THE PROPAGATOR

The monthly newsletter of the Illawarra Amateur Radio Society Inc. (IARS)

Meetings are held on the second Tuesday each month (except January) at 7:30pm in the State Emergency Services building in Montague Street North Wollongong.

VISITORS ARE MOST WELCOME

Volume 94 Number 7 July 1994

SIGN UP A MEMBER AND SAVE FIVE DOLLARS

With membership renewals being due to be paid by the August meeting the club is offering a $5 discount on YOUR membership with every NEW MEMBER you sign up. If you sign up enough new members you will get your membership FREE. Think about it. Now please read and complete the "Important Notice To All Members" elsewhere in this issue.

NOMINATION FORM FOR ANNUAL GENERAL MEETING (JULY)

Please don't forget to fill out the nomination form included elsewherein this issue and nominate someone for the upcoming **ANNUAL GENERAL MEETING** to be held on the 12th July at 7:30pm.

WANTED

A pre-loved printer for an IBM computer.
Contact JIM VK2ZWG via landline on 84 8634 most of the time.

Would any member have a book which I could photocopy of a YAESU FT411
It's a HT radio I will pay costs of photo copying. Contact Brian VK2UBF on 67 2296

Would any member have a circuit diagram of an Alinco AMP Model ELH 230E.
This is for a friend of mine cost will be paid. Contact Brian VK2UBF on 67 2296.

REPEATER REPORT (5/6 - 26/6)

If this is the version of the Rptr Report that finally gets into the Propagator, it is the fourth version that I have written in the space of the last 5 hours.

This version will be shorter than the previous three & will also not contain any direct comments that could be regarded as "hostile" to particular people. I have decided to do this to avoid tension & friction within our Club, which could be generated from the many comments that I would dearly love to include. Believe me, nothing would please me more than to "tell it like it is", but at this point in time, I see no real good in doing this, except that it would make me feel a whole heap better!

The reason for the above disclaimer is due to the Motion that was voted on at the last meeting, which I now quote directly from the IARS Secretary's Notes:

"That the Club's Sublime Point Repeater be changed back to it's licensed frequency & all other Club stations be returned to their licensed frequencies." Voted: 28 FOR , 3 AGAINST , 1 ABSTAINING.
(Two notes on the Motion. 1) - No time frame was included. 2) - The inclusion of "Club stations" instead of perhaps what was meant to be "Club repeaters". So be it, the Motion stands & was voted on, NOTHING will be done to any of the other Club's repeaters.)

Those in attendance at the meeting, will be aware of the reason that was given to have this Motion floated. Those who weren't there will have to ask others for the details, but summarising, the underlying reason is to force the SMA to do something about the Pager interference that they, (or the previous DOTC), have done nothing about.

For the past 12 days, since the June Meeting, I have thought long & hard about the Motion & the subsequent vote. As I stated above, I am not going to "finger-point" & generate perhaps unnecessary tension, but I do believe that ANY Vote that takes place, should be done with both sides of the issue being equally represented & discussed, & that all issues raised in support of either side, should be both complete & factual.

The following are questions that you the voting member should perhaps ask yourselves regarding the reason for the motion, it's supporting arguments & how it was subsequently voted on...

*Is there more to this issue than what I've been told? (eg: Do Politicians always tell you the WHOLE truth or just what they want you to know.)

*Question what chance does this idea REALLY have of succeeding. (Think about the HUGE resources, both financially & legally, the SMA has up there sleeves. Also, think about how much effort they will put into winning such a case, when they have so much to lose.)

*Ask how much will this SMA challenge cost & who's going to pay?

*Question how long this issue with the SMA is going to take, (no timeframe could be given) & consequently how long is the IARS 2m Rptr going to have to continue copping illegal Pager interference? (Remember, it had already suffered interference close on 4 years).

*Wonder why if, as we were told, the problem encompasses SO MANY other users & has much more far reaching effects than just our Amateur service, why does the case apparently rely so heavily on one little Amateur Rptr copping Pager interference?

*If the case really does rely so heavily on our 7275 rptr, how strong a case is it anyway? (Don't forget the HUGE resources the SMA have behind them. Being in the "right", just doesn't always count. It hasn't helped so far.)

*Is it not conceivable that someone else in Australia has thought before to take the SMA (or DOTC) to task for the interference caused by Pagers to legitimate licensed services?

