



NEWSLETTER-AMSAT-EA

07/2021

JULIO

contacto@amsat-ea.org

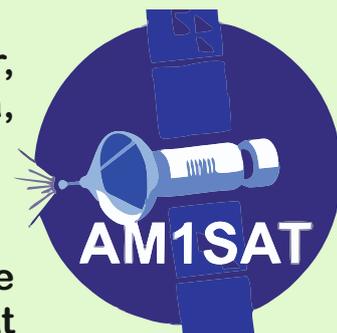
eb1ao@amsat-ea.org

Translation by Fernando EC1AME



AM1SAT 2.021 CONTEST

AMSAT-EA will celebrate in September, coinciding with the IberRadio Hamfest in Ávila, meeting spot for hams from Spain and Portugal, the third edition of its International Contest and AM1SAT trophy. To do this, AMSAT-EA operators will be on the air at all available satellites with the callsign AM1SAT between the 13th and 19th of that month, activating a minimum of 14 different locations.



As part of this activity and to encourage participation, will have the SILVER and GOLD classifications, as well as a trophy for the one who gets the largest number of grids and for the one that manages to work the largest number of different satellites.

In the last edition of the contest held in 2019, 727 QSOs were made, awarding 10 gold and 28 silver diplomas. The trophies to best 'hunter' of grids and satellites were awarded to F4DXV and EA3CAZ.

AO-109 Fox 1E - RadFxSat-2

The operations and engineering team of AMSAT informs us that AO-109 (RadFxSat-2- Fox 1E) is open for the use of hams. They recommend using modes CW or FT4 to perform QSOs due to problems with the satellite.

This satellite has an inverted linear transponder. Frequencies:

Uplink: 145.860 Mhz - 145.890 Mhz
Downlink: 435.760 Mhz - 435.790 Mhz





AMSAT-EA will be in the air on all available satellites with the callsign AM1SAT from September 13 to 19, 2021 to celebrate the third edition of the AM1SAT trophy-contest. AMSAT EA operators will activate the callsign AM1SAT from a minimum of 14 different locations during that period of time, in order to facilitate the maximum number of EA grids via satellite.

As part of this activity and to encourage participation, will have the SILVER and GOLD classifications, as well as a trophy for those that get the largest number of grids and different satellites worked.

RULES TO GET THE CERTIFICATE

1. The diplomas may be requested by any worldwide radio amateur with a valid license.
2. Contacts with AM1SAT are valid if made through any amateur radio satellite, between September 13 at 0h UTC and 19 September 23:59 UTC, in the indicated modes .
3. The locators exchanged will be 4 digits, for example, IN71, IM68, Im77.
4. Diplomas are distinguished for contacts made in LEO satellites and others apart for contacts in GEO
5. Two groups of requirements are defined according to the location of the applicant to obtain LEO diplomas: within Europe (plus EA8 zones and EA9) and the rest of the world.
6. FM and CW / SSB / Digital categories are distinguished for diplomas LEO, there is only one category in GEO.
7. Diplomas will be awarded in silver (easier) and gold (more difficult).
8. A physical trophy sent free of charge will be awarded to the greatest hunter of grids and the biggest satellite hunter.

LEO DIPLOMAS

Participant in EUROPEAN territory plus EA8 and Ea9:

- LEO EUROPA FM SILVER Diploma: To obtain this diploma the Applicant should contact AM1SAT station on FM receiving 5 different locators, being understood by locator, the one composed of 4 digits, for example, IN71, IM68, IM77, etc.
- LEO EUROPA FM GOLD Diploma: To obtain this diploma the Applicant should contact AM1SAT station on FM receiving 10 different locators.
- LEO EUROPE CW / SSB / Digital SILVER Diploma: To obtain This diploma the applicant must contact the AM1SAT station in CW / SSB or digital modes, receiving 3 different locators.

- **LEO EUROPE CW / SSB / Digital GOLD Diploma:** To obtain this diploma, the applicant should contact the AM1SAT station on CW / SSB or digital modes receiving 7 different locators.

