

Record/Play TELEPHONE ACCESSORY

Looking for a simple and inexpensive way to connect a tape recorder to your telephone line? If so, give this a try. Recorder isn't energized until receiver is lifted.

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AT ONE TIME OR ANOTHER, MOST OF YOU have had the need to record a telephone conversation. To do so, you've probably had to hunt around for a telephone pickup coil, attach it to the phone and your recorder, hope that the batteries in your tape recorder would last and then try not to get tangled up in the wires and accidentally pull the coil away from the telephone.

With the Telecorder, you can eliminate recording problems. For less than the cost of a commercial unit that does not contain its own power supply, you can build this device which will automatically record all incoming and outgoing calls from your phone. It works with your cassette recorder and any telephone.

The Telecorder (see Fig. 1) contains a built-in regulated power supply that can be used to power the recorder and save batteries. This is particularly important in continuous monitoring applications.

About the circuit

The heart of the Telecorder is the interface module (Fig. 2). This module is the element that interfaces the phone line with the recorder. When it is connected to the red and green wires of the telephone, it senses the voltage across these two wires and produces a switching signal that energizes a relay connected across terminals 3 and 5. A relay switching signal is produced every time the telephone receiver is lifted off the hook.

The interface module also isolates the recorder from the phone line and protects the input of the tape recorder from damage that might be caused by the 90-volt ringing signal. A 10- μ F nonpolarized capacitor is placed across the relay to keep the ring signal from affecting it.

The audio signal from the phone line is fed through the module into the auxiliary audio input jack of the cassette recorder. The operation of the tape recorder is controlled by the relay, whose normally closed contacts are connected to the remote switch jack on the recorder.

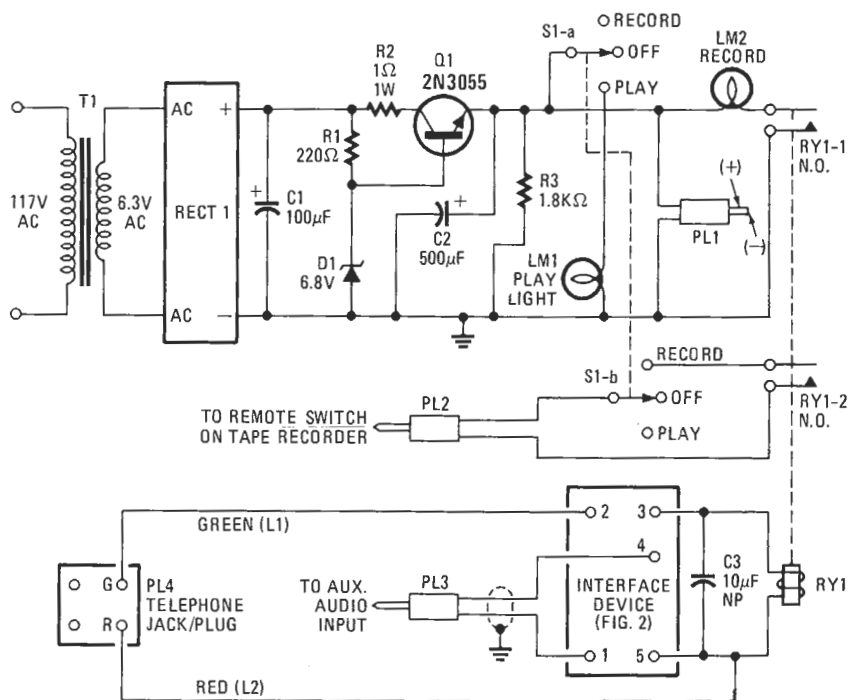
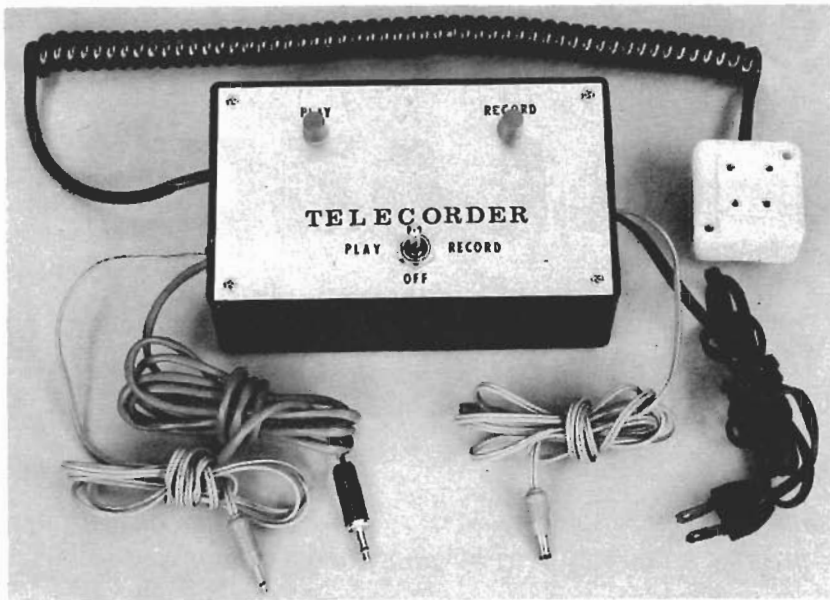


