AN INTRODUCTION TO AMATEUR RADIO - FOR BEGINNERS OF ALL AGES

RADIO

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D-I-Y

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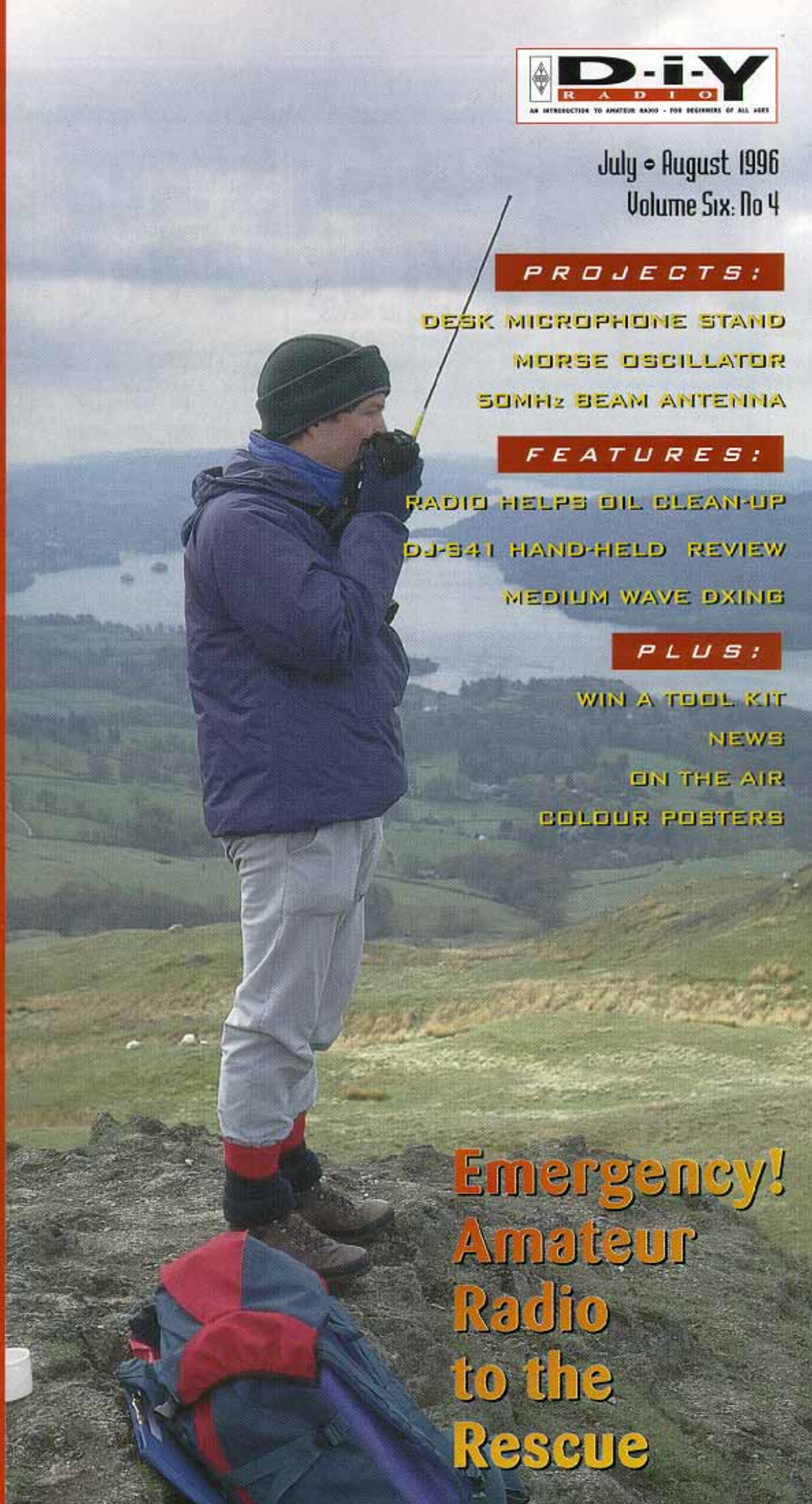
July • August 1996
Volume Six: No 4



PROJECTS:

DESK MICROPHONE STAND

MORSE OSCILLATOR

50MHz BEAM ANTENNA

FEATURES:

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PLUS:

WIN A TOOL KIT

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ON THE AIR

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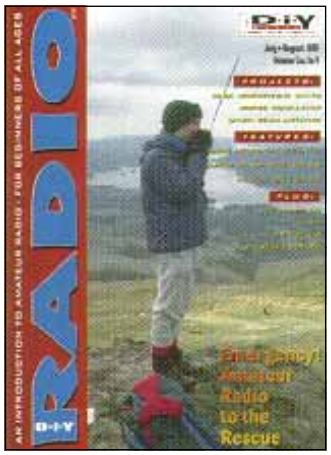
Emergency! Amateur Radio to the Rescue



John Bowness, G7EFO, on the summit of Wansfell Mountain (482m above sea level) providing communications for an event organised by the Westmoreland & North Lancs Group of the Long Distance Walkers' Association. John is a member of the South Lakeland Raynet Group which can provide efficient and flexible communication in an emergency situation. For more on emergency communication, see our poster and the feature on page 10. Photo: Ted Bowness.

Comment

THIS EDITION features the role played by radio amateurs in helping to provide emergency communications. In these days of instant world-wide satellite communication and digital mobile telephones you would think that simple amateur radio stations would be of no use. But in an emergency, there is so much information to pass that the existing radio and telephone networks tend to overload.

Amateurs are able to be flexible, too, changing site or providing repeater stations in order to improve coverage. Turn to pages 10 - 13 to see some examples of amateur radio providing this public service.

The various amateur organisations offering their help to the User Services (Police, local councils, etc) spend a great deal of time carrying out exercises to train for 'the real thing'. The picture on our cover shows communications being provided for a walking event; this serves to train the operators in passing messages accurately and efficiently.

If you want to help to provide this type of public service, write to us and we'll pass your details to the nearest group.

Mike Dennison, G3XDV
Editor

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Robert Snary's Desk Microphone (see page 5).

CONSTRUCTION CODE

FOR THE COMPLETE BEGINNER . . . . .

REQUIRES A LITTLE EXPERIENCE . . . .

FOR THE MORE EXPERIENCED

The new AKD 'Target' receiver, tuned to 73kHz. See stories opposite.

Managing Editor: Mike Dennison; Production Editor: Jennifer Crocker; Tech Ed: Peter Dodd; Tech Illustrator: Bob Ryan; News Ed: Steve Lowe; Features Ed: Deniz Huseyin; Prod Asst: Wai-Yee Man; Secretary: Samantha Ralph. *D-i-Y RADIO* is published six times a year by the Radio Society of Great Britain, Lambda House, Cranborne Road, Potters Bar, Herts. Filmset by JJ Typographics Ltd. Printed by Southernprint (Web Offset) Ltd. ISSN No: 0959-843X.

AKD 'TARGET' NEW LISTENERS

AKD IS TO launch a series of communications receivers which they hope will revolutionise the entry-level amateur radio market. The basic model will be marketed under the Target name and it is to be launched at a price around £160, including VAT. AKD hope that, at that price, it will encourage newcomers to short wave listening and amateur radio to buy their first 'serious' communications receiver.

The new radio is due out in September. It will cover 30kHz to 30MHz in 1kHz steps, with a clarifier control so the user can tune between the steps and resolve SSB signals. Other versions of the receiver will be available for those who wish to receive weather fax pictures, and for existing SWLs and licensed amateurs who require a higher specification receiver. An option on the 'amateur' version will allow computer control and a spectrum display on a PC screen.

● SMC WILL BE holding an Open Day on Saturday 17 August at their Chandlers Ford, Hampshire, HQ. For further details, ring 01703 255111

● TO COMMEMORATE the golden anniversary of the Irish Naval Service, special event station EI5INS will be on the air during the month of July from the Irish Naval Base on Haulbowline island in Cork harbour.

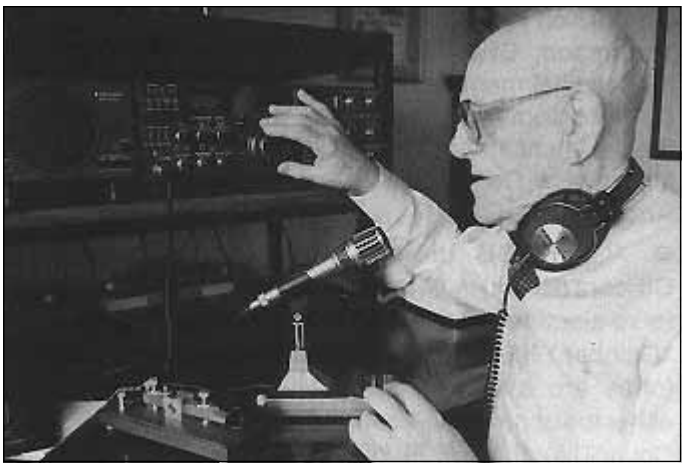
● CY7TUB WILL BE on the air from Nanaimo, British Columbia, 24 - 28 July to celebrate the 30th anniversary of the 'world famous' Nanaimo to Vancouver bathtub race!

G0HZZ Helps to Avert Gas Blaze Disaster

QUICK-THINKING Norman Coathup, G0HZZ, ensured that a blaze - 100 miles from his home - was swiftly quelled. Norman received a distress call from a radio amateur in Cumbria who had seen a gas cylinder explode near an isolated caravan site. The fire was dangerously close to woodlands and vehicles. Norman, from South Wirral, called Ellesmere Port police, who faxed firefighters in Cumbria. A fire engine arrived on the scene within minutes and the blaze was quickly brought under control. Local police also caught youths suspected of causing the fire.

Norman said: "I've never had to do anything like this before, but I am not going to boast about it. I was the nearest one to a phone so I did what I had to do."

PHOTOGRAPH: COURTESY OF THE *CHESTER CHRONICLE*.



Norman Coathup, G0HZZ, at his station in South Wirral.

