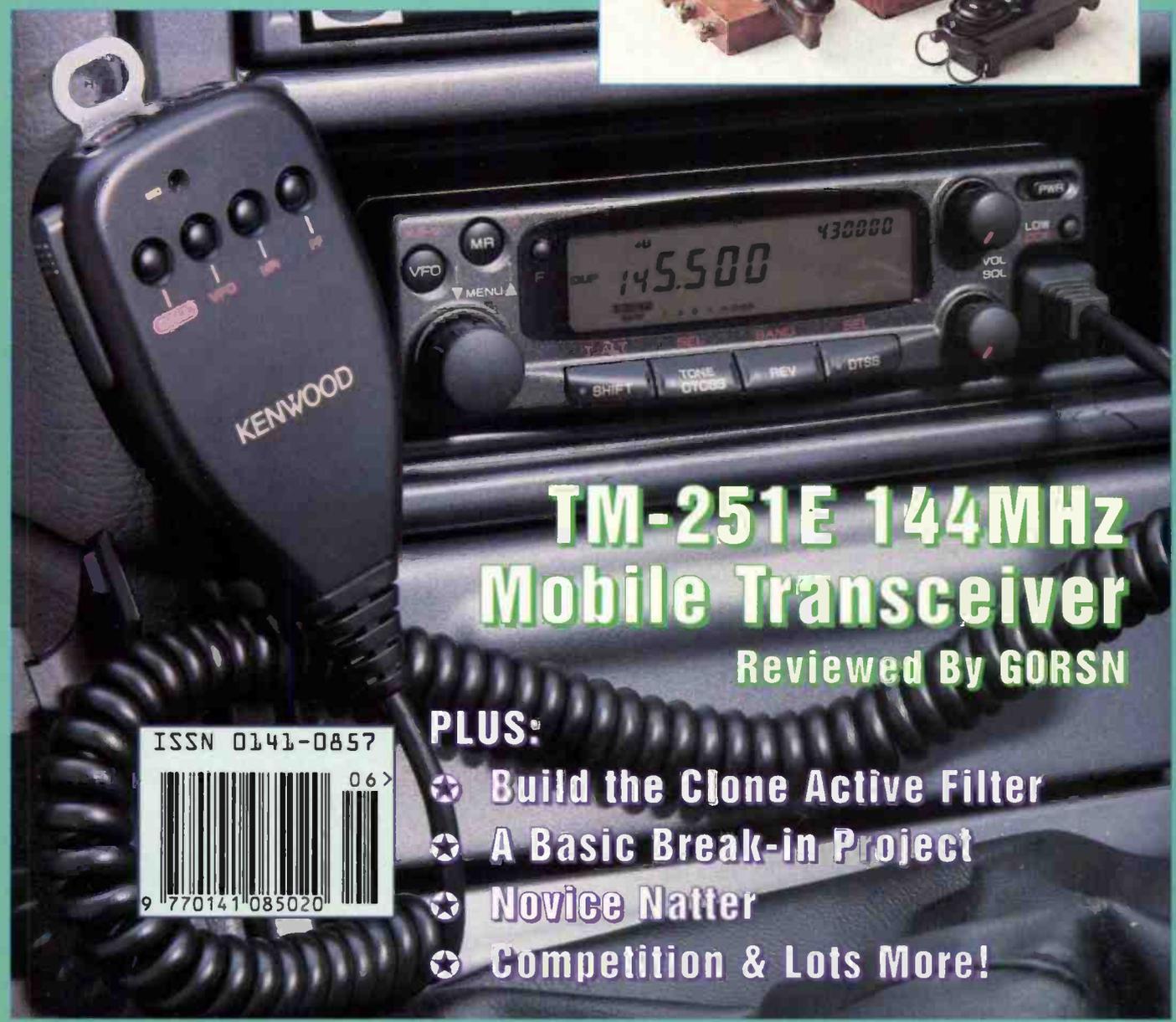


# practical Wireless



## MORSE SPECIAL

Reviewed: The MFJ-411 Pocket Code Tutor and the MFJ-451 Morse Key Board



## TM-251E 144MHz Mobile Transceiver

Reviewed By GORSN

### PLUS:

- ✦ Build the Clone Active Filter
- ✦ A Basic Break-in Project
- ✦ Novice Natter
- ✦ Competition & Lots More!

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# practical Wireless

JUNE 1994 (ON SALE MAY 12)  
VOL. 71 NO. 6  
ISSUE 1047

NEXT ISSUE (JULY)  
ON SALE JUNE 9

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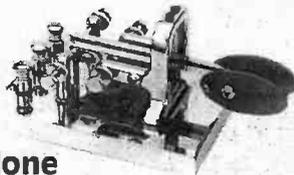
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## DON'T MISS IT!

### FRONT COVER ACKNOWLEDGEMENT

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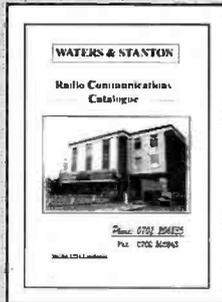
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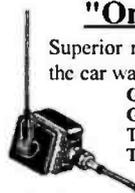
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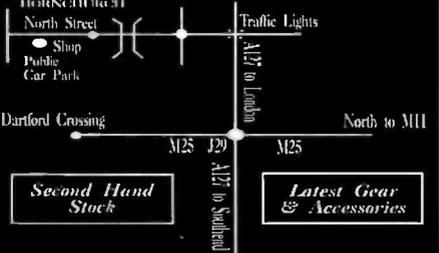
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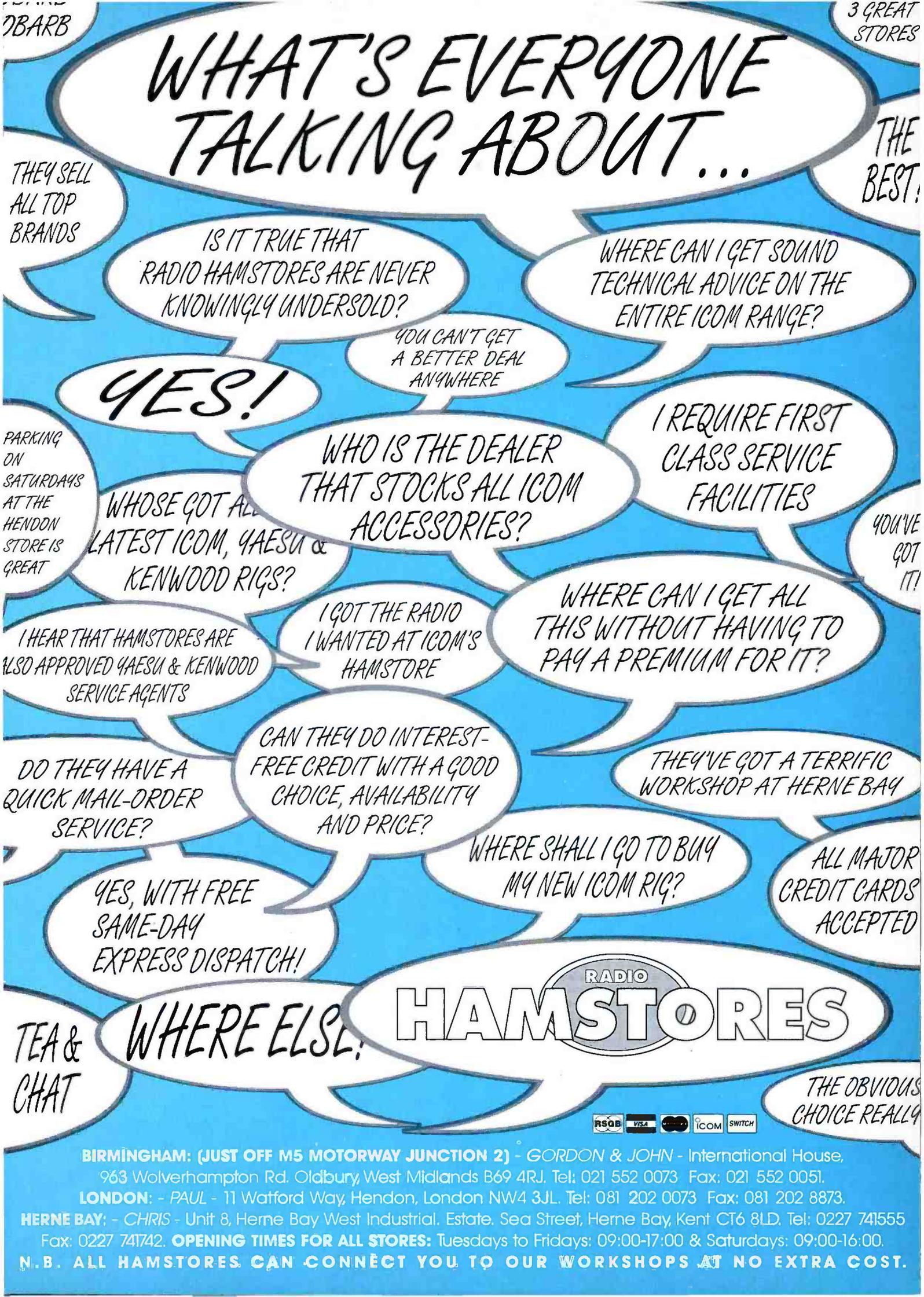


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This antenna coupler matches 1kW transmitters with 4.5 to 10.6 metre whip antennas over the 2 to 30 MHz frequency range (1.6 to 30MHz for 10.6 metre whip antenna): It is suitable for use in shipboard, fixed station and transportable shelter applications.

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# GUEST keylines

## Why Support The RSGB?

When I was offered the opportunity by G3XFD to write the 'Keylines' editorial, I realised that I had a unique means of communicating the views and aspirations of the Radio Society of Great Britain to a different section of the amateur community.

Although the RSGB represents over 50% of the active licensed amateurs and short wave listeners within the UK, we are always anxious to take such an opportunity to reach non-members and groups that have an interest in one of the many facets of amateur radio.

It is especially pleasing to be able to use *PW* as a vehicle for this since the paths of G3XFD and myself have crossed in the past as we were both employed by the Independent Broadcasting Authority at their Winchester Headquarters. I continue to work for the successor to the IBA's engineering division (National Transcommunications Ltd.) whilst Rob has returned to full time journalism.

So why support the RSGB? Primarily for two reasons. The RSGB is accepted within the International Amateur Radio Union as the organisation that represents the views of Radio Amateurs within the UK. And it is the organisation that discusses with our licensing authority, The Radiocommunications Agency, all aspects of the privileges that are granted in the UK.

I: The IARU represents the interests of Radio Amateurs world-wide. The IARU specialists represents us at World Administrative Radio Conferences and major conferences dealing with all aspects of the spectrum. The IARU has ensured that delegates to these conferences are aware of the contribution that the Amateur Service has made to Emergency Communications and generated many specialist papers setting out the technical parameters affecting the allocations that we already enjoy and giving reasoned arguments why these must be retained or expanded.

And who pays to support these VOLUNTEERS? - the National Society

accepted by IARU - the RSGB. The RSGB contributes on behalf of every licensed members to protect our allocation for EVERYONE.

You can also help to protect the bands you use - join the RSGB.

2: The Amateur Service in the UK is fortunate in having an administration which appreciates that the work is carried out by AMATEURS.

The role of the RSGB is to place before that administration the views of as many as possible of the licensed amateurs in the UK. In this area we appreciate the space that has been donated by *PW* for input by non-members of the RSGB.

The RSGB maintains a specialist committee structure, again of volunteers, many of whom give a considerable amount of time to the RSGB. It is from this structure that proposals are formulated and submitted to the RA for the benefit of all. It is also these committees that monitor the whole area of radio development so that the Society members are kept informed of trends.

How can you help to maintain this service? - join the RSGB!

## What Else?

What else does the Society 'DO'? It produces a monthly magazine, *Radio Communications*, produces a wide range of technical books with price concessions to members, offers advice from the specialist committees, runs the QSL bureau, operates GB2RS for general up to date news, promotes the Novice scheme, organises and adjudicates contests across the whole spectrum.

In one phrase: the Society 'Looks after the interest of ALL interested in Amateur Radio'.

I believe therefore, that all UK amateurs (licensed or not) should support the Society. As a member, it is worth making a positive commitment to continue to support the Society, and as a non-member, by joining either under the normal methods or by taking advantage of the three month trial offer available if you use the Direct Debit method of payment. Finally, we welcome commitment - input illustrates interest - and the RSGB goes to a lot of trouble to generate interest.

I hope that if you are not already a member, you will take advantage of the special offer. I look forward to hearing from you.

**Ian Suart GM4AUP**  
President Radio Society of  
Great Britain 1994

## COMPETITION CORNER Wordsearch

U	Y	I	Z	E	M	C	S	U	K	V	N	F	B	H
O	B	L	M	O	N	Q	C	E	F	X	A	F	L	W
Y	I	N	R	T	O	W	O	G	Y	O	Q	C	A	
A	V	S	N	G	L	R	L	H	D	C	T	O	V	L
N	E	I	J	R	U	J	B	C	A	E	U	V	U	L
V	O	N	I	F	S	S	C	L	W	S	T	D	Q	S
P	B	D	O	C	L	I	L	F	A	O	O	P	U	Y
J	J	C	O	V	B	F	D	G	W	E	R	O	D	S
E	Q	L	L	O	U	B	J	V	R	W	U	X	N	R
W	S	K	A	U	W	T	T	Z	O	N	G	O	M	G
S	A	R	E	A	B	N	O	S	I	Y	S	Y	V	Y
F	F	V	A	Z	Z	K	E	T	U	C	F	P	P	M
T	T	R	E	H	P	P	N	K	O	B	S	Y	S	Y
Z	S	I	H	B	S	O	J	Y	B	X	S	X	E	E
A	K	R	H	S	C	I	H	F	N	D	F	Q	U	K

### Wordsearch rules:

Twelve different words have been hidden in the letter grid. They have been printed across (forwards or backwards), up and down, diagonally, but they are always in a straight line without odd letters between. You can use the letters in the grid more than once for different words. Once you have found all 12 words, mark them on the grid and send it, along with your name and address (photocopies accepted with the corner flash) to our editorial address, marked 'Competition Corner' Wordsearch June 1994.

Send your entry (photocopies acceptable with corner flash) to: Competition Corner, Wordsearch Competition, June 1994, PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Editor's decision on the winner is final and no correspondence will be entered into.

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Entries to reach us by Friday 24 June 1994.

### Words To Find

Morse	Clone
Key	Focal
Continuous	Point
Wave	Code
Kenwood	Subs
Tutor	Club

Name .....

Address .....

.....  
.....  
.....

Send your letters to the editorial offices in Broadstone. They must be original, and not duplicated in any other magazine. We reserve the right to edit or shorten any letter. The views expressed in letters are not necessarily those of *Practical Wireless*.

# RECEIVING *you*

The Star Letter will receive a voucher worth £10 to spend on items from our Book or other services offered by *Practical Wireless*. All other letters will receive a £5 voucher.

## Europe For QRP Weekend - Reply

**Dear Sir**

In reply to Mr W. Farrar G3ESP in the April issue of *PW*, I think he is correct in part. I should like him to try and prove his assumption on 144 or 430MHz, on a regular basis. It is not too unusual to have S2 or S3 of noise evident on the above bands. On occasions we, in the Fort

William area, have this unpleasant experience.

Further to the above on VHF National Field Day 1993, my group using 100W to a 17-element Yagi on 144MHz had reports of 'barely audible' through such noise. So, instead of going down in e.r.p. we shall go much higher, indeed had we reduced

power we would have been as well to use the Royal Mail!

Can I suggest he try the *Practical Wireless* VHF Low Power Contest? And then compare his results with the top ten VHF Field Day entrants.

**R. Johnstone GM1YGV  
Inverness-shire**

## 'Criminal' Operators?

**Dear Sir**

Reference *PW* April news story 'Repeater Group Trap Misusers'. So, this is what amateur radio is coming to! Repeater Group's sending invoices to the 'criminal' operators that have the bare faced cheek to exceed the two minutes time out, or worse still, don't contribute towards the 'electric bill'.

I thought amateur radio, to quote ARRL "is a way of making new friends" through your hobby. Can Mr Colin Lansley inform me if GB3SN's address is the registered 'business address', because once invoices are issued to user's of a repeater, it then becomes a money earning concern which I am sure contravenes licence regulations. I would also like to know how many of his repeater group use packet or any other mailboxes, and if so, do they contribute to their upkeep?

Sorry Colin, you have got it wrong. I think it's time to get back to the real spirit of amateur radio. Repeaters have their place in the hobby, but don't expect other radio amateurs to 'finance' your equipment, other than on a voluntary basis and don't try to be the policemen of the air waves or worse still 'REPEATER TRAFFIC WARDENS', lastly, don't 'rip off' your fellow amateurs or you could end up being a 'RADIO LEPER'. I can continue my interest's in amateur radio without using repeaters, but not without replies to my CQ calls, can you Colin?

**R. Frettsome G4WPW, Nottingham**

**Editor's reply: Wow! It seems as if the *PW* 'April Fool' spoof really worked this year! Quite a few readers seemed to fall for our 1994 joke (despite the news story saying it started on April 1st!) and I received quite an 'earbashing' from really upset visitors to the Picketts Lock show who thought that GB3SN's keepers were being high-handed. I thank those who recognised it as an April Fool spoof and called us in the office to 'pull our legs'. I cannot promise we won't try another devilish trick in 1995!**

## Insurance

**Dear Sir**

As a full time insurance intermediary I read with some interest the article by Jim Stroud in the March 1994 *PW*. Having spoken to those of my clients who are radio amateurs, I think that there are two issues here.

The first issue is whether or not motor insurers regard the installation of a transceiver as a modification. Most of the insurers that I have spoken to on this issue seem not to have any problem with this, although I would suggest that any reader taking out motor insurance checks with his broker or the company as to whether or not problems exist. I would suggest that anyone insuring through a Lloyds syndicate be particularly careful about this.

The second relates to cover on the equipment itself, as Jim Stroud suggests; cover under a motor policy is likely to be limited. It is, after all, the intention of motor insurers to cover standard risks at a standard price and cover on amateur radio equipment installed in cars is not standard. It is also quite likely that much of the equipment installed is put in on either a semi-permanent or temporary basis, for example using locking slide mounts. Many amateurs may well use their mobile rig in the house, up a mountain or take it away with them on holiday.

As a result of this, I would like to suggest that readers wishing to insure their equipment, insure it as extensions to their household contents policies. Most insurers will do this, although it is important to explain to them exactly what your intentions are. This has the advantage that the equipment is covered anywhere, the excess will be less and there will be of course be no loss of motor claim bonus, which, as Jim Stroud pointed out, is a very important consideration.

**P F. Rigg G0TVB, Lancashire**

## Direction Finding

**Dear Sir**

Before becoming licensed I found your magazine a great source of information and inspiration. Now that I am licensed I am finding it difficult to pursue my chosen field of interest, namely direction finding.

The only book I have found on d.f. equipment is the *ARRL Handbook*, but none from the RSGB or just separate authors.

I found the *ARRL* books good but found it difficult to copy the circuits as many of the important components

were not available in England, I wasn't sure what the best equivalent was. Through sheer luck I came in contact with an amateur who has built a 144MHz d.f. unit which uses Doppler shift to give an extremely accurate bearing. The said gentle-

man gave me a lot of help in the construction of my own unit. I would like to know if there are any amateurs who share my interest in d.f. or any clubs who cater for this subject.

**G. Kinder G7PUT  
Surrey**

**Editor's reply: We would be like to hear just how many readers would be interested in d.f. operating. We will also pass on any letters to G7PUT.**

## ☆☆ STAR LETTER ☆☆

### No Projects For VHF

Dear Sir

I am writing in support of Bob G1WEX (April issue). The v.h.f. bands are neglected in *PW*, you only have to read it regularly to see the truth of this. No projects for v.h.f. bands from a magazine with 'practical' on its cover, in small print and getting smaller!

It takes no effort and no skill to criticise, but surely one issue a year wouldn't be too much to ask. The magazine is, after all, the same price to G7s and 2EIs as it is to everyone else!

Secondly, your magazine is also read by many people who are not amateurs but might like to be. For the benefit and encouragement of those people could the syllabus and approximate cost of the NRAE be printed, say twice a year. They cannot enquire on air can they?

On the plus side I subscribe to *PW*, so it can't be all bad.

'Antenna Workshop' is my favourite and G3RJV is my hero!

John Cartwright G7OBG

Derby

**Editor's reply:** We will be doing another v.h.f. special issue soon John. 'Antenna Workshop' will also be covering more v.h.f. projects and you'll see more of G3RJV's writing (including some in 'Antenna Workshop'). I hope to make an announcement very soon. Watch this space!

### Restrictions On Subscriptions

Dear Sir

Some few years ago, as a pensioner, it became necessary for me to exercise financial restrictions on subscriptions to newspapers, magazines, etc. Regretfully, *PW* had to be included in the cancellations.

A request to the local library to take out a subscription to *PW* was rejected on the grounds they too were on strict budget control.

Notwithstanding, enquiries were made by them to the many other libraries in Staffordshire, resulting in the Cannock Library transferring their copy of *PW* after use to the Stone Library, especially for my reading pleasure.

I have enjoyed this unique arrangement for three years and as *PW* does not 'date', the arrangement is entirely satisfactory and will explain the somewhat dilatory response to your invitation in the December 1993 issue of *PW* to share experience of Public Library services. Hats off to Staffordshire County Library Service in general and to Stone and Cannock Libraries in particular!

D. Long  
Staffordshire

### Licence Problems

Dear Sir

As the anniversary of my first receiving my 'A' licence was the 14 November and I arranged to pay the fee by direct debit to Post Office Counters I was not expecting to receive a reminder, but I was most certainly surprised to receive on the 29 December a red Final Notice that payment had to be received within 14 days OR ELSE!

Without delay, I sent my cheque for £15 to the RLC as requested. On 14 January my cheque was returned and I was informed that I had to re-apply for a licence. Sending original RAE pass and Morse test certificates.

Following two telephone calls to Subscription Services Ltd., Bristol, I learnt that payment in November had been returned and the computer listed me as not having paid, as my cheque was received after 1 January when the rules had been changed and a 30 day warning rule had been brought in. I was told that I was one of those who 'had been caught out'.

I have received one or two circulars from the RA all undated with unfranked envelopes which I found confusing, so I suppose it is my own silly fault. In the meanwhile I understand that my application has gone to the bottom of the pile of new applications and I am at present incommunicado!

N. Bray GW0MOJ  
Gwynedd

## Getting Through The RAE

Dear Sir

Reference getting through the RAE. I noticed the recent correspondence in *PW* from readers who had problems in passing the RAE.

My studies for the RAE consisted mostly of reading just one book, *Foundations of Wireless* by M. G. Scroggie.

The author's style of writing is extremely clear and lucid and makes electronics and wireless very understandable, (indeed the book itself serves as a classic example of a good textbook, regardless of the subject). I believe that Mr Scroggie edited the book from the time of the Second World War through to the last decade. He died only a few years ago when aged around 90.

I readily recommend this book to anyone struggling to understand electronics and wireless in preparation for the RAE.

I took the RAE twenty years ago, after reading *Foundations of Wireless*. I did not find it too hard going (although the exam itself was in a different form then and the range of topics has since changed).

I am now studying for a BSc. in Computer Science and Management Studies. As a final tribute to this book, several of my fellow students found it of great use when they encountered electronic theory and semiconductors for the first time.

Ian Brothwell G4EAN

Nottingham

**Editor's comment:** Fortunately Ian, copies of *Foundations of Wireless* regularly appear on bookstalls and at car boot sales (I bought two copies last year myself) and they still provide an excellent reference source. Another series of books commonly available secondhand (which I thoroughly recommend) are the 'Common Core' *Basic Electricity*, *Basic Electronics*, *Basic Television*, etc. Although out of print, many libraries still stock the hard back versions. They provide excellent, easy-to-read structured basic teaching courses which in my opinion have never been bettered. I bought three sets of *Basic Electricity* for a school club last year...for an outlay of only £3 a set!

Dear Sir

I would like to add a few lines to your correspondence on the RAE and the tuition available.

In 1960 I started an evening class course in preparation for the RAE. After a few weeks I realised that 95% of the students had electrical backgrounds.

As one who had no knowledge of radio or electricity I was completely out my depth and dropped the whole idea. During the following 30 years, my interest in radio continued, but I only participated as a listener.

In 1992 having retired, I again considered the RAE and enrolled as a student with the Rapid Results College. I thoroughly enjoyed every lesson and my tutor G8PG was first class.

I sat the examination in 1993 and was successful in both papers. I would recommend the RAE to anyone and can honestly say there wasn't one question on the papers that hadn't been covered on the RAE course.

Doug Mayhill  
West Glamorgan

Dear Sir

I'm writing in response to Mr T. M. Pirrie's unfair criticisms in the April *PW* of both the RSGB and the Rapid Results College.

I was not able to attend the RAE classes given by our local club and so I decided to use the Rapid Results College course.

After studying at home and with the excellent tutorial support given then by Gus G8PG, I was able to confidently sit the RAE after six months.

My sole sources of information were from the Rapid Results College and the RSGB's Radio Amateurs' Examination Manual. The excellent content of the information provided by both these sources is obviously regularly updated and more than adequate. After six months of hard slog I was able to sit the RAE and achieved a Credit and Distinction in the papers. I will also add that I have no connection with either the electronics or radio industry and I started my study from the basics.

The RAE is far from being a 'doddle' and one only gets out what one puts in. Frankly, Mr Pirrie's letter smacks of sour grapes.

R. J. Kent G0ROS, Oxon

## Shoestring Morse

Swansea based Shoestring Software have produced a new program entitled *Morse Helper*, designed to run on IBM PCs and compatibles. Anyone owning an IBM PC or compatible computer, with a minimum of 512K RAM will be able to take advantage of this educational program.

*Morse Helper* is available in two versions, one for personal use and one for club use. The club version will support up to 21 users recording the individual settings and recalling them by name.

Shoestring's program is capable of providing Morse speeds from four to 17 words per minute complete with user definable word and letter spacing. The sound is played through the computer's own built-in speaker and the tone can be adjusted to suit the user. It's also possible to send random Morse groups as well as continuous streams of Morse and to read a standard PC text file into ASCII and have it replayed in Morse.

*Morse Helper* comes complete with full instructions and is available direct from **Shoestring Software, 78 Carmarthen Road, Waun Wen, Swansea SA1 1HS**, although dealer networks are currently being sought. The program is currently available for the introductory price of £6.99 for the single user version or £10.99 for the club user version. The introductory prices will be held until June 30 1994 when they will increase to £8.99 and £14.99 respectively.

A free demo of *Morse Helper* is available on receipt of a blank formatted 3.5in disk and an s.a.e.

## Straight Key Evening

The Edgware & District Radio Society are, this year, again holding their Straight Key Evening (SKE) on Friday May 20 1994 on the 3.5MHz band from 1900UTC for as long as possible. It is hoped, as in previous years that, Edgware & DRS will be able to operate their special event callsign GB2SKE for an extended time and possibly make it a Straight Key Afternoon.

The idea behind the Straight Key Evening is not a con-

test but to encourage people to plug in the straight key and indulge in some relaxed and friendly operating. Anyone can join in from the newest and most hesitant operators to the high speed paddle enthusiasts.

Further information can be obtained from **John Bluff G3SJE, SKE Organiser, 52 Winchester Road, Kenton, Harrow, Middlesex HA3 9PE. Tel: 081-204 1034.**

## Prize Draw Winners

Congratulations go to the lucky winner of the *Practical Wireless* Questionnaire Prize Draw, **Edward Hart** from Preston in Lancashire. Mr Hart's completed questionnaire was the first one pulled from the hundreds of entries in the Editor's (low calorie) biscuit barrel!

