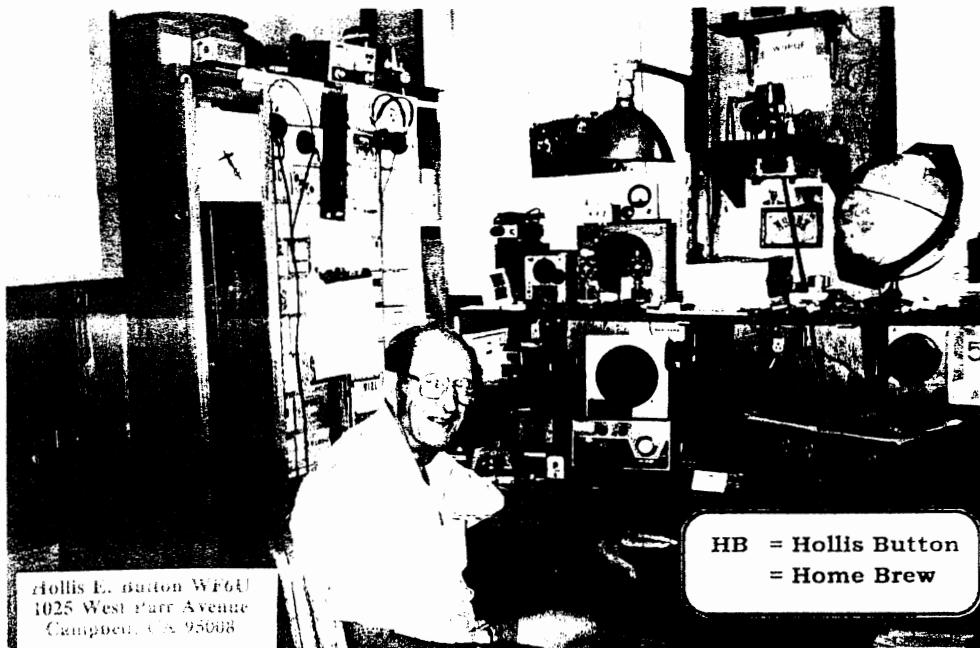


**The Journal of the CW Operators' QRP Club**  
**Promoting Low Power CW Mode Communication and Homebrewing**  
**in the Amateur Radio Service**

June 1993  
Issue No. 38

# Lo-Key



Hollis E. Button W1F6J  
1025 West Parr Avenue  
Campden, CA 95008

HB = Hollis Button  
= Home Brew

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Editor: Don Callow VK5AIL #75

5 Joyce St., Glengowrie SA 5044

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# KEVIN'S KOMMENTS

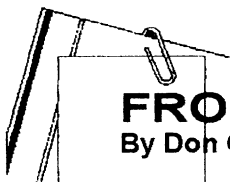
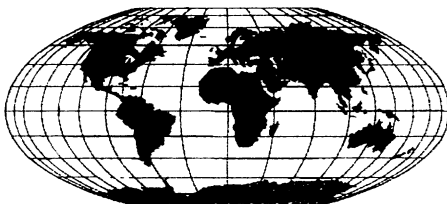
By Kevin Zietz VK5AKZ #43  
Treasurer and Membership Secretary  
41 Tobruk Ave. St. Marys SA 5042 Australia  
Packet: VK5AKZ@VK5TTY.#ADL.#SA.AUS.OC

**Thanks** to several active members your committee has been kept on its toes [fingers ?] issuing new membership numbers - the list should show the picture. **N8ET Bill Kelsey** signed up 14 new members at the KANGA US stand at the annual Dayton event in the USA and the team of **VK3ADX Merv Quinn & VK3BNC Bob Terrill** signed up 12 at the Bendigo Hamvention [plus one or two who joined later] - **FB!**

We currently have about 260 financial members. 12 others have not yet responded to their "last Lo-Key notice" and hence will be unable to read this !

p.s. The Club photocopier, out of use for several years, has now been scrapped.

**Continued opposite ...**



## FROM THE EDITOR'S DESK

By Don Callow VK5AIL #75 5 Joyce St. Glengowie SA 5044

The number of new members who joined this quarter is greater than for any similar period since this club was formed by Len O'Donnell VK5ZF #1 nearly ten years ago. We now have an even better geographical spread of members than before and those of us who see overseas QRP and other Amateur Radio publications will recognise some well known names/call signs in the list of new members.

Steve Mahony VK5AIM #184 has told us in VK5 - in no uncertain terms - that we need to get organised and 'have a go' by promoting QRP at some local events, so there should soon be some action towards this.

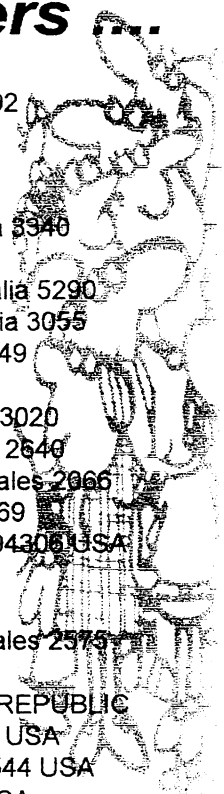
Apart from technical articles such as VK2AOH Nick's "Walkabout" tcvr, this is an 'index issue' containing both the Lo-Key index [previously appeared in March '91] and a list of articles by Drew Diamond VK3XU #49. Still no room for the QRP Kit-Set Centre price list, even though we are now producing 32 page issues instead of 28, but the complete Price List is available on request.

Keep the items coming for Lo-Key. It doesn't matter whether you send fully fledged articles or brief 'technical tips', there is always someone who is new to homebrewing or has not seen what you have to say about practical experiences with a circuit or whatever. A number of members, including Ron VK3MHM, Ian VK8CW, Steve VK5AIM, Matt ZL1ATW and Peter VK6BWI, have 'done the right thing' and I expect you will see the results of their efforts in the technical articles in the September issue.

72, *Don* VK5AIL

# Welcome To New Members

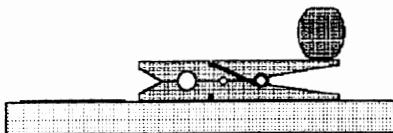
297 VK3CCE	Reg SOUTHWOOD	MALVERN Victoria 3144
298 VK3CCY	Doug RICHARDS	CHELTENHAM Victoria 3192
299 SWL	Peter WALTERS	MAIDSTONE Victoria 3012
300 VK3CCA	Tuck CHOY	BURWOOD Victoria 3125
301 VK3MGR	Danny McDONALD	BALLAARAT Victoria 3350
302 VK3AKS	Peter PRIME	BACCHUS MARSH Victoria 3340
303 VK3AMW	Max JOINER	LANCEFIELD Victoria 3435
304 VK5EE	Tom AUBREY	MT GAMBIER South Australia 5290
305 SWL	Mick PHILLIPS	WEST BRUNSWICK Victoria 3055
306 VK3ADP	Don PAICE	MT WAVERLEY Victoria 3149
307 VK3PIZ	John PEARCE	DEER PARK Victoria 3023
308 VK3KEL	Ray BERGER	WEST SUNSHINE Victoria 3020
309 VK2AY	Jack FLYNN	ALBURY New South Wales 2640
310 VK2WD	Bill DUKES	LANE COVE New South Wales 2066
311 VK4ER	Bob LEES	KENMORE Queensland 4069
312 AB6RG	Tom ADLER	PALO ALTO CALIFORNIA 94306 USA
313 VK3NEA	Alan POTTER	MILDURA Victoria 3502
314 VK3EXI	Keith ROSSITER	MAIN RIDGE Victoria 3928
315 VK2ADW	Dennis PEAKE	COLO VALE New South Wales 2575
316 VK3ESD	Stewart DAY	EMERALD Victoria 3782
317 OK1CZ	Peter DOUDERA	PRAGUE 6 16200 CZECH REPUBLIC
318 KF8FY	Terry FRAZIER	CIRCLEVILLE OHIO 43113 USA
319 AA9AB	Thad JONES	MISHAWAKA INDIANA 46544 USA
320 WS8T	Patrick TENDAM	BLUFFTON OHIO 45817 USA
321 KE9GG	Donald KOZLOVSKY	WEST CHICAGO ILLINOIS 60185 USA
322 VE2DRB/WA6ERB	Robert GOBRICK	CHAMPLAIN NEW YORK 12919-1591 USA
323 G0BPS	Dick PASCOE	FOLKESTONE KENT CT187E UK
324 VE3OTC	John ERSKINE	SIOUXLOOKOUT ONTARIO P8T158 CANADA
325 KN1H	John COLLINS	CORNISH NEW HAMPSHIRE 03745 USA
326 W1FMR	Jim FITTON	SALEM NEW HAMPSHIRE 03079 USA
327 KI6DS	Doug HENDRICKS	DOS PALOS CALIFORNIA 93620 USA
328 KA0IQT	James JOHNS	GROTON MASSACHUSETTS 01450 USA
329 WA3SRE	John SALONY	YORKE PENNSYLVANIA 17403 USA
330 SWL	Gary FISHER	DUNSTABLE BEDFORDSHIRE LU62AG UK
331 VK1TB	Tony BENNETT	FLOREY Australian Capital Territory 2615



**Welcome** - We hope you benefit from your membership of the CW Ops QRP Club,

73 *Kerria* VK5AKZ





# AWARDS AND CONTESTS

By Ian Godsil VK3DID #112

25 Monaco St., PARKDALE Victoria 3194

**Greetings to all Club Members** and I trust that you are all well and getting ready for some enjoyable Winter QRPing.

There has been a suggestion from **Ron VK4EV #130** that there should be a national QRP competition. June 17th, 1994, World QRP Day, has been suggested. Whilst there is much thinking and planning to do, the broad outline would involve all bands with a 'loaded' scoring system. I have been adjured to go into KISS (Keep It Simple, Stupid) Mode for this, but would certainly welcome any thoughts that any of you may have to make this a special day in the AR calendar.

