International Amateur Radio Union
Region 1
VHF - UHF - MW Newsletter

Edition 44
1. February 2007
Michael Kastelic, OE1MCU

Vienna 2007

I am pleased to inform you about the current agenda and the proposals for the IARU Sub Working Group 2007. In the appendix please find two more motions (B24, B25) by Stefan, ON7TI, and further ones (27,28, 29) that have been amended by SP6LB. B26 is a proposal with respect to contest evaluation, submitted by myself.

Hans, PB2T and Ole, LA2RR, will present the IARU Spectrum Policy document. It can be found under www.iaru.org/ac-spec06.html . To be current in this matter, please read it before the Sub Working Group is convened.

Joe Taylor, K1JT, has contacted me with respect to proposal B08, submitted by Peter, SM2CEW, "The need for minimum requirements for a valid digital QSO". He has compiled a document that can be found in the appendix, and is intended to be part of the discussion concerning proposal B08. To be current in this matter, please read it before the Sub Working Group is convened. To be current in this matter, also please read this before the Vienna Meeting.

Numerous e-mails have been received, commenting the proposal B01, submitted by G3VZV "Increased Amateur Satellite Service 2 Metre Usage". In this matter, too, I assume that we will have a lively discussion.

Will the participants in the Vienna Sub Working Group please pay the conference fees in time, so that the administrative efforts can be minimised.

Participants will be picked up from the airport. Therefore, please e-mail us your travel data, including flight number, so that we can plan accordingly. Westbahnhof [the rail terminus for trains from the West] is only a 2 minutes walk form the hotel.

INTERIM MEETING OF THE IARU REGION 1 VHF/UHF/MICROWAVE COMMITTEE
VIENNA FEBRUARY 24-25 2007

Agenda

1. Opening by the chairman

1.1. Check on documentation

2. Preparing the meeting

2.1. Introduction of delegates (proxies shall be mentioned explicitely)
2.2. Setting up ad hoc WG's (if required)
2.3. Terms of reference

3. DAVOS 2005

3.1. Report of the DAVOS 2005 meeting
3.2. Action points

4. Report from the chairman

4.1. Report
4.2. List of standing recommendation (C1)

5. Report from the coordinators

5.1. Allocations coordinator
5.2. Records coordinator
5.3. Beacon coordinator
5.4. Satellite coordinator

6. Frequency allocations/international bodies

6.1. IARU spectrum requirements (LA2RR, PB2T)
6.2. WRC-03 and for future WRCs 50 MHz and 275+ GHz. (PB2T)

7. Operational matters

B08 The need for minimum requirements for a valid digital QSO.
B12 Change of BASIC OPERATING AREA
B18 Minimum requirement for a valid (digital) VUHF QSO
B20 Alternative QSO procedure on Microwaves?
B23 Operating a remote controlled VUSHF station
B29 Complement of VHF Managers Handbook – Section EME

8. Technical Recommendations

B04 A REVIEW OF THE IMPLEMENTATION OF 12.5kHz CHANNEL SPACING SYSTEM
B17 Beacon Data and Specifications

9. Bandplanning

B01 Increased Amateur Satellite Service 2 Metre Usage

B02 Bands above 275GHz

B03 CHANGE TO USAGE OF 144.160 – 144.180MHz FOR FSK441 COMMUNICATION

B13 Allocations at 3400 MHz

B16 Amateur Satellite Service Spectrum

B19 Access points for Echolink/IRLP etc. in the 144 MHz bandplan

B21 Frequencies for digital voice communication in the IARU, Region 1, VHF band plans?

B22 How to accomodate another satellite down-link segment –144 MHz band plan.

B25 70cm & 23 cm Bandplan for Radio Gateways

B15 23cms Bandplan

B14 Microwave Spectrum Threats

B07 CHANGES TO EXCLUSIVE USAGE OF 144.000 – 144.036MHz FOR EME

B06 CHANGE TO THE 70.26MHz AM/FM CALLING FREQUENCY.

B05 FREQUENCY ALLOCATION FOR DIGITAL VOICE COMMUNICATION

To the theme “ATV and the occupied bandwidth” we will hear a 20 minutes presentation from Walter Worischek, OE1WWA at Saturday before Lunch.

10. Contests

B09 Omitting penalization for claimed points for duplicate QSO in IARU

B10 Exchange of contest logs between VHF managers for checking purposes

B11 Contest logs

B26 Contest Evaluation

B27 New contest operating Section (6h)

B28 Complement of VHF Managers Handbook V 5.11 - definition of the section SO

B24 Electronic logs for ATV contests

11. Any other matter

(Please inform the meeting secretary about the items you wish to discuss under this heading before the start of the final C5 meeting)

INTERIM MEETING OF THE IARU REGION 1 VHF/UHF/MICROWAVE COMMITTEE
VIENNA FEBRUARY 24-25 2007

Document	B01
Subject	**Increased Amateur Satellite Service 2 Metre Usage**
Society	RSGB
Contact	Graham Shirville G3VZV
Status	Discussion paper

(based on proposals raised at the AMSAT International Meeting held at UoS Guildford in July 2005)

The Amateur Satellite Service has, according to ITU decisions, access to the full allocation of 144-146MHz but, by agreement of all three IARU Regions, only uses a section of the allocation on an exclusive basis - namely 145.800 – 146.000 MHz.

Current Use

It is used for both for satellite uplinks and downlinks. It is the most popular of the Amateur Satellite allocations for the following reasons:

- It is the only band between 30 MHz and 24 GHz that we have primary use and hence some control. The 435 MHz, 1.26, 2.4, 5.6, 5.8, and 10 GHz bands are all shared with either high power users (radars) or large numbers of consumer devices which raise the noise floor.
- 144 MHz is the best band for amateur satellite downlinks due to ease of on board RF power generation and efficiency thereof and the reduced path losses.
- Receiving equipment is widely available; this is an important consideration in many countries where Amateur Satellites are seen as an important tool in encouraging young people to pursue technical self-training.
- Ready availability of launch opportunities where size constraints mean Attitude Control is not be possible. The lack of attitude control mandates the use of simple omni-directional antennas. This in turn means the use of VHF due to the lower path losses.

Although, in theory, our primary status should prevent this, there has been a dramatic increase in levels of unlicensed usage in the 2 metre band in a large number of countries in ALL IARU regions. It is therefore apparent that we should start to use 144.800 – 146.000 primarily for downlinks to overcome the interference that is caused to uplinks. This part of the 2 metre band is presently quite heavily used by Amateur Satellites. In addition, on the International Space Station, there is an Amateur Packet Repeater and Voice operation from the Amateurs onboard are also taking place in this narrow segment.

Future Use Requirements

An area that has been growing rapidly has been the development of Amateur Satellites by university students. Already large numbers of students have been involved in developing Amateur Satellites; this growth activity is beneficial to both the students and the wider Amateur community. The students of today are becoming our successors and supporters of tomorrow.

There is, under development, a very small (triple cubesat), university student satellite using a Linear Transponder for CW/SSB use with a bandwidth of 40-50 kHz. The uplink will be on 435 MHz and the downlink on 144 MHz. It is expected that more of these projects will materialise and developments are also taking place to develop DSP based AGC systems for these transponders to remove the “alligator effect” problem.

It is also anticipated that additional and unexpected launch opportunities may occur where this sort of transponder could be quickly/easily incorporated.

There is therefore a need for an additional Satellite segment at 144 MHz that could be used for linear transponder downlinks for CW/SSB operation. Given that these transponders might have a bandwidth of perhaps 40 kHz, the use of a segment approximately 50kHz wide would be required to allow for Doppler shift, which can be as high as +/- 3 kHz.

It has been reported that there is a reduced level of terrestrial CW/SSB activity on 2 metres in all countries in recent years and this may provide an opportunity. In particular, at least in Region 1, the segment between 144.315 and 144.365 MHz has become much quieter. Except in major VHF contests it is rare to find high levels of activity in this section.

Discussion points

1+ To permit satellites, operating in the Amateur Satellite Service, which incorporate “linear” transponders, which are generally used for narrow band non channelised signals, to use, on a **non exclusive basis**, the section of the 2 meter band 144.315 –144.365MHz for downlink (satellite to ground) mode only, by amending the bandplans in each IARU Region.

An analysis of current band use and operator flexibility in this part of the 2 metre band suggests that this would be compatible with the existing terrestrial activities around the world and would have no detrimental affect on them.

Amateur Satellite “linear” transponders operating in this section of the band might even have the additional benefit of helping to stimulate both terrestrial CW/SSB operation and new narrow band modes.

2+ The presence of interfering non-amateur signals in the 145.80-146.00MHz part of this band, in many parts of the world, is well documented. To prevent the retransmission of interfering terrestrial signals, satellites in the Amateur Satellite Service that plan to use the 2 meter Amateur band are encouraged to use this band for downlink (satellite to ground) modes only, regardless of modulation type

Proposal

These ideas be discussed at the forthcoming IARU Region 1 VHF Managers meeting in Vienna and, at the same time, be circulated for discussion in the two other IARU regions

Document	B02
Subject	**Bands above 275GHz**
Society	RSGB
Contact	Murray Niman G6JYB
Status	Discussion paper

Background

Future WRC Conferences will consider allocations in the 275-1000GHz range, where IARU has already expressed an interest in seeking new allocations. Developments in atmospheric propagation data/models, regulatory environment, technology and amateur experimentation point to the need to review the historical IARU position.

Considerations for Discussion:

a) The published/historic IARU position and recent submissions to CEPT, FCC etc

b) A priority should be to seek allocations below 500GHz due to atmospheric losses and technology availability.

c) Any new allocation should be for both the Amateur and Amateur Satellite Service – the latter being both Space-Earth and Earth-Space.

d) Possibility of no-change preferences by many ITU administrations at WRC

e) Recent UK/EU regulatory trends to much lighter regulation or wholesale licence exemption in all bands as the default for >30GHz

f) Compatibility with other IARU policy on not having/requesting excessive microwave spectrum allocations, in exchange for better protection. By default, the IARU list is seeking >100GHz of spectrum which is hard to justify and fully utilise.

g) Allocations above 100GHz can be dominated by both water vapour losses and an increasing number of molecular resonances such as Oxygen

h) Amateurs now have ready access to 76GHz equipment with some experiments in higher bands such as 134, 248 and even higher such as 403GHz.

i) Recent years have witnessed considerable research and advances data and technology for scientific and security applications in the Terahertz bands.

j) In contrast to lower microwave bands, access to such high frequencies may still heavily rely on frequency multipliers, which may influence preferred choices. For example:-

Band, GHz	BW, GHz	Access by
268-272	4	134/6 x2
340-344	4	134/6 x2 + 24.048 x3
402-408	6	134/6 x3

The rest of this paper provides data to facilitate discussion at Vienna

Published IARU Position (reproduced from http://www.iaru.org/ac-spec06.html, Nov-2006)

Frequencies above 275 GHz

WRC-2000 extended the mandate of the ITU Radio Regulations from 275 - 400 GHz to 275 - 1000 GHz but did not make any specific allocations to radiocommunication services. However, the conference revised a footnote listing bands above 275 GHz used by passive services that should be avoided by active radiocommunication services. In addition, WRC-2000 adopted preliminary agenda item 2.3 for WRC-07 to review studies and consider allocations in the frequency bands above 275 GHz. The 2002 ITU Plenipotentiary Conference extended the mandate of the ITU to allocate much higher frequencies and studies have begun on frequencies up to 375 THz.

