

TEL TONE®**M-917**

M-917 DTMF DECODER AND DIAL PULSE COUNTER

T-75-27-07

The Teltone® M-917 Receiver Module is designed for applications where a high-performance central office grade Touch-Tone® DTMF (Dual-Tone Multifrequency) detector and/or a rotary dial pulse counter is required. The receiver's compact size and low heat emission make it well suited for high-density packaging.

The receiver, as functionally displayed in Figure 2, consists of a bridging buffer amplifier, dial tone filter, bandsplit filter, and a crystal-controlled digital frequency detector capable of detecting all 16 DTMF digits. A dial pulse counter detects rotary dial digits. The unit can be programmed to accept DTMF signals only, rotary dial pulses only, or to provide mixed DTMF and rotary dial operation.

Data outputs interface with a variety of external devices. These outputs are available in partial 2 of 8 (for use in inhibiting * and # outputs), partial 1 of 12 (for use in inhibiting A, B, C, and D outputs), binary, or blank formats. Figure 3 displays related DTMF digit codes.

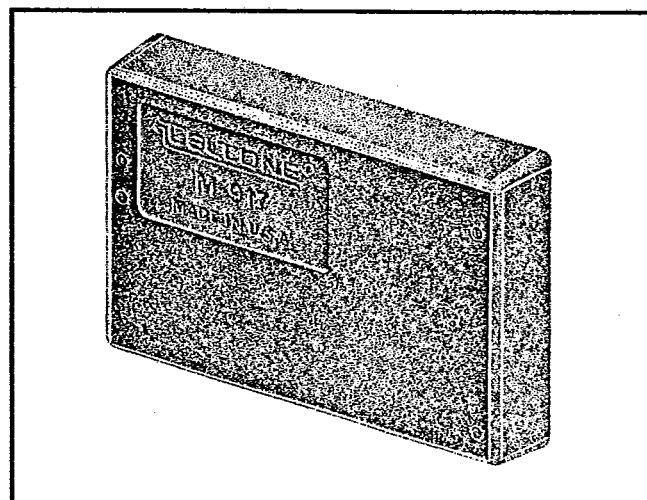


Figure 1 M-917 Receiver

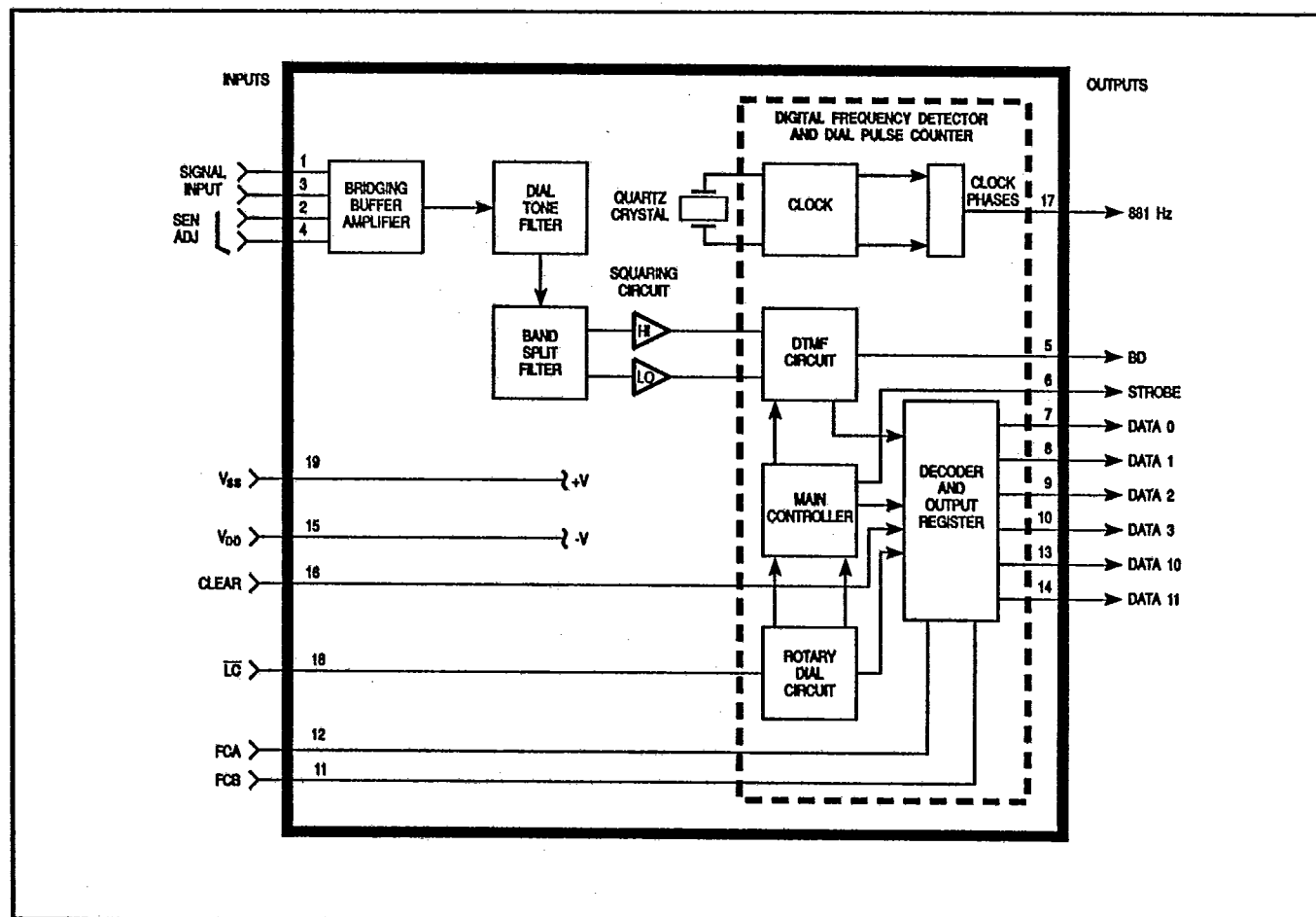


Figure 2 Block Diagram

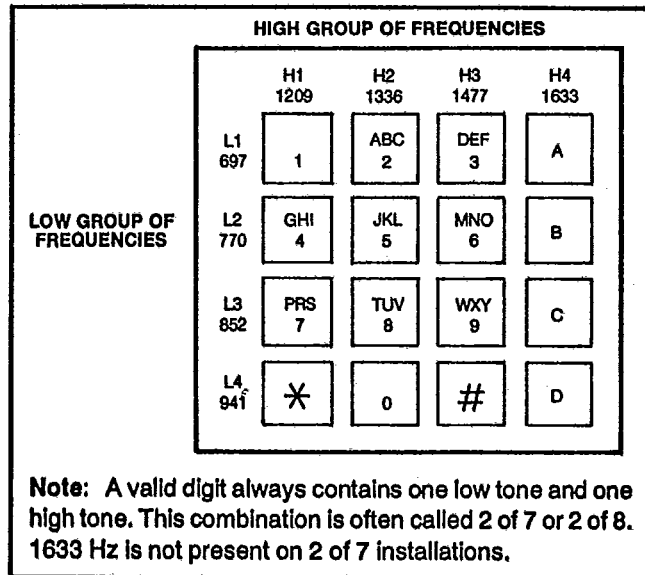


Figure 3 DTMF Signal Format

