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# THE PROPAGATOR

MONTHLY NEWSLETTER OF THE ILLAWARRA AMATEUR RADIO SOCIETY

PO BOX 1838 WOLLONGONG NSW 2500

VOLUME 84, NUMBER 11

Registered by Australia Post Publication No. NBH1491

NOVEMBER 1984

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MEETINGS ARE HELD ON THE SECOND TUESDAY OF EACH MONTH (EXCEPT JANUARY) AT 7.30 P.M.  
AT THE STATE EMERGENCY SERVICES BUILDING, MONTAGUE STREET, NORTH WOLLONGONG.  
VISITORS ARE WELCOME TO ATTEND MEETINGS.

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LAST MONTH'S MEETING Over fifty members and friends attended our last meeting on 9.10.84 including for the first time, two students from the Friday night classes, John and Jeff. The principal item of general business was the announcing of our annual guessing competition. Last year's response to the prize of a VZ200 was such a success that we felt it couldn't be matched, notwithstanding that at the price they are selling now, the market is saturated. Accordingly we have arranged a first prize of a 34cm portable colour T.V., expected to have more of a general appeal, with second and third prizes of twenty and ten Instant Lotto tickets respectively. If we can get our act together, books will be enclosed with this month's issue for members who were unable to collect any at the last meeting. The competition will be drawn at the December General Meeting on the eleventh. Treasurer Andrew VK2XGC (home phone 042-29-7636) has tickets in between times.

Dave Routledge has extended an invitation to inspect the Police Communications Centre at Warilla for those who would like to liaise with our force in a social way. Dave can be contacted at the Dapto Police Station.

The monthly raffle was won by Keith VK20B (who was chairman for the night) and Walter VK2YWJ (who drew his own ticket). They have since been invited not to participate again.

The meeting concluded with a most interesting talk by Roger Harrison VK2ZTB, Editor of ETI who dared be prophetic enough to attempt an answer to "Will Amateur Radio Exist Beyond the Year 2000?" A report on Roger's presentation is contained elsewhere in this issue.

Since last meeting, we have received advice that Warilla High School is conducting a Community Fair and we have been invited to provide a display. This will be an ideal way to promote the hobby and perhaps gain some additional members. Show date is Saturday November 24th - Ian VK2EXN will be recruiting volunteers.

A request was forthcoming for the address of Delta Radio Communications Ltd. For others who might be travelling, the company is located Room 1109, Houston Centre, 63 Mody Road, TSIMSHATSUI, EAST KOWLOON, HONG KONG. The MD's name escapes me.

NEXT MONTH'S MEETING - will be held as usual, the second Tuesday of November, being on this occasion, day thirteen.

## REPEATER REPORT

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The last month has seen some of the strongest winds we have had for quite some time, and fortunately all of the repeaters have come through with no problems. This has been a good test for the new wind generator at Mt. Murray.

Since there have been no breakdowns, all of the available time has gone into the duplexer project. The parts that will go into making up the duplexers were on display at the last club meeting. These bits and pieces were put on display so that the amount of work involved could be seen and appreciated by members who are not directly involved with repeaters.

At this time of writing the tops and bottoms of the cylinders and the tuning plungers have been soldered and the coupling loops are being made up. There are still a considerable number of man hours to go before the first cavity comes off the production line ready for alignment.

This is a list of the parts that had to be custom made to a high degree of accuracy by people with special skills who had access to specialized machine tools.

- 12 Outer conductor tube
- 12 Inner conductor tube
- 12 Brass tuning plunger
- 12 Brass plunger bushing
- 12 Top cavity plate, machined from 4 inch diameter solid billet
- 12 Bottom plate, machined as above
- 12 Threaded brass tuning rod, made from solid rod
- 12 Clamping sleeve, brass tubing
- 12 Plated brass fingerstock sections
- 12 Terminal boxes, made from double sided p.c. board
- 24 Teflon bushes
- 24 Coupling loops
- 12 Inductors

That makes 180 individually made parts which all have to fit together perfectly to make the 12 cavity resonators. The resonators then have to be mounted and connected together with accurately cut lengths of double shielded co-ax to make the two duplexers.

It is appropriate to mention those who have helped to get this project up to this stage of being 80% of the way towards completion.

