IARS The IARS
PROPAGATOR

The monthly newsletter of the Illawarra Amateur Radio Society Inc.
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Meetings are held on the second Tuesday each month (except January) at 7.30 pm in the State Emergency Services building in Montague St, North Wollongong.
Visitors are most welcome.

Number 7 Volume 93 July 1993

**** Editorial ****

Well, have you thought about it? I certainly have. The situation has altered dramatically since last month. Last month we only needed two committee positions to be filled, now we need them all! All?? How could that be? Simple, members aren't standing again.

Brian our president wants a break. Personally, I would like to see him carry on but he will stand as vice president to keep continuity.

Our treasured Dale, who has done the best job of any of the past few treasurers has gone to greener pastures.

Our secretary and his assistant are jaunting around the country side and won't be back for several months.

As much as I enjoy doing the Propagator, I am unable to devote as much time to it and my own business as I feel I should so I must stand aside for someone else.

John wants a break from the Broadcast officers job as he is becoming more involved with the WIA.

Fortunately, our repeaters are in safe hands with Rob and Ken. These two deserve a hundred times the thanks they have received for the work they have done.

Of the many other members who work behind the scenes doing those jobs you never see, many will continue, but there are still a lot of positions to be filled. I have a very uneasy feeling about Our Club at this time.

Maybe it's time for some new blood with fresh ideas. I hope you'll come along to the meeting and have a say in what's going to happen in the future.

Times are changing very fast and maybe, just maybe, a lot of amateurs aren't as progressive as an amateur should be.

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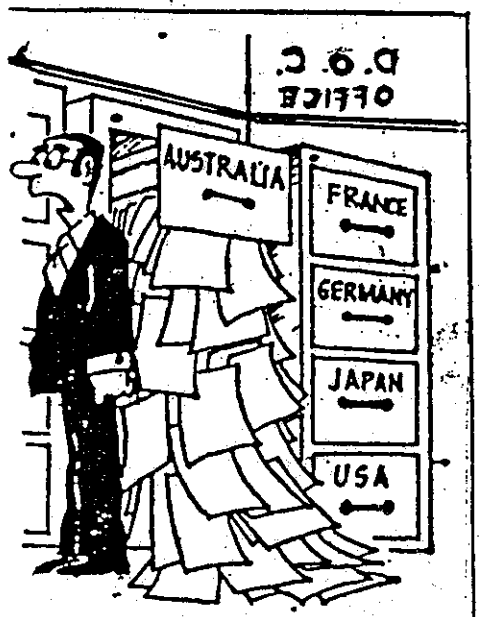
* Future Events ***

Ah! The power of the press. The committee have decided to have a wine and cheese night to celebrate the Election Night. There is a problem however - I have been nominated to purchase the wine and cheese. The only cheese I know about goes in mouse traps, and the only wine I know about is bought for John VK2XGJ and comes in a flagon wrapped in a brown paper bag.

The basic idea is to get you somewhat inebriated and then get you to sign a nomination acceptance form and before you realise it, you'll be President!

Don't forget that on the 18th July we will be visiting the local Pizza Hut and just to finish the meal off, we will visit WIN TV at 2pm.



★ "OKAY, who's the joker?"

***** Thought *****

It's now 02:30 am. Last night I went to the club and saw a rock show with Digger Revell. It's just my kind of music, so I came home, cracked a bottle and continued on with the show with my headphones and music at 200db. It got me thinking about the 60's and the good times I had and more particular, the dreams I had. Whatever happened to those dreams? Some months ago, I wrote an editorial on ruts, firmly believing it was You I was writing about, not me. In the cold light of memories, I have realised I am in a rut. Me! Who is always fantastic. Me, who won't whinge about anything. Me! Who is never downhearted. Me! Who has one of the best lifestyles you could imagine. Me! Who won't criticise anyone for something they do (but often for what they don't do). I am in a rut! Me! Impossible! I'm happy! I'm content! Life's fantastic! I've a quid in the bank. I have no worries. I'm healthy. I've a fantastic wife and daughter. I've a fantastic mate. How can I be in a rut? Unfortunately, I also have the ability to look at, and accept, the facts and the fact is, I'M IN A RUT!!!! It's hard to accept, but my life is monotonous, boring, dull. I look at the things I dreamt (and still dream) about. The opportunities I have missed. The opportunities I am missing. The things I haven't done, and most likely will never do. HELP! How do you escape your rut? Help! Let me out!! How do I get out?? I have things I want to do. Help me! Help me! I want to be free

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*** Presidents Report ***

Hi! It's that time again when we say all those nice things about one an other. Space and my ailing memory will not permit me to thank every one of you personally so if I've missed you out, please don't take it too hard. The things I want to concentrate on in this Annual Report are club meetings, site visits, club facilities and the Propagator.

Club Meetings.

Over the last 4 years, attendance at club meetings has gradually fallen from an average of nearly 37 in 1989/90 to about 27 in the most recent year. This kind of fall off is happening in other clubs - but new membership of the WIA is increasing slowly, as is the number of Australian amateur licensees.

Some fall off is due to some of our more generous members moving interstate and others changing occupation, employer or shift - in other words, economic pressures. But what is happening to the others?

We have had several home-brew-cum-technical nights. Dale VK2TZ from SGARS on antennas, John VK2XGJ on packet and Barry VK2BZ on RFI/TVI. Col Christiansen VK2CC gave us more insight into Antarctica/Nella Dan/King Penguins.

We have had our regular annual auction - I think all of the original stock of William Mess's stuff has gone and we should now expect some recycling. We also had an 'unscheduled' deceased estate auction, which brought to light a new talent in Simon 'It's Only Money' VK2XQX.

Attendance at our Xmas nights have been the lowest for all nights for the last 3 years; we seem to have the format of this event all wrong. Scrooge and economic rationalism seem to be driving out altruism and jolie bonhomie.

