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Minimum Two-Way Radio Features

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The minimum requirements set forth in this document are required for any field subscriber radio added to the STARCOM21 network after the effective date of this document. These minimum requirements are in addition to features, zones, channels or other items needed for local operational purposes. Note: Radios used for fixed sites, PSAPs, Hospitals, Agency Dispatch, and similar applications that require vigilant monitoring on a single talkgroup are not required to implement the entire SWIT template.

Minimum required feature set for radios on the STARCOM21 network:

- FCC Part 90 Compliance Certification
- P25 Compliance Assessment Program (CAP) Certified
- Listed on FEMA Approved (Grant Eligible) Equipment List
- Military Specification MIL-STD-810G for Moisture Resistance and Submersion
- Conventional Narrowband FM Analog (12.5 kHz)
- P25 Conventional Common-Air-Interface (CAI)
- P25 Trunking
 - Phase I (FDMA)
 - Phase II (TDMA)
- STARCOM21 Hardware/Advanced System Key Required (Secure Trunking Programming)
- Alpha-Numeric Display
 - Channel Name Aliases
 - Zone Name Aliases
- Minimum SWIT Channel Capacity – Single Band Radio
 - 16 SWIT Zones and 256 Modes/Channels
- Minimum SWIT Channel Capacity – Multi-Band Radios
 - 25 SWIT Zones and 496 Modes/Channels
 - SWIT 7/800: 16 Zones – 256 Modes/Channels
 - SWIT UHF: 3 Zones – 48 Modes/Channels
 - SWIT VHF: 6 Zones – 96 Modes/Channels
- Minimum required encryption level for SWIT encrypted channels *Note: Nothing in this document requires that encrypted radios be purchased. However, all new radios with encryption on the STARCOM21 network must meet these minimum requirements.*
 - FIPS Level II Key Storage
 - AES256 Mandatory
 - Multi-Key (10 minimum to meet SWIT)
 - Over-the-Air-Rekeying (OTAR) – Required
 - Key Management Facility OTAR Capable
 - Over-the-Air Rekeying Multi-System – Recommended

- Radio must be operationally capable of control channel management and automatic roaming between sites, zones and affiliated systems that are part of the STARCOM21 network.

Recommended/Optional Features in addition to items specified above:

- Encryption: Over-the-Air Rekeying (OTAR) – Required
- Over-the-Air Rekeying Multi-System – Recommended
- Additional Channel Capacity for Local Use
- Global Positioning System (GPS) Equipped
- Portable Radios: Battery life that is equivalent to or better to match required duty shift. Portable radios should be issued with a second battery.

Non-STARCOM21 and All Federal Grant Funded Radios:

- FCC Part 90 Compliance Certification
- P25 Compliance Assessment Program (CAP) Certified
- Listed on FEMA Approved (Grant Eligible) Equipment List
- Military Specification MIL-STD-810G for Moisture Resistance and Submersion
- Conventional Narrowband FM Analog (12.5 kHz)
- P25 Conventional Common-Air-Interface (CAI)
- If Trunking Operation is Required:
 - P25 Trunking
 - Phase I (FDMA)
 - Phase II (TDMA)(If required currently by local system.)
 - Advanced System Key Capable (Secure Programming)
- Alpha-Numeric Display
 - Multi-Line Display
 - Channel Name Aliases
 - Zone Name Aliases
- Minimum Channel Capacity – Single Band Radios
 - SWIT 7/800: 9 Zones – 144 Modes/Channels
 - SWIT UHF: 3 Zones – 48 Modes/Channels
 - SWIT VHF: 6 Zones – 96 Modes/Channels
- Minimum Channel Capacity – Multi-Band Radios
 - 18 Zones and 288 Modes/Channels
 - SWIT 7/800: 9 Zones – 144 Modes/Channels
 - UHF SWIT: 3 Zones – 48 Modes/Channels
 - VHF SWIT: 6 Zones – 96 Modes/Channels

Recommended/Optional Features:

- Minimum required encryption level for SWIT encrypted channels is AES256 Multi Key. (10 key minimum to meet SWIT.) *Note: Nothing in this document requires that encrypted radios be purchased. However, all new radios utilizing SWIT encrypted channels must meet these minimum requirements:*

- FIPS Level II Key Storage
- AES256 Mandatory
- Multi-Key (10 minimum to meet SWIT)
- Over-the-Air-Rekeying (OTAR) – Required
- Key Management Facility OTAR Capable
- Over-the-Air Rekeying Multi-System – Recommended
- Global Positioning System (GPS) Equipped
- Additional Channel Capacity for Local Use
- Portable Radios: Battery life that is equivalent to or better to match required duty shift. Portable radios should be issued with a second battery.

Radio Ordering Lessons Learned:

- **Portable Radio Batteries:** Battery capacity should be sized to ensure it will be large enough to cover the intended duty shift or other work cycle between charges. Portable radios should be issued with a spare battery. Battery chemistry should be appropriate for the environmental conditions the radio will be expected to operate in.
- **OTAR and Multi-System OTAR:** These feature sets are part of the secure encryption key loading that can allow rekeying the radio without it physically being connected to a programming computer. Several entities on the STARCOM21 network have secured Key Management Facilities (KMF) to permit rekeying automatically, over-the-air (OTAR). It is anticipated that additional KMFs, and perhaps a statewide KMF system, will be available soon. Therefore, if purchasing radios for encrypted duty, it is recommended that OTAR and Multi-System OTAR be purchased with new radios.
- **Hardware Encryption:** Some vendors may offer software-based encryption key storage within the radio. (FIPS 140-2 Level 1). This is considered an unsecure method of storage and the use of the statewide (SWIT) encryption keys will require FIPS 140-2 Level 2 which utilizes a hardware based secure key storage “vault” within the radio.
- **USER Training:** Comprehensive initial user training is imperative for effective system operation and user safety. Ongoing refresher training for radio and system features and operations are also important and encouraged.