Promoting Low Power CW Mode Communication and Homebrewing in the Amateur Radio Service

March 1993
Issue No. 37

Lo-Key

The Journal of the CW Operators' QRP Club

Vale **C. Northcote Parkinson**

English historian; author of books on historical, political and economic subjects; renowned for his incisive humour, directed at government and business.

Parkinson's Law:
"Work expands to fill the time available for its completion"

Editor: Don Callow VK5AIL #75
5 Joyce St., Glengowrie SA 5044

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KEVIN'S KOMMENTS

By Kevin Zietz VK6AKZ #43 Treasurer and Membership Secretary
41 Tobruk Ave. St. Marys SA 5042 Australia

WELCOME TO NEW MEMBERS:

280	SWL	Edward SMEDA	Elthan VICTORIA
281	VK5TL	Tom LAIDLER	Glandore SOUTH AUSTRALIA
282	SWL	Keith HAWKINS	Tumbi Umbi NSW 2261
283	N9BDL	Lee ANDREAS	Lake Tomahawk WISCONSIN USA
284	VK6KDC	Darrell CHURCH	Manjimup WA 6258
285	VK2BNX	Bert ALLEN	Glenmore via Camden NSW 2570
286	VK3ALR	Geoff HIPWELL	Park Orchards VIC 3114
287	VK2GJS	Greg SMITH	Merewether Heights NSW 2291
288	SWL	Bob MORGAN	Echuca VIC 3564
289	VK3MIJ	David BENNETT	North Ballarat VIC 3350
290	VK2FW	Ray L DAVIES	Orange NSW 2800
291	SWL	Nic SMELT	Mt Gambier SA 5290
292	VK3EHZ	John BEDWELL	Mooroolba VIC 3138
293	VK2CAF	John WHITE	Moss Vale NSW 2577
294	SWL	Robert WILKINSON	
295	SWL	R. MOORE	Narangba QLD 4504
296	VK6BR	Barrie FIELD	Innaloo WA 6018

WELCOME BACK TO:

132	PA3ELD	Jan VISSER	Amsterdam HOLLAND
139	VK5GI	Norm LEE	North Adelaide SA 5006

If you receive an account with this issue it means that I have not yet received a response to your DECEMBER 1992 account. This is a reminder for OVERDUE subscriptions, either full year or pro-rata adjustments, to extend membership to 31/12/93. We try to bring everyone to this date to make the budget estimates easier.

I have again been kept very busy, even more than usual, due to family commitments, car problems, hot water service problems, and a FLOOD of club mail - it all seems to come at once! The good side of this is that most members have sent in their membership renewals - and they must also be encouraging new members as we are still seeing quite a few fresh applications for membership.

By the way, statistics show that our average rate of increase has been better than 13% a year for the last four years or so - very pleasing.

Missing Member ! We need an address for Martin Reece VK6BER #211, as Martin's December Lo-Key has been

Continued opposite ...

CLUBTIVITIES

By Don VK5AIL #75

ON AIR Greg Davis VK1NGD #250, QTH Australian Capital Territory, has now joined the happy band [excuse the puns] of 'transmitters'. *Congratulations, Greg!*

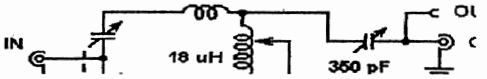
UPGRADE Brian Cooper VK5BSC #145 is a winner, having recently upgraded from VK5PAS. Brian's QTH is in the mid-north of South Australia at Peterborough.

THE MORE THE MERRIER Several of us are active in 'signing up' new members to our Club and no doubt others are helping to increase numbers, too. **Keith VK6KC #25** has introduced two or three recently and by the time you read this **Merv VK3ADX #85 and Bob VK3BNC #53** will have represented QRP and this club at the **Bendigo Hamvention**. They were very thorough in preparing for this event, so it should be a winner. We hope to get some brief notes for June Lo-Key.

BY BUS2 THE WEST ? Chris Proud VK2BUS #233 went about as far west as you can go [on dry land] recently. Chris writes "... had the pleasure of meeting **Peter VK6BWI and Rod VK6KRG** when in Perth this last November, and seeing their homebrewing projects. For me it was a very memorable visit."
Knowing how much homebrewing Rod and Peter have done, it must have been a long visit, too !

returned to us. Enquiries so far have been unsuccessful. We hope he's only gone on holidays to a remote Pacific island for some QRP/CW DX'ing.

73 Kevin VK5AKZ COQC



PACKET RACKET Lindsay LaPouple VK3DXH #47 is one of several members who are 'on packet' or heading that way. Lindsay's Home BBS is VK3BBS and he writes:- "... would like to see other members indicate if they are on Packet and have a home BBS, where messages could be sent to if necessary. Perhaps such details could be shown in Lo-Key and included in the membership list when the list is again published."

If you would like your details listed please send them to me [VK5AIL]. Depending on the response received and on what you desire, we will either print them in Lo-Key or include in the Membership List or just pass them on to Lindsay.

QRP ACHIEVER Greg Smith VK2GJS #287 is a new member who is also involved with the **Westlakes A.R.C.** Greg mentioned in a letter that the long distance record holder for the 1 watt xtal controlled Tx his club sells is none other than our **Garry Cottle VK2AGC #121**. See Lo-Key #23 p11 & #24 p12 for details of the rig.

"BEST BENT WIRE" Reg Bedford VK3BPG #7 told us he heard Greg VK2GJS or a friend in a CW QSO sending the R.A.F. test piece: "BEST BENT WIRE", which you will agree is quite a useful phrase for morse practice.

'CAN OF WORMS' DEPT. Alan VK2ACN #182 contributed this item on the origin of the term 'ham' as a description of an Amateur Radio operator. The truth is probably lost in time, but here is an extract from the 'Correspondence From Members' column of **QST** September 1965:

Continued on page 14 ...

The Minicom Superhet Receiver

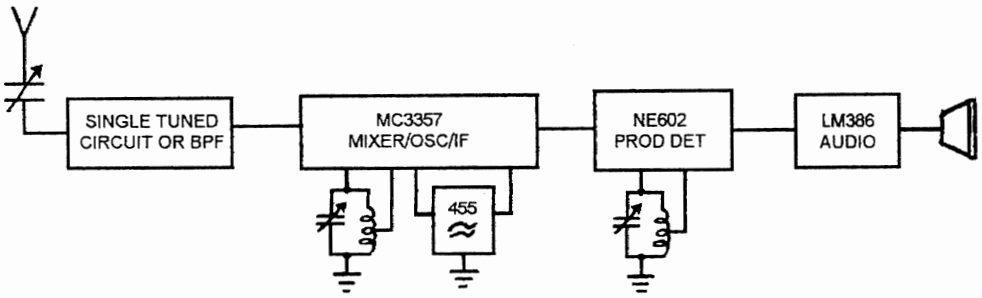
By Basil Dale VK2AW #180

CONCEPTS

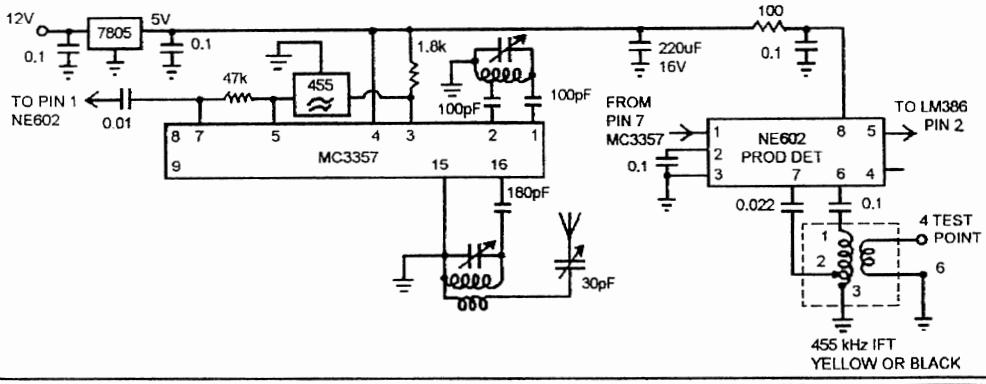
An outline of a simple minimum components receiver for amateur communications was given in LO-KEY No. 35 September '92 [1]. This receiver is based on articles in QST [2] and SILICON CHIP [3] but uses the Motorola integrated circuit 16-pin MC3357 instead of the 18-pin MC3359. The MC3357 contains a mixer, an oscillator which can be configured with external components as a Colpitts, a Hartley or crystal controlled, and five stages of IF (limiters). The other features of the chip, the quadrature detector, audio stage and squelch are not used. An on-chip audio filter is available and details are given in case its use is desired.

The MC3357 has been around for many years in use in quality FM receivers. It has one advantage over the MC3359 - there is an output from the IF (limiter) stages at pin 7 and this is important for the purposes of this receiver.

BLOCK DIAGRAM OF VERSION 1 RECEIVER, SINGLE BAND, 455 KHZ IF



CIRCUIT DIAGRAM OF VERSION 1 RECEIVER



Four versions of the receiver (dubbed "MINICOM" = **MINI**mum number of **COM**ponents) can be suggested:-

1. CW/SSB superhet for any amateur band, 455 kHz IF using a Murata or similar ceramic IF filter (or two or more in series) or multiband using plug in or switched mixer and oscillator coils;

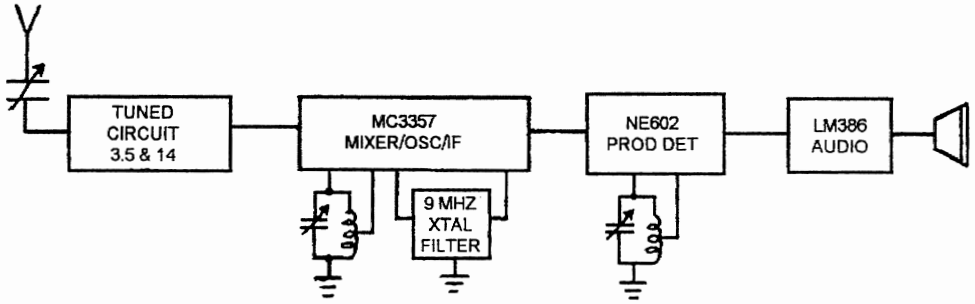
2. Dual band CW/SSB superhet, no switching, for 3.5 MHz and 14 MHz using a 9 MHz crystal ladder filter and 5 MHz on-chip oscillator (band imaging);

3. CW/SSB superhet for any single band, 9 MHz crystal ladder filter and suitable oscillator frequency e.g. 2 or 16 MHz for a 7 MHz receiver, or a multiband receiver using plug-in coils or switched coils for mixer and oscillator.

