

TAC COM 2005

User Programmable
8 Channel RX & TX
Tactical Repeater
NTIA Compliant



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:

Tel: 603-880-4411

Fax: 603-880-6965

Website: www.dtccom.com

Email: info@dtccom.com

486 Amherst Street
Nashua, New Hampshire 03063

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- ArmorNet™
- SplitPIX™
- MiniPIX™
- DynaView™

Other product names used in this manual are the properties of their respective owners.

FCC information

The following information is provided as a service to our law enforcement customers who require a Part 90 station license for video surveillance operations.

You will need to provide two documents:

- Form 600 (the application form)
- Form 159 (the filing fee form)

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

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.

RF EXPOSURE STATEMENT

A separation distance of at least 20 cm must be maintained between the antenna and the body of the user or nearby persons and must not be co-located or operating in conjunction with any other antenna or transmitter..



NOTE: This device is for occupational use only. Occupational users are those persons who are exposed as a consequence of their employment, provided these persons are fully aware of and exercise control over their exposure.

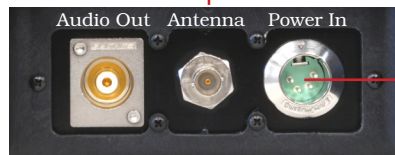
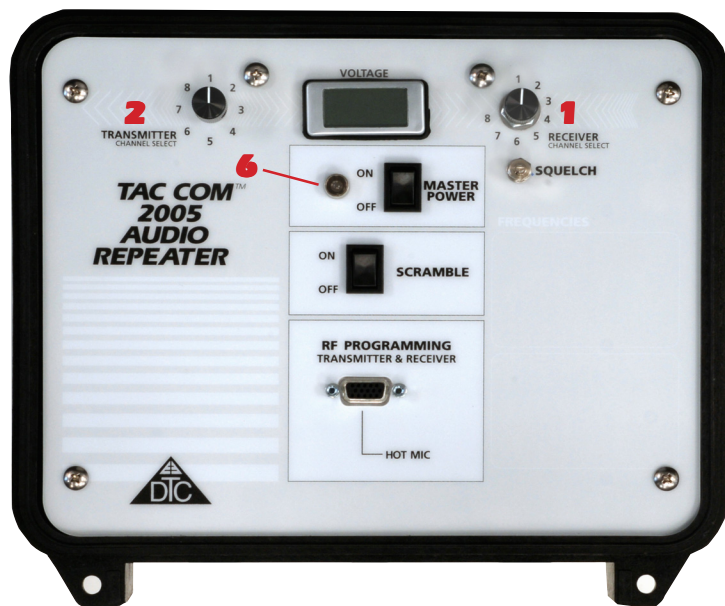


WARNING: In order to comply with FCC rule 47 CFR 1.1310 regarding general population radiation exposure, deployment of this device must be such that unaware bystanders maintain a minimum separation from the antenna of 42 cm.

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QUICK START



Rear Panel Connectors



Antenna

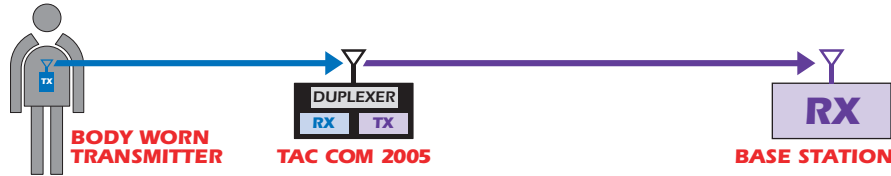
Complete the following steps to start using your TAC COM 2005:

- 1** Set Receiver Channel to match your body wire transmitter frequency.
- 2** Set Transmitter Channel to match your listening post receiver's frequency.
- 3** Connect antenna to BNC connector on rear panel.
- 4** Locate antenna in high, open position (never in the trunk of a car).
- 5** Use the internal rechargeable battery, or apply 11 to 16 VDC power to the TAC COM 2005 using the automotive power cable provided (or optional DC supply).
- 6** Verify system by turning ON your body wire transmitter, TAC COM 2005, and receiver. Listen for audio on the receiver.