FIG. 1—SCHEMATIC of the Telecorder. The regulated supply can be used to power the recorder, thus eliminating the drain on its batteries. The interface device connects Telecorder to phone line.



The design of the power-supply portion of the Telecorder is relatively straightforward. The AC line voltage is stepped-down and rectified, and then applied to a regulating circuit. The supply's output voltage is determined by the voltage across Zener diode D1 minus the 0.7-volt drop across transistor Q1. If your recorder requires a 7.5-volt supply, substitute an

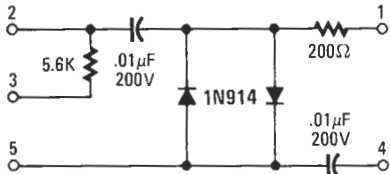


FIG. 2—INTERFACE DEVICE provides matching and isolation between phone and recorder.

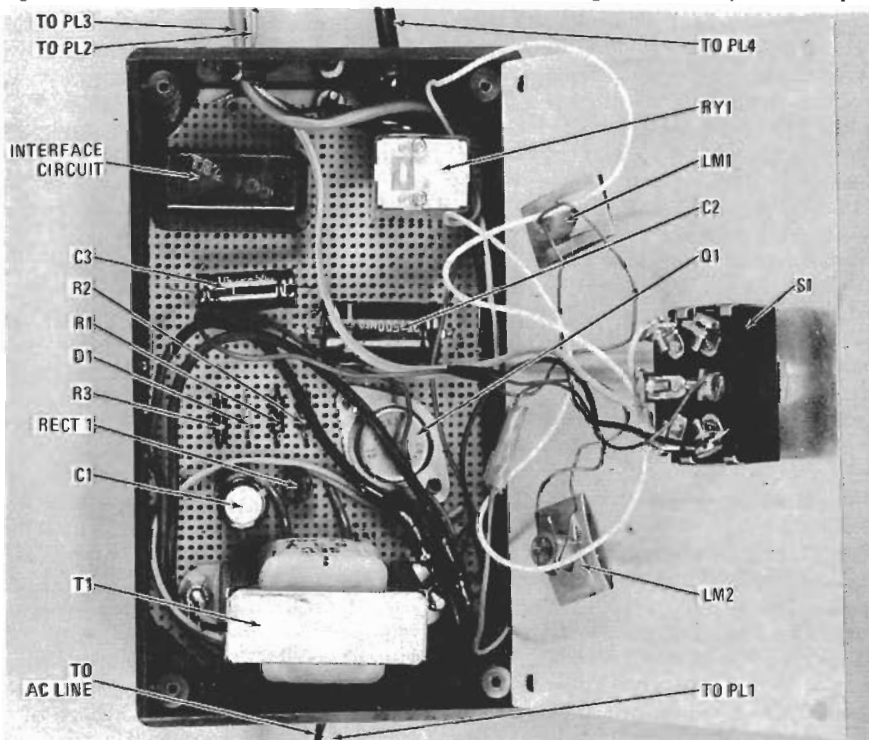


FIG. 3—INTERIOR VIEW OF THE TELECORDER shows the location of all of the components. The simplicity of the circuit makes point-to-point wiring on perforated board easy to use.