Stan VK2BKS	-----	Machining and supply of material
Archie VK2JAC	-----	Building the first prototype cavity
Ian VK2EXN	-----	Threading of tuning rods and supply of material
Mike VK2DFK	-----	Making terminal boxes
Jim VK2KJJ	-----	Supply of material
Dave VK2EZY	-----	Liaison and "talent scout"
Lyle VK2ALU	-----	Use of test equipment for alignment
Keith VK2OB	-----	Supply of material
Denis VK2DMR	-----	Supply of material
Roy VK2KO	=====	Supply of connectors
Ned VK2AGV	-----	Making teflon insulators
Ron VK2DXQ	-----	Supply of material

Many others, too numerous to mention have contributed in various ways.

Various organizations, too, have contributed by supplying information or assistance:

Wollongong University Amateur Radio Club  
North Wollongong Technical College  
A.N.A.R.T.S.

Shoalhaven District Amateur Radio Club  
Several anonymous Wollongong business houses  
Those truck drivers who, by not securing their loads properly, have caused some of the material to fall our way.

We are still looking for more BNC plugs and chassis mounting sockets. We have not yet obtained enough for one duplexer, let alone two.

One final note ... have you noticed that this report is being done on a proper typewriter instead of the usual Siemens 100 teleprinter? That's because I am too lazy to change the ribbon on the teleprinter ... ..

Graeme VK2CAG

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RADIO AMATEUR SHACK SELLOUT.

YAESU 101ZD TRANSCIEVER WITH W.A.R.C. BANDS. OUTPUT 150 WATTS.  
\$600.00 OR OFFER. FL-2100B LINEAR. JUST CHECKED AND A.O.K.  
\$500.00 OR OFFER. BOTH UNITS V.G.C. WITH HANDBOOKS.  
3 WAY POWER/MODULATION/S.W.R. METER. \$20.00 POWER/S.W.R. METER \$5.00.  
KENWOOD 7730 2 METER F.M. MOBILE. 25 WATT. ORIGINAL PACKING & MANUAL.  
ALSO MOBILE MOUNT. V.G.C. \$300.00 OR OFFER.  
KENWOOD 120V MOBILE H.F. TRANSCIEVER V.G.C. WITH SERVICE MANUAL.  
ALSO WITH HAND MIC, DESK MIC AND MOBILE MOUNT, PLUS LUNAR  
150 WATT LINEAR. 13.8 VOLT. \$550.00 BOTH OR WILL SEPARATE.  
KENWOOD MA-5 SET OF MOBILE WHIPS. 80 THRU 10 METERS. \$50.00 OR OFFER.  
SONY ICF-2001 PORTABLE COMMUNICATIONS RECEIVER. A.M./S.S.B./C.W.  
ALSO F.M. BROADCAST BAND. KEYBOARD FREQUENCY ENTRY. \$170.00 OR OFFER.  
TRS-80 MODEL 1 LEVEL 2 COMPUTER. 48K IN KEYBOARD. GREEN SCREEN,  
CASSETTE RECORDER AND TRANSFORMER. ALSO SOFTWARE AND BOOKS.  
MAKE AN OFFER AROUND \$450.00. COMPLETE SYSTEM V.G.C.  
A.K.G. STEREO HEADPHONES \$10.00. HIGH IMP MIC. \$10.00.  
ALL OFFERS WILL BE CONSIDERED.  
PHONE DAVID VK2NH. Q.T.H.R. 02-845860. BEFORE 10 A.M. AND AFTER  
7 P.M. <sup>WEEKDAYS.</sup> AND ALL WEEKEND.

Moonbounce Report - November 1984.Lyle VK2ALU.

In last month's report it was mentioned that VK2AMW was non operational on moonbounce because of the failure of a 3CX100A tube in the driver stage of the transmitter. This news was also passed on in reports sent overseas. The results were typical of the tremendous spirit that exists worldwide in the EME group. An airmail parcel of tubes arrived from OE9XXI in Austria, who had heard of our problem from HB9BM in Switzerland. This was followed by tubes sent by good friends VK5ZQ and VK5MC. A letter has now been received from Peter ZS6JT(ex Z25JJ) in South Africa, indicating that he was sending tubes as well. While these tubes are not new, they represent the spares held by the people concerned and some have been tested as giving quite good output. Our grateful thanks are being sent to them all.

The defective tube was replaced on 19/10/84 and the transmitter was checked to give a measured output of 140 watts.