LED: **GREEN** = STANDBY/RECEIVE
RED = TX ON



NOTE: Always fully charge the internal battery before a mission.



Repeaters are devices comprised of both receiver and transmitter sections, which are used to extend the range of a transmitted signal. It does this by receiving a weak signal on one channel and retransmitting the signal (at the same time) on a second channel, at higher power. The TAC COM 2005 has special features that extend its capabilities for surveillance operations. These include a phono output for direct connection from the repeater to a recorder, an optional HOT MIC for full time audio signal transmissions, and an optional scrambler to encrypt any of the TAC COM transmitted signals. In addition to receiver and transmitter options, the TAC COM is capable of connecting with an array of directional and covert antennas through the use of its standard BNC antenna connector.



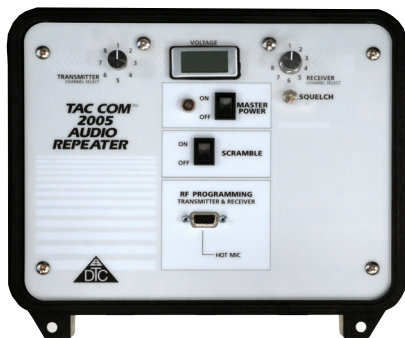
WARNING: Never place the repeater with antenna attached in a closed trunk of a car. You will degrade your range to the extent that the repeater is useless.



TIP: DTC recommends the use of highly efficient antennas, such as the ANT-3 Cellular disguise antenna.



DESCRIPTION



The TAC COM 2005 is a portable 2 Watt VHF FM tactical repeater capable of receiving and transmitting both 12.5 kHz and standard wideband (+25 kHz signals).

Both the receive and transmit frequencies are user-programmable within a 2 MHz range and can be set to any of eight switch selected channels for both RX and TX. (Programming Kit is optional.) Minimum separation between receive and transmission frequencies is 3.5 MHz. Programming cable and software are available as an option. The 2 MHz range and factory preset frequencies are listed on a label on your TAC COM 2005.

The TAC COM 2005 repeater is housed in a rugged, water resistant, Pelican case and is designed to operate over a wide temperature and humidity range. Both transmitter and receiver sections are frequency synthesized and both are locked to highly stable temperature compensated crystal oscillators (TCXO's). The repeater will transmit continuously for approximately 3 hours on one full charge of the internal battery.



NOTE: Minimum 3.5 MHz separation between receive and transmit channels is required. Wider separation between transmit and receive channels will provide improved performance.

The typical mission of the repeater is to extend the range of a low power FM transmitter such as a bodywire. The repeater should remain in standby mode (not transmitting) until the transmitter is activated. When the transmitter is keyed ON and in range of the repeater, the repeater will retransmit the signal on another selected channel. Typically, the repeater is powered from its own internal rechargeable battery, or via another DC source such as automotive power. The performance of the TAC COM 2005 is highly dependent on the proper location and orientation of the antenna.

Is the transmitter that you are using narrowband (12.5 kHz) or is it a wideband (25 kHz) unit? It is always best to select the bandwidth which matches the transmitter. If this is unknown, the repeater can receive either signal in the wideband mode. The TAC COM 2005 bandwidth can be set with the optional software.

The repeater's receiver channel should be set to the transmitter's (bodywire) frequency using the Receiver Channel control. The repeater's transmit channel also needs to be set to a frequency covered by the listening post receiver. This is accomplished with the Transmitter Channel control. The squelch can be set with the control on the main panel but it normally should not require adjustment.

If you experience the squelch breaking when the bodywire is off, try another transmitter channel, which is free of interference. Squelch parameters can be modified with the Squelch control.



NOTE: Do not adjust the squelch unless you are experiencing a constant transmit condition. If that happens, temporarily switch to another receive channel. If the transmit condition stops, you may be receiving a third-party transmission on the original channel.

