

THE PROPAGATOR.

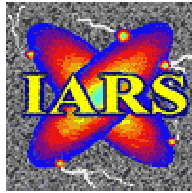
Club Call VK2AMW

**VOLUME 04/01 ISSUED 2nd February 2004. PRINTED BI MONTHLY
PRICELESS.**

Meetings held second Tuesday of each month (except January).
S.E.S building Montague Street Nth Wollongong. Starting at 7:30pm.

Official newsletter of the
ILLAWARRA AMATEUR RADIO SOCIETY INC.
PO Box 1838 WOLLONGONG 2500.

WEB Page www.iars.1earth.net E-MAIL www.iars@1earth.net



Editor Dave VK2TDN
davenn@optusnet.com.au

Greeting to everyone for another new year. Happy new Year to those I have not caught up with on air so far. Hoping you all had a good Xmas and New Year break. A new year always brings the chance of new opportunities for the club and its members in the form of new members, better outreach into the community and also of course improving our own understanding of the various facets of radio communications. Every amateur should make one of their new year resolutions be .. the advancement of their knowledge of radio. We are involved in a field of technology that is evolving daily and we owe it to ourselves to keep up with some of the changes. When I started servicing domestic electronics some 20 years ago it was reasonably easy to keep abreast of the changes. But as I went through the '90's, technology was changing so fast that I found I was specialising more and more. It is the same with amateur radio, as we all find our niche in the radio field. Learn all you can about your favourite subject, then share it with others.

There were a lot of on and off air activities over the last two months that are noteworthy including the following.
Several club working bees at Ted '2ARA's place building and erecting his new mast and antennae (see photos and comments further into the newsletter).
The 2 metre band on 144.100 MHz SSB saw a lot of activity between 25th Dec and the 4th of Jan (refer to the Band Reports section).
And oh how the HF bands have come alive since Jan 1st , with all the new operators who now have access to those lower frequencies. I have been enjoying a net on 40m over the last 3 weeks daily at 1600 – 1800 EDT on 7.085. The net is run by Tom VK2TDM and has regularly up to 15 log-ins.

COMING EVENTS.

- 1) Club Broadcasts Tuesday nights 1930 hrs local time 10, 17, 24 Feb
- 2) Club Slow Scan TV Monday nights 1930 hrs local time

The above events take place on the 146.850 and linked repeaters.
The Tuesday nite club net can also be heard on 3.620MHz
- 3) The Wyong Fieldday... Sunday 29th February something for those who
wanna travel out of town a bit. There may be a bus going up from
Wollongong if enough people can be found to fill it, contact VK2UBF Brian
for info.
- 4) The 'new' have a chat net is on 28.320, 1700 onwards, most nights

Our Committee.

President. John Peary VK2JJP 42614762
Vice President. Ted Thrift VK2ARA 42729521
Secretary. Brian Farrar. VK2UBF. Phone, 42672296. vk2ubf@fishinternet.com.au
Treasurer. John Lawer VK2KEJ 42289856
Committee. Brian VK2UBF, Peter VK2HPR, Ned VK2AGV, David VK2EZD
Fund Raising Committee.
Editor. Dave VK2TDN, e-mail davnenn@optusnet.com.au
Publicity Officer. Still needed Can u fill this role ? speak to a committee member
Membership secretary. John Bennett VK2AAL 42976065
Repeater Committee. Rob VK2MT, Simon VK2XQX, Phil VK2TPH, John VK2AAL
Canteen. TO BE ADVISED.
Web Master. Mike VK2GNV, with help from Daniel VK2TAU.

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Secretary's report January 2004.

Hi Members. The first meeting for the club will be February 10th 2004. The meeting will be held at the usual place of the S.E.S building Montague St., North Wollongong and will start at 7:30pm.

At this meeting the Committee will be organising a FUND RAISING COMMITTEE.

So if you can help out with this committee stand up at the meeting. This Committee will hopefully raise the money to keep the repeater network working and hopefully the membership fees maybe REDUCED!! The Committee have got the shopping centres and the raffle tickets are available. The Committee, thinks that only 50 books will be needed. This should raise around \$800 for your club. All that is needed is SOME members to arrange dates, times and willing helpers are available to attend these centres. Just a roaster is needed. So come on members get going and put your hand up for this Committee.

