



The PROPAGATOR

Illawarra Amateur Radio Society Inc.



The monthly newsletter of the Illawarra Amateur Radio Society Inc.
Registered by Australia Post publication number :- NBH - 1491.

Meetings are held on the second Tuesday each month (except January) at 7.30 pm in the
State Emergency Services building in Montague St, Nth Wollongong.

Visitors are most welcome.

VOLUME 90, No 9

SEPTEMBER 1991

THE FRONT PAGE

Greetings! Here we are for another action-packed month. I say action packed, because I haven't had to write any fill articles for a couple of months now.

It is also an action packed month, because there is a lot going on in the Society at the moment. Perhaps you hadn't noticed, but some issues are being dealt with by the committee and you should be aware of them. Make your feelings known about things that you care about.

One the one hand, we are trying to improve the Society, whatever that means, to make it more worthwhile, and attract other people. This happens in two forms: attract outsiders to the hobby, and attract existing and new amateurs to the Society.

Also, there are things happening within the hobby that require a bit of involvement. The new procedures for conduct of exams will affect us personally and in the hobby.

Plus getting the Club Station together and the usual repeater maintenance. Busy, aren't we?

CALENDAR

SEPTEMBER: For this month, we have Roger Harrison, who will speak on the subject of Antennas (and not digress too much). This is someone worth hearing.

OCTOBER: Rob VK2MT has been working on a video on the Club's repeaters. "Around the Sites" will be shown at this month's meeting. Also this will be our Jamboree On The Air night. No doubt we might wander off to general stories (tall tales?) as well. Bring your memories, pictures, tales, etc.

Also in October, the Propagator will be going to all Amateurs in the Illawarra (that Ray can find in the call book). Send your articles in now!

NOVEMBER: Yes, you guessed it, another Auction. Clean out your garage so you have room to stack all your purchases. All proceeds to the VK2RAW back-hoe fund. (If it still exists...see inside)

DECEMBER: Christmas party and social night. Radio widows welcome to come along and meet other like-minded people.

Minutes of IARS General Meeting,
13th August 1981, at SES HQ,
Montague Street, North Wollongong.
Start 19.45

Apologies: VK2 KHE, TPH, XTE, YKQ,
ZDM.

Visitors: Raymond Goodwin, Mervyn
Collett VK2UCM

Correspondence in:

1. BARG News - Ballarat ARG
2. Canberra Amateur Packet Radio
Group - Technical Symposium 31/8/81
3. WICEN - information from State
Co-ordinator
4. Aust Post - New price schedule
5. Wollongong City Council - Info
Directory
6. APC Newsletter - Moorabbin &
Dist ARG
7. "What's new in Radio Comms"
June/July 1981

Correspondence out:

1. Bulli Pass Trust - re levy on
Sublime Point site
2. Amateur Radio Action - Club info
3. WIA NSW Div - Club info

Coming Attractions: We are
endeavouring to obtain a well known
amateur as guest speaker for
September meeting. Other topics
being considered for future
meetings (if we can secure the
services of appropriate guest
speakers) include: Latest
technology in communications
equipment. Amateurs in Antarctica.
Spread spectrum and frequency agile
systems.

Also being considered are a
discussion night on topics of
concern and interest to amateurs,
and joint activities with other
amateur radio groups.

Our well renowned auction has not
been forgotten and will be held at
the November meeting.

REPORTS:

1. Club Station: Some final
adjustments are required for the
antenna supports and bearings,
especially in view of the heavy
winds experienced this month. A
working bee was held 17/8 to make

these necessary mods. It is hoped
that the station will be functional
shortly.

2. Club property: Steve, VK2TSB,
to obtain a price on a solid core
door for radio room.

3. Repeaters: All repeaters
operating satisfactorily except
for squelch problem with VK2RAH.

4. Finance: Treasurers report was
received.

5. QSL Cards: Cards are being
held for VK2 JJJ, ANO, CAG, IU,
PJS, PG, DGJ, CRH. Please collect
from Ray VK2XCC as soon as
possible, please.

WIA topics:

Some concern has been expressed
re the devolvement of examinations
by DOTC with the WIA to gain
complete control of examination
material. Major concerns centre on
the potential cost and availability
of exams to future applicants under
any revised arrangements. Our
concerns will be presented to the
WIA so that their views can be made
known to our members.

Conference of Clubs:

Brian, VK2KLH, advised that a
resolution at the Conference had
been omitted from the report in
the Propagator. The resolution
concerned the production of a
current amateur licence when
purchasing any gear capable of
transmitting.

A vote of members agreed to the
resolution by the majority but
considered it doubtful if it could
be implemented, given the current
apathy among many recognised
dealers.

Club History Project:

Lyle, VK2ALU, advised that Brian,
VK2AXI, has provided copies of
early Propagators and that the
first article has been completed.

--- More over Page ---

Leather Tongue Award:
John, VK2XGJ, advised the meeting that the award should go to Bill, VK2DYU, as he had not been heard on the club's repeaters for quite some time. Carried unanimously - especially by those who are equally guilty.

JOTA:
This year 19/20 Oct. Graham VK2GID is trying to secure a site at Campus East for this activity.

Members in hospital:
Morry VK2EMV is in Wollongong Hospital, Ward 18. Get Well Soon Morry.

Meeting closed 22.00

WELCOME TO NEW MEMBER!

The IARS welcomes VK2KSP, Stiven Bordin as a new member to the Society. Stiven has been active on both HF and VHF, and joined last month. Another VK2OB graduate!

DOTC QUESTION

Last month, Keith VK2OB asked about voltage gain and decibels: A voltage gain of 100 equals how many dB?

The answer was (D) 40 dB. Remember that for voltage and current, the $\text{dB} = 20 * \log(\text{value})$, and you get 40dB. Anyone who got 20dB was thinking of the rule for power.

This month, Keith asks: Transistors in a complementary symmetry amplifier circuit configuration must be:

- (A) Terminated in a perfectly balanced output transformer.
- (B) A matched pair of NPN transistors.
- (C) A matched pair of PNP transistors.
- (D) A matched pair consisting of one PNP and one NPN transistor.

For People Who Want Quality and Support a Realistic Price!

