Report

Global Simulated Emergency Test (GlobalSET)

May 3rd 2008, 18.00 – 22.00 UTC

by

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Content

1. Background and objectives

This was the first event under the title 'Global Simulated Emergency Test' or 'GlobalSET' and continues the work started in November 2006 of the 'EmCom Parties on the Air'. The new name was intended to reflect the seriousness of the exercise as well as avoiding the 'party' name also used by some contests. The aim however remains the same, to provide an opportunity for Amateur Radio Emergency Communications Organisations around the World to demonstrate the provision of communications across national borders since disasters do not respect national boundaries.

The GlobalSET had four objectives:

1. increase the common interest among member societies in emergency communications,
2. test how usable the CoA frequencies are across ITU Regions,
3. create practices for international emergency communication and
4. practice the relaying of messages by voice and data modes.

This exercise attempted to address some organisational difficulties experienced in November 2007 by making the announcement and instructions available in languages other than English.

Two notable 'firsts' were that full 'HQ station' coverage was available in each IARU region to receive messages by voice throughout the exercise. This has not been possible in earlier events but now that the exercise is truly global it was easier to achieve.

Data modes were also included for the first time though no dedicated HQ stations were available for those modes. This did cause an issue with the use of modes such as PSK31, RTTY etc. but there was a great deal of interest from more structured modes such as Winlink, ALE and PSKmail who have fixed stations on VHF/HF able to pass received messages onto the internet and a dedicated email address was provided to receive this traffic.

We always say, "**This is not a contest – this is an emergency communication exercise!**", this does not mean though that contests will not have an impact on us... Unlike earlier 'Parties on the Air', the times of the GlobalSET will change for each event so that each region experiences the difficulties of communicating in daytime, evening and night time hours. Unfortunately this meant that what had been a previously clear weekend in earlier events now clashed with contests in Region 1 that started later in the day. This obviously had an impact on the way that some stations were able to operate with high levels of contest QRM which together with operating at different times of the day added some frustration but also a sense of realism to the event.

2 Achieving Objectives

2.1 'To increase the common interest among member societies in emergency communications.'

An electronic mailing list was set up to allow interested parties to be kept advised of developments. With representatives from all three regions , good support was received in the organisation of the event and much help was received in preparing translations of the GlobalSET announcement and rules into languages other than English. The idea was that this would help in getting announcements placed in local magazines and news broadcasts but unfortunately this good effort did not bring the expected results and getting the event publicised in some areas remains a problem.

Despite this, the number of countries participating in the Parties on the Air continued to increase, though the participation is now spreading more around the World reflecting more convenient operating times for the event. As in previous years, the average number of operators reported by stations has been used to provide an estimate of total global participation.

Date	Countries Participating	Estimated Operators
November 2006	27	100
May 2007	30	140
November 2007	35	~240
May 2008	40	~270-308

Some groups continued the theme set last year by the Bangalore Amateur Radio Club in obtaining a Special Event Callsign to raise awareness of Amateur Radio Emergency Communications. This had variable success with some groups having difficulty in obtaining such special callsigns from their National authorities. This is disappointing, but not having a special event callsign should not be a barrier to participating in the event in its current form. Where emergencies occur it is unlikely that Special Event callsigns would be available, this is why the GAREC conference in 2007 recommended the use of the suffix /D to indicate emergency working, though as will be stated later, this usage does present some problems with some licensing authorities and data modes.

Generally, this objective continues to be achieved and a list of countries and entities which participated in this exercise is given in Appendix A. This time the list includes groups such as the International Radio Emergency Support Coalition (IRESC) which are not part of any national organisation.

2. **To test how usable the centre-of-activity frequencies are across the Regions.**

Propagation conditions remained at or near Solar minimum conditions for GlobalSET, this together with the different timings for the event caused many stations difficulties in making contacts with some not able to pass any messages at all.

The introduction of Data modes also caused some problems, the Centre of Activity frequencies (CoA) are all in the 'voice' segments of the bandplan. While some licensing authorities do not restrict where data transmissions can take place others do so it became impossible to have Data and Voice transmissions in the same area as the CoA. This had the impact of making the more informal modes such as PSK31 and RTTY difficult to use since there was no dedicated HQ station to communicate with and even if there was, where could they listen to be compliant with bandplans and regulations. Most of the data messages were passed on more formal networks such as those provided by Winlink, ALE and PSKmail where fixed stations are available to link radio users to the internet, this allowed a lot of data messages to be passed but is not strictly compliant with part of ITU recommendation M1042-2 that Amateurs should prepare networks which are "robust, flexible and independent of other telecommunications services and capable of operating from emergency power". The topic of data modes will inevitably need to be discussed at GAREC-08 to investigate how we can make full use of both formal and informal data modes in future exercises.

