Practical Wireless
PW
amateur radio & more!

Pat G3VA
Remembers Talking Dangerously

Build
Beacon Clock Pt 2

Tried & Tested
Copper Islands Construction Outfit

Tough as a Tank!
Yaesu FT-1500M

January 2002 £2.75

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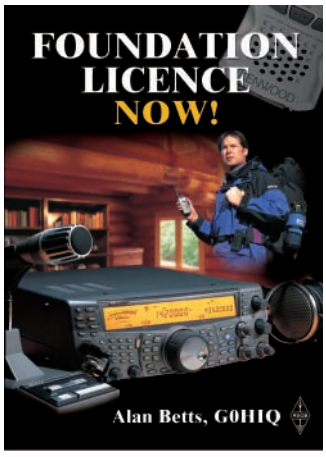
THE BEST OF THE NEW FROM THE RSGB

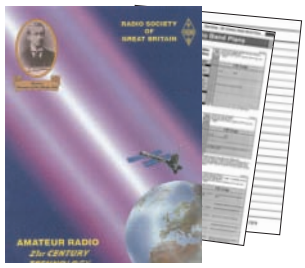


Foundation Licence NOW!

For those wanting to know more about the new Foundation Licence the RSGB has produced *'Foundation Licence - Now!'*. The book contains all that is required to obtain this first step into Amateur Radio. Not only covering the basic course the book also provides a useful insight into the technical basics, receivers, transmitters and antennas. Attention is also paid to good operating, licence conditions, safety and EMC. Written in an easy to use and understand style this is the ideal book for young and old alike.

In addition the books shipped by the RSGB also provide, free of charge, an information and materials pack including the New Foundation Licence application form and many other items such as current Band Plans etc., making this a very useful addition for every Radio Amateur beginner.

OUT NOW!



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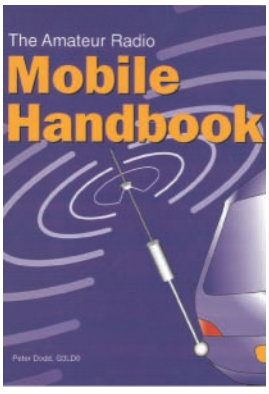

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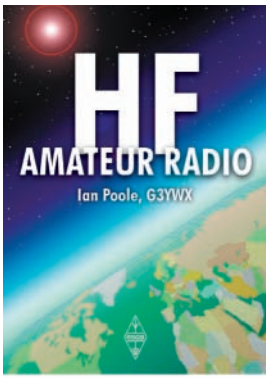

HF Amateur Radio

HF Amateur Radio takes the reader through setting up an efficient station, how to make the best use of each of the bands, choosing equipment and antennas, and the advantages of each type of transmission.

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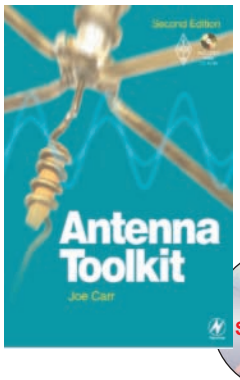

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PW

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Cover Subject
We couldn't resist the opportunity of seeing if the Yaesu FT-1500M really was tank-proof, so we brought the military in! Of course we didn't really drive a tank over Yaesu's 144MHz transceiver but as Rob G3XFD described the FT-1500M as being as "tough as a tank" it gave us the chance to do something different. (The tank shown is a Hatfield Tank).

Main Photograph courtesy of: **Bovington Tank Museum Picture Library, Dorset**

Design by: **Bob Kemp**

January features

22 Looking At.....
Gordon King G4VFV looks at how power supplies work and at how they're used in modern day transceivers.

24 Radio Basics
Following on from last month **Rob Mannion G3XFD** continues with the building the capacitor/resistance bridge project. This time he looks at the circuitry that's involved.

26 Review - The Yaesu FT-1500M 144MHz Transceiver
The FT-1500M is a "Tough & Tiny Talker" so says **Rob G3XFD** after he'd 'road tested' it for over 5000 miles! Find out how well it performed by reading the review...

32 The PW International Beacon Electronic Timer Project
Phil Cadman G4JCP introduces part two of his project. This month Phil concentrates on the circuits and encourages you to have a go at building one so you too can monitor the 14, 18, 21, 24 and 28MHz bands.

38 One Man Mini DXpedition
A weekend's mini-DXpedition to Les Iles Chausey, stuated in the Gulf of St. Malo provided **Phil Whitchurch G3SWH** with some interesting contacts, even if it ended up as a 'one-man' band, event! Find out what happened and how Phil fared by reading his story.

41 Talking Dangerously
Pat Hawker G3VA delves deeper into the Clandestine radio operations of the Second World War. Compiled from his own memories of radio operations from behind the lines, Pat's account makes fascinating reading!

46 Setting The Bands Alight!
St. John's Point Lighthouse, situated off the coast of County Down, Northern Island provided the Lagan Valley ARS with the ideal site to take part in a Lighthouses on the Air event. **Victor Tait GI4LKG** takes up the tale of how the club got involved and how much they enjoyed the challenge.

49 Review - Copper Island Construction Outfit
Great for prototyping work and ideal for the newcomer to construction this Copper Island outfit is well worth a second look says **Rob G3XFD**. It will also come in very useful for Radio Basics projects in the coming months.

50 Book Profiles
If you're quick you can still add these recommended radio titles to your Christmas wish list! Three brand new titles and three old favourites are profiled for you to choose from.

52 Carrying On The Practical Way
Keep yourself and the kids busy over the festive season with **George Dobbs G3RJV's** short wave project using the MK484. It's easy, fun, better than watching the television and will provide all the family with hours of entertainment!

54 Antenna Workshop
David Butler G4ASR takes time out from writing his VHF report column to share his ideas for five antenna designs for use on the 70MHz band.

57 Subscribe for £6!
If you've been thinking about taking out a subscription then do it now! This month you can subscribe at a discounted price by paying £6 every quarter and what's more we're offering three ways to pay!

