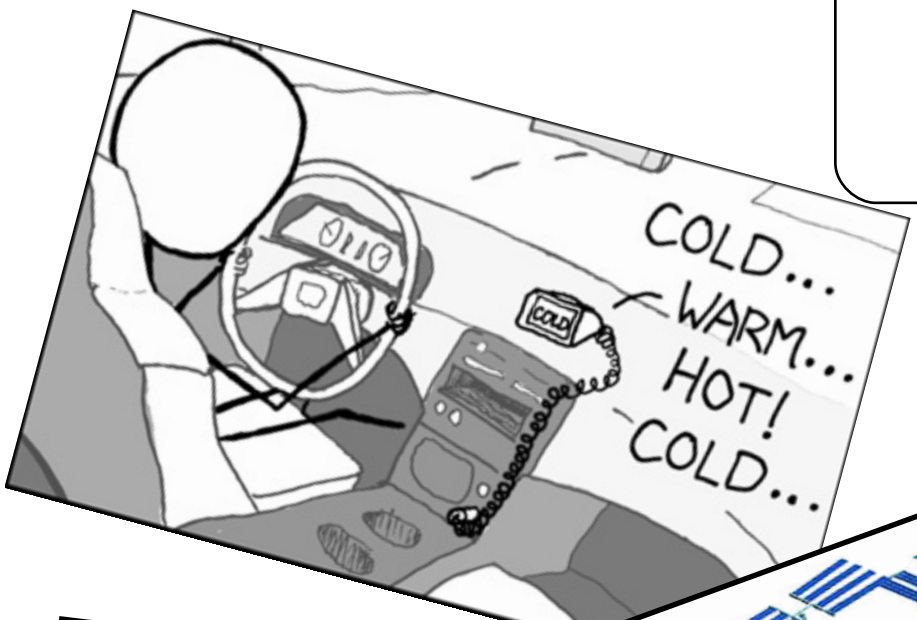
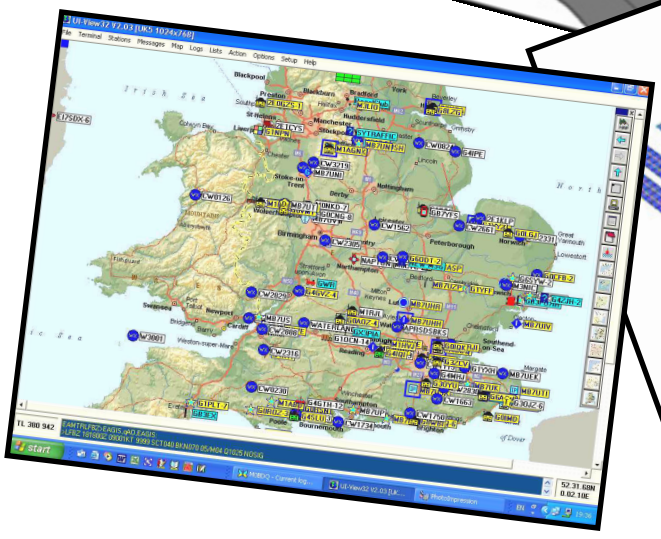
DIGICOM

