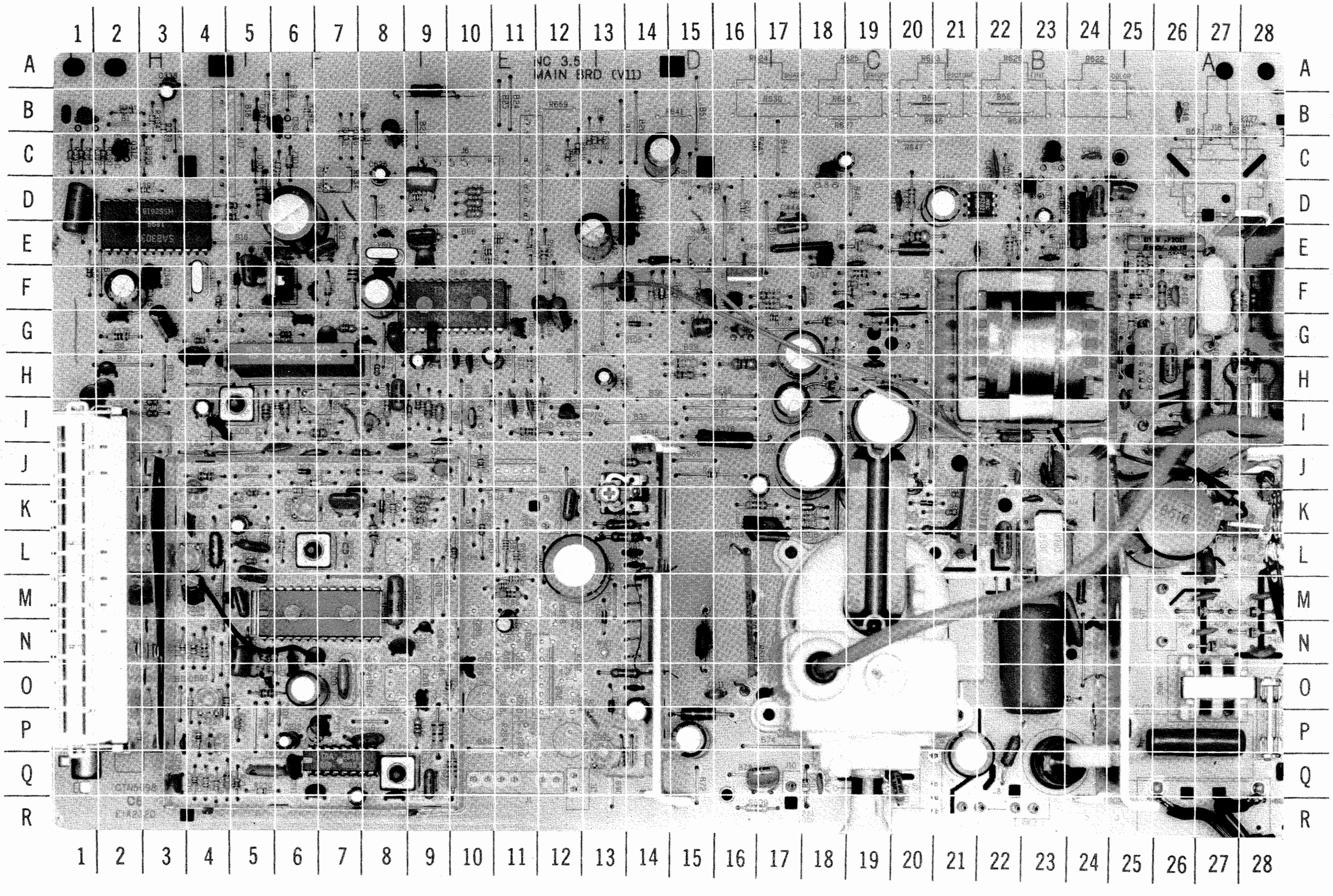
TERMINAL GUIDES AND NOTES



 # 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 ½W or less, 5% unless noted.
Value in ( ) used in some versions.
10% unless noted.
Measurements with switching as shown, unless noted.

