

Season's Greetings from the CW Operators' QRP Club

December 1993 // Issue No. 40

Lo-Key

10th Anniversary
of the CW Ops QRP Club -
Promoting Low Power CW Mode
Communication and Homebrewing



*Silent Key -
Len O'Donnell VK5ZF #1*

At the key - Left hand on key, right hand ready to write if needed - early 1960's ?

CONTENTS

Editor: Don Callow VK5AIL #75

5 Joyce St., Glengowrie SA 5044

AUSTRALIA

- | | |
|--|---|
| 2 Silent Key - Len O'Donnell VK5ZF #1 | 13 Packet Addresses |
| 3 Kevin's Komments | CW Net News |
| 5 The "QRP Cannon", A Resonant
Speaker For CW Operation | 14 Ceramic Resonator
Experimental Circuits |
| Boomerang Circuit Books | 18 Clubtivities |
| 6 The Max Brunger Awards for
Best Technical Articles | 20 Variable Output From the FT-7 |
| 7 Incorporation Update | 21 Circuits and Shortcuts |
| 8 More Power From Your QRP Rig | 24 'Natter Net' Notes
U Can Help ! |
| 10 From the Editor's Desk | 25 QRP Kit-Set Centre |
| 11 Awards and Contests | 28 Membership List - 1 December 1993 |

© COPYRIGHT CW Operators' QRP Club Incorporated
Not to be reproduced without permission.

5/12/93 e:\page\lk#40\lk#40.PM5 x0.75

Silent Key - Len O'Donnell VK5ZF #1

We regret to inform members that Len O'Donnell VK5ZF, Member #1, who founded the CW Operators QRP Club in December 1983, passed away on 6 October 1993 following an illness which became evident in April this year. Len died of cancer in the Royal Adelaide Hospital at the age of 71 years.

The Club extends its sincere sympathy to Len's wife Doris and family. Len and Doris had three daughters, and Len was very proud of his six grand-children and one great-grand-child.

Ian Leonard O'Donnell was a Radio Technician by trade. For most of his career he worked at the Royal Adelaide Hospital, responsible for patients' radio systems and, later, the pocket radio paging system and advanced developmental work - Len was very strong technically. There is a photograph of Len at age two years with headphones on, so he was a very early starter!

During World War II he served in the 13th Field Regiment in New Guinea for about 4 years and operated radios during that time.

He held his Amateur Operator's licence for about 47 years. Len was very partial to the use of valves in radio circuits - definitely a valve person - but knew his way round solid state circuits as well. He introduced others to Amateur radio, including home-brewing, QRP and the 'myster-



ies of morse' - one such 'convert' being our Treasurer Kevin VK5AKZ, then a first year apprentice.

We had originally intended to celebrate the 10th anniversary of our club in this issue. For a description of the setting up of this club readers are referred to Len's article on page 5 of the 25th issue of Lo-Key (March 1990) and see the early issues of Lo-Key, which

he edited. Len and Doris both had health problems in the 1980's and subsequently Len stepped down from his administrative positions. Soon after he edited his 8th and last issue of our journal in September 1988.

Len had become frustrated at what he saw as lack of support in running the various activities of the club, associated with an unacceptable level of personal work load, and there were also some ups and downs in membership numbers.

Since those days he several times expressed pleasure with the progress made by our club and as recently as the end of September Len volunteered (the first to do so) to assist in any way he could, in response to the 'Incorporation' article in #39.

Len was a keen QRP'er (many Amateurs were first introduced to QRP during a CW contact with Len's station at

Subs time again ! - The accounts sent out with this issue are for ANNUAL subscriptions. Our subscription year is the same as the calendar year, so if you have joined recently you may receive an account with a *pro rata* amount for less than the full year subs.

If you don't like the cost of cheque & postage 'overheads' required to pay only a few dollars, you may wish to pay your subs. to the end of 1995.

Keep the cheques in check ! - It is ok to pay subs and other payments with the same cheque, money order etc. It is also ok to include your subs with other correspondence, to save you postage. As long as you let us know your intentions the club system can handle all this.

Council Anyone ? - Your subscription account this year has an option for you to choose: Council Membership is offered to all existing members with at least one year's continuous membership. By paying the extra annual amount (to allow for extra printing and postage etc.) you may then take part in the formal administration of the club.

Any comments ? - We have left the back of the account form clear in case you wish to send any suggestions

KEVIN'S KOMMENTS



or other feedback.

Silent Number ? - It is normal practice to publish membership lists from time to time. Street name and house number can be suppressed from publication upon request.

If we have received your request, that portion of the address will be hand written on the otherwise computer generated address label on your Lo-Key envelope.

International finance - During the last few months several overseas members have, in one way or the other, raised the issue of payment methods.

We realise it can be inconvenient and costly to pay the subscription [which is quite a small amount] when you are overseas. Overhead costs can be nearly as much as the annual subs !

As a result we will soon write to two overseas QRP clubs which have members in VK to see if some reciprocal arrangement can be put into operation to make it easier and cheaper to pay subs.

Continued next page ...

Lucas Street, Richmond, a suburb of Adelaide) and he was an effusive 'ideas man', but he was a 'doer' as well. At work and in his radio hobby, he was always ready to assist others, whilst displaying a very forthright attitude in stating his opinions and ideas.

Len 'picked up the pieces' when the VK CW QRP Club closed down in 1983, after 3 years in existence.

There was no VK CW/QRP club at all for a period in '83. Len thought about it (as others no doubt would have) - But he alone DID something about it !

Out of respect to the memory of 'Member No.1' we will not reissue this number.

Kevin VK5AKZ & Don VK5AII

Welcome To New Members

348	VK2GP	George PILE	EUGOWRA New South Wales
349	VK4MAS	Allan SENDEN	VICTORIA POINT Queensland
350	ZL1CVK	Rohan WAHRLICH	TEKAUWHATA NEW ZEALAND
351	VK3EGM	Charlie EVANS	ELLIMINXT Victoria
352	VK3WN	Kevin HUGHES	SEBASTOPOL Victoria
353	VK3FRO	ERIC FROUDE	LINTON Victoria
354	VK3COR	Harly GROOT	MORLAVE Victoria
355	VK3DHF	Dave SHAW	HEATHMONT Victoria
356	VK3JFL	Richard VOSS	ALFREDTON Victoria
357	VK3IM	Tim HUNT	MT ELIZA Victoria
358	VK3AYQ	Rod GREEN	BELMONT, GEELONG Victoria
359	SWL	Garry BELL	GLEN OSMOND South Australia
360	SWL	Dave GUY	INGHAM Queensland
361	G0BXC	Paul HUGHES	MORDEN, SURREY ENGLAND
362	VK3WCW	Willis CHANDLER	HIGHTON, GEELONG Victoria
363	VK2SPS	Steve SMITH	NEWPORT New South Wales
364	ZL1AWR	Hal GOODACRE	HAMILTON NEW ZEALAND
365	PA3ALM	Dick KRAAYVELD	MAASSLUIS HOLLAND
366	VK4NAS	Steve SENIOR	CABOOLTURE Queensland



Welcome Aboard !

We're very pleased to have you join us. Please let the Editor know what you are doing in the way of operating or home brewing - it could be useful for Lo-Key.

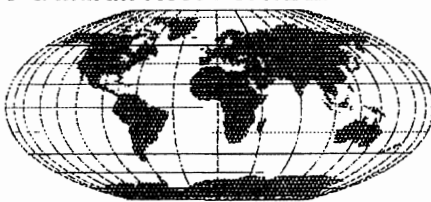
Don't forget to mention the CW Ops QRP Club to others. Our membership has grown at nearly 20% a year since the initial membership was reported in March '83, mainly as a result of 'word of mouth' and displays at hamfests etc.

*Regarding the latter - **Special thanks to Trevor Quick VK5ATQ, Merv Quinn VK3ADX and to the VK6 gang: Rod Green VK6KRG, Peter Parker VK6BWI, Richard Hosking VK6BRO & Martin Reece VK6BER.***

Keep on with the good work !

Season Greetings to all ...

73 *Kevin* VK5AKZ



QRP

The "QRP Cannon", A Resonant Speaker For CW Operation

George D. "Danny" Gingell, Jr. K3TKS

3052 Fairland Road

Silver Spring, MD 2094

This speaker is my version of a Resonant Speaker for CW listening. The idea was suggested to me by Wally Millard, K4JVT, based on an article originally published years ago in QST.

It's constructed out of 2" PVC pipe and fittings so the materials are easy to come by. The tuning plug is made out of a 1-1/2" length of broom handle (1" dowel) with four 1/4"-deep slots sawn the length of the dowel. Each of these slots is fitted with a 3/4" x 1/2" piece of sheet aluminum or printed circuit board material.

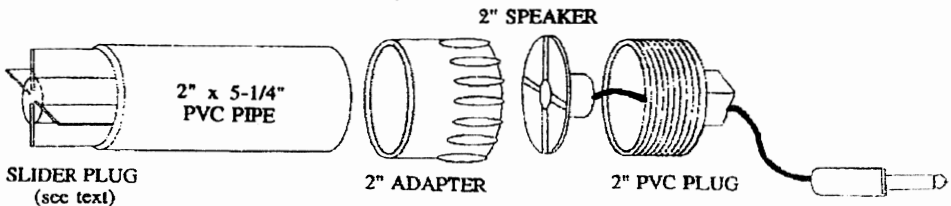
The PVC plug has a 1/8" hole drilled in its end to pass the speaker cord out of the assembly. The 2" speaker rim is slightly larger than the PVC threads and will need to be ground and filed slightly so that it may be screwed into the adaptor. When assembling the speaker, be sure to include a strain relief knot in the speaker

cord between the speaker and PVC plug.

I wound a loop of #6 wire around the length of PVC pipe and used the protruding ends to fashion a pair of mounting feet. The wire stands the speaker up at one end so the nickname "QRP Cannon" is self-evident when you view the finished product.

To use the QRP Cannon, simply adjust the plug assembly in or out of the barrel to set the peak response frequency. I've chosen 750 Hz but there's no reason you couldn't select your own favorite. You'll need a longer pipe, of course, if you prefer a pitch much below the one I've chosen. This is a narrow filter and really cleans up the QRM!

GDG



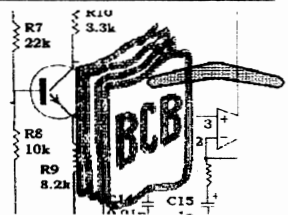
From *QRP Quarterly* July 1993 - Mni trx QRP ARC!

BOOMERANG CIRCUIT BOOKS

By Don Callow VK5AIL 5 Joyce St., Glengowrie SA 5044

Here are the BCB circulation lists. An asterisk * means that you will be sent all BCB's. If you are in VK and wish to go on the list for any of the BCB's please let me know.

You pay the postage to the next member (rates are \$2.65 interstate and \$2.00 intrastate).



BCB #2 - 5th flight
(current):

*Len VK4CWM
*Ron VK3MHM
*Doug VK3CCY
*Trevor VK5ATQ
*Leith VK5LG

BCB #3 - 7th flight
(current):

*Daryl VK7DMJ
*Len VK4CWM
*Ron VK3MHM
*Doug VK3CCY
*Trevor VK5ATQ

BCB #4 - 4th flight
(current)

*Len VK4CWM
*Doug VK3CCY
*Ron VK3MHM
*Alan VK2KW
*Daryl VK7DMJ

BCB #4 - 5th flight
(later)

*Trevor VK5ATQ
You ?

GDG

THE MAX BRUNGER AWARDS FOR BEST TECHNICAL ARTICLES *December 1992 to September 1993*

Thankyou to Rob Gurr VK5RG for undertaking the difficult task of judging members' articles from the last four issues of Lo-Key.

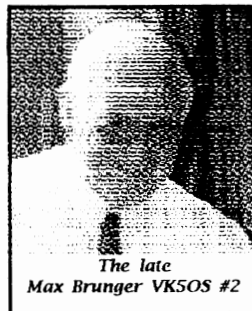
Rob writes that in reviewing the articles he ...

