

This document describes the changes to the E2-900 radio (FCC ID O9P-E2-950) in relation to the application for a Class II permissive change under rules CFR 47 § 2.1043(a), and under the FCC Permissive Change Policy 178919 DO1 v06

The change involves an extension of the operating band of the device. The original grant was for the frequency range 932 MHz to 952 MHz. This application is to extend the device’s frequency range to 928 MHz to 954 MHz.

The change involves a software change to extend the operating band of the radio, and a change to the Receiver RF SAW Filter to extend the receiver range of the radio.

- The radio firmware has been updated so that it takes account of the operating frequency when adjusting the transmitter modulation balance. This ensures consistent transmitted waveform across the full operating band. The modulation balance affects both the transmit spectrum and the performance of the radio when transferring data using 4-FSK signalling. This modification ensures that the radio provides a consistent transmit spectrum, and operates reliably over the full extent of the new operating band.
- The RF Receiver SAW filter has been replaced with a part of identical specification but with increased pass-band to match the extended operating range.

The relevant sections of FCC 178919 DO1 Permissive Change Policy v06 are Section III – Hardware Changes, and Section V – Software Changes.

RF SAW Filter Replacement – Hardware Change

III. PRINTED CIRCUIT BOARD (PCB) OR HARDWARE CHANGES

This section applies, as there has been a change in the RF Receiver SAW Filter component.

- F.** Minor circuitry for non-transmitter portions (such as receiver, peripheral circuits, or some other digital function) can be changed or depopulated, and may be approved under one FCC ID. For example, a base station for a 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 §§ 2.908 and 2.933(b).⁸

This clause applies, as this is a change to the receiver. The original RF SAW Filter part is TaiSaw TA0991A. The replacement part is TaiSaw TA924GG. These devices are electrically equivalent other than the pass band. This change has no impact on the transmitter operation.

TA0991A: http://www.taisaw.com/upload/product/TA0991A%20_Rev.1.0_.pdf

TA924GG: http://www.taisaw.com/upload/product/TA924GG%20_Rev.3.0_.pdf

Frequency Band Extension - Software Change

V. SOFTWARE CHANGES

- A.** 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. When 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 the grant of authorization.

The device is not approved as an SDR, so this clause applies. The following controls are implemented to prevent third or unauthorized parties from making modifications to the transmitter to enable operation outside the conditions of the grant of authorization:

- The radio hardware incorporates components that are read by the radio firmware, and indicate the capability of the radio. The radio firmware limits the allowed frequencies to those encoded by these hardware components.
- These hardware components are different for the new hardware version. The device firmware will recognize both the original and new hardware versions, but only allow the extended band of operation on the new hardware version.
- If these hardware components do not match the expected value for either the old or new hardware version, then the radio will not transmit at all.
- The device radio firmware is not made publicly available, and in general would not be feasible to reverse-engineer the firmware to by-pass these checks.

- B.** Additional frequencies may be added by a Class II permissive change to an approved device under the following conditions. A new test report demonstrating compliance must always be submitted for the new frequencies of operation.

- 1) No hardware changes have been made.

This change is a software change, improving the operation of the radio over the extended band. There are no Hardware changes that impact the transmitter. The change of RF Receiver SAW Filter is addressed in the previous section. The test report will be submitted.

- 2) There is no increase in the output power rating on new frequencies (unless such exceptions are permitted by rules or KDB publications – see V) G)).

There has been no change to the output power rating

- 3) The Equipment Class remains the same. (Changes that require a new Equipment Class code require a new grant of certification (FCC ID), except for SDR approvals.)

The Equipment class has not changed

4) RF exposure changes must be addressed.

There are no changes to RF Exposure. The operating frequency has changed from 932-952 MHz to 928-954 MHz.

5) Only the original equipment manufacturer may implement the new frequencies.

ELPRO Technologies Pty Ltd is the Original Equipment Manufacturer, and is implementing the new frequencies.

6) There are no other changes to the device that indicate a need for a new FCC ID.

There are no other changes to the device.