

MODEL 5153

IBM
MODEL 5153

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MODEL 5153

PRELIMINARY SERVICE CHECKS

ENCLOSED

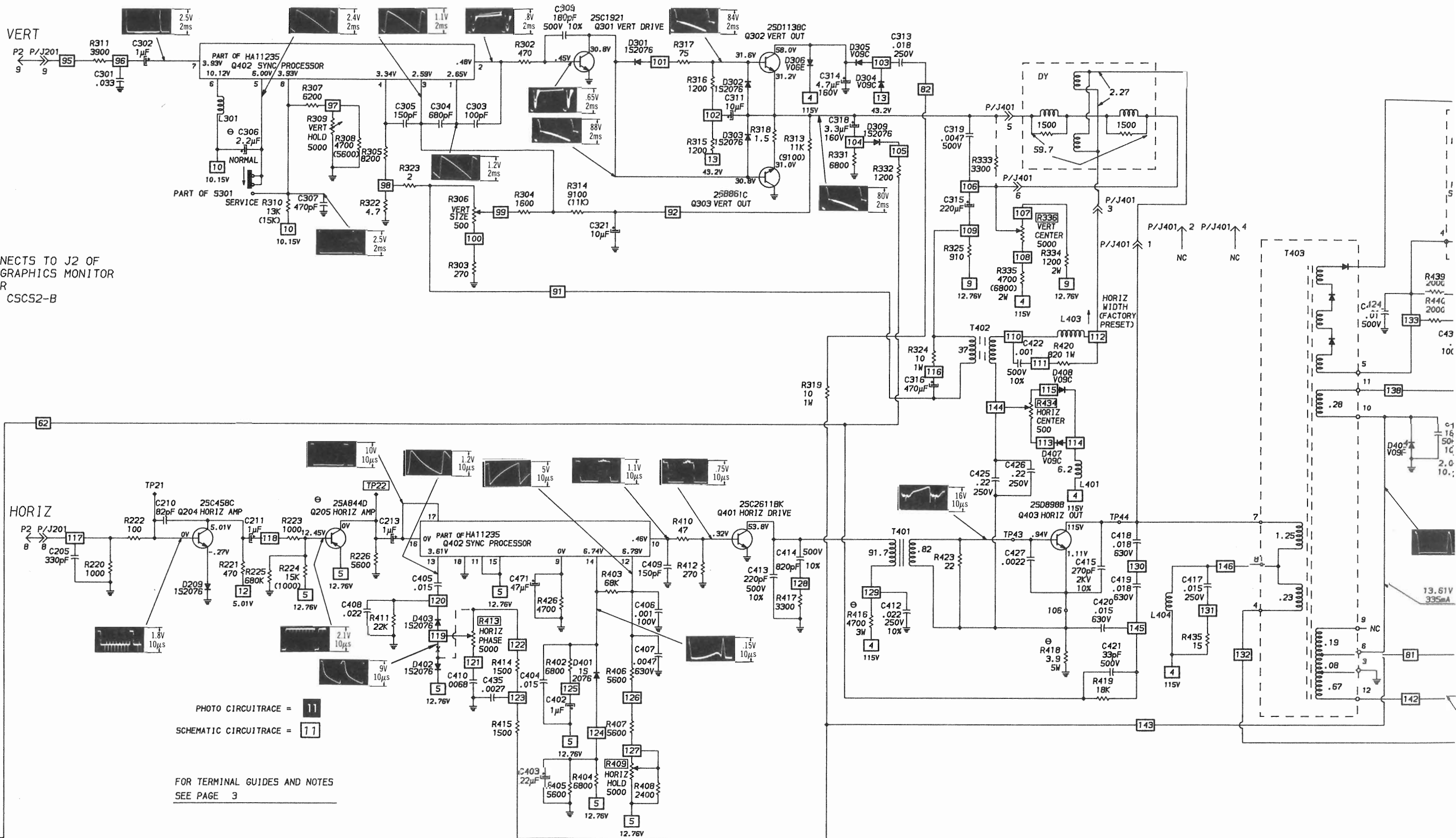
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SAMS™ Howard W. Sams & Co., Inc.
4300 West 62nd Street, P.O. Box 7092, Indianapolis, Indiana 46206 U.S.A.

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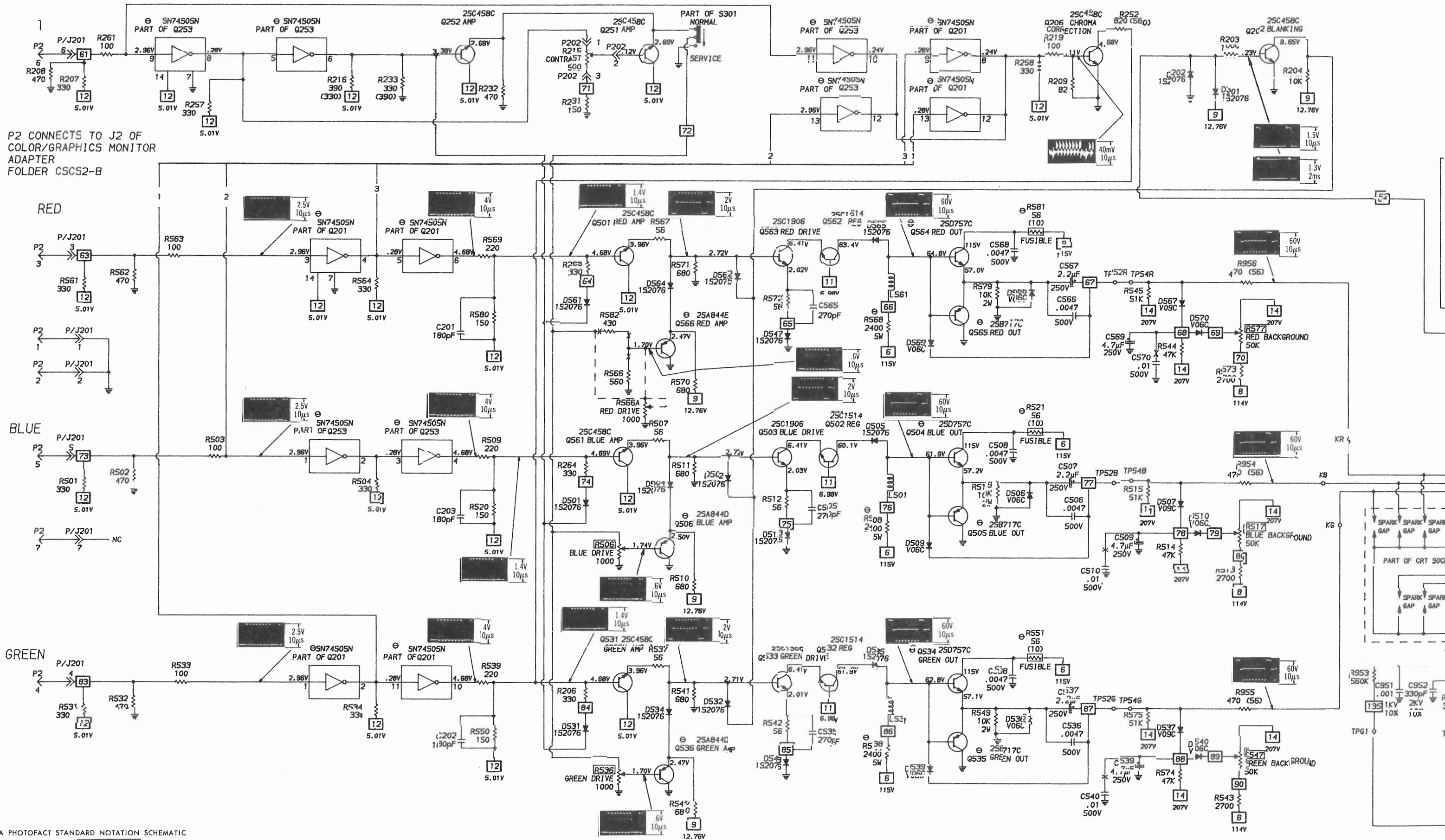
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P2 CONNECTS TO J2 OF
COLOR/GRAPHICS MONITOR
ADAPTER
FOLDER CSCS2-B

PHOTO CIRCUITTRACE = 11
SCHEMATIC CIRCUITTRACE = 11

FOR TERMINAL GUIDES AND NOTES
SEE PAGE 3

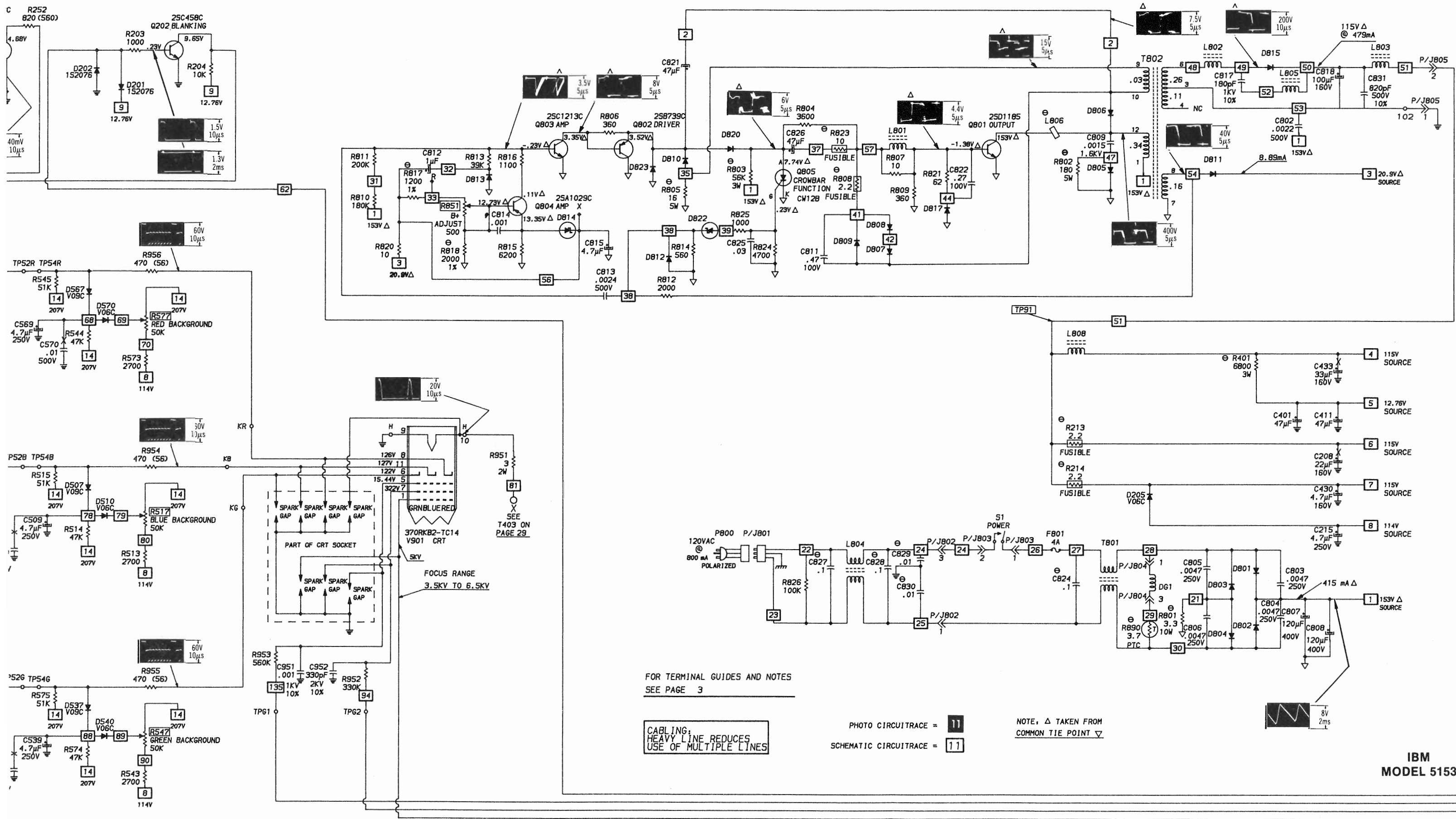


P2 CONNECTS TO J2 OF
COLOR/GRAPHICS MONITOR
ADAPTER
FOLDER CSCS2-B

RED

BLUE

GREEN

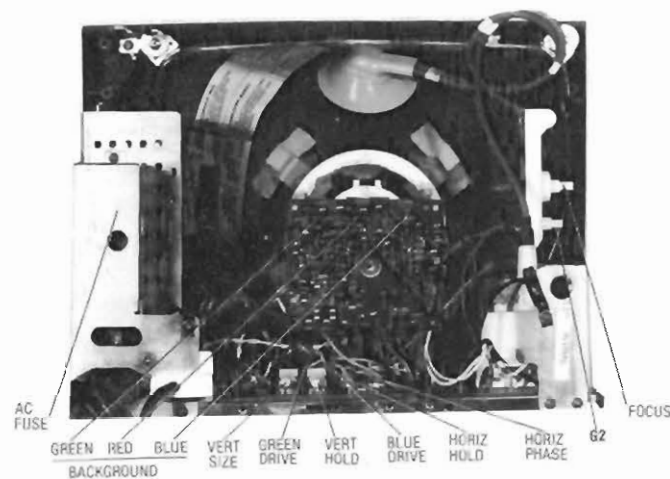


FOR TERMINAL GUIDES AND NOTES
SEE PAGE 3

CABLING:
HEAVY LINE REDUCES
USE OF MULTIPLE LINES

PHOTO CIRCUITRACE = 11
SCHEMATIC CIRCUITRACE = 11

NOTE: Δ TAKEN FROM
COMMON TIE POINT ▽



CABINET-REAR VIEW DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

Remove two caps from cabinet top and remove two screws holding cabinet to cabinet front. Remove four screws (from bottom) holding cabinet back to cabinet front and remove back.

Disconnect HV anode, CRT socket and ground leads. Remove two screws (from bottom) holding main chassis assembly to cabinet bottom and remove assembly from cabinet.

Remove four screws holding AC power assembly to power supply assembly and main chassis. Remove assembly and disconnect connectors as required. Remove five screws holding power supply assembly to main chassis assembly and cabinet front brace and remove power supply assembly. Remove four screws holding power supply cover

and lift cover off power supply. Remove five screws holding power board to chassis, disconnect connectors and lift board out of chassis.

