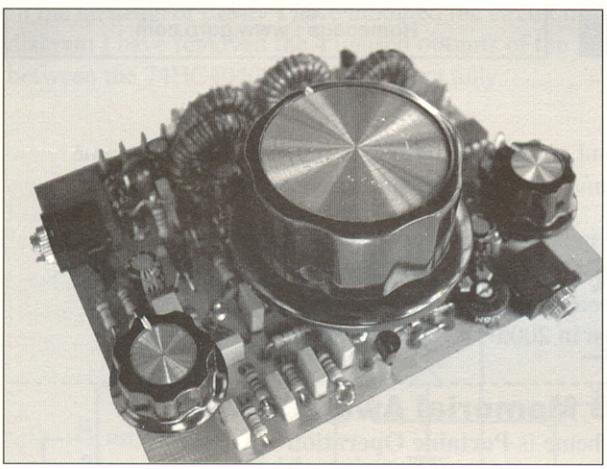
SPRAT

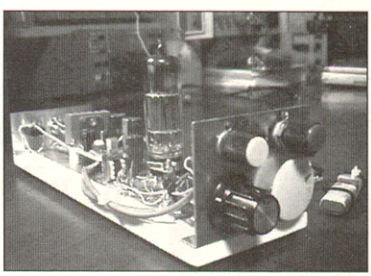
THE JOURNAL OF THE G QRP CLUB

DEVOTED TO LOW POWER COMMUNICATION

ISSUE Nr. 121 | © G-QRP-CLUB | WINTER 2004/5



Left: The Brent Transceiver Featured in this issue with a special kit offer for members



Right: The JA9MAT 12BH7A 12v. Autodyne Receiver

Simple Frequency Counter Updates ~ 12BH7A Autodyne Receiver
Op-amp Comparisons ~ NVIS Aerial ~ KX1 Power Supply
Zener Tester ~ Pottenstein 05 ~ Poor Man's Spectrum Analyser
Cheapest VHF Receiver ~ Sensitive RF Sniffer ~ The BRENT
SPRAT Feedback ~ SST Muting ~ Subscription Information
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JOURNAL OF THE G QRP CLUB

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Rev. George Dobbs G3RJV

Welcome to SPRAT 121. Some members have had problems emailing me. For some time I have not used the "dot-com" email address and my current address is as above.

The W1FB Award entries for 2004 were of a high standard and after a lot of deliberation; the award is to go to **Hans Summers, GØUPL for his "Simple Frequency Counter".** The theme for 2005 is as below. I look forward to your entries.
Good QRP construction and operation in 2005!

The W1FB Memorial Award 2005

For 2005, the theme is **Portable Operation**
Submit any design on this theme – accessories, antennas, measuring equipment … or even a complete transceiver.
Please submit your design to G3RJV as soon as possible, with circuit sketch, all values and brief notes.
The project will be published in SPRAT and the winner will receive an engraved plaque.

72/3

G3RJV

EDITED BY GEORGE DOBBS G3RJV ARTWORK BY A.W. (MAC) McNEILL G3FCK
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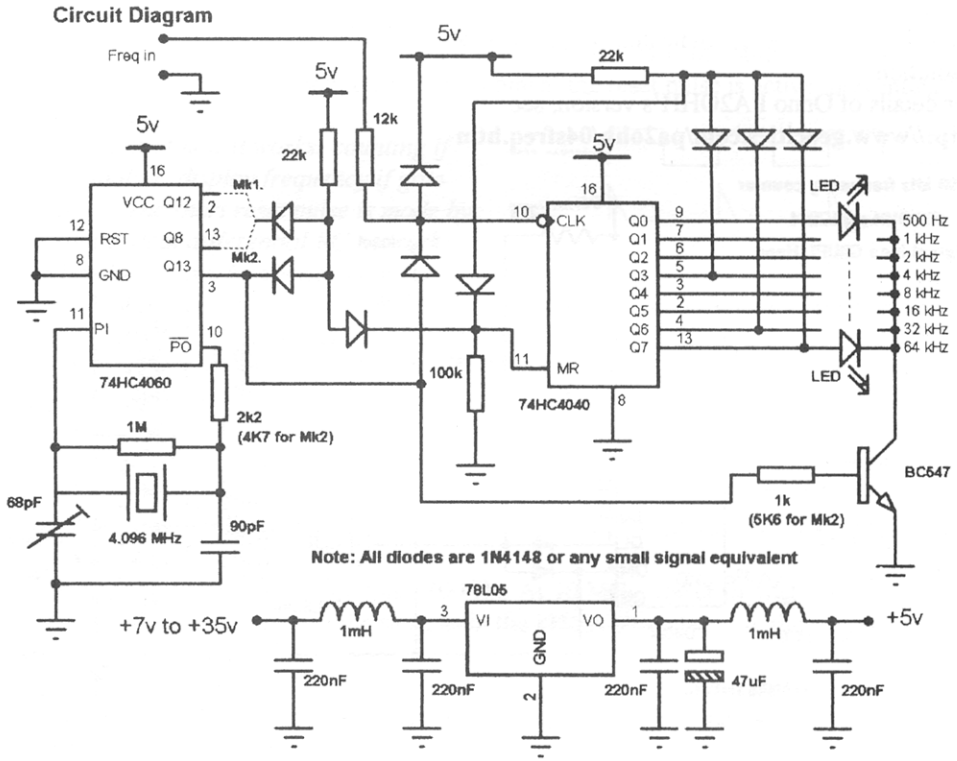
More Ideas with the Simple Frequency Counter

Hans Summers G0UPL, Tudor Capital, Great Burgh, Epsom, KT18 5XT
With ideas from Onno PA2OHH and Miguel, PY2OHH

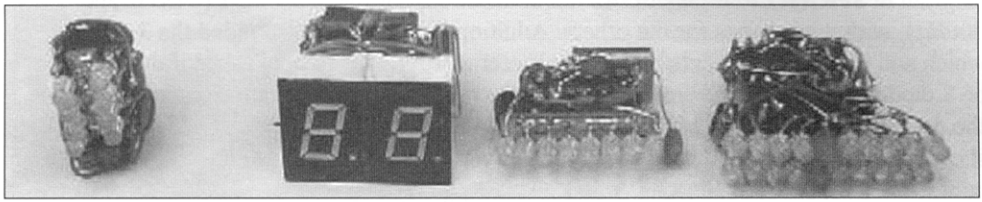
My original article in SPRAT 120 attracted a lot of attention. I have had several queries from people who did not understand how the LED's were connected. If you look at the diagram in SPRAT 120 it only draws full connections for the end LED's (64KHz and 500Hz), with dotted lines for the others. Additional confusion surrounded the 3 diodes which add 64 + 32 + 4KHz to reset the counter at 100KHz. People asked if there should be 8 diodes, but only 3 are drawn, and how the remaining 6 LED's are connected. Due to the drawing program used by Tony Fishpool G4WIF (thanks Tony), the 74HC4040 is shown with all 12 outputs, though only the lower 8 are used; this also contributed to the confusion.

In the interests of clarity I have modified the circuit diagram drawing. In this version of the diagram I have removed the 4 unused outputs of the 74HC4040, and drawn all connections between the 74HC4040 and LED's more fully.

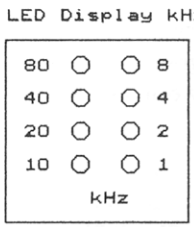


A BCD (binary coded decimal) Version

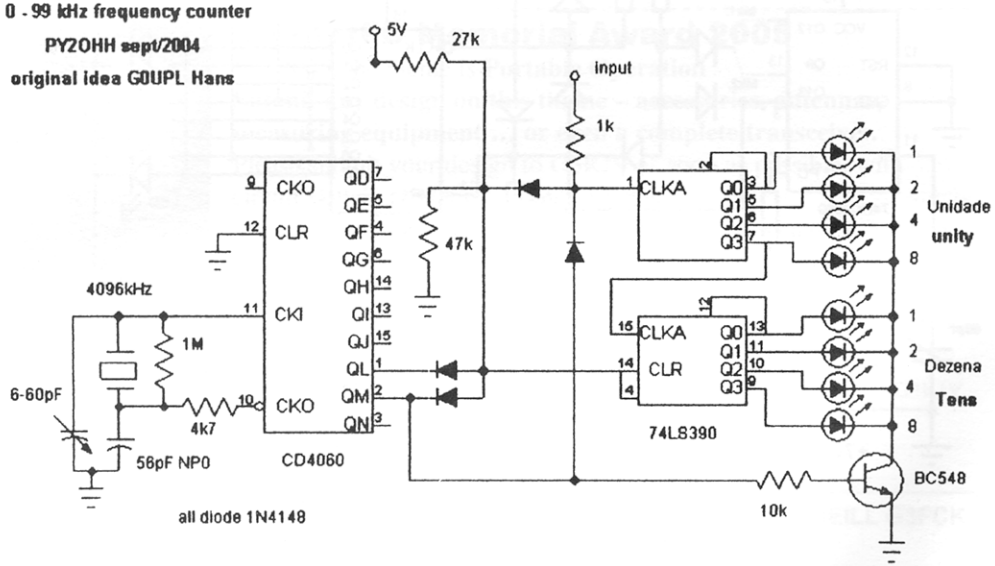
Subsequently Onno PA2OHH had the idea of using the 74HC390 in place of the 74HC4040 in order to obtain a binary coded decimal (BCD) readout. Later I mentioned it during correspondence with Miguel, PY2OHH and he built it (pictured far left), along with an original 4017 version (far right) and a 7-segment version. Note that Miguel has also perfected my new boardless, 3-dimensional, "really-ugly" construction technique!



Using a 74HC390 dual BCD decade counter instead of the 74HC4040 provides two columns of four LED's with BCD frequency readout, which is easier to read than plain binary. Indication is 80-40-20-10 and 8-4-2-1 instead of my original 64-32-16-8-4-2-1-0.5. BCD is easier to add up! The modified design still only requires 2 cheap IC's, but considerably fewer diodes etc. With a simpler circuit and more convenient display format, the only disadvantage is that the resolution of the lowest bit LED is 1KHz instead of 500Hz. Indicated count is 0-99KHz with 1KHz resolution.



For details of Onno PA2OHH's version, see
http://www.geocities.com/pa2ohh/04sfreq.htm



A BINARY DECIMAL 2x4 LED DISPLAY from Onno PA2OHH

Instead of the original 8 led binary display, we can also make a 2x4 led binary-decimal display. Here a more complex version of the simple frequency counter with 4 chips, it has a kHz and a MHz mode:

Working principle

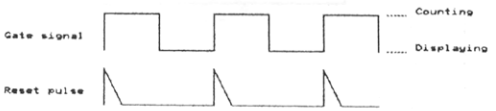
The 74HC4040 in the original 8 led counter is replaced by a 74HC390. This chip has two /10 dividers so that we will have that new display with 2x4 leds instead of the 1x8 led display. A 74HC00 (do not use a HCT) is added, one NAND is used as RF preamplifier to increase the sensitivity and as buffer between the VFO and counter, another as an RF gate switch to start and stop the counter. The unused inputs of the two remaining NAND's are grounded. Using a 74HC00 instead of the transistor amplifier eliminates the problems with the settling time of the RF transistor amplifier of the original two chip frequency counter. The chip is even cheaper than the transistor but needs more supply current!

It works as follows: We reset the 74HC390, then count, then stop counting and display the frequency and then reset again etc.

The 74HC4060 oscillator with the 4096 kHz X-tal generates a frequency of 500Hz. Only the +5V half period is used for counting. During the +0V half period, the leds are displaying the frequency, during the +5V half period, they are off and the 74HC390 is counting the frequency. At the beginning of the counting period, the 74HC390 is reset by the short reset pulse from the 100 pF/Rcal differential network.

The gating is very critical as a 1 to 0 transition from the 74HC00 gate will cause an extra count. This does not occur when the gate switches off, then the output goes from 0 to 1 (or 1 to 1). But when the gate switches on while the input is 1, the output of the gate is changes from 1 to 0. However, during this moment the reset pulse is active, preventing that extra count.

Explanation of how it works: counting if gate signal=1, display frequency if gate signal=0. The short reset pulse is made by the 100pF/Rcal differential RC network.



Calibration of the frequency counter

Normally, the calibration is done by adjusting the crystal frequency with a trimmer. But not here! Due to the 100pF capacitors, the oscillator frequency is lower than the crystal frequency. The resulting gating pulse is a little too long. But the frequency measurement time is the length of the gating pulse minus the reset pulse. Calibration of the frequency counter is done by changing the length of the reset pulse (depending on Rcal value). Select the Rcal value for a correct display of a reference frequency.