Phil Jefferies from Nevada Communications kindly presented Edward with his prize of a Yupiter MVT-7100 Scanner, at the recent G-Mex Rally held in Manchester on February 20 1994.

The second and third prize winners, who each win a one year subscription to *Practical Wireless* were **Stan Williams G3LQI** and **S. G. Rose G7PMG**. The *PW* editorial team send a thank you to everyone who took the time and trouble to fill in the *Practical Wireless* Questionnaire.

**Edward Hart** being presented with his Yupiter MVT-7100 Scanner by Phil Jefferies in front of the *PW* & *SWM* stand at the G-Mex Rally.

# NEWS 1994



**Coastal Communications**

The Essex based Amateur Radio dealer Coastal Communications stock an extensive range of equipment for the amateur radio and short-wave enthusiast. This includes the Hustler range of h.f. mobile antennas.

The Hustler range of antennas from yesteryear are fast re-gaining their previous popularity. Hustler h.f. mobile antennas offer a wide variety of components which enable the user to customise their own installation to suit their needs. The antennas also come in a choice of four different support masts, making them easy to install on a variety of vehicles.

Prices for the Hustler antennas, from the main stockist for England and Wales Coastal Communications, start from £15.95. Contact **Coastal Communications at 19 Cambridge Road, Clacton-on-Sea, Essex CO15 3QJ. Tel: (0255) 474292** for details on their full range of equipment.

## Famous Open Day

**Waters & Stanton Electronics** are holding their fourth annual now famous, Open Day on Sunday 22 May 1994, at **22 Main Road, Hockley, Essex**. Doors open at 10am.

The Open Day is your chance to see how a radio dealer operates, and Waters & Stanton say it will be the biggest open day yet. A

vast number of discontinued lines, reconditioned goods and samples, to be sold off on the day, have been accumulated.

Free food and drink will be available as will free parking behind the building and all Hockley car parks are free on Sundays. Alternatively, the showroom is a five minute

walk from Hockley station on the Liverpool Street/Southeast Victoria line.

The advice from Waters & Stanton is get there early to increase your chances of picking up a bargain and enjoying what promises to be a great social occasion.

## Novice Science

**Michael Stott G0NEE** has informed the *PW* Newsdesk that he will be running a Novice course at the Science Museum, Blandford Street, Newcastle, situated close to the bus, main line train and metro stations. Michael's course will run for ten weeks, with two or three weeks off, leading up to the exam in September.

There will be no charge for the course, which commences on Saturday June 11 1994 at 10am for three hours. However, there will be a charge for the course book and for the bits and pieces required for the projects that will be constructed during the course.

Anyone who is interested in enrolling for the Novice course should contact Michael by writing and enclosing an s.a.e. to **'Wellview', 12 Castle View, Ovingham-on-Tyne, Northumberland NE42 6AT**. Alternatively you can call him on **(0661) 832020**.



## Young Radio Amateur Of The Year 1994

The search is on by the Radiocommunications Agency and The Radio Society of Great Britain to find the Young Radio Amateur Of The Year 1994. The award, which was initiated by the Radio Society of Great Britain in 1988 is given for the most outstanding achievement by a young amateur radio enthusiast under the age of 18.

The idea behind the award is to generate interest in amateur radio and to encourage people to become involved for themselves. Entrants do not need to be licence holders but might like to consider the following areas of activity: d.i.y. radio, operation of radio, community service (helping in emergency communications etc.), encouraging others and school projects.

The prize for the most outstanding achievement between August 1 1993 and July 31 1994 will be awarded by the Radiocommunications Agency and presented at the RSGB's HF

Convention in September. The winner will receive a £300 cash prize from the Agency and the runner-up a £50 cash prize. Both will also be invited to visit the Radiocommunication Agency's Radio Monitoring Station at Baldock in Hertfordshire. All those that enter will receive a copy of the RSGB's amateur radio log book.

The award is open to anyone resident in the UK, Channel Islands or the Isle of Man who has not reached his or her 18th birthday by the closing date. Entrants can enter themselves or can be nominated by an adult sponsor and all applications should be received by July 31, 1994.

Applications and nominations should be sent to **Young Amateur of the Year Award 1994, Radio Society of Great Britain, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE. Tel: (0707) 659015.**

**Send in your news, photographs and product information to Donna Vincent at the editorial offices in Broadstone.**

## Welsh RSGB Meeting

The first Radio Society of Great Britain Regional Meeting for many years was held on March 27, at Newtown, Wales. Peter Kirby G0TWW, RSGB General Manager, together with council members GW4YKL, G0MJY, G4EJP and G3JW met members and non-members from all over Wales.

The morning session was taken up by Council and the General Manager. After a break for socialising, the second session was a cross between questions and answers and a debate, covering many topics. By the close both sides were able to say they had gained something from the meeting.

It is hoped that the RSGB will set up more such meetings. (Report supplied by Paul Essery GW3KFE)



**Clive Trotman GW4YKL and Peter Kirby G0TWW at the Welsh meeting.**

(Photo courtesy of the RSGB)

## South Midlands Break-In

*Practical Wireless* has recently received news of a late night break-in at the South Midlands Communications Head Quarters, Chandlers Ford, Eastleigh. The break-in occurred at the end of March and the following items were stolen.

Model No	Type	Serial No.
1 x MVT5000	Scanner	
1 x FT-26	144MHz H/H	1G064794
1 x FT-76	430MHz H/H	11080984
1 x FT-415	144MHz H/H	1L061036
1 x FT-11R	144MHz H/H	3K022304
1 x AR1500	AOR scanner	0015843
1 x 200XLT	Bearcat scanner	
25 x RL102	Rexon 144MHz H/H	033842/033880/033858
		033983/033846 (5 of each stolen)
		3F160336/3F160309/3F160229/
		3F160328/3F160367/3F160307
		(6 of each stolen)
		40900045
		40900453
36 x FT-530	Yaesu dual-band	
		9N181221
		21101622/30800958
		(2 of each stolen)
1 x TH-28E	Kenwood 144MHz H/H	
1 x TH-78E	Kenwood dual-band	
2 x Airhandy	RX KE3000	
2 x Poky Toky		
1 x FT-411	Yaesu 144MHz H/H	
4 x MVT7100	Yupiteru scanner	

Also stolen were a variety of NiCads and chargers.

If anyone can offer any information to help recover any of the stolen goods they are asked to contact **South Midlands Communications Ltd., S.M. House, School Close, Chandlers Ford Industrial Estate, Eastleigh, Hampshire SO5 3BY. Tel: (0703) 255111.**

## Stations For D-Day Anniversary

To commemorate the 50 year anniversary of the D-Day Landings the Radio Club of Thanet will be activating GB50DD. The station will be operational continuously from June 4 - 12th, although there will be some activity outside these dates.

The station GB50DD will be operated from a site close to HMS *Robinson*, a wartime combined operations base at Richborough, Sandwich, Kent. The choice of site is very appropriate as the club has a number of ex-service members.

If you work GB50DD and want a QSL card

they will be available from G3OPL via the bureau or direct. If you enclose an s.a.e. you will also receive a history sheet of the invasion with your card.

**Maurice Stiévenart ON5MS** from Belgium has informed *PW* of the special event station ON4SOE, which has been granted by the Belgian Minister in charge of Post and Telecommunications. This station is being set up to commemorate the work done by the Belgian Special Operations Executive in helping the Allied offi-

cers who parachuted into Belgium during World War Two.

It is hoped to renew contacts with the former SOE members presently living in the UK. The special event station will be active on the following dates: June 5, 6th & 7th, August 26, 27th & 28th and September 3, 4th & 5th 1994 using the 3.5, 7 and 14MHz bands. If you wish to join in please write to

**Maurice Stiévenart ON5MS, Chaussée de Renaix, 163, B-7500 Tournai, Belgium.**

## Birmingham Badger

**Badger Boards** who produce the complete range of *Practical Wireless* & *Short Wave Magazine* printed circuit boards have recently moved. The new address for Badger Boards is 80 Clarence Road, Erdington, Birmingham B23 6AR. Tel: 021-384 2473.

The new Badger Boards shop is situated close to Spaghetti Junction (Junction 6) off the M6. From the 'Island of Spaghetti' off junction six take the first left, into Slade Road and then third right into Hunton Hill and you will find Badger Boards 100 yards up on the right-hand side. Hours of business are 9am - 6pm Monday to Friday and 5.30pm on Saturdays, except for the London, Leicester and Llandudno rallies.

Why not go along and see for yourself the comprehensive range of goods in stock for the Amateur radio enthusiast and Hobbyist?

# NOVICE *natter*

By now a number of you will have received your copies of JVFAX, the popular FAX and SSTV package for the IBM PC. I think a few operational tips may come in handy.

One of the first areas of confusion seems to be selecting the appropriate settings for the demodulator. As most people use one of the simple comparator interfaces, you need to select the Configuration screen and set-up as follows:

Demodulator: 8 bits  
comparator addr 02F8  
IRQ 3

This is the correct set-up for a computer with the interface connected to COM 2. If you are using a different COM port you will need to adjust the addr and IRQ as follows:

COM:	addr	IRQ
1	03F8	4
2	02F8	3
3	03E8	4
4	02E8	3

The next problem which faces listeners is deciding on the correct tuning point. Whilst the JVFAX bargraph display is very good the correct tuning point is not very clear.

The answer is to adjust your receiver so that the signal peak sits just over the right hand end of the display. However, before doing this you must check that the deviation is correctly set for 400Hz on h.f and 150Hz on i.f.

## Out Of Space

Unless you have a very large hard disk you will probably find you start running out of disk space very quickly. This is because

*Elaine Richards G4LFM unravels JVFAX confusion, provides the answers to her technical teaser and has advice on QSLing.*

*Elaine Richards G4LFM, PO Box 1863, Ringwood, Hants BH24 3XD.*

many weather chart files can be around 1.2Mb each.

There are a few ways to overcome the space problem. The most obvious is to practice good file management and to make sure you delete all but the files you really want to keep.

You can also save a lot of space by using the Zoom facility from the Show and Save menu. This enables you to save just selected portions of images (don't forget to delete the original afterwards!).

If you mainly view your received images on the screen you can save some disk space by changing the resolution of the received image. This is done by selecting the mode editor followed by the required mode.

A look at the figure for 120/576 FAX shows that the images are normally received with a line resolution of 1810. This can easily be reduced to around 800 for on-screen viewing.

Another space saver if you want to receive weather charts is to set the greys option to two. This eliminates the grey scale information which has a significant effect on the size of the saved image.

That about finishes this update, but if you have any questions about JVFAX please write and let me know. If you would like a copy of JVFAX, then send a formatted disk, a sticky address label and three first or second class stamps

to the address at the head of the column.

## Technical Teaser Answer

If you take a look at Fig. 1, you will see a reminder of the circuit printed in last month's 'Novice Natter'. The question I posed was

for you to explain why the circuit wouldn't work.

As I hinted last month, the answer lies in the bias voltage that's needed between the base and emitter of a transistor before it will start to conduct. From Fig. 1, you can see that the voltage on the base of the first transistor is set by the potential divider R1 and R2. The current through this divider can be calculated as

$$9/(2700+270) = 0.003A \text{ or } 3mA.$$

From this you can calculate the voltage at the base of the first transistor as

$$270 \times 0.003 = 0.81V.$$

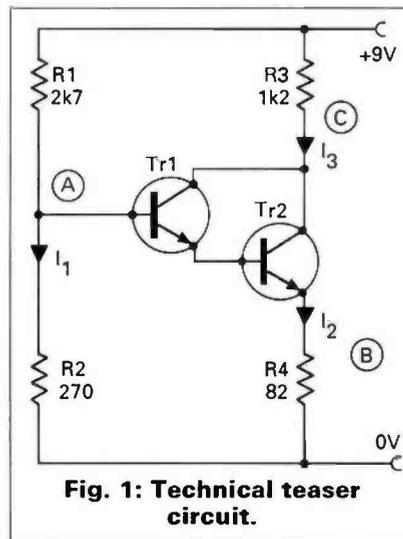
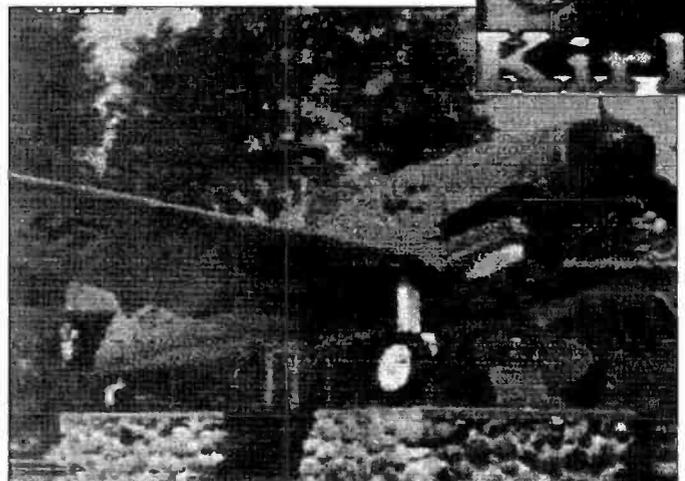


Fig. 1: Technical teaser circuit.



Now the first two transistors are connected together in a special way that's known as a Darlington pair. For our purposes all you need to do is work out the voltage required at the base of the first transistor.

By taking the standard allowance of 0.7V per transistor, you can see that at least 1.4V is needed on the base of the first transistor for the circuit to start to work. As there is only 0.81V available, this is the reason for the circuit failing to work.

## Rallies Advice

**Tony Tuite** has written this month following on from the recent Rallies Advice. He mourns the passing of the days when you could buy a really good receiver for £3 at a rally.

Tony's 54 year old AR88D has been passed onto his wife, Joy, now as she's

seven years now and has grown somewhat over the years.

My apologies to those who support this rally, I didn't mean to ignore it - honest! I'm sure if you keep your eyes on the Radio Diary feature, you'll see the date for this year's show appear before long. If my memory serves me right it's usually held in September or October. Many thanks to Tony for the reminder.

## Novice Bureau

I've also had a letter this month from **Michael Shread GM6TAN**. He operates the RSGB UK

envelope for the number of cards or you'll have to pay the excess when they're delivered!

Of course, if you are a member of the RSGB then you can send your cards via the bureau. Using the bureau can save a great deal of money if you spend a lot of your time operating and QSLing those stations you make contact with.

Your envelope should go to: **Michael Shread GM6TAN, 2a Seatown, Gardenstown, Banff, Banffshire AB45 3YQ.**

Don't forget, if you receive a really good QSL card, send it in and we'll show everyone else how well you've done. All cards

regarding a value for money QSL service.

## Reference Book

Still in my QSL theme, I've got a reference book in my collection that I thought others might find useful. I think *K3CHP's DX QSL Guide* is a very unusual book, especially if you've just finished a 'rubber stamp' QSO with say a Danish amateur.

How can you make your QSL card stand out? How about writing your report in Danish. This is all very well assuming you are multi-lingual (and I'm not - just a bit of O level French more years ago than I care to remember!). This is where the QSL guide comes into play.

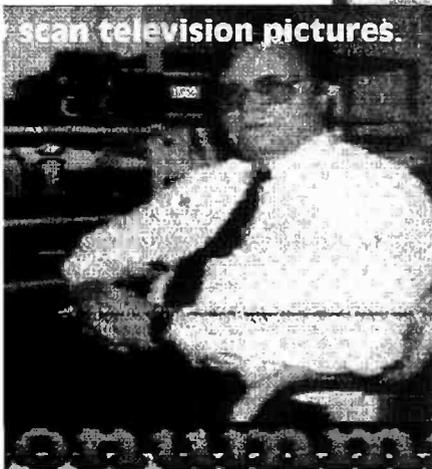
The guide contains 12 standard phrases, such as 'Thank you very much for the QSO', 'my age is ..... years', 'I hope to meet you again soon', 'I would be very grateful for your QSL card', etc., in 54 different languages! These range from Africans, through Cambodian, Hindi, Malagache and Sinhala to Zulu.

The *K3CHP's DX QSL Guide* costs \$12 postpaid surface mail to the UK. If you're interested, send to: **Joseph Mikuckis K3CHP, 6913 Furman Parkway, Riverdale, MD 20737-3016, USA.**

Now, if you can tell me in which language **Terima Kaseh untok QSO** says, **Thank you for your QSL**, you'll go into the biscuit tin for the prize draw this month. The first two out of the biscuit tin will win an amateur radio world clock kindly donated by **Eastern Communications, Cavendish House, Happingburgh, Norfolk.**

Space has caught up with me again, so cheerio for now and I'll give you the answer to the language question next month.

*Elaine G4LFM*



Novice QSL Bureau and points out that you don't need to be a member of the RSGB to **collect** cards from the bureau.

Michael is currently holding a large number of unclaimed cards for Novice licensees, but is sure that they would be welcome. He hasn't had to destroy any cards yet, but he's only got so much space to store them.

So, if you're a Novice licensee and you think you might have some cards awaiting collection, send a suitably-sized pre-paid envelope with your call-sign, name and address on the front. You should also state how many cards you want put in the envelope before it is posted to you. Don't forget to put the right value in stamps on the

are carefully looked after and returned in one piece.

Another letter I've received this month about QSL cards is from **Margaret Christmas**. She has recently had a batch of QSL cards printed from Adur Press.

Margaret found Adur Press advertising in a CB magazine and has been very pleased with the helpful and swift way her order was handled.

To see the kind of work Adur Press can do, send an s.a.e. to: **Adur Village Press, 'Alamosa', The Paddocks, Upper Beeding, Steyning, West Sussex BN44 3JW.** And before you think there's a connection between Margaret and Adur, don't worry, she just thought she'd pass on the informa-

# CLUB news

## Avon

**City Of Bristol Group.** Last Tuesdays, 7pm. New Friends Hall, Purdown, Bell Hill, Stapleton, Bristol BS16 1BG. May 31 - Half Yearly Meeting. **Dave Bailey G4NKT** on (0272) 672124.

**North Bristol ARC.** Fridays, 7pm. Self Help Enterprise, 7 Braemar Crescent, Northville, Bristol. RAE & Morse tuition available for members. May 13 - A Display Of Radios For All, 20th - Open Forum, 27th - How To Use A Dip Oscillator, June 3 - Committee Meeting, 10th - The Latest In Kits. **Tony G4ROX** on (0272) 513573.

**Shirehampton ARC.** Fridays, May 13 - HF NFD Planning, 20th - Use Of E150! Software For NFD, 27th - Final HF NFD Preparations, June 4/5 - HF NFD 50MHz Contest. **Ron Ford** on (0272) 770504.

**South Bristol ARC.** Wednesdays. Whitchurch Folkhouse Association, Bridge Farm House, East Dundry Road, Whitchurch, Avon BS14 0LN. May 18 - Simple Computer Programming by G4RZY, 25th - Working Lundy Island Station by G7PKJ, June 1 - 80 Metres Activity Evening, 8th - Bulls Eye Darts Evening. (0275) 834282.

## Bedfordshire

**Shefford & DARS.** Thursdays, 8pm. Church Hall, Amphil Road, Shefford, Bedfordshire. May 26 - Mobile DF Hunt, June 2 - Mainline Electronics Talk by Zee Whysall, Retail Sales Manager. **Paul G1GSK** on (0462) 700618.

## Berkshire

**Maidenhead & DARC.** The Red Cross Hall, The Crescent, Maidenhead, 7.45pm. May 17 - Preparations For HF & VHF Field Days, June 4th/5th HF Field Day at Cliveden. **Neil G8XYN** on (0628) 25952.

**Newbury & DARS.** 4th Wednesdays, 7.30pm. Bucklebury Memorial Hall, May 25 - HF Radio Contesting by G3SJJ. **Norman** on (0635) 863310.

## Cheshire

**Stockport RS.** 2nd & 4th Wednesdays, 7.45pm. Room 14, Dialstone Centre, Lisburne Lane, Offerton, Stockport, Cheshire. May 13 - How To Apply Applications by G0NKM, 20th - Easy Home-Brew by G3URW, 25th - HMS Bronnington by G3XGE, June 10 - A Beginners View of TCP/IP by G0UDC. **Jim France G3KAF** on 061-439 4952.

## Clwyd

**Wrexham ARS.** Maesgwyn Community Centre, Maesgwyn Road, Wrexham. May 17 - HF Activity Night, June 7 - Junk Sale. **Ian Wright GW1MVL** on (0978) 845858.

## Derbyshire

**Buxton Radio Amateurs.** Lee Wood Hotel, Buxton, 8pm. May 24 - New Members Night. **Derek Carson G4IHO** on (0298) 25506.

**Derby & DARS.** Wednesdays, 7.30pm. 119 Green Lane, Derby. May 11 - AOR Illustrated Talk by Richard Hillier G4NAD, 18th - The CAIRO System by Peter Best G8CQH, June 1 - Surplus Sale. **Hayley Winfield G7PXA** on (0773) 856904.

## Devon

**Appledore & DARC (Devon).** 3rd Mondays, 7.30pm. Appledore Football Clubroom. May 16 - Radio Operating by G0DLC, G0FCL & G0KKG. **Reg Lyddon G4ETJ, QTHR** on (0237) 477301.

**Plymouth RC.** Tuesdays, 6.30pm RAE class, 7.30pm Morse class, 8pm club activities. (As from June for the summer,

meetings will be fortnightly). The Basement, The Royal Fleet Club, Devonport. May 17 - Business Meeting/Natter Night, 22nd - Proposed Coach Trip To Goonhilly Downs, 24th - Rally Job Selection Night, 29th - PRC Rally, 31st - Field Day Briefing, June 5 - Field Day, 7th - Natter Night. **F. P. Russell G7LUL, 63 Fleet Street, Keyham, Plymouth PL2 2BU** on (0752) 563222.

**Torbay ARS.** Fridays, 7.30pm. ECC Social Club, Highweek, Newton Abbot. May 20 - Second Hand Sale. **W. Hipwell G3HTX** on (0803) 526762.

## Dorset

**Dorset Police ARS.** The Dorset Police ARS will now be holding regular monthly meetings, at Force HQ on the first and third Thursdays of every month, at 7.30pm. Membership is open to Police Officers, serving and retired, civilian employees, Special Constables and their immediate family. The club welcomes contact from other local clubs. June 19 - Visit To The Club By The Staff of *Practical Wireless*, June 2 - Direction Finding by Ted Bain & Clive Hardy. Further info from **PC915 Richard Newton at Ferndown Police Station** on (0202) 229351 or (0202) 229342.

## Dfnyed

**Aberystwyth & DARS.** 2nd Thursdays, 8pm. Scout Hut, Plascrug Avenue, Aberystwyth. May 12 - DF Hunt by Ray GW3LNM, 26th - GWOARA On The Air. **Kathy GW0SFD** on (0545) 580675.

## Essex

**Braintree & DARS.** 1st & 3rd Mondays, 8pm. The Clubhouse, Braintree Hockey Club, Church Street, Bocking. May 16 - AGM, 23rd - Club Net, June 6 - Discussion On Carnival Entry. **J. F. Button G1WQD c/o G4JXG, 88 Coldnailhurst Avenue, Braintree, Essex CM7 5PY** or **Publicity Secretary** on (0376) 327431.

**Colchester RA.** Colchester Institute, Sheepen Road, Colchester. May 19 - Electronics And The Bomber Offensive by J Stanley Wood, June 6 - Construction Competition. **Trevor Bradbeer G0URJ** on (0206) 764034.

## Fife

**Dunfermline & DARC.** Thursdays, 7.30pm. Former RAF Station, Outh Muir located by the A823 Dunfermline to Crief Road. May 12 - HF Operating Evening, 19th - Contest Logging by Computer by Wallace GMOGNT, 26th - Junk Sale. **Wallace Shackleton GMOGNT, QTHR.**

## Grampian Region

**Aberdeen ARS.** Fridays, 8pm. Queen Mother House, Aberdeen. May 13 - Unlucky For Some, 20th - Building The Yearling Part 3, 27th - Mock FCC Exam, June 3 - NFD Briefing, 10th - Junk Sale. **Gordon Stuart GM7PXW** on (0224) 780591.

## Greater London

**Cray Valley RS.** 1st & 3rd Thursdays, 8pm. Progress Hall, Admiral Seymour Road, Eltham SE9. May 19 - *Radio Communication* by The Editor Mike Dennison G3XDV, June 2 - Surplus Sale.

**Bob Treacher** on 081-850 1386.

**Crystal Palace & DRC.** 3rd Saturdays, 7.30pm. All Saints Parish Rooms, Beulah Hill, London SE19 (opposite junction with Grange Road). May 21 - Fibre Optics by A. Ogden G6JZN. **Wilf Taylor G3DSC** on 081-699 5732 or **Bob Burns G30DU** on (0737) 552170.

**Edgware & DRS.** Watling Community Centre, 145 Orange Hill Road, Burnt Oak, 8pm. May 12 - F. J. Camm - The Man And His 'Comic' by Steve Slater G0PQB, 26th - Constructors Cup/NFD Briefing. **Rod Bishop G0SQL** on 081-204 1868.

## Greater Manchester

**Rochdale & DARS.** Mondays, 8pm. The Cemetery Hotel, 470 Bury Road, Rochdale, Lancs. May 16 - PMR Gear by G0GNR. **Brian** on 061-653 8316 or **John** on (0706) 376204.

## Gwent

**Newport ARS.** Mondays, 7pm. Brynglas House, Brynglas Road, Newport. June 4 - Talk by John Case GW4HWR. **Pat Pearl GW7MVQ** on (0633) 250017.

## Gwynedd

**Dragon ARC.** 1st & 3rd Mondays, 7.30pm. Four Crosses Hotel, Menai Bridge. June 6 - The Art Of QRP by George Dobbs. **Tony Rees GW0FMQ** on (0248) 600963.

**Porthmadog & DARS.** 3rd Thursdays, 8pm. Harbour Cafe, Ffestiniog Railway, Porthmadog. May 19 - History Of Radio by Pat GW3KJW. **Pat Vermalls (0766) 770546.**

## Hampshire

**Andover RAC.** 1st & 3rd Tuesdays, 7pm. Wildern Village Hall. June 7 - Natter Night. **G8ALR (0264) 773547.**

**Basingstoke ARC.** 1st Mondays, 7.30pm. Forest Ring Community Centre, Sycamore Way, Winklebury, Basingstoke. May 22 - 144MHz Direction Finding Competition: OS174 - Fox Eddie G4SQZ, June 4/5 - 144MHz Direction Finding Weekend, New Forest, 6th - Planning For VHF Field Day/ Visit From Local RSGB Liaison Officer. (0256) 25517.

**Farnborough & DRS.** 2nd & 4th Wednesdays, 8pm. Farnborough Community Centre, Meudon Avenue, Farnborough, Hants. May 25 - HF Field Day Preview & Mini Lecture. **GBATK** on (0252) 715765.

**Horndean & DARC.** 1st Thursdays, 7.30pm. Horndean Community School, Barton Cross (off Catherington Lane), Horndean, Hants. June 2 - *Radio Bygones* by Geoff Arnold G3GSR. **Stuart Swain G0FYX** on (0705) 472846.

**Itchen Valley RC.** 2nd & 4th Fridays, 7.30pm. Scout Hut, Brickfield Lane, Chandlers Ford. May 27 - How Antennas And Feeders Work by Nigel Gerdes G7CAW, June 10 - Amateur Radio Astronomy by John Smith. **Les Kennard G3ABA** on (0703) 732997.

**The Three Counties ARC.** Every other Wednesday, 8pm. Railway Hotel, Liphook,

Hampshire. May 25 - The History Of Electronic Warfare by Harry Spiller Ex Chief Engineer Of Racal Electronics. **Tom Milne** on (0428) 606298.

## Hereford & Worcester

**Bromsgrove ARS.** 2nd & 4th Tuesdays, 8pm. Lickey End Social Club, Alcester Road, Burcot, Bromsgrove. May 24 - Night On The Air. **Mr B. Taylor G0TPG** on (0527) 542266.

