AMSAT

RadFXSat-2 / Fox-1E

The FOX-1E / RadFxSat-2 satellite, from AMSAT NA, the last of the FOX series of CubeSats, and with an experiment aboard by the Vanderbilt University, has been launched successfully this Sunday, January 17, along with other satellites hosted by NASA's ElaNa program, using a rocket deployed from a modified Boeing 747 aircraft. The FOX-1E incorporates, unlike the rest of the satellites in the series, a linear transponder (inverted) instead of the usual FM repeater, with a V / U configuration instead of the usual U / V used before .

Telemetry - 435,750 Mhz
Inverted Transponder :
      Uplink   145,860 MHz - 145,890 MHz
      Downlink 435,760 MHz - 435,790 MHz

UVSQ-SAT: a cubesat to observe the earth and the sun

The UVSQ-SAT is equipped with ultraviolet and infrared sensors with high efficiency. It´s a pioneering space-based mission to demonstrate technologies for broadband measurements of earth radiation Budget(ERB) and for Solar Spectral Irradiance (SSI) in the Herzberg continuum (200 – 242 nm). UVSQ-SAT is a research and innovation mission initiated by Université de Versailles Saint-Quentin-en-Yvelines (UVSQ) with the support of the International Satellite Program in Research and Education (INSPIRE).

As part of the amateur radio mission, the CubeSat incorporates a radio transponder that will be accessible to the community in parallel to the other scientific objectives according to the power state. The UVSQ-SAT team will provide a Transponder availability of up to 20% (Schedules 7 hours to 15 days in advance available in the project website and / or tweeter account, transponder activation / deactivation dates, satellite status information (battery level, …), restrictions (ex: eclipses.

YAGI ANTENNA - CROSSED BAND 4 (VHF) + 7 (UHF)

EA1PA - SALVA

INTROCUCTION

In this article I will share information with all of you on the construction details of one of my favorite antennas for my portable activations. I commonly call it a "PArrow" antenna, since reminds of the famous "arrow" antenna widely used by hams who work LEO satellites. I mean one of my favorites for portable operation because another antenna that I want to mention here, and that deserves a recognized place in my arsenal, is the IOio antenna from the pioneer and renowned EA4CYQ - Juan Antonio.

Both antennas, although very different with each other, they have given me very many good moments, and it´s always very funny to use one or the other, depending on the kind of activation I do. The IOio antenna is perfectly described by Juan Antonio and it can be found in this site:

Fig. 1: IOio antenna, design by EA1CYQ – Juan Antonio, ready for the portable operation as a handheld antenna..

http://www.ea4cax.es/paginaea4cyq/Antenaioio/antena.pdf.

And also I recommend the leisurely reading of his other outstanding works that also are available at: http://www.ea4cax.es/   Many years of experimentation and good work with a single mouse click.

DESCRIPTION

Before starting describing the antenna, I have to indicate that I have not invented anything new, I have relied on the information provided by the well-known DK7ZB - Martin Steyer, adapting it to my possibilities. His magnificent website, https://www.qsl.net/dk7zb/start1.htm, has models and data for all kind of bands and configurations; It is Almost a must for any radio amateur. In this case I have focused in the section titled "2m / 70cm-Yagis ultralight".

Let's start with the subject. First of all I will list the basic characteristics of the "PArrow" antenna to know the scenario in which we are going to move:

- 4 elements for VHF yagi.
- 7 elements for UHF yagi.
- Arrangement of yagi antennas in perpendicular planes on the same central boom.
- Absence of "gamma match" or impedance adapter.
- Two independent coaxial drops for each band.
- Choke made with coaxial cable near the feed point.

The material used for its construction is listed below:

- 1.15m of Ø20 PVC pipe used for electric canalizations.
- 7 aluminum rods of Ø3.2mm and 1m of length . Like the ones used for TIG welding procedure.
- 11 3D printed supports shaped like "Clip" or clamp.
- 2 blocks for electrical connections or "Clemas".
- 130mm rubber with Ø20 inside for the hand holder.
- 2 sections of 1.6m of coaxial cable RG58 or similar with its connectors.
- M3 x 16mm screws.
- 2 plastic caps of Ø3.2mm.
-

Fig. 2: The photograph of the "PArrow" shows the settings. Actually consists on two DK7ZB antennas placed in perpendicular on a single boom.

