NEWSLETTER-AMSAT-EA

09/2020 SEPTEMBER

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CROSSBAND ISS REPEATER , ACTIVATED

The space station activated the FM cross band ham radio repeater with a downlink on 437,800 MHz.

The setup and installation of the first element of the next generation radio system is completed and the ham radio operations are already underway.
This first element, called "InterOperable Radio System "(IORS), is installed in the Columbus module of the ISS.

The IORS replaces the Ericsson radio system and the packet system that were originally certified for space flight on July 26, 2000. The initial operation of the new radio system is in repeater mode.
FM crossband using an uplink frequency of 145.990 MHz with an access tone [CTCSS] of 67 Hz and a downlink on 437,800 MHz.

This system will allow new and exciting capabilities for radio amateurs, students and the general public. The capabilities include a higher powered radio, voice repeater, digital packet radio (APRS) and a slow scan television (SSTV) Kenwood VC-H1. A second IORS undergoes flight certification and it will be released later for installation in the Russian service module.

This second system allows dual and simultaneous operations (for example, voice repeater and A P R S) The following elements of the next generation radio system include a repeater with an uplink on the L-band , currently in development, and a Raspberry-Pi , called "ARISS-Pi", which is barely starting the design phase.

The ARISS-Pi promises operational autonomy and improved SSTV operations. ARISS is directed almost entirely by volunteers and with the help of generous contributions from sponsors and individuals . Donations to the ARISS program for hardware development, Next-generation operations, education and management are welcome, visit https://www.ariss.org/donate.html to contribute to these efforts. ARISS: We are celebrating 20 years of continuous amateur operations on the ISS!

SSTV camera of the University of Brno for satellite Hades by AMSAT-EA

AMSAT-EA's Hades satellite payload, scheduled to launch in december with SpaceX through the Alba Orbital broker , consists of a miniature camera module that sends the images captured as an audio signal in SSTV mode. The SSTV formats it uses are compatible with Robot36, Robot72, MP73 and Mp115.

The design is based on the one used in the successful PSAT2 satellite mission, amateur radio satellite of the United States Naval Academy and the Brno University of Technology. This camera has been operational since June 25, 2019: (http://www.aprs.org/psat2.html).

The camera chip is the OmnivisionOV2640, which provides a resolution up to 2M pixels and compressed JPEG output. Resolution is limited by the internal memory of the CPU (MCU) that controls the camera at 320x240 (typical) or 640x480 maximum. The MCU selected for control is the STM32F446RET6, which has the smallest possible footprint with connection to a DCMI peripheral, required for connection to the camera. Images can be stored in a 2MB serial flash memory. The full SSTV encoder has managed to be implemented on a 4 layer PCB with dimensions of only 38x38mm.

The MCU can be fully controlled from ground stations. The firmware allows the sending of live camera images, images previously saved in a flash memory or ROM encoded images. It also provides advance scheduling for imaging and PSK telemetry with current status (event counters, temperature, voltage, conditions, etc.) and a brief summary.

The described module has been developed and manufactured in the Department of Radio electronics of the Brno University of Technology in the Czech Republic. Both hardware and firmware designs with source codes will be available at Github under MIT license (https://github.com/alpov/SatCam).

UPMSat-2

On September 3 at 01:51 UTC it was put into orbit after several postponements the UPMSat-2 on board a Vega rocket (Vv16).

UPMSat - 2 UNION is a project of university microsatellite led by IDR / UPM, thought as a logical continuation of the previous satellite UPM-SAT 1, qualified for flight with Ariane-4 in 1995 and put into orbit in July of that same year. The project objective is to design, build , qualify, launch and operate in orbit a platform based on the already qualified, incorporating new technologies and adapted to the requirements of current launchers, usable as an orbiting technology demonstration vehicle, as well as for scientific and educational applications.

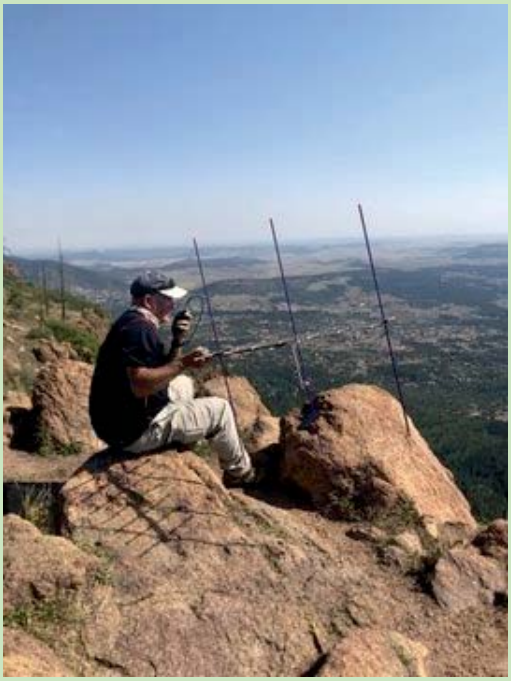
Announced Activations:

Bob,W2ZF, will be active from FN55/56.