In order to continue with their activities, the Amateur Services will require allocations of sufficient bandwidth to permit experimentation spaced throughout the range 275 - 1000 GHz. Studies of Amateur Services' requirements in this range should be completed in preparation for WRC-10. The radio astronomy service has indicated a desire to share with the Amateur Services in this range.

The Amateur Services seek to obtain not less than 75 GHz of spectrum in the band 275 - 1000 GHz in order to provide for future development of the Amateur Services utilising new technologies.

Analysis of attenuation due to gasses and precipitation through the atmosphere indicates that the following bands are better choices than others are for the Amateur Services.

Better bands (GHz)	Attenuation (dB/km)
275 - 300	6
355 - 400	10
490 - 510	10
690 - 710	50
800 - 850	50

The following are the bands preferred for the amateur and amateur-satellite services because they are within the better bands identified above and are free of other radio-frequency lines of the greatest importance to the radio astronomy service. Primary allocations within these bands appears feasible, and the bands from 510 GHz and below are the most ideal for the amateur services, based on atmospheric attenuation, and where the bulk of the allocations within these bands is preferred.

Preferred bands for the amateur services (GHz)	Available * bandwidth (GHz)
280 - 294	14
358 - 363	5
365 - 371	6
389 - 400	11
493 - 496	3
506 - 510	4
692 - 710	18
810 - 850	40

* Total is 101GHz, representing 14% of total spectrum in 275-1000GHz

The ITU has begun studies of frequency bands above 3000GHz (3THz), considered the beginning of the optical spectrum.

Current Radio Regulations

As mentioned above the current key allocation footnote is **RR5.565, which** includes a request to protect certain passive service bands:-

The frequency band 275-1000 GHz may be used by administrations for experimentation with, and development of, various active and passive services. In this band a need has been identified for the following spectral line measurements for passive services:

– **Radio Astronomy Service:**
275-323 GHz, 327-371 GHz, 388-424 GHz, 426-442 GHz, 453-510 GHz, 623-711 GHz, 795-909 GHz and 926-945 GHz;

– **Earth Exploration-Satellite Service (passive) and Space Research Service (passive):**
275-277 GHz, 294-306 GHz, 316-334 GHz, 342-349 GHz, 363-365 GHz, 371-389 GHz, 416-434 GHz, 442-444 GHz, 496-506 GHz, 546-568 GHz, 624-629 GHz, 634-654 GHz, 659-661 GHz, 684-692 GHz, 730-732 GHz, 851-853 GHz and 951-956 GHz.

Future research in this largely unexplored spectral region may yield additional spectral lines and continuum bands of interest to the passive services. Administrations are urged to take all practicable steps to protect these passive services from harmful interference until the date when the allocation table is established in the above mentioned frequency band. (WRC-2000)

German Amateur Service Allocations

Although there are no formal allocations above 275GHz, administrations bound by a strict interpretation of RR5.565 are obliged to safeguard the frequency bands listed, which conversely enables them to **currently** allocate frequencies in the gaps between. This effectively has happened in Germany where, since February 2005, the current amateur radio regulations explicitly permit the following bands to be used by the Amateur Service:

444 - 453 GHz,
510 - 546 GHz,
711 - 730 GHz,
909 - 926 GHz,
945 - 951 GHz and frequencies above 956 GHz

A number of observations may be made on the logic of these allocations:-

- It is noteworthy that the exclusions have included all the passive bands, including the Radio Astronomy Service (RAS). Sharing with RAS has proved possible in lower frequency millimetre wave Amateur Allocations.

- There is no overlap with the long-standing IARU request, a position of some concern to DARC.

- Most of the bands are above 500GHz and all feature high atmospheric attenuation levels, making them particularly unattractive for DX operation.

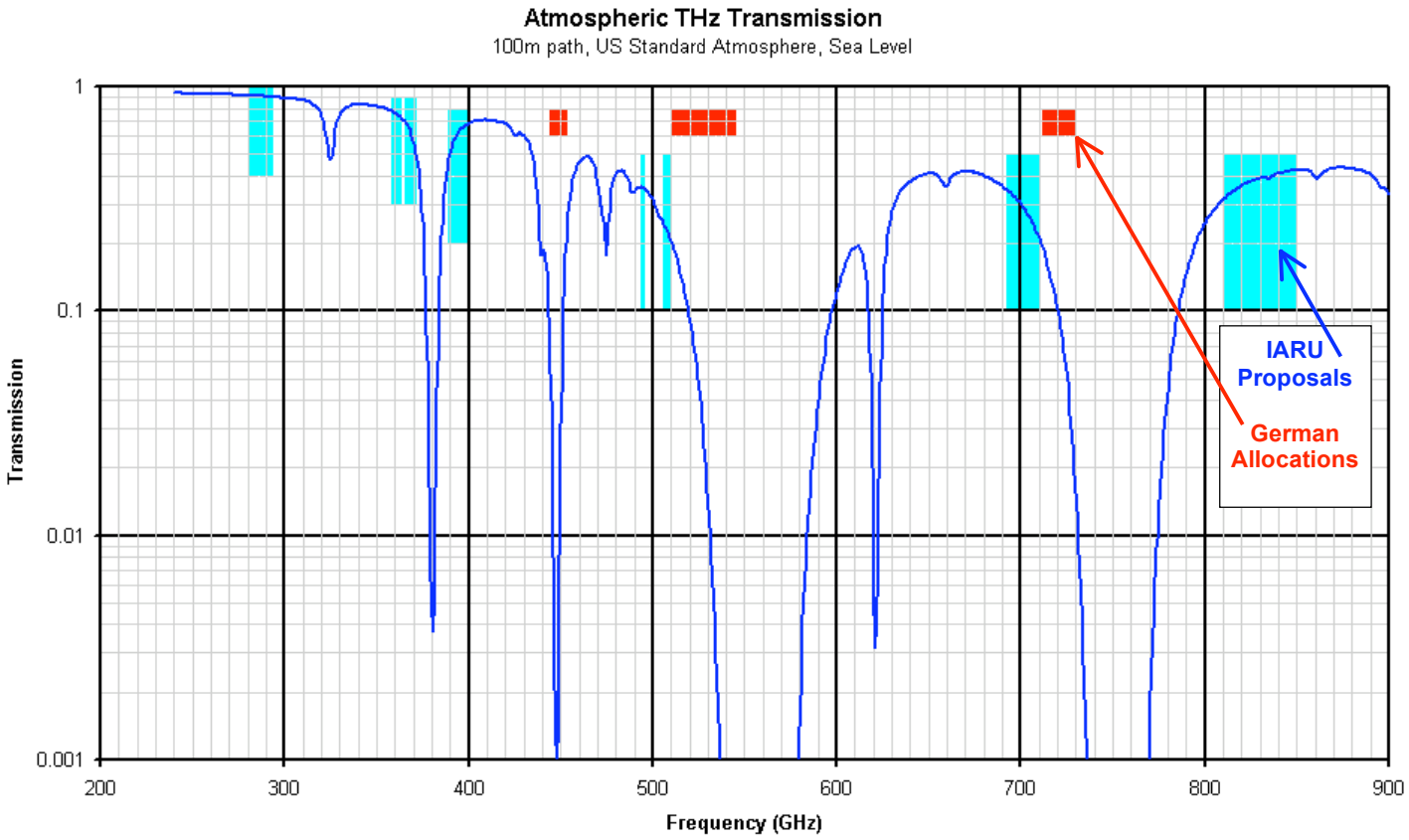
- The same regulatory logic would also permit the bands 568-623, 732-795 to be made available, but these are also high attenuation frequencies, as are bands above 900GHz.

HITRAN Atmospheric Absorption and CRAF Data

Contemporary knowledge of sub-millimetre propagation is improving rapidly. A number of prediction codes are derived from molecular absorption databases. Of these, the Hitran database is public domain, although codes that utilise it can be proprietary – see http://www.hitran.com/. Courtesy of BAE SYSTEMS ATC, plotted below is a Hitran prediction. This is largely dominated by water vapour, and clearly illustrates certain frequencies where little transmission would occur.

In the plot below cyan markers indicate the historic IARU proposals, whilst the current German allocations are denoted in red. It can be see that some of the currently proposed IARU bands are on steep attenuation gradients. The current German allocations coincide with even higher atmospheric losses and are not expected to be suitable for DX working.

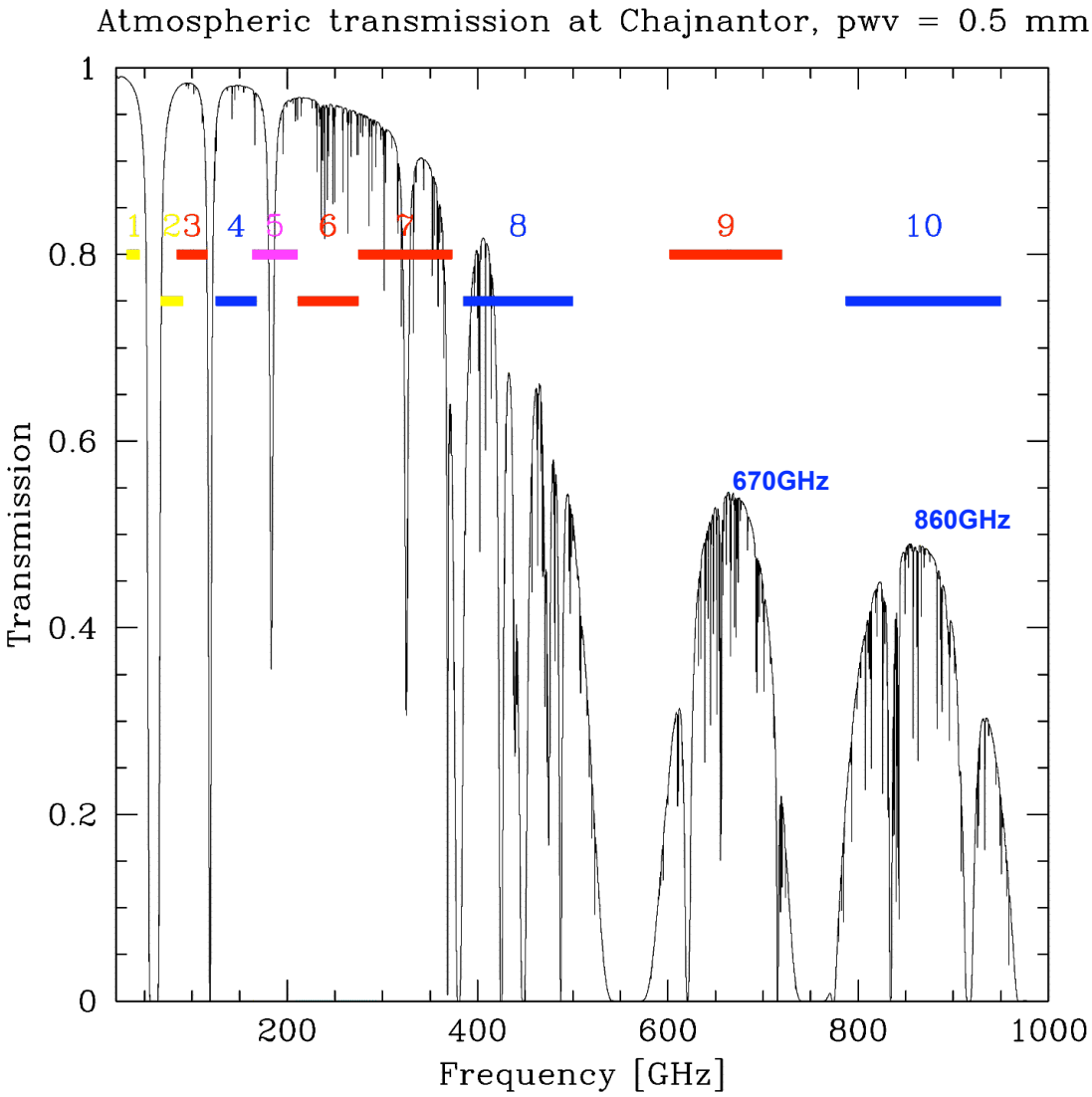
This quick prediction for sea level masks some molecular resonance contributions but could be refined. It is missing some Oxygen lines for example (compared with the ALMA data). In addition to Hitran a very useful listing of molecular resonance frequencies is available on the CRAF radio astronomy spectrum management site at: http://www.craf.eu/iaulist.htm. Liaison with the radio astronomy community is of course strongly recommended.