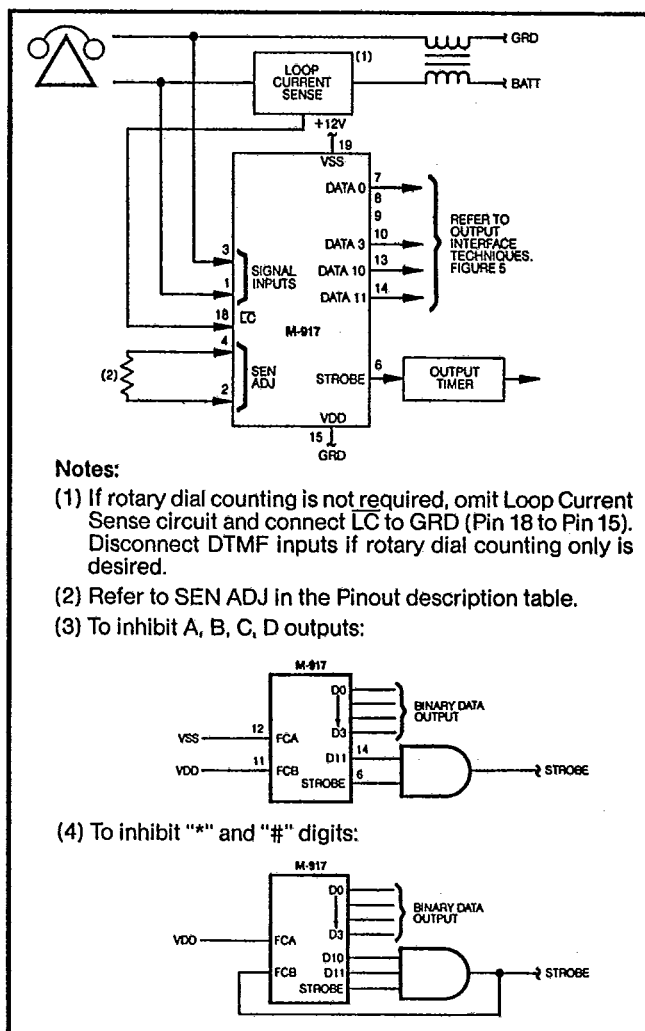


Figure 4 Applications

The M-917 provides maximum flexibility in a variety of customized applications. Input/output features are illustrated in Figure 4. Refer to Figure 5 for output interfacing techniques.

Features

- A complete LSI digital Touch-Tone detector and rotary dial counter contained in a module requiring less than 3.25 x 2.25 x 0.635 inches.
- Meets or exceeds telephone central office requirements for DTMF recognition and voice talkoff protection.
- Fully time-guarded rotary dial pulse counting.

Table 1 Output Formats

	DIGIT	1	2	3	4	5	6	7	8	9	0	*	#	A	B	C	D
DATA	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	2	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1
	3	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1
	10	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1
	11	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1

Partial 1 of 12 Output Format
(FCA=0, FCB=0)

	DIGIT	1	2	3	4	5	6	7	8	9	0	*	#	A	B	C	D
DATA	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0
	1	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0
	2	0	0	0	1	1	1	0	0	0	0	1	1	1	1	1	0
	3	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0
	10	1	1	0	1	1	0	1	1	0	1	1	0	1	1	1	1
	11	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0

Binary and Partial 2 of 8 Output Format
(FCA=1, FCB=0)

	DIGIT	1	2	3	4	5	6	7	8	9	0	*	#	A	B	C	D
DATA	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0
	1	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0
	2	0	0	0	1	1	1	0	0	0	0	1	1	1	1	1	0
	3	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0
	10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Binary Output Format
(FCA=0, FCB=1)

	DIGIT	1	2	3	4	5	6	7	8	9	0	*	#	A	B	C	D
DATA	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Blank Output Format
(FCA=1, FCB=1)

□ BINARY
□ DATA

- Decodes all 16 DTMF digits and counts rotary dial digits.
- Crystal-controlled LSI digital circuitry assures maximum frequency detection accuracy and stability.
- Provision for adjusting tone detection sensitivity.
- Precision clock output at 881 Hz.
- Selectable output format.
- Selectable button-up or button-down operation.
- Separate output indicates early tone presence.
- Single voltage operation (12 VDC).
- Low power consumption: typically 420 mW (35 mA at 12 VDC).

Applications

- PBX and central office receivers
- Data transmission
- Tone and/or rotary dial controlled dictation links.
- Radio telephone systems.
- Other applications using a telephone dialing mechanism or an analogous device to convey information.