8.2-volt Zener diode for the 6.8-volt diode specified.

Construction

The circuit can be easily assembled on a perforated board (see Fig. 3). Except for the two panel lights and the control switch, all components are mounted directly on the circuit board. When installing the semiconductors, make sure to observe the proper polarities and heat-sink their leads while soldering.

In the prototype, the circuit board was mounted in a $6\frac{1}{4} \times 3\frac{1}{4} \times 2$ -inch plastic utility box. Drill three holes in the box to accommodate wires going to and from the Telecorder. Make sure to line these holes with rubber grommets to prevent frayed

PARTS LIST

Resistors $\frac{1}{2}$ watt, 10% unless otherwise noted

- R1—220 ohms
 - R2—1 ohm, 1 watt
 - R3—1800 ohms
 - C1—100 μ F, 16 volts, electrolytic
 - C2—500 μ F, 16 volts, electrolytic
 - C3—10 μ F, 50 volts, nonpolarized
 - D1—6.8-volt Zener diode
 - RECT1—diode bridge, 50 volts PIV
 - Q1—2N3055
 - LM1, LM2—6-volt lamp
 - S1—DPDT center OFF switch
 - PL1—coaxial power plug
 - PL2—subminiature phone plug
 - PL3—miniature phone plug
 - PL4—telephone jack-in-a-plug
 - RY1—24-volt DPDT relay, coil resistance, 2000 ohms
 - T1—power transformer, 115-volt primary, 6.3-volt secondary
- Interface module (see Fig. 2)

wires.

While the layout of the circuit is not critical, it is important that the audio input lead to the tape recorder be shielded to prevent 60-Hz hum from being picked up. A two-conductor shielded cable is recommended, with the shield connected to ground at the PC board. Connections to plugs PL2 and PL3 are not critical in that any wire can be connected to the tip or the body of the plug. The interface module can be built by following the schematic diagram in Fig. 2 and using discrete components.

Installation and operation

The Telecorder can be connected to any telephone or directly to the telephone junction box. But the easiest way to hook it up is to use a telephone jack/plug, available from most electronic parts suppliers. This device fits in between a standard telephone plug and a standard jack.

continued on page 98

TELEPHONE ACCESSORY

continued from page 63

Two of the four terminals on the jack/plug are marked R and G for (red and green). Wire L2 from the Telecorder is connected to terminal R and wire L1 is connected to terminal G. The jack/plug is then inserted into the telephone jack, and the plug on the telephone is inserted into the Telecorder's jack/plug.

When the jack/plug is inserted into the telephone jack, you should hear the relay click. If you do not, check to make sure the wires are properly connected to the jack/plug. Now with the switch in the center (off) position, plug in the AC line cord. None of the panel lights should go on. If the RECORD light is on, the relay isn't working and the unit is probably incorrectly connected to the phone line. If the PLAY light is on, the wiring to the switch is at fault.

Now, set the switch to the PLAY position. The PLAY light should illuminate and the recorder should be operational. If it is, place the switch in the RECORD position. The PLAY light should go out and the recorder should stop. At this point, the RECORD light should not be on. Lift the telephone receiver off the hook. The RECORD light should now go on and the recorder should now be taping anything that is heard in the telephone receiver. When you replace the receiver in its cradle, the light should extinguish and the recorder should stop.

For a continuous monitoring operation, the Telecorder is connected to both the recorder and the phone line, and both units are placed in the RECORD mode.

Note that, although it is not illegal to connect privately owned equipment to the telephone line (due to the 1968 Carterfone Decision), in some areas of the country it is against internal phone company regulations. In those areas, for the device to be strictly legal, it is necessary to place a recorder coupler between the phone line and the equipment to be connected to it. If you want to make sure if a recorder is required in your area, it is best to check with your local phone company.

(Material for this story was taken from the author's book, Telephone Accessories You Can Build. Published by Hayden Book Co., Rochelle Park, NJ 07662. —Editor)

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