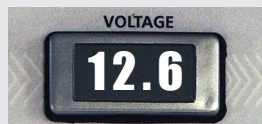
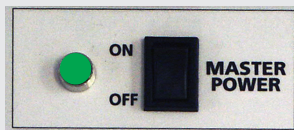


NOTE: To provide easy narrowband/wideband selection capability, program the same frequency on different channels using the wide setting on one and the narrow setting on the other.



NOTE: using a wideband transmitter with a narrowband receiver setting will cause some distortion and loss of some audio.

COMPONENTS



Channel Select

TRANSMITTER - This rotary switch selects the channel for the repeater's transmitter section. The frequencies are programmed in software.

RECEIVER - This rotary switch selects the channel for the repeater's receiver section. The frequencies are programmed in software.

Original factory settings are provided on a label with your equipment

Master Power/ Voltage Meter

MASTER POWER SWITCH - This rocker switch turns ON/OFF the repeater's power.

POWER LED - This indicator turns ON when the power is ON. The LED changes to indicate the following:

Green	Standby/Receive
Red	Transmitter ON
Flickering	Weak Signal Receiver

VOLTAGE METER - This device measures the voltage present at the internal battery. 12 Volts is nominal. Low voltage (< 11 VDC) indicates the battery should be recharged.

Optional Scrambling

SCRAMBLE ON/OFF SWITCH - If your TAC COM 2005 is equipped with the optional Scrambler feature, a Scramble ON/OFF switch is located on the main panel. Generally, it is recommended that you test the system first with the Scramble feature turned OFF. Once the system has tested successfully, turn the Scramble switch ON. The listening post receiver must also be equipped with a descrambler.

Squelch

Adjustment is not usually needed. If needed, make sure the bodywire transmitter is OFF. Loosen the locknut and use a small screwdriver to turn the Squelch control on the TAC COM 2005 counterclockwise until the Master Power LED turns **RED**. Then turn the adjustment slightly clockwise until the LED turns **GREEN**. Finally test the squelch setting by transmitting with the bodywire and observing the listening post receiver, to make sure it transmits ON/OFF properly. Retighten the locknut.

RF Programming/Hot Mic

TRANSMITTER & RECEIVER/HOT MIC - This DB-15 connector attaches to an optional serial cable to allow for programming the repeater's transmitter and receiver sections. (Programming is optional.) The same connector is used to connect to the optional Hot Mic.

Antenna Connector

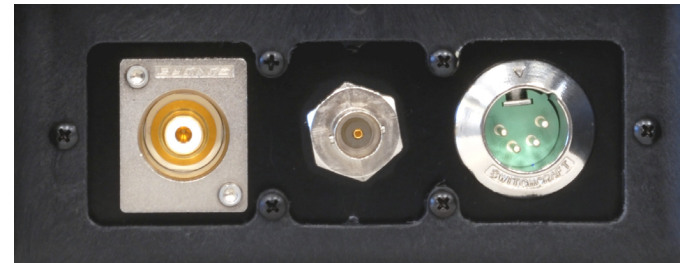
BNC - This RF connector allows for RF transmission. The device comes with a mag mount antenna, however optional 50 Ohm external VHF gain antennas can improve performance.

Line Audio Out

RCA - This audio connector allows for connection to a recorder or other line-level audio device.

Power/Charging Input

XLR - This connector attaches to the power cable to allow for automotive auxiliary power. This is also used with the external AC charger provided.



Audio
Line Out

Antenna
Connector

Power/Charger
Input

TROUBLESHOOTING

Problem	Solution
Unit will not turn ON.	Check internal battery voltage as read on the panel meter. If less than 11 VDC, recharge the battery. Use an external power source 11 to 16 VDC.
Poor local Audio at Audio out jack.	Audio out jack is at line level. It will not drive an external speaker without use of an external amplifier. Check battery and antenna on body wire transmitter. Ensure that body wire transmit frequency and TAC COM 2005 receive frequency are the same. Ensure that the body wire transmitter is in range of repeater. Ensure that the TAC COM 2005 antenna is positioned vertically, or an external antenna is in use. Ensure that an antenna is attached to the antenna jack. Ensure that the squelch adjust has been performed correctly. Ensure that the TAC COM 2005 receiver is programmed correctly for wide/narrow bandwidth operation. This bandwidth must match that of the body-wire transmitter for optimum performance.
Good local audio at the Audio out jack, but poor or no audio at listening post.	Ensure the TAC COM 2005 transmit and listening post receive frequencies are the same. Ensure that the scramble feature is deactivated. Check the listening post's receiver program to ensure that any subaudible coding (i.e. PL code) matches the transmitter, or is turned OFF. Ensure a clear, line-of-sight path with no buildings or mountains between listening post and repeater. Ensure that there is no interference near the listening post. Try changing frequencies.