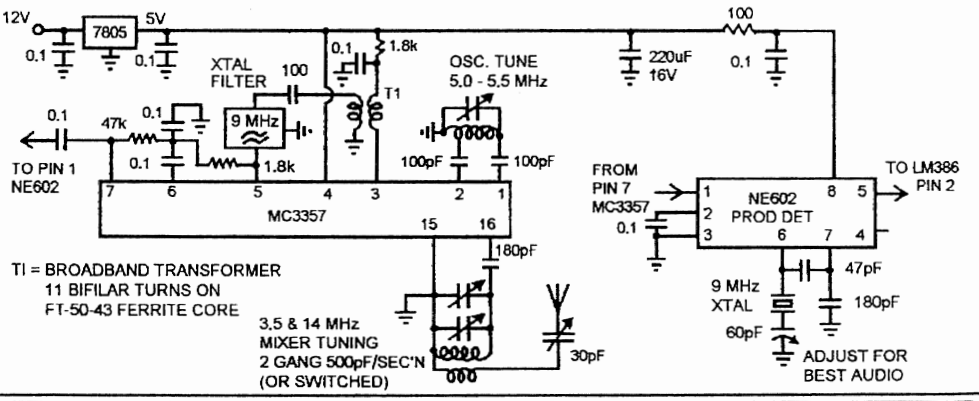
4. General coverage AM receiver for short-wave listeners, 455 kHz IF using single Murata or similar ceramic filter and a diode AM detector. Mixer and oscillator tuning could be 300 to 400 pF capacitors to give extensive coverage over desired bands.

These are very simple but effective receivers with a minimum component count.

BLOCK DIAGRAM OF VERSION 2 RECEIVER, DUAL BAND 3.5 MHZ & 14 MHZ WITH 9 MHZ CRYSTAL FILTER



CIRCUIT DIAGRAM OF VERSION 2 RECEIVER



CIRCUIT DESCRIPTION

The desired signal enters the mixer at pin 16 via a trimmer capacitor (adjusted to give the optimum signal level) and a coupling coil. Both the 3359 and 3357 ICs are susceptible to overload from strong HF signals particularly when connected to a resonant antenna or antenna via ATU. The mixer is coupled internally to the on-chip oscillator, which uses the Hartley design, by an external tapped coil. This is a stable oscillator and the capacitor across the coil (main tuning) is selected to give the required frequency coverage. Details of coil winding and capacitor values are not given, as individual constructors will have their own preferred components. The Hartley oscillator is preferred to the usual Colpitts with fixed capacitors, as these have to be changed for each frequency if a multiband receiver is required. The simple approach is to use a tapped coil (25% of total turns from ground end is usually satisfactory).

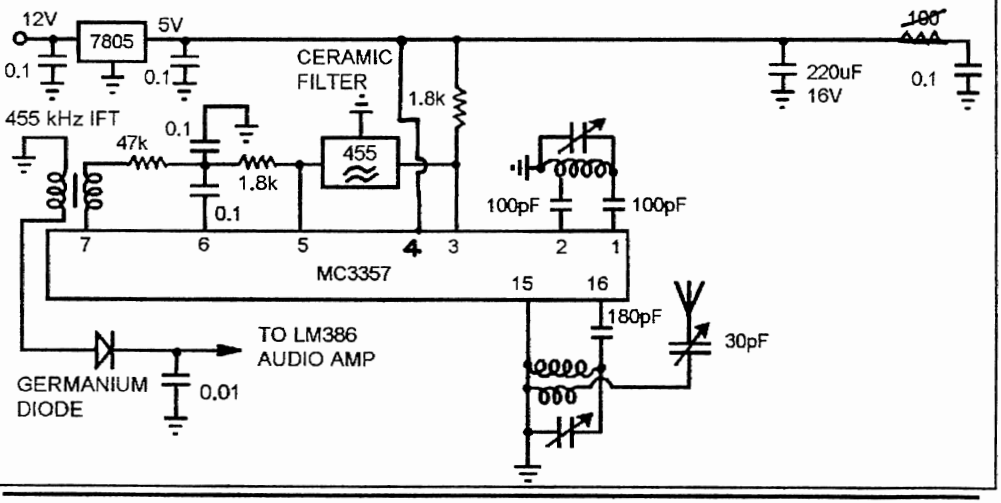
The mixer output at the intermediate frequency (IF) is taken from pin 3 to the IF

VERSION 3 RECEIVER -
ANY SINGLE FREQUENCY WITH 9 MHZ CRYSTAL FILTER

The schematic diagram is the same as Version 2 with appropriate changes to mixer and oscillator circuit constants.

VERSION 4 RECEIVER -
GENERAL COVERAGE AM RECEIVER FOR SHORT WAVE LISTENING

This version has not been built. The schematic diagram would be the same as Version 1 but with the additional circuitry around pins 5,6 and 7 (bypassing pins 5 and 6 with 0.1 uF capacitors to give increased gain) and connecting pin 7 of the MC3357 to a diode detector. The NE602 is omitted and as this has a gain of 15 db it may be necessary to increase audio gain with an extra stage. A suggested circuit is shown:



filter, the output of which connects to pin 5 which is the input to the five stages of IF. The IF output at pin 7 enters an NE602 product detector/BFO for CW/SSB versions or a diode for the AM version. The NE602 circuit is the standard configuration, using in the oscillator either a 9 MHz crystal or a miniature IF transformer (455 kHz version). An alternative for the 455 kHz version is to use an orange 2-pin ceramic resonator (Tandy Electronics) or similar which will oscillate at 455 kHz. Audio output from the 602 is taken from either pin 4 or 5 to the LM386 audio IC. When using 455 kHz IF, the gain of the 5 stage limiter is reduced to prevent overloading from strong HF signals by omitting the by-pass capacitor from pin 6 of the MC3357.

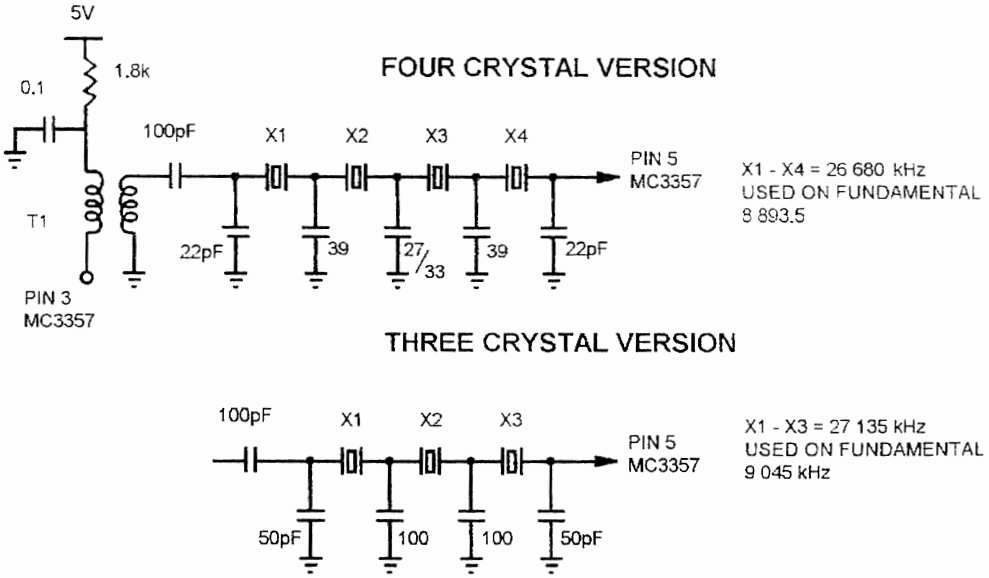
The gain of the LM386 audio IC may also be reduced if required by omitting the usual 5 uF to 10 uF capacitor between pins 1 and 8, as the overall gain of the 455 kHz version is adequate. A speaker or phones may be used. If an audio filter is desired, one is available on the 3357 (circuit shown) or a Bessell filter centred on 700 Hz [as per Reference 4] can be applied to the two inputs of the LM386.

CRYSTAL FILTER

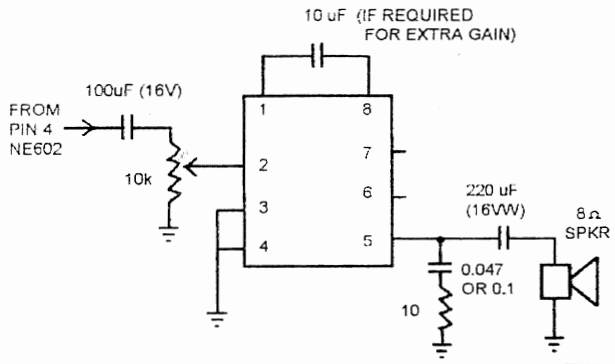
[See Reference 5] For many years, the half lattice or full lattice type of crystal filter was predominant in amateur literature. Commercial filters were (and still are) expensive and home-made filters of these types using surplus crystals required considerable work in construction and adjustment.

The advent of the ladder filter has superseded other types for amateur receivers and transmitters. It is simple to construct and requires no adjustment.

CRYSTAL FILTER DETAILS (SEE REFERENCE 5)



LM386 AUDIO STAGE USED FOR ALL VERSIONS



Colour burst TV crystals on 3.579 MHz and 4.33 MHz and computer crystals are readily available at around $3.50 each. Three or four crystals are required for each filter with another two for use as upper and lower sideband in the BFO. Details are given at the end of this article of the availability of 9 MHz crystals in matched sets at a very reasonable price, originally sourced from Rob Gurr, VK5RG. There is now no reason to avoid the use of crystal filters in receivers and SSB transmitters built by home constructors.

MIXER AND OSCILLATOR TUNING

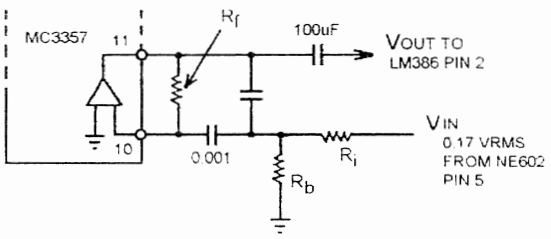
If only a small band of frequencies needs to be covered, the input tuning capacitor can be replaced by a suitable bandpass filter (as in the G-QRP Club "Sudden" receiver and the CW Ops QRP Club "Flexi-Sudden" version). Iron powder toroids such as Amidon T-50-2 and T-50-6 are suitable for both mixer and oscillator circuits. If constructor preference is for slug tuned coils, such as Neosid, these may be used provided good construction practice is observed.

