

**Title:** RECOMMENDED GENERAL APX PORTABLE MAINTENANCE

**Product Affected:** APX Portable Radio

### **SUMMARY**

This “*Best Practices Guide*” describes the general procedures to clean and maintain an APX portable radio.

- Align the reference oscillator on all radios at least **once per year**
- Vacuum test all radios at least **once per year**
- Clean the radio with 0.5% soap solution **ONLY**. NO cleaners or solvents. Use a soft bristle brush.
- Place the radio under a faucet for cleaning and rinsing. **IMPORTANT:** Use care not to get water in the chassis cavity containing the radio’s battery contacts.
- Remove all accessories (battery, antenna, RSM’s and accessory side connector cover)
  - clean and rinse the accessory the same as the radio. **IMPORTANT:** Use care not to get water in the RSM’s accessory connector.
  - dry thoroughly before reattaching to radio
- Dry radio thoroughly with a lint free cloth or shop vacuum
- Clean the radio when:
  - exposure to high debris environments resulting in build-up of dirt or debris that can hinder the function of the radio (speaker grille, displays, control top levers, knobs, ports, side buttons, etc.)
  - exposure to fluids, especially salt water (or other corrosive liquids)
- Use only decontamination agents listed below according to the manufacturer’s directions

### **ANNUAL MAINTENANCE**

In order to avoid operating outside the limits set by the FCC, Motorola Solutions recommend that you align the radio’s reference oscillator every time the radio is disassembled, or once per year, whichever comes first. Checking this parameter when the product is placed in service is especially important if the product has been in storage for a significant period of time (six months or more).

Elastomer technology materials used for seals in rugged portable radios can age with time and environmental exposure. Therefore, Motorola recommends that rugged radios be checked once a year as a preventive measure in order to assure the watertight integrity of the radio. Radio submersibility should be checked annually by qualified service technicians.

### **GENERAL CARE**

Do not pound, drop, or throw the radio unnecessarily. Never carry the radio by the antenna.

Avoid subjecting the radio to corrosives, solvents or chemicals.

Do not disassemble the radio. This could damage radio seals and result in leak paths into the radio. Any radio maintenance should be performed only by a qualified radio technician.

Keep the accessory side connector cover in place until ready to use the connector. Replace the cover immediately once the accessory has been disconnected.

If the radio has been submerged in water as part of normal operations, shake the radio briskly so that any water trapped inside the speaker grill and microphone port can be removed.

Check that the external surfaces of the radio are clean and that all external controls and switches are functional.

The radio has a vent port that allows for pressure equalization in the radio. Ensure that no oily substances come in contact with this vent. Never poke this vent with any objects, such as needles, tweezers, or screwdrivers. This could create leak paths into the radio and the radio’s submersibility will be lost.

Motorola Solutions also recommends wearing the radio in a carry case or inside the turnout coat (fire departments) to better protect the radio from prolonged exposure to dirt, debris, heat and/or impacts.

## **GENERAL CLEANING**

The following procedures describe the recommended cleaning agents and the methods to be used when cleaning the external surfaces of the radio. External surfaces include the housing assembly, the control top surface, including antenna mounting area, the speaker grille, the battery case and the battery interface area. These surfaces should be cleaned whenever a periodic visual inspection reveals the presence of a buildup of dirt or soot that may impair the function of the radio.

All accessories should be removed prior to cleaning. This includes the battery, antenna, remote speaker microphone and/or the accessory side connector cover. Replace once all parts are thoroughly dried.

For general cleaning, Motorola Solutions recommends mixing one tablespoon of mild dishwashing detergent to one gallon of water (0.5% solution) to clean the external surfaces of the radio. The solution should be applied sparingly with a stiff, non-metallic, short bristled brush, making sure excess detergent does not get entrapped near the connectors, controls or crevices. Do not submerge the radio in the detergent solution. Place the radio under a faucet for rinsing. The radio should then be dried thoroughly with a soft, lint free cloth.

