

Federal Communications Commission
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Laboratory Division Public Draft Review

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Draft Laboratory Division Publications Report

Title: Permissive Change Policy

Short Title: Permissive Change Policy

Reason: Revision of Publication for clarification of Software configuration for Non SDR radios.

Publication: 178919

Keyword/Subject: Section 2.1043, Permissive Changes

First Category: Administrative Requirement

Second Category: Permissive Changes Part 2.1043

Third Category:

Question: What are the Federal Communications Commission (FCC) guidelines for permissive changes?

Answer:

The below attached document (178919 D01 Permissive Change Policy v04r06) provides guidelines for permissive changes.

Attachment List:

[178919 D01 Permissive Change Policy v04r06](#)

10/14/2010

Attachment 178919 D01 Permissive Change Policy v05r01

Permissive Change Policies

The permissive change rules in Section 2.1043¹ describe the modifications that may be made to an RF device without filing for a new equipment authorization; define the three different types of permissive changes; and identify when a permissive change (PC) filing with the Commission is required. Note that changes to the basic frequency determining and stabilizing circuitry (including clock and data rates), frequency multiplication stages, basic modulator circuit or maximum power or field strength ratings will always require a new FCC ID and a new equipment authorization application to the FCC.²

This document defines general permissive change policies - other more specific policies may be described in related documents. Permissive changes and policies are addressed in this document as they apply to the following categories:

- Antenna changes
- Printed Circuit Board (PCB) and Hardware changes
- Enclosure changes
- Software changes
- Miscellaneous changes

Related Notes:

- a. When a device is modified, all proposed changes must be considered to determine the type of filing required. For example, a software change to add additional frequencies may be authorized by a permissive change; however, if the power in the new frequency band increases, then Section 2.1043 requires a new equipment authorization filing except as discussed in Section 4. f) below.
- b. When a Class II permissive change is filed for either EMC or RF exposure (RFx) purposes, an EMC test report or RFx evaluation is required, regardless of whether EMC or the RFx levels have degraded.³
- c. Guidance for permissive change policies for Hearing Aid Compatibility (HAC) is contained in a separate publication: 285076 Equipment Authorization Guidance for Hearing Aid Compatibility.

1) Antenna Changes:

- a) Part 15 equivalent-type antennas

¹ Also referenced in Sections 2.932, 2.907, etc.

² With some exceptions as noted later in this publication – see section 4. f).

³ Degradation for EMC parameters:

- Any increase in the fundamental emission for output power rated devices is considered degradation. Section 2.1043 does not allow an increase in maximum output power rating without application for equipment authorization under a new FCC ID.
- Spurious emissions - an increase of up to 3 dB from the original authorization is allowed, if the emission level is compliant.

- i) When a Part 15 certification application includes an antenna list and photos,⁴ lists of all antennas are needed in the filing. The antenna type(s), gain, model number and manufacturer are usually listed.
- ii) Additional equivalent antennas from other manufacturers may be substituted, and then marketed without a Class II permissive change, with the following exceptions:
 - 1. Subpart D Unlicensed Personal Communications Service Devices - the lowest gain antenna is needed for detecting lowest energy above the noise floor, in addition to the highest gain of each type. The addition of a lower gain antenna shall require a Class II permissive change.
 - 2. UNII devices - the lowest gain antenna, in addition to the highest gain of each type, is needed because the lowest gain results in worst case radar reception. The addition of a lower gain antenna, of the type currently authorized or not, shall require a Class II permissive change.
 - 3. For Ultra Wide Band (UWB) devices, all antennas affect emissions so all antennas need to be tested. The addition of an antenna shall require a Class II permissive change.
 - 4. Transmitters subject to radiated power density limits, and operating at or near the maximum power density level may need to reduce EIRP with lower gain antennas. This applies to conditions when the radiated power density (V/m²) is higher for lower gain antennas with less antenna surface area operating at the same EIRP levels - an evaluation is required to determine if a Class I or II PC is applicable.
 - 5. For antennas operating in portable exposure conditions, see 5. b) iii. below.
- iii) Equivalent antennas must be of the same type (e.g. yagi, dish, etc.), must be of equal or less gain than an antenna previously authorized under the same FCC ID, and must have similar in band and out of band characteristics (consult specification sheet for cutoff frequencies).