The HQ stations suffered particularly this time, the Region 3 station provided by JARL made no contacts at all through the period, the Region 1 station OF3F had originally been selected as a data modes station and did not have operators used to operating weak signal SSB. Despite a good station, OF3F also could not compete with contest stations using voice keyers occupying frequencies which were to have been used for the exercise. Region 2 is lucky in that a number of groups occupy 14.300 to provide emergency message handling facilities for Maritime Mobiles and others so there is an existing structure to take messages on that frequency. The Maritime Mobile Service Network accepted GlobalSET messages alongside their normal traffic using a different station every hour to provide good geographical coverage. It is unfortunate that they did not receive a great number of messages due to poor publicity in Region 2. Alternative HQ stations would also be needed in that area for times when 20m propagation would not support message handling.

Contests were not the only problem to exist during the exercise. 80m was heavily used for traffic in Region 1 but the CoA frequency of 3.760MHz was in use by both UK and German nets early in the evening, as propagation changed and the two nets became aware of each other they began a number of actions to try and hold 'their' frequency and drive off the other. This made the true CoA unusable for some time but

we should remember that these are 'centre' frequencies, not absolute frequencies. G4HPE of IRESC was running a VoIP->HF gateway on 3.753MHz and on this clearer frequency this activity provided a second focus for 80m messages to be passed as required.

Maps of the Ionospheric conditions existing during the event are given in Appendix B but these do not reflect some of the observations made in Region 1. High powered stations were unable to make contacts where low powered or even QRP stations were able to get through at the same time or even to the same station. Experience on HF bands and participation in regular exercises seems to play an essential part in successfully getting messages through.

The message format required that stations reported the bands that they were capable of operating on as part of the exercise, by analysing the all the log entries submitted the following distribution of available frequencies was obtained.

Band	**% of total reports May 2008**	**% of total reports Nov 2007**
80m	24.09	15.18
40m	24.55	20.42
20m	25.45	34.03
17m	8.18	15.08
15m	10	13.09
2m	1.36	2.09
Others	5.91	-

Previously reports have been dominated by those from IARU Region 1 which has operated in daylight hours leading to 20m appearing to be the preferred band. This time, increased reporting from other Regions as well as Region 1 operating in the Evening time led to a more even distribution of bands available for use. However since the majority of Stations were in Regions 1 & 3 which were operating the event during darkness hours it is probably unsurprising that >60% of contacts reported were on 80m. The next most used band was 20m (21%) and then 40m (15%).

Some contacts were able to be made between the regions and 20m remains the preferred band with some interesting propagation being observed. Comments about the problem of QRM are noted, the CoA still do not appear in all published Band Plans so increased publicity is still a requirement for the CoA and the GlobalSET.

2.3 To create practices for international emergency communication.

The message format used in GlobalSET is intended to create some random data for transmission and avoids the creation of complicated scenarios or the use of messages which may cause alarm and concern if heard by people not involved in the exercise. The message format for the May 2008 GlobalSET gathered information on Emergency Power available or in use at stations and following problems in the last event, more messages were allowed to be originated by stations to avoid excessive repeats.

Despite having the exercise message format translated into other languages there were still problems with stations sending incorrectly formatted messages, sending them to the wrong email addresses etc. The GlobalSET messages require stations to learn or understand something new every six months but not really develop a means of passing true emergency messages.

Introducing data modes added a new dimension to GlobalSET but also raised two problems that had not been anticipated.

- Some data mode software will not accept '/D' as a callsign suffix for transmission or identification. Other systems treat '/D' as a separate callsign from the main call so leading to messages being left in two different mailboxes.
- Some data modes will not pass punctuation marks like '/'. This led to messages which were sent via the ALE-SMS data service being in a non standard format to fit the capabilities of that service.

Having messages that change their content depending upon which mode is used to transmit them is not good for message accuracy and having variation in the message structure passed during each exercise is not good for getting a common message handing procedure.

