International Consortium for Telemetry Spectrum

News

CHARTERED BY THE INTERNATIONAL FOUNDATION FOR TELEMETERING

IN THIS ISSUE

The ICTS and You

Why should you care?

Aeronautical Mobile Telemetry (AMT) forms the lifeline for many scientific and test activities around the world. Users like commercial aircraft testing, scientific research, military/weapon testing, atmospheric research, and many other industries are reliant on AMT and the spectrum it requires.

This "international telemetering community" needs to closely monitor the ever-increasing battle for spectrum waged within their own countries at the International Telecommunication Union (ITU), the United Nation's policy forming body that drives international spectrum management regulations.

The International Consortium for Telemetry Spectrum (ICTS) strives to inform the international telemetering community of vital issues that we all need to monitor and alert members as needed to preserve this critical scientific capability. ICTS monitors and reports on regional and international telecommunications regulation and policy activities that could affect this community. If you develop, use or rely on radio frequency (RF) telemetry, you should engage in the development of these international regulations and policy decisions that could affect you locally.

If you develop, use or rely on RF telemetry, you should be engaged …

The ICTS was formed in 1999 and is chartered under the sponsorship of the International Foundation for Telemetering (IFT). The IFT is a non-profit organization dedicated to serving the professional and technical interests of the telemetering community.

Over the past few years, several factors within and external to the telemetering community have resulted in a change in the way the electromagnetic spectrum is viewed. These factors include:

- Commercial RF spectrum utilization is increasing rapidly and this trend will continue
- Frequency bands used for telemetry continue to be at risk of reallocation and interference
- Telemetry data rates are increasing, thereby increasing the RF bandwidth needed for each mission
- We are caught in the midst of these trends as we seek to keep pace with the extraordinary growth in telemetry data being required of test programs

.ICTS Objectives

The purpose of the ICTS is to establish an international information exchange of telemetry practitioners to promote and defend the benefits of electromagnetic spectrum utilization for scientific telemetering applications.

In this endeavor, the main objectives of the ICTS are to:

- Create a forum for information exchange on potential telemetry spectrum issues;
- Better inform national, regional, and international spectrum managers of the importance of telemetry to their economy and security;
- Inform and invite open participation in the group to all telemetry practitioners, including government, industry, academia, etc.;
- Share information on the use, research, and development of new technologies for improving the use of telemetry spectrum;
- Prepare members for World Radio-communications Council (WRC) agenda items affecting the telemetry community.

The **International Foundation for Telemetering** charters the ICTS (**www.telemetry.org**)

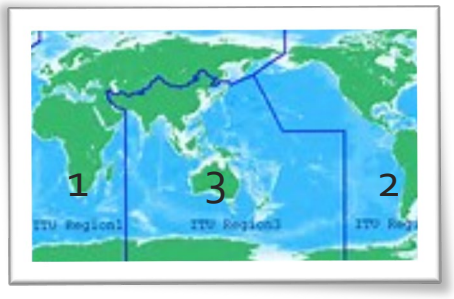
An ICTS/WRC Primer

Radio frequency (RF) energy ignores national borders, both intentionally (large footprint tests) and un-intentionally (interference). As a result, international agreements are important to utilize and protect aeronautical telemetry. The main goal of the ICTS is to help the telemetry community raise awareness of telemetry spectrum encroachment and needs internationally. This is accomplished by participating and monitoring the International Telecommunication Union (ITU), chartered by the United Nations, to manage information and communication technologies.

To do this work, the ITU's **Radiocommunications Sector** (ITU-R) was established to ensure rational, equitable, efficient and economical use of the radio-frequency spectrum by all radio communication services including:

- Effective allocation of bands of the radio frequency spectrum in order to avoid harmful interference between radio stations of different countries, and
- Coordinating efforts to eliminate harmful interference between radio stations of different countries to improve the use of radio-frequencies for radiocommunication services.

To facilitate these efforts, the ITU-R divides the world into 3 Regions: Region 1 (Europe, Africa, Russia), Region 2 (North and South America), and Region 3 (Pacific, Asia, Australia). Allocations are typically described and documented according to the various Regions in the Radio Regulations.



To perform these tasks, the ITU sponsors the **World Radiocommunication Conference (WRC)** which is held every three to four years. It is the job of the WRC to review and revise the international Radio Regulations, the international treaty governing the use of the radio-frequency spectrum. Revisions are made based on an agenda determined by the ITU-R Council, which takes into account recommendations made by members at previous conferences.