Remove knobs from cabinet front. Remove three screws holding control indicator assembly to cabinet front and remove assembly from cabinet.

CRT REMOVAL

CAUTION: Set employs CRT with neck assemblies permanently bonded to CRT. **Do Not** attempt to remove neck assemblies from CRT.

Follow "Chassis Removal" procedure and lay set facedown on a soft protective surface. 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.)

LAMP ACCESSIBILITY

Lamp is accessible after removing cabinet back.

HORIZONTAL OSCILLATOR

Adjustment of the horizontal hold is accomplished by the proper setting of the horizontal hold control (See photo, Cabinet-Rear View.)

WIDTH

The width may be varied by adjusting the width coil. (See Placement Chart.)

FOCUS

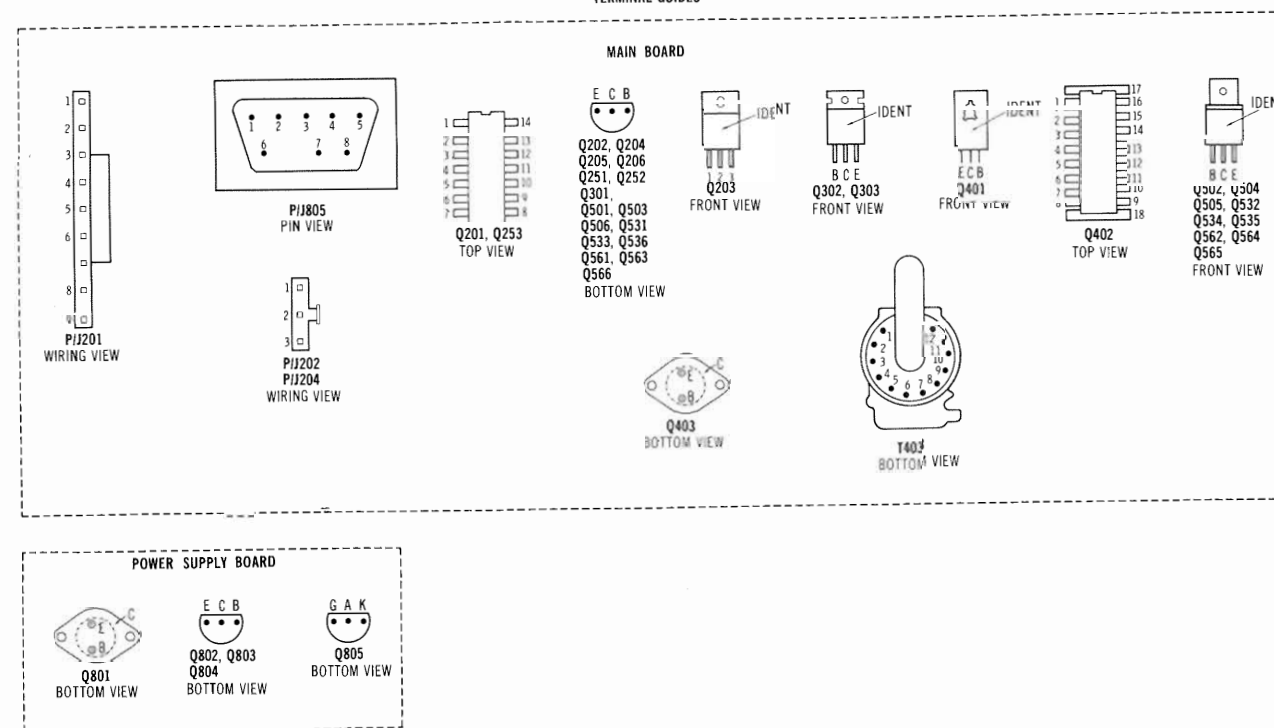
The focus may be varied by a focus control. (See photo, Cabinet-Rear View.)

CENTERING

Horizontal centering is accomplished by proper adjustment of the horizontal centering control. (See Placement Chart.)

Vertical centering is accomplished by proper adjustment of the vertical centering control. (See Placement Chart.)

TERMINAL GUIDES



SCHEMATIC NOTES

- *— Circuitry not used in some versions
 - - - Circuitry used in some versions
 - See parts list
 - ⊕ Ground
 - ∇ Common tie point
- Waveforms and voltages are taken from ground, unless noted otherwise.
- Waveforms: triggered scope, RGB pattern generator.
- Item numbers in rectangles appear in the alignment/adjustment instructions.
- Supply voltages maintained as shown at input.

Voltages measured with digital meter, with signal applied.

Controls adjusted for normal operation.

Terminal identification may not be found on unit.

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

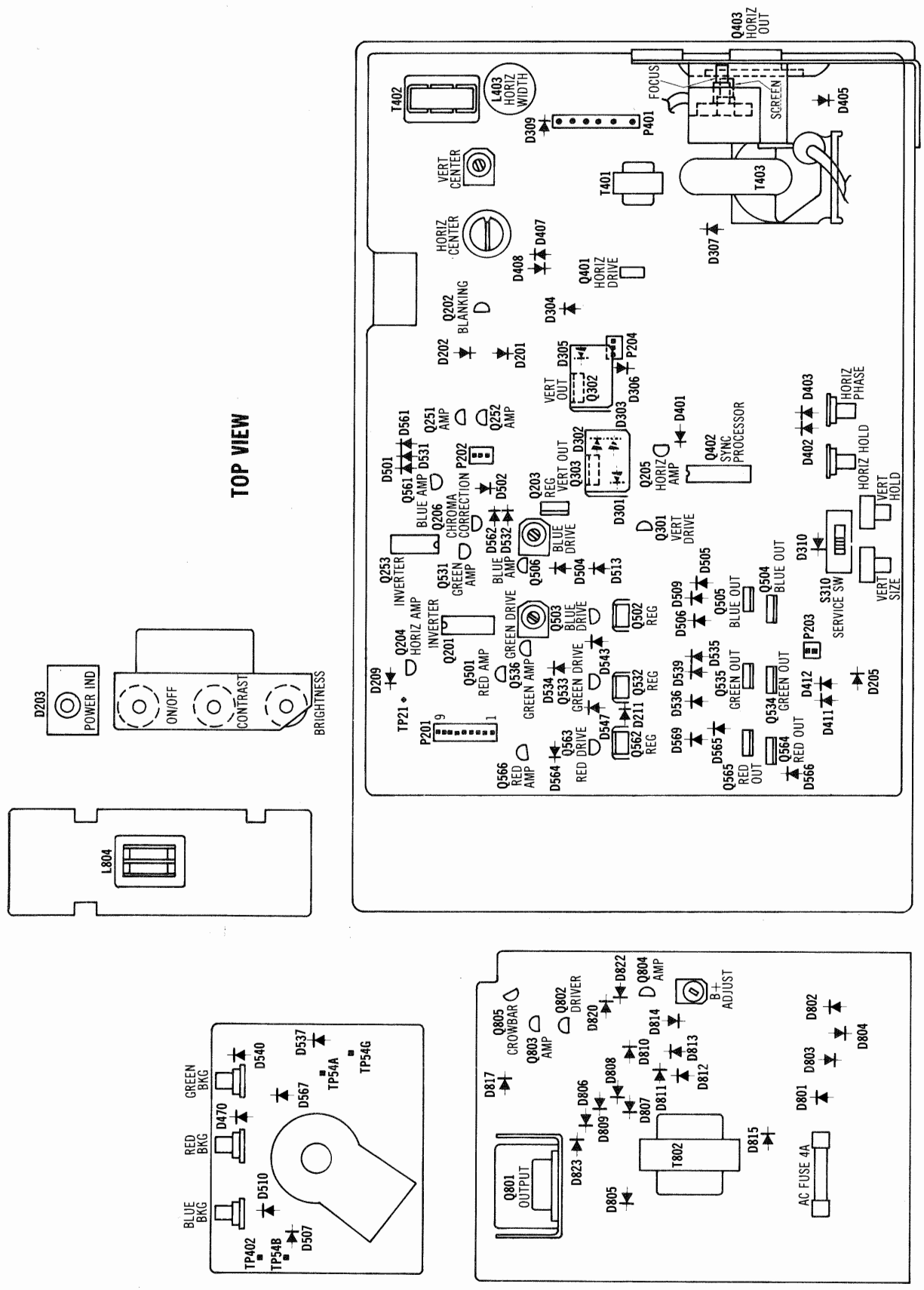
Electrolytic capacitors are 50 volts or less, 20% unless noted.

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

Value in () used in some versions.

Measurements with switching as shown, unless noted.

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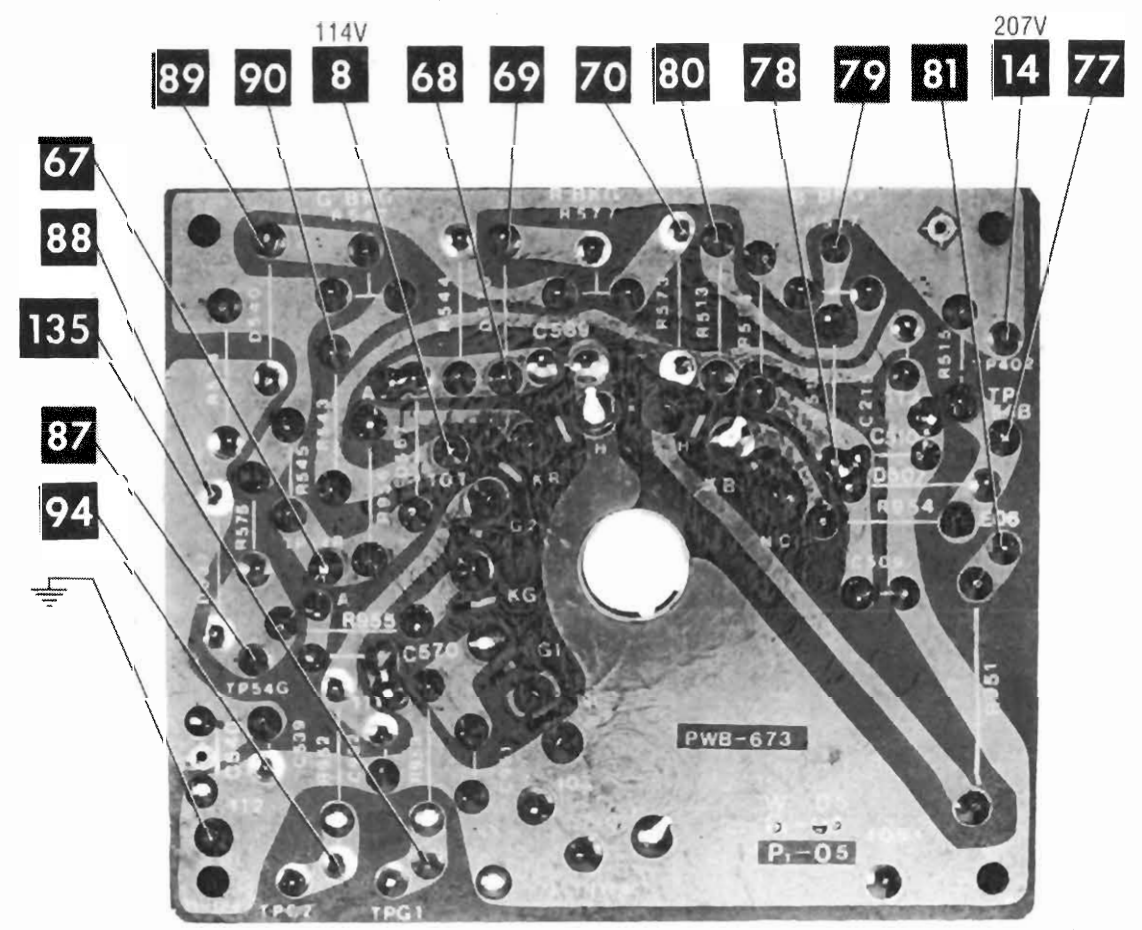