● THE RA IS still settling in to its new premises at New King's Beam House, so please continue to be patient over the next few months. They inform us that repeater and beacon licensing is now back on course following the bombing at their Docklands headquarters and apologise to those who have been kept waiting. The repeater and beacon papers were amongst the last items to be retrieved from the South Quay building after the bombing.

RISING STARS

AT A RECENT 'crash course' organised by STELAR (Science & Technology through Educational Links with Amateur Radio) at Kenwood Electronics UK Ltd, 20 teachers learned enough about amateur radio to pass both papers in a mock examination. Five of them also gained a 100% pass in a mock Morse exam on the final day of the course. Thanks to this course, another 20 school radio clubs will be on the air in the near future.

● LADY PLOWDEN, DBE, G6PHY, has agreed to be the Patron of STELAR.

A NEW LF AMATEUR BAND

BRITISH FULL CLASS A licensees can request a Notice of Variation to allow them to operate on a new frequency band at 71.6 - 74.4kHz. It's in a part of the radio spectrum which until now had not been available for use by amateurs at all. The new band will appropriately be known as 'the 73kHz band' ('73' being a Morse code abbreviation meaning 'best regards').

The new band comes about following several years of negotiation between the RSGB and the Radiocommunications Agency, which allocates use of the radio spectrum in this country.

The 73kHz band is in the *low frequency* (LF) part of the spectrum, and its wavelength, about 4100 metres, is 25 times greater than that of the 1.8MHz band, until now the lowest frequency amateur band. A dipole antenna for 73kHz would be over a mile long, although much traditional antenna theory is irrelevant at this wavelength.

Key items of RSGB News for HamClub Members

● **IAN SUART, GM4AUP,** is acting as **caretaker Chairman** of the **RSGB Executive Committee** until the position is filled. **Steve Thompson, GW8GSQ,** is the new chairman of the **VHF Contest Committee,** whilst the new chairman of the **Microwave Committee** is **Andy Talbot, G4JNT.**

● ALL **RSGB Liaison Officers (RLOs)** must stand for **re-election** in September / October 1996. Nomination forms are available from either the appropriate Zonal Council Member, RSGB HQ or Chairman of the Membership Liaison Committee Ian Kyle, GI8AYZ. Completed forms must be returned to the Zonal Council Member by 31 July.

● THE RSGB WILL be holding **amateur radio car boot sales** at its Potters Bar HQ from 10am to 4pm on **15 July, 17 August, 21 September and 19 October.** Books at bargain prices will be available on the RSGB bookstall, and there will be a raffle and refreshments. There will be a charge of £5 per car, payable on the gate (no booking necessary), for those wishing to sell equipment. The HQ building will also be open (free admission), as is usual on the third Saturday of each month, with the GB3RS shack, National Amateur Radio Museum, and Library available to visitors. Morse tests are available on demand between 11.00am and 12.30pm.

● THE RSGB will have a **bookstall** and membership information stand at the following rallies and events: 4 August RSGB National Mobile Rally, Woburn, Beds; 18 August Red Rose Rally, Horwich, near Bolton; 18 August Great Eastern Rally, Kings Lynn, Norfolk.

● THE RSGB IS conducting an **opinion survey on the future of amateur radio**. *D-i-Y Radio* readers are invited to participate by writing to 'Survey Request' at RSGB HQ in order to receive a copy of the survey form. Please note that the completed surveys should be returned to Isis Research Ltd (by 29 July at the latest) at the address on the forms, and *not* to RSGB HQ.

● NOMINATIONS ARE wanted for several trophies and awards. For the 1996 **Young Amateur of the Year** award, contact Marcia Brimson, 2E1DAY, at RSGB HQ for full details and a nomination form. The closing date is 31 July. The **G5RP Trophy** is awarded to the newcomer thought to have made the **most rapid progress** in **HF DXing** in the recent past. Send nominations to Fred Handscombe, G4BWP, QTHR by 30 August. The **Jack Wylie Trophy** is awarded to the **Scottish** club, society or RSGB member thought to have done most for amateur radio generally in the past year, and the **Jock Kyle Trophy** is awarded to the **Scottish** club, society or RSGB member thought to have done most in Scotland in the field of **VHF** in the past year. Nominations should be sent to Tom Menzies, GM1GEQ, QTHR by 14 August 1996.

● A GB2CW slow Morse transmission from the station of GI3USK is now being broadcast on Sunday mornings at 11.00am on 3600kHz.

● THERE ARE vacancies for **Senior Novice Instructors** in: South and East Devon; North Devon; Gloucestershire; and the Glasgow, Kilmarnock, Motherwell and Paisley area. There are also vacancies for **Novice Instructors** in North Devon. Anyone interested in filling these roles should get in touch with the RSGB's Co-ordinator, Phil Mayer, G0KKL, on 01202 700903.

● NEARLY A THOUSAND candidates took the RSGB Morse Test, with a pass rate of 72.5 per cent, for the year ending 31 March. Chief Morse Examiner Roy Clayton, G4SSH, says that the five per cent increase over the previous 12 months was due entirely to "a last minute panic" by candidates wishing to obtain one of the last G series callsigns before the change to M calls on 1 April.

● THE RSGB's **Repeater Management Group** now has a new national Helpline phone number: **0956 708873** available from 9.00am to 9.00pm, seven days a week.

Simple Desk Microphone

by Robert Snary, G4OBE

THE FIRST radio used by Novices, and others starting in amateur radio, is often a handheld transceiver. The handheld is quite versatile in that it can be used in the shack as well as mobile. However, when used in the shack with an outside antenna a handheld can become somewhat awkward to use.

It can be more convenient to use a desk microphone. In this article I have described the construction of a desk microphone that can be used either with handhelds which use a common microphone and PTT line (such as Icom, Rexon, ADI Kenpro etc) or for sets where a separate 'push-to-talk' line is used. The design is very simple and uses two plastic pen shells, the plastic lid of an old coffee jar (or similar) and the plastic case of a 'DIN' plug. The overall design is shown in the photograph on page 2.

CONSTRUCTION

THE END-CAP AND the ink tube/ball point should be carefully removed from the pen and discarded, leaving only the clear plastic shell.

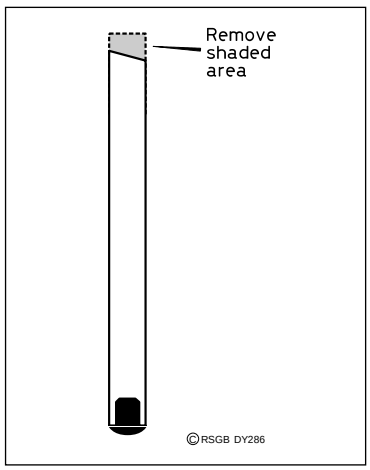


Fig 1: Vertical support made from ball-point pen shell.

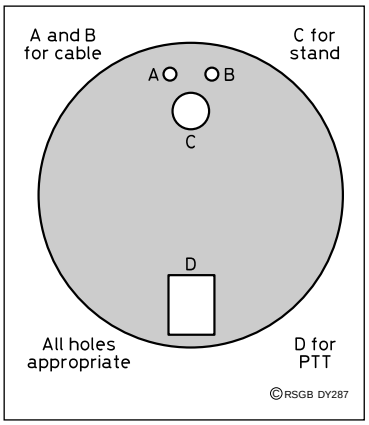


Fig 2: The microphone stand base.

One of the pen shells is used to make the vertical support for the microphone and the other is used to hold the microphone element.

The body for the vertical support should have the pointed end shaped so that the microphone support is set at a convenient angle (see **Fig 1**).

The base should be prepared next (see **Fig 2**). Four holes are required, two ('A' and 'B') are small holes for cable to be fed through and a third slightly larger hole, 'C', which is used to take one of the plastic end caps from the pen bodies. The fourth hole, 'D', is dependent on the type of switch that you use for the push to talk (PTT).

Some epoxy resin such as 'Araldite Rapid' is used to fasten all the bits together. Only a small amount at a time should be mixed as it is best to assemble the base, piece by piece and let the glue harden before moving on to the next part of the assembly. The instructions and warnings on the glue **must** be followed to prevent any accidents.

The first item to be glued into place is the plastic end from the pen body and this is passed through hole 'C' underneath the lid **(see Fig 3)**. Then the shaped pen body is placed over this piece and glued in place as the vertical support. While the glue is setting you can place the DIN plug body on to the second pen.

Once the resin has set for the vertical support you can then glue the second pen body in place, making sure that the assembly is supported until the glue has set. A side view is shown in Fig 3. The microphone assembly should be left for 24 hours before completing the electronics side of the project so that all the glue is properly set.

Any type of switch which has a 'press-to-make' contact can be used, the only recommendation that I would make is to use a switch which does not require a great deal of pressure to operate so that it does not become too uncomfortable to press during a long transmission.

If you find that the micro-

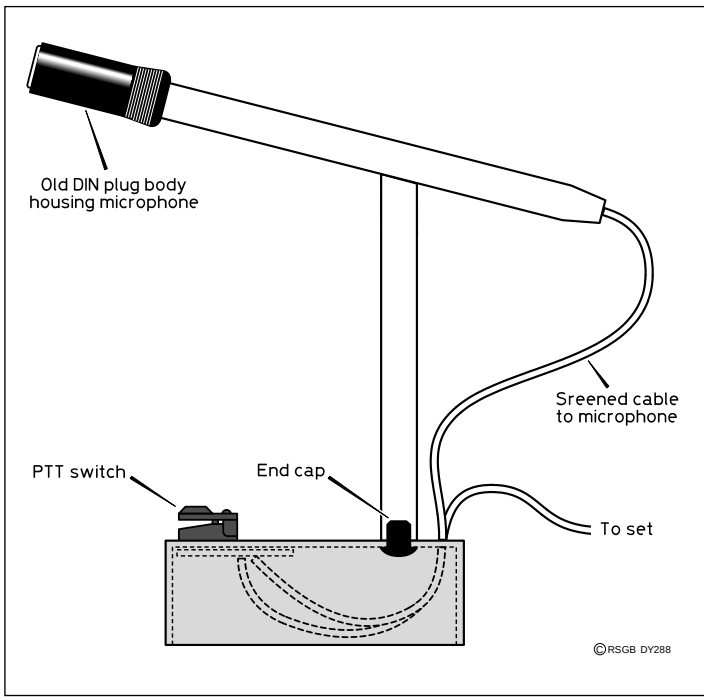


Fig 3: Complete microphone stand assembly.

phone is too light and slides round your operating desk then you can use some plasticine in the base.

