



# INSTRUCTION BOOK

HOW TO BUILD  
HOME RADIOVISION EQUIPMENT

PRICE \$1.00

PROPERTY OF  
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CHARLES AND READ STS.  
BALTIMORE, MD.

SEE THE ARTIST



YOU ARE HEARING

TELEVISION STARTED

## HOW TO TUNE IN TELEVISION SIGNALS

### Describing the Assembly and Wiring of the Jenkins JK-20 Television Receiver Kit

By radiovision is meant the transmitting and receiving of animated or moving pictures via radio. The subject may be based on the use at the studio end of motion picture films, thereby obtaining radio movies. Again, living persons or actual objects may be employed at the studio end, in which event we have radiovision pictures. Again, the studio subject may be talking picture films or living subjects facing the microphone as well as the radiovision pick-up, in which case we obtain radio talkies, or synchronized sight and sound broadcasting. In the last mentioned case, two transmitters are employed, one for the picture signals on short waves, and the other for the sound signals on the broadcast wave lengths. At the receiving end, a shortwave receiver and radiovisor are employed for the pictures in combination with a standard broadcast receiver for the sound accompaniment, tuned in to their respective transmitters.

### SCANNING SYSTEMS

In radiovision, the picture to be transmitted is dissected or broken up into suitable pictorial units for conversion into electrical and radio terms. The common practice today is to break up the image into strips or lines, this process being known as scanning. In other words, the image is transmitted in 60 lines, forming the complete picture. The 60 lines must be assembled in proper order at the receiving end. The device that assembles these lines is known as the radiovisor. It corresponds to the usual loud-speaker of the sound receiver, in that it converts radio signals into the desired form to impress our senses. In order to obtain the optical illusion of animation, a number of complete pictures must be flashed per second. The usual practice is 20 pictures per second. Hence the usual standard radiovision signal is known as a 60-line, 20 picture-per-second signal. There are other signals now on the air, namely 45-line and 48-line signals. By certain changes in the radiovisor, different standard signals may be handled. However, the receiver remains the same irrespective of the scanning system employed.

### TELEVISION RECEIVING REQUIREMENTS

In order to receive radiovision programs in the home it is only necessary to provide a radiovisor adapted to the standard scanning, operated in conjunction with a shortwave radio receiver tuning to the 100 - 150 meter wave band in which the radiovision programs are now being transmitted. The radiovisor is considered in another bulletin issued by the Jenkins Television Corporation, and will not be discussed here.



The Jenkins Television receiver type JK-20 is an all AC operated radio receiver developed to provide an economical outfit which will pick up the many interesting television programs that are now on the air. Only the highest grade parts and finest materials have been used, and by following closely the directions given below a television receiver of the highest quality may be assembled.

Keep in mind that the Jenkins receiver is not a broadcast receiver nor again a shortwave set hurriedly adapted to television use. It is a full-fledged radio movie receiver released only after months of experimentation and research on the peculiar and intricate problems of satisfactory television reception.

Because the eye can detect distortion not readily noticeable to the ear, special precautions have been taken to insure fidelity over a much wider band of modulation frequencies in television reception than is necessary for sound broadcasting.

### THE JK-20 TELEVISION RECEIVER

The type JK-20 television receiver consists of four essential units or groups of parts which, although not segregated from each other, have distinct functions of their own.

The first unit is a power pack located at the rear of the base panel. This includes a special power transformer supplying 2.5 volts and 5.0 volts for the audion filaments, as well as 600 volts to each plate of the rectifier audion. The rectified high voltage is filtered before delivery to voltage divider by means of two special 30 henry chokes, enclosed in the transformer housing for simplicity, and a 6 mfd. condenser block. This unit supplies all the power required to operate the receiver, and is turned on and off by a switch mounted on the volume control knob on front panel.

The second unit is a radio-frequency amplifier and station selector which is located on the center and left front portion of the base immediately behind the front panel. This consists of two screen-grid audions operating between three tuned circuits. Shifting from one station to another and tuning to maximum response is effected by a single tuning knob mounted on the end of a shaft running through a gang of three variable condensers rotating in unison.

The three tuned circuits serve efficiently to separate the desired station from the unwanted ones, while the two screen-grid audions provide amplification sufficient to give a good picture signal when the received wave has a field strength as low as 15 microvolts per meter. It has been found inadvisable to provide any greater sensitivity than this value, as the background level of static and other electrical disturbances causes distortion to appear in a picture when signals weaker than 15 microvolts per meter are received.



The r. f. amplifier, while eliminating unwanted stations, amplifies side frequencies as well as the carrier frequencies, and there is no discrimination which would result in loss of picture detail.

The third unit is a simple grid leak and condenser audion detector which separates the latent pictorial values from the signal and passes them along to the audio amplifier for further amplification.

The fourth unit is a resistance capacity coupled amplifier consisting of three stages. The first stage is a screen-grid audion, and the second a standard three-element audion, both being of the indirect, quick heater type. The third stage is the output stage of the 445 type which delivers power to the neon lamp terminals of the radiovisor.

The JK-20 kit includes every part necessary to completely assemble a television receiver. To assist in the assembly, each part is numbered and the location of each is indicated in Figures 1 to 10.

A complete list of these parts is given below. This list should be carefully checked upon unpacking to make sure that no parts are thrown away with the packing material.

#### BILL OF MATERIAL

<u>Description</u>	<u>Part No.</u>	<u>Amount Supplied</u>
Base mounting plate	JK-20-1	1
Front panel	JK-20-2	1
Coupling condenser mounting strap	JK-20-3	2
Coupling condenser mounting support studs	JK-20-4	2
Coupling condenser mounting spacers	JK-20-5	2
RF coil shield can bases	JK-20-6	3
RF coil shield cans	JK-20-7	3
Power pack	JK-20-8	1
Filter condenser 4.0 - 2.0 mfd.	JK-20-9	1
Plate by-pass condenser 1.0 mfd.	JK-20-10	1
Audio coupling condenser 0.25 mfd.	JK-20-11	3
RF coupling condenser .0001 mfd. )		2
Grid condenser .0001 mfd. )	JK-20-12	1
Detector by-pass condenser .0001 mfd.)		1
Grid bias by-pass condensers 2.0 mfd.	JK-20-13	3
RF by-pass condensers 0.1 - 0.1 - 0.1 mfd.	JK-20-14	2
Variable tuning condenser gang	JK-20-15	1
Bleeder resistor 41000 ohm tapped	JK-20-16	1
Hum balance resistor 20 ohm center tapped	JK-20-17	2
Coupling resistor 250,000 ohms	JK-20-18	3
" " 100,000 "	JK-20-19	3
" " 25,000 "	JK-20-20	1
" " 50,000 "	JK-20-21	2



BILL OF MATERIAL (CONT).