The club is also in need of a PUBLICITY OFFICER. So if you can help in this field, kindly come forward at the meeting or let Brian VK2UBF or Ted VK2ARA know asap. The term investment has matured and the money is sitting in a holding account until March 26th, 2004 earning interest of 3.4%?. After this time the club will know if we can re-invest this money into a 12 month term. This will all depend on the response the committee gets with fund raising. The interest for the first 3 month term was around \$56, so it was worth the effort of to invest this money.

As soon as possible the Committee will be looking at the membership fees. With a hope of REDUCING THEM. But this will depend on the ART UNION sales. At the moment the committee has a SPECIAL offer for NEW members joining the club. This is for a limited time, end of April, the cost will only be \$10. This membership will need to be renewed at the end of July 2004. All members now who nominate a NEW member will receive a voucher for \$5 which will be redeemable when the member renews their membership. Members can only receive the amount off to the amount of your membership. I.E. if you pay \$20 then if you nominated 4 NEW members then your membership is free.

If any member has any inquiries about Amateur Radio and how to go about getting their ticket for HAM radio. Refer them to the web page. On there, there is a link to a web site that allows people to do the ham radio course via the internet. If you get any inquires then keep in touch with these, hopefully NEW members.

Brian VK2UBF has had some hams that have NOT not renewed their licence and have I believe got there ticket again and have been heard on air. The url for the web site www.iars.1earth.net

The SSTV net is running again on Monday nights from 7:30 on the coast link.

Tuesday nights from 7:30pm the club broadcast is on the coast link and 3.620. Most evenings from around 5pm local (0600UTC) on 28.320 there is a HAVE A CHAT NET.

So why not join in on these nets. Remember you only get out of the club what you put in.

At the last committee meeting it was request that BEFORE ANY NET that the repeater be left to cool off for at LEAST 10 MINUTES. The first club broadcast for the year was not possible to start at 7:30pm because of repeater use. One member was told the broadcast was to start soon but kept using the repeater. The Committee have taken steps that this will not happen again.

See you on HF or one of the club nets or even at this coming meeting.

Regards Brian VK2UBF
Hon Secretary IARS inc.

A Venture into Microwaves

Dave VK2TDN

My first attack on the 10GHz band was around 1986 after I acquired some old microwave motion detectors from burglar alarm systems. I was also very lucky at the time to be working for Telecom NZ and their radio depot was in the same place as the telephone line depot. I was able to take my modules into them and get them tuned to the frequencies that I wanted them on.

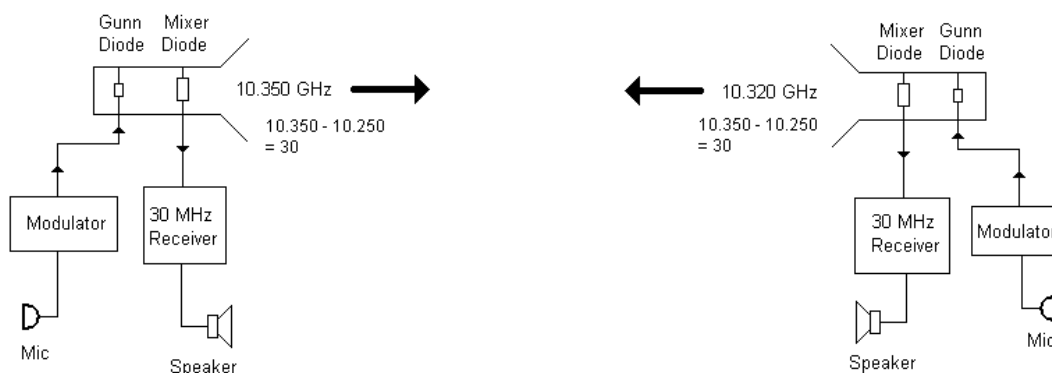
Back to the basics.... The common (easiest) method of generating a signal on 10 GHz is to use the Gunn diode, named after its developer J.B Gunn. Without going too deeply into the theory of their operation, here is a brief description (read some microwave handbooks to get a better understanding).