Attendance and membership are strongly non-representative of the population at large. We still seem to be mostly old, white/grey men. Unless we do something to interest youth and women in our hobby we will follow the dodo. Compare Australia with Japan, where youth and women are joining amateur ranks in droves. Carole Perry in New York is training 7 year olds to technician and advanced levels.

Site visits.

Our annual Xmas outing - to another water catchment dam - was very enjoyable; there was a much better showing of youth and women - but we did miss VK2XCC as Father Xmas.

We visited the CSIRO Dept of Radio Physics at Nth Ryde - an eye opener for some, and extremely valuable for others - where else can you get 10 GHz stuff tested for free?

We visited the Police Traffic control centre at Warilla to learn what Big Brother knows and can learn about us.

We held a field weekend at Saddleback, which attracted enthusiastic visitors from SGARS - but unfortunately no scheds with ZL in spite of prior attempts to arrange these.

In the near future we have visits to Mascot Air Traffic Control, Sydney Police Traffic control, WINTV and Castle Hill Military Radio Museum. Many other valuable suggestions were made at the June meeting.

Club Facilities.

We have lost our club's storeroom\library\station-to-be, leaving us with an antenna mast we cannot easily use - In spite of Herculean efforts by Vic VK2KVH. The antenna mast remains a mute testimony to our powerlessness against the SES establishment at the time - and our lack of antenna at the top a further testimony to our unwillingness to admit ignorance.

On a lighter note, we recently celebrated our first year's use of the Science Centre as the site for the club station, at the home of the driving force behind this venture, Dale VK2DSH. This was a great night. Many thanks Dale. In the year we have been there, we have made over 130 contacts with 19 countries - with almost no prior scheduling. We are indebted to Keith VK2OB, for the loan of an HF txcvr. Contacts on other than HF by other than VOX or CW have been on equipment which you have brought in.

I personally have enjoyed visiting the Science Centre, chatting in a relaxed atmosphere with other club members, unsuccessfully chasing DX (a Fin, on one occasion, no less!), and talking with young visitors and their parents/guardians to try to interest them in amateur radio.

But in the 4 visits I have made, I believe I have met ALL the club members who've supported this venture, some of them twice! If each of our regular club meeting attenders put in one visit every 7 weeks, we would have 2 people 2 days a week, 48 weeks per year. If all our financial members showed willingness to roster on, each of us would only need to visit 4 times a year. To have the same set of excuses for a year tends to strain the credibility nerve a bit.

What we need to make this venture more effective are :-

- more comms equipment on long term loan.
- More organised scheds with overseas amateurs.
- more support by club members
- more organised visits by bus loads of young school students

(On that school visit prompt, I note that only John VK2XGJ, of SMH fame, has actually made contact with a school. Keep it going John.)

- A new organiser - Dale is becoming VK0 till mid '95.

In spite of the economic circumstances, I think we could all put a little something back into the hobby that gives us so much.

The Propagator

Our monthly journal has become a prized gem, eagerly sought ny members of other clubs. In the last year, we have seen the content, advertising and quality of image grow and grow! What makes us different is the quality of reporting about our events and facilities - not our skill at nicking stuff from others. Our editorial team John VK2XGJ and

Peter VK2FPN has done a great job.

But we do depend on you for new material. What about writing up the talk you gave or the GaAs Fet amp you blew up or mods you made to a PM828/Mocom 70! (yes, I'll keep doing the UPSU!)

Where to!

At our June meeting, many exciting possibilities were suggested by you - but we were preaching to the converted. We must put some more effort, in a proactive way, into attracting youth and women into our hobby.

Finally I would like to express my sincere thanks to you, the committee for the support you have given to the club, and to you, the club members for the enjoyment of your company.

It is now your chance to offer your services to lead the club on to better and brighter things.

***** Chilly *****

As reported earlier, we are losing Dale VK2DHS to greener pastures. Dale has accepted a position as a radio operator in Antarctica for the next two years.

I could talk for pages about what Dale has done for Our Club, but it would only serve to embarrass him. Anyone who has been involved with Our Club for the past 12 months will know what Dale has done, and those of you who haven't, most probably couldn't care less anyway.

Thanks Dale. Hurry back.

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***** Membership *****

In 1992-1993, We had 87 members. This is 24 less than we had in 1991-1992! What's our chance of an improvement this year

*** Think about it ***

A winner says the job is difficult but possible.

A loser says the job is possible, but too difficult.

***** ARSENE Update *****

ARSENE inoperable

ARSENE launched from the Kourou space centre was sending only a weak signal after its deployment Wednesday, officials said.

The ARSENE French amateur radio club satellite was one of two deployed by an Ariane rocket that lifted off at 9:56 p.m. Tuesday (0056 GMT Wednesday).

"The signal is indeed coming from ARSENE, but it is extremely weak and not serviceable," said Jean Gruau, president of the Radio Amateur Club de l'Espace.Gruau said his group and space officials were looking at whether the satellite was improperly oriented or whether equipment was malfunctioning.

An Astra-1C of the Luxembourg-based Societe Europeene des Satellites was functioning normally, officials here said.

Thanks to AFP to send part of this information.

73 Gustavo, LW2DTZ.

***** Scientific Report *****

NEW ELEMENT DISCOVERED

The heaviest element known to science was recently discovered by university physicists. The element, tentatively named ADMINISTRATIUM has no proton or electrons and thus has an atomic weight of 0. However, it does have one neutron, 70 vice neutrons, and 161 assistant vice neutrons. This gives it an atomic mass of 232. These 232 particles are held together in a nucleus by a force that involves the continuous exchange of meson-like particles called morons.

Since it has no electron, Administratium is inert. However, it can be detected chemically, as it impedes every reaction it comes in contact with. According to researchers, a minute amount of Administratium, added to one reaction, caused it to take four days to complete. Without the Administratium, the reaction ordinarily occurred in less than one second.