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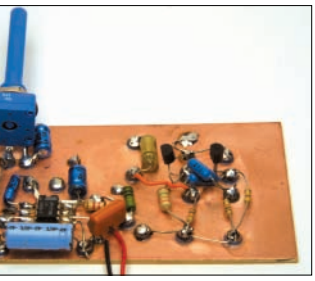

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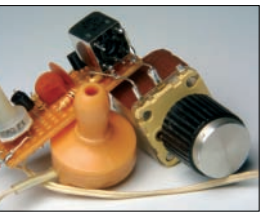

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January regulars

9 Rob Mannion's Keylines
Rob G3XFD introduces another cram packed issue with comments and news.

10 Amateur Radio Waves
There's a bumper post bag this month as readers make 'waves' by writing in with their comments, ideas and opinons.

12 Amateur Radio Rallies
A round-up of radio rallies taking place in the coming month.

13 Amateur Radio News & Clubs
An overflowing Newsbasket means there's lots for you to read this month so make sure you are right up-to-date and don't forget to check out what activities your local club has planned too!

60 Valve & Vintage
Charles Miller remembers the day he got his 'call-up' for National Service and how that influenced his early days in radio.

66 VHF DXer
Australia, Malaysia and Japanese stations all feature as 50MHz contacts this month in **David Butler G4ASR's** monthly round-up.

68 HF Highlights
Carl Mason GW0VSW's report shows that the h.f. bands have been busy again this month.

70 Keyboard Comms
Roger Cooke G3LDI presents useful radio related websites for you to check out as well as reporting on the latest data comms news.

72 DX Destination
If you are thinking taking your Amateur Radio hobby on holiday then **Ed Taylor G3SQX** could have the answers you've been looking for on what antennas to use.

74 Tune In
All the latest h.f. broadcast schedules and news are brought to the pages of PW by **Tom Walters.**

78 Bargain Basement
The bargains just keep on coming! Looking for a specific piece of kit? - Check out our readers' ads, you never know what you may find!

80 Book Store
The biggest and best selection of radio books anywhere!

85 Topical Talk
The team are in a nostalgic mood this month as we look back at early constructional projects from **F.G. Rayer G3OGR.**

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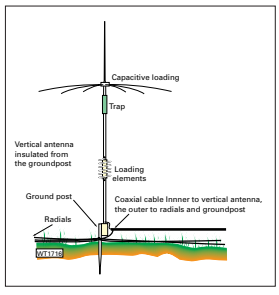

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ANOTHER PACKED ISSUE

rob mannion's keylines

Welcome to 'Keylines'! Each month Rob introduces topics of interest and comments on current news.

Now that *PW* is approaching it's 70th anniversary in the coming September...I'm rather humbled, and proud, when reminded by readers that they've been regular readers for longer than my lifetime! And when I meet those who remember reading the magazine in the early 1930s...I really do feel like a 'Johnny-come-lately'!

Hopefully, as many readers as possible will be able to attend our special celebrations during the **Leicester Show** this coming September. The magazine team looks forward to sharing your memories, along with a celebratory glass of wine and a selection of 'nibbles' on the stand - courtesy of our publishers. However, more details on what we're planning will be announced as the year proceeds because of course, you the reader, should be involved in the ongoing celebrations as **you're also very much part of *PW* itself**. Indeed **you are** very much part of the magazine's 'Family of Friends'.

During 2002 we're also planning to bring you some rather special articles, feature and topics. I'm also delighted to announce that thanks to the inclusion of a mention of the work of the late **Frank Rayer G3OGR** (F. G. Rayer) that most prolific Amateur Radio author, in **Phil Cadman G4JCP**'s Valve & Vintage December column, I've heard from a member of G3OGR's family! We're now planning to publish a tribute to someone who undoubtedly helped many Amateurs along in the hobby with his huge number of projects. It will be an article that's bound to evoke many memories for *PW* readers.

Another Grand Old Lady!

As I tend to think of *PW* as a very sprightly, extremely experienced and knowledgeable older Lady - rather like a specialised teacher - I was astounded (having had to give up the sport myself over 25 years ago!) that another lady (the term 'Grand Old Lady' suits her very well indeed) associated with *PW* - recently enjoyed some SCUBA diving while on holiday in Australia!

Hilda Rusbridge, **Fig. 1**, is the sister of the late **Bert Newman G2FIX** and you may remember (from the December *PW*) that she makes a point of travelling from her Hampshire home to present the '**Bert's Bell**' trophy to the National Category winners in our club magazine competition. However, when I heard that **82** year-old Hilda had recently been SCUBA diving during a holiday in Australia on the Great Barrier Reef...it could not pass without mention in *PW*.

Hilda's picture, **Fig. 2**, taken during a pause in her dive (apparently discussing the one that got away) with her Instructor. It seems that these grand old ladies from the 1920s and 1930s are remarkable survivors. I wish them well...and hope that both Hilda and *PW* will both enjoy their respective centenaries! Thanks for your support Hilda...I admire your pluck - and the spirit of your age which also saw the growth of our hobby and gave us the legacy of the modern electronic world!

Fig. 1: Hilda Rusbridge - a keen supporter of Amateur Radio attends the Leicester Show especially to present the G2FIX 'Bert's Bell' trophy.

Fig. 2: Hilda enjoyed her Australian SCUBA experience - but there was no octopus hunting for this octogenarian diver - she was only too pleased to observe the ones that got away!

Yaesu FT-7100M Review

Occasionally, due to reasons beyond our direct control, equipment promoted as coming up for review in *PW* in a particular issue - does not appear as scheduled. Unfortunately, with the best will in the world this can happen for many reasons...as it's done with the Yaesu FT-7100M review.

My apologies for the non-appearance of the review we'll be publishing it as son as possible. In the meantime - as our front covers graphically suggests...I hope you find my evaluation of the Yaesu FT-1500M to be of interest. What a tough and reliable little nut it proved to be too!

Guest Editorial

The February issue of *PW* sees the welcome return of a 'Guest Keylines' editorial writer. This time I'm delighted to make way for one of our friends from Ireland - **John Corless EI7IQ**, Vice President of the **Irish Radio Transmitters' Society**. The first of a number of 'guest' writers...I'm sure he'll have something interesting to say!

Finally, as we prepare to enter the 2002 volume of *PW* - I send a message of goodwill to you all, and on behalf of everyone involved with *PW* - wish you a happy Christmas and New Year. May God bless and keep you...wherever, and whoever you are.

