

Motorola PDR-3500

PORTABLE
DIGITAL
REPEATER

Tactical repeater for Ground and Airborne use

Ground

1. Replace fixed repeater.
2. Use at a Mission or Activity Base.
3. Deployable for forward Ground Team support.

Air

1. Highbird operations.
2. Wide area radio nets

Repeater Basics



This is the shipping and transport container the repeater comes in.

This is the repeater as it comes out of the shipping container.



Mag-mount
antenna
whip

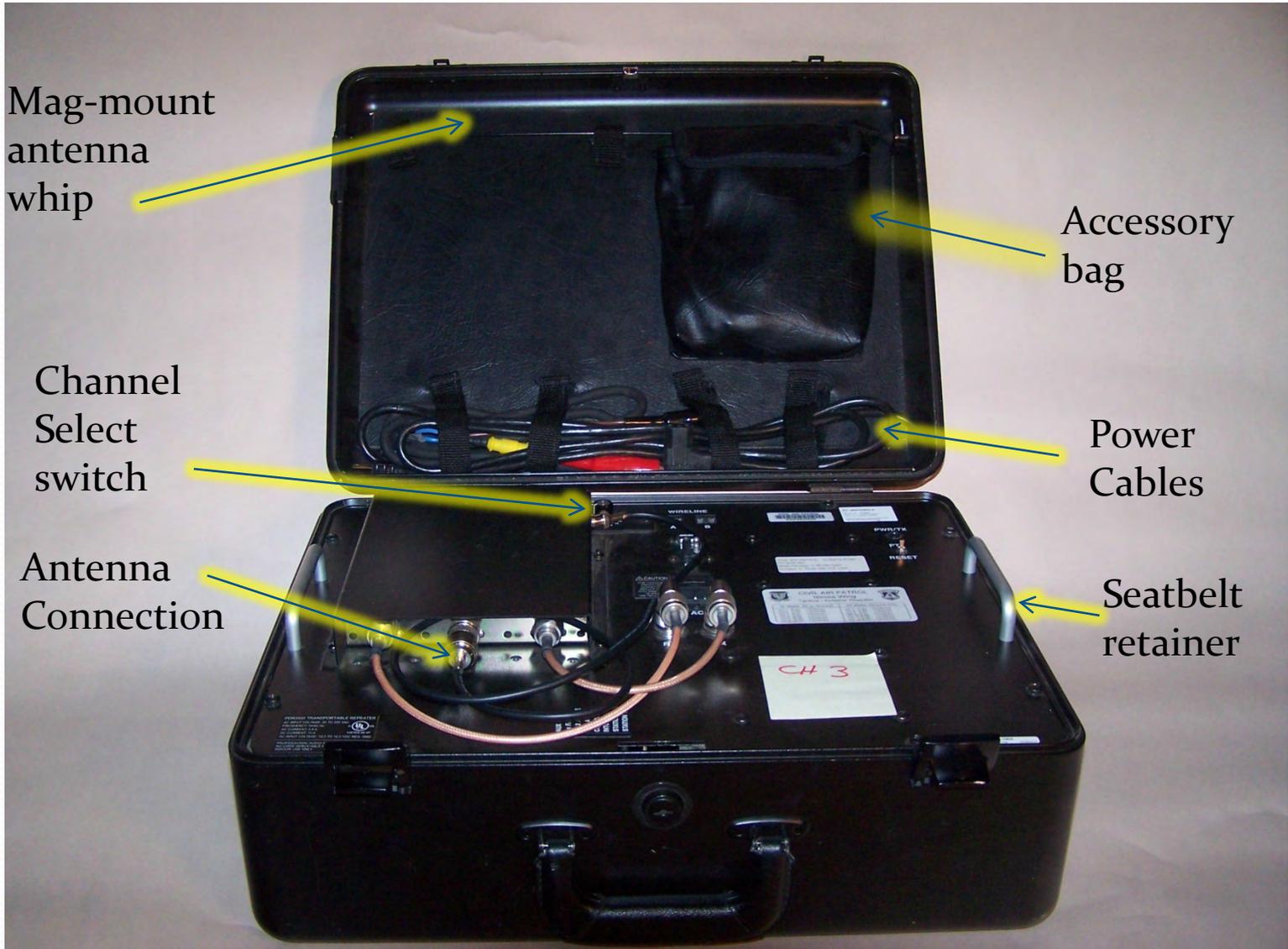
Channel
Select
switch

Antenna
Connection

Accessory
bag

Power
Cables

Seatbelt
retainer



Included accessories

Aircraft antenna cable



12V DC



Power Cables

Aircraft power



AC Power



Mag-mount with coax and whip



Various coax adapters
(These will vary by wing)