The Gunn diode is a GaAs "transferred electron device" TED that exhibits a "negative differential resistance" NDR. Unlike a normal diode, when the voltage is increased, the current will increase too, i.e. The resistance is expected to remain constant. In the Gunn diode there is a voltage range where this is not true. Through this range as the voltage increases, the current decreases, and this can be interpreted as a lowering of the diode's resistance as the voltage increases or NDR. This effect causes the electrons travelling through the diode material to bunch into a charge dipole that moves through the semiconductor material till it emerges at the anode end as a pulse. Once that pulse reaches the anode and is emitted another charge dipole forms at the cathode and drifts through the diode.

The frequency is dependant only on the length of the drift and the speed of the electrons of the material. This means that the Gunn diode will oscillate outside a resonant cavity. The resonant cavity is used to capture the microwave energy and radiate it in a useful manner. Gunn diodes are available with outputs up to ~ 200mW. The ones commonly found in the intruder / door opener units are around 5 – 12 mW.

Here is a basic Wide Band FM setup, the diag. shows two Gunn Oscillator units set with a 30 MHz difference in frequency. This freq. difference provides us with our receiver IF. A small portion of each of the Gunn oscillator signal is fed to the mixer diode to act as a Local Oscillator signal.

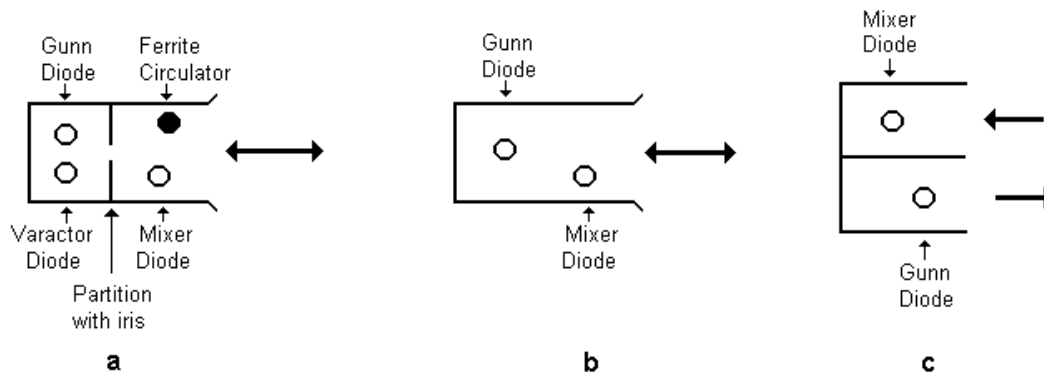
The LO and the signal from the distant Gunn oscillator combine in the mixer diode leaving the resultant 30MHz with is amplified and demodulated to recover the audio.



The three common types of units are ... a) Gunn diode and mixer diode in the same waveguide but separated by a wall with an iris. In the cavity with the Gunn diode there is also a varactor diode ... b) Gunn diode and mixer diode in the same waveguide cavity with no separation and ...

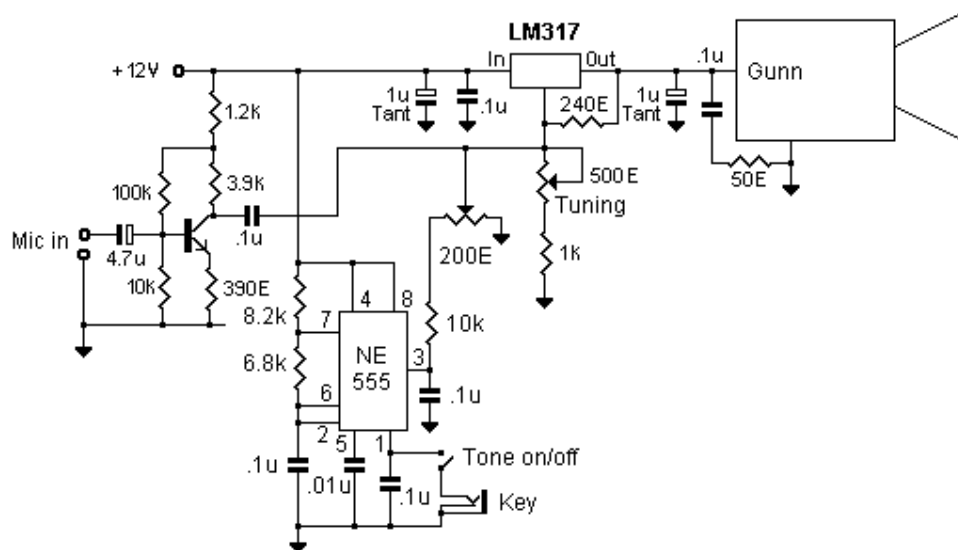
c) the 2 diodes in separate cavities side by side. a and b systems are easier and more efficient to work with but is less common to acquire.

