



Signal Boosters – Certification Requirements Overview

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Signal Boosters

- Boosters certified after 2/20/2013 must comply with new rules
- Boosters sold and marketed starting 3/1/2014 must meet new rules
- Consumer boosters
 - Wideband: non-specific providers
 - Provider-Specific: provider(s) specified at certification
 - Can be fixed or mobile (≥ 20 cm separation)
- Industrial (Part 20) boosters
 - Non-consumer boosters used in subscriber-based services
 - Can be fixed or mobile (≥ 20 cm separation)
- Part 90 boosters
 - Class A (Narrowband, each passband ≤ 75 kHz)
 - Class B (Broadband)
 - Can be fixed or mobile except Class B (fixed only)



Signal Boosters

- R&O FCC 13-21 and new rules apply to the following bands:
 - 800 MHz Cellular (824-849/869-894 MHz)
 - Broadband PCS (1850-1915/1930-1995 MHz)
 - AWS-1 (1710-1755/2110-2155 MHz)
 - Part 27 Lower and Upper 700 MHz bands
 - Part 90 PLMR bands > 150 MHz
- New rules will be effective 30 days after publication in the Federal Register, except those contain new or modified information collection requirements, which are subject to the OMB review per PRA of 1995
- Signal Boosters have been added to the TCB exclusion list since 2/20/2013, certification applications should be filed directly with the Commission
- Before final procedures are published, applications will be reviewed on a case-by-case basis, FCC may ask for samples to be tested at the FCC Lab.
- Policies are still being developed, additional issues will be addressed in the final guidance. Comments to draft KDBs are encouraged.



Additional Rules and Policies

- 800 MHz SMR (817-824/862-869 MHz), consumer or industrial boosters, allowed only when nationwide band reconfiguration is substantially completed
- 2.5 GHz BRS/EBS band: consumer signal boosters not allowed
- Modular approval not allowed for boosters
- Extended frequency listing on grant or the EF grant note not allowed, applications must meet all necessary requirements
- Third-party or field configuration of frequency and power:
 - Consumer boosters: not allowed unless under direct control of grantee
 - Industrial boosters: allowed within operation bands and other conditions specified during certification or on grant
- All boosters, consumer and industrial, must comply with general population/uncontrolled RF exposure limits



Consumer Boosters

● General requirements:

- Licensee consent (in most cases per FCC ID)
- Registration (per subscriber)
- Meet NPS
- FCC certificated
- Operate on a secondary, non-interference basis
- Shut down if causes harmful interference
- Do not need fine tuning or other technical adjustments
- Individuals can install without third-party, professional assistance
- Be sold together with antennas, cables, and/or coupling devices that meet the requirements



Consumer Boosters – Licensee Consent and Registration

- Manufacturers and providers may initiate separate authorization process to provide consent on a per-model basis
- If the booster does not have the warning label, needs to get wireless provider permission (consent)
- Registration information: owner/operator, make/model/SN, location of the booster, and date of initial operation
- Most providers will establish a free registration mechanism by 3/1/2014
- Provider-Specific Boosters: certificate from the provider or attestation that the applicant has received the consent of the relevant licensee(s) to manufacture the device be presented at time of equipment authorization



Consumer Boosters

● NPS requirements:

– General:

- Comply with existing technical parameters for the applicable band of operations (if more stringent than new rules)
- Self-monitoring (noise and gain)
- Anti-oscillation
- Power-down/shut-down when not in need
- Not easily defeatable protection features
- Interference avoidance for wireless subsystems

– Technical (different specifications for Wideband and Provider-Specific):

- Noise limits, bidirectional capability, booster gain limits, power limits, OOB limits, intermodulation limits, antenna kitting, transmit power off mode, uplink inactivity



Consumer Boosters

- Certification warning label requirement: must include required information on registration, antenna/cable restriction, cease operation, and E911

This is a CONSUMER device.

BEFORE USE, you **MUST REGISTER THIS DEVICE** with your wireless provider and have your provider's consent. Most wireless providers consent to the use of signal boosters. Some providers may not consent to the use of this device on their network. If you are unsure, contact your provider.

You **MUST** operate this device with approved antennas and cables as specified by the manufacturer. Antennas **MUST** be installed at least 20 cm (8 inches) from any person.

You **MUST** cease operating this device immediately if requested by the FCC or a licensed wireless service provider.

WARNING. E911 location information may not be provided or may be inaccurate for calls served by using this device.



Consumer Boosters

- Warning label (cont'd)
 - Can be combined with the FCC ID label
 - The content and location of the label should be presented in the ID Label exhibit
 - Permanently affixed to a permanently attached part of the equipment enclosure, and readily visible
 - Alternatives (e.g., only in user's manual, only in electronic format, or only on gift box) not permissible without advance FCC approval
 - Stating that the booster is approved by all providers for use is prohibited on the label or elsewhere
 - If label contains acknowledgement that particular providers have given consent to this device, the statement would be followed by "Some wireless providers may not consent to the use of this device on their network. If you are unsure, contact your provider."