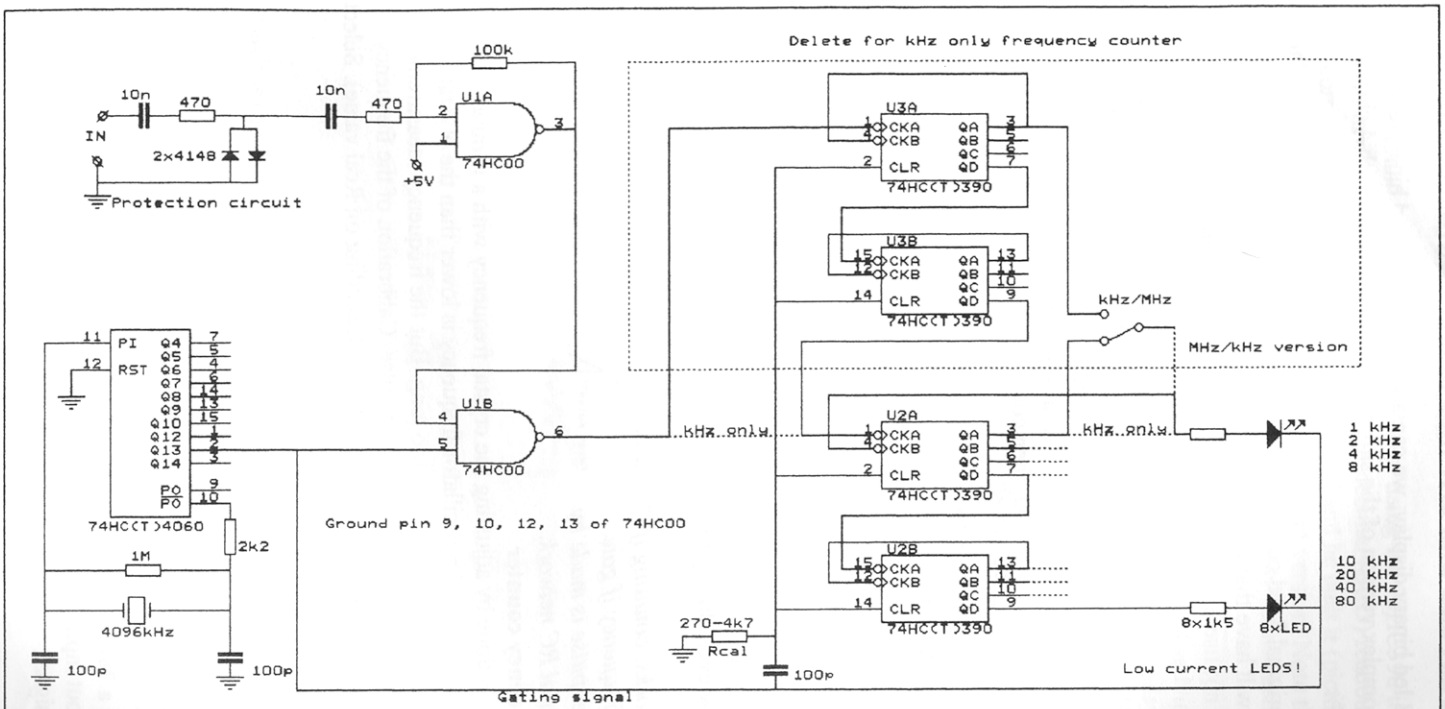
Notes: Use 3mm low current leds.

You should build the counter in a screened box to avoid RF interference in your receiver!!

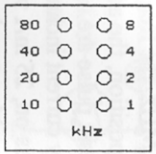
Performance.

At 30 MHz, the frequency error was +300 Hz. At 10 MHz, the error was 100 Hz. In the MHz position, the accuracy is the same as in the kHz position because the same gate pulse and reset pulse are used.

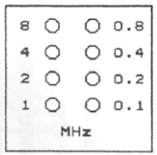
Supply current including a 78L05 stabilizer is 10 mA with an input signal and 50 percent of the leds on, 25 mA without input signal as the supply current of the 74HC00 is much higher without an input signal.



LED Display kHz



LED Display MHz



All IC's: 0,1 uF between +5V and ground.
+5V: pin 14/16 0V: pin 7/8.
Select Rsens value for max. sensitivity.
Sensitivity: 5 MHz: 15mV; 30 MHz: 50mV eff.
Freq. calibration by changing Rcal value.
Ground unused inputs pin 9, 10, 12, 13 of 74HC00.
74HC390 and also 74HCT390 can be used.

Counting when gating signal "1".
Display on when gating signal "0".
Reset by upgoing gating signal via rcal+100p.

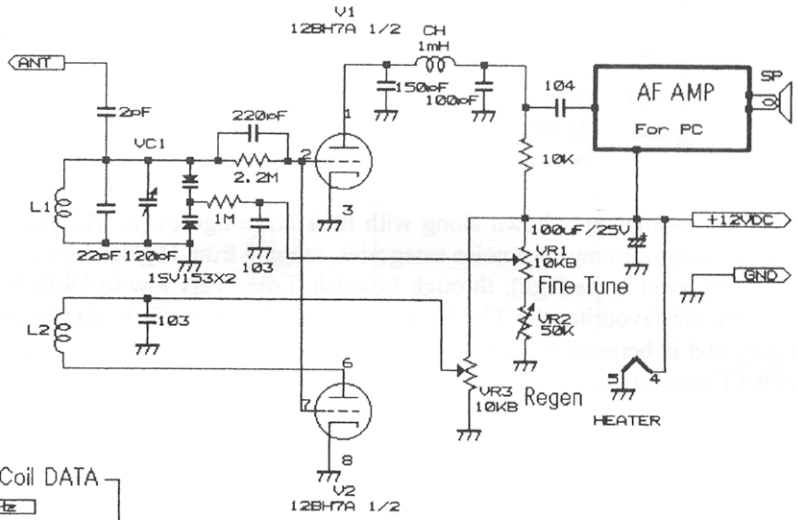
PA2OHH		
Title: 8 LED MHz/kHz FREQUENCY COUNTER		
Size: B	Document Number: 04FRCNT4	REV: 1.0
Date: August 16, 2004	Sheet 1 of 1	

12BH7A 12V Separate Autodyne Receiver

Hidehiko Komachi JA9MAT, 44-10 Ishize-Honmachi,
Takaoka City, TOYAMA. 933-0011. Japan. (ja9mat@jarl.com)

FEATURES;

- Separate OSC Circuit has a stable regeneration.
- 4-Bands Coil covers from 600KHz to 12MHz including 7 and 3.5MHz Ham Bands.
- Only 12Vdc required.
- Using an IC AF-Amplifier for PC.
- Fine Tuning Circuit using Voltage Variable Capacitor.



2Bands Coil DATA

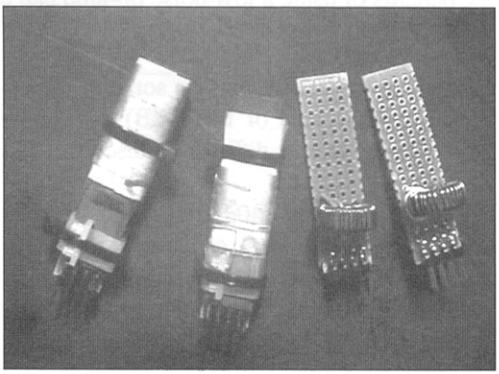
7-10MHz

T-50-2
L1 39T
L2 4T

0.5-1.6MHz

100 Yen Radio
ANT Coil

16,January,2004 - JA9MAT "Hidehiko KOMACHI"



COIL DATA:

7 to 10MHz:
L1 39T, L2 4T on T50-2 Core

0.5 to 1.6MHz:
AM broadcast receiver ferrite slab coil.

Op-amp Noise Comparison

Stef Niewiadomski, Saddlestones House, Faringdon Road, Stanford-in-the-Vale, Oxon.

The good old 741 op-amp is often used as an audio pre-amp in superhet and direct conversion receivers. It has the advantage that it's cheap and often found in our junk-boxes (ie effectively free). The disadvantage the 741 has is that it's relatively noisy compared to more modern devices. In many projects I've used the TL071, which I've always considered to be "low noise" so I thought I'd survey what's available, drawing on the vast amount of information and data sheets on the WWW, and carry out some subjective tests.

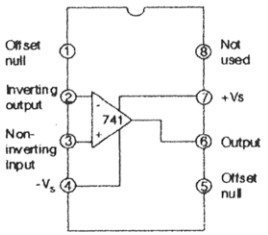


Table 1 shows the op-amps I surveyed. My main criteria for selection were:

1) op-amps must have the same pin-out as the 741 (see Figure 1) so that they are interchangeable on the PCB if a socket is used;

2) tabulate the op-amps for input voltage noise, which tends to be heard as "hiss".

In the table the op-amps are shown along with their noise figures (in nV/√Hz), and I've grouped the op-amps into my own noise categories, ranging from High (ie not-specified for the 741, but suspected to be high), through Low-ish, Low, Very low to Ultra low. It can be seen that my old favourite, the TL071, with a noise figure of 18nV/√Hz, is only in my Low category and is bettered by many other op-amps. The NE5534N, which I've seen in several SPRAT projects recently, is in the Very Low category, and is definitely a good choice.

Input noise and op-amp gain

The noise specified in Table 1 appears at the input of the op-amp, and therefore the noise at the output is related to the gain of the op-amp in your circuit, as defined by the feedback resistors around the op-amp. In a direct conversion receiver, most of the gain of the receiver is concentrated in the audio stages. Often there is a single stage op-amp with 60-80dB of gain, and this stage amplifies the input noise along with the signal. This is where the benefits of using a low noise op-amp can be most heard.

Subjective tests

I did some subjective tests on some of the op-amps with a simple inverting op-amp circuit. With a voltage gain of 10 (20dB) the difference between a 741 and an OP27 (Very Low noise category) was difficult to discern. I tried an AD797 and no noise could be heard at all.

With a gain of 100 (40dB) a 741 is definitely noticeably "hissy"; the TL071 was quieter (but not as much as I expected), the OP07 and OP27 much quieter again, and I still couldn't hear any noise from the AD797.

At 1000 (60dB) voltage gain, the relative order was the same, and the AD797 was still absolutely silent. In fact I had to check several times that it was powered.

Cost of the op-amps

If you had to buy a 741, you'd have to pay about 20p. Most of the low-ish and low noise op-amps are commonly available from normal sources and typically cost between 50p - £1. The NE5534N is about 60p, and I've seen the OP27 for about £2.30. The ultra-low noise op-amps are not easy to get hold of, except for the AD797, which ESR (www.esr.co.uk) sells for about £6.50. My advice is that if you are looking for a very high gain, ultra low noise, stage try to get a loved one to buy you an AD797 for your birthday!

Device	Noise figure typical (nV/rtHz)	Noise category
741	unknown	High (typical junk-box)
TL061	42	Low-ish
CA3140E	40	
LF351	25	
LF355	20	
NE531	20	
TL071	18	Low
TL081	15	
LM301	15	
OP97	14	
LF357	12	
OP07	10	
NE5534N	3.5	Very low
AD743	3.2	
OP27	3.0	
OP37	3.0	
OPA620KP	2.3	
CLC425	1	Ultra low
LT1115	0.9	
AD797	0.9	
OPA847	0.85	
MAX4106	0.75	

An NVIS Aerial for Cramped Locations

Duncan Telfer G0SIB/G8ATH (duncan@g0sib.freeserve.co.uk)

If your location has no room (or is too cluttered) for a full length low dipole and you still want to explore near-vertical incidence skywave (NVIS) propagation [1,2,3] on HF, then you might like to try aerial designs based on the inwardly inclined dual monopole (IIDM) concept [4,5]. This idea was progressed with the aid of Roy Lewallen's (W7EL) excellent aerial design tool EZNEC™ for the PC [6], which so easily allows an experimenter to conduct 'armchair' based explorations before committing designs to wire.

Papers in [4,5] give details of far field (FF) patterns – the near ideal being a sphere resting on the ground at the aerial's location – and discuss VSWR and multi-band capabilities [esp. in 5]. E.g., the same aerial used at 40m for NVIS can, without further adjustment (apart from ATU tuning), exploit horizontal sidelobes that appear at second harmonic and higher frequencies (14, 18 and 21MHz) for skip working. Paper 4 explored an earlier unbalanced feed design which performed well but lacked the NVIS FF lobe stability with frequency of later [5,7] balanced feed designs (e.g., Figs. 1, 2 and 3). Pre-match capacitors (Cm) in the matching unit M of Fig. 4 should be high voltage types and may be constructed from co-axial cable as part of the MQ and MP connections. The values provide a 50 ohm match in each case, using an ATU for fine tuning. Paper [5] also demonstrates the robustness of the IIDM design to changes in configuration, including element elevation and sideways tilt. Most locations, especially cluttered ones, have their own idiosyncrasies. At the home QTH, environmental constraints (beloved of XYLs) include flowerbeds and footpaths. Therefore to avoid strangling visitors (the friendly ones) the grounded leg of a folded element (c.f. Fig. 2) had to be extended and re-routed down a shed wall. But checking via EZNEC™ predicted little effect on the FF pattern. The modified aerial still works fine and remains the one for main HF use.

Figs. 1a,b, 2 and 3 show 7.05MHz IIDM aerials along with captions giving details of wire lengths. If it turns out that what is shown would not fit into your back garden, the design is sufficiently flexible to allow even further modifications – but check with your simulator program (e.g., EZNEC™ 3.0 or 4.0) first! Thus for further height reduction the unfolded DM aerial can be top-loaded with horizontal wires and folded versions can employ 'squared off' elements. Enjoy! 73s – Duncan.

References:

[1] Fiedler, DM and Hagn, GH (1996). Beyond line-of-sight propagation: modes and antennas. In: Fiedler, DM. And Farmer, E.J. (Eds.) Near Vertical Incidence Skywave Communication: Theory, Techniques and Validation. Worldradio, CA. pp10-17.

[2] Austin, BA and Murray, KP (1998). The application of characteristic-mode techniques to vehicle-mounted NVIS antennas. IEEE Antennas and Propagation Magazine, 40 (1) pp. 7-21.

[3] Pat Hawker (2001). Cloud-Warming Antennas, Technical topics, RadCom, Sept.

[4] Telfer, DJ and Austin, BA (2001). Novel antenna design for near vertical incidence skywave (NVIS) HF communications. Proc. 2nd International Conf. on Advanced System Design, Glasgow.

[5] Telfer, DJ and Spencer, JWS (2004). Properties and performance of a new compact HF aerial design for multi-band operation. Proc. 4th Int. Conf. on Advanced System Design, University of Glasgow. [PDF obtainable from www.cims.org.uk]

[6] Lewallen, R. 2004. Antenna analysis software suite from EZNEC.com (Internet).

[7] Telfer,DJ. 'Multiple Monopole Aerial.' UK Patent GB2375235. April 2004.

