

MEMORANDUM

To: The Executive Committee
Copy: Ed Hare, Brennan Price, Kermit Carlson, Mike Gruber
From: Chris Imlay
Date: September 4, 2015
Re: FCC ET Docket No. 15-170; Equipment Authorization Rule Change Proposals

Greetings. In early August, there was some e-mail traffic among Kay, Ed, Dave, Brennan, Kermit and me about the above FCC docket. I was at the time completely engrossed in the LF and MF band comments and I didn't see any way that we had the bandwidth to file comments by the original comment date in this proceeding, which was September 9. Kay indicated that perhaps we could file reply comments making points that Ed and Mike Gruber had put together, and Ed was (and perhaps still is) also contributing to an industry committee filing that was not related to ARRL but which would make points that might be beneficial to Amateur Radio. However, FCC issued an Order extending the time for filing comments in this proceeding to October 9, and so there does exist some time to prepare a short filing if you think it best to do so. There are issues that Ed and Mike were especially interested in pertaining to labelling of Part 15 and Part 18 devices. But recently we have heard from some hams who are concerned about a much different issue: Under the rules proposed by the FCC, devices with RF components may be required to prevent modifications to firmware, including modification of Wi-Fi systems. All devices operating in, for example, the 5GHz Wi-Fi spectrum may be forced to implement security features to ensure the devices cannot be modified. This would prevent hams from adapting this equipment for Amateur use in Amateur bands, or so the concern goes. Here is a backgrounder on some of the issues raised in the NPRM that may be of interest to ARRL; what our lab recommends; and what some hams have complained about concerning this docket. We could decide to file comments in this docket, file only reply comments, or file no comments at all. The EC should determine our best course of action. If no EC instruction is forthcoming, we would propose to file limited comments on at least the RF labelling issues discussed in Item II below.

I. Background and Summary of FCC NPRM:

The FCC released a Notice of Proposed Rulemaking (NPRM) to update the rules that govern the evaluation and approval of radiofrequency (RF) devices.¹ Comments responsive to the NPRM were extended by FCC in an Order released August 25, 2015 and they are **now due October 9, 2015** and Reply Comments are due November 9, 2015.

The NPRM proposes to:

¹ Amendment of Parts 0, 1, 2, 15 and 18 of the Commission's Rules regarding Authorization of Radiofrequency Equipment and Request for the Allowance of Optional Electronic Labeling for Wireless Devices, ET Docket No. 15-170, RM-11673, *Notice of Proposed Rulemaking* (released July 21, 2015).

- Combine the Declaration of Conformity (DoC) and verification equipment authorization procedures into a single self-approval program;
- Codify and clarify the provisions for certification of modular transmitters and radios where the RF parameters are controlled by software;
- Clarify responsibilities for compliance when a final product may be composed of one or more certified modular transmitters;
- Codify existing practices protecting confidential and market-sensitive information;
- Codify and expand existing guidance for electronic labeling; and

Discontinue the filing of FCC Form 740 for RF devices imported into the United States.

Test Lab Issues

New self-approval program for equipment authorization. The FCC is proposing to do away with the DoC authorization program by combining it with equipment verification to form a “Suppliers Declaration of Conformity” (SDoC) program. Testing of unintentional RF radiators subject to SDoC will not require testing in an accredited laboratory, will not require data base registration, and will not require any review by an independent third party. The FCC logo would also be abandoned, but certain compliance-related information would have to be provided with the product at time of marketing.

Certification Procedures

Software-controlled devices. The FCC will continue to generally follow the policies that have been in place all along for software defined radios (SDR). However, the new rules will require a grantee of a software-controlled device to (a) explicitly describe the RF device’s capabilities for software configuration and upgradeability including all frequency bands, power levels, modulation types, or other modes of operation for which the device is designed to operate, including modes not enabled in the device as initially marketed; and (b) specify which parties will be authorized to make software changes (*e.g.*, only the grantee, the wireless service provider, or other authorized parties) and the software controls that are provided to prevent unauthorized parties from enabling different modes of operation. This information would be included as part of the operational description information required in the application for certification. It is not clear how this would affect Amateur Radio SDRs.

E-Labeling. The FCC is proposing a new rule to generally allow a radiofrequency device with an integrated electronic display to electronically display any labels required by the rules. This will include the FCC ID required for certification as well as any warning statements or other information that the rules require to be placed on a physical label on the device. The rule will also require that this electronic labeling information is secured in order to prevent modification by a third party. The rule will require that the user be provided with prominent instructions on how to access the required labeling and regulatory information, in either the packaging material

or another easily accessible format, at the time of purchase, and that these instructions be available on the product-related website, if one exists. The FCC also proposes that accessing the labeling and regulatory information not require any special codes or permissions and should require no more than three steps; and when the labeling information is electronically displayed, it must be clearly legible without the aid of magnification. When devices are imported, the FCC is proposing that devices displaying labeling and regulatory information electronically must also place this information either on the product packaging or on a physical label placed on the device at the time of importation, marketing, and sales. If a physical label is used, it may be a removable label, or, for devices in protective packaging, a label on the protective packaging. The FCC believes these alternatives may be useful when placing the information on the product packaging is not feasible, such as when devices are not individually packaged.