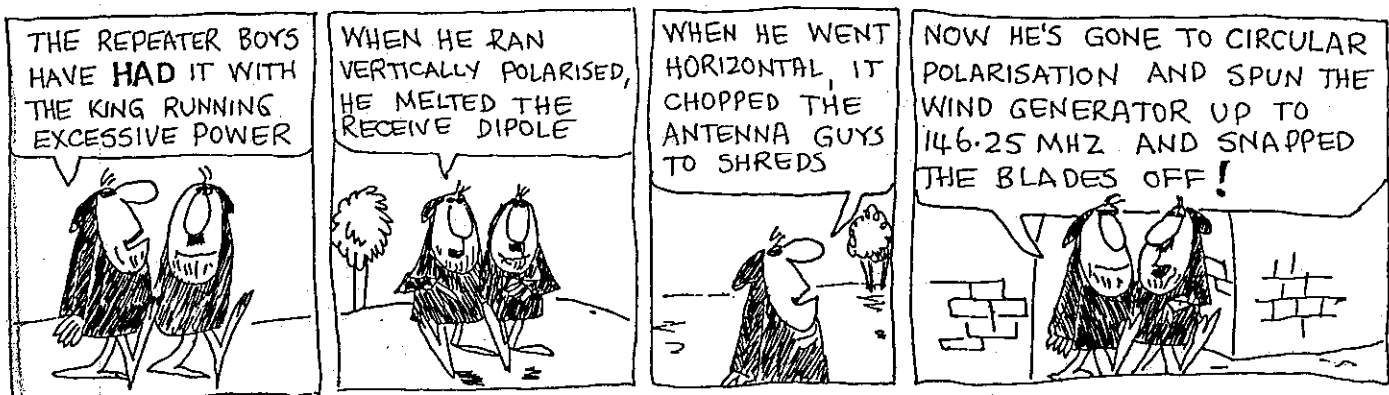
Although the October scheduled EME tests coincided with the Jamboree of the Air weekend in which both VK2ALU and VK2EXN were committed, it was possible to operate VK2AMW on 1296MHz EME for several hours on 20/10/84 during the European window period. Unfortunately the moon was not visible and no signals were heard.

Calibration of the dish tracking computer is continuing. Progress is limited by several factors, one of which is 'glitches' caused by voltage dips in the 240v AC supply when the dish drive motor is started to drive it in the 'fast' mode or when the transmitter is keyed. The old 240VAC supply regulator unit has therefor been refurbished and is now available for use, although it was necessary to use a 5V4G rectifier tube in the control circuit in place of the required 5R4G or 5U4G, as the only 5R4G in my 'junkbox' had an open circuit filament. As the 5V4G is overloaded, perhaps someone locally has a 5R4G or 5U4G hiding away somewhere that could be donated to a worthy cause. If you care to bring it along to the next club meeting I would be happy to take care of it.

The tracking computer calibration is now within approx. 2 degrees of correct but needs to be lined up using the sun at early AM, approx. midday and late PM before being finally 'zeroed in'.

As follow up to my talk on EME at the WIA Symposium in Sydney last Sept. I have received an audio tape cassette from Tim VK2ZTM which contains a segment of an A.B.C. programme broadcast back in 1946. It depicts publicity given to the first Moonbounce experiments carried out by Amateurs in the US Army Signal Corps in the early part of 1946. It sounds quite dramatic and I dont know what the listeners must have thought of it in those days.

HB9BM has requested a test with VK2AMW in November. Tentative skeds. have been suggested for 0100-0200GMT on Saturday 17/11/84 or 0930-1015GMT on Saturday 24/11/84.



POLICE COMMUNICATIONS INSPECTION.

ANYONE INTERESTED IN INSPECTING THE COMMUNICATIONS INSTALLATION AT THE WARRILLA POLICE STATION MAY DO SO ON SATURDAY 17TH NOVEMBER AT 2.00 PM. SEE DAVE ROUTLEDGE AT THE MEETING ON TUESDAY NIGHT OR CONTACT DAVE AT DAPTO POLICE STATION TO ARRANGE NUMBERS ETC.