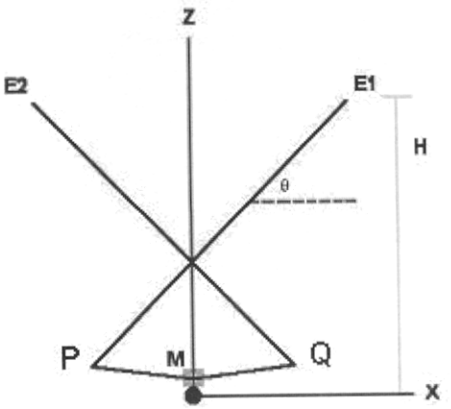


Fig.1a Unfolded DM aerial for 40m : θ=45°, H=1040cm, E1(P)=E2(Q)=1293cm, H(M)=60cm, H(P,Q)=100cm, PM=MQ=340cm, separation at tops of E1,E2 = 1090cm.

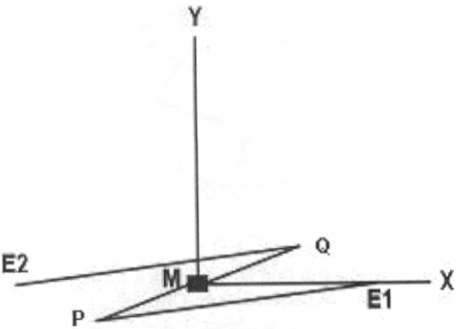


Fig.1b Unfolded DM aerial, plan view. Separation of E1 and E2 at crossover point is 115cm. The horizontal displacements (Y) of P and Q are -100cm and +100cm, respectively, from X-axis.

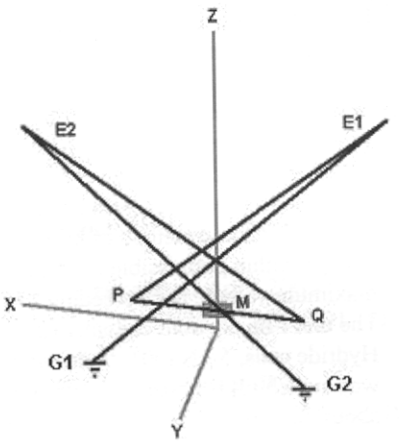


Fig.2 Folded DM aerial with grounded wires E1(G1) = 1255cm, E2(G2) = 1228cm. Driven wires E1(P) = 1149cm, E2(Q) = 1178cm. G1,G2 are 260cm from the PQ (Y=0) axis. X-separation between G1,G2 = 630cm. PM = MQ = 260cm. Ht (Z) of E1,E2 = 900cm and separation of skewed tops = 1072cm, with top of E1 directly above the (Y=0) axis and top of E2 above (Y=260cm) axis. Heights (Z) of P, M and Q are each 56cm.

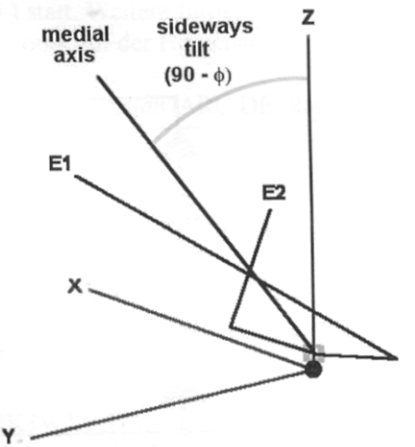


Fig.3 Unfolded DM aerial of Fig. 1a with sideways medial axis tilt of 45°. PMQ parameters in Fig. 1a are retained – only the elements E1 and E2 are tilted, and lengthened slightly to 1297cm to improve impedance match. Cm values in the matching unit should be reduced slightly to 41pF (see also Fig. 4).

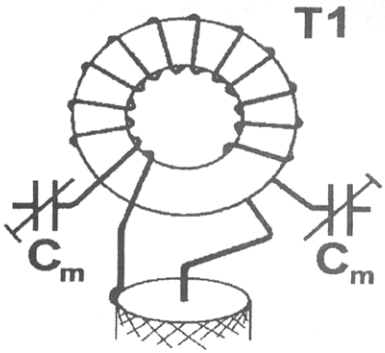


Fig. 4. Matching unit M may use a toroidal transformer or choke balun. Capacitors Cm =43pF for DM aerial of Fig. 1 and 63pF for Fig. 2.

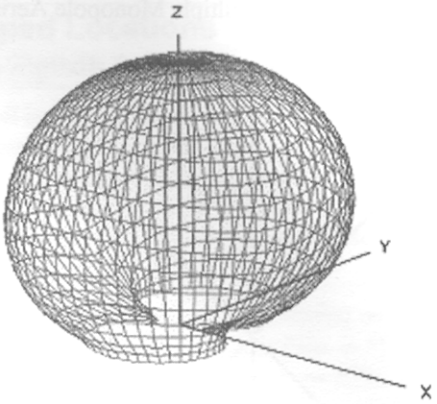
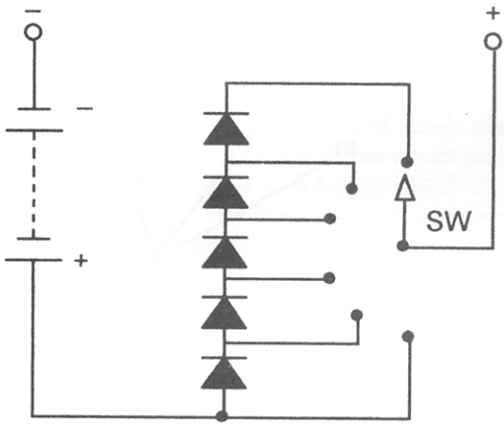


Fig.5 7.05MHz FF pattern for DM aerial of Fig.1, assuming perfect ground. The other two aerials have closely similar FF patterns [see Ref. 5].

A Portable Battery Pack for the KX1

George Davis, G3ICO, Broadview, East Lanes, Mudford, Yoevil, BA21 5SP



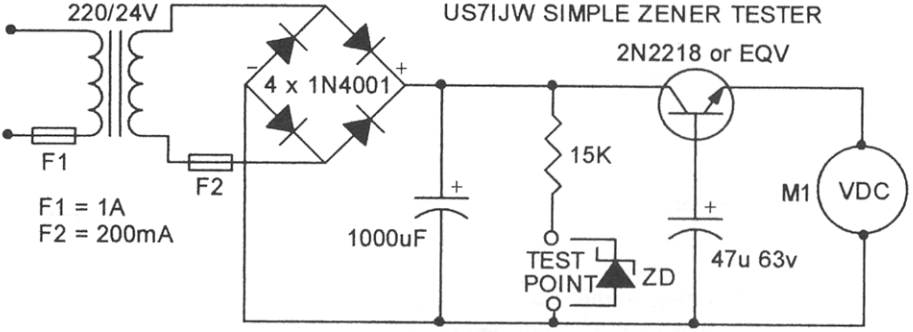
Earlier this year I built an Elecraft KX1 transceiver. This does have provision for batteries but I wished to have an external battery available. The requirements were 14V max voltage, receive current about 40mA and transmit current about 750mA. I decided to use rechargeable AA cells and needed some method of keeping the voltage within permissible limits, i.e. the maximum voltage not exceeding 14 volts. The unit I finally built contains 12 nickel Hydride cells, 5 1N4001 diodes and a six way switch. It is housed in a plastic box about the same size as the transceiver.

In use, when the battery is fully charged all of the diodes are required to reduce the voltage to 14volts. As the battery voltage drops the diodes are switched in one by one to maintain a supply voltage of between 13.5 to 14 volts. The KX1 incorporates a supply meter which makes this an easy task.

At the time of writing, I have had 34 QSOs during an operating time of about 6 hours, from one charge of the battery and have one diode yet to switch out. I must confess that 15 of the QSOs were during NFD and lasted about ten seconds each!

A Simple Zener Tester

Victor Scljarov US7IJW, PO Box 173, Slavyansk 343222, Donetsk Region, Ukraine



This tester has been useful for me in my work. I don't know, but perhaps it is well known? The secondary voltage of the transformer can be less than 24 volts – 15 to 20 volts works well. M1 can be any DC voltmeter or a multimeter.

Pottenstein-Treffen 2005

Das traditionelle Treffen in Pottenstein fuer Mitglieder des G-QRP-Clubs findet auch 2005 wieder am letzten Wochenende im April (22/23/24) statt. Weitere Infos gibt es von DJ3KK, POB 801, D-25697 Meldorf (bitte SASE) - oder auf der Homepage:

http://www.g-qrp-dl.de

Zu Vortragsthemen und Beiträge usw. bitte Bernd via DK3WX@DARC.DE kontaktieren – vy 72 es awds

Bernd,DK3WX - Fred,DJ3KK - Klaus,DL8MTG - Franz,DJ9EO

The traditional meeting in Pottenstein/Germany for members of the G-QRP-Club will be held

at the last weekend of April 2005 (22/23/24).

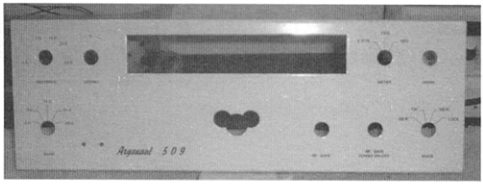
Further infos via DJ3KK, POB 801 , D-25697 Meldorf (pse SASE) and on our homepage:

http://www.g-qrp-dl.de

Lecture and article etc., please contact Bernd via DK3WX@DARC.DE

vy 72 es hpe cu Bernd,DK3WX - Fred,DJ3KK - Klaus,DL8MTG - Franz,DJ9EO

FOR SALE: Replacement NEW front panel for Ten Tec Argonaut 509, powder coated to almost exact match and silk screen printed. Cost £45 to have made, sensible offers please to Snowy,G0HZE, QTHR 01733 342439



WIFB MEMORIAL ENTRY

A POOR MAN'S SPECTRUM ANALYSER

Gert de Gooijer, PA3CRC, St. Adrianusstraat 81,
5614 EN EINDHOVEN, The Netherlands.

It is not a high-tech design but still it is a real spectrum analyser! I do not remember where I've got the idea from. I built it many years ago when I was working on a premix-VFO and wanted to see what the output of the mixer was.

How it works

In principle it is an absorption wavemeter, but the variable capacitor has been replaced by a varicap diode. The voltage applied to this varicap comes from the sweep output (saw-tooth) of a very old oscilloscope. Bandwidth of this scope is of no concern DC...100kHz will do. If the peak voltage of this saw-tooth is higher then the PIV-rating of the diode, please apply a voltage divider. The detected voltage (AA119 or other Ge-diode) is read on the Y-channel of the same oscilloscope. The 47k shunt over the output is essential, because you do not want to have a peak-hold detector. This way it will swiftly follow amplitude changes while sweeping over the spectrum.

How to build it

I built the "pick-up head" on a very small piece of copper clad board "à la hay-wire". Each frequency band needs an other pick-up head. Please adjust the values of the components according to the frequency rage. The BB106 with 100p in series and some 10p to the detector diode will do well for 2m and 6m, depending on the coil. On lower bands use appropriate higher values and a varicap intended for SW and MW. Do not use to much capacitance in parallel with the saw-tooth line and the detector line, or use a very slow sweep time.

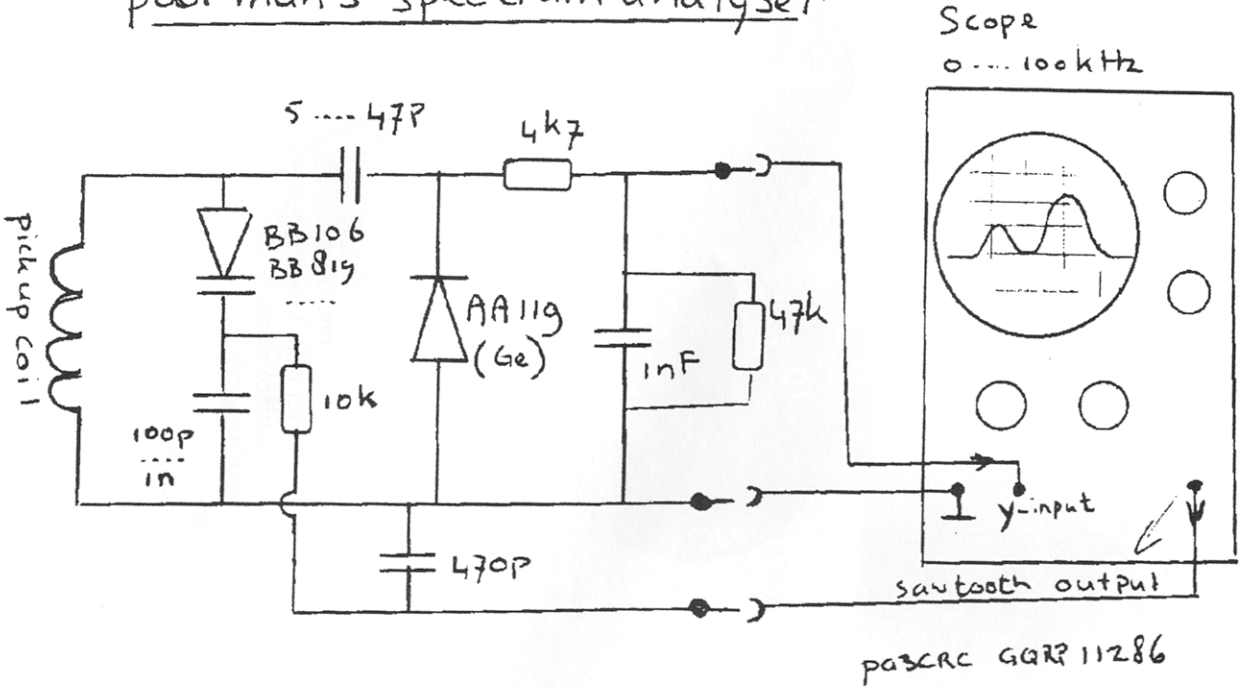
How to use it

Use the scope in a slow mode, e.g. 10 sweeps per second setting (10ms/div), Auto-Triggering. Couple the pick-up coil as loosely as possible with coils in your circuit under test. Use your grid-dipper as a marker generator, i.e. to find where in the spectrum you are around. It is much fun to see that such a little and simple tool really works and helps showing mixing products, finding parasitic oscillations, etcetera. Do not, however, expect it to make phase noise measurements...