<u>Description</u>	<u>Part No.</u>	<u>Amount Supplied</u>
445 Bias Resistor 2,000 ohms	JK-20-22	1
427 " " 2,000 "	JK-20-23	1
424 " " 500 "	JK-20-24	3
Volume control resistor (25,000 ohm) with insulating washers and on-and-off switch	JK-20-25	1
RF chokes 300 turns	JK-20-26	4
RF coupling coils	JK-20-27	2
RF antenna coil	JK-20-28	1
5-Prong audion sockets	JK-20-29	5
4-Prong audion sockets	JK-20-30	2
Grid lead shields $4\frac{3}{4}$ " long	JK-20-31	2
Grid lead shields 9" long	JK-20-32	1
Grid terminal clips	JK-20-33	3
Tuning dial	JK-20-34	1
Binding posts - ANT. GRND. + and -	JK-20-35	4
Brown lamp cord	JK-20-36	10 ft.
110 volt attachment plug	JK-20-37	1
Black hook-up wire	JK-20-38	15 ft.
Green " "	JK-20-39	5 ft.
Red " "	JK-20-40	5 ft.
Yellow " "	JK-20-41	2 ft.
6-32 Brass mach. screws $\frac{3}{8}$ "	JK-20-42	25
" $\frac{3}{4}$ "	JK-20-43	17
" 1"	JK-20-44	4
" 2"	JK-20-45	2
6-32 Hexagonal nuts	JK-20-46	59
Lock washers	JK-20-47	52
Ground terminal washer	JK-20-48	1
Binding post insulating washers	JK-20-49	3
Bleeder brass washer	JK-20-50	1
Rubber grommet	JK-20-51	1
Soldering lug terminals	JK-20-52	9
Bleeder mounting stud	JK-20-53	1
Grid clip insulating washers	JK-20-54	3

FOLLOW THE INSTRUCTIONS!

Before beginning assembly of JK-20 Receiver Kit read instructions clear through carefully.

To start assembly of the kit refer to Figure 1. This shows the bottom of base panel which is supplied with all holes drilled ready for mounting component parts.



### BY-PASS CONDENSER MOUNTING

Locate the three grid bias by-pass condensers JK-20-13 in their proper positions as indicated in the figure and hold them in place by means of two JK-20-42 screws and two JK-20-46 nuts as in "A". DO NOT mount JK-20-14 condensers as yet.

52 shakeproof lock washers, JK-20-47, are supplied with kit and one of these should be placed under every JK-20-46 nut used except under those nuts where a shakeproof solder lug type JK-20-52 is used.

Leaving Figure 1 and the base panel for a moment, refer to Figures 2 and 2A. These show the audio coupling condenser mounting and are self-explanatory. When this unit has been completed, locate it in its proper position on top of panel as shown in Figure 3 at "B".

When located properly it will be found that the two 2" machine screws JK-20-45 will protrude thru base and thru mounting lugs on JK-20-13 condensers previously mounted and indicated by "C" in Figure 1. Fasten these in place by means of two JK-20-46 nuts. Also tighten nuts at "A" firmly at this time.

### MOUNTING THE TUBE SOCKETS

Next, mount the four-prong audion sockets JK-20-30 on the right hand side on top of base panel as shown in Figure 3, fastening these in place with JK-20-43 screws and JK-20-46 nuts. DO NOT FORGET LOCK WASHERS.

The five-prong audion sockets JK-20-29 should next be mounted in their proper places as indicated in Figure 3, using the same type screws and nuts as in mounting the four-prong sockets.

Next, insert two JK-20-42 screws thru holes between sockets as shown at "D" in Figure 3. Screw two JK-20-46 nuts over each of these beneath panel at "DD" in Figure 1.

Also screw a second JK-20-46 nut over each socket holding screw at "E" in Figure 1. These serve as spacers to hold JK-20-14 condensers clear of obstruction. These condensers should next be mounted in place and held by a third JK-20-46 nut at "E" and "DD".

### MOUNTING THE RESISTOR

The bleeder resistor JK-20-16 should next be mounted in its place as shown at "G" in Figure 3. Figure 4 shows in detail the method of mounting and is self-explanatory. Care should be taken to mount exactly as shown, as an improper adjustment of voltages would result should it be mounted upside down.



### MOUNTING THE TUNING COMPONENTS

The gang tuning condenser JK-20-15 may next be mounted as shown in Figure 3 by means of three JK-20-43 screws shown at "H" in Figure 1.

The r. f. coil shield can bases, JK-20-6, are next mounted and partially held in place by screws JK-20-42 at "K" as shown in Figure 3 and nuts JK-20-46 at "KK" in Figure 1.

The r. f. coils are next mounted on top of can bases by means of JK-20-42 screws which pass thru mounting bracket as shown by "R" in Figure 5. These pass thru hole in center of can base and thru hole in base panel to be held by JK-20-46 nuts as shown at "L" in Figure 3 and "LL" in Figure 1.

Coil JK-20-28 mounts on can nearest front of panel, while JK-20-27 mount on the second and third cans from front of panel.

The plate by-pass condenser JK-20-10 may now be mounted as shown in Figure 3, taking care that the terminal lugs point toward the front or tuning condenser end of the panel.

### POWER PACK AND FILTER CONDENSER BLOCK

The power pack JK-20-8 and filter condenser block JK-20-9 may now be mounted in their respective positions as shown in Figure 3. Care should be taken to mount power pack so that terminals are facing exactly as shown in figure in order to facilitate wiring.

Filter condenser JK-20-9 should be mounted with terminal lugs on side away from power pack.

### BINDING POSTS

The four binding posts JK-20-35 marked ANT., GRND, +, and - may next be mounted as indicated in Figure 3. Make certain that the threaded portion of ANT, +, and - binding posts is carefully insulated from metal of base by means of insulating washers JK-20-49 which are placed in hole in base before binding posts are inserted. These should be held in place by JK-20-46 nuts screwed down on top of JK-20-52 soldering terminals as shown at "P" and "P2" in Figure 1.

The ground binding post connects directly to metal of base plate thru brass washer as shown at "Q" in Figure 1.



### OTHER MOUNTING DETAILS

Do not mount front panel until set has been wired. Volume control resistor and on-off switch JK-20-25 is shown in its place in Figure 3. This mounts on front panel and is not attached to base.

Center tapped filament resistors JK-20-17 should now be mounted on socket terminals as shown at "T" in Figure 3.

Three r. f. choke coils JK-20-26 are shown soldered to plate terminals of audion sockets at "V".

JK-20-12 condensers shown at "W" are r. f. coupling condensers.

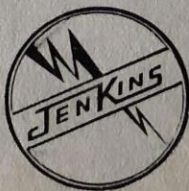
JK-20-12 condenser shown at "X" is grid condenser.

JK-20-12 condenser shown at "Y" is plate r. f. by-pass condenser.

Coupling resistors (JK-20-18)  
(JK-20-19)  
(JK-20-20)  
(JK-20-21)

are not shown with assembly as they are best placed in their proper positions as the wiring of the set progresses.