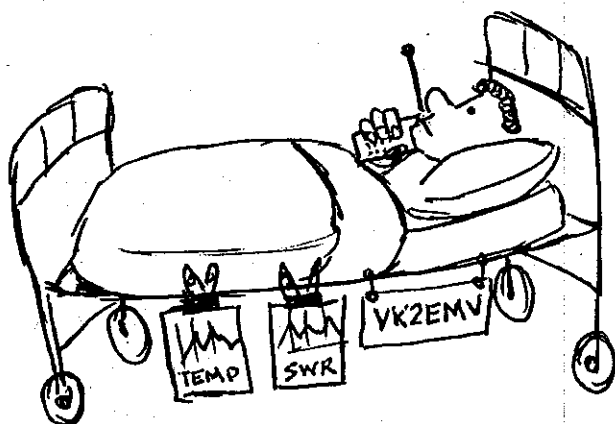
WANTED WANTED

TWO AMATUERS ARE NEEDED TO ASSIST AT THE WARRILLA HIGH SCHOOL OPEN DAY ON THE 24TH. NOVEMBER 84.. DUTIES ARE TO RUN THE STATION AND ANSWER ANY QUESTIONS ABOUT THE HOBBY. ANY PERSONS INTERESTED, PLEASE CONTACT IAN VK2EXN OR MURRY VK2MY, FOR FURTHER INFORMATION..

THIS MONTHS MEETING DISPLAY.

THE MEETING THIS MONTH WILL FEATURE A DISPLAY OF AMATUER RADIO GEAR KINDLY PUT ON BY "DICK SMITH ELECTRONICS" KEIRA ST, WOLLONGONG.. ALL THE LATEST GOODIES FROM "YAESU" AND OTHER MANUFACTUERS WILL BE ON DISPLAY, AND ALL WILL BE AVAILABLE FROM TONY AND THE BOYS AT TRICKIE'S IN THE GONG... THEY ARE ONLY TOO HAPPY TO HELP WITH ANY ITEMS THAT YOU MAY REQUIRE FOR YOUR SHACK TO MAKE LIFE ALITTLE BETTER IN THE HOBBY. SO, COME ALONG AND SUPPORT A LOCAL SUPPLIER WHO SUPPORTS US.. ALSO IT IS HOPED TO PUT ON A CLUB DISPLAY AT TRICKIE'S SHOP LATER THIS YEAR TO HELP PROMOTE THE CLUB AND THE HOBBY..

de Dave VK2DFL



MORRY HAS BEEN MAKING GOOD USE OF THE REPEATER WHILE CONFINED TO BED...



IT'S GREAT TO SEE MORRY UP AGAIN, ALTHOUGH HIS SIGNAL IS DOWN...!

VK2AXI

# How E.T. Really Called Home

*If it were not for an inventive ham, E.T. might still be trying. In this exclusive article, the designer of the little guy's communicator unveils its inner workings.*

Henry R. Feinberg K2SSQ  
415E 85th Street  
New York NY 10028

"**T**GIF," I thought as I returned from lunch to my office in the exhibit department of Bell Labs. Lying on top of my desk—on top of a pile of exhibit plans—was a telephone message asking me to call Kathleen Kennedy in Hollywood. Now, the public

relations department of Bell Labs gets many requests for information, but this one was considerably more unusual than most.

Ms. Kennedy, who produced *E.T.* with Steven Spielberg, had called Bell Labs earlier that day to find someone who would work at home during the weekend, designing a space communicator to be used by a stranded alien to contact his space ship. Few other details

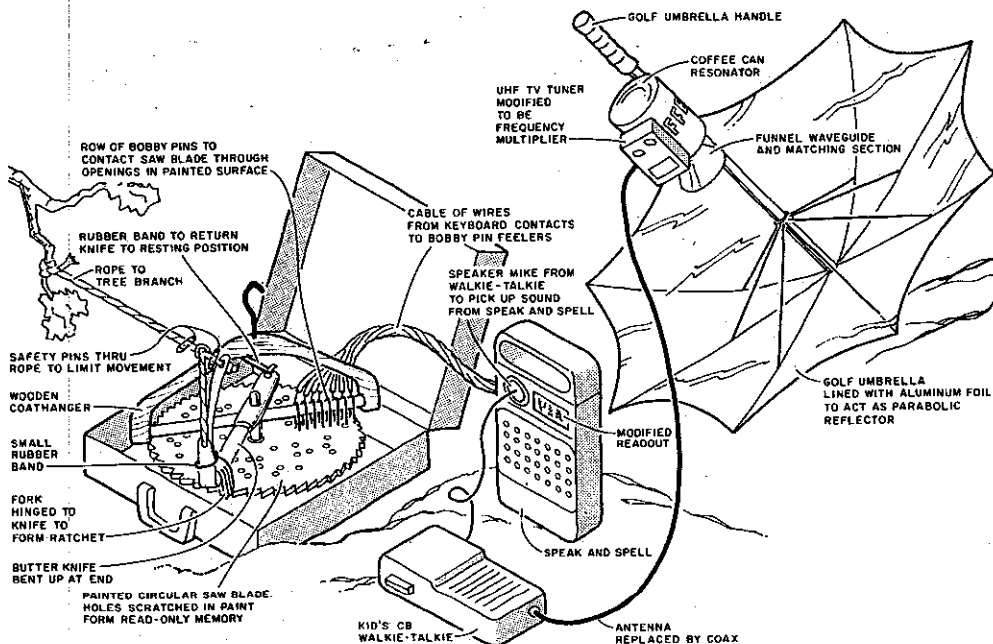
were given, as a great deal of secrecy surrounded the film. Even the name of the film was a secret. I was told that the alien was called E.T., short for extra-terrestrial, but the working title given me for the film was deceiving; it was called "A Boy's Life."