**Reference:** Below is a link to a “best practice” video for the general cleaning of APX portable radios.

<https://www.youtube.com/watch?v=OWS8P99b-O0&t=6s>

**Important:** If the radio battery contact area has been exposed to water, thoroughly dry and clean the radio battery contacts before attaching a battery to the radio.

**Important:** The effects of certain chemicals and their vapors can have harmful effects on certain plastics and the metal platings. Do not use solvents, sprays or wipes to clean your radio (except as noted below).

## **HIGH DEBRIS ENVIRONMENTS**

For high debris environments, additional cleaning steps may be needed to maintain optimal radio performance. Excessive debris in the speaker grill or microphone area may cause poor or degraded audio quality. Excessive debris in or around the functions buttons or control knobs, may cause inconsistent operation or controls.

In high debris environments, the speaker grill may trap dirt and debris, resulting in degraded audio quality and clarity. Motorola recommends attaching a crevice nozzle to a vacuum cleaner, and vacuuming the speaker grill. Avoid covering all the grill openings at once with the nozzle. Perform a “Talk/Listen” test to confirm audio performance has returned to normal. If audio issues persist, radio should be sent in for servicing.

In high debris environments, the control top may trap dirt and debris, resulting in reduced tactile feel in the buttons, switches and knobs. Motorola recommends attaching a crevice nozzle to a vacuum cleaner, and vacuuming all the radio surfaces, especially the control top, to remove dirt and debris from crevices. Perform a “button check” to confirm optimal tactile performance.

For submersible radios (“R”, “I” or “XE” designators): An alternate debris cleaning method is to turn the radio upside down and place the top of the radio into a container of water or under a faucet. The antenna may be removed to clear the antenna port area. With only the control top submerged, shake the radio vigorously to loosen dirt and debris. Vacuum again to remove dirt, debris and water.

### **EXPOSURE TO LIQUIDS**

If the radio has been exposed to chemicals or salt water / salt spray (or other corrosive environments), remove all accessories and thoroughly rinse the radio or wipe down the accessories with fresh water as soon as possible. Then dry completely by a vacuum or a lint free cloth.

If the radio battery contact area has been submerged in water, dry and clean the radio battery contacts before attaching a battery to the radio. Otherwise, the water could short circuit the radio.

If an accessory or the accessory side connector cover is attached to the radio, check the interface after exposure to liquids to ensure no liquid has penetrated the seal. Liquids left at this interface could degrade the performance of the accessories. Reattach once all parts are thoroughly dried.

### **RADIO DECONTAMINATION**

If there is a risk that the radio and attached accessories may have been exposed to harmful pathogens or carcinogens, the following cleaners have been approved for use on APX series portable radios. For maximum efficacy, it is recommended that the contaminated radio first receive a “*general cleaning*” as detailed above. Then:

- For **pathogen decontamination**, apply “*Zep DZ-7*” per manufacturer’s instructions. **Note:** The radio may also be wiped down with over-the-counter isopropyl alcohol (rubbing alcohol) with no more than a 95% isopropyl alcohol solution (alcohol and water). When cleaning with isopropyl alcohol, the alcohol should never be applied directly to the radio. It should be applied to a rag first, then the radio can be wiped down by the rag. Avoid rubbing labels or adhesive areas with the alcohol-soaked rag.
- For **carcinogen decontamination**, wipe down the radio with either “*Hygenall FieldWipes*” or “*Enspire Fire Wipes*” per the manufacturer’s instructions

**Note:** Motorola Solutions is unable to, and did not, determine whether any particular cleaning product is effective in removing specific foreign substances from the radio. However, the above cleaners and processes have been approved for use by Motorola Solutions, Inc. related to their less degrading effect on the physical radio.

**Important:** Please consult the manufacturer’s documentation for specifics on cleaning product efficacy.