DIMENSIONS FOR THE VHF PART

ELEMENT	POSITION	LENGTH
Reflector (Labelled as 'A')	0mm	1022mm*
Dipole (Labelled as 'B')	260mm	977mm**
Director 1 (Labelled as 'C')	470mm	935mm
Director 2 (Labelled as 'D')	985mm	915mm

DIMENSIONS FOR THE UHF PART

| ELEMENT	POSITION	LENGTH
Reflector (Labelled as '1')	12.5mm	341mm
Dipole (Labelled as '2')	127.5mm	336mm**
Director 1 (Labelled as '3')	177.5mm	312mm
Director 2 (Labelled as '4')	342.5mm	302mm
Director 3 (Labelled as '5')	557.5mm	299mm
Director 4 (Labelled as '6')	797.5mm	302mm
Director 5 (Labelled as '7')	972.5mm	295mm

DIMENSIONAL SKETCH

Now I will expose the sketch of the antenna for what we must take into account regarding the dimension tables above:

- (*) The length of the reflector of the VHF part, 1022mm, exceeds the maximum length of aluminum rods I had available. For not having to do a splice I finally decided to put the maximum length without cutting. Practice and experimentation has shown me that this change to

1000mm does not significantly influence the final behavior.

- (**) Total lengths for radiating elements. Are not total lengths of unique rods since these are divided into two. Each section connected to + and ground without electrical continuity between them. Center separation is about 10mm
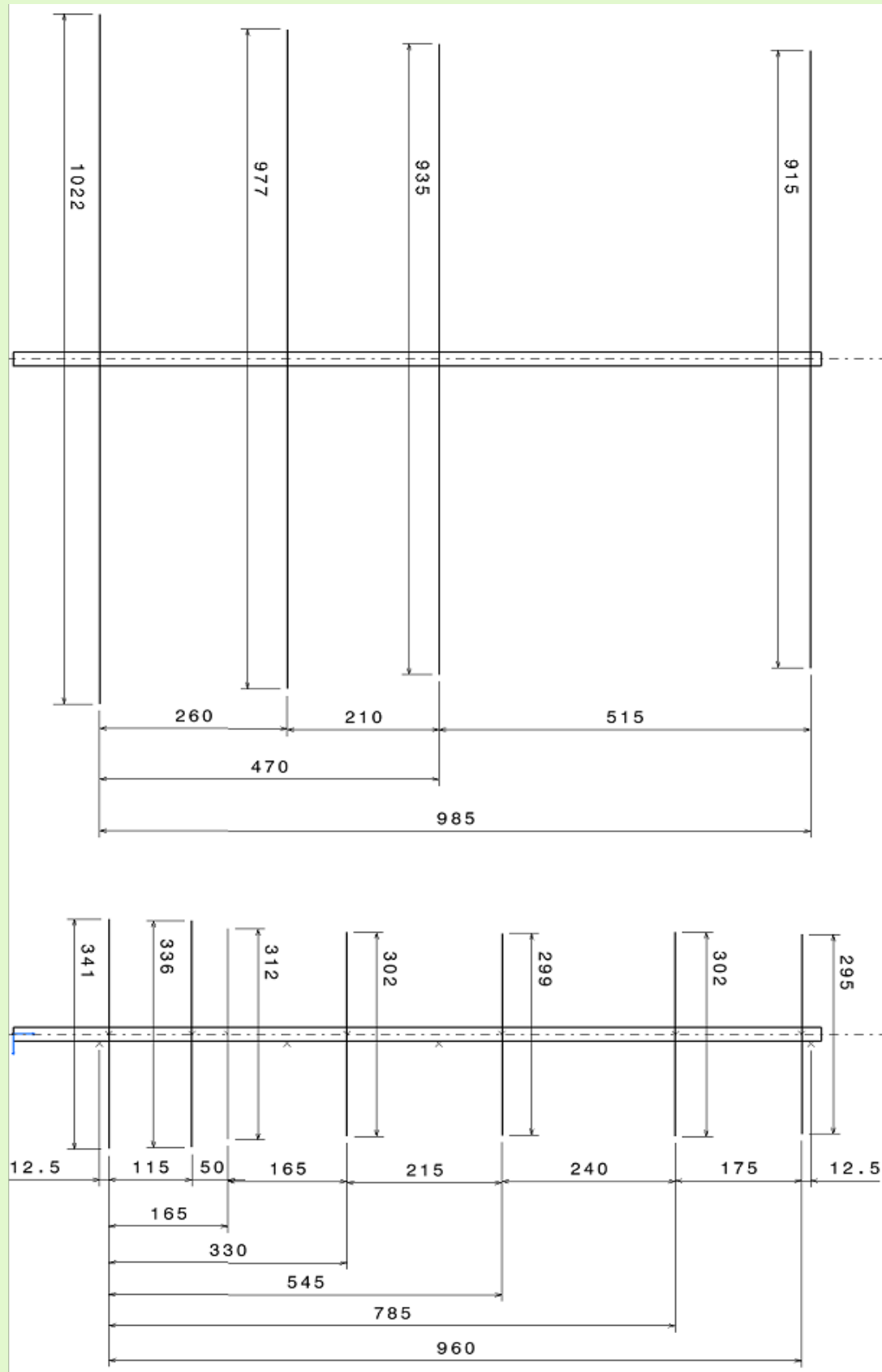
SUPPORT PART OF THE ELEMENTS

