

Derringer

Audio Transmitter

T-2071-M



DTC COMMUNICATIONS INCORPORATED

How to contact DTC

For operator and troubleshooting information, customers are encouraged to refer to the details in this manual. For additional clarification or instruction, or to order parts, contact DTC.

Customer Service is available Monday through Friday between the hours of 9:00 AM and 5:00 PM EST at:

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Warranty

DTC warrants its manufactured components against defects in material and workmanship for a period of two (2) years, commencing on the date of original purchase.

Products manufactured by others that are approved for use with DTC equipment are warranted for the manufacturer's warranty period, commencing from the date of shipment from DTC.

FCC information

Forms can be obtained from the FCC on their website at:

www.fcc.gov

You can also contact the FCC using their FAX back service at: (888) 418-3676


Additional instructions are available by telephone at: (888) 225-5322


The filing fee form is returned to:

Federal Communications Commission
1270 Fairfield Road
Gettysburg, PA 17325-7245

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Manual Conventions

 **NOTE** Describes special issues you should be aware of while using a particular function.

 **WARNING** Calls out situations in which equipment could be damaged or a process could be incorrectly implemented, but in which operator safety is not a factor.

 **TIP** Describes application hints.



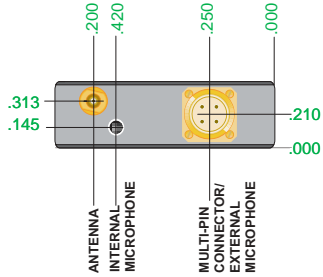
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What should you expect to receive with your Derringer transmitter?

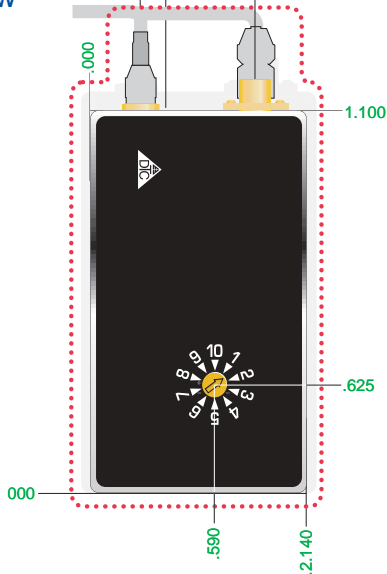
- T2071-M Transmitter
- 2 9V Batteries
- 1 "AA" Battery Pack
- Programming Software kit with programming cable
- 36" Microphone
- Noodle antenna
- Data sheet and 1 Operator's Manual
- Screwdriver

OVERVIEW

Top View



Front View



Using The Derringer

The T2071-M Derringer is a small audio transmitter which can transmit a secure and clear audio signal. It has up to 10 programmable channels for the RF transmission, accessed through a PC with DTC programming software installed. The transmitter is designed for personal protection and evidence gathering missions. Its miniature size and rugged design ensures safe concealment and long-lasting performance. The frequency is programmable for narrowband (TIA/EIA 102 compliant) or wideband operation. These parameters may be saved in memory. The Derringer has a built-in internal microphone, the ability to use an 36" external microphone, and built-in scrambler.

Channel Programming Includes

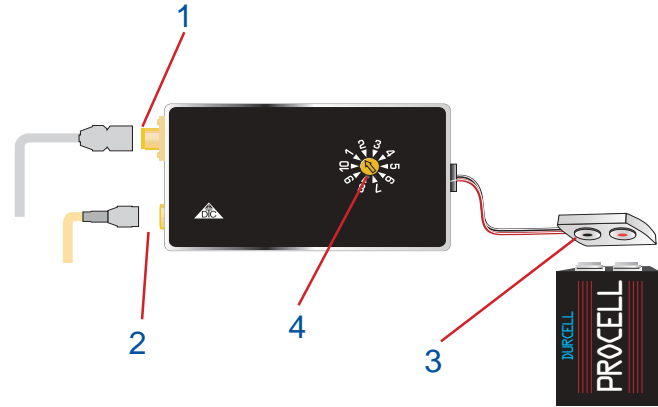
- Frequency
- AGC (Automatic Gain Control) On/Off
- Width (Narrow / Wide band)
- Scrambled / Clear Signal ON/OFF

✓ Note: Do not operate the transmitter without the noodle antenna installed.