Thinking about PC's??

We sell quality IBM COMPATIBLES with Superior specifications to the original AND at much LOWER PRICES

XT, AT and 386 compatible Computers

All are TURBO machines and have 12 months warranty.

**All we ask is that you PHONE US before buying
COMPUTERS, SOFTWARE or PERIPHERALS.**

SOFTWARE

Available - Educational, Real Estate, Milko, Doctor, Hire, Register, Accounting, Sales Monitoring and Programming Languages for IBM and compatibles.

HARDWARE

Available - All peripherals for IBM and compatibles including Printers, Monitors, Hard Disks and Expansion Cards.

OTHER

Consulting, Contract Programming and Training Available. We have been in the industry since 1979.

For your Computer needs phone

Janson Computer Services

Ph (042) 61-5451

Shop 1/27 Princess Hwy
Dapto. 2530

**** Page 3 ****

Minutes of IARS Committee Meeting -
20 August 1991 at SES HQ, Montague
Street, North Wollongong. Start
19.30

Present: VK2 KLH (Chair), DSH, GID,
GPJ, KCV, KWG, MT, OB, TKE, TSB,
URB, XCC, XSV.

Apologies: VK2KHE.

The minutes of the last Committee
Meeting of 16/7/91 were read and
received. Moved VK2 GID, GPJ.

Correspondence in:
Smoke signals - Central Coast ARG
Newsletter.
Subscriptions from VK2 EXN, AHN.
Bob Maughan, VK2CRM, request for
info re Club.
Goodhand Technologies - info sheet
re PC Morse Code software "Morse
Course" - for IBM & Amiga. Further
info call (09) 279 9338.

New Members: Application from
Stiven Borden, VK2KSP, was
considered and accepted. Welcome
aboard, Stiven.

Review and update of the Society's
Memorandum and Rules held over
until next meeting, to allow all
Committee to peruse documents.

Treasurers report: received from
Ken, VK2TKE.

Technical/Training report from
Keith, VK2OB: Exams were held 20/8
at Wollongong Tech. 1 limited
licence was obtained and a number
of students passed various
sections. The next exams will be
held in November.

Repeater report:
VK2RUW 438.225 off air to remedy
squelch problem and fit control
board for linking with VK2RGN.
VK2RIL 438.725 control board being
prepared by Rob, VK2MT, and ident
board programmed by Ken, VK2KWG.
VK2RAW - discussion being held with
site owners re installation of 240V
AC to site. 146.850 has
experienced some desense problems
lately. Packet working O.K. and
battery situation appears ok at
present.

Club Radio Room:
Slight hitch experienced with new
staff at SES apparently not being
aware of previous granting of
permission to use the room.
Consequently, the door (obtained
gratis by Steve, VK2TSB) remains
unhung at the moment.

A working bee to reinstall the
antenna for the Club Station will
take place on Sat 31/8, including
work by Rob VK2MT, who feareth not
the great antenna without the use
of an oxygen mask (weather and Mrs
Rob permitting of course).

Propagator: pricing structure for
commercial ads to be discussed at
next committee meeting.

Education/Exams: With the current
uncertainty re devolment, Brian,
VK2KLH, will arrange to contact St
George ARC to ascertain their
system and views re education.

The club is in the early stages of
planning an exhibit at the 2WL Expo
to be held in October. A sub
committee of Rob VK2MT, Dale VK2DSH
and Ken VK2KWG, will investigate
and report to the next committee
meeting.

Meeting closed 22.15

TECH EXAMS UPDATE

Last committee meeting, Keith
came straight from running the
exams to tell us the news. Lots of
passing was going on and it is good
to see everything so successful.
Congratulations to those who
succeeded.

However, due to changes to the
exam arrangements (see separate
article), the upcoming November
exams look like being the last ones
at the Tech. Get your entries in to
Keith while you still can...

2WL EXPO DISPLAY

As part of the Radio 2WL 60 years celebration, the organisers of the 2WL Lifestyle Expo have invited the Illawarra Amateur Radio Society to set up a display stand at the Expo. This is to show some "then and now" radios, and also some publicity for us.

The event is on the weekend of the 19th and 20th October (same weekend as the Scouts Jamboree on the Air), at Beaton Park (near Wollongong centre). The committee have arranged for a stall in an indoor location, but with proximity to a window or what have you for feedlines.

What we intend to do is to have some sort of display of old gear, new gear, homebrew gear, working gear and so forth, on a stall personned by IARS persons to tell people all about it. Also some papers to take away with information about the Society.

Perhaps some ex-military gear might be nice, a latest and greatest rig (IC-781 anybody?), some packet gear packetting away, who knows?? We can then show off a few of the things that Amateurs do. If everything goes well, we might see some more faces in the Society, and more hams on the bands.

This is where we need help. We need some ideas on what to do. So far we have some ideas, but every ham likes doing different things, so if you think that you have an idea, let us know. We need equipment and gear and stuff to have about the place, and maybe you have something suitable. We will also need people to look after the shop over the weekend, probably rostered half days at a time or something.

FREE FIE FO FUNNI

Well, not too much fie, fo and funn, but definitely Fee. Those of you who haven't paid your IARS membership fees (they came due in July) are reminded to pay up soon or suffer the wrath of Ray VK2XCC. The blue wrappers commence next month. Fees to Ken VK2TKE please.

We have been allocated an area 4 metres by 4 metres to play with. One suggestion was some tables at the back of the stall with the "Don't Touch" gear on them, and a couple of tables at the front set up like a shop counter. This needs tables - anyone with a source of tables please let us know.

Some videotapes are being sourced from the W.I.A. they apparently have various things that would be useful, then maybe a screen of Scouts and Guides talking to each other on packet (what's that, Ray? Something about starting them on the wrong foot?), and um... we don't really know what.

If you have suggestions or any ideas, contact Ken VK2KWG, Dale VK2DSH or Rob VK2MT. Don't be backward in coming forward.

Calling All Amateurs

It's time to visit your local
Market at BULLI if you need :-

METERS

ANTENNA MATERIAL

RADIO PARTS

KEY BITS AND PIECES

ELECTRONIC THINGAMYS

TRUE VALUE 4 MONEY

CAVIONS

11 Molloy St. Bulli

Ph (042) 84-6838

**** Page 5 ****

WAY BACK THEN...