## Hertfordshire

**Dacorum AR & TS.** 1st (informal) & 3rd (formal) Tuesdays, 8pm. The Heath Park, Cotterells, Hemel Hempstead. May 17 - BBQ & Radio Junk Sale. **Nicholas Camp G7KFL, 48 Northfield Road, Harpenden, Herts AL5 5HZ.**

**Hoddesdon RC.** Alternate Thursdays, 8pm. Conservative Club, Rye Road, Hoddesdon, Herts. May 12 - Junk Sale/Natter Night, 26th - Photography Is My Profession by Rod, Grafton ARC, June 9 - First Visit To Stanstead Air Traffic Control Centre. **John G7OCI** on (0920) 466639.

**Stevenage & DARS.** Tuesdays, 7.30pm. Stevenage Day Centre, Chells Way, Stevenage. May 17 - How To Make The Best Out Of A Difficult Job by Ralph G7HFD, 24th - Arrangements For VHF Field Day, 31st - Video Evening by Ralph G7HFD. **Neil Ravilious 2E1ASZ** on (0438) 350882.

## Humberside

**Goole R & ES.** Fridays, 7.30pm. West Park Pavilion, West Park, Goole, last Fridays at the 'Old George Inn', Market Place, Goole. May 13 - Contests, 20th - DF Practice, 27th - Social Evening, June 3 - On Air, 5th - DF Event. **Steve Price G8VHL** on (0405) 769130.

## Isle Of Wight

**Isle of Wight RS.** Unity Hall, Mill Square, Wootton, Isle of Wight PO33 4HS. May 21/22 - Kite Festival Puckpoole Special Event. (0983) 872620.

## Kent

**Dover RC.** Wednesdays. Duke Of York's School, Guston, Nr. Dover. May 18 - Natter & Operating Night, 25th - Locators, June 1 - Novice Evening, 8th - RF Q&A Session. **Mike Bowers G7NOR** on (0304) 825030.

**Medway AR & TS.** Fridays. Tunbury Hall, Catkin Close, Tunbury Avenue, Walderslade, Chatham, Kent. Visitors & new members welcome. May 20 - An Introductory Chat On Air Traffic Control by Dave Lawrence G6HXR, June 10 - RAYNET Video by Alan Stanley G10MH. **Mrs Gloria Ackerley G3VUN, 40 Linwood Avenue, Strood, Rochester, Kent ME2 3TR.** Tel: (0634) 710023.

**Sevenoaks & DARS.** May 16 - Electronic Repairs by John Turnbull G1TYJ. **The Secretary, c/o Sevenoaks District Council, Council Offices, Argyle Road, Sevenoaks, Kent TN13 1HG.**

## Lancashire

**Fylde ARS.** 2nd & 4th Tuesdays, 7.45pm. Blackpool South Shore Lawn Tennis Club, Midgeland Road, South Shore, Blackpool. May 24th - NFD Preparations. **Eric Fielding G4IHF** on (0253) 726685.

## Lincolnshire

**Grantham RC.** 1st & 3rd Tuesdays, 8pm. Kontak Sports & Social Club, Barrowby Road, Grantham. May 17 - Prison Service Dog Display, June 7 - Discussion Night. **John Kirtan G8WWJ** on (0476) 65743.

**Lincoln Short Wave Club.** Wednesdays,

Please send in all of your 'Club News' items to Donna Vincent at the editorial offices in Broadstone.

7.30pm. City Engineers Club, Central Depot, Waterside South, Lincoln. May 18 - Japanese Morse by Norman Kendrick G3CSG. Pam G4STO on (0427) 788356.

**Spalding & DARS.** Fridays, 7.30pm. Old Fire Station, Albion Street, Spalding. May 30 - Life Of An Auctioneer by A. Porter. G400, QTHR on (0775) 750382.

### Merseyside

**Liverpool & DARS.** Tuesdays, 8pm. Churchill Club, Church Road, Wavertree, Liverpool. May 17 - Quiz, 24th - OF Hunt, 31st - Surplus Sale, June 7 - Special Event Preparations. Ian Mant G4WWX on 051-722 1178.

**Sefton ARC.** 1st & 3rd Tuesdays, Liverpool Prison Officers Social Club, Walton. Phil Taylor G4KIN on 051-531 0991.

### Norfolk

**Dereham ARC.** 2nd Thursdays, 8pm. St. Johns Ambulance Hall, Yaxham Road, Dereham. May 12 - Trip To Eastern Communications, June 9 - Informal. Mark Taylor G0LJG on (0362) 691099.

**Fakenham ARC.** 1st Tuesdays, 7.30pm. Trinity Church Room, Hempton. June 7 - AGM. Dave G4DCJ on (0485) 528633.

**Norfolk ARC.** Wednesdays, 7.30pm. University Arms, South Park Avenue, Norwich. May 18 - Night On The Air/Construction/Morse Practice, 25th - Final HF NFD Briefing. Dale Simkin on (0603) 37393.

### Northants

**Kettering & DARS.** Tuesdays, 7.30pm. Electricity Sports & Social Club, Eskdale Street, Kettering. May 17 - A Talk By Radio Investigation Service, 28th/29th - Castles On The Air G88RC. Chris Bourne G4RPG at Eskdale Street address.

### Nottinghamshire

**Nottingham ARC.** Thursdays, 7.30pm. Sherwood Community Centre, Mansfield Road, Nottingham. May 12 - The Secret War by Henry G4MHB, 19th - Fox Hunt No. 2, 26th - Construction/Activity Night, June 2 - Forum/Night On The Air, 9th -

Visit To Nottinghamshire Ambulance HQ. Simon G0IEG on (0602) 501733.

### Shropshire

**Salop ARS.** Thursdays, 8pm. Dak Hotel, Shrewsbury. May 12 - Junk Sale, 19th - Foxhunt Chase 2, 26th - Discussion By RSGB Representative Dave Gourley G0MJY, June 2 - Natter Night.. Sheila Blumfield G0SST on (0743) 361935.

### Somerset

**Yeovil ARC.** Thursdays. Red Cross HQ, Grove Avenue, Yeovil, Somerset. May 12 - Post Mortem on QRP Convention/Enrolment For RAE Classes, 19th - Negative Resistance Oscillators by G3MYM, 26th - Club Station On Air, June 2 - RSGB Videos, 9th - A QRP Booster by G3PCJ. Cedric White G4JBL on (0258) 473845.

### Staffordshire

**Bloxwich RS.** 2nd & 4th Mondays, 7.30pm. All meetings are non-smoking. May 23 - Contest Preparation. Rob Briggs G0TDF on (0902) 722830.

### Strathclyde

**Paisley ARC.** Alternate Wednesdays, 7.30pm. 5 New Street, Paisley. RAE/Morse classes on Tuesdays. May 25 - AGM. Stuart GMOUKD on (0505) 335195.

### Suffolk

**Ipswich RC.** May 18 - ESWR Rally Planning Meeting, 25th - CW Evening. Mrs S. Elden G8HYE, 124 Larchcroft Road, Ipswich IP1 6PQ.

**Sudbury & DRA.** 1st Tuesdays, 8pm. Wells Hall Old School, Great Conrad, Sudbury, Suffolk. 3rd Tuesdays, 8pm. Five Bells Public House, Bures Road, Great Conrad, Sudbury. May 15 - Special Event Station, 17th - Natter & Noggin, June 7 - Using Integrated Circuits by Tony G8LTY. Tony Harman G8LTY on (0787) 313212 or G8LTY @ GB7NNA.

### Surrey

**Dorking & DRS.** The Friends Meeting House, South Street, Dorking, 7.45pm.

May 24 - Workshop Practices by John Greenwell G3AEZ. John Greenwell G3AEZ on (0306) 631236.

**Surrey RCC.** 'Terra Nova' The Waldrons, Waddon, Croyden, Surrey. May 23 - Natter Night, June 6 - Early Days Of Baird TV by Ray Herbert G2KU. Berni G8TB on 081-660 7517.

**Sutton & Cheam RS.** 3rd Thursdays, 7.30pm. Sutton United Football Club, The Borough Sports Ground, Gander Green Lane, Sutton, Surrey. Natter Nights - 1st Thursdays. May 19 - AGM, June 2 - Natter Night. John Puttock G0BWW, 53 Alexandra Avenue, Sutton SM1 2PA.

**The Kingstons & DARS.** 3rd Wednesdays, 8pm. Alfriston, 3 Berrylands Road, Surrey KT5 8RB. May 18 - Siberian Adventures by Paul Hughes G0BXC. Ray Fuller on 081-398 1128.

**Wimbledon & DARS.** 2nd & last Fridays, 7.30pm. St. Andrews Church Hall, Herbert Road, Wimbledon SW19. May 27 - Surplus Equipment Sale. George Cripps G3DWW on 081-540 2120.

### Tayside

**Dundee ARC.** Tuesdays, 7pm. College of Further Education, Graham Street, Dundee. May 17 - Club Awards Evening, 24th - Construction Night. George Millar G4MFSB, 30 Albert Crescent, Newport-on-Tay, Fife DD6 8DT.

### Warwickshire

**Coventry ARS.** Fridays, 8pm. Baden Powell House, 121 St. Nicholas Street, Radford, Coventry. May 13 - Night On The Air, 20th - Portable Night On The Air, 27th - Night On The Air/Morse Code Tuition. David G1ORG on (0203) 311468.

**Stratford-Upon-Avon & DRS.** 2nd & 4th Mondays, 7.30pm. Home Guard Club, Main Road, Tiddington, Stratford-Upon-Avon, Warwickshire. May 23 - 144MHz Of Hunt. Alan Beasley G0CXJ on (0608) 82495.

### West Sussex

**Worthing & DARC.** Wednesdays 7.30pm. Parish Hall, South Street, Lancing, Worthing, West Sussex. May 15 - Special Event Station, 25th - Discussion Evening, June 5 - Special Event Station. G4GPX on (0903) 753893.

### West Yorkshire

**Halifax & DARS.** 1st & 3rd Tuesdays, 7.30pm. May 17 - Valves by Jim G4MH. David Moss G0DLM on (0422) 202306.

**Keighley ARS.** The Ingrow Cricket Club, Ingrow, Keighley, 8pm. May 12 - Visit by RSGB RLO G0RZP, 26th - Fox Hunt, June 2 - Natter Night, 9th - Natter Night. Kathy Conlon G0RLO on (0274) 496222.

**Spenn Valley ARS.** Thursdays, 8pm. Old Bank Working Men's Club, Mirfield. Alternate Thursdays - 'Noggin & Natter Nights'. May 19 - Home-Brew 23cms f.m. Mobile Rig by Mike G8HUA. Tony Galvin G0IKD on (0532) 534437.

### Wiltshire

**Salisbury R & ES.** Tuesdays, 7.30pm. 3rd Salisbury Sea Scout Hut, St Marks Avenue, Salisbury. May 17 - HF Operating Evening, 24th - Construction & Advice Clinic, 31st - RAIBC by Dick G0MZI, 7th - Open Forum. David Kennedy G7GWF on (0722) 330971.

**Trowbridge & DARC.** 1st & 3rd Wednesdays, 8pm. Southwick Village Hall, 8pm. May 18 - Natter Night, June 1 - 144MHz Foxhunt. I. L. Carter G0GRI on (0225) 864698.

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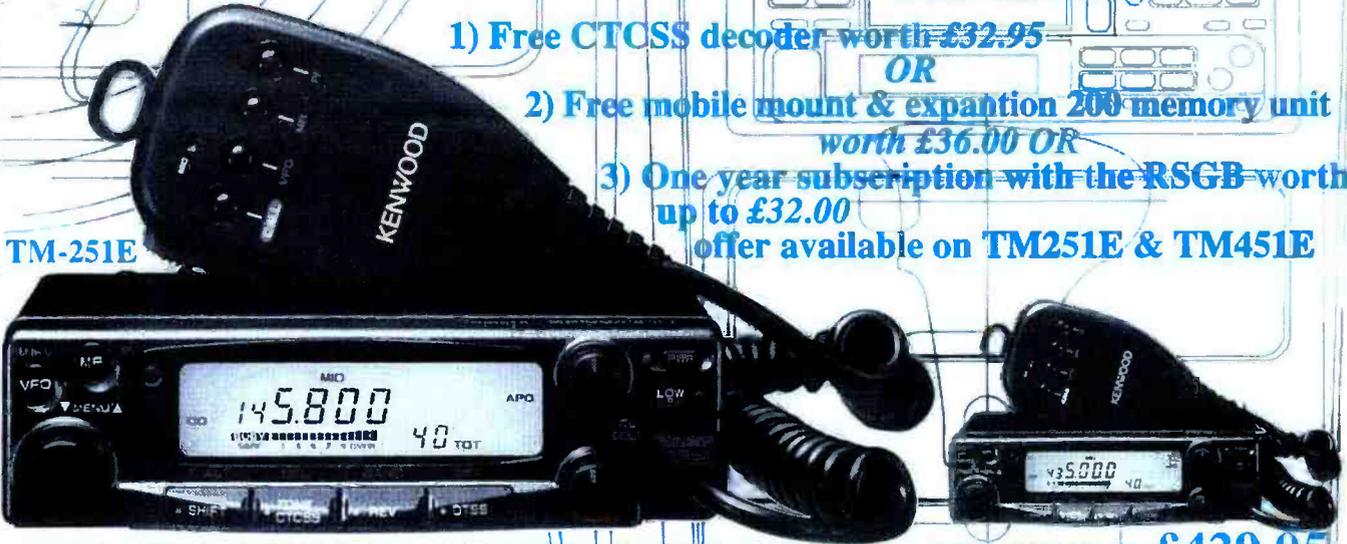
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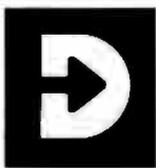
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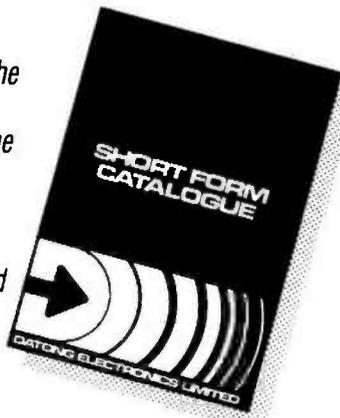
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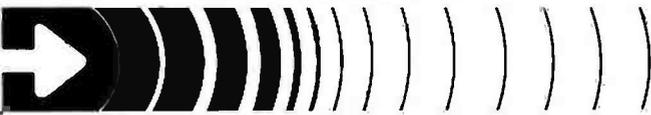
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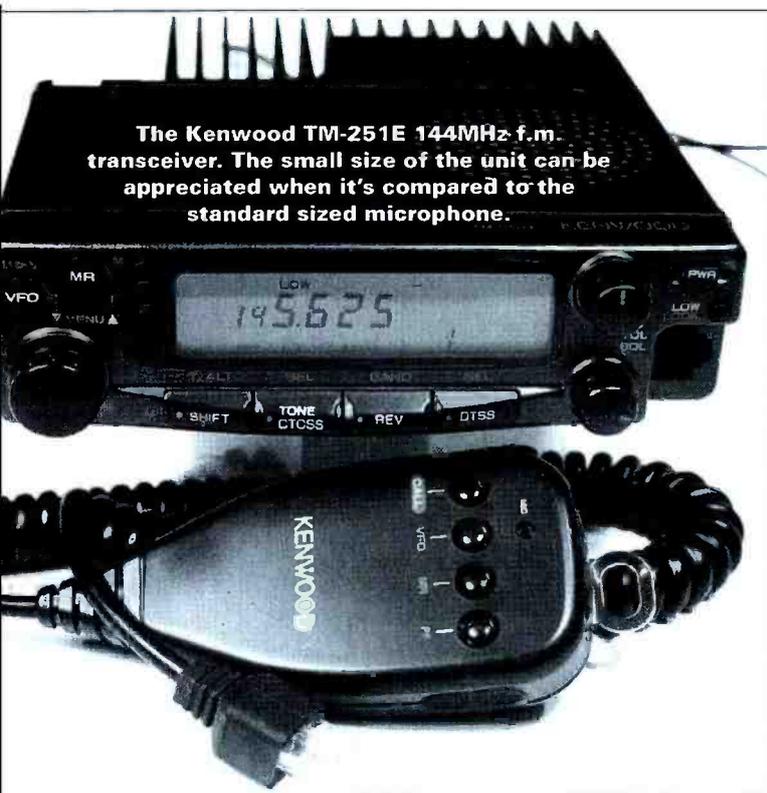
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# KENWOOD

## TM-251E 144MHz Mobile Transceiver

*Richard Newton GORSN tries out a new 144MHz mobile transceiver from Kenwood.*



The Kenwood TM-251E 144MHz f.m. transceiver. The small size of the unit can be appreciated when it's compared to the standard sized microphone.

The Kenwood TM-251E is an f.m. mobile transceiver covering 144.000 to 145.995MHz. It also covers from 433.000 to 439.995MHz and airband frequencies on receive only.

The transceiver comes with a multi-function fist microphone, d.c. power cable and a spare 15A fuse. It also has a mobile mounting bracket with screws, a small spanner and handbook.

The transceiver only has a few front panel controls. These are well labelled and large enough to use with ease but small enough to be in keeping with the transceiver's compact design.

The TM-251E measures 140 x 40 x 160mm. These dimensions include the heat sink but exclude protruding knobs.

The top panel of the transceiver houses the internal speaker. The two side panels of the TM-251E have two screw holes for attaching the mobile bracket. Finally, the rear panel has the antenna connection provided by a SO239 on a coaxial cable flying lead.

The d.c. power cable connection is also a fly lead type with a snap in/out connector. There's also an external speaker 3.5mm jack socket for an 8Ω impedance unit.

### Data Connector

The TM-251E is fitted with a dedicated data connector situated on the rear panel. You can connect a TNC without having to use the microphone or speaker sockets.

The transceiver has a large, easy to read black l.c.d. display. This can be back-lit using five settings from 'off' to very bright indeed!

A total of three rotary switches, nine push buttons and the microphone socket are used on the front panel. Two of the rotary switches are one above the other, providing the volume and squelch control, but they're well spaced.

The third, slightly larger rotary switch is used the v.f.o. memories 'up' and 'down'. It is also used to configure the set-up menu choices and set the CTCSS, DTSS and 'Page' codes and tones.

### Essential Controls

Only the most essential controls are placed on the front panel of the TM-251E. Still important functions are set by means of two set-up menus.

The buttons on the front panel all have at least two functions. The Function or 'F' key is a small button, which enables the secondary function on all the other control buttons. If pressed for more than one second, this control will give instant access to set-up menu 'A'.

More about that later.

The VFO button is used to gain access to the v.f.o. It's also used with the MR button in menu set-up mode as an up/down control.

The secondary function of the v.f.o. key is the ability to copy the contents of the last used memory directly to the v.f.o. (very useful). If the VFO button is pressed for more than one second it starts the v.f.o. scan.

The memory recall, or MR button selects the memory mode. The TM-251E has 40 memories, but this can be expanded to 200 if an optional unit is purchased.

To scan memories, all you have to do is simply press the MR button for more than one second. Used with the 'F' key the MR button is used to write information into a memory location.

### Setting Simple

Setting up the memories on the TM-251E was very simple indeed. Programming repeater frequencies was made even easier because of

the automatic repeater shift facility.

The auto-repeater shift automatically selects the correct repeater shift as soon as you tune to a repeater frequency. But it's possible to disable this feature at will.

The TM-251E offers an added flexibility when in memory mode. If you set the appropriate control in the set-up menu, you can use the Up/Down keys on the multi-function microphone to move frequency up and down from the selected memory. This can be done without changing the memory or

### Manufacturer's Specifications

Frequency range transmit	144 to 145.995MHz
Receive only	430 to 439.995MHz
Mode	F3E (f.m.)
Antenna impedance	50Ω
Power supply	13.8V d.c. (±15%) Negative ground
Current consumption	11A or less (Transmit)
Current consumption	600mA (no signal) on receive
Frequency stability	Within ±10ppm (v.h.f.) Within ±10ppm (u.h.f.)
Useable temperature range	-20°C to 60°C
Dimensions	140 x 40 x 160mm (W x H x D)
Weight	1kg

**Due to space limitations in this issue we are not able to provide the PW workshop tests for this equipment.**

having to move back into v.f.o. mode.

The Low button is a small control situated just under the power on/off button. Its primary function is to change the output power from the TM-251E. The options available are 50, approximately 10, and approximately 5W.

The Low button has two other functions. Used with the 'F' key it locks all controls on the TM-251E except power on/off, squelch, volume and the 'F' key.

If pressed for more than one second in memory mode, the Low button will lock out the presently selected memory. In other words, the memory can be accessed manually but it will be skipped over in memory scan mode.

### Accessed With Ease

The other four control buttons are situated below the display. They are incorporated in a

# OOD

gently curved protrusion which allows them to be accessed with absolute ease.

The **Shift** button manually selects a transmit shift frequency. This shift frequency can be programmed by the user to be anything between zero to 40MHz in steps equal to those currently selected in the v.f.o.

The **Shift** button's secondary function is in conjunction with the 'F' key. This toggles the **Tone Alert** function on and off.

The Tone Alert function provides an audible alarm. This is used to indicate when a signal is present on the selected frequency.

Although the alert function is useful in its own right, it's even more effective when used with either the CTCSS, DTSS or Page facilities. In this case the alarm will only sound when selected stations call.

The TM-251E offers the ability to transmit CTCSS tones. But in order to decode the tones, an optional CTCSS unit is required.

## Interesting Feature

Another interesting feature of the TM-251E is allied with the Tone Alert function. This is a voice recording facility.

When the Tone Alert, DTSS, CTCSS or Page facilities are enabled, the recording facility is automatically switched on. This records the audio of any station that calls you while you are away from the transceiver.

The TM-251E will either record one message 16 seconds long or two messages each of eight seconds. These options are toggled by use of the set-up menu.

The recording is of a very high audio quality. They're easily played back by depressing the **Shift** button for more than one second.

The voice record feature is obviously more effective when used in conjunction with the DTSS, CTCSS or Page facilities. In these modes only stations with the correct tones will be able to open the squelch and thus leave you a message.

The **Tone/CTCSS** button is used to toggle between Tone transmit, and full CTCSS. Tone transmit is where the selected CTCSS tone is transmitted by the TM-251E, but the squelch will open on reception of any signal.

The TM-251E will transmit CTCSS tones when it is supplied, but full CTCSS operation is only possible with the optional CTCSS module which has to be purchased separately.

When used with the 'F' button the **Tone/CTCSS** button allows you to select the CTCSS tone.

The next button is the Reverse or **REV** button. This enables you to instantly monitor the reverse frequency when using the **Split** facility, particularly useful when using repeaters.

The secondary function of the **REV** button is to toggle between the 144 to 145.995MHz range and the receive only v.f.o. range of 433 to 439.995MHz.

The **DTSS** button is the last one on the curved frontage. This toggles the **DTSS**

function from **On**, to **Page** and **Off**. The **DTSS** feature is similar to the full **CTCSS** function in that it uses matching **DTMF** tones to open and close the squelch.

The page facility is slightly different in that this can be programmed with individual tone codes or group tone codes.

You can therefore either choose to page a friend's transceiver or a whole group of friends at the same time.

The **Page** feature is dependent on whether your friends' radios have a page facility and that they're actually turned on!

## Connector Unusual

The microphone connector is rather unusual. It is an eight pin modular plug looking like a telephone type.

The microphone plug latches into the TM-251E by a locking tab that clicks into place. I'm not keen on this, as tabs will wear and eventually break.

The supplied fist microphone is a multi function unit. Including up/down buttons for moving up and down frequency and memories.

There are also four programmable function keys. These will replicate most of the functions of front panel buttons or even a sequence of front panel buttons.

## Extra Receive

As I have already indicated, the TM-251E offers an extra receive facility on the band 433.000 to 439.995MHz. Using this facility it's possible to have a full duplex cross band contact (transmitting on v.h.f. and receiving on u.h.f.).

I reviewed the TM-251E over a period of about four weeks and installed it into my Vauxhall Astra without many difficulties. The physical size of the radio and the fly leads helping greatly.

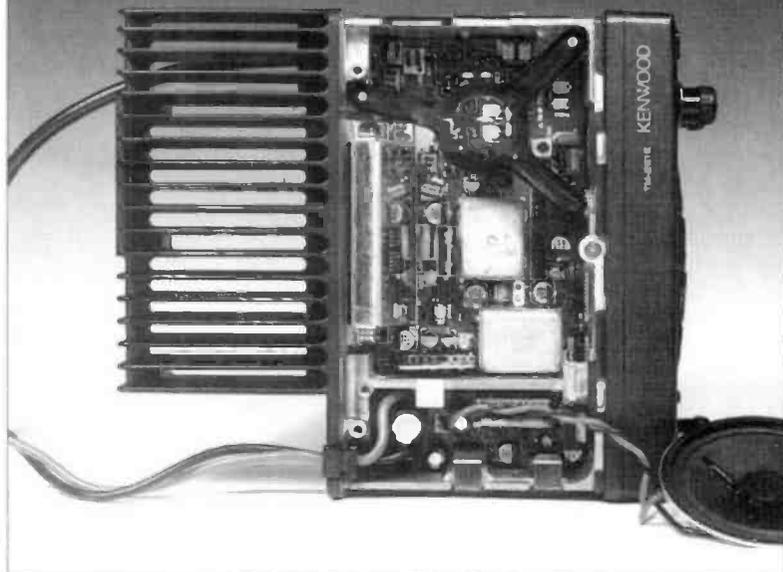
My wife and I share the car, so I had to find a mounting to make it easy to get the TM-251E in and out. As a result, I find myself in the unlikely position of recommending an optional extra!

The Kenwood MB.12 mobile mount is just the job. It allows the transceiver to slide in and out with ease. It costs about £15 and I think the improved security and convenience provided are well worth the money.

I provided the TM-251E with a quarter wave antenna on a magmount. When operating the transceiver I found the receive sensitivity to be very good on both bands and I was particularly impressed with the u.h.f. sub-band.

The various scan facilities of the TM-251E

An internal view of the TM-251E 144MHz transceiver. Clearly shown are the flying type leads for power and antenna connections. Also shown is the large area of heatsinking and relatively large speaker.



are also useful. The operator can scan the whole v.f.o. range, a programmed segment of the v.f.o. range and the memories. The call frequency and last used v.f.o. frequency and lastly the call frequency and the last used memory can also be scanned.

The Set-up menus that I have touched on I feel deserve a mention. Many functions of the TM-251E are selected by two software controlled menus, 'A' and 'B'. The Menus are used to set everything from channel steps to baud rates.

The TM-251E has the facility to set a hang time on the transmission of the repeater access tone. You just press the **Tone** button, leisurely pick up the microphone and speak...wonderful!

## Summing Up

In summing up, I think the TM-251E's transmitted audio was of a very high quality. It had a subtle 'punchy roundness' this ensured a contact even if the signal strength was down. The received audio was of a similar high quality.

What I really liked about the transceiver was its non fussy, friendly appearance. I also liked the thoughtful way in which it had been designed and its incredible flexibility.

It was handy to be able to change output power without having to use the function key plus another key. This and the easy access to the repeater reverse monitoring were just two of the many aspects that made this transceiver a joy to use.

The handbook is excellent, well written and illustrated. This, along with the well labelled controls, make sure that the TM-251E is an absolute pleasure to operate.

My thanks for the loan of the TM-251E go to Trio-Kenwood (UK) Ltd., Kenwood House, Dwight Road, Watford, Herts WD1 8EB. Tel: (0923) 816444. The TM-251E is available for £389.95 from any Kenwood approved dealer.