Atmospheric loss predictions with IARU and German Allocations overlaid
Data from ALMA: Atacama Large Millimetre Array http://www.eso.org/projects/alma/

The European Southern Observatory (ESO) in a joint project with the USA has started construction of the ALMA phased array telescope using fifty 12m-diameter antennas covering 50-950GHz. Background research for this major project included one of the most detailed ever modelling and measurement campaigns of sub-mm atmospheric attenuation, with results available in the IEEE journals and online. The very arid 5000m altitude site at Chajnantor in Chile probably represents a best-case scenario. **Notable in the linear plot below are a number of fine molecular resonances**

in addition to the major water absorption nulls. Some of these are Oxygen-related but the reader is advised to compare with the CRAF list for others at http://www.craf.eu/iaulist.htm.



For information, the coloured bands above are the tuneable receivers that will be used on ALMA:-

Band	Fstart	Fstop	Rx Supplier
1	31	45	None planned
2	69	90	None planned
3	84	119	EU-US
4	125	163	Japan
5	163	211	EU
6	211	275	EU-US
7	275	373	EU-US
8	385	500	Japan
9	602	720	EU-US
10	787	950	Japan

Modifications to the IARU List

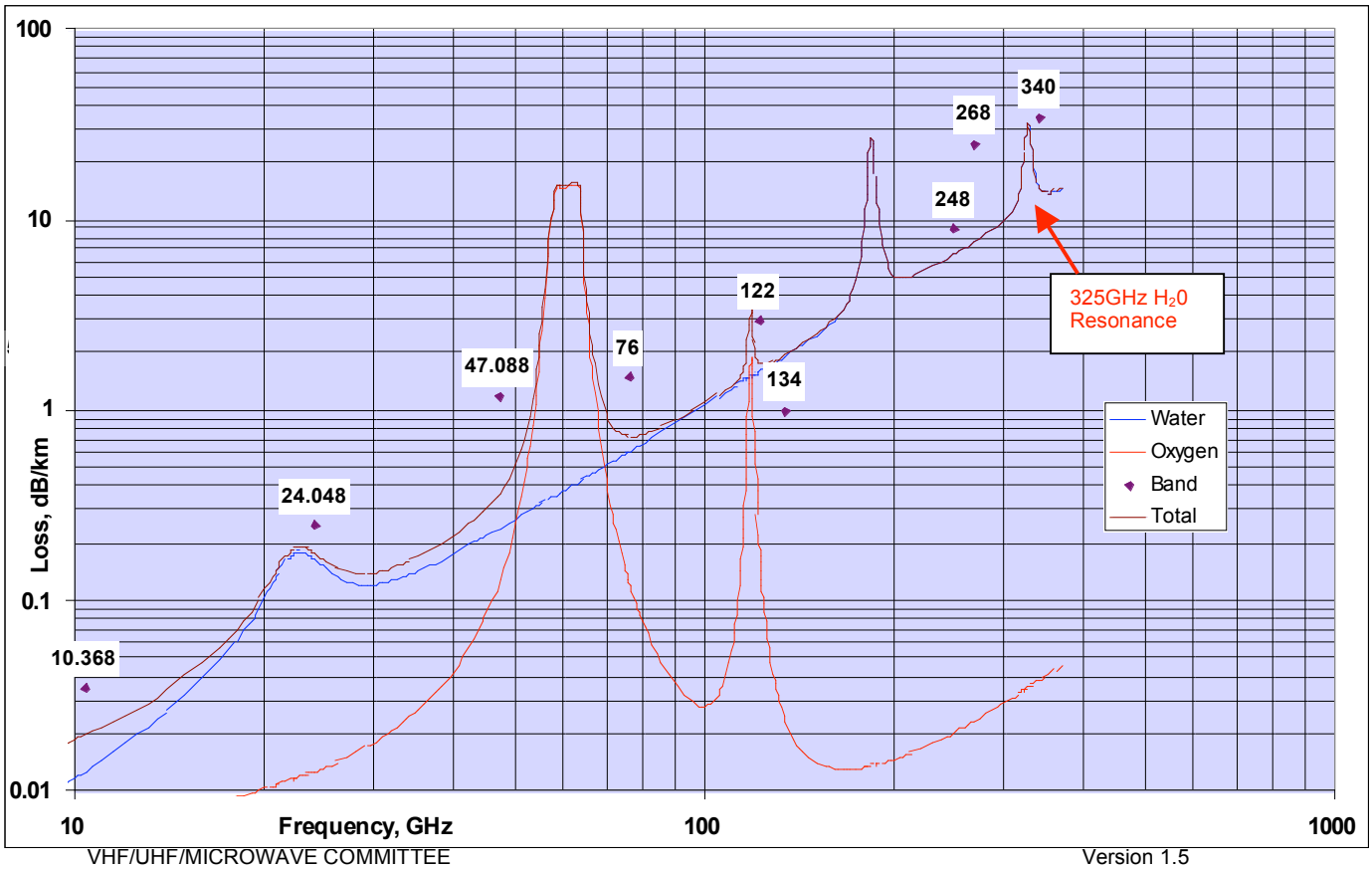
Based on data elsewhere in this paper the following may be possibilities, assuming sharing is agreed with Radio Astronomy, but still respecting the passive Earth Exploration & Space Research Services

IARU Preferred Band (GHz)	Comment
280 - 294	Suitable
358 - 363	340-342 or lower part of the 349-363 window is preferred
365 - 371	Oxygen Resonance at 368 & Water at 380 in Alma/CRAF data
389 - 400	400-410 Preferred
453 - 470	New alternative?
493 - 496	Rather close to 487GHz Oxygen & 489GHz Water Resonances
506 - 510	Getting lossy
692 - 710	Consider around 670-684 instead, to avoid rolloff and Oxygen resonance at 714GHz+
810 - 850	Avoid Oxygen and other resonances at 833-5GHz. The 853-870 GHz range may be better?

Propagation Data at Lower Frequencies

For reference, atmospheric attenuation based on water vapour and oxygen is plotted below, with markers for current and possible amateur bands. This is based on a relatively dry day with 6g/m^3 water vapour density.

One point worth noting is that there are substantial gaps between some of the lower frequencies. IARU may therefore also wish to consider future spectrum requirements between 10 and 24GHz, and around 30GHz in the 'moisture minimum'.



Document	B03
Subject	CHANGE TO USAGE OF 144.160 – 144.180MHz FOR FSK441 COMMUNICATION
Society	RSGB
Contact	DAVID BUTLER G4ASR
Status	Proposal

BACKGROUND:
The Usage column of the IARU Region 1 145MHz Band Plan shows the sub-section 144.160 – 144.180MHz as an alternative sub-band frequency for FSK441 usage.

HOWEVER:
since the Davos Conference the alternative sub-band has not been used by FSK441 operators.

PROPOSAL:
That the VHF Manager of each IARU Region 1 Society to monitor the situation in their country with the objective of deleting FSK441 usage 144.160-144.180MHz at the next IARU Region 1 Conference.

Document	B04
Subject	**A REVIEW OF THE IMPLEMENTATION OF 12.5kHz CHANNEL SPACING SYSTEM IN THE 145MHz BAND.**
Society	RSGB
Contact	DAVID BUTLER G4ASR
Status	Proposal

BACKGROUND:
Thirteen years ago in De Haan, Belgium (1993) it was recommended that FM repeaters (and simplex usage) within the 145MHz band would change to a 12.5kHz channel spacing system.

A decade ago in Tel Aviv, Israel (1996) the decision was made that national Societies shall promote the use of the 12.5kHz channel spacing standard for NBFM channels in order to "effectively implement the 12.5 kHz system".

HOWEVER:
(1) A problem exists within the original recommendation that there was a lack of any explicit explanation of receiver bandwidth specifications.

(2) No-one was charged within IARU Region 1 to formally inform transceiver manufacturers of the decision to implement a genuine 12.5kHz channel spacing system in the 145MHz band.

PRESENT SITUATION:
Analysis indicates that in the UK there has been an increase in NBFM usage via repeaters and simplex channels within the 145MHz band.

However users are increasingly complaining of interference between adjacent channels and repeater access problems caused by excessive deviation.

Measurements have been made on a number of current VHF transceivers and it appears that although channel spacing of 12.5kHz has now been implemented the transmitter and receiver specifications do not conform to a maximum deviation of +/- 3kHz, 12KOF3E standard.

It would appear that some transceiver manufacturers adopt a half-way house specification allowing satisfactory operation within 25kHz and 12.5kHz channel systems.

PROPOSAL:
(1) To provide explicit transmitter and receiver specifications within the VHF Managers Handbook for a genuine 12.5kHz system.

(2) For IARU Region 1 VHF/UHF/Microwave Committee to agree a method of formally informing transceiver manufacturers of this standard.

Document	B05
Subject	**FREQUENCY ALLOCATION FOR DIGITAL VOICE COMMUNICATION WITHIN THE 145MHz BAND.**
Society	RSGB
Contact	DAVID BUTLER G4ASR
Status	Proposal

BACKGROUND:
At the Davos Conference (2005) the HF Committee C4 recommended (in DV05_C4_Rec_13) that digitised speech is considered a digital data mode with regards to band plan matters.

The matter of digital voice communication was not discussed by the VHF/UHF Committee C5.

DISCUSSION:
Some Societies have suggested that digital voice should be placed (in the HF band plan) within the SSB telephony section. However this may not be suitable when considering VHF band planning.

The SSB telephony sub-band is traditionally used for weak-signal (DX) working. Currently digital voice communication is an experimental mode carried out by local stations.

Digital voice should not be considered as a Machine Generated Mode (MGM) as voice is the origin of the modulation and not a computer.

PROPOSAL:
That digital voice communication experiments be carried out in the ALL MODES section of the 145MHz band.

Document	B06
Subject	**CHANGE TO THE 70.26MHz AM/FM CALLING FREQUENCY.**
Society	RSGB
Contact	DAVID BUTLER G4ASR
Status	Proposal

BACKGROUND:
The frequency 70.260MHz has been used in the UK for many decades for AM/FM calling and this frequency is now contained within the IARU Region 1 70MHz Band Plan

HOWEVER:
There are now a number of countries within IARU Region 1 that have authorisation to operate within the 4M band but they do not have any significant attachment to the historical frequency of 70.26MHz.