K5IX, plans to go, from September 12, to DL99, DM90, EM00, EL09, EL08 and DL98. Only FM sats passes.

EA6/EA4NF Philippe will be active from Formentera Island using the call EA6/EA4NF, More info on his twitter.

EA8/EA4NF, Philippe



KE9AJ on a SOTA

DL6AP/mm

EA6/EA4NF

EA6/EA4NF Philippe will be active from Formentera Island using the call EA6/EA4NF, More info on his twitter.

New Record on AO-7 : 8.204,6 km

KE9AJ, Joe

For the second time in just over a year , KE9AJ, Joe Werth and F4DXV Jérôme Lecuyer have set a new world record on the AMSAT AO-7 satellite (Mode B).

The contact was scheduled for August 10 at 17:49 UTC in orbit # 9278 , Jerome and Joe would have little more than 38 seconds to complete the QSO and set a new distance record of 8,204.6km. This represents an increase of 144km more than its previous record of July 4 of 2,019 when they achieved a QSO of 8,060.8km.

Coincidentally, both Jérôme and Joe were enjoying their family vacation. Jérôme and his family were at the Chapelle de Rieupeyroux area in France (Jn14ch76pb) at a height of 806m above sea level. Joe was visiting his family near Denver, Colorado just a 30 minute drive to the top of the Genesee Mountain (Dm79iq58) at a height of 2,240m above sea level. Thanks to these locations, the QSO was made at -2.0º for Joe and between -1.0º and -1.5º for Jérôme below the horizon.

The QSO was recorded by both of them and listened to by 2 satellite operators in Europe and USA.

The AO-7 is affectionately called "Old Lady" and was operated in this orbit also using "old" transceivers and not equipped with the latest SDR technology and waterfall.

The setup used by Jérôme was an FT- 847 with external preamp and a yagui , the Alaskan Arrow powered by RG-223 / U. Joe also used a Yaesu FT-847 with its internal preamp and a 3x9 Arrow II antenna powered with LMR-240F supplied by Dave, KG5CCI.

They both had a extremely short window for the QSO. Joe used an Acer netbook to run PSTRotator for automatic correction of Doppler on the uplink.

Despite the extraordinary of this QSO, surprisingly Jérôme established 2 world records in those days, in the AO-91 and AO-92 thus accumulating a total of 3 new records in just 4 days.

Joe Werth

How to link SATPC32 with SDR console V3

EA5WA - Juan Carlos

Although Simon Brown's superb software has a section for satellite tracking, from my point of view, it´s not as perfect in this aspect as SatPC32, which for me is the best satellite tracking software (although not perfect) to control the doppler of the downlink frequency.

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

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

Software that we will need:

SatPC32: www.dk1tb.de/downloadeng.htm
SDR Console V3: www.sdr-radio.com/download
VSPE: es.ccm.net/download/descargar-28145-free-virtual-serial-ports-emulator?n=1#28145

Create the virtual serial cable

Having previously installed the VSPE software, creating this cable virtual is simple, we will simply have to create a new device of type "PAIR" and choose the number of ports at the ends of this cable. In my case I have selected ports 10 and 20, but it can be done with any port not used (photo 1).

Once created, it should look like the following image and pressing the "play" button will be ready to use (photo 2).

