ENC-3300-DTMF

User Guide,
Installation & Service Manual,
Programming Guide

Universal DTMF Radio Encoder

Made in USA

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Warning

If incorrectly used, this equipment can cause severe injury. Those who use and maintain the equipment should be trained in its proper use, warned of its dangers, and should read the manuals before attempting to set up, operate, adjust or service the equipment. Keep this manual for future reference.

Important Safety Information

System Planning

Proper planning is the cornerstone to an effective warning system. The Federal Emergency Management Agency (FEMA) publishes the "Outdoor Warning Guide" CPG 1-17, which should be used in planning your system. In addition, you should recognize and understand the following items:

•Outdoor warnings sirens and equipment are not intended to be heard indoors. Conversely indoor devices are not intended to cover outdoor environments. All devices have specific purposes and distances that they can be considered effective. Proper placement and selection of the correct equipment is necessary to cover a desired area. Refer to the FEMA guide for placement guidelines.

•Training is necessary to ensure those responsible can correctly activate the system. It is also necessary that everyone understand the purpose of the warning system and the protective actions they need to take when the system is activated. Periodic tests can serve to accomplish the training for the operators, in addition to demonstrating the various signals to the public.

•All warning systems must have contingency plans in case equipment problems or operator errors interfere with its performance. Just as with the primary warning system, the contingency plans should be periodically tested to make sure those responsible know how to implement them and the necessary response from the public is achieved.

Installation & Service Precautions

•Electrocution, severe personal injury and damage to equipment can occur during installation or servicing this equipment. All electrical work should be performed by, or under the supervision of, an experienced electrician and in accordance with all applicable electrical, fire, building and safety codes.

•This equipment can cause devices to start at any time from local controls, automatic timers, radio remote, commands from a computer and many other sources. The output of such equipment could cause hearing damage, while other attached equipment can cause personal injury when they engage. Whenever working in or around the equipment you must assume it could activate at any moment, and take appropriate precautions to protect yourself and others. You should completely disable the equipment before working on or in close proximity to any part of it.

•You must test the system and equipment to ensure it is operating correctly after the installation, as well as after any work has been performed.

System Operation

•Training is necessary to ensure those responsible can correctly activate the system. It is also necessary that everyone understand the purpose of the siren and the protective actions they need to take when the system is activated. Periodic tests can serve to accomplish the training for the operators, in addition to demonstrating the various signals to the public.

•You must carefully read and completely understand all the information about the system including its abilities and its limitations. Since no warning system is infallible, you must have contingency plans for warning in the event the primary systems do not perform as expected, for any reason.

RXC-3300-DTMF™

Phone 651-460-6616
Fax 651-460-6686

Warranty:
Genave/NRC, Inc. products are warranted to be free from defects in material and workmanship for a period of ONE (1) year from the date of shipment. Genave, during this period, will repair or replace any parts, which upon our examination appear to be defective in materials or workmanship. This warranty does not apply to defects, malfunctions or breakage due to improper installation, servicing, handling or use thereof, nor to units that have been damaged by lightening or other "Acts of God", excess current, reversed supply connection, nor to units that have had their serial numbers altered or removed. Equipment damaged in Acts of War, abuse, misuse, tampering, submersion or willful destruction will also void this warranty.

Prior to returning equipment for warranty repair, contact Genave Customer Service Department for an RMA number. They can be reached by using the telephone number or fax number listed above. Genave/NRC, Inc. (Genave) and its licensers offer this warranty in lieu of any and all other guarantees or warranties, either express or implied, including without limitation the implied warranties of merchantability and fitness for a particular purpose, regarding hardware or software. Genave and its licensors do not warrant, guarantee or make any representations regarding the use or the results of the use of the software or hardware in terms of its correctness, accuracy, reliability, most recent or otherwise. You assume the entire risk as to the results and performance. The exclusion of implied warranties is not permitted by some jurisdictions. The above exclusion may not apply to you.

In no event will Genave, its licensors, directors, officers, employees or agents (collectively Genave's licensor) be liable to you for any consequential, incidental or indirect damages (including damages for loss of business profits, business interruption, loss of business information, and the like) arising out of the use or inability to use the software or hardware even if Genave and/or its licensor has been advised of the possibility of such damages. Because some jurisdictions do not allow the exclusion or limitation of liability for consequential or incidental damages, the above limitations may not apply to you. Genave and its licensors liability to you for actual damages from any cause whatsoever, and regardless of the form of the action (whether in contract, tort, (including negligence), product liability or otherwise), are expressly excluded.

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Life Support Policy:
Genave/NRC, Inc. products are not authorized for use as critical components in life support devices or systems without the express written approval of the president of Genave/NRC, Inc. As used herein:

1) Life support devices or systems are devices or systems which, (a) are intended for surgical implants into the body, or (b) support or sustain life, or whose failure to perform, when properly used in accordance with instructions, can reasonably be expected to result in a significant injury to the user.

2) Critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

FCC Compliance Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

FCC WARNING

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution:

To comply with the limits for an FCC Class B computing device, always use the accessories supplied with this unit.

The Federal Communications Commission warns that changes or modifications of the unit not expressly approved by Genave could void the user’s authority to operate the equipment.

Table of Contents

Specifications

Voltage In: 11 to 14 volts dc.

Current requirements:
209 ma Quiescent
250 ma Active
300 ma Max

Output Connector:
16 – 26 AWG
3.5 mm pin spacing
125v @ 5 amps

DC Connector:
2.1 mm x 5.5mm Barrel
Center pin positive

DTMF Signal:
Max V_{pp}: 5.20 V_{p-p}
Max V_{rms}: 3.78 V_{rms}

Audio Output:
600 ohm
Transformer isolated

Weight:
3.2 lbs (1.45 kg)

Dimensions:
Height 11.5 inches (29.3 cm)
Width 7.0 inches (17.8 cm)
Depth 7.0 inches (17.8 cm)

Environmental:

Operating Temperature	0 deg C to +60 c
Humidity	0-95% Non-condensing

Relay Outputs:
Form C, Sealed, 5 amp max

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Installation

The ENC-3300 attaches to a customer supplied two-way radio to generate over-the-air DTMF signals intended to control remote equipment and pagers.

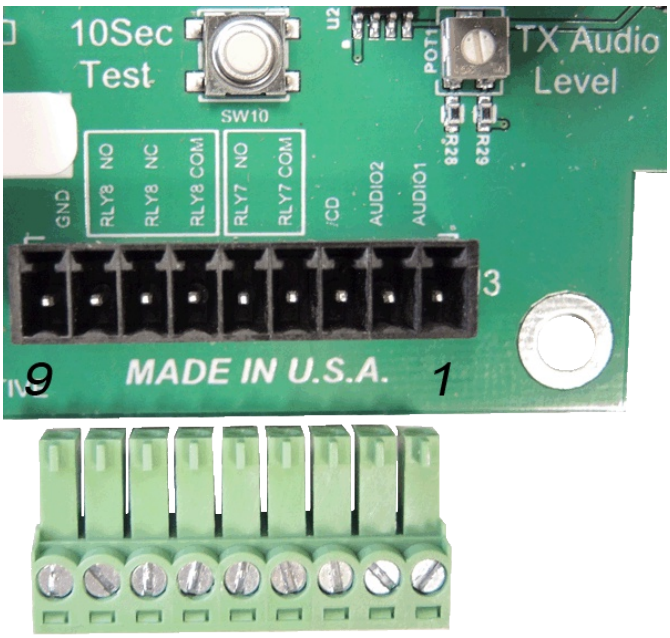
Audio, PTT and carrier detect lines from the radio are attached to the ENC-3300 using connector J3.

Access to connector J3, testing and adjustment controls is performed by removing two screws from the bottom of the door, then pulling the lower edge of the door forward and out and setting the access door aside.

Output Connector

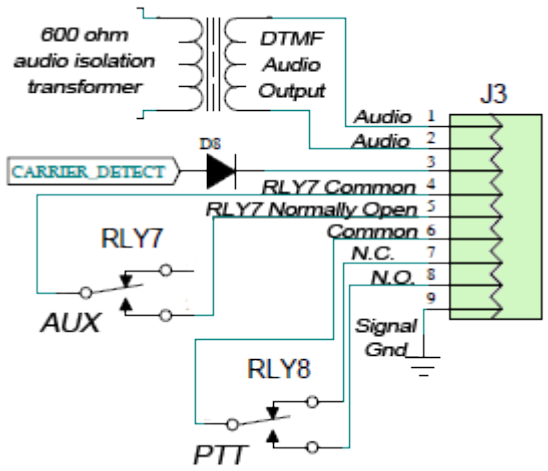
Connect the appropriate wires between your radio to the encoder. See the Output Schematic on page 44 or Radio Interface on page 25 for additional information.

The ENC-3300 includes a 9 position depluggable connector for connections to the external radio. Connectors and cables for specific radios are not included with the encoder.