Editor's note: This is the first of our new series by Lyle VK2ALU on the history of our Club (and the ones before it). Anyone who wants to share some memories, please see Lyle.

EARLY DAYS - WOLLONGONG RADIO CLUB

The Wollongong Radio Club was formed as a result of Howard Booth (now VK2AMD) being asked to form a radio club when he arrived in Wollongong in July 1948, as a migrant from England, accompanied by his wife and sons. He had held a U.K amateur licence under callsign G2AS since 1926 or 1927, although he had operated an amateur station in England since 1922.

Howard applied for his Australian licence shortly after arrival and at the same time he applied for a station licence for the then being formed radio club. He received his callsign, VK2AMD, in September 1948, but it was 3rd December 1948 before the club licence, under the callsign VK2AMW, was received.

The Wollongong Radio Club was formed in the latter part of 1948 with Howard Booth as President and Eric Fisher (the father of Eric Fisher, who later obtained his amateur licence and callsign VK2DY, now VK3UQ) as Secretary/Treasurer.

The club first met at the Technical College, Gladstone Avenue, with meetings being held each Wednesday evening.

Howard built a receiver and transmitter for club use, but in order to be able to establish a club station the club moved location to a building at the rear of the home of a member, Reg Walters VK2WV, at 21 Bourke Street, Wollongong. Here the members were able to operate the station (with a licensed member present) at any time they wished. Operation was on the 7 MHz and 14 MHz bands and was initially on phone.

However, Howard soon realised that phone operation was not to the benefit of the club, as members who were not licensed were content to operate without taking steps to obtain their own amateur licences. Howard therefore modified the transmitter so that it would operate in the CW mode only, after which they worked over 100 countries in a 12 month period.

After about two years or so at the Bourke Street premises, the club moved to a more central location in a room at the rear of Passlow's Book Store, which was located towards the lower end of Crown Street. Howard was running weight lifting classes in this room on three evenings per week, so the club shared the rent with him.

Howard Booth relinquished the position of President of the club after about 18 months, when he moved from Wollongong to Windang. This move was brought about by a change of jobs from one in the repair section of Palmer's Electrical and Radio Store to that of an electrician on the wharves at Port Kembla. Eric Fisher took over as President of the Club.

The Club continued to meet and operate their station at the rear of Passlow's several times a week until July 1952, when it had to vacate the premises because the owner was starting up a stocking factory in the building. At that time, the rent was five shillings a week, shared between the Club and Howard Booth.

Several members obtained their licences after the Club was formed, including Kevin Brady VK2AFF of Dapto, Don Fisher (now VK4UF) had his licence under the callsign VK2AFD when he joined the club. An army officer, Greville Dennis, was a licenced amateur who joined the Club when it was formed in 1948, he and Howard being the only licenced amateurs in the Club initially.

As time went on, others including VK2PG, VK2ALV and VK2ANO also obtained licences.

After the Club was forced to leave the premises at the rear of Passlow's Book Store, some of the members continued to gather at Howard Booth's home each Sunday for several years.

It is not clear whether other members resumed meetings elsewhere. I have been in touch with three of those who were in the district prior to 1982 and there is some thought that meetings were held at a member's home in Rosemont Street, where the Club's station equipment (or some of it) was stored but not placed in operation. Eventually this group also disbanded.

There is memory of one of those to whom I have spoken, being taken by a member to a Club meeting in the small building on the edge of Coniston Oval, possibly in the mid 1950's. Maybe further information will come to light on this period of the Club's activities prior to 1982.

If anyone's memory is jogged by the above account then perhaps they might care to provide us with additions of corrections to the information.

Howard Booth is now aged 83 years, and is still conducting weight lifting classes!! My thanks to Howard for most of the above information.

--- Lyle VK2ALU



See Jack at

**NEWTEC
ELECTRONICS**

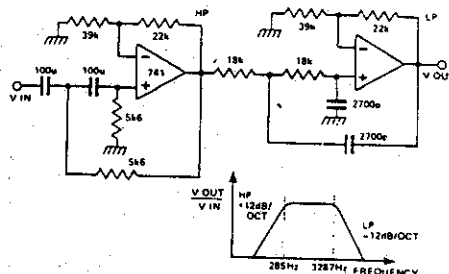
We stock

Alarms, antennas, kits, tools, cable, data books, Goldstar test equipment, Electronic components for the professional, Amateur and hobbyist.

102 Kembla St.
Wollongong

(opp. W'gong Bowling Club)

Ph. 27-1620



Speech Filter

For any purely speech audio system application — communications receivers, transmitters, dictaphones etc. — it is desirable, for best intelligibility, to limit the audio bandwidth to provide relatively steep rolloff below about 300 Hz and above about 3 kHz or so. Most speech information is contained between these limits. This circuit shows a simple bandpass filter system with 12 dB/octave rolloff below 285 Hz and above 3287 Hz. One unusual application of such a filter would be in a 'light show' system so that the display varies with voice variations of an announcer or performer.

**** D Q U D ****

REPEATER REPORT for AUGUST '91

(Compiled 24/8/91)

6850 - Appears to have some slight desense. (The RXer is being affected by the TXer. The resultant affect is what sounds like someone repeatedly triggering the rprr with quick transmissions.) We're not sure what's causing the problem. Could be as simple as a loose connector or as complicated as a re-tune on the cavities in the diplexing system. To be investigated next visit. No probs with battery bank capacity since Packet system changed, consequently 6850 has not had to be shut-down now for almost 2 months.