Rob G3XFD

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Just some of the services *Practical Wireless* offers to readers...

Subscriptions

Subscriptions are available at £30 per annum to UK addresses, £38 in Europe and £42 (Airsaver), £49 (Airmail) overseas. Subscription copies are despatched by accelerated Surface Post outside Europe. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both Practical Wireless and Short Wave Magazine are available at £60 (UK) £73 (Europe) and £81 (rest of world), £85 (airmail).

Components For *PW* Projects

In general all components used in constructing *PW* projects are available from a variety of component suppliers. Where special, or difficult to obtain, components are specified, a supplier will be quoted in the article. The printed circuit boards for *PW* projects are available from the *PW* PCB Service, **Kanga Products, Sandford Works, Cobden Street, Long Eaton, Nottingham NG10 1BL. Tel: 0115 - 967 0918. Fax: 0870 - 056 8608.**

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We have a selection of back issues, covering the past three years of *PW*. If you are looking for an article or review that you missed first time around, we can help. If we don't have the whole issue we can always supply a photocopy of the article. Back issues for *PW* are £2.50 each and photocopies are £2.50 per article.

Binders are also available (each binder takes one volume) for £6.50 plus £1 P&P for one binder, £2 P&P for two or more, UK or overseas. Prices include VAT where appropriate.

A complete review listing for *PW*/*SWM* is also available from the Editorial Offices for £1 inc P&P.

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Technical Help

We regret that due to Editorial time scales, replies to technical queries cannot be given over the telephone. Any technical queries by E-mail are very unlikely to receive immediate attention either. So, if you require help with problems relating to topics covered by *PW*, then please write to the Editorial Offices, we will do our best to help and reply by mail.

amateur radio waves

Make your own 'waves' by writing into *PW* with your comments, ideas, opinions and general 'feedback'.

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.

Diode Crystal Sets & Piezo-Electric Earpieces

Dear Sir

I recently helped my nine year old grandson make up a diode crystal set kit which we connected to a 120ft long wire antenna and to a proper earth. Result - zilch!

I then substituted a pair of old SG Brown headphones (resistance 4000Ω) for the crystal earphone supplied with the kit. Result - acceptable strength signals from at least three broadcast stations.

When measured, the resistance of the crystal earphone was open circuit hence no impedance match for the load. The manufacturers kindly sent me two more crystal earphones and when measured, one was about 20kΩ and the other about 25kΩ. When each in turn was connected to the crystal set, signals were barely audible.

I wonder whether any of your readers have met this problem of have I been unlucky? If on the other hand the resistance of the average crystal earphone supplied is unlikely to match the optimum load impedance required by a diode crystal set (which I take to be a few kΩ), then youthful expectations are likely to be rather dampened. Perhaps my grandson needs to live within half a mile of a broadcast transmitter?

David Wilcox M0DAW
Shrivenham
Swindon

Editor's comments: I plan to discuss the interesting points raised in David's letter in a future Keylines editorial and also in Radio Basics (soon). As David says...there must be many disappointed first time constructors who've suffered the same problem!

Careful With That Callsign

Dear Sir

I must disagree with **Patrick Allely GW3KJW** (Careful With That Callsign - *PW* November 2001) when he claims that it is incorrect to use the suffix /M from stationary vehicle. The term 'mobile' does not in any imply that the subject is moving. It simply means that it has the ability to move, or can be moved easily. This means that either a motor vehicle or even a caravan is always mobile, even if it has not moved for a month.

For some reason both CB users and Radio Amateurs seem to misunderstand the term. Perhaps this misunderstanding is, so far as Amateurs are concerned, in some way exacerbated by a (now defunct) regulation defining the end of a journey as being when the vehicle has not moved for a period of 15 minutes. This dates from the time when it was mandatory to keep a mobile log which had to be filled in at the end of each journey, and therefore an official definition of the end of a journey was thought to be necessary, but for log filling purposes only So far as I am aware there has never been a requirement to change suffixes when operating from a stationary vehicle.

Tony Pacitto G0HKH
Hovingham
York

Some more comment....

Dear Sir

I really did enjoy the piece by **Patrick Allely GW3KJW** Careful with that Callsign! in the November issue of *Practical Wireless*. I treated it as a quiz, in the sense that I tried to spot the infringements before reading the answers. I think that I did fairly well, but I failed to get 7 right, and I was out of date with 9. (I thought that transmission from a public transport vehicle was still prohibited).

Although in each of those cases the authorities **could subject** G9ZZZ to the full majesty of the law it's fortunate that they either are too busy, or have more common-sense than to do it! **It is unfortunate though however,** that the same seems to apply to the deliberate transgressions that can be heard every day.

For example on the Manchester area 144MHz repeater that I listen to (until it gets too irritating) it's becoming increasingly common to use abbreviated versions of the callsign. Usually only the G or M is omitted, but it's not at all unusual to hear no prefix at all. Swearing is also becoming more noticeable.

There's one non-repeater frequency on 430MHz where I might hear just an occasional callsign mentioned through the whole of a weekend's chatter! As nothing happens about these more serious transgressions, I think we may assume that mistakenly using "/M" while in a car park is unlikely to get the operator boiled in oil!

Tony Jaques G3PTD
Stretford
Manchester

Editor's comment: Yes, common-sense prevails Tony. The RA staff (many of whom are licensed Amateurs themselves) are sensible in the use and effective management of their time and generally we don't cause much bother to them. However, I've been amused recently to hear from a large number of readers (thank you everyone) who have heard and passed on the comments from the 'chat gangs' between 3.7 and 3.760MHz (Editorial comment accompanying 'Star Letter' September *PW*, page 10) who have said 'For The benefit of the *PW* Editor;' as they gave callsigns at the end of each 'over'! (Because I'd suggestred they were anonymous!). I'm pleased that they took my passing comment in the friendly way it was meant. However, I'm sure they'll be very surprised at just how large their listening audience is, as there are many insomniacs involved in Amateur Radio.

Criticising The Foundation Licence

Dear Sir

Having downloaded the syllabus for the Foundation Radio License from the RA website I was surprised to read in the assessment objectives, items which were all covered in the RAE exam, apart from the last page of this syllabus which refers to recognising Morse code receiving and sending a minimal amount of Morse code at any speed, even being able write down dots and dashes to the requirements of the examiners.

