

Fig. 2. Component pinouts.

Part	Description	Source
R1	4.7k 5% 1/4W	—
R2	10k 5% 1/4W	—
R3, R4	220 ohms 5% 1/4W	—
C1	470 nF 250V	Salvaged
C2	1 nF	—
Q1, Q2	2N3904	—
U1	UA7805	Salvaged
D1	1N5252B	—
D2-D5	1N4007	—
D6, D9, D10	1N4148	—
D7	Yellow LED	—
D8	Green LED	—
ISO1	Optoisolator	Salvaged
T1	600 ohm to 600 ohm transformer	Salvaged
K1	5V SPST N.O reed relay	Salvaged
J1	Telephone jack	Salvaged
J2	1/8-inch jack	—
P1	3/32-inch plug	Radio Shack #274-289C
P2	1/8-inch plug	Radio Shack #276-286
S1	SPST toggle switch	—
Wall transformer	9V 200 mA transformer	Salvaged
Perfboard	—	Radio Shack #276-1688
Hookup wire	—	—

Table 1. Parts list.

When the tape recorder is in the RECORD mode, the contact closure of K1 starts the recording process. The 600 ohm primary of T1 is connected to the phone line through C1. The 600 ohm secondary has its output clamped at ± 700 mV by D9 and D10 to protect the recorder input during telephone rings. This clamped voltage is connected to the tape recorder "MIC" input.

Because the ring voltage oscillates below 24 volts, the yellow LED will flash during telephone rings. Similarly, K1 will open and close its contacts at 20 Hz during the ring. Depending on the tape recorder, this may cause clicks or tones to be recorded on the tape before the handset is lifted on an incoming phone call. U1 (7805) provides 5V to power the TRA from 9 VDC at J2.

In this design, a heat sink is not required for U1. S1 is used to turn the recording adapter on and off. D8, a green LED, glows to indicate power to the device is on. Turning off S1 will disable the recording function when it is not needed (during modem communications, for example).

Construction

This design uses several components which can be salvaged from a defunct cordless phone or out-of-date modem card. Some of the components that can be salvaged are U1, C2, ISO1, T1, K1, J1, and the 9 VDC wall transformer.

