

INSTRUCTION MANUAL

VIDEO MONITOR

MODEL VM114



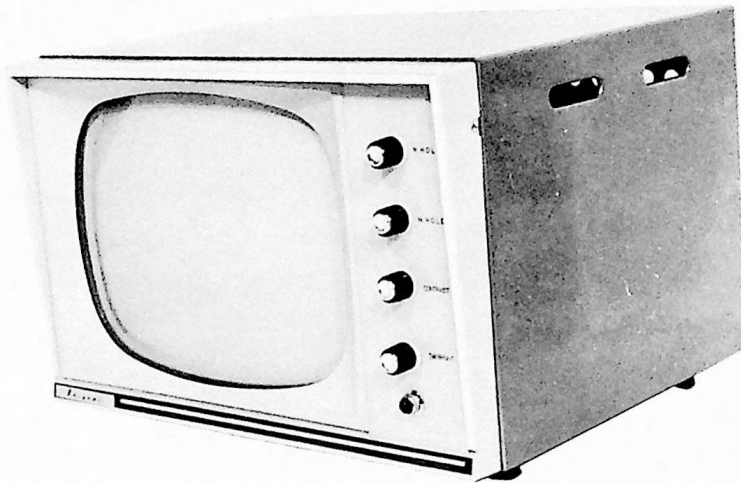


FIGURE I
CLOSED CIRCUIT TELEVISION MONITOR
MODEL VM114

SECTION I PERFORMANCE SPECIFICATIONS

ELECTRICAL

1. Picture tube	No. 14WP4A, 14 inches
2. Input impedance	75 ohms, or high impedance
3. Input level	V: 0.5V, (p-p) VS: 1V, (p-p)
4. Scanning frequency	H: 15.75 cps $\pm 10\%$ V: 50 or 60 cps $\pm 10\%$
5. Resolution	Center: minimum 500 lines Corners: minimum 400 lines
6. Ambient temperature	14°F - 104°F
7. Power source	100/117 VAC, or 200/400 VAC

MECHANICAL

Dimensions:

Height	11.8 inches
Length	14.6 inches
Width	18.5 inches
Weight	40.7 pounds

OPERATION

Front panel	Power switch Contrast Brightness Vertical hold Horizontal hold
Rear panel	Vertical linearity Height Horizontal width Horizontal linearity 75 ohm termination ON-OFF switch
Base panel	AFC Control sweep frequency

QUALITY CONTROL

1. Input impedance	75 ohms $\pm 5\%$, or high impedance
2. Input video voltage	0.5 to 2 V, (p-p)
3. Horizontal frequency	15.75 cps, $\pm 10\%$
4. Vertical frequency	50 to 60 cps, $\pm 5\%$
5. Frequency response	5mc; +1db, -3db
6. Video amp. gain	34db, minimum
7. Deflection linearity	Less than 5%
8. Signal-to-noise ratio	Less than 5% at line-lock

SECTION II

2.1 GENERAL DESCRIPTION

The Model VM-114 Video Monitor is designed for use in conjunction with TV Video cameras employed in closed circuit TV systems. It is of sturdy construction, light weight and can withstand almost any environment. It is a self-contained unit designed to operate from a 105-125 VAC source. Circuits are designed to use standard type TV tubes and components. All components are contained on a well-engineered chassis in accordance with good engineering practice, and arranged to provide adequate ventilation and prevent overheating.

Controls are on the front panel for ease in adjusting the viewed picture to suit individual taste. These controls are: Vertical Hold, Horizontal Hold, Contrast, Brightness and a push type On-Off switch. A pilot lamp mounted below the On-Off switch indicates when the unit is turned on.

On the lower rear apron of the main chassis are mounted the two AN type connectors for camera and additional monitor connection, an input line termination switch for setting the input impedance to the Video Amplifier to provide low or high impedance connection, and the Vertical Height and Vertical Linearity controls for picture size adjustment. The Horizontal Width and Horizontal Linearity controls are slide-type and are mounted on the back of the High Voltage Cage. All controls are accessible for ease in making adjustments.

2.2 MECHANICAL FEATURES

The Model VM-114 Video Monitor cabinet is carefully engineered, giving every consideration to accessibility of the components for maintenance. It is all metal construction with the exception of the front panel and picture mask, which is molded plastic. The front panel and cabinet are finished in grey.

The front panel contains the protective glass in front of the picture tube, the four control knobs, and the indicator lamp. It can be easily removed for cleaning of the protective glass. Adequate ventilation is provided for the cabinet. Two cutouts on either side permit easy movement of the cabinet when desired.

Two sub-chassis and a high voltage enclosure are mounted on the main chassis for safety and ease of maintenance. They may be removed for inspection and maintenance of the Video Amplifier and Main Power Supply circuits. The High Voltage Cage serves as a protective from potentially dangerous components.

The main chassis is held in place within the cabinet by means of machine bolts passing through the underside of the cabinet. Four rubber feet on the underside of the cabinet permit placement on any surface.

2.3 ELECTRICAL FEATURES

The power input circuit to the Monitor is fused and designed to operate on 105-125 VAC. The On-Off switch also includes the brightness control. A pilot lamp on the front panel indicates when the unit is in operation.

All the circuits comprising the individual stages of the Model VM-114 are conservatively rated to provide highly stable operation. The Main Power Supply is transformer controlled. It provides AC line isolation and makes use of standard 6.3 and 12.6 volt tubes. The DC portion is a well-filtered supply using a Silicon-type rectifier designed and rated to withstand peak surge current demands.