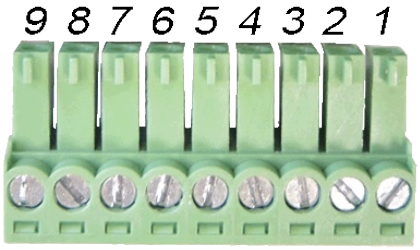
Depluggable Connector J3

Output Schematic



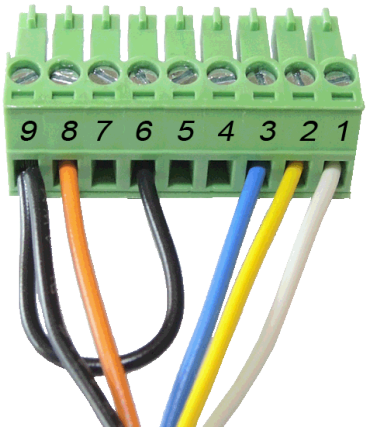
J3 Pin	Purpose
1	Audio Output 1
2	Audio Output 2
3	Carrier Detect Input
4	Relay 7 - Common
5	Relay 7 – Normally Open
6	Relay 8 - Common
7	Relay 8 – Normally Closed
8	Relay 8 – Normally Open
9	Signal Common Ground

Connector for J3



The 9 pin connector is keyed to fit only one direction.

Example connection

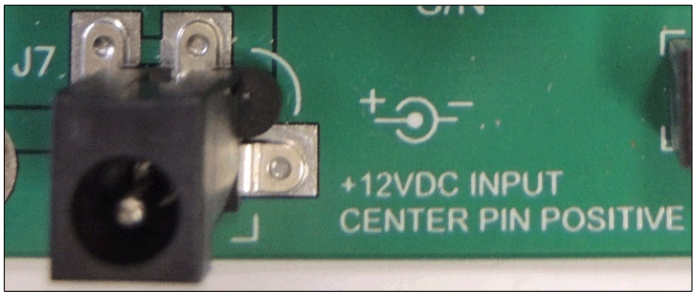


This example shows a common wiring connection that can be used for many different types of radios, although you must check your radio for proper application. Numbers and colors in the table are for instructional purposes and do not appear on the connector.

J3 Pin	Wire Color	Purpose
1	White	Audio output to transmitter
2	Yellow	Audio output to transmitter
3	Blue	Carrier detect from radio
8	Orange	Transmitter key-up / push-to-talk
9	Black	Common signal ground

Power

Attach 11 to 14 volts DC to power connector J7. Connector is 2.1mm x 5.5mm. Center pin positive.



Audio connections to your Radio

It's beyond the scope of this manual to address the programming of individual two-way radio models, however its generally best to begin with your radio set to transmit flat audio response and to disable AGC and other settings which may affect the inbound audio from the ENC-3300.

Adjust Audio Levels

After connecting your radio, use a communications service meter and adjust the output deviation on your radio to the correct level.

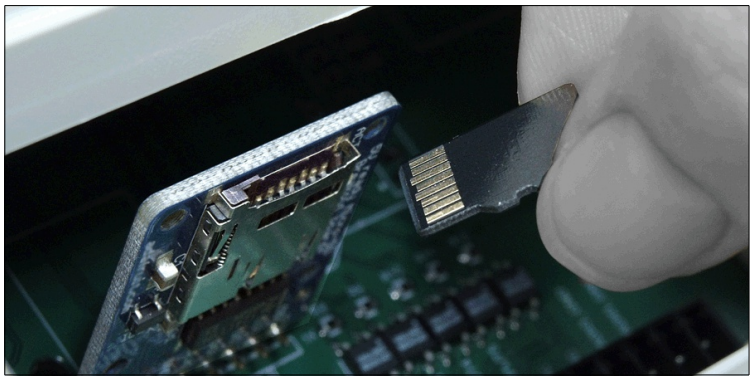
1. Press and release SW10 “10 sec Test” to transmit a test tone.

2. Adjust POT1 “TX Audio Level” to the correct level while the radio is transmitting.

Programming

If the encoder is not yet programmed, insert the 2GB SD memory card containing the DTMF settings then reset power to the encoder. The program information will be transferred to the encoder as it starts.

Open the access door on the ENC-3300 to insert or remove the memory card.



To insert, slide the card into the card holder until it latches into place.

To remove, lightly press the memory card down to release it from the card holder. It will pop up slightly and can then be removed.

During a program upload the encoder actively monitors the new data as it arrives and searches for possible errors or corrupted data. It saves the results of the search in a report file on the SD card. The report file has the same name as the file just uploaded, but with a suffix of .RPT (Report) instead of .GP3. To verify the transfer it's recommended this report be examined with a text editor such as Windows Notepad after an upload.

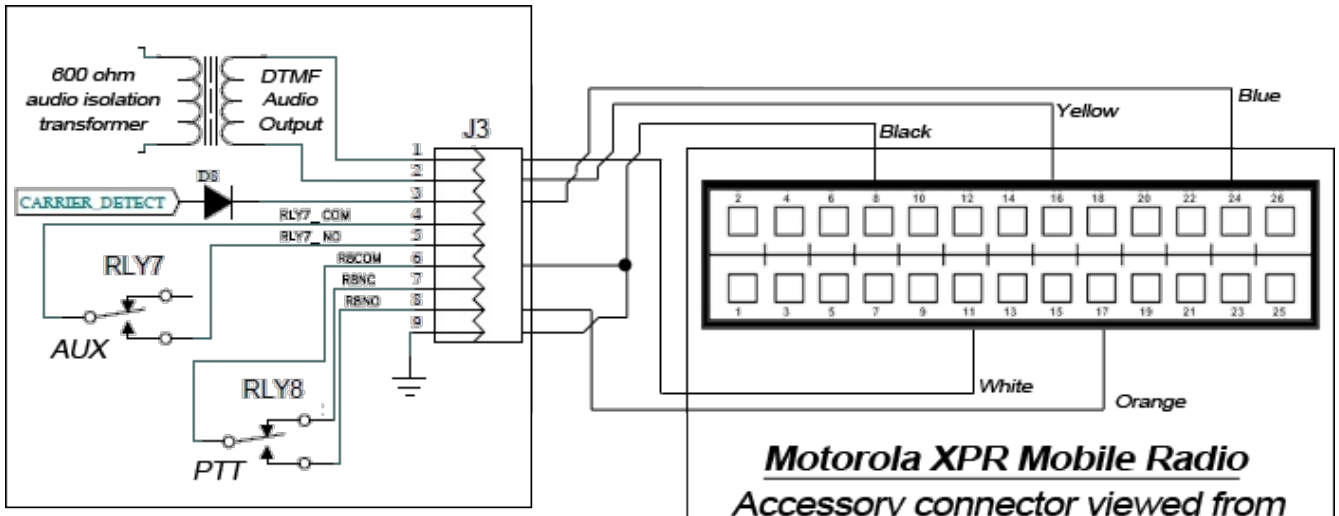
See Programming via SD Card on page 20 for additional information.

Testing

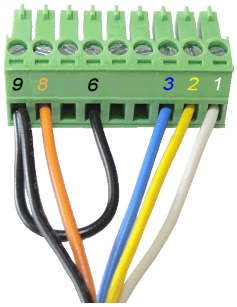
Reattach the access door. Test the encoder and radio completely before placing into service. Check the transmitter deviation, signal symmetry, and all codes and actions using a communications service monitor, oscilloscope and associated test equipment.

Example connection – Motorola XPR-4350 in analog mode

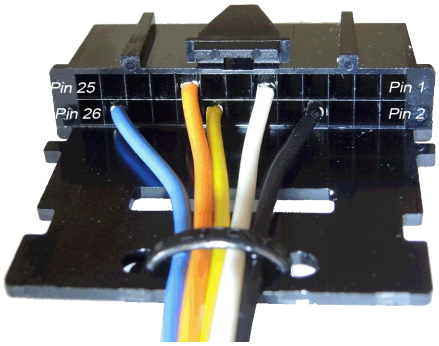
This is an example only. Your radio may vary in firmware, hardware or programming.
Consult your radio's service manual for specific details on setup and operation.