✓ NOTE: To prevent unwanted interference keep the microphone and the noodle antenna separated. Do not allow them to come into contact with each other.

Using A Separate Microphone

- 1 Install the 36" microphone into the microphone connector on the transmitter.
- 2 Install the noodle antenna into the antenna connector on the transmitter. Adjust length according to band of operating frequencies.
- 3 Attach fresh batteries to the snap on connector.
- 4 Using a small screwdriver, turn the recessed rotary switch located on the front cover to the desired channel. The configuration of each channel is managed with DTC programming software. The programming software included with your Derringer allows you to assign frequencies, and set the deviation.

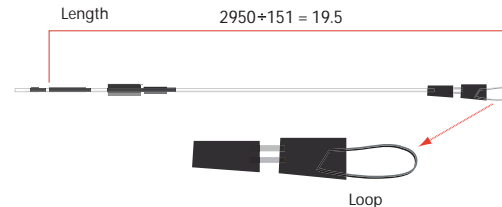


Example:
 CH1: 150.000
 CH2: 151.000 ← Center of operating frequency
 CH3: 152.000
 Length (inches) = 2950/151
 Total length = 19.5"

The NOODLE ANTENNA

The "hoodle" antenna may be adjusted over the frequency range of 138 MHz to 174 MHz by adjusting the amount of wire that is folded back along side the end of the antenna. Use heatshrink tubing to hold the adjusted length.

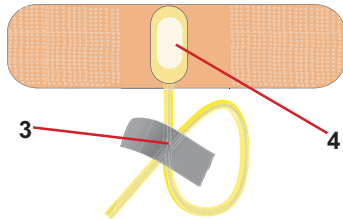
The total length may be calculated by the following formula.
 Length (inches) = 2950 / (Freq MHz)



TIPS



- ✓ **Note:** This is a push-on, pull off locking connector. The connector will rotate 360° in the transmitter without disconnecting. Use extreme caution when connecting or removing the noodle antenna. To remove pull the noodle antenna straight out.



Battery Operation:

Always remove battery when not in use. It is imperative to discard partially used batteries, as their remaining life is not predictable. Always start an operation with fresh batteries.

Audio Circuit and Body Mounting Tips:

All body-worn transmitters are susceptible to “clothing noise”. Reducing this rubbing effect is accomplished in a variety of ways. Secure the transmitter to the body with an ace bandage or a custom harness.

- 1 Try to locate the microphone in an area where “pickup” will be best and rubbing noise is least. Avoid the arms, legs, crotch, under the arms or waist area. Front torso mounting is ideal.
- 2 Always provide a small amount of strain relief on the microphone cable itself. This reduces the noise caused by the microphone cable and element being tugged and prevents cable damage.
- 3 Secure the microphone cable to the body with medical adhesive tape in at least two spots, the final being about an inch below the element. Remember to leave a strain relief loop!
- 4 Completely cover the microphone element (facing outward) with an ordinary Band Aid™. This provides a damped baffle for the microphone and a slick surface for clothing to rub on, and actually does not impact audio pickup level at all.

CONNECTIONS

ANTENNA (Male MMCX Connector)

This connector accepts the noodle antenna.

MICROPHONE

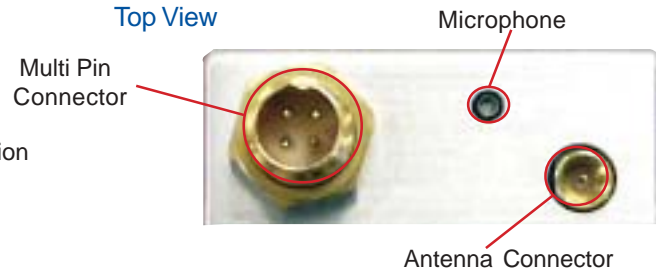
The Derringer uses an internal electret microphone in addition to an external microphone

MULTI-PIN CONNECTOR (Male multi-pin connector)

This connector mates with the 36" external microphone and also mates with the programming cable and optional vehicular power adaptor model VPA-2001.