Participants out of europe:

- **LEO NO EUROPA FM SILVER Diploma:** To obtain this diploma, the requesting station outside Europe should contact the station AM1SAT on FM receiving 2 different locators.
- **LEO NO EUROPA FM GOLD Diploma:** To obtain this diploma, the station outside of Europe should contact station AM1SAT on FM receiving 4 different locators.
- **LEO NO EUROPE CW / SSB / Digital SILVER Diploma:** To obtain this diploma, the applicant station outside Europe must contact the AM1SAT station in CW / SSB or digital modes, receiving 2 different locators.
- **LEO NO EUROPE CW / SSB / Digital GOLD Diploma:** To obtain this diploma, the requesting station outside Europe should contact AM1SAT station in CW / SSB or digital modes, receiving 4 locators different.

DIPLOMAS GEO (Global)

- **SILVER GEO Diploma:** To obtain the GEO diploma in category SILVER, the applicant must contact the AM1SAT station receiving 5 locators in CW / SSB or any valid digital mode on the QO-100 satellite.
- **GEO GOLD Diploma:** To obtain the GEO diploma in category GOLD, the applicant must contact the AM1SAT station receiving 10 locators in CW / SSB or any valid digital mode on the QO-100 satellite.

Diploma	Plata	Oro
LEO Europa FM	5 locators	10 locators
LEO Europa CW/SSB/Digitales	3 locators	7 locators
LEO No Europa FM	2 locators	4 locators
LEO No Europa CW/SSB/Digitales	2 locators	4 locators

Diploma	Plata	Oro
GEO Global	5	10

GRID HUNTER TROPHY

The trophy will be awarded to the Grid Hunter, to the participant who receive a greater number of AM1SAT squares during the event. In case of tie, it will be awarded to the participant who has needed less time to contact them.

SATELLITE HUNTER TROPHY

The trophy will be awarded to the Satellite Hunter who has contacted AM1SAT through a greater number of different satellites during the event. In case of satellites with more than one mode or band (For example, AO-7, AO-92 or QO-100), it will only be counted as a single satellite regardless of whether both modes or bands have been worked on. In case tie, it will be awarded to the station that has needed the least time in get the claimed figure.

In case the same station is worthy Of the two trophies, the Satellite Hunter Trophy will go to the second classified.

Sending of logs and receipt of diplomas and trophies

- No physical or electronic QSLs are required. When the Requirements are done, the applicant must send a list with the QSOs in ADIF form, including his callsign, name and the data of the different QSOs (Date, time UTC, frequencies, mode, locator received and satellite used for contact), and the email in which you want to receive the diploma. The diplomas will be sent within a maximum period of 2 months and only in PDF format, free of charge. The trophies will be sent without any cost to the winner to the address indicated.
- The log and any question regarding the rules must be sent to eb1ao@amsat-ea.org
- The deadline for receiving logs is October 1, 2021 at 23:59 UTC. The logs of the AM1SAT operators will be considered valid when checking the QSOs . In case of discrepancy or incidence, this will be solved by AMSAT-EA.

PORTABLE STATION OF THE MONTH - (LA8XGA- TOR)



PORTABLE OPERATION ON LINEAR TRANSPONDERS

EA1PA - SALVA

Introduction.

With the arrival of good weather, we all want to go out and, why not, be able to practice our hobby abroad. With that idea in mind I decided to write this article focusing on SSB linear transponder, which demand a little more than single channel satellites on FM. Do not be lazy to grab the "gear", experiment and practice radio outdoors !.

What I am going to describe in the following lines is my way of operation in the field. In advance I want to highlight that It is about the method that I follow, but that does not mean that is the best, but is the one that I find most comfortable and that is particularly adapted to my portable configuration. Sure some of you do it other way, but it is already known that "each teacher has his booklet" and each one manages a way to get to the same goal.

After this introduction we begin with the object of this article. I am going to structure it in different points.

Description of the portable station.