SECTION III

3.1 INSTALLATION

Determine the number of units required for the particular installation. Position the Monitor at the desired location. Plug the Monitor into a suitable outlet and turn the Monitor "ON." Allow a few minutes for warm-up. Connect a Video camera designed to work with Closed Circuit TV Monitors, to the Monitor by means of suitable RG59/U cable fitted with suitable type AN connectors at both ends, and connect to the equipment.

Position the Line Termination Switch on the Video Monitor to the "ON" position to provide proper line termination. With video signals fed to the Monitor, a picture should now be visible on the face of the picture tube. Adjust Contrast and Brightness controls to provide the best picture. Adjust the Horizontal Hold and Vertical Hold controls for picture lock if necessary. The Monitor is ready for normal operation.

VM-114 Video Monitors and Video Cameras can be used in various combinations; one monitor fed by one camera, one camera feeding several monitors, or several cameras feeding one monitor. Line Switches are available for multi-camera or multi-monitor installations. Figure IIA indicates the proper method for connecting single and multi-monitor installations. It is important that the last monitor in the hook-up chain have the proper line termination.

This is accomplished by means of the Line Termination Switch on the back of the Monitor chassis. When connecting several monitors for use with one camera, the monitors should be connected in series (as shown), and Line Termination Switch on the last monitor should be turned to the "ON" position. All previous switches should be in the "OFF" position.

Failure to comply with the above will result in poor picture resolution.

A type RG59/U cable is recommended for connection between cameras and monitors. When running extremely long lines between equipment, where loss of signal strength along the line will affect picture quality, use a low loss cable line having the same impedance characteristics as the RG59/U.

Although the Monitor was designed to give trouble-free service, there may be occasions when it may require some adjustments. When adjustments or repairs are required, refer the unit to qualified experienced electronic technicians or your qualified service dealer.

The Video Amplifier is built on a sub-chassis. It comprises a 6AW8A Voltage Amplifier connected in cascade and feeds the Video Output Tube 12BY7A. Two input connections are provided: 75 ohms, and high impedance termination under control of the Line Termination Switch. The Video Amplifier has a gain in excess of 34 db and will operate satisfactorily on an input voltage of from 0.5 - 2 volts p-p.

The 12BH7A(V3) is used as a sync amplifier stage. It couples to the tube 12BH7A(V4) which operates as a Vertical Oscillator and to the Vertical Output Stage to produce vertical sweep and deflection voltage to the vertical deflection coils. The 12BH7A(V5) operates as a Horizontal Oscillator and drives the Horizontal Output Stage, 12GB3(V6), to produce the high voltage pulse to the 1X2A(V7) Rectifier. The 12GK17(V8) is used as a conventional damper tube.

The tubes within the Monitor are series connected and fed by the 63 volt winding of the transformer. A separate 6.3 winding on the transformer supplies operating power for the pilot lamp.

SECTION IV

4.1 MAINTENANCE

A. Operation

The Model VM-114 Video Monitor is designed to provide trouble free service. It requires minimum maintenance, consisting of an occasional cleaning of the picture tube protective glass and the picture tube itself. If a malfunction does occur refer to the recommended checks outlined under the "Trouble Chart". If after making checks as outlined, the monitor does not return to normal operation the unit should be referred to a qualified electronic technician or to your local service dealer for repairs.

B. Picture Tube Cleaning

The picture tube protective glass and the face of the picture tube should be cleaned every six months. To accomplish this, remove the five machine screws securing the front panel to the face of the cabinet.

Clean the protective glass and the face of the picture tube with a damp cloth, then dry. Apply very light pressure to these items.

CAUTION The face of the picture tube is part of a high vacuum. Scoring, scratching or applying undue pressure may result in implosion of the picture tube, and serious personal injury may result.

C. Technician Checks

Power: Fuses F10/F20 are the AC input fuses to the Model VM-114 and are located on the main chassis. The tubes in the monitor are series connected and fed by the 63 volt winding of the Main Power Transformer. The pilot lamp has it's own 6.3 winding. Failure of any tube filament will open the series chain. Check all tubes for normal operation prior to making adjustments.

Picture Masking: If the picture appears smaller in size horizontally, off to one side, or tilted loosen the locking bar which tightens and secures the Deflection Yoke on the neck of the picture tube. Push the

yoke forward onto the neck as far as it will go. Check picture tilt by rotating the yoke to the left or right as required, then tighten the locking bar.

Vertical Adjustments: The Vertical Size and Linearity controls located on the rear panel of the main chassis should be set to provide a full picture in proper proportion. The picture can then be moved in an orbital plane by adjusting the two focusing rings on the Deflection Yoke assembly.

Pin-Cushion Effect (Horiz. Width/Linearity): The over-all horizontal width and linearity can be varied by adjusting the Width and the Linearity Controls located on the rear cover of the High Voltage Cage. The pin-cushion effect can be corrected by positioning the two magnets on either side of the Deflection Yoke and forming part of the Yoke assembly. Moving the magnets toward the shell of the picture tube will reduce the pin-cushion effect.

Horizontal Frequency Range Adjustment: Horizontal frequency adjustments may be required to insure Horizontal Sync Lock stability. To accomplish this, first locate the Horizontal Sync Coil on the main chassis just below the neck of the picture tube. Tune the coil with a screwdriver by turning the adjusting screw in a CW or CCW direction until a picture lock condition is arrived at. Check horizontal lock stability by rotating the Horizontal Hold Control on the front panel fully, without loss of picture. If the picture remains locked under these conditions no further adjustment is required. If the picture does not remain locked, adjust the coil until a satisfactory picture is displayed.

Service: If the adjustments and checks outlined under the above maintenance headings do not correct faulty operation of the unit refer to the schematic diagram for circuit values and make internal inspection of the circuit components. Make all voltage measurements as shown under the tube

voltage reading chart. Use a 20,000 ohm, voltmeter or a vacuum tube voltmeter. Determine the particular circuit in trouble and check all components for proper value. Replace any component suspected as defective. Always adhere to the specified component values, voltage ratings and tolerances, as shown in the parts list.