Previous reports have reminded stations that there is already an "IARU HF International Emergency Operating Procedure" which is a sub-set of the ARRL National Traffic System procedures. (http://www.darc.de/referate/notfunk/info/emerg-ww.pdf)

After two years of global exercises it is now time to make solid plans to meet this objective using the procedures we have available to us now. The following recommendations are made to achieve this;

1. The November 2008 GlobalSET will keep the same message format as May 2008 but will introduce CW as an operating mode. We will have then brought in all modes and tested at all times of day in each Region.
2. The May 2009 GlobalSET will call for messages to be sent according to the IARU HF International Operating Procedure. Messages can be sent from Amateur to Amateur without conflicting with any licence conditions, the content of the messages to be agreed at GAREC-08.

It is time to make progress with this objective. There is only so much stations can learn about propagation with exercises in the current format and the level of interest needs to be maintained. Many countries have their own message formats and the re-introduction of the IARU format may meet resistancebut we have to start somewhere. There are differences in approach between the Regions which are created by their local conditions. The best example of this is the use of 'Q' codes, the Maritime Mobile Service Net in Region 2 wishes to eliminate 'Q' codes and use 'plain language' while NETMAR in Region 1 which servesthe same community promotes the use of 'Q' codes. The reason for this may be that in Europe with many languages in use other than English, Q codes allow for efficient and unambiguous messages to be passed, while in North America the English language is more prevalent. Both parties are using the codes correctly for their normal nets, when we wish to have international emergency communications though we all need to be using the same format.

Waiting until May 2009 to introduce this message format will give enough time for groups to learn the procedure, translate it if necessary and produce message forms in a format which is independant of language so the structure of the message should not change dependant on the country of origin.

2.4 To practice the relaying of messages

To overcome difficulties from the message relayexercise of November 2007 stations were now allowed to originate up to six messages during the exercise.This was intended to allow multi-operator, multi-band stations enough messages to send on all bands until they had some messages from other stations to relay. Confusion over the instructions and poor propagation to the HQ stations meant that the success of the message relay section of the exercise was difficult to judge for voice stations. 292 lines of log for the voice section of the exercise were received but without a consistent chain of log entries from source to destination it proved difficult to perform any meaningful analysis.

While not strictly 'relayed' messages, an analysis of messages submitted by Data modes was interesting since some stations dispatched their quota of six messages to the defined address of globalset-data@raynet-hf.net at regular intervals through the exercise.It had previously been commented during the planning stage that it would be interesting to time how long it took for a message to be relayed on voice, the message format however does not allow this to be easily achieved. On the structured data modes used for this GlobalSET though, since all messages were originated in an email format then they weretime stamped at the time of sending and at points when they passed through internet email servers.

It is normally assumed that email is accurate and quick for message handling, on this occasion though it was observed that messages were subjected to a wide variation of message delays and messages that were sent at regular intervals arrived out of sequence due to delays. The cause of these was not readily identifiable through examination of the email headers but given

that the number of messages passed through the various systems was a small fraction of their normal quantity it also seems unlikely that it was due to an overload of the amateur systems. This is an issue which needs further investigation on the next GlobalSET. The summary of messages passed by data modes is as follows.

	Winlink	ALE-SMS	PSKMail
Number of messages	62	23	1
Minimum time delay	41 seconds	36 seconds	16 minutes 44 seconds
Maximum time delay	7 hours 48 minutes 57 seconds	4 hours 46 minutes 24 seconds	16 minutes 44 seconds
Average delivery time	1 hour 55 minutes 8 seconds	1 hour 9 minutes 5 seconds	16 minutes 44 seconds

Whether the message is passed by voice or data it needs to be sent accurately and quickly. While the intention is to keep the message format the same for the next event in November 2008 it would be useful to get Data stations to include the time of message creation in their transmissions to allow further investigations into the delays experienced in passing messages in this exercise.

The ALE community set up an alternative address to receive messages of GSET@HFLINK.NET because not all ALE radios are capable of sending the hyphen (-) character so the official address would be unreachable to them. ALE messages are then relayed to their destination via the Winlink email system which includes an anti-SPAM measure to protect their users from unwanted email. The way that this works is that stations only receive email from people who they have sent a message to first. Unfortunately the use of the alternative address by the ALE community meant that the automatic response message sent by globalset-data@raynet-hf.net was blocked by the system and did not get back to the originator since as far as the system was concerned the message had been sent to GSET@HFLINK.NET. It is not unreasonable for messages or email addresses to contain punctuation marks but there is no way for all ALE controllers to be able to send those marks. This is something which would require close control by system administrators to set up alternative addresses in an emergency to ensure that messages get through to their destination.

