

Mobile-ON Alarm/Timer

This little circuit could save your car's battery.

by James W. Elkins, Jr. KA8PHO

At one time or another, we have all walked away from our cars and trucks with the mobile rig still powered up. I have done this on many occasions. I don't like the thought of draining the battery. I don't like the thought of the radio accidentally transmitting an unidentified signal, either. The latter could tie up a repeater for hours, or until the culprit is discovered. With these thoughts in mind, I decided that it would be nice to have a control system that would remind me that my equipment was still on. An alarm would do nicely, but another thought that crossed my mind was that I occasionally operate mobile during public service events and so I need to be able to use the radio gear when the car is shut off. I decided that a time delay circuit could be incorporated into the control, to bypass the alarm but still shut itself off after a predetermined time.

The circuit that I put to work for myself is shown in Figure 1. I decided to call it the "Mobile-ON Alarm/Timer." It is a simple but effective device, easy-to-assemble and to install with minimum wiring. The completed unit was placed in a Ten-Tec enclosure, painted and labeled to keep its appearance neat in the automobile. Relay K1 is a heavy-duty type used for switching higher current loads. This keeps you from having to run heavy wires to the circuit, so it could be mounted under the hood near the vehicle's battery terminals. You will also notice from looking at the schematic that I color-coded the wiring. This, I thought, would make it easier to trace back any wiring, if the need ever arises. Nothing is more aggravating than opening the hood and finding a massive amount of red and black wires to weed through. Smaller-gauge wiring can be used

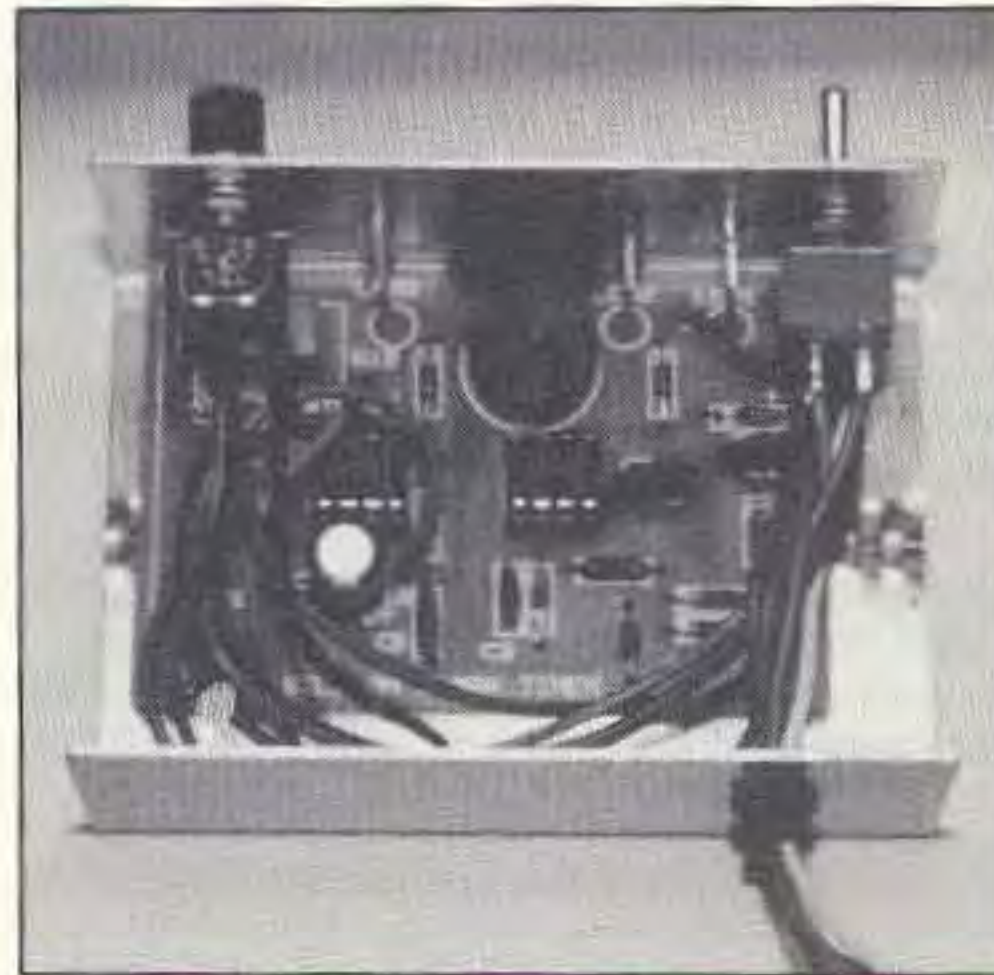


Photo A. A bird's-eye view of the Mobile-ON Alarm/Timer circuitry.

to run back to the control box; 18 or 20 gauge should work fine.