*If someone has done this, (& the odds are someone would have had to), what happened to them or their challenge to DOTC/SMA?

*If the case was ever won against the SMA, will we be then able to seek compensation for inconvenience, lost time, wear & tear on our Rptrs & radios as well as ourselves, caused by the Pagers? (After all we are all legitimate licensed operators/services). (What about compensation for Pager filters bought?)

*If per chance this SMA challenge doesn't succeed, what does NTAC &/or FTAC have up their sleeves to accommodate the ongoing Pager interference to Rptrs & users?

*As there is no time-frame given for the outcome of this issue with the SMA, are we Amateurs, Clubs & Rptr Groups suppose to just sit down & shut-up about the Pager interference in the meantime?

Since the Meeting, quite a bit has surfaced that would have had a direct influence against the motion. If some of what I have typed above has you questioning how you voted on the night, that is good. As with ANY vote, you should be questioning the motives & reasons presented to you. There is a LOT more to this whole issue than what was presented on the night. Hopefully, it will either be found to be incorrect or it will be brought to the attention of the Amateur population before it is to late.

By the way, I hope the 28 members that voted to "sacrifice" our 2m rptr back to the Pager interference for an undetermined period of time, will also be the same people who use 7275 with whatever problems it then has.

As per the wishes of the IARS members, if all goes well, 5650 will cease to exist by the time you read this & 7275 will be resurrected. Be aware that once it is changed back, except for major breakdown, the rptr will be left as is. Consequently, the search for a bigger & better site for the system will be stopped, it will probably only get more interference anyway.

The only personal comment I have about the Motion & the Vote is that with just 15 minutes discussion & a raising of hands, 4 years of frustrating, time-consuming & relatively considerable financial input on my part, were promptly swept out the door. No that's not "sour grapes", I firmly believe in personal sacrifices for the greater good of all, but I'm afraid I have grave reservations about the success of this whole challenge to the SMA. So be it, if that's what the IARS members want, that's what they'll get.

As this is the last Rptr Report before the AGM, it should contain a summary of the operation of the IARS Rptrs over the last 12 months. Well I think the following is a good representative summary...

VK2RAW (6850)
Working fine.
WIA B/cast RXer & link to 8225 fine.

VK2RUW (8225)
Working fine (except for occasional unidentifiable noise).
Goulburn link fine.
10m Gateway fine.

VK2RIL (8725)
Working fine.

VK2RIL (5650)
Working fine.

VK2RUW (Packet)
Working fine.

Before closing, I would like to thank the following for their assistance in looking after our Club's Rptrs (apologies if I miss someone).
VK2TKE VK2CAG VK2XCE VK2BIT VK2XGJ VK2UBF VK2ZLJ VK2XQX

Till next time (maybe)
RoB - VK2MT

PS: The AGM is next meeting. Consider standing for a position & getting more out of your membership with the IARS & as well as helping your fellow member. It really isn't all that bad. (Typing Rptr Reports at 3am in the morning really is a lot of fun!)

WAY BACK THEN ..... Episode 31 ..... 1983.

(i) Keith Curle, VK2OB, made Life Member of IARS.
(ii) 70cm repeater made operational at Sublime Point.
(iii)Wind generator installed at Mt Murray repeater site.
(iv) IARS 70cm "Kilometre Kontest" organised.
(v) IARS Tee Shirts available.

Keith Curle, VK2OB, was made an IARS Life Member at the March meeting - in appreciation of the many years of work which he had put into the club and into getting members trained to pass their amateur proficiency certificate examinations.

Keith had been either President or Secretary of the club for some 10 years and had provided CW and theory training for prospective amateurs at his home - which had been instrumental in many of the club members receiving their licences. He had also been involved at the Wollongong Technical College in organising and teaching theory classes to aspiring radio amateurs for five years.

At the AGM in March the following officers were elected - Pres. Dave VK2DFL, VP. Keith VK2OB, Sec. Murray VK2KER, Treas. Geoff VK2ZHU and Richard VK2ERF. Committee was VK2's DFK, BXV, XCC, BMV, EJM, JT and KO.

The club's second 70cm repeater was constructed by Graeme, VK2CAG, and was installed at the Sublime Point repeater site. It became operational on 29/6/83 on 438.725MHz output as a combined FM/RTTY repeater (The first such?) It soon became widely used, even in the Sydney area, as a RTTY repeater.