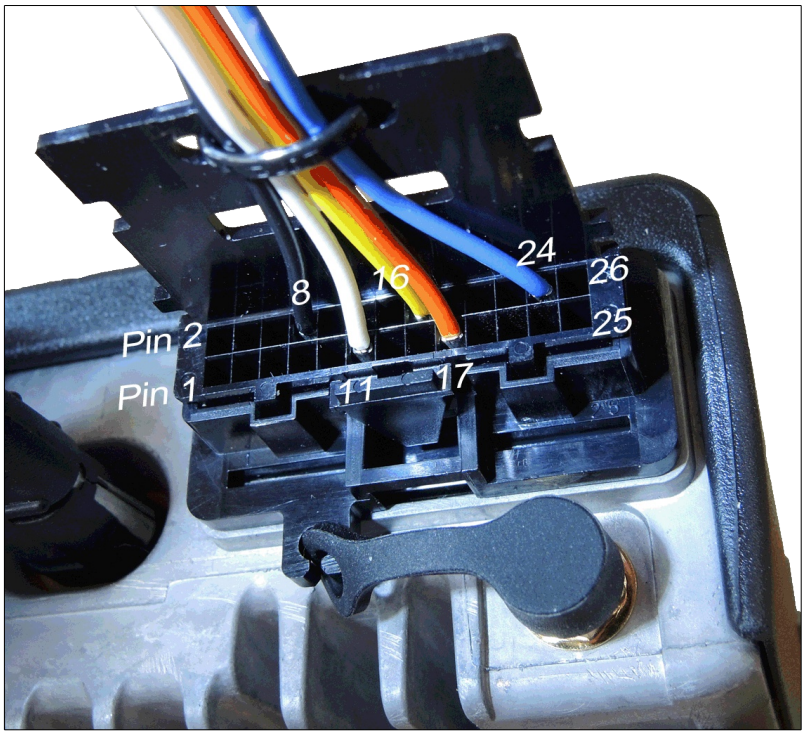
Notes: In the above configuration program the radio as follows:
1) Accessories->GPIO Physical Pins->Pin 17->Ext Mic PTT
2) Accessories->GPIO Physical Pins->Pin 24->CSQ Detect



Wiring to J3 connector



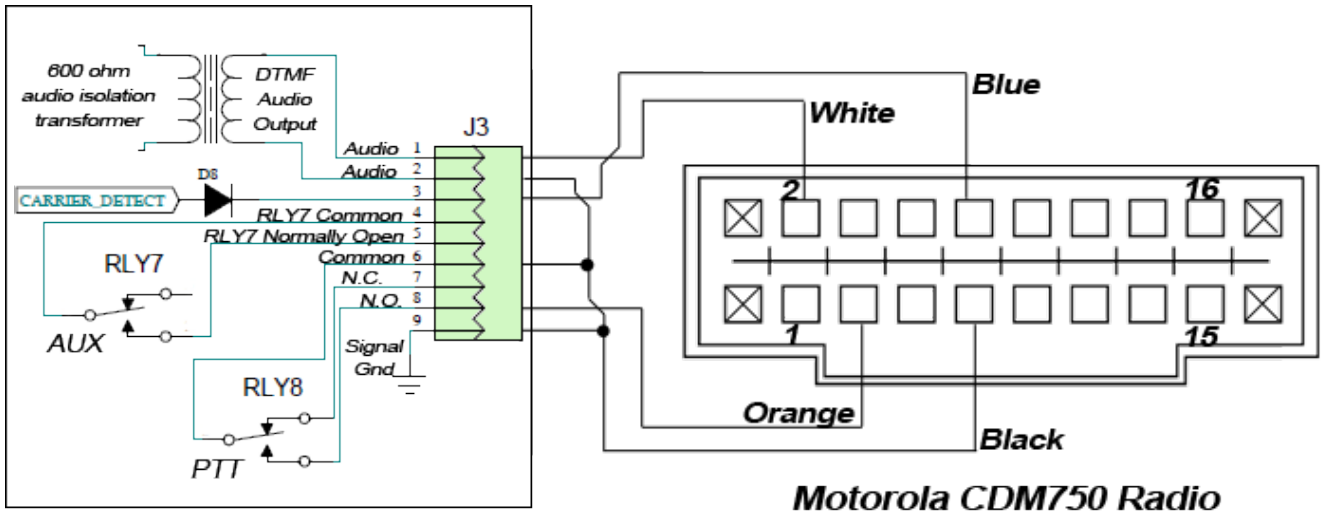
Accessory connector bottom view



Motorola accessory connector attached to radio.

Example connection – Motorola CDM750

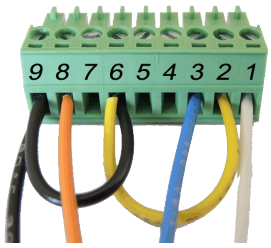
This is an example only. Your radio may vary in firmware, hardware or programming.
Consult your radio's service manual for specific details on setup and operation.



ENC-3300-DTMF Encoder

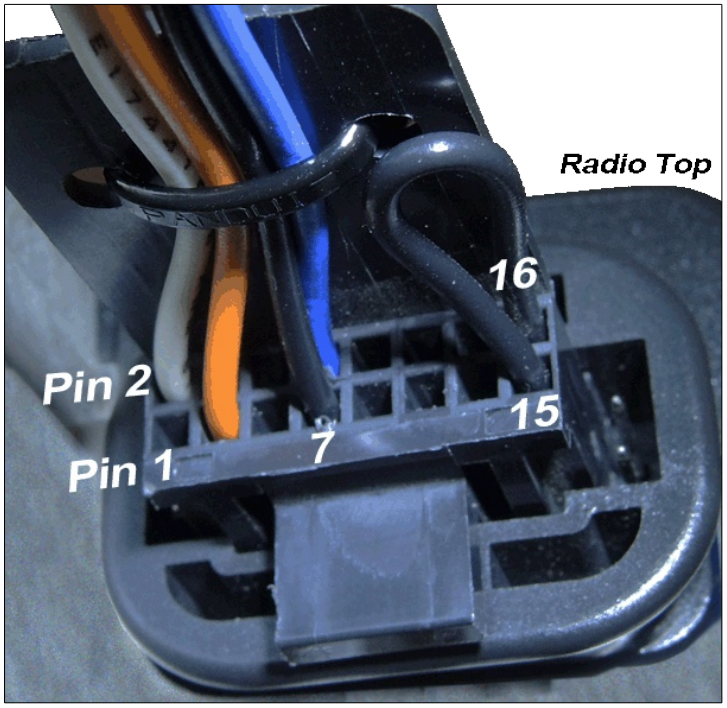
Motorola CDM750 Radio

Accessory connector viewed from rear of the radio.



Wiring to J3 connector

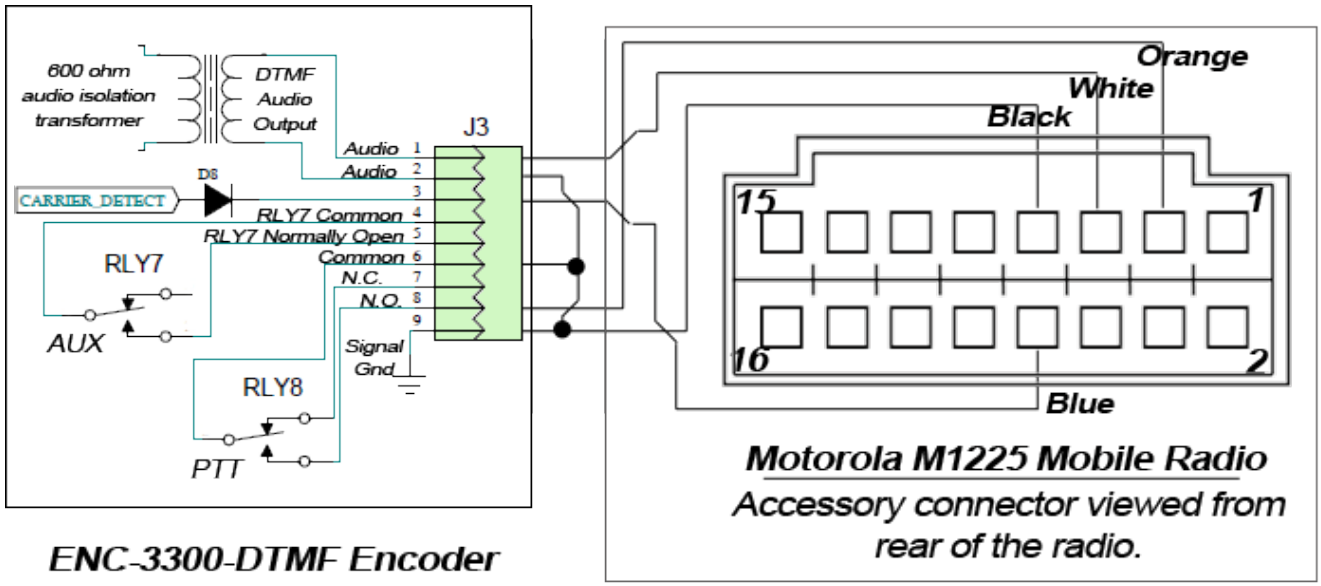
Accessory connector bottom view

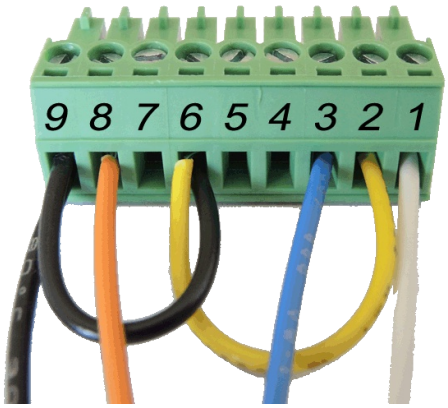


Motorola accessory connector attached to radio.

