OFFICIAL NEWSLETTER FOR THE WEST AUSTRALIAN VHF GROUP(INC)
P.O. BOX 189, APPLECROSS WA 6153.

MEETINGS ON THE FOURTH MONDAY OF EACH MONTH AT WIRELESS HILL TELECOMMUNICATIONS MUSEUM, ALMONDBURY RD, ARDROSS

VK6WH VK6WH

PATRON MR. F.W. DAWSON

PRESIDENT	BOB BLINCO	VK6KRC H277 7049	SECRETARY	BOB PINE	VK6ZFY H 339 3273
VICE PRES	TERRY LEITCH	VK6ZLT H332 7008	TREASURER	JACK BORTHEN	VK6KDX H 447 5933
COUNCILLOR	BRUCE DOUGLAS	VK6BMD	BULLETIN ED.	VACANT	
COUNCILLOR	ROSS TOLCHARD	VK6KAT	MUSEUM REP.	BOB PINE	VK6ZFY
COUNCILLOR	CEC ANDREWS	VK6AO	MUSEUM REP.	TOM BERG	VK6ZAF
ACTIVITIES	TERRY LEITCH	VK6ZLT	PUBLICITY	VACANT	
MATERIALS	JACK BORTHEN	VK6KDX H 447 5933	LIBRARIAN	ILMAR BELTS	VK6AIB

CALENDAR

NOV	15	COMMITTEE MEETING	DEC		
	20	FOXHUNT		MERRY XMAS	
	22	GENERAL MEETING			
JAN	17	COMMITTEE MEETING	FEB	21	COMMITTEE MEETING
	22	FOXHUNT		26	FOXHUNT
	24	GENERAL MEETING		28	ANNUAL GENERAL MEETING
MAR	21	COMMITTEE MEETING	APR	18	COMMITTEE MEETING
	26	FOXHUNT		23	FOXHUNT
	28	GENERAL MEETING		25	GENERAL MEETING
MAY	16	COMMITEE MEETING	JUN	20	COMMITTEE MEETING
	21	FOXHUNT		25	FOXHUNT
	23	GENERAL MEETING		27	ANNUAL GENERAL MEETING
JUL	18	COMMITTEE MEETING	AUG	15	COMMITTEE MEETING
	23	FOXHUNT		20	FOXHUNT
	26	GENERAL MEETING		22	GENERAL MEETING
SEP	19	COMMITTEE MEETING	OCT	17	COMMITTEE MEETING
	24	FOXHUNT		22	FOXHUNT
	26	GENERAL MEETING		24	ANNUAL GENERAL MEETING

Future Of The Group's Finances

The President, when addressing the AGM, raised the need for members and the committee to recognise the delicate state of club finances. He sounded a warning about complacency in the light of a strong financial result this last year. This result followed upon the situation several years ago when the club faced insolvency and possible extinction.

A number points arose from his address which the membership at large should think about. Foremost is that the club is enjoying a resurgence of interest and participation. This is something which we can all help with by attending meetings, contributing to club projects and generally firing up everyones enthusiasm. (Even writing articles for the bulletin).

The next point is that the clubs present sound financial position is due to the hard work of the two Bobs in the materials and disposals department.(Who said you get nothing for two bob any more, even pre-decimal currency ones.) The president and secretary have made enormous contributions to the group with the VK5 kits and resale of surplus gear. The friends of the group should also be remembered for their contribution.

In this light dont forget if you want something moved or stored to talk to Steve at

CURTIS BROS VAN LINES
phone no **470 1400**.

The membership should be aware that their fees only cover half the outgoings and the rest has come from these other fortuitous sources. These outgoings include beacon licenses and costs, bulletin materials and postage and meeting room rental.

The dilemma is whether to raise fees or reduce costs. Both would have a dramatic impact on membership. Raising fees will increase revenue but risks losing members. Reducing bulletin publication further may cut costs but will possibly reduce membership.

So what shall we do? The committee is interested in your ideas as now is the time to act. That is before the wolf is at the door again.

Despite the above, it is not a time for doom and gloom. The group has an enthusiastic committee and Terry has plans for some great activities. So get along to the meetings. Bring a visitor. Who knows, they may then join the group.

Finally I am sure I echo the general memberships sentiments by thanking all past and present committee members and helpers for their efforts.

Jack VK6KDX.

SWAP

8 foot spun aluminium dish (ex Sky Channel) to swap for 4 - 6 foot spun aluminium dish

VK6ZAY 332 8912

PROPOGATION ON THE BANDS
50 MHz TO 1296 MHz
by Eric Jamieson VK5LP
Part 2 of 3

Backscatter A quite unusal mode of propogation is known as "backscatter" wherein a signal is received best with the antenna rear-on to the station. Turning the front of the antenna towards the station will lose or considerably weaken the signal. Backscatter signals may be varying degrees of strength, often the reception is of a fluttery nature thus reducing intelligibility, at other times the signal may be reasonably clear. An example of backscatter would be when you could be working a station in VK2 and suddenly you hear a VK6 station in the background. On turning the antenna to VK6, you may lose that station entirely.