"... kept in mind both the (wording on) the Club logo and the 'Guidelines' for the Awards. In general all articles are of some interest and value to someone, if not everyone, however I have selected specifically those that meet the following criteria:

- * *'We Do More With Less';*
- * *Relevance to the spirit of Amateur radio;*
- * *Likely usefulness to members;*
- * *Originality of content;*
- * *Layout and degree of completeness.*

I find that two items have significant originality, viz., 'Walkabout 80M' and 'Home Brew Impedance Meter'. The item 'QRP Tuner-Meter' (Issue #36), whilst a magnificent article, was highly sourced, being a combination of two separate projects, with a consequent absence of originality. The article 'SUCH Receiver 20M Super' deserves special mention, as it describes experiments in a number of pertinent areas (chips, filters, etc.), but is lacking in some constructional information.

Items of Test Equipment were sparse, however if the award for this area could be given to the author of "Some Useful Varicap Theory", it would be some reward for a very well presented technical article.



The late
Max Brunger VK5OS #2

In summary, I recommend the following:

1. *'Walkabout 80 Metre QRP Transceiver', (Issue #38), and 'Home Brew RF Impedance Bridge', (Issue #39), share equally the Open Section.*
2. *'Some Useful Varicap Theory', (Issue #39), deserves consideration for the Test Equipment Award.*
3. *'The SUCH 20m Superhet Rx', (Issue #37) be considered for a Special Mention.'*

Thanks for inviting me to participate yet again in a very lively competition, and best wishes to you and the Club for another year."

Now that Rob has done the hard work, your Committee has the pleasant task of announcing the winners of the awards:

Open Section - Two winners. Each receive a certificate, one year's free CW Ops Club membership and \$25 credit at the QRP Kit-Set Centre during 1993/94:

Nick Eichhorn VK2AOH#210 and Steve Mahony VK5AIM #184, for

INCORPORATION UPDATE

3. OBJECTS

You may be interested to read the Objects which we included in our Rules for the incorporated association

the 'Walkabout' and RF impedance bridge articles, respectively.

Test Equipment Section - No winner . Maybe YOU next year.

Special Prizes - Three winners. Each receive a certificate and \$20 Kit-Set credit:

Ron Steinfeld VK3MHM #274, Peter Parker VK6BWI #66 and Barry Samuel VK5BLS #209, for the varicap theory, 'SUCH' and 'Tuner-Meter' articles, respectively.

Thanks to Mrs. Roma Brunger, widow of the late Max Brunger VK5OS #2, we are able to give extra encouragement to authors by means of these awards.

The guidelines for articles appearing in Dec. '93 to Sep. '94 issues are unchanged from those printed in Lo-Key #34 (page 4), except that there is no reason why Management Committee members, with the exception of the Editor of Lo-Key, should not be eligible for the awards.

GO TO IT!

QRP

3.1 The Association is established for the purpose of promoting the use of low-power radio communications in the Amateur Service. 'Low-power' is defined as those power levels, within legal limits, at or approaching the minimum transmitting power required for successful communication.

3.2 The objects of the Association are to promote, encourage and assist persons:-

3.1 Experimenting with low-power Amateur Service radio communications and designing, constructing and modifying suitable equipment for such communications;

3.2 With the use of the CW mode of radio communication in the Amateur Service;

3.3 With the use of simple equipment, constructed by the user;

3.4 To improve their level of education in aspects of low-power radio communications;

3.5 To use a scientific approach to technical investigations into various aspects of low-power radio communications in order to further the science of radio communication;

3.6 To enjoy the recreational aspects of radio;

3.7 To conserve and make best use of the radio spectrum available to the Amateur Service.

3.3 The property, assets and income of the Association, however acquired, shall be applied towards the achievement of the objects of the Association, subject to rule 22, and shall not be applied for the personal benefit of any individual member or distributed to individual members.

QRP

More Power From Your QRP Rig

By Peter Parker VK6BWI

As the sunspot cycle drops, more of our long distance contacts will be made on the lower-frequency bands. Whilst long distance contacts can occasionally be made with QRP on these bands, a modest increase in power can make operating more pleasurable.

It has been my observation that when operating at the one-watt power level, signals are often of equal strength to the noise level. Local contacts are easily made, but 2000km-plus interstate contacts are a rarity, and hardly ever result from calling CQ.

Yet the addition of a small amplifier can mean that QSOs end when you want them to, rather than being curtailed due to interference. A little more power allows contacts to progress beyond the standard RST-QTH-Name pattern, and increases the probability of people answering your CQ call, particularly if you live in VK4, 6 or 8.

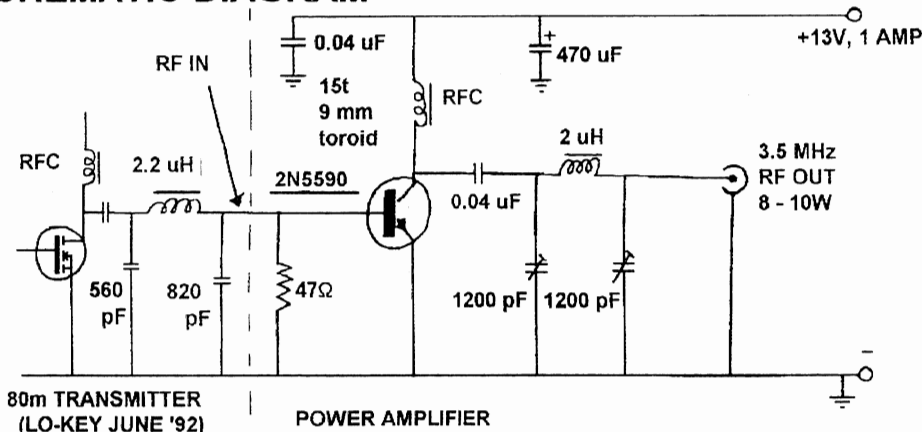
A suitable amplifier should be able to be switched out for local QRP operation and be constructed from readily-obtainable parts. I chose a 2N5590 transistor. This is a VHF 10-watt NPN device and, although expensive when purchased new, is common in old VHF two-way radio equipment. These sets often show up at hamfests and junk sales for only a few dollars each.

Here's an ideal project if you have a QRP rig on a single band, such as 80m. It will keep you on air on those 'hopeless' nights and extend your range on the 'bad' ones!

An input of 1 watt will provide about 8-10 watts output on eighty metres. Whilst tests have not been made on other bands, the 2N5590 (being a VHF transistor) should provide useful gain.

Because of their high gain at low frequencies, there is a propensity for VHF transistor RF amplifiers to oscillate. My own unit is built on a 45 x 90 mm single-sided fibreglass printed circuit board and appears to be stable. As the printed circuit board is so simple, pieces of household adhesive tape can be used as the etching resist. A hole is drilled through the circuit board to mount the transistor. All components are mounted on the copper side of the board.

SCHEMATIC DIAGRAM



The RF choke consists of fifteen turns of insulated wire through a violet 9 mm toroid (as obtainable from the CW Ops Club). The wire must be reasonably thick to minimise voltage-drop and possible overheating - the collector current of the 2N5590 is around 1 amp.

Two 25 mm square 1200 pF mica compression trimmer capacitors were used in the pi network. These came from old commercial AM HF radio equipment. You could experiment with fixed-value capacitors if you have no trimmers. Values of 600 - 1000 pF would probably be most suitable, but to obtain peak power output from the amplifier some experimentation will be required.

The 2 uH inductor in the pi-network consisted of two commercially available 1 uH RF chokes connected in series. A single 2.2 uH choke could be substituted if required. Although only small chokes are used in mine, they have not yet burnt out.

If you are feeding this amplifier straight into an antenna, you may choose to add another inductor and trimmer to the pi-network to further reduce harmonic emissions.

Both 0.04 uF capacitors are disc ceramics. 0.047 uF capacitors should work equally well.

The copper on the circuit board provided sufficient heatsinking for the 2N5590; though it was initially thought that an amplifier of this power level would require a heatsink, the transistor runs surprisingly cool during normal operation.

The 47 ohm resistor should be rated at 1/2 to 1 watt, although perhaps a 2-watt unit may be better if one is available.

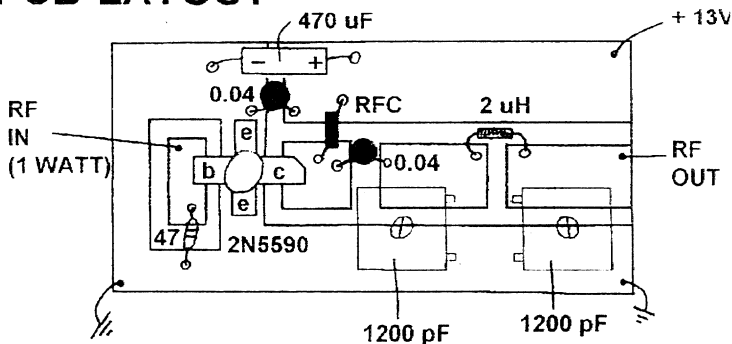
The 2N5590 base is connected directly to the pi-network of the transmitter's 1-watt final stage. I decided to leave the pi-network intact to aid harmonic suppression and to make it easier to switch out the power amplifier for occasions when it is not required.

The transmitter to which the power amplifier was added uses a CMOS variable ceramic resonator oscillator and VN10KM 1-watt PA. It was described in June 1992 Lo-Key¹. When in transmit mode 12v power is applied to both the oscillator and the 2N5590 amplifier, but the VN10KM is collector keyed by a PNP transistor. The amplifier draws 1 amp of collector current when running off 13 volts. RF power output is in the 8 - 10 watt range. As it runs in class-C, it is unsuitable for SSB or DSB service.

1. Parker, P Lo-Key June 1992, p6.



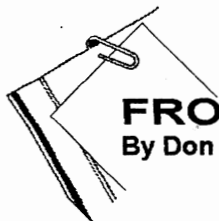
PCB LAYOUT





FROM THE EDITOR'S DESK

By Don Callow VK5AIL #75 5 Joyce St. Glengowrie SA 5044
Telephone (08) 295 8112



Firstly, on behalf of all members:

Thankyou Kevin VK5AKZ for your efforts over the 10 years this club has operated.

After a period assisting Len VK5ZF with Lo-Key, from early 1985 Kevin has been Treasurer and Membership Secretary. This is quite a considerable task in an expanding club like ours. Kevin has enthusiastically (an attitude he displays in everything he does) set up and operated all the accounting and recording systems necessary. I hope he keeps finding the time, otherwise we will be in 'big trouble' !

Someone recently asked me whether I was concerned that some club activities mentioned in Lo-Key appeared not to be popular with many members, because the participation rates are low.

Just about anything that is in line with the recently defined objects of our Club and helps in: "Promoting Low Power CW Mode Communication and Homebrewing in the Amateur Radio Service" is likely to be a worthwhile.

I believe that the Club should offer a **range** of activities for members, but it's up to YOU to decide whether you wish to participate in them.

As long as there are members willing to run the activities, let's have them. They are clearly worthwhile for those who participate, even if only small

percentages of total membership.

By the way, **have you ever done something not really of your choosing and then found it to be highly satisfying ?** This is a hint to 'get out of the rut' and try something different - you may be pleasantly surprised !

Here are a couple of items from my mailbag ...

From Rex VK2YA

During the 1930s somebody invented the signal "55" in the attempt to cut down on much wasted on air time that so many amateur ops spent. The last over in a contact often presents problems, as so many want to cram a lot in the effort to observe the courtesies such as: "Thank you for the chat.

He's an efficient communicator, so he just sent me an '8'

Does that mean 'love' or 'kisses' ?



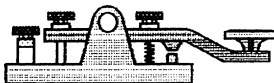
(VK5AIL)

Best wishes to you and your wife and your family. Hope to hear you on the air and have another pleasant conversation. Best wishes. Best wishes. I hope to contact again soon. Keep well and

Continued opposite ...

AWARDS AND CONTESTS

Ian Godsil VK3DID #112
25 Monaco St., PARKDALE Victoria 3194



This came via the twisted pair as your Editor moved the printing of Lo-Key ahead, THEN told Ian - oops! The March issue will contain results for two quarters of Scrambles. (VK5AIL)

We start the 1994 Scrambles with an Australia Day Special (well, the day after the 26th !)

Scramble 33 - Thursday January 27th 1994

From 1000 to 1200 UTC 80 metres 3500 kHz to 3535 kHz

Scramble 34 - Thursday February 17th 1994

From 1000 to 1200 UTC 40 metres 7000 kHz to 7035 kHz

SCRAMBLE RULES are very simple and were printed in September Lo-Key #39 on page 9.



Continued over page ...

healthy - 73 73 and all sorts of good wishes and thanks".