Do you not think this whole operation is bit of a farce? Especially where you have just taken an eight month course which covers these items (contained within the syllabus) to have to sit another....albeit short exam...which basically you have a City and Guilds pass certificate for?

Why therefore cannot we (the losers in this operation) just carry out the short Morse requirement **without having to sit** a ten hour exam covering the same ground. I'm

sure that many other B licence holders feel the same as I do... that we've all been 'Sold down the river' if you like with regard to this further exam to generate not only more revenue and generating more callsigns.

It's my opinion that the 'suits'; in high places generated this operation pending the removal of the Morse requirement in 2003! Let those who require to pound the key continue...it's their right...but not at the expense of others!

What is next after 2003? Are the Class B Licence holders still going to be kept off the h.f. bands? Or do the RA want to increase the already happy band of operators operating on illegal frequencies?

I should like other's opinion on this subject and I continue to be very disgruntled...along with (I suspect) many others.

Eric Thew M1ZZZ
Eltham
London

.....and another

● **Dear Sir**

I disagree with and object to the Foundation Licence (December *PW*), but only after searching correspondence with the RA, lengthy consideration and discussion with other Amateurs. I have no problem whatever with keen and motivated youngsters (or people of any age) who are interested in the methods, means and techniques of radio communication joining in on our bands to further their involvement in and knowledge of radio communication, once they are competent to do so. I welcome that as something which was traditionally quite normal. Indeed, like many others at the time, I was still at school when I got my callsign.

I do however object to the Amateur Bands being officially sacrificed on the altar of business with the carcass then being handed over to commercial interest to feed on.

The Editor of *PW* refers to the practical element of the foundation examination in positive terms. Yet as we are told, Foundation Licensees will be compelled to use ready made commercial equipment in other words 'Black Boxes'. My objection would ease enormously if they were **only allowed** to use self-built equipment constructed by themselves from a range of approved kits under supervision say at local clubs, schools or colleges. This would be a positive move for the hobby and give youngsters especially some practical insight into basic radio communications methods and techniques plus a solid foundation for those looking at being future radio professionals. As it is, it looks like another dose of upmarket CB type activity will invade Amateur Radio, but then more 'black box' sales are good for business!

Motivation for this Foundation Licence is money making not the future good of our hobby. Dealers have suffered with poor sales figures during recent years. Some are diversifying into other areas whilst others have closed their doors. I will not spare the magazines either, for unless they are specialist subscription only magazines without pages of glossy colour ads, they rely heavily on commercial advertising from 'black box' dealers for their profits. Maybe we can understand therefore why so many editors support a scheme designed to enlarge the market.

The December issue gives four names of 'influential' people who support the Foundation Licence. Two are magazine editors who I say have reason to be biased in favour of it for commercial reasons.....the future of their jobs! One represents the RA so he is unlikely to criticise it, and the fourth isn't even a British National. Are the views of these so called influential figures credible and do they matter? I say not. This is just hype to give the foundation licence some kind of undeserved respectability. Lots of black boxes need selling, big money is at stake, and the RA along with its supporters would have us all believe its acceptance is politically correct since it is essential for future Amateur Radio health. I feel it is a health hazard!

For an intelligent technical and practical pastime as Amateur Radio once was, the benefit of the Foundation Licence in its current form is at best uncertain, but the mandatory use of ready-made commercial gear during the formative period of new Radio Amateurs is a retrograde step and a likely catalyst to a 'dumbing down' process making the hobby much less technical and much more appliance operator orientated than it is even today. It is the official stamp of approval for 'upmarket CB', or maybe the birth certificate to mediocre 'hobby radio', the offspring of an arranged marriage between Amateur Radio and CB.

During correspondence with the RA, two aspects cropped up in particular: (1) Is Amateur Radio really in terminal decline as they suggest; and (2) is it a genuine source of professional radio engineers as they claim?

The RA claims Amateur Radio will be extinct within the foreseeable future unless the decline is halted ....by (amongst other things) the foundation licence. They take the year during the 1980s when the greatest number of UK licences ever were issued as their yardstick, and use this to show a pattern of decline of new licenses issued since then. They conveniently forget to mention that in earlier years before the 1980s, the hobby had been doing very nicely indeed with tiny numbers of licensees compared to the boom years.

For instance, in 1960 it was flourishing and the bands were 'buzzing' with a mere 9000 UK amateur radio licences issued. Compare this with recent figures of 55,000 UK licences issued, and the hobby is now said to be terminally declining. Just who is kidding whom?

As many people know, UK Amateur Radio was subjected to a unique boom in the 1980s and earlier 1990s, a spin-off from the then widespread interest in Citizens' Band radio. This enormously boosted Amateur Radio licence numbers (and of course related business) for many years and any decline now is only a reflection of the subsequent virtual collapse of CB in favour of other interests.

Left alone to its own devices as it is now, our hobby would find numerically its own level of dedicated people. Probably, they would be mainly interested in practical radio communication (i.e.) the methods and techniques involved like it once was. Whilst the half-hearted ones or those lacking inclination, motivation and technical interest would go elsewhere. But that's not good for business, is it? It doesn't sell black boxes.

The RA feels that Amateur Radio has been a training ground for professionals and could be once more. Superficially this sounds fine, but what have they got to back it up? I asked them to supply figures showing how many professional radio engineers over the years reached their chosen calling as a result of involvement in Amateur Radio.

Government organisations love statistics to prove their own arguments, so it may surprise readers to know the RA has no figures, no facts, indeed nothing whatever to show Amateur Radio has ever produced many, or indeed any professional radio engineers. I do know a few people who are both Amateurs and Professional radio engineers, so small numbers of that rare species do exist.

Without good evidence to support them, the RA's argument is no more than wishful thinking. They cannot produce anything to show Amateur Radio ever was in the past, nor ever will be in the future, a significant training ground for professionals. Amazingly, they even say they have no intention of gathering information to measure their success or failure, as any good manager would do, to show how effective future Amateur Radio, along with its Foundation Licence is as a source of professionals. I say this speaks for itself and shows the professional engineer argument for what it is...empty words and no substance.

Other items cropped up revealing the RA had either not considered implications

such as on air discipline and standards or if they had, regarded them unworthy of further action.