Consumer Boosters

- Attestation (non-confidential exhibit) includes:
 - Licensee consent for provider-specific booster has been obtained (consent be made available upon FCC/TCB request)
 - NPS and other compliance/safeguard features have been implemented
 - NPS and other compliance/safeguard features are defaulted to be “On” (in operation)
 - NPS and other compliance/safeguard features can not be field reconfigured, disabled or removed
 - Consumer booster is not user programmable, does not need fine tuning or adjustment, does not require professional installation
 - Future software upgrade will not cause non-compliance



Consumer Boosters

- User's Manual (non-confidential exhibit) includes:
 - Consumer signal booster warning label messages
 - Warning message for use of unauthorized antennas, cables, and/or coupling devices
 - Provide a complete list of authorized antennas, cables, and/or coupling devices
 - List the default antenna, cable, and/or coupling device that are shipped with the booster
 - Describe installation accessory, procedure and any necessary configuration, fine tuning or adjustment
 - Provider(s) contact information for provider-specific boosters
 - High level summary and/or description of operational features related to booster rule compliance



Consumer Boosters

- Operational Description (can request confidentiality) includes:
 - Provide a list of all operation bands
 - If device is capable of operating outside the authorized frequency bands through software configuration, describe how software is managed and controlled
 - Describe the self-monitoring mechanism (HW and SW)
 - Describe the anti-oscillation mechanism
 - Describe the automatic power-down and shut-down mechanism when the booster is not in need
 - Detection scheme for own network
 - Detection scheme for other, like and unlike, networks
 - Power down triggering criteria and adjustable range
 - Shut down triggering criteria and resume/recovery algorithm
 - Describe how “operate only for the duration of a call” is achieved
 - Describe any interference avoidance scheme



Industrial Boosters

- Sold and marketed after 3/1/2014 must meet new requirements
- Industrial boosters may only be used by FCC licensees or those given express (individualized) consent of a licensee
- Consumers should make sure they only purchase and use boosters with a consumer use label
- Label and manual must warn users that express licensee consent should be obtained
- Consent can be in the form of a letter, e-mail or other record sent from a licensee or agent of a licensee to an operator, owner, or installer of an industrial signal booster with specified frequency bands for retransmission



Industrial (Part 20) Booster Warning Label

- Industrial (Part 20) booster warning label
 - Can be combined with the FCC ID label
 - The content and location of the label should be presented in the ID Label exhibit
 - Permanently affixed to a permanently attached part of the equipment enclosure, readily visible
 - Alternatives (e.g., only in user's manual, only in electronic format, or only on gift box) not permissible without advance FCC approval

WARNING. This is **NOT** a **CONSUMER** device. It is designed for installation by **FCC LICENSEES** and **QUALIFIED INSTALLERS**. You **MUST** have an **FCC LICENSE** or express consent of an FCC Licensee to operate this device. Unauthorized use may result in significant forfeiture penalties, including penalties in excess of \$100,000 for each continuing violation.



Part 90 Boosters

- 90.219 allows booster operation above 150 MHz, and not used to extend the boundary of the normal service area
- Non-licensees seeking to operate Part 90 boosters must obtain the consent of the licensee(s) whose signals they intend to amplify and do not cause interference
- Existing and future Class B Part 90 boosters must be registered with FCC (maintained by WTB) before use
- Class B Part 90 boosters registration system to be available by 11/1/2013 (est.); registration completed by 11/1/2014
- Registration information: operating range, physical location, contact information



Part 90 Boosters

- Fixed boosters: both Class A and Class B can be deployed
- Mobile boosters: only Class A allowed, operation of Class B mobile permissible until 11/1/2014 if not causing interference
- Both Class A and Class B can be used outdoors
- 90.219
 - Max. 5 W ERP per channel, operation should use only power necessary to achieve the intended communications
 - Spurious emission limits: 90.210 and -13 dBm/100 kHz
 - Noise figure < 9 dB in either direction
- May not amplify service bands where the operator does not have a license or licensee consent
- Class B cannot amplify both commercial (including CMRS and ESMR) and PLMR bands – except DAS



Part 90 Booster Warning Label

- Part 90 Industrial Booster warning label:
 - Specify the booster is Class A or Class B device
 - Can be combined with the FCC ID label
 - The content and location of the label should be presented in the ID Label exhibit
 - Permanently affixed to a permanently attached part of the equipment enclosure, readily visible
 - Alternatives (e.g., only in user's manual, only in electronic format, or only on gift box) not permissible without advance FCC approval

Part 90 Signal Boosters

WARNING. This is **NOT** a **CONSUMER** device. It is designed for installation by **FCC LICENSEES** and **QUALIFIED INSTALLERS**. You **MUST** have an **FCC LICENSE** or express consent of an FCC licensee to operate this device. You **MUST** register Class B signal boosters (as defined in 47 CFR 90.219) online at **www.fcc.gov/signal-boosters/registration**. Unauthorized use may result in significant forfeiture penalties, including penalties in excess of \$100,000 for each continuing violation.



Industrial (Part 20) & Part 90 Boosters

- Attestation (non-confidential exhibit) includes:
 - Warning label messages and Class A/B disclosure (Part 90) will be also shown in online and point-of-sale marketing materials and on outside packaging of device
- Operational Description (can request confidentiality) includes:
 - Provide a list of all operation bands and the scope of the license or the licensee consent
 - If HW or SW platform permits other frequency bands, describe how are they selected and managed
 - Describe the automatic power down mechanism and its adjustable range to ensure that the booster operates only with the power necessary to achieve the intended communications



Industrial (Part 20) & Part 90 Boosters

- User's Manual (non-confidential exhibit) includes:
 - Specify booster is Class A or Class B (Part 90)
 - Signal booster warning label message
 - Warning message for use of unauthorized antennas, cables, and/or coupling devices
 - Provide a complete list of authorized antennas, cables, and/or coupling devices
 - List the default antenna, cable, and/or coupling device that are shipped with the booster
 - Describe installation procedure and any power, RF cable, and antenna adjustment guidelines
 - Contact information (licensee or FCC) for CMRS/SMR industrial or Part 90 Class B boosters



Questions and Answers

Thanks!