RESISTANCE MEASUREMENTS

MEASUREMENTS TAKEN WITH LOW POWER OHMS METER

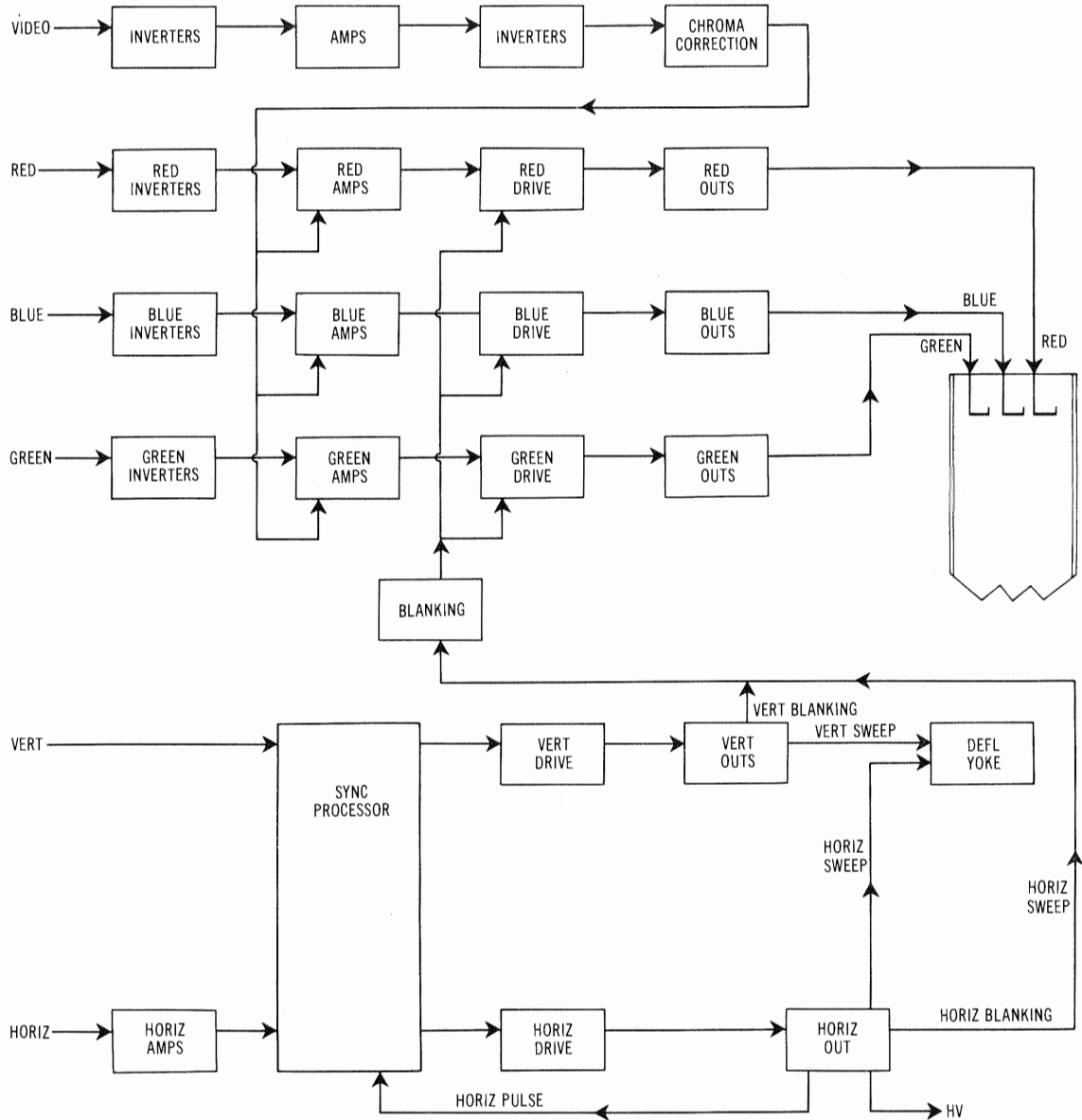
ITEM	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9	PIN 10	PIN 11	PIN 12	PIN 13	PIN 14
Q201	325	415	323	418	418	461	0	128	418	458	415	128	415	93
Q203	135	0	93											
Q253	322	417	417	459	262	197	0	262	324	128	324	128	324	93
Q402	6470	3410	1628	8120	INF	253	48K	4990	4650	315	4760	17K	INF	84K
											PIN 15	PIN 16	PIN 17	PIN 18
											4760	3460	14K	0
V901	INF	NC	NC	1	810K	INF	INF	INF	FIL	FIL	4.5			
ITEM	E	B	C		ITEM	E	B	C		ITEM	E	B	C	
Q202	0	1.6M	10K		Q502	INF	458	INF		Q561	727	241	93	
Q204	1.6M	1091	563		Q503	1.6M	672	INF		Q562	INF	458	INF	
Q205	4760	19K	5430		Q504	9910	7970	5630		Q563	1.5M	669	INF	
Q206	0	71	1051		Q505	9910	7970	0		Q564	9980	7970	2520	
Q251	195	282	93		Q506	810	320	0		Q565	9980	7970	0	
Q252	195	197	93		Q531	727	241	93		Q566	805	302	0	
Q301	0	3890	1.5M		Q532	INF	458	INF		Q801	0(1)	356(1)	82(1)	
Q302	2260	INF	INF		Q533	1.6M	671	INF		Q802	INF(1)	INF(1)	0(1)	
Q303	2260	1.5M	0		Q534	10K	7980	5630		Q803	0(1)	561K(1)	INF(1)	
Q401	0	265	10K		Q535	10K	7980	0		Q804	6170(1)	1987(1)	542K(1)	
Q403	3.8	7.4	5570		Q536	808	330	0		Q805	K 0(1)	G 4690(1)	A 3940(1)	
Q501	725	242	93											

(1) Taken with reference to isolated ground.



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TROUBLESHOOTING AID



BLOCK DIAGRAM

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

PICTURE

NO PIC, NO RASTER: Check AC power supply and sources generated from Horizontal Output Transformer (T401). Refer to "Troubleshooting" Power Supply and Horizontal circuits.

NO PIC, HAS RASTER: Check source voltages from Horizontal Output Transformer (T401). Refer to "Troubleshooting" Horizontal circuits.

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

SWEEP

NO RASTER: Check HV rectifier, Part of Horizontal Output Transformer (T401). 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.

TROUBLESHOOTING

POWER SUPPLY

Check the AC Line Fuse (F801). If bad, check for possible short at Bridge Rectifier Diodes (D801 thru D804), DC to DC Converter Transformer (T802), Output Transistor (Q801) and SCR Q805. Replace defective components and apply 120 VAC power.

Check for 153V (with respect to isolated ground) at the cathode of Diode D801 and at the collector of Transistor Q801. Check voltages and waveforms (with respect to isolated ground) at pin 12 of Transformer T802, base of Transistor Q801 and the anode of SCR Q805. Check for 115V at the cathode of Diode D815. If the 115V is missing, check Transformer T802, Transistor Q801, SCR Q805 and associated components. Check sources that are developed from the Horizontal Output Transformer (T401), refer to the "Power Supply" section of this Troubleshooting guide.

VERTICAL

No vertical deflection. Inject a vertical signal at pin 2 of the Sync Processor IC (Q402). If vertical deflection returns, check voltages, waveforms and components associated with pins 2, 3, 4, 6, 7 and 8 of IC Q402 and associated circuitry. If the vertical deflection does not return, check voltages, waveforms and components associated with Vertical Driver Transistor (Q301), Vertical Output Transistor (Q302 and Q303), Electrolytic C315 and the vertical winding on the deflection yoke.

Vertical linearity or foldover problems can be caused by vertical feedback and bias circuits. Check the condition of Diodes D301 thru D306, Electrolytic C315, Side Pincushion Transformer (T402) and associated circuitry.

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TROUBLESHOOTING (Continued)

SYNC

No vertical sync. Check for vertical pulses at pin 9 of P2, check voltages, waveforms and components associated with pins 2 thru 8 of the Sync Processor IC (Q402).

No horizontal sync. Check for horizontal pulses at pin 8 of P2, check voltages, waveforms and components associated with the Horizontal Amp Transistors (Q204 and Q205) and pins 13 thru 16 of IC Q402.

RASTER

Check the CRT and CRT voltages and waveforms.

Raster is magenta (No green). Check voltages, waveforms and components associated with Transistors Q535, Q534, Q532, Q533 and pin 4 of the CRT socket.

Raster is yellow (No blue). Check voltages, waveforms and components associated with Transistors Q505, Q504, Q502, Q503 and pin 9 of the CRT socket.

Raster is cyan (No red). Check voltages, waveforms and components associated with Transistors Q565, Q564, Q562, Q563 and pin 6 of the CRT socket.

Raster has a keystone shape. Check the deflection yoke.

Raster has a pincushion shape. Check the Side Pincushion Transformer (T402) and associated circuitry.

Raster has height or width problems. Refer to the "Vertical", "Horizontal" and "Power Supply" sections of this Troubleshooting guide.

HORIZONTAL

Check for 115V at the collector of the Horizontal Output Transistor (Q403). If 115V is missing, check for 115V at TP91, at both ends of Coil L404 and at pins 7 and 8 of the Horizontal Output Transformer (T401). If the 115V is missing at TP91, refer to the "Power Supply".

Inject a horizontal signal at the base of Transistor Q403. If the high voltage returns, check voltages, waveforms and

components associated with pins 9 thru 12 of the Sync Processor IC (Q402), Horizontal Driver Transistor (Q401) and associated components. If the high voltage does not return, check voltages, waveforms and components associated with Transistor Q403 and Transformer T401.

The high voltage rectifier is a part of Transformer T401 assembly and may be bad. Check for possible shorts at the B+ sources that are developed from Transformer T401 that could be loading down the horizontal circuits. Check for 207V at the cathode of Diode D405, 43.2V at the cathode of Diode D307 and 13.61V at the cathode of Diode D404.

Poor horizontal linearity or foldover problems may be caused by the condition of Capacitors C422 and C415, Side Pincushion Transformer (T402) and associated circuitry.

VIDEO

No characters appear on the screen of the CRT. Check for 5.01V at pin 14 of the Inverter ICs (Q201 and Q253) and check the Regulator IC (Q203).

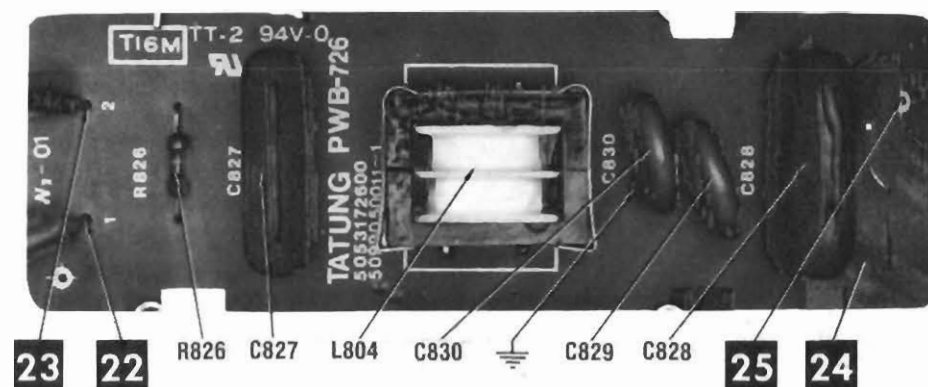
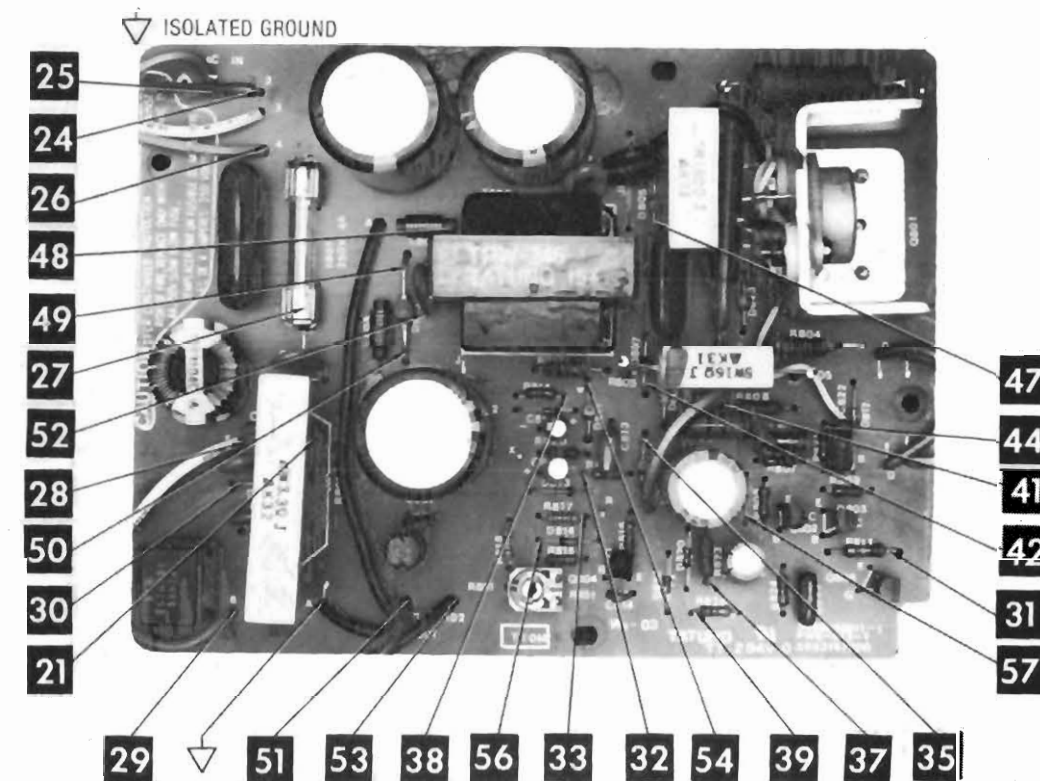
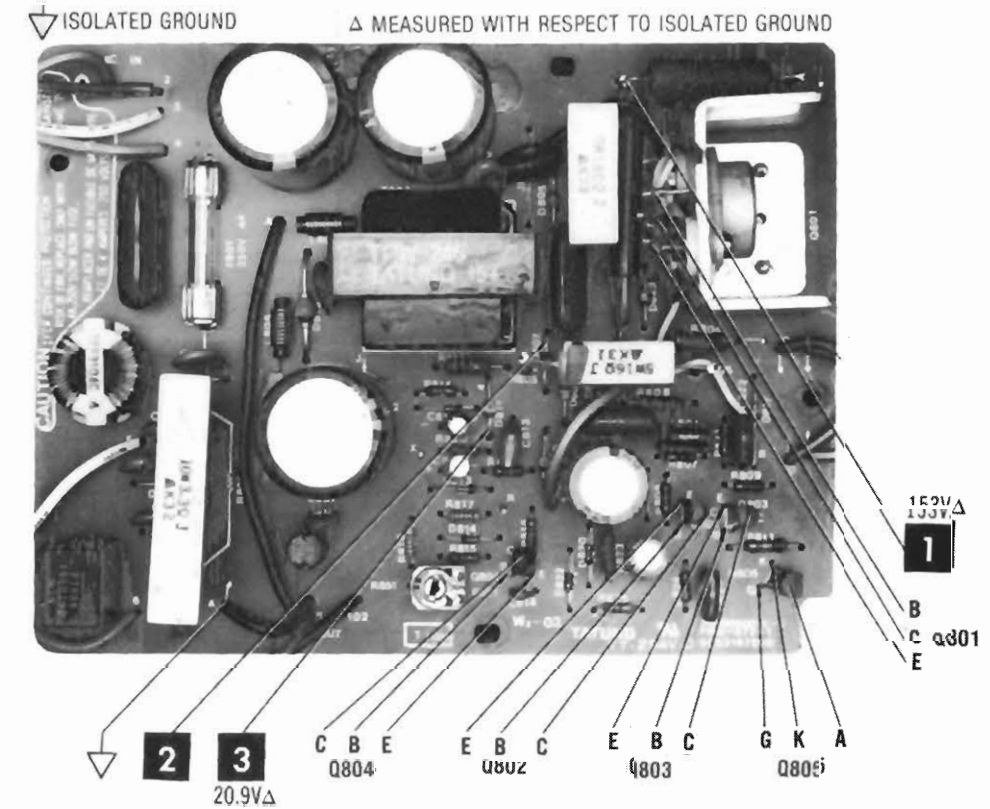
Inject a video signal at the base of the Blue Amp Transistor (Q506) and check for blue picture on the CRT. If there is no video on the CRT, check voltages, waveforms and components associated with Transistors Q506, Q502, Q503, Q504 and Q505.