We have all heard these never-ending efforts. SO, some of us used "55" and reduced our transmitting time. I have heard it being used by a couple of European stations and it might not be a bad idea to re-introduce this shortening signal to the VK scene. What think ?

I like the idea of "72" but I couldn't enthuse about "72 72" just as the "73 73" is an idiotic time-waster - and, after all, quick communication is a GREAT THING - even with ops who can only handle 9 or 10 wpm.

Anyway, here it is for a point of discussion.

From Peter VK6BWI Overheard on 20m SSB -

VK2... "Here we can run up to 400W, what is the limit over there ?"
EA3... (S9 + 40) "I don't care".

Editor's p.s. For several months I have been involved with a major building project at home; also some other time-consuming 'problems'. These have impacted on editor's duties, kit-sets/components work and on-air time. Thankyou for being patient. Pse drop me a note or telephone me on [08] 295 8112 (day/night) or come up on the Friday 'Natter Net' if there are any 'loose ends' I can help with.

Best 72 *Don* VK5AIL



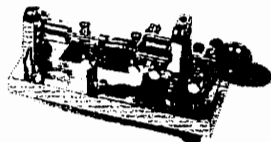


1994 MICHIGAN QRP CLUB 14th ANNUAL CW CONTEST



Date: 1200Z January 1 1994 to 2359Z January 2 1994 (36hrs). CW only. 160 thru 10 metres (no WARC bands). Contest is open to all amateurs and all are eligible for awards.

Classes: A - 250 milliwatts or less output.
B - One watt to 250 milliwatts output.
C - Five watts to one watt output.
D - Over five watts output.



Exchange: RST, QTH (State/Province/Country) and MI-QRP Membership Number. (Nonmembers send power output.)

Frequencies: 1810, 3560, 7040, 14060, 21060 and 28060 kHz.
Novices: 3710, 7110, 21110 and 28110 kHz.

Scoring: Stations may be worked once per band for QSO points. Member contacts are 5 QSO points each, nonmember contacts are 1 QSO point each. Multiply total QSO points (all bands) by the number of States/Provinces/Countries worked (all bands) for total points.

Bonus Points: Total points may be multiplied by 1.25 for homebrewed Rx or Tx with commercial Tx or Rx combination. Total points may be multiplied by 1.5 for total homebrew station (HW-7/8/9 not eligible).

Award Certificates: Certificates will be issued by class for the highest score in each State/Province/Country.

Logs: A separate log is required for each band. Please include your name, call, address, equipment description and POWER OUTPUT. Logs must be received by **5 February 1994**. Please send an SASE for a copy of the results.

All logs to: **L.T. Switzer N8CQA 654 Georgia Ave., MARYSVILLE, MI 48040**
A set of 1 log sheet and 1 entry form is available for an SASE to the above address.
Help the Michigan QRP Club celebrate its 16th anniversary !

ARRL STRAIGHT KEY NIGHT

This is a yearly activity period for stations using a straight key, and runs from 0000 to 2359Z on New Year's Day, Saturday 1 Jan. 1994. Suggested frequencies on 80, 40 & 20 metres are 60-80 kHz up from the band edge.

Use "SKN" instead of "RST" in the exchange, to indicate to other stations you are using a straight key. This is not a contest, serial numbers are not exchanged - ragchewing is encouraged. Send a list of stations worked plus your vote for best fist heard, most interesting contact etc. by January 8th to: "ARRL SKN", 225 Main St., Newington, CT, USA 06111. (TNX to Amateur Radio December 1993 p. 30)

Seasons Greetings to All Members and families, *Jan VK3DID #112*

GDPC



Packet Addresses

No room to put these with the postal addresses this time but here they are, in response to many requests (well, a couple !) from you:-

Bob	Terrill	VK3BNC@VK3IBM
Chris	Roy-Smith	VK4CRS@VK4UN.#CQ.QLD.AUS.OC
Kevin	Zietz	VK5AKZ@VK5TTY.#ADL.#SA.AUS.OC (in full)
Lindsay	LaPouple	VK3DXH@VK3BBS
Merv	Quinn	VK3ADX@VK3IBM
Nick	Eichhorn	VK2AOH@VK2ASY

Ian Godsil VK3DID is on a 'phone BBS
FIDONET 3.635/543@JKARC BBS

If you would like your packet address added to our list please send it to the Editor (not by packet, because I lacket). Better still, send it to the Treasurer, Kevin VK5AKZ.

E.&O.E.

CW Net News

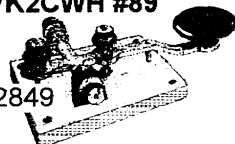
Net news is pretty scarce, mainly due to persistent QRN from weather fronts. These have just about wiped out the net from early October.

The main reasons for using 80 metres are that Novices are able to participate and that the majority of home brew gear is for 80 metres. However, these reasons lose a good deal of their validity when QRN makes it impossible to operate on most nights.

So, for the remainder of the Daylight Saving period in VK2 I intend to move to 40 metres and see how we fare. From the first Tuesday in January 1994, please look for the CW Net on

By Ted Daniels VK2CWH #89

Wombat Hole,
Bylong Rd.,
Rylstone N.S.W. 2849



7.031 to 7.035 MHz, starting at 0830 UTC.

At the end of Daylight Saving (8th March 1994 is first Net), we will revert to 80 metres with a starting time of 0930 UTC.

Thanks to all who supported the CW Net in 1993.

72, Ted

p.s. Last night's net (30 Nov. 1993) was quite good with five starters, including a potential Club member.

Ceramic Resonator Experimental Circuits

By John Rickard VK3MF #277
14 Dickason Rd., HEATHMONT VIC 3135



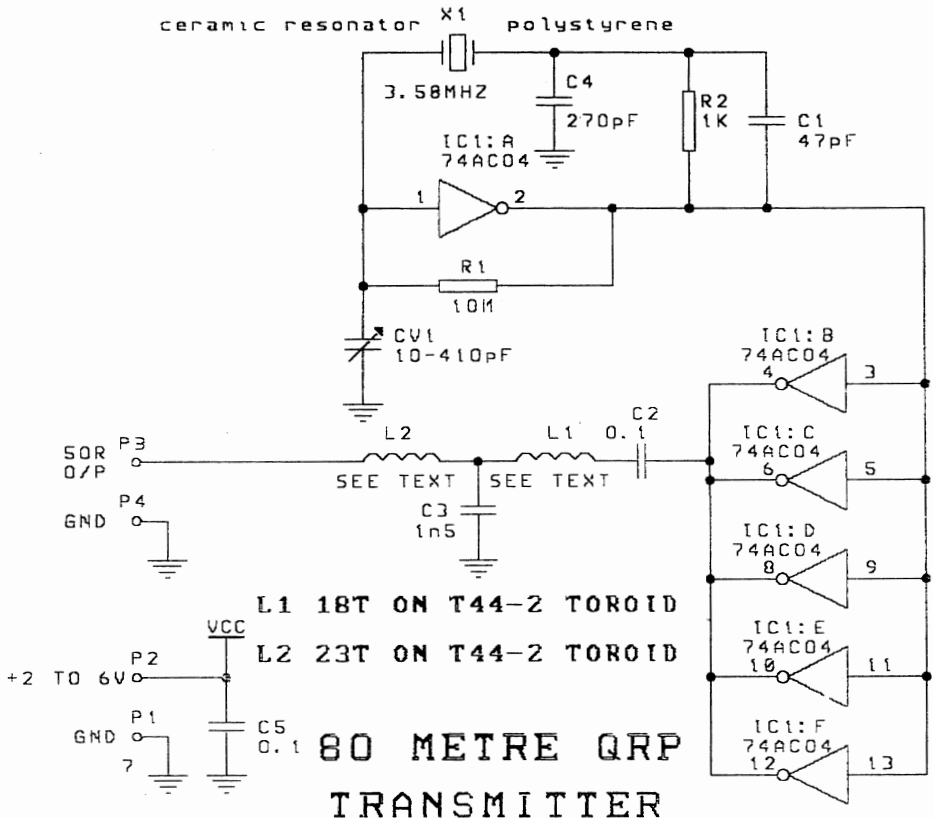
Over the last year or so I have been doing some experimenting with ceramic resonators. Here are a few circuits that I have developed to the point where they may be of interest to fellow readers of Lo-Key.

Circuit No.1 - 80m Tunable QRP Transmitter

The 74AC04 is a hex inverter ic. One inverter is used as an oscillator, tunable from approx. 3.5 MHz to ap-

prox. 3.59 MHz. The other five inverters are paralleled together to raise the power output.

The power output, efficiency and current drain are shown below (see table).



<u>Vsupply</u>	<u>Power O/P</u> mW	<u>I mA</u> (total)	<u>Eff.</u> %
6.5v	460	92	77
6.0v	385	83	77
4.5v	205	63	73
3.0v	81	37	73
2.0v	27	20	67

Notes:

- The 47 pF capacitor cured a slight tendency to sluggish oscillator starting when full voltage was used.
- Pin 14 must be effectively by-passed (0.1 uF small ceramic).
- Pin 7 must be earthed directly, preferably direct to a ground plane.

The more common 74HC04 can be substituted but the power output is only about one-third of that using the 74AC04.

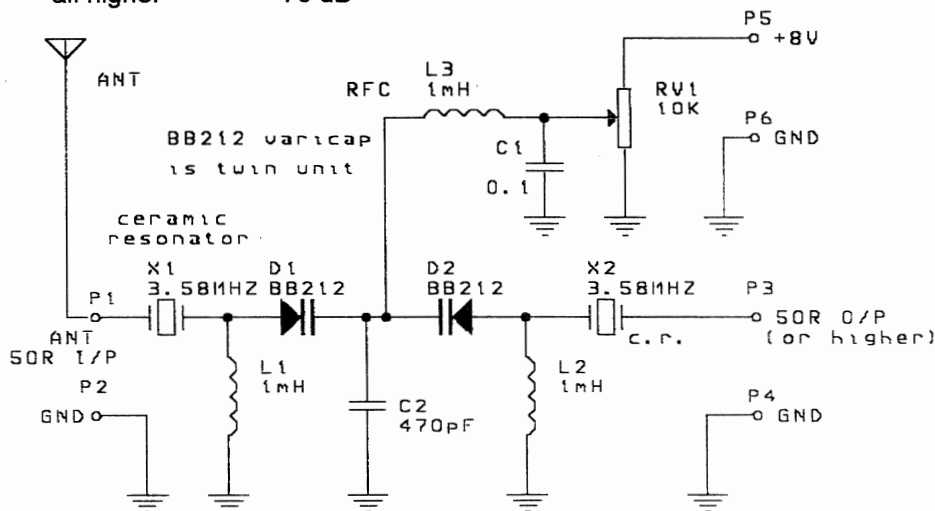
At 3.530 MHz the following harmonics were measured relative to the fundamental power output of 460 mW (+6.5v supply):-

2nd Harmonic	-45 dB
3rd Harmonic	-49 dB
4th Harmonic	-65 dB
5th Harmonic	-68 dB
all higher	> -70 dB

Circuit No.2 - High-Q Filter for Simple DC Rx

A big problem with many simple direct conversion receivers is that the front end is wide open to any strong signals in band. This can lead to such receiver problems as intermodulation, blocking and direct detection unrelated to where the receiver is tuned in the band.

Using a pair of 3.58 MHz ceramic resonators, a tunable high-Q filter can be constructed for the lower end of the



80 METRE BAND PASS FILTER

80 metre band. This is capable of more than 20 dB rejection at just 30 kHz from the peak response.

The filter is tunable from below 3.5 MHz to well over 3.55 MHz. The loss and bandwidth characteristics are as follows:-

<u>f - MHz</u>	<u>Insert. Loss</u>	<u>-3 dB B/W</u>
3.500	3.0 dB	24 kHz
3.510	3.5 d	21 kHz
3.520	4.2 dB	19 kHz
3.530	5.0 dB	16 kHz
3.540	5.8 dB	14 kHz
3.550	7.0 dB	13 kHz

There is a deep notch in the response at approx. 3.65 MHz, ≈ -80 dB, regardless of the peak tuning. Above 3.58 MHz the response is at least 50 dB down, to over 4 MHz.

transmitter can be built based on a 3.58 MHz ceramic resonator. One gate is used as a 3.5 → 3.55 MHz VFO; the next stage is a broadband doubler; then the last two gates are used as a low power P.A. stage.

The LC network matches the approx. 20Ω combined output Z to a 50Ω load.

