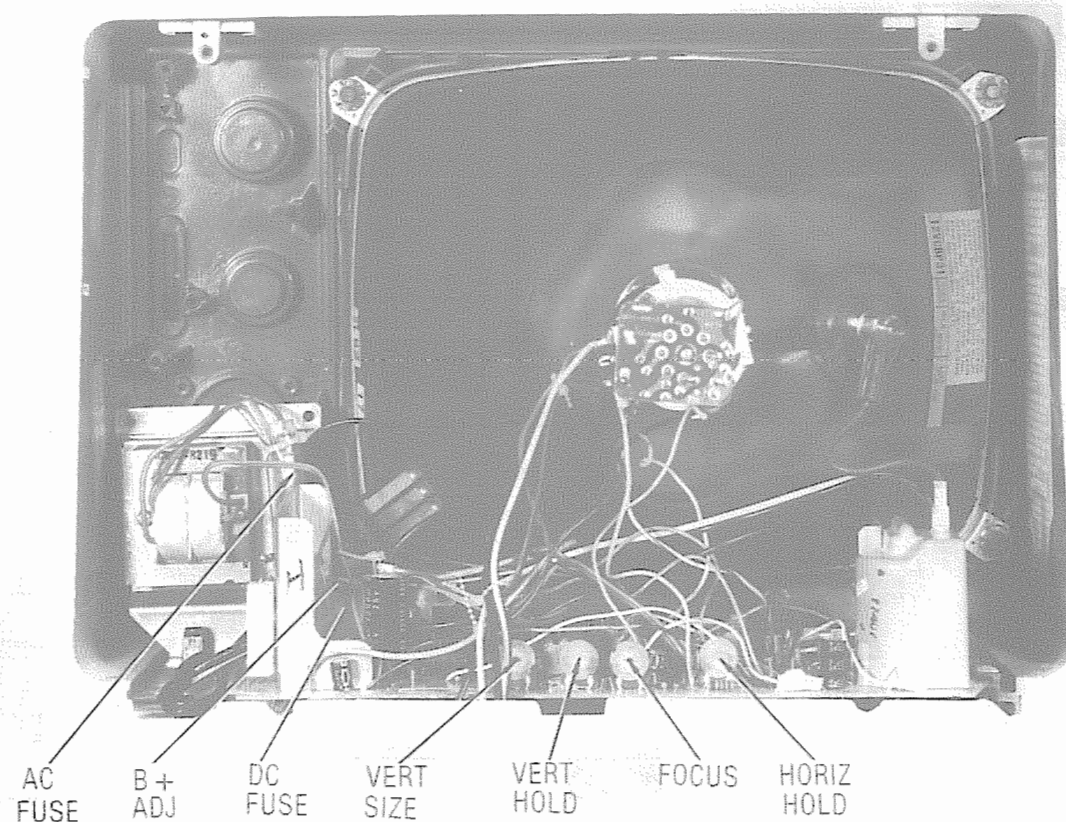




CABINET-REAR VIEW
DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

Remove four screws holding cabinet back. Remove one screw holding video input block to cabinet back and remove cabinet back from set. Disconnect CRT socket, HV anode lead and ground wires. Loosen and remove deflection yoke from neck of CRT. Remove three screws holding power transformer to cabinet front. Carefully remove main PC board and assemblies from cabinet.

CRT REMOVAL

Follow "Chassis Removal" procedure. Then, place set face down on a soft protective surface. Remove four screws holding CRT to cabinet front. Lift CRT from 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 2.25-amp fuse is used for low-voltage power-supply protection. (See Placement Chart.)

A 4-amp fuse is used for AC line protection. (See Placement Chart.)

HORIZONTAL OSCILLATOR

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

WIDTH

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

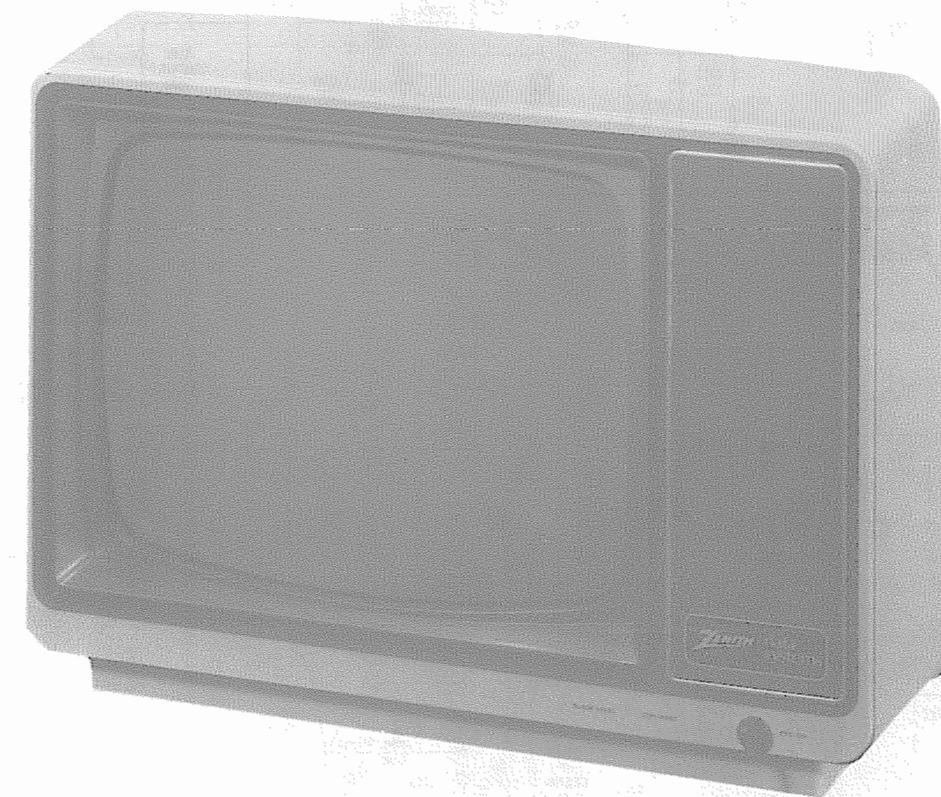
FOCUS

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

CENTERING

Centering is accomplished by proper adjustment of two magnetic rings located on the yoke rear cover.

CMT2-2 ZENITH MODEL ZVM-121



MODEL ZVM-121

CMT2-2 ZENITH MODEL ZVM-121

PRELIMINARY SERVICE CHECKS

ENCLOSED

SAFETY PRECAUTIONS

See pages 4, 5.

INDEX

	Page		Page
Adjustment	14	Placement Chart	3
Disassembly Instructions	16	Resistance Measurements	14
GridTrace Location Guide		Safety Precautions	4,5
Main Board	5,12	Schematics	
Parts List		Notes	2
TV	7 thru 10	Terminal Guides	2
Photos		TV	2
Cabinet-Rear View	16	Servicing in the Field	16
CRT Socket Board	15	Troubleshooting	13,14
Main Board	6,11,12	Troubleshooting Aid	13

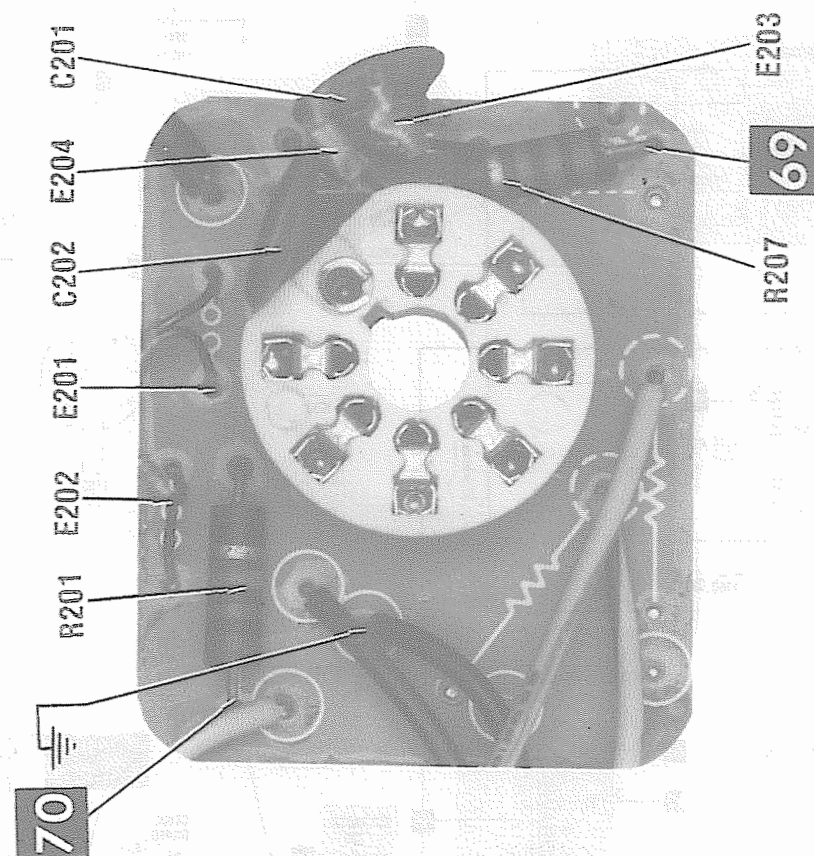
SAMS Howard W. Sams & Co., Inc.

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.