My thanks to those who replied to my hint about 160 metres last edition. Unfortunately I have done nothing about it as I simply do not have any time for operating on air, or even for listening. I have now reached the stage when I hope that retirement (probably about the end of 1994) may bring some time *[Don't count on it - VK5AIL]*, but as I have heard so many say, retirement only means the opportunity to catch up on all the things that never got done when you were working !

## RESULTS OF SCRAMBLES 25 & 26:

My sincere thanks to all those who submitted logs, especially to long-time CW operator **Ivor VK3XB** who took part in Nr. 25.



### NR.25

1	VK3XB	Ivor	30 points
2	VK3BPG	Reg #7	15 pts
3	VK2WES	Wes #162	12 pts
4	VK3AAM	Phil #224	11 pts
5	VK3SSB	Lex #254	7 pts
6	VK6BWI	Peter #66	1 pt

### NR.26

1	VK3AAM	Phil #224	12 points
2	VK2WES	Wes #162	6 pts

Again many thanks to you all for taking part and getting your logs along promptly. It is a great satisfaction to me to know that there is a band of loyal participants in the Scrambles.

## WINTER 1993 SCRAMBLES:

As well as the regular-type Scrambles, I would like to try two longer runs on the upper frequencies on Sundays. These will give us an idea of the situation of each band at present and of the possible style of things for a national QRP day as mentioned above.

**Nr. 27** Thursday, July 15th, 1000 - 1200 UTC 7.015 - 7.030 MHz

**Nr. 28** Sunday, July 25th, 0000 - 0700 UTC 21.100 - 21.135 MHz

**Nr. 29** Thursday, August 26th, 1000 - 1400 UTC 14.010 - 14.060 MHz

**Nr. 30** Sunday, August 29th, 2200 - 0200 UTC 28.010 - 28.130 MHz

Rules and scoring are as in December '92 Lo-Key page 25. 15 & 10 metres may turn out to be 'useless', but I would urge all members to 'have a go' and see what may happen. The argument that you don't have any gear for 'xx' band is invalid in the light of the fact that QRP means 5 watts or less, no matter how you get it down to that level. I do not believe that this works contrary to the Aims of our Club. I ask for your support in these Scrambles, but **PLEASE** send your logs so that accurate pictures of the situation can be gauged.

*Yours in QRP,*

*73, Jan VK3DJJ #112*

**CONTESTS** - Rules are on pages 46 & 47 of June *Amateur Radio* magazine.

**Australasian 80m Sprint** - Organised by the Adelaide Hills Amateur Radio Society - the CW section is held over a one hour period on 3 July. **Be in it!**

**NZART 80m Memorial Contest** - This has a CW section, held on 3 July over a period of 6 hours, and is held "to commemorate those from our ranks who lost their lives in World War II".

**Sunshine State Jack Files Memorial Contest** - CW section of this VK4-based contest is on 1 August - the contest runs for 5 hours and honours the late Jack Files.

### News of QRP in South Africa from Dave Gemmell ZS6AAW

"... .. I am a member of the Verwoerdburg Branch ZS6TVB and its QRP/ Homebrew Interest Group and try to co-ordinate the activities of Low Power affairs in South Africa by means of a monthly column in RADIO-ZS, the official journal of our League.

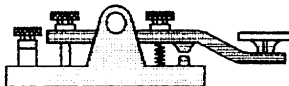
Recently we have arranged for one or two QRP Field Days with varying success. The object is to operate anywhere in the open air be it on a picnic or just in your own back yard - does not matter just as long as you get going on QRP. The next QRP Field Days for this year will be 8-8-1993 and 24-10-1993 and we hope you can join us.

I believe that Perth is some 6 hours ahead of South African standard time whilst Sydney is 8 hours, so in order to cater for time differences can we work out a schedule to aid the average QRP DX hopeful? Then I can arrange for some low power DX fans to monitor the usual QRP frequencies of 7030 kHz, 10110 kHz, 21060 kHz and 28060 kHz. I should imagine that if the ZS-QRP group arrange to be available in the afternoon, that is about 13H00 to 18H00 SAST it should suit you chaps in the morning.

..... The mode of operation will be mainly CW but as this will be a friendly event phone may be used should you wish."

The August event is definitely worth a go and we'll try to organise some more information for September Lo-Key, in advance of the October QRP Field Day.





# SOME MORSE CODE SPECIAL CHARACTERS

.	FULL STOP	• — • — • —
,	COMMA	— — • — • —
=	EQUALS SIGN OR BREAK	— • — • —
/	SLASH OR DIVISION SIGN	— • — • —
-	DASH OR HYPHEN	— • — • —
:	COLON	— • — • —
'	APOSTROPHE	— • — • —
?	QUESTION MARK OR REPEAT	• — • — • —
K	INVITATION FOR ANY STATION TO TRANSMIT	— • —
KN	INVITATION TO QSO STATION TO TRANSMIT	— • — • —
AS	WAIT OR STANDBY	• — • — • —
CT	ERROR OR ERASURE	• — • — • —
AR	COMMENCE TRANSMISSION	• — • — • —
SK	END OF MESSAGE	• — • — • —
SOS	INTERNATIONAL DISTRESS SIGNAL	• — • — • — • — • —



**Rex Black VK2YA #131**, who is one of the Amateurs giving valuable on-air Morse practice sessions, recently said:

*"... the WIA exams do not require use of fullstops and commas or oblique strokes etc. As far as we are concerned (VK2WAS and VK2YA), we devise practice passages where these are included. Bill VK2WAS is an ex-PMG Teleg. and I had years in Army and RAAF Signals and KNOW that a bare knowledge of alphabet letters and numbers is just NOT ENOUGH to enable intelligent and competent communications to take place."*

Well Rex, opposite is a reminder to CW'ers about a few special characters - some used often, several maybe not so often, and one of them rarely, if ever.

©©©

## FOR SALE

Ian Smith VK8CW #91 has QRP rigs and other items which are in excess of his requirements, although he emphasises that this does not indicate any withdrawal from QRPing! He is keen to encourage members or potential members to give home-made equipment a try. Details are as follows:

§ 20 metre fully featured QRP transceiver, with SWR meter & power supply. \$80

§ 1 only Morse Key Type D 10A/7373. \$5

§ 20 metre fully featured QRP transceiver, with SWR meter. \$70

§ 1 only Morse Key - Key Telegrapher Light Weight (Aust.) No.1. TSE(W)9-2. \$5

§ 80 metre fully featured QRP transceiver, based on C.M.Howes kits. \$80

Method of transport and cost will be arranged at time of purchase.

§ 5 element beam antenna. Model CA-35DX. 20, 15 and 10 metre operation. Requires beta matching stub & mounting plates for 10 metre director and reflector. \$120

**Ian Smith VK8CW #91**  
**GPO Box 4756 Darwin NT 0801**  
**Phone 089 450834**

**T**here has been a good level of activity in the autumn quarter, with conditions mostly very good, and consistent contacts with ZL.

The support from our ZL members has been outstanding. One night there were three out of our four ZL members on the net!

Also of note: These three, **ZL1ATW #34 Matt**, **ZL1BYY #29 George** and **ZL1ATN #188 Gil** are also operating a QRP net using simple xtal locked Tx's putting out between 1-1/2 and 2-1/2 watts. Nets are held on Thursdays at 0800 UTC on 3832 approx., so why not try a contact if you are free then.

It is good to report several members checking in for the first time: **VK2ACN #182 Alan**, **VK3JHX #234 Murray** and **VK3SSB #254 Lex**. *Nice to hear you all.*

Finally, one night I thought I had created a new record for the net when I heard **DL3XC, Hermann** call in, RST 339, but alas, on checking carefully, he was heard to be calling /QRP/ZL!

Ah, well, maybe another time!

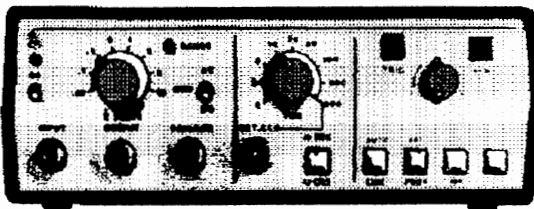
72, **Ted**

# CW Net News

By **Ted Daniels VK2CWH #89**

Wombat Hole

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



[Editor's Notes:

1 **Peter VK6BWI #66** wrote to say that "I have access to 7 acres 250 km south of Perth not far from Witchcliffe. Despite a makeshift antenna I could hear CW QRP operators on the 3.529 net quite well from VK2, 3 & ZL as the site is free from powerline noise and TV line oscillators.

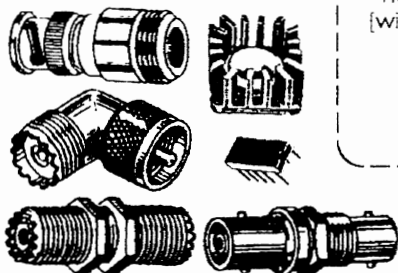
2 A couple of people on the ssb net the other night mentioned that **Ted VK2CWH** always slows down to YOUR speed on the Tuesday CW nets. For quite a few of us it's a slow QSO or none at all, so thanks Ted!

## FOR SALE

'Doc' **Wescombe-Down VK5HP/VK4CMY #221** has a TEN TEC 'Century 21' full QSK 70W CW TXCVR [with manual], Very Good Condition [untampered!] which is for sale - price **\$370**.

