Newcomers and Elmers Net: Satellite Listening
11.01.15 Robert AK3Q

For much of our time tonight we are going to talk about listening to satellites
-- this is not intended to discourage you from making contacts through satellites, but rather to encourage you to “get your feet wet” so to speak by just listening
-- I feel confident that after you have listened to the birds for a while you will want to make contacts anyway
-- the other purpose is to demonstrate how you can use existing equipment to listen to the satellites; you do not need expensive equipment, nor do you have to be in the perfect location
-- all of that can help boost your enjoyment of the hobby, but they are not necessary to hear your first satellite

Listening first for a time is well worth the effort
-- while there are no rules to making satellite contacts, there is a relatively standard protocol or procedure—by listening you can learn how these contacts go
-- the same way with working with some of the satellite sites for reporting contacts/reception reports
-- reception reports are as important as actual contacts, because it helps others in multiple ways
-- some satellites are practically begging for people to give them reception reports because they are trying to collect data from all around the world, as well as monitor the health of a satellite
-- you could easily be the first person who catches a problem with a bird, not because you are a scientist, but because you have uploaded your data to the research center

Fox Telemetry
Funcube
ISSFanclub.com
AMSAT.ORG
ARISS.net
APRS.fi

For some things monitoring can be done unattended, such as with the Foxtelem or Funcube programs
-- you can leave fldigi or Multipsk going on a frequency if there is going to be SSTV images downloaded – the software will automatically start up and save the photos if set up properly

Several satellite-tracking programs are available in shareware or for purchase, as well as in a variety of different computer formats.
-- a number of Web sites related to amateur satellite operation now have online tracking programs that make rough tracking a snap.
--Online tracking of satellites can be found at heavensabove.com or amsat.org
-- Another option suggested by Frank KC8FPT was spotthestation.nasa.gov
-- once you've loaded your location (latitude and longitude), the current time along with the Keplerian element files into your satellite tracking software, the computer then solves the complex orbital math to make a prediction of where a selected satellite should be at the current (or a future) time.

Because they are such a vital ingredient to this part of our hobby (and because they age over time) finding a reliable source for the latest Keplerian Elements for Amateur Radio satellites should be high on your list of things to do as you get started in satellite work. Keps are often listed on many Amateur Radio Internet Web sites.

The AMSAT-North America Web site lists the latest Keps in a variety of downloadable formats
-- it also has an embedded online tracking feature which allows you to simply plug in your latitude and longitude (or your Maidenhead Grid Square) to find out when those satellites of interest to you will next be in range of your location.

-- you can record off of a radio onto your phone or any other recording device and pump it through your computer line-in or microphone to software which can then decode it
-- or capture voice sessions on satellites such as AO-73 or SO-50 or the ISS

Beacons
Probably one of the first things you will learn to do after you find out when a particular satellite will be within range of your station is to listen for the satellite's beacon.
-- Most satellite beacons consist of one or more transmissions coming from the satellite that will assist you in your search as well as tell you other things about the satellite's health and the nature of its transponders.
-- Satellite beacons operate in many modes, from Morse code to a variety of digital formats, and can usually be found on frequencies immediately above and/or below the satellite's other downlink frequencies.
-- In addition, as most satellite beacons transmit with a fixed amount of output power, they can also serve as a superb reference point for setting up and calibrating your station antennas and other equipment.

-- Most satellite telemetry signals, which consist primarily of transmissions about the health of the satellite, are also sent to ground controllers by way of the beacon.
-- What's more, some satellites even provide information regarding their transponder schedules, along with other items of interest to satellite operators, using their beacons.
-- However, in the case most of the FM satellites, the single channel downlink is itself, the beacon.