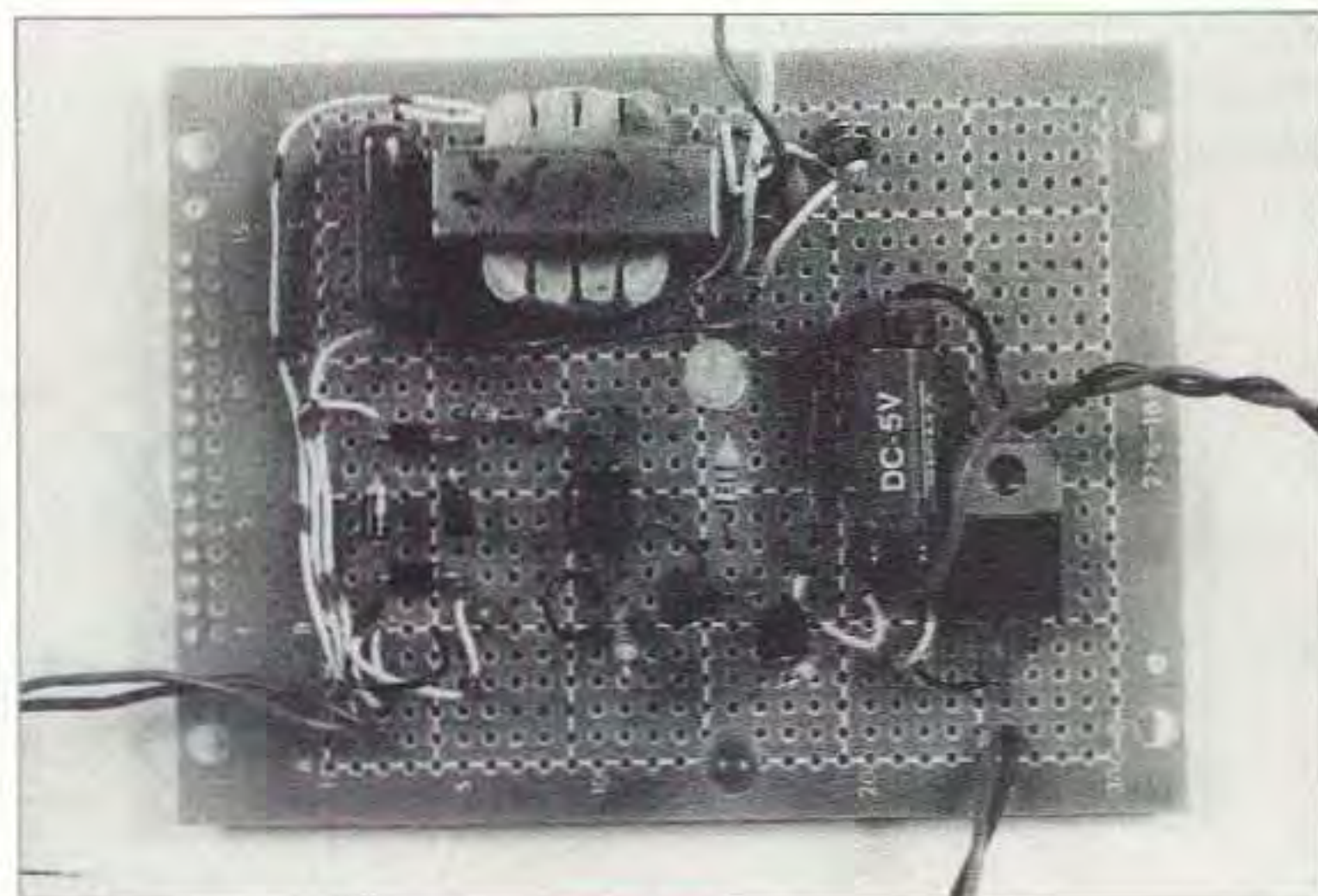


Photo A. Telephone Recording Adapter.

(Record) condition. Q1 turns on K1 (which is connected to the tape recorder "REMOTE" input).

Examine the cordless phone or modem circuit board and remove these components (refer to Fig. 2 and Table 1).

If any of these parts cannot be located, they can be purchased new. A salvaged optoisolator is most likely to have a pinout shown in Fig. 2a or Fig. 2b. An example of a 600 ohm to 600 ohm transformer is shown in Fig. 2c. The primary and secondary may be center-tapped or the secondary windings may have two 600 ohm windings. Note that the impedance of T1 at audio frequencies is 600 ohms, but the DC resistance for a 600 ohm winding impedance is usually between 75 and 200 ohms. The primary and secondary windings may have the same impedance without having the same DC resistance.

Once these windings have been determined, use a permanent marker to label the location of the windings terminals on the transformer. K1 is a 5 V N.O. reed relay. To verify the coil terminals, use an ohmmeter to look for a resistance of a few hundred ohms. When the coil pins are determined, use the ohmmeter to check contact resistance with 5 V applied to the relay coil. The contact resistance should be approximately zero. When the coil voltage is removed, the contacts should be open circuit. When connecting J1 to the Adapter, only the two center terminals out of the six are used.

Assemble the circuit on a piece of perfboard using point-to-point wiring. A printed circuit board is not given

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because of the variety of pinouts of the salvaged components. P1 and P2 are each connected to the perfboard using about 1 foot of twisted pair wire each.

Twisted pair wire can easily be made with a variable speed drill. Simply put the ends of the two wires in the drill chuck and tighten. Hold the other end of the wires taught while running the drill at a slow speed. Turn the wires until the pair has about two turns per inch. Remove the wires from the chuck, trim, strip, and tin the ends.

The J2 ring connection (-) is connected to ground with a 6 inch piece of wire. The J2 tip (+) connection is wired to one side of switch S1. The other side of S1 is connected to the IN terminal of voltage regulator U1. Refer to **Fig. 2d** for U1's pinout. I will leave it up to you to be able to mount the Telephone Recording Adapter assembly into a suitable enclosure.

Testing

Plug in the 9 VDC wall transformer.

Insert the wall transformer plug into J2. Turn on S1. The green LED (D8) should glow. The yellow LED (D7) should also glow, indicating an input voltage at J1 of less than 24 volts. If D7 and D8 are not on, check for proper installation of these LEDs. Measure continuity at P1, tip to ring. The reading should be a short circuit. Next, plug the phone line into J1. With all of the phones on the line "on-hook," the yellow LED should be off. If this is not the case, check for proper installation of D1 through D5.

Use

Obtain a tape recorder with "MIC" and "REMOTE" inputs. The MIC input is a 1/8 inch (3.5mm) jack, while the REMOTE input is a 3/32 inch (2.5mm) jack. Plug the power cord of the recorder into the wall and insert a blank tape (it should be rewound completely) into the machine.

Make sure the 9 VDC transformer is plugged into the wall and its output connected to J2. Verify that S1 is off. Ensure that J1 is connected to the phone line. Next, plug P2 into the MIC input and plug P1 into the REMOTE input of the tape recorder. Put the tape recorder in the RECORD mode (this is usually accomplished by pressing the PLAY and RECORD buttons simultaneously).

Then, turn on S1. The green LED should glow. The yellow LED will glow if any telephone on the line is "off-hook." When the yellow LED is on, the phone conversation is being recorded. As mentioned earlier, turn off S1 to disable the Telephone Recording Adapter.