Doc's address is:

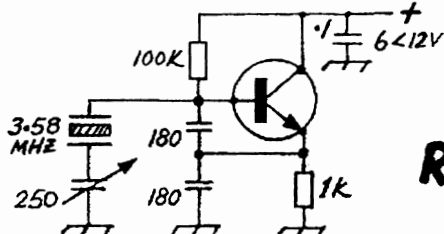
Via P.O. **DALVEEN** Queensland 4374



# CERAMIC RESONATORS IN RECEIVERS

Ian Macpherson GM3RXU 12 Hawick Avenue, Paisley, PA2 9LD

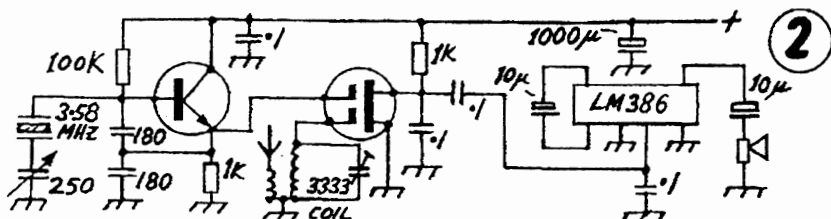
Ceramic resonators have become available as low cost very compact and robust alternatives to crystals. The Q of these components is lower than that of the equivalent crystals and consequently the frequency of oscillation can be pulled much further than for a crystal. A typical oscillator circuit might be:



1

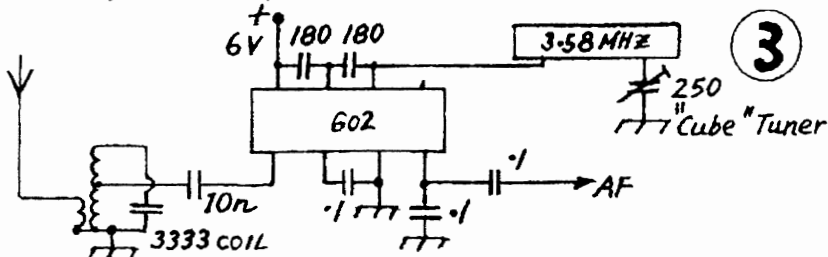
## CERAMIC RESONATORS

The tuning capacitor can be a small medium wave radio tuning capacitor and will cover the range 3.59 MHz to 3.515 MHz. This circuit will fit well into a minimum direct conversion receiver for 80 m.



2

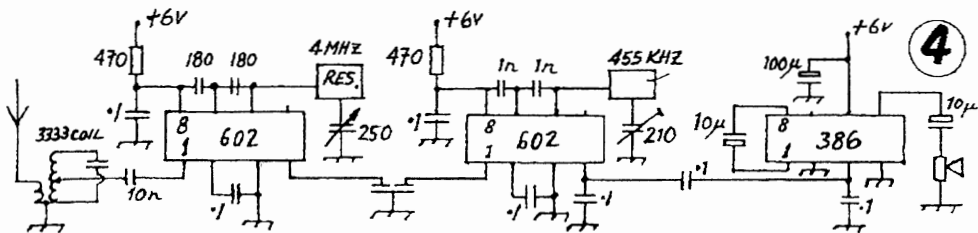
This receiver works well but can be improved by including a simple passive AF filter in the AF feed to the LM386. The mixer can equally well be an NE602. There are a variety of other frequencies available as ceramic resonators and a look



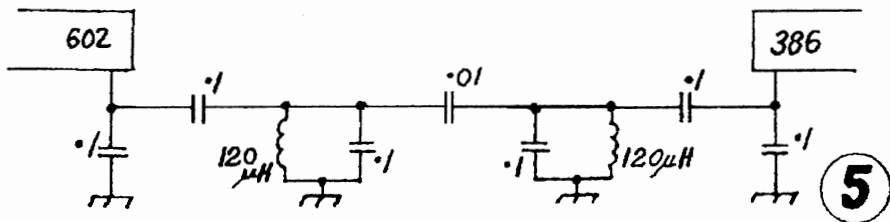
3

at these will throw up several combinations with ceramic filters which are likely to be of use at amateur radio frequencies. As an example, resonators at 4.19 MHz, 4.0 MHz and 455 kHz can be combined with a 455 kHz ceramic filter to produce a very simple super gainer with virtually no tune-up requirements.



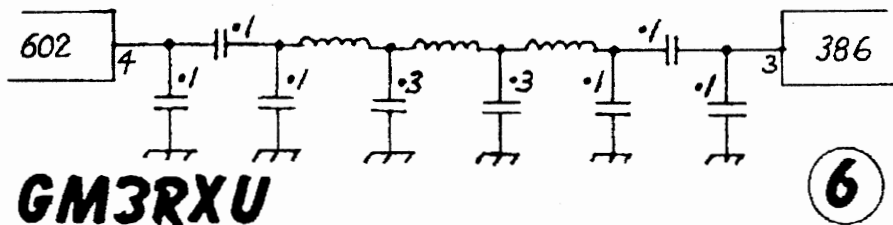


This receiver tunes 3.57 MHz and only requires the RF coil to be peaked, everything else is pre-tuned. The filter can be a type CFU455IT at about £2.00, or a type CFW455HT at about £2.50. The 455kHz resonator as the BFO can be tuned with a 250 pF trimmer but two small polystyrene capacitors in parallel [137 pF and 80 pF] are just right to place the BFO on the correct side of the IF passband. As it stands the circuit gives single side band CW reception but with a wide audio band width. CW reception can be improved considerably by the inclusion of a passive AF filter. The circuit:



will give a nice peaked response with the 120 mH pot cores from Cirkit.

Replacing the 4.0 MHz resonator with a 4.19 MHz resonator will tune a portion of the SSB part of 80 m. Here a different AF filter will be required and the one shown below will give a narrow passband more suited to QRM elimination than high quality.



## GM3RXU

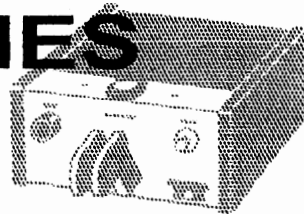
This is based on the same 120 mH pot cores from Cirkit. Gain in all these circuits is not high but can be improved if required by the addition of a small low noise single transistor amplifier between the AF filter and the LM386.

Ceramic resonators are available from Radio Spares\*\* and Cirkit at low cost.

[\*\* RS Components Pty Ltd in Australian capital cities - VK5AIL]

# CLUBTIVITIES

By Don VK5AIL #75



## NEW CALLSIGNS

**Ray Taylor VK3FQ #263** [was VK3NCM]

- *NCM didn't mean Never Could Make it!*

**Greg Smith VK2CW #287** [was VK2GJS]

- *That call carries a message, for sure!*

## WINNER TAKE ALL!

**SWL Mick Phillips #305** won the competition among our new members at the Bendigo Hamvention. The prize is a \$10 voucher for Kit-Set Centre items [with free postage]. *Well done, Mick!*

## BENDIGO SHOW

**Lindsay LaPouple VK3DXH #47** went to the Bendigo event and says:

*".. what a delight it was to see Merv, VK3ADX, at the Bendigo Hamfest. He deserves a special mention for his effort. The display of home-brewed gear was impressive; I wonder how many new members we got from his exhibition? I was most impressed with "The Rat" and will be waiting to see it in Lo-Key.*

*Received a "Packet" message from Merv this morning, trying out my suggestion re BBS's being included in Lo-Key address lists. So at least one member reads Lo-Key!"*

Well Lindsay, Bob VK3BNC & Merv [Now called "Arkwright" after the anti-hero of 'Open All Hours' - "Don't let 'em get out the door without buying something/anything!"] signed up 12 new starters.

Everyone knows that packet operators have to be accomplished readers - Lo-Key is but a drop in the ocean compared with the mass [mess?] of packet messages. So it's not surprising that we have some names for the list which follows. - VK5AIL.

## MORE PACKET RACKET

§ **VK3DXH Lindsay LaPouple's** packet address is **VK3DXH@VK3BBS**

§ **Nick Eichhorn VK2AOH** advises that he has packet radio at address **VK2AOH@VK2ASY**

§ **Merv Quinn VK3ADX** can be found at **VK3ADX@VK3IBM**

§ **Kevin Zietz VK5AKZ** [our Treasurer] has the address [in full]:

**VK5AKZ@VK5TTY.#ADL.#SA.AUS.OC**

§ **Chris Roy-Smith** is at **VK4CRS@VK4UN.#CQ.QLD.AUS.OC**

§ **Ian Godsil VK3DID** is on FIDONET **3.635/543@JKARC BBS** [a'phone BBS]

## ANY 10.5 GHz EXPERIMENTERS ?

**Chris Roy-Smith VK4CRS #193** has

*"... acquired some door openers, working on proper mixing system. Will be true QRP at 14 mW! Sorry not CW! FM much easier for first experiments. If others experimenting, I may be contacted at home QTH [14 Carige Court, BILOELA Queensland 4715] or by packet."*

## HOLLIS BUTTON WF6U #17 NEWS:

*"I run 3 watts on 20 mtrs into a 3 element Monoband Cubical Quad, up 50 ft. Xmtr is H/B 6F4 Acorn tubes in pushpull, VXO 4 xtal 6AQ5 osc. Rcvr is Drake R-4B. Don't operate much, but spend most of my time home-brewing. Best DX so far Tierra del Fuego, Argentina, a VK and Thule, Greenland, long way around."*

## VHF/QRP - TNX PETER!

**Murray VK3JHX #234** is interested in running QRP at VHF frequencies and sought some help from **Peter VK6BWI #66**, who has written for Lo-Key on this subject. Murray recently mentioned on the ssb net that Peter had been of great assistance in supplying information on this subject, for which he is very thankful. If you can assist in this area, pse contact Dr. Murray Lewis VK3JHX at 7 Shalimar Court, VERMONT SOUTH, Victoria 3133.



## LITTER TITTER!

Spotted during a visit to the QTH of **Leith VK6LG #154**:- a square wastepaper basket with its four sides labelled:

"Pending"      "Bright Ideas"  
"Too Hard"      "Suggestions".