Administratium has a normal half-life of approximately three years, at which time it does not actually decay, but instead undergoes a reorganisation in which assistant neutrons, vice neutrons and assistant vice neutrons exchange places. Studies seem to show the atomic number actually increasing after each reorganisation.

Research indicates that Administratium occurs naturally in the atmosphere. It tends to concentrate in certain locations such as government agencies, large corporations and universities. It can usually be found in the newest, best-appointed and best-maintained buildings.

Scientists warn that Administratium is known to be toxic, and recommend plenty of fluids and bed rest after even low levels of exposure.

--Author Unknown (but astute!)

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***** Space Travel *****

I take the freedom to relay a bulletin which was found on Kitsat

"Historic Contact Between Spacefarers"

A report, analysis and commentary by Vern "Rip" Riportella, WA2LQQ

Persons in two orbiting manned spacecraft, in a chance encounter, have for the first time linked up by radio in a deeply symbolic "handwave" exchange of greetings between fellow spacefaring pioneers.

Not unlike past terrestrial pioneers hailing at fellow adventurers encountered across a canyon, today's radio rapprochement symbolises in meaningful ways the imminent confluence of man's previously disparate, occasionally hostile endeavours in space. Future multi-national missions on Shuttle, Mir and even a joint US-ESA-Russia-Japan space station now seem more attainable perhaps, because of today's symbolic "handwave" across the canyon of space.

In today's achievement, NASA Astronauts aboard the Shuttle Discovery, mission STS-56, have successfully contacted their Russian counterparts aboard the Mir Space Station.

The historic first contact took place over Amateur Radio frequencies while both spacecraft flew in a transient formation 60 miles apart over the South Atlantic just west of Chile. The short exchange, lasting only a few moments, occurred just before 23:25 UTC Saturday, 10Apr93. A VHF FM signal in the Amateur 145 MHz band was used.

The effort was coordinated by the SAREX (Shuttle Amateur Radio Experiment) team at the Johnson Space Centre (JSC) in Houston. Sergei Krikalev, a Russian Cosmonaut in training at JSC earlier had assisted in coordinating the project with the Cosmonauts aboard Mir via Amateur Radio station W5RRR, the club station at JSC.

The success was announced by NASA shortly after the contact with congratulations sent to all by the Flight Director.

All 5 Astronauts on Discovery and both Cosmonauts on Mir hold Amateur Radio licenses.

Aboard Discovery STS-56 are:

Mission Commander Ken Cameron, KB5AWP

Ken Cockrell, KB5UAH

Mike Foale, KB5UAC

Ellen Ochoa, KB5TZZ

Steve Oswald, KB5YSR

Aboard Mir are:

Mission Commander Gennady Manakov, U9MIR

Flight Engineer Aleksandr Polischuk, R2MIR/RV3DP

All were apparently well prepared and looking forward to this "unofficial" linkup. SAREX organised the project by providing precise orbital data showing the exact time when the orbital paths of the two spacecraft would converge. At their closest they were 135 km apart.

The contact lasted for only a few moments because the spacecraft are in different orbits which mean they are within range of each other only occasionally.

Although they passed relatively close for a few moments, there was never any danger of collision between the two spacecraft. NASA's analysts routinely examine the Shuttle's anticipated flight trajectory to see if any objects in other orbits will approach Shuttle perilously close and, if any are found, Shuttle's orbit is changed slightly in an avoidance manoeuvre. Nevertheless, the Mir and Discovery were sufficiently close on this occasion that, under proper lighting conditions, the Astronauts and Cosmonauts might have spotted each other's spacecraft. In anticipation of a possible visible sighting, the crew of Mir turned on their running lights. These are used for crew docking purposes when relief crews approach Mir at night in their Progress spacecraft vehicles. However, on this occasion the Discovery crew reported "negative". They didn't catch a glimpse of the huge Mir as it flashed by roughly 60 miles overhead.

Mir's mean altitude is about 400 km while Discovery orbits at about 295 km. At the moment of closest approach today, Mir was just over 100 km above Discovery.

During a close encounter on a previous Shuttle flight, Discovery Mission Commander Ken Cameron did report seeing Mir and recorded the occasion on video tape. But on that occasion, the attempted radio crosslink was unsuccessful.

Close encounters between Shuttle missions and Mir are relatively rare. Most Shuttle missions are low inclination orbits, around 28 degrees, while Mir's inclination is about 52 degrees. In order to closely study the polar regions, STS-56 has a 57 degree inclination. This affords many more conjunctions with Mir than the lower inclination Shuttle orbits.

A simple gesture, like a handwave across a canyon, carries a strong symbolic message. That such a gesture is proffered in the verdant turf of earth orbit bodes well for these former adversary nations, and thus for all who bear witness to today's historic precedent.

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***** AGM Agenda *****

Here is the agenda for the AGM to be held at the SES Hall in Montague St North Wollongong at 19:30 on Tuesday 13th July 1993.

1. Opening refreshments.
2. Receipt of nominations.
3. Apologies and proxies.
4. Minutes of last AGM.
5. Matters arising from minutes.
6. Correspondence.
7. Proposal that the editor of the Propagator be a portfolio of one or more of the duly elected official positions.

Proposed Brian Clarke. Seconded Peter Read.

8. Proposal that coordination of the Science Centre be a portfolio of one or more of the duly elected official positions.

Proposed Dale Hughes. Seconded Brian Clarke.

9. Reports from outgoing officers.
10. Resignation of officers.
11. Selection of returning officer.
12. Election of officers.
13. Closing refreshments.

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** The Ultimate PSU **

You may be wondering why I have said so little about the switched mode PSU's when we are becoming increasingly immersed in them for powering TV's, microwave ovens, computers, VDU's etc. Their main advantage is light weight - that's it!

