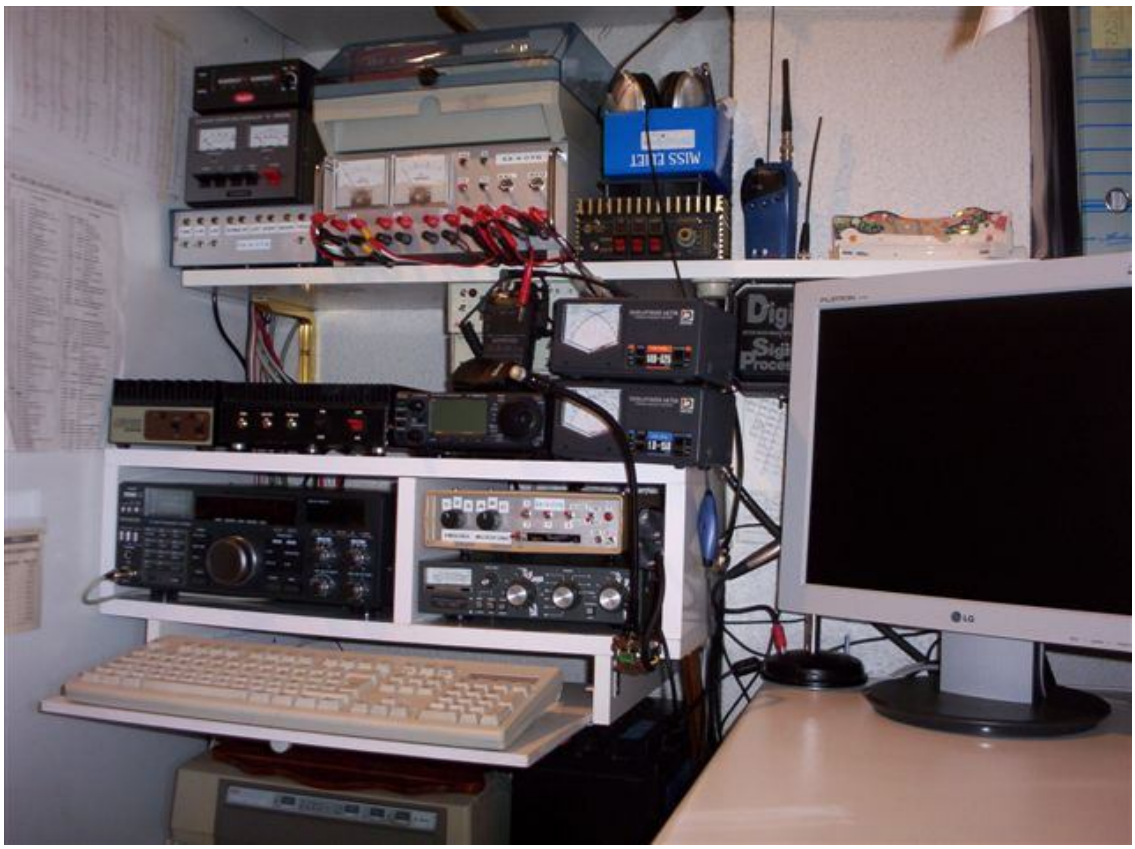
THE EA4CYQ SHACK

My station is focused on working ham satellites and receiving NOOA weather satellites, although I also enjoy working digital modes in all bands such as PSK31, SSTV, APRS, etc. I will try to describe my station with the hope if you have the intention of working ham satellites it could be an example. All ham stations can be improved, my station is only a standard and enough to carry out its task.



POWER SUPPLY

I have two independent power supplies:

1.- All the transceivers and accessories are supplied by a battery-charger system. The charger is home-made and it turns on when the voltage is down to 12 Volts and it turns off when the voltage is up to 14.1 Volts. The charge is limited to 2.0 Amp to fulfil two premises, the transceivers receiving do not drain more than 2.0 A. Amp, so the battery does not supply energy and the other is that with this limit the battery acid does not boil. The battery is a 90 Amp/hour. The box supplies energy by means of ten exit terminals and all of them are overcharge protected by proper thermal switches in the following way:

- Two 30 Amp protecting switches for two terminals each one.
- One 15 Amp protecting switch for two terminals.
- Two 5 Amp protecting switches for two terminals each one.

2.- The second source is a 20 Amp switching power supply which only supplies to the HF, VHF and UHF amplifiers.

TRANSCEIVERS, RF METERS, RF AMPLIFIERS AND RF PREAMPLIFERS

For HF bands a I have an IC-706 MKIIG and a FC-767 Tuner/Meter.

For VHF/UHF bands the main transceiver is a TS-790E and secondly the IC-706 MKIIG. The RF meters are Daiwa models CN101L and CN103L which I have modified to add a real RF peak meter circuit.

For SHF band I have a DB6NT downconverter 2.4 GHz to 144 Mhz which I usually use with a PCR1000 receiver.

To receive the NOOA weather satellites I use the PCR1000 receiver which is suitable for this task due to its wideband up to 50 KHz in FM.

