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Abstract: This document summarizes HP positions and perspectives on the FCC's regulation of wireless devices, to include short range wireless LAN and cellular telephone technologies that support digital information exchange. Both general and specific issues are discussed, and recommendations are presented for changes to the FCC rules and procedures.

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Hewlett-Packard Positions & Perspectives
On FCC Wireless Regulatory Issues

Compiled by
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Short-range wireless devices, such as those using the Bluetooth or IEEE 802.11 technologies, are subject to the FCC rules in 47CFR Part 15. Other rule parts apply to different radio services, such as cellular or PCS telephones. However, some of these rules may be unnecessary, onerous, and excessively burdensome. In some cases, it has been observed that they are inconsistently interpreted and administered, and sometimes inconsistent with FCC procedure. Often, these issues seem to revolve around what appears to be an FCC hypersensitivity to the potential for hazards from RF exposure.

At the 5 June 2002 meeting of the ITI's Technical Regulatory Committee (TRC), Bruce Franca of the FCC announced their intention to initiate a proceeding within the next few months to encompass issues relating to the FCC rules and processes for approving low-power, short-range wireless transmitting devices. Curiously, no one at the OET Lab seemed to have any knowledge of this NPRM effort, when asked about it at another industry meeting several weeks later. Nevertheless, this or other proceedings may present opportunities for industry input to the FCC on wireless matters. The most recent opportunity is the Public Notice (FCC 02-264 in WT Docket 02-310) that sought comment in the 2002 Biennial Review of FCC regulations covering wireless telecommunications.

This worksheet attempts to collect, organize, and articulate issues and solutions that are important to Hewlett-Packard toward influencing the FCC to make productive, beneficial changes to its wireless regulations. Input for this document was received from many across HP who are interested in these issues – Their contributions are acknowledges and appreciated.

The FCC's Perspective

When working for changes to FCC's wireless regulations, it's important to understand that the FCC has a very different perspective than manufacturers. The FCC sees themselves as working in the public interest by being great enablers and facilitators of new technology while also protecting consumers from RF exposure hazards and limiting incidences of interference. For example, the FCC believes that their 15-year old wireless spread spectrum rules have been a tremendous success, enabling a wide variety of wireless devices for business and consumer use. From their perspective, rule changes they have initiated have provided for the continued development of these wireless technologies, increased sharing of the allocated spectrum, and have enabled ever-higher data rates. They see the development of industry standards (such as Bluetooth and 802.11b) as providing the capability necessary for the introduction of a wide variety of new wireless devices in the future.

To succeed, comments, proposals and petitions to the FCC for changes to their rules should be:

- *Specific and clear.* Give specific desired rule language whenever possible. Write clearly and avoid verbosity.
- *Accurate.* Write from a position of intimate knowledge of the existing rules. Avoid complaints without evidence that problems actually exist.
- *Balanced toward the positive.* Avoid tendancies toward being excessively negative or not recognizing the underlying purpose of rule sections.
- *Demonstrably in the public interest*. Petitioners who succeed are those who can show why their proposed changes will benefit the public.

The "10,000 Foot" View

It is sometimes helpful to rise above the specific issues and concerns, and seek a common high ground on which agreement is more readily possible. Working at "the 10,000 foot level" also tends to be less confrontational. Progress on the specific, lower-level issues may then become easier, or at least more straightforward. With this in mind, here are some principles on which we may want seek FCC resonance first.

Everyone Wants Safe Consumer Products

Manufacturers, suppliers, and the FCC can probably agree is that it's important to ship products that will do no harm. While shipping unsafe products continues to occur in the marketplace, consumers are quick to identify these products and limit their purchases. Furthermore, consumers are not reticent about suing manufacturers of unsafe products. Consequently, responsible manufacturers and suppliers of consumer products who are interested in long-term success recognize that it is in their own self-interest to only ship safe products. Agreement on this point changes the discussion with regulators to "How safe is safe enough?"