They were developed for military and aerospace applications in the 1960's, when money was no object, and when design engineers populated the electronics design labs, richly.. When a SM PSU fails nowadays, the main repair strategy is replacement. So lets remind ourselves of some of the advantages of linear PSU's:-

- simple, rugged, very reliable, easy to repair and maintain - all adds up to low cost to make and own.
- moderate purchase price compared with SM PSU
- excellent line and load regulation - often better than 0.01%
- very low output ripple and noise - 1 mv is easy to achieve at full load
- rapid recovery from load transients - typically 50us - this one can be a disadvantage for amateur gear when high speed packet is in use - and when faster responses are achieved there can be RFI susceptibiltiy
- a major safety isolation barrier - the mains transformer
- no AC mains on the PCB
- very low levels of generated RFI - class A is easy to achieve without line filters - and with very simple design changes, class B can be achieved

While there are differences in levels of acceptable RF generated in all the world Electro Magnetic Compatibility (EMC) codes, all have 2 classes. Class A equipment can only be used in industrial areas while class B standards can be used anywhere. Australia does not yet have EMC codes or standards, so we often get class A stuff dumped on our markets eg computers from Amstrad.

Some pundits see a resurgence of market share for linear PSU's, particularly in view of the 1992 European EMC directive.

So, we will continue with linear PSU's for a while in this series.

Diodes

Whether we use linear or switched mode PSU's, all require diodes to convert AC to DC - static DC to DC converters use diodes only. Rotary converters may or may not use diodes.

There are 4 main considerations in selection of diodes:-

1. Die material.
2. Current rating.
3. Fusing capability
4. Heat dissipation

A few notes on each will help, followed by some examples of calculations, selection and installation.

1. Die material

There are 3 major materials currently in use - selenium, germanium and silicon. For high voltage applications, there are still vacuum tubes and mercury vapour rectifiers available; but because our

main focus so far has been on low voltage PSU,s we will leave these aside.

Selenium, historically, followed valves and achieved quite a market share in the 1940's & 1950's. Its use nowadays is mainly for nostalgic reasons. When it fails, it gives off a highly toxic gas. If a selenium rectifier appears corroded it should be disposed of in the same way as some regulator tubes eg 0A2WA; it should not go anywhere near the food chain ie, do not handle directly.

Germanium was first used for its semiconducting properties in the Bell Labs in the 1930's, but did not appear in the market place until after WWII. However, selenium was easier to produce and machine and hence germanium diodes, although they have a lower conduction voltage (typically 0v2 to 0v3) and hence lower power dissipation, are mainly used for very low current. They are still popular for detection and balanced modulators - but not for PSU's.

Silicon has become the material of choice because of its widespread use in IC's, which were really pushed along by the cold war and the need for high resolution radar - which in turn required large capacity computers which also required IC's. Silicon can operate at higher temperatures than germanium and does not age as Ge and Si do.

Silicon junctions have a no load volt drop of about 0v6. This provides an easy diagnostic for testing that box-car load of unknown devices you picked up at Gosford/Wyong or the auction. Under load volt, drop can vary from 0v7 to 1v1 at 25 degrees C and even more at higher temperatures. This means higher transformer voltages, higher C voltages off load and more heat dissipation in diodes and pass transistors.

2. Current rating

This usually runs hand-in-hand with the method of packaging, eg from lead supported, glass beaded (eg 0A series - about 100mA max), lead supported, moulded body (eg 1N4000, 1N5300 series between 1 and 3 amps), potted (eg KBPC series 5 - 35 amp if adequately heat sunk), stud mounted (eg 1N3260 series 10 to 100 amp) and flange mounted (300 to 1500 amps).

The selection tables mention several current ratings. For steady state eg steering, protection or isolation, use I_{FAV} ie average forward current - this may also appear as I_{FM}. I_{FAV} is rated for 180 degree of conduction. So, if you plan to use diodes for isolation ie 360^{o} conduction, derate by a factor of 3 or so.

For rectification of AC, especvolt dropially when followed by capacitive input filters, use I_{FRP} or I_{FSM} ie forward repetitive peak or forward surge maximum. This is quite different from your maximum load, as we shall see soon.

When a resistive load, or L filters beyond L_{crit}, follow the diode, use $I_{F\,RMS}$, the RMS rated current.

When the current rating is exceeded, the diode usually goes open circuit.

3. Fusing Capability

When the fusing capability is exceeded, the diode usually go short circuit. Fusing is related to the total amount of work the diode is expected to do ie I^2Rt. However, as R is essentially constant for a particular diode die, the main phenomena the designer can play with are 'I' and 't'; hence, selection tables show I^2t values. I is the mean current flowing over the conduction period t.

4. Heat dissipation.

For small diodes eg 1N4000 series, heat is dissipated by radiation and convection from the body and conduction via the leads to the pcb tracks. In the selection tables, assumptions are made about operating temperature range, length of leads, distance to and size of pcb tracks etc, to arrive at an overall R_{ja} or heat resistance from die junction to air. For larger diodes, two figures are quoted - R_{ja} for heat transmission from the body and R_{jc} for heat transmission from the junction to case. (More on R factors later.)

Some examples of calculations for diode selection

In order to get some runs on the board, lets assume we are planning to build a 50A linear PSU, with C filter; whether there is a series regulator is irrelevant. (sufficient calculations will follow that you can try a shunt regulator or an L-C filter yourself)

Start initially with t/RC = 0.1. This means voltage across filter C's falls to 0.905 of peak before the next charging pulse of duration t. How do we calculate t? Assuming the mains in put is essentially sine wave, the angular period is

$$90^{o} - \sin^{-1} 0.905 = 90^{o} - 65^{o} = 25^{o}$$

Pulses in a diode (bridge or not) are 180^{o} apart. Hence pulse duration, t, is $25^{o} / 180^{o} * 10$ msec = 1m4 sec.

To achieve max IL of 50A, we need to achieve an average peak current flow of 180^{o} / 25^{o} * 50A = 360A ie IFSM or IFRP, the peak current = 360A.