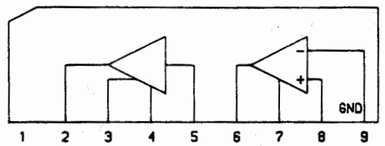


MAIN BOARD

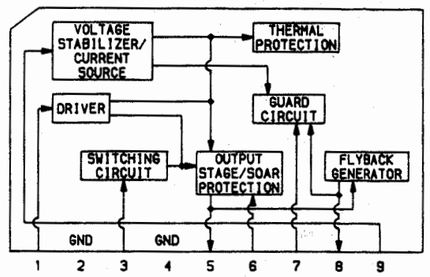
A Howard W. Sams GRIDTRACE™ Photo

MAIN BOARD

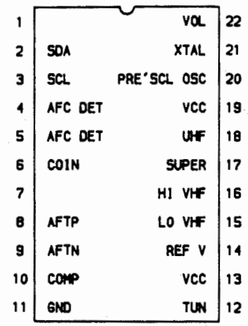
IC280



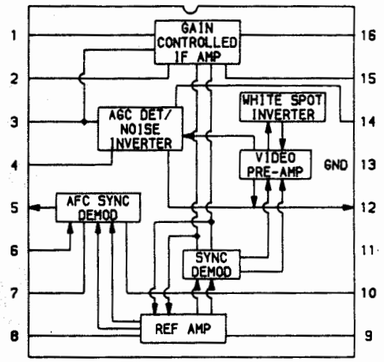
IC580



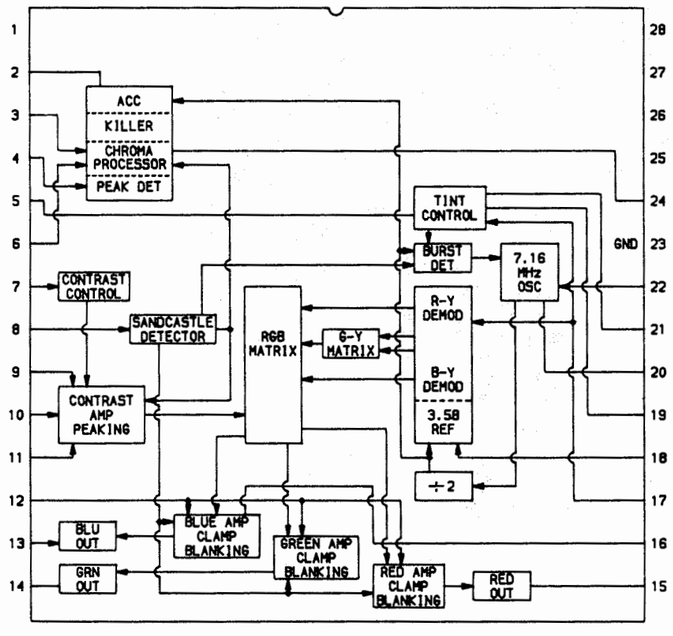
IC310



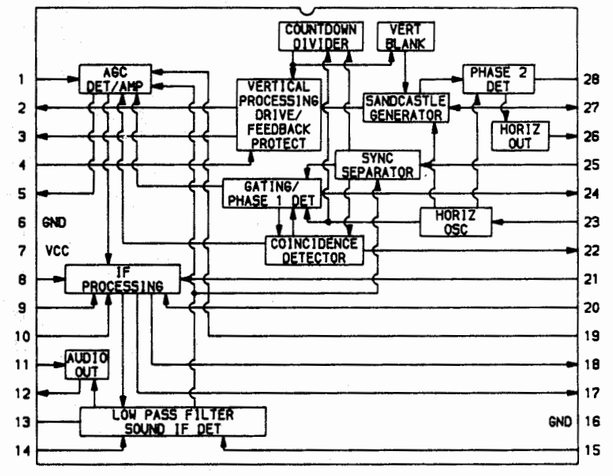
IC202

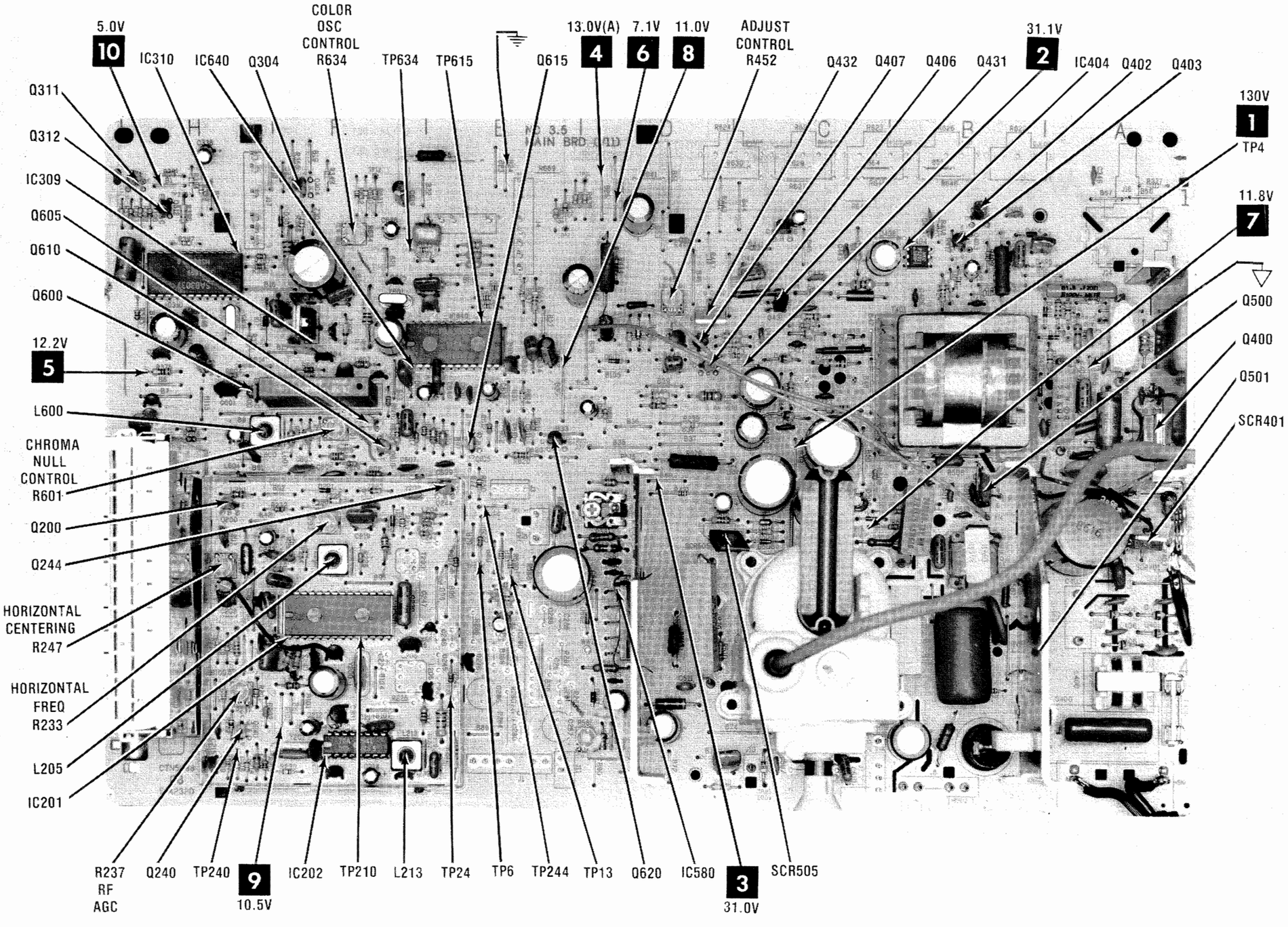


IC640

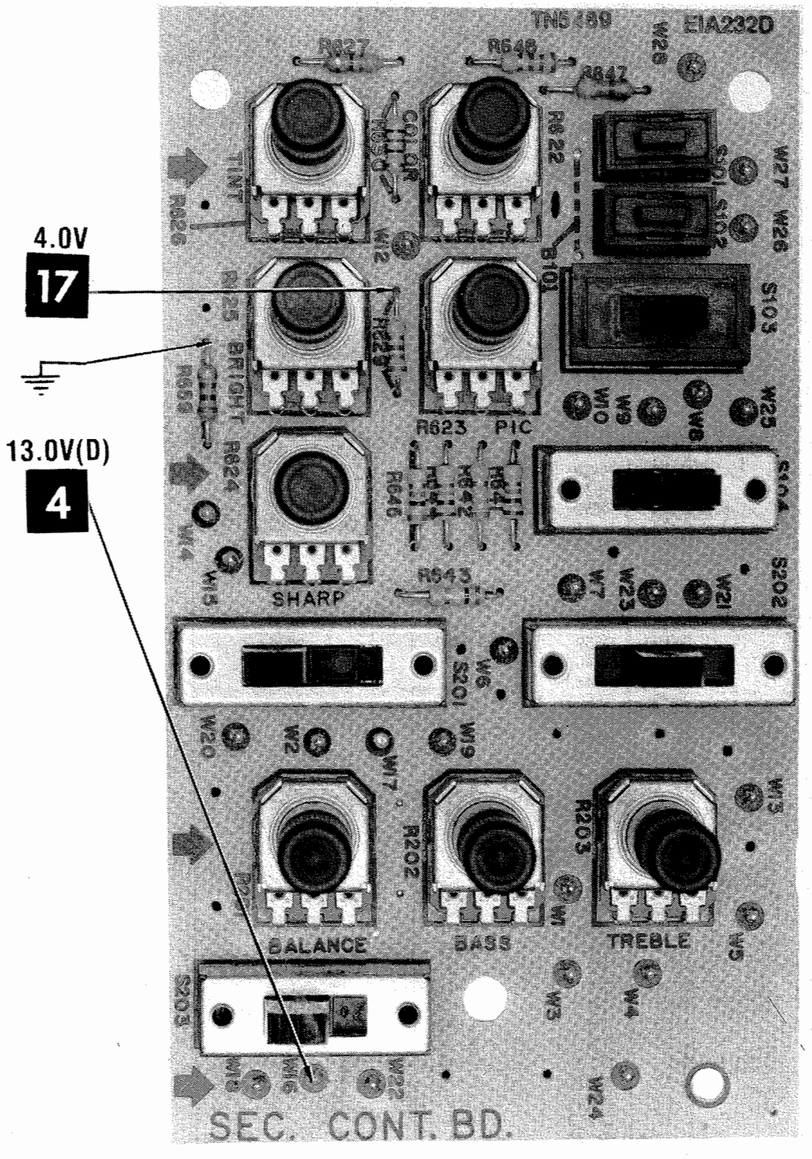


IC201





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

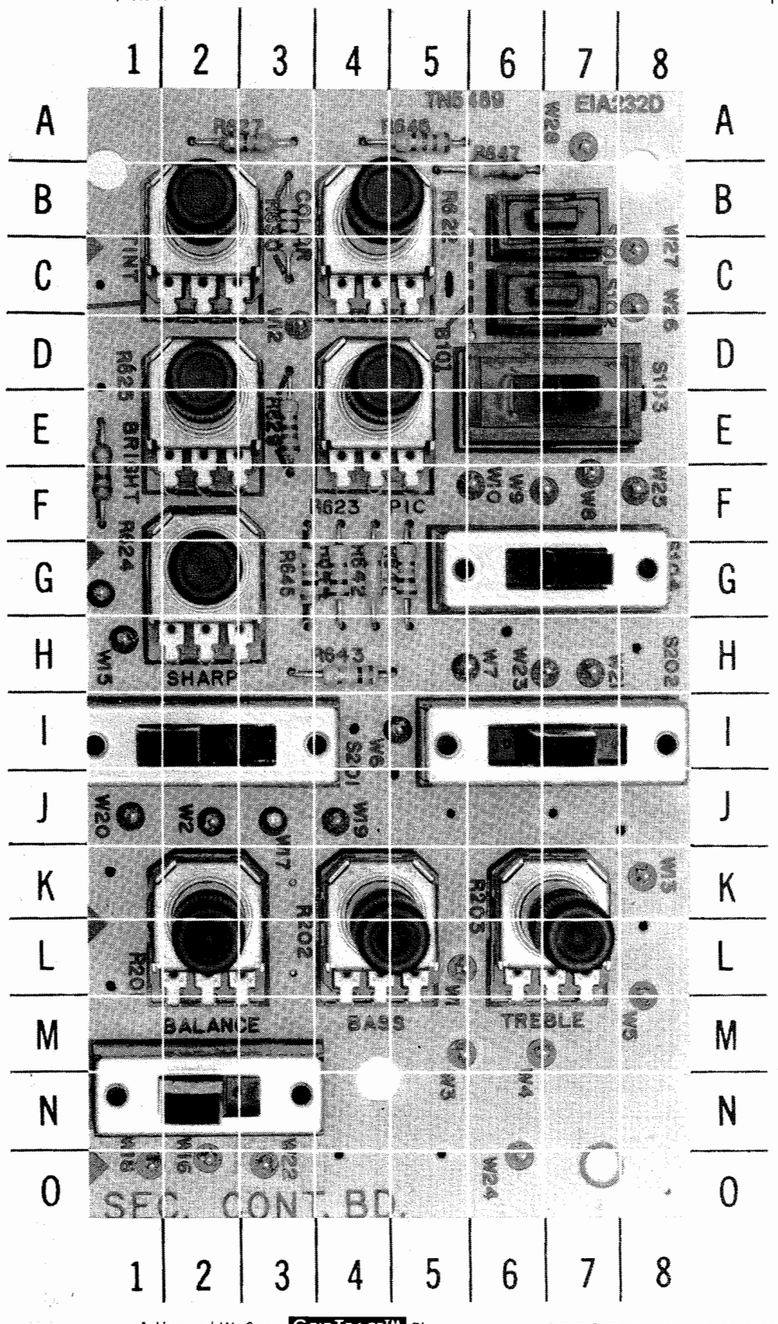


SECONDARY CONTROL BOARD

A Howard W. Sams CIRCUITRACE Photo

SECONDARY CONTROL BOARD-GridTrace LOCATION GUIDE

R201	L-2	R626	B-2	R644	G-4	S102	C-7
R202	L-5	R627	A-3	R645	G-3	S103	E-7
R203	L-7	R629	E-3	R646	A-5	S104	G-7
R622	B-5	R630	B-3	R647	B-6	S201	I-2
R623	D-5	R641	G-5	R659	F-1	S202	I-7
R624	G-2	R642	G-4	S101	B-7	S203	N-2
R625	D-2	R643	H-4				