CONSTRUCTION

Several methods of construction are available. The MC3357 can be mounted on a 16-pin PCB (DSE Catalogue H-5600 $1.95 page 157 1992/93 Catalogue). Alternatively, dual 20-pin IC Boards (Tandy Cat. No. 276-153 page 14 1993 small catalogue $2.99), which can be separated, have been satisfactory. The components are mounted on the copper side of the boards. The 3357 can be mounted on one board and the NE602 and LM386 on the other. If more space is desired, DSE Prototype Boards (Cat.H-5660 $4.95) or Plug-in IC Boards (Cat. H-5310 $3.95) could be considered.

Crystal filters can be mounted on a small piece of single-sided board, isolating pads being created with

OPTIONAL AUDIO FILTER (USES MC3357 - SEE REFERENCE 2)



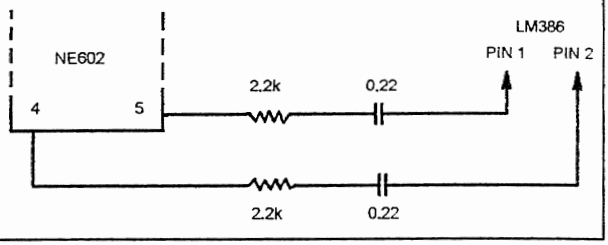
For a Q of 8 and gain of 8 at 700 Hz
R_f = 1.8 megohm R_i = 110k R_b = 7.5k

hacksaw cuts across the board. Crystals can be soldered direct to the board, using a heat sink when soldering the pins.

All the boards can be mounted at the bottom of a simple "U" chassis, the front panel taking the mixer tuning capacitor (if used), the main tuning (oscillator) capacitor, audio gain control, on-off switch and a LED indicator. On the rear panel can be mounted an RCA socket for antenna input and suitable power connectors.

If constructors have available the PCB obtained from RCS Radio for the Silicon Chip receiver [Reference 3] Code SC06112891 (this is the correct RCS code number - there was an error in the article) then this could be modified to take the 3357 instead of the 3359 as some pins are identical.

ALTERNATIVE OPTIONAL AUDIO FILTER
(USES NE602 - SEE REFERENCE 4)



POWER SUPPLY

Requirements are modest, being 5 volts regulated for the NE602 and MC3357 and 6 to 9 volts for the LM386. Some versions of the 386 will accept 12 volts (LM386-N2). A 5 volt regulator should be used in preference to a zener, as the latter can be noisy in receivers.

[National Semiconductor data: Operating Supply Voltage ranges are 4 to 12 V for LM386N-1 & LM386N-3 and 5 to 18 V for LM386N-4 - VK5AIL]

Step by step construction notes are not given, as assembly and soldering of components is straightforward.

The results obtained from this simple design should provide the constructor with a receiver suitable for amateur and shortwave listener requirements.

REFERENCES

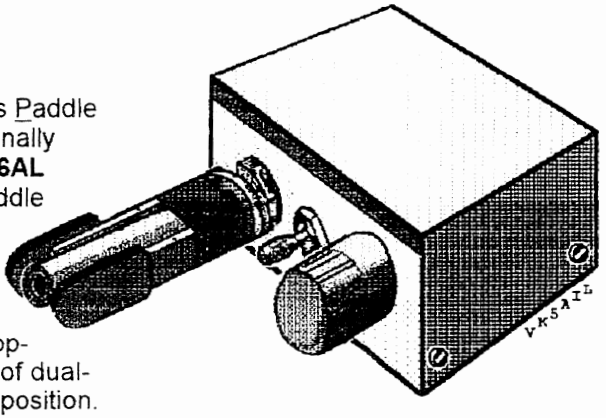
1. Receiver Notes, B. Dale, MC3357 and MC3359 Experimenting.
2. The SIMPLEceiver, Bruce O. Williams, WA6IVC, QST September 1986.
3. 40 Meter Receiver, Garry Cratt, VK2YBX, Silicon Chip, Dec. 1989.
4. Simple SupeRX, Bruce O. Williams WA6IVC, 73 Amateur Radio April 1991.
5. Single Frequency Crystal Ladder Filters, Rob Gurr, VK5RG, Amateur Radio, November 1982.

Source of matched sets of crystals - Thanks to Rob Gurr VK5RG, who has long maintained a special interest in xtal filters, we are able to supply sets of crystals already matched for use in crystal filters - see **QRP Kit-Set Centre** column in this issue. Rob has spent a considerable amount of time selecting these sets, which will enable members without crystal matching facilities to build crystal ladder filters using 9 MHz [nom.] xtals. Rob's donation, which is aimed to encourage experimentation in this field, is greatly appreciated.

COQC

THE *APEK* PADDLE AND VK5LG MODS

1. The Original APEK



The APEK - "Ambidextrous Paddle for Electronic Keyers" was originally described by **Vidi la Grange ZS6AL** in an article entitled "Simple Paddle for Electronic Keyers" in **Ham Radio** April 1978 p. 28.

It is intended for use with a battery operated electronic keyer during portable or mobile operation, where the normal type of dual-lever paddle is not a practical proposition. This design is an easy-to-use dual type and is not a separate piece of gear with an annoying lead. It is installed on the front panel of the keyer box - so does not need to be held down somewhere before use, although you still have to position the keyer. If the operating area at your QTH is crowded it could well find a permanent place there.

The APEK is built into [or is it onto?] a 1/4" stereo phone plug, so is very compact. Find a line plug with a metal body shell. Obviously you will need a matching phone socket on the front panel of your keyer, preferably not too far above table top level. If you have a different type of socket or if it is not in a convenient location on the keyer, you will have to take up Vidi's suggestion of mounting an addition jack in parallel with the original.

The APEK can be rotated in the jack to have the dot paddle at the right or left [hence the use of the term "ambidextrous" in the name] or at any angle which suits you. Just the thing if you are laying down in a sleeping bag, or even climbing half way up a cliff face !

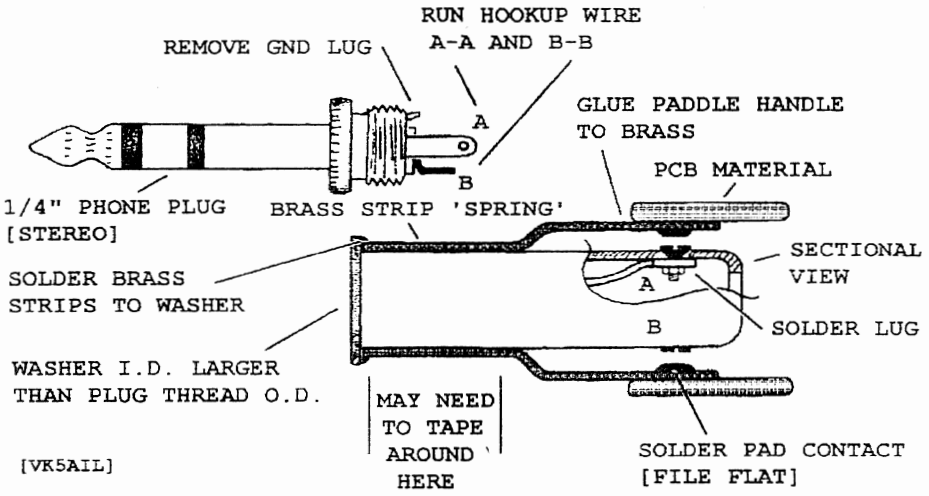
The unmodified version of the paddle is constructed as shown in the annotated sketch. The following section gives the modifications used by Leith cotton VK5LG #154.

The ZS6AL article suggests using countersunk holes in the body about 8mm from the unthreaded end. Use 2mm or 2.5mm screws to form the contact with the solder blobs.

Select paddle springs of suitable conductive material [spring brass, about 5mm x 40mm x 0.5mm thick, in the ZS6AL article] and shape as required.

Temporarily assemble the body to the plug with the washer [preferably made of brass] in position, then solder the brass springs to the washer. This is a good time to properly locate the contact screws etc.

Use sufficient lengths of stranded hookup wire to allow the two wire leads to be twisted up before assembling the body onto the plug. The wire will unwind while the body is being screwed on. Vidi ZS6AL used solder lugs on the ends of the wires.



Vidi also said that "one or two wraps of electric tape cut to the correct width should be wound onto the jack shell ... [to] ... provide the necessary damping of the otherwise too springy brass strips".

You will need to experiment to find the optimum stiffness of the paddle springs. Taping will stiffen the springs. Reduction of width will soften the action - Vidi suggested drilling a small hole at the centre of the spring width just clear of the tape edge.

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2. The VL5LG Modifications

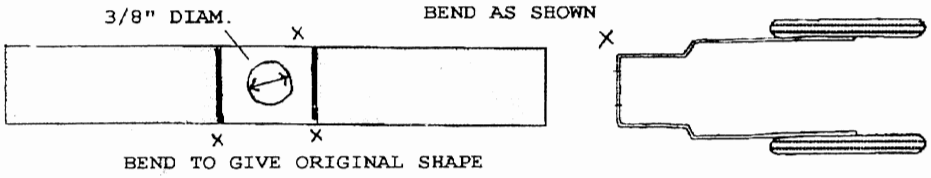
By Leith Cotton VK5LG #154

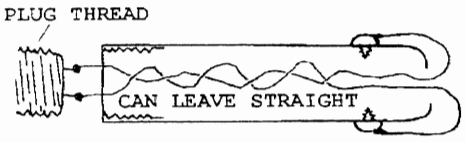
After obtaining the APEK paddle article some time ago, I promptly got to work to build this instrument, which was just what I was looking for at that time - a really bright idea ! However I then found out that my vocabulary of blasphemy was inadequate. I now know why dentists charge such enormous prices for their work ! But lets get on with the job ....

Following the instructions as per the article I started to fit the wires - heres where the cussing started. Perhaps, being a boilermaker by profession, I am too ham fisted. Try as I may I just could ***not*** connect those wires to the nuts & bolts as directed, so to overcome my difficulty I got two small PK [self tapping] screws and attached them to the shell [body of the line plug], then cleaned out and soldered over the screw heads. I took the two leads and attached them as per directions, but left the wire long for a particular reason, explained later.