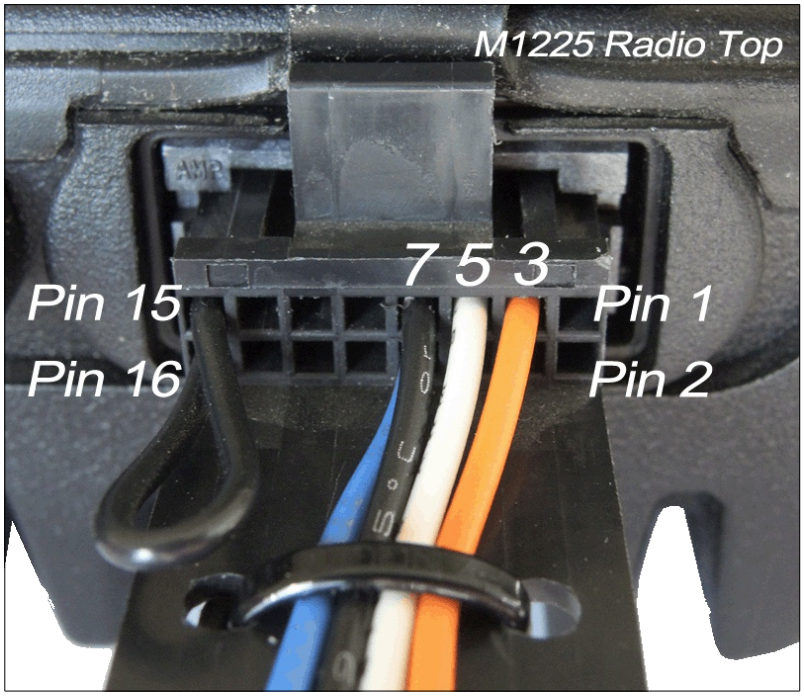
Example connection – Motorola M1225

This is an example only. Your radio may vary in firmware, hardware or programming.
Consult your radio's service manual for specific details on setup and operation.





Wiring to J3 connector



Motorola accessory connector attached to radio.

Using the ENC-3300

The encoder should be placed on a flat surface.

Sending a signal or command

• Make sure the encoder is powered and ready. Also make sure the two-way radio is turned on, working and the correct channel is selected on the radio.

• Firmly press then release the button on the ENC-3300 to initiate the transmission sequence. The button should be pressed for at least 1/2 second or until the unit beeps. The red “Busy” indicator will turn on.

• If the button has been programmed to require a second press (Tap-2™) before sending the signal, a 15 second countdown timer will appear and the internal speaker will beep every second. The signal will not be sent unless the button is pressed again before the timer expires.

• The “Tx” indicator will turn on when the encoder begins generating the DTMF code string.

• The LCD screen will indicate the progress and completion of the action.

• After completion of the transmission, both the Busy and Tx indicators will turn off and you are free to begin another activation. After a short period the encoder returns to its welcome screen if no other buttons are pressed.

Stopping a transmission in progress

Press and release the **ESC** button to stop a transmission in progress. This will stop further signals or actions, however it will not retrieve signals already sent.

ESC Button

The ESC button located on the keyboard has several duties.

1) Press and release while the RXC is running to stop actions including button countdowns, uncompleted transmissions and other activities.

2) Pressing and holding the ESC button for at least four seconds will result in the RXC prompting you to release the button to adjust the clock.

3) Press and hold the ESC button for at least eight seconds to perform a reboot that will also reinitialize the network and SD memory card interface. It has the same effect as removing and reapplying power.

4) While the ENC-3300 is powering up, press and hold the ESC key. After a few seconds the LCD screen will display a countdown timer. If the button is still pressed when the timer expires the program in the ENC-3300 memory will be transferred to the SD memory card. The new file will overwrite any file on the SD card with the same name.

The download feature can be disabled by using the SYS,PGMLOCK command. See PGMLOCK on page 35.

No countdown or option to download the program information will occur if PGMLOCK is enabled.

System Clock – Adjusting Time and Date

Press and hold the ESC button for at least four seconds. When you initially press the ESC button the lcd screen will display “Release ESC button.” After four seconds a countdown timer will begin and the lcd screen will display “Release ESC now to set clock”. Release the Esc button to enter the clock adjust mode.

The top line of the lcd screen shows text information describing the values on line 2.

Use keyboard buttons 1 and 2 to move the cursor on line two left and right respectively.

When the cursor is under the digit to be changed, **use keyboard buttons 5 and 6 respectively to increase and decrease the value**. Repeatedly pressing the increase value (button 5) will roll the digit from its maximum value back to zero.

After completing all changes, press keyboard button 8 to save the changes.

The encoder will exit without saving the changes if there have not been any button presses for several minutes or if the ESC button is pressed.

Programming via SD Card

Programming changes are accomplished using a 2GB micro SD memory card with FAT16 formatting. This method makes field changes fast and easy since no computer is required on-site. Memory cards can be sent to customers so they can make the changes themselves.

After making program changes and saving them to the SD card, the card is inserted into the ENC-3300 and the new settings upload the encoder as the encoder starts. The encoder retains the data in memory when power is removed so the SD card can be removed after the program upload is completed.

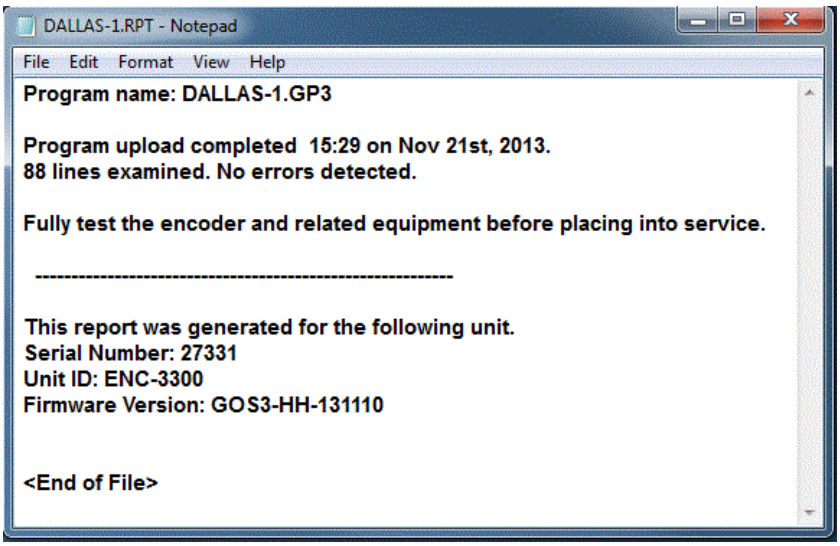
Active Upload Monitoring – Report File

During a program upload the encoder actively monitors the new data as it arrives and searches for possible errors or corrupted data. It saves the results of the search to a report file on the SD card. The report file has the same name as the file just uploaded, but with a suffix of .RPT (Report) instead of .GP3.

The report is a standard text file and can be viewed with programs such as

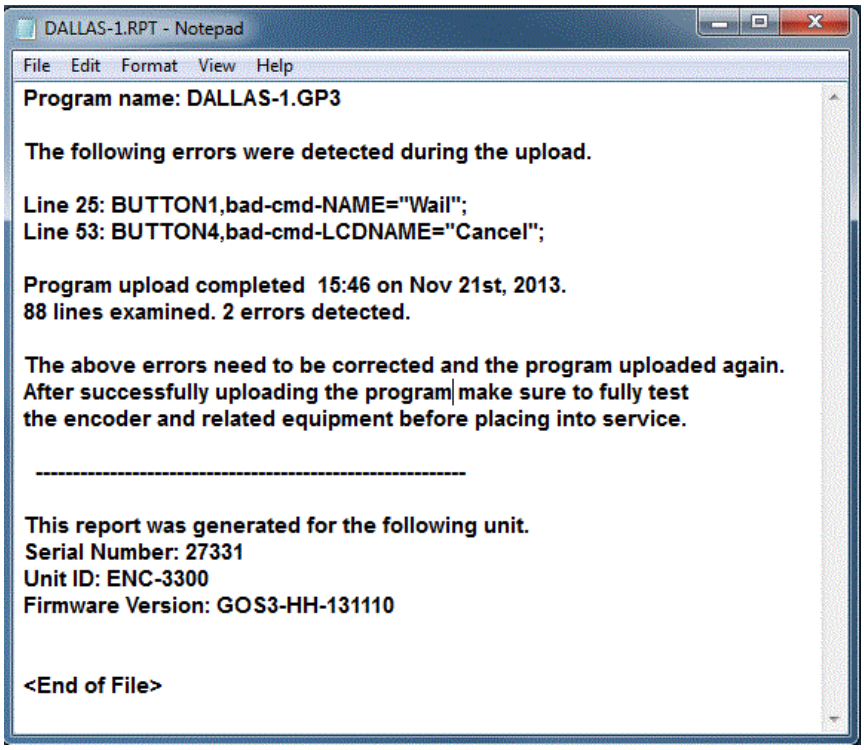
- Microsoft: Notepad, Wordpad or Word.
- Multi OS: OpenOffice or LibreOffice.
- Apple: TextEdit.
- Linux/Unix: gedit, vi, nano.

Example - Successful Upload Report



The above report indicates no errors were detected,

Example – Upload Fail Report



In the example above, two lines were intentionally failed by manually adding “bad-cmd-” to the program before the upload was attempted.

During the program upload transfer from the SD card, the encoder detected the errors and added them to the report so they could be quickly found and corrected.

Active Upload Monitoring - LCD

During a program upload, the ENC-3300 actively monitors the data arriving from the SD card for errors. During the upload, each line entry is displayed in real time on the LCD screen with the result of the line scan indicating “FAIL” if an error is detected.