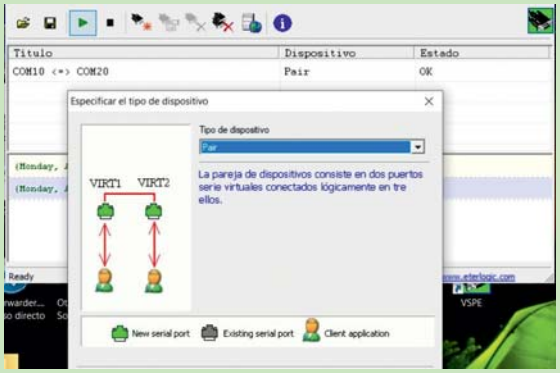


Photo 1

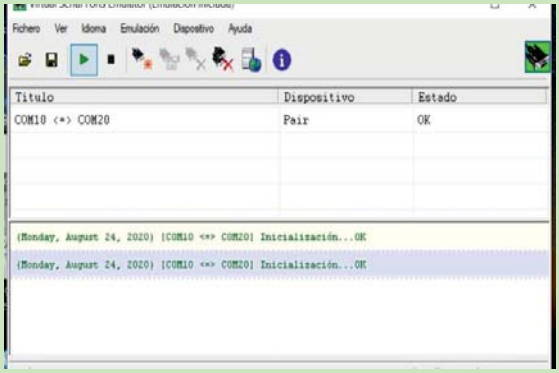
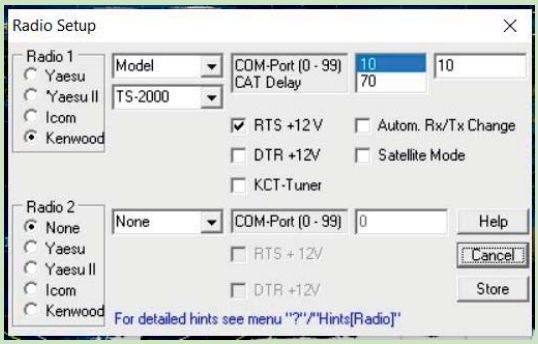


Photo 2

Setting up SatPC32

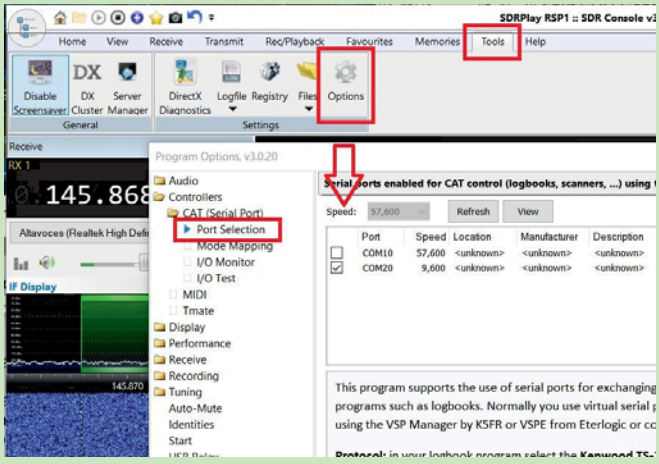
From the "Setup" menu choose the "Radio Setup" option and select a radio Kenwood such as the TS2000, since the protocol used for the communication is the Kenwood protocol. Choose one of the ports as COM virtual Port pair created with VSPE, in my case port 10 and speed (Baudrate) we should set it to 9,600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

Also check the RTS + 12v box.



Setting up SDR Console V3

To configure the SDR Console V3 from the "Tools" menu, click on Options, and on Controllers, CAT (Serial Port) choose "Port Selection" . In this window the ports (real and virtual) that we have on our PC will appear. Choose the other port of the virtual pair previously created with the VSPE, in my case port 20, and choose the same port speed, in my case 9,600. We click OK and with that would be ready.



Enjoy it:

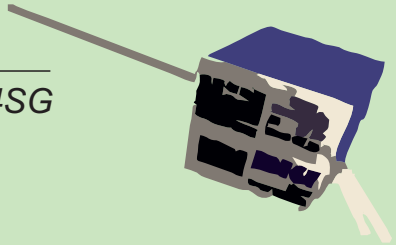
Once these steps are done , we have everything ready.

We will simply open both programs and to link them the only thing that we have to do in the Satpc32 is to activate the "C +" option:

Juan Carlos, EA5WA
www.ea5wa.com

The other satellites

EA4SG



With this series of small reviews, we want to pay attention every month in the Amsat bulletin to those other satellites that also transmit in our ham radio bands, so we also have to consider them as "ham radio sats ".

The intention is to show the community that the range of possibilities and fun doesn't end with the 4-5 FM satellites or the half-dozen ssb satellites we all know. We currently have some 75 sats flying over our heads and we can consider them as active satellites transmitting on our ham bands.

It´s true that the ham likes to call DX and make QSOs, but ... shouldn't we also consider as communication the reception of data from these satellites and the retransmission of the data received to the owners of those satellites?

These other satellites do not carry repeaters or transponders but they transmit on our bands offering us the possibility of use them as beacons for our stations.

The variety of emission modes is tremendous, ranging from CW to complex high speed data and in weird protocols, so this part of "radio listening" allows you to go deeper In this facet and get more and more...

In this section different satellites or groups of satellites will be presented with the objective that you know them and can listen / decode them. We will combine "historical" satellites with current ones, always looking for "listenable" and decodable with some ease and will also provide reviews or mentions of tools needed to get the job done.

