Telephony Dialing and Signaling Tones

North American Call Progress Tones (CPTs)

FUNCTION	FREQUENCIES	TIMING
Dial Tone	350 Hz + 440 Hz	Continuous
Ring Back	440 Hz + 480 Hz	ON 2.0, OFF 4.0 seconds
Busy	480 Hz + 620 Hz	On 0.5, OFF 0.5 seconds

RING SIGNAL TO PHONE:
Voltage: 40 Volts RMS (or more) at 20 Hertz (sinusoidal)
Timing: ON 2.0, OFF 4.0 Seconds

THE DIALER: PULSE and TONE

In the early days, to call someone you picked up the telephone and told the operator the number of the person to whom you wanted to be connected. Then the operator connected you. But soon telephones were built so that you entered the number yourself. Originally, you entered the numbers by means of a rotary "dial" as shown in Figure 1 (A). As you "dialed" the digits of the number, a switch connected to the rotary would pulse the DC loop-current. Figure 1 (B) shows that when the digit 3 was dialed, the loop-current was interrupted three times. The central office equipment would detect the pulses and decode the number.

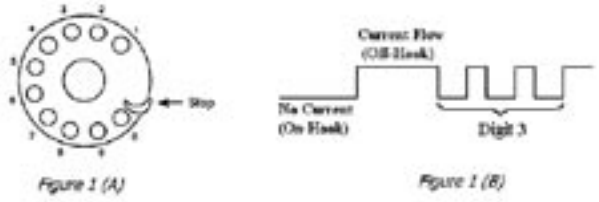

Figure 1 (A) Figure 1 (B)

Figure 1

Newer phones use a system called "Dual-Tone Multi-Frequency" or DTMF. Touch-Tone® is the name used by AT&T for the system. DTMF uses push-buttons as shown in Figure 2. When you push the button corresponding to a digit, circuitry inside the telephone generates a pair of tones. For example, pushing the button for digit 3 will produce a 697 Hertz tone along with a 1477 Hertz tone. Equipment at the central office detects the tones and decodes the number.

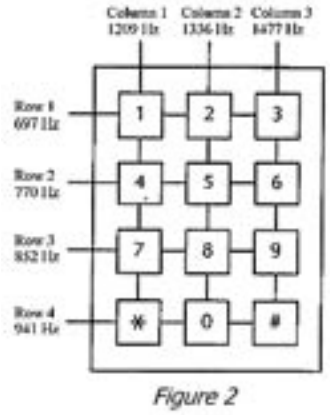

Figure 2

Figure 2