This also applies to bias resistors: JK-20-22  
JK-20-23  
JK-20-24



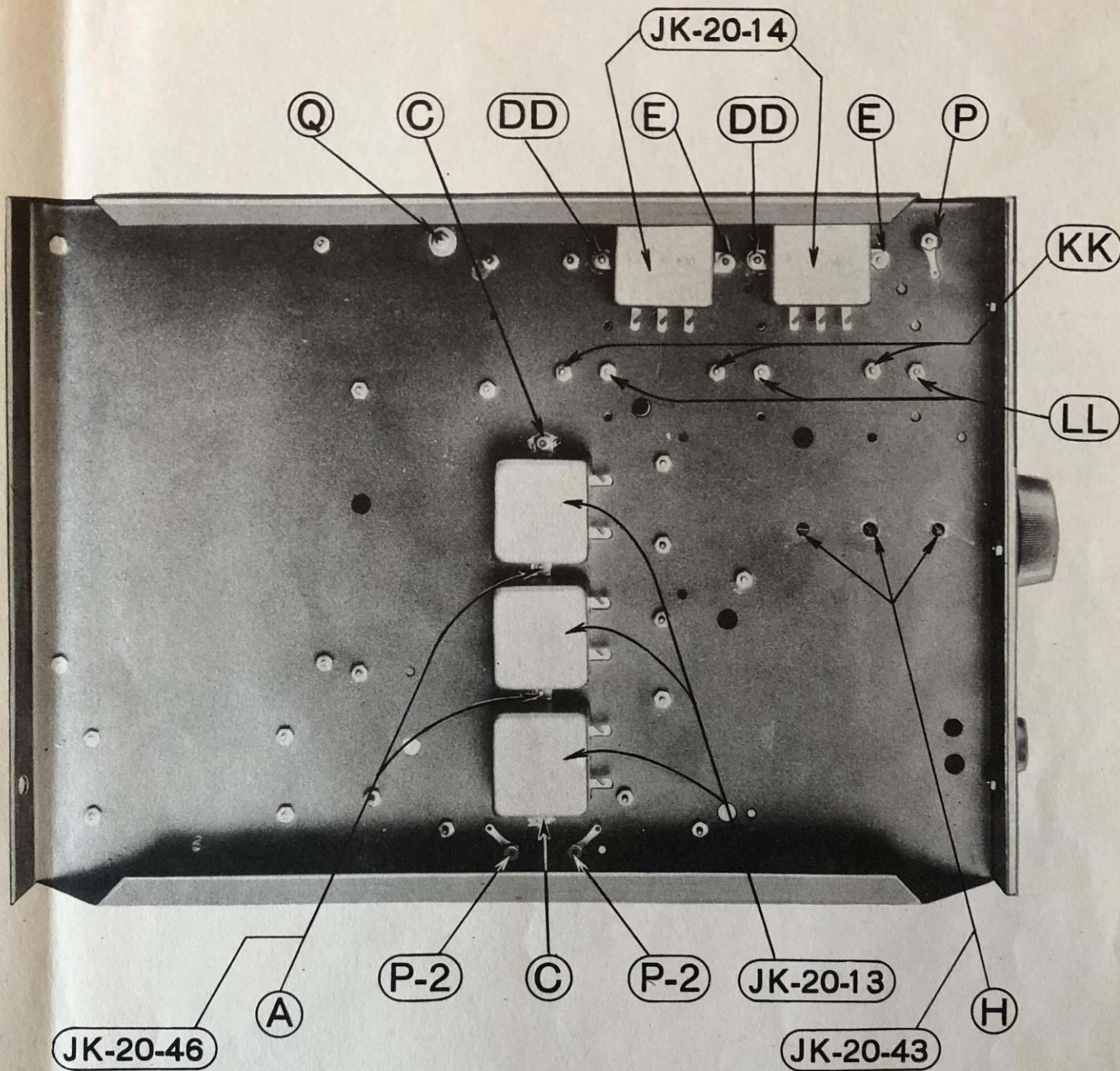
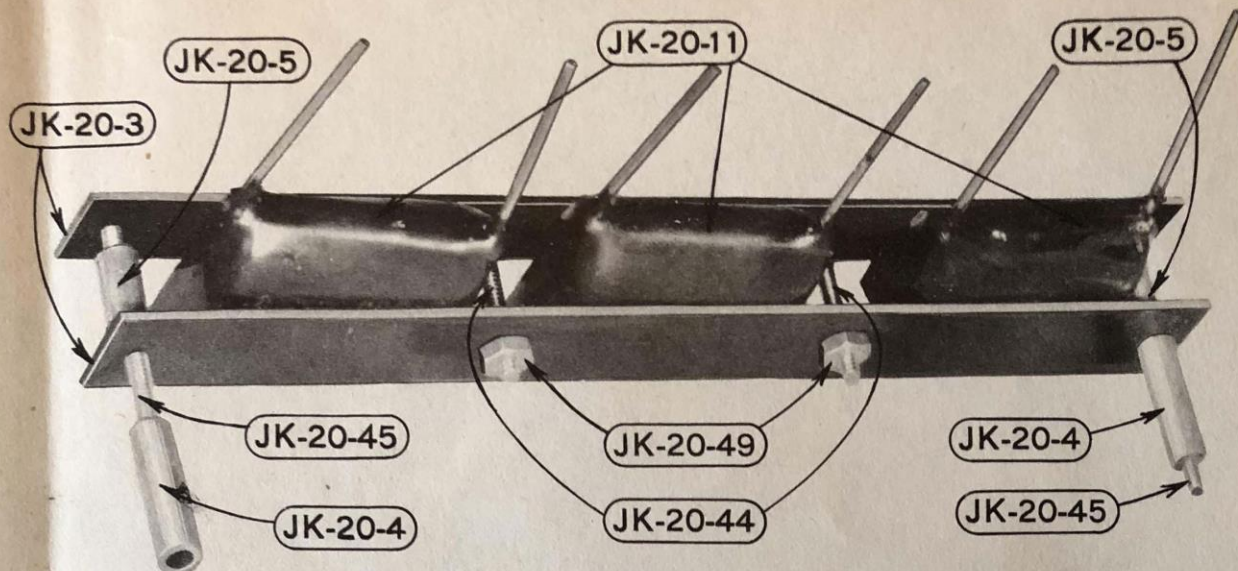
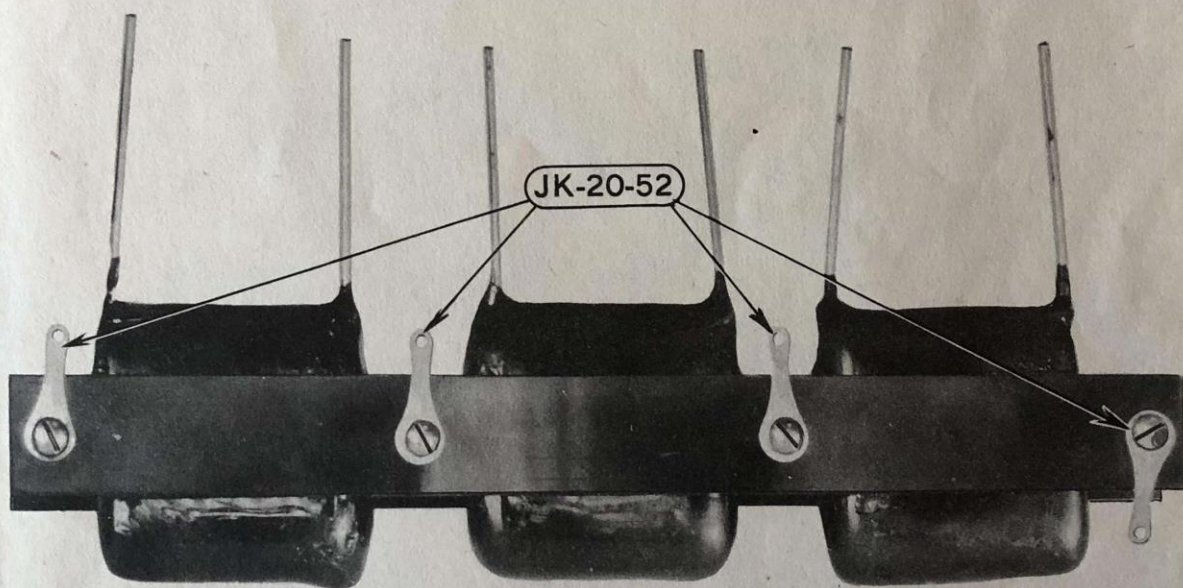