If an error is detected, the encoder:

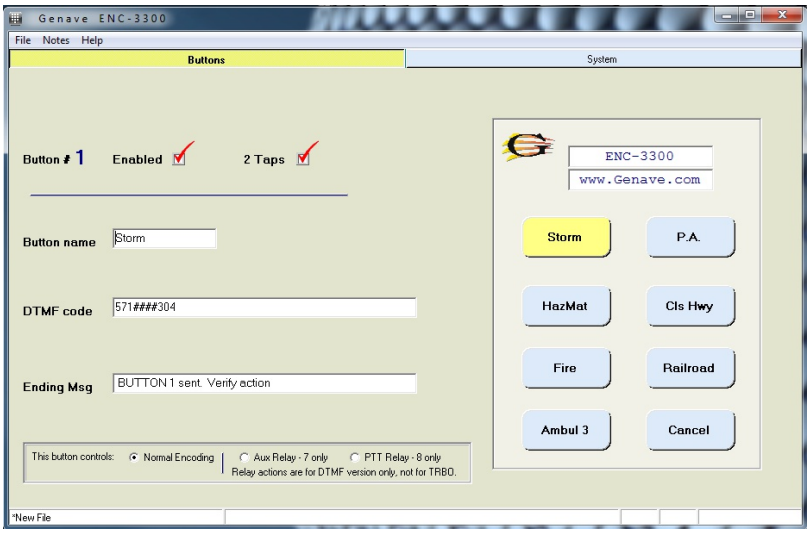
- Reports “FAIL” on the LCD screen.
- Displays the program line number on the SD card where the error can be found.
- Activates the internal alert tone to get the operators attention.
- Delays the upload for several seconds so the operator can note the information.

After the upload is finished the LCD will display the total number of problems it detected with the program. All errors must be corrected and the program successfully uploaded and fully tested before placing into service.

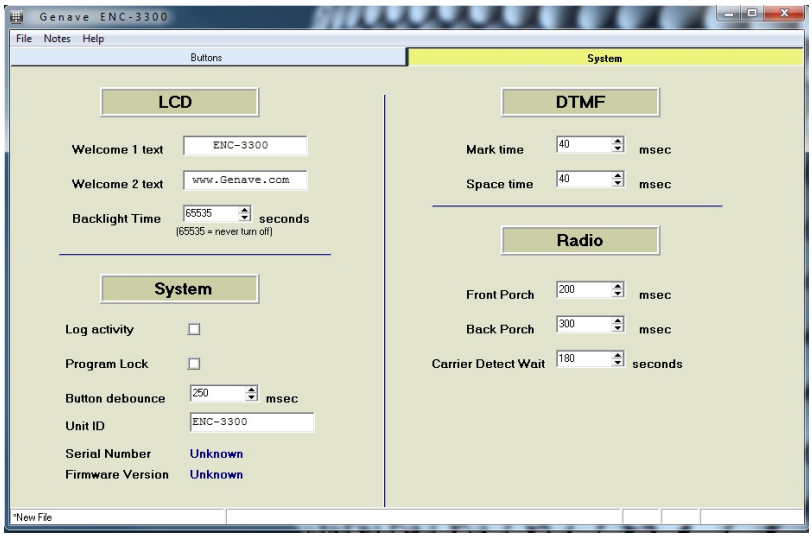
GP3 Programming File

Programming can be accomplished using Genave programming software filename "**ENC3300.exe**". The program operates on Windows 2000, XP and Windows 7 operating systems.

ENC3300 is a fill-in-the-blank type of program that is easy to operate. In addition to quickly constructing files for the encoder, it can also read and display information downloaded from an already programmed encoder.



ENC3300.exe program for W7, XP and W2K.



The resulting programming file is a standard text file which can also be edited using a program such as Microsoft Notepad. The file must not contain any formatting options such as Bold, Italic or others.

The .GP3 programming file on the SD card contains the command **SYS,PGMUPLOAD=1;** to instruct the encoder to use the programming information from the card. If the command is missing or **SYS,PGMUPLOAD=0;** then the encoder will not upload the information to the encoder.

After a file has uploaded, **SYS,PGMUPLOAD=1;** is automatically changed to **SYS,PGMUPLOAD=0; .** This change prevents the same program from reloading next time the encoder starts. See PGMUPLOAD on page 34 for additional information.

An example filename
FILEA01.GP3

Filename Length

File names are DOS 8.3 style. The filename prefix before the period cannot be greater than eight characters and the suffix after the period cannot be greater than three characters.

Example
CUST-ONE.GP3 This name is fine.
CITYWV.GP3 This name is fine.
CUST-TOO-LONG-OF-A-NAME.GP3 This name is too long.

Comments

Comments in the file are preceded by two forward slashes without any space between them.

Anything after the comment symbols is ignored until the next line.

// This is a comment that will be ignored

// BUTTON3,ENABLED=1; This command will not be processed since its preceded by comment.

BUTTON3,ENABLED=1; // The command will be processed since the // is after the command.

Activity Log

Actions, events and communications can be automatically saved to a log file on the SD card.

Activity such as power up, button presses, failed attempts due to busy radio channel, ESC key presses and others are recorded. The micro SD memory card can be removed and the data viewed at any time. The ENC-3300 allows “hot-swapping” so its unnecessary to power down the encoder when removing or installing the memory card.

Filename

The log file uses the program name with a .LOG extension. As an example, if the file name were DALLAS1.GP3, then the activity log would be DALLAS1.LOG.

Example log file

15:28:18 11/21/13 , 980, Sys, Program upload to ENC-3300 from SD memory card has started.
15:28:43 11/21/13 , 981, Sys, Program upload to ENC-3300 has completed. No errors detected.
15:28:44 11/21/13 , 901, Sys, POWER UP
15:31:47 11/21/13 , 201, Btn 02 - Steady, Tap-2 button pressed first time. Countdown timer started.
15:31:51 11/21/13 , 202, Btn 02 - Steady, Tap-2 presses complete. Countdown stopped. Proceeding to action.
15:31:59 11/21/13 , 210, Btn 02 - Steady, Action completed.
17:42:10 11/21/13 , 200, Btn 07 - Wail, Single press button. Proceeding to action.
17:32:12 11/21/13 , 210, Btn 07 - Wail, Action completed.
21:14:51 11/21/13 , 903, Sys, ESC button pressed.
03:02:44 11/22/13 , 201, Btn 03 - Fire, Tap-2 button pressed first time. Countdown timer started.
03:02:46 11/22/13 , 202, Btn 03 - Fire, Tap-2 presses complete. Countdown stopped. Proceeding to action.
03:02:49 11/22/13 , 210, Btn 03 - Fire, Action completed.
15:02:50 11/22/13 , 902, Sys, Power check ok.

Formatting the Memory Card

While its possible to format SD cards using your computer's operating system, its strongly recommend you download the free official SD card formatting utility written by the SD association.

The utility solves many of the problems associated with by formatting by Windows and Mac operating systems and ensures standard FAT16 formatting.

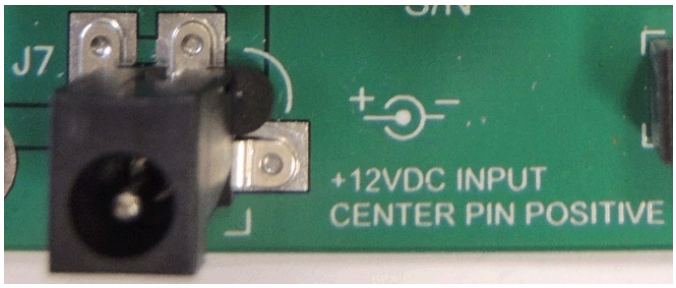
Download the free program at ***https://www.sdcard.org/downloads/formatter_3/***

Power

The ENC-3300 operates from 11 to 14 volts DC.

A power cord attaches to connector J7 which is 2.1mm x 5mm in size and uses a **CENTER PIN POSITIVE** configuration.

