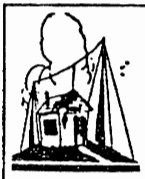

LO·KEY

NEWS BULLETIN

CW OPERATORS QRP CLUB
WE DO MORE WITH LESS
5W
QRP

PUBLISHED QUARTERLY

CONTENTS

"WE DO MORE WITH LESS !"

25 12th AVENUE W. MOONAH, HOBART, TASMANIA AUSTRALIA

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DX	JAY STURDIVANT KV7X	(78)

CO-ORDINATORS NEEDED FOR UNREPRESENTED STATES AND ZL.

****

MEMBERSHIP

The CW OPERATORS QRP CLUB is an International Club, open to Amateurs and Short Wave Listeners from any country. The Club was formed with the aim of promoting QRP using the CW mode, on ALL frequencies allocated to the Amateur Service.

****

ANNUAL MEMBERSHIP FEES

VK....$8 : ZL.... Lo-Key by surface mail....$A9 : ZL....Lo-Key by airmail....$A10 : DX....Lo-Key by surface mail.... $A9 : DX.... Lo-Key by airmail....$A12. Please make all Money Orders and Cheques payable to the CW OPERATORS QRP CLUB. IRC's not acceptable.

****

CORRESPONDENCE

Please address all correspondence for the Secretary, CW Operators QRP Club, 25 12th Avenue, West Moonah, Tasmania. 7009. Australia All membership fees to be sent to the Treasurer, CW Operators QRP Club, 41 Tobruk Avenue, St. Marys, S.A. 5042 Australia.

****

CLUB CALLING FREQUENCIES

1815:3530:7025:14050:21130: 28125

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INTERNATIONAL CALLING FREQS

3560:7030:14060:21060:28060:

****

LO-KEY

Published in March : June : September : December.

Merv Quinn (85)
104 Lake St
Ballaarat.
VK3ADX.

Dear Sir,

thought I should put pen to paper and say hello, and here is my sub.

But while the pen is on paper I would like to QRO abt "el president" Don.

On behalf of all the members - with one exception (No 85) I would like to vote the president his own regular page in the magazine. And I know how eternally grateful he will be.

Having worked Don many times, and reading between the lines of copy, I have come to realise that this has always been a burning and uncontrolable desire of Don's, but he was apparently too shy to ask. So pushing aside my natural protective instinct and only doing it for Dons "benefid." I therefore write this humble request.

Also the fact that he obtained his AOCP is another good reason.

The fact that he lives in VK5 has no bearing at all on this letter.

Merv VK3ADX

Jubilee 150 Award

The colony of South Australia was founded on 28 December 1836, and to celebrate its 150th anniversary, the SA Division of the WIA is issuing the Jubilee 150 Award. The award is sponsored by SA Tourist Bureau, ESTROW and QANTAS and will be issued free of charge to all amateurs and SWLs who satsify the criteria.

Amateurs must accumulate 150 points by contacting other amateurs in South Australia between 1 January and 31 December 1986. SWLs must also accumulate 150 points by logging calls with SA amateurs between the same dates. Points are calculated as below according to your location and the band used:

	160	80	40	20	15	10	VHF
VK5s	1	1	1	1	1	1	1
Other VKs	3	1	1	1	1	2	5
Oceania	5	3	2	1	2	3	10
Other DX	6	5	3	2	3	4	10

Satellite and EME contacts with VK5s are worth five points each regardless of your location. Contacts with VK5s on the WARC bands are worth five points each also, regardless of your QTH. WIA affiliated club stations count double (VK5s WI, WIA, ALE, ALM, ARN, APC, ARC, BAR, BPA, BWR, LZ, RCN and SR). Jubilee station VK5JSA counts 15 points.

Stations outside VK5 may make valid contacts via repeaters on VHF and UHF. Each station may only be contacted once per band. Contacts may be made on any mode and awards will be endorsed appropriately if requested. Contest contacts are acceptable. QSL cards are not required but log extracts submitted may be checked for authenticity.

JUBILEE 150

On December 28th 1836 the Colony of South Australia was proclaimed, and to celebrate the sesquicentenary of that event, the Wireless Institute of Australia S.A. Division Inc. has much pleasure in awarding this certificate to Amateur Radio Operators of the world, who have accumulated 150 points by working (or in the case of shortwave listeners, hearing) South Australian Amateurs in the year January 1st 1986 to December 31st 1986. This certificate acknowledges the accumulation of 150 points by

_____ operating Amateur Radio Station

____ SAMPLE ____ and congratulates

_____ on this performance.

Signed. _____ Date _____

No. _____ Endorsements _____

The W.I.A. (S.A. Div.) gratefully acknowledges the support of the South Australian Department of Tourism and Estrow Civil Engineering Consultants.

SOUTH AUSTRALIA Enjoy! QANTAS THE SPIRIT OF AUSTRALIA

Log extracts should show contacts in time/date order and include UTC time, UTC date, callsign, RST sent/received, band, mode and points claimed. Applications can be sent to:

R.J. Bruce VK5OU
GPO Box 1234
Adelaide, SA 5001

This appears to be a great award to chase particulary when the DX stations are not around. Lets get stuck into it, wouldn't it be good if one of our club members could get the first award endorsed QRP ALL CW?

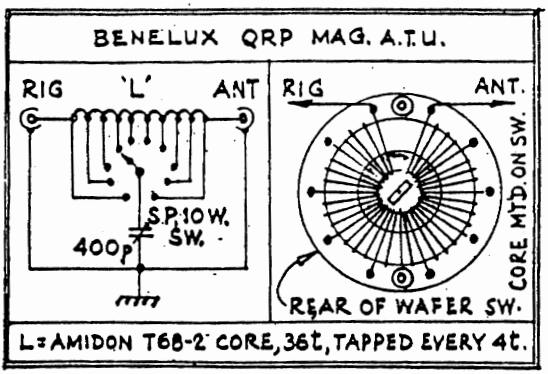
To cover postage and packing a handling fee of $2.00 or 4 IRCs is requested with all applications.

ELECTION OF OFFICES

Yet another year has slipped by, in fact slipped by so quickly that I forgot all about the clubs policy to hold annual elections. The idea being of course to allow members who have held committee positions to reconsider their commitment and act accordingly.
Therefore ALL positions will be declared vacant on May 18th 1986 this means that all members currently holding a club committee position must notify the secretary, thats me,"Rai VK7VV" in writing by this date that they wish to carry on for the next 12 months. If the secretary has not been informed by this date it will be assumed that the member does not wish to hold his office any longer.
Should the secretary receive two or more nominations for the same position, an election will be held for that position.
I am sure that a lot of members would like to help in running the club.
A list of positions is given, please consider the commitment required, there is little point in taking on the job in name only unless you are prepared to make freely your commitment.

1) Secretary
2) Treasurer
3) President
4) Editor
5) Assistant Editor
6) Scoreboard Manager
7) Contest and Awards Manager
8) Public Relations Manager
9) WAF Delegate
10) State Co-ordinators
11) Technical Problem Adviser
12) Technical Editor

VK7VV No3 Secretary



A variable coil for a QRP tuner with QRP dimensions. This tuner is good for tuning long wires, greater than a half wave.
The coil is mounted on the back of the switch as in the drawing.

Translated from Dutch by G3VTT.