4.2 WARRANTY

Video Systems of America, in connection with apparatus sold hereunder, agrees to correct any defect or defects in material or workmanship, as determined by the manufacturer which may develop under proper or normal use during the period of

from the date of shipment, by repair or replacement f.o.b. Video Systems of America's New York City office, of the defective part or parts. Such correction shall constitute a fulfillment of all Video Systems liabilities in respect to said apparatus, unless otherwise stated hereunder. Video Systems of America shall not be liable for consequential damages. This warranty is in lieu of all other warranties expressed or implied, and does not extend to our apparatus which has been subjected to misuse, abuse or alterations not authorized by the manufacturer.

Apparatus may not be returned without Seller's written permission.

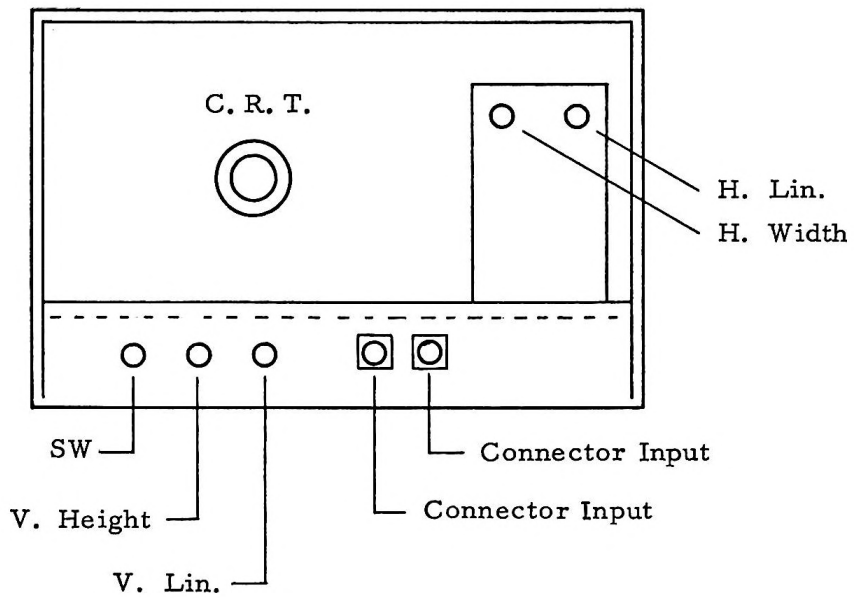
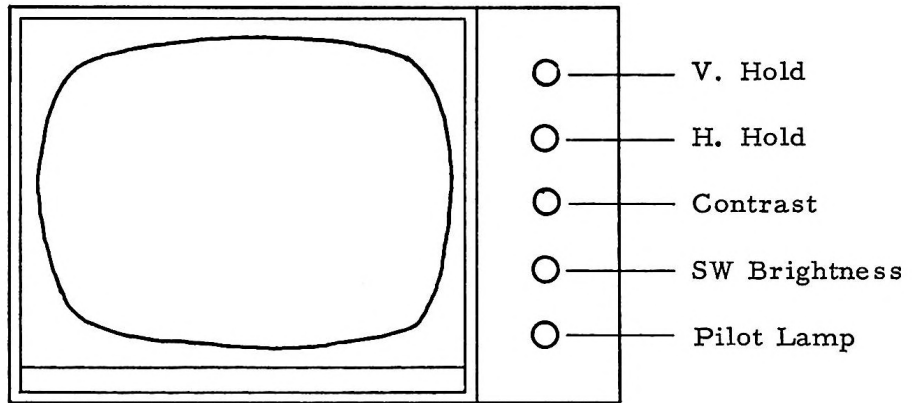
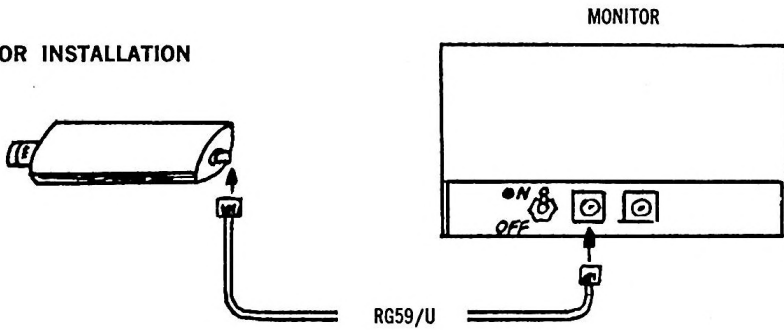


