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SUBJECT	METEOR SCATTER		
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During the Vienna meeting last year, a working group was created or better said, the existing working group on MS-procedures was asked to come with a MS procedure which would take into account the following objectives :

1. The procedure should be mode independant
2. the procedure should be band independant - any reference to any frequency should be taken out and migrated to the bandplan
3. the procedure should be a procedure which was to be discussed and agreed on a broader scale.
4. The procedure should be more precise and compact

Unfortunately, as you know, this workgroup decided that the work was completed, even though many members objected, and a proposal, which does not meet the Vienna 2004 criteria was sent as a final document to the chair of the R1 committee. In fact that document is a step back as especially on the random timing issue, as the procedure can only be applied to any QSO of which one of the stations is in the IO and JO fields and the other station is outside. Random QSO's completely inside or completely outside those fields will not be possible according to this procedure. As such the proposed procedure may be a valid Western European Procedure, but certainly not an all-European leave alone Region 1 procedure.

As such OeVSV felt it necessary to continue the work to come to a better proposal to meet the above mentioned objectives. Attached you will find 2 proposals which need to be considered with the other as a reference; plus a motivation of why the proposals are as they are. The document is not from OevSV only; Extensive discussions with a number of active MS operators both within OE and outside OE have been instrumental in coming to this procedure. PE1AHX has been very helpful in drafting the English text and as a very critical "mirror".

The main points are:

Bandplan change

- create a second MGM sub band around 144.170 in order to allow for more space "far away" from the 144.370 center of activity. The change also allows more space for the increased MGM EME activity.

MS R1 Procedure :

- uniform period lengths for all modes
- taken out a lot of unnecessary text
- taken out specifics on SSB and HSCW operations, considering that these modes are hardly used nowadays and that the specifics as they were extremely useful once, have lost their importance
- taken out the "missing information" procedures; same motivation as before; but inserted one "error" message
- taken out all frequency specific information
- taken out all examples, and rephrased the relevant text portions, considering that any text which need to explained with an example is badly written.
- new reporting scheme
- and several other minor and cosmetic things

I therefore OeVSV kindly asks you to consider the documents for decision.

See attached detailed papers.

Proposal for 144MHz bandplan change.

1. Considering.
 - The rapid increase of FSK441 based meteorscatter activity.
 - The increasing problems with the period system described in the IARU R1 MS procedure especially in the central part of Europe. These problems are spreading as a result of the increasing activity in Eastern Europe and the Mediterranean area.
 - The large fringe areas where stations can and do interfere with each other regardless of the wording used in the MS procedure.
 - The problem can be alleviated by allocating a secondary calling frequency at sufficient frequency distance.
 - That the same period problems exists when executing QSO's close to the calling frequency
 - That this problem can be alleviated by allocating a secondary frequencyspectrum at sufficient frequency distance for using in opposite periods as per the proposed new MS procedure.
 - The worldwide increase in EME activity using narrow band MGM modes resulting in de facto use of frequencies as high as 144.160
 - The substantial decrease in CW and SSB activity in the 144MHz band.
 - That the drop in CW activity does not justify a large part of the spectrum on a non-shared basis

2. Proposals.

Modification of the current bandplan as follows:

 - Change the current low frequency limit for 500Hz MGM from 144.135 to 144.080 to increase the available frequency spectrum to these modes.
 - Change the current high frequency limit for 2700Hz MGM from 144.165 to 144.195 in order to increase the size of the 2700Hz MGM subband.
 - Add following text to Usage of 144.150-144.195: Secondary FSK441 allocation. 144.170 Secondary FSK441 calling frequency (m)
 - Modify Usage of 144.360-144.399 to: Primary FSK441 allocation. 144.370 Primary FSK441 calling frequency (m)

OPERATING PROCEDURE FOR METEOR SCATTER QSO'S

1. Introduction

The goal of the procedures described is to enable valid contacts to be made by meteor scatter (MS) reflection as efficiently and easily as possible. As the reflections are often of very short duration normal QSO procedures are not readily applicable and measures must be taken to ensure that unmistakably correct information is received. Even though there are times when reflections are strong enough to make some of these measures unnecessary, there is no reason why the suggested procedures should not always be used.