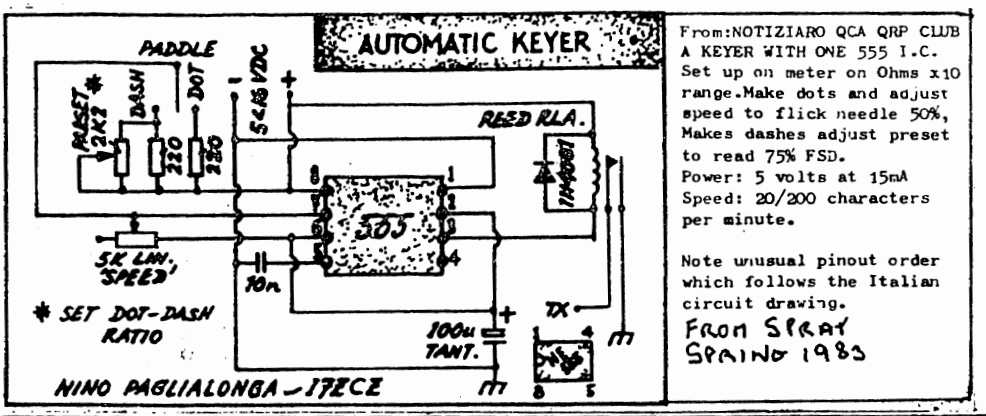
FROM:. SPRAT AUTUMN 1984.

Radiotorial Comment

Your ass. Editor having returned from U.K., has a few comments to make which may serve as a warning of purchasing problems we may face in the near future - if, in fact, we haven't come across them already. The first concerns our ability to walk into shops and purchase fairly large items over the counter. "Of course we can", you may say, BUT if Australian conditions become the same as those of other countries, this won't be so for much longer. Your Editor went into three radio suppliers who adv ertise widely in the technical press, and have branches in different parts of U.K. All he wanted was to buy a Daiwa CN620A SWR/power meter. "Certainly, sir. We'll order one for you at once. It will take about two or three weeks". Having protested that there was one in the glass cabinet, your Editor was told, "Ah, but that's our display model - it's the only one we have, so you can't have that one". Now, it may sound quite hilarious, but it happened again, when trying to purchase a double electric cooking ring, AND again, with a refrigerator supplier. It seems that shops are becoming merely showrooms - orders are taken, and when enough items have been "put on the books", a bulk order goes in. The second problem is that, in some cases, payment in advance is required, too - a nice little "extra" to have YOUR money in THEIR bank for a few weeks, with interest.

We already meet this situation in Tassie, in that some shops will order an item "from the mainland", and it takes two or three weeks to arrive. We know perfectly well that overnight air freight is possible in most cases - so what do we do? We bypass our own shops and order direct, even by phone and credit card! The U.K. suppliers said it didn't pay them to have large stocks of expensive goods on their shelves "because it was all dead money". Very frustrating for the buyer with <u>his</u> money ready and waiting. What do you think?

VK7JK.



From:NOTIZIARO QCA QRP CLUB
A KEYER WITH ONE 555 I.C.
Set up on meter on Ohms x10 range.Make dots and adjust speed to flick needle 50%, Makes dashes adjust preset to read 75% FSD.
Power: 5 volts at 15mA
Speed: 20/200 characters per minute.

Note unusual pinout order which follows the Italian circuit drawing.

FROM SPRAT SPAING 1983

CLUB SCOREBOARD 1985-86

FULL CALL SECTION

	I60m	80m	40m	30m	20m	I8m	I5m	I0m	
KV7X		I5I	23I	4	943		40		I369
VK3BGH		796	I66	2	24		33	I	I022
WA1JVY		I4	522	28	I70		I6		750
VK7VV		79	22	8	482		6		597
VK5BJF	2	I06	6	I56	43	I2	44		339
VK3CVF		I06							I06
VK3C6E		89	6		2				97
VK5AIL		39	7		48		2		96

NOVICE SECTION

VK5NDC		370					I2	I	388

CONGRADULATIONS TO: Jay member No 78 Ist place sect B fullcall
Graeme member No 82 2nd place sect B fullcall
Mark member No 70 3rd place sect B fullcall
Don member No 75 Ist place sect A novice

Well here we are with another completed year of our club scoreboard section. It was most pleasing to see a few extra members participate this year, our DX members have put in a very good score. But I am sure that with a little more effort some of our local lads could of made the final score a lot closer. How about a few more members participating this year? Remember the scoring has already started now, and all contacts count from the Ist of April I986. So please put pen paper and have a go. It would be of great assistance to the scoreboard manager if the quarterly score logs are received by the I8th of the particular month that Lo-Key is published ie I8th March, I8th June, I8th Sept, I8th Dec ect. This will mean that the progressive scoring will be of more interest, apart from the fact that it is easier on you to send scores in on a regular basis, rather than taking on the onerous task of compiling the scores in one big entry.

If one cares to look into back issues of Lo-Key, I am sure you will find on many occasions that both myself and Len have asked, no, pleaded for feed back from members in regard to all aspect, of the club. And in particular looking for suggestions on how you would like the scoreboard runs. Sad to relate members responce has been pathetic.

As you will recall, because of the apathy shown I took it upon myself to modify the rules to accomodate the international members of the club, and also to assist all members in keeping a tag on our own internal award system, in doing so I imagined that it would make the scoreboard more appealing and interesting. It would appear that I was mistaken.

Elsewhere in this issue you will find a list of questions, suggestions ect. Please take a few minutes of your time and give some thought to them, and having done that, more importantly let either myself or your state co-ordinator know what your thoughts are.

Rai VK7VV scoreboard Manager

VK VERSUS THE WORLD CONTEST

Good to see more entries arrive for the contest. Unfortunately they did not turn up in time for me to include them in the last issue of Lo-Key. Fortunately none of them effect the overall placings of the previous announced winners. The final standing is as follows:

	BAND	CONTACTS	ZONES	MULT	BONUS	SCORE
RAI VK7VV (3) Ist PLACE WORLD SINGLE	20m	33	9	5	I.5	2217
GUS G8PG (50) Ist PLACE WORLD MULTIBAND	MULTI	80	IO	4	I.5	I200
LEN VK5ZF (I) 2nd PLACE WORLD SINGLE	I5m	26	7	5	0	345
TED VK2CWH (89) 2nd PLACE WORLD MULTIBAND	MULTI	23	I	6	0	I38
MAVIS VI3KS Ist PLACE SHARED QRO	MULTI	5	3	0	0	I5
IVOR VI3XB Ist PLACE SHARED QRO	MULTI	5	3	0	0	I5
RUDIC YU7SF Ist PLACE YUGOSLAVIA	I.8m	I	I	2	0	2

COMMENTS

GUS G8PG="Conditions seemed poor, but during the 7½ hours I was on, met up with a lot of old W mates and had a small ball. All the best to the gang, also Merry Xmas and Happy New Year to you all.

LEN VK5ZF="Conditions lousy nothing about on 80M so worked on I5M only, It was hard work to get the score, but enjoyed it.