Even more disturbing: How soon it will be before all Amateur Radio licensees, not just foundation licensees, will be restricted to using approved commercial transmitting equipment only? After all, there's a risk that home-brewed or converted surplus equipment used by anyone may cause interference to other radio users, not just that in the hands of Foundation Licensees.

Commercial influences now result in fewer full licensees undertaking significant practical work compared with their pre-1980s equivalents. Also, not all full licensees these days are technically equipped to build much themselves, even if they want to.

The RA might say universal restrictions within the UK forbidding use of anything but black boxes could never happen. But 20 years ago, or even five years ago, no one would ever imagine them allowing people on the bands after a mere 10 hours of training and a 20 question assessment.

When everything is exposed and put on the table, the question is does **Amateur Radio really need this foundation licence at all?** I say not!

What is being imposed looks like the last straw for traditional practical Amateur Radio. It's intended to drum up new business for dealers and commercial advertising, etc., and gives the official stamp of approval for further encroachment of business and commercial interest into our hobby. Its provisions bring the possibility of future restrictions forcing all UK licensees to use ready-made transmitting gear ever nearer. The Foundation Licence as it stands is one big mistake. I deplore it. I feel there is no good reason to support it and from widespread talking with people, know many others feel likewise.

H. Aspinall G3RXH
Skipton
North Yorkshire

Editor's comment: Your opinions are important (whether or not we agree with them and even when comments of a personal nature are made!) but please make your letter as short as possible. Mr Aspinall submitted his original - much longer - letter requesting "no censorship or alterations". However, we do not 'censor' letters...only shortening them when necessary (preferring the authors to do this). It was re-submitted, drastically cut, but still very long. So, please help us to help you get your opinion into print by following the guidelines!

ATC Need Alinco's Help!

● **Dear Sir**

I have recently been given an Alinco DX-701 h.f. transceiver for use by the Air Training Corps. The '701 is a 100 memory channel h.f. (no 50MHz) radio very similar to the DX-70 and is sold mainly as a commercial transceiver. Readers might remember it was reviewed in the June 1997 *PW* by the Editor, **G3XFD**, himself.

Unfortunately the set is dead, and apart from looking well 'used' it has also suffered moisture ingress to the phase locked loop (PLL) board, and a gentle cleaning with a tooth brush dislodged some of the surface mount (SM) components.

On enquiry I was told by the importers that there are no PLL boards in the country, and was also warned of the quite high replacement cost from the maker. Unfortunately though, like many other ATC Squadrons mine is permanently 'strapped for cash'.

The PLL board for the DX-70 or DX-70TH will work in the set and a simple replacement will probably get the radio working. What I need is a dead DX-70, let's say one with a faulty power amplifier (p.a.) stage? - so that I can dismantle it for parts. I've made enquiries but cannot find such an item, (does this mean that the Alinco is an inherently reliable radio?) I wonder if the readers of *PW* will be able to assist me in any way. Thank you.

Roy Walker G0TAK
3 Elderberry Close
Thornton-Cleveleys
FY5 2ZB

Editor's comment: I've no doubt that a *PW* reader will come to the aid of this good cause. Many young Amateurs have entered into the hobby via the ATC. (Please contact Roy direct at the address shown).

● Keep your letters coming to fill *PW*'s postbag

Letters Received Via E-mail

A great deal of correspondence intended for 'letters' now arrives via E-mail, and although there's no problem in general, many correspondents are forgetting to provide their postal address. I have to remind readers that although we will not publish a full postal address (unless we are asked to do so), we require it if the letter is to be considered. So, please include your full postal address and callsign with your E-Mail. All letters intended for publication must be clearly marked 'For Publication'.

Editor

amateur radio rallies

Radio rallies are held throughout the UK. They're hard work to organise so visit one soon and support your clubs and organisations.

2002

February 10
11th Northern Cross Radio Rally
Contact: John G7JTH
Tel: (01924) 251822
E-mail: g7jth@wdrs.org.uk
Website: http://www.wdrs.org.uk
The Northern Cross Rally takes place at Thornes Park Athletics Stadium, Wakefield, W. Yorkshire. There's easy access from M1 junctions 39 & 40 and it will be well signposted. Talk-in will be on 144 and 430MHz. Doors open 1100 (1030 for disabled visitors and Bring & Buy). Usual attractions plus Morse tests on demand.

February 10
Harwell ARS Radio & Computing Rally
Contact: Alan G8NVI
Tel: (01235) 816379
Website: http://www.hamradio.harwell.com
The Harwell club's rally takes place at the Didcot Leisure Centre in its large spacious hall, offering disabled facilities (including lift), bar, refreshments and good parking. Located three miles from the A34 between Oxford and Newbury (signposted from A34). Doors open from 1030 until 1530.

February 10
Cambridge & District Amateur Radio & Computer Rally
Contact: John G0GKP/Bob G0GVZ
Tel: (01954) 200072/(01223) 413401
Email: j.bonner@ntlworld.com/bob.grimes@btinternet.com
The Cambridge rally is to be held at Lordsbridge Arena, Wimpole Road, Barton, near Cambridge. Entry is £2, concessions and disabled, £1.50. Doors open at 1000. There will be a car boot sale, Bring & Buy (mostly under cover) and a bar. Free parking.

March 9
Crystal Palace and District Radio Club Spring Fair
Contact: Bob G3OOU
Tel: (01737) 552170
The Spring Fair takes place at St John's Hall, Sylvan Road, London, SE19 between 1030-1300 hours. There will be Amateur Radio, electronics, computing, tools etc,. on offer. Admission, including one free drink, is just £1, children free.

March 17
The Norbreck Amateur Radio, Electronics and Computing Exhibition
Contact: Peter Denton G6CGF
Tel: 0151-630 5790
Organised by the Northern Amateur Radio Societies Association (NARSA) the electronics and computing exhibition takes place at the Norbreck Castle Exhibition Centre, Blackpool. Don't miss the largest single day exhibition in the country! Morse tests will be available on demand.

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

amateur radio **news**

A comprehensive look at what's new in our hobby this month.

A First For Morse

History in the Making

The development and subsequent introduction of the Foundation Licence has brought about some interesting changes to the Morse 'argument'.