2. Scheduled and Random Contacts

Two types of MS contacts, arranged in different ways, may be distinguished:

- a. A scheduled contact, where two interested stations arrange in advance the frequency, timing, transmission mode and call signs to be used.
- b. A non-scheduled contact, where a station calls CQ or responds to a CQ call. These are called "random contacts".

3. Timing & Transmit Periods

- a. MS operation requires clocks to be set to better than 1 second of standard time.
- b. The recommended duration of a period for all modes is 30 seconds.
- c. In order to minimise interference with other stations standard transmit periods are recommended as follows:
 - i. All MS operators living in the same area should, as far as possible, agree to transmit simultaneously in order to avoid mutual interference.
 - ii. Northbound and Westbound transmissions should be made in odd periods (1, 3, 5 etc. counting from the full hour) while transmissions in opposite directions should be made in the even periods.
 - iii. When two calling frequencies are available in a frequency band 3.c.i and 3.c.ii are to be used for the primary allocation. Periods and directions are to be reversed for the secondary allocation.

4. QSO Duration

Every uninterrupted QSO period must be considered as a separate trial. QSO's which are not completed within 3 hours are to be considered unsuccessful.

5. Frequencies

a. Scheduled contacts

These contacts may be arranged on any frequency, taking into consideration the mode and band plan. Scheduled contacts must not use the random MS frequencies. Special care should be applied on the frequency selection to avoid interference when using reverse transmit periods according to your location.

b. Random contacts

The frequencies used for CQ calls for random contacts should be according to the IARU Region 1 band plans. In addition to using the random calling frequencies, calling CQ on alternative frequencies is strongly encouraged. Due to the nature of MS, announcing an alternative frequency by selfspotting via DX-cluster or other electronic means will help decrease the pressure on the calling frequencies and is therefore strongly encouraged

6. QSY Frequencies

To avoid interference, QSY is recommended. During the CQ the caller indicates on which frequency he will listen for a reply and wants to carry out any subsequent QSO. The procedure is as follows.

Calling Station:

- i. Select the frequency to be used
- ii. In the call, immediately following the letters "CQ", the kHz part of QSY frequency is inserted.
- iii. During the receiving period the receiver should be tuned to the QSY frequency
- iv. When the caller receives a signal on the receiving frequency as an answer to his CQ, the rest of the QSO procedure takes place on this QSY frequency.

Answering Station:

- i. Listen on a calling frequency.
- ii. When a CQ call is received, note the kHz-frequency
- iii. QSY to the indicated frequency, and transmit a reply during the appropriate period.
- iv. As the QSO will take place on this frequency, continue to transmit and to listen, during the appropriate periods, on this frequency

7. QSO Procedure

All modes use the same QSO procedure. When attempting random SSB contacts, speak the letters clearly, using phonetics where appropriate.

a. Calling

The contact starts with one station calling CQ or during scheduled contacts by calling each other by sending both call signs, e.g. "DXCALL MYCALL DXCALL MYCALL....".

b. Reporting system

The report consists of two numbers:

	First number (Burst duration)		Second number (signal strength)		
			S-Units	S/N	
1:	0.0sec	<	0.1sec	6: <S2	<5dB
2:	0.1sec	<	0.5sec	7: S2-S3	5dB-10dB
3:	0.5sec	<	1.0sec	8: S4-S5	10dB-15dB
4:	1.0sec	<	5.0sec	9: >S5	>15dB
5:	5.0sec	>=			

c. Reporting procedure

A report is sent when the operator has positive evidence of having received the correspondent's or his own call sign. A report is sent immediately when replying to a CQ call.