Note: Any new antenna type, or higher gain antenna, approved under Part 15 requires a Class II permissive change, and the requirements of Section 15.203 must be met.

- b) Antenna replacement for licensed service transmitters.
 - i) Antenna changes may be made without an authorization request, if adherence to the grant conditions for RFx compliance and applicable maximum ERP/EIRP rules is observed. Otherwise, an equipment authorization application is required.
 - ii) An integral antenna requirement (e.g. GMRS, FRS transmitters, etc.) means that the antenna is not user replaceable, or is not removable.
- i. **Printed Circuit Board (PCB) or hardware changes:**
 - a) Changes described in Section 2.1043(a) that result in a non-electrically equivalent device require a new FCC ID.

⁴ Sections 15.204(c) (3), 2.1033 (b) (4), 2.1033 (b) (7). Recall also that per Section 15.204 (b) all Part 15 intentional radiators must be marketed with at least one antenna, except in certain situations such as where a filing has justified professional installation (Section 15.203).

- b) Versions of a device with different internal active hardware components (e.g. amplifiers and crystals) that result in different radio parameters (e.g. output power, frequency) or that result in the device not being electrically identical require authorization under a different FCC ID for each version. Such changes are NOT considered electrically identical.⁵ For example, versions of a device with different internal filter designs that operate on different frequencies must be filed under different FCC IDs.
- c) Part substitution - electrically identical parts may be substituted. An initial evaluation of test results will determine if a Class I or Class II PC application is required. A chip replacement of a portion of the transmitter that performs some sub-function such as an amplifier chip, oscillator chip or frequency determining chip may be considered a Class II permissive change under the following conditions; however, replacement of a chip that constitutes a complete transmitter shall require a new FCC ID.
 - i. The new chip component is pin for pin compatible.
 - ii. The new chip has the same basic function as the old chip, from an external perspective (internal circuitry may differ).
 - iii. No change in radio parameters has occurred.
 - iv. The same conditions apply when a small area (approximately the same area as the chip) of the PCB is replaced with an equivalent chip.
- d) Adding or subtracting an on-board amplifier component requires a new FCC ID, except when substituting an amplifier part, as provided in subparagraph c), above.
- e) A transmitter with and without an external amplifier may be authorized under one FCC ID, if approved in the original authorization. Adding an external amplifier is not allowed with a permissive change. A new equipment authorization application with a new FCC ID is required to add an external amplifier.

⁵ Electrically identical device considerations:

- For Part 95 devices (i.e. 95C) the FCC does not allow device designs that permit end-users to change plug-in crystals. When the plug-in crystal is only changed by the original equipment manufacturer, the grantee may receive authorization for multiple crystals under one FCC ID. Historically, this has not been considered a design change for Part 95 devices, as the change involves exchanging one crystal for another. A permissive change request for a new crystal(s) is acceptable if the new crystal does not cause the frequency range to exceed that granted in the original authorization. A new FCC ID is required if the new crystal causes the device to exceed the frequency range approved in the original authorization.
- If the transmitter PCB board and enclosure remains the same, external or internal mechanical passive filters for a transmitter may be approved under one FCC ID and/or can be added with a Class II permissive change even if the mechanical passive filters result in different frequency bands of operation. If the change in these filters result in a reduced frequency band from the original grant and all emissions have not been degraded, a Class 1 permissive change is acceptable.
- Part 74 and Part 90 wireless microphones - Minor differences in passive components (resistor or capacitor) for internal circuitry is allowed in an original application for authorization, but not in a permissive change application

- f) Transmitters may not be modified and approved with a permissive change, if an internal amplifier is added or subtracted. Transmitters with and without an internal amplifier require two equipment authorization applications, with two FCC IDs.
 - g) Depopulated versions of a transmitter require authorization under separate FCC IDs for each version.
 - h) Minor circuitry for non transmitter portions (such as receiver, peripheral circuits, or some other digital function) can be depopulated, and may be approved under one FCC ID. For example, a base station cordless phone with or without a digital display (for an answering machine function) may be approved under the same FCC ID. Significant depopulation usually requires a separate FCC ID because the devices are not electrically identical. See Sections 2.908 and 2.933(b) of the Rules.
3. **Enclosure changes:** For devices not approved as modules, only minor changes to an enclosure are allowed with a permissive change. If the basic functionality and intended usage are not the same, a new FCC ID is required. For example, approval of a desktop and tower computer under the same FCC ID, or a laptop and desktop under the same FCC ID, is not permissible.