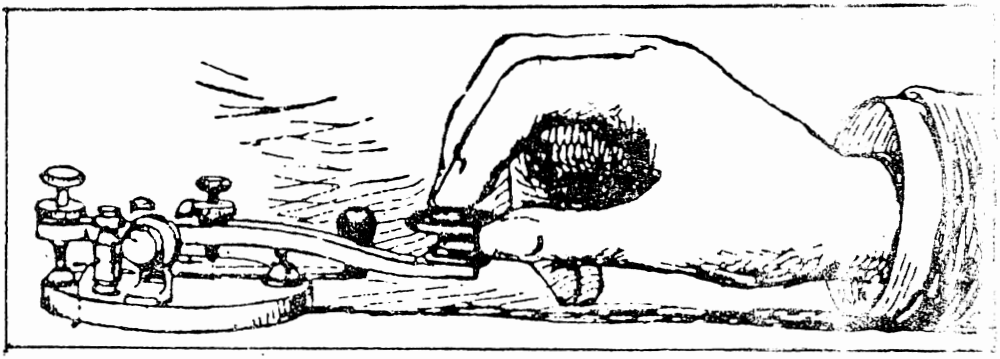
RAI VK7VV="Took the campervan up the bush, and built a 20M version of the modified version of the VK2ABQ as described in Sept issue of LO-KEY, worked a treat, out of the 33 contacts made, I7 were different countries. The only other QRP stations worked, VK3BXN and VK2CWH (89) Ted.

IVOR VI3XB="It was a very dissappointing participation by the QRP gang, so far as we heard. I suggest that the rules in future include indicated band segments where one can search for the QRP stations. Searching all over every band for QRP stations is horribly wasteful of time. Only 30 Khz or even less is all that is needed.

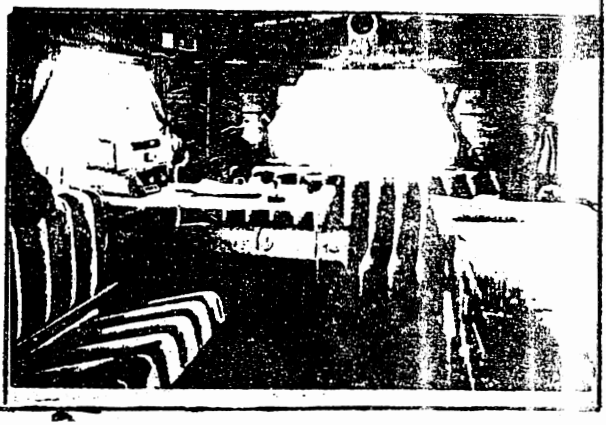
VK VERSUS THE WORLD CONTEST COMMENTS CONTINUED.

TED VK2CWH-"Very few contacts were aware that the contest was on. At this part of the solar cycle the international aspect of the contenst seens irrelevant, perhaps it could be moved to winter to give more scope for VK/ZL operators , (I only heard these QRP operators and was only able to log one). It seems paradoxical that I, with a one watt output, have no trouble copying a QRO station, gets six points while the QRO station which has much greater trouble copying me, gets only one It would be hard to get around this one, and keep the focus on QRP stations.

RUCIC YU7SF="My transmitter is VFO-PA four watts (EL84) this is my 98th conte



The photo below shows the mobile set up used by Rai VK7VV. During the "VK Versus The World"contest it is well worth the effort if only to operate under the very quiet enviroment that a country side location can ofier, no power line hash or electrical interference. I will be looking forward to the next contest, who knows I may have a go at Gus's "Miracle Sky Hook".



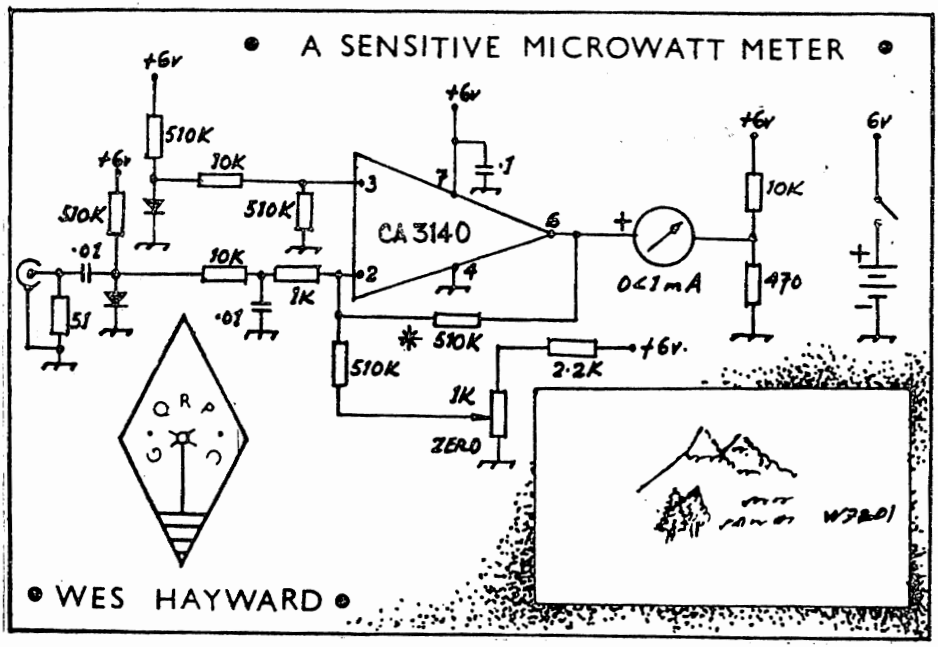
A SENSITIVE MICROWATT METER By Wes Hayward, W7ZOI

Shown in the firgure is the circuit for a simple RF power meter with excellent sensitivity and stability. The sensitivity results from bias applied to the diodes. Low drift comes from using an Op-Amp with MOSFET inputs for low bias current. Full scale sensitivity is -10dBm, or 0.1 milliwatt when silicon diodes are used. Sensitivity improves by about 5dB with hot carrier diodes. Minimum detectable signal with silicon diodes (IN4152, IN914, etc) is about -23dBm for a meter deflection to 0.05mA. Sensitivity changes slightly over the frequency range from 1 to 1000MHz. Leads should be kept very short for the RF portions of the circuit if the unit is to be used at VHF/UHF.

A 51 ohm input resistor is shown; it may be eleiminated for significantly improved sensitivity, but at the price of measuremont accuracy. Full scale sensitivity drops to less than a microwatt if a tuned circuit is used. This could be the basis for a very sensitive wave meter.

This unit is normally used as a piece of test equipment. However, it may be used by the milliwatting enthusiasts as an in-line power meter. This is done with a coupler like the one shown on Page 151, Fig. 23 of Solid State Design for the Radio Amateur (A.R.R.L.). The system is calibrated with a step attenuator and a higher power indicator such as the meter shown on Page 147, Fig. 9 of the same book. That meter may be calibrated against a DC source using the methods popularised by Ade Weiss.

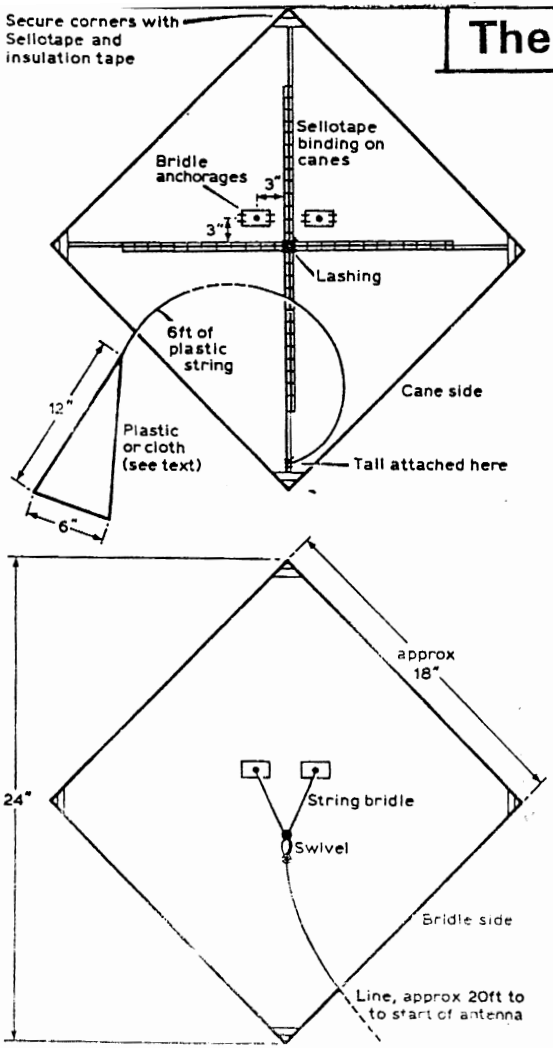
This meter is extremely sensitive, so do not apply a transmitter or even an antenna directly to the input. Attenuators should be used. The battery is a pack of penlight dry cells. Current consumption is only a few mA. The circuit will function with no changes with a 9 volt battery.