7575 (Digi) - The old extended Ringo-type antenna has been re-installed. The Shoalhaven guys needed their colinear back that they had been lending us. (The "lent" antenna was only suppose to be temporary until we could fix our big colinear, but as the repair has meant almost a total rebuild of the internal half-wave elmnts, the project has taken longer than expected.) The antenna was needed back by the Nowra group because their main Packet antenna had been severely damaged in the recent storms & high winds. The day after Geoff (VK2XVK) contacted me (26/7), Ken & myself went up to Mt Murray & took it down & replaced it with the Ringo. Geoff works in W'gong so came & got it on the 28/7. While on site, we also installed a control board to run off the existing remote control system. This now enables us to control (ie: turn on or off) the Packet system. We now have full remote control of all the systems at Mt Murray. (6850/7575 & 620). This will be of great assistance if battery problems become a concern again. 7575 is now running "Net-Rom" & with the eqmmt in use, power consumption is much lower than using the Rose gear. With the lower current being drawn, battery problems haven't been a problem. As for the mains power being connected to the site, the owner is having reservations about allowing us permission to dig the trench & lay the cable & conduit. At this point in time, we aren't allowed, but he's still thinking about it & we're optimistic.

7275 - The pager problem reported last month has ceased & has not been heard for well over a month, cross fingers. The band-pass filter installed to try & help with the Pager interference has been removed. It couldn't prevent the type of interference we were getting & was only adding to the loss in the RX line. No other problems to report, everything OK.

8725 - X-tals have been installed, still to be tuned-up, ident has been made (courtesy of Ken KMG), control board still to be built & some other mods as we have discovered with it's brother (or is that sister?) repeater 8225. (They are identical repeaters). Site at Sublime Point near to Kiosk has been decided upon. No one contacted us as to the site decision mentioned in last month's report, so Sublime Point it is. Where it will be located will give an excellent coverage of all of W'gong, south to Kiama. The only possible shadow area will be the suburbs to the Sth & SW of Mt Keira, ie: West Dapto, Albion Park. All being well, the system will be on the air within a few months.

8225 - Late July/early August the rprr suffered from a type of radar interference. The interference did not open the rprr's sqch, but "rode" in with legitimate signals. VERY strong in strength. Even very close high power stations were affected. It wiped-out all but the strong users. It appeared to have a pulse every 8 to 9 secs & fluctuated in signal strength. It had a screeching sound to it. I thought it sounded similar to the interference you sometimes get to your car radio (on FM) when passing the Mascot Radar installations along General Holmes Drive, Sydney. A few people said that they had heard that there were possibly manoeuvres taking place off Sydney. Others tried DFing it, but the signal could not be pin-pointed. Listening on FM you needed another signal to "demodulate" it. Listening to the white noise only on 70cm nothing could be heard. Strange..... Anyway, we felt it would be of a temporary nature, even though it rendered the rprr useless, so it was not reported to DOTC & besides we are the Secondary Service on 70cm so I guess we probably have to just put up with it.

On the 5 & 6/8/91 the area was hit by very strong winds, in excess of 100kph. (Damaged the Club's 20m Yagi). If it was a 100 plus down here the rptr sites would have really copped it, in particular Knights Hill. The mains power was interrupted up there many times over the few days, (branches breaking power lines, etc). You may remember the TV stations going on & off the air. Our rptr stayed on thru all of it (courtesy of a large 3 phase generator) till late on the 6th. I thought the fuse in the cubicle may have blown, caused by a spike possibly on the mains. Late on 7/8 I went up to the site after work. Still very windy, dark & bloody cold. To cut a long story short, the fuse hadn't blow. It appeared the primary winding on the transformer of the rptr's internal P/S had gone open circuit. Connected (with frozen fingers) the cubicle's P/S to the rptr. Back on the air. Later found the muffin fan on the cubicle's P/S had also failed. Something happened up there, but what?...

11/8/91 - Went around all rptr sites & took a video of each. Shot about 45 mins & travelled over 150kms. Ken came with us (me & the Family) & had his first look at Sublime Point. The video is to be edited down with some old video shot about 6 years ago by Graeme (CAG) & some old photos of the systems many years ago. It will be a look at the Club's Rptr systems past & present & should be of interest to most members. If I can get all the stuff together in time, the video will be shown at the October Club meeting. As they say... "you've read the book, now see the movie."

On the day of shooting the video we also removed all eqmmt from Knights Hill. The new cubicle (the "pie-warmer") has been totally cleaned-out & re-fitted with 240 & 12V control panels, shelves, wiring, full thermostatically controlled heating & cooling (if needed), alarm system & more! We decided to remove everything, give everything a check over & tune, fix 8225's temp sensitive sqch (has been done), & hook-up the link ctrl bd for the Goulburn linking & other work. The systems will be re-installed when the "pie-warmer" goes up to the site. Will be done by the time you read this.

Till next time... Rob-VK2MT

VIMCOM

YOU KNOW THE PLACE
AND YOU KNOW THE NAME
AND YOU KNOW WHAT WE
DO SO WHY DO WE NEED
TO ADVERTISE TO TELL
YOU THAT BESIDES
ELECTRONIC
COMPONENTS AND BITS
AND PIECES, WE HAVE A
VERY LARGE RANGE OF
MICROCHIPS TO HELP
YOU BUILD THOSE
PROJECTS.

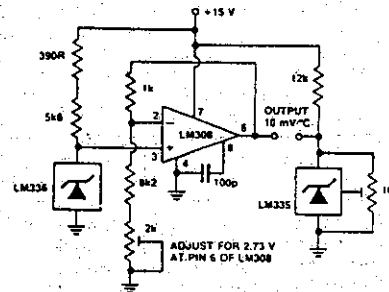
WE ADVERTISE TO ENABLE US TO
PROVIDE AN EVEN BETTER SERVICE
AND HELP YOUR CLUB.

Call in and see us at:-

131 Kenny St
Wollongong

(right down the southern end)

Ph. 284400



Centigrade Thermometer

This simple circuit can be used to measure temperature in Centigrade degrees and will read out directly on a standard digital multimeter. The LM335 is a precision 2.5 V voltage regulator, the LM335 a precision temperature sensor. The LM308 output provides a 'milli' reference scaled up from absolute zero. The 2k trimpot is set to provide 2.73 V between pin 6 of the 308 and common. The 10k trimpot is set so that you get 2.982 V across the LM335 at 25°C. The LM335 can be used for contact temperature measurement.

AMATEUR EXAMS - THE FUTURE

Editor's note: Keith VK2OB was sent a copy of this letter (him being an authorised examiner), from another examiner to the Minister for Transport and Communications. Some background: the Dept of Transport and Comms has decided that after this year, all Amateur exams will be drawn up by the W.I.A. and everyone else gets to buy them off the W.I.A. (at whatever price they charge).