I then took a long strip of springy brass and drilled a 3/8" diameter hole dead centre then, instead of the washer idea [of the original article], I fitted the strip to the plug and bent the strip to the design of the original.

Continued on next page ...





I next attached the shell and screwed it up tight onto the plug, first having pushed the two connecting wires right through the shell. The ends of the wires were then cut to length and soldered to the heads of the PK screws.

The rest is very simple and mainly involves adjusting the spring brass strip as set out in the original article

It took me one hour to build the paddle my way, NOT counting the 5 or 6 hours I spent playing dentist, trying to work inside the shell as required by the original idea - *Hi!*

This, in my view, is stronger than trying to solder to a washer, is just as flexible and, for me, was much easier to construct.

I have used the APEK paddle a number of times now and keep it always ready as a backup in case of emergency in my shack.

I would like to express my thanks to the 'U Can Help' segment of Lo-Key, because as a result I obtained a Galbraith paddle and was also introduced to the APEK design by **Bob Johnson VK2DRL** - many thanks to Bob for this help. My advice to members is to make use of this really useful section of Lo-Key.

73 Leith VK5LG

COQC

Awards and Contests continued ...

Note from the Executive Committee -

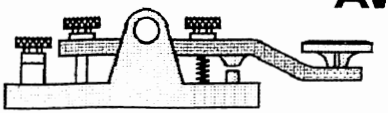
Ron VK4EV and Ian VK3DID have been working on the idea of a QRP Week-end or similar event open to members and non-members, for which awards would be issued.

Peter VK6BWI #66 made a similar suggestion some time ago and other members have recently indicated support for an activity like this. Provided we are sure that it can be properly organised and managed, we will proceed with the idea.

By the way, in his Pounding Brass column of Amateur Radio (May 1992 page 42) **Gil Griffith VK3CQ #4** mentioned that June 17 is annually designated by the International Amateur Radio Union as **World QRP Day**, when stations are encouraged to operate QRP. Watch out for a similar item this year.

COQC

AWARDS AND CONTESTS



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

Greetings for 1993 to all Club members.

Well, the Summer has certainly given the southern States a pounding this year, but I hope that did not stop many of you from getting on the air and trying your CW skills. I must admit that the few times that I listened I heard little or no CW, not even on 20 metres. But then I have been doing night shifts for the last three months, so that is probably an unfair comment.

Four logs each were received for scrambles 23 and 24 and I thank those members very much. Comments again (still) indicate high levels of QRM but, pleasingly, also refer to weak DX CW in the 40 m Scramble.

Results are --

SCRAMBLE 23

=1st	**VK3AAM**	**Phil #224**	11 points
	VK2WES	**Wes #162**	11 "
3rd	VK2AW	Basil #180	7 "
4th	VK6BWI	Peter # 66	1 point

SCRAMBLE 24

=1st	**VK2AW**	**Basil #180**	25 points
	VK2WES	**Wes #162**	25 "
3rd	VK3AAM	Phil #224	20 "
4th	VK4EV	Ron #130	10 "

Once again many thanks to you all and Certificates will be on the way soon.

I was interested to read that Wes #162 lives in an hollow surrounded by hills. Must be some hole! Also, that Basil #180 will be moving to Sydney to "an 8th floor penthouse". Does this mean CQ DX QRP World or will you get overload from reflections off the Harbour Bridge ????

I must say that I am very disappointed at the decision of DOTaC to refuse Amateurs access to the VLF band, as I was hoping that some of our Club members may be interested in experimenting down there. (*See AR Mar 93 p.4 "Amateur Operations 165-190 kHz" - VK5AIL*) However, there is still 160m which hardly ever gets used and even less mentioned. If anyone would like to try, please let me know. (Some years ago I used to call regularly CW QRP on that band until I got no answers except a friendly "ribbing" from a VK5 op.)

There have been requests for a change in the scoring procedure to take account of distances involved. I shall look into this, once I have finished entering Don's program featured in Lo-Key 36.

AUTUMN SCRAMBLES 1993

Nr. 25 Thursday 22nd April 80m
1030-1200 UTC

Nr. 26 Tuesday 18th May 80m
1030-1200 UTC

Rules and scoring are as in December '92 Lo-Key page 25. Please take part and encourage your friends to join in. Also, logs to me as soon as possible, please.

73, Ian VK3DID #112

Concluded opposite ...

Clubtivities continued from page 3 ...

"H-A-M

¶ *In connection with your editorial comments in the latest issue of QST magazine with respect to the origin of the word "ham", I thought you would be interested to know that I read your comments to Mr. H.C. Gawler, who was the radio inspector "up Boston way" in 1912.*

Harry tells me that he is completely unaware of three young operators who manned the joint station at that time, whose initials would coin the word "ham", and further confirmed that in those days a ham operator usually referred to a railroad telegrapher whose code speed was approximately 10 words per minute and no more.

It would seem that these comments add further strength to your comment that the New York physician story is indeed a myth. - ***W2PXR***

¶ *It has piqued me through the long years that, widely, we are "Hams". To the morse expert, the theatrical minded - and, I fear, the public at large - the term is derogatory. Even so, we seem to be stuck with it (See Webster). Too bad! Constructively, there's so very much more to the activity than Morse, alone; and I don't mean phone.*

Along about the summer of 1907 "Cock-eye" Guard and I were manning Western Union's Indianapolis-Chicago duplex "bonus" circuit. On the receiving side at the time, "Cock-eye" had referred to his transmitting counterpart as a "ham," and, then, called in the Wire Chief for a circuit "balance." As, momentarily, we relaxed I asked the old-timer the derivation of the appellation. 'He's got a ham for a 'fist'!", he said. And there you have it - Time magazine and all others, to the contrary notwithstanding. -
Paul Godley, Ex-2ZE."

MICHIGAN QRP CLUB

Our club received some good publicity last year in **The Five Watter** [**T5W** for short], which is the journal of the **Michigan QRP Club**. Tnx to the Michigan Club's PR columnist **Bill Lauterbach WD8DWM** for this.

T5W is a good source of technical articles, hints and tips for QRP'ers and if you are interested in joining the club, here are some details "lifted" from its journal [$ figures would be $US of course]:-

"The Michigan QRP Club was organized on January 19, 1978 in Michigan's central Lower Peninsula and has grown to include members from many parts of the country and around the world.

Section 2(a) of the club's constitution reflects its purpose: "...to foster and develop friendship and cooperation among amateur radio operators who have a common interest in the unique pleasure and challenge of operation... at power levels of 5 watts output or less." The Michigan QRP Club is affiliated with the American Radio Relay League.

Membership is open to all licensed amateurs and inquiries are invited. An application and club information sheet can be obtained by addressing the Membership Chairperson, Michigan QRP Club, P.O. Box. 80804, Lansing, MI 48908-0804.

In the USA, dues are $5 for each twelve-month period and there is an additional one-time initiation fee of $2. DX stations are charged $10 for each twelve-month period and an additional one-time initiation fee of $2. M-QRP-Club has its own personalized pin-on name badges as well as attractive QSL cards."

COQC

The 'SUCH' 20m Superhet Rx

An experimental ultra-simple 20 metre superhet receiver

By Peter Parker VK6BWI #66
14 Marquis St., Bentley WA 6102

Super Ultra-Cheap Het

I think K9AY may have started a revolution in QRP which will have us all dumping our DC Rx's to build ultra simple/ultra cheap superhets! The whole Rx took only a few hours to put together and is completely foolproof - I built it and it worked OK.
[But is it in a case yet? - VK5AIL]

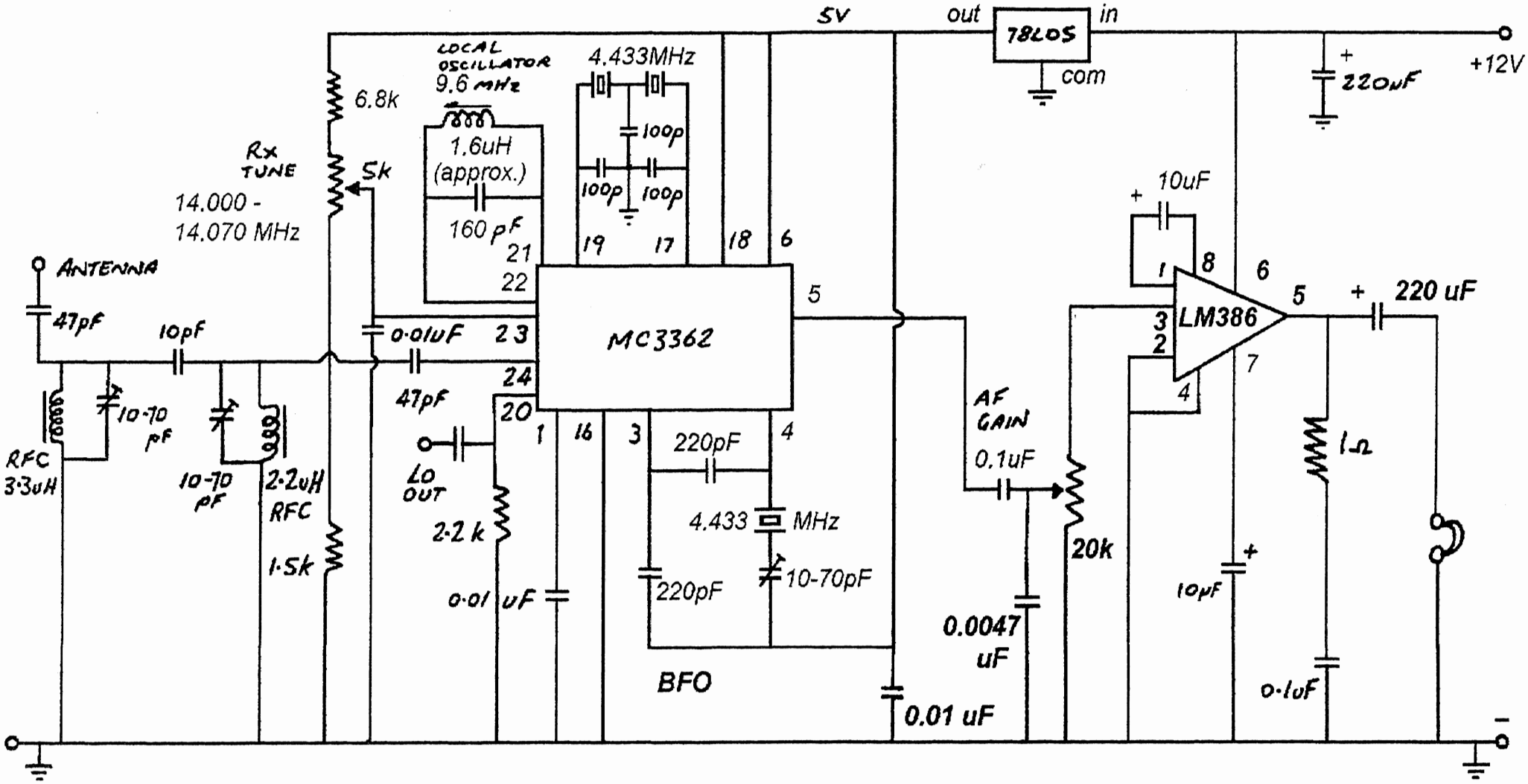
The following is my version of the receiver part of the K9AY 20m portable CW transceiver [Reference one]. The main feature of the K9AY design is the use of a VHF FM receiver chip [the MC3362]as the basis of a simple CW/ SSB HF single conversion superhet receiver. The design to be presented offers a high level of performance while being simpler and cheaper than the majority of direct conversion receivers. A ladder crystal filter provides a single-signal reception of both CW and SSB signals. Gain is sufficient for both headphone and speaker reception, and the receiver does not suffer from microphonic effects when its enclosure is bumped. The internal varicap diode of the MC3362 permits tuning with an ordinary potentiometer. Local oscillator output from pin 20 allows the set to be used with an external frequency counter or an outboard mixer/ oscillator to form the heart of a CW, SSB or DSB transceiver.