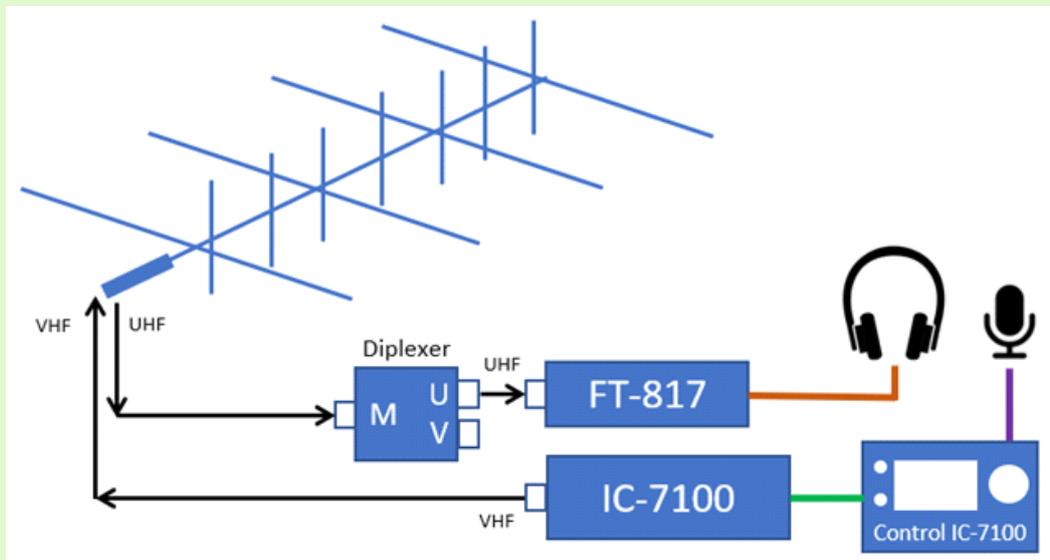
I use two rigs to work in full duplex mode and be able to listen to my own voice on the satellite downlink.



The receiving equipment is a Yaesu FT-817nd powered by its internal homemade lithium battery (see article in the previous month's edition of this newsletter). The transmitter is an Icom IC-7100 powered by another lithium battery also homemade. The antenna I use is a crossed Yagi, DK7ZB type, renamed affectionately as "PArrow". Between the antenna and the receiving equipment I place a duplexer as a filter to totally avoid possible interaction when transmitting.

In my case I don't put any 50Ω load on the free output. I always work with headphones and use a handheld microphone with manual PTT (I don't like the VOX).

For example, to work a satellite in J mode, uplink in the 2m band and Downlink in 70cm, my configuration is as follows:



Preparations.

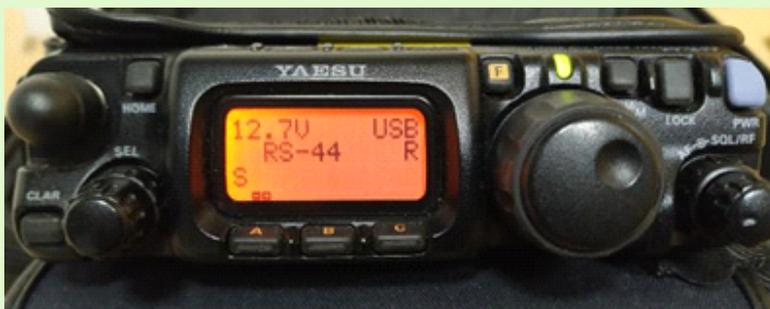
Before the operation we have to prepare the pass. You must know the type of satellite, bearing and time for the AOS, TCA and LOS. Set points reference on the horizon to point the antenna. You don't have to be very precise, with the hand and by ear then we will look for the best orientation.

I consider a free mobile application called "Look4sat", you can find it in "Google Play Store". It is a tool that I use often as it helps me to plan the day, identify passes, directions and frequencies. The "radar" view is excellent for visualize the path of the "bird" over the sky by reorienting the antenna during the pass.



On the other hand, I prepare my contact registration system. Even though I don't record the audio of the passes when I operate in portable, sure it's recommendable. In my case I almost always rely on the traditional method, handwriting callsigns and grids on a notebook.

Regarding the rigs, I have both previously programmed with the central QRGs of all satellites stored in the memories. In the case of the FT-817, the downlink frequencies and the central uplink frequency on the IC-7100.