The general scope of the agenda of the WRC is established four to six years in advance, with the final agenda set by the ITU-R Council two years before the conference, with the concurrence of a majority of Member States. Under the terms of the ITU Constitution, a WRC can:

- Revise the Radio Regulations and any associated frequency assignment and allotment plans,
- Address any radio communication matters of worldwide character,
- Instruct the Radio Regulations Board and the Radiocommunication Bureau, and review their activities, and
- Determine questions for study by the Radiocommunication Assembly and its Study Groups in preparation for future Radiocommunication Conferences.

On the basis of contributions from member administrations, the Radiocommunication Study Groups and their associated Working Parties, the Conference Preparatory Meeting (CPM) shall prepare a consolidated report to be used in support of the work of the conferences.

Per the ITU definition, telemetry (Aeronautical Mobile Telemetry or AMT) describes a particular use of the mobile service for the transmission from an aircraft station of results of measurements made onboard the aircraft. At the WRC, AMT is represented by Study Group 5 (Terrestrial Services), Working Party 5B (Maritime Mobile Service including the Global Maritime Distress and Safety System (GMDSS); the Aeronautical Mobile Service and the Radio Determination Service).

At the WRC each administration has one vote. To facilitate the decision process the WRC recognizes six regional organizations to prepare, discuss, and form positions in preparation for the WRC (see figures below). In ITU Region 1 (Europe, Africa) they are the CEPT, ATU, ASMG, and the RCC. In Region 2 (North and South America) it is primarily CITEL. In Region 3 the APT is utilized. Each nation/administration uses it associated regional organization to prepare positional reports and studies in support of the WRC.

Asia-Pacific Telecommunity (APT)

Arab Spectrum Management Group (ASMG)

African Telecommunications Union (ATU)

European Conference of Postal and Telecommunications Administrations (CEPT)

Inter-American Telecommunication Commission (CITEL)

Regional Commonwealth in the Field of Communications (RCC)

The ICTS encourages the scientific communities to engage within both their government's communications agencies, their regional alliance, and the ITU-R's Working Parties to protect AMT interests. Without this advocacy, member administrators will not be able to make informed decisions that accurately represent the telemetry interests (commercial, scientific, government) of their countries and regions.

ICTS Meeting Updates

The ICTS conducts two annual meetings; Fall (in Region 2) and Spring (in Region 1). Each Fall, at the International Telemetering Conference (ITC, www.telemetry.org) held in the United States, the ICTS will conduct its annual business meeting (elections, bylaws, action plans) and sponsor a Special Session during the conference to present regional reports, WRC reports, and spectrum encroachment topics of interest. The ITC currently rotates between Las Vegas, Nevada and Phoenix, Arizona.

In the Spring, the ICTS conducts a business meeting and Special Session at the European Test and Telemetry Conference (ETTC, www.ettc.org). This conference moves between Toulouse, France, and various locations in Germany.

The proceedings from these two meeting are published and can be downloaded from our website (www.telemetryspectrum.org).

The next meeting and Special Session of the ICTS will be at the Centre des Congrès Pierre Baudis, Toulouse (France) on Thursday, 13 June 2019.

The Fall meeting and Special Session will be at the 54th annual ITC, 21-14 October 2019, at Bally's Hotel and Convention Center, Las Vegas, Nevada.

The ICTS encourages participation from the general population in both attendance and presentations related to AMT spectrum. Membership is not required to participate.

WRC-19 Threats to Telemetry

At the next ITU-R's World Radiocommunications Conference (Sharm El-Sheikh, Egypt) several agenda items are scheduled to be discussed that could affect AMT operations in each region. Local AMT users and suppliers are encouraged to make their companies and administrations aware of concerns they may have on these topics to enable their representatives to make better informed national and regional positions.

Agenda Item 1.14; High-Altitude Platforms. This issue deals with additional spectrum allocations for high-altitude platforms (advocated by Facebook and Google); the 6 GHz telemetry band is one of a number of bands potentially affected. High-altitude platforms operating in this band could affect AMT operations in the upper C-Band (5925 MHz to 6700 MHz) as allocated at WRC-07.

This can be a concern for users in Region 2 (North and South America) where this portion of the upper C-Band has been proposed for AMT assignments.