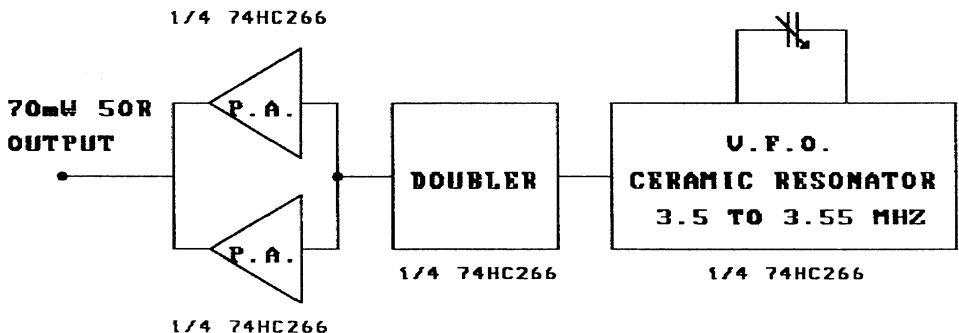
<u>Unwanted Outputs</u>	
<u>Freq. MHz</u>	<u>Suppression rel. to 7.0 MHz</u>
3.5	-22 dB
10.5	-33 dB
14.0	-33 dB
17.5	-42 dB
21.0	-58 dB
24.5	-56 dB

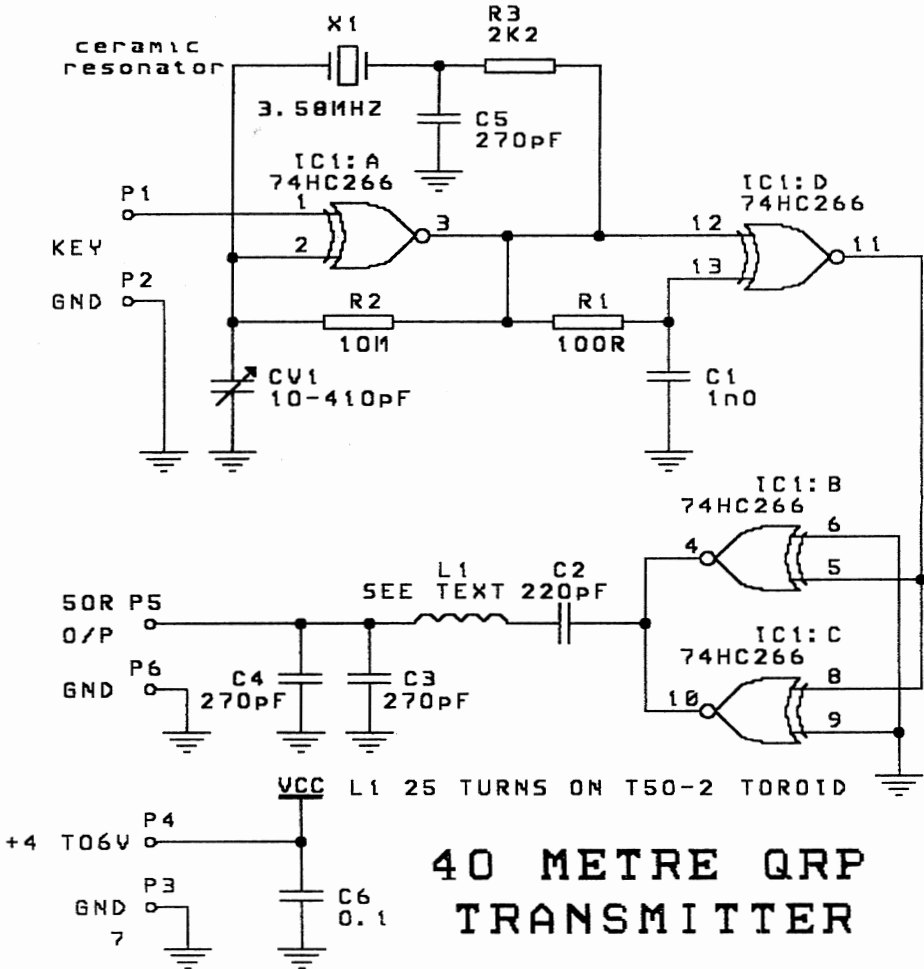
<u>Power Outputs</u>		
<u>V supply</u>	<u>I supply (mA)</u>	<u>Power Output (mW)</u>
4v	29	20
5v	40	40
6v	54	70

**Circuit No.3 - Tx
40 Metre QRP Transceiver**

Using a Quad Exclusive NOR ic, type 74HC266, a simple 40m QRP

**40 METRE QRP TRANSMITTER
BLOCK DIAGRAM**





Due to the fact that the fundamental feedthrough on 80 metres is only a bit over 20 dB suppressed, the use of an ATU is recommended.

The stability of this transmitter is not as good as an 80 metre transmitter using a ceramic resonator because any unwanted frequency variations are doubled. However it still gives a quite a reasonable sounding signal on air for such a simple setup.

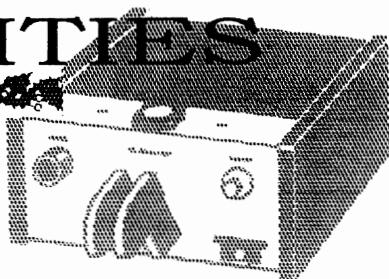
(3.58 MHz ceramic resonators are available from Radio Spares Pty Ltd (RS Components) cat. No. 656-170. Cost is approx. \$A 2.50 each in one-off quantities.



CLUBTIVITIES

By Don VK5AIL #75

Congratulations to Bob Morgan VK3MOR #288 on your upgrade from SWL - Enjoy the bands, Bob !



Three New Well-Deserved Council Memberships -

We can report that the Committee, at its meeting on 13 September, resolved that: "**Ted Daniels VK2CWH #89 CW Net Controller, Steve Mahony VK5AIM #184, 'Natter Net' Co-ordinator and Ian Godsil VK3DID #112 Awards and Contests Manager** be offered Council membership at Ordinary Member rates ...".

Rule 5.4 provides for "... Council membership at the rate of subscription applicable to Ordinary Members ... to Ordinary Members who undertake activities or hold positions ... of special importance ..."

We are all very appreciative of the efforts of Ted - CW Net Controller, Steve - Natter Net Co-ordinator and Ian - Awards and Contests Manager. These Council memberships are well-deserved - Congratulations !

Valve News from Maurie Camps VK2DCD #159 -

"I have been building home brew C.W. transmitters of the valve variety and have greatly improved a transmitter I built some time ago. Am using an 80mx home brew VFO using two 6BA6 valves. One valve is connected as a triode - a cathode follower (Hartley). Very stable. A 6AC7 can valve serves

as a buffer or xtal osc. and an old 6CM5 or 6DQ6B or 6DQ6A as a P.A.

I replaced all the capacitors in a 3 - 6 MHz BC454B COMMAND Rx and this serves as an ideal companion receiver.

The VFO is regulated by a VR150.

I started with about 3 watts output but finished up with about 15 watts by modifying the cathode resistor and grid leak and resonating the coil windings on the pi coupler. By rights it's not a QRP but I can change that by using different valves. A 6DQ6A gives lower output."

NCRG Hamfest News

from Peter VK6BWI #66 -

"The NDRG Hamfest's been and gone and it's been a great day for the Club with 16 or 17 brochures given out, plus all the Lo-Key's supplied. A lot of interest was expressed this year ...

We had our own homebrew contest - the prize was a signal generator donated by Rod VK6KRG. Wayne VK6BDP won with a 12 amp power supply.

In the main homebrew contest I came 3rd with my QRO ATU - the prize was \$10 - enough to pay QRP Club subs next year !

Present (at the QRP display) were Rod VK6KRG, Richard VK6BRO, Mar-

tin VK6BER and myself. We saw at least 3 or 4 other CW Ops members at the Hamfest. Our group has now de-

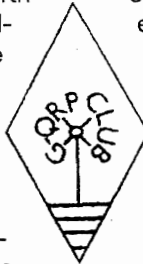
ecided to keep in contact more often - we generally meet only once a year at the Hamfest !"

The G-QRP Club

If you are interested in membership of more than one QRP club and are keen on home brewing, then it's worth considering the G-QRP Club. Already, several of our members are in both the CW Ops and G-QRP clubs. The G-Club is probably the strongest QRP club on this planet, in terms of membership and activities. The club will be in its 20th year in 1994 and membership is around 4,500 ! There is a very wide range of activities organised under the auspices of the club or associated in some way with it.

I was going to say that its well known journal **SPRAT** has become a bible of homebrewing and QRP (CW and SSB) operating during the course of its 76 issues. Maybe that wording is not well-chosen, as **SPRAT**'s editor is the **Reverend George Dobbs G3RJV** (our member #96), who originally founded the club. George would doubtless point out that **THE Bible** was probably

not published quarterly and is certainly not a technical electronics journal - certainly no circuit diagrams or other illustrations - although very comprehensive. **SPRAT** is a top-class publication - especially for homebrewers - as befits a large, well-organised club. It usually has at least 40 pages and the page size is A5, the same as Lo-Key.



The Membership Secretary is:
John Leak G0BXO
Flat 7, 56 Heath Crescent,
Halifax, HX1 2PW

(Send a SASE to your Lo-Key Editor to receive more information.)



VARIABLE OUTPUT FROM THE FT-7

Walter Farrar, G3ESP, 1 Barnsley Rd. Ackworth, PONTEFRACT. WF7 7BS

In SPRAT No. 67 there was an article by me on getting QRP CW from an SSB transmitter. Since that was written I have devised a simpler and more convenient method, utilising the existing circuitry of the FT-7, plus a simple external addition.

This transceiver has an ALC (Au-

tomatic Level Control), from the applied voltage, so a quick flick switches between the QRP and "QRO" (10W!) states. A miniature panel lamp shows when the switch is in the QRP mode (I used a 6V 0.1A lamp in series with a 100 ohm wirewound resistor).

Having completed the job and

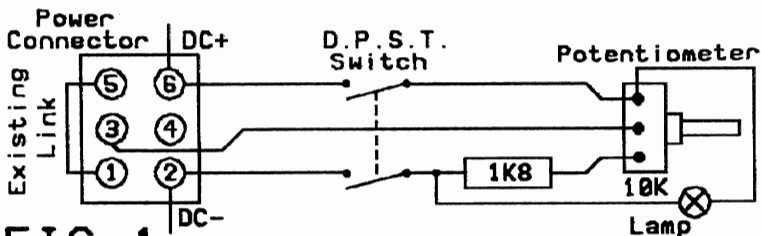
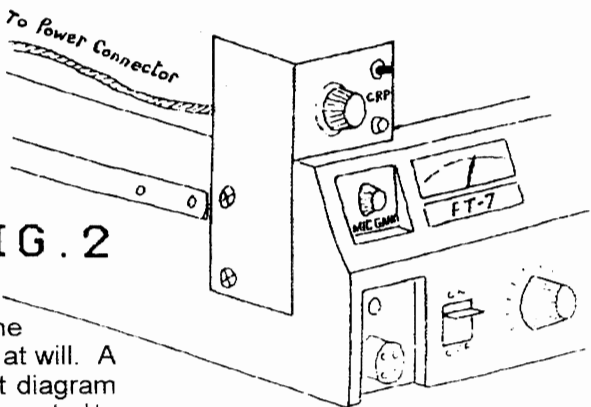


FIG. 1

Taken from SPRAT #76 -
Thankyou to the
G-QRP Club.

tomatic Level Control), to prevent the PA transistors from overheating. If the ALC line can be manually controlled, the power output can be varied at will. A look at the (complex) circuit diagram shows that the ALC line is connected to an unused pin (no. 3) on the Power Connector. The ALC line can therefore be accessed via pin No. 3 of the socket on the power cable. The total addendum can be seen in the diagrams. Increased positive voltage on pin No. 3 reduces the power output; reduced voltage increases it. In order to prevent the power output increasing beyond its designed level a 1K8 resistor is included as shown. A miniature DPST toggle switch is included to isolate pin No. 3

FIG. 2



mounted the device on top of the case, above the Mic. Gain, using existing threaded holes for fixing, I tuned around 14.060 MHz on a Saturday afternoon and set the power out at 2 watts. Almost immediately I had a QSO with a G-QRP-C member in Warsaw (SP5S-DA) with 559 both ways. Since the power can be turned down to zero, I look forward to some interesting experiences (miles per milliwatt??).