There are now many surplus synthesised AM/FM radios using 12.5kHz available throughout Region 1.

PROPOSAL:
The AM/FM Calling Frequency on 70.260MHz be moved to 70.2625MHz.

Document	B07
Subject	**CHANGES TO EXCLUSIVE USAGE OF 144.000 – 144.036MHz FOR EME COMMUNICATION.**
Society	RSGB
Contact	DAVID BUTLER G4ASR
Status	Proposal

BACKGROUND:
The Usage column of the IARU Region 1 145MHz Band Plan shows the sub-section 144.000 – 144.036MHz as 'EME Exclusive' usage.

HOWEVER:
Because of interference problems associated with the bottom end of the 145MHz band (p.c. clocks etc) very little, if any, EME operation is carried out between 144.000 – 144.036MHz.

PRESENT SITUATION:
Worldwide EME operators are currently using MGM (JT65) around 144.105 – 144.150MHz with CW operation often between 144.040 – 144.060MHz.

PROPOSAL:
To delete from the USAGE column of the IARU Region 1 145MHz Band Plan the 'EME EXCLUSIVE' comment between 144.000 – 144.036MHz.

Document	B08
Subject	**The need for minimum requirements for a valid digital QSO.**
Society	SSA
Contact	Peter Sundberg, SM2CEW
Status	Proposal

Background
Old and widely accepted standards of what constitutes a valid VHF/UHF QSO have been around for a long time. Most listings of ”first” and other achievements like distance, or number of squares worked, are built on the base of these well defined requirements.

Today the weak signal VHF/UHF community have access to digital software doing the coding and decoding of information constituting a QSO. This is not new, RTTY, PSK and other digital modes have been around for some time.

However, with the very popular WSJT package by K1JT, which is targeting the weak signal VHF/UHF community, a new protocol has been introduced. It is named ***JT65*** and this protocol differs from the other ones because known information is injected to the CPU when performing the decoding process. Under certain circumstances very little information is flowing via the RF path.

Actually, when the so called Deep Search (DS) decoder is engaged, calls and reports can not be decoded without the full information being present on the computer.

The information is present through the use of a callsign database, the CALL3.TXT file, or by correctly inserting the full callsign and locator of the other station in the ”To Radio” input box of the program.

Thus, the decoding process is comparing fragments of information, matching this with known calls and locators from a database, reconstructing and then printing the full information on the screen as if it had been received via the airwaves.

Furthermore, it is not clear to the operator what part of the information has been reconstructed, and therefore it is impossible to know what has actually been received.

This is certainly a new ”private” concept, and the decision to do away with our long since established QSO standards is a one man decision, namely one made by K1JT Joe Taylor.

What this means is that all references to old records and achievements are impossible to make. We can never compare a QSO in CW/SSB where full calls, reports and R’s have been transferred and copied in full via the RF path with digital QSO’s where equivalent of two (2) characters have been received via the RF path. Comparing complete QSO’s with fragmental QSO’s is not fair.

When making JT65 digital QSO’s using the Deep Search Decoder K1JT has decided that the information content of only 12-14 bits (equivalent to 2 characters) is considered full copy. So, instead of >56 bits which would represent full copy of both calls and a report, an extremely marginal QSO transfer is occuring.

Again, to make the procedure clear, after reconstruction of the missing parts, using the information present on the computer, a full QSO message is printed on the computer screen. And the operator is acting as if he is conducting a QSO as per long accepted and well established standards. (See Ref 2 and 3)

We have to ask ourselves whether we want our radio hobby to be diminished to the point where the RF path only provides fragments of information and computers reconstruct the full message from known data before printing it on the screen.

11.1. If and when we accept that, who would then set the limit?

As a further ”development”, some might even use the the concept of ”booking ” a 4 bit symbol via a website for a given time, representing calls and reports, and then transfer those 4 bits successfully via the RF path. Computers at both ends would of course print full QSO messages on the screen in an attempt to validate the ”contact”. Would this be considered as a valid QSO also?
Is what we see on printed on the screen valid, or is the actual transfer via the RF path the most important part?

Conclusion

I we accept K1JT’s decisions when inventing JT65 regarding information flow, analgoue to this we would have to accept each and every radio amateurs own private decisions regarding minimum requirements for digital QSO’s!

This is a highly undesirable situation.

K1JT and other people of the digital community are strongly lobbying to make the JT65 protocol a de facto standard. So, what they are suggesting is that equivalent of 2 characters received via the RF path should become a standard for ALL digital ham radio weak signal communications, not only for EME.

Furthermore, they argue that the report (what is labeled as ”unknown information” in descriptions of QSO procedures) should be allowed to be 1 (one) bit. In JT65 this is realized by using so called ”shorthand messages”, which in the case of JT65 are nothing but two tones at a given spacing. They are easily visible by eye on a spectrum display, and no coding is used. Integrity is impossible to uphold, especially in pileup situations.

Toplists, DXCC, ”firsts”, distance records, contests, awards, everyone presenting or organizing them will have to accept these private protocols without questioning.

Stations following a QSO at Deep Search level are unable to decode any information unless both calls and locators are present on the monitoring computer. If this information is unknown, at DS level, there is no way for monitoring stations to confirm that the QSO has actually taken place.

In my opinion, this is not the way weak signal VHF/UHF communication should be heading!

And of course, the use of non RF path means to augment data transfer and confirmation should not be permitted during the course of a contact. (Internet on line communications)

Below is an example showing in principle what is going on within JT65. The comparison will be made using our well established EME QSO procedure.

Note that the JT65 protocol is using symbols instead of characters, but for clarity in the example it is chosen to present the information as characters. This can be argued, but for simplicity this method is chosen. Regardless of what underlaying coding/decoding method is used, the input and output of the process is still characters on a computer screen, so therefore the example below is valid. (for full information see Ref. 1)

Station A transmitting ”3Y0X G4IGO IO80”
Station B receiving **via radio path ”IG”**
Station B computer *printing* on screen ”3Y0X G4IGO IO80” (*information reconstructed***)**
Station B transmitting ”G4IGO 3Y0X OOO”
Station A receiving **via radio path ”3Y O”**
Station A computer *printing* **”G4IGO 3Y0X OOO” (***information reconstructed***)**
Station A transmitting shorthand message RO (two tones at given spacing)

Station B *operator watching a spectrum display, determine tone spacing with eye, decide it is ”RO”*

Station B transmitting shorthand message RRR (two tones at given spacing)

Station A *operator* watching *a spectrum display, determine tone spacing with eye, decide it is "RRR"*
Station A transmitting shorthand message 73 (two tones at given spacing)

Station B *operator* watching *a spectrum display, determine tone spacing with eyes, decide it is "73"*

This is in full a JT65 QSO of today, when the Deep Search decoder is engaged.

As we can see, shorthand messages (i e reports and acknowledges) need not be decoded by the program, they can be seen on a spectrum display and visually "decoded" by eye because the differnce is only determined by the tone spacing. This procedure is fully open for all sorts of mistakes especially when it comes to RO, RRR and 73.

We clearly see in the example above that these so called QSO's have nothing in common with our well established analogue QSO procedures.

Quite the contrary, these QSO's rely on an extremely low amount of necessary information received via the RF path. Actually the received information is only about 20% of the full message. The rest is reconstructed by the computer as the information is fully known. And reports plus acknowledgements are 1 bit only.
We now understand why the JT65 digital protocol is "performing" so well. Someone has made a decision to make it perform well, by giving up the need for information to be received via the RF path.

Now, if we transfer the JT65 protocol to a digital meteorscatter QSO, using the same protocol requirements, this would be the outcome:

- 2 characters received when decoding a burst
- the missing information is looked up in a database and the computer is reconstructing the full message
- the full meteorscatter message is printed on the computer screen
- the operator is acting as if the full message was received

The example above would indeed, and rightly so, be treated by most people as an invalid meteorscatter procedure. However, this QSO information flow is exactly what the digital lobby (K1JT and others) are lobbying for. They are suggesting that 12-14 bits information received via the RF path should be considered a minimum requirement for all valid digital QSO.

In fact, as we now are well aware, for people using JT65 when working EME this is already happening. And unfortunately these contacts are suggested by the digital lobby as being equal to CW/SSB QSO's.

A couple of references to well established and accepted QSO procedures are relevant to the discussion above:
Ref 2. EME procedure as agreed and decided at multiple EME conferences.
Ref 3. Meteorscatter QSO Procedure as decided by IARU Region 1
(reference material is attached to this document)

Proposal

The IARU Region 1 should decide on minimum requirements for what is considered to be a valid digital QSO. This decision should also include the report system, i. e. what is normally called ”unknown QSO information”.

The decoding process should at all times allow any randomly formatted text message to be decoded. This would be true when the information represent calls and reports, formatted as existing and well established radio amateur QSO procedures dictate.

Injecting known information to the decoding process should not be allowed for a valid digital QSO.

Anyone following the contact should be able to decode the same information, without having the information present on their computer.

Ref 1: Klaus von de Heide, ”A comment on Joe’s paper ’How many bits are copied in a JT65 transmission”, DUBUS Magazine 04/2006, page 62-64 (pdf)
Ref 2: G3SEK EME operating procedures (pdf)
Ref 3: IARU Meteorscatter QSO procedure (pdf)

Document	B09
Subject	**Omitting penalization for claimed points for duplicate QSO in IARU VHF/UHF/SHF contests in item 10 of IARU contest rules**
Society	ZRS
Contact	Sine - S53RM
Status	Proposal

Background:
In IARU meeting in Davos 2005 a new IARU VHF/UHF/SHF contest rules was accepted. It was decided that only EDI format contest logs should be accepted as a contest entries. So, all contest logs can be easily checked for duplicate QSO errors.
As we in S5 understand, penalization for claiming DUPEs was necessary in past, to force operators to carefully check their logs, because big number of claimed dupes can significantly change result of the station and finding of duplicate QSO in paper logs was difficult for judging committee.

Proposal:

Item 10 of IARU VHF contest rules should be:

10. Judging of entries

The final judging of the entries shall be the responsibility of the organizing society, whose decision shall be final. Entrants deliberately contravening any of these rules or flagrantly disregarding the IARU Region 1 band plans shall be disqualified.
Each VHF Manager and/or national Contest Committee shall be responsible for monitoring during contests. Additional monitoring stations may be appointed but these stations may not take part in the contest. The national VHF Manager/Contest Committee is responsible for disqualification based upon the results of monitoring.
Any error in the information logged by a station shall result in the loss by the receiving station of all points for that contact.

Document	B10
Subject	**Exchange of contest logs between VHF managers for checking purposes**
Society	ZRS
Contact	Sine - S53RM
Status	Diskussion

Background:

With a relatively small number of participants and consecutively small number of contest logs received for national VHF/UHF/SHF contests from March through November the number of undiscovered errors in contest logs is quite high. More CHECK logs makes checking easier. To get CHECK logs from other managers (countries) by E-mail takes time, patience and it is sometimes mission impossible.

First step forward is page http://www.vhfcontest.net/logs/ (TNX to Ondrej OK1CDJ). There you can find all the contest logs sended for OK classification and small number of others.

It would be very helpful to have some sort of server, where all managers could send contest logs, machine will pack them with other already uploaded logs for particular contest and than all the other managers can download allthe logs for that contest in one single file with use of password.

I expect some debate about this subject and hopefully someone know the ham who will do the job.