# THE PW CLONE

## AN ACTIVE FILTER

Having trouble with your c.w. reception? The PW Clone active c.w. filter described by Peter Wilkinson G0IIT, should clear the path to better reception on the crowded amateur bands.

To start off, I'll describe the 'Clone', and provide some general technical information and notes for the active filter. It's an interesting circuit and not difficult to build.

The circuit blocks begin with an input stage comprising a buffer/isolator and level adjustment. The circuit also uses a phase lock loop (p.l.l.) tone detector.

Other circuitry includes an audio tone generator, a mixing/emphasis stage and a.f. amplifier input. Finally, to provide a stable voltage, there's a regulated power supply.

### Input Stage

The input stage interfaces the Clone circuitry to the transceiver. To some extent it satisfies the input requirements of the phase locked loop to prevent overloading.

For simplicity, you can use a log type amplifier as shown. But a Plessey SL6270 gain controlled audio amplifier is the type I can also recommend.

### Tone Detector

The p.l.l. tone detector is the nerve centre of the Clone. It's the method by which a particular tone or beat note is selected.

The tone or beat note is selected (either by tuning the receiver, or by adjusting the capacitance/resistance combination on pins 5 and 6 of the i.c. This causes the output d.c. level to change/switch from high to low, in synchronism with the incoming Morse tone. This d.c. level turns the audio tone generator on and off in synchronism with the Morse tone.

### Tone Generator

The audio tone generator on the project provides an audible tone. This tone is adjusted to suit the operator independently of the incoming beat note from the rig.

Amplitude levels of the regenerated tone can be adjusted to suit for a better balance adjustment when 'blending'. This helps to make a more pleasant beat when listening for long periods.

### Signals Combined

The signal from the transceiver or receiver is combined with the output from the tone generator. This new combined tone is adjusted to give emphasis from one or the other depending on the required working conditions.

To tune your transceiver or receiver to a particular signal the adjustment is set in favour of the signal path, until the p.l.l. detects and activates the tone generator. Then the mix adjustment could be set for full Clone emphasis.

Generally, the latter position would be used for computer use. This method provides a cleaner signal for the computer.

### Audio Output

The audio output provides the audio outlay for delivery to a speaker or headphones. It can also be fed to a computer without loading the mixer stage of the unit.

## Shopping List

### Resistors

#### Carbon film 5%

33Ω	1	R20
82Ω	1	R21
100Ω	1	R1
150Ω	1	R23
270Ω	1	R24
1kΩ	1	R10
1.2kΩ	2	R7, R12
1.5kΩ	1	R25
2.7kΩ	1	R22
6.8kΩ	4	R2, 3, 4, 13
10kΩ	1	R6
39kΩ	1	R14
100kΩ	1	R16
390kΩ	1	R9

#### Miniature preset

1kΩ	1	R15
10kΩ	1	R8 (a 20-turn pot gives easy frequency setting)

#### Miniature variable

5kΩ	1	R19
15kΩ	1	R11

Dual miniature variable

220kΩ	1	R5, 17, 18
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### Capacitors

#### Mylar 5% (almost any type will do)

220pF	1	C11
1nF	1	C14
3.3nF	1	C10
4.7nF	1	C7
10nF	1	C1
47nF	2	C12, 13
0.1μF	1	C9
0.22μF	2	C5, 6
0.47μF	1	C3

#### Electrolytic 16V working (min)

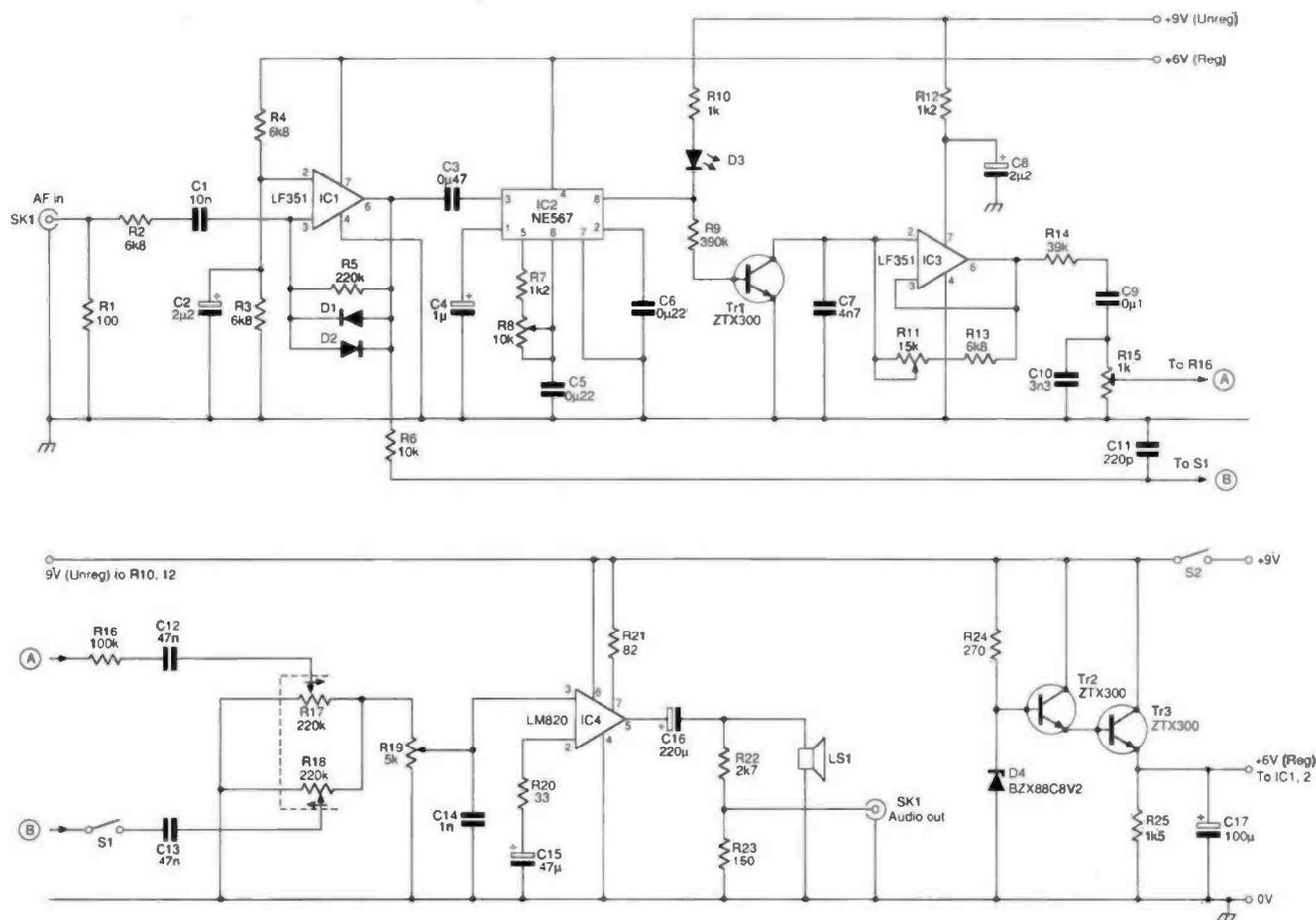
1μF	1	C4
2.2μF	2	C2, 8
47μF	1	C15
100μF	1	C17
220μF	1	C16

### Semiconductors

1N918	2	D1, 2 (small signal silicon diode)
BZX88C8V2	1	D4
LF351	2	IC1, 3
LM820	1	IC4
NE567	1	IC2
ZTX300	3	Tr1, 2, 3
I.e.d.	1	D3 (any colour light emitting diode will do)

### Miscellaneous

A suitable loudspeaker, interconnecting wire, two single-pole switches, plugs and sockets to suit and a suitable box to enclose the project.



**Fig. 1: Circuit of the PW Clone active filter unit described by GOITT. This practical device is used between the receiver and the operator's headphones (see text for setting up information).**

## Power Supply

A regulated power supply is used. This is strictly for the benefit of the phase locked loop.

The regulated power supply is used to provide a voltage unaffected by variations in the voltage supplying the rest of the Clone circuit.

## Building The Project

In building the project, the only layout that I found to require some caution lay in the proximity of the p.l.l. to the a.f. amplifier and associated wiring. This interaction was due to the on board oscillator of the p.l.l. being picked up by the audio amplifier.

I also recommend a ten or twenty turn potentiometer for fine adjustment of the initial setting of the p.l.l. It can then be generally left alone and further tuning done on the rig to get the system to lock.

The circuit diagram of the prototype is shown in Fig. 1. The d.c. unregulated input of around 9V is all that is required to be up and running for the setting up stage of construction.

## Setting Up

If general checks for wiring errors and other possible problems prove satisfactory, you can start setting up the Clone. To start off, you should tune the receiver into a c.w. station which is providing a steady clear signal.

Next, you should set the volume in the headphones to normal level. Then remove the headphones and plug the filter into the receiver and the headphones into the filter output.

Now, you should set the mixture control for emphasis on the receiver's signal and check that the buffer amplifier stage is working.

The next stage involves adjusting the p.l.l. tune control and observing the lock indicator l.e.d. When a locked indication is achieved (l.e.d. illuminated), turn the mixture control to midway or more for Clone emphasis.

You should now hear the tone generator being 'keyed'. Next, you should adjust the preset mix, adjusting for suitable level and pitch for your own choice. Make sure of course, that the main volume level on the filter is turned to a reasonable level.

## Filter Ready

The filter will be ready for use once the p.l.l. has been set. It will probably be set to around 800Hz and can then be left alone.

Now tune around the band for other c.w. stations. You should watch for the 'lock' l.e.d. to illuminate while you're listening, with the mix control in the middle, readjusting controls to suit.

Hopefully, you'll now find the filter giving you the option to hear only the clean Clone. Again hopefully, it should not be a mixture of the incoming and the filter or the incoming signal.

Setting the mixture control for both, will allow you monitor the chosen station. But, now you'll have the emphasis on the Clone for your preferred pitch and level.

For computer use where noise and other factors may corrupt decoding, the 'mix' control needs more Clone emphasis. The main volume control will need to be adjusted for correct drive.

Have fun building the Clone. It should provide an interesting and effective filter to help you work on today's crowded amateur bands.

PW



# MY 'CODE OF PRACTICE'

Keen Morse and QRP operator Peter Barville G3XJS shares a few tips and ideas on products to help you enjoy the practice of amateur radio on the key.

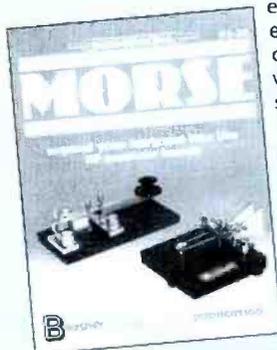
I've called my collection of tips and ideas a 'code of practice' because that's how I approach the hobby. It's a 'key' subject with me!

These days you often hear suggestions that the Morse Code is an outdated and under used mode of transmission. Not



only does the level of c.w. activity on the bands disprove this idea, but so does the enormous range of c.w. related products available to amateurs.

It's a mistake to regard the Morse Code simply as a barrier to obtaining an A Licence. It is actually a highly

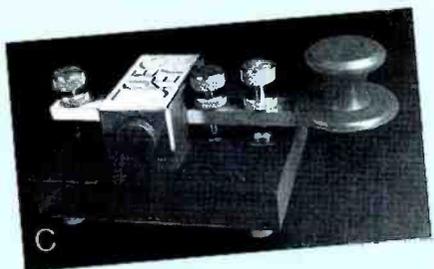


effective and enjoyable method of communicating with others, a second language in fact.

If you'd like to learn the Morse Code 'language', there are some very good books to help you get started. Mark Francis's *The*

*Secret of Learning Morse Code* (available from the PW Book Service for £4.95 plus £1 P&P UK, £1.75 P&P overseas) is an excellent guide to help you through every stage, including the Morse Test itself.

*The Morse Code for Radio Amateurs*, recently re-written by George Benbow G3HB, and published by the RSGB, is another useful aid. And finally, don't forget the useful *Practical Wireless* reprint *Introducing Morse* which is available from the PW Book Service for £1.25 plus P&P.



## Practice Oscillators

Practice oscillators are useful and Kent Keys produce a portable unit providing about 1W output from its variable pitch oscillator. The Kent Electronic Keyer has adjustable speed and weighting control. Their versatile Kent Morse Tutor offers six selectable random character programs for producing letters, numbers, and mixed letters and numbers in groups of five. For more information contact: R. A. Kent (Engineers), 243 Carr Lane, Tarleton, Preston, Lancashire PR4 6BY. Tel: (0772) 814998 FAX: (0772) 815437.

The Datong D70 Morse Tutor has, for many years, helped amateurs improve their receiving speeds once the individual Morse characters have been learned. It's a small portable unit, powered from an internal 9V battery. The speed of characters, and spacing between each character, can be adjusted to suit individual ability. Datong Electronics Ltd., Clayton Wood Close, West Park, Leeds LS16 6QE. Tel: (0532) 744822 FAX: (0532) 742872.

The ERA Microreader MkII will generate random code, at adjustable speeds, and display the characters on its built-in screen. In addition, it will decode Morse (and RTTY) signals when plugged into your receiver. The Microreader MkII (Order Code XP81C) is available from: Maplin Electronics, Rayleigh, Essex SS6 8LR. Tel: (0702) 554161 FAX: (0702) 553935 or from Nevada Communications in Portsmouth. Tel: (0705) 662145.

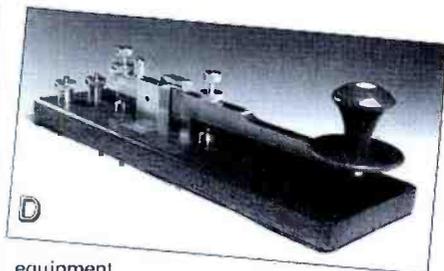
## Keys And Keyers

Vibroplex are at the deluxe end of the market, and produce a range of paddle keys, including their Vibroplex 'Original' mechanical 'bug'. This key was invented in 1890 and it's still made today. The full range of Vibroplex products are available in Europe from: Eastern Communications, Cavendish House, Happingburgh, Norfolk NR12 0RU. Tel: (0692) 650077.

Bencher is another famous key manufacturer. They produce a fine twin paddle, and a single paddle version - with the same choice of base. They're obtainable from: Reg Ward at their shop in Axminster, Devon. Tel: (0297) 34918.

G4ZPY Paddle Keys International produce an interesting, and varied range of keys which includes a Trophy Model. If it's a really miniature key you're looking for, try their Miniature Twin Paddle. All G4ZPY keys are hand crafted. Contact them at: 41 Mill Dam Lane, Burscough, Ormskirk, Lancashire L40 7TG. Tel/FAX: (0704) 894299 (0800-2300).

Samson Electronic Keyers products are used world-wide on many ships and coast stations. The Samson ETM-9C CMOS Memory Keyer is an extremely comprehensive piece of



equipment with a built-in twin paddle.

There are three other

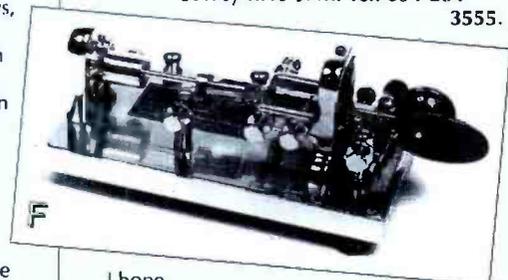
electronic keyers in the range, as well as the ETM-SQ Twin Paddle. For details of these high quality products, contact the UK Agent: Mr F. H. Watts G5BM,

Woodland View, Birches Lane, Newent, Gloucestershire GL18 1DN. Tel: (0531) 820960.

Peter Jones Engineering, produce a twin paddle key which has been making quite a name for itself. It has a distinctive heavy red base, with the feature of adjustable height and gap between the handles. A straight 'up and down' key is currently available, with a single paddle due on the market soon. The keys are available from agents or direct from PJE.

Further information from: Peter Jones Engineering at Chapel Road, Smallfield, Surrey RH6 9NR. Tel. 034-284-

3555.



I hope you'll find my list helpful. It's not aimed at being 'the ultimate' but is aimed at encouraging you to do what I enjoy - practising my hobby on the key and following the code!

G3XJS

## Key to photographs

A: One of the Kent Keys and their electronic keyer. B: *Introducing Morse*, the PW reprint. C: The Jones Straight Key. D: Hand built Morse key based on the GOMSZ design. E: One of the G4ZPY range of hand crafted keys. F: Vibroplex bug key.





# MFJ-411 Pocket Code Tutor & MFJ-451 Morse Keyboard Reviewed

*John Goodall GOSKR is a keen c.w. operator, so PW gave him the opportunity to try two new products from the MFJ stables - here's what John thinks.....*

**B**eing a keen c.w. enthusiast, I was highly delighted when asked by *Practical Wireless* to review a new Morse Code Tutor. A medium manufactured to assist in the learning process of Morse Code is a bonus and I readily accepted the invitation.

The MFJ-411 is a pocket Morse Code Tutor with its own internal power source and speaker. It's a microprocessor controlled Tutor and provides a variety of options for learning Morse Code.

The Tutor even has a random QSO simulator for those students coming up towards the test. It's also useful for increasing the reading speed of those of us who have the test under our belt.

## The Appearance

Looks aren't everything I know, but I found the appearance of the MFJ-411 to be somewhat 'Heath Robinson' (no relation to Edward G.). It was indeed pocket size, 138 x 75 x 26mm (and that is quite small in real money!!).

However, the robust sheet aluminium construction would lend itself to a briefcase rather than a pocket. Sharp corners, protruding controls and assembly screws made this small item hardly likely to find its way into my pocket.

Having said that, don't get me wrong from the start, the MFJ-411 is well made. Indeed, it's sturdy and I feel sure it would be equally at home in the tough conditions on a building site as well as in the shack.

I will steer away from the construction for the time being and take a look at the controls of the Tutor. On the face-up panel, towards the left hand edge, there are a row of six standard l.e.d.s.

Above the l.e.d.s is a hole in the case, which was a fraction too large on the review model for a plastics grommet. Through this hole protrudes the turning shaft of the p.c.b. mounted volume control.

The control shaft has grooves along its length to facilitate turning and a screwdriver slot is also cut into the end. Towards the upper right hand edge is a 20 x 15mm aperture through which a dual seven segment l.e.d. display can be clearly seen.

Towards the top right hand side panel is the large push on/push off power switch. I shall explain later, but I feel this to be a totally impractical and badly located switch.

Directly opposite the on/off switch, on the left hand edge, are two momentary push-on switches mounted one below the other. These switches control the up/down movement of the l.e.d. display menu.

Pressing both the switches simultaneously

moved to the next page of the menu, which was indicated by one of the row of six l.e.d.s. Certainly, I feel these three switches did nothing to enhance the presentation or operation of the pocket tutor. The three appear to have been used on a 'We've got 'em so we'll use 'em' basis'.

## Internal Battery

The MFJ-411 is powered by an internal 9V PP3 battery, but it can also be powered from any external 12V d.c. source. It has an excellent built-in miniature speaker and it also has a 3.5mm socket for stereo headphones.

The face panel is clearly stencilled with user information and instructions. These instructions make the initial reading, of the excellent instruction manual, the last time you should need to refer to it.

Once I had switched on the MFJ-411, it immediately sent 'On' in Morse characters. This was followed by each of the seven segments of the dual display lighting in turn until 88 was displayed.

The display then goes black and each of the row of six l.e.d.s. lights in turn, with the Speed l.e.d. remaining illuminated. The figure '13' is then displayed indicating the Speed is set at 13wpm. This is the unit's default setting and is also the speed required for the USA General and Advanced Amateur Licences.

The MFJ-411 has a built in battery saver, this extinguishes the display after five seconds. Upon pressing either of the two left hand buttons, the display can be re-illuminated.

Using these two buttons I found it was very simple to vary the parameters of any function. By pressing both buttons simultaneously, it was easy to move onto the next function. The functions are indicated by the row of six l.e.d.s.

## The Facilities

Let's take a look at the facilities provided. The speed (SPEED) can be varied between five and 60wpm. This is indicated by the number showing on the display.

The sidetone frequency can be varied between 300Hz and 3.3.kHz.

The Beginner Menu consists of the following:-

- C1 Letters EISHTMO
- C2 AWJNDB
- C3 UVGZKRPX
- C4 FCLQY
- C5 Numbers 12345
- C6 67890
- C7 Punctuation and procedural signals
- Off



**The MFJ-411 tested by GOSKR.**

The above codes are displayed and the characters will be sent at whatever speed has been set at SPEED.

The Advanced Menu available under this heading and displayed are:-

- L: Random letters A-Z
  - n: Number 0-9
  - P: Procedural signals
  - Ln: Letters A-Z and number 0-9
  - LP: Letters A-Z and procedural signals
  - nP: Number 0-9 and procedural signals
  - ALL: Letters, numbers and procedural signals
  - rc: Random words generated by internal database
  - c: Totally random QSOs
- GROUP Menus available under this heading and displayed are:-
- n5: Normal sending fixed five character words
  - nr: Normal sending random length 1-8 characters
  - F5: Farnsworth five character words
  - Fr: Farnsworth random length plus 1-8 characters
- Farnsworth is where all characters are sent at 18wpm but with spacings as per code SPEED setting. This is very useful after the dreaded test GO: Once the options above have been set for the particular training session, this menu shows:-
- n: Starts new session every time
  - r: Repeats everything sent before it was stopped
- Either n or r has a five second countdown before the code starts.

## Unit Switched Off

I should point out that when the unit is switched off (this occurred accidentally on many occasions due to the badly placed ON/OFF switch) all parameters go to default setting. I lost count of the number of times I had to re-start a session by



having to re-programme, easy though it was....!

On the base of the MFJ-411 are four well placed rubber feet. The feet keep the p.c.b. mounting screws away from my XYL's polished table top, and at the same time allow sound from the base mounted speaker to be clearly heard.

Holding the MFJ-411 in the hand allows fingers or thumb to operate the option buttons, I found that this was the biggest problem. It was almost impossible to hold and not catch the on/off button, and in doing so, having to switch on again and start afresh.

In my view, the designers should have used a rotary volume on/off control to the top edge of the unit. Two sub-miniature push to make

switches on the opposite side of the top edge for the options buttons.

All screws I feel should have been countersunk and all sharp corners rounded. Only then would I call it a Pocket Tutor.

### Summing Up

In summing up, despite my criticism of this item's construction faults, these are my personal views. My comments should in no way detract from the excellent workings within. Mr Rolls and Mr Royce would never have dreamed of putting their Ghost engine in a Lada! No disrespect to Lada intended.

The price for the MFJ-411 is £89.95, a shade on the high side I feel for a dedicated Morse Tutor. However, my earlier comments apart, the MFJ-411 was simplicity itself to use.

I gratefully thank **Waters & Stanton**

**Electronics** for the loan of the review model and hope they don't realise the box has been returned EMPTY! The MFJ-411 is a MUST for any Morse Instructor, myself included.

## The MFJ-451 Morse Keyboard

**T**he MFJ-451 is a dedicated Morse keyboard and electronic keyer in a single package. As supplied it consists of a full size QWERTY IBM-AT compatible keyboard, with electronic Morse keyer and a 12V d.c. mains adapter.

The keyboard has a 1m connecting cable. This has a coiled mid section terminated with a 5-pin DIN 180° plug.

The keyer unit itself is made from sheet aluminium. It's about half the size of a VHS video cassette which is quite small really.

On the front panel the MFJ-451 has a volume control, push-on/push off power switch and a red l.e.d. The rear panel, being craftily cut away to accommodate the various p.c.b. mounted sockets.

The rear sockets allows five pin DIN connection from keyboard. There's also a 3.5mm stereo jack from paddles, 3.5mm jack for extension speaker; phono socket to transceiver and 2.1mm 12V d.c. power input. On the top surface of the keyer are apertures for the miniature speaker mounted beneath.

### Easy To Understand

I found the instruction manual quite comprehensive and easy to understand (much to my relief). The only item I found missing was how to reset the factory default, maybe it doesn't.

The MFJ-451 sends Morse code directly from the keyboard, paddles if it's connected to the transceiver. It has two non-volatile memories of 100 characters each and a 200 character type ahead buffer. It sends all characters including punctuation and procedural signals.

After connecting keyboard, paddles, transceiver and 12V d.c. to the correct sockets on the keyer, I switched on. The keyer immediately sent 'On' in Morse followed by the illumination of the l.e.d.

### Surprised By Quality

I was pleasantly surprised by the quality of sound from the keyer's enclosed miniature speaker. Typing in a few simple words, (I don't know any difficult ones!) I soon found this was definitely cheating as far as Samuel Morse was concerned!

Anyway, back to the plot - I now had the feel of the keyboard. So, I was ready and decided to venture into the unknown and change the speed, tone and weight parameters of the keyboard.

### The Keys

The uppermost row of keys on the keyboard, the function keys have individual uses. And together with the **Up** and **Down** arrow keys, they vary the parameters of the keyboard.

Key functions are as follows:

- F1:** gives a continuous tone to facilitate tune-up.
- F2:** allows the sidetone frequency to be varied between 300Hz and 3.3kHz.
- F3:** is used to vary the Morse code speed for 5 to 100wpm, (this speed was totally illegible to my ears).
- F4:** This alters the weight of the characters, between 5 and 95%.
- F5:** This key allows entry to the first of two 100 character memories, also stores mode.
- F6:** Enters playback of first memory.
- F7** and **F8:** These keys enter store and playback mode of second 100 characters memory.

**F9:** With each press of this key, the keyer alternates between **Output On** and **Off** to the transceiver. Each press of the key is followed by either 'On' or 'Off' being sounded in Morse characters on the speaker. **F10** and **F11:** These are used for serial numbering, F10 storing the number whilst F11 will decrement the numbering. I found the auto-increment of serial numbers very easy to implement. Whilst holding the **Ctrl** key, pressing 'S' after any memory message is recorded the MFJ-451 then increments the serial numbers up to 9999 (that's a lot of QSOs!).

### User Friendly

In a very short space of time I had mastered this user friendly keyboard and keyer. It was time to go on the air (and believe me if I mastered it **anyone** can!). I made arrangements for a very good friend, **Don G0IJE** to assist me with the on air tests.

At the agreed time I hit the **F9** key and waited for the 'On' in Morse to be sent by the keyboard. This was telling me that this modern sophisticated piece of electronic engineering was now connected to my own ancient equipment.

The whole QSO couldn't have been more enjoyable and relaxed. Steady typing and a smooth QSO was soon underway. Halfway through the tests **Don G0IJE** and myself joined by **John G0TZV**. The reports from both were extremely favourable.

### Summing Up

In summing up, I must mention the only hiccup I found. Throughout my tests with the MFJ-451, the only problem that I



**John using the MFJ-451 morse keyboard.**

found was that the error signals only sent seven dits! (not exactly an earth moving fault at that!).

The MFJ-451 performed extremely well throughout both extensive off and on air tests. The ability to vary the sidetone frequency should certainly be an asset to those with hearing problems.

Whether your interest is in contesting, DXing or as myself just a lover of Morse operating, I feel sure MFJ have yet another winner with this package. The retail price is £109.95 which I think is certainly good value for money.

I for one wouldn't mind seeing the MFJ-451 in my shack on a permanent basis. Sadly, on breaking into my piggy bank, two old pennies, one old threepenny bit and four shirt buttons were all I could manage.

Thanks indeed to **Waters & Stanton Electronics** for the loan of this excellent package.

**Waters & Stanton Electronics**, 22 Main Road, Hockley, Essex SS5 4QS. Tel: (0702) 206835 can supply the MFJ-411 for £89.95 plus £4.50 P&P and the MFJ-451 for £109.95 plus £4.50 P&P.

## After seeing a copy of the G0SKR reviews, Jeff Stanton G6XYU of Waters & Stanton sent us the following comments:

Many thanks for letting me see the draft reviews of the MFJ-411 and MFJ-451. I have a couple of comments to make.