I guess the call was referred to me because of my experience in using household objects to explain science. My title at Bell Labs at

the time was Exhibits and Science Presentations Coordinator. Before coming to the Bell system, I worked with Don Herbert, TV's "Mr. Wizard," designing experiments using everyday materials to explain scientific principles. At the Labs, I continued my work popularizing science through films, demonstrations, and exhibits. Currently, my work at AT&T involves corporate exhibitions such as the Bell System's Futurecom at Epcot Center in Walt Disney World.

Kathleen Kennedy asked me to work by phone with Melissa Mathison, who was writing the *E.T.* script and who was also associate producer. I had several long phone calls with Melissa, discussing items found around the house that could be used in a communicator. As an avid ham-radio operator with a limited junk box, I first looked for household objects that could actually transmit a signal. Transmitters of various sorts were too ordinary, of course. I was looking for something more exotic, something like a microwave oven that could be converted to send a signal into space.

Plausibility was a big fac-



Pictorial drawing of the E.T. communicator.

tor. While the communicator didn't actually have to work, I wanted it to be plausible enough that my ham friends at Bell Labs wouldn't laugh me away from the "ham table" in the cafeteria. I also wanted to avoid a science-fiction look with a lot of blinking lights, coils, and sparks. It was important to me that people seeing the film would not be scared away from the science, and might even understand how a communicator like this might work.

Using a microwave oven as a transmitter seemed plausible enough, and I expanded on the fanciful design by placing a round hubcap in the oven to focus the microwave energy out the door and into a waveguide made of flexible aluminized air-conditioning duct. The duct could be run out the kitchen window to an antenna made by inverting a metal patio umbrella and using it as a parabolic reflector.

At this point, before I'm accused of gross ignorance for failing to recognize how the oven would be de-tuned or how inefficient the system would be, remember that the objective was plausibility, not practicality. It was the thought that counted, and I was having fun thinking of possibilities such as building a flying spot-scanner using a combination of mechanical and electronic components—like Christmas tree ornaments and loudspeakers with mirrors attached. Melissa Mathison told me that Steven Spielberg liked the microwave oven idea but wanted a portable unit to work from a forest clearing. Back to the drawing board.

During my years with Mr. Wizard, we put together one Rube Goldberg contraption after another to illustrate scientific principles. Invariably, we would use household materials in unorthodox ways. Psychologists call this type of creative brainstorming a release from



The E.T. communicator. (Photo copyright © 1982, Henry R. Feinberg)

"functional fixedness." Briefly stated, it means that you can do more with an old 813 than build a lamp with it. The trick is to analyze the desired result by function, breaking down each section to as simple a scale as possible; then it's easier to build the unit from the ground up in a new way. (Sounds a lot like writing a computer program, doesn't it?)

What Spielberg wanted was a beacon transmitter—something to say "Here I am! Come and get me!" I reasoned that three main parts were needed for a basic beacon: a means of producing a message, a programmer to repeat the message, and a way of transmitting the signal into outer space.

Working backward, I knew that a golf umbrella lined with aluminum foil would make a plausible-looking parabolic reflector. And on my last trip to the Dayton Hamvention, I saw coffee cans being used as resonators for receiving MDS TV signals. In fact, a UHF TV tuner purchased there *could* be extensively modified to act as a multiplier to select the ump-

teenth harmonic of a CB signal from a toy handie-talkie. The resulting microwave signal *could* then be directed from the coffee-can resonator toward the umbrella reflector through a waveguide/matching section made from a funnel. Ah, the license of plausibility!