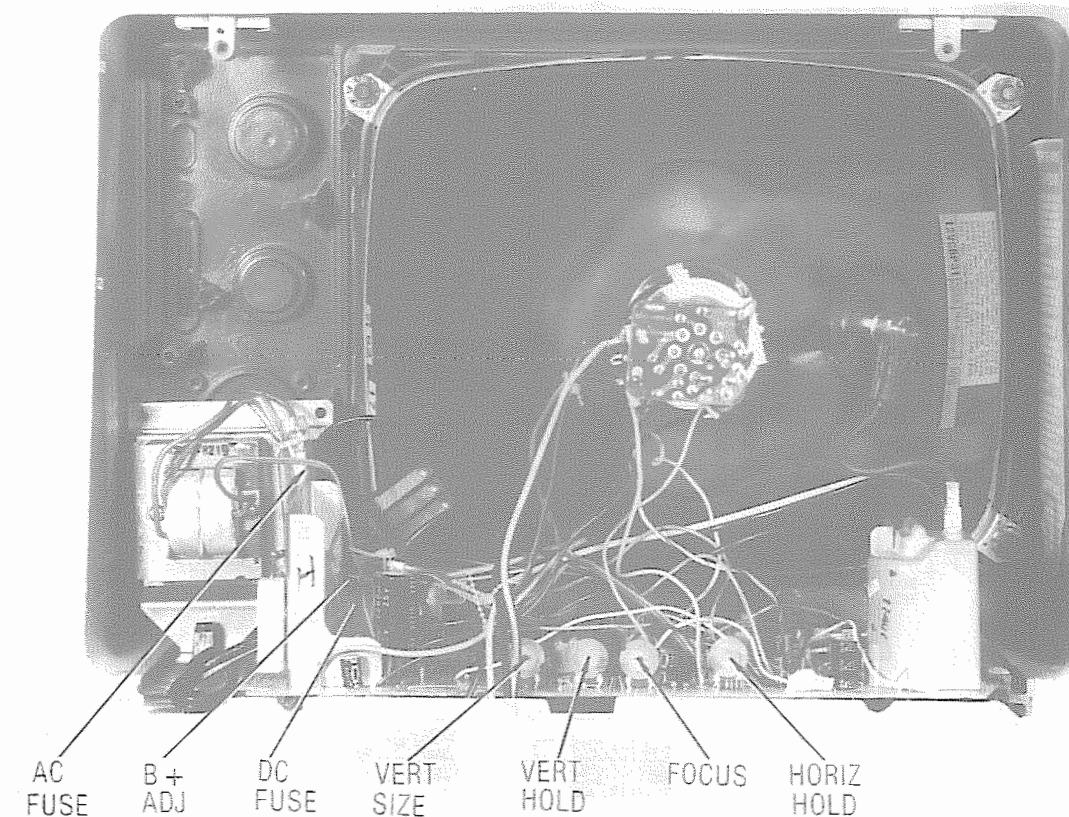
Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein.

© 1984 Howard W. Sams & Co., Inc.
4300 West 62nd Street, P.O. Box 7092, Indianapolis, Indiana 46206 U.S.A.
Printed in U.S. of America. 84CF14922 DATE 7-84



CRT SOCKET BOARD

A Howard W. Sams **CIRCUITRACE** Photo



CABINET-REAR VIEW
DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

Remove four screws holding cabinet back. Remove one screw holding video input block to cabinet back and remove cabinet back from set. Disconnect CRT socket, HV anode lead and ground wires. Loosen and remove deflection yoke from neck of CRT. Remove three screws holding power transformer to cabinet front. Carefully remove main PC board and assemblies from cabinet.

CRT REMOVAL

Follow "Chassis Removal" procedure. Then, place set face down on a soft protective surface. Remove four screws holding CRT to cabinet front. Lift CRT from 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 2.25-amp fuse is used for low-voltage power-supply protection. (See Placement Chart.)

A 4-amp fuse is used for AC line protection. (See Placement Chart.)

HORIZONTAL OSCILLATOR

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

WIDTH

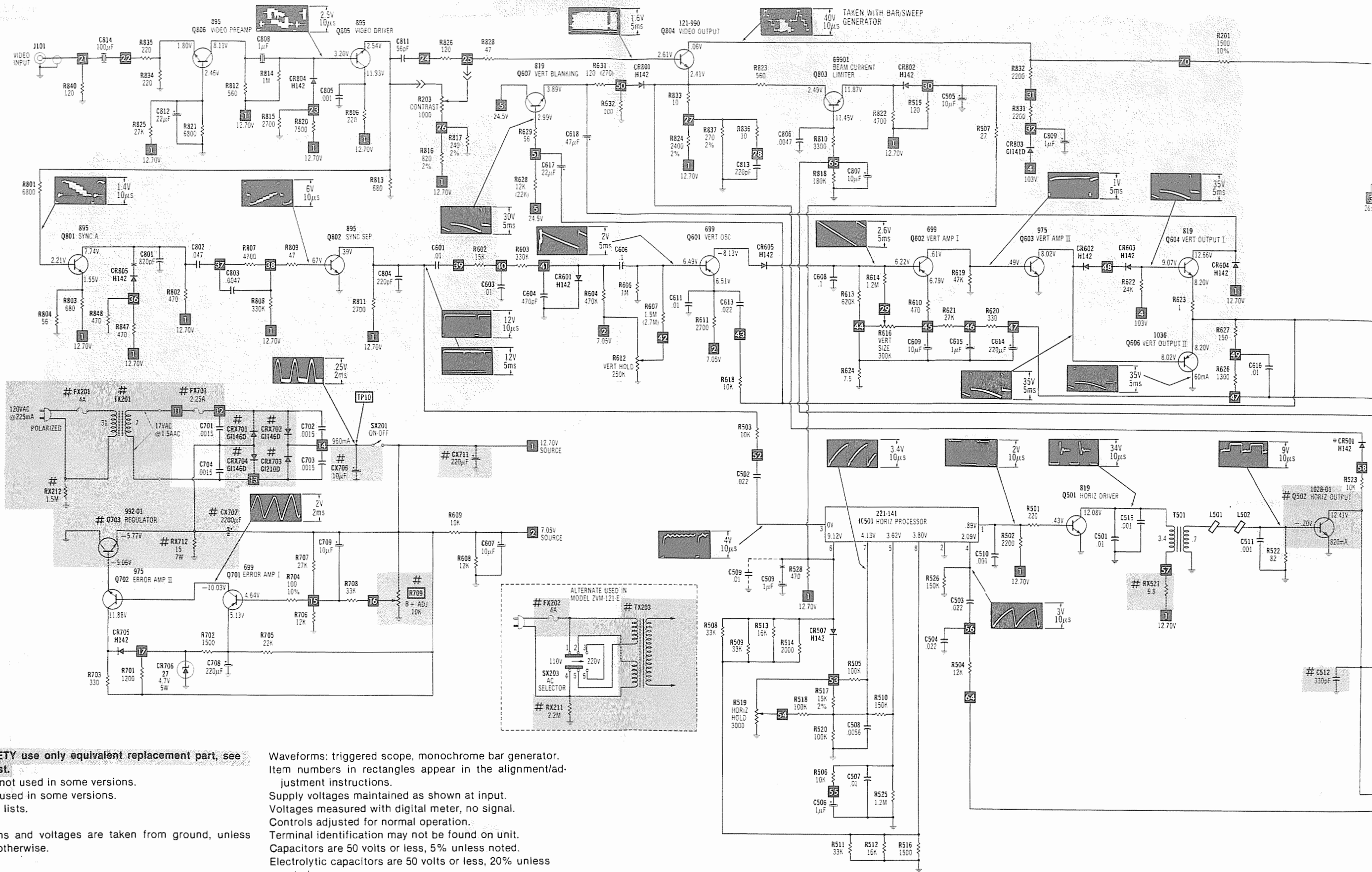
The width may be varied by width coil. (See Placement Chart.)

FOCUS

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

CENTERING

Centering is accomplished by proper adjustment of two magnetic rings located on the yoke rear cover.



⚠ For SAFETY use only equivalent replacement part, see parts list.

--- Circuitry not used in some versions.

--- Circuitry used in some versions.

⦿ See parts lists.

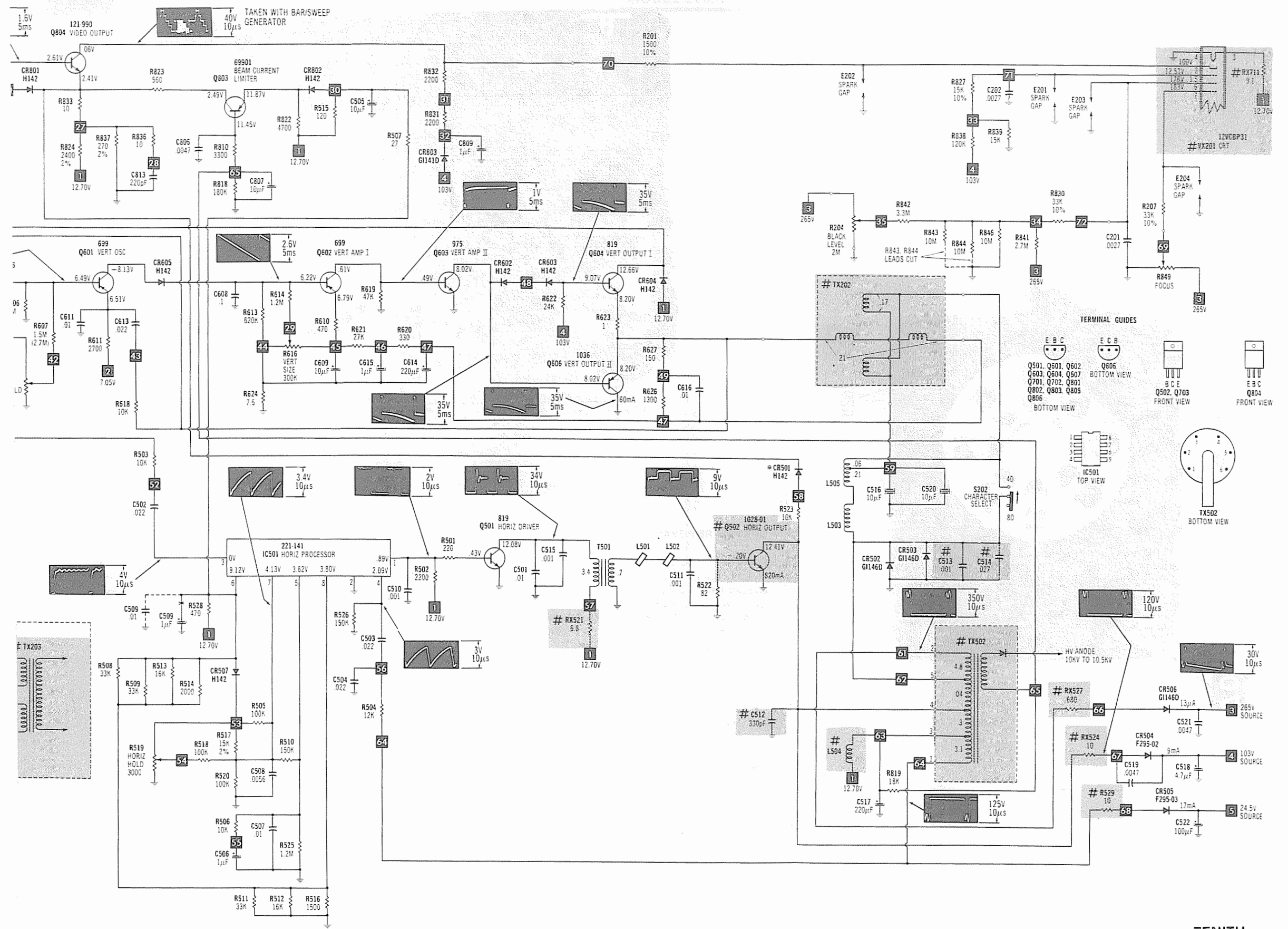
⦿ Ground

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

A PHOTOFAC STANDARD NOTATION SCHEMATIC

WITH **CIRCUITRACE**

© Howard W. Sams & Co., Inc. 1984



TROUBLESHOOTING (Continued)

VIDEO

Check the voltages and waveforms on the CRT and check the CRT. Inject a video signal at the Video Input Jack (J101) and check for video waveforms at the bases of Video Preamplifier Transistor (Q804) and Video Driver Transistor (Q805) to isolate the defective stage. If there is no vertical blanking, check for a vertical blanking waveform at the base of Vertical Blanking Transistor (Q607). If there is no horizontal blanking, check Diode CR501.