LUSAT-1 (LO-19)

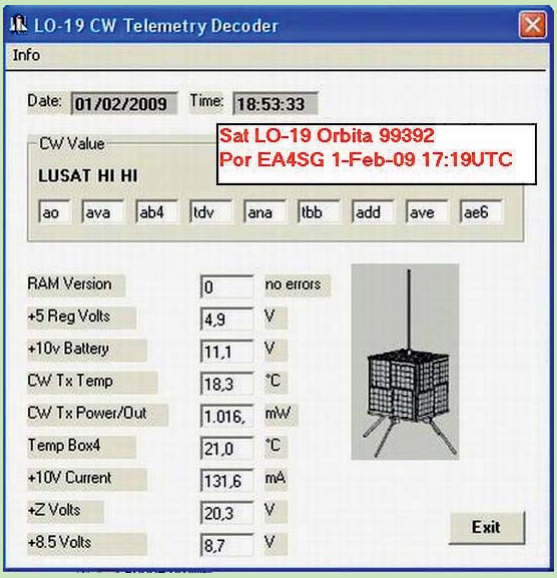
Today we start with the LUSAT – Designated AMSAT Oscar-19 (LO-19) of AMSAT Argentina . It has NORAD registration : NORAD20442.

It was launched on January 22, 1990, we're talking of one of the "surviving veterans" of our orbits only surpassed by AO-7 and AO-11. Milestone achieved by Amsat Argentina colleagues was tremendous, since that satellite was the first satellite that Argentina launched into space, and even a postage stamp commemorating the feat was issued. The LU prefix of its name is due to the callsign used in Argentina.

The Lusat was a satellite of the microsat generation and has a size of 23x23x23cm and a weight of about 10Kgs.

It orbits at a height of approximately 800km which is equivalent to about 4 or 6 passes over EA each day.

In the first years, this satellite carried a PACSAT module for digital communications in packet AX25; this is a BBS similar to the one we currently use in the Falconsat in which radio amateurs all over the world could leave and exchange messages and newsletters.



Decoding software

This PACSAT module switched to QRT when its batteries had a problem, but the satellite carried additionally a beacon that transmitted in day light periods the telemetry data of the satellite and its health in CW. This beacon was operational until the beginning of 2010, date in which this satellite stopped being heard. It was very entertaining listening to its morse sequence and extract the operational data . Here a recording (http://lu4aao.org/lu7aa/LO_19_31ene2009_1.wav) Surprisingly in December 2012, the satellite came back to life, but without its CW transmission . Even so, and 30 years after its launch, the LO-19 is transmitting in periods of illumination thanks to its solar panels, a powerful continuous tone of about 700mw .

Commemorative postage stamp

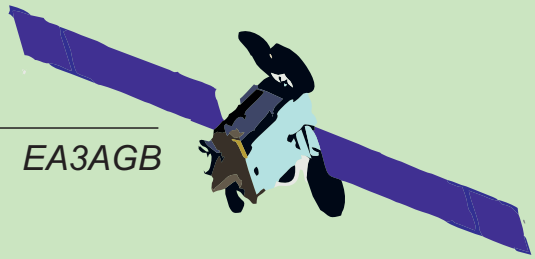
This tone can be easily heard in 437.124 +/- 10 Khz and its progressive variation of frequency is often the best educational example that a satellite can show us to understand the known Doppler effect. For tracking, the Keplerians and its current position Check this site:

https://www.n2yo.com/satellite/?s=20442

QSL confirmation.

73s EA4SG, David

QO-100



EA3AGB

4X0SA/LH	KM71HT	SSB	4Z1ZV
CT1JGA	IN61DK	CW	LOTW-EQSL
CT1DYX	IN50QU	SSB	QRZ.COM
CN8JQ	IM64OA	SSB	QRZ.COM
CU2JX	HM77ES	SSB	BURO
DA0LCC/LH	JO43JU	SSB	BURO-EQSL
DP7D	JO32PC	SSB	EQSL-DIREC
E70T/P	JN94CH	SSB	QRZ.COM
EA2ABZ	IN91LN	SSB	BURO
EI8KF	IO63MF	SSB	LOTW
EP4HR	LL69GP	SSB	QRZ.COM
TM0BSM	JO00SJ	SSB	DK5OPA
FR4OO	LG79RC	SSB	QRZ.COM
G0AUK	IO91TK	SSB	QRZ.COM
GB1DHL	IO88HQ	SSB	QRZ.COM
HB0TR	JN47SD	SSB	BURO-LOTW
IQ4RA	JN64CJ	SSB	BURO
LA6OP	JP67WJ	SSB	BURO-LOTW
PY1AX	GG87QB	CW	EQSL
RT9L	MO27SD	SSB	QRZ.COM
RZ9SP/P	LO71GX	SSB	QRZ.COM
TR8CA	JJ40QL	SSB	LOTW
Z63DNI	KN02FS	SSB	LOTW

Feed of F6BVA

Portable station of M0NPT

DL9SAD

HB9/DO8PAT

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.

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