

# Knight "Ranger" AC-DC Superhet

## PICTORIAL DIAGRAM

# Notes on Construction and Operation

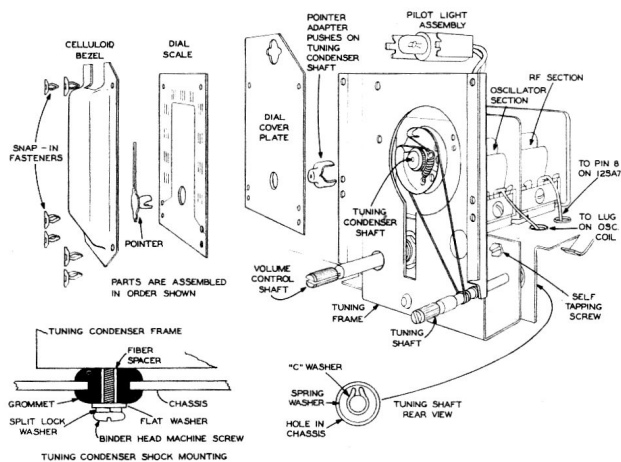
**T**HE KNIGHT "RANGER" 5 tube AC-DC superhet receiver has been carefully designed for ease of construction and professional performance. When built according to these directions, its appearance and operation will compare favorably with commercial receivers of the same type.

Among the many special features included in the receiver are: built-in loop antenna; illuminated dial marked in kilocycles; beam-power output; and automatic volume control which reduces "blasting" on strong stations and fading on weak stations. These advantages are achieved with a minimum of parts and a circuit so simple that even the most inexperienced can follow it.

The receiver covers a frequency range of from 535 to 1620 KC. It operates from 100-125 volts, 50-60 cycles AC or 100-125 volts DC. Power drain is only 27 watts.

## ASSEMBLY

**T**HE kit of parts is supplied complete in every detail. As the kit is unpacked, all parts should be checked against the parts list. Construction of the receiver should begin with the mounting of the tuning condenser and dial assembly. The diagram below shows the method of shock mounting the tuning condenser. The  $2\frac{1}{4}$ " piece of flexible braided wire is soldered to the tuning condenser and to the chassis to provide a good ground.



The mica and adjusting screw from one of the two trimmer condensers mounted on the RF (rear) section of the tuning condenser are omitted. This trimmer is not required. In assembling the tuning dial follow closely the "exploded" view shown. Knot the ends of the dial cord together in a simple knot, then thread the cord through the closed loop of the dial spring and tie another simple knot (with the spring loop inside the knot) as close to the first knot as possible. The threading of the dial cord and spring is shown in the view of the dial assembly. Mount the speaker next, being very careful not to puncture the cone. After mounting the speaker, fasten a piece of cardboard across its face as further protection to the cone while building the set. The IF transformers

should be mounted so that the wires from them, which are cut approximately to the proper length, reach their terminals by the shortest, most direct route—this is important. The 455kc. (RK42) output IF transformer has a special copper shield which mounts between the transformer and the chassis. Note that the 6-32 hex nuts holding the IF transformers in place are also used to fasten the three insulated tie lugs in the set, as shown in the pictorial diagram. Mount the .0001 mfd. mica condenser on the oscillator coil before soldering the coil into the set. Be careful not to bend or twist the lugs on this coil when mounting it.

## WIRING

**B**EFORE you begin wiring the set, study the diagrams thoroughly. Either the schematic or pictorial diagram may be followed.

**IMPORTANT:** *Keep all connections close to the chassis and as short as possible.* Note that in the pictorial diagram some leads are shown longer than they should be. They are drawn in this manner so that all elements may be seen. In actual wiring, however, the resistors and condensers may be very close together. Clip off the excess pigtail leads from fixed condensers and resistors. Leads connected to the grid and plate terminals of the sockets should be well separated from each other. This is particularly important in the IF stage (12SK7GT/G tube).

All connections should be securely soldered, using only rosin core solder. Make sure the soldering iron is sufficiently hot to insure a smooth even flow of solder, thus providing a secure mechanical as well as electrical connection. Work slowly, checking each connection as it is made. Mark either the schematic or pictorial diagram with a colored pencil as each connection is completed. When more than one wire is to be connected to a particular point, do not solder until all wires are installed at that point. An extra few minutes spent in careful wiring and thorough checking may save hours of trouble-shooting later.

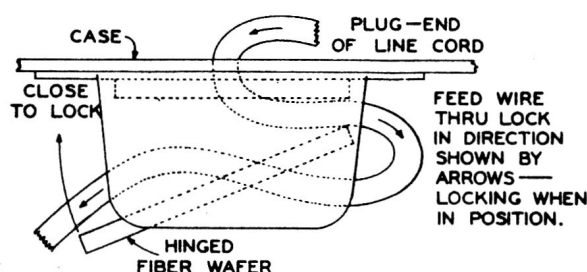
Wire the IF transformer leads first. The balance of the parts can easily be wired into the circuit by following the pictorial diagram. When wiring the tubular condensers observe polarity as indicated by the black bands printed on them and shown in the pictorial diagram.

