

patience. The best method is to flare each lead out from the case slightly so that the lead ends form a circle as close to the diameter of the mounting holes as possible. After the leads have been flared, insert them one by one into the PC-board mounting holes. The tab on the case of the IC is at lead No.12 on a 12-lead IC. Serious damage to the IC can result from incorrect connection of leads. To avoid damage, carefully check that leads are in the proper mounting holes before soldering.

After all leads have been inserted into the mounting holes, gently push the top of the IC case down until the base of the device is approximately 1/4 inch from the PC board. All leads can then be bent away from the center of the mounting-hole circle, soldered, and the excess leads cut off. Be sure to let each solder connection cool before soldering the next lead.

Correct battery polarity should be observed when the battery connection is made; improper polarity could seriously damage the IC. Note that the black lead of the battery connector is negative (ground) and the red one is positive.

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RCA

Audio Oscillator IC Kit

KC-4002



for Experimenters and Hobbyists

- R₃ = 2700 ohms, ½ watt (red, violet, red)
- R₄ = 82000 ohms, ½ watt (grey, red, orange)
- R₅ = 22000 ohms, ½ watt (red, red, orange)
- R₇ = 2200 ohms, ½ watt (red, red, red)
- R₈ = 1000 ohms, ½ watt (brown, black, red)

MISCELLANEOUS

- 1 - Battery Clip
- 8 inch - Solder
- 1 - #92CS-15801 Circuit Board
- R₆ = 10000 ohm trimpot, ¼ watt, 10%
- 1 - Battery, 9 volts, RCA VS323 (not supplied)

Fig. 1 - Circuit diagram of the KC-4002 audio oscillator.

oscillator or as a unit for code practice. It can also be used to test high-fidelity equipment and radio transmitters. In combination with other RCA IC kits, it can be used in a single-sideband two-tone test circuit, as shown in Fig. 2.

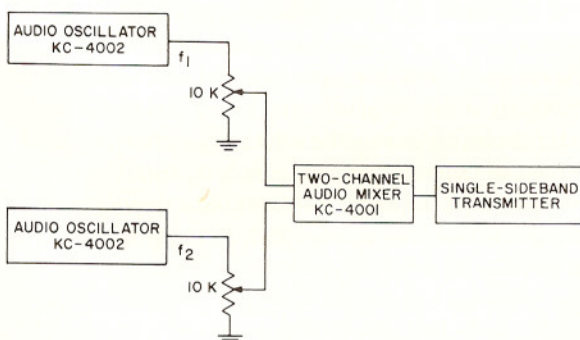


Fig. 2 - Single-sideband two-tone test using two KC-4002 audio oscillator (frequency f_1 is altered to provide 400 Hz; frequency f_2 is altered to provide 1000 Hz).

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Application of this circuit is simple. For best output waveshape, the potentiometer R₆, shown in Fig. 1, is turned so that its arm is closest to the B+ terminal. The arm is then slowly turned back until the unit just starts to oscillate. For best keying characteristics, the arm is turned back slightly more.

A separate kit KC-45000 is available. This kit contains a sturdy prepunched case, input and output jacks, on-off switch, and all the necessary hardware for housing the KC-4002 kit.

SOLDERING

In soldering operations, use only the solder supplied in the kit, which is a high-grade non-corrosive-flux-cored solder. This small-size type of solder is best suited for PC-board work. Also, use a small 20- to 30-watt pencil-type solder iron; a transformer-type soldering gun is not recommended for printed-circuit-board soldering operations. Always use extreme care in making solder connections to the integrated circuit. It is a good idea for inexperienced kit builders to practice soldering first with some pieces of scrap wire. Momentary application of excess heat or even prolonged application of a properly heated soldering iron to an IC lead can permanently damage the device. Always observe the following precautions in soldering to both the IC and component leads:

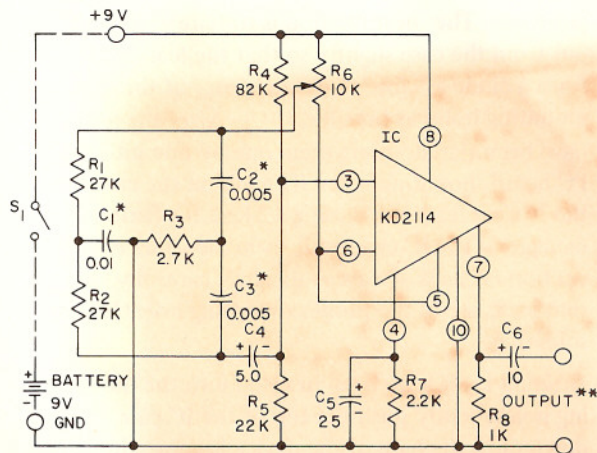
1. Never, under any circumstances, apply molten solder or a hot soldering iron to a component of IC leads for longer than 10 seconds or at a point closer than

AUDIO OSCILLATOR

The design of this Audio oscillator kit is based on the use of an Integrated Circuit (IC) which contains a number of transistors. Some advantages offered by IC's compared to other solid-state devices are economy, reliability, and compactness. These features are demonstrated with the attached RCA integrated-circuit kit. This kit is one of a variety of IC kits that RCA has introduced so that you can learn to utilize the advantages of IC's in practical circuits. Each IC kit features a circuit that has many useful applications in electronic equipment and, in many cases, can be combined with other RCA IC kits.