Finally, since HQ stations had some difficulties a number of stations were asked for their logs of messages sent and received. Since a number of countries have removed the requirement to keep logbooks, some stations were not able to provide this information. If messages were being passed for a real emergency it is important to keep copies for any enquiry after the event and this practice should include exercise messages.

3. Organisation

An email was sent to all earlier participants in the event inviting them to join a new mailing list for co-ordinating the GlobalSET even. There are 44 members of this list and they contributed greatly to the organisation by commenting on early versions of the rules and providing translations of the event documents in various languages to improve participation from non-English speakers. It was hoped that this service would assist in publicity for the event but it was not used as widely as was hoped and deadlines for National Society magazines were missed again. Since the event needs to educate all amateurs about the Global CoA frequencies rather than just the Emergency Communicators, there remains more work to be done in this area.

One problem remains the fear of 'QRM and chaos' from stations operating on the CoA frequencies in an uncontrolled manner. It would be easy to publicise the event via independent magazines in some countries but this would run the risk of upsetting National Societies whose support is still required for Emergency Communications. This will not be an easy issue to solve but continued demonstration of the discipline of our operators who pre-register for the event and good on-air practices will hopefully convince people that we can all function on air together in an emergency.

159 stations pre-registered for the event and only a further 17 joined on the day. These extra operators balanced the 23 who either could not get on air or who were unable to make any contacts through the Contest QRM. 130 Stations were actually active and able to make contacts during the event. It is difficult to identify how many messages were actually passed or relayed in the four hours of the exercise since propagation and QRM made operation difficul but this number of stations could have resulted in 780 messages and if those messages had been relayed twice before being passed to a HQ station then 2340 messages could have been passed between all stations in four hours. This does raise questions about how large the event can become before the system would become overloaded but at the moment it does not appear to be a problem .

Following earlier difficulties in getting publicity circulated for the event via conventional Amateur Radio News outlets more use was made of email to directly inform previous participants. As before the event information was sent to IARU Regional Emergency Co-Ordinators, the IARU Region 1 mailing list and the event was also publicised via the HFLINK and PSKmail mailing lists which continued to improve participation from Region 2. Having a HQ station in each region is a challenge but also a key part of the exercise. If stations feel that it is achievable to get a message through to their regional HQ station then they will take part. The availability of the Maritime Mobile Service Net to accept messages in Region 2, even on just one CoA along with the availability of a direct email address for data stations to submit messages to allowed more stations to participate than before and this progress needs to be maintained.

Email has previously been recognised as an important tool in organising events but it also has some drawbacks. Email is not a 100% guaranteed delivery system and it is thought that some of the initial announcements of the event did not get through to all recipients due to SPAM checking software or changed email addresses. A number of email addresses were also set up to assist with the organisation of the event, though due to some misunderstandings they were not all used in the way that was intended;

- globalset@raynet-hf.net is the mailing list set up for the event and exercise messages should not have been sent to this address.
- globalset08@raynet-hf.net was intended to receive registrations from both voice and data stations, messages and reports from voice stations.
- globalset-data@raynet-hf.net was intended to receive messages from data stations.

All these addresses have now been published on a number of websites around the world and have been gathered by various SPAM email sources. The addresses 'globalset08' and 'globalset-data' may be changed annually to try and minimise the amount of junk email received by the organisers, this is not intended to make things difficult for stations taking part but does also ensure that everyone reads the exercise instructions carefully.

4. Comments from participants.

A number of comments were received from participants and the HQ stations. All were appreciated and this report can only show some of those received. If your comments are not shown here please do not take it personally ! All have been read and taken into consideration.

Poland -
GlobalSET was interesting experience and great chance to improve the operating skills. Unfortunately there is still big problem with QRM from contest stations. Many stations are not aware of (or just ignore) emergency communication priority.

OF3F -
At 20:00UTC ARI contest started and noise level on 40m was S9+40at our location. It was completely impossible to hear anyone else than strong Italian contesters.
The other observation was about the message format.Most of the stations sent their messages in the proper format, but some used own variations. This means that the receiving station has no means to check if the message was received correctly. In order to make the message traffic professional and reliable the message formatneeds to be strictly standardized and followed by all participants.