The report should be sent twice between each set of call signs: "DXCALL MYCALL 37 37 DXCALL MYCALL 37 37".

NB The report must not be changed during a contact even though signal strength or duration might well justify it.

d. Confirmation procedure

As soon as either operator has correctly received both call signs and a report he may start sending a confirmation.

Confirmation is given by inserting an R before the report: "DXCALL MYCALL R37 R37 ...".

When either operator receives a confirmation message, such as "R27", and all required information is complete he must confirm with a string of R's, inserting his own call sign after each fourth R: "RRRR MYCALL RRRR MYCALL".

If and when both operators have received confirmation the QSO is complete. This is often confirmed by transmitting "73 MYCALL", but this is not necessary for call completion. He may respond in the same manner, usually for three periods, or he may start to call CQ again

e. Missing information

To allow for error correction during a QSO the following message can be used by operators to restart the QSO:

Problem detected	Send by MYCALL	Reply by DXCALL
Any	EEEE MYCALL	MYCALL DXCALL report report

8. Contests

Contests are strongly discouraged when:

- these are planned during periods where the ZHR is expected to be above average.
- the rules of the contest conflict with this procedure

9. Document history

This procedure was adopted at the IARU Region 1 Conference in Miskolc-Tapolca (1978), later slightly amended at the IARU Region 1 Conference in Noordwijkerhout (1987), Torremolinos (1990), de Haan (1993), San Marino (2002) and Davos (2005).

End of document - IARU Region 1 VHF Committee

Comments

These comments are to be read with the proposed change in the MS procedure as well as the accompanying bandplan changes.

The existing MS procedure has served the ham community well for many years. As long ago as 1978 it was recognized by the active ham community that some form of formalizing the way in which MS QSO's are performed was needed. This led to the MS procedure as we know it. Over the years there have been developments which caused the MS procedure to be updated in light of continuous developments.

We now live in 2005 and MS has come a long way since the memorykeyer and taperecorder era. In the 90's of the last century the taperecorder was quickly replaced by the DTR developed by DF7KF. This allowed for decoding received bursts while the RX period was still going and led to more successful QSO's at a much higher speed than the old taperecorder method. Soon after the DTR, in the late 90's, 9A4GL developed a computerprogram MSDSP, later succeeded by WINMSDSP which upped the ante even more and allowed for CW speeds up to 10.000 characters per minute. These speeds led to technical difficulties and were not compatible with the existing methods for MS as they were being used in IARU Region 1. Since activity in Region 2 was never very high the availability of this program stirred a great interest in MS in that area. The users there went immediately to speeds of 6.000 cpm or higher. Some QSO's were made at speeds up to 12.000cpm (40 words per second!). Sadly the development of the very highspeed CW came to a halt when 9A4GL lost the sourcecodes for his program in a computercrash around the year 2000. Since there have been no developments in the high speed CW area. As far as known the program is still available.

Around the same time Joe Taylor K1JT started the development of his, now well known, WSJT program. This program was to allow smaller stations to make EME and MS QSO's which previously could only be accomplished by large stations running high ERP. The WSJT program has meanwhile grown and resulted in a tremendous increase in the number of weak signal QSO's which were previously almost impossible to make. Nowadays it is a routine matter for QRP stations to make MS (and EME) QSO's at times previously unheard of. Where MS activity outside known showers was virtually non existent successful QSO's are now being made every single day of the year, every time of the day. Do to the very high transmission speed (8.220cps for FSK441A) even the shortest pings provide useful information. This has made it possible for everyone interested to enjoy the pleasures of real DX. Several stations in the 3-10W single category are having great fun on the bands.