A wind generator was purchased by the club and installed at the Mt Murray site as a backup to the mains supply (and to reduce cost of mains power). At about the end of the year the mains supply cables broke, leaving the wind generator and associated batteries as the sole supply to the repeater.

The encoding system for the 6850 repeater was installed at Mt Murray in July to provide remote switching etc from a number of locations.

The club participated once more in JOTA activities in October, from the field day site at Bass Point. All went off very well,as usual, as a result of the hard work put into the operation by the club members involved.

An IARS UHF "Kilometre Kontest" was organised, for participation by club members only, late in the year.It was for FM contacts on the 70cm band - either by use of simplex or by means of repeaters. It was to run for a 6 month period, from 1/1/84 to 30/6/84 as a way of getting increased activity on the 70cm band in the Illawarra area.

Talks, demonstrations etc., given at monthly meetings during the year included -

May - "Intruder Watch" by Bill Martin, VK2EBM, of the WIA.
June - Films on Amateur Radio - from the WIA.
July - Objectives and progress on the VK2AMW 1296MHz EME Project - by Lyle, VK2ALU.
Aug - Mini Auction
Sept - A video film, made by Mike, VK2DFK, on the first (successful) VK2AMW 1296MHz EME test - with ZE5JJ.
Oct - Demo. by Gil McPherson, VK2ZGE, of a 70cm Yagi array which was available from him in kit form.
Nov - Annual Auction - compered as usual by Dennis, VK2DMR, our licensed auctioneer. The club made approx $250 "commission" out of this one!!
Dec - Display of a replica of a 1920's style 1 valve "Unidyne" broadcast band wireless receiver - constructed from a kit by Dave, VK2YKQ.

A Christmas Picnic was held by the club at Cordeaux Dam in December. It included an "audio fox hunt" for children and the usual cricket match for allcomers.Over 30 attended and all had a great time (including Santa Claus!!!)

IARS Tee Shirts, supplied by Graeme and Angie Dowse, became available in December. They were worn proudly by a number of the club members at the Christmas picnic and showed what a fine body of men we were (well, at least some of us, anyway!!!!)

Lyle VK2ALU.

"A MEMBERS VIEW"

An open letter to all club members to be (hopefully) sent by the committee to the Editor of the Propagator for inclusion in the July issue.

To the Committee of the IARS, 15th June 1994

G'day,

I am writing to express my **disgust** at the treatment handed out to Rob McKnight, VK2MT, at the last general meeting. Rob would have to be the hardest worker our club has and over the last few years. He has spent hundreds, if not thousands of hours on our repeater system. I also believe he has personally donated well in excess of $1,500 in money and equipment to ensure our repeaters worked properly.

Late last year I proposed a motion that we create a Rob McKnight award in recognition of his services to our club. This was put to the committee for consideration and since it hasn't happened, I can only assume the committee felt that Rob didn't warrant the award.

We are all aware of Rob's efforts to solve the pager problem. I believe this problem only affects a few members, but Rob worked tirelessly for 4 years to solve it. When he came up with a solution, it was not rejected by the committee, so I have to assume you approved of his actions.

Now, at the June meeting, the person who attempted (??) but failed to solve the pager problem for the past few years suddenly decides he can solve it BUT we have to ensure our repeater receives pager interference. When asked how long it would take to solve the problem, no time was given. When pressed if it would be 6 months or 6 years, no time was hinted at.

So, our club just voted that a person who tried for 4 years and couldn't do the job now can, and the person who did the job is told to undo the job. Why?

Personally, if I was Rob, I would tell you all to go and get ..... but hopefully Rob is bit more mature than me and will continue to work like a dog and suffer the lack of praise, thanks and appreciation. Then again, maybe you, the committee have someone lurking in the wings who can do a better job? Ha!!!

Hang in Rob, it can't get any worse.

Sincerely yours in the regression of amateur radio.

Peter Read
VK2FPN

The PIG that Flies
Part 2 - Users and Efficiency

David Henderson, VK2YKQ
AMPRnet: david@sparky.vk2ykq.ampr.org
Internet: wehend@itwol.bhp.com.au

ABSTRACT

The arrival of the Wollongong Packet/Internet Gateway (PIG) has attracted a fair number of stations to its (currently) single frequency of 146.425 MHz. The mixture of users of both simple AX.25 and TCP/IP over AX.25 has provided an opportunity to examine packet circuits under load conditions. This is the second in a series of articles which discusses the results of traffic monitoring on the gateway frequency.