The 7 November 2001 was a very important day in Radio Amateur history - it was the day when 40 Class B Licensees took the new Morse Assessment at the RSGB's Headquarters as part of the Foundation Licence pilot schemes. Full or Intermediate Class Bs who have been licenced for more than a year, who take the assesment and successfully complete it, will be allowed to operate on the h.f. bands with M3 calls by taking out a Foundation Licence when it's launched on 1 January 2002.

The *PW* Newsdesk interviewed three of the first candidates to find out how they got on and what they thought of the new Morse Assesment. Here's what they had to say:

Kath Wilson M1CNY "The atmosphere in the room was very relaxed as there were just three of us taking the assessment at the same time. Once the formalities were out of the way the Examiner gave each of us a Crib sheet with all the letters of the alphabet on together with their Morse equivalent, although not in any particular order. First we were sent a passage in Morse letter by letter which we had to write down either as dots and dashes or as the letter - the crib sheet was there to help - so we could eventually write the passage out in full. Then the examiner read out a different passage for us to write down and then send back to him in Morse. The whole process only took about 20 minutes. All in all it was a very comfortable atmosphere and I think its a good way to gain access to the h.f. bands especially if, like me, you've never quite had the time to study for the Morse Test. Listen out for me on h.f. hopefully as M3CNY!"

Dave Garrett G8CHQ "As it was a pilot scheme there were a few teething problems but on the whole the assessment ran smoothly and I'm looking forward to h.f. operating as M3CHQ from 1 Jan 2002. I feel that perhaps standards have been lowered a little by adopting this method of h.f. access but we **must** safeguard our part of radio spectrum and if this gets more of us on the air then its got to be a good thing. If we don't use our spectrum allocation we'll lose it!"

David Wilson G7OBW "I knew a fair bit of the background behind the scheme so knew a little of what to except. There was a relaxed atmosphere to the assessment and I didn't encounter any problems. I feel this is an ideal way of gaining access to the h.f. bands particularly for those who have struggled with Morse tests in the past."

Just as *PW* was going to press the RSGB announced that under their regional umbrella they have arranged for Morse assessments to take place nationwide and that at least two sessions per region will take place before the end of December. So now there's no excuse for not having a go!

- Instructor George Eddowes G3NOH, with Kath Wilson M1CNY, Dave Garrett G8CHQ and Dave Wilson G7OBW, with their yellow Morse Assessment completion certificates. (Photo courtesy of the RSGB).

New From Palstar

Tune Your Antenna

If you are looking for a new Antenna tuner to enchance your radio operating how about trying one of these from the Palstar range?

The AT1500 CV 1.5kW antenna tuner is the latest product to be added to the Palstar range and is available now from Nevada. Built in the USA, the tuner is said to be solidly constructed from 10 Gauge aluminium and the use of a ceramic roller coaster tuning coil ensures a high level of reliability especially at high power.

The AT1500 CV can be used to match a wide variety of antennas and includes a built in 4 to 1 balun for balanced feeders. A six-position antenna switch allows rapid selection of antennas and the large easy to read Vernier dials give more accurate antenna settings.

Priced at **£369,** Nevada say that the AT1500 is bound to be popular. So, if you want to know more contact them direct at.

Nevada,
Unit 1,
Fitzherbert Spur, Farlington,
Portsmouth PO6 1TT Tel: 0239-231 3090
E-mail: info@nevada.co.uk
Website: www.nevada.co.uk

Radio Society News

Regional Organisation Prompts Changes

The Radio Society of Great Britain are to stop organising Amateur Radio trade shows.

As a result of the success of the RSGB's regional organisation the society says it's now possible for them to be present at more Amateur Radio events, rallies and trade shows throughout the country. Due to this increased level of activity the RSGB has decided it will no longer organise Amateur Radio trade shows.

A need for more convention-style meetings has been identified in a bid to give Radio Amatuers the chance to discuss new techniques and innovations at events structed like seminars. The RSGB believe that this is a better use of their resources and so they will be concentrating on this policy for the future.

Radio Society of Great Britain,
Lambda House, Cranborne Road,
Potters Bar, Herts EN6 3JE Tel: 0870 904 7373
Website: www.rsgb.org

Sign-Up Today!

Build Foundations in Chelmsford

Thinking of signing up for a Foundation Licence course? How about this one?....

If you live in or close to the Chelmsford area why not sign up for the Chelmsford Amateur Radio Society's Foundation Licence course? **Chris G0IPU** and **Trevor M5AKA** will be running the course from Thursday 10 Jan for five weeks between 1900-2100hours at the village hall in Danbury. If you want to sign-up to get on the course do it today as it's bound to be popular!

The Chelmsford ARS meet on the first Tuesday of the month at The Marconi Club, Beehive Lane, Great Baddow, Chelmsford at 1930hours. For more information on signing up for the Foundation course or about the club's activites contact the club secretary **David Bradley M0BQC.**

David Bradley M0BQC,
CARS Club Secretary,
Tel: (01245) 602838
E-Mail: davidwbradley1@activemail.co.uk

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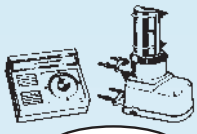

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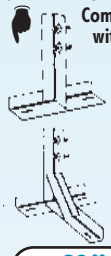

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RG213 MILITARY.....0.85 per mtr.
MINI RG8 .....0.85 per mtr.
RG58 STANDARD.....0.35 per mtr.
RG58 MILITARY.....0.60 per mtr.
H100 .....£1.10 per mtr.

£29.95

SUPER SCAN STICK

Freq. Range 0-2000MHz Length 1000mm

It will receive all frequencies at all levels unlike a mono band antenna. It has 4 capacitor loaded coils inside the vertical element to give maximum sensitivity to even the weakest of signals. *(Ideal for the New Beginner and the Experienced Listener alike.)*

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SUPER SCAN STICK II

Freq. Range 0-2000 MHz. Length 1500mm.

This is designed for external use. It will receive all frequencies. at all levels unlike a mono band antenna. It has 8 capacitor loaded coils inside the vertical element to give maximum sensitivity to even the weakest of signals plus there is an extra 3db gain over the standard super scan stick. *(For the expert who wants that extra sensitivity)*

£39.95

MULTISCAN STICK

Freq. Range Receive - 0-2000 MHz. Transmit 144 - 146 MHz gain 2.5 DBd 420 - 430 MHz gain 4.5 DBd Length 1000 mm.

