THE WEST AUSTRALIAN VHF GROUP BULLETIN

MARCH 1995

THE WEST AUSTRALIAN VHF GROUP (INC)
P.O. BOX 189 APPLECROSS W.A. 6163

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PRESIDENT	*TERRY*	*VK6ZLT*	*SECRETARY*	*BOB*	*VK6ZFY*
VICE PRESIDENT	*WALLY*	*VK6KZ*	*TREASURER*	*CES*	*VK6AO*
COUNCILLOR	*ALAN*	*VK6ZWZ*	*COUNCILLOR*	*KEN*	*VK6AKT*
LIBRARIAN	*ALAN*	*VK6ZAY*	*MATERIALS*	*CES*	*VK6AO*
BULLETIN ED	*BRUCE*	*VK6BMD*	*PUBLICITY*	*TERRY*	*VK6ZLT*
ACTIVITIES	*TERRY*	*VK6ZLT*	*MUSEUM REP*	*TOM*	*VK6ZAF*

MAR	*20*	*COMMITTEE MEETING*	*APR*	*17*	*COMMITTEE MEETING*
	25	*FOXHUNT*		*22*	*FOXHUNT*
	27	*GENERAL MEETING*		*24*	*GENERAL MEETING*
MAY	*15*	*COMMITTEE MEETING*	*JUN*	*19*	*COMMITTEE MEETING*
	20	*FOXHUNT*		*24*	*FOXHUNT*
	22	*GENERAL MEETING*		*26*	*GENERAL MEETING*
JUL	*17*	*COMMITTEE MEETING*	*AUG*	*21*	*COMMITTEE MEETING*
	22	*FOXHUNT*		*26*	*FOXHUNT*
	24	*GENERAL MEETING*		*28*	*GENERAL MEETING*

West Australian VHF Group Newsletter P.O. Box 189, Applecross W.A. 6153.

Circulation is 69. This consists of 39 city and 9 country fee paying members, 15 life members some of whom have donated $10 to the club for the bulletin costs and 6 courtesy copies of the bulletin.

Volunteers Needed to Repair Beacon

VK6KZ reinstated beacon "VK6RBS" after work was carried out on the transmitter. At the time of the reinstatement pictures were taken, using a camera and astronomical telescope, of the antennas on the tower to determine the reason for the severe drop in performance of the 144 MHz beacon. Study of these show that there is a need to remove all of the antennas from the tower, install a temporary 144 MHz antenna before winter. This work requires the tower to be climbed and a volunteer is required. All applications for the position of tower climber to Wally VK6KZ who will be coordinating the beacon committees activities for this work.

Relicencing of VHF Group Beacons

The groups licenses for Beacons VK6RPH, VK6RBS, the foxhunt VK6VF, and the VHF club station wireless hill VK6WH were renewed for the sum of $148.

Relocation of VK6RPH Beacons to New Site.

The beacon committee is seriously considering the relocation of the VK6RPH beacons to a new site. The frequencies of these were given in the last issue of this newsletter. The 1296 Beacon is currently being rebuild by Al VK6ZAY and Don VK6HK. Any offers of assistance for the relocation to the beacon committee VK6KZ, VK6HK and VK6ZWZ.

Long Range Contacts on 10 GHz Continue

Wally VK6KZ continued his success on 10GHz by contacting VK6BHT at Geraldton from Cape Leeuwin on Saturday 11/2/95 signals were 3/1 both ways.

1296 MHz contacts were made between VK6AO and VK6ZWZ during the month.

New Equipment Purchased from VK5ESC

Over the past few months the following equipment has been purchased by the equipment officer for members
4 x 2400 MHz Satellite DownConverters
1 x 2256 MHz FM ATV Transmitter
1 x 1250 MHz FM ATV Transmitter
1 x 70 cm Preamp full kit
1 x 2 m Preamp full kit

Next Japanese Amateur Satellite. Masaji Tamagawa, JH1AOY

JAS-2 will be launched in January 1996 or February 1996,
The launch rocket: H-II
Main payload: ADEOS
Size : as same as JAS-1, 44cm x 47cm.
Weight: 50 kg.
Altitude: 800-kilometres.
Polar circular orbit.
Stabilisation 3-axis stabilised earth pointing by electrical magnet.