CIRCUIT DESCRIPTION

A SMALL ELECTRET condenser element is used, which needs to be powered by a DC supply.

Most handheld sets use a single screened lead for both the PTT line and the microphone audio lead. The diagram of the wiring for a handheld in **Fig 4** shows that the microphone is connected via screened cable to a resistor R1 and capacitor C1 and then the press-to-talk switch S1 to the set.

If you find that the set will not transmit when the PTT switch is pressed reduce the value of R1 to 27kΩ. The value of R1 in Fig 4 is suitable for the Icom, Rexon and ADI Kenpro transceivers that it was tried with, but may have to be reduced for Yaesu sets.

For radios which use separate PTT lines the circuit in **Fig 5** can be used. A suitable supply is needed for the microphone and this must not exceed 9 volts. This can be derived from a PP3 type battery or from the set. Some modern sets have a suitable supply voltage available on one of the microphone socket pins, (see the handbook for details)

The PTT switch is shown in the diagram as being connected in a 'ground-to-transmit' operation but some ex-PMR sets use a different type of arrangement. Again, I would recommend that you check in the handbook for your set.

The microphone element should be connected to a length of screened cable. Insulating tape can then be wrapped around the microphone insert so that its diameter is increased and it makes a tight fit into the DIN plug cover. The screened wire should be taken through the pen body and into hole 'B'. The wiring for the few components can either be made directly on to the switch used for the PTT or on to a small piece of Veroboard. To a certain extent this is determined by the type of switch that you use.

The final length of screened lead goes from the microphone via hole 'A' to the transceiver. This requires a suitable plug for your set.

ASSISTANCE AVAILABLE

THE PROTOTYPE microphones have been used with a variety of sets, but I would recommend that before connecting the microphone you check in the instruction manual regarding connections. If you have any questions I would be more than willing to try and help. All I ask is for the queries to be in writing, with a self-addressed stamped envelope and a photocopy or sketch of any relevant information from the set's user's guide.

My address is: 12 Borden Avenue, Enfield, Middx, EN1 2B2.

COMPONENTS

Resistors

R1	(Fig 4)	33kΩ 0.25 Watt Carbon
R1	(Fig 5)	1kΩ 0.25 Watt Carbon

Capacitors

C1	(Fig 4)	0.1 µF Ceramic Disc Capacitor
C1	(Fig 5)	0.1 µF Ceramic Disc Capacitor
C2	(Fig 5)	10 µF Sub-miniature Electrolytic Capacitor

Additional Items

S1	Push to Make Switch
Electret-Condenser Microphone Element	Maplin Type FS34W
Screened Cable	
Microphone Plug	Suitable for your set.
Small Piece of Veroboard	If required
Screened Cable	
PP3 Battery and Battery Clip	if a suitable supply voltage is not available from the set.
Microphone Plug	Suitable for your set.
Two Old Plastic Ball Point Pen shells	
Plastic Coffee Jar Lid	
Plastic Body from DIN Plug	
Araldite Rapid or Similar Epoxy Resin Glue	

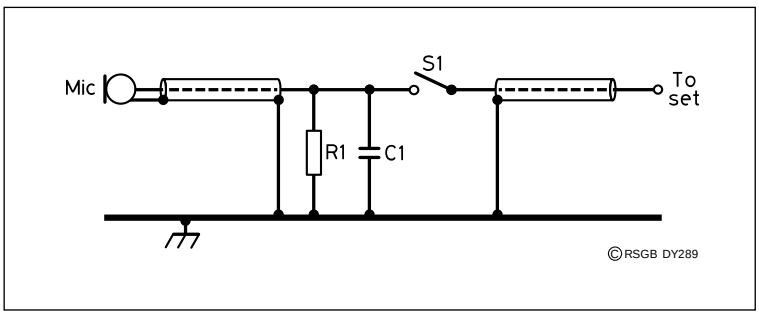


Fig 4: Wiring diagram for handheld radios.

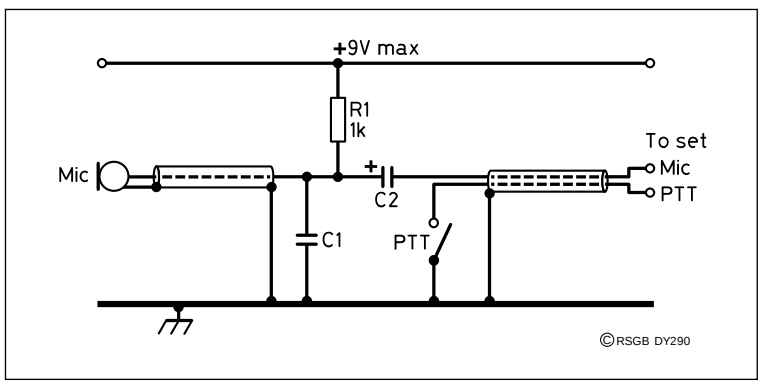


Fig 5: Wiring diagram for radios which use separate PTT lines.

Nuts and Bolts and Things

By John, GW4HWR, Chairman RSGB Training & Education Committee

WHEN EVER YOU decide to make some piece of electrical equipment (simple or complex) nuts and bolts are very likely to be needed. If they are purchased the price can be very high so try to set up a store of your own by a process of recycling!

CHEAP SOURCE

MANY REDUNDANT items of equipment are held together by nuts and bolts, so never consign any item to the bin before checking to see if there are any bits worth saving. Old tape recorders, Hi-Fi units, television and radio receivers are all likely to be full of useful small pieces including - nuts and screws.

TOOLS

TO HELP IN their removal a screwdriver with a blade ground as shown in **Fig 1** is most suitable. This shape is chosen so that the screwdriver doesn't jump out of the slot in the screw as would probably happen if the blade had a shape like those shown in **Fig 2**. In addition to the possibility of the slipping screwdriver causing damage to some other component, the slot of the screw will be deformed and the difficulty of turning greatly increased. A small pair of pliers will also be needed, they should have jaws which are serrated and not bent.

Another excellent source is ex-service equipment but there is one major snag. To ensure that the many nuts and screws do not work loose with the constant vibration met in most service environments, each one is sealed with a varnish. This usually appears as a red or blue coating and if present will make removal of the nuts almost impossible. However like most varnishes, almost all will soften with repeated application of methylated spirit. Use a cotton bud and dab a little on each nut, it takes a little time to work so be patient and go round the nuts you intend to remove, several times. Stubborn ones will probably respond to a little heat from a soldering iron but take care. Don't waste too much time on one screw!

Make a start on the most easily accessible screws first, don't worry about the size, even the bigger ones will come in useful sooner or later. It is useful to have a number of small boxes available to store your loot, for a start the round plastic boxes from used 35mm films will do but you will find that bigger sizes are needed quite quickly. DIY

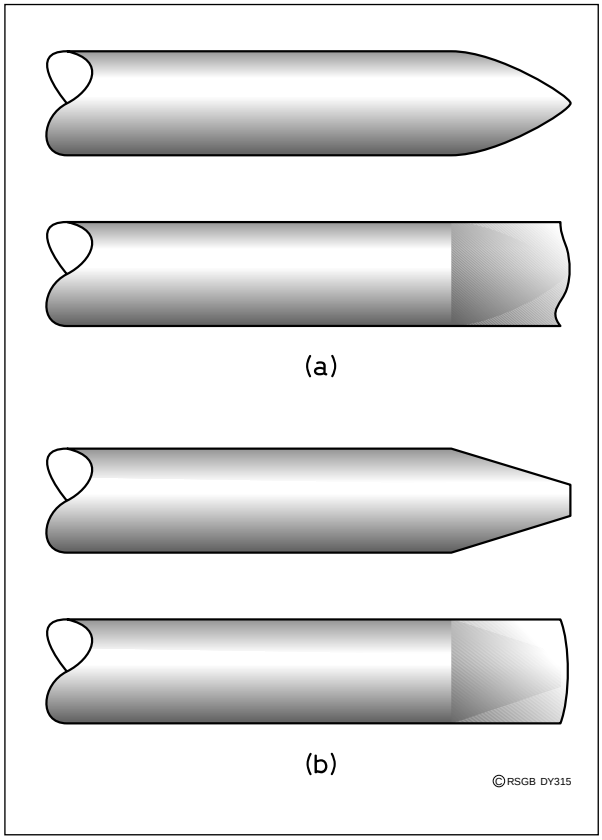


Fig 2: A screwdriver with a blade shapes as shown will tend to jump out of the slot in the screw when the blade is turned.

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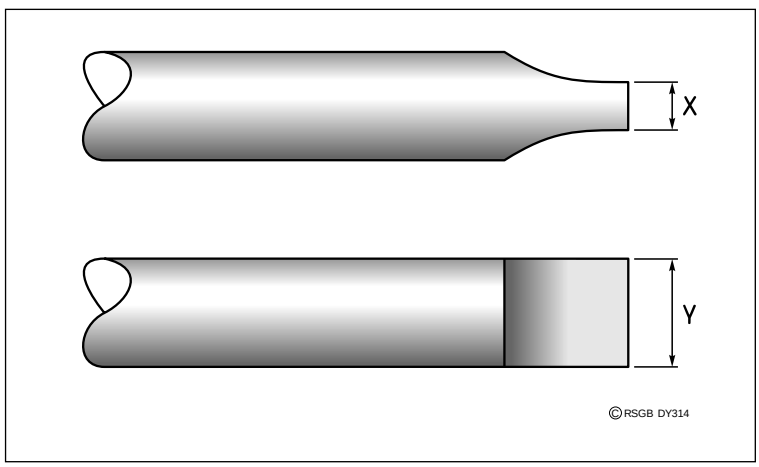

Fig 1: In an ideal world dimensions X and Y would just fit the slot of the screw.