Keys



Cables required for aircraft installation

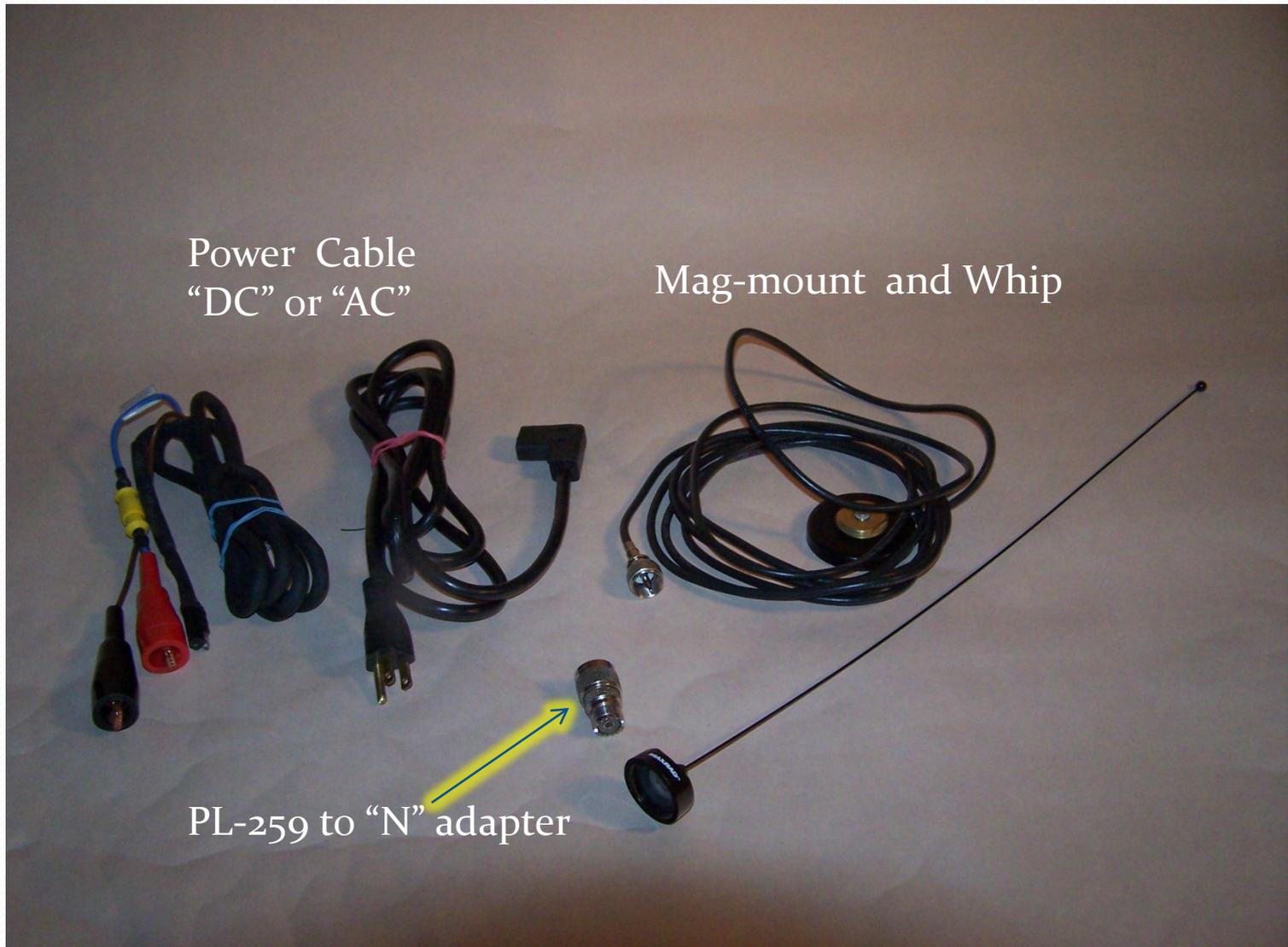
3ft coax with “N”
connector and
“BNC” connector