	145 MHZ UPLINK	435 MHZ DOWNLINK
Digital mode		
	145.850	435.910
	145.870	
	145.910	
Analog mode		
	145.900-145.600	435.800-435.900

Digital mode of operation 9600 bps FSK or 1200 bps PSK.
Digitalker: about 30sec. FM voice messages.
TX power: 1W
CPU: V50(NEC)
Memory: 2M bytes

New Israel Satellite Techsat Launch Asi 4Z7ABA and Igaal 4Z7EBA by Shlomo 4X1AS

TECHSAT1 will be launched on the 28th of March from Plesetsk Russia, about 700 km north of MOSCOW. The launcher is called START.
A few of the satellite's specs;
Size 0.45m x 0.5m x 0.5m
Weight 50 kg
Altitude 670 approx.
Orbit circular not sun synchronised.
Stabilisation 3-axis stabilised. earth pointing
(Coarse accuracy: 5. Fine accuracy: 0.1-0.5)
Power available: 20 Watt average.
Housekeeping consumption: 10 Watt.
Communication: Amateur radio standards and frequencies.
Store and forward.
Multi-user digital system.

145 MHZ UPLINK	1269 UPLINK	435 MHZ DOWNLINK
145.850	1269.700	435.225
145.890	1269.800	435.325
145.910	1269.900	
145.930	1269.950	

Mode of operation 9600 bps MSK or 1200 bps PSK

Non Financial Membership List

The secretary Ces VK6AO has compiled the following list of members who are not financial in 1995 these members will not be receiving a bulletin in May. If you are incorrectly listed please contact Ces VK6AO on 3305079 and he will correct the list.

Non Financial Members 1995
VK6XH, VK6OD, VK6AXB, VK6KGC, VK6ZKO, VK6CC, VK6ZDL, VK6QL, VK6YBR, VK6ZPG, VK6ZCK, VK6AD, VK6JAE, VK6WN, VK6SQ, VK6ZGA, VK6KC, VK6YBQ, VK6KWN, VK6ZRT, VK6APS, VK6JBU,

Operating on AO-13 Oscar 13 mode S

There are a few things that will make your operation on AO-13 Mode S a little more difficult than Mode B or the Low Earth Orbiting Satellites.

These difficulties are associated with
1. High gain antenna low beamwidth. You must point the antennas accurately.
2. Doppler. The frequency the satellite is transmitting on is different from the published frequency depending on the position and speed of the satellite toward or away from you.
3. Distance from earth of the satellite. The greater distance out the more gain and lower noise figure you need in your setup to hear the signal.
4. Lack of a continuous beacon on the frequency on the satellite. This means you must find the satellite by accurate pointing of your antennas.
5. Pass bandwidth of the satellite is only 35 kHz.
6. Incorrect clock time on your computer or tracking system.
7. Satellite elements older than 3 months. (for MA calculation)
8. Unknown frequency calibration on your 2.4 GHz receiver. This means you must know the frequency to set your 144-148 MHz receiver to in order to receive the satellite. Commercial receive converters can be up to 50 kHz off frequency. Home made converters can be up to 200 kHz or more off frequency and either too high or too low. If this frequency difference is too great the satellite frequency may not be in the pass band of the 2 meter IF radio. These things must be resolved before you turn your converter skyward.

9. Some commercial receive only sets have too high a noise figure to receive the 2 meter IF satisfactorily. Amateur radio transceivers are satisfactory for receiving the 2 metre IF. I use a Yaesu 290RII and this works fine.

10. You may have accidently transmitted into your converter without knowing it and it may not be capable of working even though it is only 30 minutes old. NOTE: some radios transmit for a few seconds when you first turn them on. I have removed the microphone and covered the socket so I cannot accidently transmit into the converter. I always connect and disconnect the converter to the radio with the transceiver turned on.

The above problems can combine so that you are not able at the first attempt to find the satellite at all. You do not

know whether the problem is

Your system is just not sensitive enough to hear the satellite.
You are not pointing correctly at the satellite.
Your receiver is not tuned for the correct frequency.
The satellite antennas are not pointing toward you.