These developments have led to an enormous increase of activity by interested stations. This is especially worth mentioning as the VHF/UHF activity in general appears to be declining. The increase can be best illustrated by looking at the results of the OH8K expedition team which made 1.300 (!!) MS QSO's in 2004 of which 185 during the 4 day Perseids shower in December. These are numbers which would not have been possible a few years ago. These numbers also indicate the problems which exist when working MS in Region 1. Where concurrent activity a few years ago was limited to a few dozen stations there are now many hundreds simultaneous during periods of high activity. All these stations share the same calling frequency and try to work by the same Region 1 MS procedure. The region 1 VHF committee has identified these problems during their Vienna meeting and wants to try improving the situation by modifying the MS procedure. The committee decided that in light of continuous developments and improvements the procedure should be band and mode independent.

The accompanying proposals are an attempt to accomplish this. The attached version of the MS procedure is a barebones, factual, mode independent, band independent document intended as a strong recommendation to all MS operators. The attached version of the bandplan changes is an attempt to try and alleviate the chaos in the 144MHz which occurs during periods of high activity

and/or good tropo openings. The bandplan change can not be seen independent from the MS procedure change.

Following is a short motivation why the new procedure is written the way it is and why certain choices were made.

- Timing and Timing Periods.

These are the most pressing issues to be resolved however also the most difficult issue. For SSB and CW operation this has never been a real issue because activity at best was and is only a fraction of the activity in digital modes.

Due to the incredible increase in speed for non voice modes it seems logical to shorten the periods from 1 minute in SSB, 2 or 2.5 minutes in CW to the accepted digimode standard of 30 seconds. Since in SSB mode there are already short breaks every 15 seconds using a shorter period there would make success easier to accomplish. The same is valid for CW where instant decode is possible for those not using taperecorders. Synchronizing periods avoids interference from stations which operate different modes at closeby frequencies. Of course, synchronizing TX periods also accomplishes the VHF committee's goal of mode independence. The shorter periods in the procedure does not prevent stations from making skeds with different timing. CW operators can make skeds with longer periods and digimode operators can do same with even shorter periods. This is not according to the procedure but since the procedure has a status of recommendation it is – even though not desirable - also not illegal.

A specific note is being added about clock accuracy. When using the shorter periods a discrepancy of even 1 second decreases the chance of a successful QSO by several percentage points. In addition it interferes with local stations listening in the other period. With the currently available methods of setting time like GPS, internet and radio timestandards like DCF77, WWV, etc. an accuracy better than 1 second can easily be achieved even at remote locations. The procedure should therefore require this as a minimal technical standard.

Determining the appropriate TX period has been changes from the current procedure. The local area criterion has become the most important one. We are seeing a great increase in MS activity in all areas covered by region 1. MS is no longer limited to - mainly - North Western Europe and its fringe areas but is expanding into Africa, Siberia, etc. Any period description based on specific squares, countries, etc. is therefore doomed to create additional problems. Also the usage of directional calling – even though still in the procedure as a guideline – does not accomplish a non-interference situation. A station at 600+ km away can wreak havoc to stations trying to listen in this period. An attempt is made to lessen the problem in the 144MHz band by allocating a secondary MGM-wide segment substantially lower in the band. This allows stations which are suffering from nearby interfering stations to choose another random frequency and another period.

- QSO duration.

With current technology it is possible to keep an attempt to complete a QSO going for an unlimited time. For all practical purposes – especially when no linkback is available – it is desirable to set a time limit on each attempt. The 3 hour period is chosen to accommodate the short and infrequent reflections in the UHF bands. It is also desirable to define a QSO for purposes of firsts lists, record attempts etc. Even though this heading does not define what a QSO is, it does define the maximum duration in IARU R1 MS perspective.

- Frequencies.

Any QSO which is not purely random should be made away from the random calling frequencies as much as possible. With the current and increasing number of active stations the calling frequency is often overloaded resulting in decreasing chances of success. Since many stations have access to DXcluster, chatpages, SMS numbers it should be easy to arrange QSO attempts away from the calling frequency. Random contacts can also be made away from the calling frequency by using similar means, particularly selfspotting in the form of "DX 144385 MYCALL calling FSK441A 1st period". Because of the sporadic nature of MS reflections selfspotting should be encouraged as a means to increase activity and accomplishing completed QSO's. A problem with this is that many DXcluster sysop's have filters in place to block selfspotting. The R1 VHF committee should through the IARU member societies approach these operators to allow these spots.