"Dear Sir:

"I understand your Department is intending to change the policy covering the methods of conducting Amateur radio license examinations, and the production of examination papers. I am informed by Mr Alan Jordan that your department is intending to give the Wireless Institute of Australia (W.I.A) the exclusive rights to produce examination papers, and fix the price.

"I remind you that the W.I.A is a non government, private organisation, and registered public company to which less than half the Australian licensed radio amateurs are members. As most government departments, in the interest of equal opportunity and fair trading practice, are required to call for tenders (or "expressions of interest") for information or service provision which can be used for financial gain. May I, therefore, request the details of your Department's call for tenders (or "expressions of interest") for the production of examination papers and for the running of examinations, including any cost protection limits intending to be set by your Department on these materials and services.

"Mr Alan Jordan refused my request to supply the full, and current, list of Australian amateur radio licence examiners. May I request to know what right your Department has to refuse access to release public access information which has already been published in the Amateur Radio Call Book.

I also notice that the Australian Amateur Radio Call Book is still being produced by the W.I.A. A few years ago I reminded you that the W.I.A is a non government, private organisation, and registered public company, and as such is not entitled to information from your Department which can be used for financial gain, unless this information is first offered on public tender (or "expression of interest"). Please provide details of the tender procedure which your Department used prior to the release of the information which allowed the W.I.A to produce recent call books.

"Yours Sincerely, A.D.Tregale."

I hope that you found that letter interesting, and worth reproducing. I also found that it raises a couple of questions. Clearly Mr Tregale has a number of points.

One of the major worries about the intended arrangements, is that the W.I.A will be the only ones who can set exam papers, and then everyone must buy them from the W.I.A. At what price? Figures like \$100 per set (ie, all the exams for one sitting) have been hinted at. Bear in mind that they will have a total monopoly.

Keith VK2OB says that if the intended move does happen, the Wollongong Tech will not be able to run any more exams. This is a sorry state, and means that if we are to have local exams, someone will have to fork out the money, then recoup it from the candidates. It is the belief of the committee that some form of action is required.

Brian VK2KLH mentioned at the last committee meeting, that the combined membership of the IARS and the neighbouring St George club, was in excess of half the membership of the W.I.A! Brian says that St George's is also annoyed with the intended move, so we may have sufficient voice to do something. Details to follow...

THE BEAM IS (WAS) UP!

On Saturday 3rd August, the 20m monoband 3 element yagi was installed on top of the VK2AMW tower at the SES headquarters. Team Curle got there early in the morning, and the antenna was raised shortly after 3pm.

After a quick trip to the top to adjust the mast for the rotator, Pat VK2GPJ and the cherry picker driver took the antenna up and bolted it on, under the ever watchful eye (and camera) of Vic VK2XSV. The antenna, cable and rotator were all installed. Keith VK2OB and Pat tried to tune everything up, but it wasn't quite right. As it was well dark by now, the fellas came home.

Through the next week, the antenna spun on its mounts, resulting in the SES people observing our helicopter. Turns out that the large diameter pipe didn't stick far enough out of the tower. The battered but repairable beam was graciously (and bravely) removed by Wayne VK2XTE.

As we go to print, Keith has repaired the antenna, and some of the others installed some thicker pipe at the bottom to raise everything up. This should also allow the gamma match to be clear of the tower.

By the time you read this, a centre bearing will have been fitted, and the antenna should again (and finally) be up). Let's hope I get it right this month. VK2AMW could have a home yet!!

TELEVISION AND VIDEO SERVICE



■ FAST SERVICE ■ COMPETITIVE RATES

46 BURKE WAY, BERKELEY N.S.W. 2506

Ray Ball
(042) 711 958

GENERAL SERVICE
TO ALL POPULAR
BRANDS OF TV's &
VIDEOS UHF SPECIALIST

JAMRORRR ON THE AIR

This event is also on 19th and 20th October, except that it will be Friday night to Sunday night. Can't tell you too much yet. The site will be Campus East, which is the University's ground in Fairy Meadow. Power will be available. Sort of a "run what you bring" weekend, perhaps a bit like the Field Day. Don't know yet. Details as they come available from Graham VK2GID.

PACKET RADIO CHAT/FORUM

This was held at the VK2XGJ residence on 23rd August. Seven people turned up (Ray VK2XCC was not one of them). A bit of a natter about various problems people were having, through to a discussion about networking types (ROSE, NET/ROM and so on), how to get your signal around the countryside, and the future of packet in the region. Not a bad afternoon, pity about the small turn out.

WOLLONGONG ALUMINIUM CENTRE

Available ex stock, we have a large range of

Aluminium

- * Rectangular Hollows
- * Round Hollows
- * Square Hollows
- * Flat Bars
- * Channels

All at competitive wholesale prices

Ideal for building your own antennas

Situated close to the railway crossing

79 Gipps St Wollongong

PH 28-5188 FAX 299-382

**** Page 11 ****

Broad-Band 80-Meter Antenna

The cage is back! Almost forgotten since the 1920s, this multiwire antenna, arranged as a center-fed dipole, provides edge-to-edge band coverage without the help of a tuner. The low SWR will make you and your rig happy!

By Allen B. Harbach,* WA4DRU, VP5AH, VP1AH

I dislike antenna tuners! I suppose there is a place for them when one can put up only one piece of wire to cover all bands, but they definitely slow down the ability to QSY quickly from one end of the band to the other to catch the rare one.

When I began chasing DX in the early '70s, I rapidly became aware that something had to be done to broaden the response of my antenna system — particularly on the 80-meter band. The reason 80 meters is so tough is that it has the greatest percentage bandwidth of any of the popular amateur bands (see Table 1). Percentage bandwidth is a concept that gives a clue to the required Q of an antenna in order to have low SWR from top to bottom. It is calculated by dividing the bandwidth (in kHz) by the band-center frequency (in kHz) and multiplying by 100 to get percent. The 80-meter band is 13.3% wide

$$\left(\frac{500}{3750} \times 100\right)$$

which means that it requires an antenna Q of 7 or below to be able to cover the whole band at low SWR. To further illustrate the concept, the 15-meter band is nearly as wide as the 80-meter band, in kHz, but is much narrower in percentage bandwidth

$$\left(\frac{450}{21,225} \times 100\right)$$

An antenna Q of 45 or less will cover the entire 15-meter band with reasonable SWR (a dipole of no. 12 wire). On 80 meters the typical dipole of no. 12 wire has a bandwidth of 75 kHz at the 1.5:1 SWR points, or in excess of 5:1 at the band edges when resonated at 3750 kHz (band center).