With regard to wireless products, HP believes that consumers are not getting the level of protection that the FCC thinks they are providing with their wireless approval regime and oversight. Consumers have always been prone to bending technology to meet their needs, sometimes in unanticipated ways. A case in point is detailed below, where consumers can buy components to form wireless, handheld functions without any subsequent regulatory processing, but manufacturers who bundle the very same components are burdened with additional regulatory testing and administrative processing. In this situation, the FCC's desire to provide increased consumer protection is easily circumvented by the consumers themselves.

Simple Always Works Better

The best solutions are usually the simplest ones. Durable, successful regulations are those that achieve their goals in the simplest ways possible. By contrast, complex regulations or regulatory processes often fail to achieve their goals because of their very complexity. Complicated or convoluted regulations or regulatory processes are prone to misunderstanding, misinterpretation, and misapplication by both manufacturers and FCC staff people as well. It should be relatively

easy to resonate with the FCC on this point, and from this basis we may be able to help them understand where they have failed to achieve their goals by adopting needlessly complex regulatory processes in some cases.

The so-called "TCB Exclusion List" detailed below is a good example. The FCC created the TCB program to provide them with a way to simplify their equipment authorization process, and reduce their costs by transferring the responsibility for approvals to industry. However, the level of detail and complexity incorporated in this Exclusion List has created a situation where the FCC feels compelled to exert a high degree of consultation and oversight. Consequently, their resources have simply been redirected instead of decreased with no significant improvement in consumer safety or interference protection. (A recent revision of this list is greatly simplified over the previous edition. The FCC should be applauded whenever they simplify processes.)

Multiple Supply Chain Options are in the Public Interest

It is in the public interest for consumers to have multiple ways to implement wireless solutions. The FCC has maintained this principle in other matters, such as stimulating competition in the wireless telephone marketplace. The FCC should apply this same principle to wireless enhancement of laptop or handheld computers and other consumer devices. It is sufficient to require that manufacturers and suppliers be responsible for providing compliant, safe products, regardless of product configuration. Furthermore, the FCC would be better to apply its resources to enforcement rather than applying needlessly burdensome administrative requirements prior to market entry.

To help clarify this point, it may be helpful to describe marketplace dynamics to the FCC. The "sales and product space" involves a multiplicity of possible combinations of equipment with different power, frequency, and proximity attributes. These can be integrated in many ways, such as pre-bundled arrangements, mounting in PDAs, laptop or desktop computers, and with an integral or external antennas. Such variety is the public interest because it gives consumers choices and enhances competition which lowers consumer costs. Onerous regulations or unnecessary administrative processes work counter to the public interest.

Specific Issues & Concerns

After achieving some convergence of views with the FCC on the "10,000 foot view," dealing with specific issues and concerns will be necessary. Listed below are some of the salient, specific issues that are important to HP, along with specific recommendations for improvement.

Spectrum Unavailability and Lack of Harmonization Impedes Wireless Development

Issue: Wireless technology development continues to enjoy great enthusiasm and success in the marketplace, in contrast to other telecommunication sectors that are clearly in a downturn. However, wireless technology development and deployment is impeded by the lack of sufficient spectrum and international harmonization of spectrum and equipment approval processes.

Example: The desire for greater workplace efficiency and mobility are driving forces behind expanded wireless deployment in offices. WLANs enhance portable computers, cordless phones allow freedom to walk around, wireless headsets are the rage, and wireless PDAs and PDA-based messaging are expanding.

However, the success of wireless is also its Achilles heal. As the number of transmitters in a given area increases, the potential for interference and degraded quality of service increases. This is aggravated when office workers bring their wireless tools home, where they must also contend with wireless camcorders, VCRs, streaming video, more cordless phones, and interference from the neighbor's devices.

Discussion: The FCC should be applauded for emphasizing the importance of spectrum issues to wireless development, as evidenced by their creation of the Spectrum Policy Task Force. The FCC and the EU authorities should also be applauded for their efforts to reduce type approval costs.

However, greater spectrum and regulatory harmonization will reduce wireless product development costs further. The cost today of regulatory approvals on a worldwide basis for a Bluetooth or 802.11b device is approximately $125,000 to $135,000[1], which contributes to the already high cost of wireless device development. Tailoring a device to unique technical or regulatory requirements in specific countries adds still more cost. Reducing development costs is in the public interest because competition will insure that these reduced costs result in more affordable and more abundant wireless products in the marketplace.