The RF amplifiers are from ZETAGI, EA4BQN and MIRAJE, they provide 150 Watts in HF and VHF and up to 100 Watts in UHF. All of them with 10 Watts input power. They are not necessary to work satellites, but I am in the habit of using them because the transceivers work with the minimal power out, so the hard work is made by the RF amplifiers.

At this time I only have one RF preamplifier in the UHF band by Microset, model PRH430.

FEED LINES

- HF: 30 meters of RG213.
- VHF: 25 meters of RG213 and 5 meters of RG214.
- UHF: 20 meters of ½" and 10 meters of RG214.
- SHF: 30 meters of RG213 after de downconverter 2.4GHz/144 MHz.

ANTENNA SYSTEM

- In HF Bands, I have two multiband antennas using paralleled dipoles all connected to a common feed line:

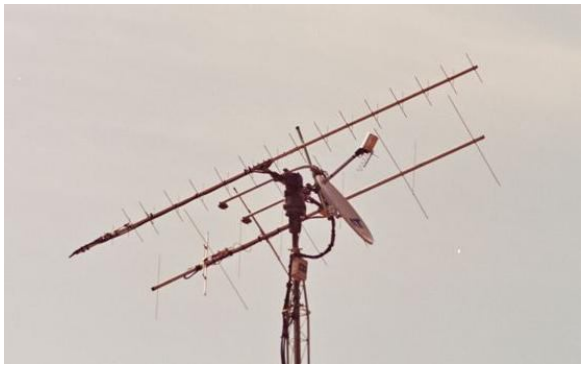
    - 10-15-20-40 and a load coil to 80 meters in the 40 meters branch.
    - 6-12-17-30 meters.

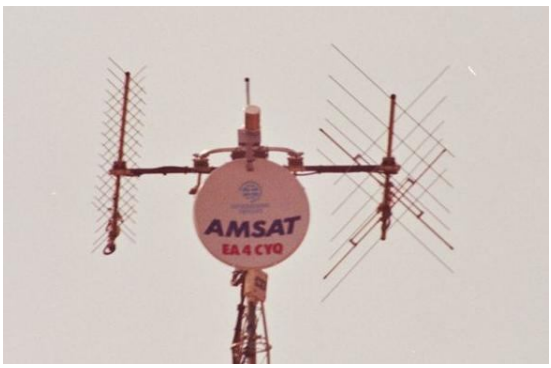
- In VHF a HY-Gain 5+5 elements crossed yagui with a switch capable to change between RCP and LCP.

- In the UHF band, a HY-Gain 15+15 elements crossed yagui with a switch capable to change between RCP and LCP.

- In SHF a 0.7 meters diameter offset fed dish with a 5+1/4 turns helix home-made.

In V/U/SHF the aiming system is made by a G-5600B azimuth-elevation rotor.





CONTROL AND TRACKING SYSTEM

It is made by an old PC, a Pentium I MMX 200 MHz, and the licensed SATPC32 software.

1.- The tracking system uses an EA4TX rotor control interface hooked on to the parallel port.

2.- The home-made KENWOOD and ICOM CATs are hooked on to a serial port.

AUDIO SYSTEM

I have built an audio switch box which lets the interconnection of:

- Audio input from two transceiver.
- Microphone output to two transceiver.
- Audio output to two speakers.
- Audio output to a headphone.
- Connection to a headphone/microphone device.
- Two microphone inputs, a desktop and an adjustable table-microphone.
- A PTT switch.
- A PTT pedal.
- An audio preamplifier by EA7DRJ.
- A 1 KHz audio oscillator (useful to find my own uplink).

It is carefully built with shield wires, insulated transformers, independent battery supply and independent microphone ground system from the main ground. It has suffer several modifications until nowadays. This box lets listen with one transceiver and transmit with other which we have chosen before. All the microphones are condenser capsules, the fine work is made by the preamplifier.

TNC/AUDIO PC CONNECTION

I have modified a four parallel ports commercial switch box. The common connector go to the serial port and the input/output audio soundcard and the other four connectors are hooked on to the DATA connectors of the two transceivers and to the 1200/9600 Bd TNC. So I can switch between:

- Transceiver nº1 – Soundcard
- Transceiver nº2 – Soundcard
- Transceiver nº1 – TNC
- Transceiver nº2 – TNC

I have added two switches to choose if the Transceiver nº1/Transceiver nº2 are input/output or output/input in relation to the TNC and soundcard.

I have also added a switch which lets me make a crossband repeater between the two different transceivers (You can read the article "The data connector and its possibilities" in this WEB http://eb4dka.tk).

This device has let me work amazing PSK31 and SSTV contacts in the croosband AO-40 U/S transponder and APRS and BBS using 1200/9600 AX.25 protocol through several satellites such as ISS, AO51, etc.

As you can see the less important are the transceivers and the most interesting all the home-made accessories which let me work in a flexible way in audio and digital modes with two transceivers and one of them two bands full-duplex capable.

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