To get around this problem, I did some reading in the library at the local engineer-

Table 1

Percentage Bandwidths for the Popular Amateur Bands

Band (meters)	160	80	40	20	15	10	6	2
Percent Bandwidth	10.5%	13.3%	4.2%	2.5%	2.1%	6.3%	7.7%	2.7%

CONFIGURATION	EQUIV. DIAMETER
1B	0.59036
1C	0.76684
1D	0.93000

Fig. 1 — Solid-tube equivalents of wire cages.

ing college. I arrived at the well-known fact that the fatter one makes an antenna, the lower the Q; hence the greater the bandwidth. But how thick? Doing some more reading and a lot of paper scratching, I arrived at some relationships that could be solved with the average scientific calculator. Later, I programmed these into our company computer to speed calculations and print tables and graphs.

The equations and math I'll tackle later for those who are interested. For the others who want to know what to build, I'll cover that now. Calculating several antennas from the equations, I found that the antenna had to be at least 3 feet in diameter to cover the whole 80-meter band with a low SWR. Now, how to put up a 3-foot-diameter pipe 120 feet long! That's the question. So back to the books!

More reading showed that one can approximate a cylindrical conductor with parallel wires of various configurations. The equivalent diameter of a conductor, made up of parallel wires, is shown in Fig. 1.

The easiest type to construct is a four-wire cage. For my antenna, I used cross sticks of 1 X 1 material, 4 feet (1.2 m) long, which were held together at the

center by a couple of brads. Holes were drilled in the ends of the sticks to take the antenna wire. Wire ties served to keep the spreaders from slipping (Fig. 2). I used a no. 16 wire for each element. This is equivalent in antenna resistance to a dipole made of no. 10 wire, and it keeps ohmic losses low.

Mechanical Considerations

Some mechanical considerations must be kept in mind. This antenna will swing in the wind. The first antenna I installed failed through fatigue both at the center and the end points. Therefore, the end sections of each half must be made of heavier material. I have used both no. 16 Copperweld and no. 12 soft-drawn copper wire for the end sections with no failures in over six years.

The ends of each half section are tapered over a distance equal to the spreader length to provide a transition between the large-diameter conductor of the antenna and the balun or coaxial connection. To keep construction simple, I did not attempt to optimize the end terminations.

Use fairly heavy insulators at the center support, as this is a heavy antenna; wind loading is five times that of the usual

*2318 S. Country Club Rd., Melbourne, FL 32901

Table 2

Characteristics for the 80-Meter Band

Freq.	Ohms	Reactance	SWR
3.500	53.4	-45.0	2.18
3.520	54.2	-41.3	2.03
3.540	55.0	-37.5	1.90
3.560	55.8	-33.8	1.78
3.580	56.6	-30.1	1.67
3.600	57.4	-26.4	1.56
3.620	58.2	-22.7	1.46
3.640	59.0	-19.0	1.37
3.660	59.8	-15.4	1.29
3.680	60.6	-11.7	1.21
3.700	61.4	-8.0	1.14
3.720	62.2	-4.4	1.07
3.740	63.0	-0.7	1.02
3.760	63.8	2.9	1.06
3.780	64.7	6.6	1.12
3.800	65.5	10.2	1.18
3.820	66.3	13.9	1.25
3.840	67.1	17.5	1.33
3.860	67.9	21.1	1.40
3.880	68.7	24.8	1.48
3.900	69.5	28.4	1.56
3.920	70.3	32.0	1.64
3.940	71.1	35.7	1.73
3.960	71.9	39.3	1.82
3.980	72.7	42.9	1.91
4.000	73.5	46.5	2.01

Note: Calculations for an antenna 124 feet (37.8 m) long and 3 feet (0.9 m) in dia covering 3.5 to 4.0 MHz. $Z_0 = 62$.

dipole. (Do not despair! Mine has survived a twister and a hurricane!) I used a separate insulator for each half with each fastened to a U bolt in a wooden arm protruding from my tower (Fig. 3). Separate insulators at the center allow each half to be made and raised separately. A no. 12 flexible wire connects the center of each half to the balun or coaxial line.

Naturally, the higher the antenna, the better it is for DX. Mine is 68 feet (20.7 m) at the center, with one end held at 55 feet (16.8 m) and the other at 40 feet (12 m) above ground.

Testing

Once in place, the antenna is ready for testing. Each installation seems to have its own peculiarities, the result of nearby objects such as trees, houses and metallic structures. These affect the resonant length of the antenna to a greater extent than they would affect a single-wire dipole because of the larger capacitance between the antenna and nearby objects. While the length was calculated to be near 124 feet (37.8 m), I had to shorten mine to 115 feet (35 m) to have it be resonant at the center of the band. I performed the shortening in the last outboard section rather than redo the end termination. That, however, was a personal choice.

All the theory in the world is useless if the thing doesn't work! I'm delighted to say, though, that the antenna does perform well. Observe, for instance, the calculated SWR plot and the measured SWR curve in Fig. 4. The return on invested time is very high. It took me only one afternoon to put the thing up. My

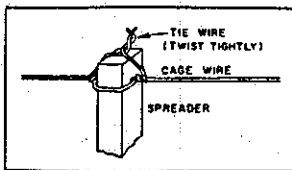


Fig. 2 — Detail of spreader ties.

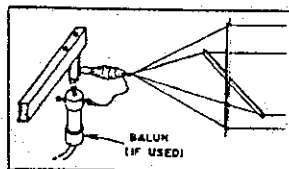


Fig. 3 — Center-support and end-taper detail of the cage.