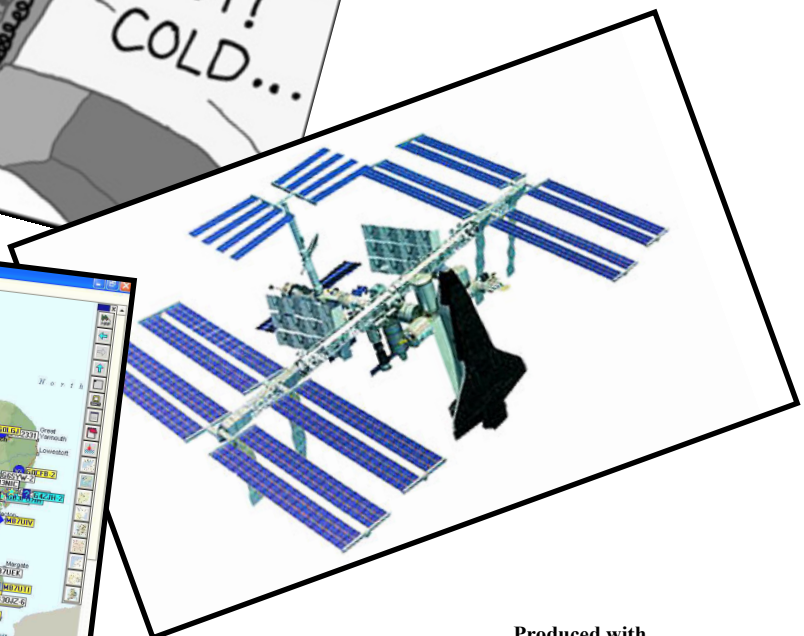
The Newsletter of MAXPAK
The Midlands AX25 Packet User Group
Autumn 2010

APRS SPECIAL

IN THIS ISSUE







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Scribus Open Source Desktop Publishing

Club Events/Diary

Monthly Club Meeting are held
in the lounge of the Public House
"One Man and His Dog"
Turnberry Road
Bloxwich, WS3 3UB
Just off the A34 Bloxwich

All meetings start at 19:45
Check the website for the latest information

November 1st - APRS & Linux Talk by M0DCM Dave, G4GSB Miles & G7III Iain
December 6th - Christmas Meeting and Meal
January 10th - New Year Meeting & Natter Night
February 7th - Natter Night

BBS/Node List

GB7MAX /BLOX Node (Bloxwich)
The BBS/Node, using WinFBB/ XROUTER continues to perform satisfactorily.
Direct Telnet access to the BBS on Port 4001 and to the BLOX node
on Port 2323 is available.
Contact Chris, G0CNG, sysop, for further information or access
password authorisation.
Current R.F. user access to both BLOX and GB7MAX is as follows:
2m 144.9375 MHz 1K2
70cm 432.675 MHz 1K2
23cm 1240.950MHz 1k2

GB7WAL (Walsall)
This BBS continues to perform satisfactorily. User ports as follows:
2m 144.850 1K2
2m 144.975 9K6
70cm 432.650 1K2

DUDLEY GB7DN (XROUTER) NODE (Dudley)
Sited at the QTH of our Secretary, G4GSB in Dudley. User access is
as follows:

2m 144.850 MHz 1k2
2m 144.975 MHz 9k6
70cm 432.675 MHz 1k2

Who's Who in MaxPak

Chairman and Membership Secretary
Chris G0CNG QTHR or @ GB7MAX
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Committee/Technical
Iain G7III @ G7III.GB7COV.#29.GBR.EU

APRS Digipeater List
All on 144.800MHz

GB7DN Digipeater (East Dudley)
Sited at the QTH of G4GSB Miles

MB7UV Digipeater (West Dudley)
Sited at the QTH of M0DCM Dave

GB7PMB and SALOP G7BUG-8 NODE (Newport, Shropshire)
Sited at the QTH of Tony, G7BUG.
Good signal reports have been received around Newport and Wellington areas.
Direct Telnet access available, contact G0CNG.
R.F. user access as follows:

2m 144.950 1K2

Chairman's Jottings

Greetings all and welcome to this edition of Digicom.

Not much to report from my end since the last edition.

My new Diamond X700 Tri Band 2m, 70cm and 23 cm Collinear continues to perform well with some good signal reports on all three bands.

Just to remind anyone with a 23cms rig that there is user access to GB7MAX/BLOX on 1240.950 MHz vertical polarisation, 1200 baud. I have two spare 23cms beams here if anyone would like one. Just email, phone or even send me a packet message to GB7MAX if you'd like one of them.