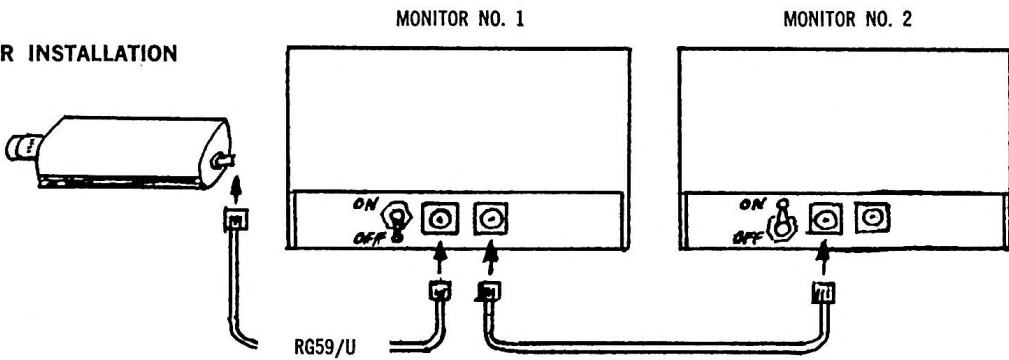
FIGURE II
VIDEO MONITOR 114

FIGURE I Ia

1. SINGLE MONITOR INSTALLATION

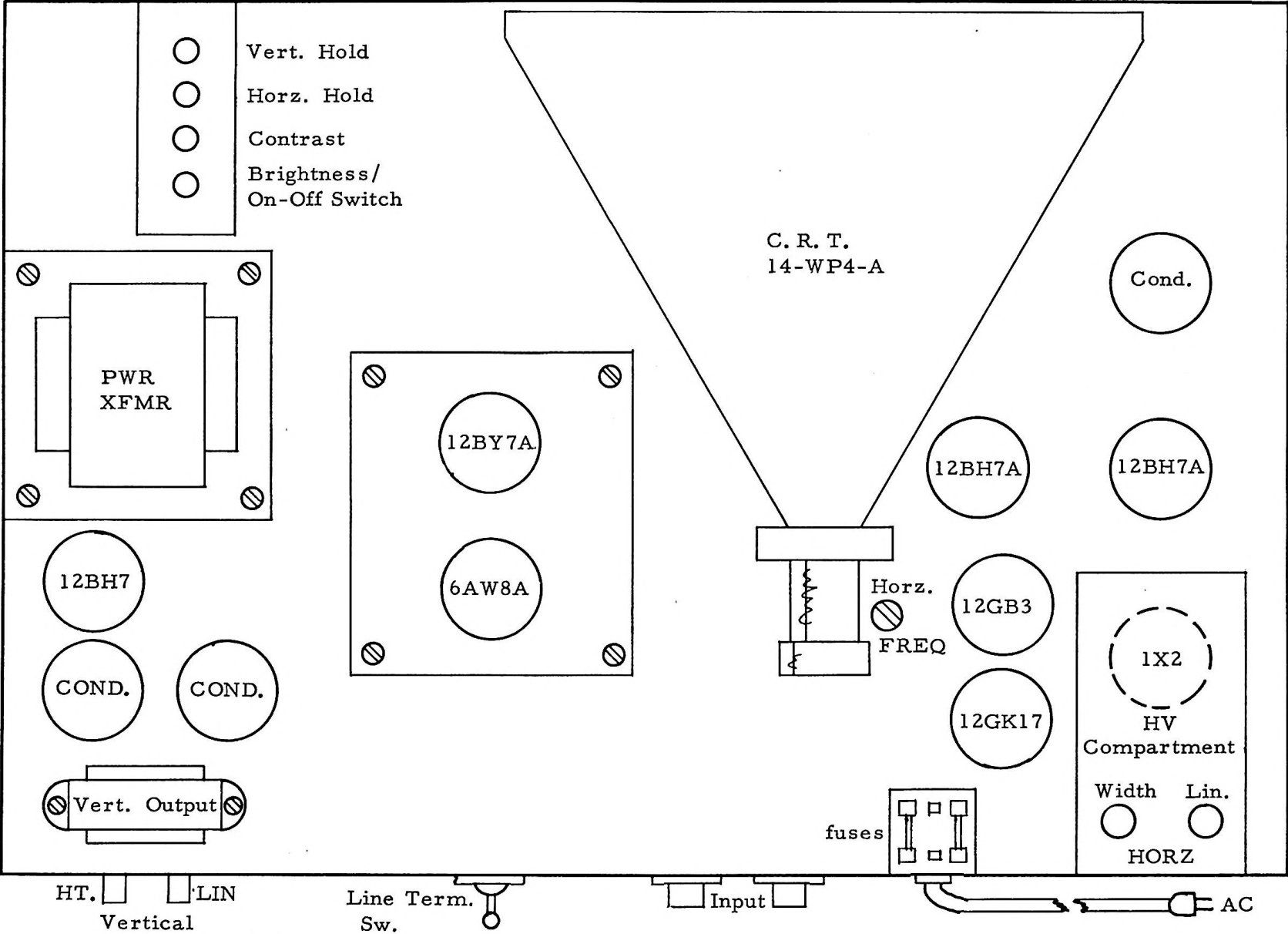


2. MULTI-MONITOR INSTALLATION



LINE TERMINATION

1. When using only one monitor, throw termination switch to the "ON" position.
2. When using more than one monitor, position all ON-OFF switches on monitors to the "OFF" position except the last monitor switch which should be in the "ON" position for proper line termination.



Vert. Hold



Horz. Hold



Contrast



Brightness/
On-Off Switch

C. R. T.
14-WP4-A

Cond.

PWR
XFMR

12BY7A

12BH7A

12BH7A

12BH7

6AW8A

Horz.
FREQ

12GB3

COND.

COND.

1X2

HV
Compartment

12GK17

Vert. Output

Width Lin.