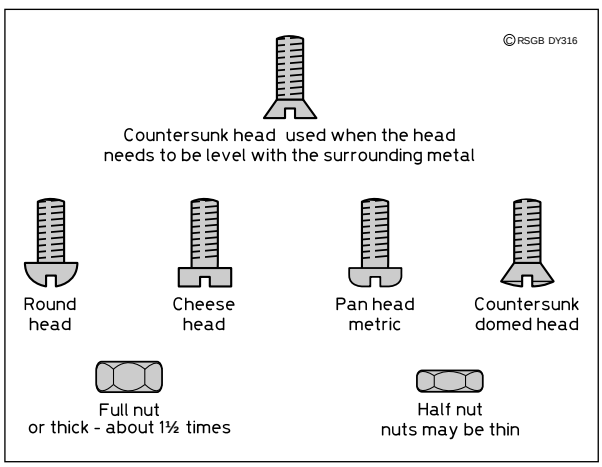

Fig 3: Some of the more common types of screws which can be found when dismantling surplus equipment.

Morse Practice Oscillator

by Steve Ortmayer, G4RAW

NOT ANOTHER Morse practice oscillator you will probably say. Well yes, but this one is rather different.

Most of the Morse practice oscillators that have been described before produce a non-sinusoidal waveform, ie a square wave or a triangular shaped waveform. The sound from such an oscillator tends to be harsh and raspy. A sinusoidal oscillator gives a sound that has a pure musical note.

THE TWIN TEE OSCILLATOR

THE BASIC REQUIREMENTS of a sinusoidal waveform **(sinewave)** oscillator is an amplifier and a feedback network. This network is necessary so that some of the output from the amplifier is fed back to the input to maintain oscillation at one frequency.

The circuit used in this project, see **Fig 1**, uses a BC109 (TR1) as the amplifier. The oscillator circuit is called a **Twin Tee**, because it uses two 'T' filters in parallel in the feedback path. The frequency at which the circuit operates is determined by the values of the resistors and capacitors in the 'T' networks.

The output from the oscillator is then amplified, by an LM386 integrated circuit audio amplifier, to drive the loudspeaker.

CONSTRUCTION

THE PROJECT IS constructed on plain perforated board (board without the copper strips) as shown in **Fig 2**. The components are supported by bending their connecting wires under the board. A common ground connection is made by soldering a length of wire between two solder tags.

It is a good idea to build the loudspeaker amplifier first and to use an IC holder for IC1, the LM386 amplifier. Connect the loudspeaker then the 9 volt battery. Touch the input (pin 3) of the amplifier with a 'probe' made from bare copper wire; if the amplifier is working a buzzing noise will be heard in the loudspeaker. If the amplifier does not work check the connections and try again.

Once the amplifier is working it can be used to test the oscillator. Build the oscillator circuit and connect the output to the amplifier. Set the potentiometer RV1 to the halfway

COMPONENTS

Resistors -1/4 watt carbon film

R1, R2	18k,
R3	4k7
R4	10k
R5	10R

Capacitors

C1,C2	10nF
C3,C8	47nF
C4	100nF
C5	22nF
C6	10µF, 16v electrolytic
C7	22µF, 16v electrolytic
C9	220µF, 16v electrolytic

Semiconductors

TR1	BC109
IC1	LM386

Other Items

RV1	10k log pot with switch

8 ohm loudspeaker
Perforated board 3.5 x 9cm
Key socket to suit your key (note it takes 9V)
Box or case

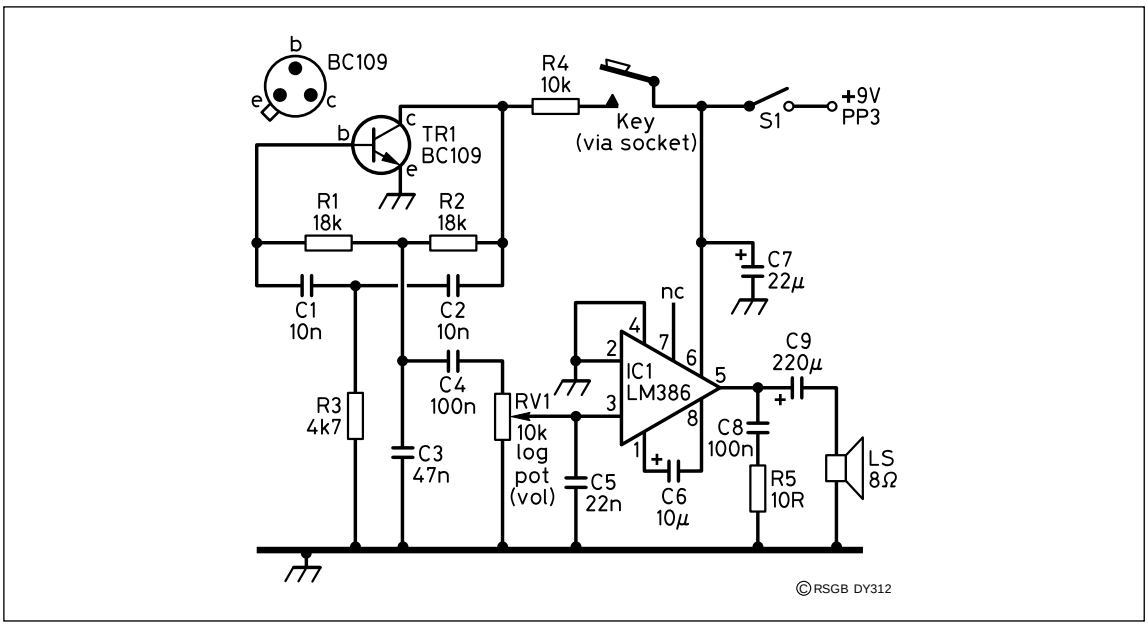

Fig 1: Circuit diagram of the sinewave oscillator and amplifier.

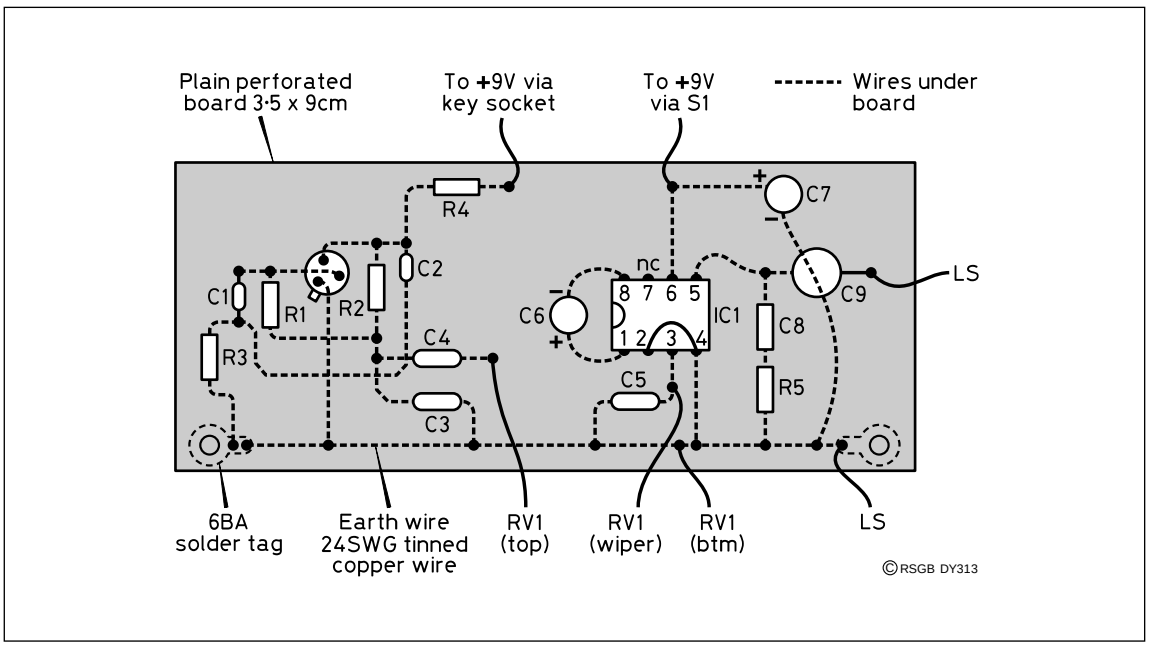

Fig 2: Component layout and interconnection diagram.

position. Connect 9 volts directly to the amplifier and the oscillator; the oscillator tone should be heard in the loudspeaker. The volume can be adjusted with RV1. The tone can be changed by altering the component values around TR1; try experimenting and note which values cause the changes in tone.

The key socket carries 9 volts, so it must be either plastic or insulated from a metal case. I used a 10k log potentiometer for RV1 with an ON / OFF switch, but you could use a separate switch.

The project is now complete and can be housed in a box of your choice.

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7 stores sell plastic cabinets of drawers which are very suitable for strong components, includung nuts and bolts.

There are other items of hardware which are worth saving, spacers of many sizes (these are tubular pieces of metal between 5 and 50mm, with either a plain or threaded hole through the centre), washers - plain and serrated (shake proof), threaded rods and solder tags. All will come in useful later.

VARIETY

YOU MAY HAVE noticed that in paragraph two the words 'nuts and screws' were used whereas the title referred to 'bolts'. Screws are threaded along the whole length whereas bolts have a plain unthreaded length below the head, also, bolts will have a square or hexagonal head (for use with a spanner) while screws have a slot or a cross point. You will also find a variety of different shapes of head. Some of the more common types are shown in **Fig 3**.

It is important to note that there are different threads for screws and nuts which sometimes prevents the two items fitting together. It is good practice (at least until the different types can be recognised) to run the nuts on to the screw from which they were removed. There are two main types in common use, these are called **imperial** which are given numbers such as 6BA or 4BA depending on the diameter of the screw and ISO **metric**, where the names are in the form M2.0 or M2.5 where the numbers indicate the diameter of the thread in millimetres.

