

B.3 Zetron M735

B.3.1 Hardware Connection

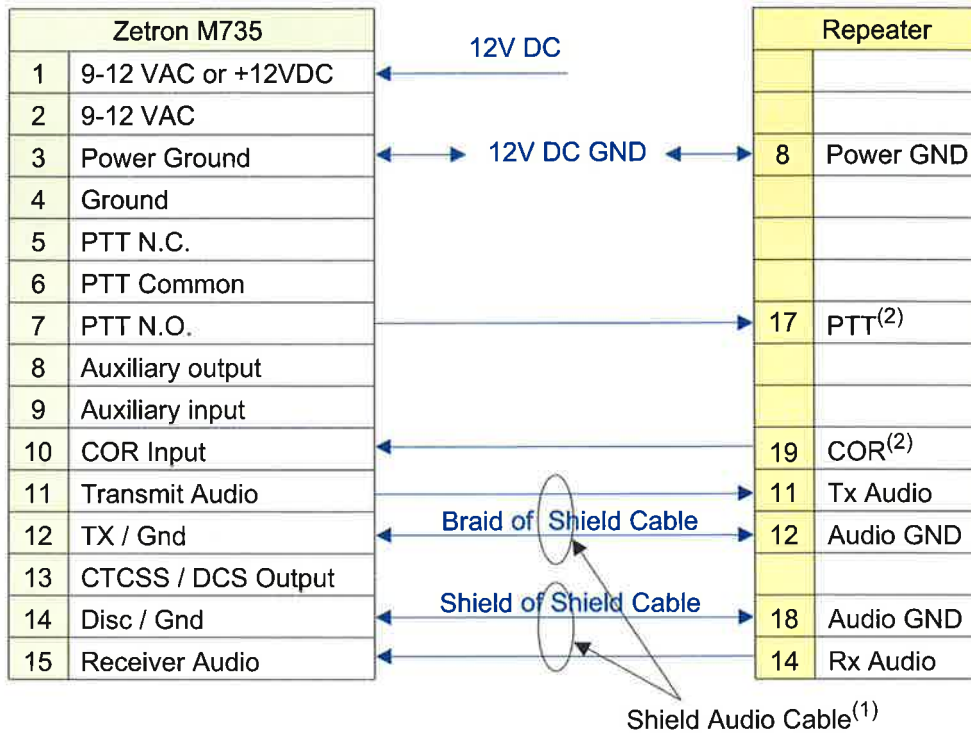


Figure B-6. Zetron M735 Hardware Connection

1. Apply shielded audio cable for Tx and Rx Audio connections to avoid any possible interference to speech signal. The connection of the shielded cable braid is indicated in Figure B-6.
2. The GPIO pin for PTT and COR function is configured in the CPS. Confirm that the CPS setting matches the Pin information. See "Figure B-6. Zetron M735 Hardware Connection" on page B-7.

IMPORTANT: Refer to the Zetron M735 service manual (part number 025-9369E.1) to install and program the phone patch for initial setup. See Section "B.3.3 Setting up the Zetron Input and Output Signal Levels" on page B-8 for more information on how to setup the Digital Telephone Patch application.

B.3.2 Jumpers on Phone patch

- JP21 – B, External COR
- JP31 – A, negative COR
- JP24 – A, flat output at Tx Audio

B.3.3 Setting up the Zetron Input and Output Signal Levels

There are two ways to access the required Zetron M735 test mode. The method using a DTMF telephone is described in detail, to access using a PC or terminal please refer to Zetron manual.

Equipment Required:

- MOTOTRBO radio
- Local DTMF (Touch-Tone) phone
- Oscilloscope

B.3.3.1 Hardware Setup and Basic Check

1. Connect Phone Patch to the repeater according to Figure B-6.
2. Connect analog telephone line from the PSTN or from a local PBX to the phone patch.
3. Power up both, the power LED should be lit on both.

B.3.3.2 Enter Program Mode

Either,

1. Call up the Model 735 phone number.
2. When prompted by the Model 735 (925 Hz beep) to over-dial a user number or ANI, enter the program access code (12735 by default).

