

**3M**

**Dynatel™**

2273 Advanced Cable/Fault Locator



## Measure and pinpoint sheath and conductor faults, locate cable path/depth quickly and easily with this lightweight, easy-to-handle unit

The 3M™ Dynatel™ 2273 Advanced Cable/Fault Locator is a microprocessor-based system that incorporates advanced digital signal processing techniques to quickly and efficiently locate sheath (earth return) faults and trace the path of underground cables, both copper and fiber optic (with metallic trace wire). Lightweight, compact and well-balanced, the 2273 cable/fault locator accurately:

- Locates cable path
- Measures cable or sonde depth with the push of a button
- Measures signal current in the cable
- Pinpoints sheath faults and cable breaks
- Discriminates between light and heavy faults
- Identifies cable and cable pairs
- Tones shorts and grounds in aerial cable
- Identifies cable pairs through wet sections
- Locates energized power cable

The 2273 advanced cable/fault locator provides accurate cable or sonde depth measurements, giving a digital readout in inches, feet and inches, or centimeters (user-selectable).

Additionally, when used in conjunction with the 3M™ Dynatel™ 2205/2206 EMS Marker Locating Accessory, the system can:

- Pinpoint the exact location of buried EMS markers
- Trace a cable path while simultaneously finding buried markers along the way

## Four modes of operation for accurate locates, even in congested areas

For cable path locating, the Dynatel 2273 Advanced Cable/Fault Locator receiver uses one of four user-selected locating modes – dual peak, dual null, differential or special peak (which increases the sensitivity of the receiver for tracing over longer distances). The mode is selected depending on which is most effective under the locating conditions.

The receiver includes four volume settings, including a special “expander” function that makes peaks and nulls more pronounced. The expander feature enhances the amplitude difference between two conductors carrying the same signal, making the unit extremely accurate, even in congested areas. A headphone jack is also included.



The Dynatel 2273 Advanced Cable/Fault Locator can be used with the Dynatel 2205/2206 EMS Marker Locating Accessory. 2

## Precisely locates faults

The 2273 cable/fault locator can precisely locate sheath (earth return) faults on both short and long cable sections. The unit sends a trace signal simultaneously with a fault-locate signal, allowing the operator to use the cable-locate function when locating sheath faults in long cable sections. Sheath (earth return) fault strength is indicated on the receiver LCD display, allowing minor faults to be ignored, if desired.

## A simple, easy-to-use system

The Dynatel 2273 advanced cable/fault locator is easy to operate and requires very little training. Digital liquid crystal display (LCD) readout and push-button operation make the unit easy to understand, for more precise locates. A “memory” feature remembers operator set-up from previous use.

The system consists of three basic components:

- Transmitter with built-in ohmmeter, which also senses and measures the presence of foreign voltage, and tests the continuity of the circuit.
- One-piece hand-held receiver with bar graph that indicates received signal and proximity to the cable.
- Earth contact frame that is color-coded to correspond with indications from the receiver directing the operator toward the fault.

The 2273 cable/fault locator uses four active trace frequencies – 577 Hz, 8 kHz, 33 kHz and 200 kHz – which can be used individually or simultaneously to compensate for varying field conditions. The receiver incorporates passive power and auxiliary frequencies that do not require the use of the transmitter.

Both the receiver and the transmitter feature a self-test routine which is executed each time the unit is turned on. A power-up battery test indicates the battery level.

Both components are constructed of heavy-duty materials designed to withstand typical field use.

## One-touch gain adjust

It's simple... no guessing, no trial and error, no multiple presses needed... When using PEAK or NULL tracing modes, just press the receiver gain key “once” to automatically adjust the gain and set the bar-graph reference point.

## Optional Dynatel accessories

- 3019 Dyna-Coupler Kit; consists of 3" Dyna-Coupler for use on cables up to 3" (7.6 cm), Coupler Extension Cable, and Pouch
- 3005 1" Dyna-Coupler; for use on cables up to 1" (2.5 cm) in diameter
- 1196 6" Dyna-Coupler; for use on cables up to 6.9" (17.5 cm) in diameter
- 9043 Ground Extension Cable
- 3011 Inductive Probe; for pair identification
- 9011 Coupler Extension Cable
- 9023 Probe Cable
- 3229 Active Duct Probe, 33 kHz
- 2205/2206 EMS Marker Locating Accessory
- 2200 Series Carrying Bag
- 2892 Small Clip Direct-Connect Transmitter Cable, for direct connection to cable and ground; 10' (3 m) long

The Dynatel brand and its distinctive Dynatel yellow cases are your assurance of rugged dependability.

## Standard Dynatel accessories

- 9012 Direct-Connect Transmitter Cable; for direct connection to cable and ground; 5' (1.5 m) long
- 8006 Ground Rod; stainless steel
- 3014 Earth Contact Frame
- 9026 Earth Contact Frame Cable; 4 ft. (1.2 m) long
- 40 ft. (12 m) long Cigarette Lighter Adapter Cable (Option 'A' Only)