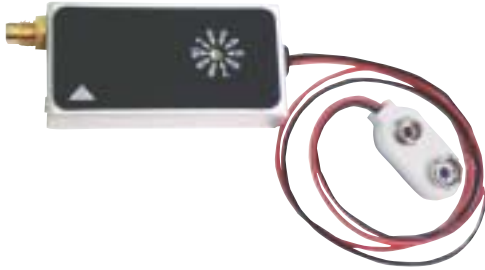
CHANNEL SELECT SWITCH (Rotary Switch)

The channel select switch allows you to change transmit channels and is located on the front of the transmitter. It is a rotary switch which requires the use of the supplied screwdriver to turn the switching mechanism. Select a transmit channel number by turning the rotary switch. The configuration of each channel is managed with DTC programming software. The programming software included with your Derringer allows you to assign frequencies, set the deviation, turn ON/OFF scrambler mode, and turn ON/OFF AGC.



SPECIFICATIONS

Front Cover View

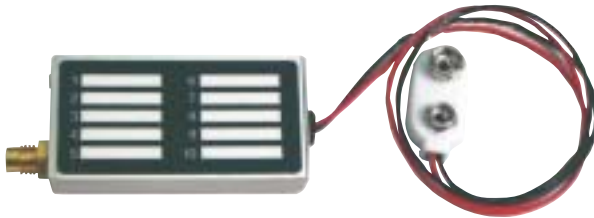


The Derringer measures just 2.1" by 1.1" by .4"; it provides ten user programmable channels and audio scrambling. Automatic gain control is programmable by channel as well.

The Derringer contains an internal microphone, which is automatically disabled if an external microphone is attached. Power is provided by a convenient snap-on 9 Volt battery type connector.

The back cover of the Derringer allows an individual to use a pencil to write down the frequency for each channel, as a quick reference guide.

Back Cover View



- ✓ Note: Consider using a designator for your frequency, such as "A" or "Blue". If you lose control of the transmitter you won't compromise your frequency.

SPECIFICATIONS

ITEM	SPECIFICATION
AGC Range	45dB
Microphone	Electret-fet internal or external
Spurious & Harmonics	-50 dBc max non-harmonic, -45 dBc harmonic
Operating Temp Range	-30° C to +70° C
Operating Voltage Range	6.0 to 9.0 VDC
Controls	10 channel recessed rotary switch
Connectors	RF output to antenna - MMCX Multi-pin Telocate (JT4MB -00) Pin 1 - Audio from external microphone Pin 2 - RS-232 serial input Pin 3 - RS232 serial output Pin 4 - external power Shield - ground return
Power Sources	External
NOTE	All specifications at 25° C and R/F measurements taken into 50 Ohms unless otherwise noted
NTIA Compliant	TIA/EIA- 102 - analog mode
Dimensions	2.10" W x 1.1" H x .043" D

ITEM	SPECIFICATION
RF output power into 50 Ohm load	6v -250 mW 9V - 500 mW ± 1.7 dB not to exceed 750 mW
Frequency	138-150 MHz 150-174 MHz 210 to 225 MHz optional
Channel Capacity	10 channels individually programmable
Programmable	Frequency Narrow/Wideband AGC enabled/disabled Scrambler ON/OFF
Minimum Tuning Step	N/A: Transmitter can be programmed to any channel in band
Frequency Stability	+/- 2.5 ppm -30 C°to -65°C
Deviation	5 KHz (Wide) at TEA/EIA-102 compliant 2.5 KHz (Narrow), programmed by channel
RF output load-stability	Stable into a VSWR of 8:1 or better

PROGRAMMING



Introduction

When you order a Derringer audio transmitter, DTC will factory program your frequencies at no additional charge to you. You may want to place a sticker over the rotary switch on the chassis so users in the field don't attempt to change frequencies. This is often the best path for state and local agencies with limited frequencies available to them.

DTC will also provide you with free software and a free programming cable, enabling you to change your transmit frequencies. This is ideal if you often work with other agencies, or anticipate the equipment being used by a multi-jurisdictional task force. You can program up to ten channel settings per unit. In general, this allows you to program most variations you might encounter in the field at the depot level. You will be able to program frequency, narrowband/wideband, AGC enabled/disabled and scrambler ON/OFF.

As a practical matter, your Derringer transmitter's frequencies will be dictated by the frequency of your receiver and/or repeater. In many cases, these devices are crystal controlled or have few channel options.