Concurrent Users

This month, we will examine the number of concurrent users on the channel[1]. Again, it is stressed that the interpretation of this data applies only to circuits with the usage characteristics of the PIG, i.e. one primary station (the gateway machine) and multiple secondary stations. The application of this interpretation to normal, many-to-many user packet frequencies is not necessarily valid.

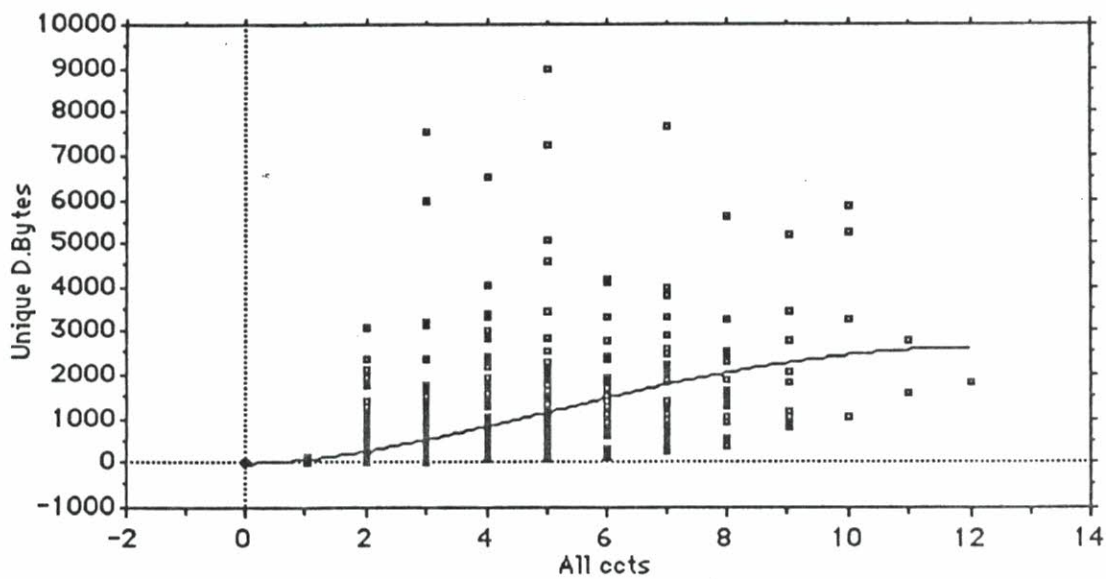

Figure 1 - Unique Data Bytes vs Number of Circuits

Figure 1 shows a plot of the total number of circuits established on the frequency, versus the unique data bytes[2] transmitted in the same time interval. The polynomial regression through the points shows a plateau at around 10 users, indicating that 10 users of the gateway on the single frequency is the maximum which can be supported before all users will suffer performance degradation. Of course, this number could also be an artifact of the data as there were few samples taken with 10 or more concurrent users. Remember also that this applies only to the mode of operation in use on the gateway frequency at the time - that of around 10 users all connected to the gateway's CONVERS service.

Figure 2 shows the mean and standard deviation of the number of circuits on the channel at any one time. From the plot, it can be seen that the average (μ) is approximately 3. This value concurs with the throughput figures of 200 bps per user and the total of 612 bps for the channel discussed in the last month's article.

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[1] The data used for this analysis was collected over the 72 hours between 07:40 hrs Friday, 15th April 1994 and 07:40 hrs, Monday 18th April 1994 on 146.425 MHz.

[2] The unique data bytes are the number of data bytes received without duplication (re-transmissions).