Of course the proven QSY procedure remains in the procedure. In order to remain mode independent the CW letter system has been dropped in favor of the kHz system. The decrease in CW-MS does not justify keeping 2 methods side by side. With high CW speeds the needed time to transfer a frequency is in the milliseconds and should not be an objection. Even so, the procedure has recommendation status and does not prevent individual operators from working in a non-procedural manner.

It is recommended to heavily promote the QSY procedure via the member societies as a means to decrease the pressure on the calling frequencies. This will be very difficult especially during low activity periods as most stations would like to hear other stations calling as well during their CQ's. Not many stations are currently equipped for dual frequency RX.

Another means to decrease interference amongst stations, especially during high activity periods is to allocate a secondary MGM-wide segment with alternate calling frequency. For now this appears only needed in the 144MHz band. This will allow stations in any geographic location to use both available periods as needed or desired and avoid interference on the primary calling frequency. Especially with the activity spreading to areas outside the traditional MS area this can alleviate the pressure on the primary calling frequency. The secondary segment has been chosen away from current centers of activity and far enough from the primary segment to prevent interference from closeby strong signals.

- Reporting system.

The reporting system has been adapted to the shorter period length as well as the possibility to use old definition pings for useful information. Technological advances will eventually allow for the shortest reflections to transfer useful information. See the table for the new length definitions. Separate reports for reflections over 30 seconds are useless in a system with period lengths of 30 seconds maximum. Additional info can of course be logged or spotted in the DXcluster.

- QSO procedure

Despite the fact that the QSO procedure is clear in what constitutes a completed QSO there appears to be much misunderstanding especially about when a QSO is complete. This is why the QSO procedure is illustrated by example even though a clear procedure should not need examples. The member societies are requested to inform the MS community of the procedure and if needed provide clarification. It is obvious that MS QSO's do not need to comply with a higher standard of confirmation than any other QSO. This is why a QSO is completed when both sides have received confirmation even though that may not be known. Double confirmation or the transmitting of "73" are not required and for courtesy purposes only.

The format of the messages is carefully chosen to allow for maximum results with minimum reflections. Care should be taken by increasing message length – less efficiency – or by transmitting messages without identification.

The missing information part has been modified. Many operators are not aware of the abbreviations used to correct errors. In the proposed procedure the number of abbreviations has been reduced to 1: EEEE. This is short enough for CW operators and usable in all other modes. The way to correct errors has also been changed: Reply with the last unconfirmed message. This contains all needed information. An error can NEVER be send after the confirmation cycle has started because it obviously signifies information missing to complete the contact.

- Contests.

Contests are a means to increase activity in our valuable spectrum and are therefore strongly encouraged. The reverse of this is that contests are not particularly needed during periods of already high activity, for example during major showers. In particular contests which by their rules decrease the efficiency of the QSO are to be strongly discouraged. Examples of inefficiency are: prohibition on using selfspotting or announcing calling frequencies. Rules like this lead to a tremendous extra pressure on the calling frequencies, particularly by contest participants – usually high ERP stations. These circumstances make it virtually impossible for smaller stations to be heard. Rules should allow for selfspotting and for preannouncing frequencies to be used.

It would be better however to use contests for their intended purpose: Increase activity on the band. This would plead for cumulative activity contests during low ZHR periods similar for example to the NAC contests.

- Bandplan changes.

The bandplan changes are an integral part of the new MS procedure. They are intended to aid in alleviating the pressure on the 144MHz FSK calling frequency and address the period problem. In addition it opens up an additional part of the band for narrow-band MGM (currently read: JT65) to be used for EME purposes.