The West Australian
VHF Group Bulletin
January 2003

Calendar

Jan	13	VHF Microwave Net
	20	Committee Meeting
	27	General Meeting
Feb	10	VHF Microwave Net
	17	General Meeting
	24	Committee Meeting
Mar	10	VHF Microwave Net
	17	Committee Meeting
	24	General Meeting
Apr	13	**Field Day**
	14	VHF Microwave Net
	21	Committee Meeting
	28	Annual Gen. Meeting
May	12	VHF Microwave Net
	19	Committee Meeting
	26	General Meeting
Jun	9	VHF Microwave Net
	16	Committee Meeting
	23	General Meeting

Committee

President	Alan	VK6ZWZ
Acting Sec.	Don	VK6HK
Vice President	Terry	VK6ZLT
Treasurer	Cec	VK6AO
Activities		
Materials		
Publicity		
Librarian	Al	VK6ZAY
Museum Rep	Tom	VK6ZAF
Bulletin Editor	Ben	VK6TLA
Councillor	Wally	VK6KZ
Councillor	Terry	VK6TRG

The official newsletter for the West Australian VHF Group (Inc), PO Box 189 Applecross. Email for the editor can be sent to vk6tla@amsat.org.

Editors Notes

Ben Rampling, VK6TLA

Welcome to the January edition of the Bulletin. The change of year brings in a new editor, and a change of typesetting software brings a new design. For those taken by surprise, I'd better introduce myself. Having been a new and unsuspecting member at the time a new editor was sought, I volunteered myself with abandon. While I have not held an Amateur license for any great period, I have clocked up many hours with a soldering iron and bring previous expertise in publishing.

The installation of the Mount Barker beacons has been scheduled to take place on or around 24 April. The site lease has recently been taken over by Tim Smith, who has generously donated the use of the site and his qualifications as a rigger to assist the installation.

A recent topic of discussion has been the use of GPS as a frequency reference for our beacons. Don VK6HK has conducted on-air tests with Wal VK6KZ and a 432MHz beacon transmitter. The resulting carrier accuracy was believed to be better than 5Hz. The transmitter was modified to run from a DDS signal source, controlled by a GPS disciplined reference. Further tests are planned on higher bands, and a proposal may be formed to employ a similar system at selected beacon sites.

As has been tradition, I am seeking submissions of news items, letters to the editors and technical articles. We will also be continuing and encouraging the delivery of these bulletins via Email. If you wish to receive your bulletin by email please contact me.

Eighth WA VHF/UHF/SHF Field Day

Sunday, 13 April, 2003

1. The contest is open to all individual licensed amateurs. All bands above 50 MHz, and all licensed modes, may be used.

2. Points are scored for two way contacts between pairs of stations, at least one of which must be portable, and at least one of which must be in the VK6 call area. (Repeater contacts do not count towards the score, but may be used for liaison purposes.) For the purposes of the contest, a portable station is one which is being operated away from the usual station address and which is not powered from the AC mains. Mobile stations (including permanently mobile) count as portable, as does the VHF Group station VK6WH.

3. CONTEST TIME: 1030-1500 WST (0230Z-0700Z) on Sunday, 13 April, 2003. The contest is divided into 2 intervals of 2 hours each, 1030-1230 WST and 1300-1500 WST. These are separated by a half hour (1230-1300 WST) for lunch. Two stations may work each other for a scoring contact once on each band in each 2 hour interval.

4. The contest exchange will consist of a signal report, 3 digit serial number starting from

001, and the station location.

5. Each scoring monoband contact is worth 1 point times the following multipliers:

DISTANCE MULTIPLIER:
One point for each 25km or part thereof, up to a maximum of 15 points.

Up to (km)	25	50	75	100	125	150	175	200	225	250	275	300	325	350	350+
Multiplier	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

BAND MULTIPLIER:

Nom. Freq. MHz	50	144	432	1296	2400	3400	5760	10368	24000	47000 and up
Multiplier	3	2	3	5	8	8	8	8	12	16

PORTABLE TO PORTABLE MULTIPLIER: 2
PORTABLE TO COUNTRY FIXED STATION MULTIPLIER: 2
Contacts count double if both stations are portable, or if one is portable and the other is a country fixed station. A country station is one which is at least 100km from GPO Perth.

NOVICE STATION MULTIPLIER: 4
Contacts with Limited Novice and Novice stations count quadruple.

SUMMARY:

	25	50	75	100	125	150	175	200	225	250	275	300	325	350	350+
50/432	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45
144	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
1296	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
2-10GHz	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120
24GHz	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180
47GHz & Higher	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240

6. SECTIONS: 1. Portable (All band), 2. Portable (Single Band), 3. Fixed (All band), 4. Novice.

All portable contestants should submit with their logs, a tally of their score for each band (for section 2) and their total score (for section 1).