Now look at I^2t, the fusing capability; 360 * 360 * 0.0014 = 180

In the International Rectifier Catalogue the smallest diode to exceed these characteristics is a 40HFxx (where xx represents 1/10 the reverse repetitive voltage,VRRM)

The 40HF has IFRMS = 63A, IFAV = 40A, TCmax = 140^{o}C, IFSM = 450A, I^2t = 1000

IFAV and IFSM have narrow safety margins - care!

What voltage rating?

If we design using a constant voltage transformer, ie no regulator, with fullwave (non bridge) rectifier and C filter, max reverse voltage = 2 * SQRT(2) * VAC RMS = 2 * VDC out

So for 13.8v DC out choose 40HF5.

What happens when we use larger C to achieve lower ripple eg so that t/RC = 0.05

The Vmin/ Vpeak = 0.95 ($e^{-0.05}$ = 0.95)

Conduction angle = 90^{o} - Sin^{-1} 0.95 = 90 - 72 = 18^{o}

Now, IFSM = 180^{o} / 18^{o} * 50A = 500A.

Conduction time, t = 18^{o} / 180^{o} * 0.01 sec = 0.001 (1msec)

Hence I^2t = 500 * 500 * 0.001 = 250

(Note:- the more C you put after the diode, the shorter and higher the charge pulse, and the more likely to generate RFI under load.)

Now we need to chose the 25G5 (from IR) diode whose characteristics are IFRMS = 95A, IFAV = 60A, TCmax = 160^{o}C, IFSM = 1000A, I^2t = 5000

IFSM has a better safety margin and fusing is quite unlikely.

These diodes are stud mount, available with or without flexible leads and available either cathode or anode stud so that heat transfer to the heat sink can be optimised, ie no insulation. Cutting a mating thread in the heat sink improves heat transfer

Anyone with access to diodes used for electroplating or electrolytic refining (ERS?) or traction engines (railways or BHP) could be very useful. Recall my postscripts to the last issue about large diodes at Cavions?

The DO-5 diode case (eg 40HFxx and 25Gxx series) has a Rj-c of approx 0.4 ^{o}C/watt. Rj-c is the thermal resistance from die junction to case - more on this in the next instalment.

So with 0.7 volts drop at a max current of 50A, 35 watts max will be generated. Without heatsink, predicted temp rise will be Rj-c * Ptot = 0.4 * 35 = 14^{o}C.

But the heat mass of the diode is so small that with a peak current of 360 to 500A, the temp rise of the pellet will be 144^{o} to 200^{o}. The pellet environment would need to be kept below -40^{o}C not to exceed operating max temperature. This is clearly impossible. Hence one adds metal to slow down the rise.

Next issue we cover heat sinks then a section on transformers.

***** Committee *****

From:VK2SRB 05/30/93 20:00:03
IARS Committee

Peter the following are the minutes of our last meeting Minutes of Committee

Meeting of IARS held at SES HQ Nth Wollongong May 18, 1993

Present: KLH (Chair) XQX FPN DSH MT KWG SRB

Apologies: Nil

Minutes of Previous Committee Meeting were read and Confirmed

Matters Arising from the Minutes:* Christmas Party and Field Day combination to be put to the members at the June General Meeting.

Visit to Mascot Air Traffic Control to go ahead on June 20 at 2pm

TAFE is not going ahead with any further Radio Courses. More discussion is to take place as to what role IARS may play in the education of future amateurs.

Correspondence in:

Newsletter "Dragnet" (St George Amateur Radio Society).

Letter of Thanks Ian Callcot and Family.

Licensing Certificate VK2RUW Knight's Hill.

Newsletter "Smoke Signals" (C. C.A.R.C INC.).

Arranged.Sydney City Traffic Control Centre visit August 15,1993 time to be arranged. It was discussed and supported by the committee that the Propagator Editor be a member of the of the committee by gentleman's agreement. This is to be put to the members at the next General Meeting.

A vote of thanks was given to Peter FPN for his excellent work over the last 12 months as Propagator Editor.

Treasurers Report as at May 18,1993 the clubs accounts showed a balance.

Repeater ReportVK2RAW was vandalised on Saturday May 15,1993. But thanks to our ever present Repeater Committee Rob MT and Ken TKE it was back on air late Sunday.

Science Centre Report The new antenna is working well,lots of European stations.

Meeting closed at 21:27

*** Repeater Report ***

27/5/93 - 30/6/93

This report is diffrent to my previous reports over the last 3 years. Can you see what it is? Originally 3 years ago, these reports were handwritten & hand-delivered to the Editor. Then they were typed on paper & delivered, followed by the author travelling to the Editor's QTH & typing it on his computer. Recently they were typed at home on my own computer with the floppy disc being posted to the Editor. This report, for the first time ever, was typed at my home & then sent direct to our illustrious Editor's computer via Packet radio. VK2MT hit the Packet airwaves on the 24/6/93 & since then, the most sleep I've had in any one night has been 5 hours! This Packet thingo' is extremely infectious. I've learnt heaps, but have only touched the tip of the proverbial iceberg. Anyway, on with the report - with 25 watts of digital packet power up the stick it goes! (With apologies to Power FM).

VK2RAW (146.850) - Nothing has come to light regarding the break-in to our cubicle & the stealing of all the double-shielded patch leads & plugs from the incoming feedlines. The rptr itself is basically performing well except that we've noticed a small amount of desense. The desense appears to be voltage related as it only occurs during daylight hours. Remember Mt Murray is a solar-powered site, so during daylight hours the voltage on the site's batteries increases. The desense is mainly confined to around 0900 to 1700 & appears to vary from none to around 5 to 10 dB. If weak signals try to access the system during the desense, the result to air sounds like someone "kerchunking" the rptr every second or so. Regular "kerchunk, kerchunk, kerchunk" is a normal indication of a rptr suffering from desense. When you listen around to other rptr's, it is surprising how many actually suffer from desense.