FIG. 1





BOTTOM VIEW  
FIG. 2



TOP VIEW  
FIG. 2A



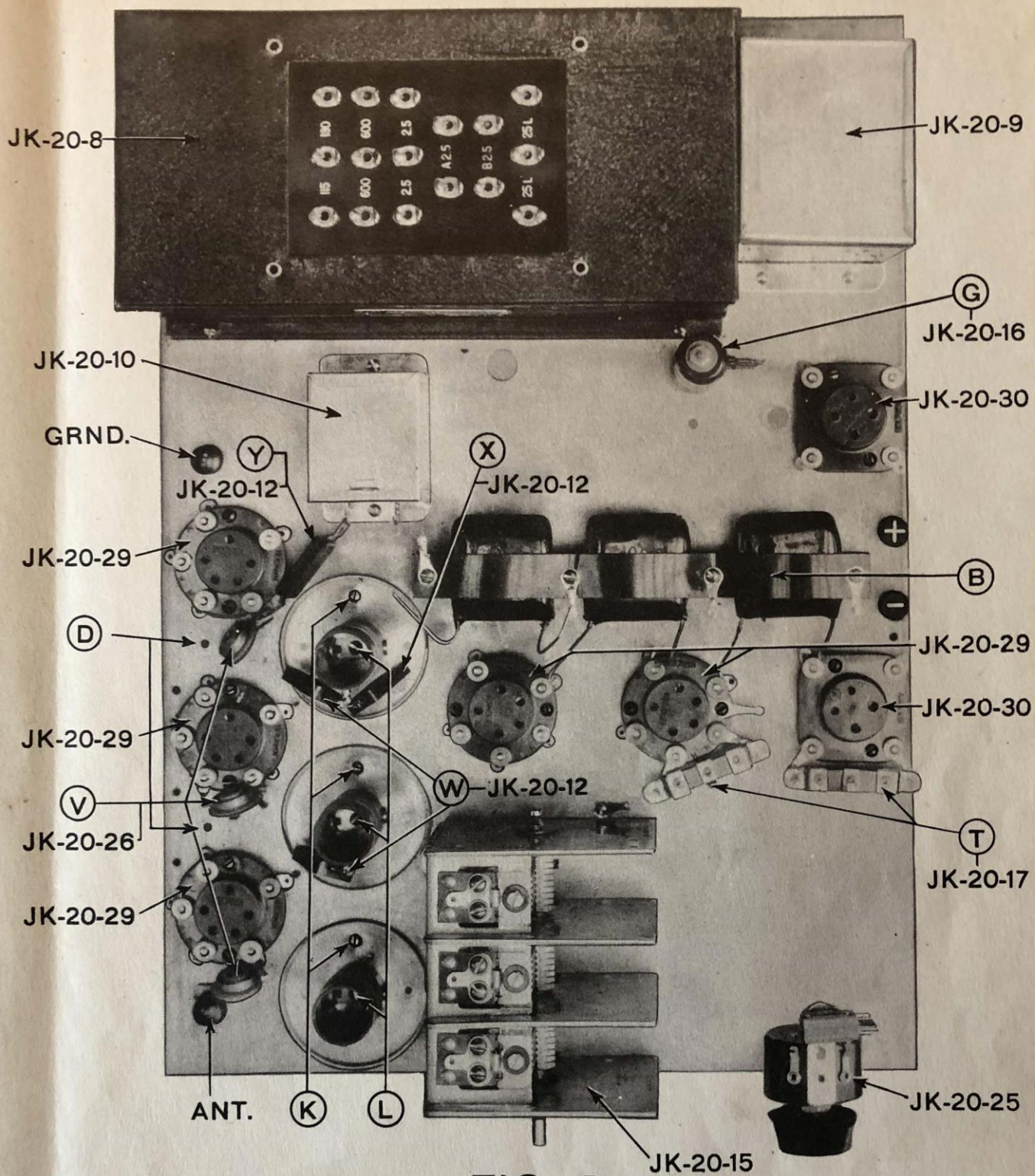


FIG. 3



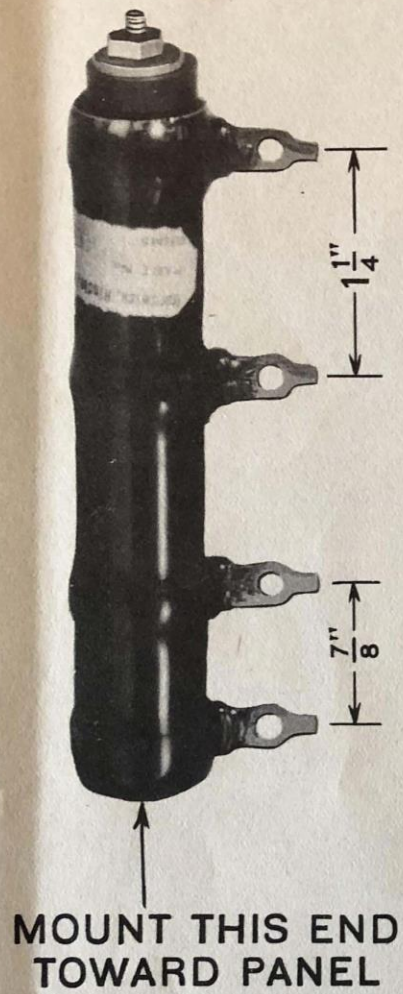


FIG. 4

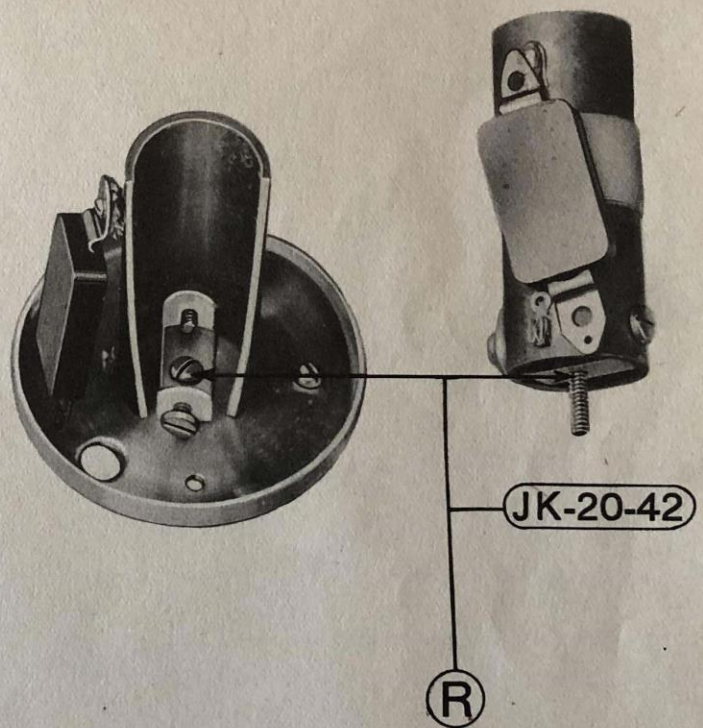


FIG. 5



## WIRING

Having completed the above outlined procedure, the wiring of the receiver becomes a simple matter as all fixed parts are in place and it is only necessary to run wires as indicated in layout diagrams Figures 6, 7, 8 and 9. Figure 10 shows the schematic circuit of the receiver and should not be deviated from in the slightest degree.

Figure 6 shows the general layout of power supply and filament wiring. In certain cases holes are provided so that leads running the length of the panel may be run underneath panel for most of their length. This is left to the option of the builder, but wherever possible it is best to secure wires in place by running them thru holes provided.

When the wiring indicated in Figure 6 has been completed, check carefully. When all wires have been found to coincide with their indicated positions, place tubes in their positions as indicated in Figure 6, and connect attachment plug to socket. Then snap on 110 volt switch by turning volume control switch to right. All tubes should then light, indicating that filament circuit is wired correctly.