## ADJUSTMENT

**W**HEN wiring is completed, insert the tubes in their sockets. The tubes may be either metal or glass. Plug in the line cord and turn on the receiver. You should be able to tune in some stations immediately. The IF transformers have been factory aligned, but some adjustment may be required for peak performance. Tune the receiver to a station at the low frequency end of the band. Using a small screwdriver with an insulated handle, adjust the two trimmer condensers in the top of each IF transformer one at a time for greatest volume. Then move the dial pointer so that it reads the frequency of the station to which

you are tuned. Tune the receiver to a station at the high frequency end of the band, and adjust the trimmer condenser on the RF (rear) section of the variable condenser until the station comes in with the greatest amount of volume. Determine whether the frequency of the station to which you are listening coincides with the reading of the dial pointer. If it does not, tune the receiver until the pointer indicates the frequency on which the station should come in, and adjust the trimmer condenser on the oscillator (front) section of the variable condenser until the station is heard again. It will then be necessary to readjust the trimmer on the RF section of the variable condenser to increase the volume to maximum. Your receiver should now operate perfectly. For best reception, tuning for stations should be done "on the nose" and any necessary reduction in volume should be made by means of the volume control — not by detuning the station.

#### INSTALLATION OF CORD LOCK



#### INSTALLATION IN CABINET

**M**OUNT the four rubber feet on the cabinet with the small machine screws and nuts provided. Cement the speaker grill cloth in place, using any type of quick drying household cement, holding the grill

firmly in position until dry. Fit the completed receiver into the cabinet so that the knobs and dial line up with the holes in the front of the cabinet. Fasten the receiver in the cabinet with the screws provided. Place the circular felt discs over the tuning and volume control shafts and push on the knobs. Lead the power cord out the notch in the lower back edge of cabinet and fasten the back cover in place with the four 6-32 x  $\frac{7}{8}$ " flat head machine screws. **CAUTION:** Excessive tightening of the screws holding the receiver or the back cover may crack the cabinet.

#### ANTENNA

**L**OOP aerials are directional. If your favorite station does not come in as loud as you would like it to, turn the receiver slowly until the station comes in with greatest volume. While the directional effect of the loop antenna is not critical, it will increase volume of weak stations or reduce volume of stations which may be interfering. For greater sensitivity and reception of distant stations, an external aerial may be connected to the wire extending from the loop antenna.

#### USEFUL HINTS

**I**F excessive hum is encountered, reverse position of the line cord plug in the socket. In one position there may be less hum than in the other. If the set still hums, check the polarity of the filter condensers. If "whistles" are encountered as a result of oscillation, it is because connecting leads are not as close to the chassis and as short as they should be. Check these very carefully.

**CAUTION!** Be sure to avoid coming in contact with any grounded metallic object, such as a radiator, etc., while handling the chassis. The chassis is isolated from the internal wiring but a small voltage may be present. When the receiver is mounted in the cabinet, this hazard is eliminated.

### COMPLETE PARTS LIST

- 1 12SA7GT/G or metal tube
- 1 12SK7GT/G or metal tube
- 1 12SQ7GT/G or metal tube
- 1 50L6GT tube
- 1 35Z5GT tube
- 1 2 gang tuning condenser
- 3 Each: grommets, spacers, washers, lock washers and binder head 6-32 x  $\frac{7}{16}$ " screws for shock mounting tuning condenser
- 1  $\frac{2}{4}$ " flexible braid wire
- 1 Set of parts for tuning dial assembly: 1 each—tuning dial frame, dial cover plate, scale, pointer, adapter, celluloid bezel,  $1\frac{1}{4}$ " dial cord, dial spring, tuning shaft, spring washer, "C" washer; 2 6-32 x  $\frac{1}{4}$ " hex head self-tapping screws; 6 snap-in fasteners
- 10  $\frac{1}{2}$  watt carbon resistors: 1 each—100, 150, 22,000, 470,000 ohm, 2.2 meg, 5 meg, 15 meg; 3—220,000 ohm
- 1 1000 ohm, 1 watt carbon resistor
- 8 Paper tubular condensers; 1 each—.002, .01 and .02 mfd; 2—.05 mfd; 3—.1 mfd
- 1 .0001 mfd mica condenser (brown & black dots)
- 2 .00025 mfd mica condensers (red, green & brown dots)
- 1 30-30/20 mfd, 150/25 volt filter condenser
- 1 3-48 x  $\frac{3}{16}$ " binder head screw and nut for mounting filter condenser
- 1  $\frac{1}{2}$  meg volume control, switch, washer and hex nut

