

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

In the Matter of)	
)	
Reallocation of the 216-220 MHz,)	WT Docket No. 02-08
1390-1395 MHz, 1427-1429 MHz,)	RM-9267
1429-1432 MHz, 1432-1435 MHz,)	RM-9692
1670-1675 MHz, and 2385-2390 MHz)	RM-9797
Government Transfer Bands)	RM-9854
)	RM-9882

INITIAL COMMENTS OF PHILIPS MEDICAL SYSTEMS

The Philips Medical Systems division of Philips Electronics North America Corp. (“Philips”), pursuant to Section 1.415 of the Commission’s Rules, hereby files its initial comments on the *Notice of Proposed Rule Making*, released February 6, 2002, FCC 02-15 (“*Notice*”) in the above-captioned proceeding. Philips is a member of the American Hospital Association Task Force on Medical Telemetry (“AHA Task Force”) and has generally supported the positions taken by it. Philips is commenting separately on those technical issues raised by the *Notice* that Philips believes are necessary to protect the critical medical applications of the Wireless Medical Telemetry Service (“WMTS”) in the 1395-1400 and 1427-1429.5 MHz bands (collectively “1.4 GHz WMTS Bands”)¹. In addition to commenting on the service rules for these bands, these comments also address operation in the adjacent 1392-1395 and 1432-1435 MHz paired bands, which may adversely affect low-power WMTS transmissions.

¹ Includes the 1429.5 to 1432 MHz primary allocation proposed for WMTS in seven geographic (“Band Flip”) areas in the United States. *Notice*, ¶ 52.

The allocations for the 1.4 GHz WMTS Bands make up most of the total WMTS allocation, and their availability for critical medical telemetry transmissions is necessary for the success of the service.

I. TECHNICAL CHALLENGES FACING WMTS OPERATION

The Commission has long recognized the technical and public health challenges facing wireless medical telemetry, culminating in the establishment of the WMTS. To provide a context for its subsequent technical comments, Philips is summarizing several of the key technical challenges.

The power of wireless medical telemetry transmitters must be very low for several reasons. First, mobile patient transceivers must continually transmit real-time critical patient parameters and waveforms without frequent battery changes, yet they must be light enough for seriously ill patients in healthcare facilities to easily wear or carry. Second, WMTS transceivers are often worn by the patient, so that the antenna is frequently in direct contact with the patient's body for extended periods of time, which could result in elevated RF energy exposure if higher a transmitter power were used.²

These power limitations place very high demands on WMTS receivers, which must also deal with the challenging RF environment of hospitals and other healthcare facilities. Received signals are frequently close to the noise floor, which limits the amount of filtering and use of other signal rejection techniques,³ since these measures also attenuate the effective "wanted" signal strength. All of these factors make WMTS receivers very sensitive to interference from unwanted strong signals in and near their passband, regardless of the technology chosen.

II. THE "BAND FLIP" AS DESCRIBED IN THE NOTICE WOULD REQUIRE STRICT TECHNICAL SERVICE RULES FOR PRIMARY TELEMTRY THROUGHOUT THE 1427-1432 MHz BAND

The implementation of the plan under which WMTS would be primary in the lower half of the 1427 to 1432 MHz band in most of the United States and primary in the upper half in

² See 47 C.F.R. § 2.1093 (RF radiation exposure evaluation for portable devices).

seven geographic areas (“Band Flip”) would require rather stringent technical limitations on primary telemetry uses. Because WMTS systems operating in this band would have to be designed to be capable of reception throughout the band, rejection of signals from the telemetry-primary half would be difficult. As discussed in Section I, *supra*, filtering and receiver dynamic range options are extremely limited given the demanding WMTS applications.

Philips has determined that a telemetry signal at a WMTS receiver at a power of approximately -50 dBm or greater⁴ *anywhere* within the 5 MHz band would likely degrade WMTS performance. Assuming a square-law path loss and 6 dB attenuation for signals entering a health care facility, a 10 W EIRP telemetry transmitter operating in the primary telemetry half of the band would have to be located at least 300 meters from any health care facility operating a WMTS system in the other half of the band. In addition, primary mobile telemetry would not be compatible with WMTS unless it were strictly limited in power and effectively prohibited from operation in or on the campus of a health care facility.

In essence, under the straight Band Flip plan described in the *Notice*, avoiding harmful interference to WMTS operations from a telemetry transmitter of a given power within the 1427-1432 MHz band requires separation primarily in distance, not in frequency. Philips and the AHA Task Force have long recognized this difficulty and much of the AHA Task Force’s work with the utility telemetry community has been prompted by it.

To permit less restricted primary telemetry operation in the upper end of the 1427-1432 MHz band, the band plan would have to be made more flexible than the straight Band Flip described in the *Notice*.⁵ WMTS could then obtain the necessary spectrum within the band without having to design the transceivers to be capable of operating all the way up to 1432 MHz. This flexibility could be accomplished through contractual arrangements between health care

³ The necessarily compact size of WMTS transceivers also places significant limitations on the amount of filtering available, even using SAW and other advanced technologies.

⁴ Equivalently, $\square 32$ mV/m for an isotropic receive antenna.

⁵ Although this could also be achieved by eliminating the Band Flip, the Commission has noted that this would prevent nationwide WMTS operation in the 1427-1429.5 MHz band if existing sites are grandfathered. *Notice*, ¶ 51.

users and a limited number of compatible telemetry users, such as the utility telemetry community. This was one of the bases for the AHA-Itron Joint Statement.⁶

However, to facilitate any such arrangements, it would be important for the Commission to designate WMTS as at least a secondary user of the primary telemetry band, so that WMTS equipment would be authorized for operation there and the WMTS frequency coordinator would have a clear role in the administration and coordination of such use.