A certified transmitter not approved as a modular device under the FCC rules may be placed or inserted into another host as either a stand-alone or plug-in transmitter, if it is accessible by the end-user or field technician and the FCC ID is visible from the outside, or visible without difficulty, when the transmitter is accessed. Further approval is not required if there are no modifications or physical changes to the transmitter and housing, only antennas approved by the manufacturer are used and all other FCC grant conditions and usage configurations are properly followed. For example, a certified wireless modem PCI card with a manufacturer approved antenna may be inserted into a typical personal computer; or an access point may be placed inside an equipment cabinet. Access to the transmitter must use common enclosure access methods so that end-users or installers do not require any special tools except for simple screw drivers, snap open covers or lock keys to access, remove and replace the transmitter. In cases where the non-modular transmitter is not end-user accessible and replaceable, the entire enclosure or device must receive a new authorization.

See KDB 996369 for further guidance on devices approved as modules.

4. **Software changes:** For devices not approved as Software Defined Radios (SDR), limited changes are permitted with software changes as Class I or Class II as discussed below. In case changes are incorporated by software, the technical description must clearly explain what controls are implemented to prevent third parties or unauthorized parties from making modifications to the transmitter to enable operation outside the conditions of grant of authorization.
- a) Additional frequencies may be added by Class II permissive change to an approved device under the following conditions; however, a new test report must be submitted for the new frequencies.
 - 1. No hardware changes have been made.
 - 2. There is no increase in the output power rating on new frequencies.

3. The Equipment Class remains the same. (Changes that require a new Equipment Class code require a new FCC ID, except for SDR approvals.)
4. RF exposure changes must be addressed.
5. Only the original equipment manufacturer may implement the new frequencies.
6. There are no other changes to the device that indicate a need for a new FCC ID.

b) Frequency band capability of the device is decreased.

If there are no other radio parameter changes to the radiated and conducted output power of the device or any grant parameter including EMC, HAC and SAR ratings due to the decreased frequency:

- i. Then the change is permitted under a Class I change procedure.
- ii. If the applicant desires to change the grant frequency range listed on the grant, then a Class II permissive change procedure is required.

c) Third party activation of software changes for any radio parameter such as new frequencies, output power, and/or modulations, or changes that modify the circumstances under which the transmitter is approved to operate, are not allowed unless the device was approved as a software defined radio.⁶ (Class III permissive change rules for software defined radios are in Section 2.1043(b)(3)). A third party is anyone except the grantee; such third parties include end-users, service providers, operating system providers, application developers, Original Equipment Manufacturer(s) (OEM) installers, professional installers or authorized service dealers. Only the following exceptions are allowed.

- i. For professionally installed equipment, the professional installer may adjust the output power so that radiated power is within the grant authorization for the authorized antenna and cable configurations. A third party must not have the ability to adjust the radio parameters of the device through country code settings or other software configuration controls if the device has the ability to operate out of compliance with the FCC technical requirements or the conditions of the grant of authorization of the transmitters. See KDB 594280 for further guidance.
- ii. Only authorized dealers under a contractual agreement with the grantee may make authorized radio parameter changes. The grantee must attest to such contractual agreements. Any such changes must be made only to newly manufactured or sold devices and not to the devices already deployed.
- iii. If the grantee has contractual agreements with specific third parties such as operating systems providers or service providers who exercise control over the software configuration of the transmitter, the Commission may allow the grantee to permit such

⁶ Section 2.944 (b) requires any radio in which the software is designed or expected to be modified by a party other than the manufacturer and would affect the operating parameters of frequency range, modulation type or maximum output power, or the circumstances under which the transmitter operates in accordance with the Commission rules must comply with the requirements for software defined radios. Depending on the circumstances the Commission may permit some third party modifications; however, such authorization requests must be submitted to the Commission for approval.