The "miracle sky hook"

by A. D. TAYLOR, G8PG*

A support that will raise one end of an antenna to between 70 and 110ft, that can be erected by one man in a couple of minutes, and that only costs a few pence, sounds like a pipe dream. Actually such a support is easy to make. It takes the form of our old friend the kite. Originally used by Marconi for his first reception of transatlantic radio signals, the kite-supported antenna seems to be largely overlooked by the present generation of hf band operators. This is a pity, as modern materials make kites very easy to construct, and give better performance than some of the heavier materials previously used. This can be said with some confidence—a few months ago G8PG had never built or seriously flown a kite, but now his home-made models fly extremely well. If a kite is to support an antenna successfully it must be very stable in flight, thus allowing long periods of "hands off" flying, and it must have a good lifting capability. After various experiments, a design which meets these requirements has been evolved. It is simple and inexpensive to make.



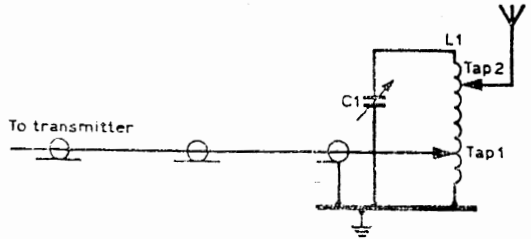


Fig 2. Coupling circuit

The kite used is a square kite, flown with two corners in the vertical plane and two in the horizontal plane (Fig 1). It is made from part of one of the polythene bags used to collect the waste in a kitchen pedal bin, four of the so-called "18in garden canes" obtainable from multiple stores, and a small fishing hook swivel (the swivel isolates the kite from the twisting motion of the nylon kite line). Sellotape, plastic insulating tape and string will also be required during construction. One pedal bin liner bag should provide enough material to make two kites.

The method of construction is as follows. Lay two of the garden canes side by side and adjust the overlap until the total length is 24in. Using Sellotape, bind the two canes tightly together along the whole length of the overlap. Repeat the process, but now using the second pair of canes. Carefully measure out and mark the exact centre point of each pair of canes.

Make a cut down one side of the pedal-bin bag, then carefully open up the bottom, which is closed by means of plastic adhesive. The result will be a large sheet of plastic. Lay one pair of canes on the centre line of this sheet, with one end level with the bottom. Secure each end of the canes firmly in place by means of a piece of Sellotape. Lay the second pair of canes over the first and exactly at right-angles to them, and carefully align the previously marked centre points. Fix the ends of the second pair of canes firmly in place with Sellotape. With a pair of scissors, accurately cut away all excess plastic until the square shape shown in Figure 1 is obtained. Put more Sellotape over the four ends of the canes until they are firmly fixed to the plastic material, then further strengthen the joints with a piece of plastic insulating tape. Note that the kite is not collapsible—it is permanently assembled and is transported by laying it on top of the luggage in the boot of a car.

Balance the centre point, where the two pairs of cane cross, on a finger. If the kite is not balanced move the point at which the two pairs of canes cross until balance is achieved, then lash the two pairs of canes together at this point with thin string.

To make the bridle, measure a point 3in above one pair of canes and 3in to the left of the second pair of canes. Fix a 1in length of insulating tape to each side of the plastic at this point. Make a small hole through the insulating tape and plastic at the point where the 3in guidelines cross. Do the same thing again, but this time at a point 3in to the right of the second pair of canes. Pass one end of a length of thin string through one of

matchsticks up to the surface of the kite and fix them in position with insulating tape. Slip the fishing swivel over the free end of the string, pass the free end through the second hole in the kite, and adjust the length of the string to produce a V with its apex 4in from the surface of the kite. Position the swivel at the apex of the V and secure it in place by putting a couple of turns of copper wire around the string. Secure the free end of the string by means of matchsticks and insulating tape as already described. The kite is then complete. Assembly only takes a few minutes and the cost of materials is about 6p.

The line/antenna

The 150ft line used with the kite is made from the so-called "stunt kite line" available from toy shops; this is a very light nylon line, usually sold in 100ft lengths. The small plastic winders supplied with these lines are not suitable for antenna work, so when the line/antenna has been made it should be wound onto a piece of board 8 by 6in with slots 1in deep and 4in wide cut in the narrower ends. As the weight-lifting capacity of a kite is limited, the antenna suggested consists of 130ft of 28swg enamelled copper wire, plus a short lead-in. Experience by other operators using "invisible" antennas shows that this gauge can handle up to 150W.

To make up the antenna, reel off 135ft of kite line and fix it firmly between two supports, such as spades, driven into the ground. Clean 1in or so at one end of a reel of 28swg wire and solder 4ft of light, flexible, insulated wire to it. Attach the joint firmly to the kite line, 4ft from one end, by tying it on with thin string and then taping it in place. Keeping both kite line and wire under tension, reel off a further 10ft of wire and tie to the line at the end of the 10ft section, using thin string. Repeat this every 10ft until 130ft of wire has been reeled out. Cut the wire and secure the end of the last 10ft section to the line by twisting the last 2in round the line and taping them in place. The line/antenna is then wound on to the winding board, starting at the lead-in end.

In tests so far made, this antenna has been worked against a counterpoise consisting of the chassis of a saloon car. Coupling to the transmitter has been with the aid of the coupler shown in Fig 2. Components L1, C1 are chosen to resonate at the desired operating frequency, tap T1 is adjusted to provide a good match to the transmitter output, and tap T2 is adjusted to pro-

vide maximum rf into the antenna.

One point is worth stressing. Even in breezy weather the wind does occasionally die away for a minute or so, and this may allow the kite to sink gently to earth. If QRO equipment is being used to excite the antenna this might cause a mismatch at the transmitter output, so to avoid any possibility of damage it is suggested that QRO equipment be run at not more than 75 per cent of its rated power when attached to a kite antenna. No problems have arisen when using QRP all-transistor equipment.

Flying the kite

Before attempting to fly a kite, the following safety precautions should be noted:

(1) Never fly a kite where it can fall on power lines, telephone lines, roads, people or animals.

(2) Never fly a kite if there is a possibility of lightning in the area.

(3) Never fly a kite above 200ft (unless special permission has been obtained).

To prepare the kite for flying, tie the end of the line to the free ring on the swivel, and tie on the tail at the point indicated in Fig 1. If the wind is strong, tie one or more additional pieces of cloth on to the tail. Lay the kite flat on the ground, reel off about 60ft of line/antenna, and weigh down the winding board with a heavy stone. Return to the kite, stand back to wind, hold the line loosely in one hand, and launch the kite with the other hand. Move back quickly, paying out line until the antenna reaches a reasonable height, then move back to the winding board and pay out the remainder of the line/antenna.