Remember, not being able to build a rig because "I ain't got a spectrum analyser" is no valid excuse anymore, hi...

I have reproduced Gert's original drawing to go with this article
..... it seems to fit in with the simplicity of the idea.....
G3RJV

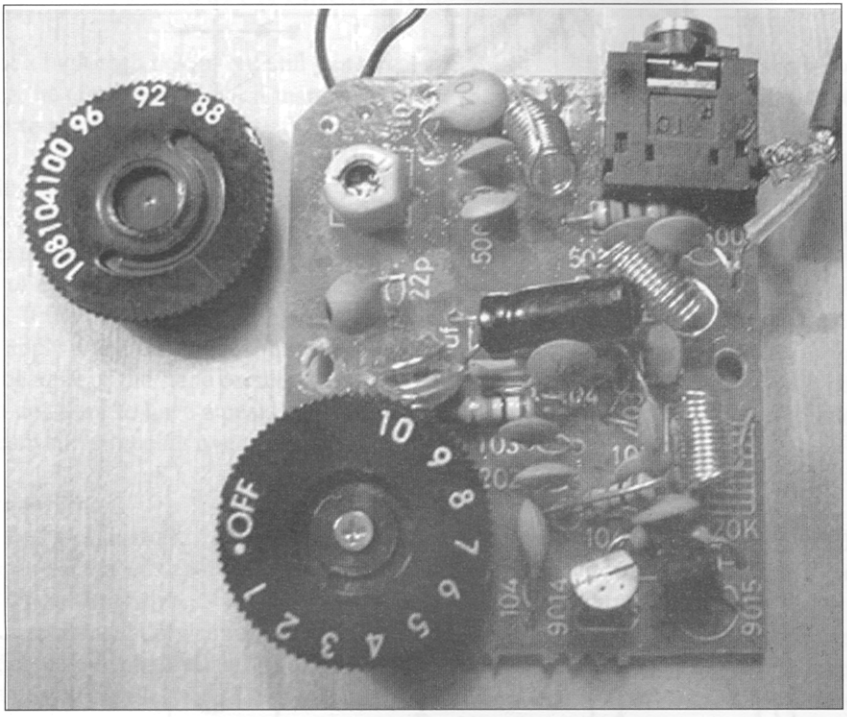
poor man's spectrum analyser



pa3CRC GQRP 11286

HOW TO MAKE A VERY CHEAP VHF RECEIVER

Sverre Holm, LA3ZA, Daeliveien 1, NO-1383 Asker, Norway
www.qsl.net/la3za



What is the cheapest receiver you can make for VHF? Here is a candidate where all you need to do to modify a small FM headphone receiver is to desolder one end of two capacitors, and connect a short cable with an antenna connector.

1. Find a simple pocket-size headphone FM receiver with tuning wheel (not push-button search). I found mine at a flea market for 10 NOK (less than £1) and it is designated "HS-822, UK design," and runs from two 1.5 V AAA batteries.
2. Open it and check the FM receiver chip. Mine has KA22429 which is equivalent to a TDA7021. It is a 16-pin surface mount device with an FM receiver with a 76 kHz intermediate frequency. Although the TDA7021 is specified for 1.5-110 MHz, don't let that scare you.
3. The oscillator tuned circuit from pin 5 to Vcc (pin 4) consists of 56 nH in parallel with a fixed 22 pF capacitor + a tuning capacitor. Unsolder and lift the hot end of the 22 pF capacitor (the end connected to pin 5).
4. This receiver uses the headphone cable as the antenna. There is a coupling capacitor from the RF input on pin 12 which is connected to the headphone socket. Unsolder and lift the headphone side of this capacitor, and connect the RF input via the capacitor to a BNC antenna connector. Connect the BNC ground to ground (pin 3) or Vcc (pin 4), whatever is more convenient.

One 22 pF capacitor lifted on the right-hand side near the headphone connector for connection to the external antenna, and another one lifted on the left-hand side, above the volume control for increasing the tuning range (The receiver IC is on the foil side of the board).

5. Performance:
   - The tuning range was 88-108 MHz. Now it is approximately 112-163 MHz. Mine receives airport communications (AM), amateur repeaters in the 2m band (144-146 MHz), and some public service transmissions in the 150-160 MHz range. If I connect my TV cable, channel S9 (sound 161.25 MHz) will be received at a setting of 108 MHz.
   - It receives wideband FM, as well as AM and narrowband FM with somewhat reduced output level.
   - Don't except miracles in terms of signal handling. If there are two active repeaters in the 2m band, only the strongest will be received.
   - Compared to wideband FM, narrowband FM/AM requires more accurate tuning, and the receiver is somewhat sensitive to the placement of your hands.

I have not tried this with other chips, such as the SC1088 = TDA7088, or the TDA7000. Both the Philips chips are specified for 1.5-110 MHz, but who knows how high in frequency they will cover?
I would be interested to hear from others who try to convert other single-chip FM receivers.

DEC. 26 – JAN 1 ~ GQRP WINTER SPORTS

CALL "CQ QRP" ON THE QRP FREQUENCIES

CW: 1843, 3560, 7030, 10116, 14060, 18096, 21060, 24906, 28060

SSB: 3690, 7090, 14285, 21285, 18130, 24950, 28360 kHz

SAMMY'S SUPER SENSITIVE SNIFFER

Bill Currie, VK3AWC, PO Box 5197. Mordialloc, Vic 3195 Australia

Reproduced from Lo-Key March 2004 – Journal of the CW Operators QRP Club

In case you are wondering who the heck 'Sammy' is, well, he is actually 'Freddy' the shack cat. For obvious reasons Freddy was renamed 'Sammy' for this project. He was of great help in the design of this RF Sniffer, but the only thing is, now he doesn't come running into the shack when I call out "Here Sammy".
Come to think of it, he didn't come running when I used to call out "Here Freddy" either!

Sammy's Super Sensitive Sniffer uses RF amplification and forward biased diodes to form a circuit that is the cat's whiskers for detecting microwatts of RF energy. It can be used as a field strength meter or for sniffing out low levels of RF.

SSSS uses two inverters of a 74HCU04 Hex Inverter chip to amplify RF signals before they are detected and indicated by a meter. The first stage of the amplifier can be switched to either untuned input or to various bands which can be tuned with the Frequency Control. The gain of this stage can be controlled with the Sensitivity Control. Another fixed gain stage is provided to lift the signals to a useable level. A plug-in probe or a hairpin loop can be used to detect RF fields or RF current, respectively.

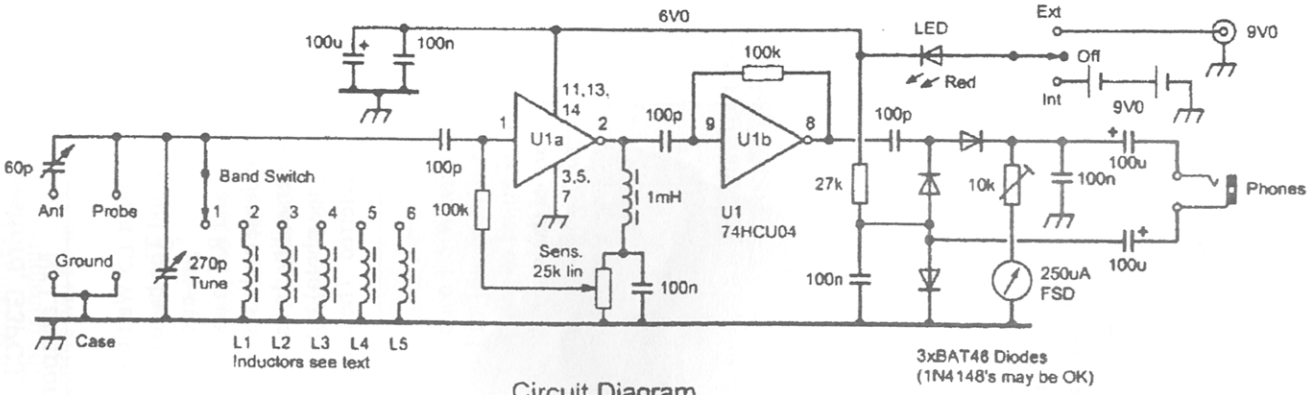
The 74HCU04 may be a bit hard to get but I think Radio Spares and Farnell (in Melbourne, Australia) still carry them. The 4069 will work on lower frequencies but needs 12 Volts or so. The 74HC04 may be useable but as it is a buffered chip the gain control may need redesigning.

A 3.5 mm stereo socket is provided for phone output. Don't expect to hear much on cheapy stereo phones but a high impedance (300 ohm) rocking armature telephone receiver works fine between L & R if you ignore the sleeve (ground) connection.

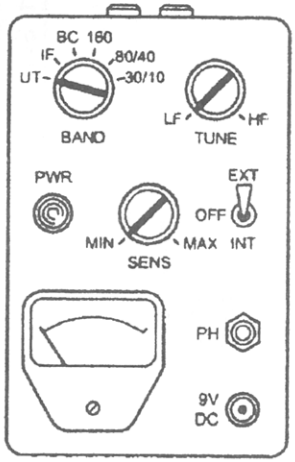
The Sniffer runs off 6 Volts or a 9 Volt mini battery with an LED in series. The current consumption is 30 mA or so. 1N4148 diodes may be OK instead of BAT46 Schottky diodes as they are forward biased.

Instead of winding coils I used RF chokes for the different bands, as so ...

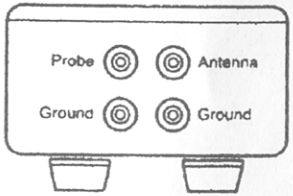
BAND	LABEL	FBEQ	RF CHOKE	REMARKS
1	UT	UNTUNED	NIL	FOR UNTUNED BAND
2	IF	300-700 kHz	1 mH	USE FREQ CONTROL
3	BC	600-1500 kHz	220 uH	AS AN ATTENUATTOR
4	160	1.5-3.5 MHz	47 uH	
5	80/40	3-9 MHz	10 uH	HI < - ATTEN - > LO
6	30/10	9-30 MHz	1 uh	" "



Circuit Diagram

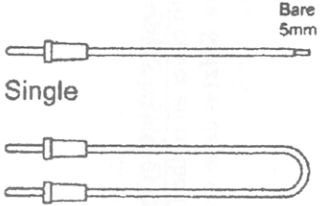


Front Panel



4-Off Ø2mm
pin sockets
in top panel

Top Panel



Probes approx 75mm long formed from heavy gauge insulated wire. Fit Ø2mm pin plugs as shown.

RF Probes

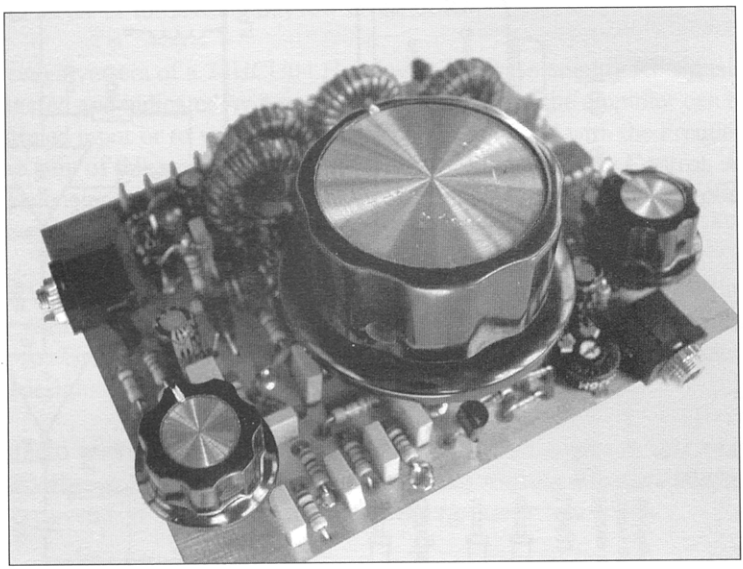
Sammy's Super Sensitive Sniffer

Bill Currie VK3AWC and Sammy aka Freddy

The Brent CW Transceiver

Tim Walford, G3PCJ, Upton Bridge Farm, Long Sutton, Nr Langport, Somerset. TA10 9NJ

This is a small specialist 1.5 Watt CW direct conversion transceiver for keen constructors/operators! The basic rig is for 80m but it can be made to do any band to 20m with the addition of the Mini-mix kit. It features full break in operation with good RF filtering for the TX and RX in addition to a narrow low pass 750 Hz filter for the audio. The PCB is pretty dense and uses toroidal inductors for the RF filters to give good performance and versatility. In basic form all the controls are mounted on the 100 x 80 mm double sided PCB (see photo) but it has plenty of scope for adaptations and mounting in your own case if preferred. The full circuit is shown.



The VFO uses a 3.58 MHz ceramic resonator for simplicity (and ease of setting up) in a digital oscillator circuit. The moderately high Q of the ceramic resonator prevents chirp but still allows the tuning capacitor to cover all of the CW section of 80m. Receiver Incremental Tuning (providing + or – a few KHz) is done with a varactor diode whose control voltage is set to mid supply by either the RIT switch or automatically when transmitting. Thus the technique is to tune for zero beat with the RIT off, and then chose either sideband with the RIT depending on QRM. When used on other bands, a sinusoidal sample of the VFO is mixed with a band dependent crystal, filtered and fed back to the rig's LO chain from the small extra Mini-mix PCB – thus the tuning and RIT arrangements are preserved for all bands.