A key part of this antenna is the ability to disassemble all elements thanks to the use of a clamp that hugs the central PVC tube. Once disassembled, it occupies very little space, allowing easy transport.
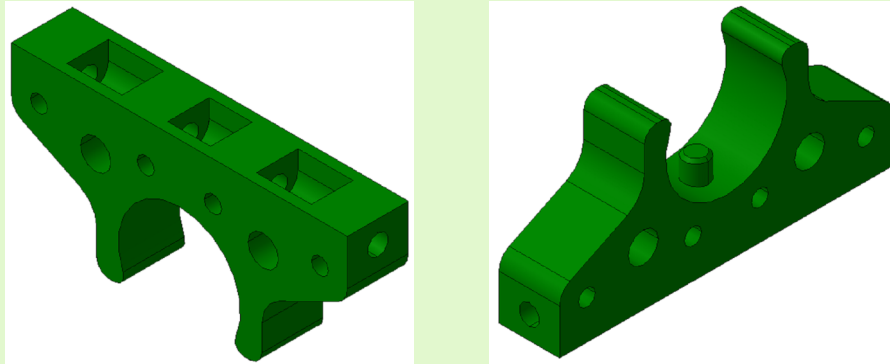

Fig. 3: Support piece of elements of own design modeled in a 3D software.

In the following link you can download the *.stl file to print the piece with a 3D printer:
 https://drive.google.com/file/d/1Nc32wE6QmFSP1gp613Tn2uGUKQ23Duig/view?usp=sharing

The brackets have a protrusion on the inside of the clamp for the correct positioning of these on the boom. The boom has some holes with defined distances and orientations. Assembly is quick and all the elements go to their "place" achieving the required geometry.

It is recommended to label them with a letter or number to find out its location. Just what we have to do is to find the coincidence of the symbols of the support and central boom.

Fig. 4: View of the antenna with all disassembled elements.

Fig. 5: Detail of the element support with its positioner protrusion.

The elements are inserted in holes made in the 3D hang. Mount is snap fit and fits. However, I secured the union with hot silicone filling the gaps at the top.

FEEDING AND CONNECTION OF THE DIPOLE:

Feeding is very simple and is done directly; the coaxial conductor to one branch of the dipole and ground to the other. To facilitate the connection / disconnection an electrical terminal has been included in such a way that with a screwdriver allows operation with set screws.

It is necessary to try that when "stripping" the coaxial cable the conductor part naked without its outer mesh is as short as possible, to avoid possible problems in the resonance and SWR of the antennas.

The captive screws of the terminals attack the other inserted M3 screws, perpendicularly, in the element support. There is contact between each M3 screw and each branch of the dipole, you simply have to insert the rod through the holes in the bracket and thread the M3 screw through existing pre-drills. In the design of the support a small overlap to ensure electrical contact.

As we turn we will be making the thread on the printed support and the aluminum rod.

Fig. 6: Detail of the dipole feeding line.

Finally in this section it´s recommended to make a small choke for each antenna. It consists of four turns of the same coaxial cable from the down line onto the Ø20 boom and positioned as close as possible to the feeding point.
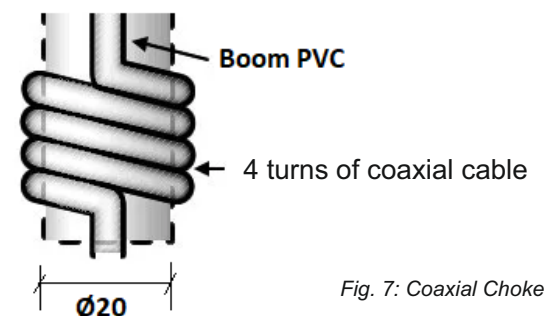

Fig. 7: Coaxial Choke.

It is also recommended that the lengths of the coaxial cables to the equipment are not too large to minimize losses on the RG-58.

STRENGTHS

- "Handheld" antenna with high performance in reception and ransmission on all types of LEO satellites.
- It is ultralight (approximately 570 grams), comfortable and easy to handle. Allows rapid orientation and polarity changes.
- Minimun Interaction between the two bands due to its configuration and arrangement in perpendicular planes.
- Possibility of disassembling all the elements.
- Simple and cheap materials.
- Low-skill manufacturing.
- Easy adjustment by modifying the length of the radiating elements.
- Ideal for portable stations, outings and excursions to clear areas and with low noise level.