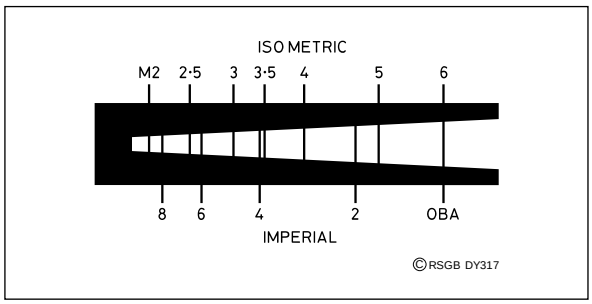


Fig 4: A guage used to compare a range of Imperial and Metric screws.

SCREW GAUGE

A GAUGE USED to compare a range of these two types of screws is shown in **Fig 4.** You can use it to measure the screw diameter by noting where the screw touches the sides of the V shaped slot.

The effort of recycling hardware described in this article can reduce the cost of projects and will often provide a particular piece which no retailer seems able to supply.

Radio Helps in Oil Clean-up

by Granville Bowen, GW0UMC

"OIL SLICKS from the *Sea Empress* have spread into Carmarthen Bay. Tenby, Saundersfoot, Amroth, Wiseman's Bridge and Pendine are all affected. The emergency services are working day and night along the coastline. Communications are weak and urgently need strengthening. Raynet have asked us for help and CPPU would appreciate the support." So went the telephone call from Islwyn Hughes, GW4ZXL. "How are you fixed for mobile work?"

I have an Alinco DJ-580 dual-bander giving a maximum of 5W if used from the car battery. Would that be sufficient? GW4ZXL thought it would. Was I prepared to help? No question about that - I was retired and although I had commitments I could organise my availability. But what about frequencies, procedure, coping under pressure? I'm a real amateur, and a new one at that - no years at sea as a radio officer or intensive training at the RAF School of Radio.

The frequency question was solved immediately. "Use S9 on 2m and 433.700 on 70cm." As for the rest, well time would tell. Finally, "Bring something to eat - it could be a long day".

Forward control, GW3IGG/M, on the Ridgeway. L to R: Joe Neal, SWL; John Jones, GW3IGG; and Alan Dicker, GW3VEN.

ON CALL

THE FOLLOWING morning, from near St Clears, I was able to monitor the controller on 2m. There was constant radio traffic and it was obvious that there was considerable activity all along the coast. At Pendine I saw some JCBs working on the beach. On Marros Hill I seized a pause in transmissions to announce myself, hoping my handheld would prove adequate: "GW0UMC Mobile calling Oil Spill Control. Reporting in. The name is Granville. GW4ZXL is expecting me. Do you copy?"

"GW0UMC Mobile from GW3IGG Mobile. Welcome Granville and thanks for coming. Islwyn, GW4ZXL, will meet you at Amroth and brief you. Please confirm."

"Confirmed, GW0UMC Mobile clear".

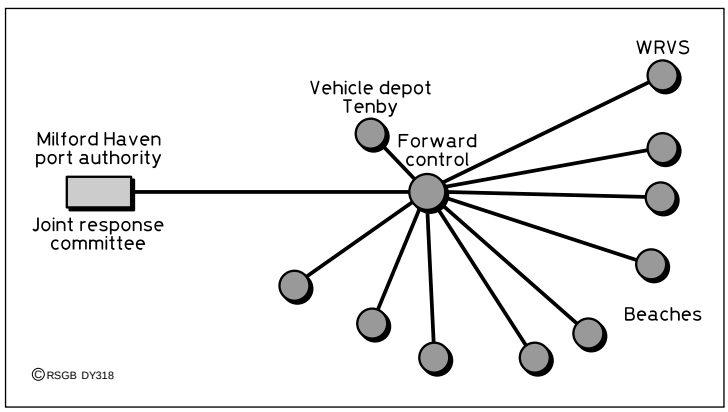
My first contact on the emergency channel during a recognised national disaster. I was working with the big boys now!

Islwyn met me at Amroth and gave me a list of the locations in our area east of Milford where cleaning operations were in full swing. In practically all of these from Freshwater East to Pendine, amateur radio operators were providing the essential communication link.

John Jones, GW3IGG, Forward Control **(Fig 1)**, was located at Monkstone Point and he was co-ordinating the traffic from there. His carefully chosen location accounted for the excellent signal and I was able to make contact from all the beaches I worked.

When he later moved to the Ridgeway at Penally, to enable better contact with the Joint Response Control at the Port Authority at Milford Haven, there were some voids in the traffic. For me, one of these was Saundersfoot and I found it necessary to make contact via a relay station at Wiseman's

Fig 1: Network diagram throwing the communications link established during the oil spill clean-up operation. GW3IGG/M was located at Forward control.



Bridge where GW8BKL was located. Later, after experimenting, I found a spot where contact was just possible, but generally the locals referred to Saundersfoot as a "hole", a radio hole, that is!

TOUR OF DUTY

MY BRIEF, on this my first tour of duty, was to relieve GW0TSF at Wiseman's Bridge; then contact the Beachmaster to establish a firm communications liaison. Wiseman's Bridge was a hive of activity so contacting the Beachmaster was not going to be easy. I later realised he was responsible for three beaches and could be on any one of them.

At Wiseman's Bridge, the beach, shingle and cliff face were all dotted with men, machinery, hoses, and various unidentifiable (to me) pieces of equipment. Each group I approached knew he was somewhere; but not there! Evidence of the oil spill was everywhere. A long stretch of shingle, interspersed with large black globules, looked particularly unpleasant, as did the areas of soaked sand. But it was the cliff face that was proving particularly obstinate and defying the efforts of the men to power-wash off the oil residue.

Here I found him. His protective clothing was oil-stained and he looked strained and under pressure. He was undoubtedly pleased to see me. His mobile phone had been malfunctioning for two days and he had a list of requirements, one of which was, "Can you do anything about food? Some of the men have been here since early morning."

I waited for a break in the radio traffic and called GW3IGG with my list of requirements. When it came to the request for food, I was told that the WRVS were travelling along the coast road and providing sustenance, but at that stage communications were tenuous and there was no ETA. Then the Gods stepped in: around the corner came the WRVS with ham rolls, tea, coffee and a choice of hot soups. From then on everyone looked at me with increased respect. There was magic in radio! Later this magic took the form of Barbara Shelley, GW7FFU, whose regular task was to travel with the WRVS van. This meant continuous communications with definite ETAs, thus avoiding confusion over work schedules.

During my 'tour of duty' I spent some time at most of the beaches and was pleased to rendezvous with GW0WBP at Tenby Harbour, GW0RNK at Lydstep Haven, GW7CDE at Manorbier and other stalwarts in 'semi-permanent' locations. There was a short spell as a relief controller for GW3IGG on the Ridgeway at Penally.

When GW4ZXL was controlling I was assigned to the South Pembrokeshire District Council Depot at the Salterns, from where labour and equipment were deployed. This was a demanding placement, requiring both tact and patience. Then, perhaps as a reward, I was asked to relieve GW7FFU on the WRVS 'bun run'. This ended at Freshwater East, from where I returned to Saundersfoot with a special pack of edible goodies for GW0RNK who was searching for the Beachmaster. He, too, had found a spot in the harbour car park from where he could contact the controller, but using 25 watts I think. I was on my way home when I last heard him calling control from a field at Monkstone Point - I wonder if he's still there?

In conclusion I'm sure that I am expressing the sentiments of all who participated with the communications organisations when I say I am pleased to have made a small, but important, contribution in assisting the authorities in their fight to minimise the effects of the *Sea Empress* oil disaster. On a personal level I feel that my knowledge and experience of radio has benefited.

THE *SEA EMPRESS* oil spill on the beaches of south-west Wales back in February provided groups of radio amateurs with a chance to display their communications skills. They played a vital role in the clean-up operation, as Granville Bowen, GW0UMC, describes.

Dyfed County Council called out Raynet on Wednesday 28 February 1996. Operations began the following day and continued until stand-down on Thursday 21 March.

Three amateur radio organisations were involved: Pembrokeshire Raynet (group controller GW3IGG), North Dyfed Raynet (group controller GW1XOT), and CARSET (Carmarthen Amateur Radio Society Emergency Team, secretary GW4ZXL).

We are grateful to John Jones, GW3IGG, Pembrokeshire Raynet group controller, for providing the background information, diagram and photographs for this article.

Now turn to the poster in the centre of this issue of *D-i-Y Radio* for more on how radio amateurs come to the rescue in times of emergency.

Beach clean-up vehicles and men in action.

Amateur Radio - To The Rescue

Amateur Radio has played a vital role in providing emergency communications in times of need. The relief work in numerous disasters - both natural and man-made - has been aided by amateur radio communications. Just a few examples include the Mexican and Armenian earthquakes, the Lockerbie aircraft disaster, the humanitarian crises in Rwanda, Burundi and Zaire, and the others on this page. In this country, the devastating North Sea flooding of 1953 led to the RSGB forming Raynet, formal groupings of radio amateurs who provide communications in times of emergency.

In the Midwest of the USA in late 1993, the Mississippi and Missouri Rivers burst their banks, causing devastating flooding. American Emergency Operations Co-ordinators (EOCs) provided the organisation behind what became one of the longest emergency amateur radio rescue operations ever.

PHOTOGRAPH BY *THE ULTIMATE CHOICE*; REPRODUCED COURTESY OF ARRL

During the recent war in Bosnia-Hercegovina, the enclave of Bihac in the extreme north-west of the country was under siege for over two years. There was no postal service and the town's telephone exchange was destroyed by a shell which meany that only communication with the outside world was by amateur radio. In this picture, an elderly lady receives a message from her family via the station of T91FNO. Queues built up outside the 'shack' as anxious members of the public waited to pass their messages to friends and family elsewhere in Bosnia.

Only with regular training exercises can groups of amateurs be expected to provide an efficient communications service during genuine crises. *Exercise Rave,* organised by the Llanfairfechan branch of the British Red Cross Society, assumed that fighting had broken out at a crowded rave party, leading to many casualties. This training exercise allowed participants to practice communications skills, as well as first aid, ambulance and leadership skills, in a realistic environment. Here, Raynet member Wyn Evans, GW6PMC, helps Red Cross volunteers put a 'casualty' into an ambulance during *Exercise Rave.*

Cyclone Val struck Western Samoa in the South Pacific with devastating force in 1991. For five days, winds of up to 150MPH pounded the islands, destroying thousands of homes, causing millions of dollars worth of damage, killing 14 people and injuring many more. The *whole country* was cut off from the outside world and amateur radio provided the *only* communications into and out of Western Samoa. Amateurs in Australia and New Zealand contacted 5W1JL, a church club station in Apia, the capital, and helped to organise immediate aid relief from the Australian, New Zealand and Canadian governments.