To produce the message, I used a Speak and Spell™ learning aid made by Texas Instruments. The unit contains a speech synthesizer, a keyboard, a fluorescent readout, and a speaker. E.T. deserved his own alphabet, so I rewired the segments of the alphanumeric readout. It took several tries to make the resulting gibberish look like another language. No changes were made in the speech circuits since I thought the sound-effects people would add their own sound. Actually, they never did, and in the film one doesn't hear any sound at all from the communicator—not even the original "message" I devised with the help of Debbie, my wife. It was our names repeated over and over.

The remaining problem was how to program the Speak and Spell to repeat

the same message over and over. To begin with, wires were attached to each keyboard contact. A set of feelers was needed for the other end of the wires. Originally, I used a row of safety pins inserted through the dowel of a wooden coat hanger. But these were a problem to keep straight under pressure. Debbie deserves the credit for suggesting bobby pins. Their flat cross-section prevented them from moving sideways.

The coat hanger was positioned across a child's record player. On the turntable, a circular metal saw blade took the place of a record. The surface of the saw blade was coated with several layers of spray paint which served as insulation, preventing the bobby pins from contacting the metal blade. The message was programmed on the blade by carefully scratching through the paint. This created a pattern of openings similar to those on a punched card through which selected sets of bobby pins could make contact with the blade as it turned.

But how to turn the saw blade? Well, since the com-

BEYOND 2000

Last meeting we had the pleasure of the company of Roger Harrison, VK2ZTB, the Editor of Electronics Today International and synergistic beer drinker extraordinaire. The theme of Roger's talk was to ask the rhetorical question, "Will there be an Amateur service in the year 2000?". Roger contended that the answer was "NO", at least in its present form.

Roger proceeded to give a capsule history of Amateur Radio and its relationship to the commercial services and then described current technology and communications concepts held by some sections of commercial users.

Equipment is currently available which will:-

- 1) Determine the MUF and ALF,
- 2) Continuously scan the range between the two frequencies,
- 3) Determine the optimum working frequency taking into account occupancy, noise and propagation conditions,
- 4) Establish this frequency as a working frequency with a selected station.

This can all be done automatically, and Roger suggested that some sections of the commercial users of point to point HF spectrum wish to open the whole HF band on a non allocated basis, i.e. pick a frequency and use it. Roger suggested that this may be the method of the future.

On these premises, Roger then went on to promote the cause of further deregulating the Amateur service so that an Amateur would be free to choose any mode, power and frequency he may deem to be appropriate to his communication needs.

At the conclusion of his talk Roger then demonstrated two RTTY projects to be published in November ETI. One is a RTTY firmware project for the VZ200, the other a complete hardware software RTTY setup for the Microbee. Both projects were most impressive.

In addition Roger spoke briefly about "6-UP" which has "done a Lazarus". A number of subscriptions were taken for this VHF and beyond publication which has a good reputation for the quality of its projects and articles.

A good deal of interest in both the talk and the projects was shown by the questions at the conclusion of the evening.

Thanks again, Roger.

de VK2DMR.

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WANTED.... Article's for inclusion in the PROPAGATOR.. If you have anything in your scrap book or any projects that you have been working on, let us have them for all to see and use. de Dave VK2DFL...



Satellite Jottings.

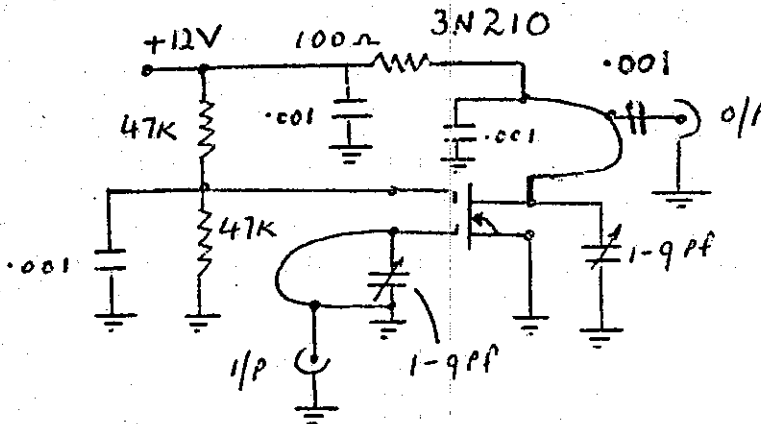
As the Oscar10 satellite orbit slowly changes, periods of good signals are getting longer for those of us in the southern hemisphere. This has been helped by a change in Mode B Transponder operation which results in a much extended 'ON' time to which we have access. It is very nice to be able to sit down and have a 'ragchew' on occasions, for a ½ hour or more with a 'W' or a 'VE' station without being bothered by QRM or 'fading out of the band'. Callsigns heard in the past week or so include 9M2, YB, P29, JA, VK, ZL, KH6, KL7, VE, W and XE.