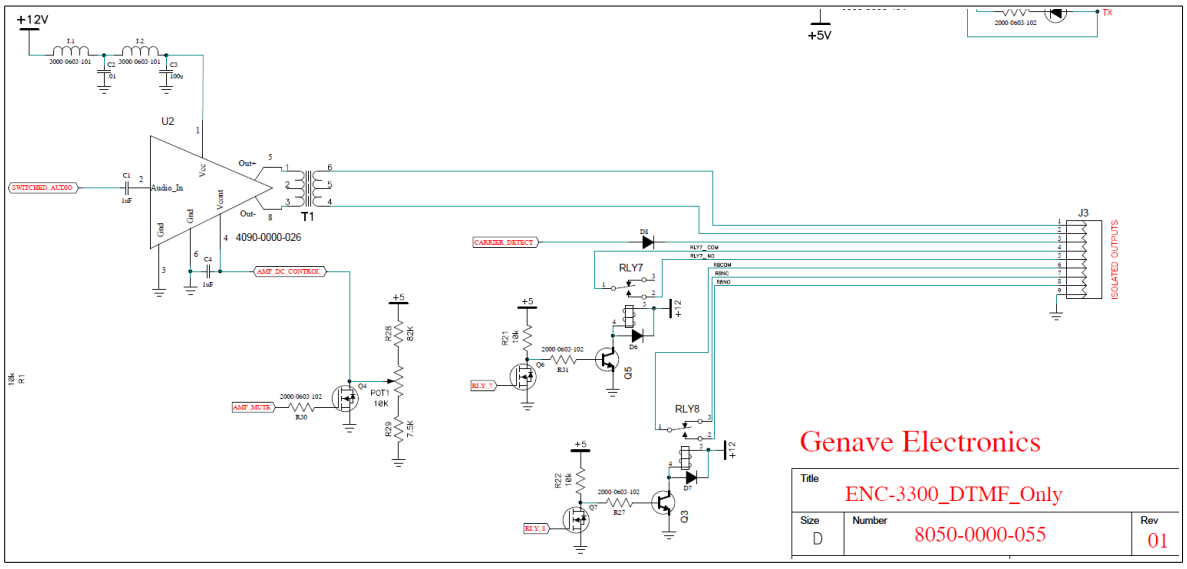
A 2 amp, 5mm x 20mm glass fuse is used for electrical protection and safety.



Radio Interface

Input / Output Connector

Connector J3 is used for connections to radios and other external devices.



A larger version of the Output Schematic is available on page 44.

Relays

Two “dry contact” Form-C relays on the board are used to interface with the radio. They are switching relays which do not deliver any voltage from the encoder.

PTT – Relay 8

Relay 8 is normally attached to the push-to-talk line of the two-way radio.

The relay engages prior to a DTMF code string being transmitted and remains engaged until the DTMF code string has finished. The “Tx” indicator is lit whenever this output is engaged.

It can also be controlled during a transmission by using commands **[R8=0]** and **[R8=1]** in the DTMF code string to turn the relay off and on respectively.

Relay 8 has all three of its form-C contacts available on output connector J3. Normally Open, Normally Closed and Common pins are all available.

Aux – Relay 7

Relay 7 provides secondary functions that can be used as necessary to control operations such as microphone on/off, transmitter steering or other external devices. It does not automatically engage during a transmit event but is instead controlled by commands in the DTMF code string.

Commands **[R7=0]** and **[R7=1]** in the DTMF code string turn the relay off and on respectively.

Relay 7 has two of its form-C outputs available on output connector J3. Normally Open and Common pins are available.

Audio

The ENC-3300 uses an internal 600 ohm matching transformer to provide superior audio response, isolation and minimum signal loading between the radio and the encoder.

The audio output level is adjusted with Pot 1 which is also labeled “**Tx Audio Level**”. Turning the control clock-wise results in higher audio output level.

Connector J3 has the two isolated audio outputs. They are labeled “**Audio 1**” and “**Audio 2**” and have no ground connection to the encoder.

10 second test switch

The 10 Sec Test switch engages relay 8, delivers a test tone for ten seconds then disengages relay 8. The switch is used to adjust transmitter deviation levels during installation and system maintenance.

Carrier Detect

Carrier detect is used to signal the ENC-3300 to wait until the channel is clear of traffic.

Connector J3 has an input labeled "**/CD**" which interfaces with the channel busy indicator from the radio.

The **/CD** input is "active low". This means the two-way radio needs to supply a ground (low) output when the channel is busy and it doesn't want the encoder to transmit.

When the channel is available the radio can release its low output and float up to 12 volts dc. The ENC-3300 waits one second extra after the **/CD** line goes high before beginning any pending transmissions.

The J3 connection labeled "GND" is normally connected to your radio's signal ground so the encoder and the radio have a common ground level to compare. Many times GND can simply be connected to the radio's power supply ground.

See CDWAIT – Carrier Detect wait time in seconds on page 36 for additional information on asjusting the maximum wait time.

See PRIORITY on page 40 for information on different methods to interact with carrier detect on an individual button level.

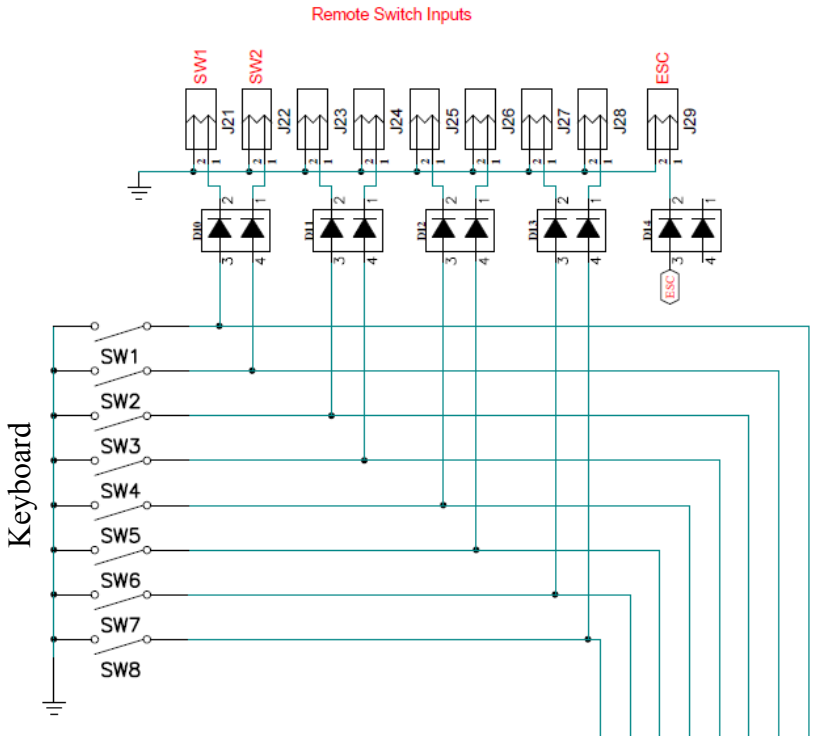
External Switches

The ENC-3300-DTMF has connections for external, momentary, dry contact switches supplied by the customer.

Please Note: Damage will result if any external voltage is applied to these connections.

The external switch connections can operate while the membrane keyboard of the ENC-3300 is still connected, however only one switch, external or keyboard, can be used at a time.

Lead length between the encoder and the external switches must be kept to a minimum distance of 10 feet. Isolating devices such as relays or opto-isolators can be added by the user for additional isolation over longer distances.



DTMF Code Strings

The ENC-3300 can send DTMF codes containing up to 128 characters.

In addition to the DTMF code itself, other instructions and actions can be embedded in the DTMF string to further customize each transmission. The special characters and instructions are not themselves transmitted, but they can change the operation of the encoder with pauses, relay actions, alert tones and LCD screen messages.

When programming DTMF codes, the entire string must be enclosed in double quotes.

Note: The leading button command has been omitted in the following examples to make reading easier. A command such as **BUTTON1,VDTMF=”12345”;** has been shorted to **VDTMF=”12345”;**

All sixteen DTMF characters are available. They are **1 2 3 4 5 6 7 8 9 0 A B C D * #** .

Dtmf code examples:

Standard codes

Example: Send the code 12345
VDTMF=“12345”;

Example: Send the code 24680BDF;
VDTMF=“24680BDF”;

Pauses

Each capital letter **P** pauses the transmission for one second.
Each lower case letter **p** pauses the transmission for .5 seconds.

Example: Send the code 12345, pause for 2 seconds, then send code 6789, pause .5 sec then send code 1357.
VDTMF=“12345PP6789p1357”;

Beep

The internal speaker in the ENC-3300 can be used to prompt the operator or get their attention.

Each capital letter J produces 5 beeps.
Each lower case letter j produces 3 beeps.

Example: Send DTMF code 9876, produce 5 beeps followed by a 2 second pause and 3 more beeps.
VDTMF=”9876JPPj”;

Send text to LCD

Displays custom text messages on the LCD screen.

This is an embedded function and must be located within square brackets [ ] .

Example: Show SEND FIRE then send DTMF code. End with LCD showing GIVE MSG NOW.
VDTMF=”[S=Send FIRE]1234[S=GIVE MSG NOW]”;

Example: Same as above but adding beeps can alert operators to give messages or perform othe actions. In this example pauses are added to keep the transmitter keyed for an addition 3 seconds to allow the operator time to key their microphone so the transmitter remains engaged without dropping between the code and the voice message.
VDTMF=”[S=Send FIRE]1234[S=GIVE MSG NOW]JPPP”;

Example: Updating LCD screen while sending several DTMF codes
VDTMF=”[S=Send FIRE]1234pp[S=Sending STORM]3212p[S=GIVE MSG NOW]PP”;

Example:
VDTMF=1442[S=ACTIVATE ALL CMD HAS BEEN SENT]PP324[S=ALL DONE]PPP”;

In the above example

- The DTMF code **1442** will be sent.
- LCD screen will display **ACTIVATE ALL CMD HAS BEEN SENT**
- There will be a two second pause.
- DTMF code **324** will be sent.
- LCD screen will display **ALL DONE**
- There will be a final three second pause then PTT (relay 8) will disengage.

Note: Text to be displayed can contain a maximum 32 characters for the standard 2 x 16 LCD screen.