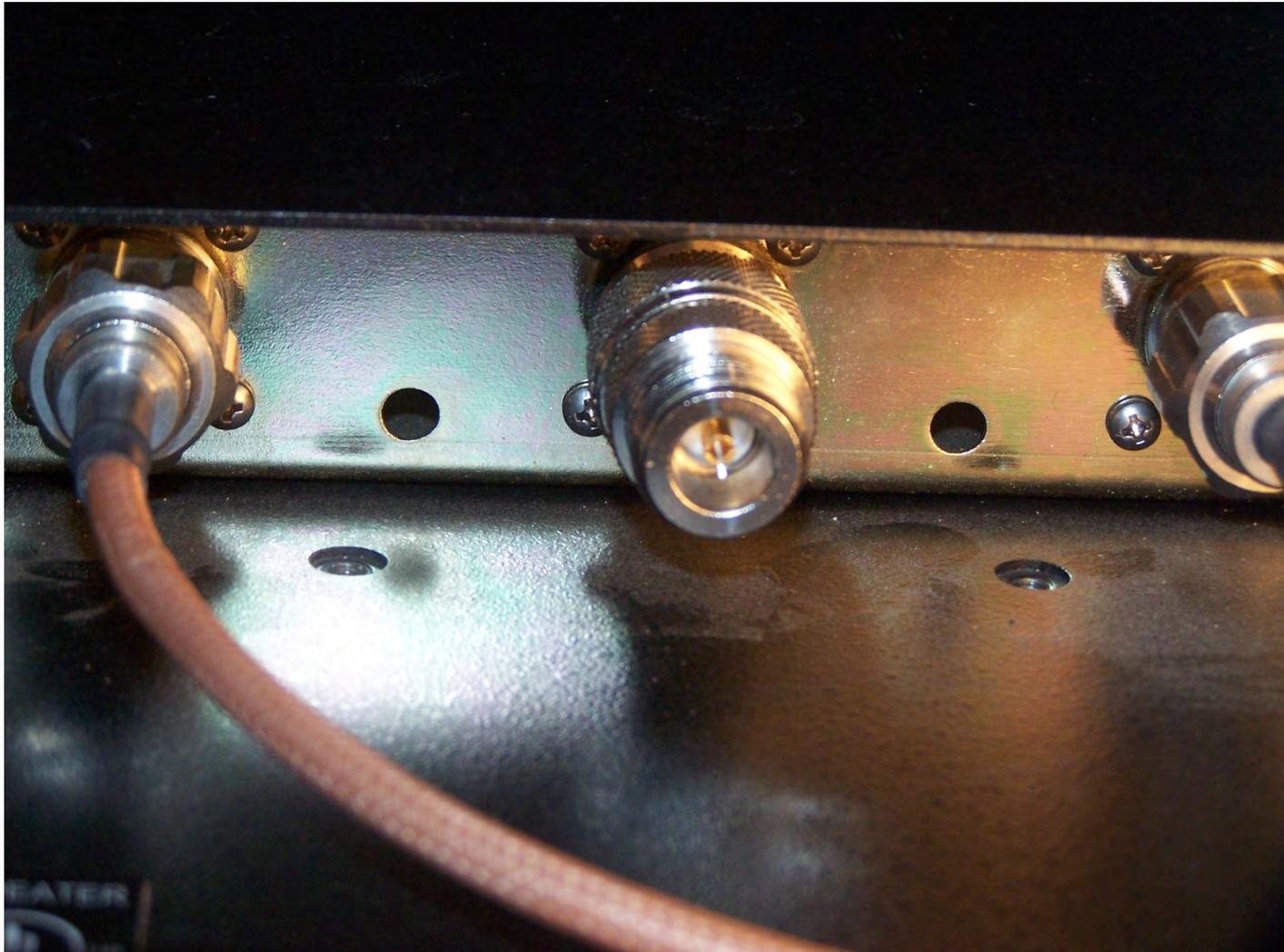
Power cable with “DC”
connector and 3-pin
Aircraft connector



Accessories needed for ground operation



PDR-3500 Antenna Connector. This is an “N” Connector



Differences between PL-259 and “N” connectors

PL-259 Male

“N” Male

“N” Female

PL-259 Female



Please note, the included Mag-mount and coax in this kit has a “PL-259” connector. A “PL-259” to “N” adapter is required.

If the adapter is omitted, the connector will still screw onto the repeater , but will destroy the “N” connector in the process



PDR 3500 in air operation configuration



Weight in this configuration is 42 pounds, with lid and accessories 45 pounds

The PDR-3500 is capable of 16 channels. CAP has programmed 12 channels into it. You will be told what channel to use during the sortie communications briefing.

