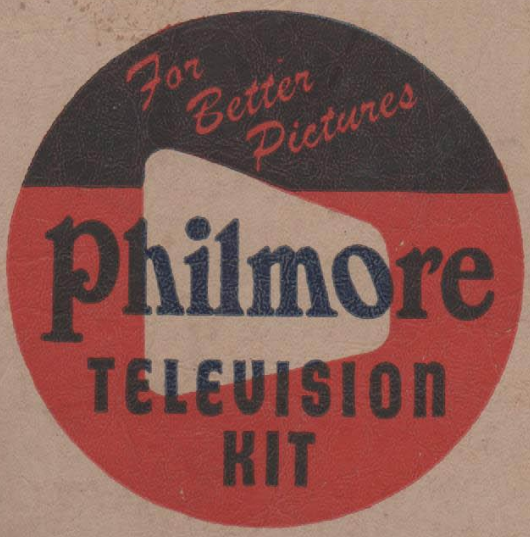


MODEL KP30

Construction and Operation

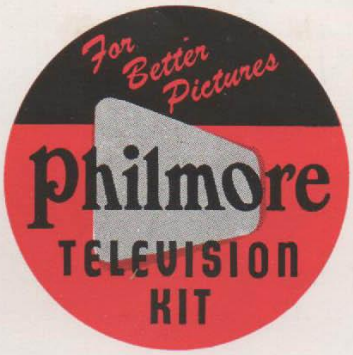
PHILMORE MANUFACTURING CO., INC.

NEW YORK 3, N. Y. — U. S. A.

INSTRUCTIONS

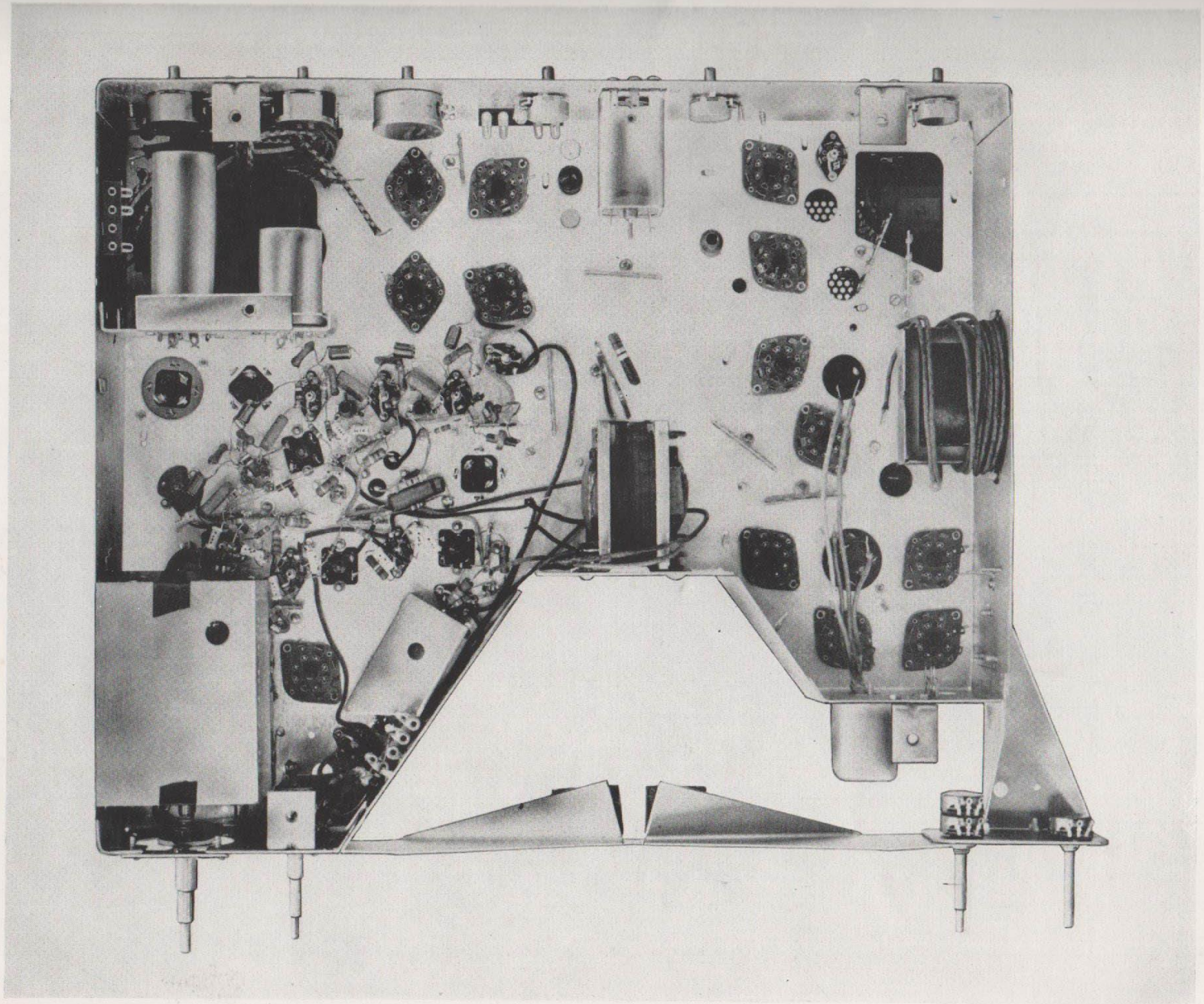
for

Construction and Operation



MODEL KP30

PHILMORE MANUFACTURING CO., INC.
113 University Place New York 3, N. Y. — U. S. A.



Preliminary Remarks on Assembly

The Model KP30 Philmore Television Receiver you are about to assemble has the Picture, Sound and 12 Channel Tuner wired and pre-aligned at the factory. In addition, all the sockets, transformers, coils, shields, tubes and other important components are already mounted on the chassis. This leaves to you the balance of soldering such items as resistors, tubular and mica condensers, and other smaller items.

With this simplification of work to be done by you, you cannot fail to achieve good results promptly if you carefully follow the progressive instructions contained in this book. With no problems of alignment, you can be assured that when the wiring is completed, a few simple adjustments of the controls will secure high quality picture results for you.

In selecting the type of circuit for this kit, it was decided that high sensitivity could be one of the main factors in order to cope with the reception at comparatively long distances from the transmitting stations, and to overcome as far as possible difficulties in apartments and other places where landlords may restrict the use of roof antennae. In most cases, the sensitivity is high enough to enable simple antennae to be used, sometimes of the indoor type. The greatest possible freedom from interference was also considered to be a necessity, in order to give stability and trouble-free reception. Furthermore, the circuit had to be such that it was not likely to become obsolete. The performance of the circuit used has been highly satisfactory in all areas where transmission is taking place. Once again it must be emphasized that the instructions must be followed without any alteration. Television receivers are operated at higher frequencies than those employed in the ordinary broadcast band, and the wiring practices which can be employed in ordinary broadcast receivers cannot be used in dealing with higher frequencies. You will see as you work through the progressive instruction steps, that the wiring which lies right down on the chassis is carried out first and that this wiring runs in definite channels which are clearly indicated. After all this wiring is completed, the various condenser and resistor connections are kept well up in the air, and are placed in the correct position to secure maximum performance. The old-fashioned sharp right angle bend type of wiring is not used and should be avoided, as it usually results in over-long wires and does not in any way improve performance.

TOOLS REQUIRED

1. Soldering Iron. The small pencil type is the most suitable.
2. Spintite wrench for self tapping cap screws. This can be purchased at any hardware store, the ¼" size being suitable.
3. Long-nosed pliers. This should have a small point.
4. Screw-driver.

SOLDERING HINTS

Always use rosin core solder. Avoid the use of special pastes and fluxes, as most of these compounds have a tendency to travel to surrounding parts under the heat of the soldering iron.

Keep your iron well-tinned. If it requires tinning, use a fine file to clean the faces of the tip while cold. Then while the iron is heating up, rub the faces with solder until it is hot enough to take the tinning. When the tip gets dirty after much use and has corrosion spots on it, cool it down and repeat the filing procedure and re-tin it. This is absolutely necessary in order to make good solder joints quickly. See that each joint is well-heated by holding the soldering iron against it and then applying the solder so that it runs freely into the joint. Do not use more solder than necessary. In making wire connections

to socket lugs or terminal lugs, push the wire through the hole. Then take it with the point of the pliers and bend it tightly around the lug. One bend is sufficient. Then pinch the bend tightly on the lug with the pliers.

WIRE

Solid No. 20 Gauge Pushback Wire is used for the majority of the connections. In only two cases, that of the Deflection Yoke and the AC Supply Wire, stranded wire is used. Waxed braided type of wire is used on account of its high breakdown voltage and the fact that age makes little difference in its insulating qualities.

PART NUMBERS

Each part has been given an indicating number together with a letter which indicates the section to which it belongs. For instance, all resistors are distinguished by the letter "R" before their serial number. All condensers are indicated by the letter "C", hardware is indicated by the letter "H", sockets by the letter "S", knobs by the letters "KN", and each coil and transformer has a distinguishing type number which is carried through all the diagrams and the instructions. Before you commence using the parts to build the kit, check all the parts against the parts list, and then stack all the envelopes in numerical order where they can be easily found. In order to avoid any confusion, keep unused parts always in their proper envelopes.