Looking back thru' the rptr diary, this has happened before to 6850. On one occasion it was caused by a 10v zener diode that generated noise on the supply rail to the rptr's RXer only between certain voltages (12.8v -14.1v). The cause this time is still unknown, but hopefully will be discovered on our next visit.

VK2RIL (147.275) - Nothing much to report since last month regarding the rptr itself. It is still operating on the folded-dipole antenna, even though it was previously reported that we would be changing back soon to the high-gain colinear. The delay is due to there being considerable changes occuring at Sublime Point in the last month. Presently the changes have not been finalised &reporting on the details prematurely, could prejudice our possible gains. (If you want to know more, ask us in person at the next meeting).

Reported previously, we have requested a change of frequency for 7275 due to the annoying & continual paging interference we have suffered

ong. This request was done 4 s ago but no official reply has been received. This is no doubt due to the considerable problems the VK2 Division of the WIA has been encountering from begruntled ex-office holders. (Some of the stories are quite amazing). We did receive a phone call requesting some technical background on the problem from one of the new committee, but the feeling I got was that an aswer or solution was a long way off. Let's hope not, our rptr's performance & reliability has been suffering for far to long as it is.

VL2RIL (438.725) - Once again, no problems have been encountered in the last month. In fact the rptr has not had a failure or problem since it was first installed almost a year ago, on the 18/7/92.

VK2RUW (438.225) - The rptr & Goulburn link all performing well. Had a little "scare" on the 23 & 24/6/93. When the rptr was triggered, it would sometimes appear to "lock-on" in TXmit. Low level crackling white noise could sometimes be heard. It became obvious the problem was coming in thru' the link RXer. The DTMF Controller came in very useful & the link transceiver was disconnected remotely from the rptr & all returned to normal. The "disconnection" was left overnight, then reconnected in the morning but it was still occasionally locking-up. Ken checked the link input & found everything OK. Once again, we remotely disconnected the link & the rptr. Later that day, Ian (AIJ) from Goulburn called, to tell us that the mute on their 8325 rptr was occasionally failing, causing the locking-on of our 8225. He subsequently visited Mt Gray & fixed the problem. The apparent scratching noise reported last month is still with us, but the severity appears to have reduced. The noise still appears to match the audio output of Power FM on 94.9MHz. The station techs have been helpful & investigated, but have found nothing unusual.

A Philips 828 UHF transceiver has been obtained to use for the linking of the Sunday WIA Broadcasts onto 8225. Completion soon...

As far as the linking of 8225 (& 8325) to 8525 Mt Ginini is concerned, we have been informed by the VK1 rptr fellows that they are more than half-way finished the 1296MHz link transceivers to link Ginini to Mt Gray & then onto Knights Hill. Spring is still the anticipated completion date for the project.

VK2RUW (144.775) Packet - While at John (XGJ's) QTH for a Packet get-together, it was reported that the digi had disappeared off the air mid-arvo' on the 12/6/93. Due to other commitments, no one was able to get to the site till Michael (XCE) got there on the 26/6/93. All that was required was a reset of the system, a long way to go for a 10sec job. Why the system crashed is unknown but

let's hope it doesn't happen to often. When the system first failed there was no real urgency in fixing it, (it was just a nuisance), but a week or so later the urgency increased when Phil (XDM's) system at Robertson went off the air. Phil's system is one of the main Packet path's out of W'gong. All OK with 4775 now.

An idea Ken & I have been discussing is a Packet "thru-peater" or translator into John (XGJ's) QTH. John has a magnificently setup Packet BBS, but he has one of the worst RF locations's in W'gong (& I think he would be the first to admit it). So many times we've heard people lament not having direct access to his system & having to digipeat thru' other stations. What we are proposing would be a good coverage "transparent" link, not a digipeater. It would be as if John's house was on top of a hill. This would allow Packet users in W'gong, to have relatively modest antenna systems to gain access. The rptr committee would like to hear your thoughts on the matter, good or bad & also if a "central" frequency were to be used, which one? (The already well-used 147.575MHz, 144.775MHz, 144.700Mhz or something different?). We look forward to your comments.

VK2RUW (29.620) - Only minor experiental work done with this one. Still to be resurrected, but boy this packet stuff can sure eat up spare time!

This is the last report before our Club's AGM when all elected positions are made vacant. Ken & I will be standing again for our 4th year of office, but please heed our Editor's comments & make a positive decision to put something back into YOUR Club by standing for a position.

The next year for rptr's looks quite exciting, but we have grave concerns for the changes taking place within DOTC (soon to be SMA). With the closing of our local office we will be losing our local very helpful & undestanding RI's. Who is going to help us fight our mighty foe, the dreaded Pagers!

In closing Ken & I would like to thank our fellow Amateurs who have helped us look after the rptr's in the last 12 months VK2CAG, VK2BIT, VK2XGJ, VK2ZDM, VK2TPH, VK2XCE, VK2XBC, VK2ZLJ, VK2XNH, VK2FPN, VK2AIJ & VK2DSH.

Till next time (maybe) - Rob VK2MT

***** Airport Visit *****

This was held on the 20th June. About a dozen of us went along to the airport and had a very interesting tour, interspersed with some action of a technical nature - things don't even go right for the experts.

It's amazing how calm everyone was, but I guess that when you're good at your job, there's no problem you can't handle.

I had meant to take plenty of notes, but I was so engrosed at what was happening I forgot!

***** Language *****

Unfortunately, electronic mail messages mask out many of the cues present in other forms of comunication - body language, voice inflection, even the stationery business letterhead, monogrammed notes, or scented tissue that gives paper mail a personal touch. To compensate, e-mail for example has developed its own language of images. Read by being mentally turning the page 90 degrees clockwise, these "emoticons" or "smiles" inflect messages in a host of ways :-D

Here is a list of only some of the many symbols used to show emotion within a text file.