As you can guess, it was full !

## QRP Amateur Radio Club International

- often abbreviated as **QRP ARCI** - is a large, well organised QRP club based in the U.S.A.

We have good lines of communication with several key [excuse the pun !] officers of QRP ARCI and are very pleased to see a number of its members on our membership list. There are real benefits for homebrewer/operator QRP enthusiasts in having access to information from other clubs, worldwide.

The QRP ARCI was founded in 1961 with the aim of reducing QRM on the air by members voluntarily limiting their power to 100 watts or less at all times. In the late 1970's the Club adopted the generally accepted definition of QRP as 5 watts output CW and 10 watts PEP SSB, as a result of increasing interest in true low power, and the voluntary 100 watt power limit was later abolished.

The QRP ARCI does not advocate reduction of the legal power limits of amateurs in any country, and serves only to provide a forum for those who enjoy the thrills and challenges of building and operating with low power equipment.



The club journal **QRP Quarterly**, edited by **Jim Griffin W9NJP**, is published quarterly [of course !] and contains a wide range of content, reflecting club activities and including very useful technical articles, with plenty of tips and projects. Forty pages of quarto size [215 x 280 mm]. *An excellent publication.*

To encourage on-air QRP operation, the QRP ARCI promotes the use of designated QRP calling frequencies, regular QRP nets and a program of QRP operating awards [see Lo-Key March '91 p.31] and contests.

To join this club send \$US 12 [not cash, use money order or cheque made out to "QRP-ARCI"] to **Mike Kilgore KG6F** at 2046 Ash Hill Rd., CARROLLTON, Texas 75007 U.S.A. I can provide blank forms - also an address in England - if you send me [VK5AIL] a SASE. However, the form only requires your Full Name, Call and your full Mailing Address. Renewal is \$US 10 a year.



# Audio Filter for CW Rx

Circuit from the **Tassie Devil [TDM 80]** by **Ian Smith VK8CW #91**  
By **Don VK5AIL #75**

There have been several requests for audio filter circuits suitable for use in direct conversion receivers, especially to improve the performance of simple designs such as the 'Sudden' or others using NE602 chips followed by LM386 audio amplifier stages. Most of the books used by QRP'ers have examples which would do what is required, but during the ssb Natter Net early in May **Peter VK2EPD**, supported by **Wes VK2WES**, suggested that the circuit opposite should be 'at the top of the list'.

The circuit is from the **Tassie Devil** by **Ian Smith VK8CW #91** [Ian was VK7IJ at the time - quite a bit south of Darwin, his present QTH], which appeared in *Lo-Key* #8 December '85. If you are interested in the overall project, there

were follow up articles and corrections in the following two *Lo-Key*'s and a comprehensive article on the 80 metre version in *Amateur Radio* January 1987 p.18, under the title "The TDM 80 Metre CW Transceiver".

I have redrawn the circuit labelled "600 Hz Filter" from *Lo-Key* and included the switching circuit from the *Amateur Radio* article. Incidentally, in the latter Ian wrote "When receiving CW signals a filter ... can be selected via [a switch] to reduce the problems of band noise and adjacent channel interference. The filter has a centre frequency of 800 Hz and a bandwidth of 150 Hz." and also mentioned that the trimpot "is adjusted so that the audio output level is a little higher than with the filter off."

Definitely worth a try !

---

## 'Natter Net' Notes

Steve Mahony VK5AIM #184  
19 Kentish Rd. Elizabeth Downs S.A. 5113

Friday 23 April '93 was probably one of the best attended nets so far. The lineup of those calling in was:

Alan VK2ACN, Chris VK2BUS,  
Rob VK2ERA, Wes VK2WES,  
Reg VK3BPG, Doug VK3CCY,  
Tony VK3CTM, Drew VK3XU,  
Don VK5AIL, Steve VK5AIM,  
Barry VK5BLS [Net Controller],  
Norm VK5GI, John VK5JO and  
Keith VK6KC.

A good net !

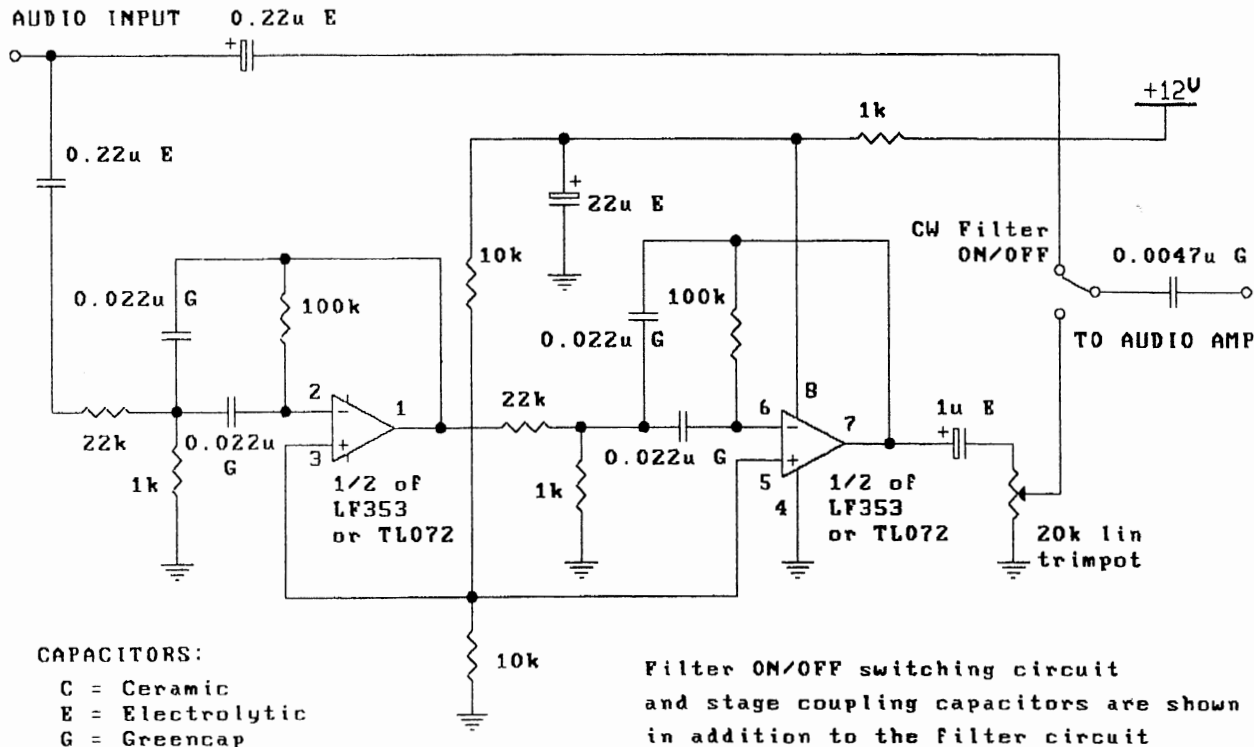
The team of Members who have controlled the ssb net in recent months includes: **Brenton VK5BZ, Graeme**



VK3BXG, Don VK5AIL, John VK5JO, Steve VK5AIM, Kevin VK5AKZ, Peter VK2EPD and Barry VK5BLS. To have a try you need to get onto the roster, so let Steve know and it will be 'fixed'.

73, *Steve VK5AIM*

GDQC



## AUDIO FILTER FOR CW Rx

From the Tassie Devil (TDM B0)

By Ian Smith VKBCW

(VK5AIL 9 May 1993)

# 'Walkabout' 80 Metre QRP Transceiver

By Nick Eichhorn VK2AOH #210

## Introduction

The design of any equipment is largely dictated by its intended application. This small transceiver is intended for those QRPer's who enjoy bush-walking in addition to their radio pursuits. It has been successfully used on several trips so far and results at times have been quite surprising.

As a bushwalker has to carry many necessities in his or her rucksack there is not much room left for radio equipment. Thus a suitable radio has to be small, lightweight and simple in its operation.

The transceiver described in this article offers the following features:

1. Built in a small case  
130 mm x 68 mm x 41 mm;
2. Xtal locked for stability;
3. 2 to 3 watts Tx output;
4. Sidetone oscillator to assist keying;
5. Inbuilt key;
6. Rx offset adjustable;
7. Active audio filter to improve selectivity.

The design is very basic - here is a brief circuit description ....

**Tx** - Xtal locked Hartley oscillator (TR1), an MFE131 with both gates connected together. Coupled by L1 to TR2, a VMOS FET VN88AF acting as the P.A. The P.A. is directly keyed by a push button switch. Key down draws 260 to 280 mA. The oscillator also supplies drive to the receiver.

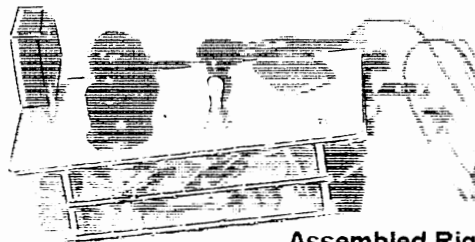
## Ready for the Bush

with 550 mAh battery, xtals and lightweight dipole.