Next refer to Figure 7 and proceed to wire grid, plate, and cathode circuits as indicated.

Checking over circuits after receiver is completed is greatly facilitated by using different colored wiring for certain parts of the circuits. Therefore, four different colors of hook-up wire has been supplied with kit. It is recommended that the set be wired as follows:

All cathode wires	-	Yellow
All grid wires	-	Green
All plate wires	-	Red
All others	-	Black

For clarity the wiring shown in Figure 6 has been omitted from Figure 7. By referring to Figure 9 which is a photograph of the completed receiver, the location and method of mounting the various coupling resistors may be ascertained. The connections to these and their values are indicated in Figures 6, 7 and 8.

In Figures 7 and 8 some wires are shown passing thru the panel. Wherever possible the continuation of wires under panel has been shown by dotted lines on the same figure. To avoid confusion in some cases the continuation is shown only on the other figure and continuations of the same wires have been indicated by



corresponding figures in circles and arrows pointing to the wires.

It is important that flexible shields JK-20-31 be placed over grid leads to first two condensers as shown in Figure 9 at "Z". The shield JK-20-32 which is longer runs from the third condenser as shown at "I" in Figure 9, under panel to coil terminal as indicated in Figure 7.

When wiring has been completed, check carefully and then mount front panel. Mount tuning dial JK-20-34 on condenser shaft and attach volume control JK-20-25 to front panel taking care to insulate shaft by means of fibre washers accompanying.



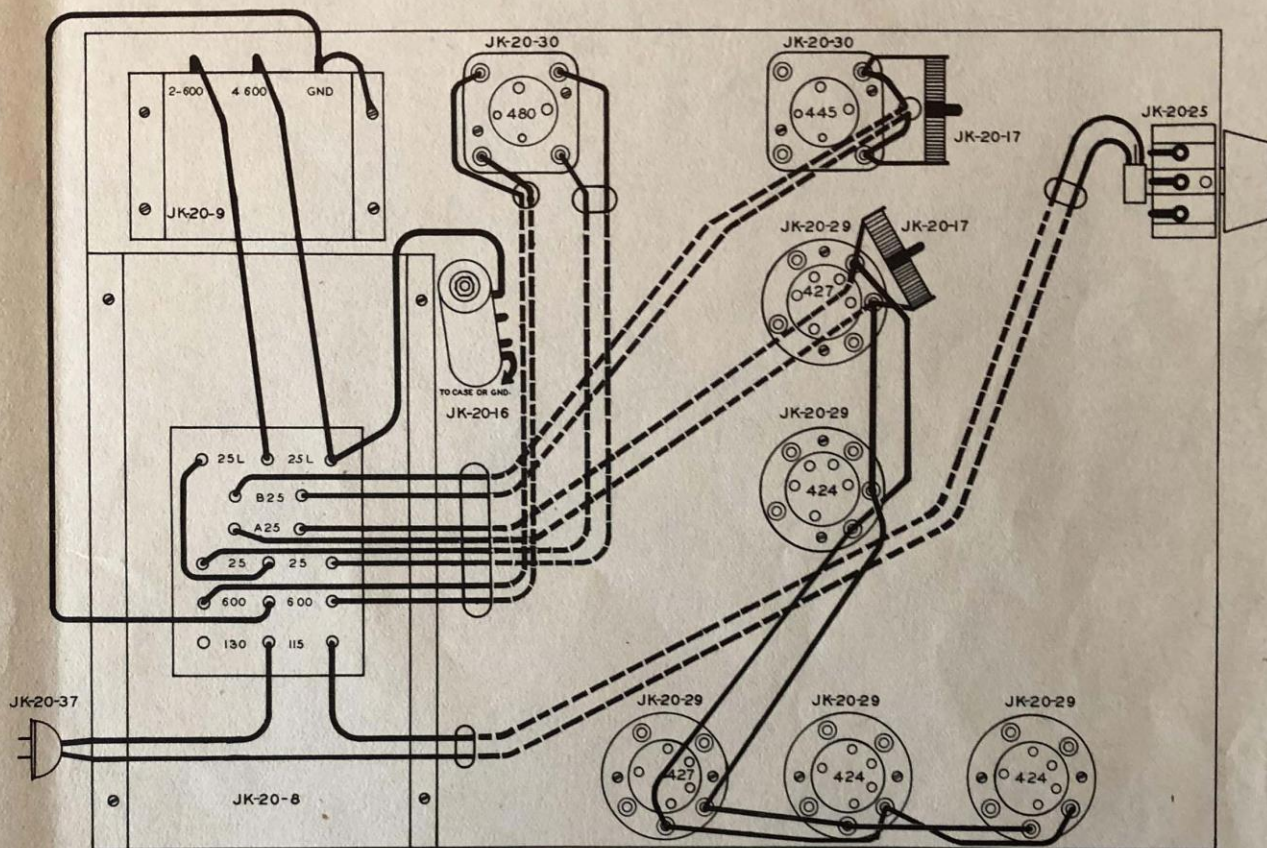
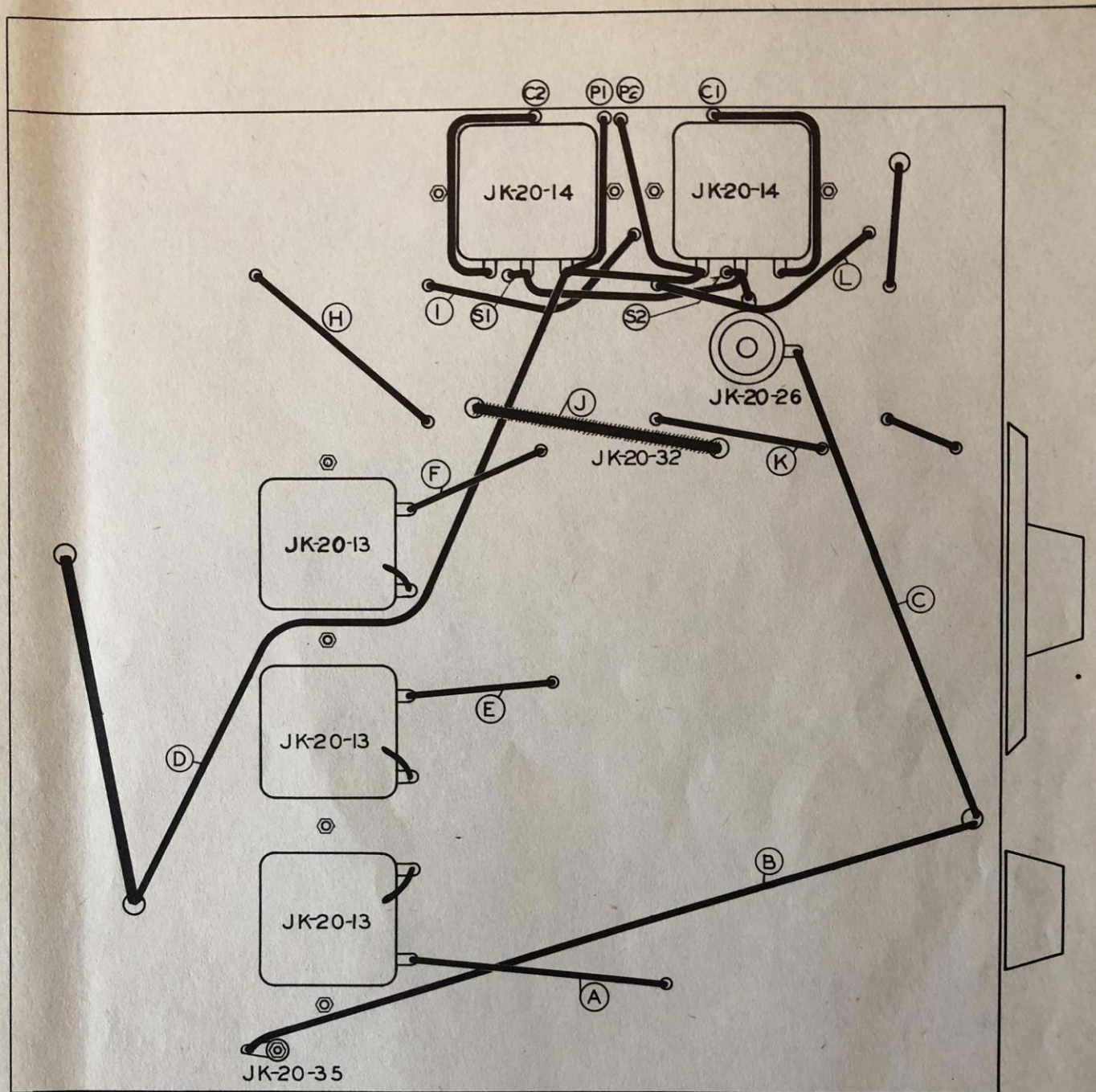