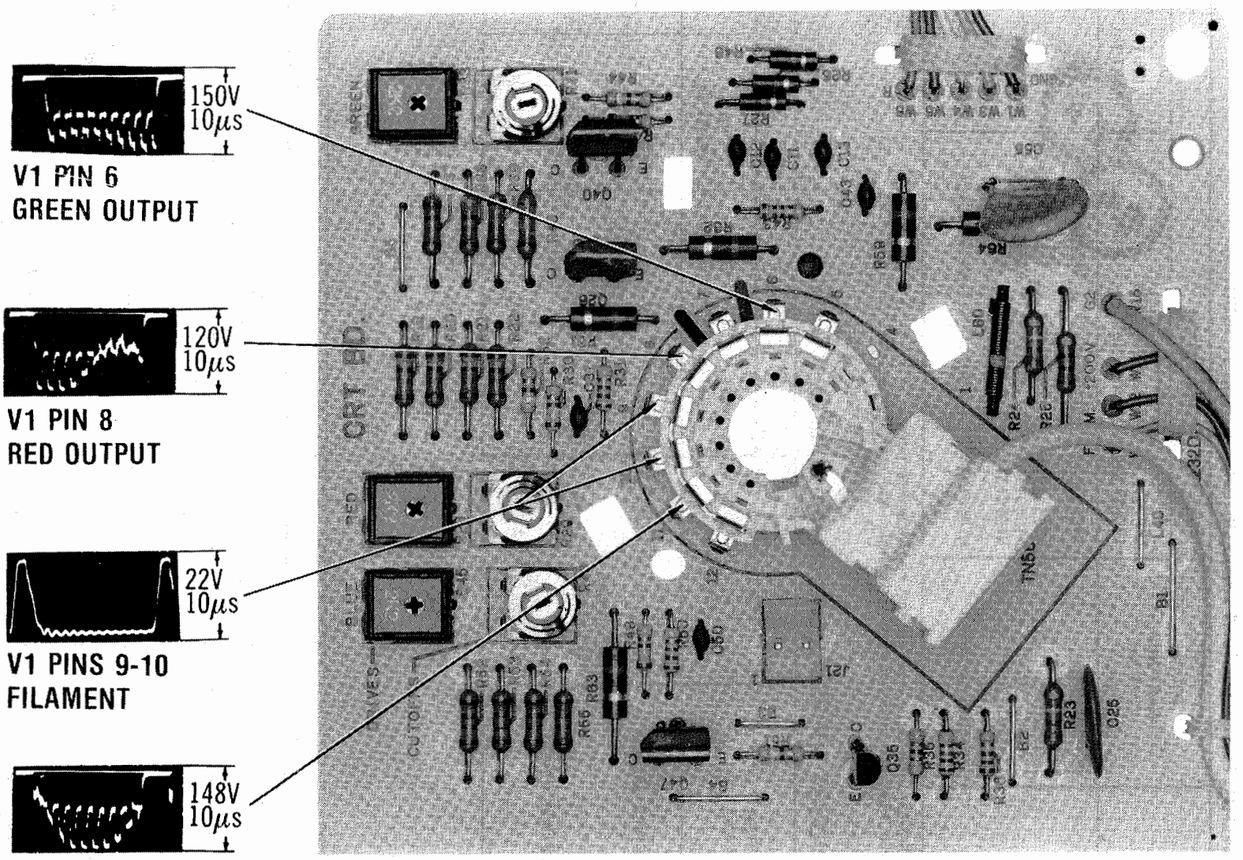


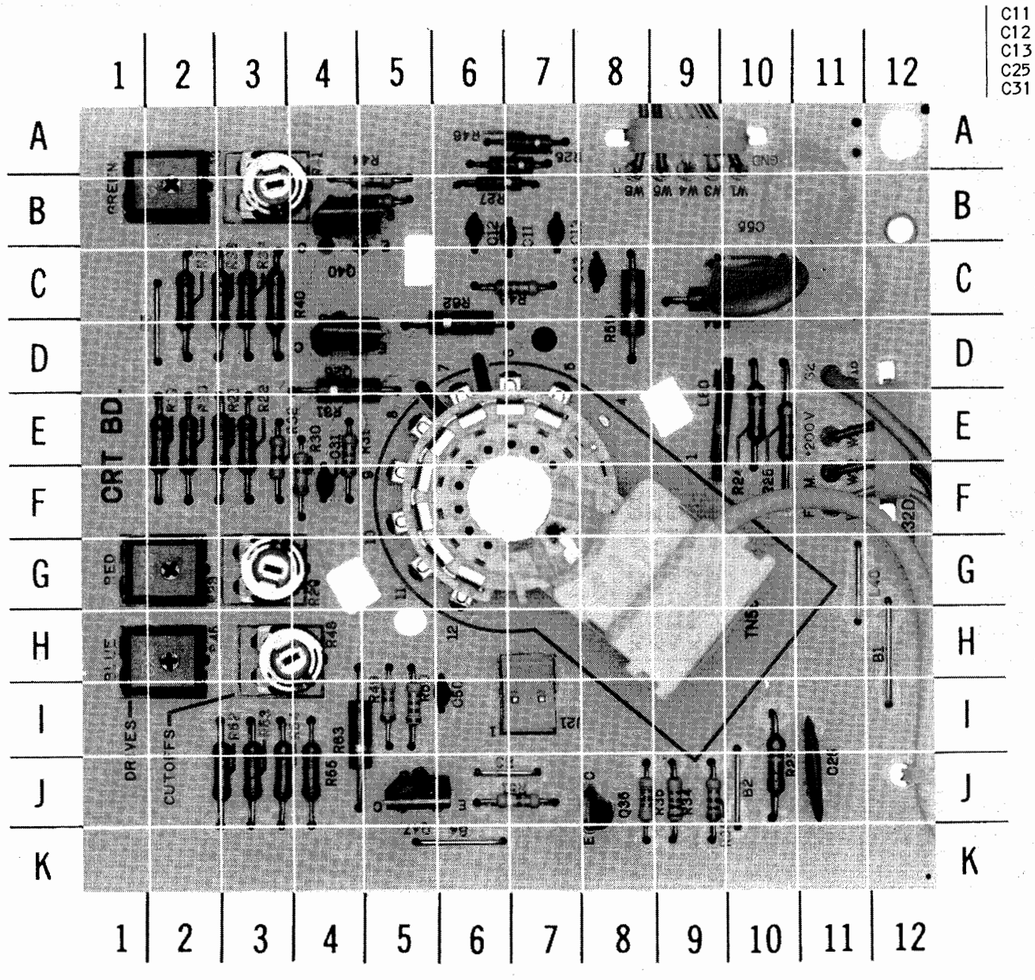
A Howard W. Sams GRIDTRACE™ Photo

SECONDARY CONTROL BOARD

MAIN BOARD-GridTrace LOCATION GUIDE

C200	N-5	C432	I-18	D301	C-5	L602	J-7	R367	D-5	R515	I-14	Y600	G-6
C201	N-5	C433	H-17	D304	F-5	L605	I-7	R375	G-2	R516	K-21	Y601	E-8
C202	N-6	C434	F-18	D305	F-5	L606	I-6	R376	I-16	R579	Q-13	Z222	J-6
C205	N-8	C435	G-17	D402	J-27	L607	G-7	R377	B-28	R581	K-13	Z223	J-7
C206	J-7	C436	P-15	D404	D-28	L609	I-9	R379	F-4	R582	O-14	Z303	C-6
C207	K-4	C437	E-19	D405	N-28	L610	I-9	R380	J-1	R583	Q-14	Z306	F-7
C209	Q-3	C438	D-21	D406	N-27	L614	D-10	R383	F-1	R584	M-11	Z408	F-27
C210	O-6	C439	E-19	D407	M-27	L615	D-10	R387	N-4	R585	Q-13	Z417	E-22
C211	Q-6	C440	C-14	D409	H-25	L616	D-10	R390	C-2	R586	M-11	Z435	E-14
C212	P-6	C442	E-13	D414	C-25	Q200	J-4	R392	C-1	R587	L-13	Z436	F-14
C213	P-8	C443	D-20	D415	F-27	Q240	P-4	R393	C-1	R587A	K-13	Z503	K-18
C214	R-7	C444	C-17	D416	E-26	Q244	J-9	R394	B-3	R588	L-12	Z504	K-18
C215	P-3	C445	G-15	D418	E-25	Q304	B-6	R395	C-1	R589	M-11		
C216	Q-9	C446	F-15	D419	E-23	Q311	B-1	R396	C-3	R590	L-11		
C218	N-6	C447	F-14	D420	F-25	Q312	C-2	R397	D-3	R600	I-6		
C219	K-7	C448	J-26	D421	H-25	Q400	I-28	R398	D-1	R601	I-6		
C220	M-5	C449	C-19	D424	H-18	Q402	C-23	R399	B-3	R602	I-4		
C221	L-4	C500	L-22	D425	D-25	Q403	D-23	R400	K-28	R603	Q-4		
C222	K-5	C501	J-22	D431	F-19	Q406	G-16	R401	L-27	R604	G-4		
C223	L-5	C502	N-24	D432	E-19	Q407	F-16	R402	K-27	R605	G-6		
C226	N-9	C503	J-18	D433	F-20	Q410	C-18	R403	M-28	R606	H-8		
C227	M-5	C504	N-23	D434	G-18	Q431	E-18	R404	F-26	R607	G-6		
C228	M-4	C505	N-21	D437	B-5	Q432	F-16	R405	H-25	R608	I-8		
C229	M-8	C506	Q-17	D449	H-18	Q500	J-23	R406	E-26	R609	I-7		
C230	Q-6	C507	Q-18	D500	K-20	Q501	O-25	R407	F-28	R610	I-6		
C231	P-7	C508	Q-21	D502	Q-18	Q600	H-4	R408	F-27	R611	H-12		
C232	Q-8	C509	J-17	D506	K-18	Q605	H-7	R409	D-23	R612	I-10		
C233	O-9	C510	Q-20	D581	O-13	Q610	I-8	R416	E-23	R614	H-11		
C278	O-10	C511	Q-16	D582	M-13	Q615	I-10	R417	D-22	R617	I-9		
C336	F-5	C512	J-23	D601	G-14	Q620	I-12	R418	C-22	R618	I-9		
C337	D-6	C513	K-23	F400	P-28	R201	O-4	R419	E-23	R619	I-7		
C338	B-3	C516	J-20	IC201	M-7	R202	P-5	R420	E-25	R620	I-11		
C339	E-7	C580	L-14	IC202	Q-7	R203	P-9	R421	D-24	R631	C-8		
C345	F-2	C581	L-14	IC309	F-6	R207	L-10	R422	E-24	R632	C-7		
C346	F-3	C582	P-14	IC310	E-3	R208	I-3	R423	E-25	R633	D-9		
C347	F-6	C583	O-14	IC404	D-22	R209	I-3	R424	E-22	R634	C-7		
C349	B-26	C584	L-12	IC580	N-14	R210	N-5	R430	G-25	R635	C-12		
C350	N-1	C585	N-11	IC640	F-10	R215	Q-5	R431	J-15	R636	C-13		
C351	P-1	C586	K-15	J1	Q-12	R216	Q-4	R432	H-18	R637	E-11		
C352	I-1	C587	M-14	J4	B-11	R217	K-8	R433	H-20	R638	C-12		
C353	D-1	C601	H-4	J6	C-10	R218	Q-4	R434	G-19	R639	C-13		
C354	H-2	C602	G-8	J7	R-21	R219	N-4	R437	F-19	R640	C-7		
C360	H-1	C603	J-6	J8	R-23	R220	Q-4	R438	F-19	R648	F-7		
C361	G-2	C604	G-6	J9	K-12	R221	N-3	R439	D-20	R650	J-10		
C362	H-2	C605	G-7	J10	Q-17	R222	P-4	R440	D-16	R655	E-12		
C364	G-3	C606	J-6	J11	Q-12	R223	K-9	R441	D-17	R666	P-15		
C365	O-1	C607	J-8	J15	M-6	R224	K-9	R443	C-16	R668	H-13		
C366	M-4	C608	H-8	J17	D-4	R226	L-7	R444	D-14	R670	E-10		
C400	P-27	C609	I-9	L201	Q-4	R227	K-10	R446	F-15	R671	E-11		
C401	J-27	C610	I-11	L202	L-8	R228	K-7	R447	G-15	R672	E-10		
C402	J-28	C611	I-11	L204	K-9	R229	K-6	R448	F-17	S580	K-13		
C403	K-26	C612	H-10	L205	L-6	R230	Q-5	R449	F-17	SCR401	K-28		
C404	M-28	C613	H-13	L210	J-4	R231	Q-10	R450	F-14	SCR505	K-17		
C405	N-28	C614	I-4	L211	O-5	R232	K-5	R451	F-15	T401	G-23		
C406	N-27	C618	G-8	L213	Q-8	R233	K-6	R452	E-15	T500	L-23		
C407	M-27	C619	B-8	L214	P-9	R234	L-6	R453	G-17	T504	N-19		
C408	H-26	C620	E-9	L400	O-27	R235	L-5	R454	O-25	TP1	K-11		
C409	C-24	C621	F-8	L402	F-27	R236	O-4	R455	A-9	TP2	C-3		
C410	H-25	C624	F-8	L403	H-16	R237	O-4	R456	D-14	TP4	I-18		
C412	F-26	C625	E-8	L405	H-26	R238	P-6	R457	D-16	TP5	H-18		
C413	C-26	C626	C-8	L406	E-18	R239	H-16	R500	J-20	TP6	L-10		
C414	H-27	C627	D-9	L409	I-28	R240	N-5	R501	K-20	TP8	E-18		
C415	C-23	C630	H-10	L410	I-27	R240A	N-5	R502	K-21	TP10	H-17		
C417	H-27	C631	H-10	L415	F-20	R242	H-15	R503	J-22	TP13	L-11		
C418	D-24	C632	G-11	L416	D-24	R243	H-15	R504	K-21	TP24	P-9		
C419	C-22	C633	E-9	L417	E-20	R244	O-9	R505	K-22	TP210	N-7		
C420	D-25	C634	F-12	L418	F-23	R246	L-5	R506	I-22	TP240	Q-4		
C421	D-23	C635	H-9	L501	M-24	R247	L-4	R507	O-24	TP244	K-10		
C422	E-26	C640	G-9	L502	N-16	R251	L-11	R508	P-22	TP615	F-10		
C423	H-19	C641	E-9	L503	Q-23	R348	C-6	R509	R-16	TP634	D-8		
C426	E-21	C642	F-12	L515	J-14	R349	B-6	R510	N-16	Y200	O-7		
C427	F-18	C647	I-4	L516	M-25	R350	B-5	R512	K-16	Y201	Q-5		
C430	I-26	D220	K-8	L600	I-5	R365	D-5	R513	M-16	Y202	J-8		
C431	I-19	D221	J-6	L601	I-5	R366	D-5	R514	N-15	Y301	F-4		





CRT BOARD
GridTrace LOCATION GUIDE

C11	B-7	C43	C-8
C12	B-6	C50	I-6
C13	B-7	C55	C-10
C25	J-11	J21	I-7
C31	F-4	L60	E-10
		Q26	D-4
		Q35	J-8
		Q40	B-4
		Q47	J-5
		R19	E-2
		R20	E-2
		R21	E-3
		R22	E-3
		R23	I-10
		R24	E-10
		R25	E-10
		R26	A-7
		R27	B-6
		R28	G-2
		R29	G-6
		R30	F-4
		R31	E-4
		R32	E-3
		R33	B-2
		R34	J-9
		R35	J-8
		R36	J-9
		R37	C-2
		R38	C-3
		R39	C-3
		R40	C-3
		R41	B-3
		R42	B-5
		R43	C-7
		R44	B-5
		R45	H-2
		R46	A-7
		R48	H-3
		R49	I-5
		R50	I-5
		R51	J-7
		R52	J-3
		R53	J-3
		R54	J-3
		R55	J-4
		R59	C-8
		R61	D-4
		R62	D-6
		R63	I-4
		R64	C-9