Inject a video signal at the base of the Green Amp Transistor (Q536) and check for green picture on the CRT. If there is no video on the CRT, check voltages, waveforms and components associated with Transistors Q536, Q532, Q533, Q534 and Q535.

Inject a video signal at the base of the Red Amp Transistor (Q566) and check for red picture on the CRT. If there is no video on the CRT, check voltages, waveforms and components associated with Transistors Q566, Q562, Q563, Q564 and Q565.

If video appears on the screen of the CRT, check voltages, waveforms and components associated with Transistors Q206, Q251, Q252 and ICs Q201 and Q253. Check the CRT and CRT voltages and waveforms.

Video has retrace lines, check voltages and components associated with the Blanking Transistor (Q202).



AC INPUT BOARD

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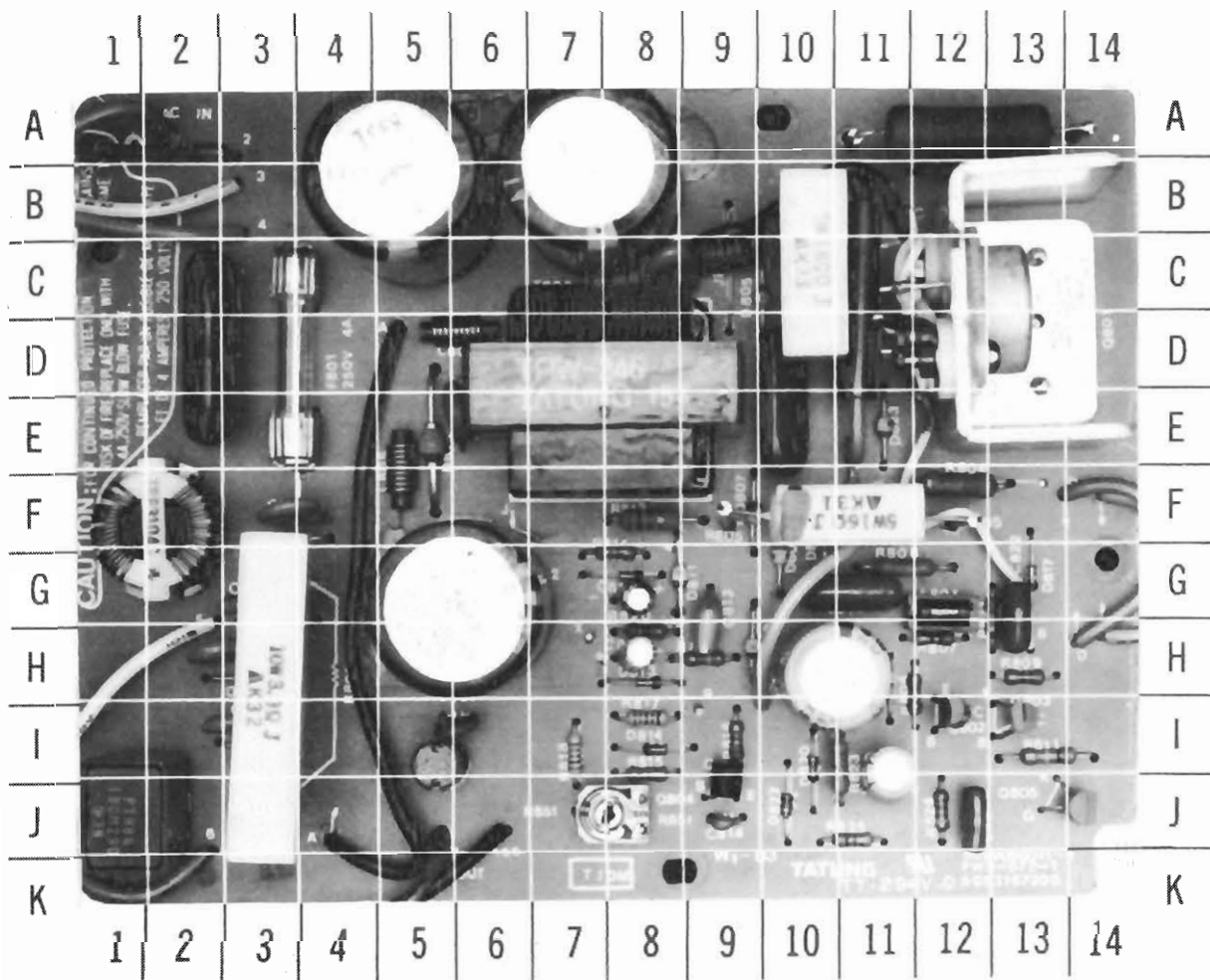
A Howard W. Sams CIRCUITRACE® Photo

POWER SUPPLY BOARD

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POWER SUPPLY BOARD GridTrace LOCATION GUIDE

C802	C-8	C831	I-5	F801	D-4	R809	H-13
C803	F-3	D801	F-3	L801	G-12	R810	B-12
C804	F-3	D802	I-3	L802	D-6	R811	I-13
C805	G-3	D803	G-3	L803	I-5	R812	F-8
C806	H-3	D804	H-3	L805	E-5	R813	H-9
C807	B-7	D805	C-10	L806	C-11	R814	G-8
C808	B-5	D806	F-11	Q801	C-13	R815	I-8
C809	E-10	D807	F-9	Q802	I-12	R816	I-9
C811	G-11	D808	G-10	Q803	I-13	R817	I-8
C812	H-8	D809	F-10	Q804	J-9	R818	J-7
C813	G-9	D810	H-9	Q805	J-14	R820	H-8
C814	J-9	D811	G-9	R	I-9	R821	G-13
C815	G-8	D812	G-8	R801	H-3	R823	I-11
C817	E-6	D813	H-8	R802	C-10	R824	J-12
C818	G-5	D814	I-8	R803	A-12	R825	J-11
C821	H-10	D815	E-5	R804	F-12	R851	J-7
C822	G-13	D817	G-13	R805	F-11	R890	J-1
C824	D-2	D820	I-10	R806	H-11	T801	F-2
C825	J-12	D822	J-10	R807	H-12	T802	D-7
C826	I-11	D823	E-11	R808	G-11	X	H-7



POWER SUPPLY BOARD

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MISCELLANEOUS ADJUSTMENTS

B + ADJUSTMENT

Connect a DC meter to TP91, low side to ground. Apply power to Monitor. Adjust B+ Adjust Control (R851) for +115V.

HORIZONTAL HOLD ADJUSTMENT

Connect a RGB video pattern generator to the Monitor. Use a color bar pattern. Connect a .1µF Capacitor from TP22 to ground. Adjust Horizontal Hold Control (R409) until the bars stop (in sync) or slowly float across the screen. Remove the .1µF Capacitor.

HORIZONTAL AND VERTICAL CENTERING

Connect a RGB video pattern generator to the Monitor. Use a color bar pattern. Adjust Horizontal Center Control (R434) for best horizontal centering of the raster. Adjust Vertical Center Control (R336) for best vertical centering of the raster.

HORIZONTAL PHASE CONTROL

Adjust Horizontal Phase Control (R413) to place the cursor at the left edge of the raster.

PURITY ADJUSTMENT

Degauss the CRT, if necessary. Set the Blue (R517) and Green (R547) Background Controls to MINIMUM. Advance the Red Background Control (R577) to produce a red raster. Loosen the deflection yoke and slide it back against the Purity/Convergence Assembly. Adjust the Purity Magnets to produce a vertical red stripe at the center of the screen. Slide the deflection yoke forward to produce uniform red

raster. Check for pure blue and green screens by advancing the Blue (R517) and Green (R547) Background Controls one at a time.

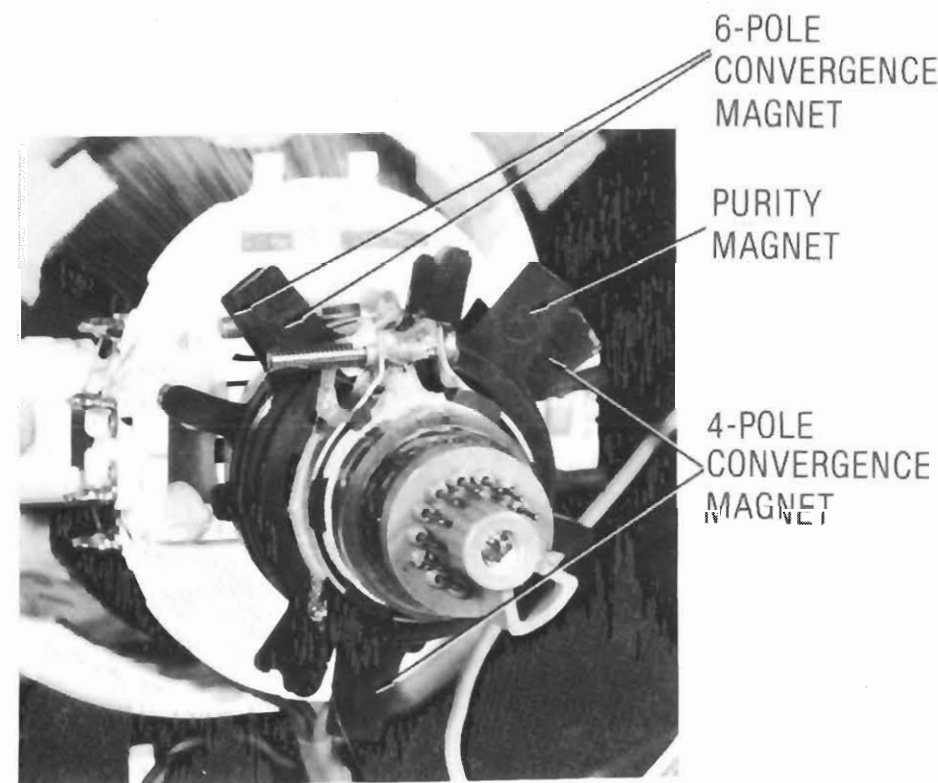
COLOR TEMPERATURE ADJUSTMENT

Set the Blue (R506) and Green (R536) Drive Controls to midrange. Set the Red (R577), Blue (R517) and Green (R547) Background Controls to MINIMUM. Set Service Switch (S301) to Service position. From MINIMUM position adjust Screen Control (R999B) to obtain a dim line of a predominate color. Adjust the two background controls of the least predominate colors to obtain a dim white line. Set Service Switch to Normal. Adjust the Blue (R506) and Green (R536) Drive Controls for a black and white picture

CONVERGENCE ADJUSTMENTS

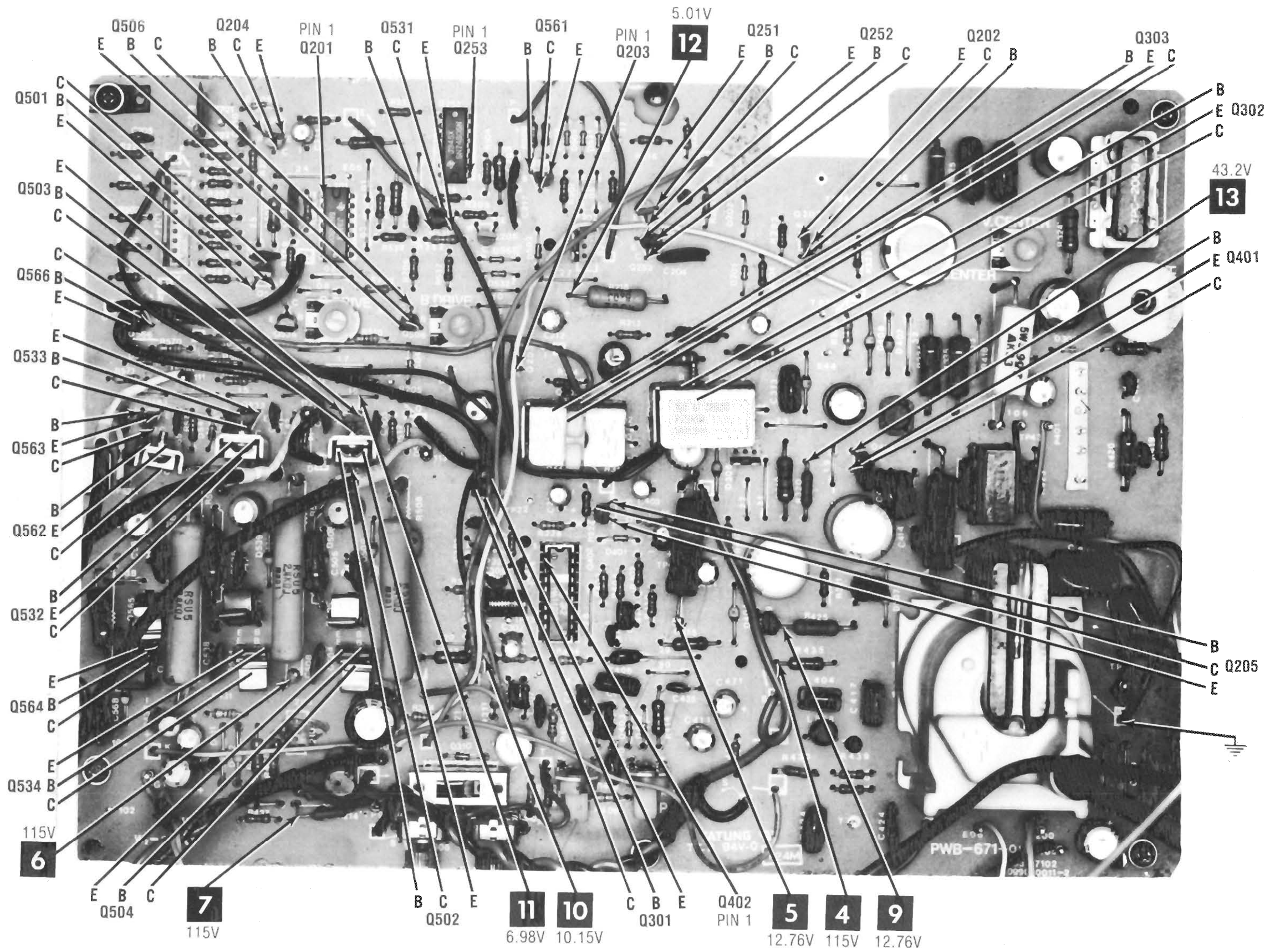
Connect a RGB video pattern generator to the antenna terminals and tune in a dot pattern. Adjust Four-pole Convergence Magnets to converge the red and blue dots at the center of the screen. Adjust Six-pole Convergence Magnets to converge the red/blue dots over the green dots at the center of the screen.

