

The 556 timer Phone Answering Machine¹

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Introduction:

This circuit offers a simple example of the 556 Dual Timer IC (along with a handful of discrete components) to form a simple Phone Answering Machine. The system interfaces with a cheap wireline phone and a spare cassette tape recorder to both send and receive audio to/from the phone after it takes it “off hook” when it rings, as well as give the caller a fixed 25 seconds to leave a message.

How it works:

The heart of this circuit is two 556 Dual Timer IC's (i.e. each chip contains a pair of 555 timers). The 1st timer (IC U1a, configured as a single shot pulse generator) starts a 10 second count (seen at Test Point “A”) when the phone's 5 volt piezo ringer starts ringing. After 10 seconds of ringing, the 2nd timer (IC U1b, also configured as a single shot pulse generator) is triggered, issuing a 2 second high pulse. This 2 second pulse activates the 3rd timer (IC U2a, configured as a free-running oscillator) generating the “beep” prompt.

Coincident with the firing of timer 2 (i.e. after the 10 second ring interval), timer 1's pulse is also used to trigger timer 4 (IC U2b, configured as a single shot pulse generator), starting the 25 second message recording interval. The output of timer 4 is used to activate relay K1, which takes the phone “off hook” while at the same time connecting power to the cassette recorder, turning it on (the recorder being previously setup to be in record mode when power is applied).

Though not quite as fancy as many answering machines on the market, this circuit does however offer an excellent example of the usefulness of the 555 / 556 timer IC's. Further, this circuit can easily be adapted to suit other similar joint single shot/tone generator applications (not to mention offering a “cheap and dirty” home brew answering machine).

Should some experimenter wish to add some of the missing phone features (i.e. a “leave a message at the beep” greeting, a caller count display, or a variable message record interval based on when the caller hangs up, etc.), these can easily be added to this circuit simply by inserting additional sections into the system and tapping off the various timer outputs.

For example, a greeting message can be added to this system by inserting an additional timer and cassette/voice chip (e.g. ISD1110p voice chip available from Jameco.com for \$7) after timer 1 (IC U1a). The output of timer 4 (IC U2b) can also be inverted (e.g. using another 2N3904) and fed into a 7493 TTL counter ganged with a 7447 and 7-segment LED to display the number of calls received while out (see the 556 Burglar/Wildlife Alarm project for a schematic figure). If one constructs a phone line voltage monitoring circuit, one could also use the voltage change on the phone line to signal when the caller ends the call to reset the system (rather than at the end of the fixed 25 second count off timer 4) – however care needs to be taken to not load down the phone line (or otherwise do anything that would upset the phone company).

¹ See “EpiphanyBySteveLee.com” for additional information to be added over time.