HORZ

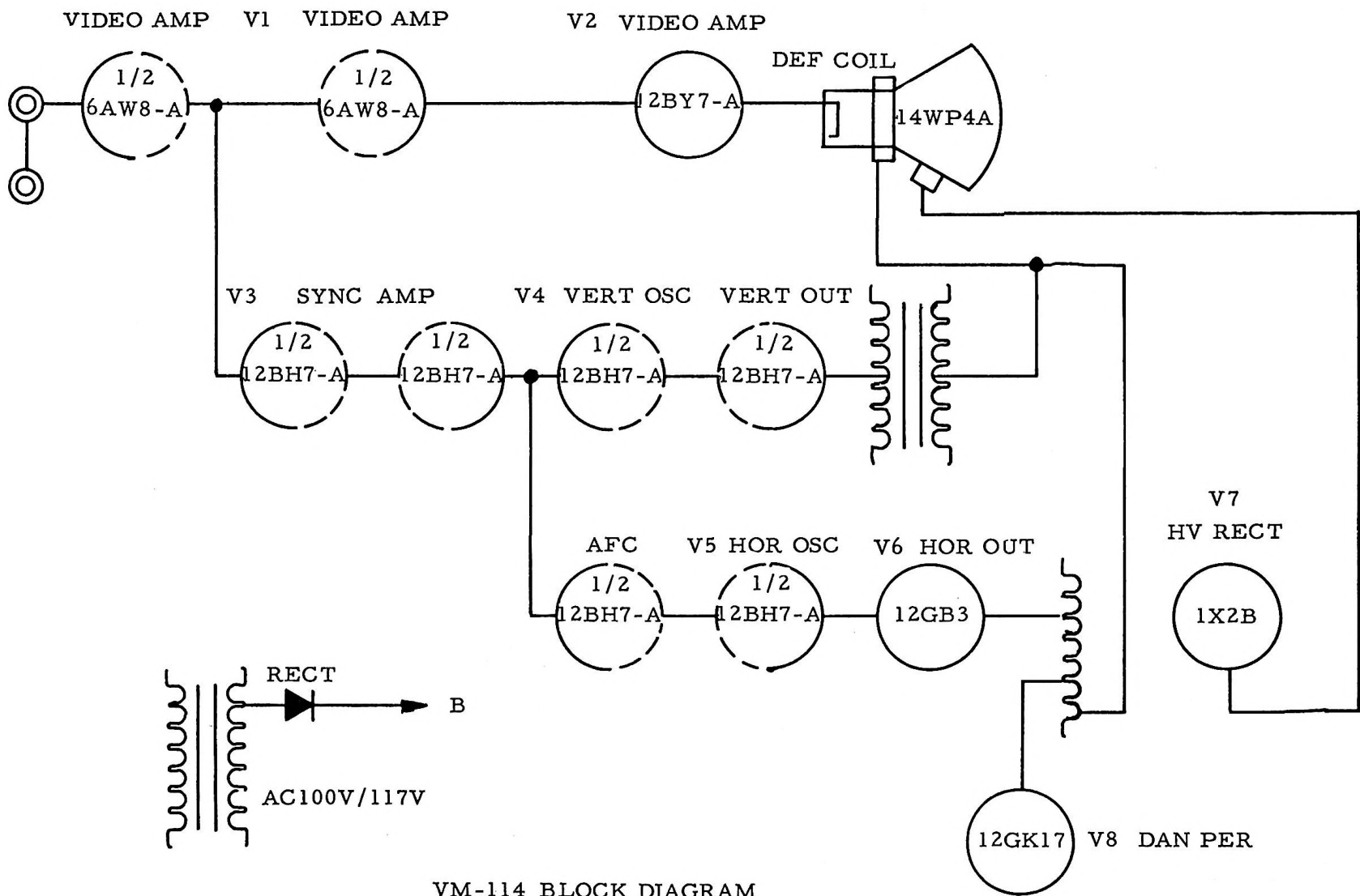
fuses

HT. Vertical LIN

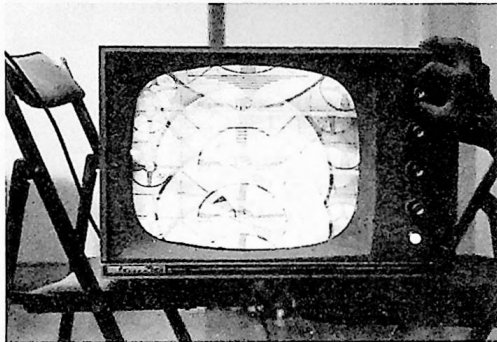
Line Term. Sw.

Input

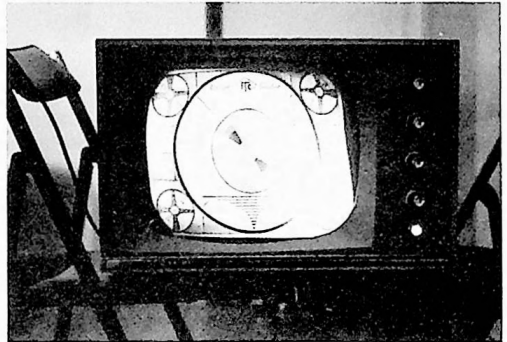
AC



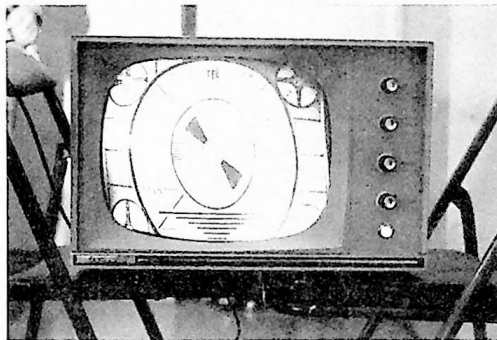
VM-114 BLOCK DIAGRAM



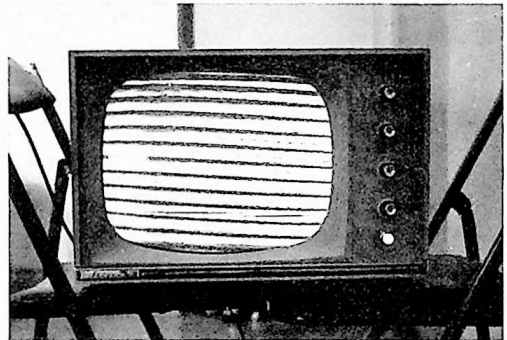
Vertical Locking Frequency Incorrect.
Adjust Vertical Hold Control to lock
picture.