While the K9AY receiver includes such frills as AGC, an S Meter and audio filtering, it requires the use of four ICs, If we are willing to do without these features, only two ICs are required to provide good performance single-signal reception. The K9AY receiver uses an IF of 8 MHz but I have used 4.433 MHz because my junkbox includes several of these crystals. The ladder crystal filter in the receiver uses only two crystals, but this can easily be extended to three or four crystals for better skirt selectivity. The 100 pF capacitor values shown are adequate for broad CW reception. Increasing the value of these three 100 pF capacitors will result in sharper selectivity. A slug-tuned inductor (actually a stripped-down IF transformer) is sufficiently stable for the 9.6 MHz local oscillator on both CW and SSB signals. The values shown permit total coverage of the 20m CW segment.

The front end bandpass filter was empirically designed from available components. Whilst it may be possible to experiment with capacitor and inductor values to optimise the bandpass characteristics of the filter, the values given were adequate to prevent breakthrough from both HF and MF broadcast stations, despite one of the latter being less than 1km from my location.

In practice, the receiver has proved to be a joy to use, although no measurements have been made on its performance. No problems were encountered in its construction, for the receiver worked as soon as it was aligned. If your set does not appear to work, try adjusting the BFO trimmer; some crystals are sluggish with only a 10 pF series capacitance. Again it is emphasised that this design is experi-

Circuit on pps 16/17, text p.18 ...



Compact 20m Superhet Receiver

P. Parker VK6BWI January 1993

CW NET NEWS

By Ted Daniels VK2CWH #89
Wombat Hole
Bylong Rd. Rylstone NSW 2849

There is very little CW Net News as there have only been three nights since the last report when successful nets have been possible, due to the consistently high level of QRN on 80 metres.

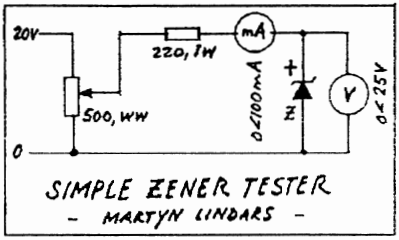
Making an appearance for the first time on the net were **John VK2AP #98**, who has recently rejoined the club, and **Doug VK2FC #202**.

Let's hope Autumn brings better conditions!

72 Ted *COQC*

SIMPLE ZENER TESTER

MARTIN LINDARS



From *SPRAT* Nr. 64 - Tnx G-QRP Club

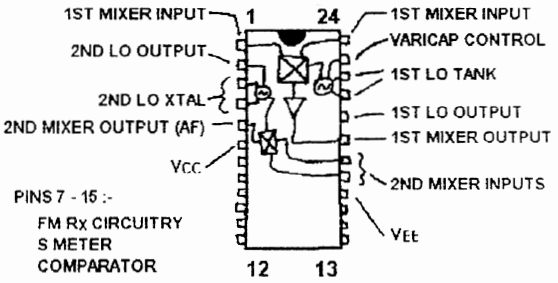
Start with pot at zero and gradually increase with an eye on the milliammeter. A point will be reached when the voltmeter settles at the zener voltage. 100mA FS will usually suffice for meter. If current and volts keep going up, you have an ordinary diode! It should not when connected reverse polarity.

COQC

Such Rx continued ...

mental and, although it works very well, component values, particularly in the front-end and the crystal filter, have yet to be optimised. The receiver could quite possibly be used on VHF, as the MC3362 functions up to 200MHz, although an RF preamplifier would be required, as would some form of PLL to reduce local oscillator drift. The PLL would make the set usable on both SSB and CW without having to frequently retune the receiver to compensate for the lo drift. The MC3362 requires the first IF of no more than 12MHz for correct operation.

MC3362



References:-

1. Breed, GA A Portable QRP CW Transceiver - Pt 1. QST December 1990, p44.
2. Motorola Data Sheet MC3362/D

COQC

'NATTER NET' NOTES

By Steve Mahony VK5AIM #184
19 Kentish Rd. Elizabeth Downs SA 5113
Telephone (08) 255 7397 (H)

"Where have all the callbacks gone?
Long time no hear!"

With a poor parody on the song "Where have all the flowers gone?", I am asking the question.

After reading Don's notes on membership numbers passing the 200 mark, and reading through the list of members - about 160 of them being VK's - I again ask, where have all the callback's gone?

How is it we can only get 8 to 12 stations on the 80m callback on a Friday night? Sure the band conditions on 80m have been poor of recent weeks with the thundery weather we have been having, but surely we can do better than this! Some members say that they don't have equipment for 80m, or that they only work CW. With the availability and popularity of commercial "Blackboxes" running all bands and all modes, I find this hard to believe, especially when you have heard some members working DX on 14/21MHz!

As regards members being "Net Controller's" for a night once in a while, look at it on a 'numbers of members' basis. If the sked is only on for 50 nights in the year, and there are 150 of us VK's, that only requires a member to run the Net 1 time in 3 years ... Surely that is not too difficult.

Some members have written to me to say that they do not have the confidence to run the Net - sure we all do not have the "gift of the gab", but there are still a lot more of you out there, so come on give it a go one night, you may enjoy it! *Maybe discover a hidden talent ....!*

The QRP group appears to contain three basic types of Amateur. I use the word types loosely.

Type 1... The Homebrewer and builder, who enjoys the challenge and the creation of a piece of gear. He/she is not interested in whether the gear will enable contact to be made over 10 or 100 000 km. The builder may not even be proficient at CW.

Type 2... The other type works the World DX on Low power, with commercial gear, and enjoys this just as much as the "Fiddler/Builder".

Type 3... The third type is the Builder/Operator, who enjoys all aspects of the hobby. He/she designs, builds and operates the gear. This type is becoming a rare type of Amateur, and is really the backbone of the QRP group.

On reading this, you decide to which group you belong and *"please consider"* joining in the Friday Night 80m Natter Net !!

73 Steve VK5AIM

[Condx have been improving lately and we had 10 members from VK2, VK3 and VK5 call in on two Fridays 5th & 12th of March, with **Brenton VK5BZ and Graeme VK3BXG** 'in control' - VK5AIL]

COQC

Mort *de* Glyn

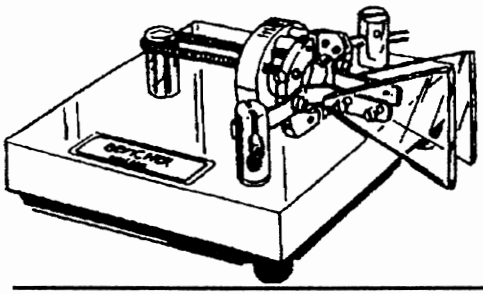
By Glyn Gibbings-Johns VK4LA #203

*See footnote **

Oh, dear! what a let down for my inflated ego!, all these years I have been led to believe that there are no idiots transmitting the Morse code, only LID's - but to comment on the beaut article by **Mort Mortimer G3JZV** in LO-KEY number 36 Dec 1992 entitled **"HOW TO DO IT ON AIR"**, I must admit I didn't know it all! LID for instance, I assumed to be an American word for a poor operator, or is it the initials for "LOW INTELLECTUAL DEVELOPER" or "LOBOTOMISED IMBECILIC DONKEY"?. The mind boggles, perhaps someone out there can enlighten me on that one?.

The article fails, as do all others I have read, in explaining to our beginners what is meant by the signal DIDDIT DIT (IE). I found out early in the piece that this is a signal transmitted after first listening, before making a call. It means "Is this frequency in use, or not?". If you hear a reply "DIT" it means that the frequency is in use and if you hear a reply "DIDDIT" it means that the frequency is not in use but someone is obviously listening; if nothing is heard you can assume that your transmissions will not interfere with anyone.

In the article it mentions that you are stuck with your allotted call sign unless you have influence or emigrate. It has been an awful long time since I emigrated and I do not have any influence over anyone (period) and yet in this country I have held five different successive call signs.



Another thing I would like to 'adjust' in this article for the sake of Australian prospective Morsiacs is the fact that, at this time, not only the Commencing signal (CT), End of Message or Test (AR or +), Error signal (HH or DIDDYDIDDYDIDDYDIDDY), but also the Oblique or Slash (/) and the Question Mark (?), are included in the NAOCP/AOCP telegraphy syllabuses. So you had better learn all these as well, just in case you get them in your exams. For those who don't know, the Oblique or Slash is (/) DAHDIDDIDAHDIT and the Question Mark (?) is DIDDIDAHDAHDIDDY or, as some prefer to remember it by, "DIDDIDUMDUMDIDDY" as in music.