Where John Goodall G0SKR mentions the rough edges of the Morse tutor, we have already suggested to MFJ that they provide a carrying case as an optional extra which will make it much more 'portable'.

I can understand the reviewer's problem with the On/Off button but in reality think that a beginner would stand the tutor on a desk so that he could write the received message down. There are other Morse tutors at slightly lower prices but I am sure that the MFJ-411 is unmatched for features and facilities.

**Jeff Stanton G6XYU**

# BASIC BREAK-IN

Richard Q Marris G2BZQ, explains how you can provide a break-in unit for Morse on any older receiver.

A potential recruit, to our hobby, reading page after page of glossy advertisements and equipment reviews, might conclude that it costs large amounts of money for an s.w.l. or amateur, to get 'on air'. He, or she, might also conclude that home construction is defunct. The beginner might also assume that Morse code has become an extinct language.

The unfortunate first impression, that the quality of amateur radio and listening is governed by the depth of pockets, could not be further from the truth. Neither is equipment shown in the latest press releases or glossy brochure everything. This impression does little to encourage newcomers to our hobby.

It is possible to 'get on air' for £50 or under. Regular listening around the h.f. bands discloses an apparent increase in c.w. activity.

## Tried And Tested

The circuit in Fig. 1 has, with variations, been around for many a year and is tried and tested. It's also about the simplest possible break-in circuit. I've used it in one form or another since the 1950s.

The circuit itself, consists of just one valve, three resistors, and three capacitors. The h.t. and heater voltages are 'borrowed' from the valved receiver.

The valve, a 6C4, is an older style triode low power transmitting type. Look at Fig. 2 for a pins-on view of the base of the 6C4 valve. The 6C4 valve is very rugged and robust, with well spaced electrodes, and will stand a fair amount of electrical abuse, though it might be possible to use other similar types. The 6C4 type as a low cost and readily available variety from many advertisers.

In normal operation the triode is used as a cathode follower and almost all the

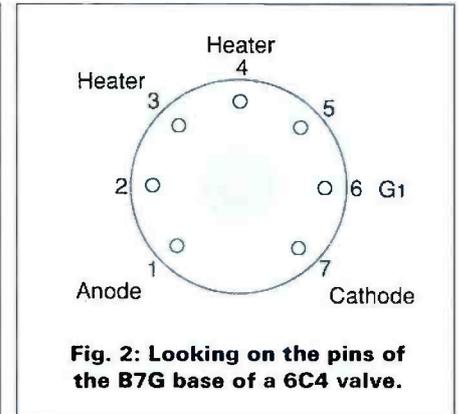


Fig. 2: Looking on the pins of the B7G base of a 6C4 valve.

The maximum power depends on the voltage that can be applied between the grid and cathode of the 6C4; plus the voltage handling rating of C1 (50pF).

Finding a really high voltage h.f. 50pF capacitor proved to be difficult, and eventually a screw-driver adjusted high quality 50pF air spaced variable was used, similar to the present day double spaced Jackson C804.

The capacitor was mounted internally on a piece of clear plastics material. It was set at the maximum 50pF capacity. In this mode it is used as a high r.f. voltage fixed capacitor, no panel knob being required.

## In Use

In use the T/R switch is inserted as shown in Fig. 3. Such T/R switches can generate harmonics, especially on transmission.

The unit should therefore be built in a fully screened, box, and

inserted between the transmitter and low-pass filter as shown. This method of installation ensures that the absolute minimum of TVI is generated.

The simple circuit, is built into a small metal box with (small) ventilation holes drilled in the box above the valve. The valve should be mounted vertically, with the valve holder secured to a metal chassis plate, bolted to the box for heat dissipation. The box should be exterior

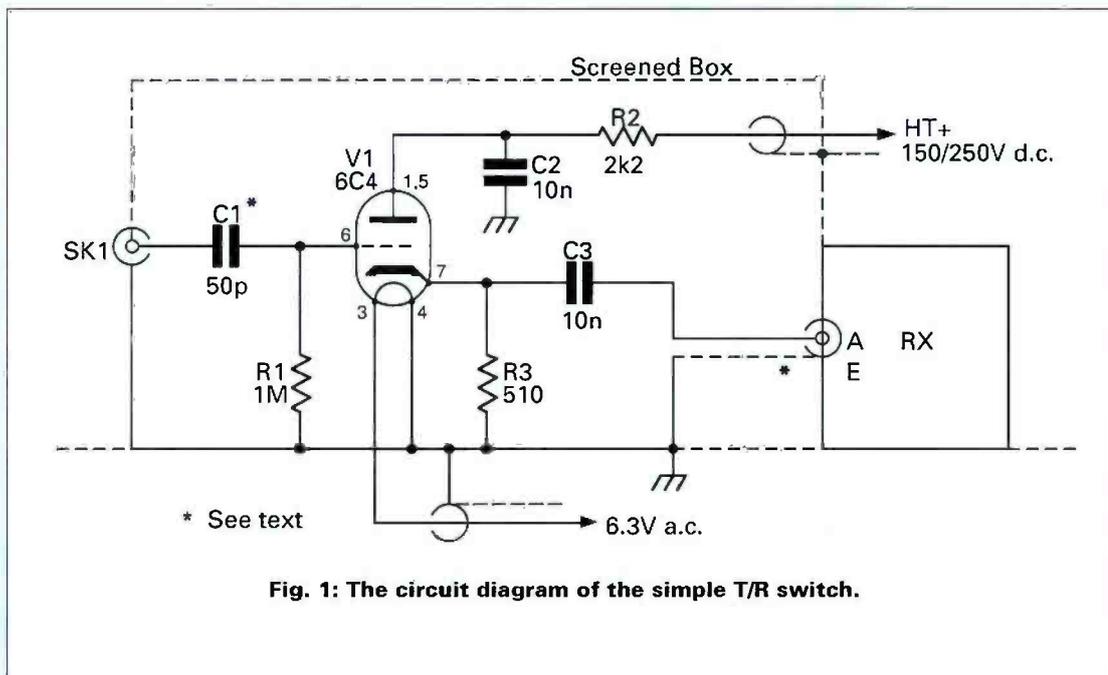


Fig. 1: The circuit diagram of the simple T/R switch.

Eavesdropping on QSOs it becomes apparent that many are using home-built transmitters, or even complete stations. These may be either commercial QRP kits or complete home-brew.

Many enthusiasts are using excellent classic receivers, such as the AR88, an HRO, Eddystone, Drake, Collins, Heathkit, etc. With these mainly valved receivers, c.w. break-in facilities can be easily, and cheaply, added.

signal is passed to the receiver. On transmission, the grid of the 6C4 is driven into conduction, and the triode is reverse biased by the rectified current. This ensures that it can only pass a minimum of signal to the receiver input.

I've used the circuit in the past, with c.w. transmitters up to about 25W or so. But the maximum r.f. power that this T/R switch will cope with depends on several things.



painted matt black.

The unit should be mounted immediately at the receiver antenna input socket with the shortest possible coaxial lead. Ideally, the box should be bolted to the rear of the receiver and the h.t. and 6.3V heater leads should be individually fully screened, and taken to the nearest possible voltage points on the receiver.

Some valved communications receivers have an auxiliary power socket for converters/pre-amplifiers that may be utilised. The wires used should be capable of handling the h.t. voltage and the heater current of 150mA.

The T/R switch should not be used with receivers that don't have a mains transformer, or that have the valve heaters in series. In the event of the receiver having a 12 volt a.c. series/parallel heater chain a series dropper resistor can be inserted between the heater lead and the 12V point. The value of this series resistor should be 42Ω (1W minimum). I suggest that at least a resistor of three watt dissipation should be used.

The coaxial connections between transmitter to low-pass filter, and the T/R switch should be as short as possible. It should ideally use a 'T' junction connector to eliminate the possibility of radiation.

With careful building and installation this project can be an excellent T/R switch for c.w. operation. It should not be used with a high power transmitter, I think 25W is a suitable limitation.

There seems to be no reason why it shouldn't be used on single sideband mode though I've never tried it on that!

PW

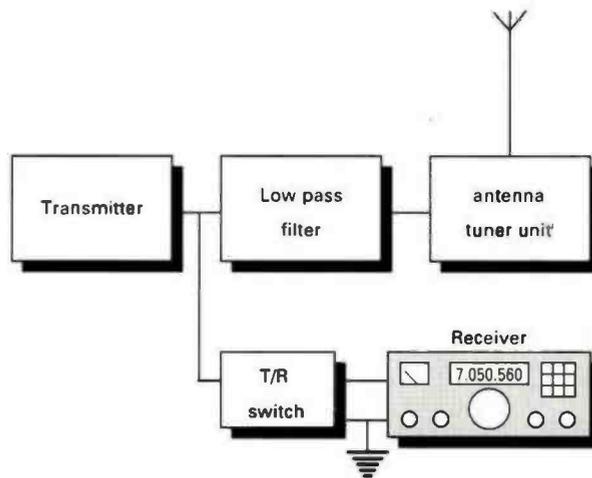


Fig. 3; The T/R switch is put into use in this fashion.

## Shopping List

### Resistors

Carbon 5% 0.5W (minimum)

510Ω	1	R3
2.2kΩ	1	R2
1MΩ	1	R1

### Capacitors

Polyester 250V working

10nF	2	C2, 3
High voltage type 350V min.		
50pF	1	C1

### Miscellaneous

A 6C4 (or similar) valve plus valve holder, a small metal box good quality coaxial cable, suitable hook-up wire, coaxial plugs and sockets to suit the station.

## RADIO DIARY

**May 15:** The Mid-Ulster Amateur Radio Club G13VFW are holding their Parkanaur Rally at the Silverwood Hotel, Lurgan. Doors open at 12noon. Proceeds in aid of The Stanley Eakins Memorial Fund.

**May 22:** The 37th Northern Mobile Rally will take place at the Flower Show Hall on the Great Yorkshire Show Ground, Harrogate, North Yorkshire. Mike GOMKK. (0423) 507653 evenings or GOMKK @ GB7CYM.

**May 29:** The 18th Annual East Suffolk Wireless Revival will be held at The Maidenhall Sports Centre, Stoke Park Drive, Ipswich, Suffolk. Attractions will include vintage radio display, Novice staff, RAIBC, BYLARA, RAYNET. Non-radio stalls and refreshments. Talk-in on S22. Bob Baal on (0394) 271257.

**May 29:** The Plymouth Radio and Electronics Fair will be held at Coombe Dean School, Charnhill Way, Elburton, Plymouth. Doors open 10.30am. Over 25 stalls selling electronic and computer and radio components, many second-hand bargains for the enthusiast. Free parking, Bring & Buy stand, club station on air, bookstall, hot and cold buffet and a grand raffle. Admission £1 at the door. (0752) 364150.

\***June 12:** The Elvaston Castle National

Radio Rally will be held at the showground of the Elvaston Castle Country Park, situated five miles south east of Derby. This is the 25th Radio rally and should be the most spectacular to date. Keith Ellis G1ZLO on (0332) 662896.

**June 12:** The Royal Navy Amateur Radio Society is holding its annual rally on the sports field HMS Collingwood, Fareham, Hants between 10am and 5pm on Sunday. This site, with its easy road access and good car parking, is a splendid successor to the previous venue. Trade stands, Bring & Buy, flea market, local repeater and radio clubs and also a large arts and crafts exhibition. A full range of entertainment for all the family along with refreshments. Talk in on 144 and 432MHz to guide visitors from the nearby M27 (leave at junction 11 and follow the A27 towards Fareham). Clive Kidd G3YTQ on (0705) 3327621 daytime or (0329) 234143 evenings.

**June 19:** Denby Dale & DARS Annual Mobile Rally will be held at Shelley High School. Phil G4FSQ on (0484) 644827.

**June 19:** The 5th Belfast Radio Rally is to be held in the Chimney Corner Hotel, 630 Antrim Road, Glengormley. Starts at 12noon. There will be a Bring & Buy,

the usual trade stands and attractions, with a chance to have a drink or a meal in the hotel restaurant. Entrance fee is £1, accompanied children only 50p each. D. Caldwell on (0232) 471370.

**June 19:** The Newbury and District Amateur Radio Society are holding a car boot sale at Acland Hall, Cold Ash, Nr. Thatcham, Nr. Newbury. 9am to 3pm, free admission and parking, talk-in GB4NBS S22. For more information contact George on (0488) 682814.

\***June 24-26:** Ham Radio '94 Friedrichshafen, Germany. The largest amateur radio show in Europe and well worth a visit. The Flea Market alone is worth the journey and Friedrichshafen situated on the Bodensee - Lake Constance to the English - and within easy reach of Austria and Switzerland is a fantastic area for a holiday.

**June 25 & 26:** The Wrexham ARS Mobile Rally and Boot Sale together with Shropshire Astronomical Society's Star Party is being held in conjunction with the Clwyd Veteran and Vintage Machinery Society's 18th Annual Steam Rally at the Plassey, Eyton, Nr. Wrexham. Doors open 10am to 5pm. Ian Wright GW1MVL on (0978) 845858.

\***June 26:** The 37th Longleat Amateur Radio Rally is being held at Longleat House, Warminster, Wiltshire. £2.50

admission for adults, £1.50 for pensioners and 50p for children. There will be a large trade show with 180 stands, a large Bring & Buy, and craft fair. Shaun O'Sullivan G8VPG on (0272) 860422 (office hours) or (0225) 873098.

**June 26:** The Norfolk Raynet Barford Rally will be held at the Village Hall, Barford on B1108 Norwich-Watton Road. Doors open 10am, there will be trade stands, a raffle, refreshments. Free car parking and talk-in on S22. Further details from Bill G4TWT, QTHR. (0603) 427008.

\* Practical Wireless & Short Wave Magazine in attendance.

If you're travelling long distances to rallies, it could be worth phoning the contact number to check all is well, before setting off.

The Editorial staff of PW cannot be held responsible for information on Rallies, as this is supplied by the organisers and is published in good faith as a service to readers.

If you have any queries on a particular event, it is advisable for you to contact the organisers direct.

Editor

NO TELEVISIONS, NO TUMBLE D

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FT-5100



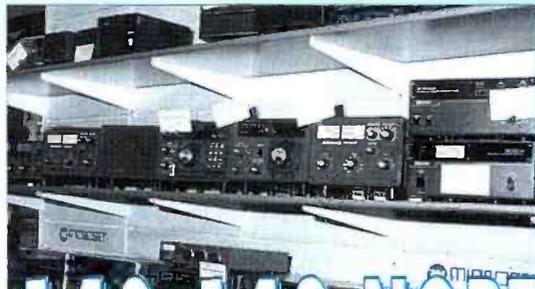
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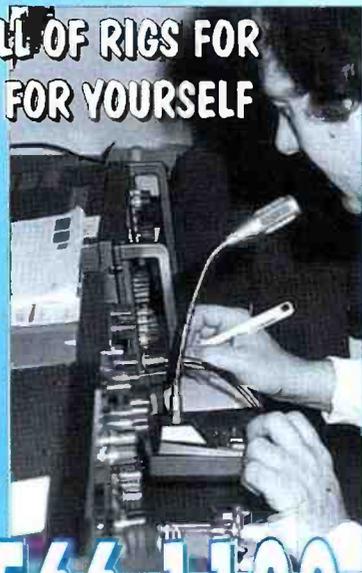
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# The Practical Wireless 144

**Contest Adjudicator Neill Taylor G4HLX reminds us that it's time once again to prepare for the v.h.f. low power enthusiast's most popular activity day of the year - the PW 144MHz QRP Contest.**

The 12th PW 144 MHz QRP contest follows the same format as in previous years. This means that trophies, prizes and certificates can be won by those individuals and groups who achieve the best performance.

But as usual, everyone, whether a winner or not, has plenty to gain by taking part in the contest. A high level of QRP activity, with stations in the best hill-top locations around the British Isles, guarantees some good contacts for even the simplest station. And the 3W power limit means that a hugely complex station is not needed to compete effectively.

The prestigious PW Winner's cup will be presented to the overall winners. They will also receive a special prize, a new Kenwood TH-22E 144MHz hand-held transceiver. It will be fitted with the optional DTP-2 keypad for frequency/memory/DTMF entry and is being donated by **Trio-Kenwood (UK) Ltd.**

Second prize will take the form of a special flexible solar panel unit, donated by **Bob Keyes of Key Solar Products.** The main prize-giving will take place at the 1994 Leicester Show at Granby

Halls on Saturday October 29.

The PW Tennamast Trophy, donated by **Norrie Brown of Tennamast**, will be presented to the leading Scottish station. Certificates will be awarded to the leading station in each locator square, as well as in various other categories.

## Listeners' Challenge

As last year, we are inviting entries from listeners in our special QRP Contest Listeners' Challenge. If you've not yet obtained your amateur licence, why not take part in the fun (maybe getting together with some friends) as a receiving station?

**Mike Devereux G3SED, of Nevada Communications** is supporting the new Listeners' Challenge and there will be a special prize which will be presented at the Leicester Show in October.

The full rules are set out opposite. I would ask **(Please!) that all entrants read them carefully.** Read them thoroughly again before sending in your entry, in particular **Rule 6**, to make sure that you have provided all the required covering information. It's surprising how many entrants lose points by omitting important things here.

Finally, I wish all stations taking part a good day, with clement weather and plenty of good DX. Have fun!

Neill Taylor G4HLX

## Practical

**1: General.** The contest is open to all licensed radio amateurs, fixed stations or portable, using s.s.b., c.w. or f.m. in the 144MHz band. Entries may be from individuals or from groups, clubs, etc. The duration will be from 0900 to 1700UTC on June 19 1994.

All stations must operate within the terms of the licence. Entrants should observe the band plan and keep clear of normal calling frequencies (144.300 and 145.500MHz) and those used by GB2RS during the morning (144.250 and 145.525MHz). Keep clear of any other frequency that is obviously in use for non-contest purposes.

The station must use the same callsign throughout the contest and may not change its location. Special event callsigns may not be used.

**2. Contacts.** Contacts will consist of the exchange of the following minimum information:

(i) callsigns of both stations (ii) signal report, standard RS(T) system (iii) serial number: a 3-digit number incremented by one for each contact, starting at 001 for the first (iv) locator (i.e. full 6-character IARU Universal Locator for the location of the station).

Information must be sent to, and received from, each station individually, and contact may not be established with more than one station at a time. Simultaneous operation on more than one frequency is not permitted.

If a non-competing station is worked and is unable to send his full universal locator, his old-style QTH locator ("QRA") or his location may be logged instead. However, for a square to count as a multiplier (see rule 4), either a full 6-character IARU universal locator, or full 5-character European QTH locator must have been received in at least one contact with a station in the square.

**Contacts via repeaters or satellites are not permitted.**

**3. Power.** The output power of the transmitter final stage shall not

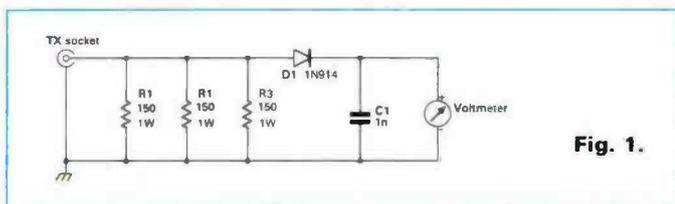


Fig. 1.

**Don't forget it's all happening between 0900-1700UTC, on June 19 1994!**

# 144MHz QRP Contest

## Practical Wireless 144MHz QRP Contest Rules 1994

exceed 3W p.e.p. If the equipment in use is usually capable of a higher power, the power shall be reduced and measured by satisfactory means. The simplest way is often to apply a (variable) negative voltage to the transmitter a.i.c. line, reached via the accessory socket. The output power can be accurately measured using the simple circuit of Fig. 1. Connect this to the 50Ω output of the transmitter and adjust the power so that the voltmeter does not exceed 16.7V on a good whistle into the microphone.

**4. Scoring.** Each contact will score one point. The total number of points gained in the eight-hour period will then be multiplied by the number of different locator squares in which contacts were made (a 'square' here is the area defined by the first four characters of a universal locator).

Example: 52 stations worked in IO81, IO90, IO91, IO92 and JO01 squares; final score = 5 x 52 = 260.

Only one contact with a given station will count as a scoring contact, even if it has changed its location, e.g. gone /M or /P. If a duplicate contact is inadvertently made, it must still be recorded in the log, and clearly marked as a duplicate.

**5. Log.** The log submitted as an entry must be clearly written on one side only of A4 sized (210 x 297mm) paper (the normal way up, not sideways), ruled into columns showing: (i) time UTC (ii) callsign of station worked (iii) report and serial number sent (iv) report and serial number received (v) locator received (or location).

Underline or highlight the first contact in each of the locator squares worked.

At the top of each sheet, write: (a) callsign of your station (b) your locator as sent (c) sheet number and total number of sheets (e.g. 'sheet no. 3 of 5'). The sample shown (Fig. 2) here illustrates how each sheet should be headed.

**6. Entries.** Accompanying each

entry must be a separate sheet of A4 sized paper bearing the following information: (a) name of entrant (or of club, etc., in a group entry) as it is to appear in the results table (b) callsign used during contest (including any suffix) (c) name and address for correspondence (d) details of location of station during contest; for portable stations, a national grid reference is preferred (e) locator as sent (f) whether single- or multi-operator (a single-operator is an individual who received no assistance from any person in operating the station, which is either his permanent home station or a portable station established solely by him/her); if multi-operator, include a list of operators' names and callsigns (g) total number of contacts and locator squares worked (h) list of the locator squares worked (i) a full description of the equipment used including TX p.e.p. output power (j) if the transmitting equipment is capable of more than 3W p.e.p. output, a description of the methods used (i) to reduce and (ii) to measure the output power (k) antenna used and approximate station height a.s.l.

Failure to supply the previous information may lead to loss of points or disqualification. The following declaration must then be written and signed by the entrant (by one responsible person in the case of a group entry): "I confirm that the station was operated within the rules and spirit of the event, and that the above information is correct".

This declaration concludes the entry, which should be sent, with the log sheets, to: **Practical Wireless Contest, c/o Dr. N. P. Taylor G4HLX, 46 Hunters Field, Stanford in the Vale, Faringdon, Oxfordshire SN7 8LX.** A large s.a.e. should be enclosed if a certificate and full set of contest results is required. Certificates will not be awarded to entrants failing to supply an s.a.e.

**Entries must be postmarked no later than July 4 1994. Late entries will incur a heavy points penalty.**

Any other general comments about the station, the contest and

conditions during it are welcome, but should be written on a separate sheet of paper. Photographs of the station are also invited (but please note that these cannot be returned); if these are not available by the time the entry is submitted they may be forwarded later, to arrive by August 1 1994.

**7. Miscellaneous.** When operating portable, obtain permission from the owner of the land before using a site. Always leave the site clean and tidy, removing all litter. Observe the Country Code.

Take reasonable precautions to avoid choosing a site which another group is also planning to use. It is wise to have an alternative site available in case this problem does arise.

Make sure your transmitter is properly adjusted and is not radiating a broad or poor-quality signal, e.g. by over-driving or excessive speech compression. On the other hand, be aware that your receiver may experience problems due to the numerous very strong signals it will have to handle, and that this may lead you to believe that another station is radiating a poor signal.

Before reaching this conclusion, try heavy attenuation at the receiver input. The use of a high-gain r.f. pre-amplifier is likely to worsen strong-signal problems, so if you do use one, it is best to be able to switch it off when necessary.

**8. Adjudication.** Points will be deducted for errors in the Information sent or received as shown by the logs. Unmarked duplicate contacts will carry a heavy points penalty. Failure to supply the complete information required by Rule 6 may also lead to deduction of points.

A breach of these rules may lead to disqualification. In the case of any dispute, the decision of the adjudicators will be final.

### Listeners' Challenge Rules

Entries are invited from v.h.f. listeners who hear and log stations on the 144MHz band during the contest period. The rules for listeners are based on the general rules (see above).

1. The listeners' contest is open to any individual or group, receiving s.s.b., c.w. or f.m. signals in the 144MHz band. The receiving station may not change its location during the contest. The duration is as stated in the general rules (above).

2. Stations heard and logged may be any station engaged in a contact (CQ, test, or other general calls may not be logged for points), whether taking part in the contest or not. The restrictions of general Rule 2 shall apply, in particular with regard to repeater and satellite contacts being invalid.

3. Scoring for listeners' entries will be done in a similar way to that specified in general Rule 4, i.e. the score will be the number of stations heard multiplied by number of different locator squares heard.

4. Listeners' logs should conform to the requirements of general Rule 5 except that the columns must show: (i) time UTC (ii) callsign of station heard (iii) callsign of station being worked (iv) RS(T) report of signals heard (v) RS(T) and serial number (if any) sent by station heard (vi) locator (or location) as sent by station heard.

Only log entries which contain all this information will count for points. If you hear both sides of a contact, write separate log entries for each station. The same callsign may appear in column (iii) no more than once in every ten log entries.

5. As far as they are appropriate for receiving stations, general rules 6, 7 and 8 shall also apply. Be certain to supply information (a), (c), (d), (g), (h) and (k) in Rule 6.

PW

Fig. 2.

PRACTICAL WIRELESS 144MHz QRP CONTEST 1994			
Date	Callsign	Locator	Sheet No Of
Time UTC	Callsign	Report & Serial No	Locator
		Sent	Received

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	CD 120	1.8-200MHz 200W SUR/PWR	\$117.95 (B)
	CD 160H	1.8-60MHz 2kW SWR/Power	\$104.50 (B)
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73 from Dave G4KQH, Technical Manager.

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PW 2

# Specifications

## - The Mysteries Explained

This month Ian Poole G3YWX takes a look at noise factors and figures.

As I said in an earlier part of this series, signal to noise ratio is used to specify the sensitivity of h.f. radios. For equipment used in the v.h.f. region and above, the noise figure is quoted instead.

The noise figure system is used because it is more versatile and gives a better indication of the overall performance than a simple signal to noise ratio. It can also be used to specify the performance of just the receiver, a part within the receiver like the preamplifier, or the complete system.

### Noise Background

Before looking at the noise figure itself a small amount of background information about noise itself is useful. The noise performance of a receiver is far more important at frequencies above 30MHz because the level of noise picked up by the antenna is much lower at these frequencies. This makes the noise generated by the receiver itself far more important because it now becomes the limiting factor.

Noise can be generated in the set in a number of ways. For example semiconductors themselves generate noise.

Fortunately, it is possible to optimise the design of the circuits to give the best performance. Incidentally, the optimum noise performance rarely coincides with maximum gain.

So, great care has to be taken when designing and aligning circuits to ensure that the optimum settings are achieved. The best signal to noise ratio should be achieved and not the maximum gain.

One type of noise which cannot be reduced (except by reducing the temperature) is called thermal noise. Any resistor or conductor will produce thermal noise.

Even an antenna which is seen as a 50Ω resistor will act as a

noise generator as shown in Fig. 1. It arises as a result of the free electrons in the conductor. At any temperature above absolute zero the electrons will vibrate in a random manner.

As any motion of electrons constitutes a current this vibration constitutes a current even though it is very small. Despite its size the current can still be detected in a receiver as background noise.

### Factor Figure

Although it's not possible to reduce the level of noise below that is produced by the equivalent resistance of the antenna, the receiver circuits should produce as little noise as possible. Ideally they should produce none, but in reality some noise will always be introduced by each stage. The noise factor and noise figure quantify the level of performance of a circuit, set, or system.

The noise factor is simply the degradation of signal as a result of it passing through the equipment. Simply expressed it is the signal to noise ratio at the output divided by the signal to noise ratio at the input. As there will be some

degradation, however small, the noise factor will always be greater than one.

Noise factor is not normally seen in the specifications of receivers and other pieces of equipment. Instead the noise figure is used. This is simply the noise factor expressed in decibels as shown in Fig. 2.