The sticker on this Illinois repeater shows that channels 1 through 6 are designators R63, 64, 67 - 70 having 10 watts of power. That is the maximum permitted for air operations. These may also be used for ground operations. This sticker reflects the national channel plan for all tactical repeaters.

Channels 7 through 12 are designators R63, 64, 67 - 70 having 25 watts of power. These are for ground operations only.

Channels 63 & 64 use the same frequency pairs as CAP fixed repeaters. See CAPR 100-1 Para 8-4c regarding use of these channels.



Air operations:

1. For planning purposes in air configuration, weight is 42 pounds.
2. Take the repeater, power and antenna cables for air ops.
3. Place repeater in back seat nearest the connections.
4. Secure repeater with seatbelt through the retainers.
5. Make connections for antenna and power
6. Activate the A/C Master , and the rear seat power.
7. Repeater should power up. Wait for the boot process to complete.
8. Should see steady green “Station on” LED & flashing AUX LED
9. Set to assigned channel (1 – 6)
10. Set the A/C radio to the correct channel (Low power may be used)
11. Make test call from A/C radio to another radio using repeater.
12. Power down.
13. Stow repeater lid and accessories in baggage compartment.
14. After start-up for sortie, remember to reactivate rear power switch.

The following pictures will show a typical aircraft installation:



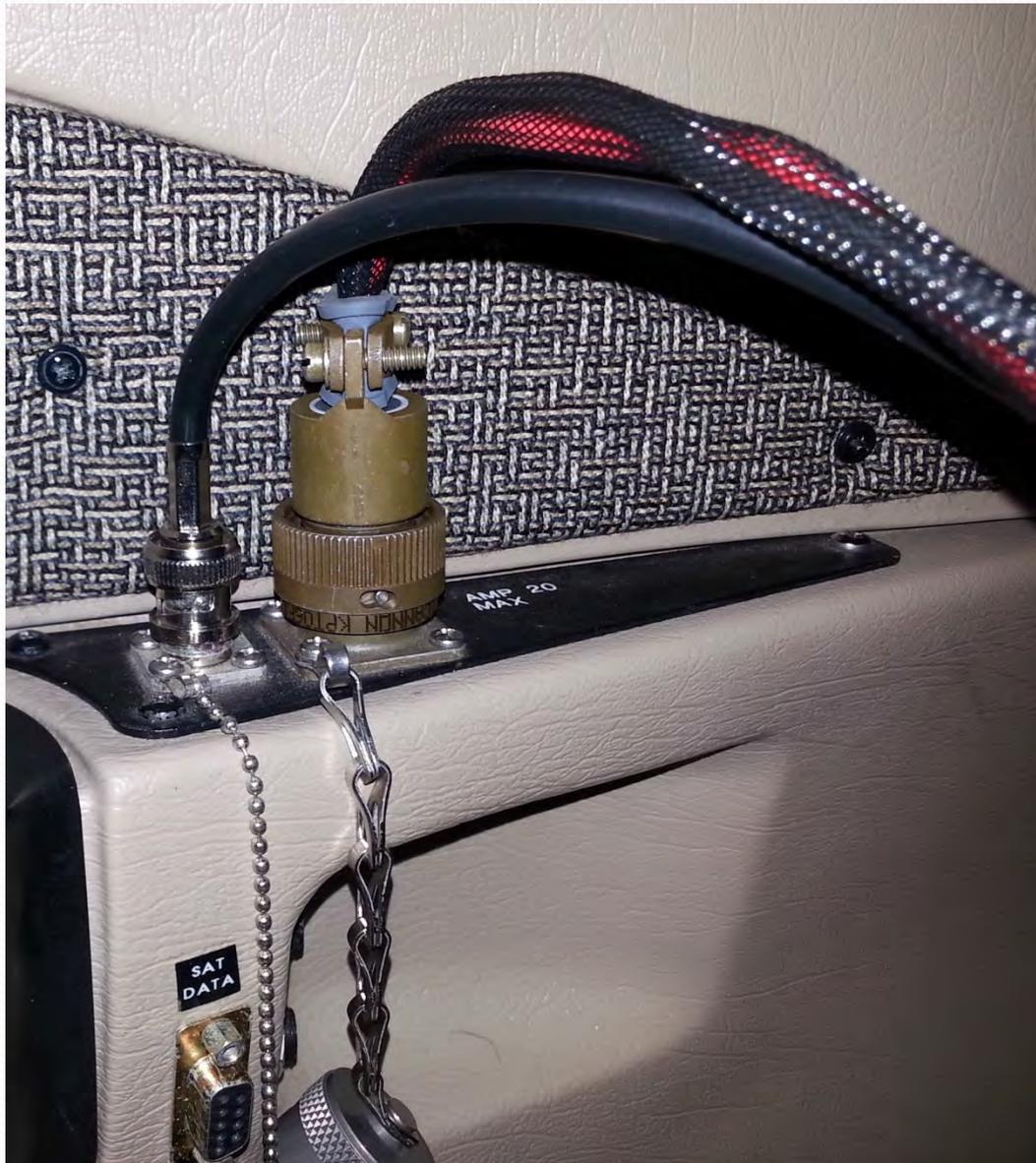
This picture shows the seat belt receptacles in the rear seat. This aircraft is equipped with airbags on the seatbelts. The short pair activate the seatbelt airbag. Do not use these. Use the longer pair.