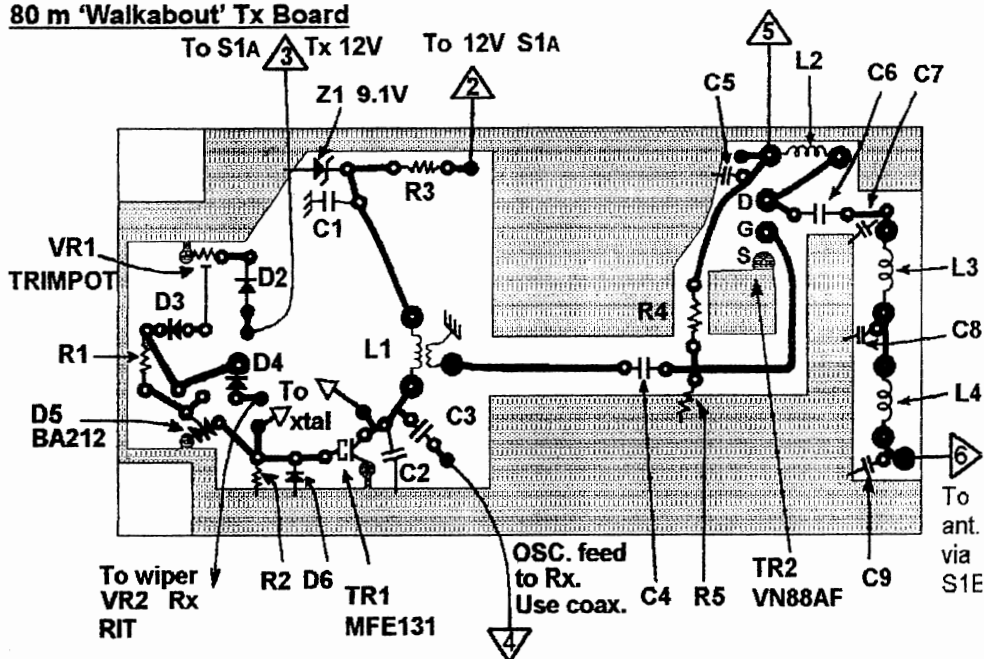
**Rx** - None other than the G-QRP Club 'Sudden' receiver in a different form. In Rx mode the bias to the varactor diode D5 (on Tx board) is adjusted by the panel RIT control VR2. The receiver IC1 is followed by a preamp TR1, an active audio filter IC2 and an audio amplifier IC3 intended for headphones or earplug.

As this is a project where space is a major consideration, part numbers of suitable components available from major suppliers have been given to assist other constructors. Always try to get the smallest size components.



**Assembled Rig**

## 80 m 'Walkabout' Tx Board



COMPONENT PLACEMENT - Viewed from top as though board is transparent. Board is a double sided PCB, 110 mm x 55 mm; track layout on underside.

Notes:

1. D1 is not on board. Mount on VR2, insulate with spaghetti and run to S1A  $\triangle 1$ .
2. PCB is double sided board, top layer to be linked to under side earth plane. Some components can be earthed to top plane where necessary.
3. Pad for TR2 source to be earthed to top ground plane.
4. Drain of TR2 to be insulated from any earth contact - mounted on top side of board.

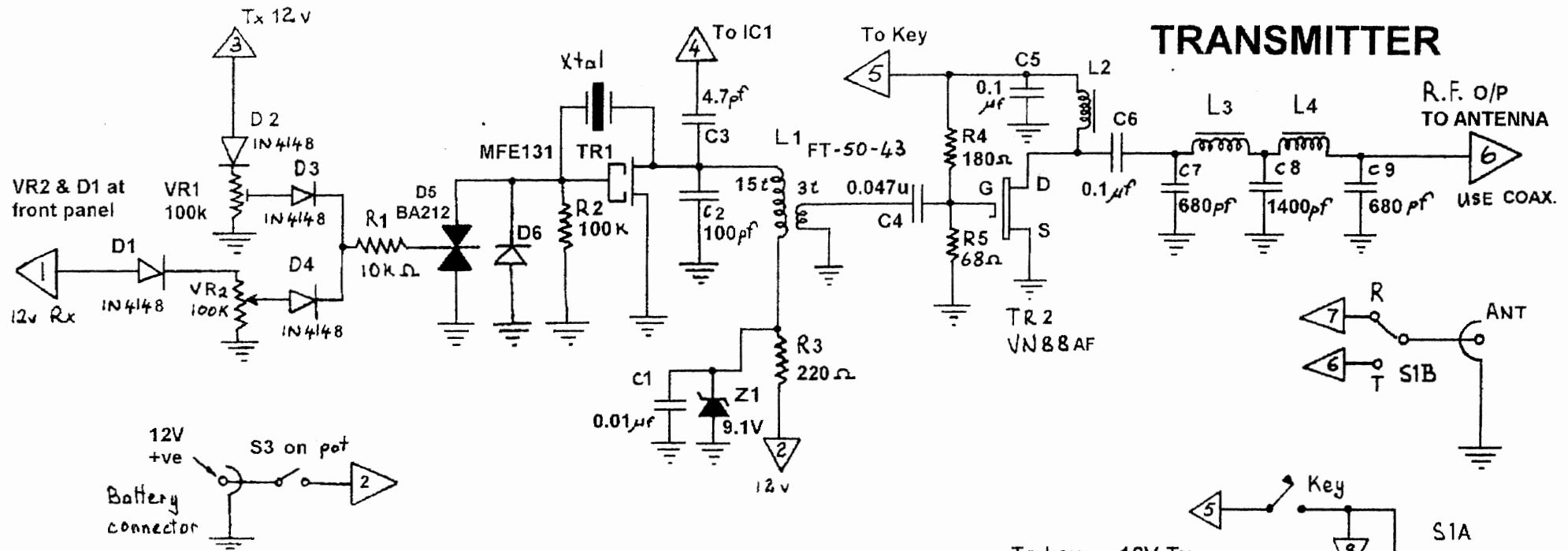
### Suggested Assembly Procedure

1. Cut and shape boards.
2. Mark out, drill mounting holes in top panel and assemble board/stand-off sub-assembly.
3. Fit together, ensuring there is sufficient space for the battery and aerial jacks.
4. Etch boards, drill and fit components.
5. Fit top panel components and wire up.

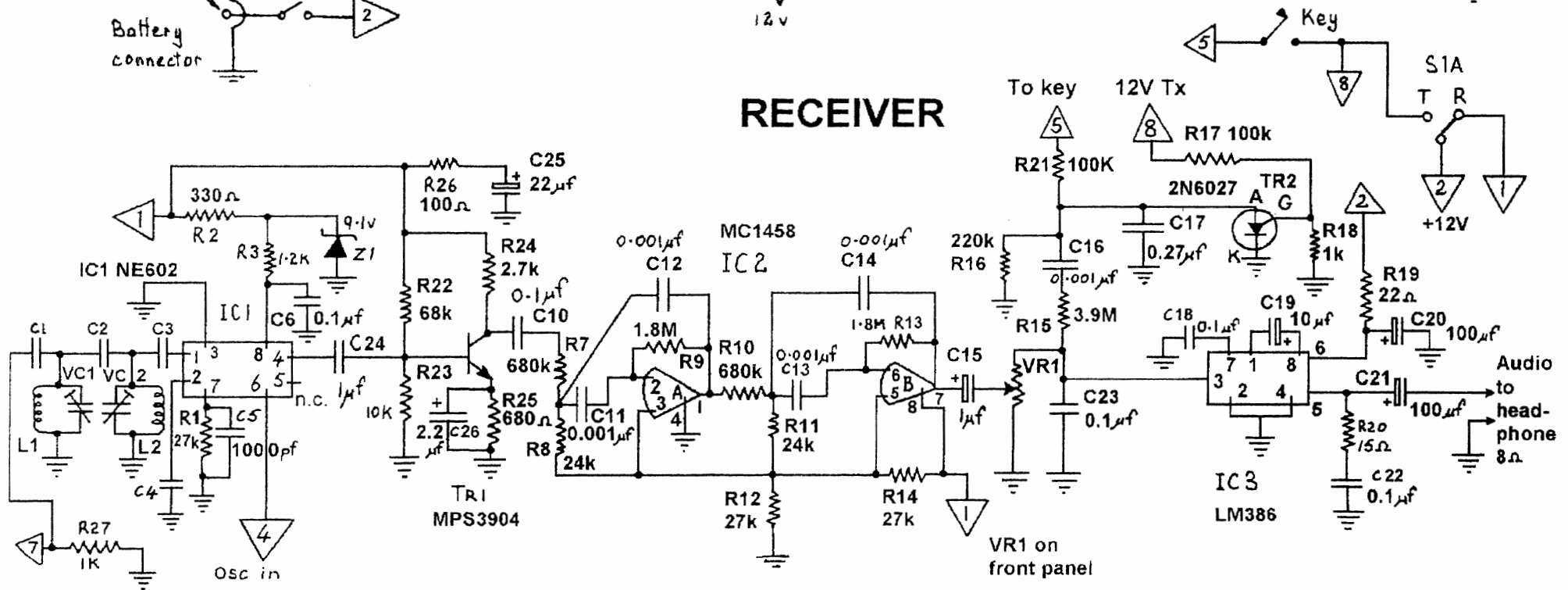
Use RG-174 miniature coax for all RF cabling and shielded leads for all audio interconnections.

After final assembly check wiring, power up and adjust VR1 on Tx board (key down) for maximum power output and reliable oscillator starting. The receiver is aligned by adjusting VC1 and VC2 for maximum signal output.