Although marginally compromising sensitivity the multi scan stick has within its transmitting capabilities plus gain makes it an excellent antenna for the amateur and expert alike.
Comes complete with mounting hardware and brackets.
(Ideal for the amateurs ham radio - user).

£89.95

IVX 2000

Freq. Range Receive - 0-2000 MHz. Transmit 50 - 52 MHz gain 2.00DBd 144 - 146 MHz gain 4.00 DBh 420 - 430 MHz gain 6.00 DBd Length 2.5 m.

For external use, but at a pinch can be used in the loft. It has been finely tuned to make this Antenna the best there is. It has stainless steel radials and hardware. *(THE BEST)*

£29.95

SUPER SCANAIR BASE (Airband)

(Stainless Steel) Freq. Range Recieve 117-140MHz Transmit 117-140MHz Length 825mm Connector-N TYPE

This is a transmitting & receiving antenna designed for the aircraft frequency range. *(For the control tower & aircraft listener).*

£49.95

MULTI SCAN STICK II

Freq. Range Receive (0-2000MHz) Transmit (144-146 MHz) Gain 4.00Dbd (420-430 MHz) Gain 6.00Dbd Length 1500mm

Same as Super Scan Stick but with extra gain, makes it an even better antenna for the amateur and expert alike. *(Ideal for the Ham Radio user)*

MWA HF Wire Antenna Mk11

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Freq 0.05Mhz-40Mhz Adjustable comes with 25 metres of H/Grade flexweave antenna wire,10 metres of military spec RG58 coax cable feeder,insulated guy rope,dog bone & choke balun. All Mods No A.T.U. required. Super Short Wave Antenna.

SWP 2000 FREQ. 25 - 2000 MHz. Length 515mm.

£29.95

Multiband good sensitivity for its small size. Fitted with two suction cups for ease of fitting to any smooth surface (i.e. inside of car window) comes with 5 metres of mini coax and BNC connector. *(Good for the car user who doesn't want an external antenna.)*

SWP HF30

£39.95

Freq. Range 0.05-30MHz Length 770mm

Although small, surprisingly sensitive for the H.F. user. Fitted with two suction cups for ease of fitting to any smooth surface (i.e. inside of car window) comes with 5 metres of mini coax and BNC connector. *(Good for the car user who doesn't want an external antenna.)*

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HF DISCONE

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Internal or External use (A Tri-Plane Antenna). Same as the Super Discone but with enhanced HF capabilities, comes complete with mounting hardware and brackets. *(Ideal for the Short Wave H.F. Listener.)*

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(Stainless Steel) Freq. Range Receive 25-2000MHz Transmit 50-52MHz 144-146MHz 430-440MHz 900-986MHz 1240-1325MHz Length 1540mm Connector-N TYPE

The Ultimate Discone Design. 4.5DB GAIN OVER STANDARD DISCONE! Highly sensitive, with an amazing range of transmitting frequences, comes complete with mounting hardware & brackets *(The Best There is).*

SUPER DISCONE

£39.95

Freq. Range 25-2000MHz Length 1380mm

Internal or External use (A Tri-Plane Antenna). The angle of the ground planes are specially designed to give maximum receiving performance within the discone design. The Super Discone gives up to 3Db Gain over a standard conventional discone. Comes complete with mounting hardware andbrackets. (Ideal for the Experienced Enthusiast.)

£19.95

MRW-100

(Super Gainer) (Rubber Duck) Wideband extra sensitive Dedicated VHF/UHF all mode Length 400mm. P.P £2.00

MRW-40 (Rubber Duck)

Dedicated for Civil & Military Airband VHF/UHF RX & TX Capabilities Length 215mm. P.P £2.00

£19.95

MRP-2000 (Preamplifier)

Freq Range 25-2000 Mhz 9-15v input (Battery not included) 14 db Gain. Complete with lead and BNC connectors.

£49.95

MRP-125 (Preamplifier)

Freq Range 118-137 Mhz 9-15v input (Battery not included) 14 db Gain Complete with lead and BNC connectors.

£44.95

WEATHER SATELLITE ANTENNA

TURNSTILE 137

Freq. 137.5 MHz Length 1000mm

(Simple and easy to install a must for the enthusiast who has it all.)

This Antenna is designed for external use to receive weather satellite signals.

Complete with mounting hardware.

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8th edition

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G. SCAN II

Freq. Range 25-2000 MHz.Length 620 mm.

Magnetic mount Mobile Scanner Antenna. 2 vertical loaded coils for good sensitivity complete with magnetic mount and 4mts of coax, terminated with BNC plug. *(Good for when you are driving about)*

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Joining In 2001

The Radiocommunications Agency 'hit the road' again in 2001 with their series of 'roadshows', so when they visited Southampton PW's News Editor Donna G7TZB went along to find out more.......

By the time the Radiocommunications Agency (RA) reached Southampton on 1 November 2001 they had already presented five roadshows throughout the country and still had three to do! The idea of the roadshows is to give all radio spectrum users a chance to contribute to the ongoing debate on the use (and abuse) of the spectrum.

The event in Southampton was well attended by those with a vested interest. Attendees ranged from mobile 'phone dealers, to Amateur Radio manufacturers, university representatives and professional radio users to name a few. But all were there with the same aim - to find out how the RA manage the civil radio spectrum and what the future had in store for their particular area of interest.

The Amateur Radio side of things formed only a very small part of the day's programme. However, one point, that I'm sure will interest *PW* readers, raised by **David Hendon**, Chief Executive was that there are **no** plans for the £15 Amateur Radio licence fee to be increased at this time. David explained that an economic benefit study had been carried out on the Amateur licence and as a result it had been **valued** at £81 a year per licence but that this was **not** a figure they were planning to charge! (Maybe that's where the rumours started that the Amateur Radio licence was going to cost thousands!). David also touched on the new Amateur Radio licensing structure and the introduction of the Foundation Licence from January 2002.