In most cases where combinations of kits are used to form a system, the printed-circuit (PC) boards may be conveniently "stacked" one on top of the other to permit a compact assembly. Because many of the PC boards in the RCA kits have similar terminal locations, inter-PC board wiring is simplified.

The KC-4002 IC kit contains all the parts required for an audio oscillator. Fig. 1 shows the circuit diagram of the oscillator. The three capacitors C_1 , C_2 , and C_3 supplied with the kit are used for a 2-kHz output; however, by simple replacement of C_1 , C_2 , and C_3 , as indicated in the parts list, the oscillator can produce outputs from 20 Hz to 100 kHz. The oscillator has a relatively distortion-free output of 1.4 volts when connected to a load impedance of 3000 ohms or greater. It may be used as a test



** RECOMMENDED LOAD 3000 OHMS MINIMUM; UNDISTORTED OUTPUT APPROX 1.4 VOLTS.
* SEE PARTS LIST

C_1 = 0.01 microfarads, 12 volts or greater (only for 2000 Hz frequency) *
 C_2 , C_3 = 0.005 microfarads, 12 volts or greater, (only for 2000 Hz frequency) *

* For following frequencies use listed capacitor values

C_1	C_2	C_3		Approx. Freq. (Hz)
200	100	100	picofarads	100,000
1000	500	500	picofarads	20,000
0.002	0.001	0.001	microfarads	10,000
0.02	0.01	0.01	microfarads	1000
0.1	0.05	0.05	microfarads	200
0.2	0.1	0.1	microfarads	100
1.0	0.5	0.5	microfarads	20

C_4 = 5.0 microfarads, 10 volts
 C_5 = 25 microfarads, 6 volts
 C_6 = 10 microfarads, 6 volts
IC = integrated circuit KD2114
 R_1 , R_2 = 27000 ohms, 1/2 watt (red, violet, orange)

1/16 inch from the body of the device or component.

- Keep the surfaces to be soldered clean and the tip of the soldering iron adequately tinned so that the connection can be made as quickly as possible.
- Always provide some type of "heat sink" between the intended solder connection and the case or body of the integrated circuit to conduct heat away from the internal elements of the device. You can prevent excessive accumulation of heat on IC leads by clamping a small alligator clip to the lead being soldered between the soldering iron and the case, by wrapping one strand of stranded hook-

up wire around the IC leads next to the base, or by gripping the lead or terminal to be soldered with a pair of long-nose pliers.

CONSTRUCTION TECHNIQUES

Before starting construction of the preamplifier, identify all the parts with the parts list given below the circuit diagram of Fig. 1. When all parts are identified, position the printed-circuit board so that the mounting holes are arranged exactly as shown in the photograph of Fig. 3. With the board in this position, note the proper location and orientation of each component and proceed with the mounting.

The proper method for fastening components to a circuit board consists of bending the lead wires as required to fit into the proper mounting holes, inserting the wires through the board, bending them over, soldering, and cutting off the excess leads. With the wires bent correctly, the component will be held to the board and will be self-supporting during the soldering operation. Mount the smallest components first, and then proceed with the larger ones. All the components should be mounted as close to the circuit board as possible.

SPECIAL IC HANDLING TECHNIQUES

If the IC is to operate satisfactorily in its final application, special care must be followed in mounting and soldering. The mounting of the IC supplied with this kit is easy with a little time and

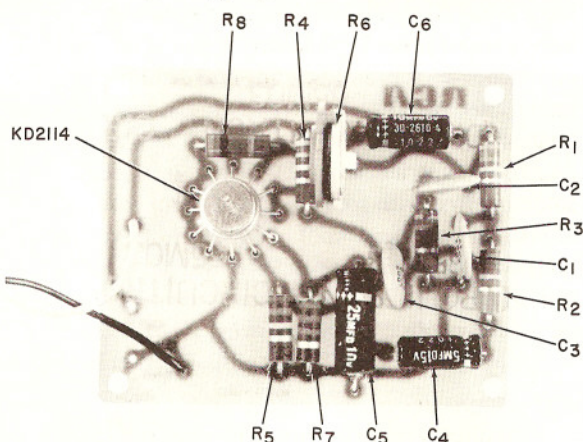


Fig. 3 - Photograph of the KC-4002 audio oscillator showing the component layout.