This shows the repeater in place in rear seat. It was found that twisting the seatbelt, inverting the clip, allowed for easy passage through the seatbelt retainer on the repeater.

This orientation allows crew easy in-flight access to channel selector if necessary.

NOTE: The repeater must be secured with seatbelt for safety reasons.



After securing repeater, make connections for both antenna and power. Jacks are located on arm rest and should have caps on them.

This is the connector configuration on most newer aircraft. Some older aircraft may be configured differently. Check with the Aircraft POC or Wing Maintenance officer.

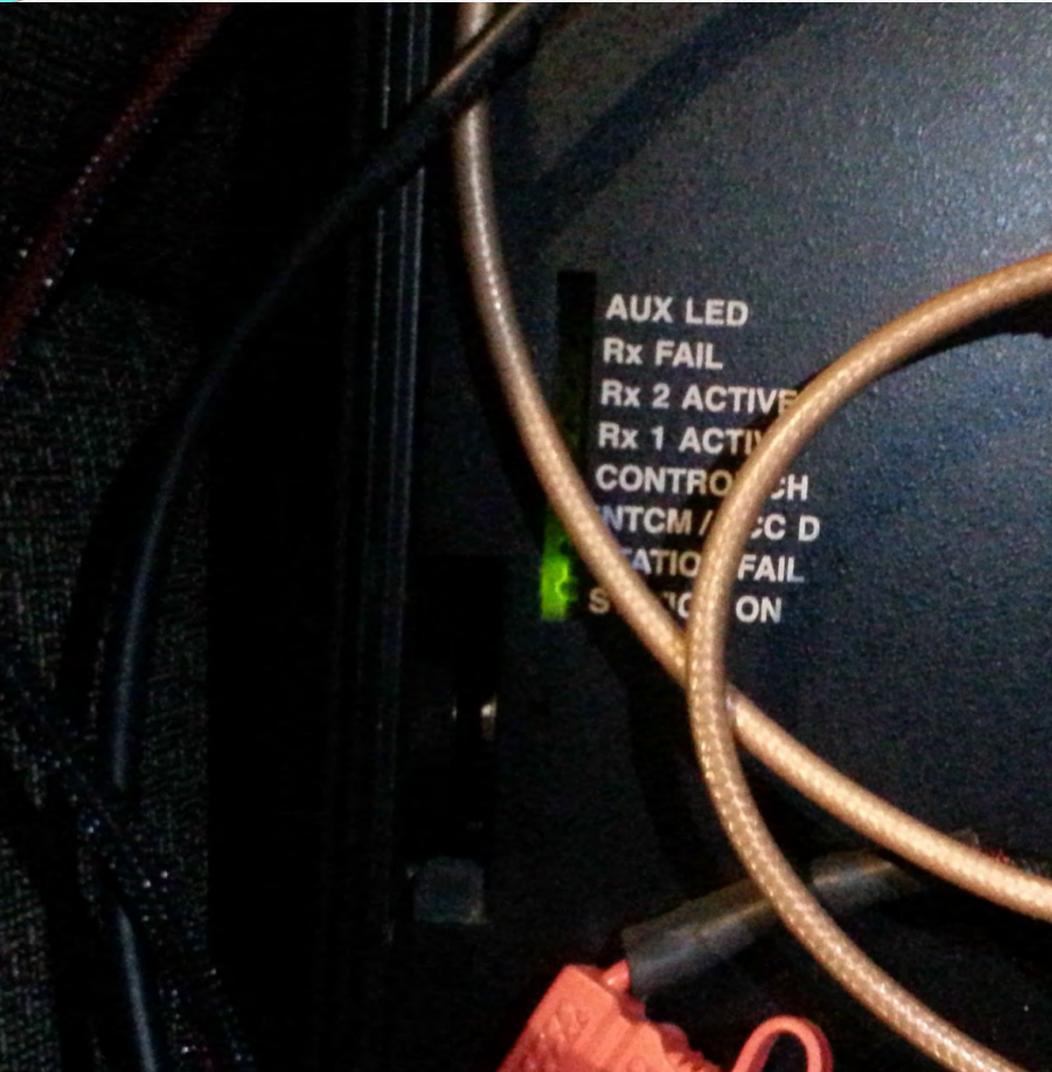


“Aft Accessory Outlet” switch

This shows the “Aft Accessory Outlet “ switch. This must be on for repeater to function.

Observer must remember to reactivate this after engine start

(This switch style circuit breaker and the circuit breaker panel is conveniently placed under the VHF-FM radio in this aircraft. Not all breakers are in the same location. Take time to become familiar with your particular aircraft.)



After making antenna and power connections, activating the A/C Master and the “Aft Accessory Outlet” switch, The repeater should start it’s boot-up process. When complete, a steady green “Station on” LED should be lit.

Ground Operations

There are many uses for the TAC Repeater in Ground operations.

Airshows:

Provides excellent coverage over a large area.

Encampments

Summer Encampment

Spring Encampment

Missions

Exercises

Forward Operations

Relay teams

Replace a Fixed repeater

AC or DC operation (Commercial power, Generator, or Battery)

Can be deployed anywhere extended coverage is needed with approval of Wing DC or higher . (Ref CAPR 100-1 p 8-4c)

Any VHF antenna may be used

Included Mag-mount for rapid vehicle deployment

Mast mounted base station type Antenna

Note: Antennas may not be indoors at any time. Be aware of RF exposure limitations.

Requires a coax with type “N” connector, or Use of a PL-259 to “N” adapter.

All 12 channels are available for use depending on area needing coverage. Again refer to CAPR 100-1 Para 8-4c for details.

May be use with lid closed to protect from elements.

Rules

Rules dealing with tac-repeater use can be found in CAPR 100-1 Paragraph 8-4c