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.



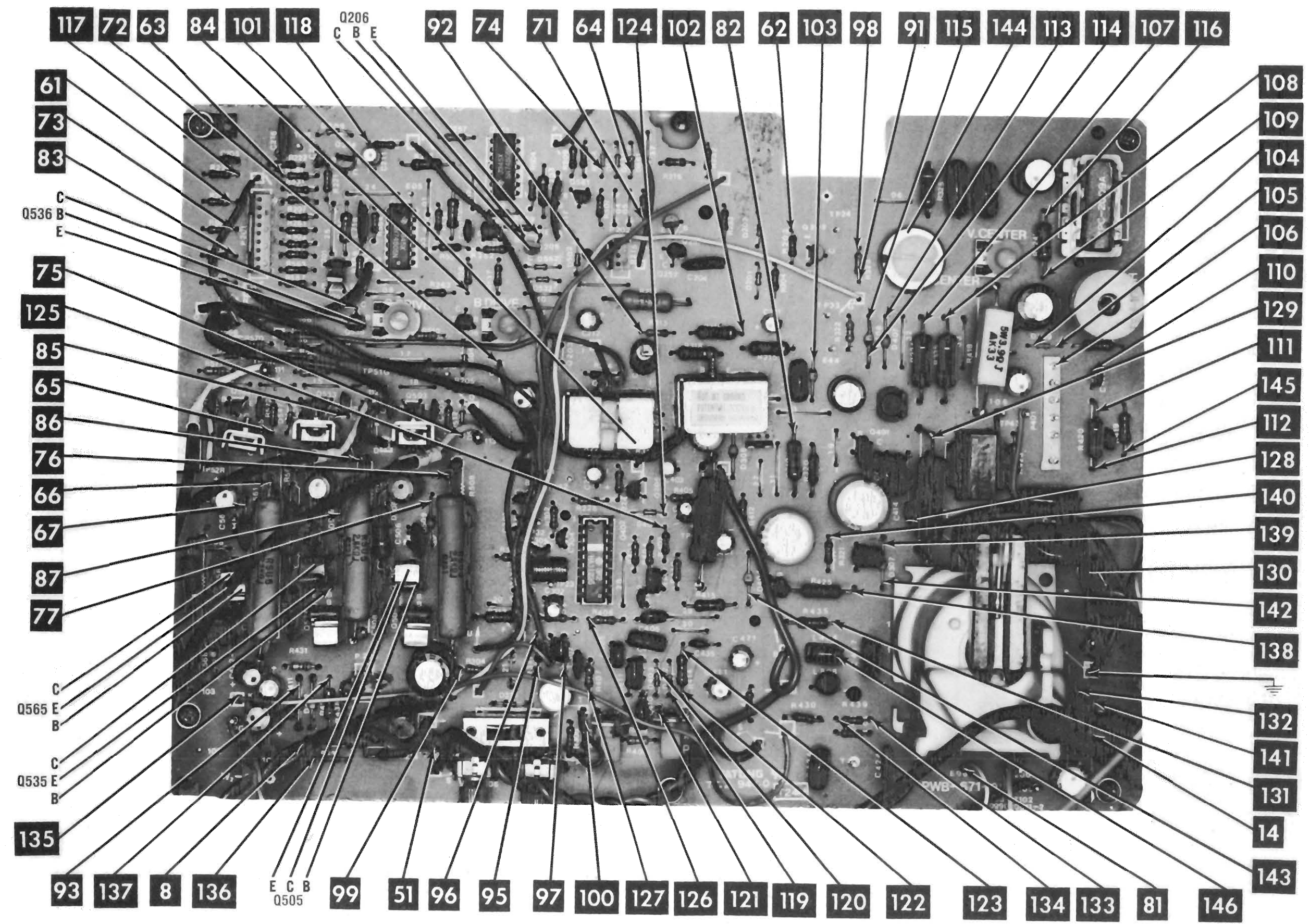
CRT NECK ASSEMBLY

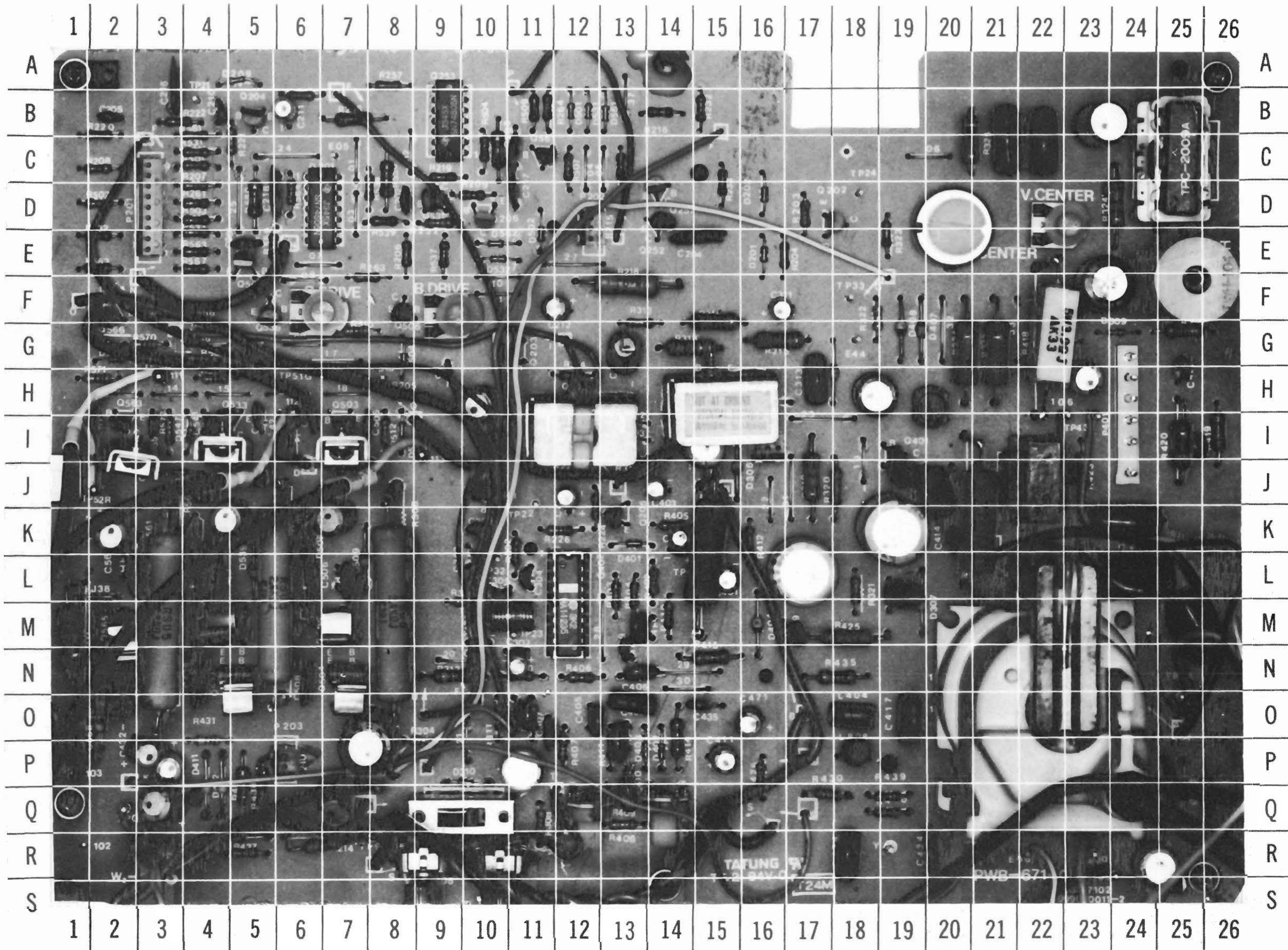
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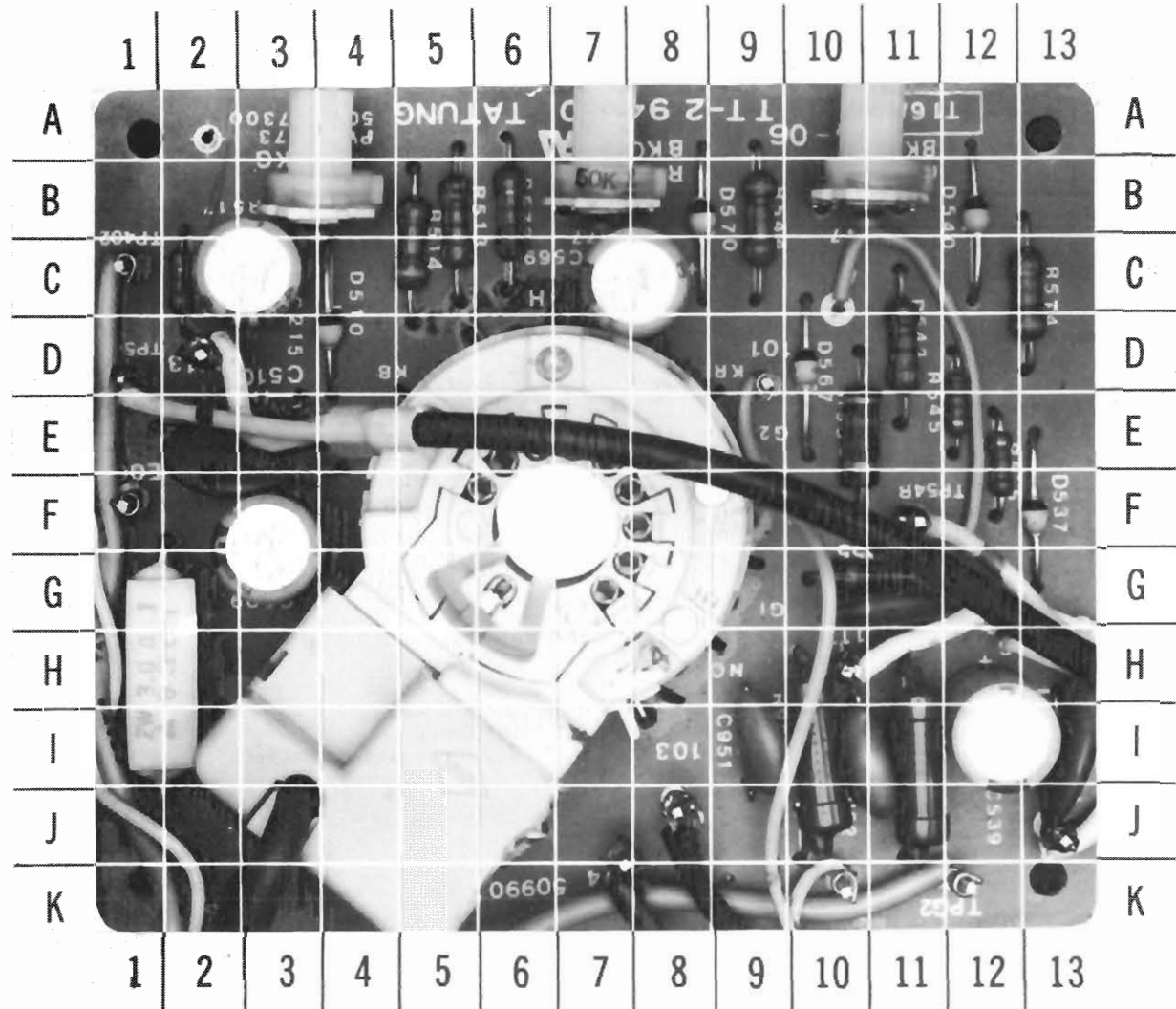
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CRT SOCKET BOARD GridTrace LOCATION GUIDE

C215	C-3	D510	D-4	R543	D-11	R952	I-11
C509	G-3	D537	F-13	R544	B-9	R953	I-10
C510	E-2	D540	B-12	R545	E-12	R954	E-2
C539	I-12	D567	D-10	R547	B-11	R955	G-11
C540	I-13	D570	B-8	R573	B-6	R956	E-10
C569	C-7	R513	B-5	R574	C-13	TP54B	D-2
C570	G-11	R514	C-5	R575	E-12	TP54G	H-12
C951	I-9	R515	C-2	R577	B-7	TP54R	F-11
C952	I-11	R517	B-4	R951	H-1	TP402	C-1
D507	D-3						