So the important guideline is the same for all radio work. Until you can hear the satellite DO NOT transmit. Even 5 watts to a moderate Yagi will be easily heard by the satellite and can wipe out other operators using it if you indiscriminately transmit even if you cannot hear a thing on your converter.

The mode S beacon currently operates from MA 218 to MA 220, this is a period of 12 or so minutes. You must adjust your system pointing angles, receive frequencies and remove all loses until you can reliably hear the beacon for the full period with good signal strength at least S1+.

I receive the beacon S1-S3 (depending on trees which attenuate 2.4GHz at a rate of 0.2db / foot thickness of foliage), on my system at a frequency of between 144.665 and 144.680 MHz depending on the position of the satellite.
The passband of the satellite at the moment is 144.725 to 144.760 MHz on my radio. This varies with time, and with doppler. It can vary so that it is 144.760 to 144.795 during autumn. The passband moves during the pass slowly by about 5 to 10 kHz. Current practice is to leave your receiver alone and adjust for doppler by slowly moving your transmit frequency. If you move your receive frequency you will move into someone else. When the satellite is extremely busy over Europe there is somebody every 5 kHz so sometimes it is hard to find a spot.

If you are using a dish of 1 metre diameter or more you must be extremely accurate with your dish pointing. My dish is 1 metre and must be pointed within 3 or 4 degrees of the correct point or I cannot hear the satellite at all. This is I suspect the most common problem of all. Most yagis antennas have a beamwidth of 20 degrees or more even my 6 metre long yagis have 15 degrees and they are therefore not so critical.
This takes some getting used to.

Wait until the satellite is pointing at you. With pointing angles greater than 20° you are losing 3 dB of the signal before you start so for the beginning only try when the pointing angles are less than 7 or 8 degrees. When your system is fine tuned you can work out to 30 degrees but not on the first day.

Those of you who purchased the 70cm exciters from the VHF group will find inside it a board on which is a 100.000 MHz crystal. Remove this board and stand the three wires on it vertically for antennas. Provide five volts to this and you have a perfect 2.4 GHz source. It has other frequencies too but the passband of your receiver will reject those. You will know 2.4 GHz when you hear it because as the source heats up there is a slight doppler shift on it. You must by the way have had your receiver on long enough to heat up and stabilise too or the doppler you hear will be the receiver not the source.

Get help from VK6ZLK, VK6ZAY, VK6ZWZ, VK6VV or VK6BMD all currently work mode S and you can visit and get your receiver calibrated.

The following article explains the fault finding skills needed to keep satellites operating and what satellite controllers have to handle to keep the satellite batteries fully charged and the satellite fully able to be used.

G3IOR Provides Explanation Of RS-15 Power System Problems

Studies of RS-15's shut-down of both the transponder and telemetry beacon show that the problem is due to the fall of the solar battery and on-board power supply voltage following passage of the satellite through prolonged darkness. The intermittent off/on switching commences when the normal 15.6 - 16.9v of the power supply falls below 12.4 volts, this condition normally resulting within 15 minutes of the passage of RS-15 in solar/earth eclipse. Immediately upon seeing sunlight again the voltage rises and both satellite systems return to continuous operation. The on/off operation was very noticeable on 10th February, coincident with popular late evening transponder use. Using GM4IHJ's eclipse computer software it was determined that RS-15 was then spending 28 minutes (22%) of its 128 minute orbital period in darkness, e.g. intermittent for some 13 minutes of each orbit. The good news is that GM4IHJ's program shows that RS-15's path is now taking it to an orbit of increasing sunlight to darkness ratio. By 17th February the satellite will see only 15.3 minutes (12%) of eclipse per orbit which should return the system to full time operation once more. On 18th February the eclipse period drops to 11.2 minutes (9%) and then to only 6.4 minutes (5%) on 19th February. From 20th February to 11 March inclusive it is in full orbit sunlight. The bad news is that we return to 6.4 minutes of eclipse on 12th March, increasing to 15.6 minutes on 14th March from when the intermittence will most likely return. By 5th April we are back to a 36 minute period of eclipse, this time then decreasing again to just 12.8 minutes again on 7th May 1995. On the assumption that the battery is in good condition, we may continue to expect regular and similar eclipse events in the future.