Miles, G4GSB and I are also planning to open up our 9K6 70cms link between BLOX and DUDLEY nodes to user access to encourage experimentation on 70cms 9600 baud. Simplex frequency to be announced soon.

With Autumn well under way, the Christmas Natter Evening on Monday 6th December is fast approaching. We plan to repeat our Christmas Eat and Natter evening at the One Man and his Dog, from 7pm onwards (NOTE THE EARLIER START TIME) which was so successful last year. MaxPak will pay for a meal from the Main Menu for all Members (you only need to buy your drinks). You are welcome to bring wives / friends etc but they will need to purchase their own meals. The Committee hope as many of you as possible will be able to support this event.

All the best for a very happy Christmas and New Year from myself and the Committee.

Chris G0CNG Chairman and Sysop GB7MAX / BLOX.

News

Orkney Wireless Museum amateur radio station

It is hoped that the Orkney Wireless Museum amateur radio station will be in operation from its premises at Kiln Corner, Kirkwall between Thursday 2 September and Wednesday 8 September during the 20th Orkney International Science Festival.
Using the callsign GB2OWM, probable operating periods will be weekdays and Sunday afternoons between 2.30 and 4.30pm and Saturday morning between 10am and 12.30pm. Operation will be primarily on HF SSB.
More information can be obtained from Bill, GM3IBU by e-mail to bill@gm3ibu.plus.com.

TruckCam - Amateur Radio is Movin' On

An Essex-based radio ham is transmitting live images from his truck as he travels around the UK.
From a dashboard mounted webcam in his delivery truck, Paul Young, G0HWC from Clacton on Sea, transmits a live video feed of the road ahead.
So, sit back and follow Paul on his journey around the country. And, just in case you can't figure out exactly where he is at the moment, Paul has a live APRS map on his website too.
Paul's website carries this description of his system:
"The truckcam is fitted into my truck and transmits a live video feed while I am working. This is Monday to Friday from 4am (0300 UTC) until I finish each day.
"I also run APRS from the truck so you can also follow me on the live map. The live video feed from the truckcam relies on a 3G mobile internet connection so in some parts of the UK I will lose connection. Same goes for the APRS tracking as when I am not in range of a APRS I-Gate the tracking will stop until my signals are picked up again."
Paul has a impressive and comprehensive SSTV website which is full of useful information.
You'll find it at: http://www.g0hwc.com/
The Truckcam has its own URL http://www.truckcam.tv

GB2RS on 4-metres

Starting this Sunday October 17th there will be a GB2RS broadcast from East Beds.on 70.425 Mhz.
The transmission will be at 10.00 local and will be simultaneous with the existing 2m broadcast from the same location.
This is initially for a 6 week trial but will continue indefinitely if there is an audience.
The coverage is estimated to be Herts, Beds, Bucks, Cambs, Northants and the west of Essex and Suffolk.
Any reports will be appreciated a few minutes after close down at 10.30 or by email to g4oxy@btinternet.com

First time on-air for Chinese Antarctic base

Mike, RW1AI (ex-UA1AFM), currently active as R1ANP from
the Progress Antarctic station, is planning to activate the Chinese Zhongshan Antarctic Base for the first time ever.
Look for him to be active as R1ANP/A from Zhongshan station in October and November.
He will be using 100 watts into vertical antenna.
If you would like to see pictures of the base, visit the French Polar Team's Web site at:
http://www.french-polar-team.fr/BY_Chinese_Stations_Antarctica.php

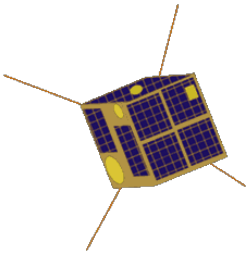
Tune Into the World - Amateur Radio Gets People Talking

