

# Call Progress Tone Detector Applications

The M-980 is an 8-pin DIP or 16-pin SOIC signal detector that operates on energy in the frequency band of about 300 to 650 Hz. Its primary use is in the detection of status tones encountered during dial telephone calls. These tones include dial tone, circuits busy, audible ringing, station busy, and others. Call status is derived by examining the cadence of those tones—some of which are illustrated in Table 1.

Typical uses are shown in Figures 1, 2, and 3. Figure 4 shows a simple scheme for connecting the M-980 to a balanced telephone line.

**Notes:** Rejection of common mode signals is enhanced by keeping the input network balanced—this means 1% resistors and capacitor values as closely matched as possible.

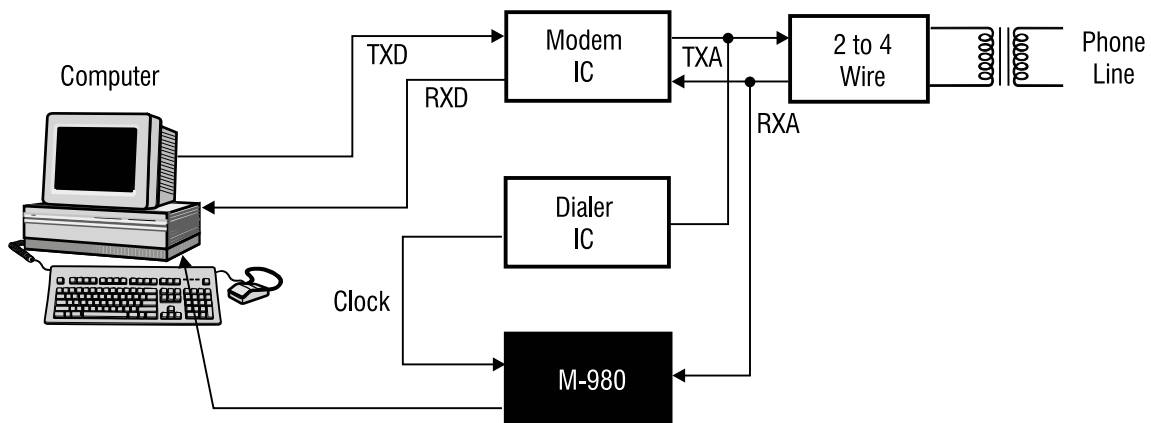
The dynamic range of the M-980 is very wide, making it very sensitive to power supply noise. Good high frequency bypassing is recommended.

The basic sensitivity of the M-980 is -40 dBm, but in general it is best to use the least sensitive configuration possible to optimize transient response and to limit spurious DETECTs. The gain of the buffer stage shown in Fig. 4 may be varied to obtain the sensitivity required for a given application. The gain of this stage is equal to the ratio of Rf to R1. When the value of Rf is changed from that shown in Fig. 4, R4 must be changed to keep the parallel combination of Rf and R4 equal to R3.

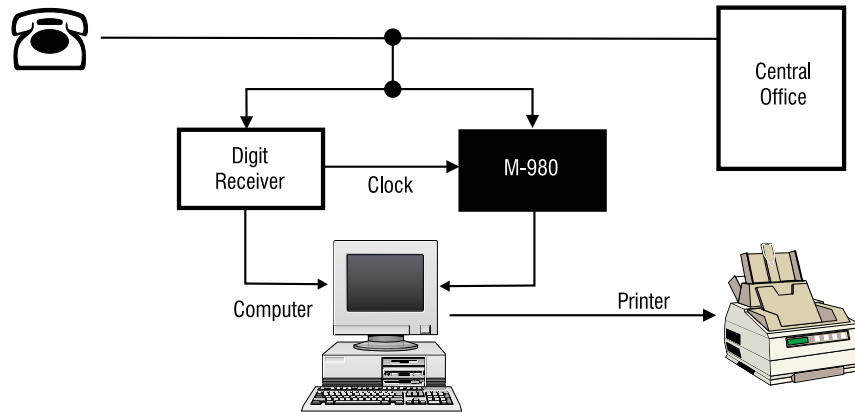
**Table 1. Some Common Call Progress Tone Cadences and Frequencies**