Short skip "Short-skip" is another characteristic of six metres under certain conditions. As the maximum usable frequency rises, probably into the region of 150 MHz or more, it will be noticed that those stations within a distance of 600 to 1000 km will be received with very strong signals, often S9+ e.g., VK5 to VK3, being contacts not normally available under the usual band conditions.

Whilst it might be great to now have a range of new stations to work, and many will work them, the experienced six metre operator suddenly disappears from the band and can be found on two metres and probably working stations in VK1, 2 or 4, sometimes 8.

The conditions which allow such contacts, often at S9, may remain for only a few minutes or perhaps an hour or more. Because it is impossible to judge this time, you will find the operators in the know don't waste any time, contacts are made and concluded very rapidly, with only the exchange of callsigns, signal reports and perhaps a name. I can recall that some years ago I worked 11 stations in VK1 and 2 in eight minutes. Such short skip openings are more likely to occur during the summer Es season, but have been known to occur randomly. It seems that these unusual conditions may occur two or three times in most Es seasons, but have been known to occur more often. This matter will be discussed further when dealing with 144 MHz or two metres.

Trans-equatorial propogation or TEP Another form of more exotic operation is that of "trans-equatorial propogation" or TEP which may occur at any time and is generally confined to areas north of the geomagnetic equator and about the same distance above the equator as Australia is below it. Hence contacts between Australia and Japan are relatively common and intermittently between other areas such as the Philippines, China, Hong Kong, Korea etc. The signals are often very strong and openings can last from a few minutes to many hours. The afternoon type TEP is often better than the evening type where the signal may be heard with a pronounced flutter, making readability more difficult.

TEP is possible when the MUF is at least 40 MHz and strong signals are possible on frequencies up to 1.5 times the MUF, hence the ability to receive signals on 50 MHz on the north-south path. Apart from our path to Japan, similar paths exist elsewhere, such as between the UK and South Africa and from Canada and northern USA to southern South America.

Auroral contacts Another method of contacting stations is by making use of an aurora. In this case, the signals sound garbled and speech is difficult to read and better results are often obtained by the use of CW. The distances covered may be 1000 km or more and irrespective of the location of the stations, best results usually come from each party pointing their antenna in a southerly direction, from whence comes the aurora.

Knife-edge Refraction In amateur circles, knife-edge refraction over a mountain is sometimes suggested as a reason for an increase in VHF signal levels between two stations, but this seems unlikely. From research undertaken overseas, it appears that to successfully increase signals over a 160 km path, a centrally placed mountain about 1500 metres in height is required and these are rather scarce in Australia. If a mountain of such height was in other than the optimum position it would probably have no affect at all unless it was close to one station in which case it could attenuate the signal. As transmitted signals are usually more than three degrees above the horizon, any range of hills or mountains a substantial distance from the

stations are unlikely to be of any consequence.

Meteor scatter Meteor scatter reflection is caused by the daily bombardment of the atmosphere by millions of meteorites, each causing a small area of ionization capable of reflecting VHF signals, the length of time being dependent on the size of the ionized area and reflection may extend from a fraction of a second to several minutes, the latter being the least likely.

It takes a high degree of skill and patience to complete a contact via this method as only fragments of a callsign may be received at a time thus requiring many bursts or "pings" to receive the information. Most success appears to come when amateurs use the refined calling and receiving sequences commonly used in moonbounce work. 50 and 144 MHz seem to be the bands most used and propogation is possible over distances up to 2000 km. SSB is now often used in place of high speed CW as it is possible to exchange more information by that method in a short period of time.

Moonbounce or EME With the advent of improved technology, especially better receivers and large antenna systems of the multiple yagi type, six metre moonbounce is becoming more popular. Such an undertaking is not for the faint hearted as a lot of hard work is required, but results are rewarding if you are prepared to try. However, it may be preferable for newcomrs to gain experience in other areas before attempting such an undertaking.

That covers most of the modes of propogation likely to be encountered under normal operating conditions. However, there remains one final important propogation mode which requires a high degree of dedication and a good knowledge of what you might expect to work at any one time. This mode is called F2 and is listed separately as follows.

The Solar Cycle and F2 propogation About every eleven years the sun goes through a period of increased solar flare activity and this has a profound effect on earthly radio communications, affecting both the HF and VHF portions of the spectrum.