Note: Beam Current Limiter Circuit is only activated when the beam current is too high. This protects the phosphorous on the CRT from being burned during prolonged use.

VERTICAL

Inject a vertical signal at the base of Vertical Amplifier I Transistor (Q602). If vertical deflection returns, check the voltages, waveforms, and components associated with the Vertical Oscillator Transistor (Q601).

If vertical deflection does not return, check the voltages, waveforms, and components associated with Vertical Amplifier II Transistor (Q603), Vertical Output I Transistor (Q604) and Vertical Output II Transistor (Q606).

For vertical retrace, check Vertical Blanking Transistor (Q607). Vertical linearity or foldover problems can be caused by vertical feedback or bias circuits. Use the resistance chart to check for possible changes in feedback and bias circuitry.

Also, check the vertical winding of the Deflection Yoke (TX202) and associated circuitry.

SYNC

Check for vertical and horizontal waveforms at the collector of Sync Separator Transistor (Q802). If the waveforms are present, check voltages, waveforms, and components associated with Sync A Transistor (Q801) and Transistor Q802.

ADJUSTMENT

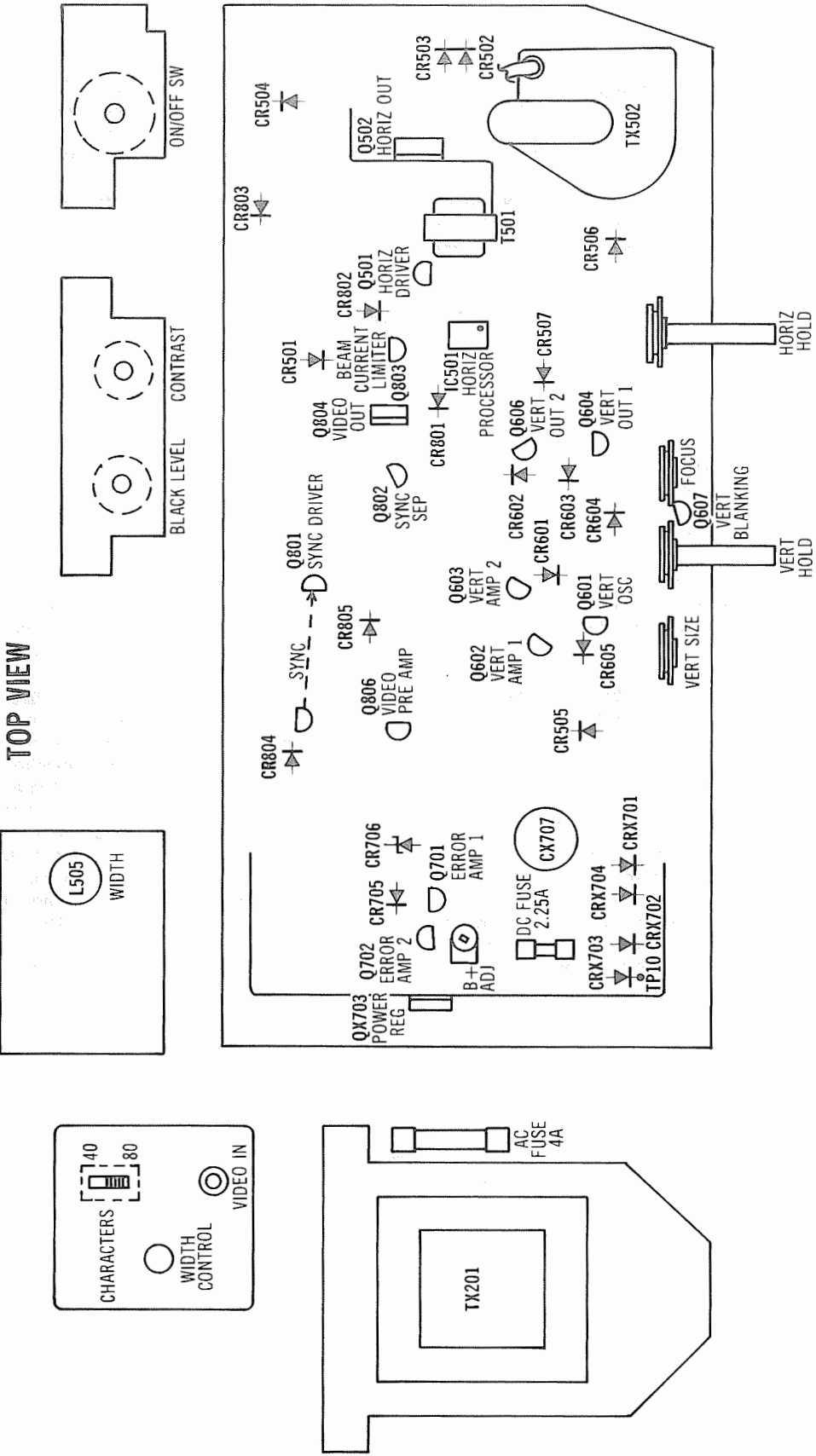
B + ADJUSTMENT

Connect a DC voltmeter to TP10. Adjust B + Adjust Control (R709) for 12.70V.

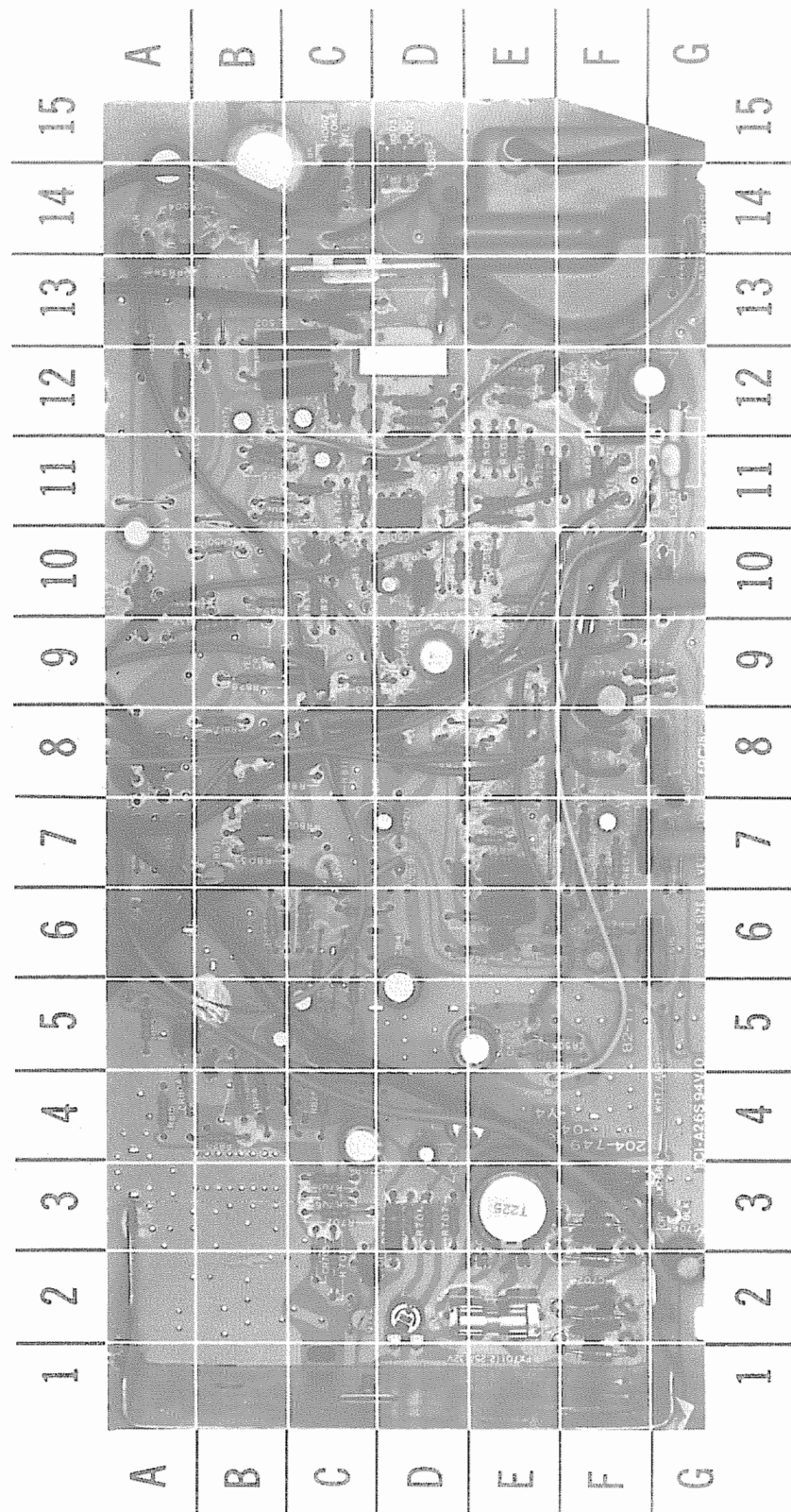
RESISTANCE MEASUREMENTS

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
IC501	2222	0	1019	1020	1NF	125	12K	747						
VX201	30K	1NF	FIL	FIL	30K	1.9M	676K							
ITEM	E	B	C		ITEM	E	B	C		ITEM	E	B	C	
Q501	0	2440	32		Q606	120K(1)	1NF	0		Q802	0	326	2725	
Q502	0	.77	22		Q607	217	1NF	1NF		Q803	4667	19K	795	
Q601	8030	600K	1.7M		Q701	2420	6800	1NF		Q804	251	483	1NF	
Q602	70K(1)	414K	47K		Q702	1NF	1NF	348		Q805	434	1NF	240	
Q603	0	47K	1NF		Q703	15	1NF	0		Q806	217	5399	579	
Q604	120K(1)	160K	1NF		Q801	51	7122	484						

(1) Reading may vary according to the condition of the electrolytic in the circuit.