QRP

Circuits and Shortcuts

Some Tech-Tips

From Murray VK3EZM #234

Whether taking a holiday by car, walking or camping, the QRP rig is likely to go in the pack with the rest of one's gear. One problem I've had is protecting everything from damage inflicted by myself or other family members during packing or unpacking the remainder of the luggage required for a holiday. In particular, my portable dipole for 80 metres is likely to become very tangled, and the solar cell panel of my battery charger is likely to become damaged. My solutions for these problems follow.

Solar Panel Holder

I recently made up a solar battery charger kit so that I could keep full power on my QRP transceiver while on holidays.

Gluing the two solar cells, each of 6 volts, to a panel of aluminium or fibreglass is fine if the panel is permanently installed somewhere, but offers little protection to the cells during portable work.

The answer to this problem arrived when I discovered a plastic case for a large size U-matic video tape cassette. This type of case measures about 170 mm x 250 mm x 40 mm deep, and opens like a book. The cylindrical protrusions, normally used to hold the cassette firmly in the cover, were removed with a sharp knife.

I then used double sided adhe-

sive tape to stick one solar cell panel inside the case, the other on the inside of the lid. The remaining space was large enough to hold the small pcb with components, and the charger leads and clips.

Now my cells are completely protected for travel. When required, I simply open my "book", connect the batteries, and let "old mister sun" do the rest!

Antenna Reels

After my holidays I became tired of untangling the 80 metre portable dipole I use during my trips away from home.

Usually the antenna is the last item to be packed before the return trip. It seems always to be hastily pulled from a tree, or other temporary antenna support, and the wires get rolled around my folded elbow. Even though I attempt to be careful, it always arrives home in a tangled mess.

In search of a solution, I eyeballed many of those plastic fishing reels displayed in sporting goods stores and supermarkets. But the price seemed too much for my mean eyes.

Finally, I decided to make my own antenna reels. Two small reels were made from plywood and plastic pipe scraps found in my workshop. Four discs, each 150 mm in diameter, were cut from plywood with a jigsaw. Two of these discs, separated by a central "core" made from a 25 mm slice of 50 mm plastic pipe, then became one



reel. The assembly was held together with adhesive and a small bolt through the centre of the plywood discs.

A second small reel was made in the same way from the other two discs and another slice of the same pipe.

Two larger diameter plywood discs were used with a slice of 100 mm plastic pipe, to make a third spool.

All three reels were given a couple of coats of a waterproof varnish. Each of the two arms of the dipole antenna (I use cheap hookup wire) were wound around the two smaller reels, while the coaxial cable feeder was wound on the larger one.

Now it's a simple matter to unwind the antenna, and to pack it away. Best of all though - no more tangles !

P.S. My kite line is wound on a monster reel, construction of which is detailed in "The Penguin Book of Kites", published by Penguin Books, 1976, and 1982. The reel uses a bicycle hub as the central "core" and the flanges are made from plywood. I've thought about making smaller versions of this reel for my antenna, but so far I've been too lazy.

Technical Note

My junk box seems to have several variable capacitors and APC trimmers with shafts too short to take a knob. But recently I discovered an easy, effective way of "curing" this problem. The idea was published by V. Scott, W1ETT in Ham Radio magazine about twenty years ago.

First slip a piece of heat shrink tubing (I use 6 mm) over the rotor extension and trim to extend at least 5 mm. Insert a suitable length of 6 mm (1/4 inch) diameter metal tubing into the open end and apply sufficient heat to shrink the tubing. Now carefully slide the shrinkable tubing and shaft extension back off the rotor extension.

Smear epoxy resin adhesive on the inner surface of the shrinkable tubing, and replace on the rotor shaft. Now pour epoxy resin adhesive through the centre of the metal tubing, and try to make sure no air pockets are left. I usually mix a small quantity of Araldite epoxy in a nonmetallic container - the plastic lid of a 35 mm film container is good - and warm the adhesive for a few seconds in the kitchen microwave oven. The lowered viscosity then makes it easier to pour.

Let the whole assembly stand for at least twenty-four hours before attempting to turn the shaft. After that, you have a sturdy shaft extension. Add a knob, and the job is done.

By the way, one of my daughters was keen archer. The aluminium tubing of broken arrow shafts is just the right size for this work.

Murray Lewis VK3EZM #234

Continued over ...

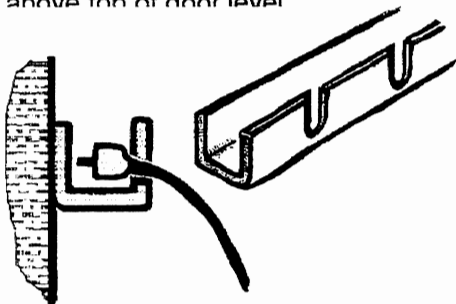
Circuits and Shortcuts (continued)

You can lead a horse to water - If you can find the lead!

By Don VK5AIL #75

Let's know if you have a neat way of storing the many leads that we seem to need.

I have some stored in boxes and a few pairs of leads in their own plastic bags, but my best device is a couple of strips of material mounted behind a door (which can still nearly open completely). The sketch shows aluminium channel fixed to a wall or timber strip, but mine is actually steel angle, with holes and slots, screwed to the underside of a timber shelf 20 mm or so above top of door level



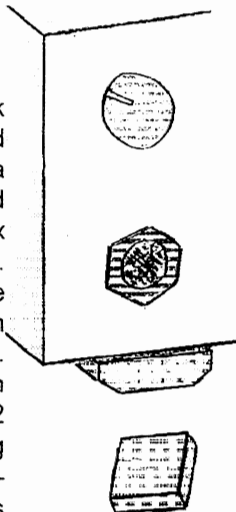
A friend recently built a lab. power supply and 'permanently' mounted a bag on one side (not the one near the heatsink!). See Sketch #2. The bag was a Bum Bag (yes, that's right) purchased for \$2.00 from a discount variety store, Cunninghams Warehouse Sales - no doubt available at other discount variety stores. It's also worth trying video cases (I bought one for 80 cents from the same source) as a convenient way of storing a pair of leads, with the possibility of screwing the case to top or side of the equipment.

Equipment Feet

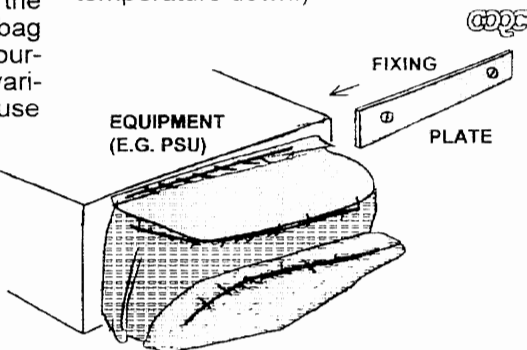
By Peter VK6BWI #66

Very expensive if purchased from normal electronic component stores.

It is much cheaper to buy a piece of 3 mm thick rubber - often sold on rolls about a metre wide - and cut it into 10 mm x 10 mm squares. These can then be glued to the bottom of your equipment. I bought a 10 mm wide strip for \$2 from a swimming pool/outdoor supplies shop. This should be sufficient for 1 000 feet. (and 250 meters - Ed.) For a more professional finish, sandpaper can be used to bevel the corners of the square.



(Ed. - Rubber is easier to work when it is cold. I have been known to sneak some into our freezer; carefully sealed in a plastic bag, of course, to bring the temperature down.)



'Natter Net' Notes

A Good Contact! - Barry VK5BLS was Net Controller on 8th October when Peter VK6BWI successfully made it onto the 80m net. The discussion at the time was on ceramic resonators, so we had the right person at the right time!

QRN has been a problem, but some nights have allowed good reception between the states. *Things can only improve.*



GDPC

~ ~ ~ ~ ~ ~ **WANTED** ~ ~ ~ ~ ~ ~

1. **Boards for the Tassie Devil** and any information about converting the circuit to 40 metres.
2. **Howes 80m VFO/Tx/Rx** - built or still in kit form.
3. Any information on **Philips GM5655 valve CRO** - about 1950. One here is alive and well, but no documentation.

Peter Taylor VK4FV

36 Sundance Way
RUNAWAY BAY Queensland 4216
Telephone: [075] 37 4411



U CAN HELP !

By Don Callow VK5AIL

5 Joyce St., Glengowrie S.A. 5044

From **Max Joiner VK3AMW** ...

"... can you tell me in your experience, what is the most popular keyer circuit for home brew?? I have the G-QRP Club handbook which includes a circuit for a cmos keyer, designed by Roy W7EL - is there anyone using this circuit that you have heard of??"

I recall **Chris Peake VK2AAA** asking a similar question a few months ago, so you can be sure others face the same situation when branching out into the area of electronic keyers and paddles.

So, **CAN U HELP?** You may wish to contact Max direct at:-

19 Dunsford St.

LANCEFIELD Victoria 3435

or let us have the information and we will pass it on to Max and maybe include something in our next issue.

WANTED (by Don VK5AIL) - I am after a copy of **RF Circuit Design** by Chris Bowick WD4C. If you have one for sale or loan please let me know, at the address at top of this page.

GDPC



QRP Kit-Set Centre

By Don Callow VK5AIL

5 Joyce St., Glengowrie S.A. 5044

Tel. (08) 295 8112 day/night



Erratica Editorum
Now I remember: it
was Dennis Peake
VK2ADW - I think!

Clipsal Key Pivot Puzzle

It seems there have been some variations in the setup of the main pivot of these keys over the years.

I noticed that the hole in the spigot supplied by Clipsal is too small for the No.4 tapered pin and is not tapered. So the spigot and sleeve we can supply cannot be used as an assembly without reaming.

One of my own keys uses two sleeves as spacers. The setscrew tightens against the taper pin so as to take up any clearance.

Enquiries with Clipsal have revealed that these keys were never made in factory production runs, but were assembled by toolmakers working in their own time - a 'cottage industry'. So far unable to trace anyone of these people. Apparently there were no drawings specifying the exact method of arranging the pivot - hence the variations observed.

If you are dismantling your Clipsal key please sketch the pivot arrangements, preferably with dimensions, and let us have a copy of the result; or send the original sketch and we will copy and return it.



Clipsal Key Knobs

I hope to obtain some more **knobs (\$2.80) and finger rests (\$2.10)** before the Christmas break, as these are very popular. The usual \$4.00 for postage/packaging applies.

Corection

On p.27 of Lo-Key #39 I said the thread on the knob is internal. NOT SO - this knob has an external thread 3/16" BSW x 3/8" (10 mm) long.

Clipsal keys have gone

Both the new keys we had in stock have been sold and are now in good homes. As stated in previous issues, no more can be obtained.

Club's Ten Year

Anniversary Specials

(This is being done at midnight on Saturday 4th December - Lo-Key has to be printed tomorrow - no time to be fancy - let's see what we've got...)

Ten BC547B transistors for \$1.00.
TO-92 case.

BC177 transistors for \$1.00 each.
Metal case.

Darlington power transistors - one each of **BD681** Si NPN and **BD682** Si PNP for **\$3.80** total. TO-126 plastic cases. The DSE 93/94 catalogue lists these at \$8.10 total.

Tuning capacitor, transistor radio standard type, with solid dielectric. **\$1.00.**

5 Amp psu kit (including instructions) ex WIA (S.A. Division) , plus salvaged heatsink complete with two extra power transistors for **\$22.** Can be easily upgraded to 20A output. You supply filter capacitors, 18V transformer, case & hardware. Two available.

Forrestfield 21 MHz PA kit for \$20. Includes instructions. See Lo-Key #27. Could be altered to other frequency. Only one available.

NE555N timers for 60 cents.

Knobs, brushed aluminium (silver colour) with pointer mark. Very nice. **16 mm dia. for \$1.30; 18 mm dia. \$1.50; 22 mm dia. \$1.80; 28 mm \$2.30.** Compare these prices. Fluted type, no pointer, **17 mm dia. with 23 mm flange for \$1.30.**

All the above are new, of course, except the heatsink with the 5A psu



Don't Forget Bonus Bits

Some people forget to ask for Bonus Bits, which are available for no additional cost with each \$10 you spend (including postage). See previous Lo-Key's for the other items.

Add to the List ...

... TNX to Alan VK2ACN

F018 Capacitors **10 uF** 50V electrolytic [5nbr] Body 10 mm dia. x 25 mm long. Radial leads.