For the purposes of this paper we will deal only with VHF, where the greatest effect is observed on six metres. Solar cycles have been observed for hundreds of years but those during the past 50 years are of interest to us due to their effect on VHF propogation. The approximate peak of these eleven year cycles have been number 17 in 1936, 18 in 1947, 19 in 1958, 20 in 1969, 21 in 1980 and 22 in 1991. Of these the 1958 and 1991 peaks appear to have had the greatest impact on six metres, with 1991 producing incredible results, such as many stations world wide establishing contact with all continents plus for the first time reaching the magic number of working 100 or more countries or DXCC.

So far no Australian amateur has reached 100 countries worked but several are very close to it. Our geographical location on the planet has made it difficult to achieve DXCC compared to those more favourably placed in the northern hemisphere. However, quite a number of Australian amateurs have Worked All Continents.

It is only fair to say that in recognising the impetus given to world wide 50 MHz communications by Cycle 22, this statement needs to be seen in perspective by acknowledging that many countries, particularly in Europe, for the first time in history have been permitted to work on 50 MHz, thus providing an opportunity for amateurs to work all continents. In Europe alone there are 50 countries able to work on six metres.

Also, there is the ready availability of specialised equipment, particularly all mode transceivers, and improvements to antenna systems, plus those amateurs prepared to mount dx-peditions to out-of-the-way places, all contributing to the outstanding results achieved by so many operators over the past three years.

The amateur with serious intentions of working long distance F2 has a few tools which can help him. He will monitor 28 MHz and observe or talk to stations in possible areas of contact, so that both parties are aware of the possibility of a rising MUF. He will also monitor between 30 and 50 MHz, looking for the reception of commercial services from other continents. A suitable scanning receiver will accurately provide a frequency readout for overseas television signals in the spectrum below 50 MHz.

He will also have observed the sunspot count given daily by WWV, the US time signal station on 10 and 15 MHz, and be aware that a count of less than 100 is unlikely to support 50 MHz propogation. Should it be say 160 or more then he will be even more serious in his intentions to work F2 DX. He will also be aware of the day of week and the local time of an overseas country, knowing that there is less chance of working stations if the operators at the other end are likely to be in bed and whether it is a working day or the weekend. Also, he will not be expecting all F2 signals to be strong, indeed, many will be worked under weak CW conditions and there will be language problems. In other words, the top operators with the highest country scores will have worked long and hard to achieve their positions. You may have been lucky to stumble across a good F2 opening or been prepared for it, but for every strong signal you work there will be another marginal one there to add to your tally, if you are capable of working it. In other words, F2 DX is the mode which clearly indicates the operating abilities of amateurs on the six metre band.

The International Calling Frequency All users of six metres should be aware that 50.110 MHz is an acknowledged international calling frequency. It should be obvious therefore, that once contact has been established with a station that you move elsewhere, leaving the frequency free for another operator. The area below 50.110 is usually reserved for CW contacts and the area above for SSB etc.

144 MHz or Two metres The two metre band is a popular band used for a multitude of purposes. The "low" end (144.0 to 144.2) is normally used for narrow band modes such as moonbounce (EME), SSB, CW and RTTY, it includes a national SSB calling frequency of 144.100 MHz; from 144.4 to 145.0 is the beacon segment, while the regions above 145 MHz are used for WICEN, satellites, repeaters, FM, packet etc. The Australian Radio Amateur Call Book has a complete listing of beacons plus voice, RTTY and packet repeaters.

The 144.100 calling frequency should be used as a calling frequency only, once a contact has been established you should move off the frequency, thus leaving it for someone else to establish a contact.

Propogation modes include normal groundwave, sporadic E, aurora and meteor reflection, inversions and ducting, moonbounce. Amateur power levels are too low to support ionospheric scatter paths.

Whilst there may seem to be a division of interests between the low and high end of two metres, many operators enjoy not only SSB and CW contacts but also make use of FM and its associated repeaters, packet etc.

The two metre band is capable of sustaining contacts over greater distances than six metres under ordinary conditions. Where six metres may be limited to about 200 km, two metres should be capable of double that distance, partly aided by the fact that increased antenna gain is easier to achieve at those frequencies. Normally, on the low end, two well equipped narrow band stations in average locations should have little trouble maintaining regular contacts over a distance of 400 km.

The term "well equipped station" would apply to a station running about 100 watts or more of SSB and CW to a K1FO or similar recognised excellent antenna, mounted about 15 metres high or at least higher than any close obstructions and fed with 9913 or similar first grade coaxial cable. There would be a masthead amplifier with a noise figure of better than 1 dB; a good rotator with accurate bearing read-out and capable of remaining where it is pointed under extremes of wind conditions.