:-)	A joking comment
;-)	A flirtatious or sarcastic comment
:-(	A frown, the user is upset or depressed
:-	Even madder
:-	A devilish remark
:-D	A laugh
:-@	A scream
%-)	Confused
:-X	My lips are sealed
:-*	A kiss

%-) ? Give it a try, :-@ !

There are dozens more, and many more possibilities - why not design some and maybe you'll become a hero.

73 Karl VK2PK

Sydney Australia

****

***** Packet *****

Below the Escarpment.

The 1992/93 Year has just about closed and a time to look back on what we have achieved. Did you get that antenna up/radio aligned/packet system, power supply online or one of the many other facets of this expansive hobby called Amateur Radio? For me it has been a frustrating and rewarding year, I didn't get the 9600 BPS Digi on air, only by having no tower on which to install it. The VK1/VK2 Satellite Gateway made it into operation and has been passing personal mail into/out of VK1 and VK2 to stns outside the VK Call area for about a fortnight or so. Not very much going out but some coming in anyway. This includes getting onto the 9600 BPS satellites UO-22 and KO-23. The amount of files available for downloading on these two satellites has to be seen to be believed. Programmes for the satellite Gateway Nodes, Processing of Mail and other files, GIF pictures of circuits, mods of "How to" for the various radios for 9600 BPS operation plus the general "Hi Fred" type of mail. And a multitude of pictures in GIF format and others. Check out the various download areas on the VK2XGJ PRBBS as it is constantly having new additions brought down from the satellites.

I have generally passed the mail that I have downloaded from the satellites onto the Home BBS of the recipient as soon as possible, so to see the VK2XGJ PRBBS sending mail to VK2OP on 144.925 MHz via ROSE,

to VK2XY on 147.575 MHz via NetRom and have our latest Packeteer VK2MT Rob uploading his Repeater report all at the same time was something to see. The 386SX was really working but all mail was passed in both direction with little problems. Oh, did you notice the "strange" call on Packet? VK2MT has finally made the fatal step of using a TNC. He made his first contact on 26/6/93 at 1630 K. Well done Rob, now where's that other "old coot" Ray VK2AGU (VK2XCC)!!!!!!

The Packet Meeting that was announced at the last Meeting and was held on the Monday of the Long Weekend went very well, with eight/nine attendees. Not all who attended were actually active on Packet but came along to ask questions and I hope we managed to give them enough information and attention to take the final step into Digital Comms. The feeling from the Meeting was that there should be a similar Packet Meeting about every second month or so just to talk about Packet and not tie up the general Meeting with something that doesn't interest everyone. This being the case the next meeting will be in August some time.

I entered a Bulletin to All @ LOCAL onto the VK2XGJ PRBBS to the effect that any User in the local area using the 147.575 MHz freq will generally be disconnected. The reason for this is that VK2XDM-1 can hear any/all xmissions that the BBS makes and interrupts the traffic on that freq to no end for no reason if the User can connect on one of the LAN freq's. Sorry but I feel that 144.700 MHz / 144.775 MHz and any other freq that can be accessed should be used rather than tying up the Node that services the south east of N.S.W. I put up a UHF freq for a User who requested it on 439.100 1200 BPS and it was never once used. So now the 9600 BPS port is back online, as Gosford will be operational soon. At least that is what I've been told. But then I've always believed the Earth was Flat not Round!!!! B-)

There are some developements in the wind that will probably help to solve most of our problems so hang in there.

Ok that's enough for this month, see you at the Meeting.
73, John de VK2XGJ

******* Thought *******

I wasn't going to say anything, but I have some spare space.

Please, please consider the future of Our Club. I know we've had low points in the past, and will have them in the future, but we don't seem to be progressing at all. I know a lot of members are disillusioned at the moment but let's face it, we have everything we need as far as expertise and interest and willing workers but, we just can't seem to put it together. A bit like the Sydney Swans - all the tallent is there, but not the cohesion and co-operation.

I'll ask you to consider very carefully where you would like Our Club to head, and more to the point, where you fit in.

Now is the time to step forward.

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*** Way Back Then

Episode 20.

Dapto Moonbounce Project...1976.

(i)First Amateur UHF contacts between Australia and Japan, Sweden, Italy and Luxembourg.

(ii)Test with Stanford Research Institute, USA.

(iii)Test during solar eclipse.

(iv)First break in by intruders.

On 17th January we made the first Aust-Japan and Aust-Italy UHF contacts, with JA1VDV and I5MSH, as well as having initial contacts with K0TLM and W0YZS and a contact with F9FT.

The period February to June was marked by the absence of VK2ALU from activities at Dapto, due to a spinal injury and subsequent periods in hospital. Charlie Proctor VK2ZEN stepped into the breach, having gained sufficient experience while assisting VK2ALU over the previous year or so.

Charlie was assisted by some of the "full call" members of the club as well as by his sons, in coping with some 8 test periods during both day and night time hours. He also had to make repairs and maintenance as required to keep the system operational. A fine effort indeed.

During this period VK2AMW had initial contacts with W4NUS, VE4JX and W1JAA as well as contacts with JA1VDV, F9FT and VE7BBG. It also saw a special test carried out with WA6LET of the Stanford Research Institute in USA. They used a "BIG" dish making their signals average approx 15dB above noise, peaking at 20dB above.

Their continuous carrier type signal was placed on our chart recorder, the chart being sent to them for analysis of the libration and scintillation fading effects which showed up clearly. We later received their thanks for our efforts. (Do you remember that test Ken Grimm?)

VK2ALU was "back on deck" for the test in July, which also saw a visit by Eric Jamieson, VK5LP, who writes the regular article in "AR" on VHF and above matters. During this test we had our first contact with PA0SSB. Later in the month we made the first Aust-Sweden UHF contact, with SM5LE.