F019 Capacitors **33 uF** 35V electrolytic [5nbr] Body 10 mm dia. x 25 mm long. Radial leads.

F020 Capacitors **47 uF** 35V electrolytic [5nbr] Body 10 mm dia. x 25 mm long. Radial leads.

F021 Capacitors **100 uF** 35V electrolytic [5nbr] Body 10 mm dia. x 25 mm long. Radial leads.

F022 Capacitors **220 uF** 10V electrolytic [5nbr] Body 10 mm dia. x 25 mm long. Radial leads.

THEY HEATHKIT HATH BITS

"**HEATH SPARES:** Rudi Wolf, DL2RM reports that Heath still stock parts for the HW9. Overseas requests [a list can be supplied] can be addressed via Heather Redman at HEATH COMPANY, BENTON HARBOR, MICHIGAN 49023."

The item in quotes was seen in SPRAT #75 published in mid-1993.

Club Files on Diskette

C090 Club Files \$4.00 (per IBM-compatible diskette) INCLUDING Postage.

Tell me which files you need from the list and what your preferred diskette size is: 3-1/2" 720k or 3-1/2" 1.44M or 5-1/4" 360k or 5-1/4" 1.2M. No paper copies are provided - you can see it all on the display/screen.

Files are current versions, so the C090 diskette will often contain more recent data than the C097 paper version.

Use the approximate size data below to work out how many diskettes you need.

<u>NAME</u>	<u>APX SIZE</u>
-------------	-----------------

¶ READQRP.TXT	5K
---------------	----

'Readme' text file with useful information about the files on the disk. You must get this.

¶ ASIANET.TXT	23K
---------------	-----

A free catalogue of the AsiaNet IBM-PC compatible programs available from Les Kinch VK2BBD. I have concatenated but not otherwise altered Les' catalogue files:

LIBRARY.HOW (ordering)
+ COMMS.LIB + GAME.LIB
+ HAM.LIB + UTIL_1.LIB
+ UTIL_2.LIB + WORD.LIB.

See Amateur Radio January 1993 page 32.

¶ DISBRG.BAS	2K
--------------	----

BASIC program for Great Circle distance and bearing calculations, from Lo-Key #36 page17, by Don VK5AIL.

¶ GCIRCLE.EXE	74K
---------------	-----

Executable program for Great Circle distance and bearing calculations, developed from DISBRG.BAS by Garry Cottle VK2AGC. Uses menus. The 74K includes two data files GCDATA.SYS and GCMQTH.SYS, to give you a flying start. You need to have a hard disk.



¶ QRP Log System	330K
------------------	------

A group of QRP Logger programs plus a Great Circle calculation program. Uses menus & colour screens. OK for QRO too! You need to have a hard disk.

¶ INDEX.TXT	14K
-------------	-----

Lo-Key Index text file - Technical and General sections.

¶ MEMBERS.TXT	16K
---------------	-----

Membership List text file - Names, call signs and addresses.

¶ PRICES.TXT	15K
--------------	-----

Club Sales Price List text file.

¶ DREW.TXT	4K
------------	----

List of articles by Drew Diamond VK3XU (From Lo-Key #38)

¶ Protel Easytrax	546K
-------------------	------

(Freeware version 2.06)

This is a very highly regarded PCB layout package and includes documentation on diskette. Software Copyright (c)1988 Protel Technology Pty. Ltd. A great opportunity to try an excellent package, thanks to Protel.

Lo-Key #37 March 1993 contains more detail on some of the above.

I must give the normal warning about computer viruses: Of course we aim to provide virus free diskettes, but it is YOUR RESPONSIBILITY to carefully check any diskettes you receive (from anybody and everybody, not only us!) and we cannot take responsibility for any outcomes.

E. & O.E.



QRP



CW OPERATORS' QRP CLUB Inc.

MEMBERSHIP LIST

1 DECEMBER 1993



#	CALL	NAME	ADDRESS [Note: Some will have changed since list prepared]			
319	AA9AB	Thad JONES	2048 Trailridge Rd	MISHAWAKA IN	46544	USA
312	AB6RG	Tom ADLER	486 James Rd	PALO ALTO CA	94306	USA
323	G0BPS	Dick PASCOE	Seaview House Crete Rd East	FOLKESTONE KENT	CT187EG	UK
361	G0BXC	Paul HUGHES	123 Garth Rd	MORDEN SURREY	SM4-4LF	UK
96	G3RJV	Rev.George DOBBS	498 Manchester Rd	ROCHDALE LANGS	OL11 3HE	UK
50	G8PG/GW8PG	Gus TAYLOR	37 Pickenill Rd	GREASBY MERSEYSIDE	L49 3ND	UK
228	K4JOD	Dennis ABDALLA	9843 S Chelsea Rd	COLUMBIA SC	29223	USA
201	K5VOL	Red REYNOLDS	835 Surrye Rd	LAKE ZURICH IL	60047	USA
343	K6ZAN	Ralph BUTLER	1812 Gunston Way	SAN JOSE CA	95124	USA
197	K9PNP	Jim JONES	615 N. Benton St	PALATINE IL	60067	USA
328	KA0IQT	James JOHNS	37 Carmichael Way	GROTON MA	01450	USA
347	KD4OGV	Chas MAYHUGH	6656 Garland St	FT MYERS FL	33912	USA
321	KE9GG	Donald KOZLOVSKY	28W256 Purnell Rd	WEST CHICAGO IL	60185	USA
318	KF8FY	Terry FRAZIER	19466 Ringgold Southern Rd	CIRCLEVILLE OH	43113	USA
327	KI6DS	Doug HENDRICKS	862 Frank Ave	DOS PALOS CA	93620	USA
325	KN1H	John COLLINS	RR2 Box 427	CORNISH NH	03745	USA
264	N8ET	Bill KELSEY	3521 Spring Lake Dr	FINDLAY OH	45840	USA
283	N9BBL	Lee ANDREAS	RT1 7600 Hwy D East LAKE TOMAHAWK WI	54539		USA
71	NW6FXE2IM	Jake JACOBS	APDO 73 MULEGE BAJA CFA. SUR			MEXICO
317	OK1CZ	Peter DOUDERA	U1 Baterie 1	PRAGA 6	16200	CZECH REPUBLIC
52	P29IL	Ian LESLIE	P.O. Box 175 GOROKA EASTERN HIGHLANDS PROVINCE			PAPUA NEW GUINEA
365	PA3ALM	Dick KRAAYVELD	Merellaan 8	3145 XE MAASSLUIS HOLLAND		HOLLAND
132	PA3ELD	Jan VISSER	Wethou Der int Veldstraat 28	1107BJ AMSTERDAM		HOLLAND
330	SWL	Gary FISHER	6 Totterhoe Rd	DUNSTABLE BEDFORDSHIRE	LU6 2AG	UK
332	SWL	Michael AUSTIN	33 Totterhoe Rd	DUNSTABLE BEDFORDSHIRE	LU6 2AF	UK
322	VE2DRB/WA6ERB	Robert GOBRICK	Box 1591	CHAMPLAIN NY	12919-1591	USA
324	VE3OTC	John ERSKINE	POB 3024	SIOUX LOOKOUT ON	P8T158	CANADA
340	VK2GXM	Tony JONES	3 Hilltop Rd	HARROGATE N YORKS		UK
326	W1FMR	Jim FITTON	Box 2226	SALEM NH	03079	USA
9	W3TS	Mike MICHAEL	P.O. Box 593 CHURCH LANE	HALIFAX PA	17032-0593	USA
31	W5QJM	Fred BONAVITA	P.O. Box 2764	SAN ANTONIO TX	78299-2764	USA
18	WA2YMW	Bill BREARE	P.O. Box 867	HICKSVILLE NY	11802	USA
329	WA3SR	John SALONY	131 Scott Rd	YORKE PA	17403	USA
106	WB0NQM	Richard LUCAS	412 Cattlemen Ct.	LAWRENCE KS	66049	USA
101	WB8ZWW	Wayne WATSON	1204 Broadway	SPRINGFIELD OH	45504-2329	USA
17	WF6U	Hollis BUTTON	1025 Parr Ave	CAMPBELL CA	95008	USA
320	WS8T	Patrick TENDAM	10213 Columbus Grove Rd	BLUFFTON OH	45817	USA
34	ZL1ATW	Matt MEENAGH	223 Te Tomo St	Te Awamutu	2400	NEW ZEALAND
364	ZL1AWR	Hai GOODACRE	Pickering Rd	RD3 HAMILTON	2021	NEW ZEALAND
208	ZL1AWZ	Tim LEITCH	38 David St	MORRINSVILLE		NEW ZEALAND
29	ZL1BYY	George CARTWRIGHT	6 Haycock Ave	MT ROSKILL AUCKLAND		NEW ZEALAND
350	ZL1CVK	Rohan WAHRlich	Wahangamarino Rd	RD2 TEKAUWHATA	2191	NEW ZEALAND
60	SWL	Trevor THOMAS	P.O.Box 150	RAVENSTHORPE WA		6346
93	SWL	Simon ANDERSON	47 McIntyre St	BURWOOD VIC		3125
177	SWL	Lorenz ECKARD	15 Angus Crs	KUREELPA QLD		4560
231	SWL	Geoff OSBORNE	6 Catherine St	ETHELTON SA		5015
236	SWL	Martin HAZELL	18 Towradgi St	NARRAWEENA NSW		2099
238	SWL	Steven JACKSON	RMB 4820	GOSFORD NSW		2250
248	SWL	Peter NEUTEBOOM	P.O. Box 534	CANNINGTON WA		6107
271	SWL	Arnold HERKELMAN	136 Camp St	TERRARA NSW		2666
279	SWL	Thuan THI	25 Livistona Rd	KARAMA NT		0812
280	SWL	Edward SMEDA	30 Luck St	ELTHAM VIC		3095
291	SWL	Nic SMELT	P.O. Box 2788	MT GAMBIER SA		5290
294	SWL	Robert WILKINSON	9 Barton Cr	ST AGNES SA		5097
299	SWL	Peter WALTERS	5 Pridham St	MAIDSTONE VIC		3012
305	SWL	Mick PHILLIPS	16 Hoffman St	WEST BRUNSWICK VIC		3055
341	SWL	Oscar VARJU	P.O. Box 110	CANNONVALE QLD		4802
359	SWL	Garry BELL	1/1 View St	GLENOSMOND SA		5064
360	SWL	Dave GUY	P.O. Box 767	INGHAM QLD		4850
163	VK1BL	Ted GARNETT	24 Brigalow St	O'CONNOR ACT		2601
250	VK1NGD	Greg DAVIS	36 Bainbridge Close	CHISHOLM ACT		2905
331	VK1TB	Tony BENNETT	31 Roughley Pl	FLOREY ACT		2615
182	VK2ACN	Alan JAMES	424 Prune St	LAVINGTON NSW		2641
315	VK2ADW	Dennis PEAKE	29 Wattle St	COLO VALE NSW		2575
121	VK2AGC	Garry COTTLE	C/O Seargents' Mess	RAAF BASE RICHMOND NSW		2755
5	VK2AKE	Jim EDWARDS	P.O. Box 385	BOWRAL NSW		2576