Agenda Item 1.16; 5 GHz RLAN Rules. Agenda Item 1.16 deals, among other things, with possible relaxation of the rules for wireless system access known as radio local area networks ("RLANs") in the 5 GHz band. These include a power increase and elimination of the indoor only restriction. Efforts to relax the out-of-band emission ("OOBE") limit for RLAN operations in this band are also included.

This can affect AMT operations in 5150-5 250 MHz (an AMT Band for numerous administrations in Region 1 and Brazil). It could also affect the internationally harmonized AMT allocation at 5091-5150 MHz (affecting all regions). European administrators noted that an outdoor relaxation to RLAN would affect the aeronautical telemetry operation. However, they are studying usage restrictions (e.g. in vehicle use) combined with appropriate mitigation techniques to achieve co-existence with incumbent services, to enable outdoor RLAN use in this band.

Agenda Item 9.1.1; IMT Operations in Lower S-Band. This agenda item considers compatibility issues between the terrestrial component of International Mobile Telecommunications (IMT) and the satellite component of IMT (as Dish Networks downlinks). It includes the frequency bands 1980-2010 MHz and 2170-2200 MHz.

Many administrations operate AMT systems in the adjacent lower S-Band (2200-2300 MHz), especially in Region 2 (North and South America). This issue needs to be monitored to ensure there is no increase in interference with AMT systems operating in the lower S-Band in the adjacent band.

Agenda Item 9.1.2; AMT in 1452-1492 MHz. This agenda item is intended to ensure the compatibility of IMT and BSS (sound) in ITU Regions 1 and 3 with a specific focus on the protection of broadcast satellite reception against mobile broadband transmissions.

While Region 2 administrations conducting telemetry are protected (per, for example Radio Regulation 5.343); AMT has no such protection in other Regions such as Europe.

Agenda Item 9.1.3; NGSO Rules for C-Band. This agenda item looks toward the development of ITU regulations to accommodate new non-geostationary satellite orbit (non-GSO) systems in the C-Band (4-6 GHz).

The AMT community needs to ensure that non-GSO systems do not cause harmful interference to, or otherwise preclude, the operation of AMT systems in lower C-Band (4400 to 4940 MHz, Region 2 and Australia), 5091 to 5150 MHz (all regions), and (5150 to 5250 in Region 1). This agenda item strikes at the heart of the new telemetry spectrum (C-Band) awarded at WRC-07.

Utilizing the Global AMT Band

At the 2007 WRC, worldwide telemetry users secured a "global" AMT band. Its utilization simplifies tests that have an international footprint and provides protection from cross-border interference.

After a long fought effort to secure additional spectrum for telemetry that started in 1993, the global scientific community was recognized for its economic and scientific value and additional allocations were approved. As one of the outcomes to Agenda Item 1.5 at the WRC in 2007 the spectrum from 5091 MHz to 5150 MHz was allocated to AMT services. WRC-07 article 5.444B adds the use of the band 5091-5150 MHz for aeronautical telemetry transmissions from aircraft stations (see No. 1.83) in accordance with Resolution 418 (WRC-07).

This was a big win for the international scientific and aeronautical communities where telemetry transmission across international borders can be very confusing and regulation bound. With this allocation, the ITU-R has recognized this issue and has made AM(R)S (which includes AMT) primary in this band.

Scientific, commercial, and government flight test communities are highly encouraged to rapidly make use of this band. It can help solved many of the regulatory and equipment provisioning issues facing a mobile test team that requires access to multiple locations in different countries. Many telemetry vendors recognize this and are now developing and producing transmitters, receivers, and antenna to utilize this band.

The ITU-R, serving to ensure efficient and economical use of the spectrum by all radiocommunication services, is also very sensitive to other user's needs (broadband, cell phones) which are actively seeking additional spectrum allocations. If the telemetry community fails to occupy this band, they risk it being reallocated at future WRCs to the benefit of other users.

Information and Assistance

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If you have any questions about AMT in this band, the ICTS can point you to subject matter experts who can help your organization make wise equipment choices and help with C-Band telemetry operation.

The ICTS is available to help. We have points of contacts in many nations who are willing to answer questions, provide information, and develop presentations to assist the international telemetry community. Through our connections, we can put you in touch with subject matter experts and a wealth of library information on many aspects of telemetry. Contact us via email through ICTS@telemetryspectrum.org or visit our website at www.telemetryspectrum.org.

The ICTS stands ready to help and serve the international telemetering communities!