

## **The Results of WRC-2000**

### **Summary and Purpose of Document**

To inform CGMS of the results of the  
World Radiocommunication Conference (WRC-2000)  
held in Istanbul during May 2000

### **Action Requested**

Members are urged  
to note the results with a view toward  
long-term planning for future Conferences

## **Results of WRC-2000**

### **SUMMARY**

Since the 1992 World Administrative Radio Conference (WARC-92), commercial pressure on the meteorological bands has increased, both in intensity and in terms of the number of the number of commercial factions attempting to “share” the bands. Initial attacks on the bands came from the Mobile Satellite Service (MSS), the so-called “Big LEOs” and “Little LEOs” who sought to use primarily the met bands respectively above and below 1000 GHz. The MSS has now been joined by other industries, including the mobile services (variously termed “UMTS” and “IMT-2000”) and the fixed wireless access (“FWA”) industries in the effort to co-opt meteorological spectrum.

The efforts of industry to obtain increased access to this spectrum at WRC-2000 failed, but will certainly be seen again at future Conferences. Continued attention to this matter is required on the part of CGMS and others involved in the meteorological sciences.

Also, passive sensors obtained a measure of additional protection as a result of WRC-2000.

### **BACKGROUND**

At WARC-92, the MSS obtained a global allocation in the bands 137 - 138 and 400.15 - 401 MHz, and an allocation at 1675 - 1710 MHz only in ITU Region 2, the Western hemisphere. Also, the band 1670 - 1675 MHz was reallocated worldwide to permit shared use by commercial ground-to-air communications.

At WRC-95 and WRC-97, a number of administrations proposed to expand these allocations – to make all or part of 1675 - 1710 MHz available globally to the MSS, to relax restrictions placed on the MSS in all these bands by WARC-92 in order to protect meteorology, and to introduce the MSS into various parts of the band 401 - 406 MHz. All these efforts failed. More recently, MSS operations at 137 - 138 MHz appear to have stabilized with little having been heard of late from the industry with regard to this band. It is likely that this quiet may continue for the immediate future, due in part to the failure to launch satellites of two of the first three Little LEO companies, and the ongoing and conspicuous financial difficulties of the third company, which actually has a system in operation.

On the other hand, similar difficulties in the Big LEO industry have not produced the same result. At this writing, two of the early Big LEOs have declared bankruptcy and a third appears, from press reports, to be financially unstable. This apparent inability of the Big LEOs to find customers is widely blamed on early industry failure to anticipate the rapid expansion of terrestrial mobile phone systems and the effect this would have on their own market. What has resulted from the disappearance of this market is not the disappearance of Big LEOs, but rather their reorientation toward providing digital rather than voice services. As early as WRC-97 an attempt was made to gain global access to part of 1675 - 1690 MHz for high-speed mobile digital access, and the recent acquisition of ICO by Teledesic reinforces movement in that direction. Continuing pressure from the Big LEO industry must therefore be expected.

### **SPECTRUM THREATS AT WRC-2000**

2700 - 2900 MHz - IMT-2000, also known as UMTS, is a “3<sup>rd</sup> Generation” or “3G” land and satellite mobile system which first appeared prominently at WRC-97. Here, it was placed on the WRC-2000 agenda as part of a tradeoff involving MSS access to part of the 1675 - 1690 MHz band and certain spectrum used internationally by the Radionavigation Satellite Service (RNSS), GPS and GLONASS. WRC-2000 did not make specific allocations for IMT-2000 (it is not a Service) but it identified certain bands as likely candidates. Certain bands were considered to be appropriate for such use worldwide in the near future, and others for eventual expansion use contingent on the needs of the administration concerned. Among the latter is the band 2700 - 2900 MHz, widely used for radiolocation and weather radar. The compatibility of IMT-2000 with such radar is not known, and studies would be required to determine this. WRC-2000 included in the agenda for WRC-2005/2006 item 3., “to consider the results of the studies related to the following, with a view to considering them for inclusion in the agendas of future conferences:” and item 3.1, “to consider results of ITU-R studies on the feasibility of sharing in the band 2 700-2 900 MHz between aeronautical radionavigation service, meteorological radars and the mobile service, and to take appropriate action on this subject;” There is no resolution calling for study of this matter.