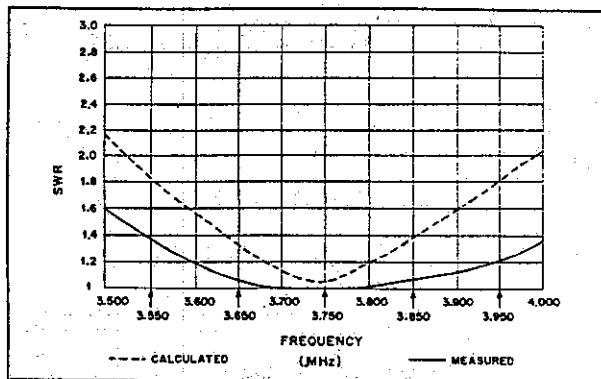


Fig. 4 — This graph shows the calculated vs. measured SWR values for the broad-band cage antenna over the entire 80-meter band. The gradual slope of the measured curve and the low SWR range indicate good bandwidth and matching.

rewards for the 80-meter portion of both 5BDXCC and 5BWAS were gained with the use of this cage dipole. The significant advantage of this antenna, however, is that you can throw away that 80-meter antenna tuner and QSY all over the band with ease without concern about the SWR!

Math 'n Stuff

The characteristic impedance of an antenna with a length-to-diameter ratio greater than 15 is given by the expression $Z_{in} = R(kl) - j[120 (\ln 2l/a - 1) \cot(kl) - X(kl)]$ where

$2l$ = total length
 a = conductor radius
 kl = $2\pi(l/\lambda)$, or the length of one half the antenna measured in radians.
 \ln = natural logarithm

Since $\lambda = 984.25/f_{MHz}$, then $kl = 6.384 \times 10^3 f_{MHz} l$, where l and λ are in feet.

$R(kl)$ and $X(kl)$ are quite complex functions, but are calculated as a table in Ref. 1. Fortunately, we are interested in antennas near 1/2 wavelength long. In this region, these functions can be approximated by the following linear equations:

$$R(kl) = 102(kl) - 87.86$$

$$X(kl) = 48.54(kl) - 34.86$$

Some error is introduced by this approximation, but it is less than 5%. Antenna location, height and trees will introduce larger errors than that! Now, the equation for the center impedance is simplified to the point where one can calculate values with the average scientific hand-held calculator.

For angles calculated in radians:

$$Z_{in} = (0.6512f_{MHz} l - 87.86) - j[120 (\ln 2l/a - 1) \cot(6.384 \times 10^3 f_{MHz} l) - 0.3099f_{MHz} l + 34.96]$$

For angles calculated in degrees:

$$Z_{in} = (0.6512f_{MHz} l - 87.86) - j[120 (\ln 2l/a - 1) \cot(0.3658f_{MHz} l) - 0.3099f_{MHz} l + 34.96]$$

SWR calculated by the *Antenna Book* formula:

$$SWR = \frac{1+k}{1-k}; k = \frac{(R - Z_0)^2 + X^2}{(R + Z_0)^2 + X^2}$$

where R and X are the resistive and reactive parts of the load, and Z_0 is the transmission-line impedance. \square

References:

¹Jayuk, *Antenna Engineering Handbook*, first edition, McGraw-Hill, 1961, pp. 3.2 through 3.7.
The Radio Amateur's Handbook, fifty-eighth edition, ARRL, 1981, p. 19.2

Want the leather tongue award?..

Then try this device!

time-out
warning indicator
for fm
repeater users

An inexpensive
transceiver-actuated circuit
that inhibits
repeater-timer override

Many fm operators have, on occasion, timed out a repeater and since this practice is frowned upon, the habitual offender is branded as a "leadfinger." This article describes an inexpensive timer that, when connected to an fm transceiver, prevents the user from timing out repeater stations. Other timer circuits have been described,^{1,2,3} but all require manual triggering and reset by a negative pulse.

circuit

The timer consists of a 556 (U1) and two 555 (U2, U3) IC timers (fig. 1). The first half of U1 is connected to trigger on a positive step-input voltage.⁴ The trigger voltage is sequenced with the push-to-talk microphone switch. (The methods of deriving the trigger voltage are described later.) The output of U1A is differentiated to trigger and reset U1B simultaneously, which is connected as a one-shot. The time delay is determined by R1, C1 to provide a delay equal to 10 seconds less than the repeater timer. Therefore, using a 60-second repeater, the time delay should be 50 seconds and is approximately found from $t(sec) = 1.1 R1C1$. When U1B is on, its output triggers U2, which is connected as a flip-flop. U2 drives a green LED, which flashes approximately 80 times a minute during this time delay.

When the 50-second time delay is reached U1B goes low and U2 is disabled, simultaneously triggering and resetting U3, which functions as a one-shot for 10 seconds (set by R2 and C2). A red LED is on for this 10-second interval. At the end of 10 seconds, the red LED goes out and the cycle is completed. For other

By Howard M. Berlin, K3NEZ, Department of the Army, Aberdeen Proving Ground, MD, and Adjunct Faculty, Department of Electrical Engineering, University of Delaware, Newark, Delaware

choices of delay times, the RC combinations can be determined from the equation. The status of the LEDs is shown in fig. 2.

power sources

For mobile installations the power supply voltage is taken from the car battery. For fixed station use, any

a single transmission exceeds the first time delay (50 seconds), the green LED will stop flashing and the red LED will light. At this point you have 10 seconds to stop transmitting or else you will time out the repeater, and *all* the LEDs will be off. If the transmission time is less than that of the repeater timer, the timer indicator can be recycled when the PTT switch is again pressed.

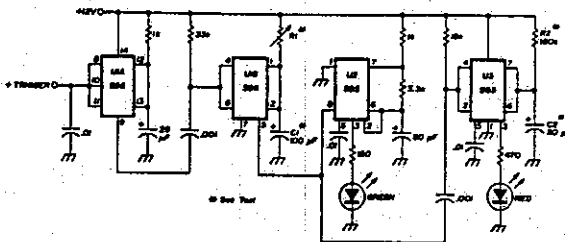


fig. 1. Schematic of time-out indicator.

regulated 12-volt supply can be used. I used the circuit described by WB2EAX⁵ because of its simplicity and used an spdt switch to permit the use of the car battery voltage when operating mobile.

triggering

Triggering the timer from a transceiver can be done in a number of ways. Using my TR-22C, I noticed that the microphone switch keys a transistor whose collector voltage is zero on receive and +12 volts on transmit (Q11). In this way, the push-to-talk action controls both the transceiver and the timer. Connection between the timer and the transceiver was by RG-174 coax cable.