parties to enable software upgrades to devices deployed in the field. The grantee must provide the details of such arrangements in a Class II PC filing made directly with the Commission.⁷ The filing must include:

1. Brief description of the arrangement between parties,
 2. Software control process used by the parties (including the grantee and specific third parties) to ensure that reasonable safeguards are in place to ensure that the device cannot be modified by unauthorized parties,
 3. An attestation from the grantee indicating that they continue to be the responsible party to ensure compliance.
- d) Adding new line items on the Form 731 is allowed under a Class II permissive change. Additional data rates (both higher and lower rates) under existing modulations that are consistent with a Form 731 line item / emission designator may be either a Class I or Class II PC, depending on emissions. A Class II permissive change is required if degradation occurs; if no degradation occurs a Class I permissive change is acceptable.
- e) A Class II permissive change for a device with a decrease in output power, or with a different field strength, is allowed under the following conditions:
- i. The maximum output power rating of the original authorization does not change.
 - ii. There is no design change that increases or decreases the output power. A decrease in the power setting configuration is acceptable.
 - iii. In no case, may a power limit be exceeded.
- f) An increase in maximum output power requires a new FCC ID per Section 2.1043. This includes an increase in conducted output power and/or radiated power listed on the grant. However, if a Class II permissive change is to add a new frequency band subject to new technical requirements (i.e. in the case of a change in the FCC rules), an increase in power is permitted subject to the new technical requirements. For instance, a Class II permissive change to allow a UNII device to operate in a newly defined UNII frequency band, subject to a higher output power limit, is acceptable.
- 5 **Permissive changes and RF exposure considerations:**
- a) Class II permissive change filings should include RF exposure evaluation results for at least the device and evaluation configurations corresponding to the highest RF exposure condition reported in previous authorizations under the FCC ID.
 - b) For portable devices, RF exposure evaluation requirements for Class II permissive change requests are based on the following:

⁷ TCBs are excluded from approving such arrangements through Class II permissive change filings for non-Software Defined Radio transmitters (*See* TCB Exclusion List KDB 628591).

- i. Comparison of the highest measured SAR among all the configurations tested for each operating condition (i.e. next to the ear and worn on the body) obtained for the original authorization, to the highest SAR tested for the modified device under similar test configurations.
 - ii. For each frequency band, if the highest measured SAR of the modified device for a certain configuration (i.e. the head or body) is larger than the highest measured SAR for the original device under similar test configurations, then in the Class II permissive change request SAR shall be addressed for the applicable operating configurations in each frequency band.
 - iii. Changes in antenna, and/or key radiating or metallic structures for portable devices require SAR evaluation to determine if a Class I or Class II permissive change is required.
 - 1. SAR is primarily dependent on the near fields and RF current distributions on a device; therefore, minor and simple metallic changes may cause relatively large changes in SAR.
 - 2. Antenna gain is normally considered a far field parameter (e.g. Sections 15.31(f) and 2.1053(a), OET Bulletin 65, Section 2.1); however, SAR is primarily dependent on the near fields. SAR compliance considerations are separate from the Section 15.204 antenna gain provisions.
 - 3. When adding an equivalent antenna for a Part 15 device, i.e., identical antenna type with the same or lower gain, with no other change to the transmitter and host device configurations, and the highest SAR measured for that antenna type in previous certification(s) is less than 0.8 W/kg, SAR evaluation is not required to add an equivalent antenna. Otherwise, SAR should be evaluated for the additional equivalent antenna(s) according to the procedures required for the transmitter, antenna and host device configurations.
- c) Permissive change applications that include a change in exposure limits, or in device use configurations, must conform to the following guidelines:
- i. Class II permissive change applications may not be used to resolve unaddressed or misrepresented exposure issues for device configurations in the original authorization. For example, original cell phone handset applications usually include SAR compliance information. A permissive change may not be used to amend an application if SAR was inappropriately not included, or if the device was represented as being for only mobile, not portable use.
 - ii. Examples of allowed permissive changes for devices having mobile and portable use configurations (different exposure limits, i.e. MPE and SAR) include:

1. Requesting authorization to add a mobile passive vehicle mount antenna to a portable held-to-head, body-worn and hand-held device (Equipment Classes TNE, PCE, PCT, TNT). The following application requirements apply:
 - a) Include a new grant line entry and radiated power, if applicable.
 - b) Include an MPE evaluation, if applicable.
 - c) Provide specific and separate grant remarks for mobile and portable usage conditions.
2. Requesting authorization to add specific hosts or antennas for Limited Modular Approval (LMA) devices (and include SAR evaluation, if applicable).