Are you interested in putting something back into amateur radio? Want to do something positive to promote it to the general public?
If you answered 'yes' to both those questions then why not join together with two of your radio amateur friends and take part of the inaugural event to outreach to the public and show amateur radio in action.
All it needs is a minimum of three people, a portable amateur radio station set up in a public space such as a shopping area, park or wherever, the use of the WIA available posters, and take part in the 'Tune Into the World - Amateur Radio Gets People Talking'.
Individuals and groups are invited to register for the event that happens across the nation on Saturday the 23rd of October. Only five week's to go.
The Adelaide Hills Amateur Radio Society will be setting up at the Eden Hills Primary School, Victoria's Scout Radio and Electronics Service Unit has chosen the Kangaroo Ground Memorial Tower in Melbourne's north-east, while Amateur
Radio Victoria will be at the Point Gellibrand Coastal Heritage Park, Williamstown. Western Australia's Peel Amateur Radio Group has identified the Rotunda on Mandurah Foreshore, as its spot to go portable.
Thank you to those 4 clubs for making an early commitment to the event.
Check out the National Field Day rules, learn about the available resources to make your participation look professional, and to register online, visit the WIA website and its WIA Centenary section

Ham radio station operating from a Boeing 737

SWL Denis F-11217 and radio ham F1USC report QSO made with an amateur radio operator signing 'Aeronautical Mobile'.
PH9HB/AM regularly flies to northern Europe and is often active on 17 meters band, and regularly contacts radio amateurs from his Boeing 737.
The airborne equipment consists of a Collins HFS900D which works on USB and AM, it can use 400 watts PEP.
The antenna is of the shunt-fed slotted type, situated in the vertical end of the tail section.
More here : http://f1jxq.passion-radio.org/ham-radio-operator/ph9hb-ham-radio-operating-from-a-boeing-737/

Aalto-1, the Finnish student satellite



Aalto-1 recently featured on Finnish TV and there is also a short video showing a graphic of the 3U CubeSat available.
It is a student satellite project of Aalto University, Finland. When launched, it would be the first Finnish satellite.
It is planned to operate at VHF-UHF and there will also be an S-band transmitter. Up to 8 watts of power will be available from the Solar panels.
The main payload of the satellite is a novel tiny Fabry-Perot imaging spectrometer, developed by VTT, Finland. The primary scientific goal of the mission is to demonstrate the feasibility of MEMS Fabry-Perot spectrometers for space applications. This miniature technology can be used in nanosatellites for large a variety of remote sensing applications in the future.
High spectral resolution images can be used for water quality monitoring and land use classification.

Aalto-1 Discussion Forum in English
https://wiki.aalto.fi/display/SatForum/Aalto-1+Discussion+Forum

What is APRS?

APRS is short for Automatic Position Reporting System, which was designedby Bob Bruninga, WB4APR, and introduced by him at the 1992 TAPR/ARRL Digital Communications Conference. Fundamentally, APRS is a packet communications protocol for

disseminating live data to everyone on a network in real time. Its most visual feature is the combination of packet radio with the Global Positioning System (GPS) satellite network, enabling radio amateurs to automatically display the positions of radio stations and other objects on maps on a PC.

Other features not directly related to position reporting are supported, such as weather station reporting, direction finding and messaging.

APRS is different from regular packet in several ways:

- It provides maps and other data displays, for vehicle/personnel location and weather reporting in real time.
- It performs all communications using a one-to-many protocol, so that everyone is updated immediately.
- It uses generic digipeating, with well-known callsign aliases, so that prior knowledge of network topology is not required.
- It supports intelligent digipeating, with callsign substitution to reduce network flooding.
- Using AX.25 UI-frames, it supports two-way messaging and distribution of bulletins and announcements, leading to fast dissemination of text information.
- It supports communications with the Kenwood TH-D7 and TM-D700 radios, which have built-in TNC and APRS firmware.