Manual Transmitter Control

Purpose: Engage / Disengage transmitter relay from the DTMF string.

[R8=0] Disengages relay 8 which unkeys the transmitter.

[R8=1] Engages relay 8 and keys-up the transmitter.

Note: Is not available on the ENC-3300-TRBO version. Only DTMF versions of the ENC-3300.

The transmitter output relay 8 is engaged each time a DTMF code string is sent. Using the [R8=0] or [R8=1] command in the DTMF code string, you can selectively turn the transmitter off and on from within the DTMF code itself.

Manually engaging the transmitter using the [R8=1] command overrides the carrier detect function and the ENC-3300 will engage the transmitter PTT regardless of the carrier status.

Example:
VDTMF=221[R8=0][S=Tx OFF]142[R8=1][S=Tx ON]121";

In the above example

- Transmitter is turned on.
- DTMF code **221** will be sent.
- Transmitter is turned off.
- LCD screen will display **Tx OFF**
- DTMF code **142** will be sent.
- Transmitter is turned on.
- LCD screen will display **Tx ON**
- DTMF code **121** will be sent.
- Transmitter will turn off.

Aux Relay Control

Purpose: Engage / Disengage the optional relay from the DTMF string.

[R7=0] Disengages relay 7.

[R7=1] Engages relay 7.

Note: Is not available on the ENC-3300-TRBO version. Only DTMF versions of the ENC-3300.

The optional relay is not engaged when a button begins sending a DTMF code string. Instead, it is left up to the user to determine if and when the relay should be engaged. Using the [R7=0] and [R7=1] in the DTMF code string, you can selectively turn the relay off and on.

Example:
VDTMF=144[R7=1][S=PA is on. Press PTT and give msg]PPPPP";

In the above example

- DTMF code **144** will be sent.
- Microphone attached to relay 7 is turned on.
- LCD screen will display **PA is on. Press PTT and give msg**
- Five second pause before transmitter is turned off at the end of the code.
- Relay 7 is automatically turns off at the end of the code.

Alert Tones

Purpose: Generate audio alert signals to get the attention of people receiving the signal.

Note: This feature not available on the ENC-3300-TRBO version. Only for DTMF versions of the ENC-3300.

[AL=x] replace X with the particular alert signal from one to eight.
1: 10 beeps
2: high-low 10 times
3 to 8: sweep tones with different frequencies and cadence.
99: ten second test tone consisting of DTMF character “A”.

Example: Send DTMF code 3579 then transmit high-low alert signal.
VDTMF=”3579[AL=2]”;

Example: Same as above but pause two seconds after the DTMF code to give the receivers time to decode and activate the signal before generating the Alert tones. It finishes by prompting the operator to deliver a voice message.
VDTMF=”3579PP[AL=2]PP[S=TALK NOW]”;

SYS – System

FILENAME

Maximum 32 character string to identify the program name.

The FILENAME is changed by uploading a new program.
It can also be changed manually. Manual changes must be enclosed in double quotes.

SYS,FILENAME=”MYPGM.GP3”;

UNITID

Maximum 32 character string to identify the location or purpose of the unit.

Changes must be enclosed in double quotes.

SYS,UNITID=”Watertower at 905 West”;

UNITID string does not need to be unique.

BKLIGHT

Time in seconds for the LCD back light to remain on after last button press or action.

Values are 0 to 65535.

SYS,BKLIGHT=60; // remains on for 60 seconds
SYS,BKLIGHT=65535; // 65535 is special value, back light does not turn off.

WELCOME1

Text to show on top line of LCD when the unit is in idle state.

Sixteen characters maximum.

Changes must be enclosed in double quotes

SYS,WELCOME1=” CUSTOMER NAME ”;

To display the date and time on line 1, use the following
SYS,WELCOME1=”__DATETIME__”;
Note that there are two underscore characters before and after the word DATETIME.

WELCOME2

Text to show on top line of LCD when the unit is in idle state.

Sixteen characters maximum.

Changes must be enclosed in double quotes

SYS,WELCOME2=”www.COMPANY.com”;

To display the date and time on line 1, use the following
SYS,WELCOME2=”__DATETIME__”;
Note that there are two underscore characters before and after the word DATETIME.

LOG

Master command which enables and disables writing to the log on the SD card. If set to zero, no logging to the SD card will occur. If set to one, the logging status of each button will prevail.

SYS,LOG=0; or **SYS,LOG=1;**

DEBOUNCE

Debounce time in msec for the inputs to debounce.

SYS,DEBOUNCE=250; (default)

SYS,DEBOUNCE=1000; Set debounce time to one second.

PGMUPLOAD

Allows or denies a program upload to occur from the SD card to the encoder memory.

PGMUPLOAD is not a stored value in the encoder memory. Instead, its a command placed in the program located on the SD memory card.

On power-up reset the encoder checks the SD card for a file with the .GP3 suffix. If found it opens the file and checks for the command **SYS,PGMUPLOAD=1;** . The program is not uploaded to the encoder if the command is missing or does not exactly match the format.

If the command **SYS,PGMUPLOAD=1;** is located then the program is uploaded to the encoder. After a file has uploaded, **SYS,PGMUPLOAD=1;** is automatically changed to **SYS,PGMUPLOAD=0; .** This change prevents the same program from reloading next time the encoder starts.

PGMLOCK

Controls the ability to download the information from the encoder to the SD memory card when using the ESC button as the encoder resets.

SYS,PGMLOCK=0; // Disables the program lock. Information can be downloaded to the SD card using the ESC button.

SYS,PGMLOCK=1; // Prevents program information from being downloaded to the SD card using the ESC button.

If PGMLOCK is enabled, no countdown or option to download the program information will occur as the encoder powers-up.

DFRONT

DFRONT is the “Front Porch” initial wait time before DTMF codes begin. Allows the transmitter to reach full power.

SYS,DFRONT=800; sets front porch time to 800 msec. (factory default time is 800 msec)

DBACK

DBACK is the final wait time after all the DTMF codes have completed. The transmitter will remain keyed during this period then automatically unkey.

SYS,DBACK=800; sets back porch time to 800 msec. (factory default time is 800 msec)

DMARK

The amount of time in msec that each DTMF digit is turned on.

SYS,DMARK=40; sets Mark time in msec. (factory default time is 40 msec)

DSPACE

The amount of time in msec that each DTMF digit is turned off.

SYS,DSPACE=40; sets Space time in msec (factory default time is 40 msec)

CDWAIT – Carrier Detect wait time in seconds

Purpose:
Adjusts the amount of time the ENC-3300 will wait for the channel to clear before attempting to transmit. If the Carrier Detect is still busy when the CDWAIT time expires, the attempt is aborted and no signal is sent.

Minimum value: 0 Zero disables Carrier Detect. Channel activity will not be checked before transmit. Maximum value 65535. When set to 65535, the ENC-3300 will not time out. A power reset or pressing the ESC key may be necessary to abort the attempt if the channel does not become available.

Overview:
The carrier detect line input of the ENC-3300 can be connected to the carrier detect output of a two-way radio to monitor the radio channel and avoid transmitting if the channel is already in use.

The ENC-3300 checks the carrier detect just before it engages relay 8 to keyup the radio. If the channel is busy it will wait until the channel is available before continuing with it's transmission. If the channel remains busy past the time set by CDWAIT, the ENC-3300 will abort the attempt and the signal will not be sent.

Hardware connection:
The Carrier Detect (**/CD**) input on the ENC-3300 is an active low. This means the **/CD** wait logic engages when the **/CD** input is taken low in respect to the ENC's ground.

Most two-way radios supply a logic low output when the channel is busy which usually matches the ENC's input quite well. It is important however to remember that the ENC-3300 and your radio must share a common power ground for CD to operate. If a common ground can not be attained, or if your radio raises it's carrier detect when there is a busy channel, then it may be necessary for the installer to add an isolation relay, opto-coupler or other techniques to complete the interface.

See PRIORITY on page 40 for information on overriding carrier detect on a per-button level.

SIDETONE

The side tone from the internal speaker can be enabled or disabled when sending DTMF digits.

SYS,SIDETONE=0; // zero disables side tone

SYS,SIDETONE=1; // one enables dtmf side tone

This setting only affects the side tone as the encoder is generating the DTMF digits. Even with “SIDETONE” set to zero, the speaker will still beep for button presses, countdown timers, errors and other prompts.

BUTTONx

Button Settings

Each of the eight buttons on the encoder is independent of the others and can have a unique code string.