CMT2-2 ZENITH
MODEL ZVM-121



MAIN BOARD GridTrace LOCATION GUIDE

C501	C-12	CR805	B-6	R623	E-9
C502	D-9	CRX701	F-3	R624	D-8
C503	D-11	CRX702	F-2	R626	D-8
C504	D-11	CRX703	F-1	R627	D-9
C505	C-12	CRX704	F-2	R628	F-9
C506	C-11	CX707	E-3	R629	F-9
C507	D-10	CX711	D-4	R631	E-10
C508	D-10	FX701	E-2	R632	E-10
C509	D-10	IC501	D-11	R701	C-3
C510	D-11	L501	C-12	R702	C-3
C511	C-13	L502	C-13	R703	C-2
C512	D-15	L504	G-11	R704	D-3
C513	C-14	Q501	C-12	R705 *	D-3
C514	C-15	Q502	C-13	R706	D-3
C515	C-12	Q601	F-6	R707	D-3
C516	B-15	Q602	E-6	R708	D-3
C517	G-12	Q603	D-7	R709	D-2
C518	A-15	Q604	F-9	R711	F-3
C519	A-14	Q606	E-9	R801	A-6
C521	E-12	Q607	G-8	R802	C-7
C522	E-5	Q701	C-2	R803	B-7
C601	C-8	Q702	C-2	R804	A-7
C603	E-8	Q703	C-1	R806	B-4
C604	E-7	Q801	B-7	R807	B-8
C606	E-7	Q802	C-8	R808	C-8
C607	F-7	Q803	C-10	R809	C-8
C608	E-6	Q804	C-9	R810	B-11
C609	F-6	Q805	A-5	R811	C-8
C611	F-7	Q806	C-5	R812	C-4
C613	E-8	R501	D-12	R813	A-5
C614	D-9	R502	D-11	R814	B-4
C615	D-7	R503	C-9	R815	A-4
C616	D-8	R504	D-12	R816	B-8
C617	F-9	R505	E-10	R817	B-8
C618	F-9	R506	C-11	R818	G-13
C701	F-3	R507	C-11	R819	G-13
C702	F-2	R508	E-11	R820	B-4
C703	F-2	R509	E-11	R821	C-6
C704	F-3	R510	D-10	R822	B-11
C706	G-2	R511	E-11	R823	C-10
C708	C-4	R512	E-11	R824	B-10
C709	D-4	R513	E-11	R825	C-4
C801	B-7	R514	D-11	R826	A-8
C802	B-7	R515	D-11	R827	A-12
C803	B-8	R516	F-11	R828	B-9
C804	C-9	R517	D-10	R830	G-10
C805	B-5	R518	E-11	R831	A-10
C806	C-10	R519	F-10	R832	B-9
C807	B-12	R520	E-11	R833	C-10
C808	B-5	R522	C-13	R834	C-6
C809	A-10	R523	B-13	R835	C-5
C811	A-8	R525	C-10	R836	A-10
C812	C-5	R526 *	C-11	R837	A-10
C813	A-10	R528 *	E-11	R838	A-13
C814	D-5	R529	E-5	R839	A-13
CR501	B-10	R602	D-8	R840	C-6
CR502	D-15	R603	D-7	R841	F-11
CR503	D-15	R604	E-7	R842	F-11
CR504	A-14	R606	F-7	R843	E-12
CR505	E-5	R607	F-7	R844	E-12
CR506	F-12	R608	F-7	R846	C-6
CR507	E-10	R609	G-7	R847	B-6
CR601	E-7	R610	E-6	R848	G-8
CR602	E-8	R611	F-7	R849	D-12
CR603	E-8	R612	G-7	RX521	B-14
CR604	F-8	R613	E-6	RX524	F-12
CR605	E-6	R614	F-6	RX527	G-1
CR705	C-2	R616	G-6	RX712	D-12
CR706	C-3	R618	E-9	TP10	F-2
CR801	C-9	R619	E-7	TX502	F-14
CR802	B-11	R620	D-7		
CR803	A-12	R621	E-6		
CR804	A-4	R622	E-8		

* Located on other side of board.

SAFETY PRECAUTIONS (Continued)

IMPLOSION PROTECTION

1. All Zenith picture tubes are equipped with an integral implosion protection system, but be careful to avoid damage during installation. Avoid scratching the tube.
2. Use only Zenith replacement tubes.

X-RADIATION

1. Be sure procedures and instructions to all service personnel cover the subject of X-radiation. The only potential source of X-rays in the current Monitor is the picture tube. However, this tube does not emit X-rays when the HV is at the factory-specified level. It is only when the HV is excessive that X-radiation can be generated. The basic precaution which must be exercised is to keep the HV at the factory-recommended level. Refer to the X-Ray Precaution Label which is located inside each Monitor for the correct high voltage. The proper value is also given in the applicable service manual. Operation at higher voltages may cause a failure of the CRT or high voltage supply and, under certain circumstances, may produce radiation in excess of desirable levels.
2. Use only Zenith specified CRT anode connectors.
3. It is essential that the serviceman have an accurate high voltage meter available at all times. Check the calibration of this meter periodically against a

reference standard, such as the one available at your distributor.

4. When the high voltage circuitry is operating properly, there is no possibility of an X-radiation problem. Every time you service a monochrome chassis, run the brightness up and down while you monitor the high voltage with a meter to be certain that the high voltage does not exceed the specified value and that it is regulating correctly. We suggest that you and your service organization review test procedures so that voltage regulation is always checked as a standard servicing procedure, and that the reason for this prudent routine be clearly understood by everyone. It is important to record an accurate high voltage reading on each customer's invoice.
5. When you are troubleshooting and making test measurements in a Monitor with a problem of excessive high voltage, avoid being unnecessarily close to the picture tube and the high voltage compartment. Do not operate the chassis longer than is necessary to locate the cause of excessive voltage.
6. Models which use a high voltage rectifier vacuum tube should have that tube replaced only with a Zenith recommended replacement type or a Zenith recommended solid-state rectifier replacement. The high voltage compartment and all metal shields, where used, must be kept in place whenever the chassis is operating. If a shield is missing, it should be replaced at once as a standard servicing procedure.

Courtesy of the Manufacturer

PARTS LIST AND DESCRIPTION (Continued)

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

TRANSFORMER (Power)

ITEM No.	RATING			REPLACEMENT DATA		
	PRI.	SEC. 1	SEC. 2	MFGR. PART No.	THORDARSON PART No.	NOTES
# TX201	120VAC @ 225mAAC	17VAC @ 960mADC		95-3262-02		
# TX203				95-3388-02(1)		
	SEC. 3	SEC. 4	SEC. 5			

For SAFETY use only equivalent replacement part.
(1) Used in Model ZVM-121-E.

FUSE DEVICES

ITEM NO.	DESCRIPTION	MFGR. PART NO.		NOTES
		DEVICE	HOLDER	
# FX201	4A @ 250V Fast Acting Pigtail 4A 2.25A @ 32V Fast Acting	136-114-23		
# FX202		136-113-23(1)		
# FX701		136-120-07		

For SAFETY use only equivalent replacement part.
(1) Used in Model ZVM-121-E.

MISCELLANEOUS

ITEM No.	PART NAME	MFGR. PART No.	NOTES
E201	Spark Gap	52-958-04	
E202	Spark Gap	52-958-04	
E203	Spark Gap	52-958-04	
E204	Spark Gap	52-958-04	
L501	Ferrite Sleeve	149-379	
L502	Ferrite Sleeve	149-379	
S202	Switch	85-1606	40/80 Character Select
# SX201	Switch	85-1610	On/Off
# SX203	Switch	85-1545-03	AC Selector (Used In Model ZVM-121-E)
# VX201	CRT	12VCBP31	

For SAFETY use only equivalent replacement part.

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

PARTS LIST AND DESCRIPTION

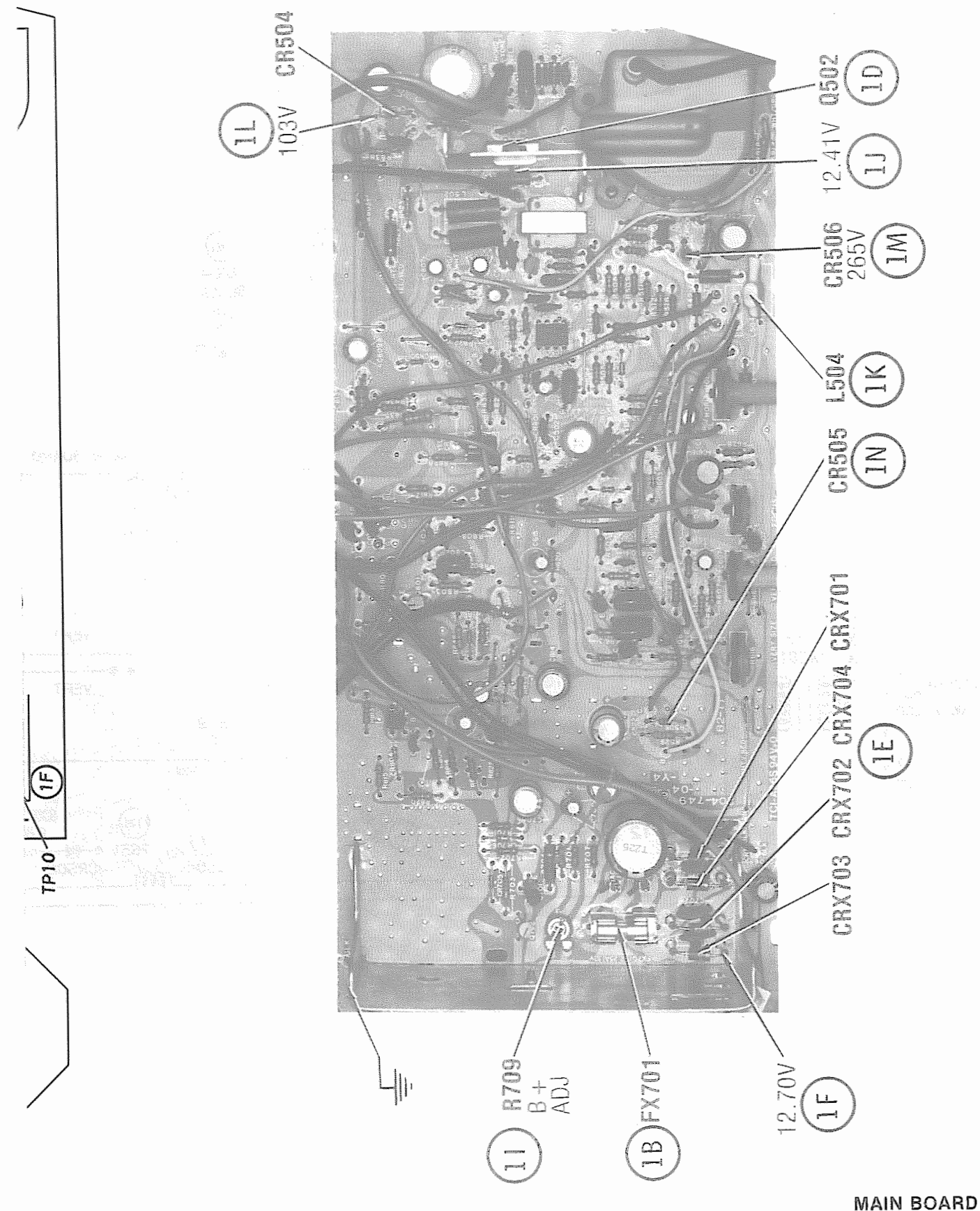
When ordering parts, state Model, Part Number, and Description