Conventional packet radio is really only useful for passing bulk message traffic from point to point, and has traditionally been difficult to apply to real-time events where information has a very short lifetime. APRS turns packet radio into a real-time tactical communications and display system for emergencies and public service applications. APRS provides universal connectivity to all stations, but avoids the complexity, time delays and limitations of a connected network. It permits any number of stations to exchange data just like voice users would on a voice net. Any station that has information to contribute simply sends it, and all stations receive it and log it. APRS recognizes that one of the greatest real-time needs at any special event or emergency is the tracking of key assets. Where is the marathon leader? Where are the emergency vehicles? What's the weather at various points in the county? Where are the power lines down? Where is the head of the parade? Where is the mobile ATV camera? Where is the storm? To address these questions, APRS provides a fully featured automatic vehicle location and status reporting system. It can be used over any two-way radio system including amateur radio, marine band, and cellular phone. There is even an international live APRS tracking network on the Internet.

APRS Features

APRS runs on most platforms, including DOS, Windows 3.x, Windows 95/98/ME/XP/Vista & Windows 7, MacOS, Linux and Palm. Most implementations on these platform support the main features of APRS:

- Maps — APRS station positions can be plotted in real-time on maps, with coverage from a few hundred yards to worldwide. Stations reporting a course and speed are dead-reckoned to their present position. Overlay databases of the locations of APRS digipeaters, US National Weather Service sites and even amateur radio stores are available. It is possible to zoom in to any point on the globe.
- Weather Station Reporting — APRS supports the automatic display of remote weather station information on the screen.
- DX Cluster Reporting — APRS an ideal tool for the DX cluster user. Small numbers of APRS stations connected to DX clusters can relay DX station information to many other stations in the local area, reducing overall packet load on the clusters.
- Internet Access — The Internet can be used transparently to cross-link local radio nets anywhere on the globe. It is possible to telnet into Internet APRS servers and see hundreds of stations from all over the world live. Everyone connected can feed their locally heard packets into the APRS server system and everyone everywhere can see them.
- Messages — Messages are two-way messages with acknowledgement. All incoming messages alert the user on arrival and are held on the message screen until killed.
- Bulletins and Announcements —Bulletins and announcements are addressed to everyone. Bulletins are sent a few times an hour for a few hours, and announcements less frequently but possibly over a few days.
- Fixed Station Tracking — In addition to automatically tracking mobile GPS/LORAN-equipped stations, APRS also tracks from manual reports or grid squares.
- Objects — Any user can place an APRS Object on his own map, and within seconds that object appears on all other station displays. This is particularly useful for tracking assets or people that are not equipped with trackers. Only one packet operator needs to know where things are (e.g. by monitoring voice traffic), and as he maintains the positions and movements of assets on his screen, all other stations running APRS will display the same information.

THE APRS DESIGN PHILOSOPHY

Net Cycle Time

It is important to note that APRS is primarily a real-time, tactical communications tool, to help the flow of information for things like special events, emergencies, Skywarn, the Emergency Operations Center and just plain in-the-field use under stress. But like the real world, for 99% of the time it is operating routinely, waiting for the unlikely serious event to happen.

Anything which is done to enhance APRS must not undermine its ability to operate in local areas under stress. Here are the details of that philosophy:

1. APRS uses the concept of a “net cycle time”. This is the time within which a user should be able to hear (at least once) all APRS stations within range, to obtain a more or less complete picture of APRS activity. The net cycle time will vary according to local conditions and with the number of digipeaters through which APRS data travels.
2. The objective is to have a net cycle time of 10 minutes for local use. This means that within 10 minutes of arrival on the scene, it is possible to captured the entire tactical picture.

3. All stations, even fixed stations, should beacon their position at the net cycle time rate. In a stress situation, stations are coming and going all the time. The position reports show not only where stations are without asking, but also that they are still active.
4. It is not reasonable to assume that all APRS users responding to a stress event understand the ramifications of APRS and the statistics of the channel — user settings cannot be relied on to avoid killing a stressed net. Thus, to try to anticipate when the channel is under stress, APRS automatically adjusts its net cycle time according to the number of digipeaters in the UNPROTO path:

- Direct operation (no digipeaters): 10 minutes (probably an event). Via one digipeater hop: 10 minutes (probably an event).
- Via two digipeater hops: 20 minutes.
- Via three or more digipeater hops: 30 minutes.