Document	B11
Subject	**Contest logs**
Society	SARA
Contact	Roman Kudlac, OM3EI
Status	Proposal

Introduction:
This paper proposes the IARU R1 contest web page as the only possibility for sending electronic logs from IARU R1 VHF&up contests.

Background:
According to the actual procedure logs must be sent to national VHF Managers or properly nominated Contest Committees which afterwards send them to Organising Society. This process results in long delays and final results are published very late.

A better way is to send logs directly to a special web page. National VHF Managers will be able to download national logs from this page for a national evaluation. They will be able to download also logs of other stations for their national cross-checking.

Participants will find on the one same web page all information concerning IARU R1 contests incl. claimed scores, rules, results etc.

Key points and proposal:
This paper proposes to replace the second sentence of the current rules for the
(VHF Managers Handbook):
- IARU R1 145MHz September Contest (item 4.6.9)
- IARU R1 UHF/Microwave October Contest (item 4.7.9)
- IARU R1 50MHz June Contest (item 4.9.9)

and third sentence of the current rules for the IARU R1 September ATV Contest

with the following sentence,

Logs must be sent to the IARU R1 contest web page not later than the second Monday following the contest weekend.

d. Recommendation:

Electronic contest log data entries from IARU R1 contests should be sent to the IARU R1 contest web page.

Document	B12
Subject	**Change of BASIC OPERATING AREA**
Society	SSA
Contact	Anders SM2ECL
Status	Proposal

Background:
VUCC Basic Operating Area Change.
VUCC basic operating area expanded for 50 through 1296 MHz: The ARRL Membership Services Department has announced an increase in the size of the basic operating area for VUCC contacts made between 50 MHz and 1296 MHz. Effective immediately VUCC rules allow stations to submit confirmations for contacts made from different locations, provided no two locations are more than 200 km (124 miles) apart. The VUCC operating area for SHF operation remains unchanged.

The change results from a recommendation of an ad hoc VHF/UHF Study Committee, appointed by the then-Membership Services Committee, chaired by ARRL New England Division Director Tom Frenaye, K1KI. The ARRL Awards Committee recently added its approval to the change. (April 2006) Needs to be the same rules WW for recordawards and other.

Proposal:
Change of BASIC OPERATING AREA from our Region 1 used rules 50 Km radius to ARRL used 200 Km radius to be the same WW for DXCC and Squar:s record lists.

Document	B13
Subject	**Allocations at 3400 MHz**
Society	RSGB
Contact	Murray Niman, G6JYB
Status	Proposal

Background
In Regions 2 and 3 the Amateur and Amateur Satellite Services have formal ITU Secondary allocations in the 3400 MHz band, within which 3400-3410MHz is allocated to the Amateur Satellite Service. The latter is noteworthy in that it is one of the few bi-directional satellite allocations in the lower microwave bands. By contrast, in Region-1 there is no ITU allocation for the amateur services, inhibiting harmonised usage and the use of amateur satellite global downlinks.

Following CEPT DSI Phase-1 in 1992 and in line with EU17[1] a modest but increasing number of CEPT states now have Amateur Service allocations. This has increased with the recent expansion of the European Union resulting in an influx of states joining CEPT and adopting EU17. A recent survey of these is illustrated by a map in Figure-1, and a more detailed list in Figure-2. In addition, permits have also been made available in Sweden, whilst Denmark also has an Amateur Satellite allocation.

Current Position
It is evident from the illustrations that there is greater success in requesting the 10MHz wide allocation in newer states than has been previously been achieved in the more established parts of Europe. It is conceivable that further countries would accede to EU17 requests if their amateur societies were to press for them. This process needs to be accelerated to consolidate our position in the face of mounting commercial pressures from Fixed Wireless Access and the fact that 3400-3500 is an 'IMT-Advanced' candidate band at WRC-07 (agenda item 1.4). It is noteworthy though that the lower 10MHz as endorsed by EU17 is effectively a radio-navigation guard band and least favoured by commercial systems.

It was recently announced in October-2006 that, after careful deliberation, the Amsat-NA Eagle amateur satellite project would use 3.4GHz uplinks to deliver a high-quality, high-data-rate 5GHz downlinks from its Advanced Communications Package. Region-1 Societies would need to acquire Amateur Satellite privileges for uplinks, if full benefit is to be gained from this exciting project.

EME as a Precedent
In considering how additional privileges may be obtained for satellite uplinks, perhaps initially by special permits, it became clear that EME activity in the 3400 MHz band might be a useful precedent. UK and European amateurs have conducted a modest amount of EME activity in the 3400 MHz band. The moon is a natural satellite and, as such, does not fall within the definition of an ITU Satellite Service (which is specifically defined to be the use of Artificial Satellites).

If it can be shown that more frequent EME uplinks do not interfere with Primary Users, then evidence-based submissions can be made for Amateur Satellite privileges. Its is important that CEPT states who have the opportunity afforded to them by EU17 press home their advantage in order to realise the IARU spectrum goal of a Region-1 allocation, and underpin the success of the ambitious Eagle programme.

[1] **EU17:** In the sub-bands **3400-3410MHz**, 5660-5670MHz, 10.36-10.37GHz, 10.45-10.46GHz the amateur service operates on a secondary basis. In making assignments to other services, CEPT administrations are requested wherever possible to maintain these sub-bands in such a way as to facilitate the reception of amateur emissions with minimal power flux densities.

In effect, EU17 encourages administrations to afford some consideration to amateur weak-signal operations in the sub-band 3400 – 3410 MHz, among others.

Summary
Interest in the 3400 band is gaining momentum from both amateur and commercial interests. It is important that our position, at least in the 3400-3410 segment, is not only maintained, but also enhanced.

Proposals

1) IARU-R1 maintain an online status table/map of Societies with 3400MHz privileges

2) 3400MHz EME Activity is actively encouraged and expanded.

3) All Societies seek to gain at least 10MHz allocation at 3400-3410MHz in line with EU17

4) Societies should collaborate more closely in order to get EU17 implemented, especially in those countries that have been particularly reticent, or are under-resourced.

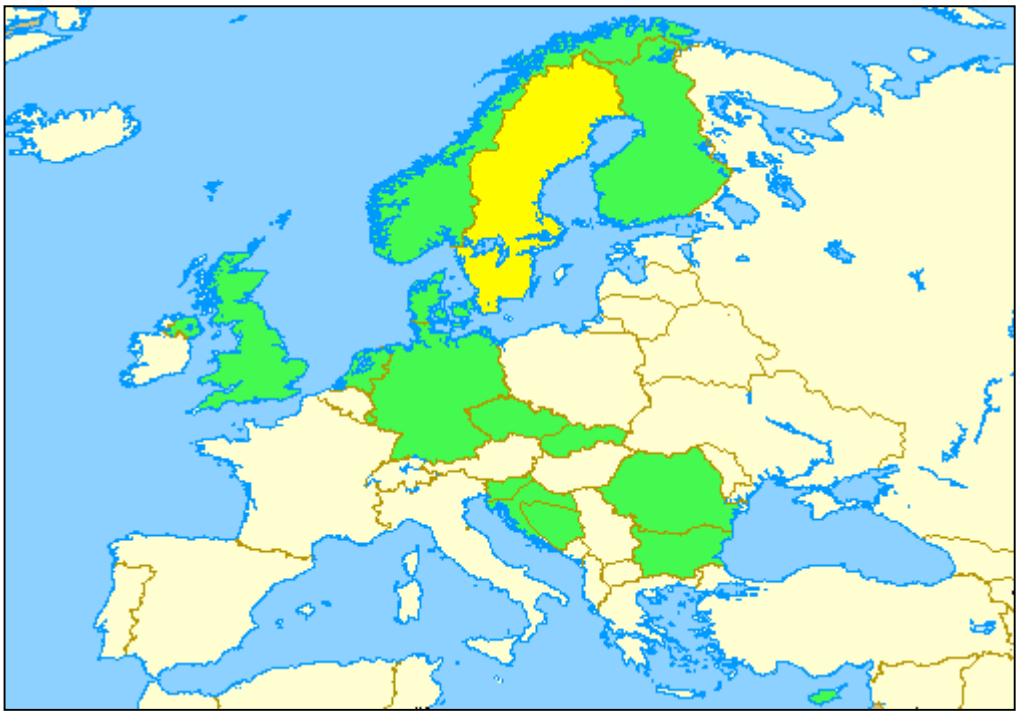


Figure-1: Countries with confirmed 3400 Amateur Service Allocations as at Nov-2006
Note: At time of writing, Poland was unconfirmed and Sweden is based on 2006 permits

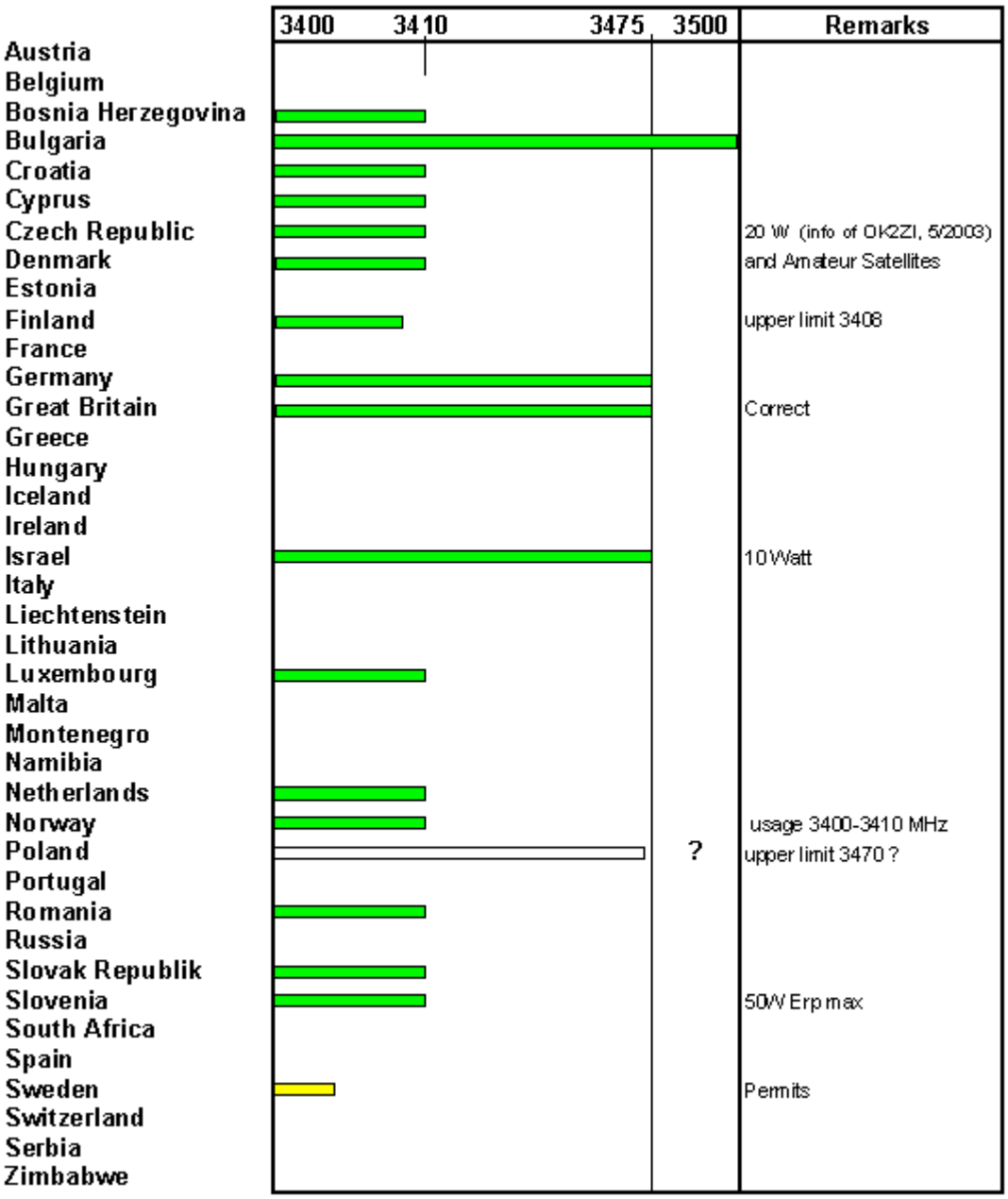


Figure-2: 3400 MHz Band Frequency Allocation Details as at Nov-2006
Note: At time of writing, Poland was unconfirmed and Sweden is based on 2006 permits

Document	B14
Subject	**Microwave Spectrum Threats**
Society	RSGB
Contact	Murray Niman, G6JYB
Status	Proposal

Background

At Davos 2005, it was agreed that "spectrum threat" tables be maintained for the benefit of Region 1 societies and to aid coordination of response where necessary. This note updates IARU-R1 on developments and serves as a basis for discussion

23cms
See other RSGB paper on '23cms Bandplan', Galileo etc.