Proposed Solution: HP seeks industry and FCC support and action to develop a wireless regulatory framework that promotes and facilitates the development of wireless data networks of all types. Specifically:

[1] The figures shown (US$125,000-$135,000) are based on actual costs per device that HP recently incurred for worldwide certification of wireless printer servers that were released in 2002.

- The FCC should designate at least a portion of the U-NII bands, and additional spectrum under 2 GHz, for "packet data networks," where devices using these bands adhere to a spectrum sharing etiquette with several levels, to include:
    - Spectrum awareness by using DFS and TPC to avoid others and to lower TX power if others are known (group minimum consensus)
    - Each 20MHz channel should have a common beacon scheme, use TDMA to share the channel, and have greater allowed power output for devices in this category.
    - Ability to detect incumbents so that those devices can operate as an "under-layment" in bands allocated to incumbents outside the U-NII bands.
    - Use new allocations below 2 GHz to provision packet data for “the last mile.”

- HP encourages the FCC and NTIA to:
    - Help develop an acceptable compromise for the U.S.A. position on WRC2003 items 1.5 and 1.6 that.
    - Work to harmonize wireless SRD allocations with the rest of the world, and to harmonize regulatory requirements.

- In addition, HP supports:
    - The WECA petition for expanding the U-NII bands to include 5470-5725 band.
    - The development and deployment of the DARPA XG radio protocol.
    - An expansion in the scope of devices suitable for modular approval, in line with the proposals of the software radio industry position.

Re-Certification of Previously Certified Modular Transmitters

Issue: Manufacturers and suppliers of bundled products formed from previously certified individual components or modules are required to re-test and re-certify the bundled configuration, even though consumers can buy the very same approved components and assemble them without any regulatory or apparent health consequences.

Example: Consumers can purchase wireless network PC cards that are fully FCC certified. They can also buy handheld PCs that have PC card slots. They can assemble these components to form (with the proper software) a wireless handheld device, and not incur any regulatory consequences. However, if a manufacturer or supplier attempts to do the same thing in order to sell the bundled wireless device, the FCC will require that they re-test to evaluate the bundled devices RF exposure (this usually means a new SAR test), EIRP, and spurious emissions.

Discussion: Those who would insist that re-testing is necessary for low power devices are also laboring under the misconception that to be below the RF exposure limit (if even by a milliwatt) is safe, while to exceed the limit (by the same milliwatt) is unsafe. This is simply not true. While it’s clearly not appropriate to knowingly exceed the RF exposure limit, doing so inadvertently and by a small amount does not necessarily mean there is a health risk any more than meeting the RF exposure limit ensures that the equipment is free of all health risks. Furthermore, for low-power devices with significant margin to the RF exposure limit, the chances of becoming non-compliant in any possible user-assembled configuration is unlikely.

The additional burden on manufacturers and suppliers who are required to re-test and re-certify previously certified products provides no additional value or protection for the public from RF exposure, nor does it provide added interference protection to other users of the spectrum. It simply adds cost and delays market entry for bundled systems with no return or gain on the cost or time incurred. This effectively shuts down the marketplace for bundled products, while leaving consumers free to purchase the individual components and assemble the same bundles for themselves.

Proposed solution: The FCC insistence on re-testing and re-certification of bundled devices that have already been certified is not based on existing rule. Adding specific language to FCC rules that allows the sale of bundled, previously approved modules could alleviate this interpretive error. The only potential question might be in cases where this bundling altered the transmitter/antenna configuration, but this could easily be incorporated into the rules. The following rule language is suggested to meet these needs:

> "Manufacturers or suppliers who wish to bundle modules or components that were previously certified may do so without having to re-test or re-certify the resulting bundle, provided that the bundling does nothing to alter the previously approved transmitter/antenna configuration."

Arbitrary Requirement of Class 2 Permissive Changes

Issue: Manufacturers have been told by FCC staff that ANY change to a certified wireless device constitutes a "Class 2 permissive change," even in cases where the post-change test data clearly show that the previous data is not "degraded," for example, where the RF emissions are not increased due to the change. Attempts by manufacturers to classify these changes as "Class 1 Permissive Changes" are deemed unacceptable by FCC staff, who insist that a "Class 2 Permissive Change" filing is necessary.