CAUTION

We must especially warn you against interfering with the adjustment screws on the various transformers and coils in the pre-aligned sections. Even slight alterations to these screws may affect the quality of your picture. The pre-aligned stages between the fixed channels are stagger-tuned at nine different frequencies. No matter how accurately this procedure is carried out, it still may not give a picture of the best quality and definition, so that the overall curve is studied with the latest type of sweep generators, and the necessary "touching up" is done until the perfect curve results. This is the only method by which high quality pictures can be reliably obtained, so please do not meddle with the tuning screws unless you wish to spoil your picture

TECHNICAL DATA

Picture Carrier I.F. Frequency — 25.75 Mc.
Adjacent channel sound tray — 27.25 Mc.
Accompanying sound traps — 21.25 Mc.
Sound I.F. Frequency — 21.25 Mc.
Sound discriminator Band between peaks — 350 K.C.
Video response — to 4 Mc.
Scanning Interlaced — 525 line.
Horizontal scan frequency — 15,750 cycles per sec.
Vertical scan frequency — 60 cycles per sec.
Frame frequency — 30 cycles per sec.
Power consumption — 320 watts.
Maximum brillance in highlights — 60 foot Lamberts.
Area Contrast Ratio — 90 to 1.
Average sensitivity on all thirteen channels provides good pictures with a 150 microvolt signal.
Picture synchronizes with a 50 microvolt signal.
Antenna input impedance — 300 ohms.
Picture I.F. Amplifier — 4 stages.
Video Amplifier 2 stages Overall gain 30 times.

CHANNEL RANGES

	Channel	*R.F. Oscillator*
1	44-50 Mc	71 Mc
2	54-60	81
3	60-66	87
4	66-72	93
5	76-82	103
6	82-88	109
7	174-180	201
8	180-186	207
9	186-192	213
10	192-198	219
11	198-204	225
12	204-210	231
13	210-216	237

TUBE COMPLEMENT

6J6	R.F. Amplifier
6J6	R.F. Oscillator
6J6	Converter
6BA6	1st and 2nd Sound I.F.
6AU6	3rd Sound I.F.
6AL5	Sound Discriminator
6AT6	1st A.F. Amp.
6K6GT	Audio Output
6AG5	1st, 2nd, 3rd and 4th Picture I.F.
6AL5	Picture 2nd Det. and DC restorer
6AU6	1st Video Amp.
6K6GT	2nd Video Amp.
6SK7	1st Synch. Amp.
6SH7	Synch. Separator
6SN7	2nd Synch. Amp. and Hor. Discharge
6J5	Vertical sweep oscillator and discharge
6K6GT	Vertical sweep output
6AL5	Hor. Synch. Discriminator
6K6GT	Hor. Sweep Oscillator
6AC7	Hor. Sweep Osc. Control
6BG6	Horizontal Sweep Output
5V4G	Reaction scanning
1B3/8016	High Voltage Rectifier
5U4G	2 Power Supply Rectifiers
10BP4	10" Kinescope

AUDIO OUTPUT

Undistorted. 2.5 watts. Maximum 4 watts.

REFERENCE NUMBERS FOR TELEVISION KIT PARTS

NOTE: *Indicates parts already mounted on the chassis and in pre-aligned stages or assembled to S105 H.V. Rectifier Socket.

Where there are numbers in brackets "()" alongside of the items, this indicates the quantity of the item. If no number is listed, this indicates a quantity of only 1 item.

Part No.	*Description*
T114	*Audio Output Transformer (Speaker)
KRK2W	*13 Channel Tuner with Tubes
SP201	Speaker PM 5"x7"
301	300 Ohm Connecting Lead to Tuner 22"
302	High Voltage Lead to Kinescope and Clip
303	*Iron Core Filter Choke, 1 Henry
201D1	*Deflection Yoke
201K1	*1st and 2nd Sound Transformers (2)
201R1	*Width Control
201R3	*Linearity Control Horizontal
201/T6	*Power Transformer 115 Volts
201X1	*Yoke Mounting Hood
202D1	*Focus Coil
202K2	*1st Pix Transformer
202K3	*2nd Pix Transformer
202K4	*Cathode Trap Coil
202L1	*3rd and 4th Pix Coils (2)
203D3	Beam Bender
203K1	*Sound Discriminator Transformer
203L1	*Video Peaking Coil
203L2	*Video Peaking Coil
203L3	Video Peaking Coils (2) Blue Dot
203L4	Video Peaking Coils (2) Red Dot
204L1	*Filament Chokes (5)
204/T2	*Vertical Output Transformer
208/T2	*Vertical Oscillator Transformer (Blocking)
208/T8	*Sync. Discriminator Transformer
211/T3	*Horizontal Output Transformer
C112	*1500 Mmfd. (21)
C116	*270 Mmfd. 1000 Volts (5)
C116	270 Mmfd. 1000 Volts (2)
C125	*.25 400 Volts
C125	.25 400 Volts
C137	*10 Mmfd.
C138	.05 400 Volts (5)
C140	.05 600 Volts (6)
C146	.1 600 Volts
C149	*.01 400 Volts
C149	.01 400 Volts (4)
C151	.002 600 Volts
C152	.005 400 Volts (3)
C154	4700 Mmfd.

REFERENCE NUMBERS (Cont'd.)

Part No.	*Description*
C157	.1 400 Volts (2)
C161	470 Mmfd.
C164	1200 Mmfd.
C166	*82 Mmfd.
C166	82 Mmfd.
C167	.004 1000 Volts (2)
C168	.015 400 Volts (2)
C172	.004 600 Volts
C176	390 Mmfd.
C178	.001 1000 Volts
C179	680 Mmfd.
C181	56 Mmfd.
C183	.01 600 Volts (2)
C186	.05 1000 Volts
C187	HV Filter Condenser 500 Mmfd. 10,000 W.V.
C188	.035 1000 Volts
C197	*51 Mmfd.
C200	*6800 Mmfd.
C205	.0025 600 Volts (2)
C209	.005 600 Volts
C220 A, B, C	*40 Mfd. 450 Volts — 10 Mfd. 450 Volts — 80 Mfd. 150 Volts
C221 A, B, C	*40 Mfd. 450 Volts — 40 Mfd. 450 Volts — 10 Mfd. 450 Volts
C222 A, B	*80 Mfd. 450 Volts — 50 Mfd. 50 Volts
C223 A, B, C	*40 Mfd. 450 Volts — 10 Mfd. 450 Volts — 10 Mfd. 350 Volts
C224 A, B	*20 Mfd. 450 Volts — 80 Mfd. 350 Volts
C225 A, B	*250 Mfd. 10 Volts — 1000 Mfd. 6 Volts
H101	*Bracket Hold Controls
H102	*Bracket Tuner Shaft Bearing (only supplied with RCA Tuner)
H103	*Bearing Bakelite Tuner Shaft (only supplied with RCA Tuner)
H104	*Brackets Mounting Chassis to Cabinet (4)
H105	*Bracket Mounting Deflection Yoke
H105A	*Wing Bolts for Deflection Yoke Bracket (3)
H106A	*Bracket Mounting Focus Coil Upper
H106B	*Bracket Mounting Focus Coil Lower
H106C	*Wing Nuts for Focus Coil Bracket (3)
H106D	*Studs Threaded for Focus Coil Bracket (2)
H107	*Bracket Mounting Speaker
H108	*Support Bakelite for Antenna Leadin
H109A	*H.V. Shield Horizontal Output Transformer Mounting
H109B	*H.V. Shield Side Cover
H109C	*H.V. Shield Top Cover
H109D	*H.V. Shield Back Cover
H109E	*Supply Cord Mounted on Back Cover H.V. Shield
H111A	*Shield Voltage Divider Cover
H111B	*Shield Voltage Divider Cover
H111C	*Terminal Strip 2 Screw Antenna Connection
H111D	*Brackets for Antenna Terminal Strips (2)
H112	*Plate Subchassis Mounting Electrolytics
H113	*Terminal Strip 3 Screw Link Mount

REFERENCE NUMBERS (Cont'd.)

Part No.	*Description*
H114	*Shield Cathode Trap Coil
H115	*Connector A.C. Supply Input
H116	*Shield Tuner (only supplied with RCA Tuner)
H117	*Shield Discriminator Sound
H118	*Terminal Strips 4 Lug (14)
H119	*Terminal Strips 3 Lug (3)
H120	*Terminal Strips 2 Lug (5)
H121	*Terminal Strip 1 Lug
H122	*Shield Tube (2)
H123	*Clips Spring for Tube Shields (2)
H124	*Screws Parker Kalon #8 x 3/8" Long (83)
H125	*Mounts Bakelite Insulating Electrolytic Condensers (4)
H126	*Screws 6/32 x 3/8" Long (18)
H126A	*Nuts #4/40 (12)
H127	*Nuts #6/32 (28)
H128	*Nuts #8/32 For Mounting Power Transformer (4)
H129	*Screws #8/32 x 3/8" Long (18)
H129A	Wood Screws for Mounting Speaker Round Head (4)
H130	*Nuts #8/32 (10)
H131	*Nuts 3/8" For Controls (9)
H132	*Screw Threaded 4½" Long (2)
H133	*Washer Dished (2)
H134	*Washers Flat (4)
H135	*Ring Corona Wire
H135A	*Terminals Corona (2)
H136	*Brackets H.V. Socket Mount (4)
H137	*Bracket Width Control
H138	*Cable Clamp
H140	Rubber Grommet
H141	Spring Connectors for H.V. Filter Condenser (2)
H142	*Bracket for Kinescope Tube
H143	Speaker Plug with Leads
KN101	Tuner Knobs and Springs (2)
KN102	Picture and Sound with Springs (2)
KN103	Vertical Hold and Horizontal Hold with Springs (2)
KN104	Brightness with Spring (2)
KN105	Escutcheon Plate and Spring
KN106	Decals for Knobs (5)
R114	*150 Ohms ½ Watt (5)
R115	*10,000 Ohms ½ Watt (4)
R115	10,000 Ohms ½ Watt
R116	*39 Ohms ½ Watt (3)
R117	*1000 Ohms ½ Watt (8)
R117	1000 Ohms ½ Watt
R125	*4700 Ohms ½ Watt
R125	4700 Ohms ½ Watt
R127	*2700 Ohms ½ Watt (2)
R131 — R222 — S101	*Picture and Sound 10,000 ohms and 1 megohm and power switch

REFERENCE NUMBERS (Cont'd.)