If the kite is stable but rises sluggishly and then stops rising, take weight off the tail. If the kite takes up a position horizontal to the ground and then falls, try additional weight on the tail, and if this does not give a complete cure slightly shorten the bridle by moving the position of the wire binding. If the kite rises well but side-slips violently to earth, slightly adjust the position of the point at which the two sets of canes cross (by moving the lashing in the horizontal plane) until the instability is cured. Time spent in careful adjustment is repaid by the ability of the kite to fly "hands off" for two or three hours at a time. Once the antenna has been paid out, the bottom of the line/antenna should be secured to a suitable anchor at the point where the lead-in is attached. A small garden fork driven into the ground makes an excellent anchor.

Test results

Tests carried out from GW8PG/P used a 3W transistor cw transmitter to excite the antenna on the 14, 7 and 3·5MHz bands. Despite poor summer daylight conditions, excellent results were obtained. One 30min session on 14MHz produced contacts with seven European countries in an arc from Sweden to Spain, indicating that, even though there is some slope on the antenna, it is still largely omni-directional. On 7MHz all of western Europe was worked, and on 3·5MHz a distance of 250 miles was worked at mid-day. The advantages of a high antenna and an absolutely quiet location were also very apparent when receiving; QRP (3 to 9W) stations in seven European countries being both heard and contacted. Indeed it is not until one goes to a really quiet location that one can appreciate the unbelievable level of electronic environmental pollution that exists in most urban areas. □

THUMB NAIL SKETCH

Kevin Zietz (VK5AKZ)

My interest in radio/electronics commenced whilst I was still at School. I enjoyed building much of my own projects and test equipment. During the early years of my apprenticeship I was encouraged to sit for my L.A.O.C.P. - I subsequently obtained the call VK5ZIB and commenced activities on 6 Metres A.M. using a Pye Reporter Mk 3. I had a lot of fun attempting mobile operation on 6 metres. Near the end of my apprenticeship 2 metres was becoming far more popular and as I had purchased a 1675 disposal unit suitable for conversion to 2 metres I was happy to find a fellow student who had the details and had done a lot of work on these units,and offered his assistance. So now 2 metres F.M.

It was this rig which led me to amateur involvement with Len. I lent it to him to encourage his use of 2 metres. Len's enthusiasm for Morse must have rubbed off a little - He made me an offer I found hard to refuse - lunch time morse lessons. Side line influence was that many of the gang on 6 metres and then 2 metres had long since mastered that "other language" and changed their calls. 'I did not find morse easy but with much patience and perseverance (on Len's part) it began to jell. At the second exam attempt it all seemed to come together and to my surprise the exam was over in seemingly short time (and they did not even complete the text ....like a film with out the ending). At last a NEW CALL VK5AKZ. Then came the C.W. Operators QRP Club.

I am Married and have two daughters (10 and 7 years) I am interested in electronics,mechanics and photography. I have constructed a computer which is based on an ETI project series and developed by a group of local enthusiasts the main design feature was to keep it as open ended as possible with in obvious financial constraints and to make it a learning experience. It is now covering most of my typing errors "the eraser does not mark the paper and it never wears out". I programmed it to send me morse to help with my receiving, and it has grown to the stage where it easily handles the club (and other's too) records.

I am involved in community service through School council and volunteer ambulance work. I work in the Health Care Area as a Technician on specialised Electromedical Equipment. Due to work, community and family commitments I find minimal time for my hobbies I am currently attempting to adjust this imbalance.

DIPOLE DIMENSIONS

Band	Mode	Length in Feet
80	CW	62.80
80	Phone	60.00
40	CW	32.85
40	Phone	32.50
20	Phone	16.50
15	CW	11.06
15	Phone	11.00
10	CW	8.30
10	Phone	8.20

Every amateur who lacks the resources necessary to erect a really impressive antenna system feels himself at a great disadvantage, especially if he operates very low power. Because propagation and antenna size and location are fraught with many variables, oftentimes one focuses on the wrong factor for his specific situation, wrongly assuming that if he works on improving that factor, his on-the-air results will improve drastically. This, of course, leads to a great deal of frustration. Often it leads to despair. At various times in this column, we've tried to consider the various factors involved in optimum antenna performance, for example, in the January, 1975 column, where the question of antenna height vs. performance was reviewed. Our old buddy Rockey, W9SCH, has been in a limited resources situation since the stone age, it seems, dwelling on his small city lot in suburban Chicago. Being a philosophical type, he had ruminated much on the pros and cons of this and that, and, after much theorizing, has managed to consistently produce a signal that never burns out any receiver front-ends, but one that is at least heard outside his own neighborhood. Every now and then, Rockey will whip off the result of his ruminations—usually printed in pencil on graph paper, replete with charts and graphs and formulae. I always find these interesting and informative. Well, one such paper appeared in the mail the other day, and seems worth sharing with the gang. His analysis and conclusions will provide food for thought, so I've decided to go ahead and let Rockey have the forum for the moment. He writes:

Relative Performance vs. Height of Half-wave Dipole Over Average Ground

Table I – Half-wave Dipole vs. Ideal Dipole in Free Space.
Table II – Gain over Dipole at 10 ft.
Table III – Power Output (watts) required to produce the same signal strength at distant receiver as one watt to ideal dipole in free space.
Table IV – Power Required to Produce same Signal Strength as from real dipole at 10 ft. for other heights.

"How High Is UP?"

We all agree that the higher an antenna is above dirt, the better it works. But antenna altitude requires both work and money for its realization. Therefore, the question is: how high does it *pay* to raise an amateur dipole? Now, the U.S. Signal Corps has investigated this matter. We "lift" the following information from Technical Manual TM 11-486, Chapter 6, modifying it for the amateur frequencies and conditions in Table I. This data strictly applies to horizontal, half-wave dipoles whose centers are at the heights specified. We round off to the nearest decibel. We regret the lack of data for the 21 and 28 MHz bands. One can assume the same trends for these bands as for the lower frequencies.

Table II presents the effects of a height increase most strikingly. *To increase the signal-strength at the receiver by one S-unit, you must double the antenna height!* This assumes one S-unit = 5dB, as is standard. This is a slightly different result than we found in *The Milliwatt* article (August, 1971), but not out of harmony with the general level of magnitude involved.

Table III compares the number of watts theoretically required to produce the same signal strength at the distant receiver as would be provided by an ideal dipole in free space radiating one watt. Those individuals making the KM/W Award with low antennas can hereby justify another slap on the back upon perusing the table. It might be of value in weighing the cost of an antenna height increase against that of increasing the power output. Table IV again puts power in place of decibels for those who find logarithmic thinking difficult, and may help some in formulating economic strategy.

The Signal Corps data from which our figures are derived is based on field testing, and, incidentally, agrees well with our amateur experience. Although this data applies strictly to the horizontal half-wave dipole, it is probably usable for any simple horizontal amateur antenna less than about a wavelength long. It will also probably work for inverted Vees. Some general conclusions which might be drawn from this data are: 1) the highest antenna still seems the best, when all other conditions are equal, but, 2) since the benefits of height are gained slowly, it is scarcely worthwhile to strain muscle or pocketbook for a few inches or feet more height. If your present antenna is at twenty feet, it is probably not worthwhile of an investment to raise it, for example, to thirty feet unless other advantages are simultaneously gained, such as gaining clearance of surrounding structures. On the other hand, it is worthwhile to get up ten to twenty feet. Remember, as a general rule, you must double the height to gain one S-unit advantage. That height is worthwhile cannot be doubted, but to have a really "high one" requires either luck or money in unusual quantity. We remember stringing a 150 meter half-wave antenna between two Chicago buildings at a height of over two hundred feet!! This antenna produced the first consistent Midwest U.S. to Europe phone QSO's in the thirties, but such opportunities are rare. Probably a 40 ft. antenna at a height of 30 ft. or so is the wisest investment, in terms of performance per dollar spent, for most amateurs—at least those who are in cramped urban areas.