According to my dictionary a CRETIN is a French word of Swiss origin, CRÉTIN, by some connection with CHRÉTIEN, CHRISTIAN, but I assume the word in the article to mean "A person afflicted with cretinism, a chronic disease, due to absence or deficiency of normal thyroid secretion characterized by physical deformity, stunted growth, IDIOCY,

** Thank goodness the 'e' follows the 'd' and not the 't'. By coincidence, 'Le Morte Darthur' by Sir Thomas Malory would have been partly inspired by the poetry of Chrétien de Troyes - VK5AIL*

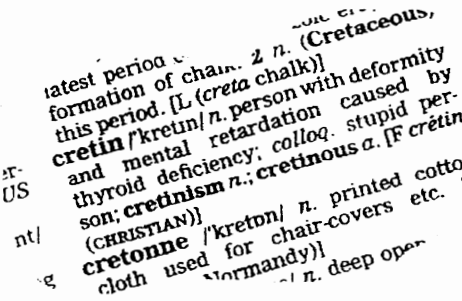
and in some cases goitre". I am pleased to say that I have not had the misfortune of meeting such unfortunates on any band. However, if the article was referring to CHRISTIANS then I must agree, as it is definitely against the regulations to use Religion or Politics as topics on the air for Amateur Radio. I sadly admit to hearing transmissions on such subjects and I promise faithfully not to be influenced by the habits of these CRETINS.

Isn't it fortunate that the bands are full of Idle people calling CQ? There just wouldn't be any contacts at all if we all tuned around to find someone, now would there? The Idiot calling CQ CQ CQ ..... to the end of time may very well be Machine, Electronic or Computer generated Morse code, the operator otherwise occupied. This is treading the thin line of the regulations covering unattended transmissions.

Alack-Alas, it would seem that according to the article I am Stupid because I am one of those persons who often send (+K) *[Ditto - VK5AIL]*, mainly because at the time I learned the morse code I was led to believe that K depicted "please **anyone** transmit', begging to be answered if you like, and am often told that the answer is in sympathy, HI HI.

Yes, I'm also guilty of sending HI HI for a laugh when we are all aware that it means "Affirmative" in Japanese. I suppose that it is really a corruption of HEE HEE as I **used** to see often in comics (do they still print them these days?).

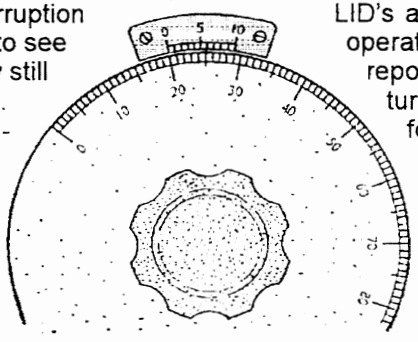
You may get an answer from me at 30 to 40 WPM but please don't try me out at 60WPM unless you first make a sched to use computers, (which I hate). I like the personal touch myself - one machine speaking to another is not my idea of an enjoyable contact. I once worked a Japanese operator, he on RTTY and me on CW (Morse code). I found it to be a novelty but not really enjoyable!



Another thing that the article's author is against is the use of the signal $\overline{KN}$. I think this is a vital signal, unless you are prepared to get involved in large networks. I have on occasions worked two CW stations at the same time because I sent K instead of $\overline{KN}$ when passing it over to another station. Working two stations at the same time isn't so hard if one of them is at, say, 25 WPM and the other at, say, 10 WPM, but if both stations are sending at the same speed it becomes nigh impossible. Ditto for three stations. $\overline{KN}$ means "only that station contacted please respond" but if you send K you are inviting all listeners to join in - and it jolly well serves you right!

LID's abound. I hate it when operating QRP and you get a report RST 579 and you return a report RST 599 and for the rest of the QSO the LID repeats everything twice or more.

I have even received an RST report of 592; nothing will get me to



Continued over ...

QRP KIT-SET CENTRE

Don Callow VK5AIL #75
5 Joyce St. Glengowrie S.A. 5044
'Phone (08) 295 8112 (day/night)

PRICE LIST

A full Club Sales Price List appeared in June 1992 Lo-Key. Later issues contain changes [including prices] and additions to the list. You get a full, up-to-date list with our Club Lists C090/C097. Please don't forget the standard charge of $4 per order for postage, packaging etc.

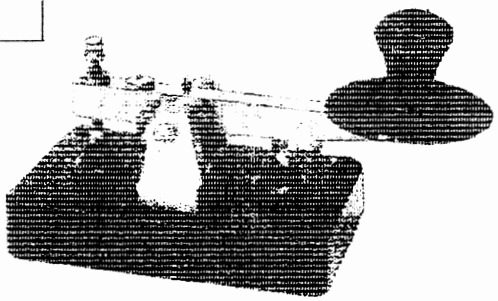
CLUB COMMUNICATOR KIT-SETS

There are none in stock and it will be several months before I can complete the current batch - *Watch this space !* You may still place an order if you can wait.

Mort de Glyn continued ...

QRT quicker. But the best LID report I ever got was RST 139, even though we chatted for over an hour. I think that most LID's are really good operators trying to overcome a badly balanced Iambic keyer or side-swiper. Of course these things don't mean that the operator is an Idiot, he probably doesn't read Morse code very well at 20WPM or know the Q code for "please slow down". And maybe can't send slower than 20WPM or down to the speed at which he can read it. Trying to hide the fact that you are a LID can be terribly frustrating!

My first CW contact was as a Novice with a VK5 operator, me at about 8WPM and he at about 15WPM. I couldn't copy him and asked that he slow down. His reply was: "dont worry about it, its good practice for you". How the Dickens did I know what he had sent? Well, I had **taped** the historic event and with great difficulty and many hours later, after we QRT'd, I learnt of his comments. I had also asked if he would please QSL so that I would have a total record of my very first contact, but unfortunately he let me down on that too [and it almost brought my Ham days to a premature close from sheer disappointment].



So, please all newcomers and LIDS, if you wish me to slow down my sending please ask and I will always oblige willingly, otherwise I will send at roughly the speed received. By the way, at one time I remember falling asleep at the key while sending three words per minute that a contact had asked for; I now try to avoid anything lower than 5WPM.

I admit that people like my first contact, those that misuse the signal 'QSL' per voice or key, and all those who not only omit the 'de' but also deliberately fail to include their call signs when *chewing the rag* with their mates must earn the name given in the article: "IDIOTS".

Thanks for the article Mort I learned a couple of new ones there in the list of abbreviations.

TTFN BCNU 73 ES 72 AR
de VK4LA/QRP 203 SK EE

COQC

NEW ITEMS

¶ **SO-239 Panel socket**, UHF coax connector, square flange mount type.
C092 4 $8.00
SPECIAL OFFER - UNTIL 1 JUNE '93 YOU CAN HAVE FIVE [YES 5] for $8.00.

¶ **Crystals, 9 MHz nominal** [27 MHz CB, 9 MHz fundamental] - matched set for crystal ladder filter construction. Each set includes an extra 2 crystals for carrier insertion oscillators [CIO] for USB and LSB. You nominate number of crystals.
C088 5 [inc. 2 CIO] xtal set $5.00
6 [inc. 2 CIO] xtal set $6.00
7 [inc. 2 CIO] xtal set $7.00
8 [inc. 2 CIO] xtal set $8.00
SPECIAL OFFER - UNTIL 1 JUNE '93 YOU CAN HALVE THESE PRICES.

PRICES UP

¶ C066 **MC1496P** Balanced modulator/demodulator 1 unit **$1.40** [includes 5 pages of data]
¶ C043 Toroidal core Amidon **T-50-2** [red] 1 unit **$1.60**
¶ C044 Toroidal core Amidon **T-50-6** [yellow] 1 unit **$1.60**
¶ C049 Toroidal core Amidon **T-68-2** [red] 1 unit **$1.90**
¶ C050 Toroidal core Amidon **T-68-6** [yellow] 1 unit **$1.90**

BONUS BITS

We have a large range of items which we will give away with items bought from the Kit-Set Centre. Yes, Bonus Bits are 'free'. As a trial a few items are listed below, with the intention of adding to the list in the future. I have started a new series of numbers, where F means 'free'.

When stock of an item runs out there would normally be no more available, so please nominate a couple of preferences or some 'back-ups', or you may get nothing. Don't expect to see power transistors, crystals for QRP calling frequencies or SBL1 mixers on this list, but there will be some bargains [if you *need* the items].

You should nominate the code number of a single 'pack' for each $10 you spend on kit-sets, components or general items, including the postage/packaging charge. For example, if you spend $36 you can have 3 Free 'Bonus Bits' Packs of your choice. You can ignore the PE numbers in brackets - I need these so I can find the bits. Here's the list:-

F001 **Crystals** [2nbr/pack] 6561.111 and 7810 kHz or one of each. Y3 10XW [large] type ex RAAF. [This was C031]
F002 **PCB graphics artwork pack** [donuts, DIP patterns, track tape etc.] Bishop and Chartpak selection with over. [100 donuts etc. per pack]
F003 **Lamp switch** SPST plastic push button [PE2603].
F004 **Adaptor** RCA/phono plug to 6.5 mm stereo phone socket metal body [Was C051; PE2408].
F005 **Belling Lee** line socket & line plug pair [75 ohm TV use] plastic body [PE2277].
F006 **Blade fuse, automotive** [set of 5nbr] 5 A, 7.5 A, 10 A, 15 A and 20 A [PE2655 - PE2659].
F007 **Blade fuse holder** In-line type [PE2654].
F008 **Adaptor** 3.5 mm phone plug to RCA/phono socket metal body [PE9996].
F009 **DB9 backshell** - computer connector [PE2303 PE2303A].
F010 **Resistors 560** Ω [11nbr] WK83 Roederstein 5% metal oxide film 7W dissipation Body 8 mm diam. x 30 mm long. Makes a very useful 50 Ω [nom.] dummy load Self capacitance <0.5 pF.
F011 **Capacitors 220 pF** disc ceramic [10nbr] 20% 12 mm diam. [PE2701]

Continued over ...

CLUB LISTS

More changes are needed to catalogue numbers, prices and details, mainly because of the popularity of the diskette version. The aim is to increase your choice of text files and programs available on diskette. We now supply this as a different item [C090] from the paper version [C097, as original]. Prices have been increased to ensure that the Club covers its overall costs on Club Lists.

This info. supersedes that in Lo-Key #36 and earlier.

¶ C097 Club Lists $0.70 [paper only]
[$4 Postage per order still applies]

You get the most recent printed Membership List with names, call signs and addresses [those approved for publication], Lo-Key Index of Technical Articles [not General Articles], Club Sales Price List and one copy of the Club's promotional brochure. This information, including the full Lo-Key Index, is also printed in Lo-Key over a one or two year period.

C090 Club Files $4.00 [per diskette]
[$4 Postage per order still applies]

Note the **new catalogue number**. 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. 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.