When the satellite in question is approaching AOS I select in both rigs the central uplink and downlink frequency already on the memory banks. In the photo you can see the RS-44 frequencies. I can easily go from Memo mode to VFO just moving the dial or just pushing the V/M button for a few seconds to pass a qrg in the memory to VFO.



The next step should be setting the mic gain and power output.

The power doesn't have to be excessive, with a relatively few watts any satellite can be reached well if our antenna is pointing in the

right direction. I pay special attention to output power when I work the AO-7, so as not to reset it due to excess of watts and avoid it restarts in A mode. Of course throughout the pass I can readjust towards the optimal value monitoring the downlink signal. Regarding mic gain I select a medium value so that the wind is not captured by the microphone. If the day is very windy I put less mic gain.

Operate

When I have everything ready, I am ready, with the central QRGs and the pre-oriented antenna, I am about to look for the satellite beacon or scan the bandwidth of the transponder looking for signals on the downlink. The goal would be to correct the orientation and polarization of the antenna to find the maximum intensity.

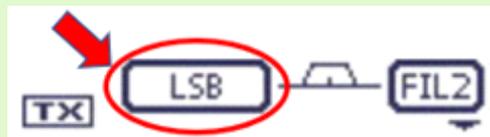
At this point it seems appropriate to distinguish now two situations:

1. 1. Make a general call on a free frequency.

- First, I tune in a frequency on the transmission equipment, IC-7100, different from the central QRG. I drift a few kilohertz up or down so that everyone is not in the middle of the transponder. Yes, with my receiving equipment, I observe activity at the top and I scroll my transmitting equipment towards a frequency above the central QRG; if it is the opposite then I tune my IC-7100 below.
- Mode change in transmitting equipment from LSB to RTTY.



- I press the PTT button leaving the TX frequency fixed. I move the dial of the rx equipment up and down from the central QRG.
- I monitor the downlink, keeping the TX frequency fixed, looking for the tone corresponding to the RTTY carrier. I adjust the RX dial until the tone becomes lower and just disappears at the threshold of the width of the passband from my receiver, the FT-817.
- I release PTT and return to LSB mode in the Icom equipment.



- Then it is time to transmit again, in this case on phone, asking if the frequency is busy. Saying "Is this frequency in use?" a couple of times it helps me to fine-tune the tuning of the downlink and hear me clearly on the downlink. So far, I have kept the TX frequency fixed.
- Once I am well positioned, with the correct QRGs, the next step is to make the general CQ call. I PTT, I start calling and I readjust the transmission tune to hear myself comfortably on the reception frequency, which from now on I leave it fixed.
- As the pass progresses I retune the TX frequency slightly. To do this, I gradually move the dial when I detect that I have a downlink QRG deviation. I usually correct the uplink frequency with the mic "UP" & "DWN" buttons on the 7100 and at the same time I PTT. It is a great help to free hands that are used for reorienting the antenna or writing down the contacts.

- If any station responds to our call is supposed to be tuned in listening and I can do the QSO. As you make the contact you have to make adjust the tuning on the downlink and uplink to correct and compensate slight frequency change due to the doppler effect. I just tune again the rx rig, following the movements of the station contacted, at the same time I adjust my TX frequency to listen my signal centered in the downlink.
- I write down the name of the satellite, time, callsign and locator in my notebook.
- I keep making general calls searching for new contacts fixing the tx frequency. There is also the alternative of going hunting for other stations that are within the bandwidth of the transponder.



2. Answer the CQ call from another ham.

- I tune the frequency of the receiving rig, FT-817, until I clearly hear the station who calls and who I intend to answer (USB mode).
- I change mode in the tx equipment, the IC-7100, from LSB to RTTY.