If you're hesitant about going into your transceiver, the timer can be actuated by the transmitter rf output signal, since its voltage amplitude is constant. Fig. 3 is a simple circuit for rectifying the rf signal. A suitable resistor may have to be placed in series with the input for transmitters with outputs greater than 10 watts. A quick estimation of the received rf voltage from your transceiver can be made by using Ohm's law for the power absorbed by a 50-ohm load: $V = \sqrt{50P}$ where P is the transmitter output power in watts.

operation

When the push-to-talk switch is pressed, the green LED will flash repeatedly and the red LED will be off. If

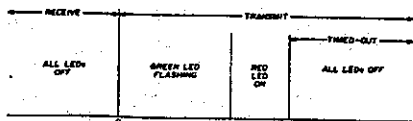


fig. 2. Status of LEDs for a transmission with a 60-second repeater.

other comments

Some of the more astute readers may wonder, "Why go through the trouble of triggering the IC timer by a positive voltage when the 555 and 556 ICs are normally triggered by negative pulses?" Well, I had a few of these chips around and wanted to experiment by wiring them in different configurations. Otherwise, a simple transistor inverter switch with a differentiated output will

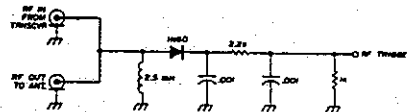


fig. 3. Circuit to trigger the timer from an rf source.

work as well in place of U1A, and a 555 could be used for U1B with appropriate pin connections. A 741 op-amp could also be used but requires a positive and negative supply. If negative triggering is preferred using the voltage from the transceiver circuitry, U1A can be eliminated.

references

1. D. Blakeslee, W1KLK, "Time - IC Controlled," *QST*, June, 1972, page 36.
2. E. Mooring, W3CIX, "Simple Timer," *ham radio*, March, 1973, page 58.
3. H. Vordenbaum, W5ZHV, "Automatic Reset Timer," *ham radio*, October, 1974, page 50.
4. H. M. Berlin, K3NEZ, "IC Timer Triggered by Positive or Negative Pulses," accepted for future publication in *Electronics* (McGraw-Hill).
5. C. Lewart and R. Libenschek, WB2EAX, "CW Regenerator for Interference-Free Communications," *ham radio*, April, 1974, page 54.

POST BOX -ALL MAIL CAN BE SENT TO "ILLAWARRA AMATEUR RADIO SOCIETY" AT
PO BOX 1838, WOLLONGONG, 2500.

REPEATERS -VK2RUW - 29.620 VOICE Mt MURRAY/KNIGHTS HILL
-VK2RAW - 146.850 VOICE Mt MURRAY
-VK2RIL - 147.275 VOICE/RTTY SUBLIME Pt
-VK2RAW - 147.575 PACKET Mt MURRAY
-VK2RUW - 438.225 VOICE KNIGHTS HILL
(OFF AIR) -VK2RIL - 438.725 VOICE/RTTY SUBLIME Pt

BROADCASTS -RTTY ON SUNDAY EVENING BEFORE CLUB MEETINGS, 8.45 pm, ON
147.275 MHz, RELAYED ON 3.618 MHz +/- GRM AND 29.620 MHz.
CALL BACKS IMMEDIATELY AFTER. VOICE BROADCAST AFTER WIA
RELAY ON 146.850 MHz, EVERY WEEK.

WIA RELAY -THE WIRELESS INSTITUTE OF AUSTRALIA 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.

MEMBERSHIP -\$15.00 P.A. CONCESSIONS \$12.00 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.

STORE -THE CLUB STORE IS OPEN AT EACH MEETING, AND SELLS ALL SORTS
OF HARD TO GET KNICK-KNACKS THAT YOU MIGHT NEED.

***** COMMITTEE *****

PRESIDENT	-VK2KLH - BRIAN CLARKE	
VICE PRESIDENT	-VK2GID - GRAHAM DENNEY (042) 288732	
SECRETARY	-VK2KCV - PAT KENNEDY (042) 873198	
ASSIST SEC	-VK2GPJ - PAT JORDAN	
TREASURER	-VK2TKE - KEN GOODHEW	
ASSIST TREAS	-VK2URB - ROBERT BONELLA	
COMMITTEE	-VK2DSH - DALE HUGHES	-VK2GPJ - PAT JORDAN
	-VK2XCC - RAY BALL	
ASSOCIATES	-VK2KWG - KEN GRIMM	-VK2MT - ROB McKNIGHT
	-VK2XGJ - JOHN SIMONS (042) 814828	
	-VK2XLA - GRAEME EAST	-VK2XSV - VIC HEE
	-VK2URB - ROBERT BONELLA	- RON HANKS
	-VK2MT - ROB McKNIGHT	
REPEATER PRES	(I don't know yet!)	
REPEATER COMM	-VK2JBS - BILL STONE	-VK2GID - GRAHAM DENNEY
QSL CARDS	-VK2KWG - KEN GRIMM	
PUBLICITY	-VK2TKE - KEN GOODHEW	-VK2XGJ - JOHN SIMONS
BROADCAST	-VK2AXI - BRIAN WADE	
CARTOONIST	-VK2DSH, VK2GID, VK2XCC	
PROPAGATOR EDS	-VK2DSH - DALE HUGHES	-VK2XCC - RAY BALL
PRINTERS	-VK2XCC - RAY BALL	
SOCIAL DIRECTOR	-	
CANTEEN	-	
STORE	-VK2XSV - VIC HEE	
CLUB STATION	-VK2XSV - VIC HEE	
DOTC LIASON	-VK2OB - KEITH CURLE	
LIFE MEMBERS	-VK2ALU - LYLE PATISON	-VK2CAG - GRAEME DOWSE
	-VK2OB - KEITH CURLE	