Part No.	*Description*
R132	*680 Ohms ½ Watt
R134	*5600 Ohms ½ Watt
R137	*3900 Ohms ½ Watt
R138	*470,000 Ohms ½ Watt
R138	470,000 Ohms ½ Watt (5)
R140	*3300 Ohms ½ Watt
R140	3300 Ohms ½ Watt
R141	6800 Ohms ½ Watt (4)
R142	820,000 Ohms ½ Watt
R143	1.2 Megohm ½ Watt
R144	330 Ohms ½ Watt
R147	3300 Ohms 1 Watt
R148	*100,000 Ohms ½ Watt (2)
R148	100,000 Ohms ½ Watt (2)
R149	1 Megohm ½ Watt (5)
R150	47,000 Ohms ½ Watt
R151	150,000 Ohms ½ Watt (2)
R152	*Brightness Control 50,000 Ohms
R154	4700 Ohms 1 Watt (2)
R156	4.7 Megohms ½ Watt
R162	*22,000 Ohms ½ Watt (2)
R162	22,000 Ohms ½ Watt (2)
R164	8200 Ohms ½ Watt (3)
R164	*8200 Ohms ½ Watt
R167	2.2 Megohms ½ Watt (2)
R168 R172	*Vertical and Horizontal Hold Controls 1 Meg. and 50,000 Ohms
R169	*Height Control 2.5 Meg.
R170	220,000 Ohms ½ Watt (2)
R171	1.5 Megohm ½ Watt
R173	56,000 Ohms ½ Watt
R177	1800 Ohms ½ Watt
R178	*Vertical Linearity Control 5000 Ohms
R179	*10,000 Ohms 1 Watt
R179	10,000 Ohms 1 Watt (2)
R181	*Vertical Centering Control 20 Ohms Tapped Center W.W.
R182	270 Ohms 2 Watt
R183	1800 Ohms 1 Watt
R184	*Focus Control 1500 Ohms Wire Wound
R185	*1360 Ohms 17 Watt and 250 Ohms 10 Watt Wire Wound
R186	*6750 Ohms 3.2 Watt, 12 Ohms ½ Watt, 93 Ohms 4 Watt Wire Wound
R187	*Horizontal Drive Control 20,000 Ohms
R188	27,000 Ohms 1 Watt
R189	*18,000 Ohms ½ Watt
R194	10 Ohms ½ Watt
R195	560 Ohms ½ Watt (3)
R196	27,000 Ohms ½ Watt (2)
R197	39,000 Ohms 1 Watt (2)
R198	47,000 Ohms 1 Watt
R200	5000 Ohms 5 Watts

REFERENCE NUMBERS (Cont'd.)

Part No.	*Description*
R204	*680,000 Ohms ½ Watt
R204	680,000 Ohms ½ Watt
R206	100 Ohms 2 Watt
R207	22,000 Ohms 1 Watt
R208	18,000 Ohms 1 Watt
R209	*5300 Ohms 20 Watt, 500 Ohms 2 Watt and 500 Ohms 2 Watt
R211	*Horizontal Centering Control 20 Ohms Wire Wound
R212	*100 Ohms ½ Watt (2)
R223	10 Megohms ½ Watt
R224	330,000 Ohms ½ Watt
R225	270,000 Ohms ½ Watt
R226	2200 Ohms 2 Watt (2)
R228	6.8 Megohms ½ Watt
R230	*2.2 Ohms 1 Watt
R233	*3.3 Ohms ½ Watt
R235	*1 Megohm 1 Watt
S101	*Miniature Wafer Sockets (10)
S102	*Miniature Mica Filled Molded Sockets (2)
S104	*Octal Sockets (13)
S105	*H.V. Rectifier Socket Assembly
S106	Kinescope Socket with 19" Leads

Tubes

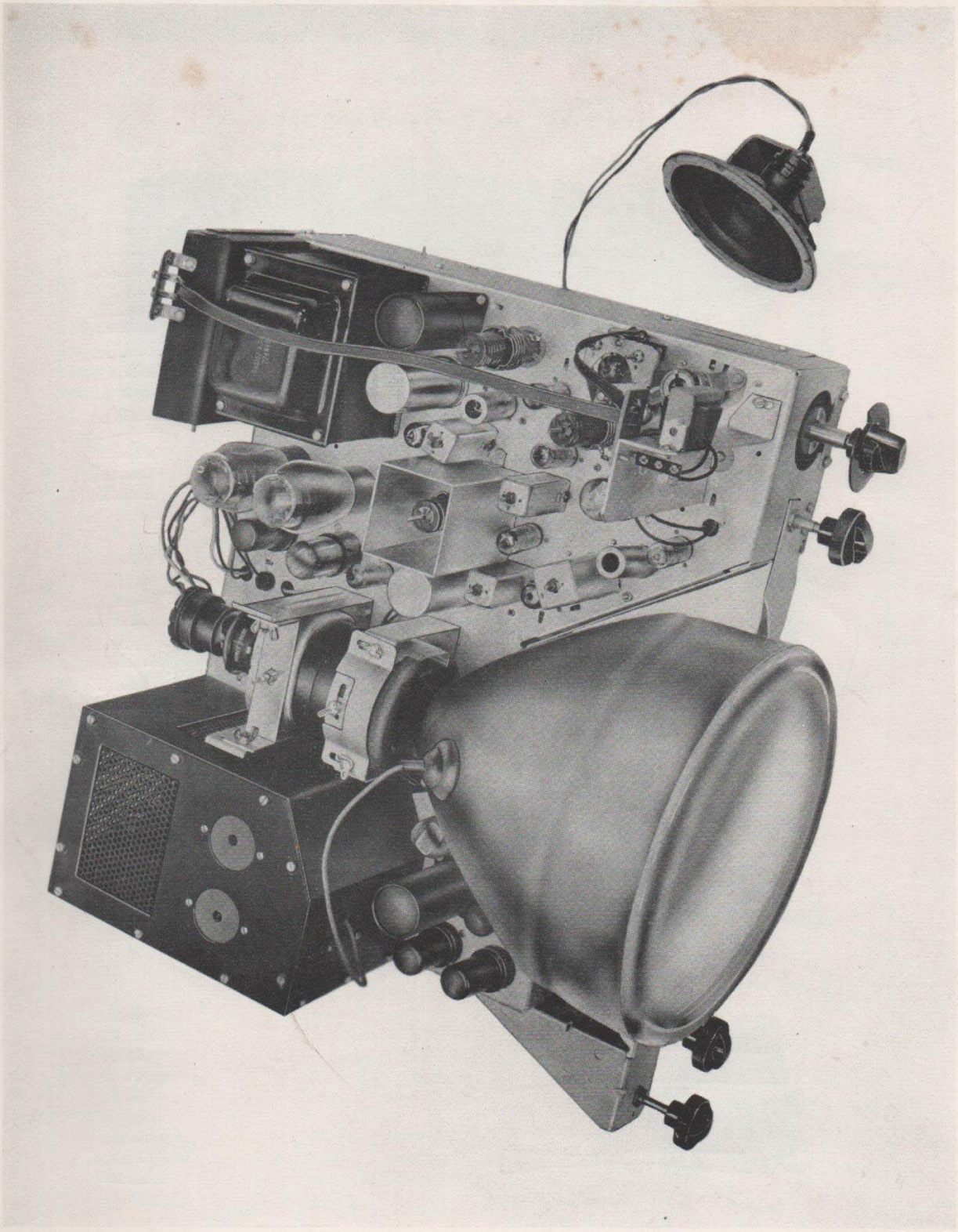
1 10BP4 Kinescope (Optional)
*3 6J6 In Tuner
*2 6BA6
*2 6AU6
*3 6AL5
*1 6AT6
*4 6K6GT
*4 6AG5
*1 6SK7
*1 6SH7
*1 6SN7
*1 6J5
*1 6AC7
*1 6BG6G
*1 5V4G
*1 1B3GT/8016
*2 5U4G