The receiver input is taken after the transmitter LPFs thus, with the receiver's double tuned RF filters, helping to reject out of band signals. The main RX filters use

toroids and trimmers giving better performance than the usual TOKOs and permitting full break in TR operation with protective diodes across the second resonator. These diodes will not conduct on any normal received signal! As in the transmitter, one set of toroids (with different numbers of turns) and one set of capacitors will do all bands 20 to 80m by parallel or series combinations.

The single JFET mixer takes signals at high impedance (so utilising the voltage step-up in the RF filter), with its source driven by the digital LO which turns it hard on/off at the LO frequency. The audio bandwidth determines the RX selectivity; the first stage of audio filtering is the mixer's LC drain load which is resonant at 750Hz. This is followed by an audio pre-amp and 750 Hz low pass filtering using a pair of BS170s which drive the AFG pot. The audio output stage is another pair of BS170s for driving 'Walkman' type series connected stereo phones.

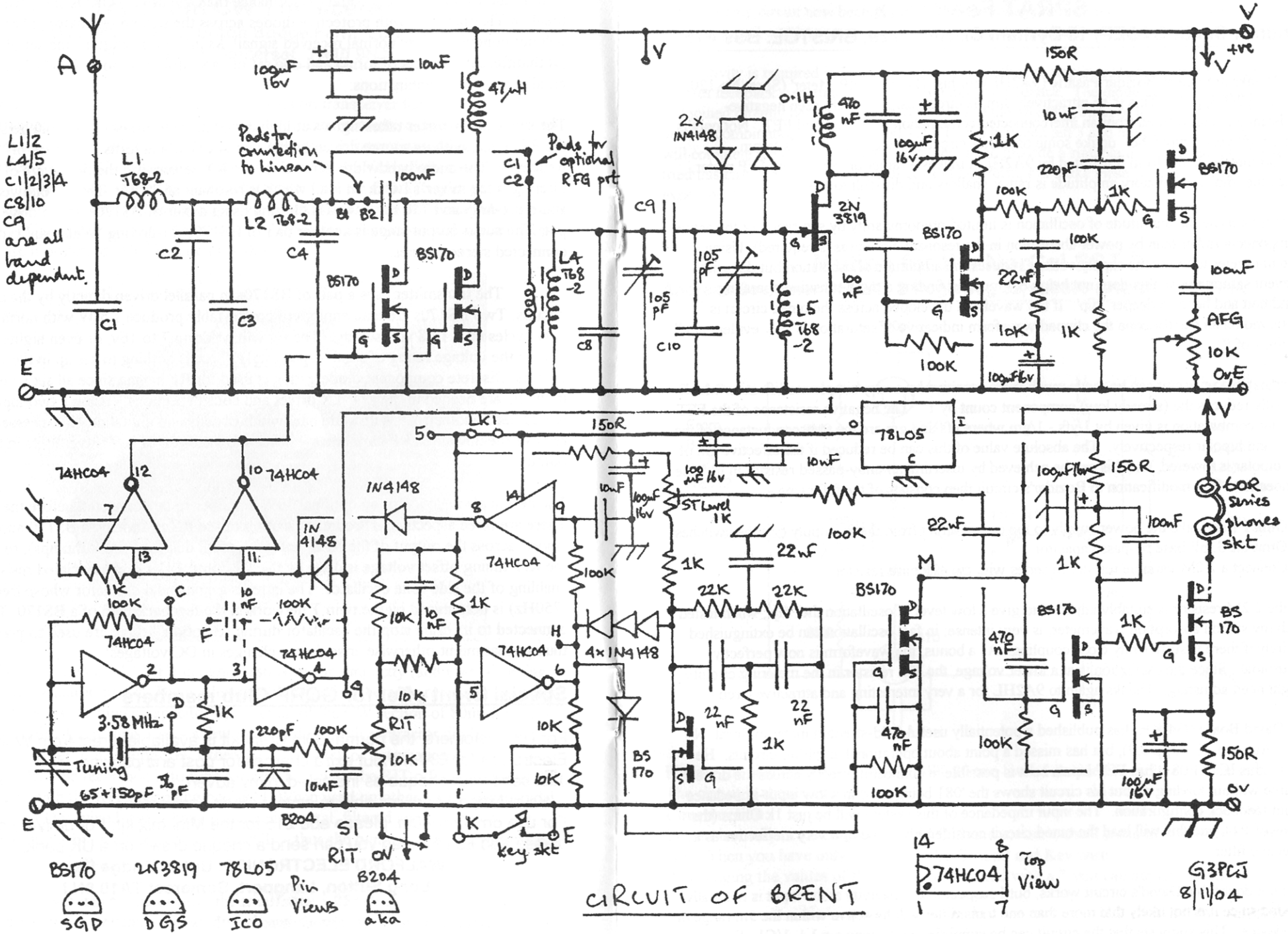
The transmitter uses a pair of BS170s in parallel driven directly by the digital logic circuits. Two BS170s are man enough to comfortably produce 1.5 W with normal CW duty cycles on a 13.8 volt supply. (The rig will work on 7 to 16v, or even higher if you change the voltage rating of some capacitors!) There is nothing to set up in the TX RF circuits. Discrete component diode gating is used for RF keying since all six inverter gates in the IC are needed in the LO, TX driver and control sections – using a two input gate would need another IC! With wide bandwidth circuits and digital drive, it is essential to remove the unwanted RF harmonics – hence the inclusion of half wave filters in the TX output.

The design also allows for an optional 10W amplifier to be connected before the LPFs. There are three aspects of TR control; muting of the RX is done by a BS170 applying a 'short' across the output of the AFG pot (with small delays to mask thumps), removal of the RIT tuning offset voltage is done by the TR control gate and associated resistors, and enabling of the side-tone oscillator. The latter is a sinusoidal oscillator whose frequency (750Hz) is determined by the twin T network in the feedback path of a BS170. The diodes connected to its drain stop the oscillator during reception – three are used to prevent the thumps that might otherwise arise due to changes in DC voltages!

Special Brent offer for GQRP Club members

For UK customers, the normal 80m Brent kit is available direct from Walford Electronics for £34 without extra charges for post and packing.
Just send your cheque as indicated in my advert.
I regret I am not able to accept credit card orders.
For use on 20 or 40m, please add £15 for the Mini-mix kit. For delivery overseas, please add £3 provided you can send a cheque drawn on a UK bank.

WALFORD ELECTRONICS, Upton Bridge Farm,
Long Sutton, Langport, Somerset TA10 9NJ


A
E
V
+ve
L1/2
L4/5
C1/2/3/4
C8/10
C9
are all
band
dependent.
L1
T68-2
L2 T68-2
C1
C2
C3
C4
100uF
16V
10uF
47uH
Pads for
connection
to linear
100nF
B1 B2
BS170
Pads for
optional
RFG prt
C1
C2
L4
T68
-2
C8
C9
105
pF
C10
2x
IN4148
0·1H
470
nF
100uF
16V
2N
3819
L5
T68
-2
100
nF
150R
10nF
1K
220pF
100K
1K
BS170
100K
22nF
10K
100uF
AFG
10K
O/E
74HC04
IN
4148
1K
100K
10
nF
F
3·58MHz
Tuning
65+150pF
33
pF
220pF
10nF
B204
S1
RIT on
RIT
10K
LK1
50
78L05
100uF16V
ST Level
1K
22K
22nF
4x1N4148
BS
170
470
nF
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skt
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K
BS170 SGD
2N3819 DGS
78L05 ICO
Pin Views
B204 aka
CIRCUIT OF BRENT
74HC04
Top View
G3PCJ
8/11/04

SPRAT Feedback

Andrew Smith G4OEP, 15 Dyrham Cl. Henleaze, BRISTOL. BS9 4TF

1] Thanks are due to Bozidar Pasaric (9A2HL) for his `Lambda DIP-Meter' (Sprat No 120, Autumn 2004, p10). This is an attractively simple circuit using a rarely-seen negative-resistance circuit formed from an interconnected combination of bipolar and FET. Not only is the circuit very simple, but, unlike some oscillator circuits, this one never fails to run. Unfortunately, in the form illustrated by 9A2HL it makes a rather unsatisfactory DIP meter, since the `dip' in oscillatory amplitude is rather shallow and difficult to observe.

This is because the amplitude of oscillation is limited predominantly by saturation of the active components rather than by power absorption in the resonant circuit (as is required). Using a potentiometer to lower the supply voltage reduces the amplitude of oscillation but does not prevent saturation, so this does not help very much in finding a more sensitive operating condition and hence a deeper `dip'. If the waveform developed across the tuned circuit is observed on an oscilloscope the clipped waveform indicative of saturation is very evident at all settings of P1.

Fortunately the circuit can be made much more sensitive by a very simple modification which actually reduces the (already low) component count by 1! The negative resistance of the FET-bipolar combination is given by 1/yfs - 1/gm where yfs and gm are the transconductance of the FET and bipolar respectively. The absolute value of this can be reduced if the effective gm of the bipolar is lowered, and this can be achieved by inserting an unby-passed resistor in its base connection. The modification to Bozidar's circuit then consists of the following -

1) Omit P1 and take the power supply to the circuit direct from the 9v supply (via the switches).
2) Omit the 33nF base by-pass capacitor.
3) Connect a 2.2M variable resistor in series with the 47k base resistor.

If the 2.2M resistor is suitably adjusted to give a low level of oscillation the `dip', when tested with my station absorption wavemeter, is very intense; in fact oscillation can be extinguished entirely if there is sufficiently close coupling. As a bonus, the waveform is now perfectly sinusoidal. Since the oscillation is at a lower voltage, the 47k resistor in the metering circuit might need adjusting. Thanks again to 9A2HL for a very interesting and attractive circuit.

2] David Boase (G4IKR) has published a potentially useful field-strength meter in Sprat No 120 (Autumn 2004, pp 8,9), but has missed a point about operational amplifier circuits. He says '..this IC (TL081) has FET inputs so it is possible to connect it directly across the drive source without loading it': but his circuit shows the '081 being used in a low input-impedance shunt feedback configuration. The input impedance of this system will be just 1k Ohms (the value of R1), and this will load the tuned circuit considerably, making it very ineffective as a selective filter.

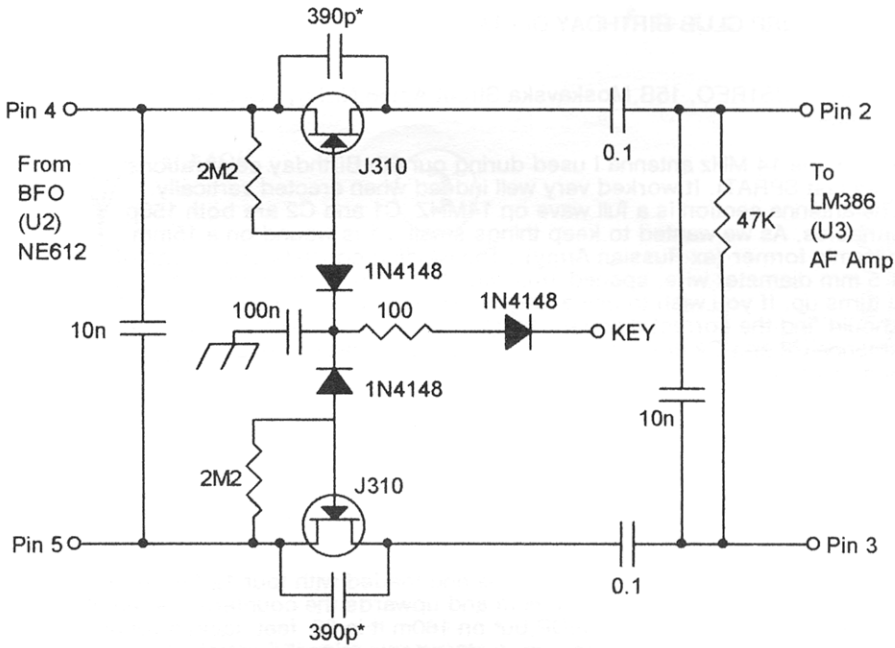
I do not doubt that David's circuit works, but I suspect that selectivity at the input is not really needed since it is not likely that more than one transmitter will be active within the 5m range of the device. This suggests that the circuit can be simplified by leaving out L1, VC1, C1,

and R1 and joining D1 directly between pins 2 and 3 of the op-amp. With antenna joined to pin 2, the op-amp circuit now becomes a 'current-to-voltage transverter'. A capacitor can be joined between pins 2 and 6 to give a dc time constant, but is probably not vital.

If selectivity is required in David's original circuit, the op-amp circuit should be re-configured as a series feedback system to provide a high input impedance. The diode must then be reversed and joined directly between the tuned circuit and the inverting input of the op amp (pin 3). A parallel combination of 1Mohm and 10nF joined between pin 3 and the junction of R3 and R4 will complete the required dc path at the input and provide a suitable time constant. I have not tried this circuit in either its original or modified form, but make these suggestions for experimenters to try.

Muting for the NorCal SST 20

Andreas Seereiner OE6EIF, S Pogleweg 39, A-8600 BRUCK. AUSTRIA



Finding the sidetone on the NorCal SST 20 too loud, I decided to build a muting circuit. The circuit is shown above.

Construction:

The easiest way is to remove C12 and C13 and mount a small piece of Veroboard over the pins. Then you have only to connect the Ground and Key wires.

By changing the values of the capacitors marked with a * you can adjust the sidetone level.