*Continued on next page ...*



## RECEIVER

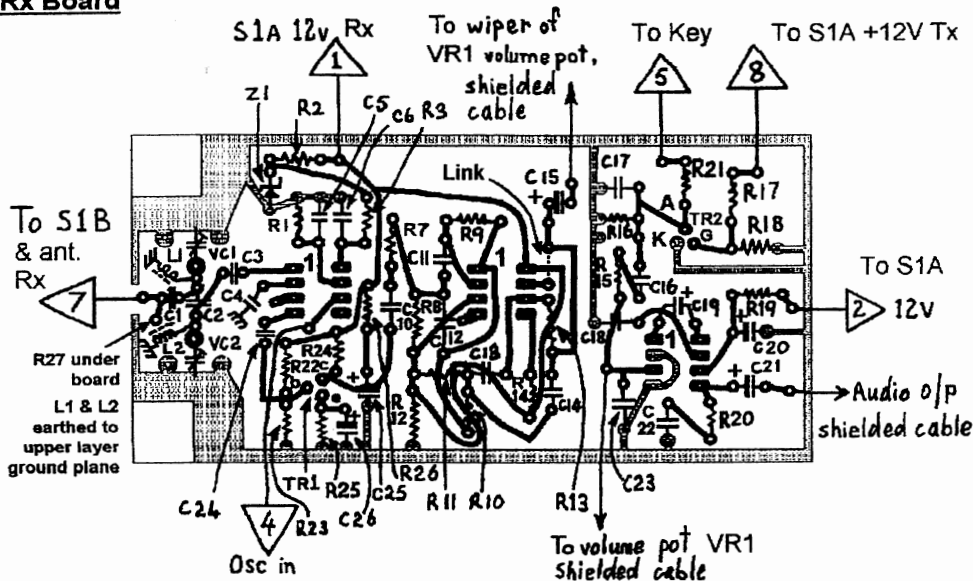




... 'Walkabout' txvr continued

80 m 'Walkabout' IC1 NE602 IC2 MC1458 IC3 LM386

Rx Board



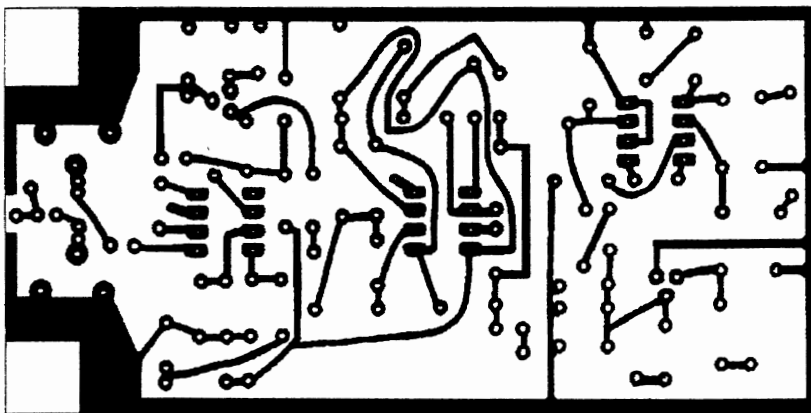
COMPONENT PLACEMENT - Viewed from top as though board is transparent. Board is a double sided PCB, 110 mm x 55 mm; track layout on underside.

Notes:

1. Link upper ground plane to lower ground plane.
2. Where necessary, components can be earthed on upper ground plane.
3. IC1 pin 3, IC2 pin 4 and IC3 pins 2 & 4 are earthed.
4. Link pin 7 of IC2 to C15.

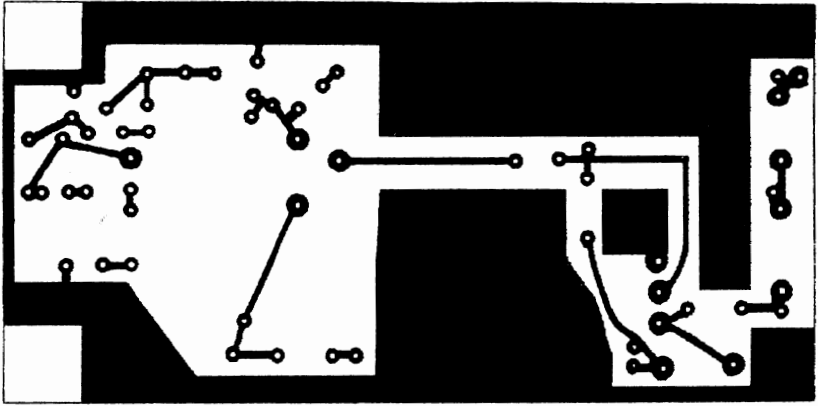
'Walkabout'  
Rx Board -  
Track Side

10 mm

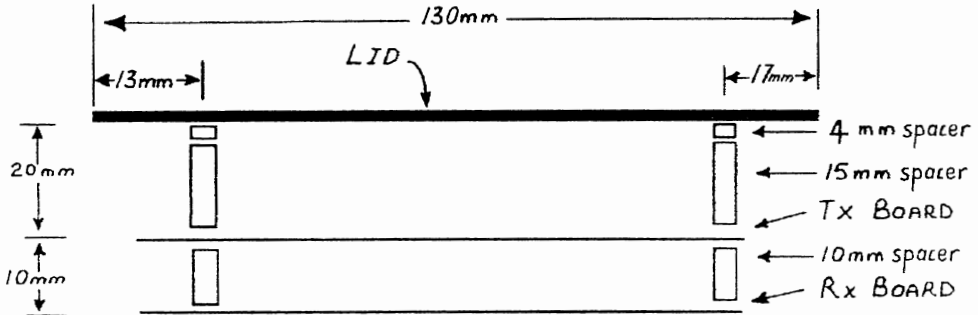


**'Walkabout'  
Tx Board -  
Track Side**

10 mm



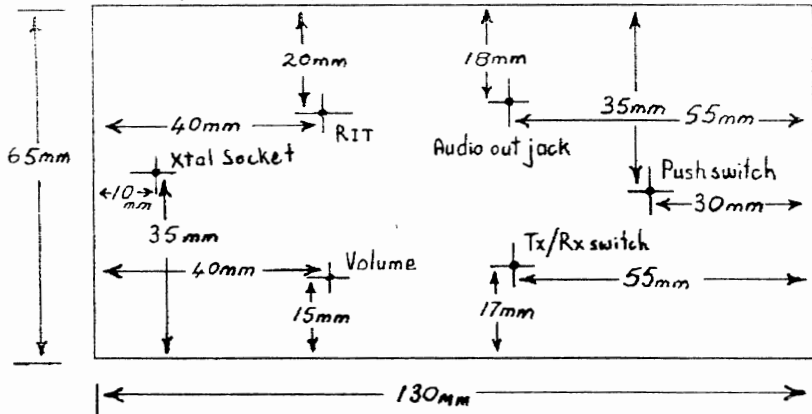
**'Walkabout' Chassis Assembly**



Should the 4 mm spacers depicted not be available, cut 25 mm spacers [Jaycar HP-0907] to size; 20 mm should be OK for Tx components.

To join Tx and Rx boards use 15 mm x 3 mm screws with the heads cut off [Jaycar HP-0406]. Each PCB is 110 mm x 55 mm.

**'Walkabout' Top Panel Layout**



**Cont.  
next  
page**

... **'Walkabout' tcvr continued**

A small piece of circuit board, 30 mm x 20 mm is glued to the push switch to aid keying. A drop of WD40 will free up the push switch mechanism. Some constructors may wish to devise their own keys.

For an aerial I made up a dipole using lightweight wire, plastic insulators and fed with RG-174 coax.

The set is powered by a 12 V sealed gel battery.

. o O o .

**'Walkabout' Tx Board Parts List**

**Semiconductors -**

- D1,D2,D3,D4,D6 1N914 or 1N4148 diode
- D5 BB212 varactor diode [DSE Z-3125]
- Z1 9.1 V 400 mW zener diode
- TR1 MFE131 MOSFET transistor
- TR2 VN88AF MOSFET transistor [QRP Club]

**Inductors -**

- L1 FT-50-43 toroid Primary 15 turns 0.55mm [24 swg] enamelled wire; secondary 3 turns multi strand hook-up wire over drain end of primary
- L2 T-50-2 toroid 29 turns 0.55 mm [24 swg] enamelled wire
- L3,L4 T-50-2 toroid 19 turns 0.633 mm [23 swg] enamelled wire

Toroid cores available from the QRP Club

**Capacitors -**

- C1 0.01 uF greencap
- C2 100 pF disc ceramic
- C3 4 to 6 pF ceramic
- C4 0.047 uF ceramic
- C5,C6 0.1 uF 63V disc ceramic
- C7, C9 680 pF styroseal
- C8 1 400 pF styroseal

**Resistors -**

- R1 10 k
- R2 100 k
- R3 220 Ω
- R4 180 Ω
- R5 68 Ω

- VR1 100 k trimpot horizontal mount

**'Walkabout' Rx Board Parts List**

**Semiconductors -**

- TR1 MPS3904 [2N3904] transistor
- TR2 2N6027 unijunction transistor
- IC1 NE602 double balanced mixer
- IC2 MC1458 dual op amp
- IC3 LM386 audio amp

**Inductors -**

- L1,L2 Philips 4C6 toroid [violet] 6 mm o.d., 30 turns 0.17 mm or similar enamelled wire [QRP Club]

**Capacitors**

- C1,C3 68 pF
- C2 5.6 pF
- C4 10 nF
- C5,C11,C12,C13,C14 1 000 pF polystyrene

C6,C10,C18,C22,C23

0.1 uF greencap

C15,C24

1 uF greencap

C16 0.001 uF greencap

C17 0.27 uF greencap

C19 10 uF 16V electro

C20,C21

100 uF 16V electro

C25 22 uF 16V electro

C26 2.2 uF 50V electro

VC1,VC2

5-65 pF trimmer capacitor [yellow]

Resistors -

R1 27 k

R17,R21

R2 330  $\Omega$

100 k

R3 1.2 k

R18 1 k

R7,R10 680 k

R19 22  $\Omega$

R8,R11 24 k

R20 15  $\Omega$

R9,R13 1.8 M

R22 68 k

R12,R14

R23 10 k

27 k

R24 2.7 k

R15 3.9 M

R25 680  $\Omega$

R16 220 k

R26 100  $\Omega$

R27 1 k

### Front Panel Assembly Parts List

Tx RIT control

100k linear potentiometer

[DSE R-6810]

Rx volume control

5k linear switch potentiometer

17 mm dia. [DSE R-1974]

Earphone socket

[DSE P-1231]

Tandy push switch

[Tandy 275-1547]

F.T. 243 xtal socket

DPDT Mini toggle switch

[DSE P-7656]