Operation

Three LEDs are mounted through the front of the enclosure. They provide status indications of the circuit. LED 1 will light when the vehicle's ignition is on, or while the car is running. Switch S1 in the ON position will close relay K1, completing the power circuit to the equipment. If the ignition switch is shut off, and switch S1 is still in the ON position, an alarm (piezo) will begin to beep and LED 2 will flash. Returning S1 to the center position will shut everything off. If operation of your equipment is desired after shutting off the vehicle, you can place switch S1 in the AUTO position and momentarily press S2, a normally-open push-button. Depressing this begins a timing

cycle. The length of the time period that the Mobile-ON Alarm/Timer operates before shutting everything off can be "programmed" by selecting R6. The approximate time delays are provided in the chart with the Figure 1 schematic. Or, you could instead change C6. These components control the holding time of relay K1. LED3 will light while the circuit is in AUTO status. Incidentally, you can also cancel the time delay at any time during the delay period by simply switching to OFF.

As shown in the Parts List, all of the parts can be easily obtained from your favorite store, catalog supplier, outlet, or surplus parts dealer. The cabinet I used is a Ten-Tec type, number TP-14, but any enclosure that suits your taste will suffice. A small hole was drilled approximately 1/4" to 3/8" in the

Parts List

Resistors, (1/4 or 1/8 watt)

R1, R5, R8	1000 ohm
R2, R3	100k ohm
R4	470k ohm
R6	Select for time (see Figure 1)
R7	150 ohm

Capacitors (All capacitors 25 or 50 volt ceramic disc type, except C6, which is electrolytic type, 16 volt.)

C1, C2, C4, C5	0.1 μ F
C3	0.01 μ F
C6	100 μ F

Semiconductors

U1, U2	NE555 timer
D1, D2, D3, D4	1N4148 diode
LED 1	Green T1 type
LED 2	Red T1 type
LED 3	Yellow T1 type

Relays

K1	Radio Shack #275-226 SPST 12 volt, 30 amp (not on PC board)
K2	Radio Shack #275-241 SPDT 12 volt
Piezo alarm	Radio Shack #273-074

Switches

S1	DPDT center off, toggle, Radio Shack #275-620
S2	Normally open, momentary, Push button type.

Cabinet

Ten-Tec type TP-14 or similar

Color-coded hookup wire

In-line fuse holder

Drilled and etched PC boards with component placement silk-screened on them are available from Far Circuits, 18N640 Field Court, Dundee IL 60118 for \$3.50 plus \$1.50 S&H per order.