6. **Miscellaneous changes**

- a) A change to an unlicensed transmitter from non-modular to modular (single or limited single) or the reverse, is permissible if the changes meet all the requirements for a permissive change (Section 2.1043), for a modular transmitter (Section 15.212) and all other applicable rules. (See KDB Publication 996369 for additional guidance).
- b) A change to an unlicensed transmitter from single (non-limited) module to a limited single-module or change from limited single-module to single module is permissible if the changes meet all the requirements for a permissive change (Section 2.1043), for a modular transmitter (Section 15.212) and all other applicable rules. (See KDB Publication 996369 for additional guidance).
- c) Changes to licensed device are permitted under the conditions similar to (a) and (b) above, if the devices use general engineering practices and guidelines similar to those for unlicensed transmitters to demonstrate compliance.
- d) A change for a licensed or unlicensed transmitter from non-modular to split modular (split or limited split) or the reverse, or modular (single or limited) to split modular (split or limited split) or the reverse, requires a new FCC ID.
- e) A change from software defined radio (SDR) to a non-SDR or vice versa requires a new FCC ID.
- f) Disabling modulation (e.g. removing GSM) - If a device has components on it that are disabled by software or keyboard function, the change to the device may be approved under the same FCC ID as the original. However, if the modulation function of a device is disabled by having the parts removed, approval under a new FCC ID is required.
- g) Change in FCC ID filings (Section 2.933) in conjunction with a permissive change filing (Section 2.1043): Where both a permissive change and a change in FCC ID are required by the grantee, the Section 2.933 change in FCC ID application (or applications in the case of composite Equipment Class FCC IDs) must be processed first, followed by the Section 2.1043 permissive change filing(s). *Note that a filing for change in FCC ID requires that the applicant has written permission from the original grantee to file the application.*

- h) Change in FCC ID filings and permissive changes for UNII devices subject to DFS and radar detection requirements:
 - a. Permissive changes are subject to the updates and requirements in KDB 443999. The filing must include the appropriate users manual and attestations.
 - b. Change in FCC ID filings are subject to the following requirements:
 1. Letter exhibit(s) and photo as specified in Section 2.933 including the authorization letter from the original grantee.
 2. An attestation statement from the applicant stating that as the grantee they are responsible for changes to the device and will not alter or offer any capabilities that will modify DFS settings.
 3. A complete User's Manual from the new grantee that meets all the requirements of KDB 443999.
 4. A letter exhibit showing how the device meets the requirements of KDB 443999 and KDB 594280.
 - i) For a change in FCC ID filing for SDR devices, the new grantee must also have a signed attestation from the original grantee addressing how they will share, manage and/or control the radio software. The attestation needs to re-address the software defined radio security description guide in KDB Publication 442812 considering the new grantee. For example, the original security description may prohibit third party radio software control but may now allow limited control with the new grantee.

7. Related KDB Publications:

- KDB Publication 447498 for evaluation of SAR for portable and mobile configuration
- KDB Publications 616217 to determine SAR and simultaneous transmission test requirements for laptop and netbook configurations to minimize subsequent evaluations for use in other hosts;
- KDB Publication 784748 Labelling requirements;
- KDB Publication 996369 Transmitter Modular Equipment Authorization Guide;
- KDB Publication 442812 SDR Apps (Application) Guide;
- KDB Publication 594280 Software Configuration control;
- KDB Publication 285076 Equipment Authorization Guidance for Hearing Aid Compatibility;
- KDB Publication 443999 UNII devices subject to DFS and Radar Detection Requirements

Change Notice:

178919 D01 Permissive Change Policy v04 has been changed to a new revision under the same version to **178919 D01 Permissive Change Policy v04r01 for clarification.**

Note 4 Electrically identical device considerations item 2

The following sentence was added: If the change in these filters result in reduced frequency band from the original grant and all emissions have not been degraded, a Class 1 change is acceptable.

