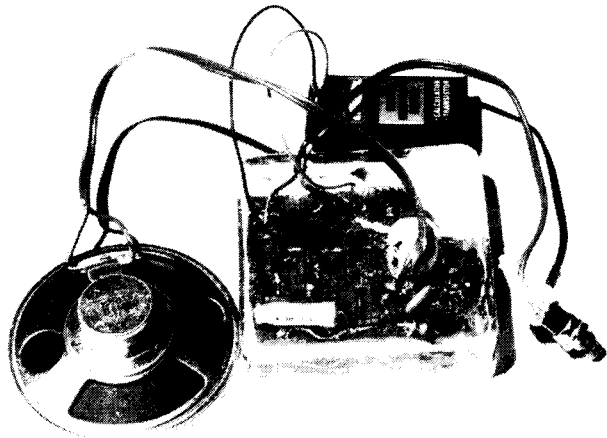


3. ELECTRONIC BIRD CHIRPER

The schematic of the electronic bird chirper is shown in Fig. 3. Transistors Q1 and Q2 form the two halves of a free-running multivibrator whose fre-

quency is determined by the voltage across C8. That capacitor is charged and discharged by closing and opening switch S1.

Transistors Q3 and Q4 make up a variable-frequency oscillator similar to the one used in the siren. The output of the free-running multivibrator frequency



modulates the Q3-Q4 oscillator, causing the "chirping bird" sound. The number of chirps per second is determined by the frequency of the Q1-Q2 multivibrator, which also varies. The pitch of the chirps is determined by C5 and C6.

Construction

Once again, there is nothing critical in

PARTS LIST—BIRD CHIRPER

Resistors, ¼ watt, 5%, unless otherwise noted

R1, R8—20,000 ohms
R2, R4—4700 ohms
R3—12,000-18,000 ohms
R5—180 ohms
R6—5600 ohms
R7—120,000 ohms

Capacitors

C1, C3—10 μ F, 6 volts or higher, electrolytic
C2—3300 μ F, 10 volts or higher, electrolytic
C4—.0047 μ F, Mylar or ceramic disc
C5—0.1 μ F, Mylar or ceramic disc
C6—.02 μ F, Mylar or ceramic disc
C7—200 μ F, 10 volts or higher, electrolytic
C8—100 μ F, 10 volts or higher, electrolytic

Semiconductors

D1—1N914
Q1-Q3—2N3904, 2N2222, or equivalent NPN transistor
Q4—MJE370 or 2N4919 PNP transistor
B1—9-volt battery, transistor-radio type
S1—SPST momentary pushbutton switch, normally open

Miscellaneous: wire, solder, miniature 8-ohm speaker, etc.

the layout of this project; it can be built using any of the popular construction techniques. The chirping is controlled by opening and closing switch S1, a normally open, momentary SPST push-button switch. When you finish the circuit, if the pitch of the chirps is too low and not bird-like, you can omit C5; but monitor the battery current if you do

so. (If you can, substitute a current-limited power supply for the battery while you are testing the circuitry; doing that will prevent the battery from draining. If the current drain exceeds 50 milliamperes when S1 is closed for a second or so, you should raise the value of C6. Be sure to use the listed transistor for Q4.

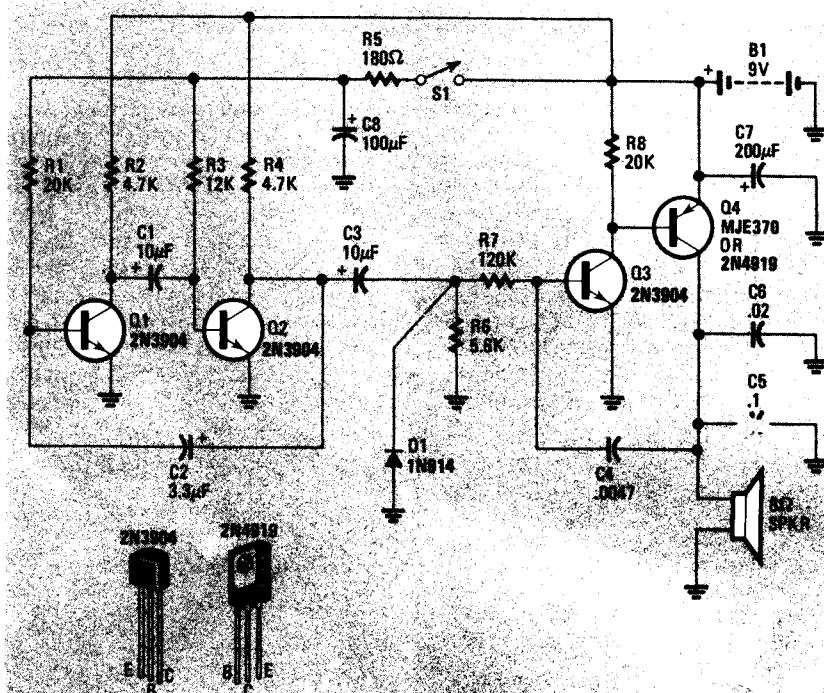


FIG. 3—SCHEMATIC DIAGRAM of the bird-chirper toy. The pitch of the bird sounds is determined by capacitors C5 and C6 (see text).