## 3M™ Dynatel™ 2273 Advanced Cable/Fault Locator

Features	Benefits
<b>Transmitter</b>	
Four operator-selectable frequencies	Optimizes unit performance in varying conditions
Simultaneous signals	Enables receiver to verify cable location
Fault-locate/cable-locate signals applied simultaneously	Enables receiver to verify cable location while fault locating
Built-in ohmmeter with voltage sensing/measuring capability	Displays earth fault resistance; confirms far-end grounds and shield continuity
Three signal application methods (direct connect, coupler, induction)	Flexibility under varying plant conditions
Auto load matching	Automatic adjustment of output voltage to maximize signal
High and normal output level	High output level for extreme distance locates and other varying cable conditions
Displays output signal current in trace mode	Assists in proper frequency selection and setup
Audible indication of hazardous voltage in ohms mode	Warns operator of potentially dangerous situation
Can connect to energized power cables up to 240 Vac live	Prevents inadvertent damage to unit; operates while attached to circuits
External DC operation (Option 'A' only)	5 Watt output capability and saves batteries
<b>Receiver</b>	
Peak and null modes	Verify cable location
Differential mode	Indicates direction to cable
Push-button digital depth readout (of cable or sonde) in inches, feet and inches, or centimeters	Easy, quick and accurate depth measurements; no conversion table required for sonde depth measurements
Measures signal current in cable	Helps identify target cable regardless of depth
Visual and audible cable locates	Ensure accuracy under varying field conditions
Digital fault strength indicator	Operator can differentiate between light and severe faults
Coupler jack	Pair/cable identification
Graphic display	Operator can distinguish between target cable and other cables in congested areas
Expander function	Improves sensitivity of audible and visual response
Three passive 50/60 Hz power frequency settings	Optimized for primary, secondary, or rectified power
31.5 kHz Auxiliary frequency	For locating CATV cables <sup>1</sup>
273 Hz, 333 Hz, 340 Hz, 393 Hz, 400 Hz, 460 Hz, 512 Hz, 560 Hz Auxiliary frequencies (some models)	Detects frequencies from central office installed transmitters
Compatible with 2205/2206 marker locating accessory	Allows unit to pinpoint location of buried EMS markers

## Physical Specifications

### Size

Transmitter	6.75" H x 11.25" W x 7.75" D (17.2 cm x 28.6 cm x 19.7 cm)
Receiver	25.5" H x 3.75" W x 10.75" D (64.8 cm x 9.5 cm x 27.3 cm)

### Weight (including batteries)

Transmitter	5.2 lbs. (2.4 kg)
Receiver	4.1 lbs. (1.9 kg)
Shipping	21.5 lbs. (9.8 kg)

## Environmental Specifications

Operating temperature	-4° to 122°F (-20° to 50°C)
Storage temperature	-40° to 158°F (-40° to 70°C)

Note 1. American NTSC, television set on

# 3M™ Dynatel™ 2273 Advanced Cable/Fault Locator

## Electrical Specifications

### Receiver

Frequencies Trace and tone modes	Active: 577 Hz, 8 kHz, 33 kHz, 200 kHz Passive Power: 50/60 Hz user selectable: L50/L60 – 5th harmonic, H50/H60 – 9th harmonic, 100/120 – rectified power Auxiliary: 'T' model: 31.5 kHz, 512 Hz, 560 Hz; 'P' model: 31.5 kHz 'LD' Model: 31.5 kHz, 273 Hz, 333 Hz, 340 Hz, 393 Hz, 400 Hz, 460 Hz, 512 Hz, 560 Hz
Depth	Range: 0 to 15' (0 to 4.5 m) Accuracy: ±10% ±1 digit for 0 to 60" (0 to 1.5 m) ±15% for 60 to 180" (1.5 to 4.5 m) ± 20% for 15 ft to 30 ft (4.5 m to 9.5 m)
Power	Six alkaline "AA" (LR6) cells
Typical battery life	50 hours

### Transmitter

Output frequencies Trace mode Sheath fault mode Tone mode Induction mode	577 Hz, 8 kHz, 33 kHz, 200 kHz, or all four 10/20 Hz for sheath fault; 577 Hz and 33 kHz for tracing 577 Hz and 200 kHz pulsed at 8 Hz 33 kHz, 200 kHz
Output voltage (maximum) Sheath fault Trace Tone	70 Vrms 70 Vrms Normal setting: 10 Vrms, High setting: 60 Vrms
Output power	Normal setting: Limited to 0.5 W High setting: Limited to 3 W, or 5 W with Ext.; DC power (option 'A' only)
Output protection	240 Vrms
Power	Batteries: Six alkaline "C" (LR14) cells; External DC: 9-18V DC (1A) (option 'A' only)
Typical battery life	Normal output level: 50 hours; high output level: 10 hours

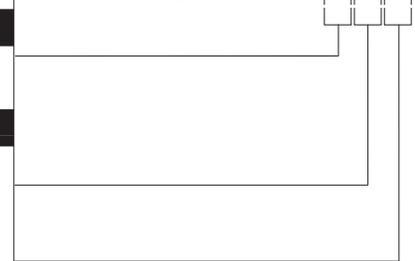
## Ordering Information

To order, specify the appropriate 3M™ Dynatel™ 2273 Advanced Cable/Fault Locator using the table below.

### Generic product number: 2273-XYZ

Market	Code X	
USA/Canada	U3 (3 Watt transmitter)	
USA/Canada (Option A)	U5 (5 Watt transmitter)	
Typical Use	Direct connect cable configuration	Code Y
Telephone/CATV	5-foot cable with telco-style direct connection clips	T
Power	10-foot cable with large alligator direct connection clips	P
Long Distance	5-foot cable with telco-style direct connection clips	LD
Coupler Kit	Code Z	
No coupler kit (not available on option A or LD versions)	N	
3" coupler kit	3	

### Example 2273-XYZ



Example: 2273-U5T3 translates to a 2273 Cable/Fault Locator with 5 watt transmitter for the telephone/USA/Canada market, used by a telephone/utility and includes a 3" Dyna-Coupler Kit

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### Telecom Systems Division

6801 River Place Blvd.  
Austin, TX 78726-9000  
800/426 8688  
FAX 800/626 0329  
<http://www.3M.com/telecom>



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