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	TYPE No.	MFGR. PART No.	REPLACEMENT DATA				
			EGG PART No.	GENERAL ELECTRIC PART No.	MOTOROLA PART No.	NTE PART No.	RCA PART No.
CR501	H142	103-142-01	ECG177	GE-300	1N4935	NTE177	SK9091/177
CR502,3	F295-02	103-295-02A	ECG177	GE-300	1N4935	NTE177	SK9091/177
	G11460	103-261-02A	ECG552	GE-511		NTE552	SK9000/552
	F295-02	103-295-02A	ECG177	GE-300	1N4935	NTE177	SK9091/177
CR505	F295-03	103-295-03A	ECG552	GE-511		NTE552	SK9000/552
CR506	G1146D	103-261-04	ECG552	GE-511	1N4935	NTE552	SK9000/552
CR507	H142	103-142-01	ECG177	GE-300	1N4935	NTE177	SK9091/177
CR601 thru	H142	103-142-01	ECG177	GE-300	1N4935	NTE177	SK9091/177
CR605	H142	103-142-01	ECG177	GE-300	1N4935	NTE177	SK9091/177
CR705	H142	103-142-01	ECG177	GE-300	1N4935	NTE177	SK9091/177
CR706	27	103-279-09A	ECG5009A	GEZD-4.7	1N5230B	NTE5009A	SK4A7/5009A
CR801,2	H142	103-142-01	ECG177	GE-300	1N4935	NTE177	SK9091/177
CR803	G1141D	103-261-02A	ECG116	GE-504A	1N4003	NTE116	SK3311
CR804,5	H142	103-142-01	ECG177	GE-300	1N4935	NTE177	SK9091/177
# CRX701,2	G1146D	103-261-04	ECG552	GE-511		NTE552	SK9000/552
# CRX703	G1210D	103-261-04	ECG552	GE-511		NTE552	SK9000/552
# CRX704	G1146D	103-261-04	ECG552	GE-511		NTE552	SK9000/552
IC501	221-141	221-141	ECG815	GEIC-244	MC1391P	NTE815	SK3255/815
Q501	819	121-819	ECG108	GE-375	MPS6543	NTE108	SK3452/108
# Q502	1028-01	121-1028-01	ECG375		2N5401	NTE159	SK9118/375
Q601,2	699	121-699	ECG159	GE-82	2N5401	NTE159	SK3466/159
Q603	975	121-975	ECG123AP	GE-123AP	MPSA05	NTE123AP	SK3854/123AP
Q604	819	121-819	ECG108	GE-123AP	MPSA05	NTE291	SK3440/291
Q606	1036	121-1036	ECG298	GE-272	2N4401*	NTE298	SK3452/108
Q607	819	121-819	ECG108	GE-82	MPS6543	NTE108	SK3452/108
Q701	699	121-699	ECG159	GE-82	2N5401	NTE159	SK3466/159
Q702	975	121-975	ECG123AP	GE-123AP	MPSA05	NTE123AP	SK3854/123AP
# Q703	992-01	121-992-01	ECG291	GE-302	MJE15030	NTE291	SK3440/291
Q801,2	895	121-895	ECG123AP	GE-123AP	MPSA05	NTE123AP	SK3854/123AP
Q803	69901	121-699-01	ECG159	GE-82	2N5401	NTE159	SK3466/159
Q804	121-990	121-990	ECG171	GE-27	MPSU10	NTE171	SK3201/171
Q805,6	895	121-895	ECG123AP	GE-123AP	MPSA05	NTE123AP	SK3854/123AP

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

CMT2.2 ZENITH
MODEL ZVM-121



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 hook-up before making service checks.

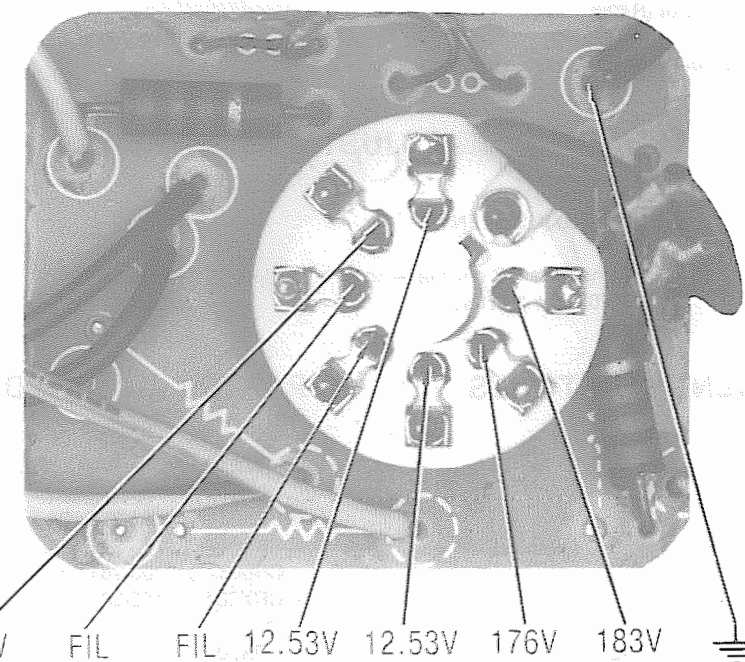
DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

Remove four screws holding cabinet back. Remove one screw holding video input block to cabinet back and remove cabinet back from set. Disconnect CRT socket, HV anode lead and ground wires. Loosen and remove deflection yoke from neck of CRT. Remove three screws holding power transformer to cabinet front. Carefully remove main PC board and assemblies from cabinet.

CRT REMOVAL

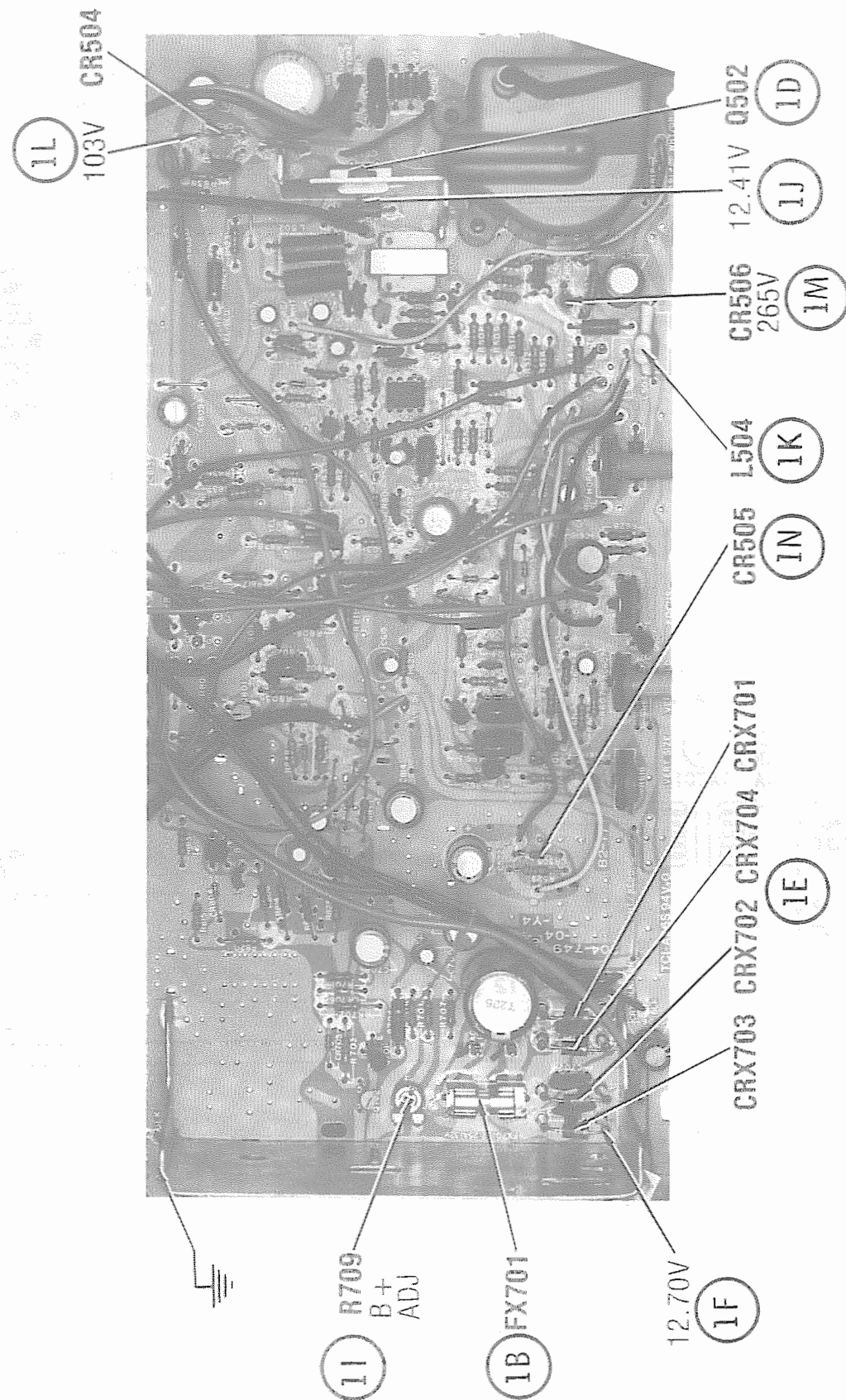
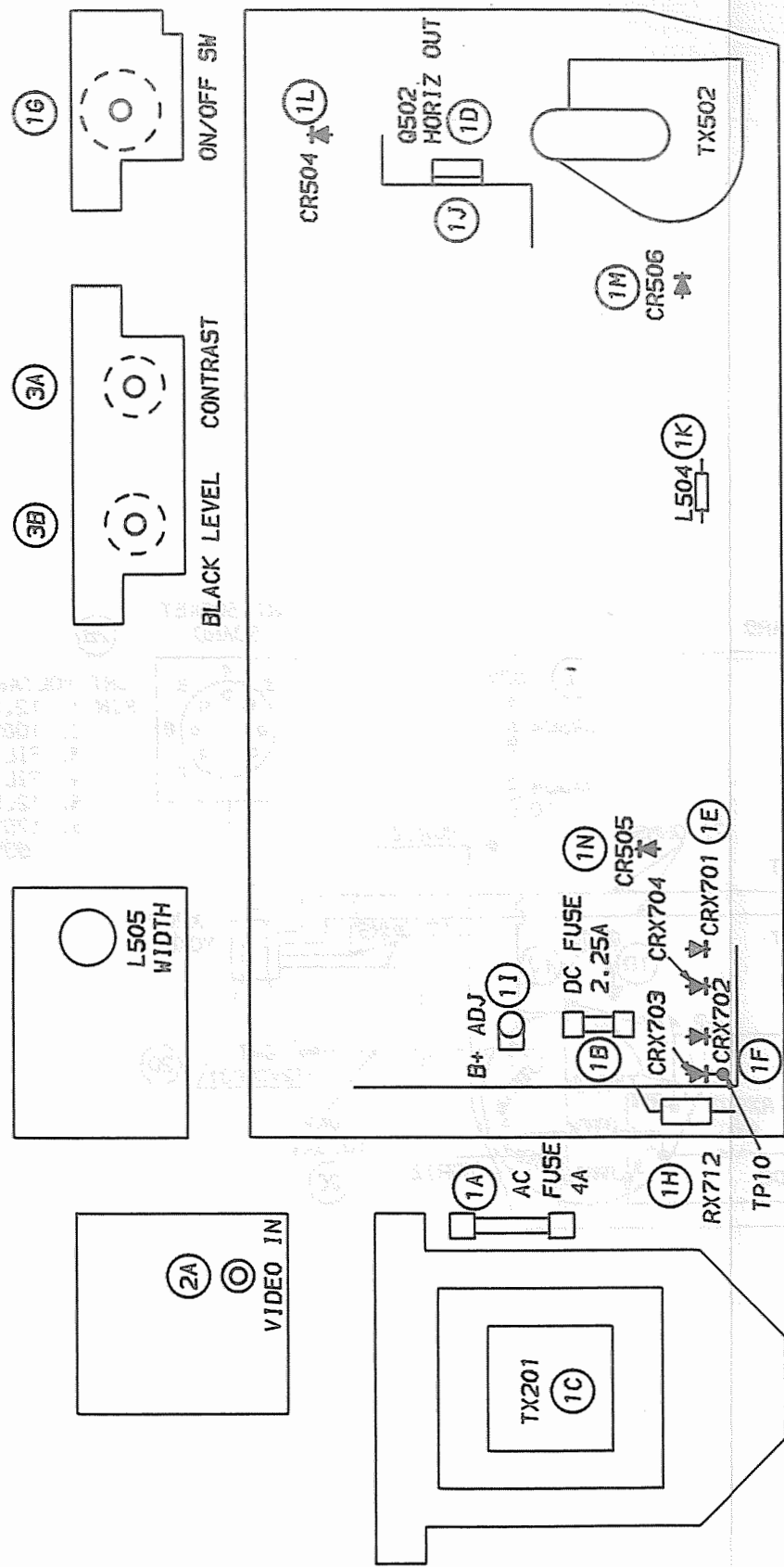
Follow "Chassis Removal" procedure. Then, place set face down on a soft protective surface. Remove four screws holding CRT to cabinet front. Lift CRT from cabinet. **Do not** lift CRT by the neck.