Operating Tips

- Put the TAC COM 2005 on the smart charger until the LED *on the smart charger* blinks green and orange, or just green to indicate a full charge. Charge time is 4 to 6 hours. TAC COM should be OFF for optimum charging.

NOTE: After extended operation, the battery may be hot (Smart Charger LED green-red flashing). After battery cool down, the Smart Charger will automatically revert to fast charge (LED solid red).

- Ensure the body wire transmit frequency is the same as the selected TAC COM 2005 receive frequency.
- Choose a frequency that is free of interference.
- Energize the bodywire transmitter and the TAC COM 2005. Using the Audio Out jack on the rear of the TAC COM 2005, you may connect an external, amplified speaker or recorder to ensure that the TAC COM 2005 is receiving the body wire transmitted signal.
- The LED will occasionally begin to flicker between green and red, sometimes appearing yellow or orange. This is an indication that the received signal is not strong enough to provide full receiver quieting. Reposition the ANT-3 Cellular look-alike mobile antenna with magnetic base to increase signal reception and working distance.

Operating Tips

- The TAC COM 2005 can be powered with an AC to DC converter, or an automotive accessory power cord. If the internal battery is fully charged, it will automatically provide power to your TAC COM 2005. Some automobiles have power-off timers on their accessory power ports, which could otherwise cause a loss of power if the automobile timed-off off during operation.
- The TAC COM 2005 will continue to broadcast the received audio signal on the original transmit frequency even if the transmit frequency is changed at the front panel. This prevents loss of audio information during the mission if the channel knob is moved. To change the channel during transmission:
 - Turn OFF the body wire transmitter, or
 - Turn OFF the TAC COM 2005, change the channel, and restore power.
- If using the body-wire with scramble option enabled, DO NOT activate the TAC COM 2005's scramble feature, as the result will be a double scrambled signal at the listening post that will not be readily usable.

SPECIFICATIONS

General

Weight	Approx. 7 Lbs.
Dimensions	10.7 in. x 9.8 in. x 5.0 in.
Operating Temperature Range	-10° to +50° C
Power Requirements	12 VDC nominal. Internal rechargeable NiMH battery and automotive cable. External Input 11 to 16 VDC diode summed with internal battery.

RF

Operating Range	150 to 174 MHz (any pair of 2 MHz TX and RX bands, separated by 3.5 MHz minimum.
Channels	8 Transmit, 8 Receive
Output Power	2 Watts min.

Programming - Optional

User Programmable	TX & RX Software Applications and Programming Cables Optional Kit
Programming Range	2 MHz bandwidth
Bandwidth	Narrow/Wide software selectable 12.5 or 25 KHz

Connectors

Antenna	BNC Female 50 Ohms
DC Power	4-pin XLR Male
Programming and Hot Mic	High Density DB-15 Female
Audio Line Out	RCA Female, line level

Display

Volt Meter	4 to 25 VDC
Charging, Charged	External (AC Power Smart Charger) 4 to 6 hours charge time

Optional Features

Scrambling	Single Inversion (Optional)
Hot Mic Connection	Hot Mic optional
User Programming	Optional



TAC COM 2005 Programming Kit
For Transmitter/Receiver section
channel configuration using a PC.
A free COM port and
DB9 connector is required.
Two software CDs and two cables
are included in kit.
P/N 4045592



Hot Microphone

The TAC COM 2005 may be turned
into a continuous 2 Watt Transmitter
by attaching the DTC Hot Mic.