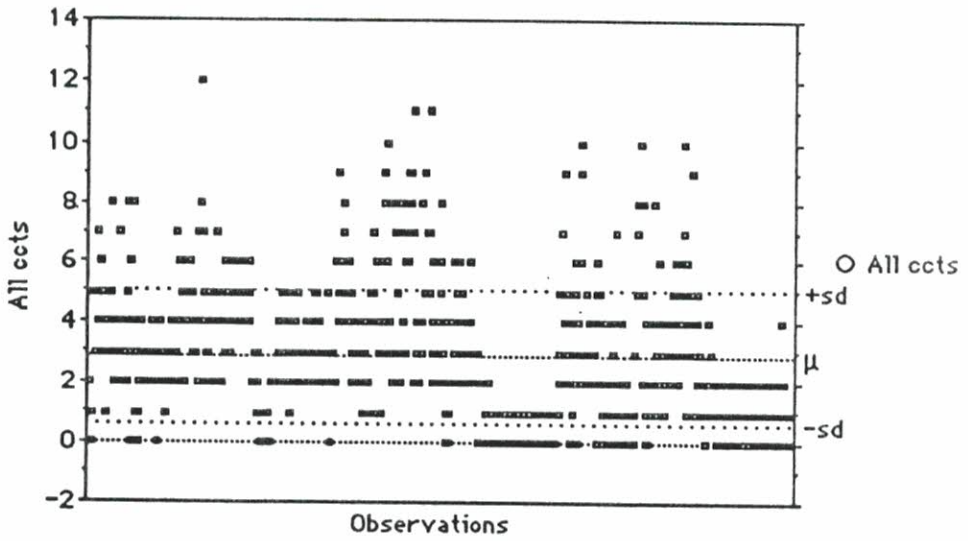

Figure 2 - Mean & Standard Deviation of Circuits

Efficiency

The next characteristic which we will examine is circuit efficiency. By efficiency, I mean the percentage of data bytes transmitted on a channel which are unique. For example, if in order for a packet to be successfully received without error it must be transmitted four times then the circuit efficiency is 0.25 (25%). Several of the low level parameters associated with the transmission of AX.25 packets can significantly affect circuit efficiency. In particular, we will examine the parameters which control the minimum interval of time a station waits after the channel becomes free before transmitting a packet. On a simple TNC using AX.25, this parameter is referred to as DWAIT and on a TNC in KISS mode (or a Baycom-like modem) the parameter is referred to as persistence[3]. Documentation accompanying most TNCs will advise that DWAIT is used to prevent the TNC 'hogging' the channel and that the value should be set to around 160 ms. Likewise, users of TNCs in KISS mode are advised to set the persistence parameter to around 128[4] . If these guidelines are followed, then the TNC will wait, either the number of milliseconds specified in DWAIT or an amount of time based on the 'probability of transmitting' controlled by the persistence value, before transmitting. A station which does this is called p-persistent. In the case of a persistence value of 128, the transmitter will key-up with 50% probability (128/255 = 50%). However, if you change these parameters and set the DWAIT value to 0, or the persistence value to 255 in an attempt to gain a 'bigger' share of the channel, then the transmitter is termed 1-persistent and will send a packet as soon as the frequency becomes clear. This means that the individual station will be working most efficiently; right? Wrong! This would only be the case if the transmitting and receiving stations were the only ones on the frequency.

Consider a scenario where the PIG is transmitting to three stations, A and B which are 1-persistent and station C which has persistence set to 128 (50% chance of transmitting). Assume also, that we start with a busy channel. As soon as the channel becomes free, both stations A and B will transmit immediately. The result is that the packets from both A and B will be lost through collision and the PIG will receive neither. Both stations will start their AX.25 t1 timers when they do not get an acknowledgement from the PIG that their packet was received. During this wait time, station C will probably transmit its frame to the PIG and receive an acknowledgement. What will happen next is that both stations A and B will have their AX.25 t1 timer expire and queue their previous packet for re-transmission, so that as soon as the PIG finishes sending its current packet both will transmit and, very likely collide again. The two

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[3] There is actually a difference between persistence and DWAIT but for the purposes of this discussion, they have the same effect on circuit behaviour.

[4] In computer networking this parameter is referred to as p. The value of p is between 0 and 1, but for TNCs, it is much easier to implement an integer, and so the values are normally in the range of 1 to 255.

stations with 1-persistence will continually encounter collisions, while the p-persistent station will successfully transfer data, albeit slowly because of the air-time taken up by the other two stations. It's not quite as bad as all that for stations A and B, because both their AX.25 t1 timers and key-up timers will undoubtedly differ and so their packets will eventually get through. In general, however, stations with persistence/DWAIT parameters set to aggressively transmit as soon as the frequency becomes clear, suffer degradation of performance as a result. Of course if there were only one station on the frequency (apart from the PIG) then things would be different, and the throughput would be as high as the circuit is capable of supporting. However, remember that collisions can occur even if the transmitting station cannot hear the interfering station - if the receiving station can hear another station then a collision will occur (in practice, the capture effect of FM detectors will reduce the impact of distant, weak stations).