- 1 RK41 Input IF transformer (455 Kc.)
- 1 RK42 Output IF transformer (455 Kc.)
- 1 Copper shield plate for output IF transformer
- 4 6-32 hex nuts for mounting IF transformers
- 1 Oscillator coil
- 3 Insulated tie lugs
- 1 5" PM speaker and output transformer
- 2 8-32 x  $\frac{1}{4}$ " round head machine screws and lock washers for mounting speaker
- 1 Dial light assembly with type 47 bulb
- 1 Loop antenna with 10 mmf and 3 mmf condensers
- 1 6-32 x  $\frac{1}{4}$ " hex head self-tapping screw and lock washer for mounting loop antenna
- 1 Chassis (sockets, lugs and cordlock installed)
- 2 6-32 x  $\frac{5}{16}$ " binder head screws for fastening chassis in cabinet
- 1 Line cord and plug
- 1 Walnut cabinet with speaker grill and back
- 4 Rubber feet with 4-36 x  $\frac{3}{8}$ " screws and nuts
- 4 6-32 x  $\frac{7}{8}$ " flat head screws for fastening back on cabinet
- 2 Walnut push-on knobs and felt washers
- Color code chart (Allied 55-550)
- Instruction sheet (Allied 38-047)

**83-275 COMPLETE KIT WITH TUBES AND CABINET.**  
Shpg. wt., 7 lbs.

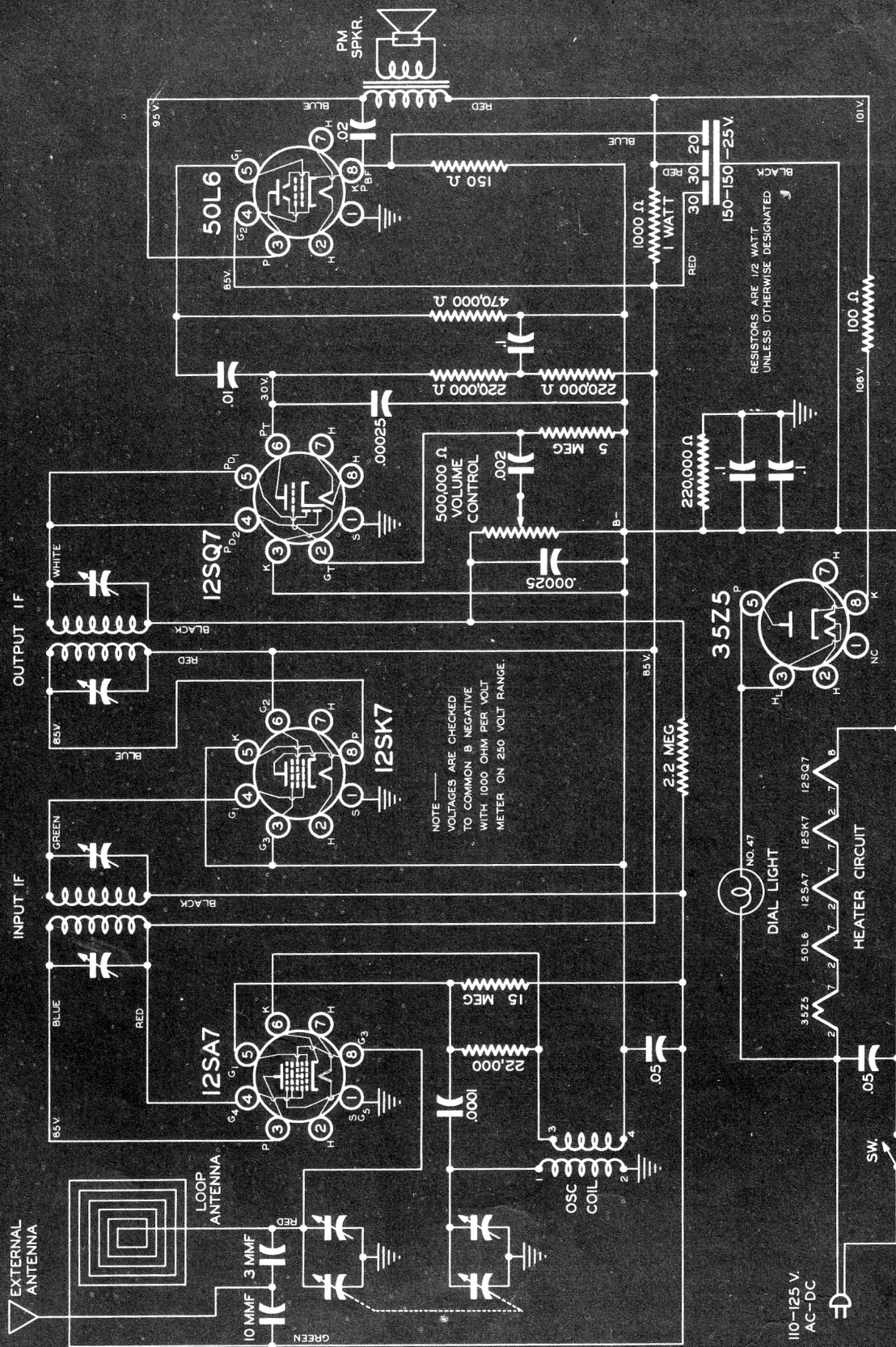
The Knight "Ranger" is supplied only as a complete kit. The above parts are not available separately.

## ALLIED RADIO CORP.

833 W. JACKSON BLVD.

CHICAGO 7, ILL.





KNIGHT "RANGER"  
5 TUBE AC-DC SUPERHET