NAME APX SIZE

¶ 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 AR Jan 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 13K
Membership List text file - Names, call signs and addresses.

¶ PRICES.TXT 11K
Club Sales Price List text file.

The original BASIC program for Great Circle distance and bearing calculations [DISBRG.BAS] is still available as it is small, simple and can easily be altered if you can program in Basic.

Now you have other options. **THANKS to some fine work by GARRY COTTLE VK2AGC**. There are now another two systems which do not require you to have BASIC on your computer:-

1. A greatly enhanced version of the Great Circle program [GCIRCLE.EXE] &
2. A QRP LOGGER system [QRPLOG].

The Great Circle Distance and Bearing calculation program is now a much more sophisticated and flexible program; it is very easy to enter and retain information on a number of Home QTH and Remote locations.

The QRP Logger system includes several programs for contest logging and an even more developed version of the Great Circle program [you don't need GCIRCLE.EXE if you have QRP Logger]. These programs are used under a menu system which is provided on disk, along with an 'automatic' setup program. They will run on colour VGA or Hercules graphics monitors. [p.s. I haven't had time to test the actual logging pogram - VK5AIL]

A top effort, Garry !

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.

THANKS MICHAEL !

Michael Toms VK3ESC/6 #229 has donated components and boards of a QRP radio that he was in the process of building but due to lack of time is unable to complete. So, *can we 'find it a home' ?*

Although I have yet to examine the 'goodies' in detail, there are a number of PCB's with components installed [mainly various CM Howes kits], relevant instruction sheets and a heap of miscellaneous parts suitable for the project.

This is not a project for a beginner, as it is a partially complete transceiver.

I intend to catalogue these items if time allows, but if you are interested please contact me now [VK5AIL].

SPECIALS

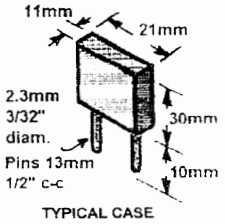
$4.00 per order for postage etc. applies.

¶ **More 'Ex Rex' xtals Price $0.80 each**

I am still sorting out the crystals donated by **Rex Black VK2YA**. Here's another batch. There is one of each, except where shown otherwise by a small number following the frequency. For this reason it would help if you give 'reserve' frequencies when ordering, in case your first choice is unavailable. As before, they have not been checked for frequency or even operation.

Nominal [branded] frequencies in kHz are:-

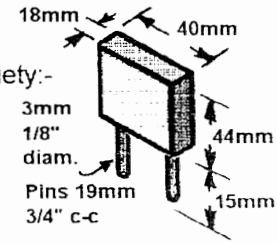
2752	3885
4175	4490
4580	4635
4995[2]	5235[2]
5245[6]	5327.5[4]
5335[2]	5500
5892.5[4]	5953



TYPICAL CASE

And a larger variety:-

150	2182
4095	6450
6561.1	6650



TYPICAL CASE

COQC

FET Two Terminal Oscillator

By Peter Spencer VK5APS

The circuit diagrams show a VFO I developed from an article in the G-QRP Club Circuit Handbook - see bottom of p.91 - **F.E.T. Two Terminal Oscillator**, by G2FWA. [Page 93 of the edition produced by Rai VK7VV - VK5AIL]

When I first noticed the article I recognised the potential of the circuit as I had previously used the valve version of this, originally termed a '**cathode coupled oscillator**'. Of all the valve type oscillators I had built, up to that time, the cathode coupled version was by far the best for freedom from drift, although everyone knows the problems caused by heating effects, with any valve equipment.

I knocked up a rough and ready version of the FET circuit and, as expected, it proved very satisfactory, with very little drift, and was very tolerant of 'high C' conditions. Without any circuit changes the test mock-up worked beautifully with all sorts of odd coils from the junk box and gave good output and waveform from about 1.2 up to 21 MHz, which was as far as I went with my tests.

I needed a VFO with high output for an 80 metre transceiver which I had built from an 8-year old kit. The VFO section of the kit had given trouble - this rig uses an SBL1 DBM which I found needed a high level of local oscillator input. I then built up the FET VFO with a buffer and amplifier , as shown on the two circuits.

Originally this complete VFO circuit was tried with the output transformer untuned. It gave plenty of output, but poor waveform. Placing a 100 pF capacitor across the primary of transformer T1, as shown, immediately gave a really good and clean waveform - just about a perfect sine wave. After adding a trimmer [about 60 pF] there was even more output when peaked for the 80m band and the waveform remained excellent. The output measured across the secondary, using a standard R.F. probe, was approximately 1.5 volts, which is plenty for most purposes. [RMS voltage ? - VK5AIL]

Fitting this unit to the rig gave excellent results and the receiver sensitivity went up to a really pleasing level. After 10 to 15 minutes warm-up there seems to be no perceptible drift and I can listen to CW for long periods without the note changing pitch to any noticeable degree. I have not yet tried the rig on CW transmit mode, but initial tests look good.

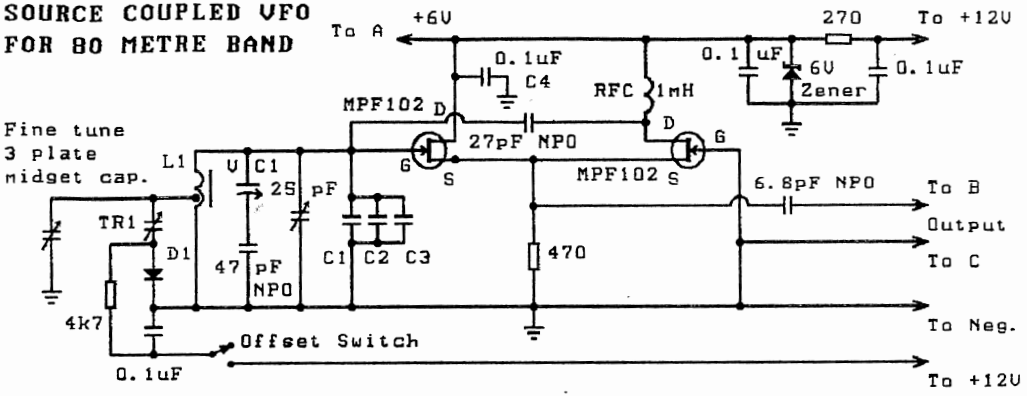
A couple of comments before going further -

Firstly, some MPF102's are very poor in performance [especially the 'bargain priced' ones] and to save many disappointments it is wise to test them for gain before use. I have been caught a few times myself and have spent hours trying to get an oscillator to perform, only to discover the fault was with the FET.

The second point is commonly recognised: the entire VFO should be encased in a substantial metal box with feedthrough capacitors for the power supply leads etc. Neglecting this can cause many odd effects, even in a receiver. The base, front and back panels on mine are made from a piece of 1/8" [3 mm] aluminium, bent into a U shape. The top and sides can be made of another lighter gauge piece shaped to fit the heavier section and attached with pieces of angle and screws.

The buffer is copied from one in the ARRL Handbook [1987] and the output stage is a 'standard' circuit. [See buffer in

SOURCE COUPLED VFO FOR 80 METRE BAND



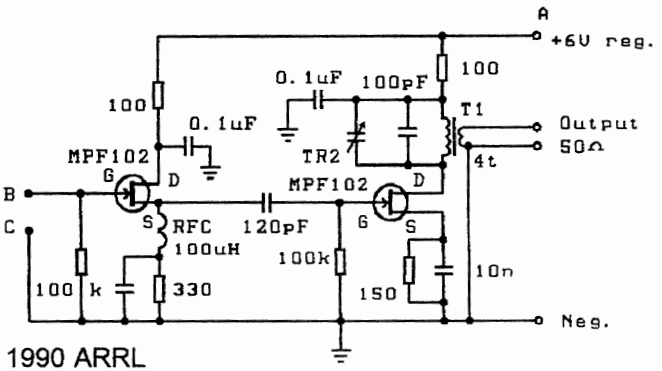
NOTES ON VFO

VC1 100pF [main tuning]
TR1 Small trimmer to suit desired offset
D1 Low capacitance switching diode
L1 36 turns 22 B&S on Amidon core T-68-2 Tap at 6 turns from earthy end
* C1 100pF NPO ceramic
* C2 47pF " "
* C3 22pF " "
* These were selected to give desired range: 3.500 - 3.700 MHz
C4 Install close to drain of MPF102

NOTES ON BUFFER/AMP

T1 Primary 21 turns Sec. 4 turns 22 B&S Sec. wound between primary at centre T-68-2 Amidon toroid

TR2 Trimmer approx. 60pF max. Tune for output at secondary



BUFFER AND AMP.

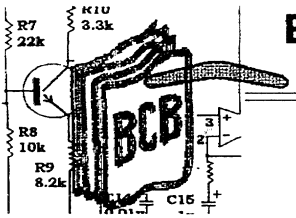
Fig.13 on p.10-7 in 1985 & 1990 ARRL Handbooks - VK5AIL.]

To return to the twin FET oscillator: I found it necessary to add some turns to my original toroid and was then left with a 'tap', 6 turns from the 'earthy' end. From this came the idea of adding the offset circuit and fine tune control. This has worked out very well; with the small 3-plate 'midget' capacitor fitted inside the box; the unit is quite stable and makes fine tuning easy. I get an offset of 800 Hz and about 500 Hz on the fine tune with the component values shown in the drawings.

In conclusion -

These circuits work well as they are, but also give a good starting point for further development. Other frequencies could be tried and should be just as satisfactory. I used FETs in the buffer and amp because of their excellent characteristics, with very little loading effects etc., but other transistor circuits could be used for the amp stage.

COQC



BOOMERANG CIRCUIT BOOK

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

The BCB circulation lists are opposite. * An asterisk in front of your name indicates that you have asked to be listed for all future BCB's [about one a year].

BCB #2 will be sent around again later this year, because newer members would not have seen it, so if you wish to go on the list please let me know. We have fairly good records of who has seen it previously, if you can't remember. The 1st flight for 1993 will be a while yet, because we would like to improve the quality of several of the pages.

BCB #5 - We are now collecting items for BCB #5 which is to come out at end of 1993. **Tnx for contributions to Murray VK3JHX, Steve VK5AIM, John VK5JO, Brenton VK6BZ** and several others.

What's the 'damage' ? - You pay the postage to the next member; currently $2.80 [interstate] or $2.65 [intrastate].