WEAK POINTS:

- Ø3.2mm aluminum elements can be somewhat flimsy and they easily deform in any accidental snagging.
- Although the elements are removable, they are quite long,
- Mainly the VHF ones, which would not fit in a backpack or small suitcase.
- The element holders can also be fragile if they are printed on a material like PLA. I recommend having several spare units or use another material.
- It´s needed to have a screwdriver to connect / disconnect the dipoles from the electrical terminals.
- If we compare it with the "Alaskan arrow", the "PArrow" has 3 elements less for UHF for the same number of elements in
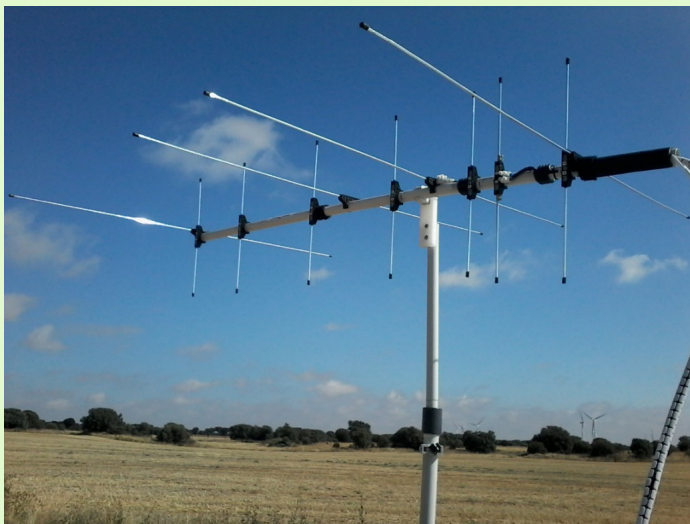- VHF. Consequently the gain in UHF is less but I think it´s enough.

Fig. 8: "PArrow" antenna attached to a swivel joint and positioned on a PVC mast.

I hope this information is useful for you and if you dedice to homebrew this antenna, I hope it´s easy and enjoyable, deserving worth the time spent.
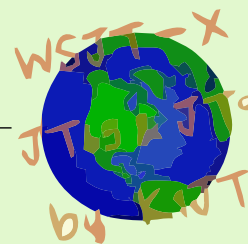
Thank you very much for your attention and patience.

Salva

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Ft4 ON SATELLITES (and 2). CLARIFICATION NEEDED

EA3HAH Carlos T. Flores

In the January 2021 newsletter I explained how FT4 digital mode is very valid for contacts thru ssb satellites. And it could even be used in FM sats without too much trouble as long as it was regulated.

I explained that it is necessary to use the CAT correction speed at x10,but I missed indicating that it is also necessary to set the Interval to zero (0), otherwise decoding is not possible. An image is worth more than 1000 words:
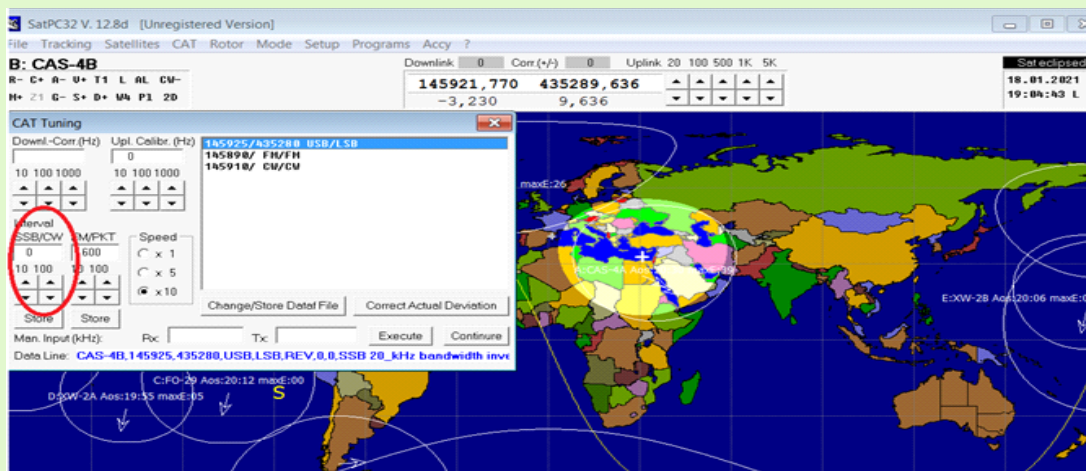
I don't know exactly what is the reason why it is necessary; but in the tests carried out with myself, even hearing myself with absolute clarity in the satellite downlink , and seeing the signal in the spectrum; if I don't set the interval to zero (0) I am not able to decode properly.

So: how will this affect stations with a semi-duplex equipment? Sincerely I dont know. But in my 857 if I set this Interval to zero, the station it is very complicated to use, as it is constantly switching between tx / rx. So there is no choice but to continue researching and testing. I encourage anyone who wants to test it to send me their conclusions. I will continue doing various tests to see what I discover.