Germany (two different stations)-
Just a little suggestion.... we heard many stations, but for beginners it was very hard, to write the complete message in one loop.. my idea.. why is everyone speaking so fast.. just a little slower.. and.. well just ONE times to speak my message..

We had 5 operators and 1 visitor in our 9 sq-meter shack. The visitor was a young lady of a German broadcasting station producing a feature about Hamradio-operation.She (or we) had the chance to give an impression of the enthusiasm of young people for hamradio and emergency operation.
So far our experience of the first Global Simulated Emergency Test this year. Compared to the number of messages we received during last EmCom Party the result was a bit poor, but the fun and interest of the operators was great.

France -
GlobalSET-08 was an interesting event. At least from my qth, propagation was very poor, nothing on 20m, and the exercise proved that 40m is definitely too congested for efficient message handling, at least in the evening. 80m was relatively quiet but signals came up later in the evening. The Portuguese contest added to the confusion, but it seems that people start to notice the difference between an emergency test and a contest. I did not notice a single announcement for a "special call sign" station or such on the DX cluster we monitored continuously.
Echolink and similar advanced data systems are definitely an option for cases where communications within a disaster-affected region are disrupted, but Internet remains available for links to locations outside this region. It adds a new dimension of inter-operability, which is worth developing further.

Maritime Mobile Service Network, Region 2 HQ stations -
From our standpoint, the exercise went quite smooth. The only problem we observed was some confusion about the message format. The web page was a little ambiguous as to how the format worked. In particular, we did not know if the first item was the callsign of the sending station or the recipient. The same holds true for the last item.

Austria -
In voice mode most frequencies are blocked here, either by the stupidity of the users (3760) or other other SSB chatters (7060) who are not willing to leave the QRG to GlobalSET2008 users.

JA1RL Region 3 HQ station -
Just came back from our HQ station that logged NO Global SET station.
We were monitoring 40, 20, 17 and 15m from 18 to 22Z (03 to 07 local),however, we could hear no Global SET station. All the bands were dead until about 20Z. We heard some EU stations on 40m running ARI contest after 20Z, and then T80K from 21Z among JA local QSOs.On 20m, we heard one strong VK4 station on 14305 running a net(?) from around 21Z. 17 and 15 were completely dead.

Australia -
We enjoyed the exercise albeit on short notice and a 4 o'clock in the morning start, local time. The next one in November will be a lot better, starting at 2pm local. I guess emergencies happen at all hours of the day or night, with little or no warning!

UK (VoIP gateway report)-
It is very satisfying, from an emergency comms perspective, that the Gateway enabled effective connections between participants even though band conditions and language differences could have been hard-going. But the Gateway is just a technical tool – the credit goes to the operators whose procedure was impeccable and showed that amateurs canwork together efficiently to provide assistance should the call come.

Uruguay -
A short report from a lonely South American station, CX1AA/D on 20 meters. No signals on the other bands, on 20 just a few, never showing more than S2 on the S-meter.
CX1AA used FT1000MP, 1Kw and 3 el yagi 25 meters high in a quiet location. The operation was much better than the last one. In that occasion we made just 1 qso ! This time 5 qsos were made, we sent and received several messages and heard a few more signals.

5. Summary

The organisation of the GlobalSET for May 2008 started in Februaryand comprises 10 weeks of work before the event and five weeks afterwards compiling logs and reports. The co-operation of all stations in registering, participating, and reporting is appreciated, especially in difficult conditions when it may not always be obvious that the event was a success. This exercise was a realistic situation in many ways. HQ stations were unable to make contacts so alternatives were required, propagation was poor and conflicting activity caused QRM but despite all this messages did get through. Stations learned more about their strengths and weaknesses and can be better prepared next time. Despite some comments, looking at all the results we are still achieving the objectives and good progress is being made.

The next Global Simulated Emergency Test is planned to be on November 8th 2008 between 0400 and 0800 UTC. This will be a challenge for Region 1 operators who will have Once again all interested parties are invited to participate and we look forward to receiving your reports.