There are many good transceivers from which to choose, but if you live an area where there a number of active amateurs using two metres, then you need to be mindful of cross modulation and overload problems, particularly if there is a need to use a noise blanker. A power output and SWR meter connected to the output of the linear amplifier is helpful in monitoring the state of your station, particularly in the antenna department. Whilst the SWR meter may not give true indication of the antenna SWR due to it being at the near-end of the coax, at least it will tell you if something is wrong if there is a change from the usual SWR. The power meter also may only be a guide to actual power, but it will soon tell you if there is something wrong with the system.

Two metres enjoys assistance from a number of enhanced conditions such as sporadic E, tropo, temperature inversions, ducting, aurora, aircraft enhancement etc.

Its chief similarity with six metres is that it is affected by sporadic E (Es). It becomes usable in the Es mode when the maximum usable frequency (MUF) rises sufficiently to encompass the two metre band. Pointers to look for which indicate a rising MUF are intensely strong signals on six metres and the accompanying ability to work stations by short skip i.e. stations from areas normally too close to work during average Es conditions.

However, such conditions on six metres do not necessarily mean that you will work stations in the short skip zone on two metres, more often they will appear from areas more distant. Also, intensely strong six metre signals from a certain area, without the addition of short skip, can indicate possible two metre contacts e.g. very strong six metre signals from VK8 could herald a two metre opening to that area.

Just to make life a little less than straightforward, there are known instances when Es has provided signals to certain areas without the corresponding strong signals on six metres to that area. I know this is so because I have been involved in contacts under such circumstances. I am not sure how one explains such a phenomenen, but such irregularities are what makes the VHF bands so interesting and why the vigilant operators pick up the cream of the signals. One only learns of these strange occurrences through experience and that takes time.

Other pointers to a rising MUF are to check the commercial FM band for signals from other states and for general commercial traffic between 108 and 144 MHz.

Despite all of the above, the experienced operator would be found monitoring the calling frequency of 144.100 when working six metres Es and is thus ready to grab a two metre contact at an instant's notice.

There is considerable evidence to suggest that there is an increase in Es occurrence on six metres during the low part of the eleven year solar cycle, thereby ensuring a higher proportion of Es openings on two metres. In support of this statement I produced two maps in Amateur Radio magazine in March 1986 and March 1987 showing the Australia wide coverage of two metre signals at that time. On each of the occasions noted, it was possible in one day to work all Australian states on two metres. I did this at least twice in each year and some operators more often. The two summer periods when these outstanding conditions occurred were at the sunspot minimum and I had been warning my readers during the two previous years to be aware that such conditions could occur.

As the information in regard to these widespread two metre contacts is so interesting but too extensive for inclusion in this address, the two maps and the associated articles are appended at the end for your reading and encouragement to share in possible future such happenings, which may well occur during the summer of 1994-95 or 96.

It is interesting to record that it took Col VK5RO and me more than 15 years to finally work all VK states on two metres because of the absence of any two metre operators with the appropriate equipment in Alice Springs. Once Jeff VK8GF and Peter VK8ZLX came on two metres it soon became possible and we both completed Worked All States on the same day in 1986 and with all our contacts made from our home locations, receiving Certificates 2 and 3 respectively, number 1 having been taken by VK4ZSH some time previously by operating portable from various areas of Queensland.

To be continued. See next issue for part 3.

Thanks again to Eric VK5LP for permission to publish and to Wally VK6KZ for his help.

MEMBERSHIP INFORMATION AND APPLICATION FORM

The VHF Group is an association of persons interested in the encouragement and scientific development of V.H.F. radio communications in all its branches, including satellites, Earth-Moon-Earth, long distance (DX), microwaves etc etc etc.

MEETING PLACE	Wireless Hill Museum lecture room, (entry via corner of Almondbury Rd and McCallum Cres, Ardross).
MEETING TIMES	General meeting on fourth Monday of each month except December, 8.00 pm at Wireless Hill. Council meeting on third Monday at 7.30 pm at nominated venues.
ACTIVITIES	Monthly meeting. Fox hunt on the Saturday evening preceding each monthly meeting. Swap-meets, junk sales, components sales, regular technical lectures at the meetings. Club station at Wireless Hill Museum with HF and VHF antenna systems.
SUBSCRIPTIONS	Metropolitan $17.00 per year payable before the end of June for the next financial year. Country $15.00 per year for those residing more than 60km from the Perth GPO.

APPLICATION FOR MEMBERSHIP

SURNAME..... OTHER NAMES.....

ADDRESS.....

..... POST CODE.....

CALL SIGN..... PHONE (H)..... (W).....

NOMINATOR..... SECONDER.....

SIGNATURE..... DATE.....

APPROVED FOR MEMBERSHIP..... (PRESIDENT)

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meeting	rect no	tr.card	bltn list	m.c.	con.

May 88

THE WEST AUSTRALIAN V.H.F. GROUP BULLETIN

NOVEMBER 1993

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The West Australian V.H.F Group (INC)
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