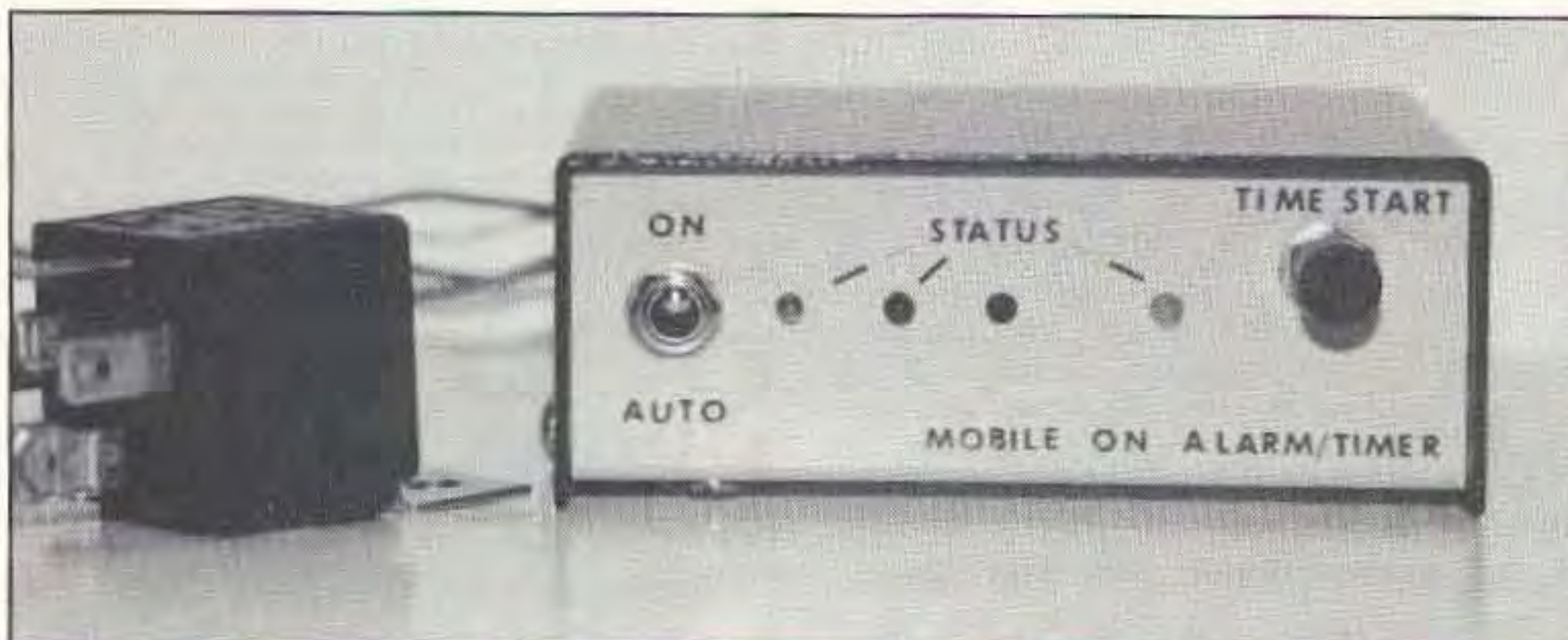


Photo B. The finished unit looks presentable in this painted and labeled metal enclosure.

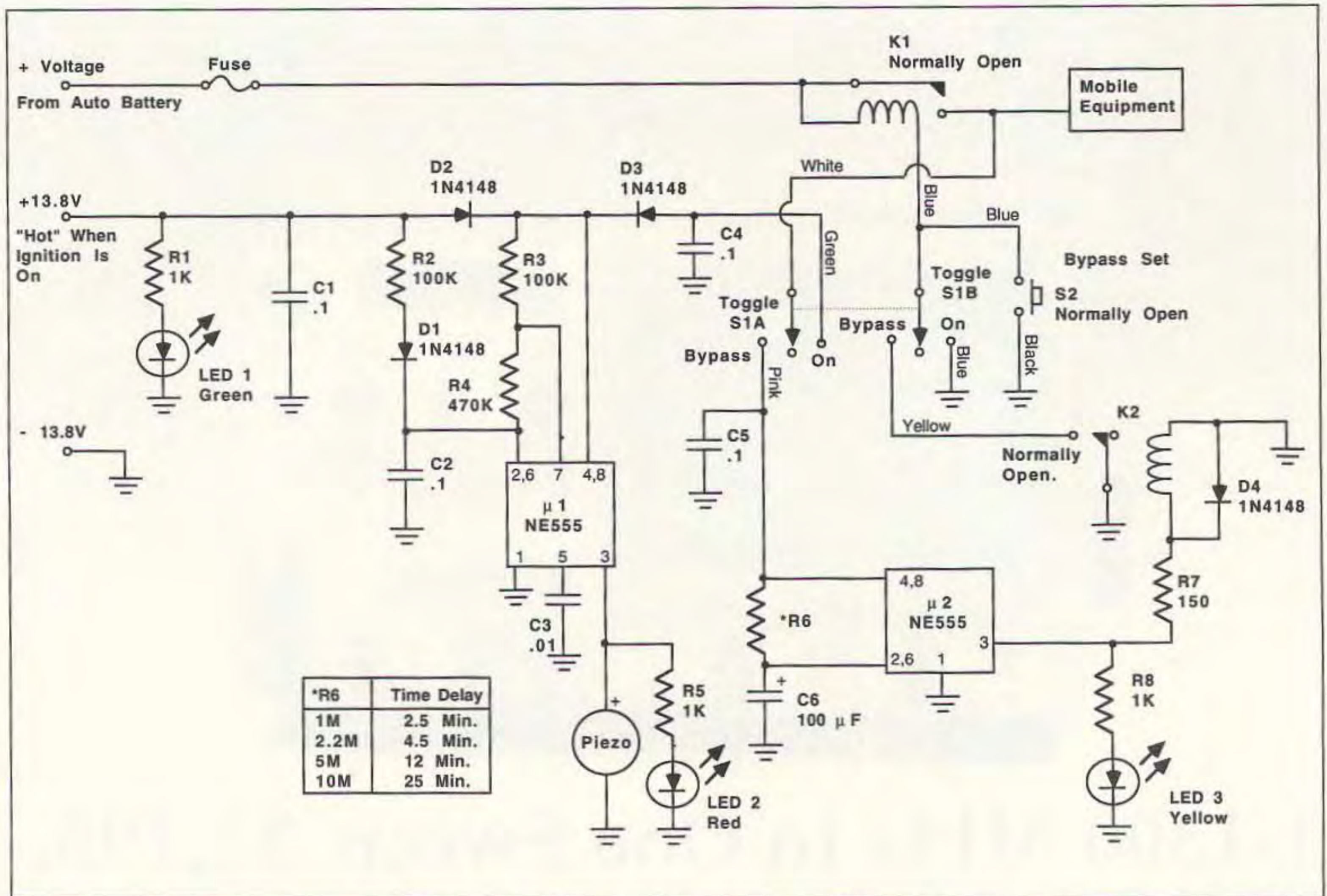


Figure 1. Mobile-ON Alarm/Timer. Notes: 1) K1 and the fuse are not on the printed circuit board; these are located elsewhere in the vehicle. 2) The colors are shown to help reference the wiring to switches, relays, and board.

front to permit the audio tone emitted from the piezo alarm to be heard better. Additionally, a piece of felt or similar material was glued to the inside front panel to keep dust out of the enclosure.