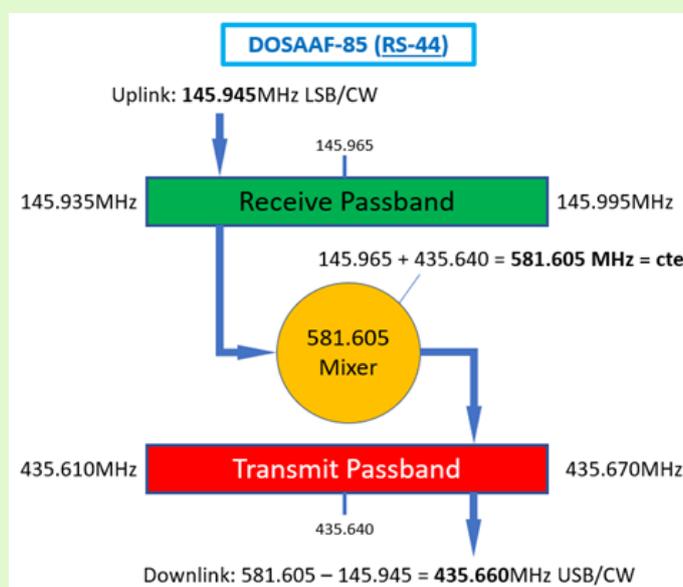
- I press the PTT button while turning the dial on the transmitting equipment up and down from the central QRG. The frequency of reception remains fixed.
- I monitor the downlink, RX frequency fixed, looking for the tone corresponding to the RTTY carrier. I adjust the dial on the IC-7100 until the tone becomes lower and just disappears at the threshold of the width of the passband of my FT-817.
- I release PTT and return to LSB mode on the Icom .



- All of the above has taken me some time and the doppler is present. We may now need to slightly readjust the tuning of reception until we get a comfortable listening.
- Then the moment of truth arrives and it's time to answer the call of the station calling. I pulse PTT, start transmitting and readjust the transmission tune until I hear myself on the downlink. I put myself on the same frequency as the other station to establish the QSO.
- If everything has gone well we have already achieved communication. As you make the QSO you have to make tuning adjustments, both in the uplink and downlink, to correct and compensate the Doppler effect. Basically retune the RX rig , following the movements of the other station, while adjusting my TX frequency to get a clear modulation, in the right place on the downlink.
- I write down the name of the satellite, time, callsign and locator in my notebook.
- I keep looking for activity on the transponder. If there is any other station, I repeat the process, or maybe call CQ.

Reminder of how a linear transponder works.

- Converts 20kHz - 100kHz of spectrum from one band to another.
- Useful beacon to help yourself to know if you “hear”.
- Use of narrow modes such as CW and SSB. CW normally in the lower segment and phone in the upper one.
- By consensus for phone, USB in the downlink and LSB in the uplink.
- Most are of the inverse linear type. The sum of the frequencies of the downlink and uplink remains unchanged. Is a specific constant for each satellite. For example, for the RS-44, the magic number is 581,605.

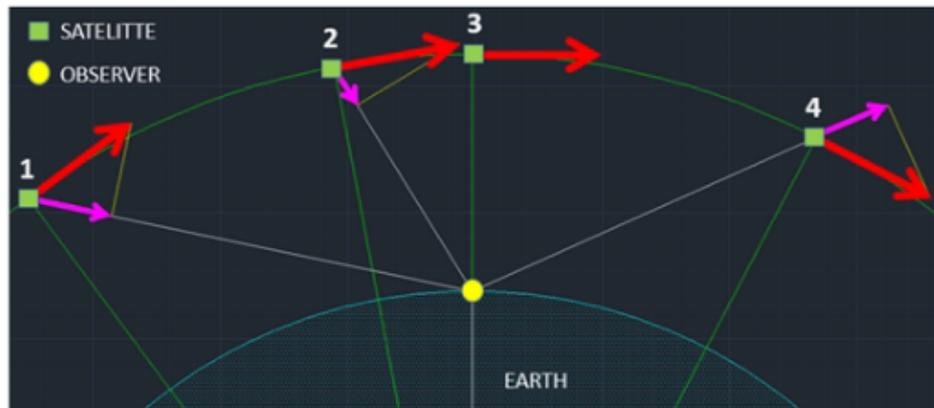


- Frequency variation due to the Doppler effect:

$$\text{Desv. Doppler} = \frac{\text{Frec. Emitida Sat}}{\text{Velo. de la Luz}} \cdot \text{Velo. Relativa Observador y Sat.}$$

↑ Velocidad relativa con el satélite: ↑ Corrección Doppler

↑ Frecuencia: ↑ Corrección Doppler



Green Square ⇨ Satellite

Observe ⇨ Yellow dot

V_{sat} = Tangential velocity of the satellite in its orbit (red arrow) = constant

V_{rel} = Relative speed of the satellite with respect to the observer (pink arrows)

' V_{rel} ' at position 3 (TCA) = 0m / s ⇨ No Doppler correction at that point.