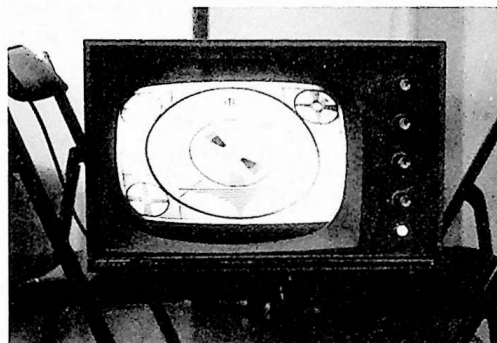
Horizontal Linearity Out of Adjustment.
Adjust Horizontal Linearity and Width
Controls on back of chassis for best
picture.



Vertical Size Control Out of Adjustment
(expanded).
Adjust Vertical Size Control on back of
chassis.



Horizontal Locking Frequency Incorrect.
Adjust Horizontal Hold Control on front
panel and Horizontal Frequency Control
on chassis inside cabinet.



Vertical Size Too Small.
Adjust Vertical Size Control to correct.

TROUBLE CHART

No operation of Monitor Pilot Lamp does not light	Check AC plug to supply Check Fuses F1o/F2o Check AC On-Off Switch
Pilot Lamp does not light	Check and replace Pilot Lamp PL1
No raster on Picture Tube	Check and replace 12BH7 (V5); 12GB3 (V6); 1X2 (V7); 12GK17 (V8); and Picture Tube 14WP4A
Raster OK but no vertical deflection	Check and replace 12BH7A (V4)
Raster OK but no video on Picture Tube	Check and replace 6AW8A (V1) and 12BY7A (V2)
Raster and video OK but horizontal lines on picture	Check and replace 12BH7A (V5)
Tubes do not light	Check all tubes for open filaments
Picture unstable-tearing	Check and replace 12BH7A (V3)
Picture blooming when brightness control advanced all the way	Check and replace 1X2B (V7)

VOLTAGE READING CHART

Socket Pins

Tube Type	Pos.	1	2	3	4	5	6	7	8	9	10	11	12
6AW8-A	V1	1.8	0	210	fil	fil	2.0	0	90	105			
12BY7-A	V2	2.7	0	0	fil	fil	190	210					
12BH7-A	V3	7.0	0	0	fil	fil	50	0	0				
12BH7-A	V4	400	0	18	fil	fil	40	0	0				
12BH7-A	V5	175	-12	15	fil	fil	175	-20	0				
12GB3	V6	0	fil	0	125	-20	0	fil	0				
1X2A	V7	HV fil								HV fil			
12GK17	V8	fil	460			250		fil					
14WP4A	V9	fil	0.7				250				440	60	fil

All readings $\pm 20\%$ as taken with a VTVM

CIRCUIT WAVEFORMS



Junction of R34, R35 and C23
Vertical Intergrator



Junction of R36 and .01
Vertical Feedback



Pin 6 of 12BH7A (V4)



Pin 2 of 12BH7A (V4)



Junction of C43 and R55
Horizontal Oscillator



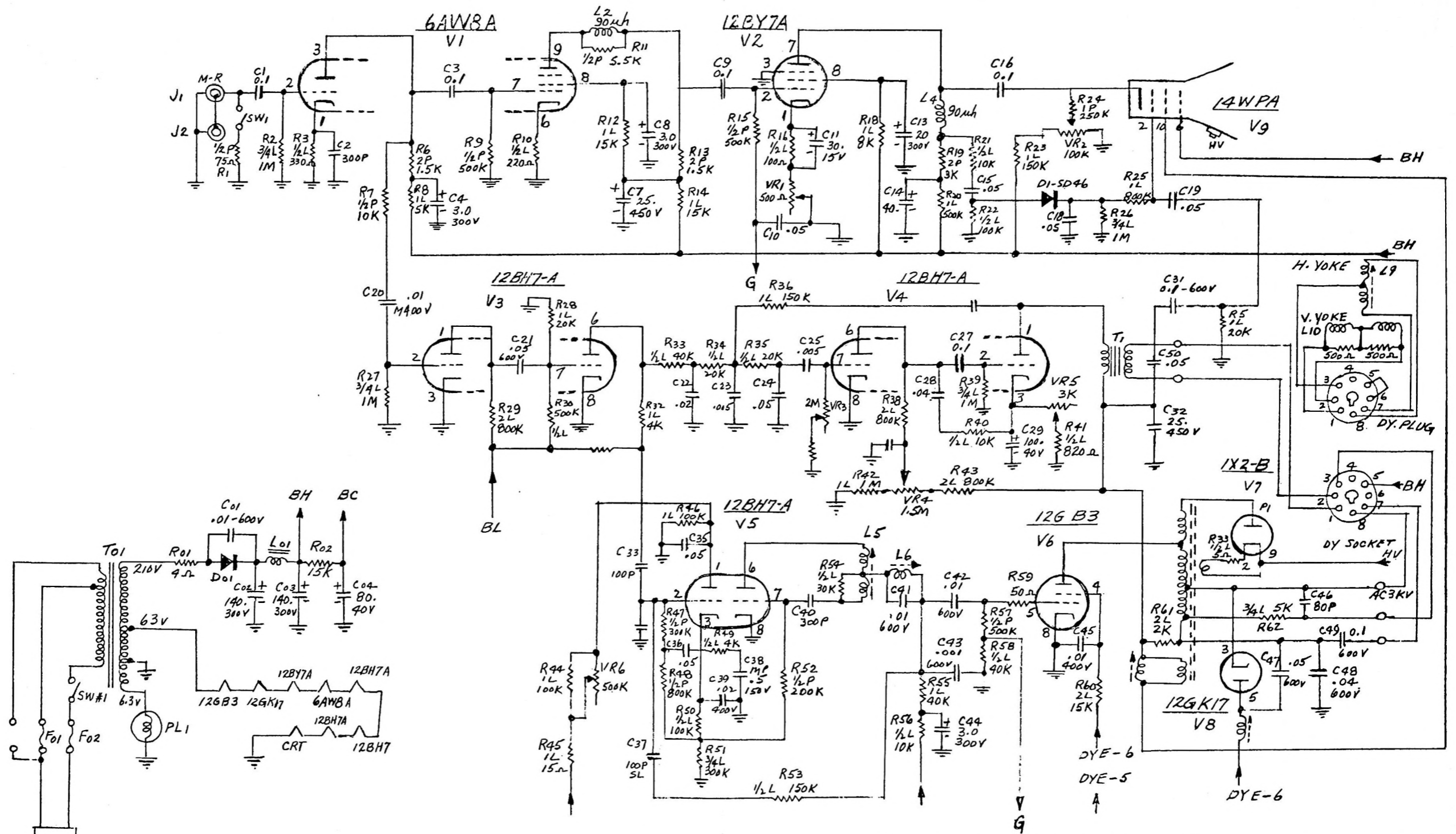
Junction of C49 .01 Capacitor
and the Horizontal Yoke