WRC-2005/2006 then is to consider, with a view to recommending consideration by some then-future Conference, the results of such studies as may take place up that point.

1675 - 1690 MHz - Studies in ITU-R of compatibility between the MSS and meteorological users of this band have been ongoing within since they were called for by a Resolution of WARC-92. They have shown that the MSS cannot share except possibly in the band 1683 - 1690 MHz as a result of incompatibilities of the MSS with MetSat and MetAids, and incompatibilities of MetSat with MetAids. As a result, WRC-2000 called, in Resolution COM5-30 (later renumbered to Res. 227) for additional study of the band 1683 - 1690 MHz only, determining that “...no further study

is required on sharing ... in the bands 1675-1683 and 1690-1710 MHz.” WRC also included in the agenda for WRC-2003 item 1.31, “to consider additional allocations to the [MSS] in the 1-3 GHz band, in accordance with ... Resolution 5/30.”

401 - 406 MHz - In the past few years, it has become clear that a large number of administrations see no need for additional Little LEO allocations in this frequency range and are determined to end repeated efforts by the industry to obtain access. WRC-2000 suppressed a standing Resolution calling for study of MSS access to the band but, noting an “urgent need” for additional Little LEO spectrum, resolved in Res. 214 that additional studies should be conducted by ITU-R and that WRC-2003 should be invited to consider the results with a view toward additional MSS allocations below 1 GHz. Note that this does not preclude allocations within 401-406 MHz but does not, as did previous Resolutions, target that band specifically. It should also be noted that studies regarding possible MSS use of that band are expected to continue in ITU-R.

### **ADDITIONAL SPECTRUM CHANGES**

55.78 - 56.26 GHz - It has been clear for some time that the projected expansion of the High Density Fixed Service (HDFS) in this band could cause unacceptable interference to passive sensors operating on certain MetSats. The level of this interference is of course dependent on the characteristics of individual HDFS stations and on their geographic density, but it could be severe if density eventually meets industry predictions. It was necessary that the output power of individual stations be limited in some way to protect passive spaceborne sensors, and the WRC agreed on a transmitter output limit of -26 dB(W/MHz). While not all that had been hoped for by meteorologists, neither was it what the industry had wanted and overall it provided an acceptable compromise.

Bands above 71 GHz - Passive bands in this range, including one AMSU-A and all AMSU-B passive channels, are now fully protected. This was accomplished by a regulatory exchange of frequencies with the terrestrial Fixed Service in which the passive services gave up bands in which they had no interest in exchange for bands whose characteristics made them essential for sensing purposes.

### **CONCLUSION AND RECOMMENDATIONS**

The rapid expansion of the telecommunications industry is creating a huge demand for an item which exists in limited supply: the radio spectrum. Some bands allocated to the meteorological services have characteristics highly prized by commercial operators, including propagation characteristics and global allocations. Pressure to “share” or to surrender them will continue and may well increase, and meteorologists must continue to defend their bands if they are not to lose

them.

## **GLOSSARY**

FWA	Fixed Wireless Access, uses radio rather than copper wires to connect consumers to a telecommunications supplier such as the phone company.
ICO	A Big LEO, not yet operational, recently purchased by Teledesic.
IMT-2000	A set of standards for International Mobile Telecommunications, planned for initial operation about the year 2000.
GLONASS	A Russian RDSS system
GPS	Global Positioning System, a U.S. RDSS system
ITU	International Telecommunications Union
ITU-R	Radiocommunication sector of ITU. Deals with radio issues, as did the former CCIR which became part of ITU-R.
LEO	Low Earth Orbit Big LEO      LEO MSS system with service links above 1 GHz. Little LEO    LEO MSS with service links below 1 GHz
MSS	Mobile Satellite Service
RDSS	Radio Determination Satellite Service. RDSS systems provide time and position information.
Teledesic	A proposed satellite constellation providing interconnect among telecom suppliers rather than directly to users.
UMTS	Another name for IMT-2000