



The

# **Broadcasters' Desktop Resource**

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## **The Maintenance Shift** **Build a Good Maintenance Checklist**

*[January 2018] There is a lot to do every day, every week, and if we lose track, it is easy to miss something important. That is why we encourage you to have a personalized checklist.*

At times, the broadcast engineer seems to be chasing the most recent “fire” – whatever emergency of the moment is most important.

But any experienced engineer will tell you that keeping up with routine preventive maintenance is the best way to keep the facility running well. And the best way to do that is have a personalized checklist to help the memory, especially for those times when you get distracted by the sudden need to reprogram someone’s phone extension or recover from a forgotten password.

Of course, the content of your checklist will be different than anyone else’s. We would like to offer a few suggestions. And, we would welcome your suggestions for additions.

### **CHANGES**

Long time broadcast engineers well remember the days when every piece of gear had tubes and the standard maintenance program included checking and restocking the tube shelves to meet FCC and operational requirements.

The next generation was checking on the stock of ICs as the tubes slowly disappeared. And, in more recent years, replacement modules and PC boards are on standby, to get equipment back online faster and more reliably.

In fact, the newest gear is so much more reliable – the weekly overnight shift at the transmitter

site is a memory for most folks – that there are many places where a transmitter could get very lonely for months waiting for attention. Some engineers would even swear that, on occasion, if they do not get enough attention, some transmitters have been known to essentially commit suicide.

### **HOW LONG?**

What interval is best for regular maintenance? Clearly, this will depend upon whether it is at the studio or the transmitter, the time since your last check, and the environment.

The key is to have your own checklist and priorities – and cover them. True, an unexpected fire, flood, or hurricane might cause you to go “off book” for a week. The recent snow and ice storms in the country might be a good example of why it is important to both keep the routine most of the time but be ready to improvise in an emergency.

Nevertheless, just because your transmitter runs for months without problems does not mean you should only go out there every six months or longer. Not only air filters get clogged – which can lead to much more serious issues – but you do not want unwanted critters to take up residence.

Clusters with multiple stations may require special planning to get around to each location on a regular basis. Breaking Weekly into Bi-Weekly is one option. Hiring an assistant is another, perhaps better solution, subject to your GM’s level of respect for the station’s technical department.

## ASSIGNING PRIORITIES

Start with a list of things worth checking each week.

To repeat, you may add to this category as you have time, or adjust any of the items. Other weekly items might depend upon how many locations you need to cover. Nothing here is written in stone. Just use reasonable rules that work for you.

For example, it is required that the Chief Operator (which may or may not be the station's engineer) re-view and sign the Station Logs each week – covering EAS activities and tower light observations. The Assistant Chief Operator can also help with this.

### WEEKLY

- Review the Station Log entries.
- Check the EAS receivers to ensure clean audio of sufficient level.
- Check each transmitter's parameters to ensure compliance with the Station Authorization.
- Check audio output of each station to ensure audio is clean, not distorted nor intermittent.
- Check fault logs in equipment that records such information.
- Make sure computer backup systems are running and producing usable files.
- Security check of all doors, windows and roof hatches.
- If you are using security cameras, check the position of the camera and observe operation.
- Do a visual check of all roof structures and antennas
- Check power rooms to make sure no one has stored items blocking access to breaker panels and/or transfer switches.
- Run the emergency generator manually if it is not set up for automatic exercising

## MONTHLY

- Check the HVAC systems are in good condition with clean filters (dirty sites need to be checked more often).
- Check each site to ensure no vandalism has damaged the building, HVAC, or other items – make sure site is protected against break-ins.
- Check level of grass/vegetation on site to prevent trees from growing into guy wires or grass from becoming a fire hazard.
- Check all UPSs for proper operation – implement weekly automatic test function if available.
- Check all engineering-related computers for updates if not done automatically.
- Check emergency generator fuel tank levels and oil level.
- Check generator battery condition with a load tester.
- Check smoke detectors including labels for when batteries were last replaced.

### QUARTERLY

At the transmitter site:

- The site fence is in good condition and secure.
- The site gates are locked and the locks are in good condition.
- Fences around towers and guy anchors are in good condition.
- Check to ensure the warning signs and tower registration numbers are in good condition.
- Check to ensure area inside tower fence is free of excessive vegetation or other debris.

Building Inspection

- Ensure the door is secure and the lock has not been damaged.
- Building is in good condition, no punctures or rusted items visible.

- Check all cable entrances to ensure they are tight and leak protected.
- Check roof to ensure it is in good condition.
- Interior shows no sign of leaks, etc.
- Interior temperature is normal.
- Note any burned out light bulbs and replace them.
- Note any supplies that have been depleted and in need of replacement.

#### Transmission System

- Check all parameters, note any that are unusual.
- For FM tube units: check temperature rise.
- Check any RF filters for proper operating temperature.
- Check auxiliary transmitter and dummy load, if present.
- Check STL, RPU, and other gear for proper operation.
- Ensure the remote control indications are calibrated.

#### Tower Inspection

- Check to see tower(s) are straight, with no twisting or sway.
- Conduct a visual inspection of tower base and ATU boxes. Ensure no local fauna have taken residence.
- Check to see that all the guy wires appear to be properly tensioned.
- Check to see that the grounding points are in good condition, the ground system (for AM) is intact, and buried.
- Check to see if the paint looks to be in good condition with good contrast between bands.

#### Tower Anchor Points

- Check to see that the anchor points are free of vegetation and debris,
- Check to see that the turnbuckles are cabled to prevent turning.

- Check to ensure all nuts and bolts are tight.
- Check to see all hardware is free from rust or corrosion, including the anchor itself.
- Check to see any antennas or radomes are in good condition.
- Check to see all coax and other cables are tightly fastened to the tower.

#### Tower Lights”

- Check the tower lighting system to ensure it is working correctly.
- Check to see the photocell is pointed to the North.
- Check to see the lights come on when you cover the photocell.
- Check to see that the controller is clean and operating properly and all connections are tight.
- Check to see the sidelights and both top beacons are flashing properly.
- Check to see lights do not have cracked lens and show white light unless they are LEDs.

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## ADDITIONAL ITEMS:

Intervals for these items will again depend on many factors. Some suggest they should be part of the Quarterly list. Others might, depending upon circumstance, do the semi-annually.

- Do a Full Load test for each generator – preferably by pulling Main disconnect for utility power to ensure the contactors and timers work correctly.
- Reboot all engineering computers – note any that take longer than necessary to reboot.
- Check breaker panels for hot spots with infrared detector.
- Evaluate the access road to the sites, add dirt or gravel as needed.

## LEAVE IT ALL RIGHT

There is one more important point: before you leave a site you should make sure to restore any gear you worked on to normal operation.

Did you flip any bypass switches? Turn any lights on or off? Open any doors with security wiring?

As you leave a site:

- Check to see all equipment is back to “normal” operating condition.
- Check to see the transmitter is left in “remote” control position.
- Check to see the remote control is in “remote” control position. Use the cell phone and call the remote control to be sure.
- Check to see the HVAC is running. Rotate the “lead” units if possible.
- If you are using security cameras, check the position of the camera and observe operation.
- Are security lights operating normally?
- Make log entries for all remarkable items for future reference.
- Lock the door securely.
- Ensure the gate and fence locks are secure.

## MORE?

Do you have any ideas for additional items that could be added to the checklist that might help your fellow broadcasters? Please do share them!

**The BDR**

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