When the transmitter failed during our test in August the cause was found to be a rats nest in one of its power supplies! However we were able to make some use of the operating period - by taking our first measurements of "star noise" - from the mass of stars in the constellation Sagittarius, which is in the centre of our galaxy - a fair sort of DX!! - They gave a noise level approx 2.5dB above the noise level when the dish was pointed at a "cold" part of the sky.

In September we made our first contact with Luxembourg, with LX1DB. We also made our first "sky noise to ground noise" test. This has become one of the standard tests for determining the receiving system noise figure for low noise systems where the antenna can be pointed at the "cold" sky then at the "warm"

earth and the difference in noise temperature compared. As the presence of side lobes in the antenna radiation pattern modify the results it is not as good a test as the "hot sky - cold sky" test but is easier to do and at least gives a reliable check on the long time noise characteristics of the complete receiving system, whereas sun noise can vary with changes in activity of the sun. In our initial "sky noise to ground noise " test we obtained a difference in noise level of 3.5dB.

Perhaps the most unusual test was that made in October during an eclipse of the sun, which, on this occasion was 95% covered by the moon. At the point of maximum eclipse, sun noise dropped from 11.5dB to 5.5dB over the inherent receiving system noise level. Subsequent calculations, allowing for the 95% coverage by the moon, inferred that the "radio sun" at 432MHz is some 8% greater in diameter than the visible sun - the suns corona being a prolific source of "radio noise" in the region of 70cm wavelength.

We then tried for echoes from the moon at max eclipse, to see what was going on in the earth's ionosphere. Here we found little change in the shift of polarisation of the received echo from the moon compared to the polarity of the transmitted signal (known as Faraday Rotation), which indicated that the ionosphere was not much affected by the relatively short period of (incomplete) eclipse of the sun. Our echoes were 2dB above noise level during this period.

Unfortunately October also saw the first of the break-ins of the operating building by intruders, though on this occasion none of the equipment was damaged or stolen.

December provided initial contacts with JA1ATL and F2TU.

To sum up the year's activities I think that it is fair to say that 1976 showed that the VK2AMW EME system was capable of not only achieving many EME contacts but also was able to be used to provide really worthwhile information on extra terrestrial phenomena.

Lyle VK2ALU.

PS Just for something a bit different. As one of our EME test periods fell within the 1975/76 Ross Hull VHF contest period, "just for the hell of it" we submitted an entry in the CW section - and won it!! (I still have the certificate at home). Subsequently the contest rules were changed to exclude "the use of Satellites or the Moon, or similar artificial aids". The moon an "artificial aid", what a laugh!!!

***** Finale *****

Well, we come to the end of another issue, and the end of a year. I'm sorry I won't be able to continue and hope that the next editor receives as much enjoyment out of the job as I have done. Toi all those who assisted I say thanks a lot, I couldn't have done it without you. In particular, I would lile to express deep appreciation for my favourite article. Thanks a lot Lyle, your historical section is most enjoyable

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POST BOX "THE ILLAWARRA AMATEUR RADIO SOCIETY Inc"
PO Box 1838, Wollongong, 2500.

REPEATERS	VK2RUW	29.620	Voice	Mt Murray/Knights Hill (off air)
	VK2RUW	144.775	Packet (ROSE)	Knights Hill
	VK2RAW	146.850	Voice	Mt Murray
	VK2RIL	147.275	Voice/RTTY	Sublime Pt
	VK2RAW	147.575	Packet (NetRom)	Mt Murray (Off air)
	VK2RUW	438.225	Voice	Knights Hill
	VK2RIL	438.725	Voice/RTTY	Sublime Pt

BROADCASTS - The Wireless Institute of Australia, N.S.W Division broadcast is relayed to 29.620 MHz and 146.850 MHz at 10.45am and 7.15pm each Sunday. Callbacks after the broadcast. RTTY broadcast in the week before the Club meeting, Sunday evening, 6:45pm on 147.275 MHz, relayed onto 3.618 MHz +/- QRM and 29.620 MHz, with callbacks immediately after.

CLUB NET - There is a club net on 147.275 (VK2RIL) at 19:30, 7.30 pm and 09:30 UTC on Monday evenings. All amateurs are invited to join in and waffle.

NEWS LETTER - The "PROPAGATOR" is published each month to reach all financial members in the week preceding the Club meeting. Articles and letters are always welcome. Commercial advertising is $60 per ad per year, member's classifieds are free. See Peter VK2FPN for details.

MEMBERSHIP - $20.00 P.A, concessions $15.00 P.A, expiring immediately after the Annual General Meeting in July.

LAWRENCE HARGRAVE AWARD - VK stations require 10 contacts with IARS members. Overseas stations require 5 contacts. One contact with the Club station VK2AMW is suitable. Details of contacts are to be sent to the Club secretary.

********** COMMITTEE **********

PRESIDENT	VK2KLH	Brian Clarke	
VICE PRES	VK2KWG	Ken Grimm	
SECRETARY	VK2UR	Ron Hanks 84-2691	
ASSIST SEC	VK2SRB	Robert Bonella	
TREASURER	VK2DSH	Dale Hughes	
ASSIST TREAS	VK2GID	Graham Denney	
COMMITTEE	VK2SRB	Robert Bonella	VK2XQX - Simon Ferrie
REPEATER	VK2MT	Rob McKnight	VK2TKE - Ken Goodhew
QSL CARDS	VK2GID	Graham Denney	
PUBLICITY	VK2KWG	Ken Grimm	
BROADCAST	VK2XGJ	John Simon	
EDITORS	VK2XGJ	John Simon, 61-4628	VK2FPN Peter Read 61-714
SOCIAL	VK2XCC	Ray Ball	
CANTEEN	VK2GMC	Phillip Klower	
DOTC LIASON	VK2MT	Rob McKnight	
LIFE MEMBERS	VK2ALU	Lyle Patison	VK2CAG - Graeme Dowse
	VK2OB	Keith Curle	