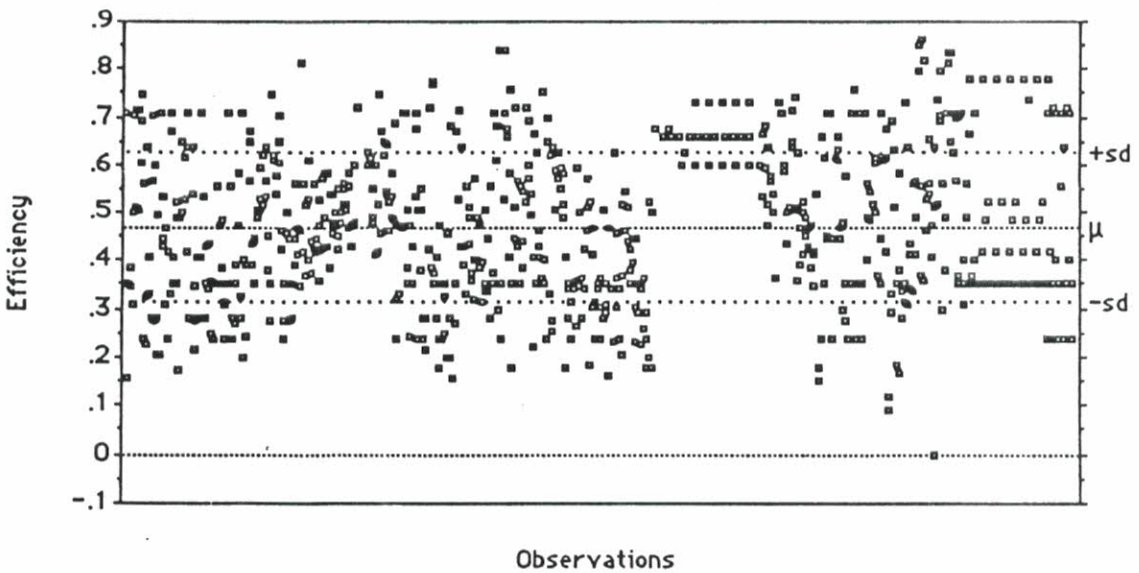

Figure 3- Mean and Standard Deviation of Circuit Efficiency (vs. time)

Figure 3 shows the circuit efficiency over time. The average can be seen to be approximately 0.5 (50%). The same data is plotted in figure 4 and shows what in statistical terminology is referred to as a normal distribution - the typical 'bell-shaped' curve.

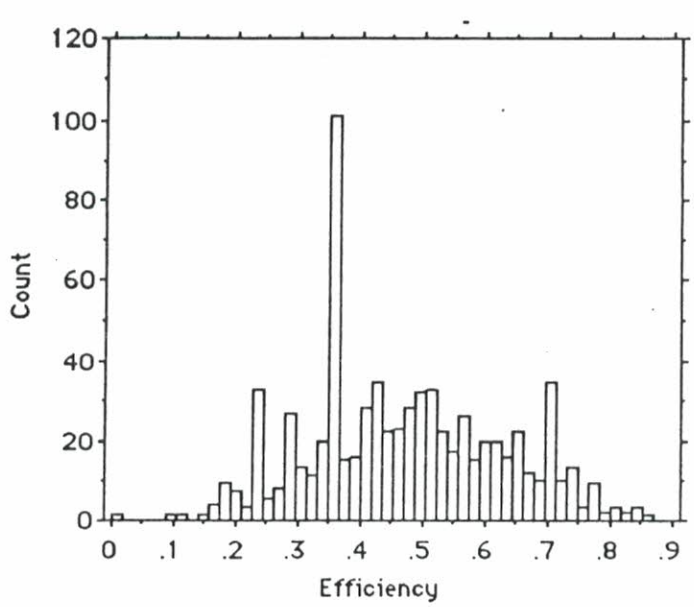

Figure 4 - Frequency Distribution of Efficiency

The stations covered by this curve are those with p-persistence. The average circuit efficiency of approximately 50% means that for a packet to be received without error, it must be sent (on average) twice, which on a loaded channel of around 3-4 users is about normal (pardon the pun). There is a significant exception visible on figure 4, and that is the large deviation at around 0.35. This exception is present in other samples taken on the gateway frequency and will be examined in a future article.