III. TECHNICAL SERVICE RULES FOR SECONDARY TELEMETRY IN THE WMTS-PRIMARY BANDS

As the Commission notes in Paragraph 66 of the *Notice*, there are currently no technical specifications or channel plan for telemetry operations in these bands. Given the very low power at which WMTS systems operate, the likelihood of interference from secondary users in the WMTS-primary band would be very high. Because of the high interference risk and the difficulty in even assessing such a risk in the absence of technical rules, Philips believes that secondary telemetry in this band should be not be permitted unless it is provided for in a contractual arrangement governing the use of WMTS-primary spectrum or after confirmation from the WMTS frequency coordinator that no WMTS licensees could be affected by the proposed secondary telemetry use. Such limited secondary use would certainly only be possible with site-by-site licensing as proposed by the Commission.⁷ Because it is even less controllable, secondary mobile telemetry should be subject to even stricter rules, if not prohibited outright.⁸

The greater the variety of secondary telemetry users of this spectrum, the more difficult it will become for the WMTS frequency coordinator to effectively assess their potential impact on WMTS operations. To the extent that secondary use of these bands is desirable, it will be also be facilitated by having relatively common uses, such as utility telemetry applications as proposed by the AHA Task Force.⁹

⁶ Attachment to Itron comments filed March 8, 2001, entitled Joint Statement of Position by the American Hospital Association Taskforce On Medical Telemetry and Itron, Inc. (“*AHA-Itron Joint Statement*”); *see also Notice*, ¶ 56.

⁷ *Notice*, ¶ 59.

⁸ *See Notice*, ¶ 56.

⁹ *See id.*; *see also AHA/Itron Joint Statement*.

IV. LIMITATIONS ON THE OPERATION OF THE 1392-1395 MHz AND 1432-1435 MHz PAIRED BANDS NECESSARY TO PROTECT WMTS

In commenting on paragraph 105 of the *Notice*, Philips addresses interference arising from outside the 1427-1432 MHz band. The 1392-1395 MHz band is immediately adjacent to the 1395-1400 MHz WMTS band, and the 1432-1435 MHz band is adjacent to the 1429.5-1432 MHz band, for which it is proposed that WMTS have a primary allocation in seven areas in the United States.¹⁰ There are two critical issues involving these bands that must be resolved to permit the safe use of the 1.4 GHz WMTS Bands: in-band power limits and out-of-band emission limits. We also address the Commission's band management proposal.

A. POWER LIMITATIONS IN THE 1392-1395 MHz AND 1432-1435 MHz PAIRED BANDS

The same issues that limit signal rejection and filtering for small wearable WMTS transceivers within the 1427-1432 MHz band apply to a more limited extent in the bands adjacent to the 1.4 GHz WMTS Bands. To avoid disabling interference to WMTS operations, received power from within these bands at a WMTS receiver would have to be limited to approximately -45 dBm (equivalent to a 100 W EIRP fixed transmitter at 1000 m).¹¹

These same power limitations make use of mobile transmitters within these bands problematic, requiring their exclusion from the general vicinity of a health care facility. Unfortunately, ensuring compliance with such exclusion rules in traditional land mobile services is difficult.

B. OUT-OF-BAND EMISSION LIMITS IN THE 1392-1395 MHz AND 1432-1435 MHz PAIRED BANDS

If mobile transmitters are permitted in the paired 1392-1395 MHz and 1432-1435 MHz bands, in addition to the limitations described in Subsection A, *supra*, a limit of 500 μ V/m at 3 m outside of the band and a prohibition on the use of mobile transmitters in or on the campus of

¹⁰ *Notice*, ¶ 52.

¹¹ The examples of transmitter powers provided assume a square-law path loss and no building attenuation. The allowable power could be increased if the 1427-1432 MHz Band Flip were eliminated or if a more flexible band plan for WMTS were implemented, either of which would not require the use of the uppermost frequencies in the 1427-1432 MHz band for WMTS.

health care facilities would ensure protection of WMTS users. An equivalent set of limits would have to be applied to fixed transmitters within these bands.

C. BAND MANAGEMENT IN THE 1392-1395 MHz AND 1432-1435 MHz PAIRED BANDS

As the Commission has recognized, setting these emission limits is one task, confirming that they are met is another.¹² Aside from technical measures, it is important to establish clear responsibility for harmful interference to WMTS transmissions from these bands and to be able to quickly identify sources of such interference. Philips is concerned that the use of band managers as proposed in paragraphs 37-42 of the *Notice* would significantly complicate these important tasks. Under the band manager proposal, many actual operators and sources of interference would not be FCC licensees, but merely have a private contractual relationship with the band manager licensee,¹³ making identifying these operators and holding them accountable for violations of license conditions more difficult. Consequently, Philips does not believe that band management is appropriate. However, if a band management approach is nonetheless adopted, it is imperative that the band managers have full legal responsibility for any actions and violations by spectrum users assigned to them and to provide the Commission with information to allow it to limit interference and enforce its rules.¹⁴

¹² *Notice*, ¶ 105.

¹³ *Notice*, ¶ 39.

¹⁴ *See Notice*, ¶ 42.

CONCLUSION

For the foregoing reasons, Philips Medical Systems urges the Commission to take action consistent with the comments presented herein.

Respectfully submitted,

PHILIPS MEDICAL SYSTEMS

/s/

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