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Go to next page

Alinco's Tiny UHF Handie

The new DJ-S41 reviewed.

ALINCO HAVE just brought out a hand-held transceiver for the 432MHz (70cm) band which is not only extremely small but also relatively inexpensive at just under £150. The cost and size have been kept down by the use of ordinary 'AA' type batteries and a power output of only a few hundred milliwatts. Despite these compromises, there are still many useful additional features.

The first thing you notice about the DJ-S41 is how tiny it is - it's genuinely pocket-sized - and then its weight. This really is the sort of radio you wouldn't mind carrying everywhere you go. The next is the ingenious fold-down antenna (the radio and antenna are shown actual size).

The Alinco DJ-S41 is shown here actual size.

It is possible to run the radio from ordinary dry batteries (preferably Duracell or equivalent), or from rechargeables which are available, with a charger, from high street shops. At 4.5V the output power is 320milliwatts. A power-in socket is provided on the top panel for a 5.5V stabilised DC supply; this increases the output to 420mW.

CONTROLS

IN ADDITION TO the power connection, sockets are provided for an external speaker and a microphone (or packet radio TNC). All three sockets have rubber protective covers. A chunky on/off and volume control is also mounted on the top panel.

The left hand side has three rubber-covered push buttons: PTT (which is in exactly the right pace), a Function key which changes the way the other buttons work (see below), and L/Monitor, which opens the squelch (there isn't an adjustable squelch control) and allows the controls to be locked.

On the front panel is the usual display, a tiny window approximately 2 x 1.5cm which displays no less than 12 things, including frequency, channel number, battery level, signal strength, power output, repeater shift and CTCSS tone.

Six small buttons make up the rest of the controls. They are each a different size, presumably to make it easier to distinguish between them in the dark - handy for everyone but a real bonus for blind operators. The loudspeaker and microphone are located next to each other and take up almost half of the front panel area.

FACILITIES

UNFORTUNATELY, the only handbook available at the time of doing the review was in Japanese (the penalty for being able to tell you about this rig before anyone else). A few notes were available in English but it is possible that we have missed some facilities due to the poor documentation. Importers Waters & Stanton tell us that they will be producing some proper instructions in English.

The radio will transmit on the whole of the 70cm band from 430 to 440MHz and tunes from 415 to 470MHz on receive. Attempting to transmit out of band produces the word 'OFF' on the display.

Pressing the UP / DOWN buttons alters the frequency in 25kHz steps, or a quick press of the Function key allows tuning in steps of 1MHz or 100kHz.

Pressing UP or DOWN for about one second starts the scanning facility. This scans the whole band, or the memory channels, and stops for about five seconds before moving on. Scanning can be halted by pressing UP or DOWN.

A light can be switched on behind the LCD display, though this should be used sparingly with dry batteries. The same button can be used to start Automatic Power Off (APO) which switches the radio off after there has been no activity for several tens of minutes.

The DOWN button, when used with the Function key, allows adjustment of the CTCSS tone. According to the instructions, pressing either UP or DOWN whilst transmitting sends a 1750Hz tone for repeater operation; but we were

unable to make this work. The same procedure with the UP button allows the frequency steps to be altered: 5, 10, 12.5, 15, 20 and 25kHz steps are available. Currently all UK 70cm amateur stations operate on 25kHz spaced channels, though 12.5kHz spacing may be introduced at some time.

Twenty-one memory channels (0 - 19 and Call) can store frequency, repeater shift and CTCSS tone frequency. It is advisable to set up all of your most-used repeater channels in these memories to avoid having to remember to get the transmit/receive split right every time.

As with many modern radios, CTCSS is fitted as standard - this is used on many repeaters as an alternative to the 1750Hz access tone. The Call Memory is a single channel, accessed by a call button; this is where to store your local repeater or net channel.

GREAT FOR BEGINNERS

COMPARED WITH ITS competitors, the DJ-S41 is small and light. Together with the clever folding antenna, it makes the most portable transceiver so far produced. The memories make operating easy and the CTCSS is a bonus.

The receiver worked well in on-air tests. It proved to be sensitive and produced loud, clear audio from the loudspeaker.

The transmit power is less than most other handhelds, but it is surprising how far 340mW will go, especially if all you need to do is reach the local repeater. Because of the unusual antenna, however, it is impossible to connect the DJ-S41 to an external aerial. This really would have been useful in order to increase the effective radiated power (ERP).

Most of the controls are easy to use and are located close to the appropriate finger. Once instructions are available in English, this should be a very good radio for the beginner. It will also appeal to anyone who wants a truly portable 70cm transceiver, ready for use at any time.

The DJ-S41 is priced at £149 and is available from Waters & Stanton, 22 Main Road, Hockley, Essex SS5 4QS; tel 01702 206835, who are thanked for the loan of the review model.

STOP PRESS

At the time of going to press, Waters & Stanton are in contact with Japan seeking a solution to the 1750Hz tone burst problem.

2's Company

News and Reports from Novice Licensees

WE START with a success story. It is often said that the Novice licence should be seen as a stepping stone to the full Class 'A' or 'B' licence. One young man who has certainly taken full advantage of this is **Matthew Kennedy**, formerly **2E1DRF.** Matthew spent about six months on 70 centimetres packet radio and took advantage of last year's good conditions to work some DX (long distance) by voice. However, by the end of the summer, he realised that his range was limited. Calculations showed that less than half a watt of power was reaching the antenna, due to the loss in the feeder cable. To improve things, more power was needed - in other words, a full licence!

11-year old Matthew Kennedy, M0AAT, who 'upgraded' from his Novice callsign 2E1DRF in April.

Looking at a sample paper, Matthew realised that just on the strength of his Novice experience - practical training and actual operating - he already scored around 40% on the full RAE. Matthew's father is Dave, G3VZE, and he was able to train Matthew further. He sat the exam last December.

Meanwhile, Dave taught Matthew Morse with a series of short sessions, sending characters at 12WPM but with long spaces. With one session a day, all the letters were known in two weeks. Speed was increased to an overall 10WPM and punctuation introduced. A 'barrier' occurred but this was overcome and after a total practice time of only about eight hours, Matthew took - and passed - the 12WPM test.

By this time his RAE result arrived - a pass and a credit - and Matthew applied for his Class 'A' licence immediately. He now has a brand-new 'M' series callsign: **M0AAT.**

Congratulations to Matthew for this success story. By the way, Matthew is still only 11 years old.

SPOTS

NOVICES ARE OFTEN 'spotted' as **DX** stations on the *DX PacketCluster.* This is a packet radio network used by **DXers** (those interested in contacting stations in rare locations or with unusual callsigns) to share information about the activity of DX stations.

For example, **P Knapton, 2E0AJY,** of Huddersfield, West Yorkshire, was 'spotted' on the *DX Cluster* when he was operating on CW (Morse) on 3565kHz on 13 May. **P A Williams, 2E0AJE,** of Wakefield, West Yorkshire, was also spotted, this time on 6 metres. He was taking full advantage of the recent excellent **Sporadic E** conditions on the 6m band.

THE LOG BOOK

IN MAY, AS THIS is being written, radio propagation conditions are improving somewhat. On HF, the 14MHz band (20 metres) had been virtually 'dead' after about 1700UTC during the winter months. This is to be expected during the evening close to **sunspot minimum.** Now, with the lighter evenings, the band is staying open later, often until almost midnight. On the higher frequency bands, the usual summer **Sporadic E 'season'** has now started and will continue until about September. Sporadic E propagation brings strong signals from European stations, particularly on the 28 and 50MHz bands (10 and 6 metres).

P A Williams, 2E0AJE, of Wakefield, West Yorkshire, reported the following stations on 50MHz: **T9**7V in **Bosnia-Hercegovina, YU1**BN in **Yugoslavia (Serbia), 9A**3AT in **Croatia, S5**7AC in **Slovenia** and **EU**1AA in **Belarus.**

QSL card from GB2MMW, which operated from Marsh Mill at Thornton Cleveleys in Lancashire on 12 May.

No fewer than 33 special event stations were on the air on 12 May from **windmills and watermills** around the country. The event was to celebrate the 50th anniversary of the Windmills and Watermills Section of the Society for the Preservation of Ancient Buildings. QSL cards featuring line drawings and the history of each of the mills were sent out to those making contact with the stations, and an example of one of the cards is pictured here. Also, stations making contact with 10 or more mills could apply for a special certificate.

Band by Band

The Amateur Radio Spectrum: The 4 metre Band

FOUR metres, the 70MHz band, is the 'odd man out' amongst the UK amateur bands. Unlike almost all of the other bands, which are allocated on a worldwide basis, 4m is only available for use by amateurs in the United Kingdom, Ireland, Gibraltar, and - by special permit - Cyprus.

In the UK, the band is available to full class A and B licensees (not Novices) on a **Secondary** basis only. The power limit is restricted to 22dBW (equivalent to 160 watts). The band is available on the basis of non-interference to other services, including those outside the UK.

During the summer months, typically May to September, **Sporadic-E propagation** occurs on 4 metres. The most noticeable effect is the reception of Eastern European broadcast stations, which use frequencies between 66 and 74MHz as well as the 88 - 108MHz band. The Polish Radio transmitter at Gdansk on 70.31MHz is a good indicator of Sporadic E conditions. Broadcast stations use **wide-band FM (WBFM)** rather than the **narrow-band FM (NBFM)** used by amateurs, so the signals will sound distorted unless you have a receiver capable of resolving WBFM properly.

Much 4m amateur equipment is converted from 'low-band' VHF PMR (private mobile radio) commercial equipment, although **AKD Ltd** (tel: 01438 351710) makes a 4m NBFM transceiver which sells for less than £200.