Therefore, as a summary to work via FT4 you have to:

1) Use SatPC32
2) Keep the keps well updated
3) Set CAT correction speed to x10
4) Set the Interval to zero (0)

I remember again that I will be every Monday, at various times and satellites in FT4 mode making calls, except when I´m bussy. You can contact me for any question and / or suggestion to my email: ea3hah@yahoo.es

Although Simon Brown's phenomenal software has a section for satellite tracking, from my point of view it's not that perfect as SatPC32 which for me is the best sat tracking software (although not perfect) to control the Doppler on the downlink frequency.

For people who use an SDR for reception of the satellites and do not want to have to be manually with the mouse following the satellite drop frequency (which, as we already know, varies due to the doppler effect), you can use these instructions to link the SatPC32 with the SDR Console V3.

To link them we will need a "virtual serial port cable",two virtual ports linked together. In the SatPC32 we will configure the radio with one of these ports, and in the SDR Console V3 we will use the other virtual port , that is, both programs will be linked by this virtual cable.

SOFTWARE WE NEED

SatPC32: www.dk1tb.de/downloadeng.htm

SDR Console V3: www.sdr-radio.com/download

VSPE: http://ea5wa.noip.me/descargas/Software/SetupVSPE.zip

SETTING UP THE VIRTUAL CABLE

Having previously installed the VSPE software, creating this virtual cable is simple, we will simply have to create a new device type "PAIR" and choose the number of ports at the end of this cable. In my case I have selected ports 10 and 20, but it can be done with any unused port:
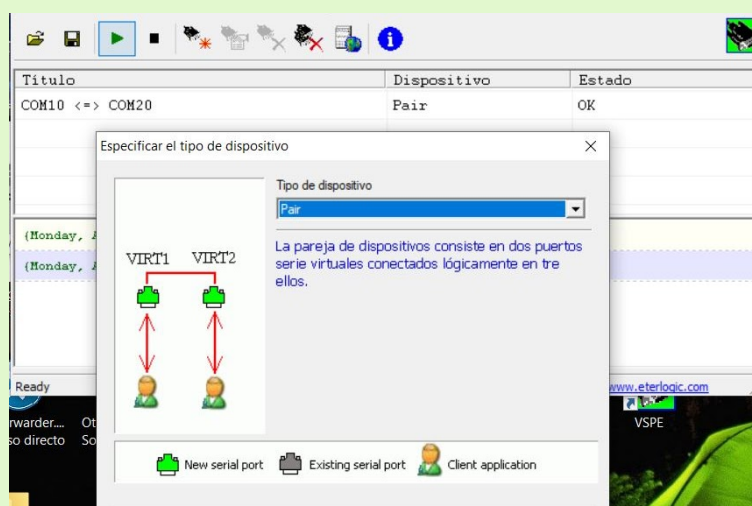
Once created, it should look like the following image and pressing the button "play" will be ready to use:
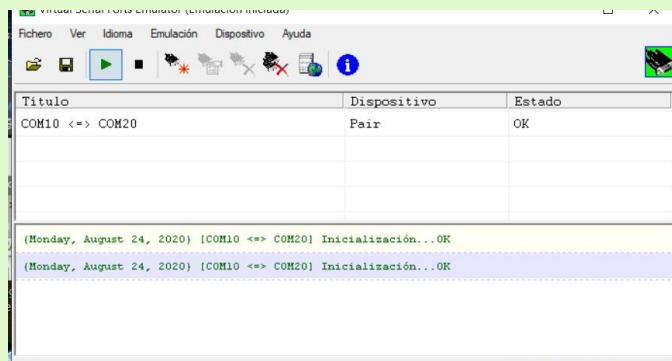
## NECESSARY CONFIGURATION IN SATPC32

From the "Setup" menu choose the "Radio Setup" option and select a Kenwood radio such as the TS2000, since the protocol used for communication is the Kenwood protocol. Choose as COM Port one of the virtual ports of the pair created with the VSPE, in my case port 10 and speed (Baudrate) we should set it to 9,600 (although we could use any allowed value).

Also check the RTS + 12v box.
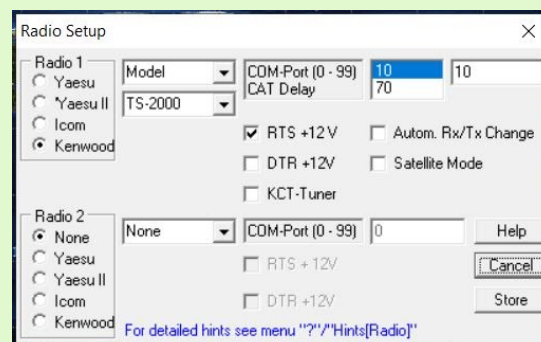
REQUIRED CONFIGURATION IN SDR CONSOLE V3