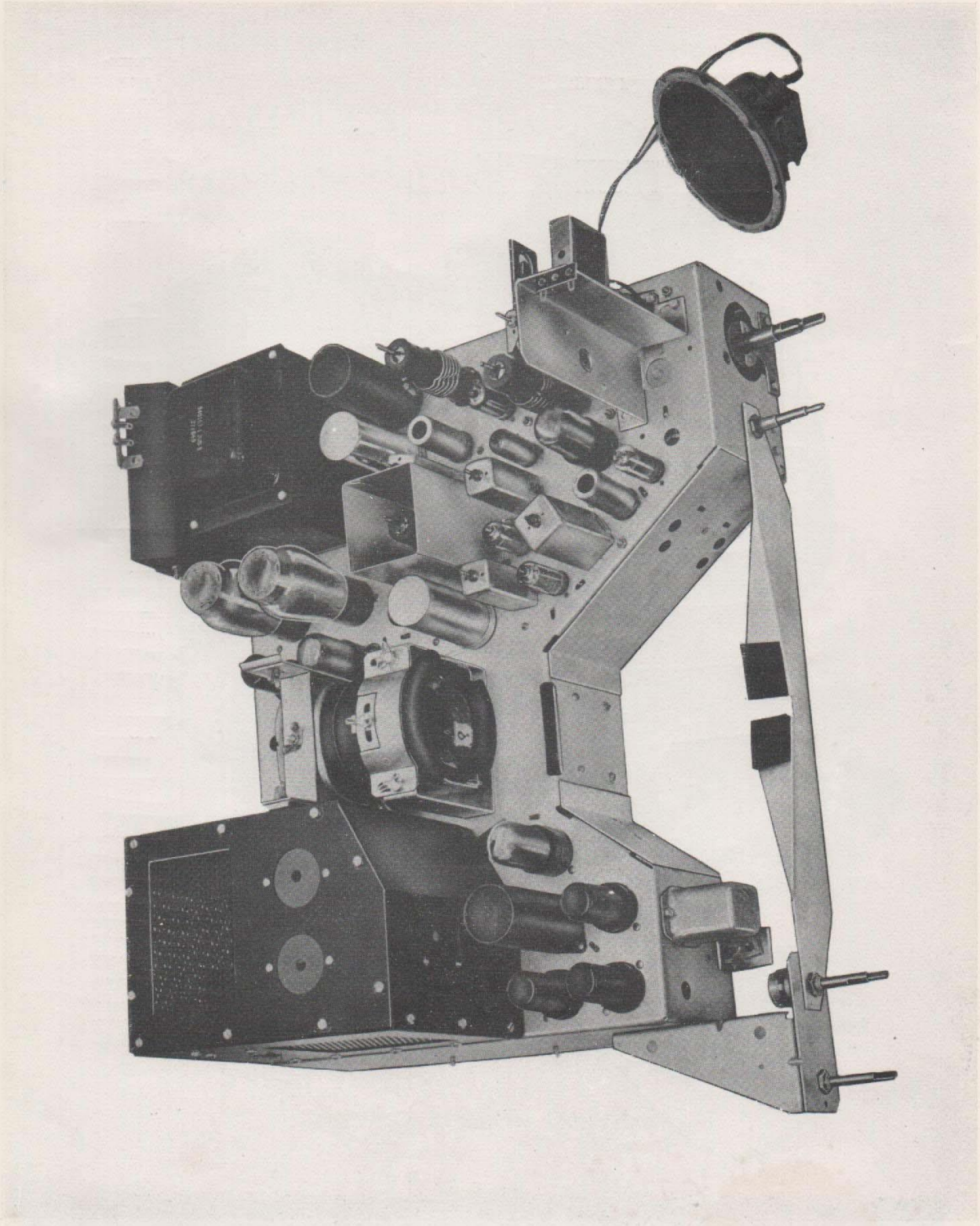
Wire

Solid #20	Red	14 Feet
	Green	4 Feet
	*Green	1 Foot
	Yellow	9 Feet
	*Yellow	1 Foot
	Orange	3 Feet
	White	7½ Feet
	*Brown	4 Feet
	Brown	9 Feet
	Blue	13 Feet
	Black	6 Feet
Stranded #20	Red	1 Foot
	Green	1 Foot
	Black	2 Feet
	Yellow	2 Feet

Stranded #18 Red with Black Tracer 8 Feet
*#20 Solid Tinned Copper Wire 3 Feet
#20 Solid Tinned Copper Wire 4 Feet
*18" Length Plastic Tubing #15
42" Length Plastic Tubing #15
42" Length Plastic Tubing #5

NOTE: Solder is not supplied by us. We recommend the use of 40/60 Rosin Core Solder 1/16" diameter.





PROGRESSIVE WIRING INSTRUCTIONS

This wiring has been systematically laid out so that the basic wiring which lies right down on the chassis frame is carried out first. It will be noted that this wiring as shown in Diagrams B, C, and D, follows regular channels which are clearly indicated on each diagram. The routing through these channels should be strictly adhered to, and although at times there may seem to be a lot of wires in each channel, it will be found that they can all be accommodated by keeping them close together. This basic series embraces such wiring as the Power Transformer, the Heater Wiring, the B minus leads and the various B plus leads. The remaining wiring, most of which is shown on Diagram E, consists of the various resistor and condenser connections, and this group of wiring should be kept in the air off the chassis. It is a good idea to run a colored pencil along each wiring step on the diagram as it is completed, and when all the wiring is completed on the diagram, a thorough check should be made in order to make certain that the right connections have been made.

DIAGRAM "B"

Color of Wire	*From*	*To*
1. Green-Black	Power Transformer	V16 Pin 2
2. Green-Yellow	Power Transformer	V16 Pin 8
3. Brown	Power Transformer	V11 Pin 7
4. Brown	V11 Pin 7	V14 Pin 7
5. Brown	V14 Pin 7	V17 Pin 2
6. Brown	V17 Pin 2	V18 Pin 7
7. Brown	V18 Pin 7	V20 Pin 7
8. Brown	V20 Pin 7	V21 Pin 7
9. Brown	V21 Pin 7	V22 Pin 7
10. Brown	V22 Pin 7	V19 Pin 2
11. Brown	V19 Pin 2	V28 Pin 2
12. Green	Power Transformer	V13 Pin 2
13. Brown	V13 Pin 2	V12 Pin 2
14. Yellow	Power Transformer	V13 Pin 8
15. Brown	V13 Pin 8	V12 Pin 8
16. Black-Brown	Power Transformer	V10 Pin 7
17. Red	Power Transformer	V13 Pin 6
18. Red	V13 Pin 6	V12 Pin 6
19. Green-Red	Power Transformer	V13 Pin 4
20. Red	V13 Pin 4	V12 Pin 4
21. Black-Red	Power Transformer	Strip A
22. Black	Power Transformer	Strip A
23. Red-Yellow	Power Transformer	C221 Can Lug
24. Black-Yellow	Power Transformer	Chassis Ground Lug
25. Yellow	Vertical Output Trans.	No. 4 Lug Vert. Cent. Control 181
26. Blue	Vertical Output Trans.	V19 Pins 3 and 4
27. Red	Vertical Output Trans.	C221 Triangle
28. Green	Vertical Output Trans.	Strip H
29. Green	Vertical Oscillator Trans.	V22 Pin 4
30. Red	Vertical Oscillator Trans.	Strip C
31. Yellow	Vertical Oscillator Trans.	Strip F
32. Blue	Vertical Oscillator Trans.	V22 Pin 3
33. Brown	V15 Pin 4	Strip X

DIAGRAM "B" (Cont'd.)

34. Bare Wire	V10 Pins 1 and 2	Chassis Ground Lug
35. Bare Wire	V11 Pins 1, 2 and 3	Chassis Ground Lug
36. Bare Wire	V14 Pin 2	Chassis Ground Lug
37. Bare Wire	V15 Pins 3 and 6	Chassis Ground Lug
38. Bare Wire	V17 Pin 7	Chassis Ground Lug
39. Bare Wire	V18 Pins 3 and 8	Chassis Ground Lug
40. Bare Wire	V19 Pin 7	Chassis Ground Lug
41. Bare Wire	V20 Pins 1, 2 and 5	Chassis Ground Lug
42. Bare Wire	V21 Pins 1, 2, 3 and 5	Chassis Ground Lug
43. Bare Wire	V22 Pins 1 and 2	Chassis Ground Lug
44. Bare Wire	V28 Pins 7 and 8	Chassis Ground Lug

45. Wire two leads of Choke 303 to C221 D and Square

NOTE: It is important that you check your wiring thoroughly at this point. If possible get someone to help you.

DIAGRAM "C"

Color of Wire	*From*	*To*
1. Red-Black Twisted Pair	AC Supply Input	Strip A
2. Red-Black Twisted Pair	Strip A	Switch on Volume Control
3. Red	Strip E	Strip G
4. Blue	Strip J	V21 Pin 6
5. Blue	V21 Pin 6	C223 Triangle
6. Bare Wire	Lug 1 on Strip G	Lug 2 on Strip G
7. Red	Strip G	Strip K
8. Red	Strip G	C223D
9. Red	C222D	C225 D
10. Red	Hor. Cent. Control	Thru Chassis Hole leave 6" wire (See Dia. "E")
11. Orange	V20 Pin 6	Strip T
12. Red	Strip B	C223 D
13. Red	Strip W	Strip Z
14. Red	Strip Z	C225 Can Lug
15. Red	Strip W	Vert. Cent. Control No. 1 Lug
16. Red	Vert. Cent. Control No. 1 Lug	Through hole in chassis to 275 Volt Tap on Voltage Divider R185B cover with No. 5 tubing through hole in chassis
17. Red	Vert. Cent. Control Lug 3	Hor. Cent. Control Lug 1
18. Brown	Horizontal Cent. Control No. 1	C225 Triangle
19. Blue	Horizontal Cent. Control Lug 3	C225 D
20. Red	C225 D	C221 Square
21. Blue	V10 Pin 4	Through hole in chassis to 135 Volts Tap on Voltage Divider R186C cover with No. 5 tubing through hole in chassis

DIAGRAM "C" (Cont'd.)

Color of Wire	*From*	*To*
22. Brown	V12 Pin 8	C221 D
23. Red	C223 D	C225 Can Lug
*24. Red	V28 Pin 4	C224 D 20 Mfd.

*NOTE: Thread this wire under existing wiring and lay down on chassis.

25. Brown	C221 D	C220 D
26. R117 1000 ohms	V20 Pin 6	V21 Pin 6

NOTE: Some C224 condensers may show markings D 80 mfd. triangle 20 mfd., in every case connect to capacity shown in wiring steps.

NOTE: When wiring resistors and condensers, use small pieces of spaghetti tubing to cover the bare lead wires wherever there is any possibility of shorting against another wire.

27. R226 2 units 2200 ohms ea.	C224 D 20 mfd.	C220 D
28. R179 10K ohms	C225 Can Lug	C221 Triangle

NOTE: Remove voltage divider shield cover H111B.

29. Bare wire with tubing	R185B	R186C on Voltage Divider
30. Bare wire with tubing	R185A	R186A on Voltage Divider
31-32. Orange	Strip Q Lug 2	C224 Triangle 80 mfd.
33. Bare Wire	R186B	Chassis Ground Lug

NOTE: Refer to top right hand diagram of Diagram "E" for Deflection Yoke and wire as follows, using stranded wire:

34. C181 56 Mmfd.	No. 1 on Deflection Yoke	No. 2 on Deflection Yoke
35. Red 12" long	Soldered to No. 1 on Yoke	
36. Yellow 24" long	Soldered to No. 3 on Yoke	
37. R195 560 ohms	No. 4 on Deflection Yoke	No. 5 on Deflection Yoke
38. R195 560 ohms	No. 5 on Deflection Yoke	No. 6 on Deflection Yoke
39. Green 12" long	Soldered to No. 4 on Yoke	
40. Black 22" long	Soldered to No. 6 on Yoke	

Lay colored lead wires snug against the inside of yoke and carry through hole on the side as shown in diagram.