2500-2690 MHz
This valuable '3G Expansion' band will be auctioned across Europe shortly. Societies should take all possible precautions to advise amateurs that 2nd harmonics from 23cms or other spurii do not fall into this important commercial band.

Future bands for IMT Advanced
The 2400 and 3400 amateur bands are included as candidate bands for future mobile applications in WRC-07 Agenda item 1.4

2400-2450 MHz
High levels of ISM (eg 802.11) make this section difficult to use, especially for satellites.

UWB Sort Range Devices (Wireless USB)
CEPT studies seem to indicate that the 5.6 and 10GHz bands will be relatively well protected, leaving 3.4GHz vulnerable. Other UWB applications are being considered in the HF/VHF/UHF bands

10GHz
Fragmentation of the 10GHz Amateur Band continues to occur in the UK where parts are to be re-auctioned, threatening the Amateur Satellite Service in particular.

Car Radar
A narrow band variant of Short Range Radar has been developed for 24.05-24.25GHz which will not face the same restrictions as the UWB 24GHz variant. Once exempted, applications may extend to other applications such as security alarms in both the 24 and 76GHz bands. Migration of amateur activities to the relevant Primary allocation is encouraged.

General Regulation and Bands above 30GHz
Ofcom and EU studies are considering much lighter regulatory or exempt approaches

Publicity and Liaison
There is increasing evidence that amateur activities in the microwave bands may not be sufficiently publicised outside of amateur circles and that official bodies do not proactively liaise/research amateur activity. This weakness occurs at both national and CEPT levels.

Document	B15
Subject	**23cms Bandplan**
Society	RSGB
Contact	Murray Niman, G6JYB
Status	Proposal

Background

Increasing use by current and future Primary Users in the 23cms band necessitates prudent planning of what might become a much smaller effective Amateur allocation. This also adds to the demand for spectrally efficient ATV.

Considering that:

- Safety-of Life radio navigation and other Primary User applications/developments make 23cms amateur allocations/clearances vulnerable and increasingly challenging.
- The Galileo system is progressing and may cause radars to move. For example Galileo has effectively been given priority by CEPT over Wind Profiler radars.
- Analogue ATV requires considerable bandwidths that can make it difficult to gain clearance in this band in particular, or uses wideband receivers that may be vulnerable to Primary User interference. In contrast DATV developments such as QPSK can be robust and their lower bandwidth (typically 4MHz max) facilitates regulatory clearances and alternative bandplanning.
- There is no harmonised “reserve” frequency for narrowband working and beacons, should 1296MHz become unavailable.
- Traditional packet/data/fax usage is declining in 23cms.

Proposals

1. That developments in Digital ATV, using no more than 4MHz bandwidth, be encouraged with a long term view to facilitating ATV Digital Switchover in this band (and 70cms).
2. That priority is given to agreeing harmonised “reserve” frequency(s) for 1296MHz narrowband.
3. That discussion on a potential alternative 10MHz wide bandplan is undertaken, possibly in the 1240-1250MHz area (outside of the Galileo band), or the 1260/70 sub-band and/or the 1290-1300 band.
4. That the VHF Handbook 23cm bandplan footnote on beacon co-ordination be considered outdated and removed.

Document	B16
Subject	**Amateur Satellite Service Spectrum**
Society	RSGB
Contact	Murray Niman, G6JYB
Status	Proposal

Background

The Amateur Satellite Service is faced with more restricted allocations than the Amateur Service, and this is compounded by both interference threats and other restrictions that inhibit harmonised usage.

Considering that

- There are increasing levels of harmful interference from ISM etc in the 2.4GHz band
- There are concerns regarding radars and Galileo in 23cms
- Region 1 does not have any Amateur Satellite allocation in the 3.4GHz band, in contrast to Regions 2& 3 (not even within CEPT EU-17/23)
- The 6 metre band is increasingly allocated as an amateur allocation by many countries
- That Wimax, Fixed Wireless Access and future Intelligent Transport Systems threaten the 5.8GHz Space-Earth allocation.
- Some allocations are additionally restricted by being Earth-Space or Space-Earth only.
- Satellites can have a significant in-service lifetime that can complicate a phased frequency migration

Proposals

All IARU Region 1 societies request that the following additional Amateur Satellite Service bands be studied and considered, perhaps as a package, for a future WRC agenda item

50-51 MHz
1240-1250 MHz
2300-2330 MHz
2390-2400 MHz
3400-3410 MHz
5650-5670 MHz (Currently Earth-To-Space only)
10350-10400 MHz

Document	B17
Subject	**Beacon Data and Specifications**
Society	RSGB
Contact	Murray Niman, G6JYB
Status	Proposal

Background

Accurate frequency beacons with low phase noise facilitate use of highly tuned user equipment for weak signal flux DX contacts. They are a major resource for propagation studies and equipment alignment in the microwave bands

Considering that:

- A new database of Region-1 VHF/UHF/Microwave Beacons is now online at http://data.dcc.rsgb.org/.
- This continues to show that status data for many beacons is years out of date, undermining planning and co-ordination.
- The VHF Handbook does not specify beacon frequency spacing in bands above 23cms. To facilitate planning this should now be specified and at least reflect current practice which is using 5kHz spacing, with an offset procedure to resolve clashes.

Proposals

1. That a Beacon Frequency Spacing of 5kHz be adopted in the Bands 2.3GHz to 47GHz, and incorporated into the VHF Handbook.
2. Specifications for accuracy be considered that are compatible with 2.5kHz spacing in the 1-10GHz bands, should the necessity arise from increasing beacon numbers and greater DX ranges, or from potential loss of bandwidth to Primary Users.
3. That Societies are urged to provide ***regular*** updates to the IARU R1 Beacon Coordinator
4. Beacons (or changes to Beacons) which are not notified to the Coordinator forfeit arbitration rights in any co-ordination dispute

Document	B18
Subject	**Minimum requirement for a valid (digital) VUHF QSO**
Society	EDR
Contact	Ivan, OZ7IS
Status	Proposal

Background
As a result of the ever-increasing use of different types of digital modes, a debate about the need for a common standard for the minimum requirement for a valid VUSHF qso has been going on throughout the region for quite some time now.

Unfortunately the problem was not covered during the EME conference in 2006.

Proposal:
We therefore propose to establish a definition valid for ALL VUSHF contacts.
The wording could be equal to the first sentence describing the minimum requirement in the meteor scatter procedure:

"A valid contact is one where both operators have copied both call signs, the report and an unambiguous confirmation."

Document	B19
Subject	**Access points for Echolink/IRLP etc. in the 144 MHz bandplan**
Society	EDR
Contact	Ivan, OZ7IS
Status	Proposal

Throughout IARU and its Region 1 there are numerous possibilities to access repeaters etc. worldwide via the internet by using normal amateur vhf-uhf transceivers. As long as it is done through the existing repeater networks it is only a matter for the local administrations/societies. But when it comes to access via a simplex channel we need coordination.

We need frequencies set aside for that purpose in the 144 MHz bandplan.

Not too many years ago we set aside the segment 144,800 – 144,975 for packet traffic.
Since then most of the packet traffic has withered and most of these frequencies can be put into new use.

Proposal:
It seems logic that the DARC has set aside 144,975 and 144,9625 for that purpose.
We therefore propose to make that the IARU, Region 1, recommendation.

Document	B20
Subject	**Alternative QSO procedure on Microwaves?**
Society	EDR
Contact	Ivan, OZ7IS
Status	Proposal

On the open Nordic VHF meeting this past summer, an interesting idea was brought forward:

As Microwave “openings” are sometimes short-lived as in the case of “aircraft-reflections” (“flight-scatter”) it is important to have a short and precise procedure. The scheme (not the reporting system) for the “old” MS procedure seems ideal for that purpose.

In short:

SM7ECM OZ7IS SM7ECM OZ7IS SM7ECM OZ7IS K K K

OZ7IS SM7ECM 52 52 52 OZ7IS SM7ECM 52 52 52 OZ7IS SM7ECM 52 52 52 K K K

SM7ECM OZ7IS R55 R55 R55 SM7ECM…..etc

OZ7IS SM7ECM R R R R R R R R OZ7IS SM7ECM R R R R R R R R….etc

SM7ECM OZ7IS R R R R R R R R SM7ECM OZ7IS R R R R R R R R….etc

(Additional information like Locator, etc. can be added depending on the type of contest.)

This procedure have been proven successful on MS in the past, - and it is effective on Microwaves as well. We propose to recommend this procedure as an option for microwave contacts, especially during contests.

Document	B21
Subject	**Frequencies for digital voice communication in the IARU, Region 1, VHF band plans?**
Society	EDR
Contact	Ivan, OZ7IS
Status	Proposal

VHF committees throughout the region have been asked where to allocate new systems for digital voice communication like D-Star, etc.

We need to establish a few common simplex frequencies in the band plan to carry out experiments with these new modes in order to find a more permanent solution at the conference in 2008.

Proposal:
We therefore propose to establish 144,950 – 144,9375 and 144, 925 MHz as frequencies assigned for Digital Voice Modulation.

Document	B22
Subject	**How to accomodate another satellite down-link segment – in the IARU, Region 1, 144 MHz band plan.**
Society	EDR
Contact	Ivan, OZ7IS
Status	Proposal

Having recently rearranged the narrowband segment and squeezed it down below 144,500 MHz, we see absolutely no possibility to make room for a second satellite sub-band below 144,500 MHz!

However we might have another option:
The segment: “linear transponder output”, from 144,630 to 144,660 MHz.
After all the satellite transponders are linear.
A given satellite will only be around 10% of the time (roughly 10 minutes every 100).
The terrestrial transponders probably have an even lower “duty cycle” than those 10%?
We do see a possibility for co-existence here!

Document	B23
Subject	**Operating a remote controlled VUSHF station**
Society	EDR
Contact	Ivan, OZ7IS
Status	Proposal

Following discussions on the most recent open Nordic VHSHF meetings we feel it necessary to define the use of remote operated stations in IARU, Region 1.
The definition will be especially relevant during contests!