On SDR Console V3 go to the "Tools" menu, click on Options, and on Controllers, CAT (Serial Port) choose the section "Port Selection". In this window you should see the ports (real and virtual) available in our PC. Choose the other port of the virtual pair created previously with VSPE, in my case port 20, and choose the same speed port, in my case 9,600. We click Accept and with that I would be ready.
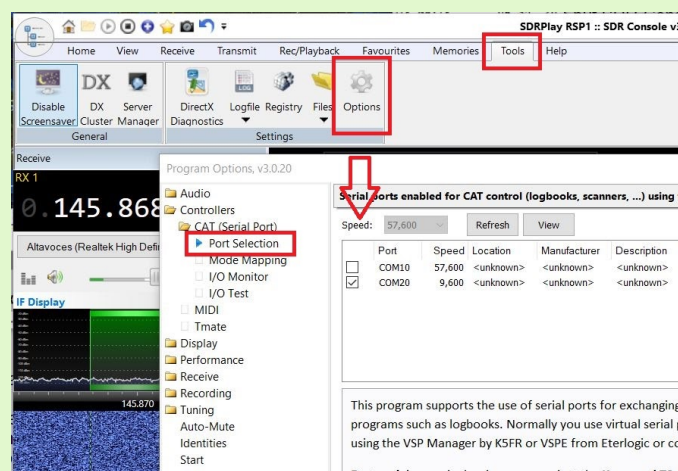
NOW, ENJOY IT

Once the previous steps are done, we have everything ready. We will simply open both programs and to link them the only thing that we have to do in the Satpc32 will be to activate the option "C +":
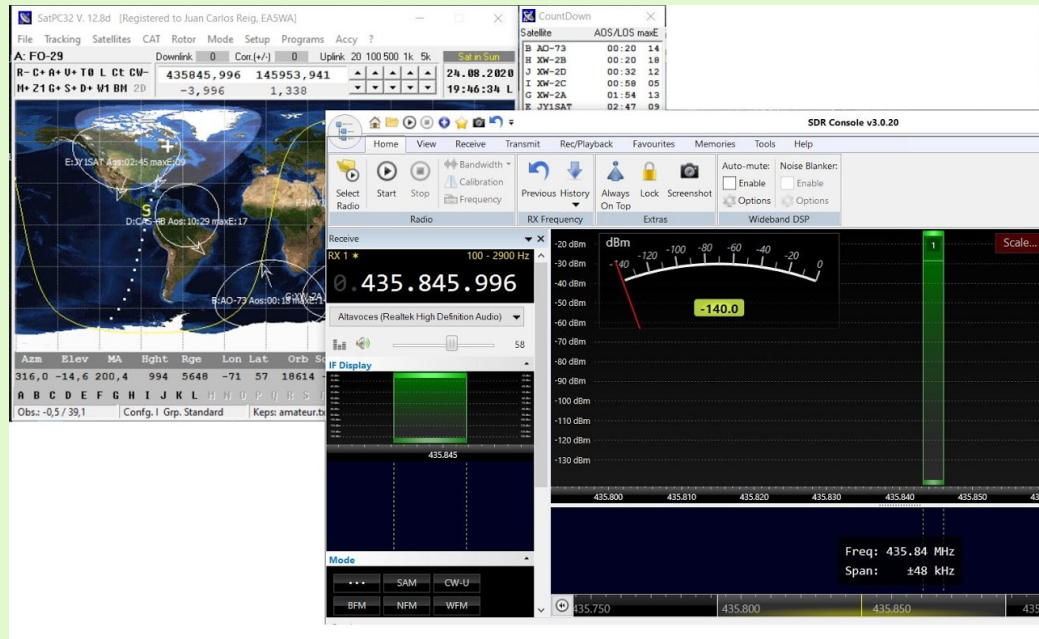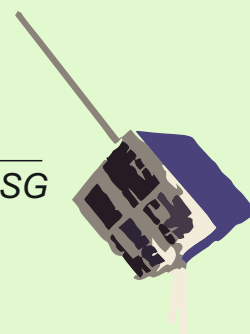

Juan Carlos, EA5WA
www.ea5wa.com

PT2AP

JW/OH8FKS/P

EA2Z


NJ7H

The other satellites. LATEST NEWS.

EA4SG

ORIGAMISAT RECOVERED

The team of controllers of the Origamisat-1 FO-98 - JS1YAX satellite reports that they have managed to recover the operations of this Japanese satellite that has been in QRT for a long time and that has been transmitting again since the end of January.