Below are three button examples. All the button data can be viewed at Sample File on page 41.

```
BUTTON1,NAME="BUTTON 1";
BUTTON1,ENABLED=2;
BUTTON1,VDTMF="111991";
BUTTON1,LCDNAME="BUTTON 1";
BUTTON1,ENDTEXT="  BUTTON 1 sent. Verify action  ";
BUTTON1,LOGOUT=0;
BUTTON1,PRIORITY=0;
BUTTON1,QUIET=0;
BUTTON1,OUTPUT=0;

BUTTON2,NAME="BUTTON 2";
BUTTON2,ENABLED=2;
BUTTON2,VDTMF="222991";
BUTTON2,LCDNAME="BUTTON 2";
BUTTON2,ENDTEXT="  BUTTON 2 sent. Verify action  ";
BUTTON2,LOGOUT=0;
BUTTON2,PRIORITY=0;
BUTTON2,QUIET=0;
BUTTON2,OUTPUT=0;

BUTTON6,NAME="BUTTON 6";
BUTTON6,ENABLED=2;
BUTTON6,VDTMF="666991PP5112";
BUTTON6,LCDNAME="BUTTON 6";
BUTTON6,ENDTEXT="  BUTTON 6 sent. Verify action  ";
BUTTON6,LOGOUT=0;
BUTTON6,PRIORITY=0;
BUTTON6,QUIET=0;
BUTTON6,OUTPUT=0;
```

ENABLED

Determines if button actions will be be processed.

BUTTONx,ENABLED=0; button is disabled, actions will be ignored

BUTTONx,ENABLED=1; (default) button is active

BUTTONx,ENABLED=2; button must be pressed twice within 15 seconds to activate

QUIET

Inhibits messages to user if they press a button that has been disabled.

BUTTON1,QUIET=0; (default) Notify user if they press a button is disabled.

BUTTON1,QUIET=1; Do not notify the user they have pressed a disabled button.

If an individual button is disabled, the QUIET option allows you to either advise the user of the disabled button status or to quietly discard the keypress without notification..

LCDNAME

Text shown on the LCD screen for the particular button.

Maximum 16 alpha-numeric characters.

Changes must be enclosed in double quotes

BUTTON1,LCDNAME="BUTTON 1";

DTMF

DTMF code string to send.

Maximum 128 characters.

DTMF codes must be enclosed in double quotes.

BUTTON1,VDTMF=”12345”;

BUTTON2,VDTMF=”[S=Send FIRE]1234pp[S=Sending STORM]3212p[S=GIVE MSG NOW]PP”;

ENDTEXT

Maximum 34 alpha-numeric characters.

Changes must be enclosed in double quotes.

This data is shown on the LCD screen after the DTMF code completes.

You can also embed text in the DTMF string instead of using this command.
BUTTON1,ENDTEXT=" BUTTON 1 sent. Verify action ";

LOGOUT

Logs the button action to the SD log file on the SD memory card when **LOGOUT** is enabled.

BUTTON1,LOGOUT=1; Make a log entry to the SD card upon a successful button action.
BUTTON1,LOGOUT=0; (default) No log entry will be made when this button is pressed.

Note. **SYS,LOG** has priority over individual button LOGOUT settings. If SYS,LOG is set to zero, no button logs will occur regardless of their individual settings.

OUTPUT

The ENC-3300-DTMF encoders (but not the TRBO model) have relay outputs which can be programmed to act directly in synch with a button.

The two relays, number 7 (AUX) and number 8 (PTT), are normally used to operate an optional device or microphone pathway and to key the external radio's transmitter. In addition to automatic operation they relays can also be controlled from within the DTMF code.

The OUTPUT command allows a third way to control the relays. Either of the relays can be programmed to mimic the action of a button. The relay will engage and hold as long as the button is pressed, then open when the button is released.

An example
BUTTON4,OUTPUT=8;

In the above example button four is programmed to operate relay number eight. Every time button four is pressed, relay 8 will engage and remain engaged until the button is released.

If relay 8 is connected to the radio's push-to-talk input, then button 4 will act the same as the PTT button on the radio's microphone.

The OUTPUT command has precedence over other actions attached to a button. Any DTMF code actions will not be sent if the OUTPUT is enabled for that button.

Enable

To enable OUTPUT actions set the value to seven (AUX relay) or eight (PTT relay).
BUTTON4,OUTPUT=8;

Disable

To disable OUTPUT actions set the value to zero.
BUTTON4,OUTPUT=0;

PRIORITY

Carrier Detect (pg. 36) is an input used to detect radio traffic and inhibit transmissions until the channel is clear. There may however be instances in your system design where some buttons need to be able to override carrier detect and generate the DTMF string. To cover this, each button in the ENC-3300 has a carrier detect priority level which is controlled by the command **PRIORITY**.

Priority	Action
0	Low (Default) – Aborts attempt if channel not still clear when CDWAIT expires.
1	High - Ignores carrier detect. Transmits regardless of carrier status.
2	Medium - Delayed override. Waits for the channel to clear. If the channel is still busy when CDWAIT expires, the unit then overrides carrier detect and generates DTMF string anyway.

Note: Some radios have their own programmable settings which inhibit transmitting if the channel is busy. You may need to change these settings if you intend to use PRIORITY.

INITIAL

Initializes the button variable back to default.
BUTTONx,INITIAL=1;

Use a value of 65535 to initialize all the buttons.
BUTTON65535,INITIAL=1;

Sample File

```
SYS,PGMUPLOAD=1;
//<HEADER>
//  This file was downloaded from ENC-3300-DTMF.
//  Thoroughly test the unit before placing into service.
//</HEADER>

SYS,FILENAME="GENAVE-1.GP3";
SYS,UNITID="TEST Unit 1";
SYS,VER="GOS3-HH-130908";
SYS,SERNUM="12345";
SYS,WELCOME1=" www.Genave.com ";
SYS,WELCOME2="__DATETIME__";
SYS,DMARK=40;
SYS,DSPACE=40;
SYS,DFRONT=500;
SYS,DBACK=1500;
SYS,CDWAIT=180;
SYS,DEBOUNCE=251;
SYS,BKLIGHT=65535;
SYS,FILELOAD=2;
SYS,LOG=0;
SYS,SIDETONE=1;
SYS,PGMLOCK=0;


BUTTON1,NAME="BUTTON 1";
BUTTON1,ENABLED=2;
BUTTON1,VDTMF="111991";
BUTTON1,LCDNAME="BUTTON 1";
BUTTON1,ENDTEXT="  BUTTON 1 sent. Verify action  ";
BUTTON1,LOGOUT=0;
BUTTON1,PRIORITY=0;
BUTTON1,QUIET=0;
BUTTON1,OUTPUT=0;

BUTTON2,NAME="BUTTON 2";
BUTTON2,ENABLED=2;
BUTTON2,VDTMF="222991";
BUTTON2,LCDNAME="BUTTON 2";
BUTTON2,ENDTEXT="  BUTTON 2 sent. Verify action  ";
BUTTON2,LOGOUT=0;
BUTTON2,PRIORITY=0;
BUTTON2,QUIET=0;
BUTTON2,OUTPUT=0;

BUTTON3,NAME="BUTTON 3";
BUTTON3,ENABLED=2;
BUTTON3,VDTMF="333991";
```

```
BUTTON3,LCDNAME="BUTTON 3";
BUTTON3,ENDTEXT="  BUTTON 3 sent. Verify action  ";
BUTTON3,LOGOUT=0;
BUTTON3,PRIORITY=0;
BUTTON3,QUIET=0;
BUTTON3,OUTPUT=0;

BUTTON4,NAME="BUTTON 4";
BUTTON4,ENABLED=2;
BUTTON4,VDTMF="444991";
BUTTON4,LCDNAME="BUTTON 4";
BUTTON4,ENDTEXT="  BUTTON 4 sent. Verify action  ";
BUTTON4,LOGOUT=0;
BUTTON4,PRIORITY=0;
BUTTON4,QUIET=0;
BUTTON4,OUTPUT=0;

BUTTON5,NAME="BUTTON 5";
BUTTON5,ENABLED=2;
BUTTON5,VDTMF="555991";
BUTTON5,LCDNAME="BUTTON 5";
BUTTON5,ENDTEXT="  BUTTON 5 sent. Verify action  ";
BUTTON5,LOGOUT=0;
BUTTON5,PRIORITY=0;
BUTTON5,QUIET=0;
BUTTON5,OUTPUT=0;

BUTTON6,NAME="BUTTON 6";
BUTTON6,ENABLED=2;
BUTTON6,VDTMF="666991";
BUTTON6,LCDNAME="BUTTON 6";
BUTTON6,ENDTEXT="  BUTTON 6 sent. Verify action  ";
BUTTON6,LOGOUT=0;
BUTTON6,PRIORITY=0;
BUTTON6,QUIET=0;
BUTTON6,OUTPUT=0;

BUTTON7,NAME="BUTTON 7";
BUTTON7,ENABLED=2;
BUTTON7,VDTMF="777991";
BUTTON7,LCDNAME="BUTTON 7";
BUTTON7,ENDTEXT="  BUTTON 7 sent. Verify action  ";
BUTTON7,LOGOUT=0;
BUTTON7,PRIORITY=0;
BUTTON7,QUIET=0;
BUTTON7,OUTPUT=0;

BUTTON8,NAME="BUTTON 8";
BUTTON8,ENABLED=2;
BUTTON8,VDTMF="888991";
BUTTON8,LCDNAME="BUTTON 8";
```

```
BUTTON8,ENDTEXT="  BUTTON 8 sent. Verify action  ";
BUTTON8,LOGOUT=0;
BUTTON8,PRIORITY=0;
BUTTON8,QUIET=0;
BUTTON8,OUTPUT=0;
```

Output Schematic