' V_{rel} ' in position 1 > ' V_{rel} ' in position 2 (zoom towards TCA).

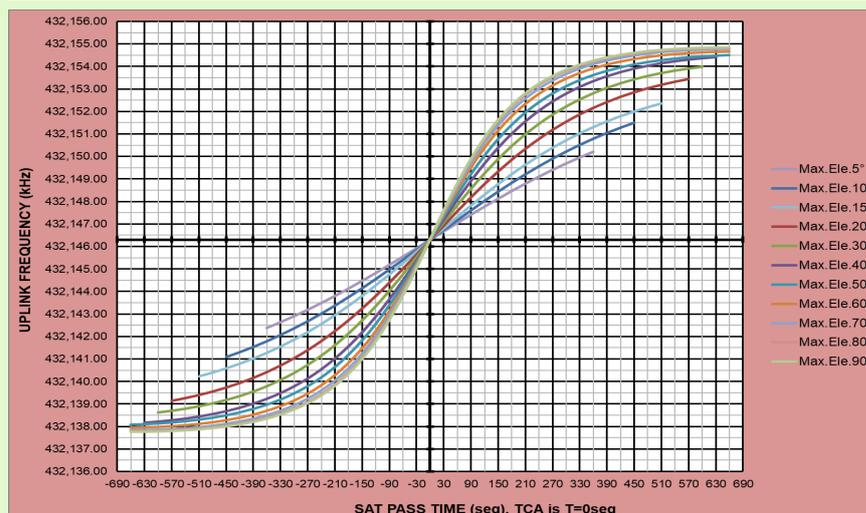
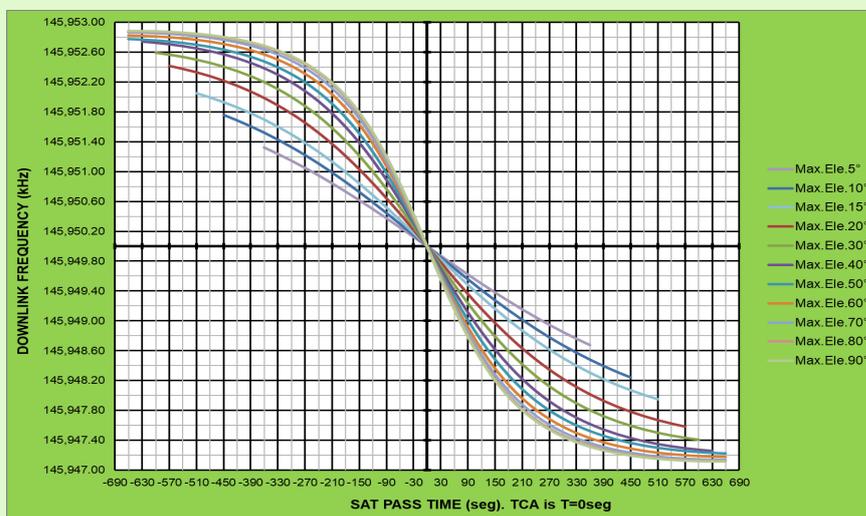
The frequency variation by Doppler at position 1 is greater than at position 2.

' V_{rel} ' at 4 (satellite moving away towards LOS) ⇨ Decreases the frequency.

' V_{rel} ' in 1 and 2 (satellite between AOS and TCA) ⇨ Increases the received frequency.