The circuit is probably best assembled on a printed circuit board, but a copper-clad perf board would work also. A PC board etching pattern (Figure 2) is shown, for those of us who have access to making a board, or would like to use one of the popular kits. Alternately, a board with component layout silk-screened

on it is available from Far Circuits, 18N640 Field Court, Dundee IL 60118 for \$3.50 plus \$1.50 S&H per order. Location of the components on the PC board is shown in Figure 2.

After assembly is completed, recheck your wiring to the relay and double-check for solder bridges, etc. Be sure that the correct polarity of the electrolytic capacitor is followed, and that the diodes are installed correctly. Also note that a fuse for the + power lead is installed in line to the relay contacts. The fuse should be able to handle

just slightly more than your equipment draws. Most equipment is fused in the factory-supplied power leads, but adding a main fuse can help here in case of a short near the relay.

I believe that after installing the Mobile-ON Alarm/Timer in your car you will enjoy its operation, and be satisfied knowing that you will not forget to turn off the power to your equipment. And, even if you leave it on in the AUTO position, it will shut everything off for you in a matter of minutes.

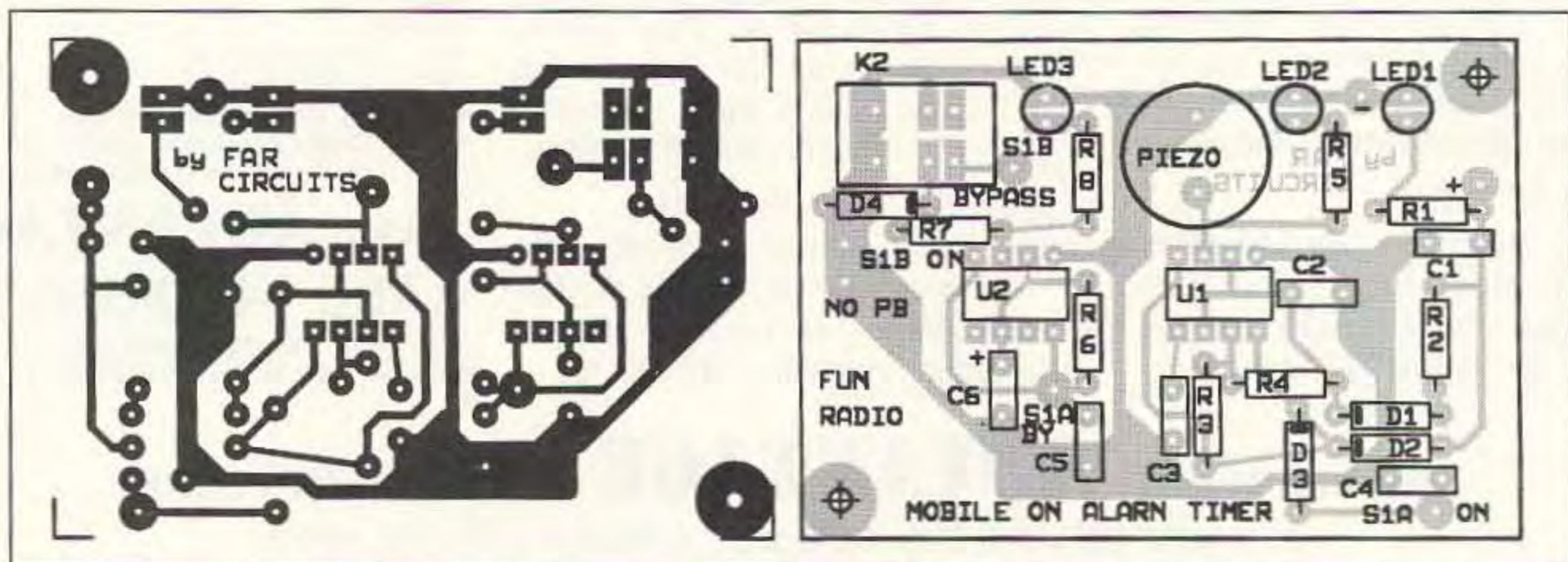


Figure 2. PC board etching pattern and component placement.