In the Nordic contests we now accept remote operated stations in the relevant contest classes if:
"No more than one transmitter may be in use at any one time. All the equipment of the station (transmitters, receivers and antennas, etc) must be located within a single circle of no greater than 500 metres diameter.
A participating station must operate from the same location throughout the event."

As an operator of a remote station you can simultaneously operate more than one remote station. We therefore felt it necessary to state that, as parts of the exchanged information must be unknown to the counterpart in a qso, a remote operator cannot work any other station that he/she is operating!
(We call it "the single brain criteria".)

We recommend the IARU, Region 1, C5 committee to implement similar rules in the general contest rules.

Document	B24
Subject	**Electronic logs for ATV contests**
Society	UBA
Contact	Stefan Dombrowski, ON6TI
Status	Proposal

1. Introduction

Currently, there is no official electronic format to submit entries for ATV contests. This is probably due to the lack of interest by contest log programs to implement the very specific features required for ATV contests.

On the other hand, several local ATV contest groups have started using Excel spreadsheets for logging, like BATC or VERON. In practice, most competitors do submit logs in some electronic format (XLS, DOC …) but the evaluation of logs is still requiring copy/pasting the QSO's from one format to another.

The official REG1TEST format, as used by conventional VHF/UHF/microwave contests lacks lots of the required features for an ATV contest, and extending the REG1TEST format itself will still not be enough due to the absence of specific contest logging software.

2. Requirements for electronic format.

The electronic format should comply with the IARU region 1 ATV contest rules as set in chapter 4.8 of the current IARU region 1 VHF handbook, as wee as the requirements for organising such contests described in chapter 4.2 of the VHF handbook.

It should be easy to use by the operators and the contest managers and should be usable by a wide community of users.

3. Key points and proposal

It is proposed to use a spreadsheet for Microsoft Excel:

- Microsoft Excel (>= 97) is widely available and does not require powerful PC's.
- It is possible to automate lots of tasks (DX calculation, points&multipliers…) even without using "macros" or a dedicated contest logging software.
- Future changes in contest rules can easily be implemented.
- These logs are also usable for the sub regional ATV contests.
- BATC, VERON and UBA already use similar spreadsheets.

The attached spreadsheet can be used as example.

Document	B25
Subject	**70cm & 23 cm Bandplan for Radio Gateways**
Society	UBA
Contact	Stefan Dombrowski, ON6TI
Status	Proposal

1. Introduction

In order to promote the development of radios interconnected to the Internet, such as IRLP and EchoLink, there is a need to determine frequency segments for the 70cm and 23 cm band plan.

The frequency segments should be allocated according to following criteria:

- Voice repeaters interconnected to the Internet and using the traditional in/out split should continue using the same frequency segments and should be coordinated like now within neighbouring countries.
- Radio gateways operated as automatic stations, but using a single frequency should have a separate frequency segment and should be coordinated within neighbouring countries.
- Radio gateways operated by private hams should be allocated in a separate frequency segment. Those stations should be imposed power, antenna height and antenna gain restrictions, and no coordination should be required.

UBA will currently promote Radio Gateways only in the 70cm band and above.

2. Background

Radio Gateways is currently one of the fastest growing activities in the VHF world, and local regulatory bodies are starting to relinquish the long imposed ban on Internet interconnection.

It is therefore important, both for the amateur community and for the observers of the regulatory bodies, to contain activities in order to reduce interference to other users as well as to show our discipline.

Nevertheless, the experimentation and practice of new technologies, such as Radio gateways, should be allowed and encouraged.

On one side, existing repeaters are starting to become part of a network of interconnected repeaters, but such repeaters are already coordinated within the usual radius of 100km and allocated in the corresponding full-duplex repeater segment.

A new kind of repeaters are starting emerge, using one single, half duplex channel, and as such it does not make sense to coordinate them in the full-duplex repeater segments, wasting one valuable frequency.

A third kind of radio gateways are personal stations, where one ham is connecting his personal station to the Internet. In the event that the ham is actually present and operating his station, there is no special need for coordination or dedicated frequency segments; the operator is himself responsible for avoiding interferences by listening first on the free channel. On the other hand, hams using a local RF path to reach via their automated station some remote Internet radio Gateway, should be allowed only in such manner that the local RF path is kept to it's minimum coverage in order to limit interferences with other users. Also, a dedicated frequency segment should be allocated for those local access channels.

The UBA has provisionally allocated following frequencies for radio gateways:

70cm band:

432,8125 432,8250 432,8375 432,8500 432,8625 432,8750 432,8875 432,9000	Unattended simlex/H-duplex radio gateways. Coordination required within 100 km
432,9125 432,9250 432,9375 432,9500 432,9625 432,9750 432,9875	Uncoordinated radio gateways. Limited power & antenna height
1242,950 1242,975 1243,000 1243,025 1243,050 1243,075 1243,100	Unattended simlex/H-duplex radio gateways. Coordination required within 100 km
1243,125 1243,150 1243,175 1243,200 1243,225	Uncoordinated radio gateways. Limited power & antenna height

Currently, there seems to be only the RSGB that also published frequency segments for such usage.

3. Key points and proposal

There should be a segment for coordinated, simplex & half-duplex unattended nodes allocated in the 70cm and 23cm bands.

There should be a segment for uncoordinated nodes in the 70cm and 23cm bands, with imposed limits on the effective power and the antenna height.

The UBA will wait for feedback of the other associations before making a definitive proposal at the next IARU Region 1 conference.

Document	B26
Subject	**Contest Evaluation**
Society	Chair
Contact	Michael Kastelic, OE1MCU
Status	Discussion

Background

To keep contests attractive, evaluations must be available to participants in near real time. Active contesters who put in much time and effort are interested in a swift and precise evaluation.
Unfortunately, the procedure, at the end of which the contest log shows up in the evaluation is not always reliable, and this is also true for the final evaluation. Therefore, many operators are very disappointed if their logs are not included in the ranking, or if no final evaluation is performed

Swift, and, above all, reliable evaluation can vastly increase the populatity of contests, and makes participation even more attractive.

Discussion

This is why I am trying to implement fully automatic contest evaluation on a central server. This is possible due to the general introduction of electronic EDI logs.

Right after the contest, contesters send their logs via e-mail to the evaluation server. The server extracts the log, saves the QSOs in a data bank, and conpares them with previously saved logs and QSOs. Once the QSOs have been checked and, if need be, corrected, participants are added to the score list and displayed immediately.

The idea is to automate this procedure, so that results are available without delay. This means that no manual work is required before the deadline. In this way, societies can save considerable manpower.

For the writing of the required software I do have a small budget to support a group of operators who are willing to take on the task to make on-line contest evaluation a reality.

We think we can have the software ready this summer. Server capabilities can be provided by ÖVSV.

INTERIM MEETING OF THE IARU REGION 1 VHF/UHF/MICROWAVE COMMITTEE
VIENNA FEBRUARY 24-25 2007

Document	B27
Subject	New contest operating Section (6h)
Society	PZK
Contact	Zdzislaw Bienkowski, SP6LB
Status	Discussion

1. In the VHF Managers Handbook V 5.11 in the section 4.6 (Rules 145 September Contest - page 94) and in the section 4.7 (Rules UHF/Microwaves October Contest page 96) there are two contest sections (4.6.2 and 4.7.2) Single Operator (SO) and others (MO).

The duration of the contest is defined in the sections 4.6.4 and 4.7.4 as the period of 24 hours (from 14:00 UTC on Saturday to 14:00 UTC on Sunday).

2. It is observed that the number of the contest entrants decreases each year. One of the reasons for such situation is that people do not want to spend the whole weekend operating in the contest. They need some time for their families and other people.

Some older entrants are not able to take part in the contest for 24 hours. Such entrants will not take part in the contest because they can not be competitive for the entrants operating 24 hours.

3. The PZK would like to invite to discussion about the new contest section: "SO 6h".

Entrants, which want to be classified within the SO 6h section in the contest have to send a log for scoring, presenting maximum 6 successive hours of the contesting time. Each QSO made after that time shall be send in a separate log for check only.

4. Such idea is based on the ARI concepts of the "Regolamento Trofei A.R.I" with a "Categoria 6 ore" < http://www.ari.it/vhf/contests/regolamenti/trofei-ari-vhf.pdf>

Document	B28
Subject	Complement of VHF Managers Handbook V 5.11 - definition of the section SO
Society	PZK
Contact	Zdzislaw Bienkowski, SP6LB
Status	Discussion

1. In the VHF Managers Handbook V 5.11 in the section 4.6 (Rules 145 September Contest - page 94) and in the section 4.7 (Rules UHF/Microwaves October Contest - page 96) there are two contest sections (4.6.2 and 4.7.2):

"1) Stations operated by single operator, with no assistance during the contest.
2) All other entrants."

2. The definition "with no assistance during the contest" is not precise.

- Does the usage of the Internet, mobile telephony violate the principle of "no assistance" or not ? Some entrants are preparing a microwave QSO using chat (ON4KST) and DX Clusters, before or during the contest and other entrants raise objections!

- Can the following case be treated as "no assistance" if two or more entrants operate on the same band from the same place, using the same rig, but each of them uses different call sign?

3. The PZK would like to invite to discussion about that matter and to take into consideration the possibility to divide the Single Operator section into:

- SO no assistance (classic contestant uses the amateur band communication only),

- SO with assistance (contestant uses other communication except the amateur band communication).

INTERIM MEETING OF THE IARU REGION 1 VHF/UHF/MICROWAVE COMMITTEE
VIENNA FEBRUARY 24-25 2007

Document	B29
Subject	Complement of VHF Managers Handbook – Section EME
Society	PZK
Contact	Zdzislaw Bienkowski, SP6LB
Status	Discussion

1. The current VHF Managers Handbook Version 5.11 does not include any section regarding the Earth – Moon – Earth (EME) contacts.

2. The PZK would like to invite to discussion about the following item:

- the possibility of creating such section in the VHF Managers Handbook, like the one already existing which concerns the Meteor Scatter (Operating procedures for meteor scatter QSO's – VHF Managers Handbook - page 134 and Amateur Satellite Operating Procedure – page 141).

While creating this section we suggest to take into consideration the experiences of the REF, ARI and others in the EME contest operating, especially the EME Operating Guide for 432MHz and Above, presented on the 10th Amateur Radio Moon-Bounce Conference and published by G3SEK in Prague in 2002.

3. In the PZK we have an expert Mr. Krzysztof Mroczkowski, SP7DCS <sp7dcs@o2.pl> who can help to create this section.

INTERIM MEETING OF THE IARU REGION 1 VHF/UHF/MICROWAVE COMMITTEE
VIENNA FEBRUARY 24-25 2007

Document	C1
Subject	List of Standing recommendations
Society	President
Contact	Ole Garpestad, LA2RR
Status	Discussion

For as long as I know, all recommendations from the Committees C2 (financial) and C3 (administrative and operational) have been accumulated in a ”Standing recommendation” document. This document has, more or less, been a list of C2- and C3-recommendations added after each Region 1 General Conference. During the last years, a need to revise this paper by going through it and deleting obsolete or outdated recommendations as well as to sort out where a newer recommendation actually contradicts or replaces an older one has been agreed.

