

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington D.C. 20554**

In the Matter of)	
)	
The Creation of a Spectrum Sharing Innovation Test-Bed)	ET Docket No. 06-89
)	
)	

**COMMENTS OF
SHURE INCORPORATED**

Shure Incorporated ("Shure"), by its attorneys, is pleased to submit these Comments in response to the Commission's Public Notice released June 8, 2006 in the above-captioned matter.¹ Shure supports the Commission's efforts to make a spectrum test-bed available to "evaluate innovative methods for spectrum sharing among disparate users to enable a more intensive use of the finite radio spectrum."² To that end, Shure makes several recommendations outlined below that it believes will be critical for the Commission to foster innovation in spectrum technologies while protecting existing wireless services from interference and without undermining the significant financial and other investments that manufacturers, operators and consumers have already made in existing spectrum uses.

I. Statement of Interest

For nearly eighty years, Shure has been a respected U.S. manufacturer of high quality, innovative audio products. Today, headquartered in Niles, Illinois, Shure is a global leader in audio electronics, including professional wireless audio products that operate within the 470-806 MHz band under Section 74.861 of the Commission's rules, 47 C.F.R. § 74.861, as Low Power

¹ *Public Notice*, Federal Communications Commission Seeks Comment on the Creation of a Spectrum Sharing Innovation Test-Bed, FCC 06-77, rel. June 8, 2006 ("*Public Notice*").

² *Public Notice*, at p. 1.

Auxiliary Stations (“LPAS”). Shure holds grants of Equipment Authorization (Certifications) from the Commission for these products. Shure is an active member of the Institute of Electrical and Electronics Engineers, Inc. (“IEEE”) and has participated in numerous other Commission proceedings involving spectrum issues, and particularly those affecting LPAS devices.³ Shure has been a consistent proponent of ensuring that the Commission establish spectrum policy informed by meaningful technical data and engineering analyses. As such, Shure is well-qualified to comment on the issues raised in this proceeding.

II. Shure Applauds the FCC/NTIA Spectrum Test-Bed Initiative

The demand for spectrum to serve new or improved wireless operations is increasing and Shure expects that it will continue to increase as new applications and user preferences for wireless telecommunications evolve. Shure strongly supports the concept underlying the proposed Test-Bed, *i.e.*, to create an open forum for the study of feasibility of increasing the efficient use of spectrum that is shared between federal and non-federal uses. The experience gained in developing technologies that support federal/non-federal spectrum sharing may also be used to enable greater sharing among non-federal uses. The Test-Bed program could be one important means of facilitating new technologies that will permit spectrum sharing thereby paving the way for the introduction of new wireless technologies and applications.

While Shure shares the Commission’s strong desire to find new technologies that will permit spectrum sharing, it is critical that the spectrum Test-Bed procedures and standards are designed not only to prevent interference to existing users as the Test-Bed is put into specific

³ For example, Shure has been active in the open proceeding considering rules that would permit unlicensed operations in the broadcast bands, ET Docket No. 04-186, as well as ET Docket Nos. 97-157, 01-175, and 02-380 and WT Docket No. 99-168.

operation by innovators, but also to ensure meaningful open assessment and evaluation of the strengths and weakness of sharing technologies. Properly implemented, the Test-Bed could promote the testing of new technology in a controlled environment while protecting longstanding users of spectrum, federal and non-federal, from interference. A Test-Bed could help validate new technologies and speed market introduction of technologies that prove to be “ripe” while weeding out technologies that are not yet “market ready.”