ADRIAN WEISS, K8EEG

*83 Suburban Estates, Vermillion, S.D. 57069

Freq. (MHz)/Skip (miles)	Dipole Height (dB Diff. Between Ideal and Real Dipole.)			
	10 ft.	20 ft.	30 ft.	40 ft.
2 at 200	–10	–5	–3	–1
3.5 at 300	–9	–4	–2	–1
3.5 at 1000	–17	–12	–10	–8
7 at 1000	–13	–8	–6	–4
14 at 1000	–9	–4	–2	+1

Table I

Height (ft.)	Gain (dB)
10	0
20	+5
30	+7
40	+10

Table II

Freq. (MHz)/Skip (miles)	Power Output (watts)			
	10 ft.	20 ft.	30 ft.	40 ft.
2 at 200	10	3	2	1.3
3.5 at 300	6	2.5	1.5	1.3
3.5 at 1000	50	15	10	6
7 at 1000	20	5	4	2.4
14 at 1000	8	2.5	1.5	1.0

Table III

Height (ft.)	Gain (dB)
10	1
20	0.32
30	0.20
40	0.10

Table IV

TASSIE DEVIL

"THE SAGA OF A TASSIE DEVIL"

Firstly I must appologise to the many members that I had to dissapoint because I just could not supply them with kits for the 80M QRP CW transciever. When Ian VK7IJ first built the prototype it was obvious that at last here was a project idealy suited to the home brewer. Not to complex, technically very interesting, and inovative in some areas.
I was genuinely surprised how well it performed and naturally only to pleased to make up a kit. The Southern Branch of the W.I.A. do have an activity centre and it was decided to investigate the componant availability and price ect. This I did and from information that I received from local supply houses, together with componants already on hand offered the kits to anyone interested for a total cost of $35.00. The original target of I2 kits was decided on. Thinking that it would be a sufficient amount we began to order the PC boards and componants ect. In the first week the orders came flooding in at about the same time some of the componants began to arrive and further price lists ect. It became obvious that the original prices quoted were no where near the current prices and it was decided to make a target of 30 kits,to do this we had to increase the price to $45.00 per kit. I personally wrote or contacted the first I2 people whose orders had been accepted, explaining the increase price. Fortunately no one objected, in fact quite a few did not know how on earth we could of provided the kit for such a low price in the first place. Of course the componants that I had on hand that had been bought years ago, help to off set the cost.

The point is that in excess of 70 people showed their interest in the kit. This response is very encouraging, it does prove that a lot of people still want to home brew their own equipment, it is a pity that most of the major componant suppliers have, or are reducing the quantity, and limiting the range of ham radio componants, true, computer buffs are being catered for very well, but I do fear for the future, of the humble ham radio home brewer, eventually even my imense junk box will run dry.
I must get off my soap box (full of junk) and get on with the question in hand. To cater for those unfortunates who missed out, we are making available a printed circuit board, parts list and information so that you can build your own "Tas Devil" and chase up your own parts, the only real difficult componants are good quality air spaced variable capacitors, and slow motion dials. Buying new parts today the estemated cost would be around $75.00.

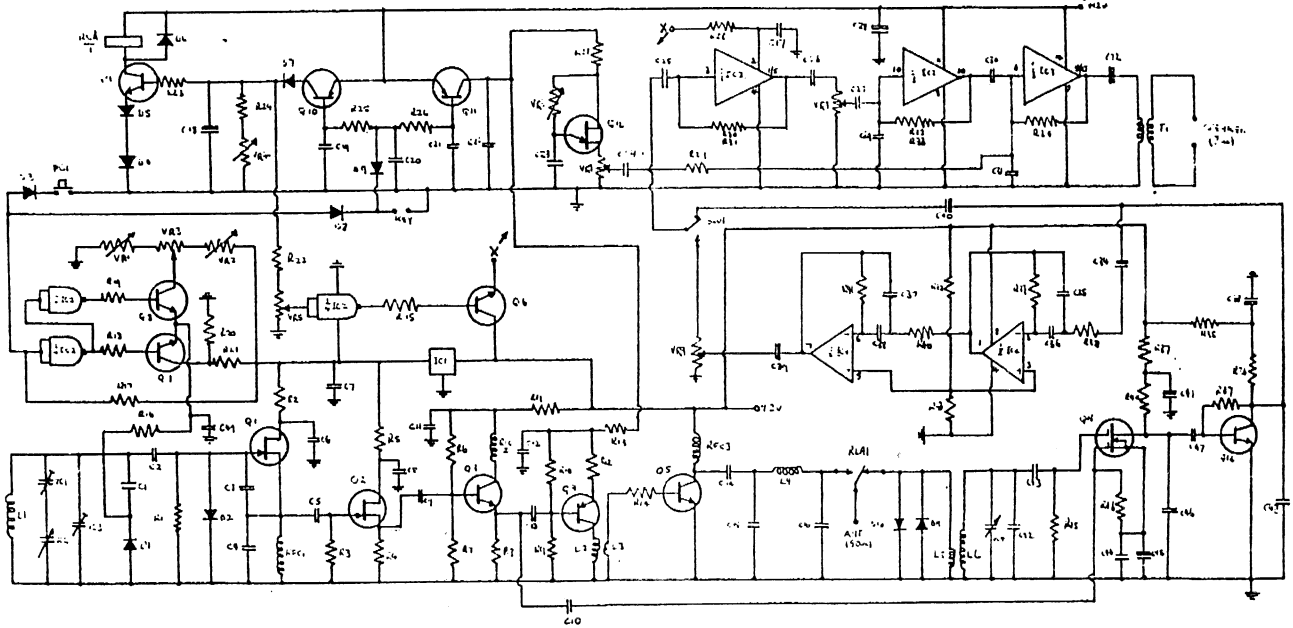
So again I repeat if you would like a P.C.B. board and construction information, write to me VK7VV, as soon as possible. This will make the ideal project during the coming winter months. The cost which includes postage within Australia and Newzealand is $I6.00. Cheques made payable to"Tasmanian W.I.A. Southern Branch.

USING A MULTIMETER TO FIND PNP or NPN:

1. Clip meter -ve lead onto centre lead of transistor.
2. Set multimeter to high ohms (x1k range)
3. Positive lead to outer pins reads:
   HIGH-HIGH IT's PNP
   LOW-LOW IT's NPN

"TAS DEVIL" 80M CW QRP TRANSCEIVER

'7IJ 12-85



LETTERS

LETTERS TO THE EDITOR

The status of W.Q.F. affiliation of our club seems to be dragging on and on. If we are unable to get a reply from the W.Q.F. direct how about sounding out other member clubs regarding their involvement and knowledge of current means of contact. I feel that regular updates on world hapenings are essential and that the W.Q.F. seems to be in the ideal position to be the vehicle for TWO WAY communication between QRP clubs.
Kevin VK5AKZ (43)

EDITORS NOTE
This sure qualifies for the saga of the year Kevin. Len VK5LP No I followed this one up as far as he could, and I as secretary followed in his footsteps came up with a blank. I also wrote to Gus G8PG No 50 hoping that he as an ex W.Q.F. president could help, also asked the same questions to our North American club members, it would appear that they could not help either, because I have not as yet received any information. Perhaps one of our readers may have some information they can pass on. It would be appreciated. I agree with Kevin of the importance of belonging to the W.Q.F.
VK7VV No3 Editor.