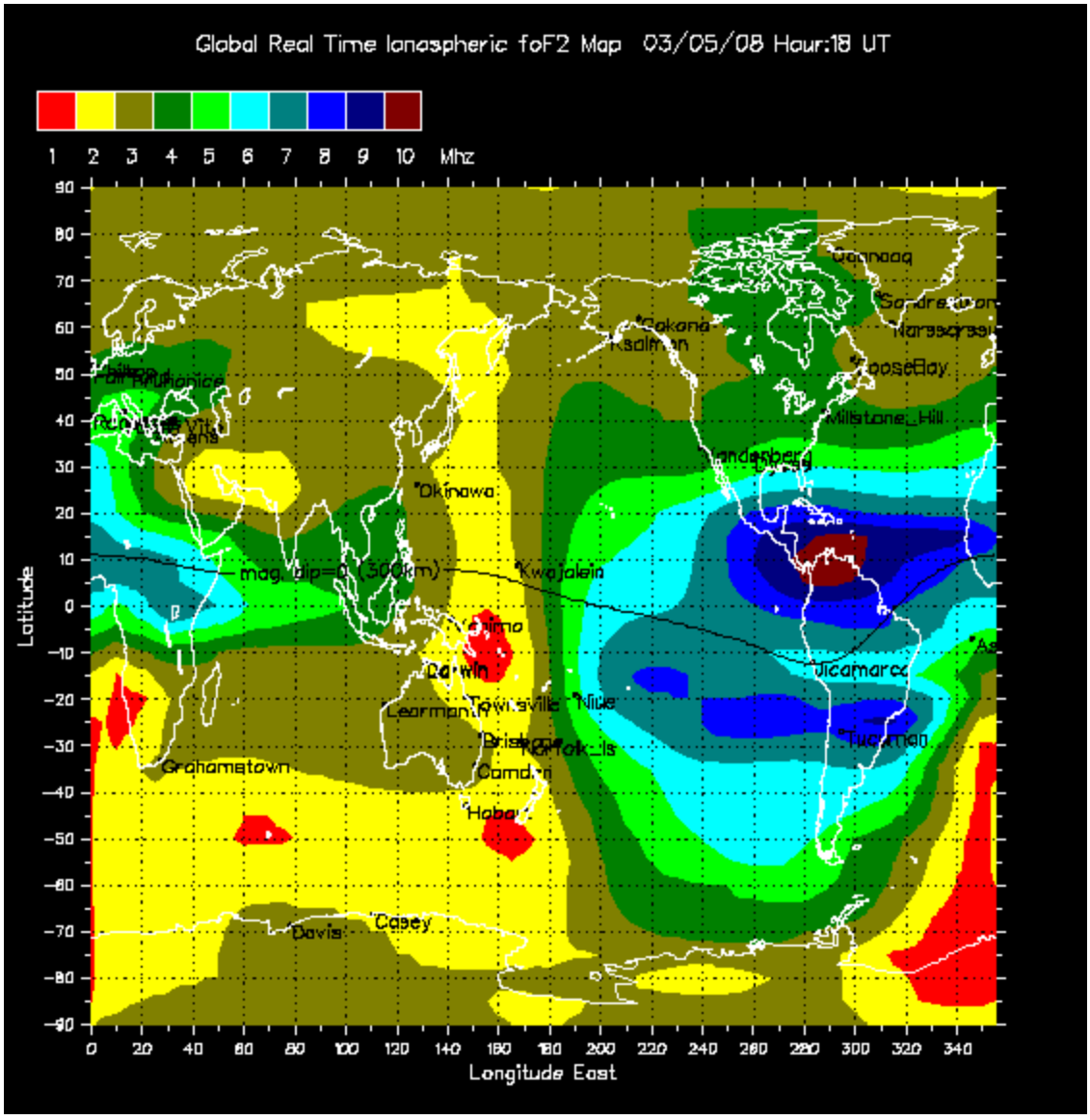
Thanks to everyone for their support !