To achieve these objectives, private industry and the government agencies involved in this effort must recognize that there currently are millions of spectrum users that rely on a diverse array of wireless services and equipment to meet a broad range of communications, media, entertainment, government, educational, health and public safety needs. These wireless services and equipment have been developed over many years and are operating pursuant to existing spectrum schemes that were carefully implemented in open administrative proceedings in which many technical and policy interests were considered. American businesses and users have made an enormous financial investment in existing wireless services and the technical and spectrum rules they rely on. Disruption of existing wireless uses will jeopardize the quality of life, health and safety benefits that are currently being reaped from existing wireless uses. In sum, it is imperative that the Test-Bed program be designed so that the enthusiasm for finding new, innovative spectrum sharing technologies does not overshadow the priority of protecting existing services and spectrum uses from harmful interference. Among other measures, this means that Test-Bed testing procedures, data and reporting requirements, and evaluation standards all must be detailed and rigorous, and open to public scrutiny. Without a clear and firm commitment to these high standards, the Commission’s new test-bed procedures could

unfold as nothing more than a government-sanctioned “show-case” for developing technologies that are promised – but not proven – to resolve spectrum interference issues.

III. The Spectrum Test-Bed Should Be Used To Test “Smart” Technology

A. “Smart” Technology and Other Interference Avoidance Technologies Need Further Study

“Smart” devices have recently received significant attention. Specifically, devices designed to listen for transmissions in the band they intend to occupy before transmitting (“listen-before-talk”), and devices equipped to dynamically move their own transmission to different channels within their allocated band if another transmission is detected (“dynamic-frequency-sharing” or “DFS”) have been heralded as potential solutions to interference conflicts in RF bands where different services may eventually share spectrum. Further public study, however, is required to determine whether “smart” technology is the appropriate solution to alleviate or mitigate interference between particular applications in particular segments of the broader regulated RF band.

All new forms of unproven technology require a testing period prior to mainstream introduction to validate performance claims and resolve problems. “Smart” technology is no exception to this rule. The introduction of “smart” devices in the 5 GHz band demonstrated the complexity of this task. “Smart” devices must be sensitive enough to identify conflicting transmissions while simultaneously ignoring other transmissions and unrelated radiation. The Commission made the 5 GHz band available to unlicensed devices equipped with “smart” technology on November 18, 2003.⁴ The original date for the submission of a final testing plan

⁴ See *Revision of Parts 2 and 15 of the Commission’s Rules to Permit Unlicensed National Information Infrastructure (U-NII) devices in the 5 GHz Band*, ET Docket No. 03-122, Report and Order, 18 FCC Rcd 24484 (rel. Nov. 18, 2003) (“5 GHz Report and Order”).

for certification of 5 GHz “Smart” devices was January 17, 2005.⁵ Due to complications in testing such devices in the 5 GHz band, however, final procedures for device certification were not submitted to the FCC until March 3, 2006.⁶ While the problems initially encountered in the 5 GHz band have now been resolved, the introduction of “smart” technology into this band is likely more straightforward than the prospect of introducing “smart” technologies as the means of avoiding interference among shared services in other spectrum bands. New “smart” devices in the 5 GHz band only need to avoid creating harmful interference for a handful of large, powerful, fixed government facilities. “Smart” devices proposed in other bands will need to have more sophisticated detection capabilities to ensure they avoid widely deployed non-government devices, many of which will be mobile, low-powered, and have distinctive or varied transmission characteristics. “Smart” technology has not yet proven itself to be sufficiently advanced to detect this diverse range of devices.

B. The Test-Bed Should Be Used To Assess “Smart” Technology

The Test-Bed can help reduce the rhetoric surrounding the unproven technical claims related to “smart” technology and assist the FCC and NTIA in developing informed policies. Public discussion concerning the capabilities of “smart” technology without technical testing and verification has created unrealistic expectations.⁷ The Test-Bed presents an opportunity for all interested parties to move past the rhetoric and begin determining how effective “smart”

⁵ See *5 GHz Report and Order* at p. 59.

⁶ See *Compliance Measurement Procedures for Unlicensed-National Information Infrastructure Devices Operating in the 5250-5350 MHz and 5470-5725 MHz Bands Incorporating Dynamic Frequency Selection*, National Telecommunications and Information Administration (March 03, 2006) (“*Compliance Document*”).

⁷ For example, “smart” technology has been touted as a solution in the ongoing “white spaces” proceeding, ET Docket No. 04-186, despite being an unproven remedy for the resulting complex interference issues.

technology will be at mitigating frequency interference in different segments of the regulated RF band. Using the Test-Bed in this capacity will help avoid the widespread distribution of devices that interfere with other occupants of shared spectrum. While this might initially temper the introduction of “smart” devices in other RF bands, it ultimately promotes the underlying goal of increased spectrum sharing by ensuring that shared spectrum does not become littered with uncontrollable intentional radiators that reduce its utility for all users.