At the moment its beacon is active in CW transmitting in 437.505 MHz. In order to diagnose its status, the radio amateur community is requested to send reception reports to @Origamisat1 or as indicated on the following website:

http://www.origami.titech.ac.jp/archives/722
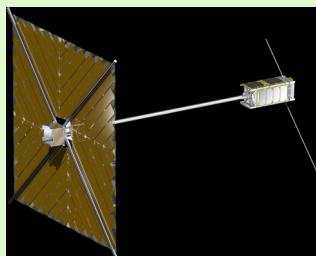
Satelite QUETZAL-1 QRT

It was on January 7, 2021 when the FSK 4800bd frames from this Cubesat 1U, which has meant Guatemala's first space adventure, stopped being received. Since then, his control team based at the Universidad Valle de Guatemala has been working to recover communication with Quetzal-1, without success. On January 26, 2021, his Twitter account declared that after 20 days of work, no communication from the satellite has been received and that after 211 days of operation, the Quetzal-1 mission has come to an end. Nice project that provides a valuable experience for a country that was put into orbit for the first time. Even so, it is always recommended to keep the NORAD 45598 in our monitoring programs for a while and listen to a pass on 437.200MHz FM in case Quetzal-1 could transmit its signals again. More info here:

https://twitter.com/quetzal1_uvg/status/1354169636275826688?s=20

UVSQ-SAT in orbit

TAs we anticipated on the cover, on January 24, 2021 a SpaceX Falcon-9 successfully put this interesting French satellite into orbit, a project of the Laboratory of Atmospheres, Space Observations of France (LATMOS) and with an exciting payload for Amateur radio, managed jointly with our colleagues from Amsat-F and with the F6KRK radio club.

To know the scientific mission of this satellite, we recommend visiting the UVSQ-SAT official website (http://uvsq-sat.projet.latmos.ipsl.fr/index.php). but we want to inform you about the HAM details of this project, that will undoubtedly bring us, as always, experimentation and fun in our bands.

The UVSQ-SAT is a Cubesat 1U format LEO and due to the large number of satellites launched by the Falcon-9, its orbit, at 600kms altitude, has not yet been 100% identified, so its NORAD number 99749 is provisional. , but usable for locating KEPS, which are already available on multiple websites, such as Celestrak.com.

This satellite is already sending telemetry on 437.020KHz and in BPSK modulation with two speeds 1200 / 9600Bd. For this type of frames the reception is in USB. Decoding software available in the Gr-satellites program of EA4GPZ and in the SoundModems of UZ7HO. Likewise, there is already a telemetry decoder on the DK3WN website, although it is advisable to use the official program developed by AMSAT-F and which can be downloaded from this website:

https://code.electrolab.fr/xtof/josast/-/blob/21-ecr-uvsqsat/ApplicationUVSQsatDecoder/src/site/markdown/ManuelUtilisateur.md

To receive the data received and promote telemetry hunting, AMSAT-F manages a ranking of SWL stations that can be consulted on this website:

https://amsat.electrolab.fr/

Likewise, a Grafana dashboard with real-time satellite data can be consulted on the following website:

https://amsat.electrolab.fr/grafana/d/ujwd-SaMz/uvsqsat?orgId=1

During the month of February, we can start playing with the UVSQ-SAT collecting telemetry and sending it to AMSAT-F or Satnogs, but at the end of this month, we will have to be vigilant because F6KRK has planned to activate the FM repeater.

Uplink : 145.905 Mhz FM
Downlink: 437.020 Mhz FM

This repeater is a secondary service of the satellite and is expected to be activated sporadically and in a planned manner and announced by its social networks. More information on his Twitter account @uvsqsat or through AMSAT-F. Best of luck to all the team and colleagues involved.

NEUTRON-1 with problems

Neutron-1 is an American satellite made by the Hawaii Space Flight Laboratory (HFSL) and launched in October 2020 from the ISS. With NORAD 46923, it is a 3U cubesat that, among other services, carries an FM repeater that would be available to hams soon. The control team is having problems with the satellite and its
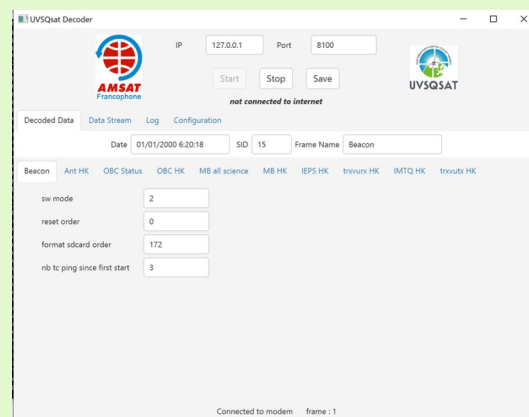
telemetry arrives weak and with a very low cadence, which causes that hardly any frames can be received.

The telemetry of the Neutron-1 uses BPSK modulation (USB) 1200bd, decodable with SoundModem of UZ7HO in the frequency 435,300KHz. Help has been requested from radio amateurs to command the satellite, and with the retransmission of a signal in FSK 9600 in 145.840MHz FM it can be achieved that the satellite sends its telemetry frames more continuously. A wav file with the instruction to transmit, as well as instructions on how to do it, can be consulted on the following website:

https://www.hsfl.hawaii.edu/missions/neutron-1/
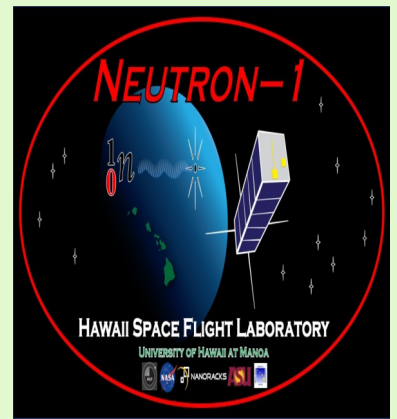
Of course, any reception report is appreciated:. Send it to:
n1-info@hsfl.hawaii.edu

Perhaps with our help the Neutron-1 controllers team will be able up there in the future.