BCB #2 - 3rd flight [later]:
*Greg VK1NGD
*Murray VK3JHX
*Ray VK2COX #226
*Ray VK3NCM #263
*Edward [SWL] #280

BCB#3 - 5th flight [current]:
*Donald VK6FQ #272
*Greg VK1NGD #250
Alan VK2KW #249
Bill VK3AWC #255
Bill VK2BWW #161
Trevor VK3HG #122

BCB#3 - 6th flight [when more names go on the list]:
*Ray VK3NCM #263
*Edward [SWL] #280

BCB #4 - 2nd flight [current]:
Trevor VK3HG #122
*Ray VK2COX #226
Col VK2EXD #35
*Ray VK3NCM #263
*Edward [SWL] #280

COQC

Continued from p.29 ...

the transistor and FET, not ICs. I would like to call it: Survival Radio". D.C. Rx and QRP CW Tx."

Well, it would be nice if we all could have enough understanding of electronic theory combined with practical knowledge to produce designs that would work. I suspect that very few people have these skills and can pass them on. Hence the success of that classic by DeMaw and Hayward 'Solid State Design for the Radio Amateur'. Mostly, we are given designs, sometimes with tabular information or suggestions about changes for different bands. The homebrewers who just 'have a go' and try substitutions no doubt enjoy themselves. Personally, I prefer to use some theory first, to come up with trial component values for a circuit, then start experimenting on the bench.

The types of articles desired are certainly difficult to find and obviously [?] must be hard to write, but maybe YOU can have a try ?

72, Don VK5AIL #75 COQC

FROM THE EDITOR'S DESK

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

THANKS FOR YOUR INPUT

Thankyou to the many members who added good wishes, suggestions and comments - including appreciation of Lo-Key and other aspects of the club - on their Account forms when returning them. This feedback is useful and is much appreciated by the Kevin VK5AKZ and me.

And NO, there was not a prize for spoting the speling erorr [an extra 'r'] on the back of the Account we sent you[r]. Kevin did a great job of the layout this year and the final result was not bad for a 10 year old 9-pin printer, either. [Next year: Absolute Perfection ?]

Here's a selection of the feedback ...

HOMEBREWER WIRED AND TEARY ?

Jim Edwards VK2AKE #5, one of the original members from 1984, said: "*What a first rate magazine "Lo-Key" is these days. .... Firstly, I lost my equipment in a severe electrical storm earlier in the year and with it some of my enthusiasm as well. The gear has now been replaced, but having been involved with Amateur Radio first as SWL in 1926, I am inclined to get a bit tired and weary these days. Kind regards and best wishes to the Club and all members for a great year in 1993.*"

WE ARE SURPRISED TOO !

Quoting from **Brian Halpin VK2BVH #22**: "*I am surprised that the Club is able to continue with its very low annual subscription fee. Congratulations to all the folk engaged in the collation & production of an excellent magazine. All the best for Christmas and the New Year.*"

The Committee reviews the Club's financial position at budget time each year. Certainly our costs have gone up since September 1986 when the present subs level [$A10 for VK members] was set. A Club policy is that we avoid owning expensive assets. We aim to stay out of debt and <u>not</u> attempt to build up financial reserves too high.

Lo-Key is almost entirely produced by the Editor, with assistance at 'enveloping time', so we have a very small team indeed. **However, everything depends on members [you] submitting articles - no articles, no magazine; so please keep up the good work.**

SUGGESTIONS FOR ARTICLES

No. 1 from **Dennis Abdalla K4JOD #228** - "*Would like to see an article explaining why or how specific components were selected to make a circuit work. For example, a VFO or audio amplifier; something not too big - give the schematic, part numbers and values and why they were put in a specific place. This will help those of us who are not designers to have a better understanding of the circuit and perhaps help us troubleshoot better, or perhaps even design something of our own. I have never seen this type of article in any Amateur Radio publication.*"

No. 2 from **Lynn Eady VK3DKE #246** - "*With the multitude of electronic waste, old TV, radios etc. and basic "junk" !! around, could some electronic wizz ?? come up with some ball park calculator formulas for theory please, centred around*

Continued opposite ...

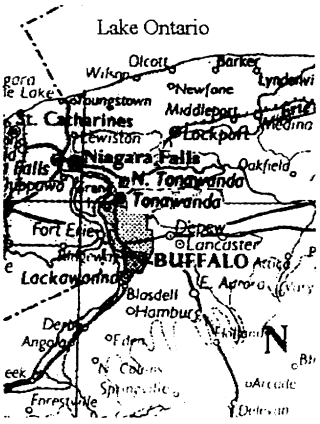
QRP ARCI'S OPERATING AWARDS PROGRAM

By Don VK5AIL QTH Latitude 34.99S, longitude 138.64E at Glengowrie 10 km [6 miles] southwest of the CBD of Adelaide, South Australia

Bob Gaye K2LGJ, Awards Chairman of QRP ARCI, recently sent over a sheet on their Operating Awards Program, which is reproduced opposite. The relevant parts of Bob's accompanying letter are given below, as there is a great deal of useful explanation contained in it.

This all arose out of VK5LG Leith's '1000-MILE-PER-WATT' Award - See articles in Lo-Key #35 [cover and page 1] and #36 [page 14].

The possibility of our club using the "GCR List" method will be considered, but we will need to find out more details of what is involved. This is one for our Awards and Contests Manager, Ian Godsil VK3DID to 'unscramble', so: Over to you Ian !



" The QRP ARCI awards program is open to all. I have enclosed a copy of the various rules. In general we follow the ARRL rules for WAC, WAS, and DXCC. ARRL forms may be used. Information regarding power used should be included with all applications. The "GCR List" method is preferred, especially for DX applications. Postage is expensive. Your club may wish to set up a GCR review program. This appears to be the method used in Japan, since most applications received are on the same style form.

Regarding the KM/W calculations, I use the propagation program 'MiniProp'. I have not published a program for this purpose .....

Station coordinates are determined from QTH information supplied and an atlas. I seldom use coordinates supplied by the applicant without checking them myself. Many people do not understand the difference between decimal degrees and minutes. Grid locators help, but again they must be checked. All distances are also calculated for the same reason, even if supplied.

The most useful information that can be supplied is the location relative to larger cities. As an example, I have no idea where Glengowrie is. My best guess is that it's a suburb of Adelaide. I live in the Town of Tonawanda. It has a population of 100,000, but shows up on only very detailed maps. It's 3 miles north of Buffalo, which shows up on most maps. I firmly support the use of aboriginal names, but please supplement it with information that can be used half way around the world. But this is not rocket science. Do not expect awards to be accurate to within one mile! "

[There are 60 minutes in a degree, so 140 degrees 35 minutes converts to 140.6 degrees, or 140.58 if you are more precise - VK5AIL]

COQC

QRP Amateur Radio Club International
Operating Awards Program

The objective of the QRP ARCI Operating Awards Program is to demonstrate that "power is no substitute for skill". It encourages full enjoyment of Ham Radio while running the minimum power necessary to complete a QSO and thereby reducing QRM on our crowded bands. QRP is defined by the club as 5 watts output CW and 10 watts PEP output SSB. The following awards are available to any Amateur. Requirements are set forth below.

QRP-25 This award is issued to any Amateur for working 25 members of QRP ARCI while those members were running QRP. Endorsements are offered for 50, 100 and every 100 thereafter. To apply send list of members worked. List should be in numerical order. Also see NOTES below about applying.

WAC-QRP This award is issued to any Amateur for confirming QSOs with stations in all six continents while running QRP. See NOTES below about applying.

WAS-QRP This award is issued to any Amateur for confirming QSOs with stations in at least 20 of the 50 states of the USA while running QRP. Endorsement seals are issued at 30, 40 and 50 states confirmed. See NOTES below about applying.

DXCC-QRP This award is issued to any Amateur for confirmed QSOs with 100 ARRL countries while running QRP. See NOTES below about applying.

1000-MILE-PER-WATT (KM/W) This award is issued to any Amateur transmitting from, or receiving the transmission of, a QRP station such that the Great Circle Bearing distance between the two stations, divided by the QRP stations power output equals or exceeds 1000 Miles-per-Watt. Additional certificates can be earned with different modes and bands. See NOTES below about applying.

QRP-NET (QNI-25) This award is issued to those members completing 25 check-ins into any individual QRP ARCI net. Subsequent 25 QNIs in another net will earn an endorsement seal. Net managers send a list of those qualifying to the Nets Manager at the end of each month. Awards are issued FREE to those qualifying by the Awards Chairman as information is received.

NOTES

1) The fee for all awards, except QRP NET (QNI-25), is $2.00 US or 10 IRCs. Subsequent Endorsement Seals are $1.00 or 5 IRCs. Make checks payable to QRP ARCI. Cash is preferred.
2) GCR List (General Certificate Rule): QRP ARCI will accept as satisfactory proof of confirmed QSOs and that the QSLs are on hand as claimed by the applicant if the list is signed by: (a) a radio club official, **OR** (b) two amateur radio operators, general class or higher, **OR** (c) notary public, **OR** (d) CPA. If you must send QSLs please include postage for their return. QRP ARCI is not responsible for lost or damaged QSLs.
3) QRP ARCI member numbers are not published. The Awards Program will accept as satisfactory proof for any of the club awards a QSO with a club member giving their membership number and power output in the log data. If the QRP number and power are not given a QSL is required for confirmation. See Note 2 above.
4) Endorsement seals are available for a) One Band, b) One Mode, c) Natural Power, d) Novice and e) Two-Way QRP if log data so indicates.

Send applications to:

QRP ARCI AWARDS CHAIRMAN
Bob Gaye - K2LGJ
25 Hampton Pkwy.
Buffalo, NY 14217-1217 USA

EXECUTIVE COMMITTEE

Treasurer & Membership Secretary
Kevin Zietz VK5AKZ #43
41 Tobruk Ave. St Marys SA 5042
Membership enquiries and applications. Subscriptions. Changes of address, callsign etc.

Editor of Lo-Key; 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 publication and to refuse acceptance of material without specifying a reason.

AWARDS AND CONTESTS MANAGER

Ian Godsil VK3DID #112
25 Monaco St. Parkdale Vic. 3194
Scramble logs and suggestions.

§ AUTUMN 1993 SCRAMBLES §

#25 Thu 22nd April
80m
1030 - 1200 UTC

#26 Tue 18th May
80m
1030 - 1200 UTC

§ 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 .....

.....

.....

L-K #37 9303

I would like to apply for membership 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 the required details being held on the Club's data base.
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 the next issue of *Lo-Key*.