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFGR. PART No./ TYPE No.	NTE PART No.	ECG PART No.	TCE PART No.	ZENITH PART No.	NOTES
Q240	6104420001	NTE319P *	ECG319P *	SK9432/319P *	121-Z9021 *	
Q244	6104340001	NTE159 *	ECG159 *	SK3466/159 *	121-Z9003 *	
Q304	6104350001	NTE123AP *	ECG123AP *	SK3854/123AP *	121-Z9000A *	
Q311	6104340001	NTE159 *	ECG159 *	SK3466/159 *	121-Z9003 *	
Q312	6104350001	NTE123AP *	ECG123AP *	SK3854/123AP *	121-Z9000A *	
Q400	6105320003	NTE2315	ECG2315			#
Q402	C327(EUROPE)	NTE159 *	ECG159 *	SK3466/159 *	121-Z9003 *	
	6103690001	NTE159 *	ECG159 *	SK3466/159 *	121-Z9003 *	
Q403	6105000001	NTE123AP *	ECG123AP *	SK3854/123AP *	121-Z9000A *	
Q406	C557(EUROPE)	NTE159 *	ECG159 *	SK3466/159 *	121-Z9003 *	
	6104980001	NTE159 *	ECG159 *	SK3466/159 *	121-Z9003 *	
Q407	6105000004	NTE123AP *	ECG123AP *	SK3854/123AP *	121-Z9000A *	
Q410	6104350001	NTE123AP *	ECG123AP *	SK3854/123AP *	121-Z9000A *	
Q431	6103600001	NTE288	ECG288	SK3434/288	121-Z9046	
Q432	C3038	NTE51	ECG51	SK9452/51		
	6105510001	NTE51	ECG51	SK9452/51		
Q500	BF819	NTE198	ECG198	SK3220/198	121-Z9028	
	6105310001	NTE198	ECG198	SK3220/198	121-Z9028	
Q501	6104330002	NTE2302	ECG2302	SK9422		#
Q600,605	6104350001	NTE123AP *	ECG123AP *	SK3854/123AP *	121-Z9000A *	
Q610	6104340001	NTE159 *	ECG159 *	SK3466/159 *	121-Z9003 *	
Q615,620	6104350001	NTE123AP *	ECG123AP *	SK3854/123AP *	121-Z9000A *	
SCR401	BT138-500	NTE56008	ECG56008	SK3660/56008		#
	6110190001	NTE56008	ECG56008	SK3660/56008		
SCR505	611018-1	NTE5456	ECG5457	SK3598/5457	185-Z9010	
	6110180001	NTE5456	ECG5457	SK3598/5457	185-Z9010	
Z222	5301571439	NTE5008A	ECG5008A	SK4A3/5008A	103-279-08	
Z223	5302491759	NTE5015A	ECG5015A	SK7A5/5015A	103-Z9002	-A001 CHASSIS
Z223	5302491829					-B002 & LATER CHASSIS
Z303	5301571569	NTE5011A	ECG5011A	SK5A6/5011A	103-Z9007	
Z306	5301571330	NTE5036A	ECG5036A	SK33A/5036A	103-Z9004	

SEMICONDUCTORS (Select replacement for best results)

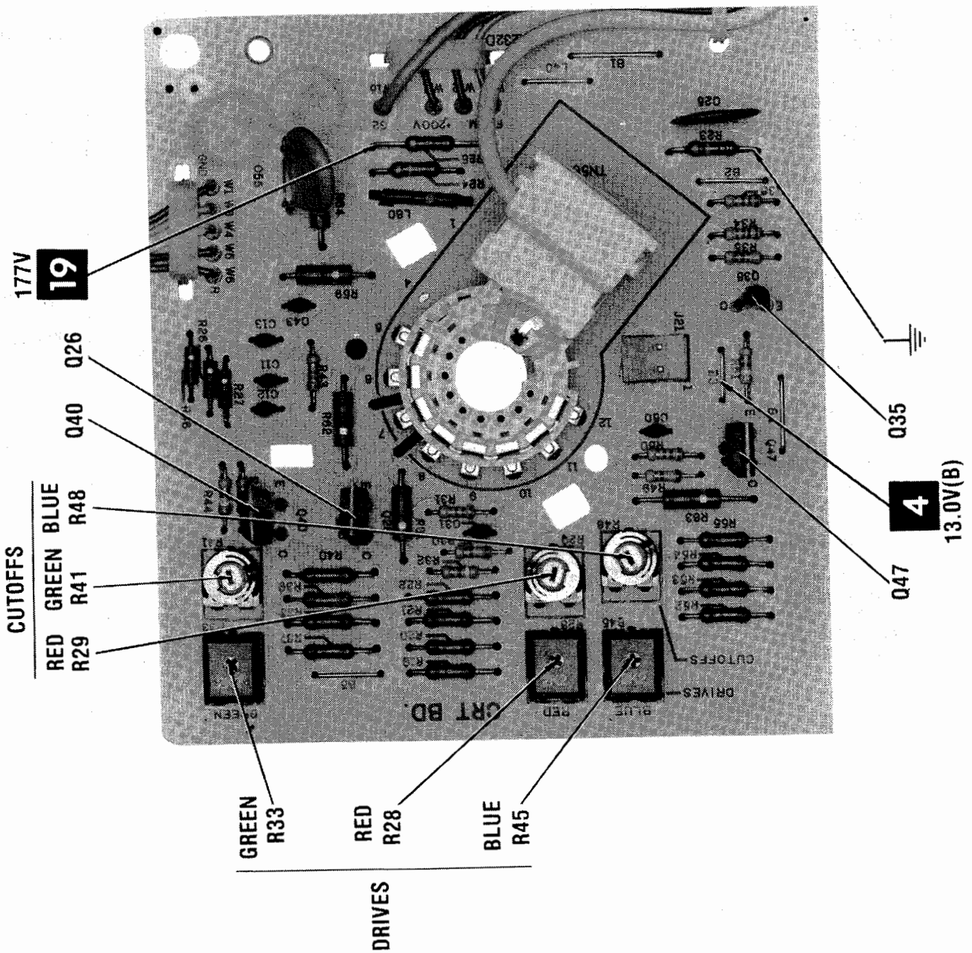
ITEM No.	MFGR. PART No./ TYPE No.	NTE PART No.	ECG PART No.	TCE PART No.	ZENITH PART No.	NOTES
Z408	5301571220	NTE5030A	ECG5030A	SK22A/5030A	103-144	
Z417	5301571130					
Z435	5303020003	NTE5021T1	ECG5021T1			
Z436	5302541039	NTE5013A	ECG5013A	SK6A2/5013A	103-Z9008	
	5303291629	NTE5013T1	ECG5013T1			
Z503	5302491160					#
Z504	5302491519	NTE5010A	ECG5010A	SK5A1/5010A	103-279-10	#

\# For SAFETY use only equivalent replacement part.
\+ Rotate 180° to conform with original lead configuration.

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFGR. PART No./ TYPE No.	NTE PART No.	ECG PART No.	TCE PART No.	ZENITH PART No.
REMOTE RECEIVER ARR002					
D2	5303176001				
IC1	6124500001				
REMOTE RECEIVER ARR007					
IC1	6125790001				

ITEM No.	MFGR. PART No./ TYPE No.	NTE PART No.	ECG PART No.	TCE PART No.	ZENITH PART No.	NOTES
TRANSMITTER TUMA5G						
D3	5301810001	NTE177	ECG177	SK9091/177	103-131	
IC1	6125670004					MA01 VERSIONS
IC1	6125990001					MA11 VERSIONS
IC2	6125660001					
Q1	6102230001	NTE159	ECG159	SK3466/159	121-Z9003	
Q2	6104430001	NTE48	ECG48			
Q3	6102230001	NTE159	ECG159	SK3466/159	121-Z9003	
Q4	6102240001	NTE123AP	ECG123AP	SK3854/123AP	121-Z9000A	
TRANSMITTER T176AG						
IC1	6125590001					
Q1	6102240001	NTE123AP	ECG123AP	SK3854/123AP	121-Z9000A	
Q2	6101580003	NTE159	ECG159	SK3466/159	121-Z9003	



CRT BOARD

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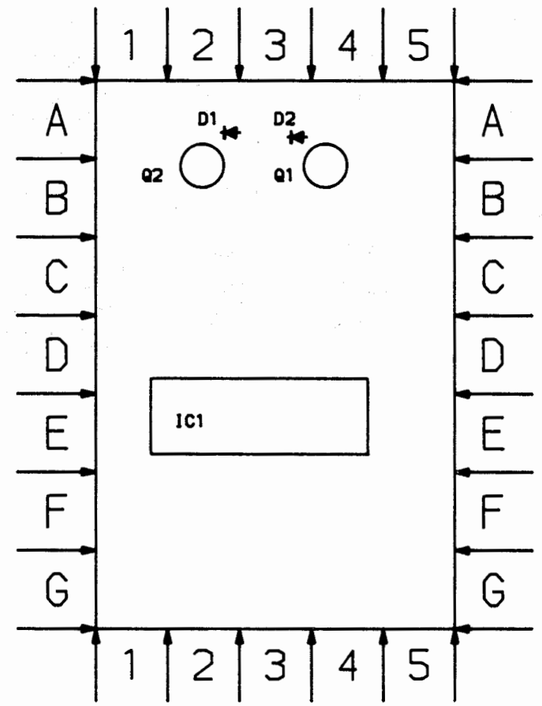
REMOTE CONTROL TRANSMITTER
T176AG-GridTrace LOCATION GUIDE

C1	C-5	IC1	E-3	R2	B-2
C2	C-1	L1	D-2	R3	C-4
C3	C-2	Q1	A-4	R4	C-4
D1	A-2	Q2	B-2	R5	B-4
D2	A-3	R1	C-2	R6	C-2



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REMOTE CONTROL TRANSMITTER-T176AG

PARTS LIST AND DESCRIPTION

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.	ZENITH PART No.	NOTES
D220,221,301	5301810001	NTE177	ECG177	SK9091/177	103-131	
D304	5302990002					
D305	5301810001	NTE177	ECG177	SK9091/177	103-131	
D402	5301810001	NTE177	ECG177	SK9091/177	103-131	-A001 CHASSIS
D402	5302990002					-B002 & LATER CHASSIS
D404 THRU D407	1N5062	NTE506	ECG506	SK3175A	212-Z9007	
	5302620001	NTE506	ECG506	SK3175A	212-Z9007	
D409	5303100003	NTE580	ECG580	SK5036/580	212-Z9000	
D414	5302990001					
D415	5302600002	NTE580	ECG580	SK5036/580	212-Z9000	
D416	5302990001					
D418	5301810001	NTE177	ECG177	SK9091/177	103-131	
D419	5302990002					
D420,21	5301810001	NTE177	ECG177	SK9091/177	103-131	
D422	BYW95C	NTE580	ECG580	SK5036/580	212-Z9000	
	5303051003	NTE580	ECG580	SK5036/580	212-Z9000	
D423	BYD33J	NTE580	ECG580	SK5036/580	212-Z9000	
	5303101003	NTE580	ECG580	SK5036/580	212-Z9000	
D424	BYV95C	NTE580	ECG580	SK5036/580	212-Z9000	
	5302600002	NTE580	ECG580	SK5036/580	212-Z9000	
D425	BZV46-1V5					
	5303010002					
D431	5302680001	NTE519	ECG519	SK3100/519	103-131	-A001 CHASSIS
D431	5302600001	NTE580	ECG580	SK5036/580	212-Z9000	-B002 & LATER CHASSIS
D432	BYV27-150	NTE588	ECG588			
	5303260003					
D433	BYV33J	NTE580	ECG580	SK5036/580	212-Z9000	
	5303100003	NTE580	ECG580	SK5036/580	212-Z9000	
D434	BYV95C	NTE580	ECG580	SK5036/580	212-Z9000	
	5302600002	NTE580	ECG580	SK5036/580	212-Z9000	