41. Take 201X1 Yoke Mounting Hood and place on Deflection Yoke at end opposite to wire connection. Place Yoke 201D1 and Hood in the Yoke Mounting Bracket H105, using Wing Bolts H105A.
42. Mount Focus Coil 202D1 on upper bracket with Wing Nut H106C. Note that the gap on the inside diameter of the coil casing is nearest to the Yoke.
43. Connect enamel covered wires from output transformer T114 to Voice Coil Terminal Lugs covering the wires with No. 15 tubing.

NOTE: It is important that you check your wiring thoroughly at this point. If possible, get someone to help you.

DIAGRAM "D"

Color of Wire	*From*	*To*
1-2. Yellow	R185A on Voltage Divider	Through hole in chassis to Strip W cover with No. 5 tubing thru hole in chasssis
3. Yellow	Strip W	Vert. Lin. Control No. 3
4. Yellow	Hor. Drive Control No. 2	V17 Pin 3
5. Yellow	C221 Can Lug	C220 Can Lug

DIAGRAM "D" (Cont'd.)

Color of Wire	*From*	*To*
6. Yellow	C220 Can Lug	Strip H
7. Yellow	Strip H Lug 1	Strip H Lugs 2 and 3
8. Yellow	Strip H	V18 Pin 6
9. Yellow	V18 Pin 6	C222 Can Lug
10. Yellow	C222 Can Lug	V22 Pin 8
11. Yellow	C222 Can Lug	Brightness Control No. 1
12. Green	C220 Square	Height Control No. 2
13. Green	Brightness Control No. 2	Strip D
14. Blue	Hor. Drive Control No. 1	Strip G
15. Blue	Height Control No. 3	Strip C
16. Blue	V22 Pin 6	Vert. Hold Control No. 2
17. Red	Vert. Hold Control No. 3	Strip C
18. White	Minus 18 Volt Tap on R186 through hole in chassis	Strip M Cover with No. 5 Tubing thru hole in chassis
19. White	Strip M	Strip B
20. White	Strip M	Strip E
21. White	Vert. Lin. Control No. 1	Vert. Lin. Control No. 2
22. White	Vert. Lin. Control No. 1	V19 Pin 6
23. White	Hor. Hold Control No. 3	Strip K
24. Black	Minus 2 Volts Tap on R186 through hole in chassis	Strip M Cover with No. 5 Tubing thru hole in chassis
25. Black	Strip M	V15 Pin 5
26. Black	V15 Pin 5	Strip E
27. Black	V21 Pin 3	Brightness Control No. 3
28. Black	Brightness Control No. 3	Hor. Hold Control No. 2
29. R182 270 ohms	Vert. Lin. Control No. 3	Focus Control No. 1
30. Black	Volume Control No. 1	Chassis Ground Lug
31. R223 10 meg.	V27 Pin 1	V27 Pin 2
32. C149 .01 Mfd.	V27 Pin 1	Volume Control No. 2
33. C205 .0025 Mfd.	Volume Control No. 3	Strip B
34. R224 330K	B Strip	V27 Pin 7
35. C205 .0025 Mfd.	V27 Pin 7	V28 Pin 7
36. C152 .005 Mfd.	V27 Pin 7	V28 Pin 5
37. R225 270 K	V28 Pin 5	Strip B
38. R196 27K	Volume Control No. 4	V28 Pin 6
39. C149 .01 Mfd.	V28 Pin 6	V28 Pin 8
40. C209 .005 Mfd.	V28 Pin 3	V28 Pin 4
41. Red	Output Transformer	V28 Pin 4
42. Blue	Output Transformer	V28 Pin 3
43. Black	Focus Control No. 2	Strip W
44. R183 1800 ohms	Focus Control No. 2	Strip W

NOTE: For 12", 12½", 15" and 16" Kinescope Tubes Step 44 and Resistor R183 — 1800 ohms are to be omitted.

45. Green	Focus Coil through hole in chassis	Strip W
46. Yellow	Focus Coil through hole in chassis	Strip W
47. Black	Deflection Yoke through hole in chassis	Vert. Cent. Control No. 2

DIAGRAM "D" (Cont'd.)

Color of Wire	*From*	*To*
48. Green	Deflection Yoke through hole in chassis	Strip H
49. Red	Deflection Yoke through hole in chassis	V16 Pin 4
50. Yellow	Deflection Yoke through hole in chassis	Hor. Cent. Control No. 2
51. Brown	Kine socket through hole in chassis	V14 Pin 7
52. Red	Kine socket through hole in chassis	Strip W
53. R151 150K ohms	Strip W Lug 1	Strip W Lug 2
54. Green	Kine socket through hole in chassis	Lug L Insert grommet H140 in hole before wiring
55. Black	Kine socket through hole in chassis	Chassis Ground Lug
56. Yellow	Kine socket through hole in chassis	Chassis Ground Lug
57. Yellow	Strip W Lug 3	C220 Can Lug
58. Bare Wire	C220 Triangle	Chassis Ground Lug

NOTE: It is important that you check your wiring thoroughly at this point If possible get someone to help you.

DIAGRAM "E"

Color of Wire	*From*	*To*
1. C138 .05 Mfd.	V21 Pin 4	Strip D
2. C116 270 Mmf.	V21 Pin 8	V21 Pin 3
3. C116 270 Mmf.	V21 Pin 8	V20 Pin 4
4. R228 6.8 Meg.	V21 Pin 4	Strip E
5. R149 1 Meg.	V21 Pin 4	Strip E
6. R154 4700 ohms	V21 Pin 8	Strip E
7. R154 4700 ohms	Strip E Lug 1	Strip E Lug 2
8. C146 .1 Mfd.	Strip E Lug 1	V20 Pin 2
9. R149 1 Meg.	V20 Pin 4	Strip E
10. R156 4.7 Meg.	V20 Pin 4	Strip E
11. R141 6800 ohms	V20 Pin 6	V20 Pin 8
12. C138 .05 Mfd.	V20 Pin 8	V18 Pin 1
13. C154 4700 Mmf.	V22 Pin 4	V22 Pin 5
14. R171 1.5 Meg.	V22 Pin 5	V22 Pin 6
15. R167 2.2 Meg.	V22 Pin 8	V19 Pin 5
16. R148 100K	V22 Pin 8	Lug Strip C
17. C157 .1 Mfd.	V19 Pin 5	Strip C
18. R177 1800 ohms	V19 Pin 8	V19 Pin 6
19. R164 8200 ohms	V19 Pin 8	Strip C
20. Orange	V19 Pin 8	C222 Triangle
21. R167 2.2 Meg.	Strip C Lug 2	Strip C Lug 3
22. R170 220K	Strip C Lug 1	Strip C Lug 2
23. C140 .05 Mfd.	Strip C Lug 4	Strip C Lug 1
24. R151 150K	Strip D Lug 3	Strip D Lug 2

DIAGRAM "E" (Cont'd.)

Color of Wire	*From*	*To*
25. R150 47K	Strip D Lug 2	Strip D Lug 1
26. C125 .25 Mfd.	Strip D Lug 2	V21 Pin 5
27. R149 1 Meg.	V18 Pin 1	V18 Pin 3
28. Blue	V18 Pin 2	Strip J
29. R125 4700 ohms	Strip J Lug 2	Strip J Lug 3
30. C149 .01 Mfd.	V18 Pin 2	Strip F
31. R162 22K	Strip F Lug 4	C222 Can Lug
32. R162 22K	Strip F Lug 4	Strip F Lug 3
33. R164 8200 ohms	Strip F Lug 3	Strip F Lug 2
34. R164 8200 ohms	Strip F Lug 2	Strip F Lug 1
35. C151 .002 Mfd.	Strip F Lug 3	C222 Can Lug
36. C152 .005 Mfd.	Strip F Lug 2	C222 Can Lug
37. C152 .005 Mfd.	Strip F Lug 1	C222 Can Lug
38. R170 220K	V18 Pin 4	V18 Pin 6
39. C149 .01 Mfd.	V18 Pin 4	Strip J
40. R204 680K	V18 Pin 5	Strip G
41. C178 .001 Mfd.	V18 Pin 5	V17 Pin 5
42. C179 680 Mmf.	V18 Pin 5	Strip G
43. R141 6800 ohms	Strip G Lug 4	Strip G Lug 3
44. R138 470K	V17 Pin 5	Strip H
45. C157 .1 Mfd.	V17 Pin 3	Strip H
46. R206 100 ohms	V17 Pin 3	Strip H
47. R207 22K	V17 Pin 8	Strip G
48. R208 18K	V17 Pin 8	Strip G
49. C138 .05 Mfd.	V17 Pin 3	V17 Pin 8
50. R149 1 Meg.	V8 Pin 2	V8 Pin 5
51. Black	V8 Pin 5	Strip N
52. C138 .05 Mfd.	V9 Pin 1	Strip P
53. R138 470K	V9 Pin 1	Strip M
54. 203L3	V9 Pin 5	Strip M
55. 203L4	Strip M Lug 3	Strip M Lug 4
56. R140 3300 ohms	Strip M Lug 4	C223 Square
57. R141 6800 ohms	C223 Square	C223 D
58. C140 .05 Mfd.	Strip M	V10 Pin 5
59. R143 1.2 Meg.	V10 Pin 5	Strip M
60. R142 820K	V10 Pin 5	V10 Pin 2
61. R144 330 ohms	V10 Pin 8	V10 Pin 1
62. Yellow	V10 Pin 8	Video Peaking Link
63. R115 10K	Strip N 4	Strip N 2
64. C140 .05 Mfd.	Strip N 4	Strip N 1
65. 203L4	Strip N 3	Strip N 2
66. R147 3300 ohms	V10 Pin 4	Strip N 2
67. 203L3	V10 Pin 3	Strip N 3
68. C140 .05 Mfd.	Strip N 3	Strip L
69. R148 100K	Strip N 1	Strip L
70. C161 470 Mmf.	Video Peaking Link 2	Video Peaking Link 1
71. Green	Video Peaking Link	Chassis Ground Lug
72. C166 82 Mmf.	Strip J 2	Strip J 1
73. R149 1 Meg.	Strip J	Strip K

DIAGRAM "E" (Cont'd.)