To illustrate the noise factor expressed in decibels. The signal to noise ratio at the input is 3:1 and at the output it is 2:1. This would give a noise factor of 3/2 and a noise figure of:

$$10 \log_{10} (3/2) \text{ or } 1.76\text{dB.}$$

Alternatively if the signal to noise ratios are expressed in decibels then it is very easy to calculate the noise figure. When using logarithms division is achieved by subtracting the two numbers.

It is simply a matter of finding

the difference between the two signal to noise ratios. For example if the signal to noise ratio for a given signal is 10dB at the input but only 7dB at the output, then the noise figure of the device is 3dB (i.e. 10 - 7dB).

### Perfect System

A perfect system would have a noise figure of 0dB. This would indicate that it would introduce no noise at all. However, this is not possible. Typically a v.h.f./u.h.f. transceiver might have a noise figure of 3 to 4dB.

Many 144MHz preamplifiers boast figures of 1dB, in fact the more expensive mast-head ones which use GaAsFETs can give even better figures than this. However, h.f. receivers are likely to have noise figures of only 10dB at best, even the most expensive ones.

PW

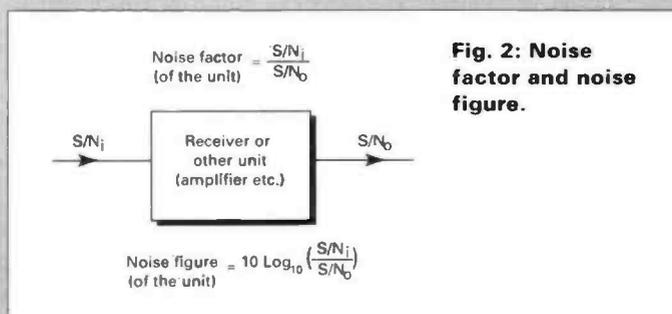
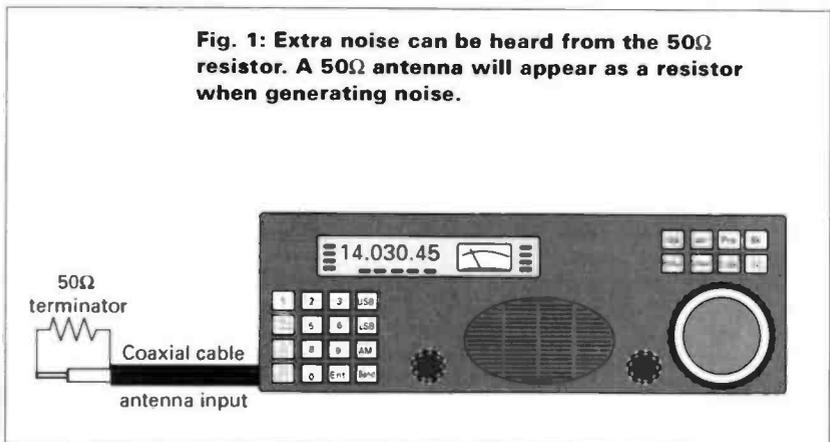


Fig. 2: Noise factor and noise figure.

That's it for this month. Next time I will look at how noise figures of individual items can be used to deduce the noise figure of a complete system.

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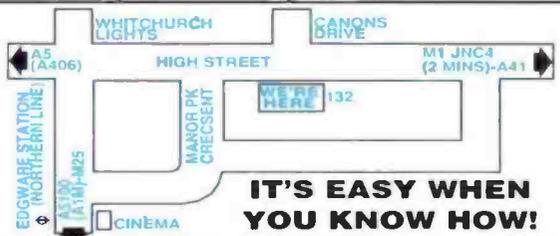
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**IT'S EASY WHEN YOU KNOW HOW!**

## The PW Jubilee 14MHz SSB Mobile Transceiver Part 4

The Rev. George Dobbs G3RJV discusses the r.f. converter section for the Jubilee project and supplies the associated printed circuit board. George also goes out of his way to help you be successful in winding toroids...something which many constructors find difficult!

I've often said in the past in my various articles in *PW*, that many constructors have problems when it comes to winding coils, toroids and inductors in general. So, to help you over this particular problem, I have provided some guidelines in **Fig. 4.1**, on how the inductors should be wound.

If you follow my guidelines carefully, you should not have any problems winding the toroids. However, if in doubt, carefully unwind what you have wound already and start again. Care and patience are always rewarded, especially when it comes to winding coils!

### Assembly Order

The main r.f. converter printed circuit board is shown in **Fig. 4.2**, and I'm going to suggest an assembly order for parts placement on the p.c.b. You don't have to follow the assembly order, but you'll probably find it helpful to do so.

I suggest that the integrated circuits, IC9

and IC10 together with diodes 10 to 15 be placed on the board first. Don't forget to handle the i.c.s with care and to orientate them correctly.

Next, you should place the individual resistors and capacitors on the board. Once you've placed the resistors and capacitors, you can mount coils L3 to L7 and the transistor, Tr4.

The coils L3 to L7, by the way, are prewound Toko inductors. They are KANK3335 type coils.

### Fitting Link

The next stage on the Jubilee requires the fitting of a link, or a 100Ω resistor on the p.c.b. This link/resistor, in conjunction with the 0.1μF capacitors (mounted below L6 and to the left of T7 in **Fig. 4.2**) forms part of a semi-obligatory filter.

The filter may be necessary to reduce r.f. feedback. The feedback may manifest itself as a 'warble' on the transmitted audio. The 100Ω resistor is advisable in any case, and if you have to fit one 0.1μF capacitor, I recommend that you fit both.

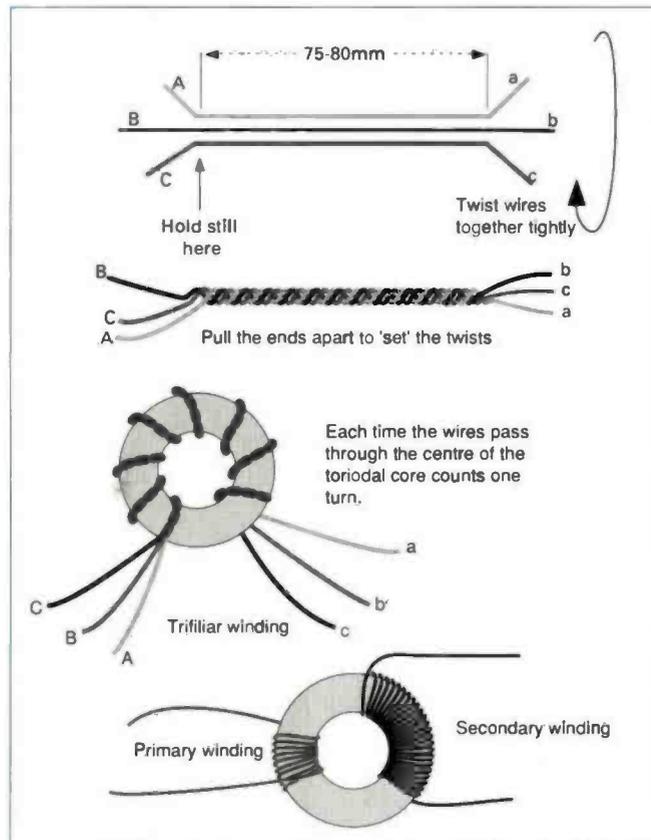
Capacitors C77a and 77b on the r.f. board are a tight fit. They have to be fitted into the same holes, there's not a great deal of space to spare, so be warned!

### Care Rewarded

At this point, I should remind you that all your care in construction will be rewarded when you end up with a stable transceiver. Stability and reliability in a transceiver such as the Jubilee is important - bearing in mind the conditions under which it's likely to be used.

Careful coil winding and neat clean solder joints are essential for reliable operations. It's also important that the ends of coil windings cannot move around (when subjected to vibration) if the stability and efficiency of the transceiver is to be at its best at all times.

**Fig. 4.1: Inductor winding information. The inductors T2, 3, 4, 5 are trifilar (details on diagram) wound on K37X830 6.3mm o.d. ferrite toroids. The inductors T6 and 7 are also wound on K37X830 toroids. The general principles used to wind the inductors are illustrated within the diagram.**



## Power Amplifier Kit

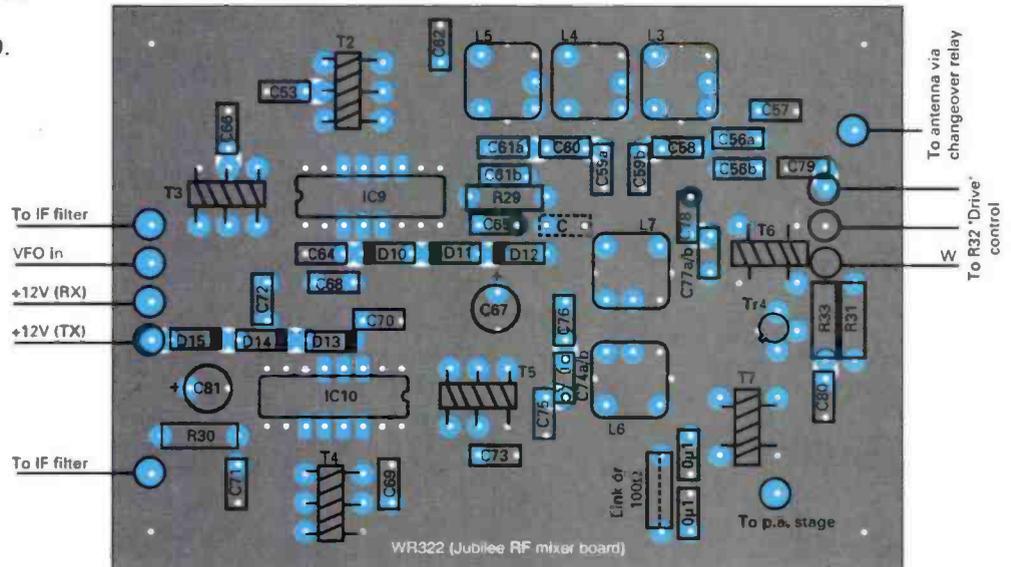
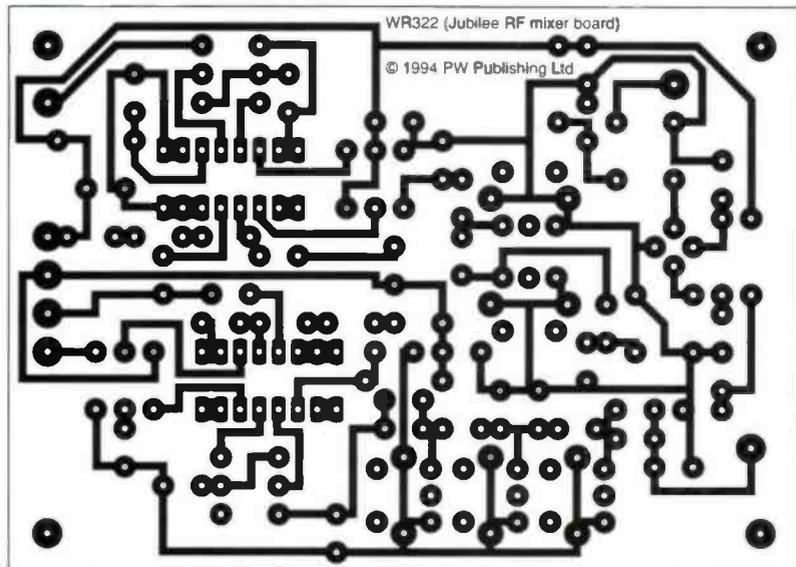
In the next part of the project I hope to complete the unit. With the addition of a suitable power amplifier stage (available in kit form), your Jubilee transceiver will be ready for service.

In the final part of the project I'll be describing a c.w. carrier oscillator, a low pass filter and an audio band-pass filter. I will also be providing a full 'shopping list' for the components and information on a kit supplier.

So, until next month I'll say cheerio and recommend that you keep your soldering iron hot and very busy!

PW

I apologise that due to an administrative problem the p.c.b. shown in last month's issue, carried the wrong number. The correct number for the IF Board is WR319. Editor



**Fig. 4.2: The p.c.b. of the r.f. converter board of the Jubilee transceiver showing the track pattern and associated overlays for earth plane and component placement. (See text for details on semi-obligatory filter to be inserted under L6 and to the left of T7).**

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WR312	Receiver/Mixer (Getting Started)	Nov 92	WR287	Morse (Speedbrush)	May 91
WR311	Oscillator BFO (Getting Started)	Sept 92	WR255	Meon-4	May 91
WR310	1.2GHz Pre-scaler	Aug 92	WR285	Scope Probe PSU	Apr 91
WR309	Volt Reg/Divide by 100	Aug 92	WR284	Scope Probe	Apr 91
WR308	TTL 1MHz Oscillator (Getting Started)	July 92	WR283	Sudden Receiver	Mar 91
WR307	Crystal Checker (Getting Started)	June 92	WR282	Repeater Toneburst	Feb 91
SET	WR303/304/305/306 Inductance Bndge GDO (Getting Started)	Apr 92	WR281	High Voltage PSU	Jan 91
WR302	Challenger Receiver	Feb 92	WR263/264-WR276-80 SET	WR263/264-WR276-80 SET	Jul 90
WR300a	OSCAMPA Oscillator	Mar 92	WR272	Marland Transmitter	Sep 90
WR300	OSCAMPA Amplifier	Feb 92	WR275	NiCad Recycler	Jun 90
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WR297/298	Additional Beaver boards		WR273	Valve PSU	May 90
SET	WR295/296 PW Beaver	Oct 91	WR275	RX Attenuator	May 90
SET	WR292/293/294 Chatterbox	Aug 91	WR271	Product Detector	Apr 90
SET	WR290/291 Robin Freq. Counter	Aug 91	WR270	Badger Cub	Apr 90
SET	WR292/293/294 Chatterbox	Aug 91	WR269	Glyme	Feb 90
			WR268	Inwell (RF PA)	Feb 90
			WR264	Inwell (Relay)	Feb 90
			WR263	Inwell (VFO)	Jan 90
			WR267	PW 49'er	Jan 90
			WR266	Tuned Active Antenna	Jan 90
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			WR199	Meon 50MHz Transverter	Oct 85
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# Valve &

Ron Ham welcomes you once again to the PW vintage wireless 'shop' where you can savour the softly glowing dials, warm cabinets and radio sets which take a minute or so to 'warm up'!

Welcome to the 'shop' again. I've heard from Mr C. M. Thomas (Haverfordwest, Wales) that he's got an ex-army R109A receiver. This receiver was made in 1945 and has 'RGD' on the name plate. If this is the makers identification, I expect the letters stand for the Radio Gramophone Development Company.

Mr Thomas says that by adding a long-wire antenna the audio output from a strong signal becomes distorted. He has also tried another output valve which made no difference.

Therefore, especially with a set of that age, I think you must look deeper into the problem Mr Thomas. Further tests are needed.

I'll assume that your receiver's h.t. and l.t. voltages are correct and that the loud-speaker is clean and the cone has free movement. Then my thoughts would turn toward the coupling capacitor to the control grid of the output valve or possibly 'high' value resistors in the a.g.c. circuits.

If the insulation of the former is breaking down then it would cause distortion by letting a positive voltage, from the anode of the driver valve, on to the output valve's grid. This capacitor is there to block the path of the d.c., needed to run the driver, but let the audio signal pass through. Incidentally, the capacity of this component is almost critical because it can effect the audio tone.

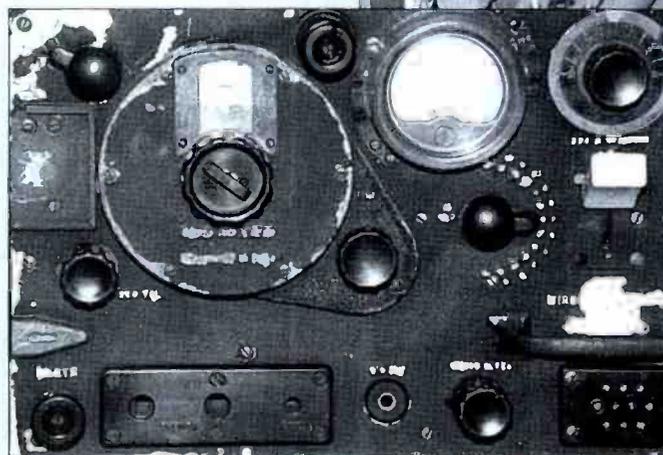
## Interesting Letter

Another interesting letter arrived and it began "The 19 set has had a great meaning for me". So wrote Christian Callaerts-Le Roye from Waterloo, Belgium.

Christian was a young technician when the war ended in 1945. He discovered that a large number of 'smashed' 19s were being sold for 15 Belgian Francs per 1kg.

"It was marvellous for me to discover the superb quality of the components used in them", he said. However, Christian bought one, "in an awful state".

A few days later he was back at the shop for more bits to get his set working. This was the beginning of



many hours of real pleasure for Christian. He still has a crystal calibrator (CMC 110-583) made for the 19 set by the Canadian Marconi Company.

Time for more memories now. My February 'V&V' brought back childhood memories for Ian Ruddock (Harlow, Essex). During his weekends and school holidays, Ian worked in a scrap-yard helping to sort the 'junk' which included government surplus

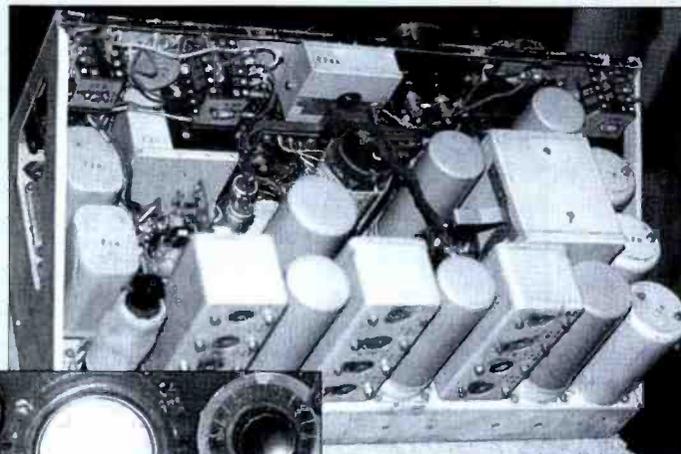


Fig. 3: The control switches and 'tappings' on the p.a. coil can be seen in the centre of this photograph (see text).

Fig. 2: Close up view of the 11 set's dial mechanism (see text).

gear.

The scrapyards owners gave him a 19 set, complete, in its wooden packing box (stop drooling readers!) "The battery cable had its lugs fitted on the wires and I had the two 6v lead-acid batteries (40/50Ah), in metal boxes, with wing-nut terminals", Ian wrote.

Ian cut a lead to the rotary transformer to stop the set switching to transmit and very much enjoyed using the receiver. "This 19 was my 'pride and joy', he wrote, but unfortunately it was among the things stolen from his home while he was at work.

## Rare Set

Now we turn to a rare set. "In all the many articles I have read about Second World War radios, I have yet to see any reference to the WS11, the predecessor of the WS19", wrote Alex McCreadie from Eyemouth, Scotland. There are many stories about the famous 19 set and its use in battle.

Alex was a signaller with the Royal Artillery and well remembers their excitement when they received their first consignment of 19 sets. "They were the state-of-the-art technology of the time", said Alex.

The 19 set used international octal

valves and an 807 p.a. "We happily 'tuned for maximum smoke' - and it seemed to work"! he said and now knows that the saying 'the only way to kill an 807 is with a sledgehammer', is true!

But Alex, you spoke of the WS11, so take a look at Fig. 1. And, as you rightly said, "it used 2V battery valves and was black, bulky and heavy".

## Sussex Barn

The set in Fig. 1, was found in a Sussex barn some 10 years ago and given to the Amberley Chalk Pits Museum. It was built in 1939 by E. K. Cole Ltd., has eight valves, two Westectors and tunes from 4.2 to 7.5MHz in one band.

Like most military sets the controls can be locked by the usual plate compression arrangement. This can be seen in Fig. 1, at the upper right and upper left of the receiver and transmitter antenna trimmers respectively. See also top right Fig. 2.

The operational frequency is selected by first slackening the 'lock' in the centre of the tuner, Fig. 2. Then the operator has to rotate the outer knob.

After selection, the 'lock' is tightened. This action engages the knob at the lower right of the tuner and allows



Fig. 1: The 'Wireless Set No. 11' seems to be quite rare. The WS11 pictured here was found in a barn approximately ten years ago and now resides in the Chalk Pits Museum in West Sussex (see text).

# Vintage *By Ron Ham*



**Fig. 4:** Close-up view of the p. a. stage coil with associated tappings in the 11 set. The two screening cans visible shield valves(see text).

for the operator's headphones.

Next is a connection for a telephone line input, and the pair on the far right are for a microphone and Morse key. The terminal posts to the left of the meter and at the bottom left of the panel are for the antenna and earth connections respectively.

Switching for high/low power, a.g.c./manual and c.w./r.t. are among the pointed knobs in Fig. 1. The potentiometers to adjust the b.f.o. depth of modulation, noise limiter and audio gain have the round knobs at the bottom

ATP7 or CV1368 or Mazda V226.

The other valves (all directly heated) are two triode-pentodes (ARTP1-CV1344-Mazda TP22). There are also five pentodes (ARP4-CV1322-Mazda SP210).

The two 9-pin TP22 valves are positioned on the lower right of Fig. 3 and to the right of the 'tank' coil in Fig. 4. An eleven position circuit test panel is situated under the handle in Fig. 1 and 2.

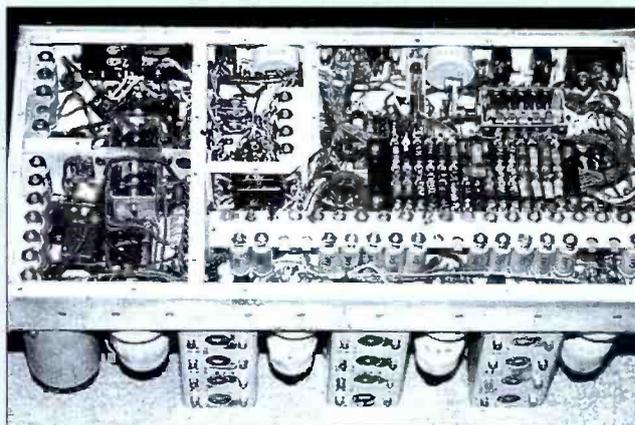
## Museum In Orkney

My thanks go to George Wright (Lowestoft) for telling me that there's a radio museum, "well worth a visit if you are in the vicinity", at St. Mary's Hope, on South Ronaldsay, in the Orkney Islands just north of the Scottish mainland.

Thanks also to Ted Double for telling me that, in addition to a fine selection of military vehicles and artillery guns, 'The Muckleburgh Collection' at Weybourne Military Camp, (on the A149 coast-road between Sheringham and Blakeney,

Norfolk) has a large section, under-cover, of military radio gear.

That's the lot now. It's time to shut up the shop, but I'll be back next month. In the meantime....keep writing!



**Fig. 5:** A full length covering plate has to be removed to expose the under-chassis of the 11 set.

slow-motion tuning for just a few kHz each side of the chosen frequency.

Two 13-position stud switches, one each side of the send/receive switch, (above handle, Figs. 1, and 2) are used in conjunction with the antenna trimmers to match the antenna to the transmitter or receiver.

The tappings on the 'tank' coil to one of the stud switches can be seen in the centre of the upper-chassis layout, Fig. 3. They're also visible in the close-up, Fig. 4.

## Metallised Coating

Each valve, except for the p.a. stage (upper right Fig. 4), has a metallised coating. They are further screened by a screw-on metal cover.

Six of the tall round screening cans can be seen in Fig. 3. There are also two in Fig. 4, and the seventh, bottom left can be seen in Fig. 3, (which I removed to show the valve in position).

Obviously, screening is an important feature because the main tuning capacitor is under the oblong cover, right Fig. 3. The 'square' receiver and antenna trimmer enclosures are visible at the top centre and lower left respectively of the front panel in Fig. 3. (Also on the left of Fig. 4).

A full size metal plate has to be removed to see the under-chassis wiring and component layout, Fig. 5, of the WS11. About 45 of the metal cased 'small' capacitors, are bolted to sub-frames mainly at the left and lower centre, Fig. 5 of the chassis.

Each securing nut is sealed, like the coil cores, to stop them vibrating loose in action. Four of the valves, with cans removed and their WD labels visible can be seen at the bottom of Fig. 5.

The large send/receive lever, prominent in Fig. 1 and 2, operates two multi-contact switches seen at the centre left and upper right of Fig. 5.

A section of its lever control mechanism is protruding to the left of the switch unit in the upper right of Fig. 5. The two Westectors are visible in the upper left and the centre of the resistance bank in Fig. 6. This close-up, also shows three of the h.f. chokes on a tag board hidden behind the lower chassis frame in Fig. 5. The circuit position markings are carefully 'scribed' on each component.

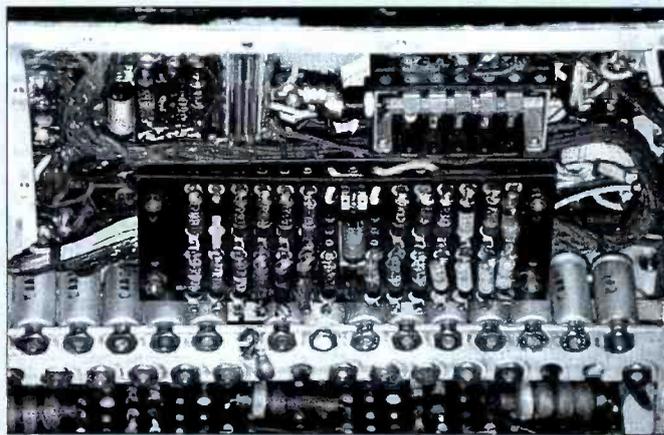
## The Controls

Let's take a look at the controls now. The first two jack sockets on the lower left of the front panel, Fig. 1 and 2, are

right, top right, bottom centre and centre left respectively.

## The Valves

Now we come to the valves. All I know about the clear glass p.a. valve, with its top cap secured by a clip, (right of 'tank' coil Fig. 3 and 4) is listed as an



**Fig. 6:** The two Westectors used in the 11 set can be seen in this photograph (one is mounted at the left top and the second is located in the centre of the tag-board carrying resistors).

# Antenna Work

Few houses have gardens with enough land to take a full sized h.f. beam. This has led to many designs being published for reducing the physical size of an antenna while at the same time trying to retain its effectiveness.

Some designs for compact antennas use loading coils that work quite well. But loading coils are often lossy and are not easy to construct. Another way of reducing the physical size of a beam antenna is to bend the elements.

In this 'Antenna Workshop' I will look at some of the simpler practical designs that have been published. Quite a lot has been written about this method of making compact antennas, and this is about some of my experiments using simple two element antennas with bent elements.

## Two Elements

Let's start with a look at the gain and front-to-back ratio of a full size two-element Yagi working on, say 28MHz. Although the boom of this antenna is only 3m, the longest element is over 5m in length.

The calculated directivity curves are shown in Fig. 1, these agree quite closely with the measured values. This is to be our reference antenna and any compact antenna worth erecting should have a performance that's fairly close to it.

## Earliest Documented

The earliest documented attempt at making a compact parasitic beam, to my

knowledge, was described in *QST* magazine some 47 years ago (October 1937!). The design was apparently first suggested by John Reinartz W1QP.

A wooden frame was used to support the W1QP antenna elements, which allowed the element ends to be folded towards each other. A model was constructed for 14MHz by Burton Simson W8CPC and the diagram, Fig. 2, of this antenna is from *QST*.