7. GROUP OPERATION: There is no section for club stations, but contacts with club stations count towards the scores of individual amateurs entering sections 1 to 4. Groups of up to 3 licensed amateurs may pool their equipment, and operate from a single portable site under their own individual call signs. (An exception is made for VK6WH, which is allowed multiple operators, and can enter the portable section even if operated from Wireless Hill.) The use of multiple call signs by a single individual is not allowed.

8. CROSSBAND CONTACTS are permitted, but only score in special circumstances. If two stations work crossband from band A to some other band (B, say), but do not have a two way

contact on band A in the relevant 2 hour time period, then once, and only once, in that period, each may claim towards their band A (and total) score half the points that would have resulted from a band A contact. This means that if they do not have a two way contact on band B in the time period, they may also claim (once only) half the points that would have resulted from a band B contact.

9. LOGS should be sent by Monday, 28 April, 2003 (April Meeting night) to:

CONTEST MANAGER, WEST AUSTRALIAN VHF GROUP (INC),
PO BOX 189 APPLECROSS, W.A. 6953

The Contest Manager's decisions and interpretation of the rules are final.

REMEMBER: Contacts between a portable station, and a portable or country fixed station, count double. Contacts with Novice stations count quadruple.

If things get a bit quiet, some suggested frequencies to try are:

SSB: 50.175, 144.120, 432.120, 1296.120
FM: 52.525, 53.5, 146.5, 439.0, 1296.3
Liaison: 144.175 (SSB), 432.175 (SSB), 145.375 (FM)

APRS® Primer

Ben Rampling, VK6TLA

ARPS, the Automatic Position Reporting System, is a protocol developed by amateurs to track the location, course, speed and altitude of moving objects. The APRS protocol is layered over the top of AX.25, and is used in all the same places traditional packet radio can be found. After years of development and experimentation, it has been extended beyond simple object tracking, and now supports weather stations, direction finding, fixed station information, emergency beaconing, short messaging and a generic telemetry format.

APRS transmitters are often attached to cars, people, boats, remote sites and home stations. They almost always acquire their location and velocity information from a GPS, however in fixed stations and all but the most cyclone prone weather stations it is sufficient to use a hardcoded location and omit the GPS.

The APRS computer or controller has the task of configuring the GPS on boot, and decoding the GPS or sensor information. It is rare that much computing power is needed, so when space is tight a microcontroller can be used. The controller or computers will then encode this data in to a single APRS packet, and send the packet off to a TNC to be modulated. Some APRS controllers eliminate the need for a separate TNC by modulating the packet to AFSK, but these controllers are usually limited to transmit only and fairly simplistic carrier sensing.

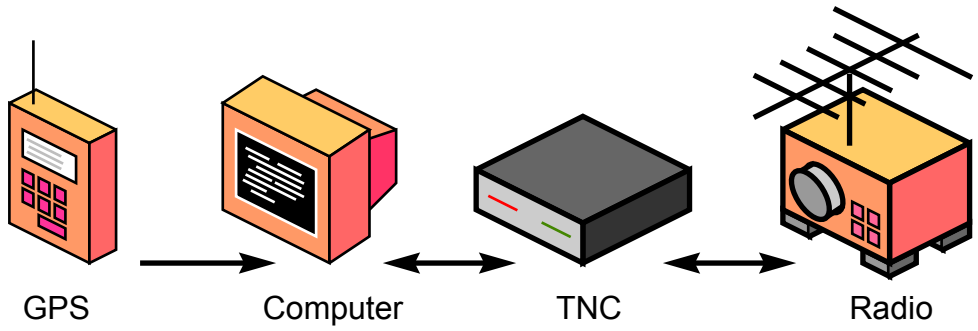

Figure 1. A full APRS station. Some stations may use a software TNC, others may use a transceiver with integrated APRS processing and display.

An APRS packet is broadcast as single AX.25 frame, in the same way that packet beacons or packet BBS MAIL notifications are broadcast. The packet will not be acknowledged by any receiving station, except in some cases where the packet contains a question or short message for the receiving station. In contrast to typical packet beacons, APRS packets may be digipeated and will either contain explicit digipeating paths or hints. The hints can specify how far and in what direction the packet should be retransmitted. Explicit paths can specify particular stations to digipeat through, but are uncommon due to the mobile nature of most stations.