5. Since almost all home stations set their paths to three or more digipeaters, the default net cycle time for routine daily operation is 30 minutes. This should be a universal standard that everyone can bank on — if you routinely turn on your radio and APRS and do nothing else, then in 30 minutes you should have virtually the total picture of all APRS stations within range.
6. Since knowing where the digipeaters are located is fundamental to APRS connectivity, digipeaters should use multiple beacon commands to transmit position reports at different rates over different paths; i.e. every 10 minutes for sending position reports locally, and every 30 minutes for sending them via three digipeaters (plus others rates and distances as needed).
7. If the net cycle time is too long, users will be tempted to send queries for APRS stations. This will increase the traffic on the channel unnecessarily. Thus the recommended extremes for net cycle time are 10 and 30 minutes — this gives network designers the fundamental assumptions for channel loading necessary for good engineering design.

Packet Timing
Since APRS packets are error-free, but are not guaranteed delivery, APRStransmits information redundantly. To assure rapid delivery of new or changing data, and to preserve channel capacity by reducing interference from old data, APRS should transmit new information more frequently than old information. There are several algorithms in use to achieve this:

- Decay Algorithm — Transmit a new packet once and n seconds later. Double the value of n for each new transmission. When n reaches the net cycle time, continue at that rate. Other factors besides “doubling” may be appropriate, such as for new message lines.
- Fixed Rate — Transmit a new packet once and n seconds later. Transmit it x times and stop.
- Message-on-Heard — Transmit a new packet according to either algorithm above. If the packet is still valid, and has not been acknowledged, and the net cycle time has been reached, then the recipient is probably not available. However, if a packet is then subsequently heard from the recipient, try once again to transmit the packet.
- Time-Out — This term is used to describe a time period beyond which it is reasonable to assume that a station no longer exists or is off the air if no packets have been heard from it. A period of 2 hours is suggested as the nominal default timeout. This time-out is not used in any transmitting algorithms, but is useful in some programs to decide when to cease displaying station as “active”. Note that on HF, signals come and go, so decisions about activity may need to be more flexible.

Generic Digipeating
The power of APRS in the field derives from the use of generic digipeating, in that packets are propagated without a priori knowledge of the network.There are six powerful techniques which have evolved since APRS was introduced in 1992:

1. RELAY — Every VHF APRS TNC is assumed to have an alias of RELAY, so that anyone can use it as a digipeater at any time.
2. ECHO — HF stations use the alias of ECHO as an alternative to RELAY. (However, bearing in mind the nature of HF propagation, this has the potential of causing interference over a wide area, and should only be used sparingly by mobile stations).
3. WIDE — Every high-site digipeater is assumed to have an alias of WIDE for longer distance communications.
4. TRACE — Every high-site digipeater that is using callsign substitution is assumed to have the alias of TRACE. These digipeaters self-identify packets they digipeat by inserting their own call in place of RELAY, WIDE or TRACE.
5. WIDEn-N — A digipeater that supports WIDEn-N digipeating will digipeat any WIDEn-N packet that is "new" and will subtract 1 from the SSID until the SSID reaches –0. The digipeater keeps a copy or a checksum of the packet and will not digipeat that packet again within (typically) 28 seconds. This considerably reduces the number of superfluous digipeats in areas with many digipeaters in radio range of each other.
6. GATE — This generic callsign is used by HF-to-VHF Gateway digipeaters. Any packet heard on HF via GATE will be digipeated locally on VHF. This permits local networks to keep an eye on the national and international picture.

Communicating Map Views Unambiguously

APRS is a tactical geographical system. To maximize its operational effectiveness and minimize confusion between operators of different systems, users need to have an unambiguous way to communicate to others the "location" and "size" (or area of coverage) of any map view.

