

Commonwealth of Pennsylvania
 Governor's Office of Administration
Radio Technology Bulletin Associated Document

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| Identifier/Title: | RTB003-01 Fixed Station Installation Quality Standards |
| Associated RTB: | Stations at Fixed Locations |
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Document identifier for Associated Documents (ADs) is RTB identifier, followed by two-digit sequence across documents associated with a specific RTB, separated by an en-dash. Valid supporting document types:

APP = Appendix **GEN** = General Information **RFD** = Referenced Document
BPD = Best Practices **OPD** = Operations Document **WHP** = White Paper

Record of Changes

| Ver.Rel | Issue date | Revised by | Status | Description |
|---------|------------|------------|-----------|---|
| 1.0 | 2/16/2007 | J Seefeldt | Downlevel | Original issue |
| 1.1 | 11/5/2008 | J Seefeldt | Downlevel | Apply boilerplate changes from OA Legal review. |
| 1.2 | 2/2/2009 | J Seefeldt | Downlevel | Rename from "USE003-01". |
| 1.3 | 8/12/2010 | J Seefeldt | Published | General review and upate; apply Word 2007 format. |

Purpose

This document supports the associated Radio Technology Bulletin (RTB) by specifying standards for installation of Fixed Stations, commonly known as Control Stations, for use with the Pennsylvania Statewide Radio Network (PA-STARNet).

Content

Following are standards for proper installation of Fixed Stations for use with PA-STARNet.

1. Hardware

1.1. Antennas

- 1.1.1. The installation must use a unidirectional, Yagi-type antenna.
- 1.1.2. The antenna must be installed with the mounts and ancillary hardware provided by the antenna manufacturer for use with that antenna.

1.2. Cabling and Connectors

- 1.2.1. Radio Frequency (RF) transmission line must be half-inch (0.5") super-flexible foam dielectric hard line (Andrew Corporation Heliax[®] FSJ Series or equivalent), installed without splices or adapters.
- 1.2.2. All connectors and grounding kits exposed to moisture must be sealed according to the following specifications.
- 1.2.3. Multiple layers of cold weather tape (DB Products Part Number 11903 or equivalent) must be applied over the initial layer of protective wrap, extending at least two inches (2") beyond that initial layer at each end.
- 1.2.4. Electrical coating (3M Corporation ScotchKote[®] or equivalent) must be applied over the layers of cold weather tape, extending at least two inches (2") beyond those layers at each end.

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- 1.2.5. Protective wrap (DB Products Vapor Wrap, Part Number 11316 or 11317, or equivalent) must be applied to all connectors, extending at least two inches (2") beyond the connector at each end.
- 1.2.6. The following cabling must be protected from power surges using appropriate surge suppression devices:
 - 1.2.6.1. CAN bus cables
 - 1.2.6.2. Four-Wire Tone Remote cables
- 1.3. Power Supply and Ground
 - 1.3.1. All antenna support structures (masts) must be connected to the single-point ground of the building on which the antenna is mounted using American Wire Gauge (AWG) Number 2 solid or stranded copper wire. Although mechanical bonding is sufficient to meet this standard, the preferred method of connection is exothermic welding (Erico Products CADWELD® or equivalent).
 - 1.3.2. The RF transmission line must be grounded at the point of entry into the building using the grounding kit provided by the transmission line manufacturer, connecting to the building's single-point ground using AWG Number 2 solid or stranded copper wire.
 - 1.3.3. The RF transmission line must be protected from power surges using a coaxial surge suppressor (PolyPhaser Corporation coaxial suppressor or equivalent) installed near the Fixed Station as close to the point of entry into the building as possible, and connected according to the following specifications.
 - 1.3.3.1. The coaxial surge suppressor must be connected to the building's single-point ground using green insulated AWG Number 6 stranded copper wire.
 - 1.3.3.2. On the equipment side, the surge suppressor must be connected to the Fixed Station using one-quarter inch (0.25") super-flexible foam dielectric hard line (Andrew Corporation Heliac® FSJ Series or equivalent), no greater than six feet (6') in length, with no splices or adapters.
 - 1.3.4. The Fixed Station's chassis, as well as any separate power supply used, must be connected to the building's single-point ground using green insulated AWG Number 6 stranded copper wire.
 - 1.3.5. The preferred method of supplying Alternating Current (AC) power is through suppression receptacles (PolyPhaser Corporation AC surge suppression device or equivalent) connected to the building's single-point ground using green insulated AWG Number 6 stranded copper wire. However, supplying Alternating Current (AC) power using a standard office surge suppressor is acceptable.
- 1.4. External Hardware
 - 1.4.1. External speakers must be switched or connected using an impedance-matching transformer to ensure proper load impedance.
- 2. Configuration

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- 2.1. The Fixed Station transmission power level must be regulated to prevent overwhelming the target multichannel base station site's receive signal amplifier to the exclusion of weaker signals from other sources.
- 2.2. Fixed Station configuration is subject to review and revision by OPRS.
3. Ground
 - 3.1. As far as possible, ground connections must be straight vertical or horizontal runs using conductors no greater in length than necessary to meet other installation requirements.
 - 3.2. The bend radius for all conductors must be at least 12 inches (12").
 - 3.3. Connecting conductors must in all cases be oriented in the direction of current flow or earth ground.
 - 3.4. Any mechanical ground connections must use bronze, stainless steel, bimetallic transition galvanized steel clamps, or split bolts.

Questions

Any questions about this document should be directed by e-mail to RA-RadioPolicy@state.pa.us.