I am very keen regarding club logo stickers my understanding was that your investigations found that they were too expensive. Please indicate how expensive, we can then look at other sources and then put it to the members.
Don VK5AIL (75)

EDITORS NOTE
Yes Don you are correct, local enquires indicated that stickers would cost about IOc each, thats more than the price of a QSL card. Other readers may be able to come up with a better price. Maybe one of our computor buffs can come up with a computor generated stickers suitably worded, we look forward to some feed back on this problem.
VK7VV No3 Editor.

How about a "Tas Devil" class of operation which would maybe serve a couple of ends. Publicity, fair competition and a limit on the cost of the device-which would make it accesable to all.
Merv VK3ADX (85)

EDITORS NOTE
Good suggestion Merv., elsewhere in this issue you will find the current situation regarding the "Tas Devil".

How about a column in AR? When has QRP had good exposure is there anyone, or group out there that could write an article and or a column on QRP for AR if they are interested. Some good photos and we may even be in the running for a lead article with frount cover display. ARA is another vehicle. By the way the club info in ARA regarding our club is incorrect; and should be corrected as a matter of urgency. I will be trying to get back on HF and to set up with some help from Len a net for the organisation and communication between the officers of our club. I feel we have sunk into a rut and that if nothing is done the club will follow with exceeding speed.
Kevin VK5AKZ (43)

EDITORS NOTE
I have written to A.R.A. pointing out the error, I hope our readers have the

answer to your other suggestions. The HF NET is badly needed I hope you have more success than Neil and I had introducing a net.

I am sorry but I have one gripe (only one); I was disappointed that you scrapped the scoreboard and put in a club awards instead. I don't like contests and awards; For me, the new system is too complicated, too serious and too much bother; S. please just delete my name from the awards list. I don't mind putting in a score for interest only. My additional points scored are:- 80m, 27; 40m, 5; 30m, 41; 20m, 14; 17m, 5; 15m, 12. Incidently, there was an error in the last club award, the 10mhz pts. should have been 75 and 18mhz 0 pts. Otherwise a very good edition of Lo-Key;
Jeff VK5BJF (57)

EDITORS NOTE
As you can see Jeff I did not scrap your name off the scoreboard list.(HI) as this years scoreboard is now finished, and I have made comments regarding this in other issues of Lo-Key, you may have other thoughts on the concept. Maybe other members will let the committee know how they feel and submitt some constructive advice.

That was a good effort of Jeffs (VK5BJF) on INTRUDER WATCH, to be recognised by receiving the W.I.A. certificate No,004 for his services (AR January 1986 p,52). I guess you will let everybody know in Lo-Key, which would be FB.
Don VK5AIL (75)

EDITORS NOTE
Well done Jeff, keep up the good work.

It is difficult to write a VK5 news when I have not received any news. I don't like to just write about my activities. However, I would like to bring to member's attention a very useful item which should be on sale soon. It is a C.W. memory unit which a group of VK5 amateurs have developed and they will be producing a production model in the next month or two. I have just received a prototype and it is really good. Several other members are also using them e.g. VK5PH and VK5AIL. You can key into one or both of it's two memories a "CQ" or short message and it can then key the Tx., repeating the message continuously. Just great for stirring up some activity on a quiet band, even if it takes half an hour; Any enquiries should be directed to Lindsay, VK5GZ.
Jeff VK5BJF (57)

EDITORS NOTE
Members may like to note Jeffs comments on lack of news.

VK5BD BYRON

ROD GREEN DOES IT AGAIN

80 METER PA. CIRCUIT.

5 MILLIWATTS IN, 5 WATTS OUT.

DIGITAL TECHNOLOGY. 80% EFFICIENT

How it works, see fig 2.

First your VFO signal must be converted to C.M.O.S, logic levels (I2VPK-PK) via the seperate interface circuit of fig I. This is just a buffer circuit, and any circuit which will provide I2V peak to peak or there abouts will do as well. However I doubt if it could be done more simply. Ok, now this signal now feeds IC2a, whos functions are (I) to convert the I2V P.P AC coupled signal from C2 to CMOS level ie OV to + VE I2V, and (2) in the case of RF drive fail during a key down period, will ensure that QI is off. It happens this way, 2, puts OV into IC2a, this is wired as an inverter and thus has +I2V on its output. This is fed to IC2B, C and D in parallel, which again inverts the signal and puts OV on the gate of QI which shuts it off. Now the function of IC2B, C, and D in parallel, provide extra drive current into the capacitive input of QI, as one individual C mos inverter might not completely turn on QI at this frequency.

QI is the actual PA amplifier. The output circuit is absolutely standard. The reason for the C mos driver is that QI,s gate is zener protected and cannot be driven below zero volts on the gate, as thus is not capable of conventional methods.

A final couple of comments, QI needs a small heat sink about 25 x 25mm. I used a conventional bolt on commercial one. Q2 is a keying transistor if needed, otherwise short out collector to emitter, ie earth the source. The keying transistor also needs a small heat sink (a flag type will do), the ARRL hand book shows how to use this style of keying, however I will include details with the rest of the TX next time.

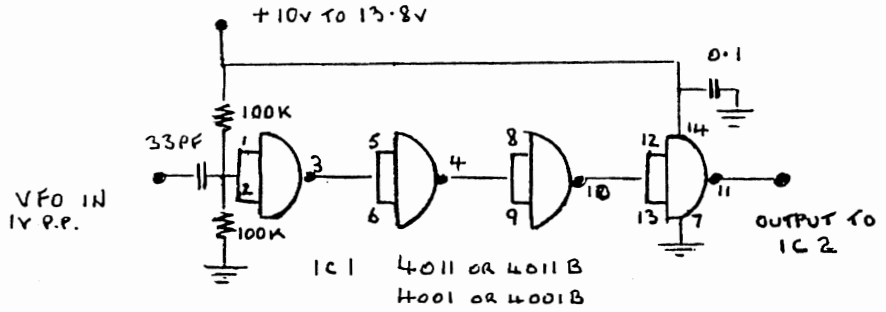
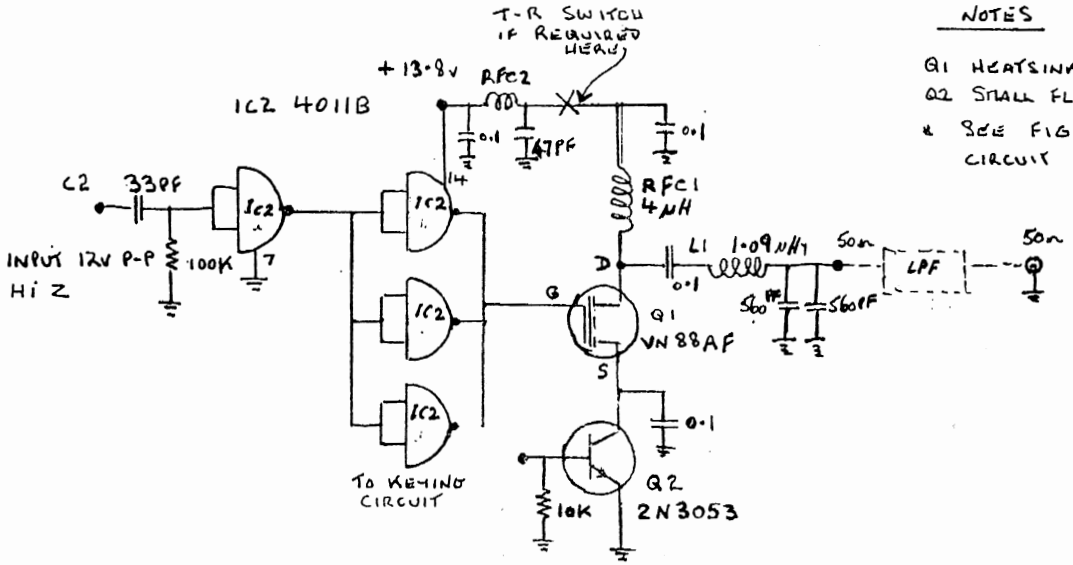