FIG. 6 POWER SUPPLY & FILAMENT







**FIG. 8** WIRING UNDERNEATH BASE



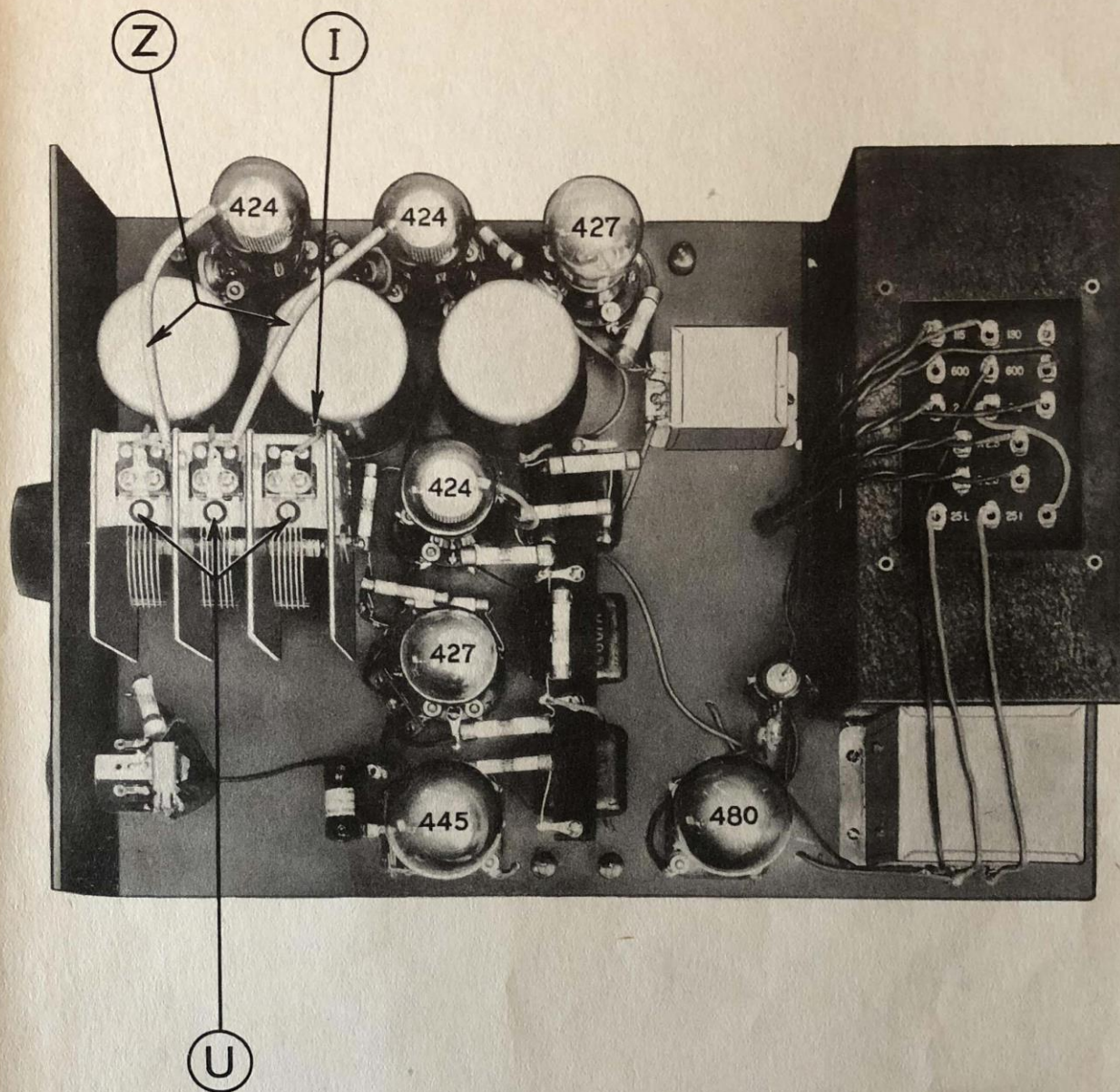


FIG. 9



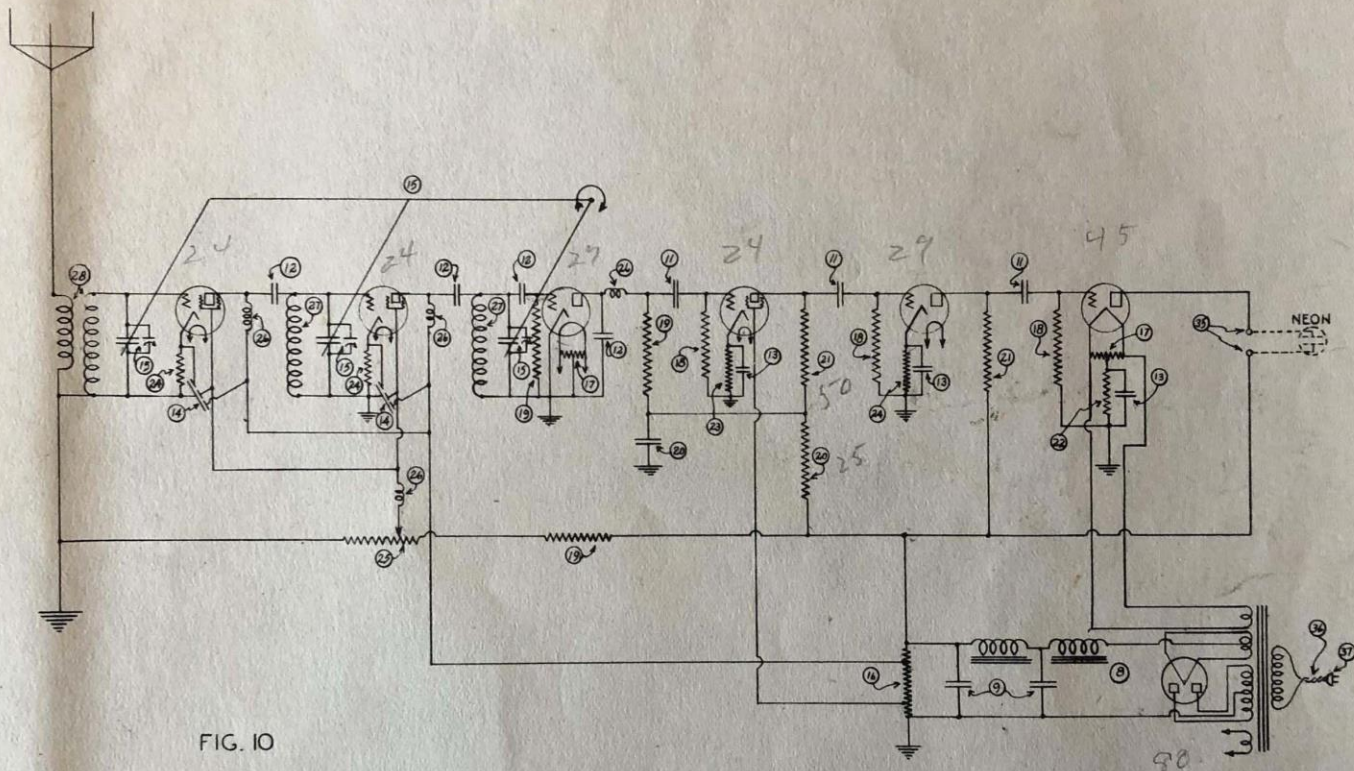


FIG. 10

SCHEMATIC OF JK-20 KIT TELEVISION RECEIVER



### OPERATING THE RECEIVER

To prepare receiver for operation, connect ground terminal of set to a good ground connection, preferably a water pipe.

An antenna 75 to 100 ft. long and as free as possible from obstructions should be connected to antenna terminal. Connect loud speaker to + and - posts and turn on set.

Allow about fifteen seconds for audions to heat up. Then, with volume control full on, tune for any signal preferably at low end of dial (with condenser plates nearly all out). To line up condenser, adjust trimmer condenser by means of wooden handled screw driver inserted in heads of screws shown at "U" in Figure 9. Adjust these screws to right or left until maximum response is obtained in loud speaker.

Set is now ready for operation and the radiovisor should be connected to + and - terminals. The operation of the radiovisor is described in detail in the bulletin accompanying it and will not be gone into here.



NEW JENKINS TELEVISION CORPORATION  
PRICE LIST PARTS

Receivers

JK-20	Special Receiver Kit	\$69.50
J-D	Special Receiver	150.00
J-DS	Special Receiver (self-synchronizing power supply)	175.00

Radiovisors

RK-2	Radiovisor-Kit Assembly	42.50
RK-11	Lens Assembly for RK-2	7.50
102	Radiovisor (1½" image, square hole disc)	69.50
202	Radiovisor (7" image, drum scanning, 60 cycle synch. motor, Cabinet)	135.00
302	Radiovisor (4" image, self-synch., eddy current motor, Cabinet)	160.00

Synchronizing Devices

SK-30	Power amplifier kit for self-synch. motors	35.00
502	Self-synch. motor controlling disc speed by signal	60.00

Vis-ion Lamps

601	Low internal capacity neon lamp, 1½" plate	6.00
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WORKING ASSEMBLY COMBINATIONS