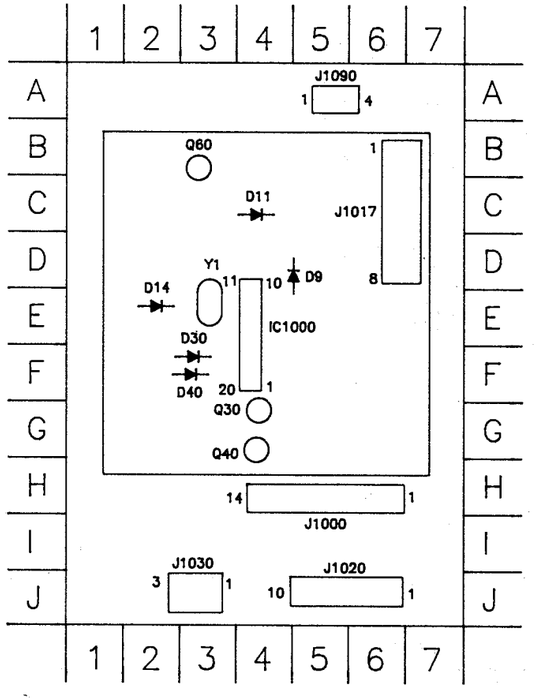
SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFGR. PART No./ TYPE No.	NTE PART No.	ECG PART No.	TCE PART No.	ZENITH PART No.	NOTES
D437	5302990001					
D438	5301810001	NTE177	ECG177	SK9091/177	103-131	USED LATE VERSIONS
D449	5301810001	NTE177	ECG177	SK9091/177	103-131	
D450	5301810001	NTE177	ECG177	SK9091/177	103-131	-E005 CHASSIS ONLY
D500	5301810001	NTE177	ECG177	SK9091/177	103-131	
D502	BYD33J	NTE580	ECG580	SK5036/580	212-Z9000	
	5303100003	NTE580	ECG580	SK5036/580	212-Z9000	
D506	5302660001	NTE177	ECG177	SK9091/177	103-131	#
D581	5302990001					
D582,601	5301810001	NTE177	ECG177	SK9091/177	103-131	
D702	5301810001	NTE177	ECG177	SK9091/177	103-131	
IC201	TDA4505A					
	6125070001					
IC202	TDA2541	NTE1413	ECG1413	SK7635/1413		
	6121260001	NTE1413	ECG1413	SK7635/1413		
IC202	6125880001					LATE PRODUCTION
IC280	6124670001					MONO CHASSIS ONLY
IC309	612479-1	NTE960	ECG960	SK3591/960	221-Z9043	
	6124790001	NTE960	ECG960	SK3591/960	221-Z9043	
IC310	SAB3037					
	6125450001					
IC404	PS2021	NTE3041	ECG3041	SK2041/3041		
	5302980001	NTE3041	ECG3041	SK2041/3041		
IC580	TDA3654Q	NTE1567	ECG1567	SK7805/1567		
	6124440001	NTE1567	ECG1567	SK7805/1567		
IC640	TDA3564					
	6125080001					
IC640	6126150001					-E005 CHASSIS
Q26	6102500003	NTE171	ECG171	SK3201/171	121-822	
Q35	6104340001	NTE159 *	ECG159 *	SK3466/159 *	121-Z9003 *	
Q40,47	6102500003	NTE171	ECG171	SK3201/171	121-822	
Q200	6104350001	NTE123AP *	ECG123AP *	SK3854/123AP *	121-Z9000A *	

TUNING SYSTEM TS-12B/C-GridTrace LOCATION GUIDE

C1	I-7	C53	A-4	L6	G-5	R11	C-3
C2	I-6	C54	E-2	L7	G-5	R12	D-3
C3	I-6	C60	A-6	L18	C-4	R14	B-4
C4	I-6	C62	B-2	L19	D-4	R15	E-2
C5	I-6	C90	A-6	L20	C-5	R30	I-2
C6	I-5	D9	D-5	L21	C-5	R32	G-3
C7	I-5	D11	C-4	L30	G-4	R40	I-2
C8	I-3	D14	E-2	L40	G-5	R42	G-3
C11	I-2	D30	F-3	L50	D-5	R51	G-2
C12	D-4	D40	F-3	Q30	G-4	R52	G-2
C13	D-4	IC1000	E-4	Q40	G-4	R53	G-3
C14	B-3	J1000	H-5	Q60	B-3	R54	G-3
C15	I-2	J1017	C-6	R1	F-7	R56	B-4
C18	C-4	J1020	J-5	R2	F-6	R58	D-6
C20	C-4	J1030	J-3	R3	F-6	R59	E-5
C21	C-5	J1090	A-5	R4	F-6	R60	B-4
C30	J-4	L1	G-7	R5	F-6	R62	C-2
C40	I-5	L2	G-6	R6	F-5	R64	C-2
C50	D-5	L3	G-6	R7	F-5	R90	C-6
C51	E-6	L4	G-6	R8	F-5	Y1	E-3
C52	D-4	L5	G-6				

ATU006,ATU007,ATU008 & ATU009 (TS12B/C) P.C. BOARD OVERLAY (COMPONENT VIEW)



TUNING SYSTEM TS-12B/C

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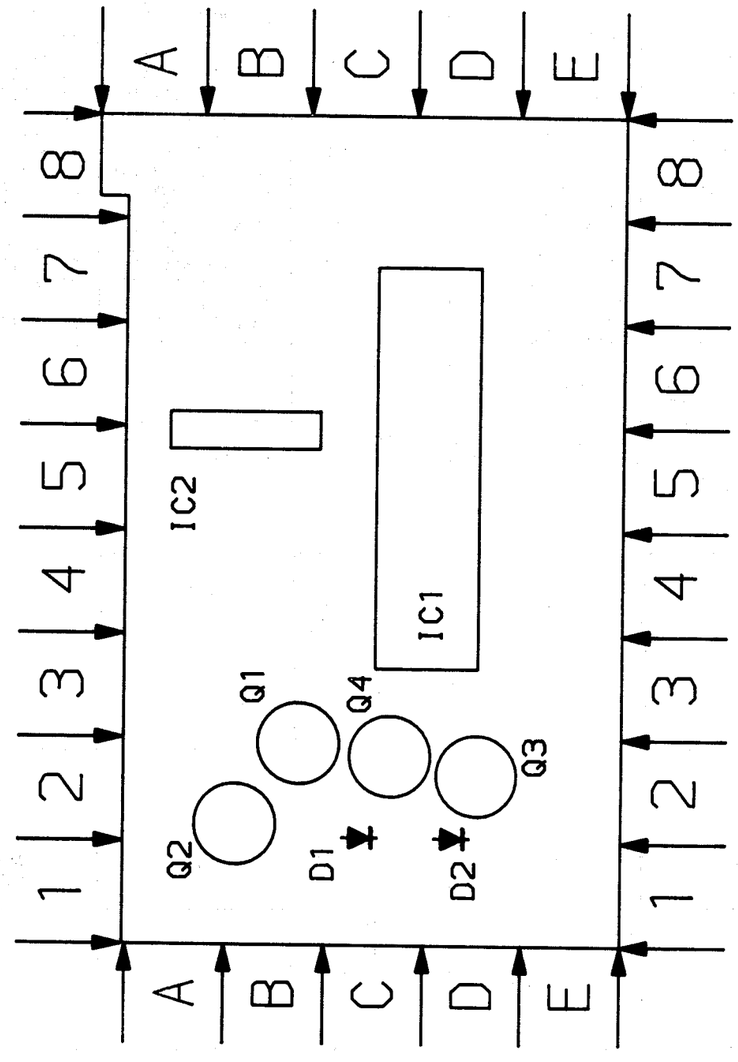
REMOTE CONTROL TRANSMITTER-TUMA5G GridTrace LOCATION GUIDE

C1	B-4
C2	D-7
C3	B-3
C4	B-3
C5	A-4
C6	E-3
D1	C-2
D2	D-2
D3	A-6
IC1	D-5
IC2	B-5
Q1	C-2
Q2	B-2
Q3	D-2
Q4	C-2
R1	A-7
R2	B-7
R3	B-7
R4	B-7
R5	E-7
R6	E-6
R7	C-7
R8	B-7
R9	E-6
R10	E-6
R14	D-3
R15	C-3
R16	D-2
R17	C-3
R18	A-1
R19	A-1
R20	D-2
R21	C-4
R22	B-2
R23	B-4
R24	E-3
S-1	E-1
Y-1	B-3



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REMOTE CONTROL TRANSMITTER-TUMA5G
SET 2646 FOLDER 1

ELECTROLYTIC CAPACITORS

	ITEM No.	RATING	MFGR. PART No.
#	C402	220 10V 22 35V	2702152210 2702152135

	ITEM No.	RATING	MFGR. PART No.
#	C509	100 25V	2702151225

For SAFETY use only equivalent replacement part.
Items Not Listed Are Normally Available At Local Distributors.

CAPACITORS

	ITEM No.	RATING	MFGR. PART No.
	C204	82 NPO 50V 5%	2508418205
	C208	15 NPO 50V 5%	2508411505
	C230	82 NPO 50V 5%	2508418205
	C231	82 NPO 50V 5%	2508418205
	C232	82 NPO 50V 5%	2508418205
	C233	82 NPO 50V 5%	2508418205
	C278	82 NPO 50V 5%	2508418205
	C340	150 N220 50V 5%	2508421515
	C362	39 NPO 50V 5%	2508413905
#	C400	.22 120VAC	2509842240
	C439	68 N750 50V 5%	2508686805
#	C448	.0047 125VAC	2506260014
#	C502	470 2KV 10%	2508850004
#	C504	.47 400V 5%	2508050002 (1)
		.43 400V 5%	2508050004 (2)
#	C505	.011 2KV	2508181135
	C602	10pF NPO 50V 10%	2508411008
		4.7pF NPO 50V 10%	2508414798
	C603	300 N750 50V 5%	2508433015
	C604	82 NPO 50V 5%	2508418205
	C606	180 N220 50V 5%	2508421815
		150 N220 50V 5%	2508421515
		220 N220 50V 5%	2508422215

ITEM No.	RATING	MFGR. PART No.
C607	120 NPO 50V 5%	2508411215
C609	18 NPO 50V 5%	2508411805
	68 NPO 50V 5%	2508416805
	22 N750 50V 5%	2508412205
	100 NPO 50V 5%	2508411015
C610	82 NPO 50V 5%	2508418205
	330 N750 50V 5%	2508433315
	100 NPO 50V 5%	2508411015
	470 N750 50V 5%	2508444715
C611	180 N220 50V 5%	2508421815
	680 N220 50V 10%	2508446819
	220 N220 50V 5%	2508422215
	.001 100V 5%	2508451025
C615	15 N220 50V 5%	
	150 NPO 50V 5%	2508421515
C624	100 NPO 50V 5%	2508411015
C625	10pF NPO 50V 5%	2508411008
	4.7pF NPO 50V 10%	2508414798
	13 NPO 50V 5%	2508411305
	2-40pF Trimmer	2602290001

For SAFETY use only equivalent replacement part.
Items Not Listed Are Normally Available At Local Distributors.
(1) 26" CRT Models.
(2) 25" CRT Models.