CRT SOCKET BOARD

PRELIMINARY SERVICE CHECKS (Continued)

PLACEMENT CHART



MAIN BOARD

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.

(K) If 12.41V is missing, check Coil L504.

(L) Source voltage 103V at the cathode of Diode CR504.

- (M) Source voltage 265V at the cathode of Diode CR506.
- (N) Source voltage 24.5V at the cathode of Diode CR505.

(A) Check for bad connection at the Video Input Jack (J101).

- (B) Check voltages on CRT.
- (C) Check for high voltage with HV probe.
- (D) Check the CRT with CRT tester.

(A) Clean Contrast Control (R203).

(B) Clean Black Level Control (R204).

- (A) Clean Contrast Control (R203).
- (B) Clean Black Level Control (R204).

B + ADJUSTMENT

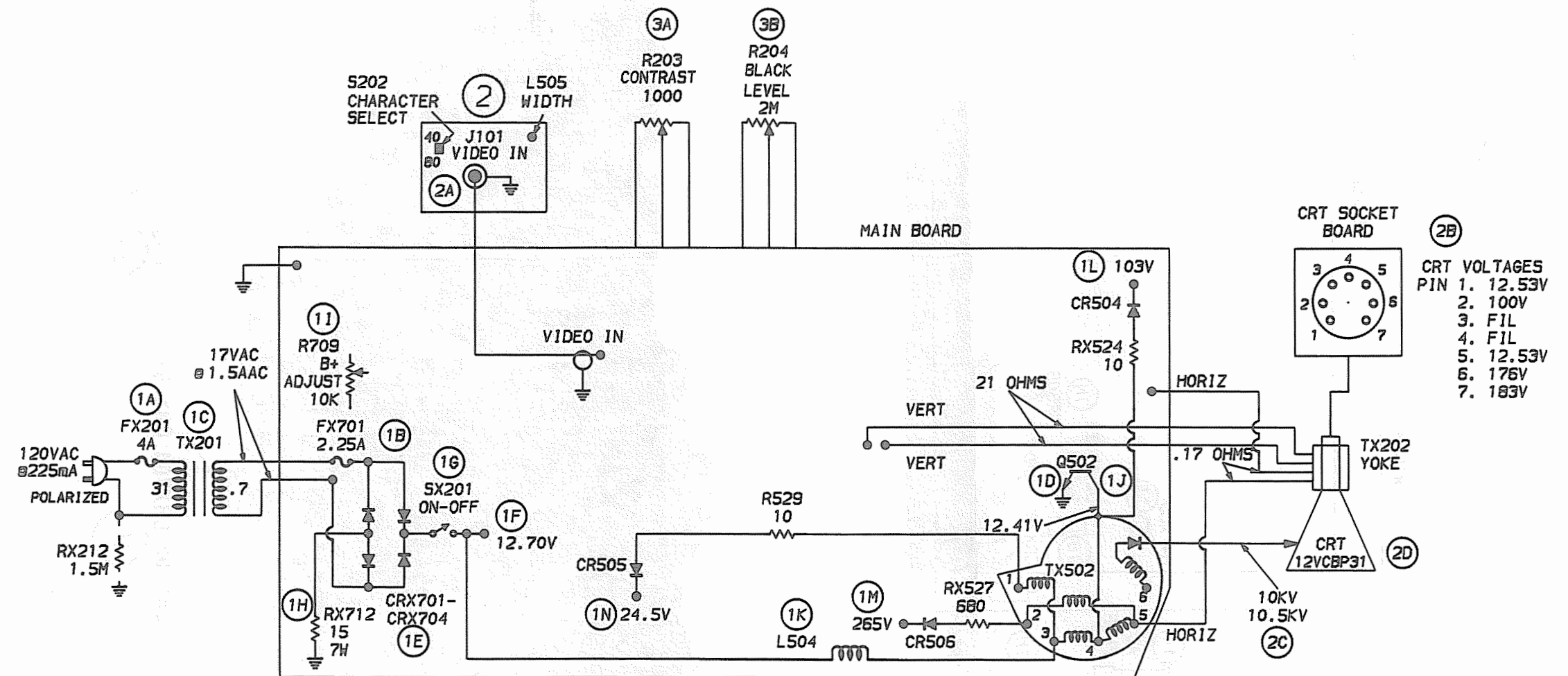
TEST EQUIPMENT AND TOOLS

PARTS LIST AND DESCRIPTION

TEST EQUIPMENT	ITEM	PART NO.	DESCRIPTION
Digital Volt/Ohm Meter	CR504	103-295-02A	DIODE
High Voltage Probe	CR505	103-295-03A	DIODE
CRT Tester	CR506	103-261-04	DIODE
	# CRX701	103-261-04	BRIDGE RECTIFIERS
	thru		
	CRX704		
TOOLS	# FX201	136-114-23	4A FUSE
	# FX701	136-120-07	2.25A FUSE
Phillips Screwdriver	# L504	20-3984	RF CHOKE
¼" Nut Driver	# Q502	121-1028-01	HORIZONTAL OUT-PUT TRANSISTOR.
Soldering Iron	# R709	63-10817	B + ADJUST CONTROL
Desoldering Tool	# RX712	63-10449-52	15 ohm, 7W RESISTOR
	# SX201	85-1610	ON-OFF SWITCH.

[illegible]

PRELIMINARY SERVICE CHECKS (Continued)



ZENITH
MODEL ZVM-121

INTERCONNECTING DIAGRAM

PARTS LIST AND DESCRIPTION (Continued)

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

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869 (17 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
Power Cord	Use BELDEN No. 8895 (Polarized Interlocking Type)

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	MFGR. PART No.
C505	10 16V	22-7151-04
C506	1 50V	22-7153
C509	1 50V	22-7153
C516	10 25V 20% NP	22-7313
C517	220 16V	22-7151-09
C518	4.7 160V	22-7674-01
C520	10 25V 20% NP	22-7313
C522	100 35V	22-7154-08
C607	10 16V	22-7151-04
C609	10 16V 20%	22-7456-01
C614	220 16V 20%	22-7579-06
C615	1 25V 20%	22-7389-02

For SAFETY use only equivalent replacement part.

ITEM No.	RATING	MFGR. PART No.
C617	22 16V	22-7151-05
C618	47 25V	22-7152-07
C706	10 50V	22-7153-04
C708	220 10V	22-7150-09
C709	10 16V	22-7151-04
C807	10 16V	22-7151-04
C808	1 50V 20% NP	22-7407-01
C809	1 160V	22-7674-02
C812	22 16V	22-7151-05
C814	100 10V NP	22-7403-09
CX707	2200 25V	22-7152-13
CX711	220 16V	22-7151-09

CAPACITORS

ITEM No.	RATING	MFGR. PART No.
C201	.0027 500V	22-7763
C202	.0027 500V	22-7763
C501	.01 50V	22-7614-24A
C502	.022 50V	22-7615-08B
C503	.022 50V	22-7615-08A
C504	.022 50V 10%	
	.022 50V	22-7615-08A
C507	.01 50V	22-7615-06A
C508	.0056 100V 10%	22-7739-09
C509	.01 50V	22-7615-06A
C510	.001 500V	22-7433
C511	.001 500V	22-7433
C512	330 500V 10%	22-3255
C513	.001 500V	22-7433
C514	.027 200V 5%	22-7612
C515	.001 500V	22-7433
C519	.0047 500V	22-4782
C521	.0047 500V	22-4782
C601	.01 50V 10%	22-7613-24B
C603	.01 50V 10%	22-7613-24A

For SAFETY use only equivalent replacement part.