The proposed rules would not change the requirements to place warning statements or other information on device packaging or in user manuals or make information available at the point of sale. FCC rules would not allow other forms of electronic labeling such as Radio Frequency Identification (RFID) tags or Quick Response (QR) codes to substitute for the on-screen information display, or otherwise permit displays that require the use of special accessories, supplemental software, or similar plug-ins. The FCC is not proposing to require parties to display any information that is not already required by the rules as part of an electronic label, nor is it proposing to eliminate the ability of manufacturers to continue to physically label devices if they wish to do so. The FCC proposes to continue to require that devices that rely on a wireless or remote connection and have no display use a physical label.

II. The ARRL Lab Proposals

The NPRM is about equipment authorization and not about substantive rules for RF devices. However, because it asks questions about labeling, the ARRL Lab drafted a recommendation on rules changes about the labeling of Part 15 and Part 18 devices. Necessitating change, notably, is the fact that there are industrial Part 18 devices sold that are not legal to use in residential environments, but because there is no external labeling of the packaging of the devices, the end user, unless he or she opens the box and reads the manual (which very few people who buy, for example, RF lighting devices, ever do) doesn't get the message at all and uses industrial RF devices in residential areas. The ARRL EMC Committee earlier put together a proposal to improve labeling of these devices, and this is considered by the lab to be a good opportunity.

Mike Gruber and Ed Hare have what I consider a good suggestion with respect to RF "grow lights:" we could use this opportunity to ask that all lighting controllers that operate at power levels of greater than 400 watts be authorized under a certification process, due to the interference potential of the devices. These are now subject to the much more informal verification process that is not working well now. Given the number of interference complaints, non-compliance with emissions limits and the dismal record that the FCC has in enforcement related to these devices, a tightening of the rules is quite justifiable.

Additionally, for Part 15 RF lighting devices, Mike Gruber suggests some additional requirements as follows: (1) Add user information for users of Part 15A (i.e. non-residential) RF

lighting devices. (2) Add Part 15A labeling requirements for all Class A devices on the box or packaging of any Class A (industrial environment) Part 15 device in a conspicuous location and clearly visible at the time of sale or purchase: “CAUTION: This is an FCC Class A device and may cause harmful interference to radio communications. It should not be used in a home or residential environment. Any interference caused by this device must be corrected by the user at his or her expense.”

As to Part 18 ISM devices, the Lab suggests three rule change proposals: (1) A definition should be added for the term “consumer RF lighting device”. (2) Part 18B and 18A RF lighting devices should be categorized and defined as consumer and non-consumer, respectively. This is already being done in practice but there is no definition for such in the rules. (3) Among the labeling requirements should be added the following: “In addition, all Class A RF lighting devices and fixtures must bear the following advisory statement in a conspicuous location and clearly visible on the device or fixture. This statement must also be included on the device packaging or box such that it is conspicuous and clearly visible at the time of sale or purchase to an end user: ‘CAUTION: This is an FCC Part 18 Class A device and may cause harmful interference to radio communications. It should not be used in a home or residential environment. Any interference caused by this device must be corrected by the user at his or her expense.’”

III. Non-modification of RF devices.

Brennan Price, Dan Henderson and at least one Director have received statements of concern about this docket. The complainant’s argument goes generally as follows: Certain segments of the 2.4 GHz and 5 GHz Wi-Fi bands authorized by Part 15 overlap Amateur allocations. In full compliance with equipment authorization rules in place now, and in compliance with Part 97 regulations, some Amateurs are modifying devices originally designed for Part 15 use for legal use on Amateur bands. The uses of these modified devices are varied, but include fault-tolerant mesh networks for high-speed multimedia communications without the presence of traditional infrastructure or an Internet backbone. One such effort allows users to replace the firmware on off-the-shelf Part 15 Wi-Fi devices, reconfiguring them for Amateur use. Reportedly, this allows self-discovery of routes between nodes and creates a self-healing characteristic of the mesh network. The features necessary for Amateur use of these devices are not typically available in the firmware of normal Part 15 devices. There is presently no vendor of Wi-Fi devices that operate under Part 97 out of the box. The only route available to amateurs presently is to take Part 15 devices and modify them for Part 97 use.

This level of experimentation has not, the advocates say, resulted in interference to Part 15 users of the same equipment. One effort takes advantage of the modular radio features of consumer Wi-Fi hardware to enable communication on frequencies that are within the amateur allocation, but adjacent to the Part 15 segment (for example, 2.397 GHz or 5.660 GHz).

If FCC prevents Amateur licensees from modifying the firmware of these devices, arguably the use of high-speed multimedia or mesh networks in the Amateur Radio service will be adversely affected and relegated to use of outdated hardware. The ability to experiment and to adapt and improve existing communications infrastructure will be curtailed unnecessarily as well.

This arguably supports the filing of some limited comments in this otherwise wide-ranging and largely (from our perspective) irrelevant proceeding.

Let me know if further information is called for.

73, Chris Imlay W3KD