MAIN BOARD GridTrace LOCATION GUIDE

C201	E-5	C537	K-4	Q253	B-9	R324	D-24	R568	M-3
C202	D-8	C538	N-4	Q301	J-10	R325	C-21	R569	E-5
C203	C-11	C541	I-4	Q302	H-15	R331	G-22	R570	G-3
C204	E-14	C565	I-3	Q303	H-12	R332	G-25	R571	H-2
C205	B-2	C566	L-2	Q401	I-19	R334	G-20	R572	I-3
C206	H-10	C567	K-2	Q402	L-12	R335	G-2	R579	M-1
C208	P-7	C568	O-1	Q501	E-5	R336	D-22	R580	D-5
C209	Q-26	C571	I-2	Q502	I-7	R401	K-15	R581	N-3
C210	B-4	D201	E-16	Q503	I-7	R402	L-14	R582	G-4
C211	B-6	D202	D-16	Q504	N-7	R403	L-13	S301	Q-9
C212	F-12	D205	R-5	Q505	M-7	R404	L-13	T401	J-22
C213	J-12	D209	A-5	Q506	F-8	R405	K-14	T402	C-25
C216	A-3	D211	J-3	Q531	D-9	R406	N-12	T403	O-22
C217	D-11	D301	I-12	Q532	I-4	R407	P-12	TP21	B-4
C218	D-5	D302	I-13	Q533	I-4	R408	Q-13	TP22	J-11
C301	O-11	D303	I-13	Q534	N-5	R409	Q-12	TP43	I-3
C302	N-11	D304	H-17	Q535	M-4	R410	M-14	TP44	O-25
C303	L-10	D305	H-16	Q536	F-5	R411	P-13	TP52B	J-7
C304	L-11	D306	J-15	Q561	C-11	R412	K-16	TP52G	J-4
C305	L-10	D307	M-19	Q562	I-2	R413	Q-14	TP52R	J-2
C306	N-10	D309	G-24	Q563	I-2	R414	P-14	TP91	R-8
C307	O-11	D310	P-10	Q564	N-2	R415	N-15		Q-2
C308	P-11	D401	K-13	Q565	M-2	R416	K-21		
C309	K-10	D402	P-14	Q566	F-2	R417	J-21		
C310	H-18	D403	P-13	R203	D-17	R418	G-22		
C311	F-16	D404	M-16	R204	E-17	R419	I-26		
C313	H-17	D405	Q-25	R205	H-8	R420	I-25		
C314	I-15	D407	G-19	R206	E-8	R421	P-25		
C315	F-24	D408	G-19	R207	D-4	R423	J-23		
C316	B-23	D411	Q-4	R208	C-2	R425	M-18		
C318	H-23	D412	Q-4	R209	D-10	R426	P-16		
C319	F-23	D501	B-12	R213	Q-6	R430	Q-17		
C321	G-13	D502	E-11	R214	R-7	R431	Q-4		
C401	L-15	D504	G-8	R216	B-14	R434	D-20		
C402	K-14	D505	L-8	R218	F-13	R435	N-18		
C403	J-14	D506	L-6	R219	C-9	R436	Q-5		
C404	M-13	D509	L-7	R220	B-2	R437	R-5		
C405	O-12	D513	I-8	R221	C-5	R438	Q-5		
C406	N-13	D531	B-12	R222	B-3	R439	Q-19		
C407	O-13	D532	E-10	R223	B-6	R440	Q-19		
C408	P-13	D534	G-5	R224	J-12	R501	C-4		
C409	N-13	D535	L-5	R225	J-12	R502	D-2		
C410	Q-13	D536	L-4	R226	K-12	R503	D-4		
C411	P-15	D539	L-5	R231	C-13	R504	C-10		
C412	J-20	D543	I-6	R232	B-15	R506	F-9		
C413	J-19	D547	I-4	R233	D-15	R507	C-12		
C414	K-20	D561	B-13	R252	D-9	R508	M-8		
C417	O-19	D562	E-10	R257	A-8	R509	B-11		
C418	L-24	D564	G-2	R258	B-7	R510	G-7		
C419	M-25	D565	L-3	R261	D-4	R511	H-7		
C420	K-24	D566	O-2	R263	E-7	R512	I-8		
C421	I-25	D569	L-3	R264	B-11	R519	L-6		
C422	H-25	L301	M-11	R302	K-11	R520	C-10		
C423	R-25	L302	L-19	R303	Q-12	R521	N-8		
C424	R-20	L401	H-20	R304	O-9	R531	C-4		
C425	C-22	L403	F-25	R305	M-10	R532	E-2		
C426	C-21	L404	O-18	R306	R-9	R533	E-4		
C428	L-17	L501	K-8	R307	O-11	R534	D-8		
C429	M-17	L531	L-6	R308	Q-11	R536	F-7		
C430	Q-7	L561	K-3	R309	R-10	R537	E-9		
C431	P-3	L808	P-18	R310	N-11	R538	L-5		
C432	P-3	P/J201	D-3	R311	O-10	R539	D-8		
C433	K-19	P/J202	D-12	R312	N-9	R540	G-4		
C434	R-18	P/J203	P-6	R313	F-13	R541	H-4		
C435	O-15	P/J204	I-16	R314	H-12	R542	I-6		
C436	Q-3	P/J401	I-24	R315	G-16	R549	L-4		
C471	O-16	Q201	D-6	R316	F-15	R550	C-8		
C505	I-7	Q202	D-18	R317	I-13	R551	M-5		
C506	L-7	Q203	G-11	R318	G-14	R561	B-4		
C507	K-7	Q204	B-5	R319	J-17	R562	E-2		
C508	N-6	Q205	K-12	R320	J-18	R563	F-4		
C511	I-6	Q206	D-10	R321	L-18	R564	D-6		
C535	I-5	Q251	D-14	R322	F-18	R566	F-3		
C536	L-4	Q252	D-14	R323	E-19	R567	E-4		



PARTS LIST AND DESCRIPTION

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

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFGR. PART No.	REPLACEMENT DATA						
			GENERAL ELECTRIC PART No.	MOTOROLA PART No.	NEW-TONE NTE PART No.	PHILIPS ECG PART No.	RCA PART No.	WORKMAN PART No.	ZENITH PART No.
D201,2 D205 D209 D211	1S2076 V06C 1S2076 HZ-7B1 HZ-7B		GE-514 GE-504A GE-514 GEZD-6.8 GEZD-6.8	1N4935 1N4003 1N4935 1N5235B 1N5235B	NTE519 NTE116 NTE519 NTE5014A NTE5014A	ECG519 ECG116 ECG519 ECG5014A ECG5014A	SK3100/519 SK3311 SK3100/519 SK6A8/5014A SK6A8/5014A	WEP925/519 WEP156 WEP925/519 WEP1415/5014 WEP1415/5014	103-131 212-76-02 103-131 103-Z9009 103-Z9009
D301 thru D303 D304,5 D306 D307	1S2076 V09C V06E V09G		GE-514 GE-511 GE-504A GE-511	1N4935 1N4005	NTE519 NTE552 NTE116 NTE552	ECG519 ECG552 ECG116 ECG552	SK3100/519 SK5002 SK3017B SK9000/552	WEP925/519 WEP172/506 WEP158/116 WEP172/506	103-131 103-287 212-76-02 103-287
D309 D310 D401 thru D403 D404	1S2076 HZ11A 1S2076 V09E		GE-514 GEZD-11 GE-514	1N4935 1N5241B 1N4935	NTE519 NTE5020A NTE519	ECG519 ECG5020A ECG519	SK3100/519 SK11A/5020A SK3100/519	WEP925/519 WEP1421/5020 WEP925/519	103-131 103-279-20 103-131
D405 D407,8 D411,12 D501,2 D504,5	V09C V09C V06C 1S2076 1S2076		GE-511 GE-511 GE-504A GE-514 GE-514	1N4003 1N4003 1N4935 1N4935	NTE552 NTE552 NTE116 NTE519 NTE519	ECG552 ECG552 ECG116 ECG519 ECG519	SK5002 SK5002 SK3311 SK3100/519 SK3100/519	WEP172/506 WEP172/506 WEP156 WEP925/519 WEP925/519	103-287 103-287 212-76-02 103-131 103-131
D506 D507 D509,10 D513 D531,32	V06C V09C V06C 1S2076 1S2076		GE-504A GE-511 GE-504A GE-514 GE-514	1N4003 1N4003 1N4935 1N4935	NTE116 NTE552 NTE116 NTE519 NTE519	ECG116 ECG552 ECG116 ECG519 ECG519	SK3311 SK5002 SK3311 SK3100/519 SK3100/519	WEP156 WEP172/506 WEP156 WEP925/519 WEP925/519	212-76-02 103-287 212-76-02 103-131 103-131
D534,35 D536 D537 D539,40 D543	1S2076 V06C V09C V06C 1S2076		GE-514 GE-504A GE-511 GE-504A GE-514	1N4935 1N4003 1N4003 1N4003 1N4935	NTE519 NTE116 NTE552 NTE116 NTE519	ECG519 ECG116 ECG552 ECG116 ECG519	SK3100/519 SK3311 SK5002 SK3311 SK3100/519	WEP925/519 WEP156 WEP172/506 WEP156 WEP925/519	103-131 212-76-02 103-287 212-76-02 103-131
D547 D561,62 D564,65 D566 D567	1S2076 1S2076 1S2076 V06C V09C		GE-514 GE-514 GE-514 GE-504A GE-511	1N4935 1N4935 1N4935 1N4003	NTE519 NTE519 NTE519 NTE116 NTE552	ECG519 ECG519 ECG519 ECG116 ECG552	SK3100/519 SK3100/519 SK3100/519 SK3311 SK5002	WEP925/519 WEP925/519 WEP925/519 WEP156 WEP172/506	103-131 103-131 103-131 212-76-02 103-287

PARTS LIST AND DESCRIPTION (Continued)

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

FUSE DEVICES

ITEM NO.	DESCRIPTION	MFGR. PART NO.	DEVICE	HOLDER	NOTES
F801	4A @ 250V Slow-Blow				

TRANSFORMER (DC-DC Converter)

ITEM No.	DESCRIPTION	RATING					REPLACEMENT DATA		
		SEC. 1	SEC. 2	SEC. 3	SEC. 4	SEC. 5	MFGR. PART No.	THORDARSON PART No.	NOTES
T802	400V P-P @ 412mA DC	200V P-P @ 479mA DC	40V P-P @ 8.89mA DC	14V P-P @ 64mA DC			TPW-246 (1)		

(1) Number on unit.

MISCELLANEOUS

ITEM No.	PART NAME	MFGR. PART No.	NOTES
D203	LED	8654275 (1) 8654275 (1)	Power, FLV310, Grn (2.07V @ 10.78mA)
D61	De-gaussing Coil	8529158	AC Power Normal/Service 370RKB2-TC14
L806	Ferrite Bead		Main Board
P800	Power Cord		Power Supply Board
S1	Switch		CRT Socket Board
S301	Switch		AC Input Board
V901	CRT	8529290 (1)(2)	Includes Cable and Connectors

(1) Restricted Availability.
(2) Includes CRT and Yoke.

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

ITEM	PART No.	ITEM	PART No.
Front Cover (Includes Top, Bottom and Power Supply Brackets).	8529285 (1)	Plug, Cover Screw	8529287
Rear Cover	8529286 (1)	Knob, Brightness	8529288
		Knob, Contrast	8529289
		Knob, Power On/Off	

(1) Restricted Availability.

MODEL 5153
IBM

PARTS LIST AND DESCRIPTION (Continued)

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

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		
		MFGR. PART No.	NEW-TONE PART No.	WORKMAN PART No.
R213	2.2 1/2W Fusible			
R214	2.2 1/2W Fusible			
R320	10 1/2W Fusible			
R401	6800 5% 3W Metal Oxide			
R416	4700 5% 3W Metal Oxide			
R418	3.9 5% 5W WW		5W3D9	
R421	2.2 1/2W Fusible			
R425	2.2 1/2W Fusible			
R430	10K 2% 1/4W Carbon Film		QW310	22-2253
R508	2400 5% 5W WW			
R521	56 1/2W Fusible			
	10 1/2W Fusible			
R538	2400 5% 5W WW			
R551	56 1/2W Fusible			
	10 1/2W Fusible			
R568	2400 5% 5W WW			
R581	56 1/2W Fusible			
	10 1/2W Fusible			
R801	3.3 5% 10W WW		10W3D3	
R802	180 5% 5W WW		5W118	
R803	56K 5% 3W Metal Oxide			
R805	16 5% 5W WW			
R808	2.2 1/2W Fusible			
R817	1200 1% 1/4W Carbon Film			
R818	2000 1% 1/4W Carbon Film			
R823	10 1/2W Fusible			
R890	PTC 3.7 Cold			FR605

COILS (RF-IF)

ITEM No.	FUNCTION	MFGR. PART No.
L301	RF Choke (5uH)	
L302	RF Choke	
L401	RF Choke (3.3mH)	
L404	RF Choke (18uH)	
L501	RF Choke (10uH)	
L531	RF Choke (10uH)	
L561	RF Choke (10uH)	

ITEM No.	FUNCTION	MFGR. PART No.
L801	RF Choke	
L802	RF Choke	
L803	RF Choke	
L804	AC Line Choke	
L805	RF Choke	
L808	RF Choke	
T801	AC Line Choke	

COILS & TRANSFORMERS (Sweep Circuits)

ITEM No.	FUNCTION	REPLACEMENT DATA		
		MFGR. PART No.	OTHER IDENTIFICATION	THORDARSON PART No.
DY	Yoke 90° Horiz 2.02mH Vert 134mH	8529290 (2)(3)	89235100 (1)	
L403	Width		TWH104 (1)	
T401	Horiz Driver		TLN114 (1)	
T402	Side Pincushion		TPC2009A (1)	
T403	Horiz Output		TFB150A (1)	

- (1) Number on unit.
- (2) Includes CRT and Yoke.
- (3) Restricted Availability.