CAPACITORS

ITEM No.	RATING	MFGR. PART No.
C12 C13	TS-12B/C 27 NPO 5% 27 NPO 5%	

ITEM No.	RATING	MFGR. PART No.

CAPACITORS

ITEM No.	RATING	MFGR. PART No.
	TS-12A TUNER CONTROL	
C15	27 NPO 5%	2507392705
C16	27 NPO 5%	2507392705

ITEM No.	RATING	MFGR. PART No.

CAPACITORS

ITEM No.	RATING	MFGR. PART No.
	TUMA5G REMOTE TRANSMITTER	
C3	22 NPO 50V 5%	2508412205
C4	22 NPO 50V 5%	2508412205

ITEM No.	RATING	MFGR. PART No.

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
	MAIN BOARD P.L.			
R28	Red Drive	2200	2204202222	
R29	Red Cut-Off	4700	2204204722	
R33	Green Drive	2200	2204202222	
R41	Green Cut-Off	4700	2204204722	
R45	Blue Drive	2200	2204202222	
R48	Blue Cut-Off	4700	2204204722	
R201	Balance	50K	2204590011 (4)	
		Detent @ 50%	2204320010 (5)	
R202	Bass	50K	2204590011 (4)	
		Detent @ 50%	2204320010 (5)	
R203	Treble	50K	2204590011 (4)	
		Detent @ 50%	2204320010 (5)	
R233	Horiz Freq Adjust	4700	2204804722 (1)	
		6800	2204806822 (2)	
R237	RF AGC	47K	2204804732	
R247	Horiz Centering Adjust	10K	2204801032	
R452	130V Adjust	1000	2204801022	
R585	Vert Height Adjust	100	2204801012	
R601	Comb Amp Null	470	2204804712	
R622	Color	10K	2304590001 (4)	
			2304320011 (6)	
R623	Picture	10K	2304590001 (4)	
			2304320011 (6)	
R624	Sharpness	10K	2304590016 (4)	
		Detent @ 50%	2304320011 (6)	
R625	Brightness	10K	2304590001 (4)	
			2304320011 (6)	
R626	Tint	10K	2304590001 (4)	
			2304320011 (6)	

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

ITEM NO.	FUNCTION	RESISTANCE	MFGR. PART NO.	NOTES
R634	Color Osc Adjust	10K	2204801032	
# R635A	Focus		(3)	
# R635B	Screen		(3)	
R710	Volume Limiter	500	2204130027	

For SAFETY use only equivalent replacement part.
(1) Early Production.
(2) Late Production.
(3) Part of Horizontal Output Transformer #T504, Part No. 3620541002.
(4) ASC184,ASC186,ASC187,ASC197,ASC198,ASC199 and ASC201 Modules.
(5) ASC202 Module only.
(6) ASC200, ASC202, ASC203 Modules.

CHASSIS BREAK-DOWN

25C806 (-00AA & -00BB)

EMC803	Main Chassis Board Asm
340293	Varactor Tuner Module
APT030	CRT Socket Board Module
ATC455	Tuner Control Unit Asm
ADP024	Channel Select/Display Module
ARR007	Remote Receiver Module
ASC199	Secondary Control Module
ATU001	TS12A Tuning System Module (-00AA)
ATU008	TS12C Tuning System Module (-00BB)

25C807 (-00AA & -00BB)

EMC803	Main Chassis Board Asm
340293	Varactor Tuner Module
APT030	CRT Socket Board Module
ASC201	Secondary Control Module
ATC464	Tuner Control Unit Asm
ADP026	Channel Select/Display Module
ARR007	Remote Receiver Module
ATU001	TS12A Tuning System Module (-00AA)
ATU009	TS12C Tuning System Module (-00BB)

25C808 (-00AA & -00BB)

EMC803	Main Chassis Board Asm
340293	Varactor Tuner Module
APT030	CRT Socket Board Module
ATC456	Tuner Control Unit Asm
ADP025	Channel Select/Display Module
ARR007	Remote Receiver Module
ASC199	Secondary Control Module
ATU001	TS12A Tuning System Module (-00AA)
ATU008	TS12C Tuning System Module (-00BB)

25C809 (-00AA & -00BB)

EMC803	Main Chassis Board Asm
340293	Varactor Tuner Module
APT030	CRT Socket Board Module
ATC456	Tuner Control Unit Asm
ADP025	Channel Select/Display Module
ARR007	Remote Receiver Module
ASC199	Secondary Control Module
ATU001	TS12A Tuning System Module (-00AA)
ATU008	TS12C Tuning System Module (-00BB)

25C810 (-00AA & 00BB)

EMC803	Main Chassis Board Asm
340293	Varactor Tuner Module
APT030	CRT Socket Board Module
ATC457	Tuner Control Unit Asm
ADP025	Channel Select/Display Module
ARR007	Remote Receiver Module
ASC199	Secondary Control Module
ATU001	TS12A Tuning System Module (-00AA)
ATU008	TS12C Tuning System Module (-00BB)

25C816 (-00AA)

EMC803	Main Chassis Board Asm
340293	Varactor Tuner Module
APT030	CRT Socket Board Module
ATC491	Tuner Control Unit Asm
ADP025	Channel Select/Display Module
ARR007	Remote Receiver Module
ASC199	Secondary Control Module
ATU001	TS12A Tuning System Module

25C817 (-00AA)

EMC803	Main Chassis Board Asm
340293	Varactor Tuner Module
APT030	CRT Socket Board Module
ASC201	Secondary Control Module
ATC429	Tuner Control Unit Asm
ADP027	Channel Select/Display Module
ARR007	Remote Receiver Module
ATU001	TS12A Tuning System Module

25C818 (-00AA & -00BB)

EMC803	Main Chassis Board Asm
340293	Varactor Tuner Module
APT030	CRT Socket Board Module
ASC201	Secondary Control Module
ATC465	Tuner Control Unit Asm
ADP027	Channel Select/Display Module
ARR007	Remote Receiver Module
ATU001	TS12A Tuning System Module (-00AA)
ATU009	TS12C Tuning System Module (-00BB)

26C805 (-00AA & -00BB)

EMC813	Main Chassis Board Asm
340293	Varactor Tuner Module
APT030	CRT Socket Board Module
ATC448	Tuner Control Unit Asm
ADP020	Channel Select/Display Module
ARR007	Remote Receiver Module
ASC197	Secondary Control Module
ATU001	TS12A Tuning System Module (-00AA)
ATU009	TS12C Tuning System Module (-00BB)

CHASSIS BREAK-DOWN (continued)

26C807 (-00AA, -00BB, -00CC & -00DD)

EMC813	Main Chassis Board Asm
340293	Varactor Tuner Module
APT030	CRT Socket Board Module
ATC449	Tuner Control Unit Asm (-00AA & -00CC)
ADP022	Channel Select/Display Module
ARR007	Remote Receiver Module
ASC197	Secondary Control Module
ATC481	Tuner Control Unit Asm (-00BB & -00DD)
ATU001	TS12A Tuning System Module (-00AA)
ATU009	TS12C Tuning System Module (-00BB)

26C808 (-00AA & -00BB)

EMC813	Main Chassis Board Asm
340293	Varactor Tuner Module
APT030	CRT Socket Board Module
ATC450	Tuner Control Unit Asm
ADP022	Channel Select/Display Module
ARR007	Remote Receiver Module
ASC197	Secondary Control Module
ATU001	TS12A Tuning System Module (-00AA)
ATU008	TS12C Tuning System Module (-00BB)

26C809(-00AA)

EMC813	Main Chassis Board Asm
340293	Varactor Tuner Module
APT030	CRT Socket Board Module
ATC461	Tuner Control Unit Asm
ARR007	Remote Receiver Module
ASC200	Secondary Control Module
ATU002	TS12A Tuning System Module

25C814 (-00AA)

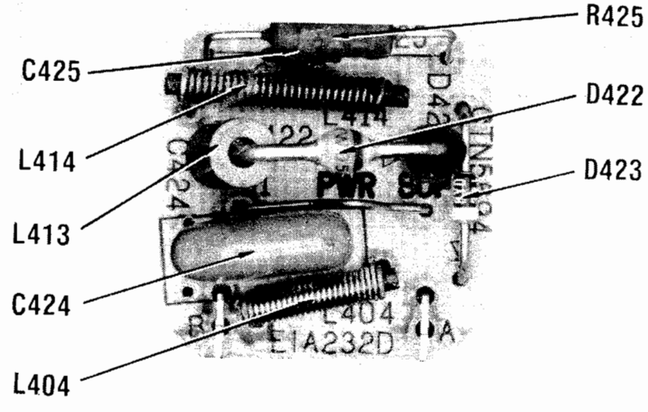
EMC813	Main Chassis Board Asm
340293	Varactor Tuner Module
APT030	CRT Socket Board Module
ATC463	Tuner Control Unit Asm
ARR007	Remote Receiver Module
ASC200	Secondary Control Module
ATU002	TS12A Tuning System Module (-00AA)

26C816 (-00AA)

EMC813	Main Chassis Board Asm
340293	Varactor Tuner Module
APT030	CRT Socket Board Module
ATC478	Tuner Control Unit Asm
ARR007	Remote Receiver Module
ASC203	Secondary Control Module
ATU002	TS12A Tuning System Module (-00AA)
ATU008	TS12C Tuning System Module (-00BB)

26C817 (-00AA & -00BB)

EMC813	Main Chassis Board Asm
340293	Varactor Tuner Module
APT030	CRT Socket Board Module
ATC462	Tuner Control Unit Asm (-00AA)
ARR007	Remote Receiver Module
ASC200	Secondary Control Module
ATC488	Tuner Control Unit Asm (-00BB)
ATU002	TS12A Tuning System Module



130V POWER SUPPLY BOARD

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFGR. PART No./ TYPE No.	NTE PART No.	ECG PART No.	TCE PART No.	ZENITH PART No.	NOTES
TS-12B/C TUNER CONTROL						
D11	5301811001	NTE177	ECG177	SK9091/177	103-131	
D14	5302471001	NTE112	ECG112	SK3089/112	103-61	
D30	5301811001	NTE177	ECG177	SK9091/177	103-131	
D40	5301811001	NTE177	ECG177	SK9091/177	103-131	
IC1000	6125710001	NTE701	ECG701	SK9026/701	221-105	ATU008-A001
IC1000	6125760001					ATU009-A001
Q30	6102230001	NTE159	ECG159	SK3466/159	121-Z9003	
Q40	6102230001	NTE159	ECG159	SK3466/159	121-Z9003	
Q60	6102320002	NTE123AP	ECG123AP	SK3854/123AP	121-Z9000A *	

\# For SAFETY use only equivalent replacement part.
* Lead configuration may vary from original.