When attached via the 15 pin
connector, the Hot Mic disables the
audio receive section. Mic level
audio is connected directly to the
transmit section.

This is ideal when:

- A. You are setting up the system and
want to ensure the repeater is within
range of the listening post.
- or
- B. You require maximum transmit power
using a hard wired microphone, such as
in a vehicle installation.

P/N 4540107

ACCESSORIES



Mag-Mount Antenna

ANT-3 Cellular look-alike
mobile antenna with magnetic
base and BNC connector.

P/N 7011114-T



External AC Power Supply

Input = 100 to 240 VAC, 47 to 63 Hz
Output = 15 VDC, 2.0 A

P/N 4640137

TWO YEAR WARRANTY

DTC Communications, Inc. (DTC) warrants its RF transmitting and receiving products to be free from defects in workmanship or material for a period of two (2) years from the date of shipment unless otherwise stated.

The liability of DTC, Inc. under this warranty is limited to replacing, repairing, or issuing credit, at option, for any products, which are returned by the purchaser during such warranty period, provided: DTC is notified and a Repair Authorization Number is issued by DTC Customer Service within 30 days after discovery of such defects by Customer.

The defective units are returned to DTC with transportation charged Prepaid by the Customer.

Product damaged in shipment must be reported to and claim forms filed with the Carrier by the Customer. In shipments to the factory, notice and claim procedures will be initiated by DTC.

DTC's examination of such products shall disclose to its satisfaction that such defects exist and have not been caused by misuse, misapplication, neglect, improper installation, improper storage, alteration, physical damage or accidents.

The warranty shall not apply to material or accessories ordinarily susceptible to field damage or of a disposable nature. Examples include batteries, antennas, microphones, headsets, cases, accessory bags, etc. The warranty shall not apply to Engineering Prototypes or Customer requested modifications to electronic circuits.

This warranty does not apply to and DTC does not independently warrant items or systems sold by DTC which are produced by other manufacturers. With respect to such items, the Customer shall look to the warranty of the original manufacturer and DTC disclaims all warranty, expressed or implied.

Nothing in this warranty, or any statement, brochure, bulletin, or advertisement is to be interpreted as establishing the suitability of any product for particular application or use. Applications of the product and the determination of suitability for any application, is the sole responsibility of the Customer.

Contact Information

Nashua Main Office Numbers

486 Amherst Street
Nashua, New Hampshire 03063 USA
(T) 603 880-4411
(F) 603 880-6965
Toll Free in the USA
1-800 233-8639

Inside Sales

State & Local Law Enforcement
603 546-2217

Federal Law Enforcement
603 546-2169

Military
603 546-2121

International
603 546-2217

A complete listing of Contact Individuals
can be located on our website at:

www.dtccom.com

REGIONAL SALES MANAGERS

Howard Rich

toll free (888) 819-8570
voice (860) 626-8570
fax (860) 626-8571
NY, MA, CT, RI, PA, NJ, MD, DE, WV, DC
hrich@dtccom.com

Greg Langley

voice (702) 236-0021
fax (702) 293-6448
WA, OR, ID, MT, ND, WY, SD
glang46@aol.com

Joe Parkinson

toll free (800) 952-4914
voice (909) 598-5110
fax (909) 598-3120
CA, AZ, NV, HI, UT, AK, CO, NM
jparkinson@dtccom.com

Christine Guzman

toll free (800) 233-8639
voice (603) 546-2217
fax (603) 880-6965
NH, VT, ME, TX, OK, AR, LA
cguzman@dtccom.com

Gary Nichols

toll free (866) 794-2823
voice (765) 473-8917
fax (765) 473-8920
MN, WI, MI, IA, MO, IL, IN, OH, KY, NE
gnichols@dtccom.com

Frank Prioli

toll free (800) 246-2610
voice (727) 392-4761
fax (727) 320-0509
FL, GA, AL, MS, TN, NC, SC, VA
fprioli@dtccom.com



486 Amherst Street ■ Nashua, New Hampshire 03063 ■ 603-880-4411
www.dtccom.com