PARTS LIST AND DESCRIPTION (Continued)

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

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFGR. PART No.	REPLACEMENT DATA						
			GENERAL ELECTRIC PART No.	MOTOROLA PART No.	NEW-TONE NTE PART No.	PHILIPS ECG PART No.	RCA PART No.	WORKMAN PART No.	ZENITH PART No.
D569,70	V06C		GE-504A	1N4003	NTE116	ECG116	SK3311	WEP156	212-76-02
D801			GE-511		NTE552	ECG552	SK9000/552	WEP172/506	103-287
D802			GE-511		NTE552	ECG552	SK9000/552	WEP172/506	103-287
D803			GE-511		NTE552	ECG552	SK9000/552	WEP172/506	103-287
D804			GE-511		NTE552	ECG552	SK9000/552	WEP172/506	103-287
D805			GE-511		NTE552	ECG552	SK9000/552	WEP172/506	103-287
D806			GE-511		NTE552	ECG552	SK9000/552	WEP172/506	103-287
D807			GE-511		NTE552	ECG552	SK9000/552	WEP172/506	103-287
D808			GE-511		NTE552	ECG552	SK9000/552	WEP172/506	103-287
D809			GE-511		NTE552	ECG552	SK9000/552	WEP172/506	103-287
D810			GE-511		NTE552	ECG552	SK9000/552	WEP172/506	103-287
D811			GE-511		NTE552	ECG552	SK9000/552	WEP172/506	103-287
D812			GE-511		NTE552	ECG552	SK9000/552	WEP172/506	103-287
D813			GE-511		NTE552	ECG552	SK9000/552	WEP172/506	103-287
D814			GE-511		NTE552	ECG552	SK9000/552	WEP172/506	103-287
D815			GE-511		NTE552	ECG552	SK9000/552	WEP172/506	103-287
D817			GE-511		NTE552	ECG552	SK9000/552	WEP172/506	103-287
D820			GE-511		NTE552	ECG552	SK9000/552	WEP172/506	103-287
D822			GE-511		NTE552	ECG552	SK9000/552	WEP172/506	103-287
D823			GE-511		NTE552	ECG552	SK9000/552	WEP172/506	103-287
Q201	SN74S05N		GE-511		NTE552	ECG552	SK9000/552	WEP172/506	103-287
Q202	HD74S05		GE-511		NTE552	ECG552	SK9000/552	WEP172/506	103-287
Q203	2SC458C		GE-210	2N4401*	NTE85	ECG85	SK3124A/289A	WEP910/289	121-972*
Q204	HA17805,P		GEVR-102	MC7805CT	NTE960	ECG960	SK3591/960	WEP910/289	221-Z9043
Q204	2SC458C		GE-210	2N4401*	NTE85	ECG85	SK3124A/289A	WEP910/289	121-972*
Q205	2SA844D,E		GE-65	2N5679*	NTE234	ECG234	SK3247/234	WEP907/234	121-Z9005
Q206	2SC458C		GE-210	2N4401*	NTE85	ECG85	SK3124A/289A	WEP910/289	121-972*
Q251,52	2SC458C		GE-210	2N4401*	NTE85	ECG85	SK3124A/289A	WEP910/289	121-972*
Q253	SN74S05N		GE-210	2N4401*	NTE74S05	ECG74S05	SK3124A/289A	WEP910/289	121-972*
Q301	HD74S05		GE-222*	MPSU10*	NTE74S05	ECG74S05	SK9352/399	WEP750	121-Z9045*
Q302	2SC1921		GE-375		NTE399	ECG399	SK9118/375	WEP763/375	121-Z9106
Q303	2SD1136C		GE-375		NTE54	ECG54	SK9363/398	WEP61/157	121-Z9115
Q401	2SB861C		GE-232	MJE340	NTE398	ECG398	SK3747/157	WEP61/157	121-Z9016
Q401	2SC2611BK		GE-232		NTE157	ECG157	SK3747/157	WEP61/157	121-Z9016
Q402	HA11235		GE-232		NTE1550	ECG1550	SK9249/1550	WEP61/157	121-Z9016

IBM
CMT4-2
MODEL 5153

PARTS LIST AND DESCRIPTION (Continued)

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

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA						
			GENERAL ELECTRIC PART No.	MOTOROLA PART No.	NEW-TONE NTE PART No.	PHILIPS ECG PART No.	RCA PART No.	WORKMAN PART No.	ZENITH PART No.
Q403 Q501 Q502 Q503 Q504	2SD898B 2SC458C 2SC1514 2SC1906 2SD757C,D		GE-210 GE-251 GE-86	BU208 2N4401* TIP50 MPS6543*	NTE89 NTE85 NTE376 NTE107	ECG89 ECG85 ECG376 ECG107	SK9119/89 SK3124A/289A SK9362/376 SK3293/107	WEP89/89 WEP910/289 WEP779/198 WEP923/316*	121-29112 121-972* 121-29028 121-522*
Q505 Q506 Q531 Q532 Q533	2SB717C,D 2SA844D,E 2SC458C 2SC1514 2SC1906		GE-65 GE-210 GE-251 GE-86	2N5679* 2N4401* TIP50 MPS6543*	NTE234 NTE85 NTE376 NTE107	ECG234 ECG85 ECG376 ECG107	SK3247/234 SK3124A/289A SK9362/376 SK3293/107	WEP907/234 WEP910/289 WEP779/198 WEP923/316*	121-29005 121-972* 121-29028 121-522*
Q534 Q535 Q536 Q561 Q562	2SD757C,D 2SB717C,D 2SA844D,E 2SC458C 2SC1514		GE-65 GE-210 GE-251	2N5679* 2N4401* TIP50	NTE234 NTE85 NTE376	ECG234 ECG85 ECG376	SK3247/234 SK3124A/289A SK9362/376	WEP907/234 WEP910/289 WEP779/198	121-29005 121-972* 121-29028
Q563 Q564 Q565 Q566 Q801	2SC1906 2SD757C,D 2SB717C,D 2SA844E 2SD1185		GE-86 GE-65	MPS6543* 2N5679*	NTE107 NTE234	ECG107 ECG234	SK3293/107 SK3247/234 SK3111	WEP923/316* WEP907/234	121-522* 121-29005
Q802 Q803 Q804 Q805	2SB739C 2SC1213C 2SA1029C CW12B		GE-48 GE-268 GE-269	2N2906A 2N4401* 2N4403	NTE294 NTE289A NTE290A	ECG294 ECG289A ECG290A	SK3841/294 SK3122 SK3114A/290A	WEP916/294 WEP910/289 WEP911/290A	121-29067 121-29065 121-29003

* Lead configuration may vary from original.

WIRING DATA

High Voltage Lead	Use BELDEN No. 9867 (30 KV) or 8866 (40 KV)
Shielded Hook-up Wire	Use BELDEN No. 8401 or 8421 (Single-Conductor) 8208 (Two-Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8529 (Solid) Available in 13 Colors 8522 (Stranded) Available in 13 Colors

PARTS LIST AND DESCRIPTION (Continued)

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

ELECTROLYTIC CAPACITORS

Item numbers not listed are normally available at local distributors.

ITEM No.	RATING	MFR. PART No.	ITEM No.	RATING	MFR. PART No.
C306	2.2 25V 10%				

CAPACITORS

Item numbers not listed are normally available at local distributors.

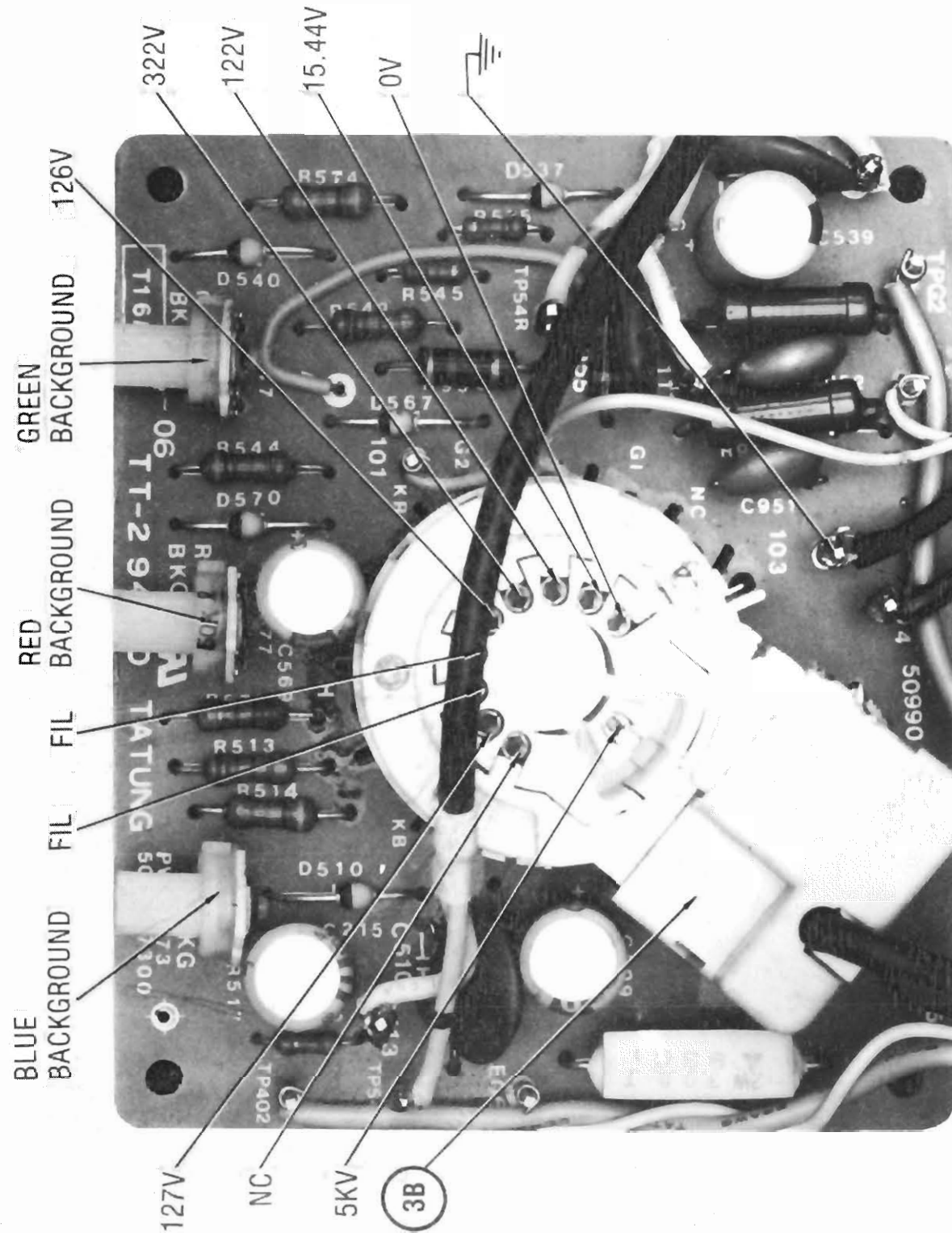
ITEM No.	RATING	MFR. PART No.	ITEM No.	RATING	MFR. PART No.
C824	.1 125VAC 10%		C829	.01 125VAC	
C827	.1 125VAC		C830	.01 125VAC	
C828	.1 125VAC				

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

ITEM NO.	FUNCTION	RESISTANCE	MFR. PART NO.	NOTES
R210	Brightness	100K		
R215	Brightness	50K		
R306	Contrast	500		
R309	Vert Size	500		
R309	Vert Hold	5000		
R309	Vert Center	5000		
R336	Vert Hold	5000		
R409	Horiz Hold	5000		
R413	Horiz Phase	5000		
R434	Horiz Center	500		
R506	Blue Drive	1000		
R517	Blue Background	50K		
R536	Green Drive	1000		
R547	Green Background	50K		
R566A	Red Drive	1000		
R577	Red Background	50K		
R851	B+ Adjust	500		
R999A	Focus	500		
B	Screen	(18)		

(18) R999A and B part of T403.

IBM
MODEL 5153



CRT SOCKET BOARD

CMT4-2 IBM MODEL 5153

PRELIMINARY SERVICE CHECKS

This data provides the user with a time-saving service tool which is designed for quick isolation and repair of computer malfunctions.

Check all interconnecting cables for good connection and correct hookup before making service checks.

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

Remove two caps from cabinet top and remove two screws holding cabinet to cabinet front. Remove four screws (from bottom) holding cabinet back to cabinet front and remove back.

Disconnect HV anode, CRT socket and ground leads. Remove two screws (from bottom) holding main chassis assembly to cabinet bottom and remove assembly from cabinet.

Remove four screws holding AC power assembly to power supply assembly and main chassis. Remove assembly and disconnect connectors as required.

Remove five screws holding power supply assembly to main chassis assembly and cabinet front brace and remove power supply assembly.

Remove four screws holding power supply cover and lift cover off power supply. Remove five screws holding power board to chassis, disconnect connectors and lift board out of chassis.

Remove knobs from cabinet front. Remove three screws holding control indicator assembly to cabinet front and remove assembly from cabinet.

CRT REMOVAL

CAUTION: Set employs CRT with neck assemblies permanently bonded to CRT. **Do Not** attempt to remove neck assemblies from CRT.

Follow "Chassis Removal" procedure and lay set facedown on a soft protective surface. Remove four screws holding CRT to cabinet front and lift CRT out of cabinet. **Do Not** lift CRT by the neck.

CMT4-2 IBM MODEL 5153

SAMS™ Howard W. Sams & Co., Inc.
4300 West 62nd Street, P.O. Box 7092, Indianapolis, Indiana 46206 U.S.A.

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.

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PRELIMINARY SERVICE CHECKS (Continued)

SERVICE CHECKS

SEE INTERCONNECTING DIAGRAM, PLACEMENT CHART, AND PHOTOS TO MATCH THE NUMBER IN THE CIRCLES WITH THOSE IN THE FOLLOWING DATA FOR SERVICE CHECKS TO BE PERFORMED.

1 POWER SUPPLY

- (A) Check AC Fuse (F801).
- (B) If Fuse F801 is bad, check Bridge Rectifier Diodes (D801 thru D804).
- (C) Check for 120VAC at the output connector of the AC Input Board.
- (D) If the 120VAC is missing, check Coil L804.
- (E) Disconnect DC output connector from Power Board.
- (F) Check for 115V across the DC output connector on the Power Board. If 115V is missing, check the Power Board by substitution.
- (G) Check the adjustment of B+ Adjust Control (R851), see Miscellaneous Adjustments.

2 NO RASTER

- (A) Check the CRT HV Anode voltage with a HV probe.

- (B) If the HV is missing, check the Horizontal Output Transistor (Q403).
- (C) Check for 115V at the collector of Transistor Q403.
- (D) If the 115V is missing, check Coils L404, L808, and pin 7 and 8 of the Horizontal Output Transformer (T403) for continuity.
- (E) Check the Sync Processor IC (Q402) by substitution.
- (F) Check the Service Switch (S301).
- (G) Check the CRT with a CRT tester.

3 NO VIDEO

- (A) Check RGB connector P2 at the Computer and P201 at the Monitor for bad connections.
- (B) Check the voltages on the CRT socket.