A copy of 'The Satellite Experimenters Handbook' was received from the VK2 Division of the WIA last week. This is an ARRL publication which is up to date and covers all that is needed by an Amateur with no initial knowledge of Satellite communications to get the necessary background and to proceed step by step to make up the gear and to operate it through the Satellites. Now is the time to 'get with the future' with your hobby!

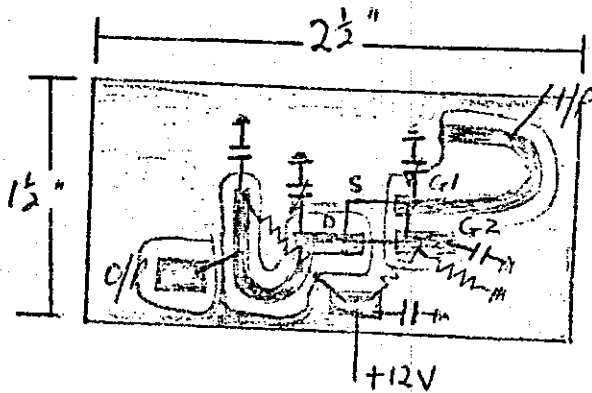
Lyle VK2ALU.

UHF PRE-AMP.

Dr. VK3VH.



ALL RESISTORS ¼ WATT.



BOARD EXACT SIZE

3N210  
TOP VIEW ASON BOARD.



## "Ready Mail Box"

### UK2RTY Repeater.

The UK2RTY repeater in Sydney, is currently being fitted with a microprocessor based controller. This controller will provide normal repeater functions such as identification and time-out supervision and also some enhanced features not previously available. It is hoped that the controller will be fitted sometime on the weekend 2nd/3rd June.

The repeater can only be triggered by standard RTTY tones, with transmitter control provided by slow "autostart" signal detection, and the time-out period is 10 minutes. The input character stream is scanned for a valid command sequence, which causes the repeater to enter the command mode of operation. To invoke the command mode a full-stop character should be sent as the first character on a new line.

So that the repeater can be used as a source of test signals, there are commands provided to generate the standard RYRY and THE QUICK BROWN FOX transmissions.

To provide moderate message storage capabilities, the controller program has the necessary routines to store, retrieve and delete messages. A directory list command enables the user to examine the current contents of the message storage area. A message to be stored can be any length between a minimum of 32 and a maximum of 512 characters (or approximately 8 lines), provided there is sufficient room remaining in the message storage area. The controller can store at least 16 messages of 512 characters. The directory can store 32 entries, which limits the maximum number of messages to 32, with an average length of 256 characters.

Although there is the facility to delete specific messages by command, the controller will automatically remove any message that has been held for at least 72 hours. This ensures that the limited storage capacity is made more generally available.

Following is a list of the commands available for general use, along with a brief description:

- |        |   |
|--------|---|
| .HELP  | Generates a response that lists the command vocabulary with brief descriptions. The only command you need remember. |
| .RYS   | Generates a response consisting of one line of RYRY..etc.   |
| .RYS n | Generates a response consisting of "n" lines of RYRY..etc., where "n" is a number between 1 and 5.                  |

VK2RTY. CONF.

.QBF Generates a response consisting of one line of the QUICK BROWN FOX.... etc

.QBF n Generates a response consisting of "n" lines of the QUICK BROWN FOX...etc., where "n" is a number between 1 and 5.

.DIR Generates a response which lists all the messages currently held by the message storage area, including the date the message was stored and it's length.

.READ filename Generates a response consisting of the message stored under "filename" in the message storage area.

.WRITE filename Stores a message under "filename" in the message storage area....  
message...etc.

WANTED

TO SUIT APPLE COMPUTER.. CASHBOOK AND LEDGER PROGRAM .. EITHER IN APPLESOFT OR CPM.. DETAILS TO....

DAVE MYERS VK2DFL.