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFGR. PART No./ TYPE No.	NTE PART No.	ECG PART No.	TCE PART No.	ZENITH PART No.	NOTES
VARACTOR TUNER						
D1 THRU D5	5302300003					
D1 THRU D5	1716580001					USED SOME VERSIONS
D7 THRU D17	5303040001					
D18,19	5302300003					
D20	5303040001					
D21	5303040001					USED SOME VERSIONS
D101 THRU D104	5302300003					
D101 THRU D104	1716580001					USED SOME VERSIONS
D105,6	5302300003					
IC1	6124400001					
IC2	6124490002					
Q1	6105210001					
Q101	6105360001					
Q102	6105150002					

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFGR. PART No./ TYPE No.	NTE PART No.	ECG PART No.	TCE PART No.	ZENITH PART No.
AUDIO JACK PANEL AVJ022					
IC1,2	612186-1	NTE4016B	ECG4016B	SK4016B	HE-442-99
	6121860001	NTE4016B	ECG4016B	SK4016B	HE-442-99
Q2,4	6104350001	NTE123AP+	ECG123AP+	SK3854/123AP+	121-Z9000A+
AUDIO JACK PANEL AVJ023					
D1 THRU D6	5301810001	NTE177	ECG177	SK9091/177	103-131
IC1	4053	NTE4053B	ECG4053B	SK4053B	905-354
	612493-1	NTE4053B	ECG4053B	SK4053B	905-354
	6124930001	NTE4053B	ECG4053B	SK4053B	905-354
Q1	6102230001	NTE159	ECG159	SK3466/159	121-Z9003
Q2 THRU Q5	6102320002	NTE123AP	ECG123AP	SK3854/123AP	121-Z9000A
Q6	6102230001	NTE159	ECG159	SK3466/159	121-Z9003

\+ Rotate 180° to conform with original lead configuration.

PARTS LIST AND DESCRIPTION (Continued)

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

COILS (RF-IF)

ITEM No.	FUNCTION	MFGR. PART No.
L40	RF Choke (56uH)	3618135609
L60	RF Choke (10uH)	3620410003
L201	Peaking (0.68uH)	3618130680
L202	Peaking (3.3uH)	3618133399
	Peaking (1.2uH)	3618131299 (8)
L204	Peaking (4.7uH)	3618134799
L205	Video IF	3617990008
L206	Sound Discriminator	3619680005
L210	Peaking (2.2uH)	3618132290
L211	RF Choke (2.2uH)	3618132290
L213	Audio Detector (45.7MHz)	3617990008
L214	Peaking (12uH)	3618131209
# L400	Line Filter	3619150002 (1)
	Line Filter	3619150003 (2)
L402	RF Choke (3.3uH)	3618353395
L403	RF Choke (12uH)	3618351209
L404	RF Choke (3.6uH)	3620430001
L406	RF Choke (12uH)	3620410001
L414	RF Choke (5.3uH)	3620410002
L415	RF Choke (10uH)	3620410003
L416	RF Choke (1.0uH)	3618351099
L501	RF Choke (3.75uH)	3620430001

ITEM No.	FUNCTION	MFGR. PART No.
L502	RF Choke (27.4uH)	3620440001
L503	Horiz Linearity	3620280003 (3)
	Horiz Linearity	3620280001 (4)
L515	RF Choke (180uH)	3618131819
L600	Comb Phase	3619660003
L601	RF Choke (10uH)	3618131009
L602	Peaking (10uH)	3618131009
L604	3.58MHz Trap	3616910002 (5)
L605	Peaking (10uH)	3618131009
L606	Peaking (18uH, 5%)	3618131805
L607	RF Choke (15uH, 5%)	3618131505
L609	Peaking (12uH)	3618131205 (6)
	Peaking (15uH)	3618131505 (7)
	Peaking (3.3uH)	3618133395 (2)
L610	Peaking (27uH)	3618132705 (6)
	Peaking (33uH)	3618133309 (7)
	Peaking (6.8uH)	3618136895 (2)
L614	Peaking (6.8uH)	3618136899
L615	Peaking (6.8uH)	3618136899
L616	Peaking (6.8uH)	3618136899
Y600	Delay Line	3615790006

For SAFETY use only equivalent replacement part.
(1) Chassis numbers ending in -A001.
(2) Chassis numbers ending in -B002 and later.
(3) 25" Models.
(4) 26" Models.
(5) Non-Comb Filter Chassis.
(6) Chassis numbers ending in -A001, Comb Filter Chassis.
(7) Chassis numbers ending in -A001, Non-Comb Filter Chassis.
(8) Late production Chassis.

COILS (RF-IF)

ITEM No.	FUNCTION	MFGR. PART No.
	TS-12A TUNER CONTROL	
L2	Peaking (4.7uH)	3618134799
L3	Peaking (4.7uH)	3618134799
L4	Peaking (3.3uH)	3618133399
L5	Peaking (3.3uH)	3618133399
L18	Peaking (4.7uH)	3618134799
L19	Peaking (4.7uH)	3618134799

ITEM No.	FUNCTION	MFGR. PART No.
L20	Peaking (4.7uH)	3618134799
L21	Peaking (4.7uH)	3618134799
L22	Peaking (4.7uH)	3618134799
L23	Peaking (4.7uH)	3618134799
L24	Peaking (4.7uH)	3618134799
L30	Peaking (4.7uH)	3618134799
L40	Peaking (4.7uH)	3618134799
L50	Peaking (12uH)	3618133399

For SAFETY use only equivalent replacement part.

COILS (RF-IF)

ITEM No.	FUNCTION	MFGR. PART No.
	REMOTE RECEIVER	
T2	Peaking	3619870001

ITEM No.	FUNCTION	MFGR. PART No.

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COILS (RF-IF)

ITEM No.	FUNCTION	MFGR. PART No.
	TS-12B/C TUNER CONTROL	
L1	Peaking (4.7uH)	3618134799
L2	Peaking (4.7uH)	3618134799
L3	Peaking (4.7uH)	3618134799
L4	Peaking (4.7uH)	3618134799
L5	Peaking (4.7uH)	3618134799
L6	Peaking (4.7uH)	3618134799

ITEM No.	FUNCTION	MFGR. PART No.
L7	Peaking (4.7uH)	3618134799
L18	Peaking (4.7uH)	3618134799
L19	Peaking (4.7uH)	3618134799
L20	Peaking (3.3uH)	3618133399
L21	Peaking (3.3uH)	3618133399
L30	Peaking (4.7uH)	3618134799
L40	Peaking (4.7uH)	3618134799
L50	Peaking (12uH)	3618133399

For SAFETY use only equivalent replacement part.

COILS (RF-IF)

ITEM No.	FUNCTION	MFGR. PART No.
	REMOTE TRANSMITTER	
L1	Peaking (8mH)	3620460002

ITEM No.	FUNCTION	MFGR. PART No.

COILS & TRANSFORMERS

	ITEM No.	FUNCTION	MFGR. PART No.	OTHER IDENTIFICATION	NOTES
#	DY1	Yoke Horiz 1.39mH 100° Vert 15.6mH	3620470002 (2) or 3619670003 (3)	362047-2 (1)	
#	DY1	Yoke			
#	T401	Switch Mode	3620570001	3112 338 31041(1)	
	T500	Horiz Drive	3204030003	30541 (1)	
#	T504	Horiz Output	3620541002	362054-2B (1)	

For SAFETY use only equivalent replacement part.
(1) Number on unit.
(2) For 26" CRT Models.
(3) For 25" CRT Models.

MISCELLANEOUS

ITEM No.	PART NAME	MFGR. PART No.	NOTES
	Antenna		UHF/ RUSSELL Replacement Antenna BOW-4H
	Antenna		VHF, RUSSELL Replacement Assembly BEA-1H
	Antenna Balun	3618050001	
	Cord, AC	4614070006	Models RG4474AK01, RG4474AK02, RG4474AK03, RG4549AK01, RG4812AK01, RG4816PE01, RG5940AK01, RG5940AK02, RG5940AK03, RG5946PE01, RG5946PE02 and RG5946PE03
	Cord, AC	4614070007	Models EMN692PE01 and EMN692PE02
#	CRT	A63AAM01XP	Models RG4812AK02, RG4816PE01
#	CRT	A63AAM13X	Models RG4474AK01, RG4474AK02,RG4474AK03
#	CRT	A66AAM03X	Models EMN692PE01,EMN692PE02,RG4549AK01, RG5940AK01, RG5940AK02, RG5940AK03, RG5946PE01, RG5946PE02, RG5946PE03.
	Module	ADP020	Channel Select/Display
	Module	ADP022	Channel Select/Display
	Module	ADP024	Channel Select/Display
	Module	ADP025	Channel Select/Display
	Module	ADP026	Channel Select/Display
	Module	ADP027	Channel Select/Display
	Module	ATU001	TS12A Tuning System Module
	Module	ATU002	TS12A Tuning System Module
	Module	ATU006	TS12C Tuning System Module
	Module	ATU008	TS12C Tuning System Module
	Module	ATU009	TS12C Tuning System Module
	Module	ARR002	Remote Receiver Module
	Module	ARR007	Remote Receiver Module
#	Magnet	3615730008	Convergence and Purity Assembly
	Module	EMC803	Main Board Assembly
	Module	EMC813	Main Board Assembly
	Module	EMC814	Main Board Assembly
	Module	3402930001	152 Channel Varactor Tuner
	Module	APT030	CRT Socket Board
	Module	ASC184	Secondary Control
	Module	ASC186	Secondary Control
	Module	ASC187	Secondary Control
	Module	ASC197	Secondary Control
	Module	ASC198	Secondary Control
	Module	ASC199	Secondary Control
	Module	ASC200	Secondary Control
	Module	ASC201	Secondary Control
	Module	ASC202	Secondary Control
	Module	ASC203	Secondary Control
	Module	ATC448	Tuner Control
	Module	ATC455	Tuner Control
	Module	ATC461	Tuner Control
	Module	ATC464	Tuner Control
	Module	ATC478	Tuner Control
	Channel Display	5302480001	Models RG4474AK01,RG4474AK02,RG4474AK03, RG5940AK01,RG5940AK02,RG5940AK03, RG5946PE01,RG5945PE02,RG5946PE03
	Channel Display	5303200002	Models EMN692PE01,EMN692PE02, RG4549AK01,RG4812AK01,RG4816PE01
	Wedge	6458520001	Yoke Positioning, Two (2) used in models RG4474AK01,RG447AK01,RG4474AK03, RG4549AK01,RG5946PE01,RG5946PE02, RG5946PE03
	Wedge	6458520001	Yoke Positioning, Three (3) used in models EMN692PE01,EMN692PE02,RG4812AK01, RG4816PE01,RG5940AK01,RG5940AK02, RG5940AK03
	Wedge	6458520002	Yoke Positioning, One (1) used in models RG4474AK01,RG4474AK02,RG4474AK03, RG4549AK01,RG5946PE01,RG5946PE02, RG5946PE03