TEST EQUIPMENT AND TOOLS

TEST EQUIPMENT

Digital Volt/Ohm Meter
High Voltage Probe
CRT Tester

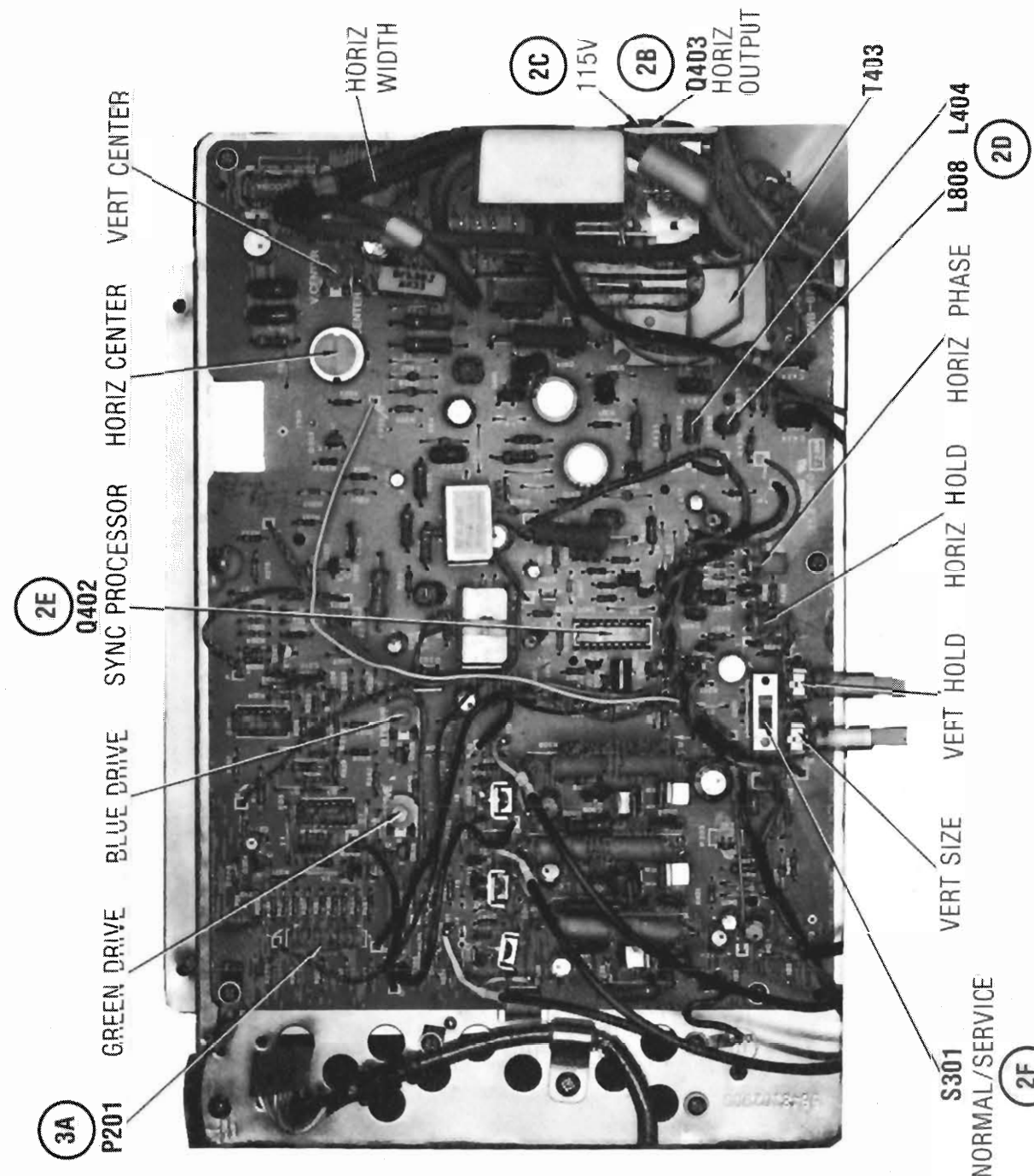
TOOLS

Phillips Screwdriver
1/4" Nut Driver
Soldering Iron
Desoldering Tool

PARTS LIST AND DESCRIPTION

ITEM	PART NO.	DESCRIPTION
D801 thru D804		Bridge Rectifiers
F801		4A Fuse
L404		RF Choke
L804		AC Line Choke
L808		RF Choke
Q402		Sync Processor IC
Q403		Horiz Output Transistor
R851		B+ Adjust Control
S301		Service Switch
T403		Horiz Output Transformer

PRELIMINARY SERVICE CHECKS (Continued)



IBM
MODEL 5153

CHASSIS-TOP VIEW

PRELIMINARY SERVICE CHECKS (Continued)

PRELIMINARY SERVICE CHECKS (Continued)



POWER SUPPLY BOARD

MISCELLANEOUS ADJUSTMENTS

B + ADJUSTMENT

Connect a DC meter to TP91, low side to ground. Apply power to Monitor. Adjust B+ Adjust Control (R851) for +115V.

HORIZONTAL HOLD ADJUSTMENT

Connect a RGB video pattern generator to the Monitor. Use a color bar pattern. Connect a .1μF Capacitor from TP22 to ground. Adjust Horizontal Hold Control (R409) until the bars stop (in sync) or slowly float across the screen. Remove the .1μF Capacitor.

HORIZONTAL AND VERTICAL CENTERING

Connect a RGB video pattern generator to the Monitor. Use a color bar pattern. Adjust Horizontal Center Control (R434) for best horizontal centering of the raster. Adjust Vertical Center Control (R336) for best vertical centering of the raster.

HORIZONTAL PHASE CONTROL

Adjust Horizontal Phase Control (R413) to place the cursor at the left edge of the raster.

PURITY ADJUSTMENT

Degauss the CRT, if necessary. Set the Blue (R517) and Green (R547) Background Controls to MINIMUM. Advance the Red Background Control (R577) to produce a red raster. Loosen the deflection yoke and slide it back against the Purity/Convergence Assembly. Adjust the Purity Magnets to produce a vertical red stripe at the center of the screen. Slide the deflection yoke forward to produce uniform red

raster. Check for pure blue and green screens by advancing the Blue (R517) and Green (R547) Background Controls one at a time.

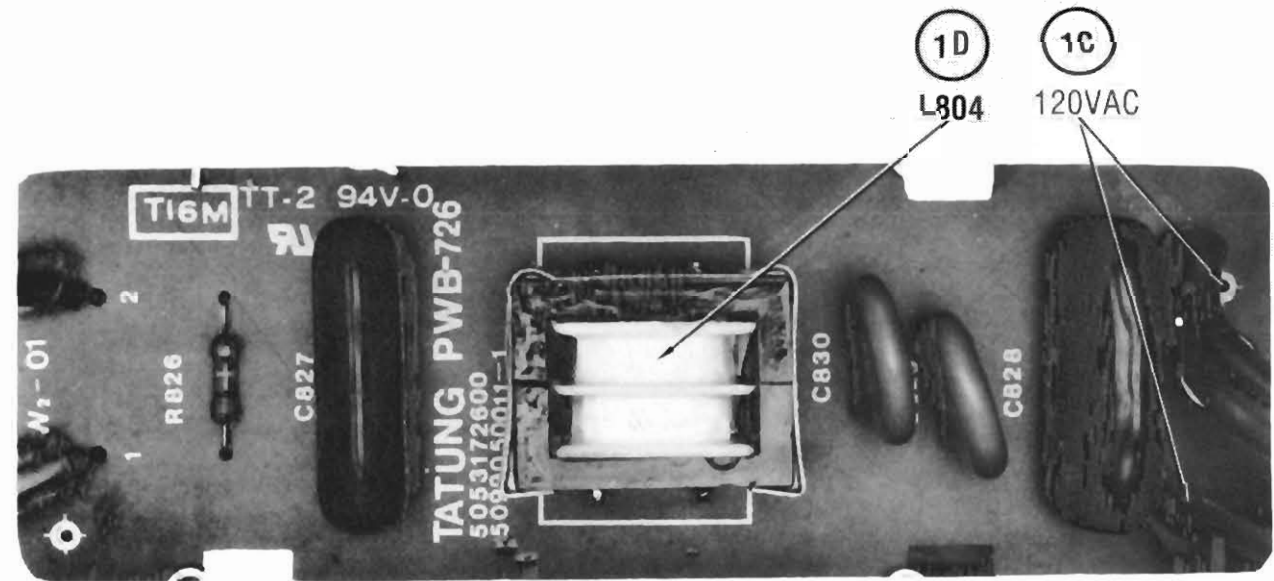
COLOR TEMPERATURE ADJUSTMENT

Set the Blue (R506) and Green (R536) Drive Controls to midrange. Set the Red (R577), Blue (R517) and Green (R547) Background Controls to MINIMUM. Set Service Switch (S301) to Service position. From MINIMUM position adjust Screen Control (R999B) to obtain a dim line of a predominate color. Adjust the two background controls of the least predominate colors to obtain a dim white line. Set Service Switch to Normal. Adjust the Blue (R506) and Green (R536) Drive Controls for a black and white picture

CONVERGENCE ADJUSTMENTS

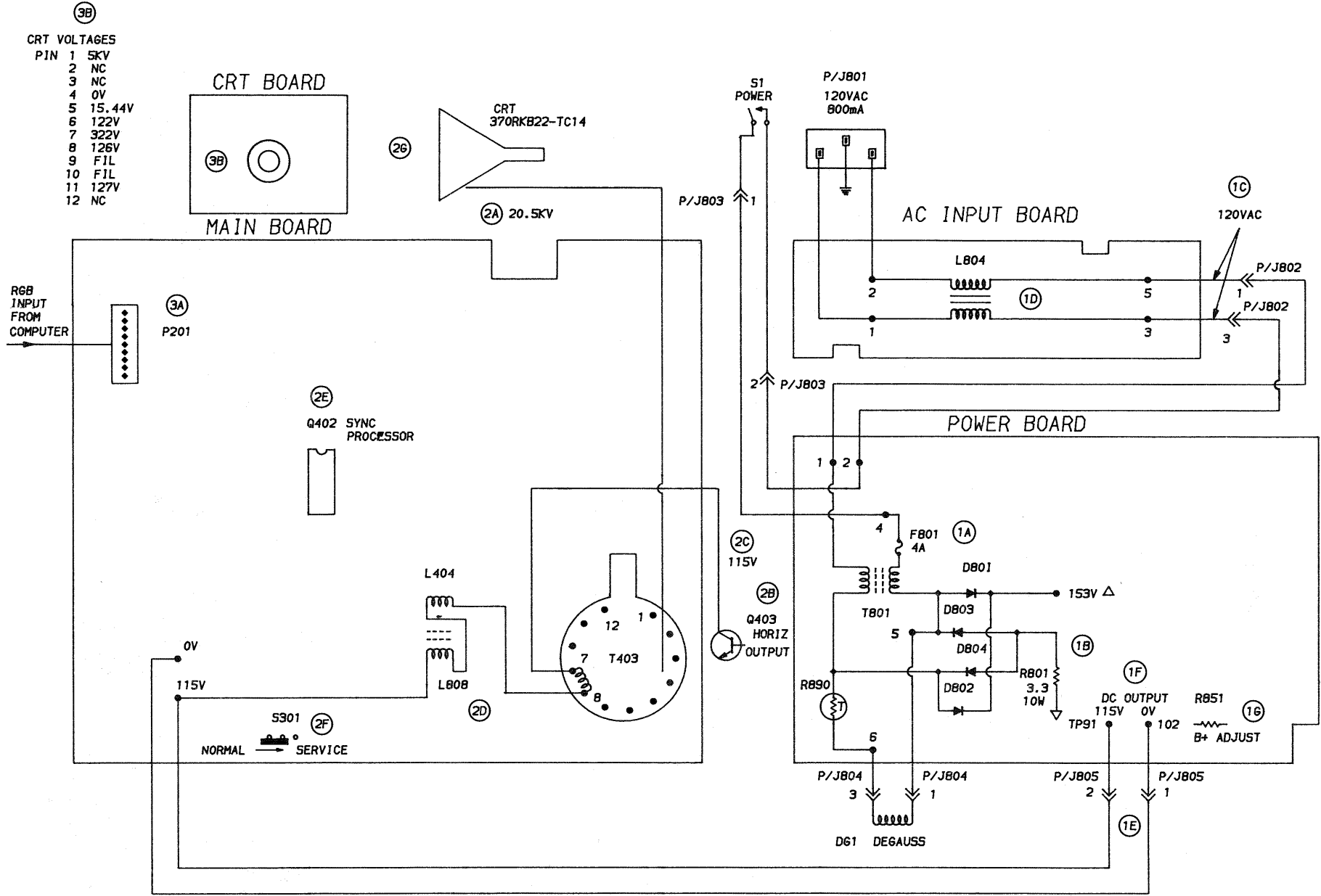
Connect a RGB video pattern generator to the antenna terminals and tune in a dot pattern. Adjust Four-pole Convergence Magnets to converge the red and blue dots at the center of the screen. Adjust Six-pole Convergence Magnets to converge the red/blue dots over the green dots at the center of the screen.

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.

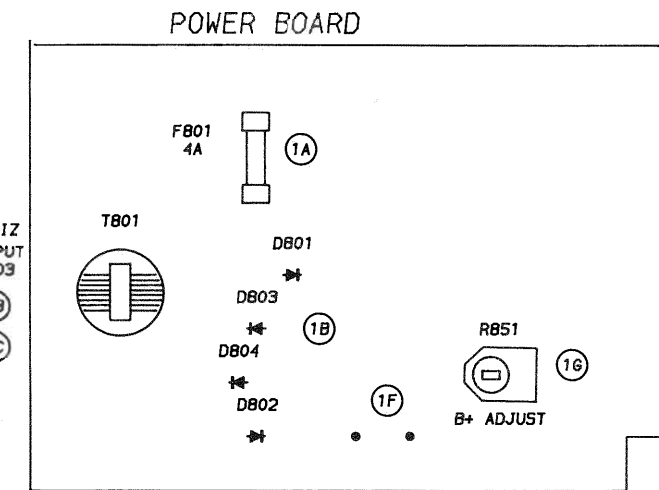
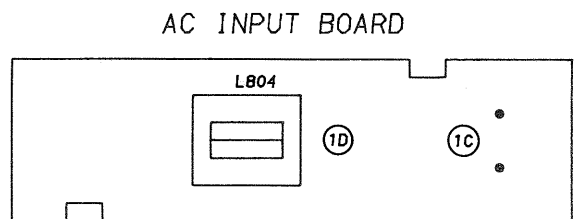
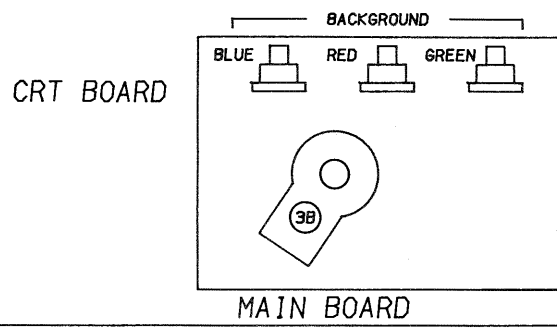


AC INPUT BOARD

IBM
CMT4-2
MODEL 5153



PRELIMINARY SERVICE CHECKS (Continued)



PRELIMINARY SERVICE CHECKS (Continued)