Color of Wire	*From*	*To*
74. R138 470K	Strip K	V15 Pin 1
75. R138 470K	Strip K	V15 Pin 5
76. Blue	V15 Pin 2	Transformer 208T8 Terminal F
77. White	V15 Pin 7	Transformer 208T8 Terminal D
78. Orange	Strip J	Transformer 208T8 Terminal E
79. C168 .015 Mfd.	Transformer 208T8 Terminal F	Terminal D
80. White	V15 Pin 1	Strip L
81. R138 470K	Strip L 1	Strip L 3
82. C138 .05 Mfd.	Strip L 3	Chassis Ground Lug
83. R195 560 ohms	V11 Pin 4	Strip L
84. Black	V11 Pin 2	Transformer 208T8 Terminal C
85. R194 10 ohms	V11 Pin 5	V11 Pin 2
86. Black	V11 Pin 5	Strip X
87. R188 27K	V11 Pin 6	V11 Pin 1
88. C140 .05 Mfd.	V11 Pin 6	V10 Pin 1
89. R198 47K	V11 Pin 8	Strip Z
90. C172 .004 Mfd.	V11 Pin 8	Strip L
91. R197 39K	V11 Pin 8	Strip Z
92. R197 39K	V11 Pin 6	Strip W
93. C167 .004 Mfd.	Strip L	V14 Pin 5
94. C168 .015 Mfd.	Strip L	Strip X
95. C164 1200 Mmfd.	Strip L	Strip X
96. R196 27K	V14 Pin 5	Strip K
97. Black	Strip L 2	Transformer 208T8 Terminal A
98. C167 .004 Mfd.	Strip L 1	Strip L 3
99. Blue	V14 Pin 3	Strip K
100. R200 5000 ohms	V14 Pin 3	Strip K
101. R179 10K	V14 Pin 4	Strip K
102. C140 .05 Mfd.	V14 Pin 4	Chassis Ground Lug
103. Green	V14 Pin 6	Hor. Output Transformer Terminal 1 thru hole in chassis and leave 6" to connect after step 128 is completed
104. R173 56000 ohms	V14 Pin 6	Height Control No. 2
105. Orange	V14 Pin 6	Hor. Lin. Coil 201R3
106. Yellow	V14 Pin 8	Transformer 208T8 Terminal B
107. C183 .01 Mfd.	AC Supply Input	Chassis Ground Lug
108. C183 .01 Mfd.	AC Supply Input	Chassis Ground Lug
109. C186 .05 Mfd.	Hor. Lin. Coil 201R3	Strip H
110. C188 .035 Mfd.	Hor. Lin. Coil 201R3	Strip H
111. Green	V16 Pin 8	Hor. Lin. Coil 201R3
*112. Blue	V16 Pin 4	Hor. Output Trans. Terminal 4 (See Step 145) thru hole in chassis and leave 8" wire

*NOTE: On this lead, use thick plastic tubing for covering.

113. Bare Wire	V16 Pin 4	V16 Pin 6
114. Green	V16 Pin 8 through hole in chassis	R209
115. C176 390 Mmf.	Strip K	Strip J
116. R141 6800 ohms	Strip J	Chassis Ground Lug

DIAGRAM "E" (Cont'd.)

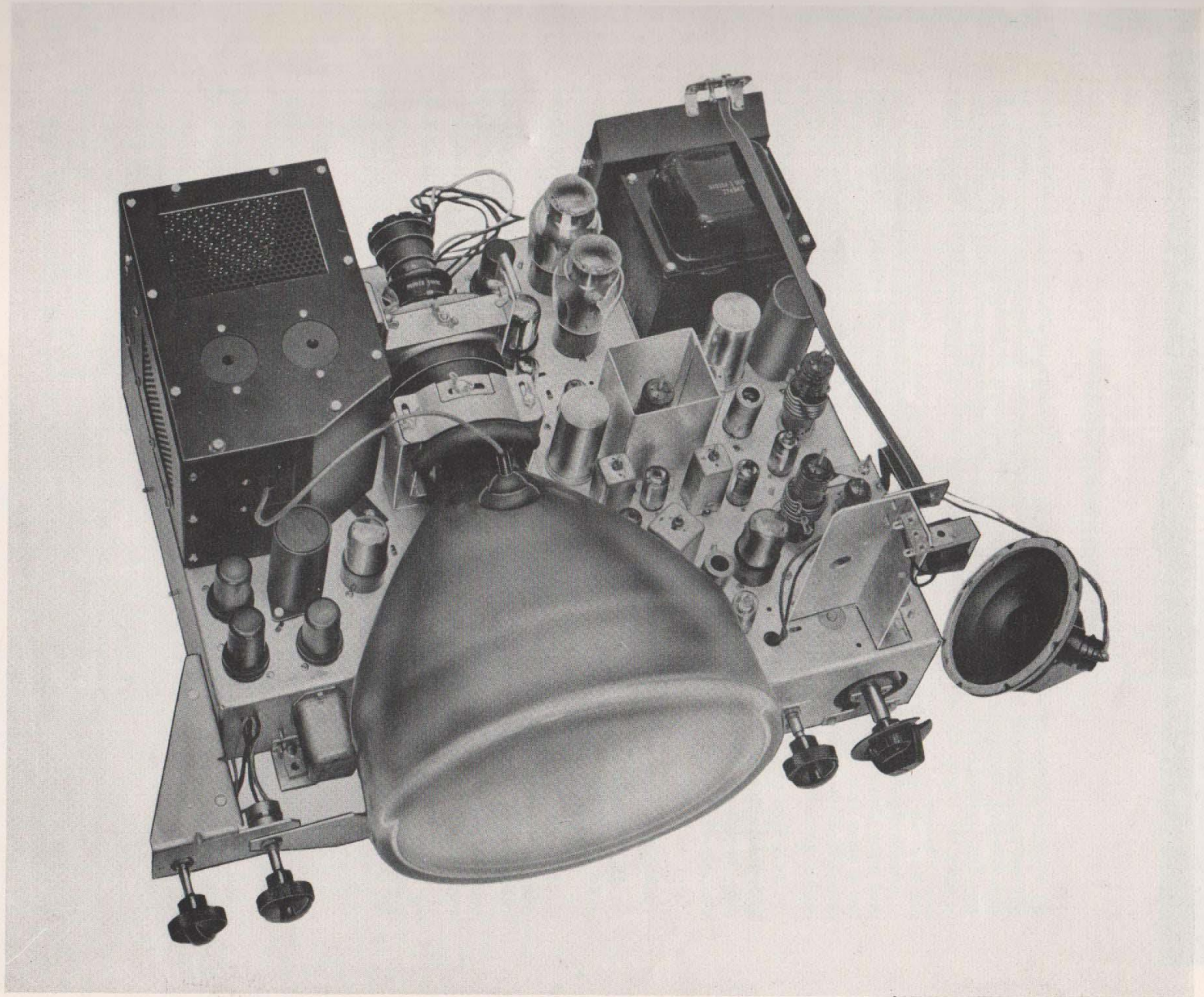
High Voltage Rectifier Socket Assembly S105 V29

NOTE: Remove H.V. Power Pack Parts Numbers — H109B, H109C, H109D.

117. Insert one terminal of C187 in hole in Bakelite Plate on 211T3. Twist H141 contact spring on terminal.
118. Solder red wire to H141, pass between core legs of 211T3. Cover with spaghetti tubing and solder wire to #4 lug of 211T3, keeping wire as short as possible.
119. Twist spring H141 which is attached to red wire on to other terminal of C187.
120. Rear Wire of Width Control Coil 201R1. Place piece of tubing over wire and connect to terminal 6 of Hor. Output Transformer 211T3.
121. Front Wire of 201R1. Place tubing over lead and connect to Terminal 5 of 211T3.
122. Blue Wire from Terminal 4 of 211T3 to Tap on R209. Cover with No. 5 Tubing.
123. With cable clamp H138, secure to the chassis this wire (Step 124) and wire in Step 112, with screw H124. This clamp will be located between V16 and V17.
124. Blue Wire from V8 Pin 2 to Lug Strip D.
125. Take High Voltage Shield Side Cover H109B and screw onto plate H109A with screws H124. Screw down to chassis also with H124.
126. Take Part 302, the High Voltage Lead to Kinescope, pass through hole in bakelite plate of H109B, and solder to Corona Terminal H135A, passing it through hole in HV socket assembly, as shown in Assembly Diagram S105.
127. Take white and black lead on Horizontal Output Transformer 211T3 No. 2 to Cap on V17.
128. Take white and red lead on Horizontal Output Transformer 211T3 No. 3 to Cap on V29.
129. Solder Red Wire of Step 10 (Diagram "C") to Horizontal Output Transformer 211T3 No. 5.
130. Solder Green Wire in Step 103 (Diagram "E") to Horizontal Output Transformer 211T3 No. 1.
131. Solder Blue Wire in Step 112 (Diagram "E") to Horizontal Output Transformer 211T3 No. 4.
132. Mount High Voltage Shield Back Cover H109D with H124 screws, to chassis.
133. Fasten with H124 screws the H.V. Shield Back Cover H109D to H109B and H109A.
134. H.V. Shield Top Cover H109C is screwed down with H124 screws.
135. Take Part 301. Strip insulation from wire for about one inch. Solder to terminal screws of H111C. Thread into support H108 (Diagram "A") and strip insulation of other end and solder to Antenna Input as shown on Diagram "A."
136. Screw on with H124 screws the Voltage Divider Shield Cover H111B onto Voltage Divider Shield H111A.