Discussion: FCC rules in Sections 2.932, 2.933, and 2.1043 describe two classes of "permissive change" that will not trigger the need for a new certification and FCC ID when a certified wireless device is modified. "Class 1 Permissive Changes" involve those things that do not degrade data previously reported to the FCC in the original filing, and a filing is not required. "Class 2 Permissive Changes" are those that degrade the originally filed data (e.g., increase emissions) but where the minimum requirements are still being met. FCC filing is required for "Class 2 Permissive Changes," and manufacturers must endure FCC processing delays (currently about 35 days) because they are not allowed to market the product until the FCC has declared the change as acceptable.

When the FCC's practice or procedure are not aligned with its rules, this sets up a situation where the procedure becomes "de facto" rules, but without benefit of the usual rulemaking procedures. Arbitrary rulemaking or rule "enhancements" undermine the foundations of regulatory process. (Can we make opacity vs. transparency argument here?)

Proposed Solutions: No changes to FCC rules are necessary, but it is necessary for the FCC to follow their own rules. The FCC must take immediate steps to insure that its practice and procedure are in synchronization with FCC rules in all cases. This goal would be furthered if FCC OET management "downtown" and the staff at the OET Lab improved their communications and integration. HP believes that the FCC should be called on to immediately take steps toward this goal.

Unnecessarily Burdensome Wireless Upgrading Procedures

Issue: The FCC requires manufacturers and suppliers of computing equipment to insist that upgrades that add wireless functionality be installed only by the manufacturer or supplier. No rule specifies this requirement, which appears to be rest on FCC interpretation.

Example: A large computer company (Dell) offers for sale a laptop computer with a wireless option. The wireless transceiver is contained on a MiniPCI card. If a customer buys the laptop without the wireless option, but later decides that he would like to upgrade it and add the option, the FCC has reportedly told Dell that it requires them to insist that the customer send their laptop back to the factory for installation of the wireless card. The manufacture is not allowed to provide the module to the consumer with instructions for performing the upgrade himself.

Discussion: Insisting that a laptop computer owner send his computer to the manufacturer for a wireless upgrade is an unnecessary and burdensome administrative requirement. When the wireless function is completely contained in an otherwise approved module, there is no practical reason why adding these modules to upgrade a computer's functionality cannot be done by the consumer himself. The FCC does not recognize that it is in the manufacturer's best interest to make it easy for their customers to perform upgrades in a manner that preserves compliance.

Proposed Solution: If a manufacturer of a laptop computer can show that versions of its product with and without wireless capability both comply with all applicable FCC technical requirements, then the FCC should not insist on burdensome and unnecessary administrative processes for post-sale upgrading a non-wireless version to wireless capability by consumers. The FCC should simply require that it's the responsibility of manufacturers and suppliers of computing equipment to ensure that all wireless upgrades are done in a manner that preserves compliance, regardless of how they are performed.

Inconsistent Rule Interpretations

Issue: Replies to questions about FCC rule or process are not always consistent.

Example: In August 2002, the TCB Council forwarded a question to the FCC from one of its members. Two FCC replies were received, one saying "Yes" and the other saying "No."

The question was (sent from the TCB Council on 6 August 2002):

> "A customer has two radios. One is an FRS ONLY and the other is an FRS/GMRS combination. Can both radios be certified under one application and the same FCC ID?"

The two FCC replies were as follows:

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From: Andrew Leimer [mailto:ALEIMER@fcc.gov]
Sent: Wednesday, August 07, 2002 9:10 AM
To: tcb@tcbcouncil.org
Cc: Joe Dichoso
Subject: Re: FRS only and FRS GMRS combination radios under same FCC ID

Yes, the applicant can produce two models of a FRS/GMRS device (One model having only FRS only capability) under one application and FCC ID. The two models must be electrically identical and the application must state how the capability is controlled by the manufacturer (ie: firmware or internal jumper). The end user must not have control of turning on or off the GMRS capability. The two models should be explained in a cover letter. The User's Manual(s) must convey the appropriate information to the end user. All data, RF exposure, labeling, etc. should be done in accordance with FRS/GMRS policy and procedure.