### Main Case and Miscellaneous

Case 130 x 68 x 41 mm

[Jaycar HB-6023 Grey]

Knobs 2 x 20 mm dia. [Jaycar HK-7762]

Battery jack

[DSE P-1661]

RCA chassis jack

[Jaycar PS-0256]

### Internal Chassis Assembly

PCB's 2 x double-sided PCB's

size 110 mm x 55 mm

Spacers

4 x 15 mm spacers, 3 mm

threaded [Jaycar HP-0904]

Spacers

4 x 10 mm spacers, 3 mm

threaded [Jaycar HP-0900]

Spacers

4 x 4 mm x 3 mm spacers from

junkbox or use 3 mm flat washers

Screws 12 x 15 mm x 3 mm screws

[Jaycar HP-0406]

Washers

12 x 3 mm flat washers

[Jaycar HP-0430]

### Cabling

Audio Shielded twin cable

DSE [W-2039]

R.F. Use RG-174 mini coax

[QRP Club]

Hookup wire



# HOME BREW WITH DREW

A LIST OF ARTICLES WRITTEN BY DREW DIAMOND VK3XU #49

Prepared by Don Callow VK5AIL #75

[Available on disk - See Kit-Set Centre column]



This list of Drew's published articles is an update of the version by **Rob Gurr VK6RG** in Lo-Key #22 June 1989 p.26. Helped by the generosity of several Club members, I have copies of the full set. *If you find errors or have suggested amendments or other information that could be shown, please let me know.*

Drew's articles in Amateur Radio magazine provide a valuable contribution to Amateur Radio home brewing. Drew often mentions that he is prepared to respond to queries about his projects - please enclose a S.A.S.E. when you write to Drew at: "Nar Meian", Gatters Rd., WONGA PARK, Victoria 3115.

## AMATEUR RADIO ACTION

Vol.2 No.11 p22 Incredible Noise Cancelling Antenna

Mar '83 p11 A "Square-One" Receiver - Part 3

Apl '83 p33 A Sensitive SWR Meter [See Lo-Key #19 p.3. Club Kit-Set K006]

## AMATEUR RADIO

Letters after year: 'n' = article is in the Novice Notes column; 'c' = subject of a cover photo.

Dec '83 p24 'Square-Two' Converter

Mar '84 p14 High Performance Direct Conversion Receiver Part 1

Oct '73 p10 A VFO for 5-5.5 MHz [Drew was then VK3ANU]

Apl '84c p10 High Performance Direct Conversion Receiver Part 2

Nov '75c p15 QRP CW Rig for 7 MHz

Mar '85 p14 DSB/CW Transmitter for 80 Metres

Oct '76 p9 A Method of Reducing HV Power Line Noise

Dec '85n p34 Basic Metalworking - "Chassis Bashing"

Sep '80c p8 Five-Watt CW Transmitter [Single band 3.5, 7, 14 or 21 MHz]

Feb '86n p37 Starting a Radio Electronics Workshop

Jul '81 p28 Home-Brewer's Linear Amplifier for the 3.5, 7.0, 14, 21 and 28 MHz Bands

Apl '86n p20 Four-Watt CW Transmitter for 80 Metres

Aug '81 p11 Direct Conversion Receiver for 3.5, 5 or 7 MHz

Jun '86n p24 The Open Wire Feed, HF Multi-Band Dipole [Correction in Jul '86 p9 under heading "Jumbled? ? ?"]

Oct '81 p7 QRP Solid State Linear Amplifier for HF

Sep '86n p34 Direct Conversion Receivers - Here to Stay

Dec '81 p12 QRP CW Transmitter with Break-In - Part 1 [Multi-band 1.8, 3.5, 7, 14 MHz]

Oct '86n p16 DC86 Direct Conversion Receiver for Eighty Metres

Jan '82 p5 QRP CW Transmitter with Break-In - Part 2

Mar '87n p22 Some Troubleshooting Tips

Feb '82 p8 QRP CW Transmitter with Break-In - Part 3

May '87n p27 Cheap Radio - The "Junk Box"

Jan '83 p8 A Square-One Receiver

Sep '87n p30 Converting the DC86 VFO

Feb '83c p14 A "Square-One" Receiver - Part 2

Oct '87n p34 A Crystal Calibrator and Signal Source

Nov '87n p20	Quartz Resonators (Crystals)	Aug '91 p7	"Handybridge" Impedance Bridge for HF
Jan '88n p45	Some Practical Tips of VFO Construction	Dec '91 p8	Multiplier CW Transmitter for 3.5/7/14MHz [Correction in Feb '92 p49 under heading "Murphy's Corner"]
Feb '88n p30	A Handy Quartz Crystal Checker	May '92 p8	DC91 Direct Conversion Receiver for 80m
May '88n p26	Measuring Small Coils and Capacitors with a Dip Meter	Jun '92 p17	"Computarock" HF Receiver [Correction in Aug '92 p24 under heading "Murphy's Corner"]
Oct '88n p6	MOSFET Power Amplifier for 1.8 to 10.1 MHz	Aug '92 p8	HF Band CW Transmitter From Junk-Box Parts [valve]
May '89n p30	A Simple Impedance Bridge	Sep '92 p30	A Simple Tuning Dial from Junk Box Parts
Nov '89 p10	'MOSFET-4' VFO CW Transmitter for 80m	Nov '92 p11	"Little-L" Inductance Bridge for RF Coils
May '90c p8	Superhet-DC Receiver for 3.5 to 4.0 MHz [Correction in Jun '90 p15 under heading "Errata and Addenda for DC Superhet"]	Apl '93 p3	An RF Power Meter Load [with notes on PEP]
Jun '90 p12	A Simple Dip Meter	Mar '93 p13	Making Simple Circuit Boards
Nov '90 p10	'Fonelist' SSB/CW Transmitter for 80 Metres	May '93 p19	HFC Regulated Variable Voltage Power Supply
Jan '91 p7	25W Mosfet Linear Amplifier	Jun '93 p24	"Simplex" Sideband Transmitter for 3.580MHz
Jun '91 p9	"Computarock" Receiving Converter [Pre-Selector idea in Oct '91 p7, from R. McGregor VK3XZ]		

**Postscript:**

After starting on this article early in 1993 I was very pleased to see the Wireless Institute of Australia give Drew some well-earned recognition in the form of it's Amateur Radio magazine annual Technical Award. Good one, Drew!



Happy New Year

**Amateur Radio Awards**

At the Publications Committee meeting held on 1st December 1992, the annual Amateur Radio awards were allocated.

**AI Shawsmith Award for Journalistic excellence**

**Technical Award** — Drew Diamond VK3XU — for a number of high quality technical articles. Drew consistently provided a first class presentation of his material, including high grade drafting of the diagrams. His articles required little or no editing.

**Higginbotham**

23 CW Operators' QRP Club

# QRP KIT-SET CENTRE

Don Callow VK5AIL #75 5 Joyce St. Glengowrie S.A. 5044  
Telephone [08] 295 8112 [day/night]



## PRICES UP

C039 **RG-174 mini coax** cable 50 ohms. Now \$2.00 a metre.

Purchased another 100m roll to replace the one bought early in 1990, to help those who can't locate this item. Difficult to find a retail source in Adelaide. DSE has teflon dielectric high quality RG-178 for about \$3 a metre [W-2088].

**SPECIAL - if you order before 1 August I will supply offcuts (minimum length 100 mm) & pieces salvaged from new wiring looms for 70¢ a metre.**

C070 **BF960** Low noise UHF DG Mesfet. Now \$2.40 for 2 transistors [with data].

C0030.1uF [104] mono. capacitors Now \$2.50 for 10. Still very cheap.

C008 **VN88AF** MOSFET. Now \$4.90 for C008H **ONE transistor with hardware & data** or \$4.30 for C008T One transistor without hardware or data. Our price has been about one-fifth that of the only known VK5 retail supplier, but now the stock we obtained at a very low price in the late 1980's has gone.

## NEW ITEMS ON THE LIST

C112 **Amidon FT-50-43 ferrite toroid**. 13 mm [1/2"] outside dia. \$1.70 each.

C111 **MC3362** Low-Power Narrow-band FM Receiver IC [& data]. \$3.40 ea.

C071 **LF356** JFET input wide band op amp. Used in mic amp of VK3XU Drew's 'Fonelist' SSB/CW transmitter for 80 metres [AR Nov '80 p.10]. \$2.00 each.

C072 **Voltage regulator 8V2** 100mA UA78L82AWC TO-92 case. These are useful for supplying circuits using such components as NE602, LM386, MC1350, if you don't want to be limited to the usual 5 or 6 volts. Not easy to find. \$1.35 each.

C089 **RCA [phono] line plug** with plastic cover. Available in red and black. 40¢ each.

C110 **DC power socket**, panel mount, open frame type, 2.1 mm [nominal] pin diameter. 50¢ each.

**C090 Club Files Addition** - Add DREW.TXT 4K to the list. This is a text version of the list of articles by Drew Diamond VK3XU #49, published elsewhere in this Lo-Key.

## New Bonus Bits

See Lo-Key #37 p.22.

F012 **Capacitors 0.05 uF** disc ceramic [10nbr] 20% 12 mm diam. [E3693]

F013 **Capacitors 18 pF** NPO disc ceramic [5nbr] 350V 7 mm diam. [pelmet]

## DELETED ITEMS

C045 **SBL-1 double balanced mixer**

C001 **500uA edge meter**

*The stock available for several years is now gone [at last !] But a search for 're-placements' was not entirely fruitless ...*

## 'BE QUICK' SPECIALS ! = New Panel Meters =

A few new panel meters are available at a good discount below the normal retail prices. All are of the moving coil, DC type. It would help if you set priorities in case you miss out on your first choice. Any \$\$ left over will be recorded to your credit by our Club Treasurer.