Maximum Doppler Shift (kHz) at Selected Altitudes for Circular Orbits				
Satellite Mode Frequency (MHz)	V 145.9	U 436.0	L 1280.0	S 2401.0
800 km	+/- 3.0	+/- 9.0	+/- 26.2	+/- 49.6
1500 km	+/- 2.9	+/- 8.6	+/- 25.0	+/- 47.3
8000 km	+/- 2.1	+/- 6.4	+/- 18.5	+/- 35.0

- Graphs showing the evolution of the downlink and uplink frequencies in a linear transponder (representative example for the AO-7B), as a function of the time of the elapsed pass and its maximum elevation:



Some good operating practices.

- As with all satellites, ensure good reception. First, look for the beacon or activity on the transponder before transmitting. It will be useful to point the antenna and know "if you listen."
- Respect the QSO's in progress.
- Give preference to special stations (/ p, / m, / mm), activities, expeditions and unusual locators.
- Work in full-duplex with headphones to be able to hear yourself on the downlink without couplings.
- It is recommended not to occupy the center frequency once calibrated.
- Use the minimum power necessary to complete the QSO, especially in the AO-7.
- If we find an expedition or a highly demanded grid, do the QSO fast to give chance to those interested who are wait their turn.
- General calls may be longer than FM satellites including CQ and other formulas more like HF.
- Highlight your uniqueness in the call: expedition, portable, antenna in hand, ...
- Use the "Q" code and international alphabet "ICAO".
- The QSO's can be extended by giving more information such as the name, conditions, rig, antenna,.... But when there are "pileups" give the essential information, call and locator, and do it fast.
- Short shifts are recommended if operating in half duplex or without assistance for frequency shift by Doppler.

I hope you have enjoyed this article and that it helps to stimulate your portable activities finding your own method. All the best, be safe

iberRadio

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18 de septiembre

Ávila

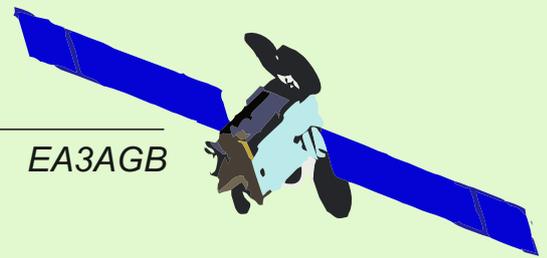
Sábado 18 de septiembre
de 10:00 a 20:00

Avenida de Madrid, 102 · Ávila



QO-100

EA3AGB



QRZ	LOCATOR	MODE	QSL VIA
3B8GF	LG89	SSB	QRZ.COM
4LOVE	LN21	SSB	LOTW
5N9JLH	JJ39	SSB	QRZ.COM
5T5PA	IL10	SSB/CW	LOTW
9A10FF	JN82	SSB	LOTW
A41ZZ/P	LL90	SSB	LOTW
A41ZZ/P	LK89	SSB	LOTW
A41ZZ/P	LK88	SSB	LOTW
A41ZZ/P	LK87	SSB	LOTW
A41ZZ/P	LK78	SSB	LOTW
A41ZZ/P	LK77	SSB	LOTW
CT7AOV/P	IM69	SSB	BURO/DIREC
EA6AJ	JM19	SSB	LOTW/EQSL
EU2AA	KO34	CW	LOTW
F/PA0CRS	JN42	SSB	QRZ.COM
G0HIK/P	IO84	SSB	DIRECT
LA9XGA/P	JP21	SSB	LOTW
PT2AW	GH64	SSB	LOTW/EQSL
PU2MST	GG76	SSB	DIRECT
PP5NY	GG52	CW	LOTW/BURO
PR8KW/P	HH07	SSB	LOTW/EQSL
R1BHJ	KO49	SSB	QRZ.COM
RN24NEW	KN65	SSB	UA6MF
TK21SAT	JN42	SSB	F1BJD
UB8QBD	MO25	SSB	LOTW/EQSL
VU3YDA	NL42	SSB	LOTW/EQSL
XT2AW	IK92	SSB	LOTW



G7BTP/p



PR8KW/P



Johannes, PA5X as 5T5PA/p

AMSAT-EA products in the URE store

For several weeks you have at your disposal several products of AMSAT-EA personalized with your callsign on the URE website.



*Don't hesitate
Support AMSAT-EA*