CAUTION: A high pitched modem tone is heard. Enter the DTMF # which will stop the Model 735 from looking for a modem. After that, five short beeps are heard to confirm access to the DTMF programming mode.

Or,

1. Connect M735 to a PC via RS-232 cable
2. Open the settings menu and select Communications.
3. Then set the following parameters:
 - Baud rate = 2400
 - Data bits = 8
 - Stop bits = 1
 - Parity = None
 - Flow Control = XON/XOFF
 - COM Port = the port the modem is connected to or configured for these parameters set up the basic rules of communication between the modem and the PC. If there is no connection, change the Baud rate to 4800.

B.3.3.3 Force a Reset

Enter command 1 10# [2 beeps] 12345# to confirm [5 beeps]

B.3.3.4 Set Tx Audio Level

1. Enter programming mode B.3.3.2.
2. Input command 111#, the transmitter will be keyed, and a 250 Hz tone will be generated from the transmitter. Each time any DTMF digit other than "#" or "*" is pressed, the Model 735 will cycle to the next tone in the list (250, 500, 1K, 2K, 3K).
3. Press a key twice to go to the 1 kHz tone. Monitor Tx Audio output signal with oscilloscope. Adjust R60 (TX AUD) to reach 226 mVpp for the 1 kHz tone. JP25 can be used to increase or decrease the output if needed. JP25 in position A increases the output and decreases it in position B. Once the level is set for a 1 kHz tone, cycle through the tones and verify a flat response. JP24 can be used to set the tones for a flat response.
4. Press # to exit the test mode.
5. Setup a Radio to Phone call, monitor the ring back tone and busy disconnect tone from the phone line at Tx Audio PIN, and make sure there is no clipping or other distortion on the signals.

B.3.3.5 99# Exit Program Mode

B.3.3.6 Discriminator Input Level Adjust

Receive Level setting impacts the speech volume heard at the phone end. The settings below are recommended and adjustment is allowed depending on requirement. Two calibration methods are available. Use either Method 1 or Method 2 to do the tuning.

- **Method 1** – Since the Motorola repeater has the same Rx Audio output level under digital and analog mode, refer to the Zetron M735 service manual, (Section II Installation) to set the Rx level under analog mode first and then switch to digital mode directly when the setting is ready. No additional setting is required.
- **Method 2** – Tuning with injected sine tone from MOTOTRBO subscriber under digital mode. Equipment: Oscilloscope, MOTOTRBO Portable/Mobile subscriber, Audio Box (Motorola part number: RLN4460B), Signal Generator

NOTE: Disable "Digital Mic AGC" on portable subscriber with CPS.

1. Enter programming mode B.3.3.2.
2. Open the shell of M735 and connect the oscilloscope probe to TP4 on M735 board.
3. Setup DTP connection and verify that phone call is setup correctly.

4. If a MOTOTRBO Portable radio is used,
 - a. Configure Signal Generator to output 1031 Hz sine tone, amplitude set as 22.6 mVpp (8 mVrms).
 - b. Inject the signal to the Audio Box audio input port.
 - c. Attach the Audio Box GCAI connector to the accessory port of the MOTOTRBO subscriber.
 - d. Setup a phone call and during the phone call, assert PTT knob on Audio Box to transmit from radio, phone should hear the tone.
5. If a MOTOTRBO Mobile radio is used,
 - a. Configure Signal Generator to output 1031 Hz sine tone, amplitude set as 226.3 mVpp (80 mVrms).
 - b. Inject the signal to MOTOTRBO mobile radio rear port, PIN 11 Tx Audio, Signal Generator's ground connects to MOTOTRBO mobile radio rear port, PIN 18 Audio ground.
 - c. Setup a phone call and during the phone call, assert MOTOTRBO mobile radio's external PTT with rear port PIN 17 PTT to transmit from radio, phone should hear the tone.
6. While MOTOTRBO subscriber radio (Portable or Mobile) is transmitting with the tone, verify that the repeater Rx Audio output is close to 1.0 Vpp and then adjust R59 on M735 for a 1.0 Vpp tone signal at TP4.