210	VK2AOH	Nick	EICHHORN	20 Autumn St	ORANGE NSW	2800
98	VK2AP	John	THURSTUN	P.O. Box 44	BLACKHEATH NSW	2785
152	VK2ATJ	Tom	KING	P.O. Box 140	KENSINGTON NSW	2033
180	VK2AW	Basil	DALE	20/112 Shirley Rd	WOLLSTONECRAFT NSW	2065
309	VK2AY	Jack	FLYNN	624 Jones St	ALBURY NSW	2640
32	VK2BBX	Bill	BALOGH	23 Bathurst St	LIVERPOOL NSW	2170
273	VK2BFN	Adrian	CLOUT	137 Lower Valley Rd	HEZELBROOK NSW	2779
219	VK2BJI	Dave	KENT	P.O. Box 564	PARKEES NSW	2870
285	VK2BNX	Bert	ALLEN	149 Moores Way	GLENMORE VIA CAMDEN NSW	2570
233	VK2BUS	Chris	PROUD	5 Chadwick Crs	FAIRFIELD WEST NSW	2165
22	VK2BVH	Brian	HALPIN	5 Carramar Crs	MIRANDA NSW	2228
161	VK2BWW	Bill	WATTS	P.O. Box 263	NAMBUCCA HEADS NSW	2448
293	VK2CAF	John	WHITE	RMB 419 Nowra Rd	MOSS VALE NSW	2577
16	VK2CBI	Ken	ELKINGTON	44 Boland Ave	SPRINGWOOD NSW	2777
171	VK2CDO	Ype	TIMMER	BOX 18	BOWRAVILLE NSW	2449
11	VK2COX	Cec	HEALEY	121 Jamison Rd	PENRITH NSW	2750
226	VK2COX	Ray	TURNER	6/276 Bunnerong Rd	HILLSDALE NSW	2036
287	VK2CW	Greg	SMITH	36 Elsworth Pde	MEREWETHER HEIGHTS NSW	2291
89	VK2CWH	Ted	DANIELS	Wombat Hole Bylong	Rd RYLSTONE NSW	2849
159	VK2DCD	Maurie	CAMPS	Box 72	COLEAMBALLY NSW	2707
95	VK2DMV	Paul	IRELAND	109 Victoria St	COFFS HARBOUR NSW	2450
192	VK2DN	John	HARPER	75 Brisbane St	ST MARYS NSW	2760
124	VK2DRL	Bob	JOHNSON	19 Britannia Rd	CASTLE HILL NSW	2154
144	VK2EPD	Peter	CANNON	"BINALONG"	FORBES NSW	2871
126	VK2ERA	Rob	ABEL	6 Laurel St	KOOTINGAL NSW	2352
56	VK2ESR	Stephen	RAPLEY	12 Phillip St	ENMORE NSW	2042
173	VK2ETW	Trevor	WILKIN	BORONIA	COONABARABRAN NSW	2357
240	VK2EWT	Peter	TRUSCOTT	130 Foxvalley Rd	WAHROONGA NSW	2076
35	VK2EXD	Col	McDOUGALL	"WOODLANDS"	COOLAMON NSW	2701
217	VK2FKE	Bill	SCOVELL	13 Tulani Ave	DALEYS POINT NSW	2257
216	VK2FKU	Warren	ROGAN		DRUMMOYNE NSW	2047
128	VK2FNF	Jim	MCNEILL	15 Pacific St	ANGURIE VIA YAMBA NSW	2464
290	VK2FW	Ray	DAVIES	43 Towac Rd	ORANGE NSW	2800
166	VK2GJW	Jim	WATSON	Smiths Creek Rd	STOKERS SIDING NSW	2484
348	VK2GP	George	PILE	"PENRYN PARK"	EUGOWRA NSW	2806
282	VK2GXB	Keith	HAWKINS	5/59 Eastern Rd	TUMBI UMBI NSW	2261
227	VK2IRJ	Ian	JONES	59 Main St	CUDAL NSW	2864
207	VK2JG	Noel	HILL	28 Kangaroo St	LAWSON NSW	2783
334	VK2JSB	Shannon	BATHIS	P.O. Box 66	MORTDALE NSW	2223
156	VK2KB	Allen	FAIRHALL	7 Parkway Ave	NEWCASTLE NSW	2300
165	VK2KSD	Stan	DOGGER	Tunnel Rd	STOKERS SIDING NSW	2484
249	VK2KW	Alan	HORSPOOL	20 Braemar Circuit	ORANGE NSW	2800
174	VK2MCH	Philip	McHUGH	P.O. Box 816	COOMA NSW	2630
239	VK2NBF	Mick	UREN	4-81 Bream St	COOGEE NSW	2034
230	VK2NLU	Eddy	TURNER	50 Pinaroo Crs	BRADBURY NSW	2560
245	VK2NRX	Rex	BUNN	SILENT GROVE	Chinamans Gully Rd	
205	VK2PA	Peter	ALEXANDER	"NANDARI" Rollands	METZ VIA ARMIDALE NSW	2350
41	VK2QB	Leo	PINKEVITCH	20 Cathrine St	Plains VIA TELEGRAPH POINT NSW	2441
363	VK2SPS	Steve	SMITH	7 Mitala Rd	KOTARA SOUTH NSW	2289
36	VK2UY	Vincent	ROBERTS	60 Edgar St	NEWPORT NSW	2103
30	VK2VBO	Brian	O'BRIEN	14 Belgrave St	FREDERICKTON NSW	2440
142	VK2WAS	Bill	SHORT	129 Simkin Crs	CREMORNE NSW	2090
310	VK2WD	Bill	DUKES	44 Avian Crs	KOORINGAL WAGGA WAGGA NSW	2650
162	VK2WES	Wes	TYLER	P.O. Box 43W	LAIN COVE NSW	2066
256	VK2WQ	Keith	SHERLOCK	174 Hall Pde	WEST GOSFORD NSW	2250
131	VK2YA	Rex	BLACK	562 Kooringal Rd	HAZELBROOK NSW	2779
					WAGGA WAGGA NSW	2650
224	VK3AAM	Phil	CARNE	2731 Nepean Hwy	RYE VIC	3941
306	VK3ADP	Don	PAICE	21 Allister St	MT WAVERLEY VIC	3149
85	VK3ADX	Merv	QUINN	12 Wesley Crt	BALLAARAT VIC	3350
169	VK3AHU	Harvey	UTBER	P.O. Box 40	VIOLET TOWN VIC	3669
189	VK3AIQ	James	GLENN	30 Horsham Rd	DIMBOOLA VIC	3414
302	VK3AKS	Peter	PRIME	P.O. Box 507	BACCHUS MARSH VIC	3340
286	VK3ALR	Geoff	HIPWELL	472 Park Rd	PARK ORCHARDS VIC	3114
303	VK3AMW	Max	JOINER	19 Dunsford St	LANCFIELD VIC	3435
125	VK3ANP	David	WARING	Banksdale Rd	HANSONVILLE VIC	3675
150	VK3APH	Tony	GOLDSWORTHY	1522 Main Rd	RESEARCH VIC	3095
342	VK3ARC	Ross	CROUCHER	3 Eyre Ct	FRANKSTON VIC	3198
235	VK3AUC	Alan	COOK		BEAUMARIS VIC	3193
204	VK3AVH	Harold	TRIBE	20 Morotai St	SORRENTO VIC	3943
255	VK3AWC	Bill	CURRIE	P.O. Box 107	MORDIALLOC VIC	3195
358	VK3AYQ	Rod J	GREEN	22 Shackleton St	BELMONT GEELONG VIC	3216
111	VK3BBI	Bob	LUKES	22 Dorothy St	EAST BURWOOD VIC	3151
178	VK3BDH	David	DUNN		EAST BRIGHTON VIC	3187
82	VK3BGH	Graeme	HARRIS	9 Loma St	RINGWOOD EAST VIC	3135
149	VK3BIE	Douglas	PEARCE	P.O. Box 65	POINT LONSDALE VIC	3225
97	VK3BMC	John	CARWARDINE	38 Barcelona St	BOX HILL VIC	3128

53	VK3BNC	Bob	TERRILL	7 Locksley St.	WENDOUREE VIC	3355
252	VK3BOL	Peter	LAYCOCK	6 View St	CASTLEMAINE VIC	3450
7	VK3BPG	Reg	BEDFORD	45 Milne St	CRIB POINT VIC	3919
344	VK3BR	Bill	ROPER	3 Tamar Cr	MENTONE VIC	3194
13	VK3BXA	Eric	IRVINE	P.O.	THOONA VIC	3726
55	VK3BXG	Graeme	BROWN	RMB 8375 Pryor Rd	DROUIN VIC	3818
114	VK3BYA	Derek	MC NIEL	17 Manning Rd	MALVERN EAST VIC	3145
157	VK3BYW	Fred	PIESSE	61 Munro St	EAST KEW VIC	3102
300	VK3CCA	Tuck	CHOY	7 Rees St	BURWOOD VIC	3125
297	VK3CCE	Reg	SOUTHWOOD	159 Wattletree Rd	MALVERN VIC	3144
296	VK3CCY	Doug	RICHARDS	11 Aiden Cr	CHELTENHAM VIC	3192
260	VK3CDR	Ray	DEAN	19 Myoora Dr	MOOROOLBARK VIC	3138
19	VK3CGE	Neil	EMENY	1 Beaumont Cr	MONTROSE VIC	3765
339	VK3CNX	Geoffrey	TRESISE	11 Patkin Cr	BURWOOD VIC	3125
354	VK3COR	Harly	GROOT	28 Plume St	MORLAVE VIC	3214
4	VK3CQ	Gilbert	GRIFFITH	7 Church St	BRIGHT VIC	3741
134	VK3CQK	Ralph	ROBERTSON	P.O. BOX 23	KYABRAM VIC	3620
225	VK3CQP	Vic.	HEARNE	54 Marshall St	WODONGA VIC	3690
199	VK3CTM	Tony	MORRIS	22 Boyd St	BLACKBURN VIC	3130
123	VK3CUC	Ken	SHIELDS	47 Sullivan St	INGLEWOOD VIC	3517
12	VK3CVF	John	ELLIOTT	OFG R36.67 BOX 400	C MELBOURNE VIC	3001
59	VK3DBR	Barry	RIDGEWAY	BOX 116	BEECHWORTH VIC	3747
39	VK3DGE	Garry	NEWTON	RMB 5044	COBRAM VIC	3644
168	VK3DGR	Graham	RUNCIMAN	P.O. Box 76	COLAC VIC	3250
355	VK3DHF	Dave	SHAW	9 Milton St	HEATHMONT VIC	3135
336	VK3DHV	Bob	CHAPMAN	25 Were St	BRIGHTON VIC	3186
112	VK3DID	Ian	GODSIL	25 Monaco St	PARKDALE VIC	3194
110	VK3DJI	Joe	LESLIE	79 Mitchell St	BENTLEIGH VIC	3204
246	VK3DKE	Lynn	EADY	5 Yarra St	YARRA GLEN VIC	3775
301	VK3DNA	Danny	McDONALD	14 Hume Crs	BALLAARAT VIC	3350
183	VK3DVB	Dave	ARCHER	6 Jerome Ct	FRANKSTON VIC	3199
261	VK3DWF	Bill	FANNING	21 Smout Dr	MELTON VIC	3337
47	VK3DXH	Lindsay	LaPOUPLE	33 Cassels Rd	BRUNSWICK VIC	3056
164	VK3ED	Geoff	BUTTERWORTH	Lot 4 Coburns Lane	TOOLERN VALE VIC	3337
351	VK3EGM	Charlie	EVANS	Lot 57 Harris Rd	ELLMINXIT VIC	3250
292	VK3EHZ	John	BEDWELL	49 Winyard Dv	MOOROOLBA VIC	3138
194	VK3EOP	Peter	GROVE	P.O. Box 255	CHADSTONE CENTRE VIC	3148
262	VK3ERS	Rob	SPALDING	P.O. Box 3	COROROOKE VIC	3254
316	VK3ESD	Stewart	DAY	P.O. Box 206	EMERALD VIC	3782
314	VK3EXI	Keith	ROSSITER	RMB 8021 Browns Rd	MAIN RIDGE VIC	3928
234	VK3EZM	Murray	LEWIS	7 Shalimar Cr	VERMONT SOUTH VIC	3133
155	VK3FDT	Dave	TOMPKIN	P.O. Box 78	LARA VIC	3212
188	VK3FGL	Gilbert	LONG	#21/Yackatooon Village	YACKANDANDAH	3749
263	VK3FR	Ray	TAYLOR	Tandara Rd	TANDARA VIC	3571
353	VK3FRO	ERIC W	FROUDE	C/O Post Office	LINTON VIC	3360
122	VK3HG	Trevor	STARRITT	"JENALAN" RMB 2340	TATURA VIC	3616
266	VK3IJ	Neil	TRAINOR	133 Bladin St	LAVERTON VIC	3028
357	VK3IM	Tim	HUNT	P.O. Box 411	MT ELIZA VIC	3930
356	VK3JFL	Richard	VOSS	22 Cedar Ave	ALFREDTON VIC	3350
6	VK3JY	Steve	PHILLIPS	37 Mangarra Rd	CANTERBURY VIC	3126
308	VK3KEL	Ray	BERGER	5 Howitt Crs	WEST SUNSHINE VIC	3020
277	VK3MF	John	RICKARD	14 Dickason Rd	HEATHMONT VIC	3135
274	VK3MHM	Ron	STEINFELD	784 Highbury Rd	GLEN WAVERLEY VIC	3150
289	VK3MIJ	David	BENNETT	270 Humffray St	NORTH BALLARAT VIC	3350
288	VK3MOR	Bob	MORGAN	P.O. Box 295	ECHUCA VIC	3564
313	VK3NEA	Alan	POTTER	P.O. Box 1778	MILDURA VIC	3502
307	VK3PIZ	John	PEARCE	54 Huddersfield Rd	DEER PARK VIC	3023
62	VK3PUC	Mark	JEFFREY	311 Peel St Nth	BALLARAT VIC	3350
176	VK3PUJ	Ian	BOYD	P.O. Box 337	BALLARAT VIC	3353
254	VK3SSB	Lex	HIBBURT	11 Nursery Ridge Rd	RED CLIFFS VIC	3496
212	VK3UG	Rodney	CHAMPNESS	17 Helms Cr	BENALLA VIC	3672
362	VK3WCW	Willis	CHANDLER	9 Porter Ave	HIGHTON GEELONG VIC	3216
352	VK3WN	Kevin	HUGHES	14 Ophir St	SEBASTOPOL VIC	3356
24	VK3WQ	Marlene	BROWN		YARRAMBAT VIC	3091
214	VK3WRB	Richard	WALLACH	8 Whalley Cr	DONCASTER EAST VIC	3109
49	VK3XU	Drew	DIAMOND	Lot 2 Gatters Rd	WONGA PARK VIC	3115
143	VK3ZF	George	COVENTRY	28-42 Happy Hollow	Drv PLENTY VIC	3090
295	VK4 ?	R.	MOORE	14 Thomas St	NARANGBA QLD	4504
218	VK4AAD	Ian	CAMPBELL	107 Banksia Dve	FOREST GLADE QLD	4306
27	VK4ACL	Bob	NEVILLE	124 Roscommon Rd	BOONDALL QLD	4034
335	VK4AOG	Tom	SAWERS	14 Kvakatoa Close	SMITHFIELD QLD	4878
45	VK4BIL	Bill	RAHMANN	28 Fontayne St	ASPLEY QLD	4034
44	VK4BSD	Stan	DEAN	380 St. Vincents Rd	NUDGEE QLD	4014
269	VK4CBR	Nev	POOLE	9 Maple Ave	GLADSTONE QLD	4680
221	VK4CMY/VK5HP	Doc	WESCOMBE-DOWN		VIA P.O. DALVEEN QLD	4374
346	VK4CPY	Bill	FRANKS	34 Tulip St	MIAMI QLD	4220
193	VK4CRS	Chris	ROY-SMITH	14 Carige Cr	BILOELA QLD	4715