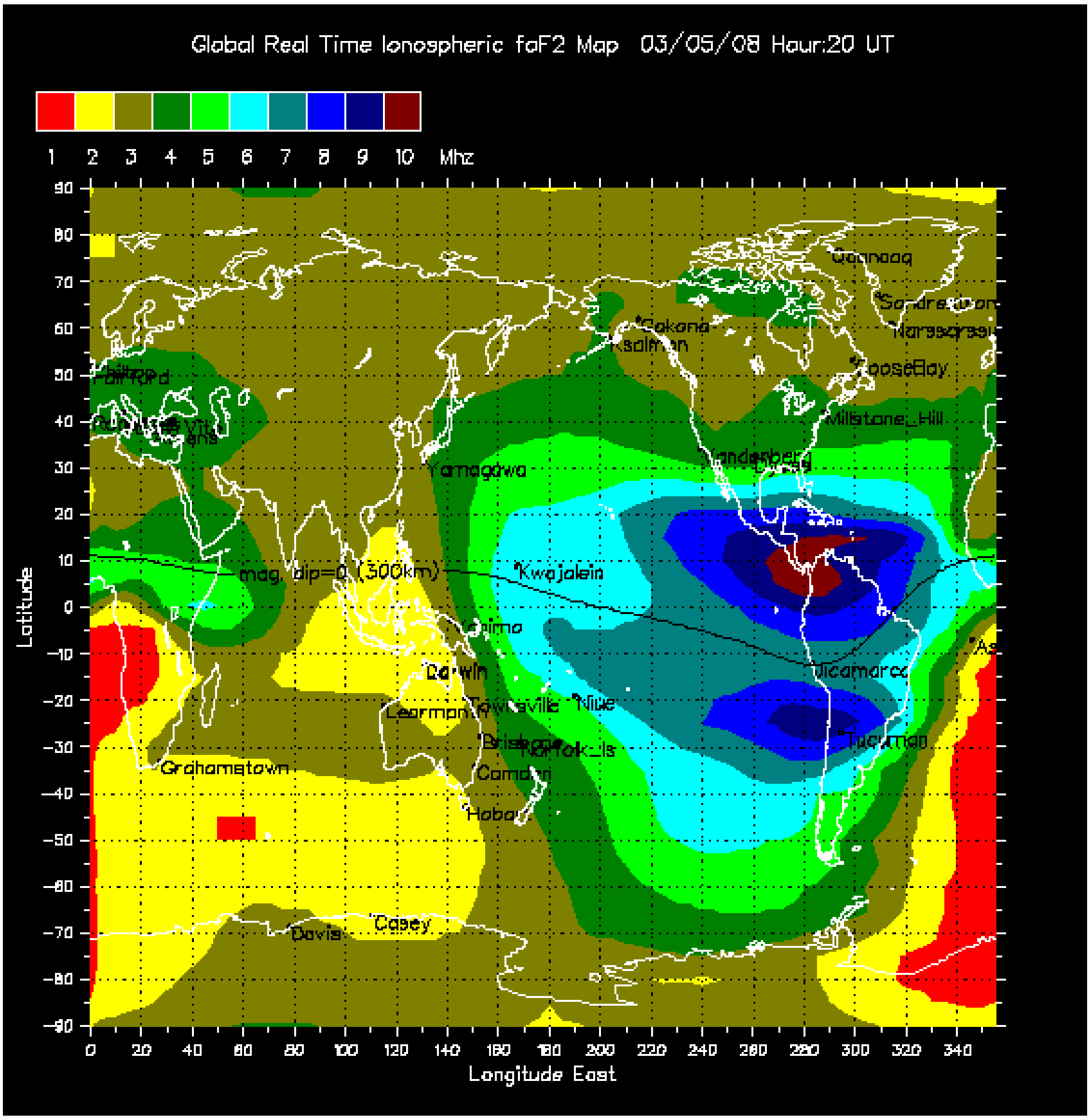
Appendix A – Participant Countries/Entities

Australia	Latvia
Austria	Lebanon
Belgium	Liberia
Bulgaria	Malaysia
Canada	Malta
China	Netherlands
Croatia	New Caledonia
Cyprus	New Zealand
Czech Republic	Oman
Egypt	Poland
Finland	Portugal
France	Republic of Ireland
Germany	Republic of South Africa
Greece	Singapore
Hong Kong SAR	Slovak Republic
India	Sweden
Indonesia	Switzerland
IARU	United Kingdom of Great Britain
IRESC	Uruguay
ITU	United States of America
Japan	