ANTENNAS - ANECDOTES - AWARDS

Gus Taylor G8PG 37 Pickerill Road, Greasby, Merseyside, CH49 3ND

A TOP BAND ANTENNA FOR THE SMALLER GARDEN

Fig. 1

H.J. Hill,6 Ash Coppice Lea, Preston, PR21

This design is provides excellent results with a short 1.8 MHz antennna. L1 and L2 are closely coupled and wound on a 3 inch diameter former,.The wire used is 18 swg gauge enamelled. L1 is 4 turns and L2 is 30 turns.L3 is 20 turns wound on the former of a Biro pen. L4 is 15 turns on a pieceis of 15mm diamareter plastic pipe . It is tuned by means of a ferrite rod which has a shorrt length of wooden rod glued to one end of it. C1 is 500p; keep the lead from C1 to L4 short. With LP1 in circuit, adjust C1 and L4 for maximum brilliance from LP1. NOTE. Do not attempt to attach and earth to the system. The only coupling to the TX is the inductive coupling from between L1 and L2

THE UR QRP CLUB BIRTHDAY DELTA LOOP

Fig. 2

P.Gritsay,US1REO, 15B,Moskavska Street,Apt58,Nizhhyn,Chernigiv Region, Ukraine,

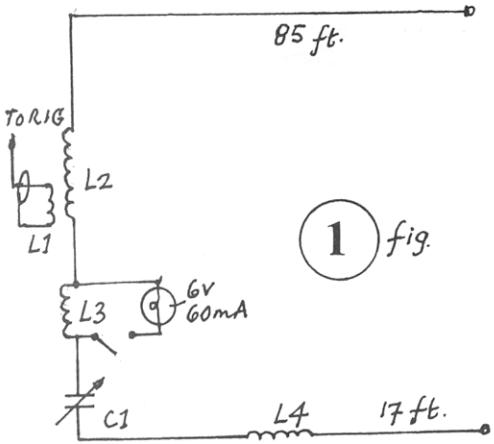
This is the 14 MHz antenna I used during our 6th Birthday celebrations (see last SPRAT). It worked very well indeed when erected vertically. The antenna section is a full wave on 14MHZ. C1 and C2 are both 150p variables, As we wanted to keep things small, L1 is wound on a 15mm ceramic former (ex-Russian Army) , The winding consists of 15 turns of 1.5 mm diameter wire, spaced 1mm,with the co-ax to the rigged tapped 3 turns up. If you wish to use a larger former a little experimentation should find the correct number of turns and tapping point. To tune the antenna C2 and C2 are adjusted to give the best ratio of high rf output and low swr. .

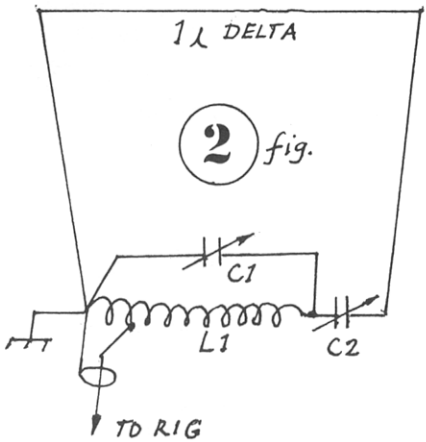
A LOADED W3EDP

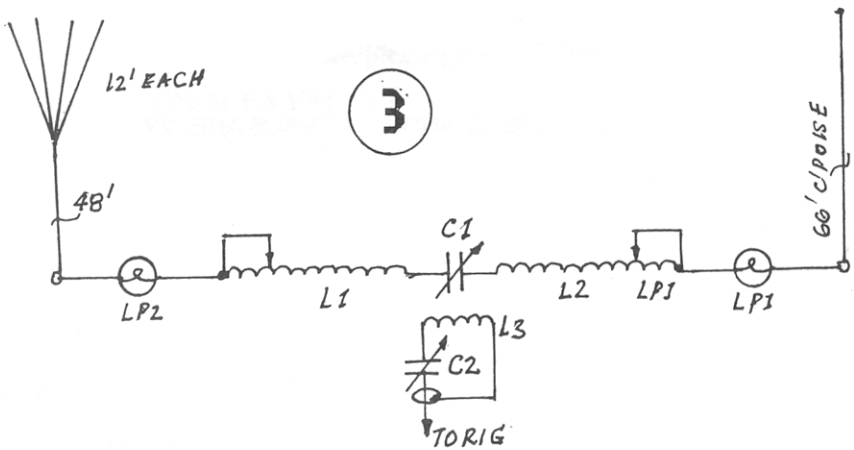
Fig. 3

.S.K. Martin, GMoHMR,57 Kilmuir Place, Invergordon, IV18 0QA

The system consists of a 48 ft antenna end loaded with four,12 foot wires, and a suitable counterpoise. On 80m and upwards the counterpoise length is the normal length for a W3EDP,but on 160m it is 66 feet tacked round the skirting board. On 80m and upwards a conventional Z-match atu is used, but on 160m the special atu shown in Fig 3 is used.In this circuit L1 and L2 are both 50 turns of 16 s.w.g. wire tapped every 5 tuurns. L3 is 10 turns of the same wire wound over the centre of L2. C1 is 300p and C2 1000p (twin gang 500p with sections in parallel. For QRP LP1 and 2 can be 6V 60mA bulbs. In tuning with the circuit at resonance the taps on L1 and L2 are adjusted until LP1 and 2 glow with equal brilliance. C2 can then be adjusted for minimum s.w.r The 4 end loading wires slope down from the end of the antenna and are welll separated from each other. In my installation the 48foot wire is L-shaped with most of it in the loft. Obviously different lengths than 48 feet can be used if the end loading wires are suitably adjusted in length.







NO ANTENNA,NO ATU BUT WE WORKED DL, F AND G !

P.Danvin,F1BDP, 14 Rue Gabriel Peri,59620 Aulnoye,France

Last summer I went out to do some /P operation,but found I had left my antenna wire and atu at home, and all I had was some 12 metres

xwas some 12 metres of co-ax and my 50 ohm dummy load resistor, A little thought and I hooked up one end of the co-ax to the rig with the screen to the live side of the TX output socket and the inner to ground, and connected the dummy load to the other end. The swr was nice and low, and there was enoughradiation from the cable to allow me to work stationsin DL, F. and G on 7 MHz.. (And that is what yfnou call real QRPers improvisation. At the G8PG QTH a quick test with a similar hook-up showed that the screen of the co-ax was radiating a useable amount of rf .)

AWARD NEWS

QRP Countries. W7CNL 280

Two way QRP W7CNL 90

A terrific performance ; Sincere congratulations Jack !

The lackof other applications highlights the long periods of bad conditions during this summer, although every so often the bands did come to life and DX was workable. The real problem was that once it did appear so did the kilowatt gang, making it tough for QRP signals to get through the pile-up.There also seems to have been a big decrease in the use of the International QRP CW frequencies recently. If you can spare the time, a few CQ calls on one or more of these frequencies would be helpful .

ANYBODY KNOW WHAT THOSE D AND C SIGNALS ARE ??

Once again stations have appeared in the amateur bands sending D or C continuously on CW, They seem to be international, as G8PG has heard them on both sides of the Atlantic , and as they regularly change frequency according to the time of day one assumes they are propagation beacons. They were just as strong in Nova Scotia (VE1) as in the U.K., so they may operate from more than one location. Incidentlly listening to European signals from VE1 is very educational. Signals from stations in southern Europe always seem to be stronger and more numerous than those from northern Europe,including the U.K. The North Atlantic path has , in general, always been a difficult one,very prone to fade-outs. Indeed prior to the days of satellite communication most North Atlantic commercial and government radio traffic was handled via a relay station on Ascention Island which provided north/ south and south/north paths to both continents. So if the QRO commercials with their big antenna farms had such problems with the North Atlantic path surely we can feel very proud when we get across with three watts and a bit of wire in the back garden !! But of course not even 20 KW and a big rhombic can beat a Dellinger fadeout. This is caused by the emissiions produced by a vast explosion on the sun. When they hit the ionesphere they knock out the reflecting layers , producing a complete blackout of all hf signals which can last for minutes or hours. The onset of such a blackout if you are in the middle of an over can be quite uncanny, When you go back to receive the loud station you were working and every other hf signal have just disappeared completely and may stay that way for a long time.

FROM THE MEMBERSHIP SECRETARY

John Leak, GØBXO, Flat 7, 56 Heath Crescent, HALIFAX, West Yorkshire. HX1 2PW
Tel:- 01422-365025. Email:- gØbxo@gqrp.co.uk

SUBSCRIPTIONS 2005

Subscriptions for the year 2005 are now due. .Please see the centre pages of this issue of SPRAT for details of methods of payment.
I can accept payment for more than one year at a time. If you wish to do this, please show clearly how many years you are paying for.

It is a very great help to me in processing payments if members respect the following procedure.
If paying by cheque, please write your membership number and callsign (if any) on the back of your cheque. I list cheques on bank payment slips under your membership number so that I can trace a cheque in the event of a query. The callsign serves as a check.

Please make cheques payable to "GQRP CLUB" not to me personally, nor to SPRAT. I will return cheques made out to SPRAT and cheques made out to me.
If you pay by credit card, please quote ACCURATELY, the card number and expiry date. If the card is not in your name, please give the cardholders name and address.

STANDING ORDER PAYMENT

IF YOU ARE A UK MEMBER AND DO NOT ALREADY PAY BY STANDING ORDER, PLEASE CONSIDER DOING SO IN FUTURE. THIS METHOD OF PAYMENT IS THE CHEAPEST FOR THE CLUB AND IS THE EASIEST FOR US TO PROCESS. A STANDING ORDER MANDATE IS INCLUDED IN THE CENTRE PAGES OF THIS ISSUE OF SPRAT.

The Whistler - SPRAT No. 120.

Despite rigorous checking, a few mistakes on the above article managed to get through to publication
DIAGRAM
1.IC2 (4046B).Amend pin 1 to read pin 11.
2.Capacitors C5 and C6 are polyester NOT electrolytics.
NOTES
3.Line 9 should read "by C6.The signal.....",not C4.
4."A PCB layout is available from the author for a SSAE."
David Boase,G-QRP-C no.789,G4IKR.

SLOW MORSE from G3ROO

Every evening I can manage I am on about 3562KHz at 1830 clock time .... I call CQ QRS NET at 12 wpm and will reply to stations at their speed if it is less than that.

COMMUNICATIONS AND CONTESTS

Peter Barville G3XJS e-mail: g3xjs@gqrp.co.uk
40 Watchet Lane, Holmer Green, High Wycombe, Bucks HP15 6UG.

Firstly, may I offer Season's Greetings to all Club members and hope that this year's festive season will be providing plenty of opportunity to get on the bands with QRP and enjoy our favourite event – Winter Sports, of course! It's not a contest, but more a festival of QRP Fun, running between December 26th and January 1st (inclusive). Most members prefer to work other QRP stations around the normal QRP frequencies, but there is no reason not to work the QRO boys and give them a run for their money! Let me have your log as soon as possible, remembering that the Club will award the G4DQP Trophy to the member making the best overall contribution to the event.6

CZEBRIS 2005

This event is a contest, but still offers plenty of relaxed operating along with our QRP colleagues from the Czech and Slovak Republics. The rules are as follows:
1600z Friday 25th February to 2359z Sunday 27th February, around the usual QRP cw frequencies: 3560, 7030, 14060, 21060, 28060kHz, +VHF/UHF if conditions permit.

Your Location		QSO With Station In			
		UK	OK/OM	Eu	Non-Eu
UK	:	2	4	2	3
OK/OM	:	4	2	2	3
Eu	:	4	4	1	2
Non-Eu	:	4	4	2	1

No multipliers. Final score is total number of points scored. Separate logs for each band showing (for each qso) date, time, callsign, exchange sent/received, and a summary sheet showing your name, callsign, claimed score for each band, and brief details of your station should be sent by the end of April to G3XJS (UK entries). Non-UK entries go to OK1AIJ (Karel Behounek, Na sancich 1181, 533705 Chrudim IV, Czech Republic). We are both happy to receive logs by email: "g3xjs@gqrp.co.uk" and " karel.line@seznam.cz ".

YEOVIL QRP CONVENTION FUN RUN 2005

FUNRUN BONUS STNS	GB2LOW from the station of G3BPM on 3.563 & 7.023 MHz +/- 2kHz. 2E0OOO at Scarborough on 3.558 & 7.028 MHz +/- 2 kHz. DL2WRJ at Stassfurt on 3.553 & 7.033 MHz +/- 2kHz.
WHEN	Tuesday 14th March 2005 to Friday 18th March 2005 inclusive, 19.00 to 21.00 UTC
FREQUENCIES	3.560 MHz and 7.030 MHz, both +/- 10 kHz.
CONTACTS	Contacts should be between QRP stations with a maximum 5 watts output CW. However contacts with QRO stations are permitted, but with reduced points value. (see "Scoring" below)

	All stations may be worked ONCE EACH EVENING on EACH BAND. Funrun Bonus Stations will be operating each evening randomly for one hour on each band.
CALL	"CQ FR"
SCORING	Each QSO with another QRP station scores 10 points. Each QSO with any Funrun Bonus station (including GB2LOW) scores 25 points. Each QSO with a QRO station scores 3 points. All duplicates must be marked and no points claimed. Points will be deducted for unmarked duplicates at twice that particular QSO score.
EXCHANGE	RST, Serial Number (see below), Output power and name.
SERIAL NUMBER	The three-figure number must start at any random number of your choice not less than 100 and must be increased by one for each QSO throughout the WHOLE of the contest. However, the three Fun Run Bonus Stations listed above will all commence at 001, with all leading zeros being sent.
ENTRY SHEETS	Separate log sheets for each band, with sub-totals for each evening, preferably in the RSGB format. A separate RSGB style cover sheet stating the Rig, Output Power, and aerial. Entries should be sent to G. W. Davis, G3ICO, Broadview, East Lanes, Mudford, Yeovil, Somerset BA21 5SP to arrive not later than Thursday 7th April 2005. Entries will be accepted by E-mail to george@mudford.fsnet.co.uk
AWARDS	Certificates will be awarded for the highest score for any THREE evenings out of the four, on each band and also for the highest overall total score for any THREE evenings on both bands. These evenings do not necessarily have to be the same on 3.5 MHz and 7 MHz. A certificate will also be awarded to the station consistently using the lowest power. All certificates will be presented at the Convention on 10th April 2005 immediately after the lunch break.
S. W. LISTENERS	Listener reports will be appreciated and a certificate will be awarded to the listener who submits the most comprehensive report.