The elements of the original W1QP/W8CPC design were constructed from 1/4 inch copper tubing with brass tuning rods fitted snugly into the ends of the elements. An additional brass rod was used as a shorting bar for the centre of the reflector.

The tuning procedure was interesting. The only test

equipment available appears to have been an r.f. ammeter (0-5A), the transmitter p.a. current meter and the receiver S-meter.

The method of adjustment for this antenna is interesting. The r.f. meter was connected by short leads to the gap in the reflector and the driven element connected to the link coil of the transmitter by low impedance twin transmission line.

The brass rods at the ends of the driven element were adjusted for maximum transmitter p.a. current. The rods at the tips of the reflector were then adjusted for maximum r.f. current.

The individual element adjustments are interactive, and so the adjustments would have been repeated several times. When the adjustments were complete, the r.f. meter was removed and the gap closed with the brass rod. This tune-up procedure tunes the reflector to the transmitter frequency.

According to K1TD, if the reflector is resonant at the operating frequency. Maximum gain occurs when the reflector is spaced  $\lambda/4$  behind the driven element, which is the case with this antenna.

On tests with G5ML, a front-to-back ratio of S9 to S2 was reported by W8CPC.

However, in the light of modern measurement and modelling techniques, I think this claim is a bit suspect. The best front to back ratio I could muster with a VK2ABQ, (an antenna using the same configuration) is about 12dB.

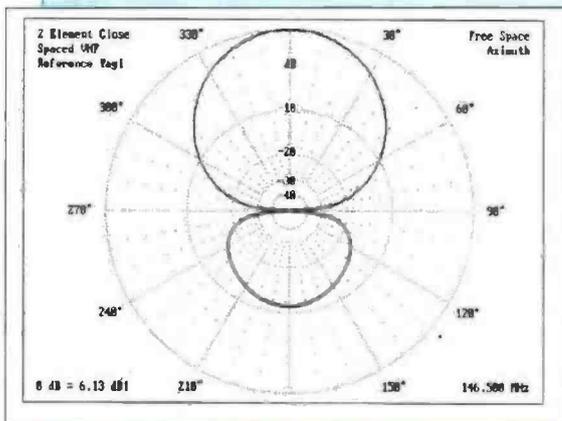


Fig. 1 (above): Computer model of a two-element Yagi gain and polar diagram.

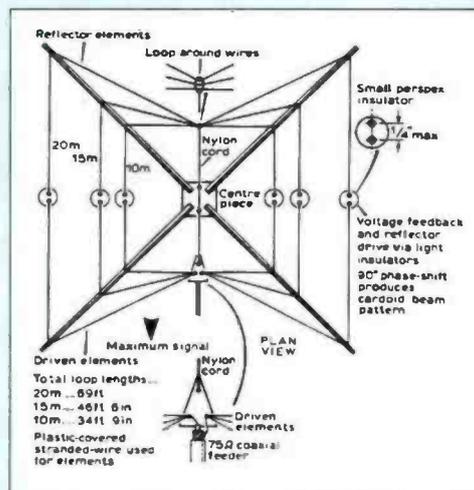


Fig. 2 (right): The VK2ABQ wire two-element beam antenna (G3LZR improved version) from *Amateur Radio Techniques*, RSGB publication [3]

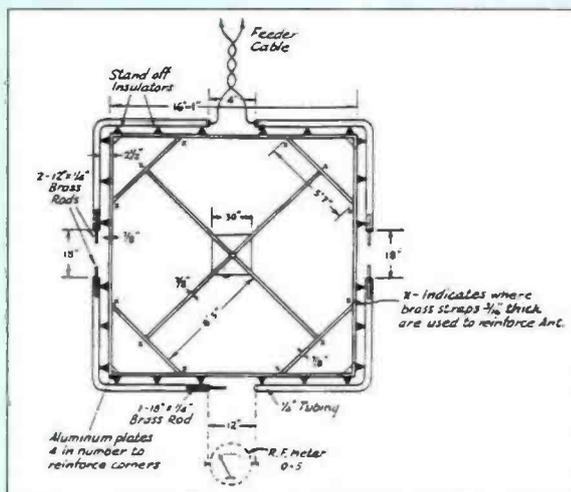


Fig. 3 (top right): The W1QP/W8CPC two-element 14MHz antenna with bent elements first described in *QST* October 1937.

## Wire Element Version

A wire element version of the W1QP/W8CPC antenna (Fig. 2) was described in 1973 by VK2ABQ[2]. And an improved derivative is illustrated in Fig. 3 [3].

In the VK2ABQ design configuration the antenna is made up from wire. The tips of both the parasitic and driven elements support each other with insulators in the

# rkshop

This month Peter Dodd G3LDO begins a two part article about reduced size beam antennas. How efficient are they? Can they replace a full size antenna. For those and other answers, read on.

horizontal plane.

The VK2ABQ design is constructed so that the tips of the elements are 5-10mm apart. According to the designer of the antenna [2], the reflector element is capacitively end coupled to the driven element. The gap between the tips of the elements is described as 'not critical'.

No mention is made of what happens when they get wet in the rain. Gains of 4dB and front-to-back ratios of 12 to 18dB (presumably relative to a dipole) are quoted.

## Design Model

If I am unsure about an antenna design, I usually make a v.h.f. model of it. The reason is that it is much easier to make a small v.h.f. model and measure its performance than to make the full size h.f. version. However, my early experiments with v.h.f. models of the VK2ABQ antenna were rather disappointing.

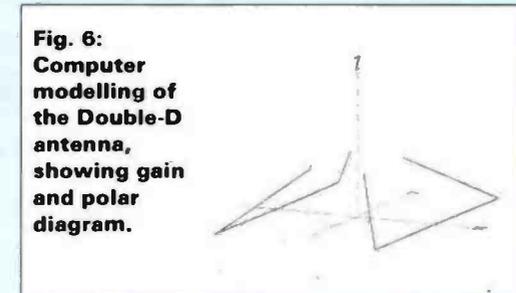
I constructed a v.h.f. scaled model of the VK2ABQ antenna with wire elements laid out on a wooden cross spreader. I tried various insulators, element tip spacings and wire lengths and succeeded in obtaining good directivity, but the gain was very little more than that of a dipole.

A computer model of the VK2ABQ roughly supports the claims made for it. The free-space gain calculates to just over 4dBi and the front-to-back ratio is 11.6dB.

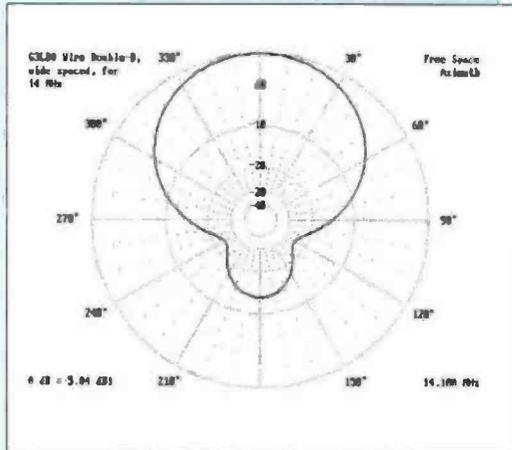
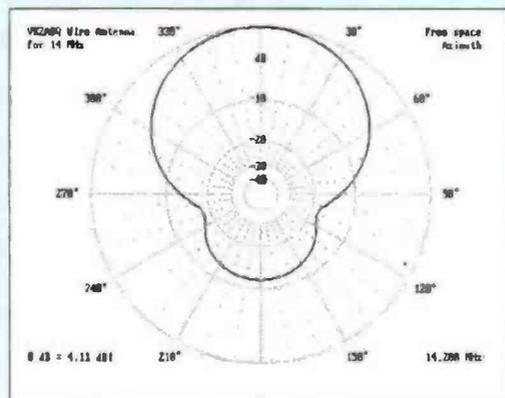
In reality, allowing the elements to droop, rather than being brought together in the horizontal plane, the gain improved and the antenna became much less critical to adjust.

The difficulty I had when modelling this antenna at v.h.f. is possibly due to capacitive end-coupling effects. I tried to introduce some capacitance to the ends of the elements in the computer model, but the performance became more unpredictable.

With v.h.f. modelling the lengths, capacitances and inductances in the v.h.f. scale model are reduced in



**Fig. 6:**  
Computer modelling of the Double-D antenna, showing gain and polar diagram.



**Fig. 5:** Configuration of the Double-D Antenna. The driven element is fed in the centre on the X axis.

**Fig. 4:** A Computer model of the VK2ABQ gain and polar diagram.

proportion to the linear dimensions. But gains and impedances are unchanged. However, the insulator represents a fixed capacitor with a reactance that is frequency dependant.

If we assume a value of around 0.2pF for the wires held in the insulator by knots, 5-6mm apart, the coupling reactance is 38kΩ at 21MHz and 5.5kΩ at 145MHz. I think that the full size VK2ABQ works as a two element beam with bent elements and this is one of the rare instances where v.h.f. modelling of larger h.f. beams has not been successful.

## All Directions

A v.h.f. model of a two element antenna was tried with the elements bent in all directions. This model gave the same gain as a two-element yagi. That was provided the elements were not folded too far back on themselves, or directly towards each other on the same plane.

The antenna structure in Fig. 5 illustrates the limit to the degree of bending that could be imposed on a two element beam without a noticeable deterioration in gain and directivity. The ends of the

elements can be folded back towards the mast and down to an angle of 20° from the horizontal before the gain started to deteriorate.

The 'new' shape proved to be a simple and stable mechanical arrangement. Look at Fig. 5, the bent elements of the wires can be supported by the mast (Z axis). This in turn can provide guys to support the element structure.

The light-weight structure can be quite strong, as an all metal derivative for 21MHz survived the hurricane of October 1987. I've christened this antenna the "Double-D" and it provides a gain of more than 5dBi with a front-to-back ratio of better than 13dB.

As you can see, by

comparing the various polar diagrams, bent antennas do not perform quite as well as the full-size two-element beam. However, considering that the turning radius can be halved, the compromise is well worth while. PW

*In the next Antenna Workshop I'll describe practical constructional information on a range of Double-D antennas.*

## REFERENCES

- [1] Concentrated Directional Antennas for Transmission and Reception, QST October 1937, John Reinartz, W1QP and Burton Simson W8CPC
- [2] VK2ABQ Antenna. *Electronics Australia*, October 1973, Fred Caton VK2ABQ
- [3] VK2ABQ Antenna. *Amateur Radio Techniques*, RSGB

The Computer  
in Your Shack

# BITS & BYTES

If you use or own a non-PC machine, Peter Hunter GOGSZ has some good news for you in this month's 'Bits & Bytes'.

Firstly this month I have an important announcement to make. Due to the large volume of messages and information received via FAX, I now have a separate line for FAX only.

The FAX line is available 24 hours a day, 365 days a year. So, whether you're a reader, a trader, a programmer, or just someone who wants to try out their FAX machine, if you want to send messages, information, software lists, hardware info, please feel free to do so. The new FAX only number is: (0603) 740800.

### The Mailbag

Now it's time for a look into the mailbag. First this month is a letter from **Carmel Accopardi** in Malta.

Carmel is building himself a Decoder Interface for RTTY for his Commodore 64. The problem he has is finding a suitable program to work on the C64. If anyone has any useful information for Carmel would you please let me know and I'll pass it on.

I will tell him where the information came from as I'm sure he'll want to write and thank you. The best advice I can offer Carmel is

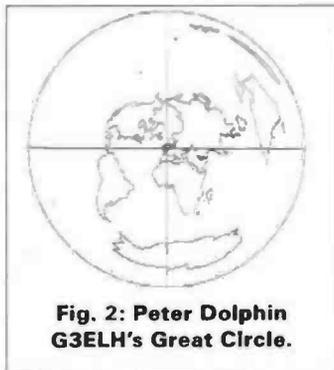


Fig. 2: Peter Dolphin G3ELH's Great Circle.

to contact **J & P Electronics Ltd., Unit 45, Meadowmill Est., Dixon Street, Kidderminster DY10 1HH. Tel: (0562) 753893.**

The next letter from my mailbag is from **Mr F. W. Rackham G0TGT, 17 Highbury Place, London N5 1QP.** The request from Mr

Rackham is for packet software for a Radio Shack Colour Computer 2 System which is operating Extended Basic by Microsoft.

This time I'm afraid I have no advice to offer whatsoever, so I'll leave this one entirely up to *PW* readers out there to contact G0TGT direct. I hope someone can be of help.

### Other Machines

Now I have some good news for users of non-PC machines. These 'other machines' are namely Apple, Amiga and BBC systems.

The first of the 'other machines' is the **Apple Macintosh**. This information is especially for all those who have contacted me in the past, wanting 'Ham' radio programs for Apple computers.

The screen dump Fig. 1, is from a program called OrbiTrack, which is a satellite tracking program. There are several programs for packet radio, including NET/Mac, SoftKISS and Virtuoso.

There is also a program called TalkTerm which is for use with your local DX Cluster, it will 'speak' incoming DX spots. There's also a Morse code training program, and much more.

All of this information for the Macintosh was sent to me by **Sean Sharkey, 7 Cromwell Close, London N2 0LL.** Sean is a very enthusiastic Mac user. If you would like to know more then please contact Sean at the above address, (Don't forget to include a

s.a.s.e.) or via packet **G00AN @ GB7HSN.** Many thanks Sean for sending me the information.

The next machine is the BBC range. **Dick Goodall GM00GZ** sent in details of amateur radio software for the BBC, and where to get it. There is a company

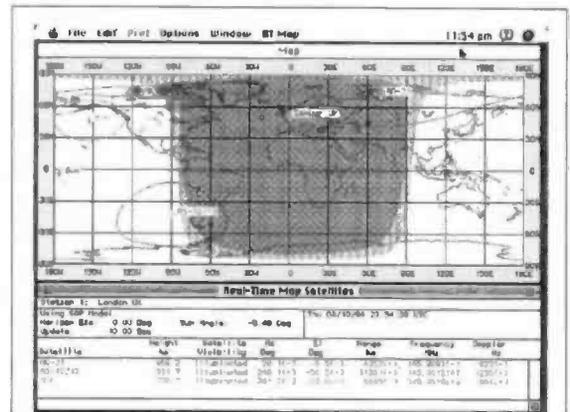


Fig. 1: Sample screen dump from OrbiTrack.

called **BBC PD** that has a large quantity of software for the BBC. Two disks of particular interest to the radio amateur using a BBC are: disk No. 83 PCB Design (CAD) and disk No. 146 which holds a large selection of programs for all the DATA modes, as well as plotters and a locator conversion program. These disks are £1.50 each, as is BBC PD's on-disk-catalogue.

The address of BBC PD is **BBC PD, Alan Blundell, 18 Carlton Close, Blackrod, Bolton BL6 5DL.** Please make cheques out to **Alan Blundell** and not to BBC PD.

Finally on the list is the **Amiga**. I received several disks and a nice screen dump (see Fig. 2) from **Peter Dolphin G3ELH.**

The screen dump was produced using a program called **Great Circle**, which Peter wrote himself in AMIGA BASIC. Peter hasn't quoted any price for these programs, so I would suggest you send him a self addressed and stamped envelope with a request for details of these and any other programs he has. The address to write to is **Peter Dolphin G3ELH, 3 Buckmore Avenue, Petersfield, Hampshire GU32 2EF.**

As I have had to part company with my Amiga I wasn't able to take a closer look at Peter's disks. However, the situation may soon change, if it does I'll give you more details of their contents.

In the mean time please don't stop sending me details of software for those machines mentioned above as well as any others. I can still inform the readers as to

what's available for their machines!

### Shacklog Upgrade

I have just received news that Shacklog has been upgraded again. It has many new advancements which include putting **Locators** onto the QSO screen and QSO labels (ideal for the v.h.f./u.h.f. operator).

Shacklog is still just £27.50 and £7.00 for the IOTA option (just £10.00 if you are upgrading from version 3). Cheques should be sent to **Alan Jubb G3PMR, 30 West Street, Great Gransdon, Sandy, Bedfordshire SG19 3AU.**

And here is a date for all you amateur radio computer users, October 7, 8, & 9, 1994. This is the date of the HF & IOTA Convention.

This year there will be lectures on 'Computers In The Shack' (nothing to do with me!) 'Data Modes', 'Packet Cluster Workshop'. There will also be demonstrations of Shacklog, Super Duper and Turbolog, as well as an exhibition of Shareware by Venus Electronics.

That's it for this month again, keep my postman busy, it makes his job more secure! 73 to all, de **Peter Hunter GOGSZ, 2 Mayes Close, Bowthorpe, Norwich NR5 9AR. Tel: (0603) 748338 or FAX: (0603) 740800 or Packet @ GB7LDI.#35.GBR.EU**

**E N D**

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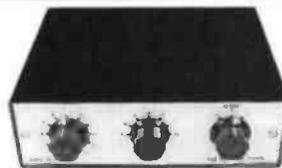
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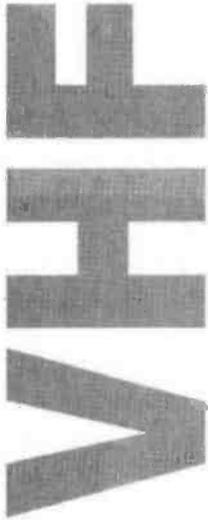
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*This month David Butler G4ASR brings reports about recent tropo and auroral openings. David's also got information about the Summer Sp-E season and details of a new amateur satellite, and news of a new DXCC country on the 70MHz band.*

# Report



Welcome to the world of radio above 30MHz! I'm sorry to report that conditions on the v.h.f. bands during March were very poor. The resident low pressure areas were not conducive to any good tropo openings.

The only propagation of any note occurred on March 8. The 144 and 430MHz bands were open to Spain and southern France.

At the station of **G0FIG** (IO90) the bands were enhanced all day from 1100-2200UTC. Contacts on the 144MHz band were made with EA1CFF, EA1DKV, EB1ACT and EB1GJP all located in IN53. Other stations to get in the log were EA1CTJ and EA1DHG (IN63) and EA1DDU and EA1EHO in IN73.

Moving up to the 430MHz band contacts were made with EA1DKV and EA1TA in IN53, F5DJB (JN03) and F6CRP (IN96). Located in East Anglia the station of **G4PIQ** (JO02) worked F1ILA (IN93) and F1PYO (IN94) on the

144MHz band. At **G4SWX** (JO02) the EA1VHF beacon (144.967MHz) was heard peaking 539 at 2015UTC.

## Working Auroras

I'm really sorry if you're not into working auroras because I find them rather interesting. They can transform a dull band into something very exciting.

Of course to make the most of auroras you really must use Morse. Auroral back-scatter is a weak-signal mode and the real DX is always found on c.w.

Apart from the more normal contacts with DL, LA, OZ and SM some other good DX has been noted this year on the 144MHz band. These include LY2FR (KO15), OH2NHP (KP20), SP20FW (JO93) and YL2MB (KO07).

Auroral openings were recorded in central England between March 6-16 and March 22. A total of 12 events, the best occurring on March 7.

On the 50MHz band a number of stations worked into LA, OZ and SM. The beacon OH1SIX (50.025MHz) was heard via Auroral-Es at 1650UTC by G8GXP.

Up on the 144MHz band the station of SM1BSA (JO97) was much in demand. Stations in northern DL, LA and OZ were also being worked.

Do you remember the auroral calendar shown in the May issue? It showed 28-day repeats of activity. These were on November 18, December 15, January 11 and February 7.

Well, the repeats continued for another two months with auroral activity on March 6 and April 2. There may even have been repeats on April 29 and May 26. By keeping this type of calendar you know when to pay special attention to the v.h.f. bands.

## The 50MHz Band

Very little activity has been reported on the 50MHz band so far this year. By the time

you read this though the summer Sp-E season will have started.

In the northern hemisphere the Sp-E occurs between April-August with a minor peak in late December or early January. On the 50MHz band it may be prevalent nearly every day at some time during the day and evening.

Expect very strong signals from stations up to 2000km away. Sometimes it's rewarding to listen for the weaker stations. They can turn out to be the real DX two or three hops away.

Openings on the 144MHz band generally occur during the months of June and July. The best times are usually between 1100-1300UTC and 1700-2000UTC.

## New Satellite

A new amateur satellite, AMRAD-OSCAR-27 (AO27) is now up and running. It's an f.m. transponder. And, just like a normal terrestrial repeater it will support only one QSO at a time.

You transmit on 145.850MHz (uplink) and receive its downlink on 436.800MHz. It's providing a strong signal, which is easily heard on a hand-held.

If the band is quiet it's also possible to capture the satellite with as little as 3W. Great for those with dual-band handies!

Unfortunately, because of its high sensitivity the new satellite is subject to interference from illegal transmissions. When the AO27 footprint covers southern Europe a number of Spanish speaking stations appear on the 436.800MHz downlink. They appear to be operational taxi cabs, mainly in the Madrid area!

A growing number of operators are now taking an interest in satellite communications. One of the advantages is that the antenna system can be quite small.

Another advantage of satellite operations is that the use of low power

reduces TVI problems. The photograph, Fig. 1, shows the 144/430MHz antennas at the QTH of Simon Lewis **GM4PLM**. Simon mentions that his photograph just shows what can be done in postage stamp gardens!

A more elaborate array is shown in the photograph, Fig. 2. It shows the terrestrial and satellite array at the QTH of Klaus Schaub **DJ3NY**.

## Locator Database

**John Dundas GM00PS**, sysop of the GB7SDX DX Packet Cluster has provided some information about a new locator database. The database has over 3 500 entries of callsigns and locators.

To access the information it's necessary to log into a local DX packet cluster. The command "SH/QRA" is then sent along with the call sign of the station being queried.

For example, sending "SH/QRA G4ASR" will return the answer "G4ASR David IO81MX". This could be a useful source of information for the v.h.f. DXer.

The database is regularly updated by users of the system. However, John mentions that he is still looking for more input. If you have a similar database or suitable log extracts please send them to him at: **34 Annesland Road, Glasgow, Strathclyde, Scotland G13 1XB**.

John has kindly offered free copies of the database if you want one. Send him a blank 3.5in or 5.25in disk with an s.a.e. and two International Reply Coupons. Overseas stations should send five IRCs. You can obtain IRCs from your local Post Office.

## Expedition To Jordan

I've received further information about the UK Six Metre Group (UKSMG)

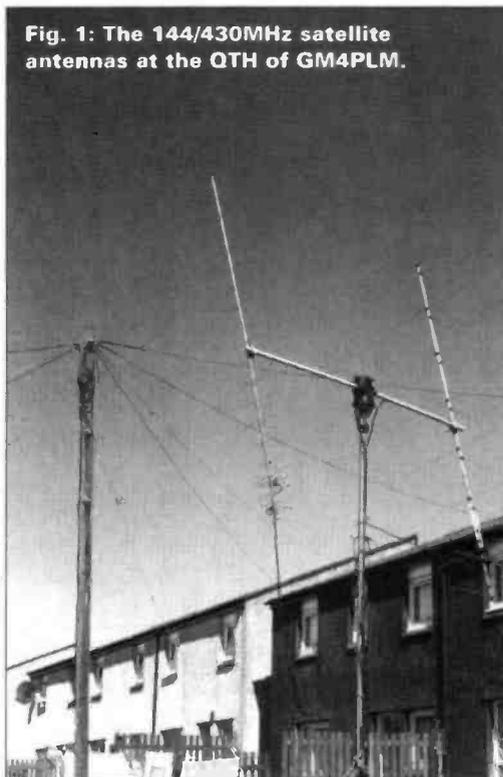


Fig. 1: The 144/430MHz satellite antennas at the QTH of GM4PLM.

expedition to the Hashemite Kingdom of Jordan. They will be active between May 29 to June 26 with the call sign JY7SIX.

The first operators to arrive and install the station will be GJ4ICD and G0JHC. They will be followed by DL7AV, G3K0X, G3SED, G3WOS and G4CCZ.

The 50MHz station will be located on the top floor of the Amman Marriot Hotel. The Marriot is situated in locator KM71WX. It's on top of Jebel hill, overlooking the city centre.

The UKSMG are pleased to announce that several UK companies have provided equipment for the DXpedition. They would particularly like to thank **South Midlands Communications, Nevada Communications, R.N. Electronics and Kent Keys**. Without them it is unlikely that the trip could take place. And, speaking for myself I think it's really good to see this level of support from UK companies.

In Jordan, a Yaesu FT-650 running 100W will feed a 6-element long boom Yagi. This will produce approximately 1kW e.r.p.

The antenna will be mounted on the roof at 50m above ground level. The location has a clear horizon in all directions.

In order to get as many calls in the log please take note of the following guidelines: If JY7SIX is running a pile-up and you are in the log, don't call again. The group are not interested in knowing your locator or name.

Please limit your exchange to call signs and reports only. If JY7SIX require more information from you they will ask for it.

Incidentally a number of you may not know what the minimum information for a valid QSO are. To help, I'll outline them below.

The basic requirements for a contact are that both stations correctly receive **ALL** of the following: Both complete call signs and some other information that was not previously known.

Additionally, an acknowledgement that these requirements have been received. This can be 'QSL', 'roger' or 'R' on c.w.

Generally speaking, you are therefore looking for both call signs, your report and a confirmation that everything has been received correctly. That's all you need to exchange for a minimum valid contact.

During the UK Six Metre Group contest on June 4 the

correct contest exchange will be required. This will additionally require the exchange of locator squares.

When the 50MHz band appears to be closed, the DXpedition will run a beacon, call sign JY7SIX, which will operate on 50.075MHz. They'll also be active on the h.f. bands (3.5-28MHz).

Various multi-band dipoles and a Kenwood TS-850S will be used by the Jordanian DXpedition team. Computer logging will be used to produce contact labels.

A full colour photo QSL will be printed. Direct cards should include an s.a.e. and return postage (\$ or IRCs). All QSLs should go via **Paul Simons G4CCZ, 'Westwood', Faris Lane, Woodham Surrey KT15 3DJ**.

## Expedition To Scotland

**John Fitzgerald G8XTJ**, the Worked All Britain publicity officer, has sent details of a v.h.f. expedition to Scotland. It's part of the Silver Jubilee activity of the Worked All Britain group.

The stations of G7BXA, G7DKX, G7HSP and G0NES will be active, with appropriate call signs, between June 10-24. Many rare WAB squares and locators in north-west Scotland and the Western Isles will be activated. Look out for them on the Island of Mull (NM31/1066) on June 12.

On June 17, the group will be on South Uist (NF71/1067). The following day they plan to be on Benbecula (1067) before going to North Uist (NF97/1067) on June 19.

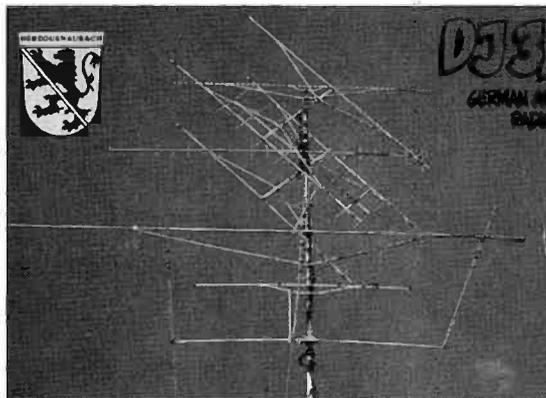
The WABers will activate the Isle of Skye on June 15 and 22. Then it's over to Ardnamurchan Point (NM46/1066) on June 24. If possible they will also try to be active from Ben Nevis (NN17/1076) sometime during the trip!

Frequencies to monitor are 50.122, 50.222 and 144.222MHz and the various calling channels. A special QSL card will be printed.

A certificate for working the WAB team from two or more islands on the 50, 144MHz or mixed bands is also available. It will cost £3 with all profits going to the WAB Royal National Lifeboat Institute (RNLI) appeal.