✚ **TIP: Make sure that you program your transmitter to match the frequencies of your receiver, and test the components as a system prior to going into the field!**

Installing DTC Universal Programming Software on your PC

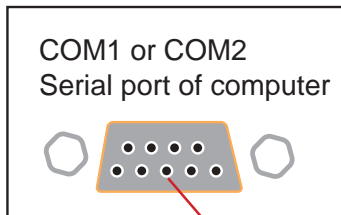
✓ NOTE: Uninstall any previous versions by going to Add/Remove Programs, clicking on DTC Universal Programming, and clicking on uninstall.

- 1 Click on Start, click on run.
- 2 Click on the Browse button.
- 3 Click on or find your CD drive.
- 4 Install the JAVA Runtime Environment Application first (CD provided).
- 5 Follow the install wizard screens.
- 6 Install the Universal Programming software next (floppy provided).
- 7 Click on Start, click on run.
- 8 Click on the Browse Button.
- 9 Click on your floppy drive.
- 10 Double click on the setup.
- 11 Follow the install wizard screens.

Your programming software is installed



PROGRAMMING



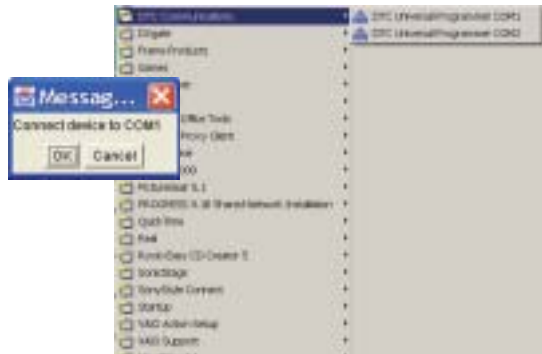
Connect the serial end of the programming cable here



- 1 Check that an antenna (or non-radiating load) is connected to the Derringer MMCX antenna port.
- 2 Connect the DB9 end of the DTC programming cable to either the COM1 or COM2 port of the PC depending on port availability.

✓ **Note:** A 6-foot extension cable may be used between the PC and the DTC programming cable.

- 3 Plug the round 4-pin connector end of the DTC programming cable into the Derringer multi-I/O connector. Rotate the cable plug until the connector can be felt to align properly. At this point push the connector in and screw the retaining sleeve until snug
- 4 Check that the Derringer has a battery power installed with proper polarity orientation.
- 5 On the PC, mouse-click on Start, Programs, DTC Communications.
- 6 You will be prompted to select either COM1 or COM2.
- 7 Select the desired port as defined in Step 2.

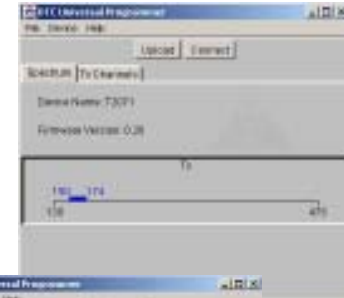


PROGRAMMING

- 8 Mouse-click OK or cancel.
- 9 Now follow the instructions on the DTC Programming Application to begin the download and subsequent frequency reprogramming process.
Select the channel number you want to edit
Click Edit Chan
Input the frequency using key pad on window or keyboard numbers
Set scramble options
Set AGC (Automatic Gain Control) options
When done, click OK-if no change is desired, click CANCEL
When all programming edits have been completed, select UPLOAD to transfer your new settings to the Derringer.
Your Derringer is now programmed.
- 10 After successfully using the DTC Programming Application, remove the round 4 pin multi-I/O connector from the Derringer by unscrewing the retaining sleeve on the connector "barrel".



Warning: Do not disconnect the programming cable until the programming operation (connect or Upload) is complete.

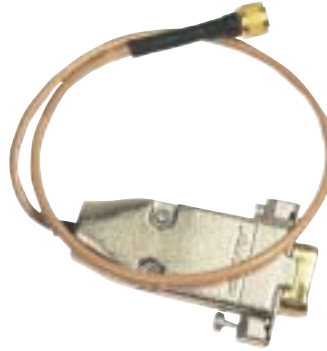


ACCESSORIES



DTC Universal Programming Software

DTC part number 8002025



Part Number	Description
4044738	Programming Cable



Part Number	Description
7011150	3' Microphone



Part Number	Description
4044377	4 "AA" Battery Pack



Part Number	Description
4045319	Noodle Antenna

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