¶ **Kyoritsu KM-86 50 uA fsd**. The whole front is clear, 86W x 78H [70 mm dia. hole]. \$20.00 each. Only 3 available. 50 uA meters in this pattern and size are very difficult to find. Only price seen was about \$55, which is incredible !

¶ **Minnipa MU65**. Lower front is black, 100W x 82H [65 mm dia. hole]. Normal retail prices seen are \$23 - \$25.

§ 50 uA fsd. Damaged - has a tiny crack [difficult to see] in bottom left corner. One available, \$13.00.

§ 20V fsd. Damaged - has a 1 cm long crack at top corner of clear face. One available, \$7.00.

§ 1 mA fsd. Damaged - has a 2 cm long crack at top corner of clear face. One available, \$6.00.

¶ **Minnipa MU45.** Lower front is black, 57W x 53H [45 mm dia. hole]. Normal retail prices seen are \$18 - \$19.

§ 1 mA fsd. One available, \$12.00.

§ 50 uA fsd. One available, \$12.00.

## PCB SOURCE

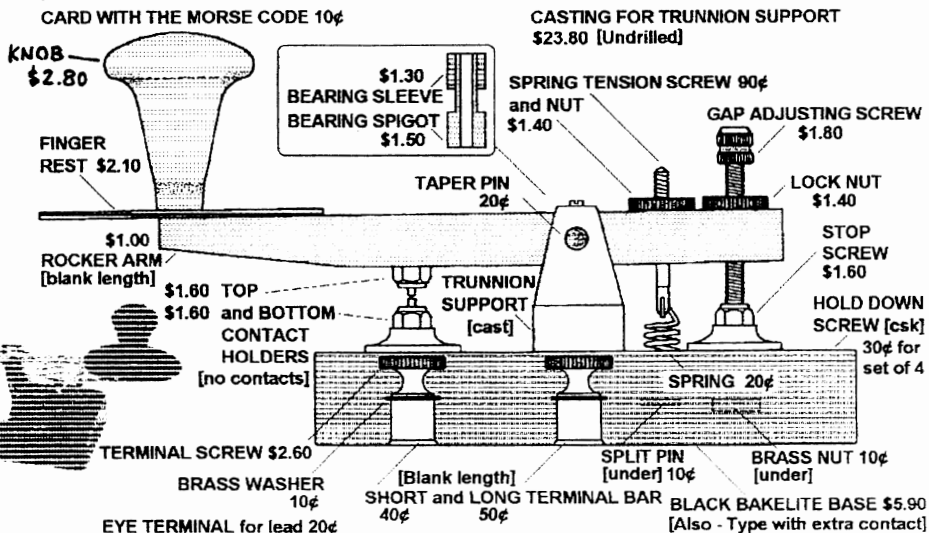
**Fred Bonavita W5QJM #31** often sends me letters with useful pieces of information, articles and ideas. One such arrived in April, with an order form and catalogue dated 28 Dec 1992 with prices [\$US] of printed circuit boards available from FAR CIRCUITS, 18N640 Field Court, Dundee, Illinois 60118 U.S.A. The

CARD WITH THE MORSE CODE 10¢

catalogue includes many PCB's for projects from: QST magazine, 73 Amateur Radio Today mag., Ham Radio mag., ARRL Handbooks 1990 & 1992 editions and QRP Classics, W1FB's Design Notebook [ARRL] and the 1991 edition of QRP Notebook. There are also a few from several other magazines: QRP Quarterly, QEX, CQ, Communications Quarterly, Fun Radio [not available in VK?]; also from several Motorola Application Notes.

Fred mentions that "FAR makes an excellent board, and they now add silk-screened parts placement overlays."

If you would like more information about this please send me a SASE [same size as your Lo-Key envelope]. Do it now before the information is out-of-date.



## CLIPSAL 'BRITISH POST OFFICE PATTERN' MORSE KEYS AND PARTS NOW AVAILABLE

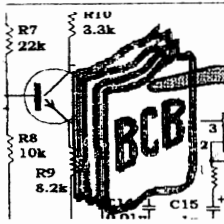
To assist CW'ers who wish to repair these keys or put aside spare parts for the future [or even construct a classic new key], I intend to place a 'once only' order for parts. Manufacture of parts for these keys stopped about five years ago [and the bakelite plant is gone]. The diagram shows most of the parts that are available. Order what you want **NOW**, [before end of July] as I intend to do this exercise **ONCE** only, to minimise prices and time.

**Late [Good] News:** Advice just received is that a small batch of 4 Model 610 and 3 610A keys have been manufactured. I will try to get **two of the normal 610's** at about the time Lo-Key is printed - **Price is expected to be \$A 89.00.** The double contact 610A's will be \$A 99.00, but I will not keep stock of these. I apologise in advance, in case I cannot get them at all [or hold the price given].

E. & O.E.







# BOOMERANG CIRCUIT BOOKS

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

Here are the current BCB circulation lists. An asterisk \* in front of your name indicates that you will be sent all future BCB's [one or two a year]. **BCB #2** is doing the rounds again for the benefit of newer members; this one was originally set up by Norm Lee VK5GI #139.

*If you are in VK and wish to go on the list for any of the BCB's please let me know.* I have a list of those who have seen the BCB's previously, in case you can't remember. You pay the postage to the next member [\$2.65 interstate or \$2.00 intrastate].

## BCB #2 - 3rd flight [current]:

- \*Greg VK1NGD
- \*Ray VK2COX #226
- \*Murray VK3JHX
- \*Ray VK3NCM #263
- \*Edward [SWL] #280

## BCB #2 - 4th flight [later]:

- \* Lex VK3SSB
- \*Jack VK2AY #309
- \*Warren VK2FKU #216

## \*Daryl VKJ7DMJ #242

- \*Leith VK5LG #154
- \*Alan VK2KW #249

## BCB#3 - 6th flight [current]:

- \*Ray VK3NCM #263
- \*Edward [SWL] #280
- \* Lex VK3SSB #254

## BCB #3 - 7th flight [later]

- \*Jack VK2AY #309
- \*Daryl VKJ7DMJ #242
- You ?

## BCB #4 - 3rd flight [current]

- \*Jack VK2AY #309
- \*Warren VK2FKU #216
- \*Lex VK3SSB #254
- \*Leith VK5LG #154

## BCB #4 - 4th flight [later]

- \*Daryl VKJ7DMJ #242
- \*Alan VK2KW #249
- You ?



# CAN U HELP ?



During the last year or so several members, the most recent being **Tuck Choy VK3CCA #300** [7 Rees St., Burwood, Victoria 3125], have asked if our Club could assist in locating sources of QRP calling frequency crystals at a reasonable price. Of course individual crystals can be ordered, but the prices are too high for many people, especially if you want to operate on most of the HF bands.

By Don Callow VK5AIL #75  
5 Joyce St. Glengowrie SA 5044  
Telephone [08] 295 8112 day/night

By coincidence **Bill Kelsey N8ET #264** of **Kanga US** [3521 Spring Lake Drive, Findlay OH 45840 U.S.A.] mentioned in a recent letter that he has a stock of standard QRP frequency crystals - 3560, 7030, 7040, 7110 [US Novice], 10106 and 14060 kHz at \$US 5.00 each, plus \$US 3.50 shipping charge "should cover it".

**If you have crystals of the 'right' frequencies available or know of a source with stocks [particularly in VK], please let us know.**



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The use of capital letters generally indicates that the actual title of an article is given.  
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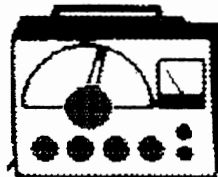
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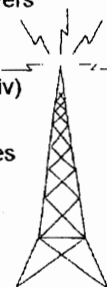
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### U Can Help !

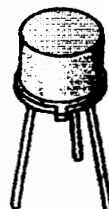
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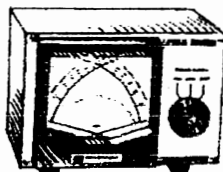
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. o o o .



## SILENT KEYS

We regret to inform Members that  
**Ted Walton VK4ATZ #94**  
 of Kippa Ring, Queensland  
 became a Silent Key on 13 May 1993  
 and  
**Jim Reid VK3VAG #215**  
 of Wendouree, Victoria  
 became a Silent Key early in June 1993.

**EXECUTIVE COMMITTEE**

Treasurer & Membership Secretary

Kevin Zietz VK5AKZ #43  
41 Tobruk Ave. St Marys SA 5042  
Packet: VK5AKZ@VK5TTY  
Membership enquiries and applica-  
tions. 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.  
Membership enquiries.

**GENERAL INFORMATION**

Yearly subscription, due January:

Aust. \$A10 N.Z. \$A12 DX \$A14

QRP calling frequencies (kHz)

1 815 3 530 7 030 10 106

14 060 21 060 28 060

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 publica-  
tion and to refuse acceptance of material  
without specifying a reason.

**§ MORE 1993 SCRAMBLES §  
AWARDS & CONTESTS MANAGER**

**Ian Godsfil VK3DID #112**

25 Monaco St. Parkdale Vic. 3194

(More details on page 4)

**#27 Thu 15 July - 40m**

**#28 Sun 25 July - 15m**

**#29 Thu 26 Aug - 20m**

**#30 Sun 29 Aug - 10m**

**§ CW NET (QRP) §**

**Ted Daniels VK2CWH**

Tuesday nights from 0945 UTC  
3529kHz or lower if QRM

**§ SSB 'NATTER NET' §**

**Steve VK5AIM's roster**

Friday nights from 1030 UTC  
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 would like to apply for member-  
ship of the CW Operators' QRP Club.

Enclosed is the annual membership fee of:

\$A 10 for VK Members or

\$A 12 for ZL Members or

\$A 14 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*. Note that the annual fee is due on  
1 January each year, not on your  
anniversary of joining.