ITEM No.	RATING	MFGR. PART No.
C604	470 50V 10%	22-7613-08A
C606	.1 50V 5%	
	.1 50V 10%	22-7547
C608	.1 50V 5%	
	.1 50V 10%	22-7547
C611	.01 50V 10%	22-7613-24A
C613	.022 50V 10%	22-7179
C616	.01 50V 10%	22-7613-24A
C701	.0015 500V 5%	22-7244
C702	.0015 500V 5%	22-7244
C703	.0015 500V 5%	22-7244
C704	.0015 500V 5%	22-7244
C801	820 50V 10%	22-7613-11A
C802	.047 50V 10%	22-7071
C803	.0047 50V	22-7614-20A
C804	220 50V 10%	22-7613-04A
C805	.001 50V 10%	22-7613-12A
C806	.0047 50V	22-7614-20A
C811	56 NPO 50V 10%	22-7622-28A
C813	220 50V 10%	22-7613-04A

PARTS LIST AND DESCRIPTION (Continued)

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

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

ITEM NO.	FUNCTION	RESISTANCE	MFGR. PART NO.	NOTES
R203	Contrast	1000	63-10770-09	
R204	Black Level	2M	63-10770-08	
R519	Horiz. Hold	3000	63-10637-09	
R612	Vert. Hold	250K	63-10637-04	
R616	Vert. Size	300K	63-10521-04	
R709	B+ Adjust	10K	63-10817	
R849	Focus	2600	63-10521-05	

For SAFETY use only equivalent replacement part.

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		
		MFGR. PART No.	WORKMAN PART No.	REMARKS
R517	15K 2% 1/4W Carbon Film	63-9920	22-2254	
# R529	10 5% 1/4W Metal Film	63-10559-24		
# R711	9.1 5% 1/2W Carbon	63-7968-59		
R816	820 2% 1/4W Carbon Film	63-9919-70	22-2240	
R817	240 2% 1/4W Carbon Film	63-9919-57		
R824	2400 2% 1/4W Carbon Film	63-9919-81		
R837	270 2% 1/4W Carbon Film	63-9919-58	22-2234	
# RX211	2.2M 5% 1/4W	(1)		
# RX212	1.5M 5% 1/2W	63-10526		
# RX521	6.8 5% 1/4W Metal Film	63-10559-20		
# RX524	10 5% 1/4W Carbon Film	63-10559-24	22-1048	
# RX527	680 5% 1/2W Carbon Film	63-10565-68	22-2092	
# RX712	15 5% 7W WW	63-10449-52		

For SAFETY use only equivalent replacement part.
(1) Used in Model ZVM-121-E.

COILS (RF-IF)

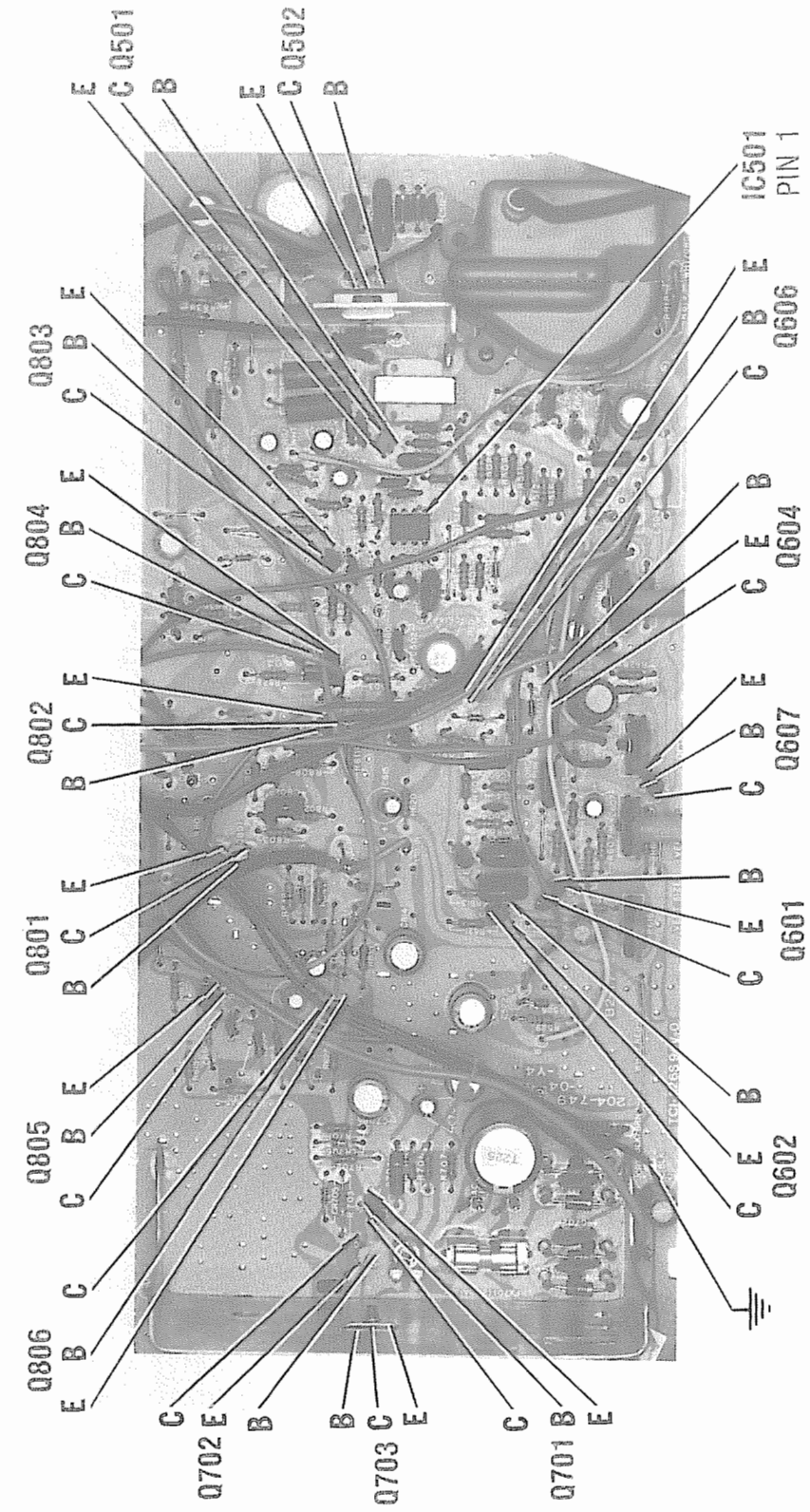
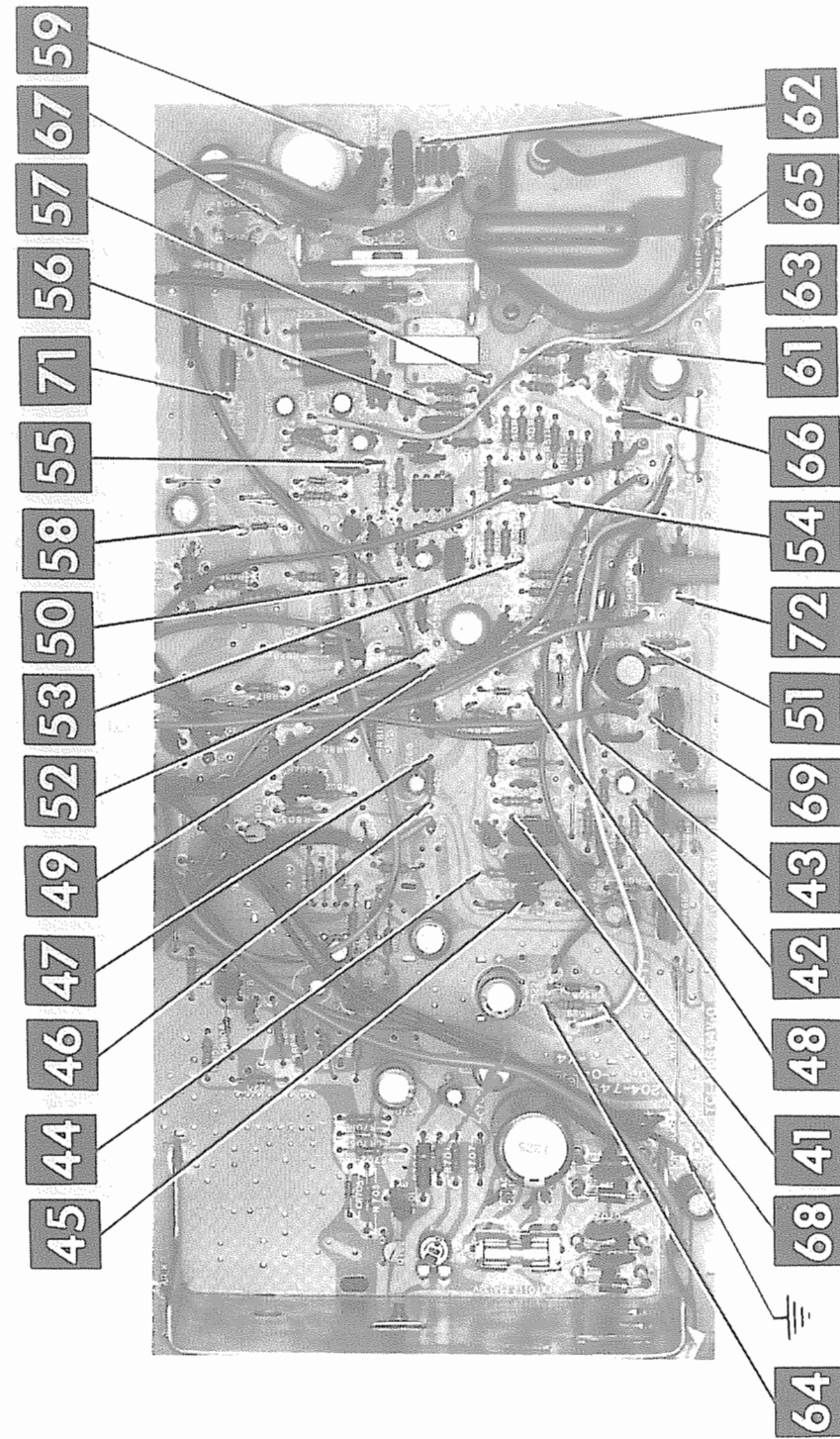
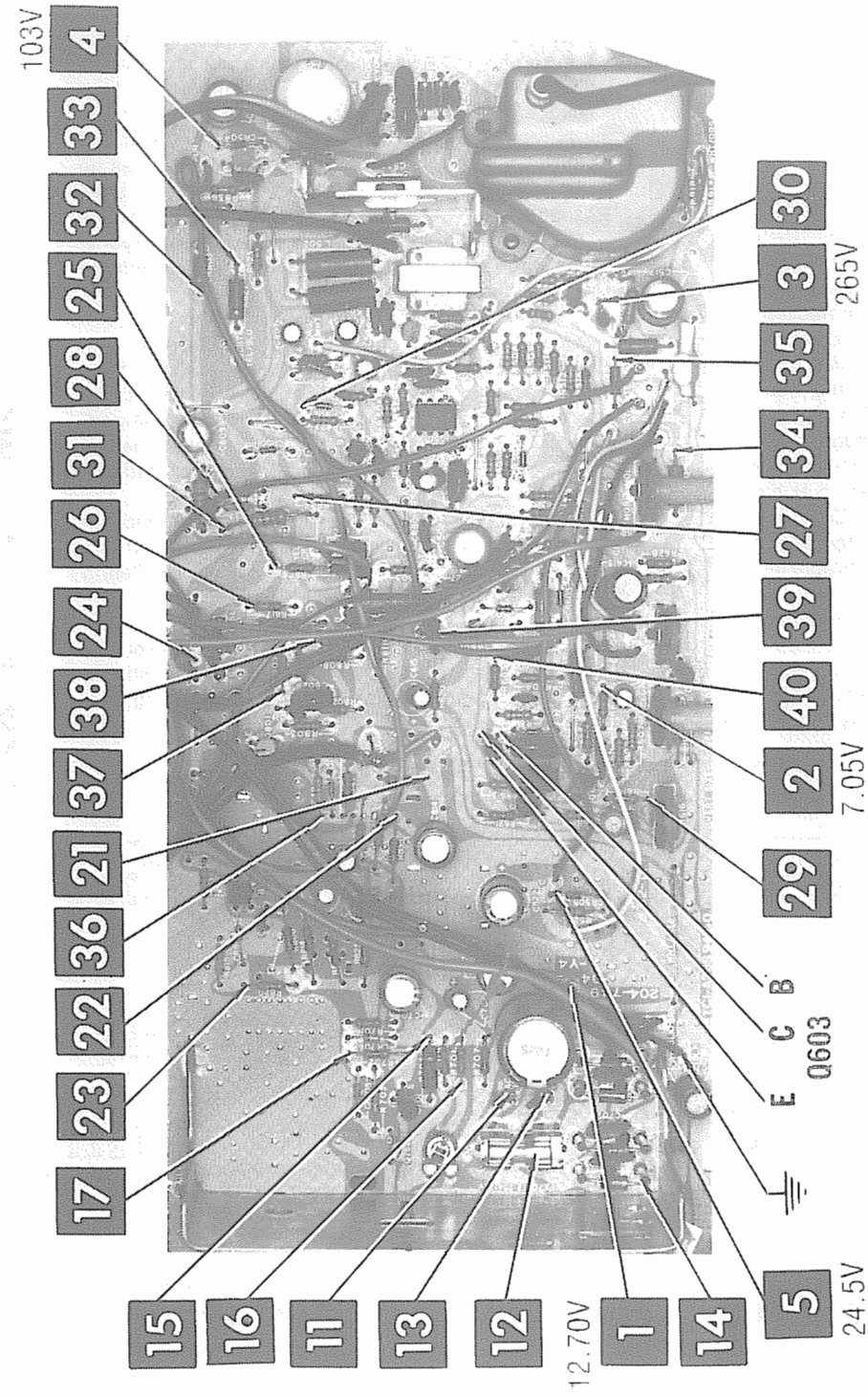
ITEM No.	FUNCTION	MFGR. PART No.	ITEM No.	FUNCTION	MFGR. PART No.
L503	Linearity	20-3906-03			
# L504	RF Choke	20-3984			