276	VK4CWM	Len	McGOWAN	20 Catherine St	AYR QLD	4807
311	VK4ER	Bob	LEES	137 Akuna St	KENMORE QLD	4069
130	VK4EV	Ron	EVERINGHAM	30 Hunter St	EVERTON PARK QLD	4053
258	VK4FV	Peter	TAYLOR	36 Sundance Way	RUNAWAY BAY QLD	4216
99	VK4GH	Murray	YOUNG	36 Raintree Bvde	Little Mountain CALOUNDRA QLD	4551
333	VK4GNN	Gordon	NIELSEN		MARYBOROUGH QLD	4650
21	VK4KFF	Donald	STIELER	89 Rosemary St	CABOOLTURE QLD	4510
203	VK4LA	Glyn	GIBBINGS-JOHNS	M/S 882 MOUNT	PERRY RD VIA GIN GIN QLD	4671
104	VK4LKF	Kerry	FIELDING	22 Ellis St	LAWNTON QLD	4501
349	VK4MAS	Allan	SENDEN	16 Allen St	VICTORIA PT QLD	4165
113	VK4MUQ	Bill	MARTIN	92 Clarke St	GARBUTT TOWNSVILLE QLD	4814
366	VK4NAS	Steve	SENIOR	68 Queen St	CABOOLTURE QLD	4510
15	VK4RE	Roy	HILDRED	P.O. Box 387	TOOWOOMBA QLD	4350
14	VK4SF	Jack	FORD	222 Warwick Rd	CHURCHILL IPSWICH QLD	4305
167	VK5ABY	Barrie	BRICE	21 River Way	FULHAM GARDENS SA	5024
265	VK5ADG	Doug	ADAM	73 Maxwell Rd	INGLE FARM SA	5098
253	VK5ADY	Trevor	DAYMAN	21 Filsoil St	ELIZABETH DOWNS	5113
75	VK5AIL	Don	CALLOW	5 Joyce St	GLENGOWRIE SA	5044
184	VK5AIM	Steve	MAHONY	19 Kentish Rd	ELIZABETH DOWNS SA	5113
43	VK5AKZ	Kevin	ZIETZ	41 Tobruk Ave	ST MARYS SA	5042
338	VK5ALS	George	STEWART	C/O 21 Brookside Ave	TRANMERE SA	5037
232	VK5APS	Peter	SPENCER	4 Paxton St	CLARE SA	5453
259	VK5ARG	Alan	RICHARDSON	48 Robinson St	WHYALLA SA	5609
270	VK5ATQ	Trevor	QUICK	Churchett Rd	HOUGHTON SA	5131
8	VK5BA	Malcolm	HASKARD	Bassnet Rd	ONE TREE HILL SA	5114
57	VK5BJF	Jeff	WALLACE	Box 344	CLARE SA	5453
209	VK5BLS	Barry	SAMUEL	5 Kinston Pl	GUMERACHA SA	5233
145	VK5BSC	Brian	COOPER	128 Queen St	PETERBOROUGH SA	5422
170	VK5BVM	Mick	SCHMIDT	37 Arthur St	PENOLA SA	5277
172	VK5BZ	Brenton	ZERBE	5 Chelmsford Gve	ANDREWS FARM SA	5114
304	VK5EE	Tom	AUBREY	1 Hartley St	MT GAMBIER SA	5290
257	VK5FE	Fred	WARD	36 Yarnbury Rd	ELIZABETH NORTH SA	5113
139	VK5GI	Norm	LEE	U2/3 Booth Ave	LINDEN PARK	5065
223	VK5JO	John	BISHOP		GLEN OSMOND SA	5064
154	VK5LG	Leith	COTTON	64 Weroona Ave	PARKHOLME SA	5043
196	VK5NLY	Graham	LOCK	27 Tumut Dr	MT GAMBIER SA	5290
281	VK5TL	Tom	LAIDLER	18 Albion Ave	GLANDORE SA	5037
268	VK6AND	Andre'	DuPLESSIS		LESMURDIE WA	6076
54	VK6ATM	Terry	MAITLAND	P.O. Box 12	WYALKATCHEM WA	6485
220	VK6BEK	Shaun	PATSTON	9 St Leonards Ave	WEST LEEDERVILLE WA	6007
211	VK6BER	Martin	REECE	1 Gaskin Rd	KENWICK WA	6107
296	VK6BR	Barrie	FIELD	5 Crocker Way	INNALOO WA	6018
66	VK6BWI	Peter	PARKER	14 Marquis St	BENTLEY WA	6102
222	VK6ELL	Elliot	GREENFIELD	21 Henley Rd	ARDROSS WA	6153
272	VK6FQ	Donald	FRASER	17 Jillian St	RIVERTON WA	6148
80	VK6IS	Peter	SCALES	P.O. Box 47	CHIDLOW WA	6556
278	VK6JCF	Bob	JOHNSON	P O Box 22	MANJIMUP WA	6258
25	VK6KC	Keith	WILLIAMS	6 Shelton St	WAIKIKI WA	6169
284	VK6KDC	Darrell	CHURCH	19 Graham St	MANJIMUP WA	6256
28	VK6KRG	Rod	GREEN	106 Rosebery St	BEDFORD WA	6052
191	VK6LT	Bill	TOUSSAINT	9 Desford Close	SHELLEY WA	6148
103	VK6MX	Warren	MEAD	347 Serpentine Rd	ALBANY WA	6330
241	VK6NQ	Merv	TURNER	23 Hanson St	ALBANY WA	6330
243	VK6OC	Stanley	MOLLOY	53 Burtonia Way	FORRESTFIELD WA	6056
267	VK6RJ	John	WIRTH	P.O. Box 427	BROOME WA	6725
61	VK6SA	REV	SUTER	BOX 261	MANDURAH WA	6210
147	VK6XC	Ben	KOH	13 Sovereign Plce	FORRESTFIELD WA	6056
345	VK6XZ	Bruce	HUNT	13 Bloom Crt	HUNTINGDALE WA	6110
133	VK7ABH	Greville	KNIGHT	P.O. Box 549	EXMOUTH WA	6707
65	VK7AJ	Lin	WILLIAMS	19 Gloucester St	LAUNCESTON TAS	7250
244	VK7CS	Alex	SZOPKO	25 Beach Rd	LEGANA TAS	7277
242	VK7DMJ	Daryl	HONEYWOOD	HUONVILLE TAS	7109	
275	VK7EB	Ted	BEARD	148 Denwent Ave	LINDISFARNE TAS	7015
26	VK7FN	Neil	FITZPATRICK	P.O. SCAMANDER	TASMANIA	7215
40	VK7JK	John	ROGERS	1 Darville Crt	BLACKMANS BAY TAS	7052
38	VK7KA	Arthur	BLACKWELL	"FAIRVIEW" Elderslie	Rd BRIGHTON TAS	7030
337	VK7LDM	David	PONSONBY	C/O P.O	PARATTAH TAS	7120
37	VK7NRE	Bob	EDWARDS	205 Davey St	HOBART TAS	7000
48	VK7NXA	Stuart	BEAN	9 Sussex St	GLENORCHY TAS	7010
3	VK7VV	Rai	TAYLOR	Lot 2 Daniels Rd	MAGRA TAS	7140
91	VK8CW	Ian	SMITH	P.O. Box 4756	DARWIN	0801



MANAGEMENT COMMITTEE

Treasurer & Membership Secretary

Kevin Zietz VK5AKZ #43
41 Tobruk Ave. St Marys SA 5042
Packet: VK5AKZ@VK5TTY
#ADL.#SA.AUS.OC
Membership enquiries and applications. Subscriptions. Changes of address, callsign etc.

Editor of Lo-Key, also QRP Kit-Set Centre

Don Callow VK5AIL #75
5 Joyce St. Glengowrie SA 5044
Lo-Key input. Kit-set & component orders & payments.
(08) 295 8112 - day/night

GENERAL INFORMATION

Calendar Year subscription, due January:
Ordinary: VK \$A 10; N.Z. \$A 12; DX \$A 14
Council: VK \$A 15; N.Z. \$A 18; DX \$A 21
Lo-Key - Our quarterly journal, posted mid-March, June, September & December
ARTICLES ALWAYS WELCOME

The Editor reserves the right to edit all material including letters sent for publication and to refuse acceptance of material without specifying a reason.

QRP calling frequencies (kHz)

1 815	3 530	7 030	10 106
14 060	21 060	28 060	

§ 1994 SCRAMBLES §

Awards & Contents Manager
Ian Godsil VK3DID #112
25 Monaco St. Parkdale Vic. 3194

#33 80m - Thu 27 January '94

#34 40m - Thu 17 February '94

(More details on page 11)

§ CW NET (QRP) §

Net Controller
Ted Daniels VK2CWH
Tuesday nights
40m from 4 Jan '94
7031-7035 kHz from 0830 UTC
80m from 8 Mar '94
3529 kHz (lower if QRM) from 0930 UTC

§ SSB 'NATTER NET' §

Steve VK5AIM's roster
Friday nights from 1030 UTC
or 0930 UTC Summer Time
Near 3620kHz

Photocopy or cut along this line

Please post this application to:

Kevin Zietz VK5AKZ
41 Tobruk Ave.
ST MARYS SA 5042
Australia



Please print

FIRST NAME

SURNAME

CALL SIGN

ADDRESS

I apply for Ordinary Membership of the
CW Operators' QRP Club Inc.

Enclosed is the annual membership fee of:

\$A10 for VK Members, or

\$A12 for ZL Members, or

\$A14 for DX Members.

I agree to these details being held on the
Club's data base and published.

I DO AGREE to publishing of my street
name and house number. (If not, write
'NOT' in the space provided.)

SIGNATURE

Your receipt and membership number will
be sent with your New Member's Pack.
Future receipts will be inserted in your
copy of Lo-Key.

The annual fee is due on 1 January each
year, at the start of our March quarter,
not on your anniversary of joining.