IV. Open Testing That Addresses Current Technical Problems Would Make the Best and Highest Use of the Test-Bed

A. Open Testing Is Essential to Ensure Results Are Credible and Can Be Put to Immediate Use.

In order to analyze what technical solutions are truly effective, Shure urges the FCC and NTIA to mandate open testing in the Test-Bed. This openness is currently lacking in the FCC’s experimental licensing rules, and is a key element that would distinguish the Test-Bed from other existing test programs. Open testing is essential to minimize potential bias and to facilitate prompt use of results obtained through the spectrum test-bed for both current and future projects. Without an open process, test results are very likely to be contested by opposing parties who were excluded from testing, which will delay putting test results to use and diminish the overall utility of the Test-Bed initiative. Thus, Shure urges the FCC and NTIA to require open testing.

To establish an open testing process, several procedural requirements should be instituted to elicit input and facilitate participation by interested parties. FCC and NTIA should require entities proposing to use the Test-Bed to submit a test plan to both agencies. All test plans should also be put out for public comment to solicit input and improvements on the proposed testing methodology. Representatives from the FCC and the NTIA should also oversee testing to augment its credibility. Additionally, to the extent the Test-Bed is used to test “smart” technology and spectrum sharing capabilities before implementation, FCC and NTIA should

specifically seek input from equipment manufacturers and incumbent licensees that currently operate in the “target” spectrum band(s). These entities should be provided an opportunity to be present to observe tests in order to assess the effectiveness of the technology’s interference prevention mechanisms. Equipment manufacturers and incumbent licensees will insist that testing be rigorous and simulate “real-world” conditions as closely as possible. Equipment manufacturers and incumbent licensees obviously have a vested interest in ensuring that their services/equipment are not adversely affected by the introduction of new services and that any “smart” technology solution fully protects such services/equipment from harmful interference.

Also as part of establishing an open testing process, the Commission and interested parties must be given status updates and access to test results. Accordingly, entities using the Test-Bed should be required to submit periodic detailed status reports on the testing that will be made publicly available. This is similar to the reporting obligations imposed on developmental authorization licensees.⁸ Finally, test results must be made available for public comment. Again this is of particular importance to equipment manufacturers and incumbent licensees operating in any “target” spectrum band, as they stand to suffer the greatest harm if the “smart” technology being tested fails to adequately prevent harmful interference.

B. The Test-Bed Should Be Used and Tailored to Study Current Technical Issues.

The Test-Bed should be used to study ripe technical problems concerning spectrum sharing issues that would immediately benefit from further study, such as issues arising in pending FCC proceedings. By targeting a specific spectrum sharing issue, the spectrum Test-Bed will be best positioned to provide tangible results that can be readily applied to solve current

⁸ See, e.g., 47 C.F.R. § 22.409(f) (1992).

spectrum allocation problems.⁹ Shure notes that not every frequency band is well-suited to study every spectrum sharing problem. The frequency band and bandwidth of spectrum to be designated for the Test-Bed must be reasonably related to the technical problem to be studied. The specific frequencies and other characteristics of the Test-Bed must be considered together with the technical issue under review in order for the Test-Bed to yield accurate, meaningful technical solutions.

V. Conclusion

Shure applauds the spectrum Test-Bed initiative and believes it may prove to be a valuable tool to promote more efficient use of spectrum. “Smart” technology holds great promise, but requires further study before it can be implemented as a spectrum sharing solution in specific applications. “Smart” technology must be proven to protect incumbent services and devices from harmful interference before it is implemented, and with the recommendations described herein, the Test-Bed can help perform this critical function and facilitate more efficient spectrum use.

Respectfully submitted,

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⁹ One example of a current technical issue that is the subject of an FCC proceeding and that would benefit from greater technical study is the “white spaces” proceeding, ET Docket No. 04-186.