178919 D01 Permissive Change Policy v04r01 has been changed to a new revision under the same version to **178919 D01 Permissive Change Policy v04r02 for clarification.**

Change 1:

2. Printed Circuit Board (PCB) or hardware changes: c) Part substitution - electrically identical parts may be substituted. An initial evaluation of test results will determine if a Class I or Class II application is required. Has been changed to:

2. Printed Circuit Board (PCB) or hardware changes:

- c) Part substitution - electrically identical parts may be substituted. An initial evaluation of test results will determine if a Class I or Class II application is required. A chip replacement of a portion of the transmitter that performs some sub-function such as an amplifier chip, oscillator chip or frequency determining chip may be considered a Class II permissive change under the following conditions; however, a replacement of chip that constitutes a complete transmitter will require a new FCC ID.
 - i. The new chip component is pin for pin compatible.
 - ii. The new chip has the same basic function as the old chip, from an external perspective. (Internal circuitry may differ.)
 - iii. No change in radio parameters has occurred.
 - iv. The same conditions apply when a small area (approximately the same as the chip) of the PCB is replaced with an equivalent chip.

Change 2:

2. Printed Circuit Board (PCB) or hardware changes:

Transmitter chip replacements are consider a Class II permissive change under the following conditions:

- i. The new chip is pin for pin compatible.
- ii. The new chip has the same basic function as the old chip, from an external perspective. (Internal frequencies may differ.)
- iii. No change in radio parameters has occurred.
- iv. The same conditions apply when a small area (approximately the same as the chip) of the PCB is replaced with an equivalent chip.

has been deleted and merged with 2 (c).

If the change in these filters result in reduced frequency band from the original grant and all emissions have not been degraded, a Class 1 change is acceptable.

178919 D01 Permissive Change Policy v04r02 has been changed to a new revision under the same version to **178919 D01 Permissive Change Policy v04r03 for clarification.**

Change 1: 1 (a) (i) (1): Antenna changes: item I exceptions has been modified for clarification;

Change 2: 2 (h): Printed Circuit Board (PCB) or hardware changes: item (h) "Minor circuitry for non transmitter portions" has been modified for clarification;

Change 3: 6 (a),(b), (c) & (d): Changes to Class II permissive changes permitted for modules.

178919 D01 Permissive Change Policy v04r03 has been changed to a new revision under the same version to 178919 D01 Permissive Change Policy v04r04 for clarification.

- 1) Antenna Changes: for a) Equivalent-type Part 15 antennas has been changed for clarification for antenna type exceptions that need additional antenna testing
- 2) Added item 5 b) (iii) (3) When adding an equivalent antenna for a Part 15 device...

02/03/2011: 178919 D01 Permissive Change Policy v04r04 has been changed to 178919 D01 Permissive Change Policy v04r05

Item 3 sub item b Printed Circuit Board (PCB) or hardware changes: has been modified for clarification.

Item 4 sub item b Frequency band capability of the device is decreased was added.

Item 4 sub item c - Software changes_Third party activation- and sub item f - an increase in maximum output power - have been modified for clarification.

Item 6 Miscellaneous, changes for clarification to Change in ID filings

Corrected incorrect title information in document properties.

02/24/2011: 178919 D01 Permissive Change Policy v04r05 has been changed to 178919 D01 Permissive Change Policy v05.

Item 4 c1 Software changes: Clarification that for third party must not have the ability to adjust the radio parameters.

Item 4 c1 iii Software changes: A Class II procedure has been added to permit the grantee to upgrade software changes through the contractual agreements through specific third parties.

05/tbd/2011: D01 Permissive Change Policy v05 has been changed to 178919 D01 Permissive Change Policy v05r01.

Item 4 Software changes:” changes are incorporated by software, the technical description must clearly explain what controls are implemented to prevent third parties or unauthorized parties from making modifications to the transmitter to enable operation outside the conditions of grant of authorization” has been added

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