Combination A Receiver-kit and Radiovisor-kit. For those who desire to assemble and wire their own outfits.

JK-20	\$69.50
RK-2	42.50
RK-11	<u>7.50</u>
	\$119.50

Tubes necessary:	3-424)	
	2-427)	
	1-445)	16.90
	1-480)	
1 Lamp -	601)	

Combination B Receiver-kit and power amplifier kit for self-synchronizing and Radiovisor-kit with self-synchronizing motor. For



Combination B  
(Cont.)

those who desire to assemble and wire  
their own outfits and automatically  
synchronize with stations on different  
power systems.

JK-20	\$69.50
SK-30	35.00
RK-2	42.50
RK-11	7.50
Model 502 Motor	<u>60.00</u>
	\$214.50

Tubes necessary:	3-424)	
	2-427)	
	2-445)	18.90
	1-480)	
1 Lamp-	601)	

Combination C Assembled receiver without cabinet and  
assembled radiovisor without cabinet,  
giving 1½" square image.

JK-20	\$69.50
Assembly charge	30.00 net
Model 102 Radiovisor	<u>69.50</u>
	\$169.00

Tubes necessary:	3-424)	
	2-427)	
	1-445)	16.90
	1-480)	
1 Lamp -	601)	

Combination D Assembled receiver without cabinet and  
assembled radiovisor without cabinet for  
automatic synchronization with stations  
on different power systems.

JK-20	\$69.50
SK-30	35.00
Assembly charge	30.00 net
102	69.50
502	<u>60.00</u>
	\$264.00

Tubes necessary:	3-424)	
	2-427)	
	2-445)	18.90
	1-480)	
1 Lamp -	601)	



Combination E Receiver and Radiovisor, giving 7" square image, mounted in deLuxe cabinet, ready to operate.

J-D	\$150.00
202	<u>135.00</u>
	\$285.00

Tubes necessary:	3-424)	
	2-427)	
	1-445)	16.90
	1-480)	
1 Lamp -	601)	

Combination F Receiver and Radiovisor, giving 4" square image, mounted in de Luxe cabinet, ready to operate. Will automatically synchronize with stations on any power system.

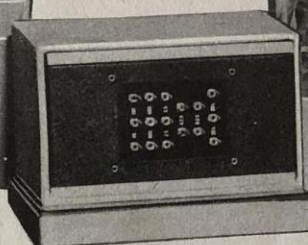
J-DS	\$175.00
302	<u>160.00</u>
	\$335.00

Tubes necessary:	3-424)	
	2-427)	
	2-445)	18.90
	1-480)	
1 Lamp -	601)	