Pin 5 of 12GB3
Horizontal Output



At junction of output winding
of Vertical Output Transformer
T1 and Vertical Yoke



K = 1000
M = MEGS

SCALE	TOLERANCES	DATE	BY	REV.
	FRAC. DEC.			
MONITOR VM-114				USED ON
DO NOT SCALE THIS DRAWING				REF.
				DWGS.
MATERIAL				DRAWN <i>DAP</i> CKD. <i>DAP.</i>
				APPR.
FINISH				DATE 3-17-63
				DRAWING NO. VM-1001-A
VSA VIDEO SYSTEMS OF AMERICA, INC.				
445 PARK AVENUE NEW YORK 22, NEW YORK				

Order No.	Symbol	Description	Ratings
C-701	C1	Oil Paper Capacitor	0.1 μ f, 600WV
C-702	C2	Titanium Capacitor	300PF, 250WV
C-703	C3	Oil Paper Capacitor	0.1 μ f, 600WV
C-704	C4	Electrolytic Capacitor	3 μ f, 300WV
C-707	C7	Oil Paper Capacitor	25 μ f, 450WV
C-708	C8	Electrolytic Capacitor	3 μ f, 300WV
C-709	C9	Oil Paper Capacitor	0.1 μ f, 600WV
C-710	C10	Paper Capacitor	0.05 μ f, 400WV
C-711	C11	Electrolytic Capacitor	30 μ f, 15WV
C-713	C13	Electrolytic Capacitor	20 μ f, 300WV
C-714	C14	Electrolytic Capacitor	40 μ f, 450WV
C-715	C15	Oil Paper Capacitor	0.05 μ f, 600WV
C-716	C16	Oil Paper Capacitor	0.1 μ f, 600WV
C-718	C18	Oil Paper Capacitor	0.05 μ f, 600WV
C-719	C19	Paper Capacitor	0.05 μ f, 400WV
C-720	C20	Oil Paper Capacitor	0.01 μ f, 400WV
C-721	C21	Oil Paper Capacitor	0.05 μ f, 600WV
C-722	C22	Paper Capacitor	0.002 μ f, 400WV
C-723	C23	Paper Capacitor	0.005 μ f, 400WV
C-724	C24	Paper Capacitor	0.005 μ f, 400WV
C-725	C25	Oil Paper Capacitor	0.005 μ f, 400WV
C-726	C26	Paper Capacitor	0.1 μ f, 400WV
C-727	C27	Paper Capacitor	0.1 μ f, 400WV
C-728	C28	Paper Capacitor	0.04 μ f, \pm 5%
C-729	C29	Electrolytic Capacitor	100 μ f, 40WV
C-730	C30	Oil Paper Capacitor	0.01 μ f, 600WV
C-731	C31	Oil Paper Capacitor	0.01 μ f, 600WV
C-732	C32	Electrolytic Capacitor	25 μ f, 450WV
C-733	C33	Titanium Capacitor	160PF, M, SL
C-734	C34	Titanium Capacitor	50PF, K, SL
C-735	C35	Paper Capacitor	0.05 μ f, 400WV
C-736	C36	Paper Capacitor	0.05 μ f, 400WV
C-737	C37	Titanium Capacitor	100PF, K, SL
C-738	C38	Metalized Paper Capacitor	0.5 μ f, 150WV
C-739	C39	Paper Capacitor	0.02 μ f, 400WV
C-740	C40	Polystyrene	300PF, SL, 500WV
C-741	C41	Oil Paper Capacitor	0.01 μ f, 600WV
C-742	C42	Oil Paper Capacitor	0.01 μ f, 600WV
C-743	C43	Oil Paper Capacitor	0.01 μ f, 600WV
C-744	C44	Electrolytic Capacitor	3 μ f, 300WV
C-745	C45	Oil Paper Capacitor	0.01 μ f, 400WV
C-746	C46	Titanium Capacitor	80PF, SL, 3KWV
C-747	C47	Oil Paper Capacitor	0.05 μ f, 600WV
C-748	C48	Oil Paper Capacitor	0.04 μ f, 600WV
C-749	C49	Oil Paper Capacitor	0.1 μ f, 600WV
C-750	C50	Paper Capacitor	0.05 μ f, 400WV