On examining the raw data, there was a reasonably even spread of stations across the bell-curve. This means that although the average (and the mode) for stations was 2 transmissions there were some times when the packet got through first time and some when it took more than 2 transmission to get through - but the average was 2.

Several stations active during the sample period had previously been identified as using 1-persistence. It is clear from the results that stations who use 1-persistence in the belief that it will get them a bigger slice of the frequency are mistaken. An examination of the raw data showed them all appearing in the bottom 30% of circuit efficiency (i.e. requiring 3 or more transmissions to get their packets through). They, in fact, reduce their throughput significantly below the average, and also reduce the amount of bandwidth available to others because of the unnecessary collisions they cause on the frequency (of course operators of older TNCs without the ability to use p-persistence may not have a choice in this regard).

Well, that about wraps it up for this month, and finishes the examination of the data collected in April. Starting next month, the format will change to a series of short articles on the use of the PIG and TCP/IP in general.

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

REPEATERS	VK2RIL	145.650 *	Voice/RTTY	Sublime Point - TEST freq only.
	VK2RIL	438.725	Voice/RTTY	Sublime Point
	VK2RAW	146.850	Voice	Mt Murray
	VK2RUW	438.225	Voice	Knights Hill
	VK2RUW	29.020	UHF Gateway	Knights Hill
	VK2RUW	144.775	Packet (ROSE)	Knights Hill - Off air.
	VK2AMW-1	146.425	Packet	Wollongong UNI (Packet Internet Gateway)

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.

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 $60 per ad per year, member's classifieds free for one issue. See Mick VK2GNV for details.

MEMBERSHIP - $20.00 P.A, concessions $15.00 P.A, expiring immediately after the AnnualGeneral 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	VK2KWG	Ken Grimm		
VICE PRESIDENT	VK2XQX	Simon Ferrie		
SECRETARY	VK2UR	Ron Hanks	(042) 84 2691	
ASSIST SEC	VK2SRB	Robert Bonella		
TREASURER	VK2UBF	Brian Farrar		
ASSIST TREAS	VK2GTJ	Theo Jepson		
COMMITTEE	VK2ZWG	Jim Beaver	VK2KLH	Brian Clarke
	VK2GMC	Phillip Klower		
REPEATER	VK2MT	Rob McKnight	VK2TKE	Ken Goodhew
QSL CARDS	VK2XGJ	John Simon		
PUBLICITY	VK2XQX	Simon Ferrie		
BROADCAST	VK2XGJ	John Simon	VK2MT	Rob Mc Knight
EDITOR	VK2GNV	Mick Eckardt	(042) 57 4101	
CANTEEN	VK2GMC	Phillip Klower		
WIA LIASON	VK2XGJ	John Simon	VK2MT	Rob McKnight
LIFE MEMBERS	VK2ALU	Lyle Patison	VK2CAG	Graeme Dowse
	VK2OB	Keith Curle		

IARS Illawarra IARS
Amateur Radio Society Inc
P.O. Box 1838 Wollongong NSW 2500 AUSTRALIA

NOMINATION FORM for COMMITTEE POSITIONS

Elections for ALL positions will take place at the ANNUAL GENERAL MEETING,to be held on TUESDAY 12th JULY 1994,commencing at 7.30 pm,at the SES HQ.Montague St.Nth.Wollongong.

PLEASE PRINT CLEARLY.

I.....Call.....

hereby nominate for the following position on the Committee of The Illawarra Amateur Radio Society Inc.

Position.....

Positions for nomination are as follows:PRESIDENT,VICE PRESIDENT, TREASURER,SECRETARY and 3 COMMITTEE MEMBERS.

Signature of Nominee..... Date.....

By my signature I hereby accept the above nomination.

Proposed by..... Call.....

Signature of Proposer..... Call.....

****IMPORTANT NOTICE TO ALL MEMBERS****

MEMBERSHIP FEES ARE DUE TO BE PAID BY AUGUST MEETING.
KINDLY FILL OUT BELOW AND BRING TO NEXT MEETING OR
MAIL TO:

THE TREASURER
I.A.R.S.
PO BOX 1838
WOLLONGONG NSW 2500

NAME:.....

ADDRESS.....

SUBURB.....

POST CODE.....

CALL:VK .....

FULL MEMBERSHIP $20 PA.
CONCESSIONS $15 PA.

UNPAID MEMBERS WILL CEASE TO RECEIVE THE PROPAGATOR .

!
TREASURER