NOTE, apart from the Club's GB2LOW, the other two Bonus Stations, as in previous years have been selected from last year's entrants. This provides not only variety but also allows a geographical spread of their locations. Your comments on any aspect of the Fun Run will be appreciated. Further information from G3ICO, postal and E-mail addresses above, Tel. No. 01935 425669.

EUCW/FISTS QRS PARTY 2005

To encourage newcomers to Morse operating, and as a contribution to the activities of the European CW Association, FISTS CW Club invites all licensed radio amateurs, especially members of EUCW

clubs, to take part in the annual EUCW/FISTS QRS Party. This event provides an opportunity for EUCW club members, and non-members, to meet and exchange greetings with each other at a leisurely pace. At the same time it is an opportunity to make contacts qualifying for the prestigious Worked EUCW award. Although not a contest in the normal sense of the word, there is a contest element for those who thrive on challenge, with awards for those who score the most points, and a merit award for the "Most Readable Morse Heard" voted for by other contestants.

In this event, taking part is more important than winning, providing fun for all in a non-stressful introduction to a contest-like event for beginners, and an opportunity for more experienced operators to put something back into the hobby by helping and encouraging those less experienced in CW operating.
Feedback can only be obtained from contestants' reports so, whatever your level of experience, and even if you only have time to make a few contacts, please make an effort to send in a log.
DATES/TIMES: From 00.01 UTC on the fourth Sunday in April, for one week, to 23.59 UTC on the following Saturday. For 2005, the dates will be Sunday 24th April to Saturday 30th April 2005.
MODE: CW only.
FREQUENCIES: All bands, except WARC bands. Non-QRP stations are requested to avoid calling CQ on the popular QRP frequencies.
KEYS/SPEEDS: Any type of key or keyer may be used, but no keyboard sending or pre-programmed messages from computers or keyers allowed. Maximum speed 14 words per minute (70 cpm). The speed of a QSO should be at the speed of the slower station
CALL: CQ QRS/EUCW. Stations may be worked or logged once each day in each band used
EUCW CLUBS: Listen out for members of the following clubs, taking part in the EUCW/FISTS QRS Party:
AGCW-DL (Germany); Benelux-QRPC; BTC (Belgium); CFT (Belgium); CTC (Croatia); CT-CWC (Portugal); EACW (Spain); EA-QRPC (Spain); EHSC (Extremely High Speed Club); FISTS; FOC (First Class Operators Club); G-QRPC; GTC (Greece); HACWG (Hungary); HCC (Spain); HSC (High Speed Club); HTC (Switzerland); INORC (Italy); I-QRPC (Italy); ITC (Italy); LZCWC (Bulgaria); MCWG (Macedonia); OE-CWG (Austria); OHTC (Finland); OK-QRPC (Czech Republic); RTC (Germany); RU-QRP (Russia); SCAG (Scandinavia); SHSC (Super High Speed Club); SP-CWC (Poland); UCWC (C.I.S.); UFT (France); U-QRQC (C.I.S.); VHSC (Very High Speed Club); YL-CW-GP (Germany); 3A-CW-G (Monaco); 9A-CWG (Croatia).
CLUB MEMBERSHIP: Entrants who are members of more than one EUCW club should take part in the QRS party as a member of only one of those clubs.
CLASSES:
A - Members of EUCW clubs using more than 10w input or 5w output power
B - Members of EUCW clubs using QRP (10w input or 5w output, or less)
C - Non-members of EUCW clubs using any power
D - Shortwave listeners
EXCHANGES:
Class A & B, RST/QTH/Name/Club/membership number
Class C, RST/QTH/Name/NM (ie, not a member)
Class D, Log information for both stations
SCORING:
Class A/B/C - 1 point per QSO with own country, 3 points per QSO with other European countries, 2 points for NON-European countries.
Class D - 3 points for every complete logged QSO.
Multiplier, all classes: 1 multiplier point for each EUCW-club worked/logged per day and band.

LOGS: To include date, UTC, band, call worked, info sent, info received, and score claimed for each QSO

SUMMARY: To include entrant's full name, call, address, EUCW club, Class entered, multiplier claimed, total points claimed, station details, including type of key/keyer used, power used, comments (if any) on the event, up to three votes for "Most Readable Morse Heard" (only one vote per station), and signature of entrant. E-mailed logs and summaries are acceptable, provided they follow the same format as detailed above.

ENTRIES: Send log and summary to: FISTS/EUCW Contest Manager,
R. Kimpton, M5AGL, 15a Buckden Road, Brampton, Huntingdon, Cambs. PE28 4PR. England.
e-mail: bobm5agl@btopenworld.com .

All logs to be received (by surface mail or e-mail) not later than 31st May 2005.

AWARDS:

a) A certificate will be awarded to the three top scorers in each class.

b) A certificate of merit will be awarded to the operator receiving most votes for the "Most Readable Morse Heard", provided the operator nominated has also submitted a log. If the recipient of the most votes has not submitted a log the certificate of merit will be awarded to the qualifying entrant with the next highest number of votes. In the event of a tie multiple certificates will be awarded, endorsed "Shared Award".

No correspondence can be entered into. The Contest Manager's decision shall be final in making all awards.

I wish you a Very Happy QRP 2005, and ask that you let me have any items of news by the end of January. 72 de QRPeter

2005 QRP CALENDAR

1st Jan: Last day of Winter Sports
1st/2nd Jan: 2000z-2300z EUCW 160m Contest
1st Feb: Last Day for Winter Sports logs to G3XJS
15th Feb: Last Day for Chelmsley 2003 logs to G3XJS
25th Feb to 27th Feb: 1600z Friday to 2359z Sunday CZEBRIS
6th Mar: AGCW Contest
19th Mar: Junction 28 QRP Rally
14th Mar to 18th Mar: Yeovil FunRun 1900-2100z each day
10th April: Yeovil QRP Convention
24th April to 30th April: EUCW / FISTS QRS Party
25th Apr: 1400z-2000z (Every Easter Monday) Slovak Low Power Sprint
30th Apr: Last Day for CZEBRIS logs to G3XJS and OK1AIJ
1st May: 1300z-1900z AGCW QRP/QRP Contest (Rules: www.agcw.de/)
5th June: Red Rose QRP Festival
17th Jun: IARU Region 1 International QRP Day Contest
2nd to 3rd Jul: 1500z-1500z Original QRP Contest
16th Jul: Last Day for International QRP Day Contest logs to G3XJS
8th Oct: Rochdale QRP Convention
20th Nov: 1300-1700z QRP Contest Community HOT PARTY (every 3rd Sun in Nov)
26th Dec - 1st Jan 2006: G-QRP Winter Sports
24th to 25th Dec: Original QRP Contest

Please advise G3XJS of any errors, or omissions.

SSB & Data Report

Dick Pascoe GØBPS. Seaview, Crete Road East. Folkestone. CT18 7EG
Tel 01303 894390 – Email gØbps@gqrp.com

Good news from Rick M1RAL who bagged his First Trans-Atlantic 5W SSB from his current QTH: 1054 UTC 20m VE3AT, closely followed by, 1112 UTC 20m K3WW and later his first ever contact with Japan, and with it I FINALLY cracked the 1000 miles per Watt on 5W SSB at the same time. Not one but two contacts: 1232 UTC 15m JA9SCB/P1 joined a few minutes later by, 1257 UTC 15m JA3YBK The Station set-up was Yaesu FT-817 with a W3EDP wire mounted indoors in loft space.

There is always an argument after any major contest about the lack of consideration given by the contesters to other users and also any hint of band plans. What is often forgotten is that band plans differ in various countries. Ian G3ROO made a point that: "the contest maybe fun 'for some', but the SSBers behaved like animals.... they were down to 7004 all night" and that "the organisers should set band limits and think of the rest of us!!" I seem to remember the same comments from SSB ops during a recent CW contest!

Simon HB9DRV commented "Without the 'animals' I would never have worked a heap of new countries on 10m such as ZD8I - I do agree about band limits. I spent quite a bit of time testing my software in anger during the contest and found behaviour to be very civilised"

It is doubtful that until band plans are enforced along with all other rules for contests that this debate will continue for many years to come. Remember the other rule conveniently forgotten by many HF contest stations. How many run BIG amplifiers and are ignored by the relevant committees.

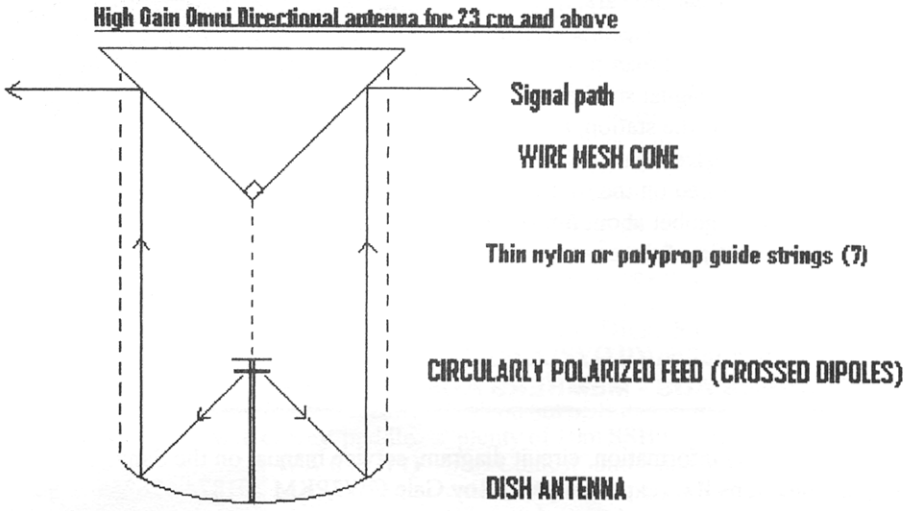
Maybe this is the time, in the new year to put aside all our nasty thoughts and remember that we are all amateurs at heart and that **QRP does NOT mean CW only**. This hobby is about communication with ANY mode that our licence allows us to use, our part of the hobby is restricted by power limitations - no other.

Happy new year everyone, enjoy the hobby wherever you are and whatever you chose to be. May your God go with you.

VHF Manger's Report

John Beech G8SEQ 124 Belgrave Road Coventry, CV2 5BH
Tel. 024 76 273190 or johng8seq@ntlworld.com

High Gain Omni Directional Antenna for SHF



NOTES: The dish and feed produce a circularly polarized beam (direction NOT imortant). This is intercepted by the cone, which has a solid right-angle at its point. The result is a horizontally polarized omni-directional signal. The cone should be slightly larger diameter than the dish and can be suspended at any convenient height above the dish, provided the dish and cone are leveled, otherwise the beam tilts. The max. theoretical gain is the dish gain -3dB because of the cir. polaarization, less a few dB in practice for under illumination of the cone.

This antenna is based on an existing dish design and the experiments were all done at 23 cm and 600 nm. If you already have a dish antenna, the only mods you need to do are: 1) replace the feed with a circularly polarized feed, 2) alter the mount so the dish points vertically upwards, 3) build & suspend a cone above the dish.

The antenna is actually a FLYSWATTER, but the trapezoidal reflector is replaced with a cone with a 90 deg. Included angle. In section this gives a continuous reflecting face at 45 deg. to the vertically radiated signal, which causes this to be radiated in all directions as a horizontal signal. In order to illuminate the cone evenly, the dish must produce a circularly polarized signal. The overall result is a horizontally polarized omni-directional signal. Anyone who is not convinced, try this simple experiment. Take a standard LED and file the lens end flat. Now drill the end of the LED (ie. the face you have just filed) with a drilled ground at 90 deg.. Connect the LED to a suitable power source and hold it upright in a darkened room. You will see a horizontal line on all the walls in the room. If you can't darken the room, make a paper cylinder about 15 cm diameter to place around the LED.

The remarkable thing about this design of antenna is that you (theoretically) only loose 3dB gain from what the dish would have given had it been pointed directly at the station you want to work. In practice the losses are slightly greater due to under illumination of the cone. This can be minimized by making the cone slightly larger than the dish diameter and not mounting it too high above the dish. The height of the cone should be chosen such that the out going and incoming signals clear any nearby objects such as trees buildings or parked cars.

This antenna was first tested on VHF NFD last year. Only a few stations were worked due to lack of man-power (we weren't entered on the band), but we were able to compare received signal strengths with distant stations as we retained the ability to point the dish directly at the station, a manoeuvre which only took 30 seconds. This confirmed that the omni was less than an S-point down on the directly pointed dish. We had in fact left the dish mounted on the roof rack of our vehicle and suspended the cone from a counterbalanced gibbet about 6m above the ground. The height between the feed point to the dish and the tip of the cone was about 1.5m.

De John Beech G8SEQ.

MEMBERS ADS - MEMBERS ADS - MEMBERS ADS - MEMBERS ADS

WANTED: Any information, circuit diagram, service manual on the Sanyo RP8880 Communications Rx. (expenses paid) Roy Gale GW3PKM 01874 676258 roygale@skymarket.org

FOR SALE: Howes DXR20 RX, TX2000 swr/S meter/Pwr meter, Spare kits (Nardware) LM2000 (Linking Module), CSLA 4 Board assembled but not tested. (RX/TX/SWR meter working, good condition). Bargain at £50. Henry, G3SOX. Tel. p.m. 01843 5851070. Pref. buyer collects

WANTED: Denco Coils, ONER or OXO, "Transistor One" for 160m, G3ZQA Main Station TX AM 160m, Bren 160m DSB TX. Thomas Williams, M3EHA, 110 Brindley Ave, Winsford, CW7 2EG Tel: 07956 060377.