Installation Data

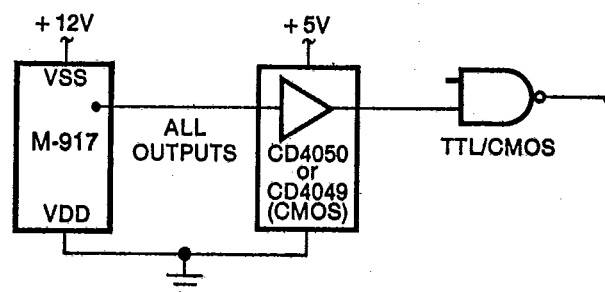
Mounting pin assignments and dimensions for the M-917 are shown in Figure 6.

The M-917 module is packed in an electrically conductive bag to protect MOSFET components from static electricity damage. The module should not be removed from this bag until ready for use. During or after removal, avoid touching M-917 connector pins. Observe static electricity precautions whenever handling the module.

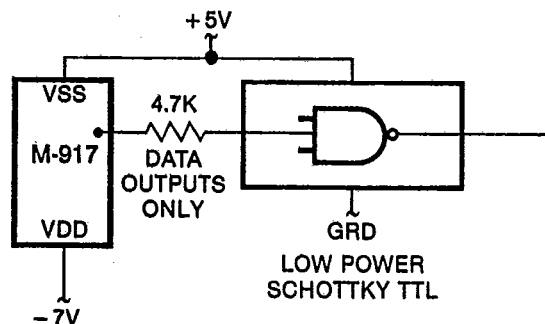
Table 2 Absolute Maximum Ratings

Supply voltage (V_{SS} referenced to V_{DD})	15 V
Lightning protection, analog inputs, differential and common modes (CCITT Rec. K.17.2)	1500 VDC
Analog inputs (constant voltage, differential and common modes)	300 VDC
Digital inputs ($V_{DD} = 0$ V)	-0.3 V to ($V_{SS} + 0.3$ V)
Operating temperature range (T_A)	0 to 55 °C
Storage temperature range (T_S)	-40 to 85 °C
Lead soldering temperature (0.035-inch from package for 10 seconds)	256 °C
Relative humidity limits	0 to 85%
Meets environmental requirements of CEPT T/CS 213.	

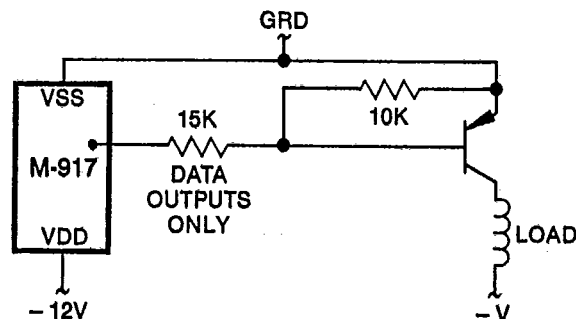
1. TO TTL OR CMOS AT A LOWER SUPPLY VOLTAGE



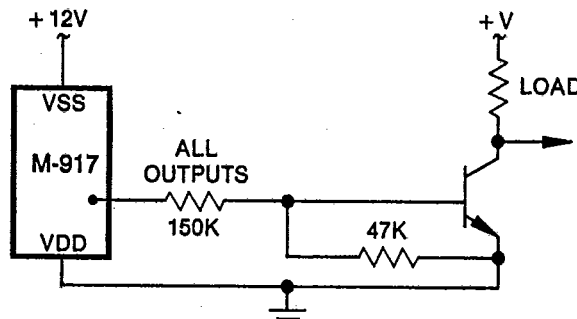
2. TO LOW POWER SCHOTTKY TTL



3. TO RELAYS OR DISPLAYS (NEGATIVE SUPPLY)



4. TO TRANSISTOR DRIVERS



5. (NOT SHOWN) TO CMOS AT THE SAME SUPPLY VOLTAGE—INTERFACE DIRECTLY (ALL OUTPUTS)

Figure 5 Suggested Output Interface Techniques