4m is close enough in frequency to the VHF / FM Band II broadcast band at 88 - 108MHz for a 4m Yagi to look very similar to a domestic VHF radio aerial, and therefore be unobtrusive on almost any chimney.

Look out for 4m activity during the **RSGB's VHF Field Day** contest on **6 / 7 July.** There is a CW (Morse) session at 1400 - 2200UTC on the Saturday, and an SSB session at 0600 - 1400UTC on the Sunday.

BAND FACTS

Allocation: 70.000 - 70.500MHz (Secondary)

UK Band Plan: 70.000 - 70.030MHz	Beacons
70.030 - 70.250MHz	SSB and CW (Morse) only
70.250 - 72.300MHz	All permitted modes
70.300 - 70.500MHz	Channelised operation (12.5kHz channels)

Activity:

70.000MHz	GB3BUX Buxton Beacon
70.010MHz	GB3REB Chatham Beacon
70.020MHz	GB3ANG Dundee Beacon
70.025MHz	GB3MCB St Austell Beacon
70.114MHz	5B4CY Cyprus Beacon
70.185MHz	Cross-band activity centre
70.200MHz	SSB / CW Calling frequency
70.260MHz	AM / FM Calling frequency
70.300MHz	RTTY / fax
70.3125MHz	Packet radio
70.3250MHz	Packet radio
70.3375MHz	Packet radio
70.4500MHz	FM Calling frequency
70.4875MHz	Packet radio

THE LOG BOOK

Jasmine Marshall, G4KFP, organised the 'national mills day' on behalf of the Denby Dale Amateur Radio Society, and she and her husband Bill, G4IOD, were amongst the operators at **GB2**GW at **Gleaston Water Mill** in **Cumbria.** Jasmine comments that she very much hopes that the event will take place again next year.

British *club* stations will be able to use **special short callsigns** in certain international HF contests from this year. The callsign will consist of G or M, a regional locator (except England), a digit corresponding to the year (6 for 1996) and a single letter. Fifty-two callsigns are available each year: G*6A - Z and M*6A - Z. Look out for these special callsigns in the major international contests, starting with the **IARU Championship** on **13 / 14 July** and the RSGB's own **Islands on the Air (IOTA) Contest** on **27 / 28 July.** Both these contests are 24 hours in duration, from 1200UTC on the Saturday, and both are mixed mode - SSB, CW (Morse) or both. In the ***CQ*WPX CW Contest** on 26/ 27 May, which covered six bands from 1.8 to 28 MHz, propagation conditions were generally considered poor. However, the widespread sporadic E conditions, referred to earlier, provided participants with an unexpectedly high number of 28MHz contacts.

Carsten-Thomas Dauer, DL2OBO, lives in Holzminden, Germany, and was first licensed in 1989 when he was 16 years old. He is a keen DXer and has operated from several countries himself, including Liechtenstein, Russia, Jamaica, Monaco and Lebanon.

Medium Wave Broadcast DXing

by Ian Poole, G3YWX

THE MEDIUM wave band can be an exciting hunting ground for listening to distant stations. Although most people think of the short wave bands as the best for DXing, it is surprising what can be heard on the medium wave band. There are signals from all over the country, and at night time many more from all over Europe can be heard. There is even a chance of hearing the odd signal from the other side of the Atlantic.

EQUIPMENT

ONE OF THE advantages about medium wave DXing is that no special equipment is needed to start. An ordinary transistor radio can be used. Many car radios also perform well.

If more money is available, the portable 'world band' receivers like the one shown in the photograph can be put to very good use. A variety of these sets are manufactured by companies including Sangean, Sony and Panasonic, and offer good performance without having to pay the cost of a full communications receiver.

These sets usually cover the long, medium and short wave bands up to 30MHz as well as having a VHF / FM band. They also give digital tuning and allow the exact channels and frequencies to be located.

Obviously if a communications receiver is available then its superior performance can be of great advantage, especially when the conditions are difficult.

WHEN TO LISTEN

DURING THE DAY it is possible to hear local radio stations running low power at distances up to 100 miles or so. Obviously this depends on the channel being clear of local stations. Higher power stations can be heard over greater distances. Some may even be audible over distances of around 200 miles.

At night, stations from much further afield can be heard. Distances of up to several thousand miles are possible for high-power stations, although low-power local stations may be limited to distances of around 500 miles. However, patience is often rewarded and it may be possible to hear even greater distances.

The medium wave band runs from 531 to 1620kHz in Europe, with stations every 9kHz (note that each channel frequency is divisible by nine). In North America the medium wave band is 530 - 1600kHz, with stations every 10kHz. The best-heard North American stations in the medium wave band are CJYQ in Newfoundland, Canada, on 930kHz and WINS in New York on 1010kHz. Reception of both of these stations tends to be better in the winter than the summer, and is only possible at all late at night. When propagation conditions are very good, they can be picked up on transistor portables or on car radios, but generally a communications receiver will be necessary.

LISTENING

THE MEDIUM WAVE band is organised so that stations are spaced 9kHz apart in Europe, although for anyone fortunate enough to travel to the States they will find the channel spacing there is 10kHz.

Car radios with digital tuning automatically skip one channel at a time, and do not tune in increments of 1kHz. This makes seeking out stations much easier. Even without the set picking the channels, one soon gets to know the frequencies of the channels.

The main problem with medium wave DXing is the sheer number of stations which are transmitting. Each channel may be used several times within

The Sangean ATS-803A 'world band' receiver is typical of those used by many hobbyists to pick up distant stations on long, medium and short waves.

Europe. In fact with the number of independent and BBC local radio stations, some frequencies are used several times within the UK. Each station which uses the channel will be outside the normal range of any other using the frequency and interference should not occur during the day. But all this changes at night when more distant stations can be heard.

To find a long distance station tune carefully over the band. Some stations are easy to find. The Voice of Russia World Service can be heard most evenings on 1494kHz putting in a very strong signal with its one Megawatt transmitter and superb antenna system just outside St Petersburg. It broadcasts some interesting programmes, and is often heard in English in the evening.

Much closer to home is the BBC World Service transmitter broadcasting from Orfordness in Suffolk on 648kHz. Again this uses a very high power transmitter (500kW) and can be heard over most of the South East of England during the day, and further afield at night.

For anyone taking up the hobby more seriously a copy of the *World Radio TV Handbook** is very useful. This is published every year and gives the frequencies of broadcast stations in the long, medium and short wave bands over the whole of the world.

CONCLUSION

AN ENORMOUS variety of stations can be heard. This makes medium wave DXing an interesting addition to the hobby of amateur radio. What's more is that it is usually not necessary to invest in any new equipment.

QSL card from WINS in New York, a broadcast station often heard in the UK on the medium wave.

*** The *World Radio TV Handbook* is available from RSGB Sales, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE at £17.39 (RSGB members) / £20.46 (non-members).**

A Simple 50MHz Beam

by Robert Snary, G4OBE

THE 50MHZ or 6 metre band is one which can offer a lot of interesting contacts (see *D-i-Y Radio* Vol 6: No 3). There are several very good commercial antennas available for this band but it is far more satisfying to operate a station using one that you made yourself.

The antenna configuration, shown in **Fig 1,** is essentially a two-element Yagi with the driven element and reflector bent towards each other to reduce the size.

The antenna is known as the VK2ABQ and it was originally designed for the high frequency bands (14, 21 and 28MHz) because it provided useful gain while occupying less space than the conventional quad or Yagi antennas.

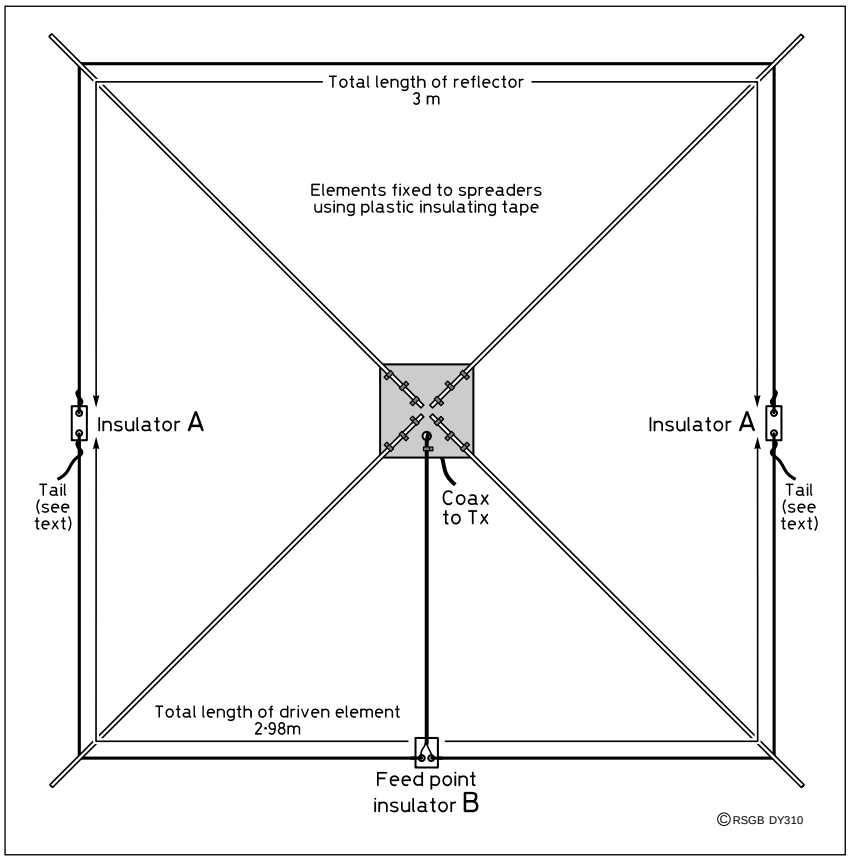

Fig 1: Plan view of the complete 50MHz VK2ABQ antenna.

The advantages of this construction are:

- It is physically small.
- The construction is simple; by using a wooden frame and making the elements of wire the antenna can be built using simple tools. It also allows the antenna to be used for portable operation, such as a scout camp, holiday or special event station.