JK-20



JK-20 ALSO



RK-2



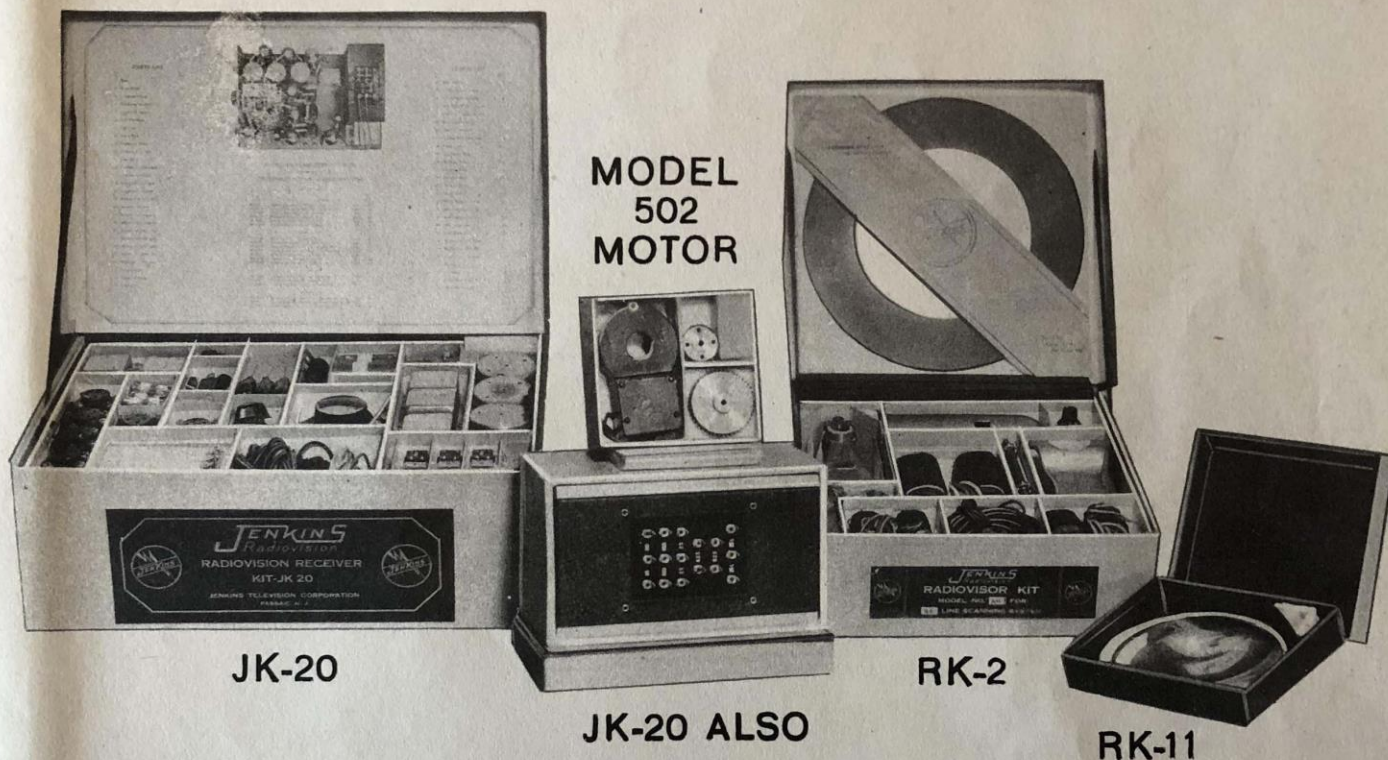
RK-11

# COMBINATION "A"

## RECEIVER KIT AND RADIOVISOR KIT

### UNASSEMBLED



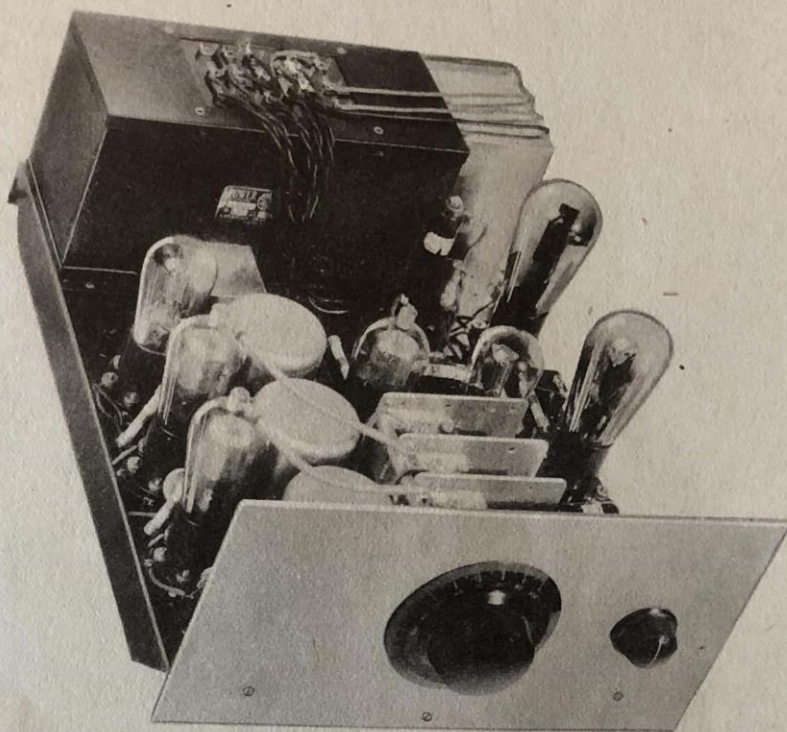


**COMBINATION "B"**  
**RECEIVER KIT AND RADIOVISOR KIT**  
**UNASSEMBLED WITH MODEL 502**  
**SELF SYNCHRONIZING MOTOR**





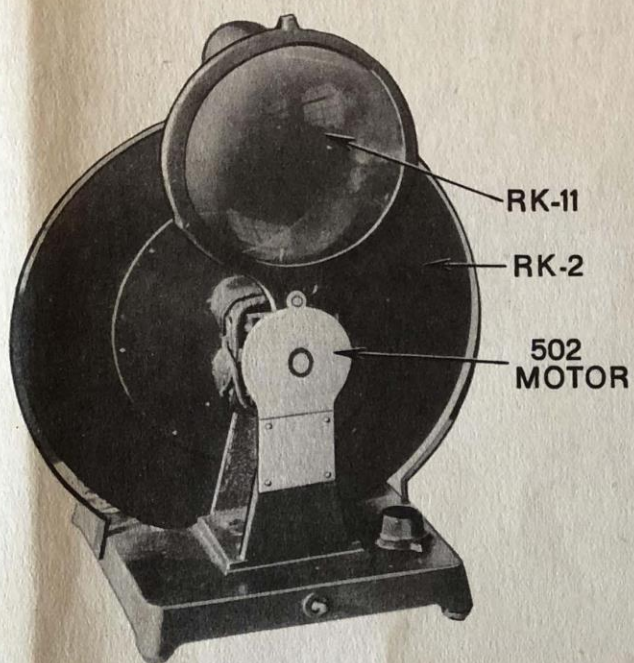
MODEL 102  
ASSEMBLED



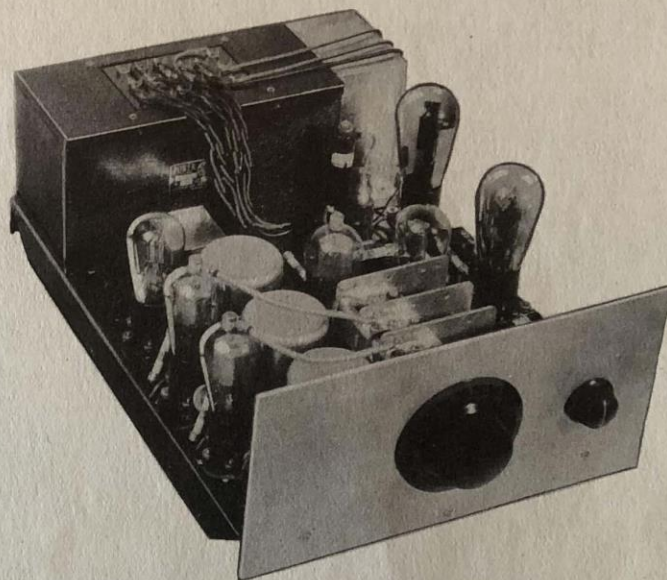
JK-20  
ASSEMBLED

COMBINATION "C"  
RADIOVISOR KIT AND RECEIVER KIT  
ASSEMBLED





**RK-2 AND RK-11  
ASSEMBLED  
WITH 502 SELF  
SYNCHRONIZING  
MOTOR**



**JK-20 ASSEMBLED**

**COMBINATION "D"**  
**RADIOVISOR KIT AND RECEIVER KIT (SERIES 100)**  
**ASSEMBLED WITH SELF SYNCHRONIZING MOTOR**





**COMBINATION "E"**  
**DE LUXE ASSEMBLY MODEL 202 AND J-D RECEIVER**





**COMBINATION "F"**  
**DE LUXE ASSEMBLY MODEL 302 AND J-D RECEIVER**



PAGE 28.

Courtesy of Luc Sirois