METRO TEL CORP.
DIGIT GRABBER®
MODEL TPM-32
Digit Display

INSTRUCTION MANUAL

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APPLICATION

The Digit Grabber allows monitoring and analysis of both DTMF and Pulse digits dialed through a telephone system. Two modes of operation are provided. In the Display mode, digit strings of up to 32 characters are captured and "frozen" on the screen; a simple touch of the reset button clears the screen. In the Analysis mode, digit strings of up to 16 characters are displayed on the top line of the screen, while digit timing information is simultaneously displayed on the bottom line of the screen. Since the Digit Grabber is a high-impedance monitoring device, it may be connected directly across a phone line without loading the line. The built-in monitor speaker allows tones to be heard as they are being displayed. Battery powered and portable, the Digit Grabber provides instant access to signaling information -- whenever and wherever needed.

OPERATION

GENERAL

1. Insert the modular plug on the test lead into the LINE jack on the front of the Digit Grabber.
2. Connect the test lead clips to the telephone line Tip and Ring. In testing other types of equipment, the LINE input may be connected to any point in an audio circuit carrying DTMF signals.

DISPLAY MODE

1. Turn power on by pressing the power switch to the up position. A flashing cursor should appear in the upper left-hand corner of the display.
2. As digits are received, they will appear at the location of the cursor. When the first line is full, the cursor will go to the second line. When the second line is full, the cursor will return to the first line.
3. Press the RESET button to clear the display.

ANALYSIS MODE

1. Turn power on by pressing the power switch to the down position. A flashing cursor should appear in the upper left-hand corner of the display. Nothing will be displayed on the second line of the screen until digits are received.
2. The Digit Grabber collects and displays up to 16 DTMF Pulse Dial digits, along with data on the timing of the dialing activity. Digits are displayed on the top of line of the screen. If more than 16 digits are received, the cursor will return to the beginning of the line, and additional digits will overwrite the previous line of data. The digit display line may be cleared by pressing the RESET switch.
3. When the DTMF digits are received, the DTMF "on" time is given in the lower left-hand corner of the screen. The time from the end of the last DTMF tone burst to the beginning of the tone burst currently being written in the top line is the inter-digit, or "off" time, and is displayed in the lower right-hand corner of the screen. If either the "on" or "off" times exceed 250 milliseconds, then the symbol "???" will appear in their respective screen locations. These times are

displayed to the nearest ten milliseconds. In the case of dialing a single digit, the “off” time will always be exceeded
4. When Pulse Dial digits are received, the dialing speed, in pulses per second (PPS), is given in the lower left-hand corner of the screen. The make/break ratio (M/B) is given in the lower right-hand corner of the screen. In the case of a single digit “1” being dialed, all analytical data will be displayed as zeros, since without successive pulses, no inter-pulse periods can be calculated.

PULSE DIAL SENSITIVITY SELECTION

Most phone systems operate on a DC voltage of 48 Volts; however, some PBX and key systems may instead utilize a 24-Volt battery. A jumper option on the circuit board of the TPM32 allows it to accommodate either of these possibilities. If the jumper plug at J7 is installed at pins 2 and 3 (factory setting), the set will pick up pulse digits on all 48 Volt systems, including DID lines. To display pulse digits from 24 Volt systems, the jumper plug should be between pins 1 and 2 of J7. In this position, the set will also display pulse digits from the subscriber end of a 48-Volt system, but will not work on the DID lines. To change the setting of J7, remove the four screws from the back of the set, remove the front cover and make the appropriate jumper setting. Replace the front cover and the four screws, being careful not to over-tighten.

BATTERY REPLACEMENT

Replace the battery when the display screen becomes faint. The battery is accessed by sliding off the removable cover on the back of the set. To preserve battery life, turn the set off when not in use.

WARRANTY/CUSTOMER SERVICE

Metro Tel Corp. guarantees to the original purchaser of this product that if it proves to be defective in workmanship or in material within a period of 90 days, the defect will be repaired without charge. For warranty service, return your unit to the New London, Minnesota factory, along with a note describing the problem, plus proof of purchase. If after reading these instructions, you have a question regarding its operation, call our customer service department in Omaha -- **Phone: 888-998-8300**.

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Ship To: RTA# __ __ __ __ __ __ __

METRO TEL CORPORATION
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SPECIFICATIONS

Parameter	Min	Typ	Max	Unit
DISPLAY				
Display Capacity			32	digits
Display Font		Full Alphanumeric		
Display Type		Liquid Crystal		
DTMF INPUT:				
Input Level	-26		+3	dBm
Twist	-8		+8	dB
Frequency Deviation Accept Limit			+/- 2.5	%
Frequency Deviation Reject Limit	+/-3.5			%
Tone Duration Accept	40			mS
Inter-digit Pause Accept	40			mS
Characters Displayed		0-9, *,#,A,B,C,D		
Input Impedance		100		kOhms
PULSE DIAL INPUT:				
Off-Hook Voltage0			40/16*	VDC
On-Hook Voltage	44/22*	48	100	VDC
Pulse rate	7	10	22	PPS
Interdigit Time	250			mS
Characters Displayed		0-9		
|	*depends upon option setting			
ANALYSIS MODE:				
PPS range	7		22	PPS
Resolution			1	PPS
Make/Break Ratio	30/70		70/30	%
Resolution			1	%
DTMF “on” time	30		250	mS
Resolution			10	mS
DTMF “off” time	30		250	mS
Resolution			10	mS
GENERAL				
Dimensions		4”h x 7.5”w x 1.375”d		
Operating Temp.	0		60	deg C.
Battery		Duracell MN-1604 or equiv.		
Battery Life			75	hours