However, this process has so far only been identified for C2 and C3 with C4 and C5 left a bit in the air. It is my understanding that the two committees have kept their recommendations updated in the HF and the VHF handbook.

The Region 1 EC would now like to see a similar collection and revision for the C4 and C5 recommendations from our General Conferences. At the next General Conference in 2008, both C4 and C5 will have an agenda item to revise and update the list of standing recommendation for their Committee respectively.

I therefore suggest that you start to introduce and discuss this task already now at your interim meeting in Vienna 2007. The EC will be interested to learn how the two committees would suggest to handle such a task to bring forward an easy to read document over “Standing recommendations” for each Committee.

Comments on "Document B08"

(as presented to the IARU Region 1 VHF/UHF/Microwave Committee)

Document B08, prepared for the Interim Meeting in Vienna on February 24–25 2007, asserts that the digital protocol known as JT65 fails to meet accepted minimum standards for valid QSOs. The document proposes that:

> The IARU Region 1 should decide on minimum requirements for what is considered to be a valid digital QSO. This decision should also include the report system, i.e., what is normally called "unknown QSO information."
>
> The decoding process should at all times allow *any* randomly formatted text message to be decoded. This would be true when the information represent calls and reports, formatted as existing and well established radio amateur QSO procedures dictate.
>
> *Injecting known information to the decoding process should not be allowed for a valid digital QSO.*
>
> *Anyone following the contact should be able to decode the same information, without having the information present on their computer.*

The proposal seeks to impose standards for "digital mode" QSOs very different from those used for traditional modes like CW and SSB. It offers no justification for such a distinction; moreover, its supporting arguments are flawed and readily disproved.

Background. Every method of communication suffers degraded performance when the signal-to-noise ratio (SNR) is low. This is true for all forms of amateur radio voice communication, for "ear-and-brain" CW, and for computer-assisted "digital modes." Whatever the form of coding and modulation, if the SNR is high enough then copy can be perfect, or nearly so. When SNR is low the rate of information transfer decreases, approaching zero at the threshold of signal detectability.

Operators using traditional weak-signal modes such as CW and SSB quickly learn that at low SNR it is helpful to format transmissions in standard ways and to include redundant information in every one. The simplest form of redundancy is repetition, so it is not surprising that when signals are marginal, wise operators include many repetitions of all essential information.

The JT65 protocol. Modern communication technologies use structured redundancies that are much more powerful than simple repetition. The JT65 protocol uses a Reed-Solomon code optimized for the needs of amateur radio weak signal communication, together with a form of modulation (multi-tone frequency shift keying) known to be much more efficient than simple On-Off keying. JT65 has been implemented in a computer program called WSJT, of which I am the principal author.

Standard JT65 transmissions convey exactly 72 bits of arbitrary "user information." As a consequence, any one of $2^{72} \approx 4.7 \times 10^{21}$ distinct messages can be conveyed in a single transmission. The 72 user bits are augmented with an additional 306 bits of mathematically encoded redundancy; the redundant symbols are created in such a way that the exact transmitted message can be decoded, with extremely small probability of error, even if many symbols are corrupted or lost in the noise during transmission. Rather than being transmitted character-by-character, as in Morse code, message information is mathematically spread throughout a whole transmission. Signal dropouts do not cause the loss of isolated portions of a message; JT65 messages are copied in their entirety, or not at all. If enough channel symbols are received with adequate SNR, copy is complete and error-free, with very high confidence. If not, the decoder produces no result and a repeat transmission is required.

Prior information and the JT65 decoder. Experienced weak-signal operators know that with marginal signals it is much easier to recognize and copy one's own callsign (or a familiar one) than unknown calls or random characters. Exactly analogous distinctions apply for the JT65 decoder implemented in WSJT. A fully general algorithm reliably decodes *any* JT65 message down to an SNR limit[1] of about −24 dB. In addition, WSJT offers a secondary decoder that yields reliable copy of *some* signals about 4 dB weaker. This "deep search" decoder is not sensitive to the full range of 2^{72} possible messages; instead, it is programmed to determine specifically whether one of a large number of hypothetical messages was *the exact message transmitted.* Hypothetical messages are generated with the help of a callsign database maintained by the user: calls found there are combined with "CQ", with the receiving station's own callsign, and with optional numerical signal reports. With the default database of more than 4800 callsigns known to have been active in VHF weak-signal communication, this procedure yields more than 14,400 hypothetical messages. If one of the hypothetical messages matches the transmitted one *in every detail*, that message can be decoded with high confidence down to about −28 dB SNR. The slightest difference between hypothetical and received messages — for example, a single-character having been changed or omitted — will cause the deep-search decoder to reject the hypothesis and produce no result.

Again, it should be emphasized that the fully general decoder will decode *any* JT65 message whenever the SNR is adequate. Slightly weaker signals can be decoded if the computer is given some information about the most plausible and interesting message contents. The situation is really no different than with human decoding of traditional-mode signals.

False assertion. Proposal B08 asserts that the JT65 decoding process

> "...is *comparing fragments* of information, *matching* this with known calls and

[1] WSJT's reference bandwidth for SNR measurements is 2500 Hz.

> locators from a database, *reconstructing* and then *printing the full information* on the screen as if it had been received via the airwaves."

This statement is false, as can be easily confirmed in a number of ways. Perhaps most fundamentally, the source code for WSJT is openly available.[2] Anyone can examine the code, compile it for him- or herself, and test it — as many interested amateurs have done. The deep search algorithm is wholly contained in 155 lines of straightforward, easy-to-read code. It contains no "comparing" or "matching" of "fragments of information." Instead, hypothetical messages are encoded in their entirety, just as they would be for transmission. The entire received signal is then correlated against every one of the hypothetical encodings. The structured redundancy built into the 2^{72} possible Reed-Solomon codewords ensures that *any* difference between a transmitted message and a hypothetical test message, *no matter how small,* ensures that at least 52 of the 63 six-bit channel symbols will be different and the correlation will be small. As a consequence, the procedure can confidently determine whether a hypothetical test message is (or is not) identical to the message transmitted — even at very low SNR.

The deep-search algorithm is well understood mathematically and is highly reliable. Its rate of "false positives" is extremely low — certainly lower than that achievable by a skilled CW operator under marginal conditions, even if the CW signals are many dB stronger than the JT65 signals. This fact is the result of the improved efficiencies made possible by using a code with strong "forward error correction," together with the well known SNR advantage of multi-tone frequency-shift-keying over On-Off keying.

Demonstrated proof of integrity. A live demonstration of the JT65 decoder was provided at the August 2006 EME Conference in Würzburg, Germany. JT65 signals could be transmitted at any chosen SNR, with any desired message content, and sent to a receiving computer running the standard WSJT program. Conference participants were invited to explore the operation of the decoder at different SNR levels, perhaps by selecting callsigns included (or not included) in the decoding computer's database. Many tests were also made with completely arbitrary messages, including random cipher groups. Participants were especially invited to try to "trick" the receiving computer into decoding a message that had not been sent: for example, by transmitting at very low SNR a message different in only one character from one that would surely be tested by the deep-search decoder. The JT65 decoders made *zero* mistakes during all of these tests: they either produced the correct result, or no result at all. It was also plainly demonstrated that even with "stranger" callsigns or random cipher groups, correct decoding was always achievable (down to about −29 dB SNR) by using WSJT's ability to average several successive transmissions. Everyone who

[2]See URL `http://developer.berlios.de/projects/wsjt/`

observed and participated in the demonstration was persuaded of the full integrity of the WSJT decoding process.

Minimal valid QSOs. For many years it has been accepted by weak-signal amateur VHF/UHF operators worldwide that a minimum valid QSO requires each station to copy both callsigns, a signal report or some other piece of previously unknown information, and an acknowledgment of complete copy. This easy-to-understand guideline wisely leaves other details concerning the validity of a contact up to the integrity of individual operators. For example, what does it mean to have copied both callsigns during a scheduled QSO attempt, when all of the necessary information is known in advance to both operators? Personal integrity requires that even if the information is already known, it must still be copied over the air, with confidence. Why is it commonly understood that completing a scheduled QSO has a 3 or 4 dB advantage over a contact with an unknown station answering one's CQ? The answer, of course, is that it is "several dB easier" to be sure that you copied something correctly, if you know in advance what to expect. The sensitivity advantage of the WSJT deep-search decoder is the computer equivalent of this well-known fact for human operators. The principal difference is that the computer can be quantitative about how many dB the advantage amounts to — and what it means to be "sure" that information has been copied correctly.

Pages 14–16 of Document B08 reveal a fundamental lack of understanding of how JT65 works in practice, and about modern coding techniques in general. The document fails to recognize that state-of-the-art design of coding and modulation methods can be as important to a reliable communication system as other engineering choices involving state-of-the-art antennas, pre-amplifiers, and power amplifiers. The document makes the nonsensical inference that decoding a Morse-code "O", "RO" or "R" by ear conveys legitimate QSO information, but decoding JT65's "OOO", "RO", and "RRR" messages (whether "by eye" or by a computer) does not.

Contrary to assertions made in Document B08, the JT65 protocol is anything but "private." Full details of its motivation, design philosophy, and implementation were published some 18 months ago in the ARRL technical journal *QEX*,[3] and the same information was made publicly available six months before that. The basic ideas, message structure, encoding techniques, QSO procedures, and other details of the protocol and its predecessor, JT44, have been presented and discussed in a number of open forums and widely attended amateur radio conferences in North America, Europe, and Australia. The most recent example is the August 2006 EME Conference in Würzburg, the published *Proceedings* of which contain

[3] J. Taylor, K1JT, "The JT65 Communications Protocol", *QEX*, September-October 2005, pp. 3–12.

a paper describing the history and capabilities of WSJT with special emphasis on JT65.[4] Additional publications and a complete copy of my presentation at Würzburg can be found on the WSJT web site.[5]

I do not consider it worthwhile to devote space here to detailed corrections of a number of additional misleading or false assertions in the text of Document B08. Instead, I will simply call the Committee's attention to the need (if they should consider proposal worthy of any further consideration) to solicit input from individuals who actually use the techniques that the document attempts to criticize.

Summary. I believe it is self-evident to nearly everyone that the basic guidelines for minimal valid QSOs should be independent of operating mode. The fact is that our long-established guidelines are sound, and JT65 QSOs meet them every bit as well as QSOs using traditional modes. Indeed, under the most marginal SNR circumstances the reliability, accuracy, and information content of JT65 QSOs far exceeds that of many CW QSOs. In writing that statement I am not questioning the integrity of any CW operator or the validity of any CW QSO; I am simply emphasizing the fact that forward error correction makes the decoded content of JT65 messages much more reliable than the best achievable under marginal CW conditions.

Yes, EME QSOs using the technology advances in JT65 are significantly easier to make than CW or SSB QSOs using otherwise identical equipment. Similar quantum leaps in weak-signal capabilities have occurred in the past several decades when other new technologies (for example, low-noise GaAsFET transistors and computer-optimized antennas) became available. We should be proud that radio amateurs have quickly learned and adopted these state-of-the-art additions to the technology of radio communication — and that our hobby has welcomed the advances.

Joe Taylor, K1JT
January 10, 2007

---

[4] "Open Source WSJT: Status, Capabilities, and Future Evolution." J. Taylor, K1JT, in *Proceedings of the 12th International EME Conference*, Würzburg, August 25–27, 2006.

[5] See URL `http://pulsar.princeton.edu/j̃oe/K1JT/Documentation.htm`.