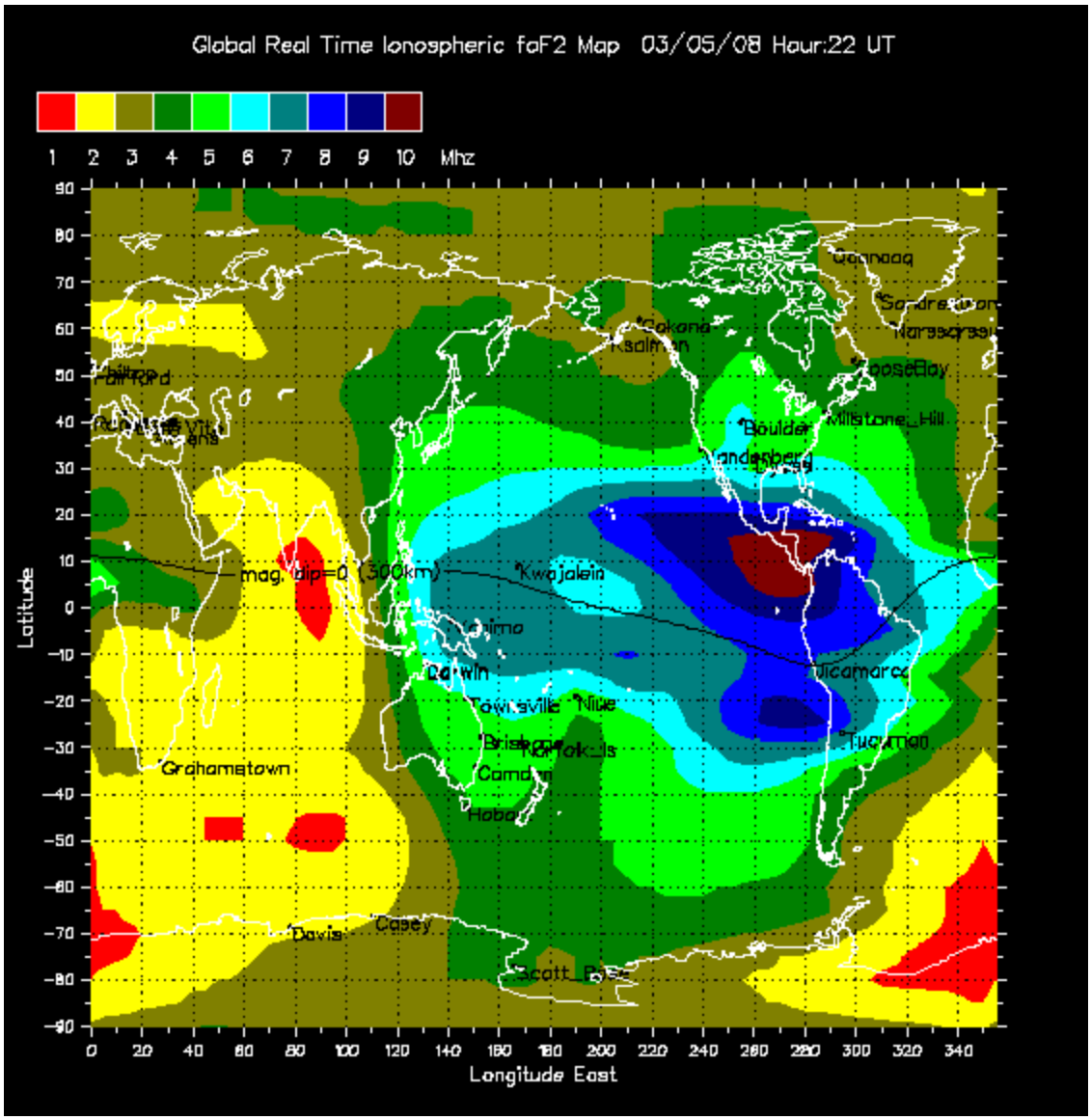
Appendix B – F0F2 Frequencies for the duration of the Party on the Air

(Source www.ips.gov.au)





Global Real Time Ionospheric foF2 Map 03/05/08 Hour:20 UT
1 2 3 4 5 6 7 8 9 10 Mhz
Latitude
Longitude East
mag. dip=0 (300km)
Qaanaaq
Sondrestrom
Narssarssuaq
GooseBay
Millstone_Hill
Vandenberg
Gakona
Yamagawa
Kwajalein
Jicamarca
Darwin
Learmonth
Townsville
Niue
Brisbane
Norfolk_Is
Tucuman
Grahamstown
Camden
Hobart
Davis
Casey
Chilton


Global Real Time Ionospheric foF2 Map 03/05/08 Hour:22 UT
1 2 3 4 5 6 7 8 9 10 Mhz
Latitude
Longitude East
mag. dip=0 (300km)
Kwajalein
Boulder
Millstone_Hill
Grahamstown
Davis
Casey
Scott_Base
Hobart
Townsville
Niue
Norfolk_Is
Tucuman
Ascension
Darwin