System a, is the original Microwave Associates "Gunnplexer™" tho now days the term Gunnplexer generally refers to any unit where the Gunn and mixer diodes are "inline". In this system the Gunn diode is supplied with a fixed well regulated 9V PSU. The varactor diode is supplied with modulated voltage from the microphone modulator. The varactor varies in capacitance in response to the varying voltage supplied and this changing capacitance causes a change in the Gunn oscillator frequency ... hence a FM signal is produced. The ferrite rod circulator redirects a small amount of the RF onto the mixer diode to provide the LO injection signal. The size of the iris hole is a bit of a tradeoff between power out and oscillator stability, ie. smaller hole, the lower power out but better osc. stability



System c is the most common unit found in motion detectors, look above the auto doors at ur local shopping centre.

Now we can look at a simple modulator system for the Gunn diode.



The schematic above shows a circuit for about the most basic Gunn modulator possible. But don't be fooled it by the simplicity, works very effectively. The circuit consists of 3 main parts.....

- 1) ... A well regulated adjustable power supply based around the adj. regulator the LM317T. Note that the 500 Ohm pot is a 10 turn pot, this is required for the fine tuning needed. You can use a larger pot with vernier dial but they will cost you around \$65 for the pair from Farnell, go for it if you can afford it, otherwise scrounge a small oblong trimpot off an old circuit board from the junk pile.
- 2) ... A 1 kHz tone oscillator using a 555 timer i.c. that has provision for a cw key
- 3) ... and finally a single transistor microphone amplifier. This provides plenty of amplification from a standard dynamic microphone. The resultant deviation is ~ 75 kHz.

Note: the 0.1uF capacitor and the 50 Ohm resistor across the Gunn diode are mounted right at the diode to the waveguide, these components provide some transient spike protection for the diode. Some constructors also place a 10V zener diode in parallel with the resistor and capacitor for protection if the PSU voltage accidentally rises to the main 12V rail level in the case of the regulator IC dying.

Treat the Gunn and mixer diodes carefully, handle them like you would any other static sensitive component. Keep yourself grounded, use an antistatic strap if you have one.

Next issue we will look at the receiver side of the system and some other bits of useful info when setting up a system and making contact over any reasonable distance.

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Band Activity Report

6 Metres

Well I wish I could report that it had been a great summer season, but so far its been very quiet, with the long haul dx being primarily worked by the hi power and big antenna stations.

Some of the stations I heard or worked are....

30/11/03 - 10/12/03 ... VK's 4ABW, 2JMP, 4JH, 5ZMB, 5AIM, 2TS, 7ZGK, 2AYE, 4BLK

11/12/03 - 20/12/03 ... VK5ZMB, FK8HA and CA, VK's 3NM, 2UBF, 5AIM, ZL4LV, VK's 7BBW, 7RR, 7TS, 9NS, 5UBC, 7ZIF, 5ZPS, ZL's 3MH, 3TJZ

21/12/03 - 30/12/03 ... ZL's 3TJZ, 3MH, 3NW, VK's 2ZUH, 4AHW, 4KJL, 7AR, 2FLU, 2TWO, VK4JH, ZL2TPY, ZL3TJZ

As seen the longest haul for me was the two FK8 stations on the 13/12/03 Those previously mentioned big stations were heard working into

2 Metres

Ahhhh, now the fun starts ☺ for 5 days in a row 2 metres was open to ZL With a good number of local stations working across the pond on 2m and several also on 70cm and 23cm. The activity started on the 30th Dec and went through to the 4th Jan as the big High Pressure drifted across the Tasman Sea. Some of the active ZL stations were ... 1AOX, 3TY, 3ADH, 3TJZ
Local stations included ...VK's 2TG, 2ZRE, 2TS, 2APG, 2ZXC, 2ZAB, 2KU

During this period there was also a lot of regional 2m dx with a lot of contacts up and down the east coast into VK4, 1, and 3.