Other Ham satellites to be launched

During this last month there have been several satellites launched and in orbit, whose downlinks can be received on the amateur radio bands. The following have arrived alive into orbit and have been reported as active:

- CAPE-3 – NORAD: 47309 – Telemetry on 437.325 – FSK-1200bd F. This satellite broadcasts telemetry data in "APRS" compatible format and the amateur radio community is asked that those stations that have it, activate their iGate's to pass the packets sent by the satellite to the APRS network and in that way have real-time information from receiving stations from multiple locations.

- MITEE-1 – NORAD 47314 – Telemetry on 437.800 – FSK-9600 FM

- CP-12 – NORAD 47319 - Telemetry on 437.150 – FSK-9600 FM and CW beacon.

- IDEASSAT – NORAD 47458 – Telemetry on 437.345 – GMSK 9600 FM

- Constellation VR3X-A-B and C - Provisional NORADs 99750-99751-99752. Telemetry on 915.600MHz. In addition to CW, this trio of satellites transmit their telemetry in LoRa modulation, being together with the Norbi satellite, the current satellites in orbit transmitting in LoRa mode successfully. Remember that shortly our colleagues from FOSSASAT will continue their project with future satellite launches also in this interesting mode.

73s of David EA4SG
Email: at746david@gmail.com
Twitter: @EA4SG

QO-100

EA3AGB
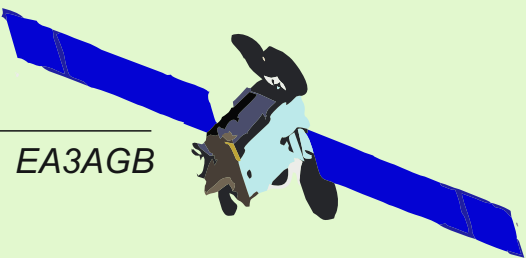
QRG	LOCATOR	MODE	QSL VIA
8Q7AO	MJ63	SSB	LOTW/EQSL
A41ZZ/P	LL91SU	CW/SSB	LOTW/EQSL
AP2AUM	MM63LC	SSB	LOTW
CN8JQ	IM64OA	SSB	QRZ.COM
DP0GVN	IB959	CW	LOTW
EA6VQ	JM19	CW	QRZ.COM
R3QN	LO00	SSB	QRZ.COM
TR8CA	JJ40	SSB	QRZ.COM
PP2RON	GH64	CW	QRZ.COM
PU3IKE	GG50AG	SSB	LOTW/EQSL
AT2GSI	NL41	SSB	EQSL
VU2AAP	MK97FK	SSB	EQSL
VU3YWY	MJ89EV	SSB	LOTW/EQSL
YI1SAL	LM23EI	SSB	QRZ.COM
YI3WHR	LM22D	SSSB	LOTW/EQSL

German Antarctic Station Neumayer III

DP0GVN

P4-A / Es'hail-2
QO-100
Qatar-OSCAR 100

Atka Bay - Ekstrøm Ice Shelf - Dronning Maud Land

German Research Icebreaker Polarstern

DP0POL /mm
German Amateur Radio Station

DP0POL/MM	HI90 - HI91 - IL27 - IC45 - IE17	
	IE25 - IE26 - IG08 - IH05 - IH09	
	HK97 -HK98 -HJ90 - HJ94 - HJ95	
	HJ98 - HJ99	SSB
DP0POL/MM	HH99 - IC46 - IC47 - HJ93	SSB/CW
DP0POL/MM	IF10 - IF19 - IG04 - IG10 -HK82	CW
		VIA LOTW

5V - TOGO, HB9EHD Daniel, is scheduled to be active again from Togo in mid-February.

8Q - MALDIVES, new DXCC entity, activated by HB9WDF

AP - PAKISTAN, Asad is the first active station in QO-100 and a new DXCC entity.

DP0POL / MM, when this bulletin goes out, DC1TH Theresa and DL5XL Félix will already be in Antarctica, during their trip aboard the ship Polarsten, they have achieved something that seemed impossible, to keep their signal stable and strong in the transponder in each of the pile-ups, and in each of the 28 activated grids.

OH0 - ALAND ISL, activity is scheduled on February 6

If you want to publish future events or see photos of your activities or your station in this newsletter, you can send the info to contacto@amsat-ea.org eb1ao@amsat-ea.org

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