FOR SALE: Palstar R20 Receiver [purchased Aug 04 for £499] surplus to requirements. Any reasonable offer considered, or exchange 2m base station receiver [in good condition]. WANTED: Manual for Realistic Pro-1002 Scanner. Willing to purchase or pay for photocopy. All expenses paid. John Noble, 35 The Queen Mother Court, Borstal Road. Rochester, Kent. ME1 3JF. Tel: 01634 401472.

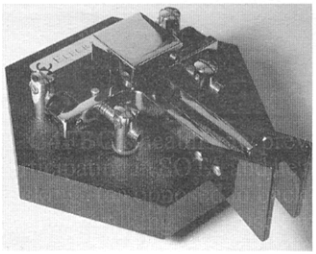
WANTED. MFJ 9030 and 9020 tcvr"s in good working order. Alan G3SLS 0151 420 1183 (Merseyside)

MEMBERS' NEWS

by Chris Page W4/G4BUE

312 Quail Avenue
Sebring, FL 33872, USA.
Tel: (863) 385 1217
E-mail: g4bue@adur-press.co.uk

K1, K2 and KX1 owners might be interested to know that Elecraft have recently started stocking the new HexKey paddle.



WA6HHQ says, "For some time we have been looking for a quality desktop CW paddle to complement the K1, K2 and KX1. Bob Locher, **W9KNI**, at Bencher has worked with us to create a special edition of his new HexKey paddle for us with a unique Elecraft serial sequence stamped into its base, starting with s/n 001. This paddle derives its mechanism from the famous Mercury paddle that Bencher also manufactures. It has a heavy hexagonal black base with a chrome magnetically tensioned mechanism with gold contacts. See <http://www.elecraft.com/hexkey/Elecraft_hexkey1_sm.JPG>.

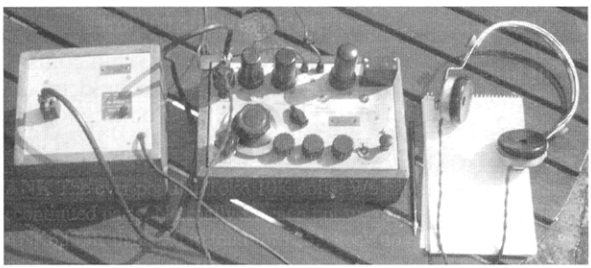
Between September and October **M5AEF** was QRV mostly on 20 and 40m with his 1w, FT-817 and dipole antennas. Robin says, "Pick of the crop has to be **D4B**, **TF4M** and **TF3AO**. I have found it particularly difficult to make any headway on 40m SSB as the band is far too crowded now. It is very much easier to make two-way QRP contacts on 40m CW as there are more stations listening over a smaller range of frequencies!". **2E1HVB** writes, "I set up my Buddipole antenna in my back garden on 11 September with a fully charged FT-817 and heard someone calling CQ. I went back to him not expecting a reply and had a QSO with **SMØXHR** in Stockholm on 20m SSB with a 57 report for just 2½ watts". Arthur has come onto HF QRP from VHF during the last year. **GW4IQP** planned to be QRV from the Berwyn Mountains in North Wales in October with his K2.

SV8./G4FBC was QRV in October from the Sporades Islands of Skiathos, Skopelos, and Allonissos in October, and also /MM with his FT-817 and ATX telescopic whip for HF and a THD seven element for 2m FM where he found much APRS activity. Ron met up with Dick, **SV8/DL8MCA**, and **DL6NBA (SVØJD)** on 2m, who are both resident on Skiathos. **G3XBM** worked 7X and EA9 on 6m SSB this summer. Roger worked "plenty of 10m SSB DX during the CQ WW SSB Contest" and made his first QSOs in the extended 40m band with two USA stations. Winter plans include a 136kHz receiver. He has a new Web site at <www.g3xbm.co.uk)

The ARCI QRP Test was held on 24 October and **GM3OXX** was looking for DX on 20m. After QSOs with **RU2FM** and **LA2MOA**, George says he, "Started with **AC5K** and then worked lots of W QRP stations on 20 and 15m and a few on 10m, even gpot called by **8P6BX**. Then at 1721z I worked **ZL2FF** and kept on working W and VE QRP stations until the HF bands closed. I then worked **KØZK** on 7040kHz at 2206z and then went to bed a very happy old lad. The conditions were really good, just like the good old days when the sun is at its best".

G3JQL writes, "Way back in Autumn 1995 (Sprat 84) the late Joe Lesuisse, **ON5LJ**, used your always interesting Members' News, to offer fellow members the drawings for the Whaddon MKVII. I took up his kind offer, and whenever asked, passed the details along. He spoke no English, and I spoke no French, so our sporadic communications were hilarius, to say the least! Anyway, my purpose in writing is to mention that on 5 August Alex, **GM3MAS**; Terry, **GM3VQJ**,

and me managed a three-way MKVII QSO on 3579kHz. I think you will agree that Joe would be proud. His draughtmanship was impecc-able, and the pattern was the set used by the father of a friend, for most of the war in Bastogne. A very lucky chap, considering how the receiver radiates!" Ian enclosed the photograph of himself operating the MKVII and the rig itself.



GØFUW worked ZL with 3w while QRV near Congnac, France in July. On 29 July **M3CUS** worked **NY3A** on 15m CW with 5w from his FT-817, and was heard by **LU1CZ** before he faded out. Martin used an inverted vee. In the WAE SSB Contest he worked his first JA. **M1RAL** was also QRV in the WAE SSB Contest and made his first trans-atlantic 5w QSOs with **VE3AT** and **K3WW** and his first ever JA QSOs, breaking 1000 miles per watt at the same time. Rick used his FT-817 with a W3EDP in his loft. **F5NYK** was also QRV and worked VE, W, TU and D4 with his FT-817 and G5RV. **G4GTU** writes, "Just called a Z37 on 20m CW rattling through stations contest-style only to be told 'G4..ur too weak QRZ'. Not giving up (I need Z3 for QRP DXCC) I tried again viz: 'Z37... QRP stn G4GTU pse K". Reply: G4GTU QRP ur too weak pse try later'. Is this not oxymoronic? Ho hum, onward and upward".

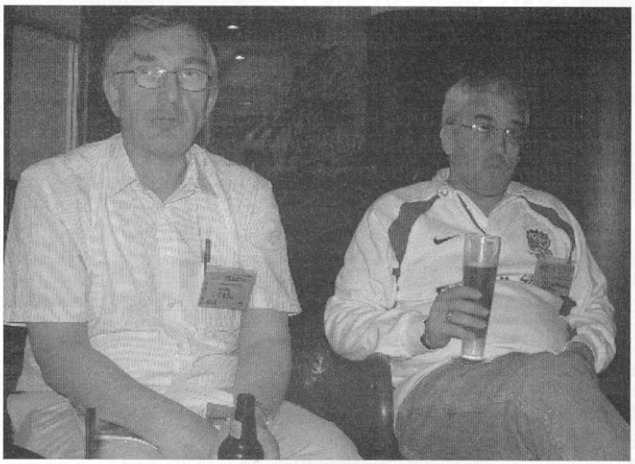
GM3MXN offers a tip for "Those who own an FT-817, FT-857 or FT-987 and want to open up the transmit side without using a soldering iron, there is a modification using software, a computer and Cat lead. This will be handy for those thinking of 5Mhz or opening up to give the extra 100kHz on 40m. The program is called *Soft Jump* by VK2IT and is at <http://groups.yahoo.com/group/FT897/files/softjump.zip>. The second EA QRP Contest was planned for 18/19 December. Nigel, **MØNDE**, and Chris, **MØJOE**, are busy building their 20m CW sets under the watchful eye of **G3ROO** at their Thursday construction club.

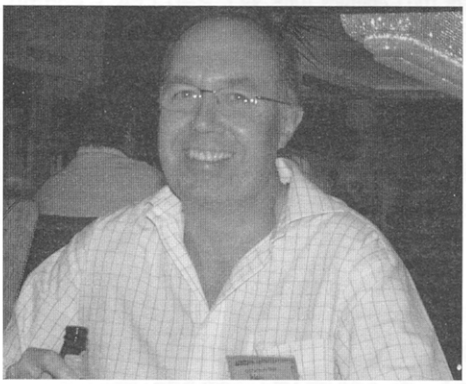
During the SOTA contest 9/10 October **IØSKK** used just 1mW (K2 at 0.1w with 20db attenuation) to make QSOs with G, EI, ON, LY and OK from the summit of Monte Le Macchie (1592 metres ASL over the sea). Alex used a modified Windom antenna with a **I7SWX** modified balun. The CQ WW SSB Contest was **MI3LDO**'s first one and he worked 32 DXCC with 5w, 21 with 1w and W and VE with 250mW. Nice going Paul,

G3YMC worked **FP/VE7SV** on five bands (including 80m), plus **5V7BR**, **4S7NE** and **FG/K9NW** in October on CW. **G1UBL** was QRV from Limousin, France in October with 10w SSB to an inverted vee on 20m. Adrian made 26 DXCC in the week and his highlight was "being told by an American station that I was one of the strongest signals out of Europe - he was running 1kW! and switching on the rig just before dinner and hearing **VE7SV/FP** calling CQ and then working him".

AL7FS's Web Site at <http://www.al7fs.us/> says "The main point of this web site is a series of articles to help amateurs who would like to get a start in QRP but are not quite sure how". The first installment is titled *QRP - Getting Started* and is well worth a

look. Jim also has many photographs of the Pacificon 2004 QRP Forum held in San Ramon, CA, USA in October, including the ones below of Jan, **GØBBL**, and Steve, **GØXAR** in the bar and below that of Alan, **MØPUB**, also in the bar (I suppose he had to be with that callsign!).





G4FBC's health now prevents him from participating in SOTA and he now goes 'car-packing' (as opposed to back-packing) and lowland walking. Ron uses an ex-army Pye Compak 8 transceiver on 40 and 80m LSB/CW with a built-in 8ft whip tuned with a sliding ferrite sleeve with very sharp Q. He also uses an ex-SAS manpack PRC320 with internal tuner and 8ft whip and says, "Although it has a crank handle generator, I have yet to find a supplier for the 24 volt battery pack which clips on the bottom of the set, can anyone help?". Ron had a QSO with it with 'white stick' operator **ON4LR** while using 1w as **G4FBC/P** beside Buttermere Lake, Cumbria on 40m.

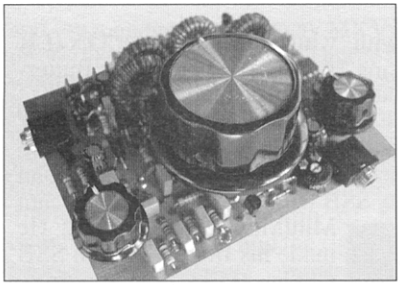
G4PEO was also QRV in the CQ WW SSB Contest and worked **FP/VE7SV** on three bands and lots of DX on 10m. John used 10w SSB with a IC-7400 to a jaybeam MiniMax beam at 25 feet. He made his first USA 40m SSB QSO using a HF2V Butternut. Since getting his FT-817 a few years back, **GM4HQF** has worked 100 DXCC QRP and is nearing 100 on both CW and SSB. Dave says, "Before this if anyone had told me that I would work any DX with 5w SSB and wire antennas, I would not have believed them!".

CO2KK reports the Cuban radio amateur training program includes learning about QRP and using the minimum amount of power to make the QSO. **GW4ALG** has continued experimenting with multi-band QRP VXO transmitters, mainly on 40, 30 and 20m. Steve says testing them this year has been made difficult by poor conditions.

Writing on the G-QRP Reflector after the last edition of Sprat , **GØNSL** said, "From the comments made by Chris, **G4BUE**, on QRP operation, at least we know of three callsigns not to waste our breath calling, still there are many thousands of others to work". Brian was referring to the comments published in Members' News of the last SPRAT by **G3SXW** and **G3TXF**, and endorsed by me, critising the use of /QRP after your callsign. Subsequent comments by **GØWAL**, **G3VGR**, **G3YMC**, **G4LDS**, **GM4XQJ**, **K7VO**, all support the stance taken by Roger and Nigel.

That clears the files once again. Please keep the news and photographs coming and let me know how your winter goes, by 20 February, please. If you write to me by ordinary mail then please send it to our Florida, USA address (see column heading).

Finally, I wish you and your families a very happy Christmas and everything you wish for yourselves for the New Year.



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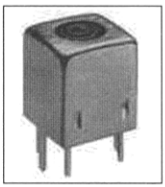

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Polyvaricon Variables Arrived recently a miniature capacitor Twin Gang 10-135pF order as PV-06 @ £1.50 each or 10 for £8. That's a club very special price.

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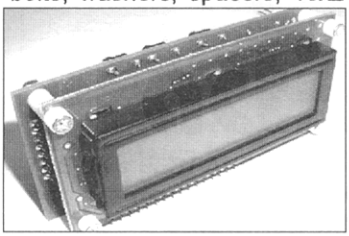

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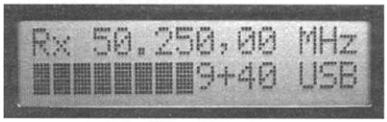

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Due to volume of other commitments, Micro Radio Products has ceased producing radio and electronics kits for the time being. All stock has been sold off therefore regretfully we will not be able to accept any orders. We would like to thank all customers for their business and support during the time that we have been trading. Also, we wish everybody a very Merry Christmas, a Happy and Prosperous New Year. David Rowlands (Sales & Commercial) G6UEB - Tony Bowmaker (Technical) G0EBP

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Back issues of SPRAT are still available as previous ads – However, UK Postage now 1st magazine – 45p, each additional magazine add 15p (blame the Post Office – not me!)

NB I am temporarily out of stock of the Drew Diamond book, also, I am out of stock of 7.2MHz resonators, Poly-varicon capacitors and NJ Club pad cutters (no more supplies expected), and 14.060 miniature crystals All the DDS kits are gone, but I still have some of the W8DIZ freq ref kits (Sprat 116) - £10.

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