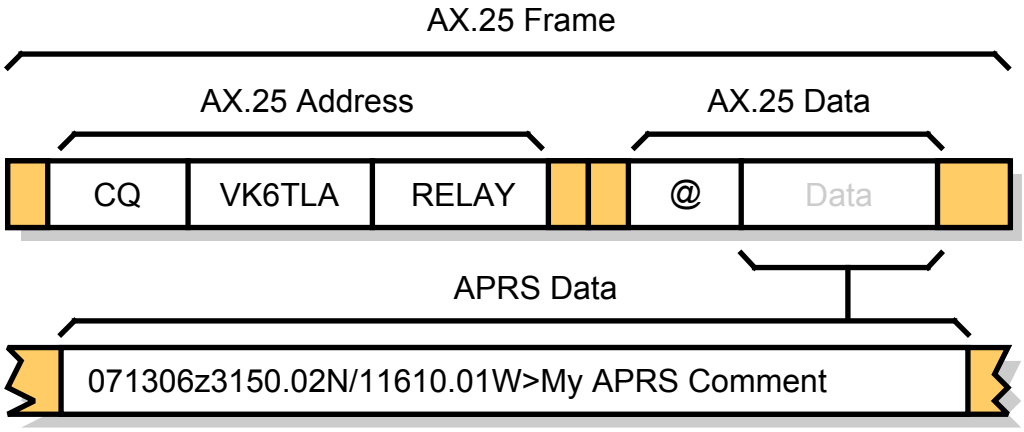

Figure 2. An APRS frame populated with data. The time is 7:13 GMT, and VK6TLA is somewhere near Perth (31° North, 116° West). Two characters select the icon to display on maps, the first between the latitude and longitude (/), and the second just between the comment (>).

So far, we have a way to transmit locations from a moving vehicle. The next problem is who receives it, and what they do with it. APRS digipeaters extend the propagation of packets in two ways. Like a voice repeater, an APRS digipeater rebroadcasts any frames heard. All APRS communications take place on a single channel, and many digipeaters may be in range of the APRS transmitter. To avert the obvious disaster, digipeaters may use the hints in the APRS frame to decide if it should repeat the message. Every digipeater will digipeat messages when the next hop in the path is “RELAY”. A digipeater with extensive coverage of an area will also react to

"WIDE" addresses. A packet jumps through multiple relay or wide digipeaters if the path has a repeated address. For instance, if you really want to get a message spread far and wide, a path like "RELAY, RELAY, WIDE, WIDE" will help.

Another way that APRS stations can propagate packets is via the Internet. An IGATE is an APRS node that sends packets to a central Internet APRS server to be distributed to all other APRS IGATE nodes. This allows world wide monitoring of APRS nodes, and short messaging between any two nodes in the world in range of an IGATE. An easy to use interface to this system is provided at the web site *www.findu.com*, and it is also possible to connect APRS software, usually used to decode on-air packets, to the Internet system.

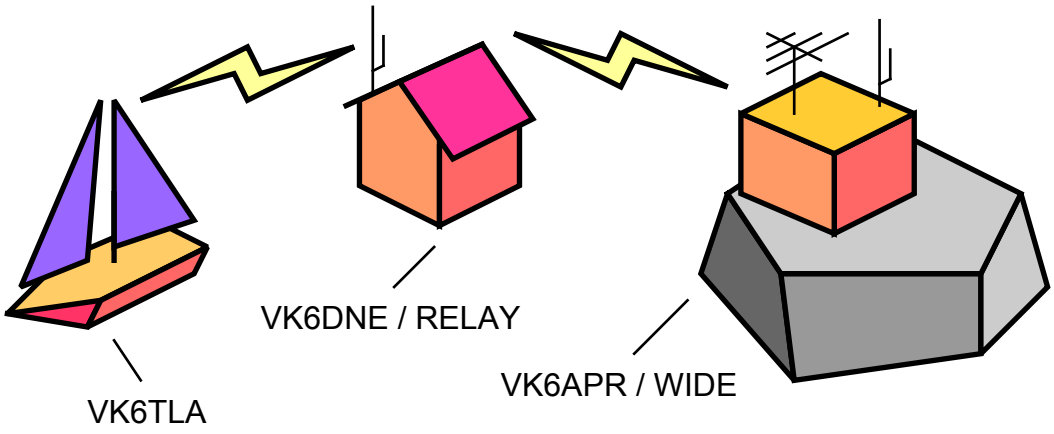

Figure 3. A roaming APRS station broadcasts packets in the hope that a nearby digipeater will receive the packet. In this case, the packet has first been received by a "relay" digipeater and then by a "wide" digipeater.

Regardless of how packets reach your station, you'll want to see what is going on. An APRS program can be installed on your computer to collect packets on-air, or to connect to an Internet APRS server. Once your computer is receiving packets, it displays the wandering cars, hikers or weather stations on a map. Messages can be sent to and from mobile stations, and weather stations and telemetry beacons can be examined. The software is usually configurable to allow only local traffic to be viewed, or to zoom out and show (the somewhat crowded) map of nodes around the country or around the globe.

It should probably be noted that the above description of APRS glosses over many details of APRS. The full standard allows for many different message formats and tricks that have appeared in the rapid evolution of APRS. Full details of APRS, software and the standard can be found at the web site *www.tapr.org*.