The APRS convention is by reference to a center and range which specify the geographical center and approximate radius of a circle that will fit in the map view independent of aspect ratio. The radius of the circle (in nautical miles, statute miles or km) is known as the "range scale". This convention gives all users a simple common basis for describing any specific map view to others over any communications medium or program.

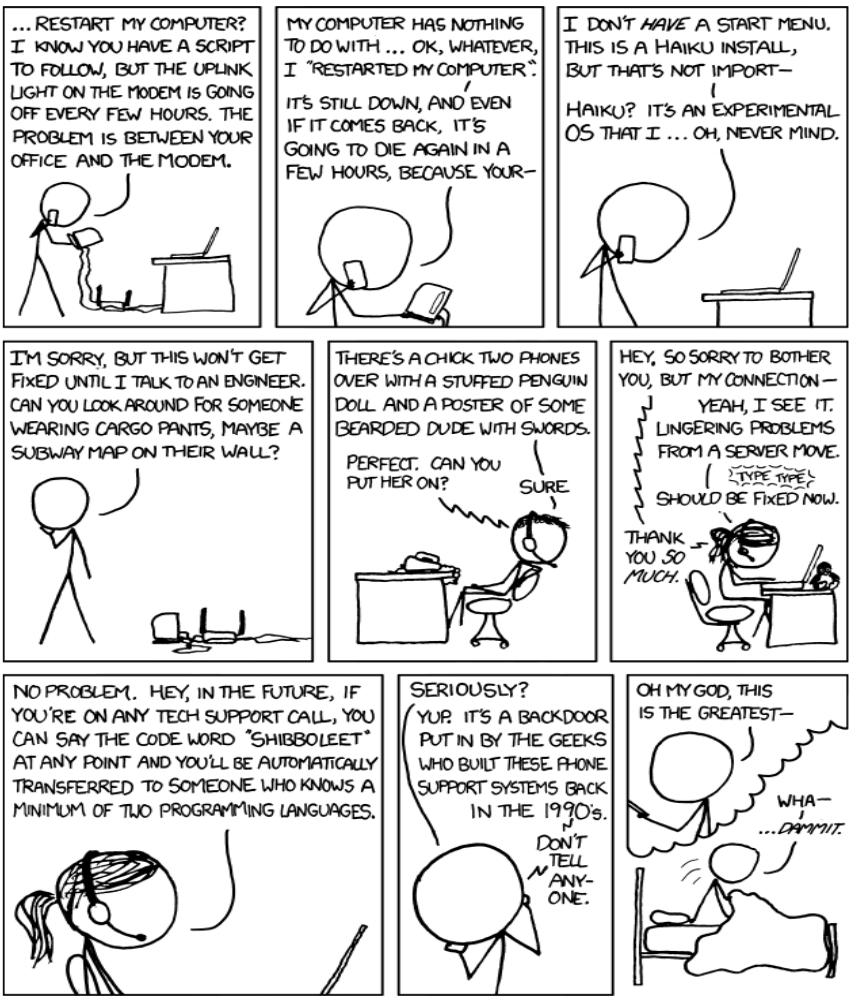
So, Hopefully this gives you the basic information you need to know about APRS. MaxPak currently run 2 Digipeaters in the Dudley area GB7DN and MB7UV. UV also sends out information Packets at set times of the local Packet BBS Network and also local VHF/UHF repeaters. There will be a a further 2 new Digipeaters added to the Network in the near Future and MB7UV will be moved to the Walsall/Wolverhampton area once again. There are also chances to send APRS to the International Space Station, when it comes in range and actually get messages digipeated across UK and Europe.

Please come along to the November meeting if you can make it, as M0DCM Dave, G4GSB Miles and G7III Iain will be doing a talk on APRS and running a live demo of the mode on Linux, and hopefully show the benefits of APRS and also do away with some of the myths of the mode.

73's and Happy APRS'ing....

M0DCM Dave

Tech Support



Campfire