30 HIGHLANDS PDE.

BULLI 2516.....

WANTED. MONTHLY.

MEMBERS & FRIENDS TO ATTEND MEETINGS.

APPLY... S.E.S. BUILDING. MONTAGUE ST. NORTH WALLONGONG.

TIME ... 7.30 P.M. SECOND TUESDAY EVERY MONTH.

REMUNERATION..... FELLOWSHIP, IDEAS, RAGCHEW, DISPLAYS,  
TEA & BIKKIES, ALL INCLUDED IN PACKAGE.

COST..... NOTHING, EXCEPT TIME & ENTHUSIASM.

THE ILLAWARRA AMATEUR RADIO SOCIETY - P.O. BOX 1838 WOLLONGONG 2500

Meetings: Second Tuesday of every month except January at 7.30 p.m. in the S.E.S. Headquarters, Montague Street, North Wollongong. Committee Meeting - 3rd Tuesday of each month.

Repeaters: VK2RAW - 6850 VHF Mount Murray. VK2RIL - 7275 VHF Sublime Point.

VK2RUW - 8225 UHF Hill 60 Port Kembla. VK2RIL - 8725 UHF Sublime Point.

Broadcasts: On Sunday night prior to Club Meeting - 7.00 p.m. - RTTY on 6850 and 7275 VHF

Repeaters; 7.15 p.m., Voice on 6850 VHF, 7275 VHF and by relay on 3.562 Mhz. Call backs after the WIA relay at 7.30 p.m.

W. I. A. Relay: On 6850 VHF at 11.00 a.m. and 7.30 p.m. weekly on Sunday.

Club Nets: 3562 MHZ SSB on Sunday at 8.00 p.m. and slow morse net on 28.440 Mhz on Tuesday at 8.00 p.m.

Newsletter: "The Propogator", published monthly to reach financial members in week prior to meeting. All articles, ads etc. to the editor, Dave Myers VK2DFL at 30 Highlands Pde. Bulli 2516. Telephone 84.9404. Copy deadline 3rd Tuesday each month.

Membership: The Secretary, I.A.R.S. P.O. Box 1838, Wollongong 2500. Full membership is \$10.00 per annum; students and pensioner concessional members \$5.00 per annum.

Awards: The award of the I.A.R.S. is "The Lawrence Hargrave" award. VK stations require 10 contacts with I.A.R.S. members; overseas stations require 5 contacts with I.A.R.S. members or contact with the Club station VK2AMW is sufficient in itself for the award.

Band details - time, day, date, frequency, station worked + \$2.00 or 4 I.R.C.'s to Award Manager, I.A.R.S., P. O. Box 1838, Wollongong 2500. No QSL cards required.

Store: The Club store operates at each Club meeting.

Committee: President - Dave Myers VK2DFL, 30 Highlands Pde., Bulli.

Vice President - Keith Curle VK2OB, 24 Beach Drive, Woonona.

Secretary - Murray McConnell VK2MY, 62 Ramah Avenue, Mt. Pleasant.

Treasurers - Geoff Cuthbert VK2ZHU, 2 Nioka Avenue, Keiraville.

- Andrew McEwan VK2XGC, 7 Nioka Avenue, Keiraville.

General Committee: Mike Keech VK2DFK, Ian Callcott VK2EXN, Ray Ball VK2XCC, Morry Van De Vorstenbosch VK2EMV, Jim Mead VK2EJM, Gerhard Mueller VK2XGA, Jim Hayes VK2KJJ.

Repeater Chairman: Graeme Dowse VK2CAG.

Repeater Committee: Mike Keech VK2DFK, Morry Van De Vorstenbosch VK2EMV, Ian Callcott VK2EXN, Dave Colless VK2EZY, Fred Zickar VK2YSB.

EME Co-ordinator: Lyle Patison VK2ALU.

Broadcast Officer: Dave Colless VK2EZY.

QSL's IN: Mike Keech VK2DFK and OUT: Ian Callcott VK2EXN.

Propagator Editor & Staff: Dave Myers, Editor VK2DFL, Ken Frost VK2DOI, Cartoonist Brian Wade VK2AXI.

Store: Ray Ball VK2PHD/XCC

Publicity Officer: Nora Fisher, 17 Elizabeth Street, Mangerton. 2500.

Awards Manager: Jim Hayes VK2KJJ.

LifeMembers: Graeme Dowse VK2CAG, Keith Curle VK2OB