

## Knight-Kit AC-DC "Ocean Hopper"

**T**HIS circuit represents one of the most efficient of the simple AC-DC type receivers. It is sensitive enough to "pull in" stations from all over the world, and on the more powerful stations it delivers sufficient output to operate a loudspeaker.

Only a few tubes are used, but the circuit is engineered so that its performance is equal to that of a larger receiver. The 12AT6 tube, serving as regenerative detector, is a detector-amplifier with a high amplification factor. The output of this tube is fed to a 50C5 beam-power audio amplifier for highly efficient audio amplification. A 35W4 tube serves as a half-wave rectifier. As in the case of all AC-DC receivers, the filaments of the tubes are connected in series. A 200-ohm resistor in series with the filaments permits operation of the "Ocean Hopper" from line voltages as high as 127 volts and as low as 110 volts. The lower the voltage, as long as it stays above 110, the longer will be the life of the tubes. The 200-ohm resistor provides more than adequate voltage drop, so that at normal line voltage (about 117 volts) tube filaments

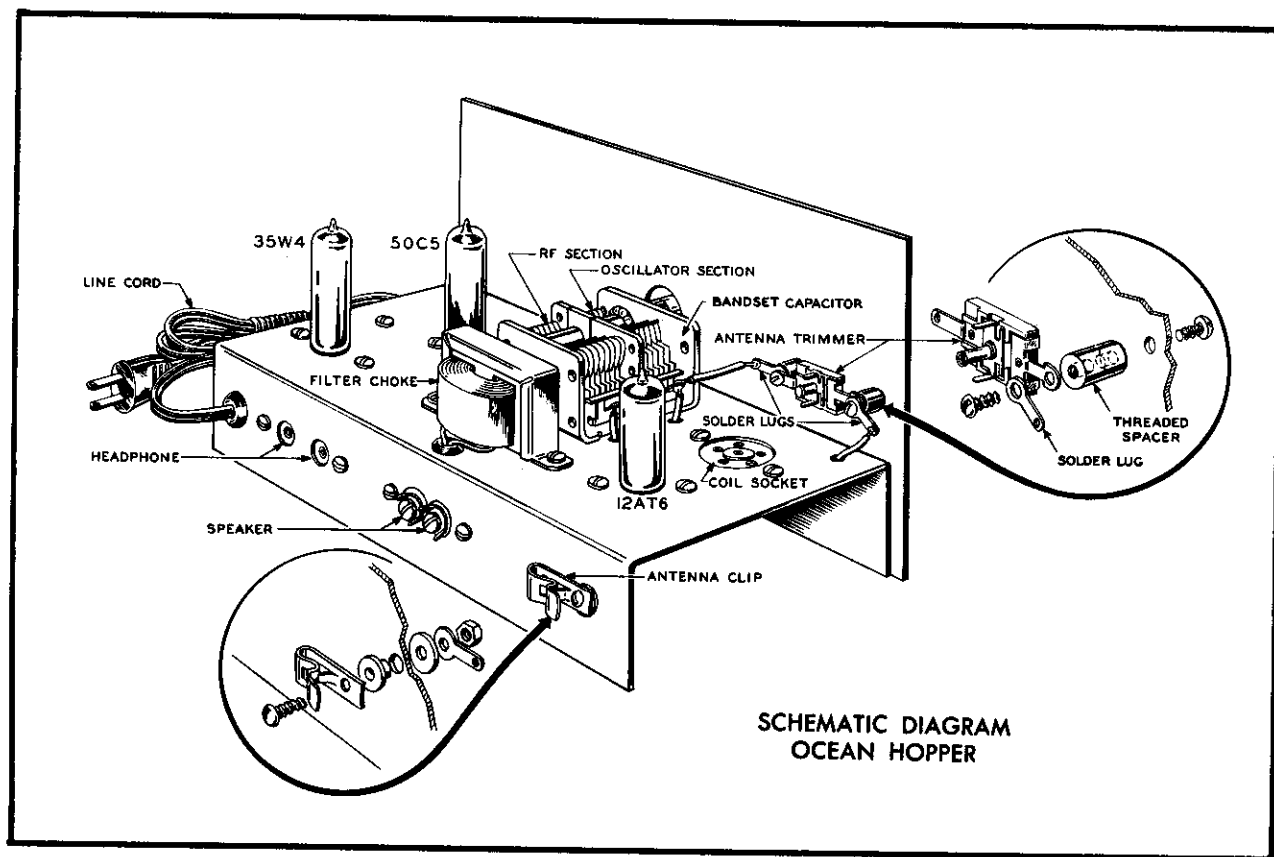
operate at less than rated voltage; this feature tends to lengthen tube life.

The .00025 mfd. mica capacitor, between the 82,000-ohm resistor and ground, filters out any RF voltage in the output of the detector. The .05 mfd. coupling capacitor passes the audio signal from the detector to the 50C5 audio amplifier, without passing DC current which would adversely affect the grid bias on the audio amplifier tube.

The power supply employs a highly efficient filter circuit. High filter capacitance, totalling 60 mfd., as well as a filter choke virtually eliminate hum.

High-impedance headphones (1000 ohms or more) or a permanent magnet loudspeaker may be used. Headphones are connected through .1 mfd capacitors to the output of the 50C5 audio amplifier. A loudspeaker is connected to the secondary of the output transformer. This transformer reduces the high-impedance output of the audio amplifier to the low impedance required for the speaker.

Six coils cover from 1935 to 8.5 meters (155 kilo-



SCHEMATIC DIAGRAM  
OCEAN HOPPER

### Knight-Kit AC-DC "Ocean Hopper"

cycles to 35 megacycles). These coils are of the plug-in type. Each consists of two parts, a primary or tickler winding, and a secondary winding. The mutual inductance between the two windings produces regeneration. The amount of regeneration is controlled by the 10,000-ohm potentiometer connected across the tickler winding. When regeneration is increased beyond a certain point, the detector will oscillate. The point of greatest sensitivity and selectivity is just before or just after the detector oscillates. The point of oscillation is easy to determine, since stations will whistle when oscillating occurs. On stations transmitting voice or music, turn the potentiometer to the point just before a whistle is heard. When receiving code stations, turn the potentiometer until the whistle is heard; this whistle is required when receiving code signals.

The "Ocean Hopper" employs two tuning capacitors. One is a two-section superhet type which serves as the main tuning capacitor. Only one section of this capacitor is used when a short wave coil is

plugged in. However, when receiving long wave or standard broadcast stations, additional capacity is required. This is obtained by a jumper, wired into the long wave and broadcast band coils, which connects the extra section of the main tuning capacitor. The other tuning capacitor (15 mmfd.) provides bandspread tuning. That is, it spreads out stations so that they are much easier to tune. Stations which occupy only a small fraction of an inch on the main tuning dial, and which would be difficult to tune in, can easily be tuned in when the bandspread tuning capacitor is used. Bandspread is not needed on long wave or the broadcast band and the bandspread capacitor has little effect on these frequencies. However, it is highly effective on short wave, where stations are crowded so close together that attempting to tune them without the aid of bandspread is a difficult and annoying task. A 3-30 mmfd. trimmer capacitor in the antenna lead permits proper adjustment of antenna couplings so that "dead spots" caused by excessive antenna coupling can be eliminated.