

Background:

MERT's Mission in supporting emergency radio communications from all open Shelters requires FCC licensed amateur radio operators which have been certified in the Incident Command System (ICS) and FEMA procedures along with specific MERT protocols.

The first challenge to creating a radio station inside a Shelter is identifying acceptable locations that are safe and where the operator has the resources to perform their duties successfully. This is a challenging process which begins from where the Shelter Operator will be located to the proximity of constructing an exterior mast and antenna. Each Shelter is different so the process is unique. Additionally, MERT facilities have occasionally been moved through planned structural changes or even by school personnel (without notice or consultation with MERT).



Lake Weir High School – A MCPS Shelter facility.



West Port High School –
A MCPS Shelter facility

The objective of this update is to share more information on the challenges of emergency communications from Shelters.

Key to MERT's overall success is the annual inspection and testing process completed after the schools close in May. The physical inspection and operational communications tests verify the readiness and proper operation of the cabling and antenna at each facility.

Emergency Operations

As we all know, all external amateur radio equipment will be subject to long term weather impacts and especially so during hurricanes. The result is there may be circumstances where the exterior facilities (mast, coaxial cable and antenna) may be damaged beyond use. Should this occur, here some ideas on... "Getting back on the air." (Note: For this discussion, it is assumed the radio operates correctly and the fault lies with a damaged external antenna.)

- First and foremost is maintaining your personal safety. Avoid the urge to go outside during intense weather to "see" or confirm the mast and antennas damaged condition.
- Next, try your cellular telephone. If it is still working, call the radio room on the main line 352-369-8194. If not successful, try 352-369-8195 and then 352-369-8196.

- If you were unable to contact the MERT radio room on any telephone circuit, send a text message to the MERT IC listed on your ICS-204 Assignment List (see Section 5 – Resources Assigned which has the telephone numbers of all MERT personnel activated for this emergency). If no reply is received, send a text message to the MERT Radio Room Operator. If no reply is received, go to the next step.
- Contact the Shelter Manager and inform them that your radio communications system has failed along with all your cellular telephone resources and ask permission to make a landline telephone call. Try the above MERT Radio Room telephone numbers in the same sequence as before. If unsuccessful, call the numbers listed on the ICS-204 Assignment List.
- If the above action was not successful, let's go back to trying a radio communications solution. If you were assigned (or brought your own) handheld radio, try making contact from your current MERT station location on one of the MERT frequencies listed on the ICS-205A.
 - For D-Star type handheld radios, that would be channel 0 – KK4DFC, the primary Shelter radio frequency. Also try calling “Any station” and “Request relay support”.
 - For conventional types of handheld radios (FM), make your voice communications tests on channel 3 – KJ4CLL. Also try calling “Any station” and “Request relay support”.
- If you were not successful at your regular MERT station location, walk around and identify other locations near a large window or glass door which is protected from the hurricanes wind force and any flying projectiles.
 - Keep in mind the school layout and structure. Avoid areas with two stories and metal structures like elevators or large machinery (kitchens, shop areas, etc.)
 - Ideally, moving to a location with a large glass window(s) or door(s) with windows provides the best opportunity of regaining radio communications with the MERT radio room.
 - If you have a choice, it is best if the window or glass door is facing towards a location that is looking towards the southeast direction of the City of Ocala (where repeaters KK4DFC and KJ4CLL are located – Marion County Transfer Station @ 5601 SE 66th St, Ocala).



The photographs above show typical commercial construction techniques used at most MCPS school Shelters. This type of roofing structure significantly attenuates MERT radio transmissions when the antenna is located inside the building. For best results, move your radio and emergency antenna to areas with large windows or glass type doors.

- Important Note: Almost all MCPS school Shelters have a metal support beam roof along with a sheet metal base then a weather tight roofing materials built on top. This makes any MERT radio transmissions from inside buildings very challenging to complete. The reason is radio signals are attenuated (reduced in strength) by the materials used. Here's a list showing the Best to Worst:

- Best**
1. Clear Glass – No film (-1 dB)
 2. Mother Nature – Added loss from nearby trees, bushes, vines outside (-3 to -20 dB)
 3. Drywall/Sheetrock (-2 dB)
 4. Fiberglass Insulation (-2 dB)
 5. Plywood (-2 to -3 dB)
 6. Solid Wood (-3 to -8 dB)
 7. Plaster (-4 to -8 dB)
 8. Brick and Stone (-4 to -14 dB)
 9. Concrete & Cement: 6 inches (-5 to -10 dB)
 10. Tinted & Low-E Glass (-12 to -20 dB)

Worst 11. Metal (-32 to -50 dB)

Note: Rain - Light (-3dB) Heavy (-5 dB) (Distance dependent per mile minimum)

Courtesy: "Electromagnetic Signal Attenuation in Construction Materials"

<https://nvlpubs.nist.gov/nistpubs/Legacy/IR/nistir6055.pdf>

- Inform the Shelter Manager you will be attempting radio communications with the EOC at the new location you have selected. With permission, try calling on your handheld radio again standing as close as practical to the window(s) or door w/glass. If contact with the radio room is unsuccessful, try calling "Any station". If contact is made, ask for "Request relay support".
- Identify where you are and how you can relocate the SHREK radio (Icom IC-880H) and battery (or power supply) to the new location in setting up a temporary transmit facility. The reason for using the SHREK radio is the output power is 50 Watts compared to the handheld portable with a maximum of 5 Watts.
- At the new location, find the emergency twin-lead antenna in the SHREK kit along with 6 feet length of coaxial cable. Connect them together and the connector end to the SO-238 connector at the back of the radio.
- If possible, push the twin-lead antenna out of the window then close it. If that is not possible, hang the emergency antenna tip at the top of the glass using tape.
- Power up your radio and try making contact from this new location on MERT channel 0 – KK4DFC, the primary Shelter radio frequency. With the added power and being near a location with low attenuation (glass), this will be the best opportunity to re-establish radio communications with the MERT radio room at the EOC. Also try calling "Any Station".

At this point, you have done all you can do to re-establish radio communications. Sit tight at your normal MERT Shelter station and expect a police officer or a Deputy to make contact with you per **MERT IC REDBOOK - Activation** procedures – “SHELTER OPERATOR MISSING ROLL CALL”.