FIG 1 BUFFER CIRCUIT ALSO PROVIDES SOME ISOLATION



NOTES

Q1 HEATSINK 25x25 mm ALUMINIUM
Q2 SMALL FLAG HEATSINK
* SEE FIG1 FOR SEPERATE BUFFER CIRCUIT FOR LOW LEVEL SIGNALS

FIG 2

5 WATT P.A. FOR 80 METRES.

CONTESTS

1986 CONTEST PLANNER

APRIL
05-06 DX-YL/NA-YLCW Contest
06-07 SP DX Phone Contest
12-13 DX-YL/NA-YL Phone Test
(19-21 ARCI QRP SSB Contest)
26-27 HB9 'Helvetia 26' Test

MAY
03-05 County Hunters SSB Test
11-12 USSR CW-M Contest
24-25 PY 'ITU' CW Contest
24-26 CQ WW WPX SSB Contest
25-26 PY 'ITU' Phone Contest

JUNE
15 WW Sth American CW test
21-23 All Asian DX Phone Test

JULY
05-07 YV DX Phone Contest
12-14 IARU Radiosport Contest
12-14 HK DX Contest
19-21 SEANET DX CW Contest
(20-21 AGCW QRP CW Contest)
26-28 County Hunters CW Test

AUGUST
03-04 YO DX Contest
09-11 WAE-DC CW Contest
16-18 SEANET DX SSB Contest
23-25 All Asian DX CW Test

SEPTEMBER
07-08 LZ CW Contest
13-15 WAE-DC Phone Contest
20-22 SAC CW Contest
27-29 SAC Phone Contest

OCTOBER
04-05 VK/ZL/6 Phone Contest
11-12 VK/ZL/O CW Contest
(11-13 ARCI QRP CW Contest)
12-13 RSGB 21/28 SSB Test
19-20 RSGB 21 MHz CW Test
25-27 CQ WW DX Phone Test

NOVEMBER
(01-08 HA QRP CW Contest)
08-10 WAE-DC RTTY Contest
09-10 OK DX Contest
29-01 CW WW DX CW Contest

DECEMBER
06-08 ARRL 160M CW Contest
07-08 TOPS 3.5 MHz CW Test
13-15 ARRL 10 Contest

"VK VERSUS THE WORLD" CONTEST
SECOND WEEK IN NOVEMBER. SUBJECT TO FEED BACK FROM CLUB MEMBERS.

STATEMENT OF RECEIPTS AND EXPENDITURE FOR YEAR ENDING DEC 85.

RECEIPTS		EXPENDITURE		
DONATIONS	$100.55	BANK CHARGES		$ 100.55
INTEREST	$ 15.78	INC TAXES		$ 15.78
		& CHEQUE FEES	$ 1.90	$ -1.90
PETTY CASH		LEN O'DONNELL		
FLOAT EX		PART REPAY	$ 60.00	$ -60.00
LEITH (84)	$ 11.00	PETTY CASH	$ 18.00	$ -7.00
QSL CARDS	$100.00	QSL CARDS	$ 80.00	$ 20.00
SUBSCRIPTIONS	$622.97	(note 1)		$ 622.97
		LO-KEY ISSUES	$291.23	$-291.23
		(note 2)		
		CERTIFICATES	$ 96.00	$ -96.00
		POSTAGE	$ 37.24	$ -37.24
		SURPLUS CARRY FORWARD	$265.93	
TOTAL	$850.30	TOTAL	$850.30	$ 265.93

SURPLUS (85)	$265.93		
BALANCE B/F (84)	$294.00		
CURRENT BALANCE		$559.93	
surplus 1986	$275.74	(to date)	
BANK BALANCE		$835.67	(to date)
LESS EST LOKEY (86)		$300.00	(see Note 2)
LESS LIABILITY		$406.41	(Loan ex L. O'donnell)
WORKING BALANCE		$129.26	

NOTES:

OUT STANDING RECEIPTS

1/ Still outstanding amount of $20.00 commission for QSL cards. included in 1986 surplus above.

OUT STANDING LIABILITIES

2/ Still a proportion of members have prepaid for issues of LOKEY (ie subs paid in advance). Congratulations to Rai for obtaining a very good price for the printing of LOKEY.

3/ It is therefore my recommendation that we pay off the loan from Mr. L. O'donnell. This in my opinion leaves sufficient reserves for the club. I feel this club owes it to Len to clear this loan as soon as possible considering club finances.

4/ The above accounts have not been audited. I have sent Rai, Don, and Len (he has a large interest) a copy of my break-down and photostats of the Bank Statments.

5/ A BIG THANKYOU for all those DONATIONS (Some quite substantial)

K. R. Zietz.
TREASURER 1985.

HELP!!

HELP WANTED

'VK VERSUS THE WORLD CONTEST"

Question 1. shall we continue with it?
2. are the rules OK?
3. what changes would you advise?

Editors comments
Change name to "World QRP contest" same rules and conditions. But additional rules. to be added.
1. entries received with less than 10 contacts accepted as check logs only.
2. section to include S.W.L. section.

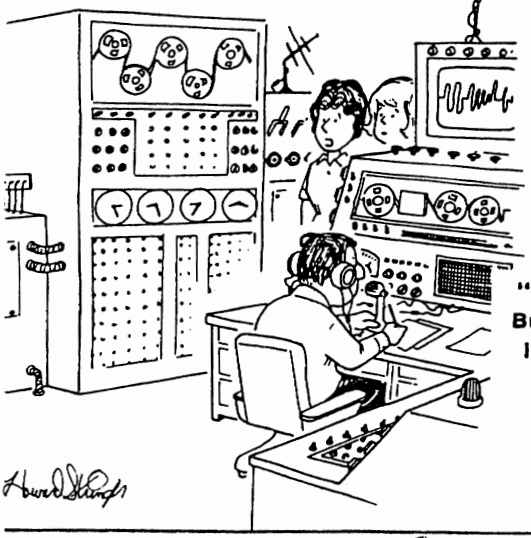
Club scoreboard

Question 1. shall we continue with it?
2. What changes would you advise?
3. are the rules OK?
4. maybe revert back to the old system of points $\frac{\text{distance}}{\text{power output}}$?

Editors comment
I'm happy with existing conditions, but wide open for your ideas;

Awards
1. How can we improve our internal awards programme. ?

Editors comment
Could sure do with some suggestions on this one. With the election of officers now in progress I have kept my comments rather Lo-Key (no pun intended) I would be only to pleased to step down as secretary and editor, and would fully co-operate with anyone seeking these offices. So don't be shy coming forward.



"It started out as a simple listening post. But that's how Arnold is. . . When he gets involved in something, he goes all out."