NOTE: It is important that you check your wiring thoroughly at this point. If possible, get someone to help you.

For further instructions refer to Operation and Adjustment.



ANTENNA

While in general the Dipole should be set up at right angles to the line of transmission, some adjustment in position is nearly always necessary in order to provide the best possible reception. In some situations, more or less faint images may appear on the screen due to reflection of the transmitted wave from various points. These reflections, commonly called ghosts, may very often be eliminated by swinging the Dipole around from one position to another until the minimum effect is obtained from these reflections.

As the sensitivity of the Philmore Television Kit is of a high order, reception may be achieved in a good many cases even with an indoor antenna made by cutting a slit down the center of the transmission line of about three feet, and opening out the two ends to simulate the dipole effect and the two ends can be taped into the most suitable position for reception. Various experiments in this direction can be easily carried out in situations where the erection of a roof antenna is not allowed.

In general where two dipoles are used one for Channels 2 to 6 and the other for Channels 7 to 11 better results will be achieved by running a separate transmission line from each dipole and connecting them through a double pole double throw switch to the receiver.

WARNING

High voltages are employed in the operation of television receivers.

The voltages generated in the high voltage Power Pack are of the order of 10,000 volts.

It is for this reason that the rear section of the High Voltage Power Pack cuts off the AC Supply when this plate is removed.

The High Voltage connecting lead from the Power Pack to the Kinescope is well-protected by the insulated covering and the rubber mushroom shield. This lead also carries between 9,000 and 10,000 volts, and while it is connected with the tube, creates no hazard.

Before attempting to operate the set, care should be taken that this connector is firmly pressed down in position on the Kinescope Terminal.

The voltages employed in the operation of the remaining tubes are all contained underneath the chassis.

At certain points, these voltages may be of the order of 375 volts.

It is necessary, therefore, that indiscriminate handling of the wiring underneath the chassis while the set is in operation should be avoided.

It is also a safe precaution in handling receivers of this nature to only use one hand and to put the other hand in your pocket while handling any of the wiring under the chassis.

OPERATION AND ADJUSTMENT

After the assembly and wiring is completed, remove the Kinescope from its special carton, using heavy gloves and keeping the tube well away from the body and face while handling. Avoid knocking any part of the tube against any sharp object. Insert the neck of the tube through the Deflection Yoke and Focus Coil and gently push the tube until the two small spring contacts on the Yoke Mounting Hood contact the graphite-coated surface of the tube.

Cut three strips of cardboard from the carton about ¾" wide and insert them evenly spaced around the neck of the tube inside the Focus Coil, to assure centering, being careful to avoid any undue pressure of the neck of the tube on the inside wires of the Deflection Yoke.

Normally the operating position of the Focus Coil is quite close to the rear side of the Yoke and it can be adjusted in this position by means of three Wing Nuts.

The screen end of the tube is supported in the correct position by the supporting bracket.

The Beam Bender is next mounted on the neck of the tube as shown on Diagram "A". Either Type 203D2 or Type 203D3 may be provided. Alternative diagrams for these two types are shown on Diagram "A" (a) or Diagram "A" (f). In either case, the rear portion of the Beam Bender is placed roughly in line with two small metal flags which can be seen inside the neck of the tube.

Type 203D2 is placed with the flat plate section underneath the tube, and with the blue colored prongs toward the Focus Coil.

Type 203D3 which is a circular type is placed on the tube with the smaller ring towards the Focus Coil, and the arrow roughly in line with the High Voltage connection terminal of the Kinescope.

Next place the Kinescope socket on the end of the tube, pressing it firmly home.

The insulated lead from the High Voltage Power Pack is then connected to the High Voltage Terminal of the Kinescope.

Connect the receiver to the AC Supply and switch on by means of the Sound Volume Control.

Set the station selector to a channel which it not used for receiving.

Turn the brightness control fully clockwise.

Turn the Picture Control fully counter-clockwise.

What is desired now is to obtain a brightly-lit rectangular section called the Raster.

If the illumination is dim or if the screen is not illuminated at all, move the Beam Bender backwards or forwards and at the same time slightly twisting it from side to side until the screen shows illumination.

At some particular position of the Beam Bender, you should get the best possible illumination over the whole raster.

Some adjustment of the Focus Coil Position may be necessary by slightly twisting it either vertically or horizontally in order to get even illumination. It may also be necessary to move it forward or backward, but generally it is quite close to the Yoke.

When the maximum illumination has been obtained, turn the Brightness Control counter-clockwise until the top and bottom edges of the raster are about ¾" from the edge of the screen.

These edges should be horizontal and if not so, adjustment can be made by means of slackening off

OPERATION AND ADJUSTMENT (Cont'd.)

the wing stud on the Deflection Yoke, and moving the Yoke sideways until the top and bottom edges of the raster are horizontal.

Tighten up the Yoke adjusting screw firmly.

Now adjust the Focus Control on the rear of the chassis until the horizontal scanning lines are sharply focused in the raster.

Adjust the Beam Bender again for maximum illumination and even lighting over the whole raster.

If necessary, readjust the Focus Control to sharp focus of the Horizontal Scanning Lines.

Turn the channel selector to a channel which is transmitting.

Turn the picture control knob fully counter-clockwise. Turn the Brightness Control until the illumination is dim.

Adjust the fine tuning control knob inside the station selector knob until the sound is at its best point. Turn the Picture Control slowly clockwise until either a picture or a test pattern appears on the screen. Make slight adjustments to both the picture control and the brightness control until the best possible contrast is secured.

Looking at the back of the chassis, turn the Horizontal Drive Control fully clockwise and then turn it back slightly in the other direction.

If the picture or test pattern is torn into diagonal lines, adjust the Horizontal Hold Control until the picture or pattern appears.

This torn appearance may be due either to the picture control being turned too far clockwise, or the Synchrolox adjustment on the rear of the chassis requires adjusting.

To do this, turn the hold control fully counter-clockwise and then adjust the small Synchrolox knob until the picture reappears. Then turn the Horizontal Hold Control knob to approximately its half-way position.

Vertical centering. If the picture or test pattern is too high or too low on the screen, adjust by means of the Vertical Centering Control on the rear of the chassis.

Horizontal centering. If necessary adjust the Horizontal Centering Control on the rear of the chassis until the picture or test pattern is properly centered on the screen.

After adjustments of the Brightness and Picture Control, it may be necessary to make slight adjustments to the fine tuning control in order to obtain the best possible picture detail and sound.

Symmetrical pattern adjustments. It will be observed that test patterns in general contain two concentric rings, the inner one marking the proper vertical height of the pattern, and the outer one marking the horizontal edges of the pattern.

Normally, these rings, particularly the inner ring should be as nearly as possible a true circle.

Circle elongated vertically. Adjust the Height Control on the rear of the chassis until the circle appears as nearly symmetrical as possible.

Now see if the center of the test pattern is as nearly as possible equidistant from the top and bottom of the circle.

OPERATION AND ADJUSTMENT (Cont'd.)

Correct any fault in this direction by adjustment of the Vertical Linearity Control on the rear of the chassis. This control stretches or contracts the upper half of the picture, and in order to obtain correct adjustment both Vertical Linearity and Height Controls will require adjustment one after the other until vertical balance is obtained.

Horizontal Adjustment. The Horizontal Drive Control has two effects. Clockwise rotation increases the picture width, crowds the right side of the picture and stretches the left side. Counter-clockwise rotation of course has the opposite effect. It should be operated as near as possible to the full clockwise position, looking at it from the rear of the chassis.

The Horizontal Linearity Control 201R3 which is a small screw adjustment located alongside of the High Voltage Shield Assembly can be used to effect small improvements in linearity. Counter-clockwise rotation of this adjustment screw stretches the second quarter of the picture, that is between three o'clock and six o'clock, and crowds the first quarter between twelve o'clock and three o'clock.

The Width Control 201R1 which is accessible through a hole in the rear of the High Voltage Shield Assembly in clockwise rotation increases the picture width and causes the right side of the picture to stretch slightly.

These horizontal adjustments as a rule are not very critical, and a little practice may be necessary in order to observe the effect of each adjustment. A mirror placed in front of the picture tube will be found to be of great assistance in carrying out adjustments on the rear of the chassis.

The Antenna Wave Trap on top of the tuner may be tuned to cancel out I.F. interference between channels which may occur on channels 2-5-6-9-10. Using a small screw driver turn the screws. Keeping both fairly level, until the interference is minimized on one screw and then adjust the other for fine tuning.

Phase Control. If the Test Pattern is off center with a black blanking bar showing on one side, this can be corrected by adjustment of the screw on the Synchrolox on the inside of the chassis. Prop the chassis up securely. Take a small screw driver and turn the screw clockwise to move the pattern to the right, or counter-clockwise to move to the left. Move until the edges of the Test Pattern cover the black blanking bar without folding over at the edge. Re-adjust Hold Control and rear Synchrolox if the pattern tears while adjusting.

FAULT FINDING PROCEDURE

In order to carry out voltage testing, it is advisable to have the use of a voltmeter of a sensitivity of at least 20,000 ohms per volt, or an instrument such as the Jr. VoltOhmyst.

B+ and B— voltages can be readily checked by removing the cover of the Voltage Divider Shield, placing the negative prod of the voltmeter on the chassis and testing the point shown on Diagram "C" with the positive prod for 135 volts + and 275 volts +.

The B— voltages are checked by placing the positive prod of the voltmeter on the chassis and testing the points shown on Diagram "D" black —2 volts, white —18 volts, and yellow —100 volts.

FAULT FINDING PROCEDURE (Cont'd.)