Order No.	Symbol	Description	Ratings
Co-601	Co1	Oil Paper Capacitor	0.01 μ f, 600WV
Co-602	Co2	Electrolytic Capacitor	140 μ f, 300WV
Co-603	Co3	Electrolytic Capacitor	140 μ f, 300WV
Co-604	Co4	Electrolytic Capacitor	80 μ f, 40WV
D-601	D1	Diode	SD46
Do-701	Do1	Silicon Rectifier	SD-1, 20A
Fo-801	Fo1	Fuse	2A
Fo-802	Fo2	Fuse	2A
J-601	J1	Connector	AN Type
J-602	J2	Connector	AN Type
K-901		Kine Scope	14WP4A
L-902	L2	Peaking Coil	90 μ h
L-904	L4	Peaking Coil	90 μ h
L-905	L5	H. Oscillator Coil	
L-906	L6	Stabilizer Coil	
L-907	L7	Width Coil	
L-908	L8	Linearity Coil	
Lo-501	Lo1	Choke Coil	3H, 250mH
PL-901	PLo1	Pilot Lamp	6.3V 0.2A
R-801	R1	Carbon Resistor	1/2P 75 Ω
R-802	R2	Carbon Resistor	3/4L 1M Ω
R-803	R3	Carbon Resistor	1/2L 330 Ω J
R-805	R5	Carbon Resistor	1L 20K Ω
R-806	R6	Carbon Resistor	2P 1.5K Ω
R-807	R7	Carbon Resistor	1/2P 10K Ω
R-808	R8	Carbon Resistor	1L 5K Ω
R-809	R9	Carbon Resistor	1/2P 500K Ω
R-810	R10	Carbon Resistor	1/2P 220 Ω
R-811	R11	Carbon Resistor	1/2P 5.5K Ω
R-812	R12	Carbon Resistor	1L 15K Ω
R-813	R13	Carbon Resistor	2P 1.5K Ω
R-814	R14	Carbon Resistor	1L 15K Ω
R-815	R15	Carbon Resistor	1/2P 500K Ω
R-816	R16	Carbon Resistor	1/2L 100 Ω
R-818	R18	Carbon Resistor	1L 8K Ω
R-819	R19	Carbon Resistor	2P 3K Ω
R-820	R20	Carbon Resistor	1L 500 Ω
R-821	R21	Carbon Resistor	1/2L 10K Ω
R-822	R22	Carbon Resistor	1/2L 100K Ω
R-823	R23	Carbon Resistor	1L 150K Ω
R-824	R24	Carbon Resistor	1P 250K Ω
R-825	R25	Carbon Resistor	1L 800K Ω
R-826	R26	Carbon Resistor	3/4L 1M Ω

Order No.	Symbol	Description	Ratings
R-827	R27	Carbon Resistor	3/4L 1M Ω
R-828	R28	Carbon Resistor	1L 20K Ω
R-829	R29	Carbon Resistor	2L 800K Ω
R-830	R30	Carbon Resistor	1/2L 500K Ω
R-831	R31	Carbon Resistor	1L 3K Ω
R-832	R32	Carbon Resistor	1L 4K Ω
R-833	R33	Carbon Resistor	1/2L 40K Ω
R-834	R34	Carbon Resistor	1/2L 20K Ω
R-835	R35	Carbon Resistor	1/2L 20K Ω
R-836	R36	Carbon Resistor	1L 150K Ω
R-837	R37	Carbon Resistor	1L 500K J
R-838	R38	Carbon Resistor	2L 800K Ω
R-839	R39	Carbon Resistor	3/4L 1M Ω
R-840	R40	Carbon Resistor	1/2L 10K Ω
R-841	R41	Carbon Resistor	1/2L 820 Ω
R-842	R42	Carbon Resistor	1L 1.5M Ω
R-843	R43	Carbon Resistor	2L 800K Ω
R-844	R44	Carbon Resistor	1L 100K Ω
R-845	R45	Carbon Resistor	1L 15K Ω
R-846	R46	Carbon Resistor	1L 100K Ω
R-847	R47	Carbon Resistor	1/2P 300K Ω
R-848	R48	Carbon Resistor	1/2P 800K Ω
R-849	R49	Carbon Resistor	1/2L 4K Ω
R-850	R50	Carbon Resistor	1/2L 100K Ω
R-851	R51	Carbon Resistor	3/4L 300K Ω
R-852	R52	Carbon Resistor	1/2P 200K Ω
R-853	R53	Carbon Resistor	1/2L 150K Ω
R-854	R54	Carbon Resistor	1/2L 30K Ω
R-855	R55	Carbon Resistor	1L 40K Ω
R-856	R56	Carbon Resistor	1/2L 10K Ω
R-857	R57	Carbon Resistor	1/2P 500K Ω
R-858	R58	Carbon Resistor	1/2L 40K Ω
R-859	R59	Carbon Resistor	1/2L 50 Ω
R-860	R60	Carbon Resistor	3L 15K Ω
R-861	R61	Carbon Resistor	2L 2K Ω
R-862	R62	Carbon Resistor	3/4L 5K Ω
R-863	R63	Carbon Resistor	1/2L 5K Ω
Ro-901	Ro1	Wire Wound Resistor	5W, 4 Ω
Ro-902	Ro2	Wire Wound Resistor	2L, 15K Ω , J
S-601	SW1	Toggle Switch	Two pole 1 position
SW-9-1	SWo1	Switch	Included in VR2
T-701	T1	V. Output Transformer	
T-702	T2	H. Output Transformer	
V-801	V1	Vacuum Tube	6AW8A
V-802	V2	Vacuum Tube	12BY7A
V-803	V3	Vacuum Tube	12BH7A
V-804	V4	Vacuum Tube	12BH7A
V-805	V5	Vacuum Tube	12BH7A
V-806	V6	Vacuum Tube	12GB3
V-807	V7	Vacuum Tube	1 x 2-B