CONSTRUCTION

THE WOODEN CENTRE piece is used to hold the wooden element supports and is shown in **Fig 2.** The centre piece is also used to fix the antenna to the mast. This can be achieved using a strong shelf bracket, one end fixed to this centre piece and the other to the mast. The element supports (spreaders) can be made from canes or wooden doweling and fixed to the centre piece using cable clips and adhesive.

If the antenna is to be used as a permanent installation the spreaders should be weather-proofed using a proprietary wood weatherproofing. The wire elements are made from plastic covered wire and are fixed to the spreaders using plastic insulating tape.

The element end insulators are made from perspex or plastic as shown in **Fig 3(a**). The antenna is fed with 50 ohm coaxial cable. An additional insulator, see **Fig 3(b**), is used to fix the coaxial cable to the driven element. The coaxial

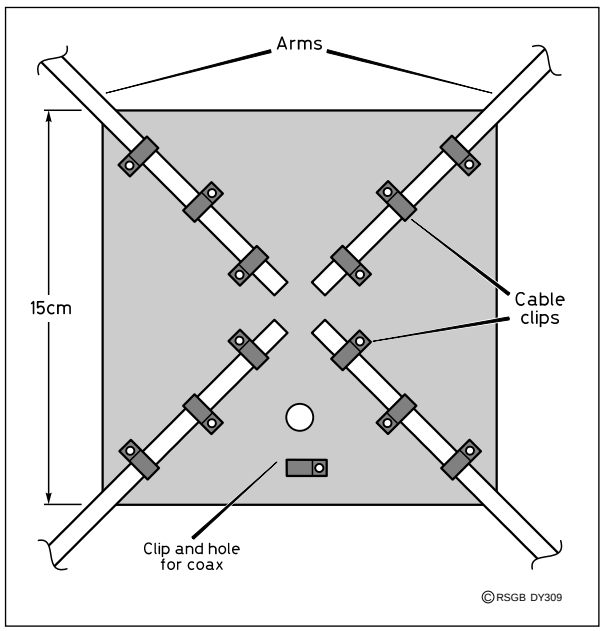

Fig 2: Centre support piece.

cable can be supported at the centre with a cable clip.

An antenna element cut in the centre so that it can be connected to the feeder cable is known as 'balanced'. However, coaxial cable is an unbalanced feeder. Normally, connecting the coaxial cable directly to a balanced antenna does not cause any problems; however, in the unlikely event that you have any interference problems, you could use an RF current choke to reduce the current flowing on the outside of the coaxial cable braid. The cheapest and easiest way to do this is simply to roll up some of the coaxial cable that feeds the antenna until you have 6-8 turns of cable with a diameter of about 20cm, supported by the coaxial cable support clip at the centre of the antenna.

ADJUSTMENT

THE DRIVEN ELEMENT is fixed to the end insulator in such a way as to have two short wire 'tails' about 10cm long, see Fig 1. The antenna matching is done using an SWR meter and the length of these 'tails' are trimmed for minimum SWR in the section of the band where you want to operate. Do not trim the element end with the transmitter on, there can be high RF voltages there, even at low power.

When transmitting to measure the SWR make sure that you do not cause interference to any other stations. Listen on the frequency first and use as little power as possible.

PORTABLE USE

THE ANTENNA CAN be made as a portable version by using the cable clips as described above, but instead of gluing the dowel spreaders as well as fixing them with the cable clips, making them so that they can slide in place. Using a small drill bit, make a hole through the spreader and base plate so that a nut and bolt can be used to fix the spreader firmly into place.

The prototype had an SWR of 1.2: 1 at 50.2MHz. The first tests were done with the antenna 3m above ground level. Strong signals were heard from the GB3NHQ beacon at Potters Bar, Herts (about 6 miles from my location). The GB3BUX beacon at Buxton, and some other weak beacons were also heard.

MATERIALS

Centre Boss	Hardwood 75mm x 75mm x 25mm (6in by 6in by 1in)
4 Spreaders	1.1 metre (3ft 8in) long wooden canes or 6mm dowels
Wire	1.5mm diameter copper wire, about 13 metres
50Ω coaxial cable	RG58 or similar for short runs (up to 10 metres)
6mm cable clips	to fix spreaders to boss
Poly-Urethane Varnish	to waterproof the wooden structure
Self Amalgamating tape	to waterproof all solder joints
Insulators	see text

Both imperial (feet & inches) & metric (mm & cm) sizes have been quoted for the wood as a lot of wood suppliers still work in imperial.

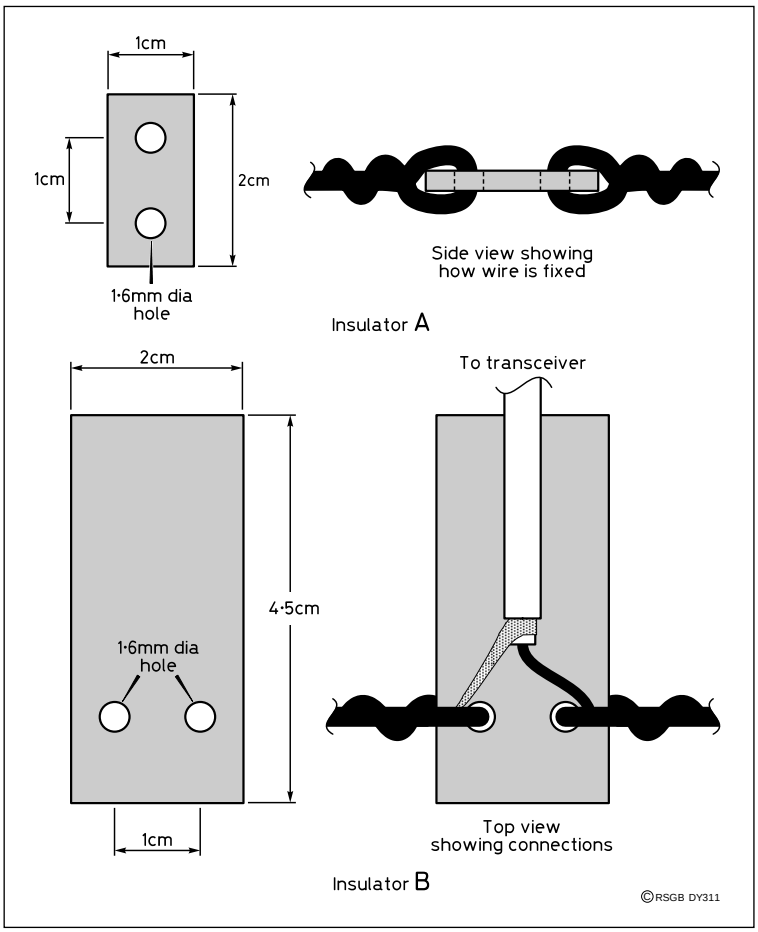

Fig 3: Details of insulators.

Readers' Letters

Keep sending your letters and photographs to:
The Editor, D-i-Y Radio, RSGB, Lambda House, Cranborne Road, Potters Bar, Herts, EN6 3JE, and we will send a pen to the sender of each letter published.

A WARM WELCOME

I AM WRITING to congratulate you on a very interesting magazine. It has helped to introduce me to the exciting world of amateur radio.

I have recently joined my local club, the Reading and District Amateur Radio Club, and took part in the recent RSGB HF National Field Day contest, which was good fun. I have had so much encouragement and help from the club, especially from Tom Cannon, G0VQR, and I am confident that I will pass the RAE in December.

Ben Firth

YOUNG AT HEART

THANK YOU for such a lovely surprise - my first prize in your *D-i-Y Radio* competition for Jan - Feb 1996.

Actually, I shall be 70 years of age on 20 July this year and have had connections with radio since 1926, and by 1936 I was well on the path. I like *D-i-Y Radio* for many reasons, one of which is it keeps me feeling young.

Ray Hounslow, 2E1CQL

D-iar-Y

JUL - AUG

JULY

6 / 7	RSGB VHF Field Day Contest, 1400 - 1400UTC.
7	3rd 144MHz Backpackers Contest, 1100 - 1500UTC.
7	York Radio Rally. Details 01904 426421.
13	Cornish Radio Rally and Computer Fair. Details 01209 821073.
13 / 14	IARU HF Championship, 1200 - 1200UTC, CW / SSB.
14	2nd 50MHz Backpackers Contest, 1100 - 1500UTC.
14	RSGB Low Power Field Day Contest, 0900 - 1200UTC, 1300 - 1600UTC, 80 & 40m CW.
14	Sussex Amateur Radio and Computer Fair. Details 01903 763978.
20	144MHz Low Power Contest, 1400 - 2200UTC.
20	RSGB HQ Car Boot Sale & Saturday Opening. Lambda House, Cranborne Road, Potters Bar, Herts. 10am to 4pm. Details 01707 659015.
21	Colchester Radio and Computer Rally. Details 01376 571239.
21	432MHz Low Power Contest, 0800 - 1400UTC.
21	Humber Bridge Radio & Computer Rally. Details 01482 837042.
21	McMichael Rally, near Slough, Berks. Details 01628 486554.
27 / 28	RSGB Islands on the Air HF Contest, 1200 - 12000UTC, SSB / CW.
28	10GHz Summer Cumulative Contest, 0900 - 2100UTC.

AUGUST

4	**RSGB National Mobile Rally, Woburn Park, Beds. Details 01277 225563.**
11	Derby Mobile Rally. Details 01332 556875.
11	Flight Refuelling ARS Hamfest 96, Wimborne, Dorset. Details 01202 691021.
17	RSGB HQ Car Boot Sale & Saturday Opening, Lambda House, Cranborne Road, Potters Bar, Herts. 10am to 4pm. Details 01707 659015.
18	432MHz Fixed Station Contest. 1700 - 2100UTC.
18	Great Eastern Rally, Kings Lynn, Norfolk. Details 01553 765614.
18	Red Rose Rally. Details 01204 62980.
25	Galashiels & DARS Open Day and Rally. Details 01896 850245.
25	Torbay ARS Rally. Details 01803 214445.
26	Huntingdonshire ARS Annual Bank Holiday Monday Rally. Details 01480 431333.

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