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MISCELLANEOUS

ITEM No.	PART NAME	MFGR. PART No.	NOTES
D1	LED	5303150001	Red Stereo (ASC202 only Secondary Control)
D2	LED	5303150001	Red ST/AV (ASC202 only Secondary Control)
D3	LED	5303150002	Amber SAP (ASC202 only Secondary Control)
D4	LED	5303150002	Amber SAP/AV (ASC202 only Secondary Control)
D5	LED	5303150003	Green EXT (ASC202 only Secondary Control)
# F400		1815205400	4 Amp @ 125VAC
L400A	Degaussing Coil	3620210004	26" CRT Models
	Degaussing Coil	3620210003	25" CRT Models
L405	Ferrite Bead	3640460003	
L409	Ferrite Bead	3640460001	
L410	Ferrite Bead	3640460003	
L411	Ferrite Bead	3640050001	
L413	Ferrite Bead	3640050001	
L417	Ferrite Bead	3640460003	
L418	Ferrite Bead	3640460001	
# L516	Ferrite Bead	3640460001	
# L518	Ferrite Bead	3640460001	
S101	Switch	1606680002	Add (ASC186 and ASC187 Secondary Control)
	Switch	1606880004	Add (ASC200 and ASC202 Secondary Control)
S102	Switch	1606680002	Delete (ASC186 and ASC187 Secondary Control)
	Switch	1606880004	Delete (ASC200 and ASC202 Secondary Control)
S103	Switch	1606690003	Program/Normal (ASC186 and ASC187 Secondary Control)
	Switch	1607100008	Program/Normal (ASC200 and ASC202 Secondary Control)
S104	Switch	1607100001	Cable/Normal (ASC186 and ASC187 Secondary Control)
	Switch	1607100008	Cable/Normal (ASC200 and ASC202 Secondary Control)
	Switch	1606730004	Cable/Normal (ASC197) Secondary Control
	Switch	1607110001	Cable/Normal (ASC199) Secondary Control
	Switch	1607100007	Cable/Normal (ASC201) Secondary Control
S105	Switch	1606880004	Channel Up (ASC200, ASC202, ASC203 Secondary Control)
S106	Switch	1606880004	Channel Down (ASC200, ASC202, ASC203 Secondary Control)
S107	Switch	1606880004	Volume Up (ASC200, ASC202, ASC203 Secondary Control)
S108	Switch	1606880004	Volume Down (ASC200, ASC202, ASC203 Secondary Control)
S201	Switch	1607110001	Mono/Stereo/SAP (ASC186 and ASC187 Secondary Control)
	Switch	1607110006	Mono/Stereo/SAP (ASC202 only Secondary Control)
S202	Switch	1607110001	Expanded Sound (ASC186 and ASC187 Secondary Control)
	Switch	1607100008	Expanded Sound (ASC202 only Secondary Control)
S203	Switch	1607100001	TV/Aux (ASC186 and ASC187 Secondary Control)
	Switch	1607100008	Audio/Video (ASC202 only Secondary Control)
S401	Switch	1606880004	Power (ASC202 only Secondary Control)
S580	Switch	1606720001	Vertical Centering
Y200	Filter	3620600001	SAW
Y201	Filter	3620700001	SAW
Y202	Filter	3617560001	4.5MHz Trap
Y301	Crystal	5604440010	4MHz
Y601	Crystal	5604450002	7.1590MHz
	REMOTE TRANSMITTER T176AG		
D1	LED	5302740001	
D2	LED	5302740001	
	Keyboard	7027850002	
	REMOTE TRANSMITTER TUMA5G		
D1	LED	5302740001	
D2	LED	5302740001	
S1	Switch	1607320001	TV/VCR
X1	Crystal	5604480004	4MHz

RESISTORS (Power and Special)

	ITEM No.	RATING	REPLACEMENT DATA MFGR. PART No.	NTE PART No.	
	R19	12K 2% 1/2W Carbon Film	2302821232	HW312	
	R20	12K 2% 1/2W Carbon Film	2302821232	HW312	
	R21	12K 2% 1/2W Carbon Film	2302821232	HW312	
	R22	12K 2% 1/2W Carbon Film	2302821232	HW312	
	R37	12K 2% 1/2W Carbon Film	2302821232	HW312	
	R38	12K 2% 1/2W Carbon Film	2302821232	HW312	
	R39	12K 2% 1/2W Carbon Film	2302821232	HW312	
	R40	12K 2% 1/2W Carbon Film	2302821232	HW312	
	R52	12K 2% 1/2W Carbon Film	2302821232	HW312	
	R53	12K 2% 1/2W Carbon Film	2302821232	HW312	
	R54	12K 2% 1/2W Carbon Film	2302821232	HW312	
	R55	12K 2% 1/2W Carbon Film	2302821232	HW312	
#	R203	18 5% 1/2W Carbon Film	2302231805	HW018	
	R232	30K 5% 1/8W Carbon Film	2303153035 (1)	EW330	
		30.1K 1% 1/8W Carbon Film	2303323012 (2)		
#	R284	22 5% 1.6W Metal Film	2303092295		
#	R365	12 5% 1/2W Carbon Film	2302231205	HW012	
#	R375	10 5% 1/4W Carbon Film	2302181005	QW010	
#	R387	13 5% 1/4W Carbon Film	2302181305	QW013	
#	R400	33 5% 1/4W Carbon Film	2302813305 (5)	QW033	
		20 5% 1/4W Carbon Film	2302812005 (4)		
#	R401	PTC 10.1 Cold	2302070008		
#	R402	10 5% 1/4W Carbon Film	2302811005 (5)	QW010	
		20 5% 1/4W Carbon Film	2302812005 (4)		
#	R403	NTC 18.4 Cold	2303240001		
	R405	5600 5% 5W WW	2303315625	5W256	
	R408	56 5% 5W WW	2400800143	5W056	
#	R416	1000 5% 1/8W Carbon Film	2303151025	EW210	
	R419	8200 2% 1/4W Carbon Film	2303158222	EW282	
	R420	1100 2% 1/4W Carbon Film	2302811122	QW211	
#	R422	56 5% 1/4W Metal Film	2302685695	QW056	
#	R430	56 5% 1/4W Metal Film	2302685695	QW056	
	R432	62K 2% 1/4W Carbon Film	2302816232	QW362	
		56K 2% 1/8W Carbon Film	2302815632	EW356	
#	R433	1 5% 1/2W Carbon Film	2302231095	HW1D0	
#	R434	1 5% 1/2W Carbon Film	2302231095	HW1D0	
	R449	20K 2% 1/4W Carbon Film	2302812032	QW320	
	R451	4300 2% 1/2W Carbon Film	2303154322	HW243	
#	R454	4.7M 5% 1/2W Metal Film	2302674755	HW547	
	R505	2200 5% 5W WW		5W222	
		2200 10% 5W WW	2400800181	5W222	
#	R510	1 5% 1/4W Carbon Film	2302181095	QW1D0	
#	R512	150 5% 1/4W Carbon Film	2302811515	QW115	
	R513	10 5% 7W WW	2400810125		
	R620	120 2% 1/4W Carbon Film	2302811212 (5)	QW112	
		110 2% 1/4W Carbon Film	2302811112 (4)	QW111	
#	R648	10 5% 1/2W Carbon Film	2302231005	HW010	

For SAFETY use only equivalent replacement part.
(1) Early Production Chassis.
(2) Late Production Chassis.
(4) Chassis numbers ending in -A001.
(5) Chassis numbers ending in -B002 and later.

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA MFGR. PART No.	NTE PART No.	
R18	REMOTE TRANSMITTER TUMA5G 430K 2% 1/4W Carbon Film	2302814342	QW443	

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA MFGR. PART No.	QUAM PART No.	NOTES
SP1	2" X 6" PM 16 Ohms	5826011001 (1)	26A07Z16	
	4" X 6" PM 16 Ohms	5846120001 (2)		
SP2	2" X 3.5"	5801160001 (1)		

(1) Used In Models EMN692PE01, EMN692PE02 and RG4549AK01.
(2) Used In Models RG4474AK01, RG4474AK02, RG4474AK03, RG4812AK02, RG4816PE01, RG5940AK01, RG5940AK02, RG5940AK03, RG5946PE01, RG5946PE02 and RG5946PE03.

MISCELLANEOUS

ITEM No.	PART NAME	MFGR. PART No.	NOTES
	TS-12B/C TUNER CONTROL		
Y1	Resonator	3620560002	Ceramic, 6MHz
	REMOTE RECEIVER ARR002 AND ARR007		
D1	LED	5302350001	
	Front Cap	7347270001	
	Rear Cap	7344150002	
	Grille	7326110003	
	Lens	1457400003	
	TS-12A TUNER CONTROL		
Y1	Resonator	3620560002	Ceramic, 6MHz

For SAFETY use only equivalent replacement part.

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

ITEM	PART No.
T176AG TRANSMITTER	
Case-Top	1458810001
Case-Bottom	1458820001
Battery Cover	1459050002
Push Button Array (17 Buttons)	1459060012
Overlay-Keyboard	1520890005
Lens-Infrared Light	1459040004

ITEM	PART No.
TUMA5G REMOTE TRANSMITTER	
Case-Top	1458810004
Case-Bottom	1458820001
Battery Cover	1459050002
Inlay-Top	1520890011
Lens-Infrared Light	1460720013

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

ITEM	PART No.	PART No.	PART No.	PART No.
MODEL	EMN692PE01	EMN692PE02	RG4474AK01	RG4474AK02
Cabinet, Front			1449610019	1449610019
Mask, Front	1457360005	1457360005		
Cabinet, Back	1457390011	1457390011	1450230012	1450230012
Bezel, Control	1458360016	1458360016	1455080009	1455080009
Grille, Left Speaker	1460530001	1460530001		
Grille, Right Speaker	1460540001	1460540001		
Door, Secondary Controls	1458350011	1458350011	1455070002	1455070002
Button Assembly, Includes Volume, Channel	1458400004	1458400004		
Button, Two (2) used. Volume, Channel			1455110003	1455110003
Button, Power	1458410002	1458410002	1456150002	1456150002
Button, Secondary Controls	1458370001	1458370001		
MODEL	RG4474AK03	RG4549AK01	RG4812AK01	RG4816PE01
Cabinet, Front	1449610019			
Mask, Front		1457360002	1444980034	1444980034
Cabinet, Back	1450230012	1457390013	6457700001	6457710001
Bezel, Control	1455080009	7052510003	1455440007	1455440007
Base and Drawer, Front			1452020002	1456540006
Clip, Back			7348370001	7348370001
Cup, CRT			1458110001	1458110001
Grille, Left Speaker		1460530001		
Grille, Right Speaker		1460540001	1446660001	1446680004
Door, Secondary Controls	1455070002	1458350005	1455450002	1455450002
Address Assembly		7052510003		
Button, Two (2) used. Volume, Channel	1455110003			
Button, Two (2) used. Prog/Normal,Cable/Normal		1458380002		
Button, Power	1456150002		1455670015	1455670015
Button, Channel Up			1455670011	1455670011
Button, Channel Down			1455670012	1455670012
Button, Volume Up			1455670013	1455670013
Button, Volume Down			1455670014	1455670014
MODEL	RG5940AK01	RG5940AK02	RG5940AK03	RG5946PE01
Mask	1456670010	1456670010	1456670010	1456670010
Bezel Assembly, Front	7052100009	7052100009	7052100009	7052100009
Base and Drawer, Front	1458270001	1458270001	1458270001	1456450007
Cabinet, Back	6457820001	6457820001	6457820001	6457880001
Cup, CRT	1458110001	1458110001	1458110001	1458110001
Grille, Speaker	1460210001	1460210001	1460210001	1460220003
Door, Secondary Control	1451700003	1451700003	1451700003	1451700003
Housing, Control/Speaker	1459630002	1459630002	1459630002	1459630002
Keypad, Includes Power, Volume Up, Volume Down, Channel Up, Channel Down	6457450001	6457450001	6457450001	6457450001
MODEL	RG5946PE02	RG5946PE03		
Mask	1456670010	1456670010		
Bezel Assembly, Front	7052100009	7052100009		
Base and Drawer, Front	1456450007	1456450007		
Cabinet, Back	6457880001	6457880001		
Cup, CRT	1458110001	1458110001		
Grille, Speaker	1460220003	1460220003		
Door, Secondary Controls	1451700003	1451700003		
Housing, Control/Speaker	1459630002	1459630002		
Keypad, Includes Power, Volume Up,Volume Down, Channel Up,Channel Down	6457450001	6457450001		