**Further details from: Peter Green G7DKX on (0532) 563 462.**

**Dave Court G3SDL** has received permission to



**Fig. 2: The v.h.f./u.h.f. antenna array used by DJ3NY.**

operate on the 70MHz band whilst on holiday in Cyprus. He will be QRV between June 30 and July 12 as 5B4/G3SDL.

But, to enable this rare 70MHz country to be activated Dave wants your help. Ideally, he needs a self-contained transceiver and amplifier. As a minimum he only needs the loan of a 100W solid-state amplifier. Please contact me if you can provide any of this equipment. Dave needs to collect it in the UK before June 27.

## Contest News

Now it's time for some contest news. Following a recommendation at the 1993 IARU Region 1 conference there will be a 50MHz IARU contest on the first full weekend of June.

A number of European societies, including the RSGB will hold the event. Some concerns have been expressed over the clash with h.f. field day on the same weekend.

However, there is a positive side to bringing these two dates together. Many clubs may have a significant number of Class B licensees in their NFD team.

The Class B operators can be an essential part of the setting up and support process, but they're unlikely to be able to help with the high speed c.w. operating. Therefore it may be a good idea to take a 50MHz station to the field day site!

It doesn't need much hardware to put a useful system together. So, while the h.f. event is running, the non-c.w. people can be operating and enjoying themselves on the 50MHz band.

The IARU event commences at 1400UTC on June 4 and runs for 24 hours. The RSGB 50MHz Trophy contest will be held during the first 8 hours of the IARU event.

Now to the next band up. On June 5 there is a WAB 'phone contest on the 70MHz

band. It will be held between 1400-1800UTC. Details of all WAB contests can be obtained from **Gordon Horsfield G4SKQ**.

An RSGB 70MHz c.w. event is being held on June 12 between 0800-1100UTC. Locator and QTH information need to be exchanged in this contest.

## Backpackers Contests

A new set of events known as the 'Backpackers' contests has been introduced by the RSGB. They are intended to encourage single operator low-power lightweight portable operation.

The new contests will be held on four occasions during the summer. Three of the events coincide with other major 144MHz contests.

In the cases where the contests coincide, it will span the last three hours of the main contest and then continue for one more hour. It's hoped this will allow the true low-power 'backpacker' to work further QRP stations without the normal contest QRM.

The first of these low power events will be held on May 22 between 1100-1500UTC. Note that the main RSGB 144MHz contest will be held on May 21-22 from 1400-1400UTC. The other 'Backpacker' dates are June 12, July 3 and September 4.

Other 144MHz contests during the period include a French Championship on June 4. And, don't forget that the *PW* 144MHz QRP Contest is being held on Sunday June 19!

There's a WAB event on June 26. This contest is for QRP phone operation and runs between 0900-1300UTC. A WAB phone contest on the 430MHz band is being held on the same day. It will start one hour after the 144MHz contest, from 1400-1800UTC.

**E N D**

## Deadlines

That's it for another month. Please send your letters to: **'Yew Tree Cottage', Lower Maescoed, Herefordshire HR2 0HP**. Alternatively you can telephone me on **(0873) 87679**.

I can also receive messages via packet radio @ GB7MAD or at my DX cluster GB7DXC. Photographs of your shack, antennas or any v.h.f. activity are especially welcome. Other pictorial items such as QSL cards, awards, certificates, etc., are also useful.



Peter Shore looks at a revitalised short wave receiver, re-launched DX programmes and broadcast schedules.

*Round-up*

# BROADCAST

Grundig, Germany's leading consumer electronics company, continues to revitalise its range of budget-priced Yacht Boy short wave receivers. The newest addition, released just a month or so ago is the Yacht Boy 400.

The Yacht Boy 400 has full digital tuning, 40 station memories, two clocks and most importantly for a good short wave set, it provides both single sideband and narrow/wide filters. Usefully, the clock is displayed continuously, along with the tuned frequency.

The radio weighs just 650 grammes including the six AA size batteries that are needed to power it. The set measures 20.5 x 12 x 4cm (width, height, depth). The short and medium wave bands are covered continuously between 520kHz and 30MHz. There is also long wave from 144 to 353kHz. Band II f.m. reception, in stereo through headphones, is also provided.

The receiver is made in mainland China unlike its larger brother, the Yacht Boy 500. This I mentioned in this column in the May issue of *PW*, comes from the Portuguese plant which is also famous for the Satellit range of short wave receivers.

The Yacht Boy 400 comes complete with a leatherette-carrying case. It's also supplied with what the company describes as a 'fishing-line' antenna.

The antenna, housed in a small unit that looks like a steel tape measure, is eight metres long and connects to the receiver through a 3.5mm external antenna socket. It is designed for use on the move, perhaps for hanging out of a hotel bedroom window, or for draping around the curtain rail if the window does not open!

The Yacht Boy 400 retails in Britain at just under £130. It offers the world-wide traveller both pleasure and business, easy access to the short wave bands and reasonable value for money.

## Weekly DX Re-launch

The radio station HCJB is re-launching its weekly DX programme, known until now as *DX Partyline*. As this column went to press, the station had not chosen a name for the revamped show. However, it promises a new DX feature each week together with DX tips, loggings and late-breaking news.

The new show can be heard on Wednesday at 0700 and 2130UTC to Europe. The station's Sunday programme *Saludos Amigos* continues at 0730 and 1900UTC to Europe with Latin American music, listeners' letters and pen-pal requests.

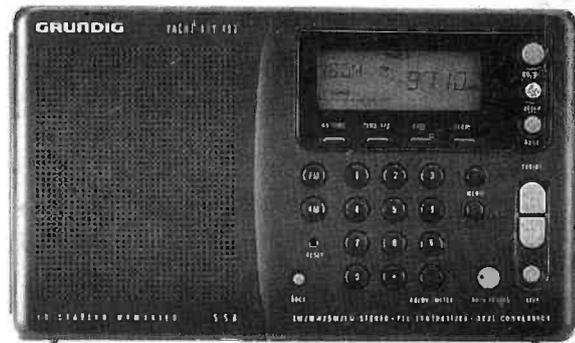
There is also the opportunity to put yourself on the air. By sending in a cassette up to two minutes long, it could be broadcast. The station's address is **Casilla 17-17-691, Quito, Ecuador**. If you have access to E-mail, you can reach HCJB in Quito direct by addressing the station: [English@mhs.hcjb.com.ec](mailto:English@mhs.hcjb.com.ec).

## More Radio Station News

Radio Free Europe's (RFE) Czech service is moving from Munich to the Czech Radio building in Prague. This move follows the start of budget cutbacks at RFE and Radio Liberty and there are discussions taking place on how the RFE Czech service might be privatised and launched as a truly independent radio station.

Look out for a new German language broadcast from Armenian Radio in the Central Asian Republic's capital, Yerevan. There is a 15 minute transmission at 1930UTC on 6.065, 5.93, 4.99 and 4.81MHz.

Italy's international service from state broadcaster RAI is now hiring time from the BBC's Atlantic Relay Station. It is beaming Italian language programmes to South America after the BBC's Spanish service closes at 0130 on 15.39 and



One of Grundig's revitalised short wave receivers, the Yacht Boy 400.

11.765MHz.

The summer months of this year could be the last opportunity to catch the Voice of the Organisation of American States (OAS) on short wave. Each weekday at 2245 there is a 15 minute English language broadcast, beamed from Voice of America transmitters, to Central and South America on 15.16, 11.835 and 9.67MHz.

The OAS plans to move to satellite delivery, ending years of short wave broadcasting. Besides English there is a daily Spanish programme at 2330 for thirty minutes on the same frequencies and at weekends Portuguese is aired at 2315 for a quarter of an hour.

## Communication Ship

You may remember the ship *MV Communicator* that for some years was anchored off the Essex coast beaming Laser 558 to the southeast of England. The ship has been in Lisbon since Laser went off the air, but now a new commercial station, Holland FM, plans to use it to broadcast its programmes from the Enkhuizen-Lelystad canal northeast of Amsterdam.

A report on Radio Netherlands' Media Network programme explained that using the ship avoids lengthy planning applications for land-based transmitters and protests on environmental

grounds. The station does plan to build transmitters on dry land in eastern and southern Holland and some signals will reach into Belgium.

## Summer Schedule

The summer schedule of Monitor Radio International includes English to Europe weekdays at 0400-0500 on 7.465; 0600-0700 on 9.87, 9.84; 0700-0800 on 9.84; 1800-1900 on 13.77 (KHB1); 1900-2000 on 15.665 and 13.77 (KHB1); 2000-2100 on 15.665; 2100-2200 on 13.77 and 15.665 and 2200-2400 on 13.77MHz.

All transmissions are from the United States sites at Cypress Creek, South Carolina or Scotts Corner, Maine except the two marked KHB1. These are from Saipan in the Northern Mariana Islands in the Pacific.

**That's it again for this month, don't forget to send your letters to me via the PW Editorial Offices in Broadstone. Until next time 'good listening'.**

**E N D**

*Andy Emmerson G8PTH encourages you to take part in ATV Contests and has some interesting news on ATV in space.*

*The World of ATV*

# FORWARD

Yes, Spring is sprung and there are plenty of TV contests to enter. And it's quite a while since I mentioned contests.

In a way they are like all other amateur radio contests in that you try to earn as many points as possible by contacting lots of DX stations.

The more stations and more distance you work, the more points you earn, so it's well worth going out portable to get the best take off for DX possible.

There are also multipliers for higher bands, so people working the microwaves can earn higher points. Contacts do have to be in vision, by the way, so you have to exchange call signs and an identifiable code number in video (and that does not mean pulsing the carrier on and off sequentially to make up the digits when the contact is marginal!).

## Remaining Contests

Here are details of the remaining contests for this year. Note that all of these, except the Cumulatives, take place on the second full weekends of the months of May, June, September, November, December and March. The start time is always 1800UTC on the Saturday and the finish is always noon UTC on the Sunday.

The Cumulatives take place in July and January. Several of these contests coincide with similar contests in continental Europe too.

Amateur television contests are open to all licensed amateurs who are equipped to transmit and/or receive pictures by fast or slow scan TV. Non transmitting amateurs and short wave listeners can also take part as receiving stations.

Members of BADC can have a list of the rules and a log sheet/entry form which can be photocopied for further use by sending an s.a.e. to **Richard Guttridge G4YTV** (yes, he does work for Yorkshire Television!), Ivy House, Rise Road, Skirlaugh, Hull HU11 5BH.

And now, here are the dates: **May Microwave**

**Contest: Saturday May 14 to Sunday 15th. Time 1800UTC Saturday to 1200UTC Sunday. Fast scan only, 24cm and above. Entries to be posted by May 30 1994.**

**Summer Fun Contest Saturday June 11 to Sunday 12th Time 1800UTC Saturday to 1200UTC Sunday. Fast and slow scan, all bands. Entries to be posted by June 27 1994.**

**Summer Cumulatives Tuesday July 5, Wednesday 13th, Thursday 21st and Friday 29th 1994. Time 1900UTC to 2359UTC for all sessions. Fast and slow scan, all bands.**

Everyone has a chance in the cumulative contests as your points add up and you can choose the best logs from three of the four sessions worked. If your commitments make operation awkward on one day of the week, again the spread of days mitigates this problem.

Please send in logs for all of the sessions worked and indicate the three which you wish to include as your entry. If you cannot manage three logs, then send one or two.

Sending all four logs helps cross-check other entries. Entries should be posted by August 22 1994.

**The 1994 International Contest: Saturday September 10 to Sunday 11th. Time 1800UTC Saturday to 1200UTC Sunday. Fast scan only, all bands. Entries to be posted by September 26 1994.**

**Autumn Vision Contest: Saturday November 12 to Sunday 13th. Time 1800UTC Saturday to 1200UTC Sunday. Fast and slow scan, all bands. Entries to be posted by November 28 1994.**

**Winter Vision Contest: Saturday November 10 to Sunday 11th. Time 1800UTC Saturday to 1200UTC Sunday. Fast and slow scan, all bands. Entries to be posted by January 2 1995.**

## Amateur TV In Space

I don't think Prof. Heinz Kaminski DJ5YM would have betted back on October 4 1957, (as he received signals from Sputnik, the world's first artificial satellite in his shack) that one day amateurs might be installing amateur television equipment aboard a Russian space station.

But it was an almost

insoluble problem of time that **Heinrich Preckelmann DC0BV** reported by telephone on February 11 1994. He was reporting on a discussion held in Kaliningrad, Russia the previous month.

Members of the AG-ATV (Bremen University ATV Group) had, under the leadership of DC0BV, been involved in space experiments since 1985. This was when they developed the antenna for the Spacelab D1 mission amateur radio experiment.

The next year they conceived the idea of an ATV experiment on the D2 mission, although in the event factors ruled against this.

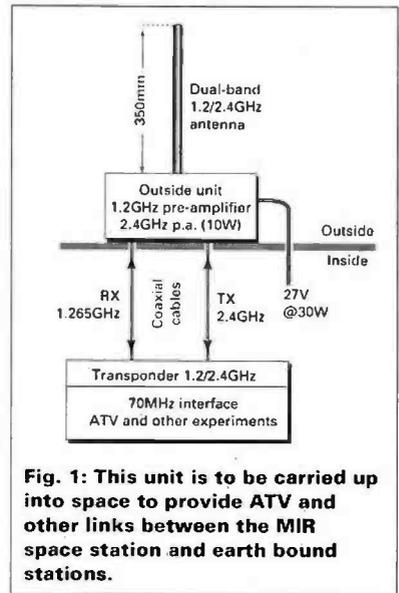
Although the Bremen Group's chief interest was a full-fledged ATV experiment, they also modified a commercial 430MHz handheld f.m. transceiver for space operation. Now at last arose a chance for Europe to turn this ATV-in-space experiment into reality.

Within the framework of the SAFEX-II amateur radio experiment on the Russian space station MIR, the Bremen group had the opportunity to take part and provide an ATV link between the station and earth. So, between them **Thomas Kieselbach DL2MDE** and the Russian experts evolved a scheme.

## Priroda Into Orbit

In spring 1995 a capsule called Priroda will be fired into orbit and docked onto MIR. By this time the following items must be developed, built and tested: the combination 13/23cm antenna, the antenna splitter, a 1296MHz pre-amplifier, and the p.a for 13cm. Since they will be carried outboard in space, they must be built for this environment.

A high degree of effort will be required to select the most appropriate designs, collecting suitable materials and completing everything by the time deadline. The next step is developing and



**Fig. 1: This unit is to be carried up into space to provide ATV and other links between the MIR space station and earth bound stations.**

## Transponder Details

Input	1265MHz
Output	2420MHz, 10W
Bandwidth	10MHz, f.m.-ATV

building three times over the units required for the ATV transponder 'down here'.

There are so many possibilities such as should the camera be mounted fixed by a window, to view the world from space, or should it be used to provide visible contact with an astronaut (who hopefully speaks English). An even more exciting prospect is making Europe-wide contacts in amateur television, although this will not be all that easy.

The flight passage of the spacecraft is such that a pass will last a maximum of 20 minutes and antennas will require constant (motorised) tracking, although **Manfred Fuetterer DC6FM** has devised a computer control system for this. If a group of amateurs did this and linked in some ATV repeaters, a kind of ATV broadcast from space would be possible.

Time is pressing on and the tests must proceed. To support the efforts of the Bremen group there are many opportunities for amateurs, firms and institutes to donate cash, ideas or materials. (Original report by Heinz Verhaas DC6MR, English version by Andy Emmerson G8PTH).

**Space has caught up with me again so until next time keep those letters and photos coming to 71 Falcutt Way, Northampton NN2 8PH.**

**E N D**

# ARCADE

## The PW Shopping Arcade

Welcome to the *Practical Wireless* 'Arcade'. In this section of the magazine, you'll be able to find all those important services 'under one roof' - just like the shopping arcades you see in the High Street.

Let your eyes 'stroll through' the Arcade every month and you'll find all departments open for business including: The Book Service, PCB Service, Binders and details of other *PW* Services. Make a regular habit of 'visiting' the Arcade, because in future, you'll have the chance of seeing special book offers and other bargains. And don't forget, this Arcade is open wherever you're reading *PW*!

## Services

### Queries:

Practical Wireless,  
PW Publishing Ltd., Arrowsmith Court,  
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Broadstone, Dorset BH18 8PW.

We will always try to help readers having difficulties with *Practical Wireless* projects, but please note the following simple rules:

- 1: We **cannot** deal with technical queries over the telephone.
- 2: We **cannot** give advice on modifications either to our designs, to commercial radio, TV or electronic equipment.
- 3: All letters asking for advice **must** be accompanied by a stamped self-addressed envelope (or envelope plus IRCs for overseas readers).
- 4: Make sure you describe the problem adequately, with as much detail as you can possibly supply.
- 5: Only one problem per letter please.

## Back Numbers

Limited stocks of many issues of *PW* for past years are available at £2.00 each including post and packing. If the issue you want is not available, we can photocopy a specific article at a cost of £1.50 per article or part of article. Over the years, *PW* has reviewed many items of radio related equipment. A list of all the available reviews and their cost can be obtained from the Editorial Offices at Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW for a stamped self-addressed envelope.

## Binders

*PW* can provide a choice of binders for readers' use. Plain blue binders are available, each holding 12 issues of any A4 format magazine. Alternatively, blue binders embossed with the *PW* logo in silver can be supplied. The price for either type of binder is £5.50 each (£1 P&P for one, £2 for two or more).

Send all orders to PW Publishing Ltd., FREEPOST, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.

## Constructional Projects

Components for *PW* projects are usually readily available from component suppliers. For unusual or specialised components, a source or sources will be quoted.

Each constructional project is given a rating to guide readers as to the complexity.

**Beginner:** A project that can be tackled by a beginner who is able to identify components and handle a soldering iron.

**Intermediate:** A fair degree of experience of building radio or electronic projects is assumed, but only basic test equipment will be needed to complete any tests and adjustments.

**Advanced:** A project likely to appeal to the experienced constructor. Access to workshop facilities and test equipment will often be required. Definitely not for the beginner to attempt without assistance.

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All items from *PW* are available Mail Order, either by post or using the 24hr Mail Order Hotline (0202) 659930. Payment should be by cheque, postal order, money order or credit card (Mastercard and Visa only). All payments **must** be in sterling and overseas orders **must** be drawn on a London Clearing Bank.

Practical Wireless, June 1994

## Book Reviews

Rob Mannion G3XFD selects some books that you might like to add to your shack bookshelf.

**Microwave Handbook Volume 1**  
Edited by M. W. Dixon G3PFR  
Published by the RSGB.

Volume 1 of this three volume set introduces the reader to the theory, techniques and components needed to start work on microwaves. Of particular interest to the intending microwave operator are the details on awards, systems analysis, components, transmission lines, antennas and propagation. *Approximately 120 pages.*

**£9.99 plus P&P from the PW Book Service.**

**Microwave Handbook Volume 2**  
Edited by M. W. Dixon G3PFR  
Published by the RSGB

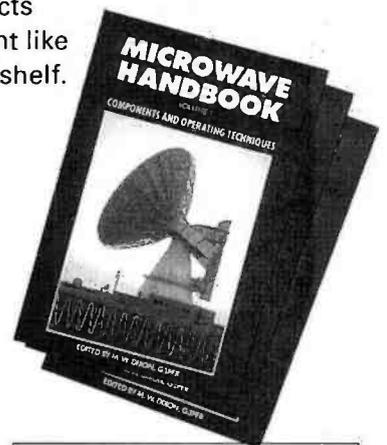
The second volume in the Microwave Handbook series deals with the construction and testing of amateur radio microwave equipment. The books includes sections on: construction techniques, materials, specialised p.c.b.s, weatherproofing and general hints. There are also sections dealing with common equipment, projects with construction details, microwave beacons and repeaters, test equipment and filters. *Approximately 120 pages.*

**£14.99 plus P&P from the PW Book Service.**

**Microwave Handbook Volume 3**  
Edited by M. W. Dixon G3PFR  
Published by the RSGB

The third volume in the Microwave Handbook series deals with bands and equipment. The various specialist authors look at the 1.3, 2.3, 3.4 and 5.7GHz bands and also discusses the 10 and 24GHz bands. The amateur bands above 24GHz are covered in a separate chapter. Each band, as it is discussed, has suitable equipment, techniques and operating hints and tips provided. *Approximately 120 pages.*

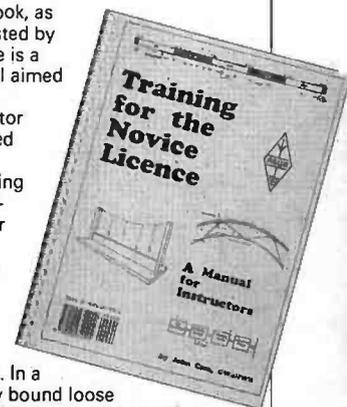
**£14.99 plus P&P from the PW Book Service.**



**Training For The Novice**  
**A Manual For Instructors**  
John Case GW4HWR  
Published by the RSGB.

This book, as suggested by the title is a manual aimed at the instructor involved with preparing candidates for the Novice Amateur Radio Examination. In a spirally bound loose

leaf format the book takes the instructor through the NRAE syllabus in a comprehensive fashion so that they can themselves instruct the Novice. The book will also be useful for the teaching of basic radio and electronics in schools as it has a sound approach with worksheets, projects and helpful hints. *100 pages.* **£6.50 plus P&P from the PW Book Service.**



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Hank Bennett, Harry Helms & David Hardy  
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### DIAL SEARCH 1992/94

George Wilcox

The listener's check list and guide to European radio broadcasting. Covers m.w., l.w., v.h.f. & s.w., including two special fold-out maps. Also includes a full list of British stations, a select list of European stations, broadcasts in English and 'Making the Most of Your Portable'. 46 pages. £4.25

### FLIGHT ROUTINGS 1993

Compiled by T.T. & S.J. Williams

This guide was produced with the sole aim of assisting airband listeners to quickly find details of a flight, once they have identified an aircraft's callsign. Identifies the flights of airlines, schedule, charter, cargo and mail, to and from the UK and Eire and overflights between Europe and America. 122 pages. 0/P

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Klingenfuss  
GUIDE TO UTILITY STATIONS  
Tenth Edition



### GUIDE TO UTILITY STATIONS 12th Edition

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BP255

Peter Shore

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7th Edition.

Julian Baldwin G3UHK & Kris Partridge

G8AUI

This book gives concise details of repeaters & beacons world-wide plus coverage maps & further information on UK repeaters. 70 pages. £2.85

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Langley Pierce

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### NEWNES SHORT WAVE LISTENING HANDBOOK

Joe Pritchard G1UQW

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Clive Woodyear

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John Breeds

This book deals almost exclusively with television broadcast satellites and is a comprehensive collection of chapters on topics, each written by an expert in that field. It appears to be aimed at the professional satellite system installer, for whom it is invaluable, but it will be appreciated by a much wider audience - anyone interested in satellite technology. 280 pages. £30.00

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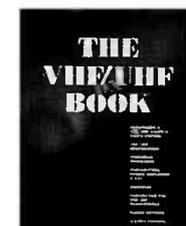
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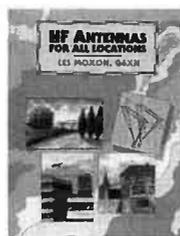
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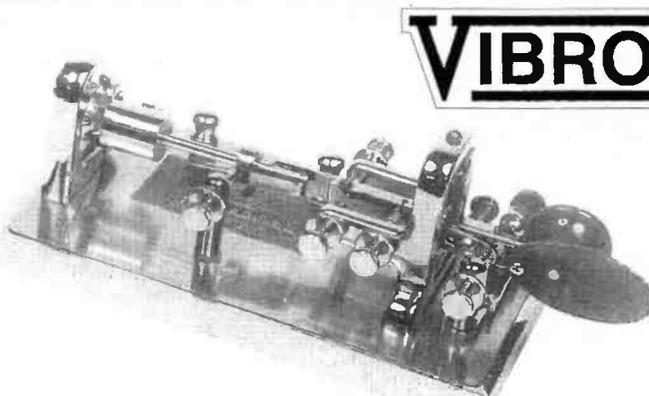
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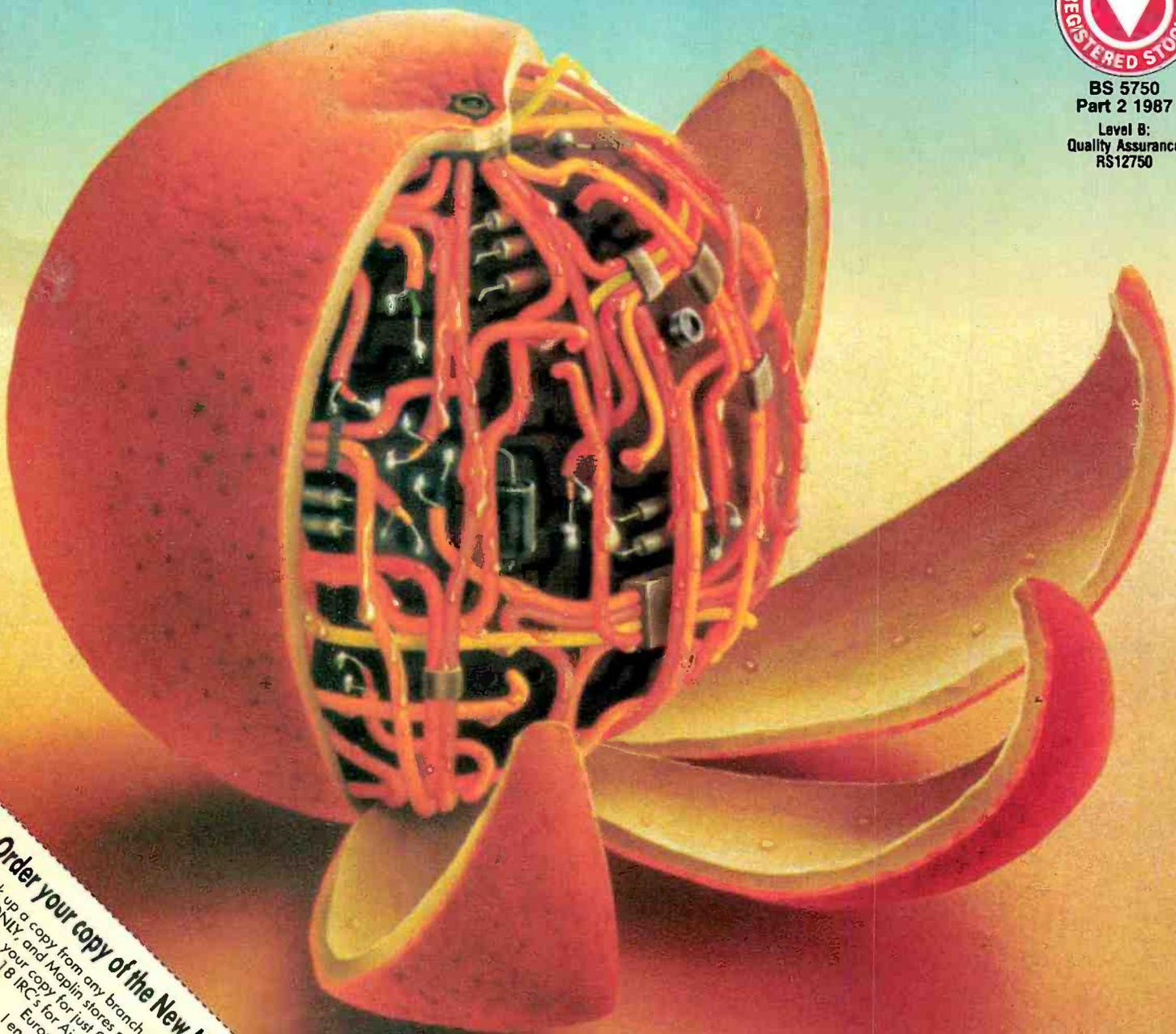
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