Dial Tone	
Cadence	On, steady
Frequencies	400, 425, 350 + 440, 600 x 120, 33 Hz
Audible Ring	
Cadence	2 sec on, 4 sec off, . . ., or 1/3 sec on, 1/3 sec off, 1/3 sec on, 2 sec off, . . .
Frequencies	400, 425, 440 + 480, 420 x 40, 450, 400 x 25 Hz
Busy Station	
Cadence	1/2 sec on, 1/2 sec off, . . .
Frequencies	400, 425, 480 + 620, 600 x 120, 450 Hz
Reorder (busy circuits)	
Cadence	1/4 sec on, 1/4 sec off, . . ., or 1/2 sec on, 1 sec off, . . .
Frequencies	400, 425, 480 + 620, 600 x 120, 450 Hz

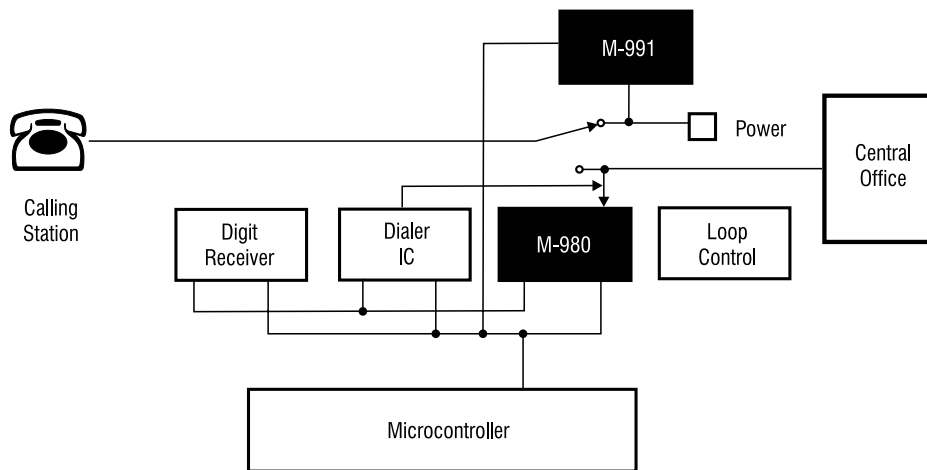
**Figure 1. Detecting Dial Tone and Secondary Dial Tones in an Automatic Dialing Data Modem**



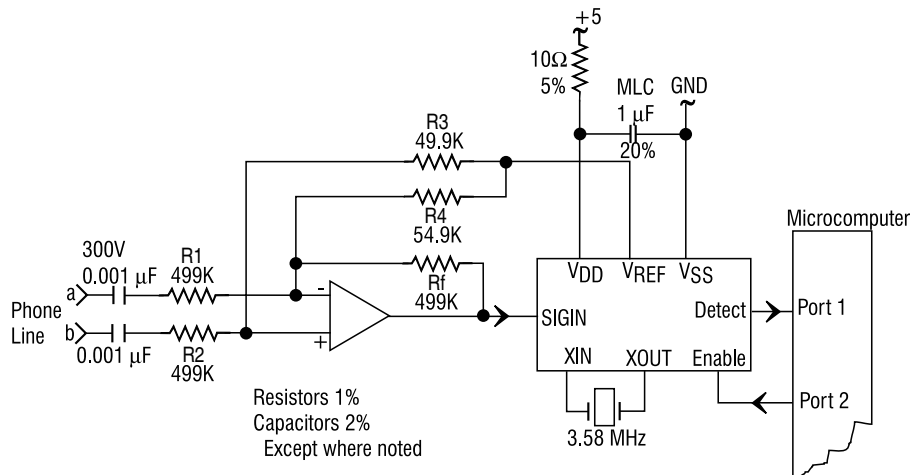
**Figure 2. Call Detail and Completion Monitor in a Billing System**



**Figure 3. Call Routing in a Speed Dialing System**



**Figure 4. Telephone Line Circuit Application**



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