c. Tactical Repeaters. Tactical repeaters may be used in temporary fixed, mobile or airborne operations. Use of such systems is limited to emergencies, temporary fixed site restoration, scheduled tests and other short term activities. Approval of the wing director of communications or higher is required before each use, except emergency use and during authorized missions. If interference to an adjacent wing or region might be experienced, in a non-emergency situation, the request must be approved by the Region Repeater Committee(s) prior to use. All technical standards, as described in this regulation, will be met by any equipment authorized as a tactical repeater system.

(1) **Unique Frequency Pair**. A unique channel (unique frequency pair) is allocated for Tactical Repeaters ONLY. A total of five channels use this frequency pair. These channels should be used for all Tactical repeater operations unless interference to the fixed repeater infrastructure has been fully precluded. See the national channelization and programming plan.

(2) **Tactical repeaters on fixed repeater frequencies**. The standard programming of tactical repeaters includes each of the two fixed repeater frequency pairs with a unique CTCSS tone, not used by any fixed ground repeaters. This unique tone shall not be used as an encode or decode tone on any permanently-installed ground-based repeater station. If a tactical/portable repeater is used for long-term replacement of an out-of-service fixed repeater, it must be reprogrammed to reflect the CTCSS tone and NAC assigned to the fixed repeater.

(3) **Aircraft Connections**. Members installing tactical repeaters in CAP aircraft MUST ensure that the aircraft has properly wired auxiliary power and antenna connections, or that appropriate adapter cords are used. Power and antenna connectors on the repeaters may not be modified to meet local aircraft wiring.

Safety Considerations

With every CAP endeavour, safety is always the number one priority.

When using the Tac-repeater there are several safety considerations:

1. When placed in an aircraft, the repeater must be secured with a seatbelt.
2. Use exercises to verify the repeater does not interfere with any other equipment in the aircraft (CAP and FAA radios, navigation aids, etc.)
3. When used on the ground, never place the supplied mag-mount antenna indoors. The power output of the repeater exceeds the maximum power allowed for use indoors.
4. When using base type antennas with masts, always employ proper safety equipment: Gloves, safety glasses, hardhats, etc.
5. Always verify the repeater is not powered up when anyone is near, or working on the antenna because the transmitter could be keyed up at any time without the local operator's knowledge.



Questions ?