For SAFETY use only equivalent replacement part.

COILS & TRANSFORMERS (Sweep Circuits)

ITEM No.	FUNCTION	REPLACEMENT DATA		
		MFGR. PART No.	OTHER IDENTIFICATION	THORDARSON PART No.
L505	Width	20-3943-02		
# TX202	Yoke Horiz 113uH 90° Vert 49mH	95-3438		
T501	Horiz Driver	95-3136-03		
# TX502	Horiz Output	95-3434		

For SAFETY use only equivalent replacement part.



SAFETY PRECAUTIONS

PRODUCT SAFETY SERVICING GUIDELINES

CAUTION: Do not attempt to modify any circuit. Perform service work only after you are thoroughly familiar with all of the following safety checks and servicing guidelines. To do otherwise increases the risk of potential hazards and injury to the user. CAUTION: Never attempt to service a chassis that is connected directly to an AC line. Make sure it is connected through an isolation transformer. No matter which way the AC plug is inserted, a potential shock hazard is present at chassis ground unless you use an isolation transformer during servicing. Since one side of the AC in-

put is fused; there's a 50% chance you'll blow a fuse, or a 50% chance you'll destroy components and/or test equipment without an isolation transformer. The chassis consists of a single circuit board mounted horizontally in the bottom of the cabinet. All circuit parts are mounted on the board except the CRT and deflection yoke. The horizontal sweep transformer is also mounted on the chassis circuit board. You can slide the board out of the cabinet without disconnecting it, and the Monitor will operate with the board exposed. Screws are not required to hold the board in place. It slides into slots which are molded into the cabinet, and the cabinet back holds it in place.

SAFETY CHECKS

After the original service problem has been corrected, check for the following:

FIRE & SHOCK HAZARD

- 1. Be sure that all components are positioned in such a way to avoid the possibility of adjacent component shorts. This is especially important on those chassis which are transported to and from the repair shop.
- 2. Never release a repair unless all protective devices such as insulators, barriers, cover shields, strain reliefs, and other hardware have been reinstalled per the original design.
- 3. Inspect the soldering for possible cold solder joints, frayed leads, damaged insulation (including AC cord), solder splashes or sharp solder points. Remove all loose foreign particles.
- 4. Check "across-the-line" capacitors and other components for physical evidence of damage or deterioration, and replace them if necessary. Follow the original layout, lead length, and dress.
- 5. No lead or component should touch a receiving tube or a resistor rated at 1 watt or more. Avoid lead tension around protruding metal surfaces.

- 6. Always replace critical components (marked # on the Schematic Diagram and parts lists) such as: fuses, flameproof resistors, capacitors, etc. with exact Zenith types. Do not use replacement components other than those specified or make unrecommended circuit modifications.
- 7. After you reassemble the set, always perform an AC leakage test on all exposed metallic parts of the cabinet to be sure the set is safe to operate without danger of electrical shock. DO NOT USE A LINE ISOLATION TRANSFORMER DURING THIS TEST. Use an AC voltmeter with a 5000 ohms per volt or more sensitivity in the following manner: Connect a 1500 ohm, 10-watt resistor (63-10401-76), paralleled by a 0.15 μ F, 150 VAC type capacitor (22-4384), between a known good earth ground (water pipe, conduit, etc.) and the exposed metallic parts, one at a time. Measure the AC voltage across the combination 1500 ohm resistor and 0.15 μ F capacitor. Reverse the AC plug and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 0.75 volts rms. This corresponds to 0.5 milliamps AC. Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.

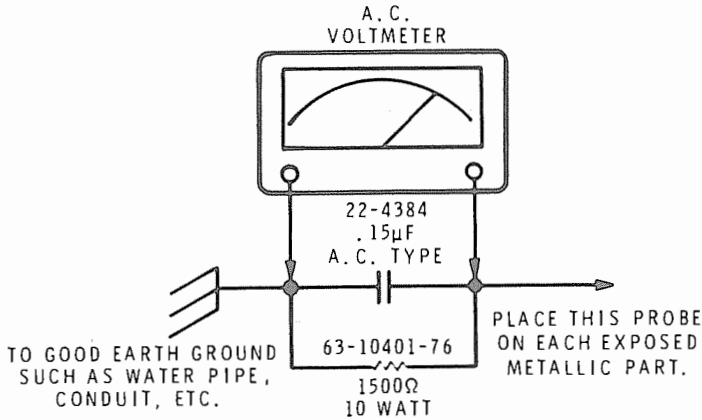


Figure 1-1

Courtesy of the Manufacturer

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

NO PIC, NO RASTER: Check AC power supply and sources generated from Horizontal Output Transformer (TX502). Refer to "Troubleshooting" Power Supply and Horizontal circuits.

NO PIC, NO RASTER: Check Horizontal Output Transformer (TX502) sources and Video circuit. Refer to "Troubleshooting" Horizontal and Video circuits.

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

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 (TX502) and Horizontal circuit. 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.

TROUBLESHOOTING

POWER SUPPLY

The 12.70V source voltage at the cathodes of Diodes CRX702 and CRX703 is missing. Check the AC Fuse (FX201). If the fuse is open, check the primary winding of the Power Transformer (TX201) for a short.

Check the DC fuse (FX701). If the fuse is open, check the Bridge Rectifiers (CRX701 thru CRX704) for shorts. Also check all the associated components for shorts.

If the fuses are good, and the 12.70V source voltage is missing or the voltage is incorrect, check the adjustment of B+ Adjust Control (R709). Also, check ERROR AMP Transistors (Q701 and Q702), Regulator Transistor (Q703) and associated components.

HORIZONTAL

For a loss of High Voltage, check for 12.41V at the collector of Horizontal Output Transistor (Q502). If the 12.41V voltage is missing, check for 12.41V at pin 3 of the Horizon-

tal Output Transformer (TX502). Also, check Coil L504. If 12.41V is still missing, see "Power Supply" section. If 12.41V is present at the collector of Transistor Q502, inject a horizontal drive signal at the base of Transistor Q502.

If high voltage returns, check Horizontal Driver Transistor (Q501). Also, check voltages, waveforms, and components associated with the Horizontal Processor (IC501). Should the high voltage not return, check Transistor Q502, Diodes CR502 and CR503, Transformer TX502 and associated circuitry. The high voltage rectifier is part of Transformer TX502 and may be defective.

The additional B+ sources developed from Transformer TX502 can cause loading of the horizontal circuit. Check B+ sources rectified by Diodes CR501, and CR504 thru CR506.

Poor horizontal linearity can be caused by the condition of Capacitors C516 and C520. Also, check the horizontal winding of the Deflection Yoke (TX202) and associated circuitry.

ZENITH
MODEL ZVM-121