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From: Diane Poole [mailto:DPOOLE@fcc.gov]
Sent: Tuesday, August 06, 2002 5:27 PM
To: tcb@tcbcouncil.org
Cc: Raymond Laforge
Subject: Re:FRS only and FRS GMRS combination radios under same FCC ID

The two radios have to be certified under two original FCC-ID.

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Predictably, this situation precipitated a yet further clarification from the FCC that validated both answers as correct, but at the cost of increasing complexity (see note above about the value of simple solutions). The following message (apparently from Richard Fabina of the FCC's OET Lab), was circulated later by the TCB Council:

From Ergun Korel
To: <ergun@timcoengr.com>
Subject: FRS_GMRS_on_ONE_FCCID_20815
Date: Thu, 15 Aug 2002 15:01:13 -0400

Sid,

I'm replying to you and Chris Harvey because you both saw the conflicting interpretations. Please have this posted on the TCB council's website and remove the ones that are confusing.

The answer to the question is complicated. It is analogous to a phone with both cellular and PCS capabilities. If both circuits for cellular and PCS are included in a phone but one is disabled through software, this phone can be approved under one FCC ID number.

However, if components are removed or the board is depopulated to eliminate either the cellular or PCS band, a phone like this would require two separate FCC ID numbers.

Hence, a FRS/GMRS combination radio may be approved under on FCC ID if it is electrically identical in both versions (has the capability for both FRS and GMRS operation/has all the components for both FRS and GMRS operation) but one band is disabled by software.

If the FRS version does not have the GMRS capablity or vise versa, these devices must be approved under two separate FCC ID numbers.

This interpretation is based on the capablity of the device. The device that has the capability to operate in both bands can be approved under one FCC ID number while the other devices do NOT have the capablity to operate in both bands so they each require a separate FCC ID number.

I hope this clears up this matter.

Rich

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Discussion: Manufacturers have seen situations where the answers to questions of rule or process differ with the FCC staff person who is responding, or when the question is asked, necessitating requests for yet further clarification that often results in unnecessarily complicated replies. This situation increases the chance for misunderstanding and errors, and increases time to market as manufacturers are forced to continually change course to follow the current rule or process interpretations.

Proposed Solution: Questions about FCC rules and processes are inevitable, but the FCC must take steps to insure that replies to these questions are consistent, clear, and uncomplicated. Once made, these interpretations must not change arbitrarily.

The FCC should be applauded for their support of a recently initiated TCB Council program for processing rule and procedure questions, FCC replies, and making those interpretations publicly available. The FCC should be encouraged to continue this support, and look for ways to expand it.

Excessive and Unnecessary Oversight of TCBs

Issue: Telecommunications Certification Bodies (TCBs) are burdened by operating rules (the so-called "TCB Exclusion List") that specify which wireless devices they may certify and which devices the FCC continues to reserve to itself for certification. Furthermore, the FCC aggressively reviews all or nearly all TCB certifications.

Example: While the most recent revision of the TCB Exclusion List (dated 17 July 2002) is a great improvement over the previous list, it's not clear why there is still a need for such a list at all.

Discussion: The FCC created the TCB program to help it expedite equipment approvals and reduce FCC resources devoted to this. Progress thusfar has achieved partial success toward this goal, yet the FCC seems reluctant to fully employ TCBs or to take full advantage of their capabilities.

Piecemeal delegation of equipment certification from the FCC to TCBs is inefficient and not in the public interest. While the FCC intends to delegate most if not all of its equipment certification process to TCBs eventually, the current situation of unnecessary oversight and certification review is actually one of double-effort. This only serves to delay the introduction of new devices and technology to consumers, without significantly providing added consumer value or protection.

Proposed Solution: Having initiated the TCB program, the FCC should expedite the transition to fully use their capabilities. The FCC should rely more heavily on the TCB Council for management of the TCB program. In cases where TCBs require "hand-holding," greater supervision, or specialized training, the FCC should look to the TCB Council to set up processes and training to meet these needs. Finally, the FCC should set a date when they will discontinue the "TCB Exclusion List," and allow TCBs to process *all* wireless certifications currently reserved to the FCC.

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