Heater voltages can be checked as follows with an AC Voltmeter:

V11 Pin 7 and Chassis 6.3 Volts

V10 Pin 7 and Chassis 6.3 Volts

V12 and V13. Remove Tubes. Test across Pins 8 and 2 for 5 Volts

V16. Remove Tube and test across 2 and 8 for 5 Volts

For remaining tubes with exception of 1B3 H.V. Rectifier, test from pin indicated on complete circuit diagram to chassis for 6.3 Volts AC.

If the tubes light up and the preceding voltage tests are not approximately correct, or if no voltage is present at any particular point, the wiring should be carefully checked over.

The following voltage chart provides test points throughout the receiver and any marked divergence from the values given should be investigated by either examining the wiring or having a particular tube tested.

Where tests are indicated on high voltages from 6000 to 9200 volts, this should not be attempted unless a special high voltage prod is available.

In case the H.V. Rectifier has to be tested, a small neon lamp such as is used in automobile ignition testing should glow brightly when placed near the cap of the High Voltage Rectifier Tube. Keep one hand in your pocket during this test. The neon tube will not glow near the High Voltage connector to the Kinescope. Failure to glow indicates the 6BG6 Tube may have developed a fault or that the Horizontal Oscillator Tube 6K6 V14 may not be functioning due to some wiring fault.

Every precaution against failure of tubes or parts is taken in the factory by stringent testing of all parts used, so that apart from wiring faults or breakage of tubes, the completed receiver should operate without any difficulty.

To give a comprehensive survey of all possible faults and trouble-shooting data would not be practicable and might prove confusing. Should the completed receiver show any refusal to operate at all, a qualified service man should be consulted.

Multiple Patterns. Where several Test Patterns show, such as three, while adjusting Synchrolox 208T8, and it will not adjust to a single pattern, check C168 .015 Mfd. which has C164 1200 Mmfd. in parallel from Lug 5 of V11 6AC7. Replace with another tested value condenser. Check also C172 .004 Mfd. connected to Lug 5 of V14 6K6.

VOLTAGE CHART

Measurements made with receiver operating on 117 volts 60 cycles a-c and with no signal input except where otherwise indicated. Voltages shown are as read with Jr. VoltOhmyst between indicated terminal and chassis ground except where otherwise noted. Symbol < means "less than." E = Volts. I = Current. Voltages may also be checked with a Voltmeter of 20,000 ohms per volt sensitivity. In this case some slight difference in reading may result but the general results will be allright. Readings need not be precisely the same as the chart but serve as a general indication.

Tube No.	Tube Type	Function	Operating Condition **	E. Plate		E. Screen		E. Cathode		E. Grid		I Plate (ma.)	I Screen (ma.)	Notes on Measurements
				Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts			
V1	6J6	R-F Amplifier	Pictr. Min.	1 & 2	130	—	—	7	0	5 & 6	—9.2	<.1*	—	*Per Plate
			Pictr. Max.	1 & 2	55	—	—	7	0	5 & 6	+.05	7.0*	—	*Per Plate
V2	6J6	Converter	Pictr. Min.	1 & 2	125	—	—	7	0	5 & 6	—3 to —6	.5 to 4*	—	*Per Plate
			Pictr. Max.	1 & 2	100	—	—	7	0	5 & 6	—2 to —5	.2 to 3*	—	*Per Plate
V3	6J6	R-F Oscillator	Pictr. Min.	1 & 2	108	—	—	7	.25	5 & 6	—4.5 to —6.5	2.5	—	
			Pictr. Max.	1 & 2	90	—	—	7	.15	5 & 6	—3.5 to —5	1.7	—	
V23	6BA6	1st Sound I-F Amplifier	Pictr. Min.	5	120	6	120	7	1.9	1	0	12.0	5.0	
			Pictr. Max.	5	110	6	110	7	1.6	1	0	10.5	4.5	
V24	6BA6	2nd Sound I-F Amplifier	Pictr. Min.	5	122	6	118	7	1.9	1	0	12.5	4.9	
			Pictr. Max.	5	113	6	108	7	1.6	1	0	10.5	4.2	
V25	6AU6	3rd Sound I-F Amplifier	Pictr. Min.	5	48	6	48	7	0	1	—.5	3.3	1.4	
			Pictr. Max.	5	41	6	41	7	0	1	—.5	2.8	1.2	
V26	6AL5	Sound Discrim.	Pictr. Min.	2 & 7	—.35	—	—	4 & 5	—	—	—	—	—	
			Pictr. Max.	2 & 7	—.45	—	—	4 & 5	—	—	—	—	—	
V27	6AT6	1st Audio Amplifier	Pictr. Min.	7	80	—	—	2	0	1	—.75	.5	—	
V28	6K6GT	Audio Output	Pictr. Min.	3	253	4	265	8	0	5	—18	27.5	4.0	
V4	6AG5	1st Pix. I-F Amplifier	Pictr. Min.	5	135	6	135	2 & 7	0	1	—5.0	<.1	<.1	
			Pictr. Max.	5	109	6	109	2 & 7	.26	1	—1.0	5.5	.9	
V5	6AG5	2nd Pix. I-F Amplifier	Pictr. Min.	5	135	6	135	2 & 7	0	1	—5.0	<.1	<.1	
			Pictr. Max.	5	113	6	113	2 & 7	.26	1	—1.0	5.6	.9	
V6	6AG5	3rd Pix. I-F Amplifier	Pictr. Min.	5	135	6	135	2 & 7	0	1	—5.0	<.1	<.1	
			Pictr. Max.	5	98	6	117	2 & 7	.26	1	—1.0	5.7	.9	
V7	6AG5	4th Pix. I-F Amplifier	Pictr. Min.	5	99	6	127	2 & 7	1.2	1	0	6.8	1.7	
			Pictr. Max.	5	89	6	117	2 & 7	1.1	1	0	6.8	1.7	
V8A	6AL5	Picture 2d. Det.	Pictr. Min.	7	—.1	—	—	1	0	—	—	—	—	
V8B	6AL5	DC Restorer	Brightness Min.	2	—100	—	—	5	—90	—	—	—	—	
			Brightness Max.	2	—1	—	—	5	—.9	—	—	—	—	

VOLTAGE CHART (cont.)

Tube No.	Tube Type	Function	Operating Condition **	E. Plate		E. Screen		E. Cathode		E. Grid		I Plate (ma.)	I Screen (ma.)	Notes on Measurements
				Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts			
V9	6AU6	1st Video Amplifier	Pictr. Min.	5	240	6	135	7	0	1	—2.15	4.0	1.55	
			Pictr. Max.	5	255	6	125	7	0	1	—2.2	2.8	1.05	
V10	6K6GT	2d Video Amplifier	Pictr. Min.	3	105	4	135	8	3.7	5	—7.5	9.6	1.6	
			Pictr. Max.	3	95	4	125	8	2.9	5	—7.5	7.5	1.3	
V30	10BP4	Kinescope	Brightness Min.	Cap	9200*	10	275	11	0	2	—100	0	0	*Measured with VoltOhmyst and high voltage multiplier probe.
			Brightness Max.	Cap	6000*	10	275	11	0	2	0	.7	—	
			Brightness Average	Cap	9000*	10	275	—	—	—	—	.05	—	
V21	6SK7	1st Sync. Amplifier	Pictr. Min.	8	163	6	129	5	0	4	—4.3	11.5	3.8	
			Pictr. Max.	8	185	6	115	5	0	4	—4.4	9.2	2.9	
V20	6SH7	Sync. Separator	Pictr. Min.	8	134	6	135	5	0	4	—5.2	.1	.05	
			Pictr. Max.	8	123	6	125	5	0	4	—9*	.3	.1	*Depends on noise
V18A	6SN7GT	2d Sync. Amplifier	Pictr. Min.	2	88	—	—	3	0	1	—.5	9.0	—	
			Pictr. Max.	2	80	—	—	3	0	1	—9*	7.9	—	*Depends on noise
V18B	6SN7GT	Horizontal Discharge	Pictr. Min.	5	—37	—	—	6	—100	4	—140	.5	—	
V22	6J5	Vertical Oscillator	Pictr. Min.	3	70*	—	—	8	—100	5	—150	.15	—	*Height, linearity and hold affect readings 2 to 1
V19	6K6GT	Vertical Output	Pictr. Min.	3	180	4	180*	8	—70	5	—100	9.0	*	*Screen connected to plate
V15	6AL5	Horizontal Sync. Discr.	Pictr. Min.	2 & 7	—6.5	—	—	1 & 5	—2.1	—	—	—	—	
V11	6AC7	Horizontal Osc. Control	Pictr. Min.	8	194	6	105	5	.05	4	—2.0	3.8	1.1	
V14	6K6GT	Horizontal Oscillator	Hold Max. Resistance	3	190	4	208	8	0	5	—30	17.0	6.7	
			Hold Min. Resistance	3	180	4	194	8	0	5	—23.5	19.5	8.2	
V17	6BG6G	Horizontal Output	Pictr. Min.	Cap	Do not Meas.*	8	134	3	—91	5	—113	77.0	11.5	*6000 volt pulse present
V29	8016	H.V. Rectifier	Brightness Min.	Cap	*	—	—	2 & 7	9200	—	—	0	—	*9200 volt pulse present
			Brightness Max.	Cap	*	—	—	2 & 7	6700	—	—	.7	—	*9200 volt pulse present
V16	5V4G	Reaction Scanning	Pictr. Min.	4 & 6	Do not Meas.*	—	—	8	350	—	—	90	—	*1200 volt pulse present
V12	5U4G	Rectifier	Pictr. Min.	4 & 6	390*	—	—	2 & 8	300	—	—	146	—	*AC measured from plate to trans center tap
V13	5U4G	Rectifier	Pictr. Min.	4 & 6	390*	—	—	2 & 8	300	—	—	146	—	

** Where separate readings are not listed for max. and min. gain settings of the picture control, the effect of the control is slight and readings are given for "Picture Min."