I was tickled pink to make the 2 metre contacts having now worked across the Tasman Sea from both sides. It was made more difficult for me as I was running vertical polarisation where as most were the usual horizontal on 144.1 SSB.

Batemans Bay



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A Call to Club Members

This is your newsletter, it needs your input to survive. Please help out By submitting articles for publication e.g. Construction projects, news snippets, good DX you have worked. Post, E-mail Items to the Editor, Dave VK2TDN davenn@optusnet.com.au

IARS 2 Metre Simplex Log.

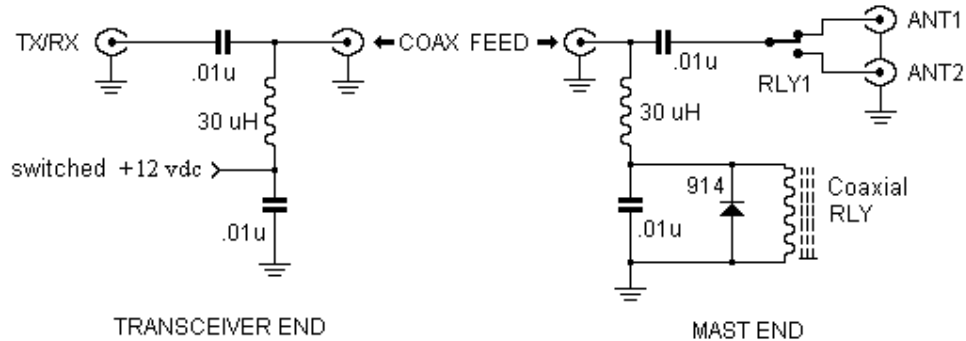
My Station.

Station			
Power			
Antenna			

		Reports	Reports	Reports	Reports
Chan	Freq				
1	144.625				
2	144.650				
3	144.675				
4	145.225				
5	145.250				
6	145.275				
7	145.325				
8	145.350				
9	145.375				
10	145.400				
11	145.425				
12	145.450				
13	145.475				
14	145.500				
15	145.525				
	CH 1 to 15 not available for Novice Licensees.				
16	146.425				
17	146.450				
18	146.475				
19	146.500				
20	146.525				
21	146.550				
22	146.575				
23	147.400				
24	147.425				
25	147.450				
26	147.475				
27	147.500				
28	147.525				
29	147.550				

On the previous page is an example of a log sheet from Ted VK2ARA, that could be used for logging simplex contacts. More use needs to be made of the simplex frequencies by those that are able to work direct. This frees up the repeater for those who cannot work simplex, for IRLP and also for the long term health of the repeater by reducing its on time. So try them out make up a list of those you can work simplex, you may be very surprised just how far your 2 metre signal travels.

A REMOTE ANTENNA SWITCH



A quick little weekend project to fill in a gap in the page nicely ☺ Maybe you want to be able to switch between horizontal and vertical 2m antennae for SSB dx and FM repeater use, here's just the ideal thing for you.

Dave VK2TDN

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PARETO'S LAW: 20% of the components account for 80% of the cost

If it jams, force it. If it breaks, it needed replacing anyway

Some pics of the New Mast construction at Ted, VK2ARA's QTH



the "work" gang 2TKB, Kevin, the hardest worker of the day took the pic



Team Effort ... Ted, 2ARA, Kevin, 2TKB, Brian, 2UBF



The final result, from top... 70cm 12 ele colinear, 2m 10 ele yagi, 6m 6 ele yagi

Well done Ted, you now have a great antenna system. Hope it serves you well for many years. I better hear about some great DX contacts as a result of all that effort ☺

That's it for this issue,
73 Dave VK2TDN

Disclaimer:

All articles presented in this publication are as given. The IARS accepts no responsibility for any damage to equipment arising from same. The views expressed within are those of the contributor not necessarily that of the Editor.