Alongside David Hendon were **Barry Maxwell**, Director of Customer Services, **Julian Mackenney**, Head of Spectrum Strategy Unit and **Hazel Canter**, Director of Spectrum Services, all of whom gave interesting presentations in their areas of expertise and were only too willing to answer questions from the audience.

It was announced at the Joining In Roadshow that plans are in place to form a new independent statutory regulatory body by the end of 2003.

One very interesting piece of news was about the work currently being carried out to develop a new independent statutory regulatory body. The new body, known as Ofcom, is proposed as an amalgamation of the Broadcasting Standards Commission, ITC, Oftel, Radio Authority and the Radiocommunications Agency.

Ofcom will be responsible for the economic regulation of communications, content regulation and spectrum management and one of its main objectives will be to encourage the optimal use of the radio spectrum in the interests of all. A timetable has been set for Ofcom's establishment and if all goes to plan the new body will be in place by the end of 2003.

So, just what will the formation of Ofcom mean for spectrum users? Quite simply, nothing much at first. All of the RAs functions will however, be transferred to Ofcom and it's hoped that as it will be managing the spectrum for **all** users and **not** just communications users it will greatly benefit everyone, if only because there will only be one organisation to deal with.

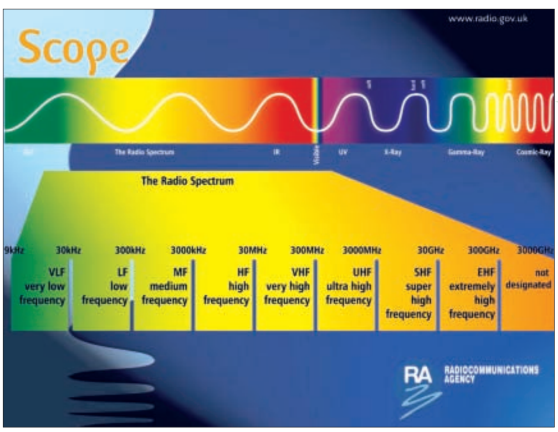
All in all the day was very informative, interesting and in my opinion really drove the message home that the RA's aim is the same as Marconi's was 100 Years ago - reliable radio communications for all.

For the full presentation take a look at the Joining In website at **www.joiningin.org.u**k where a large **.pdf** file is available for you to download.

Radiocommunications Agency,
Wyndham House, 189 Marsh Wall,
London E14 9SX
Tel: 0207-211 0211
Website: www.radio.gov.uk

David Hendon's presentation concentrated on Why Radio is Important

In a bid to serve the customer better Barry Maxwell explained how the Baldock Radio Montoring station in Hertfordshire was currently undergoing modernisation and how the operations room was open 24 hours a day, 365 days a year and that there was an engineer on site at all times.



The RA produces the Strategy for the future use of the radio spectrum in the UK, the latest edition is available on their website. As this picture shows the strategy covers the whole radio spectrum from 9kHz to 275GHz.

The RA hold regional panel meetings to provide customers with an opportunity to give their input into the development of RA policy. There are nine panels throughout the UK with about 180 members whose interests range from Airport to utility communications.

All photos courtesy of Radiocommunications agency

Reflector News

CW Needs You!

The need to fill a gap for c.w. fans recently got the better of Angie Sitton G0HGA, so she took up the challenge and set-up a 144MHz c.w. reflector.

The Two Metre CW reflector burst into life on 29 October 2001. **Angie Sitton G0HGA**, founded the group after identifying a need for a web based reflector forum, where Amateur Radio operators, interested in 144MHz c.w. operation, could 'meet' and exchange views and ideas, ask for help and post alerts.

At the time of going to press the new reflector had signed up 23 members and some lively discussions were beginning to take place - the rule is as long as it's to do with c.w. then it's welcome, what's more it's free and fun! However in order for the reflector to survive the group needs **your** support!

In recent weeks regular c.w. activity has started on Monday evenings. Of course you don't have to join the reflector to join in the fun but you'd be missing out on an excellent source of information and advice.

So, why not join in on Monday evenings (2000 to 2200hrs clock time) on and around 144.050MHz and you'll be made very welcome. For more information on this new reflector check out the 144MHz reflector info page at:
http://www.qsl.net/g0hga/2mCW.htm or E-mail Angie at:
morseladyuk@yahoo.co.uk

Help Out Your Fellow Amateurs

Can You Help?

Spare a little time to see if you can help out these fellow radio enthusiasts.

Umberto Bianchi from Italy is looking for circuit diagrams and manuals for the RACAL MA 1072 Controller and also the RACAL MA 1720S Drive Unit Transmitter. Umberto will cover all costs involved in getting him this information. If you can help please contact Umberto direct at **81 Corso Cosenzaq, 10137 Torino, Italy**.

Mr J. Quirey from Belfast is on the look out for a manual for the Realistic DX-394 scanner he recently purchased second-hand. If you have one to spare or one that you could copy please get in touch with Mr Quirey at **15 Ritchie Street, Belfast BT15 3HY**.

Testing Time

On Course With Icom

In a bid to offer the best service possible Icom (UK) Ltd., have recently run a Radio Amateur Examination Course for members of its staff to ensure they are equipped to deal with queries and offer a high standard of customer service.

The RAE course was run by two members of staff, both licensed Radio Amateurs, with the aim being to increase the knowledge base of the staff in basic electronic principle and radio theory and therefore give them greater confidence when talking to customers on a general technical level. The 13 week course, which started in September, culminated in an examination on 3 December 2001.

The idea of offering the in-house course was that of Icom's **Geoff Boakes G8PPQ**, together with colleague, **Chris Ridley G8GKC**. Between them they designed an intensive timetable so they could teach the syllabus in just 13 weeks.

Geoff commented "A lot of the teaching has been condensed into each one-hour session. Most RAE courses are run for two and a half-hours, a week for a whole year". He added that "The course structure, highly technical in nature, may have been a bit ambitious but given the technical background of many of the students, progress has been very rapid".

The Icom staff who attended the course are employed in all departments of the company including sales, stores and technical support. Chris Ridley said, "Most of the students have been very receptive to the course. All have shown a dramatic improvement in their knowledge. It has made me realise how much I had forgotten since I passed my RAE"!

Dave Stockley G4ELP, Chairman and Co-founder of Icom (UK) Ltd., said, "I think that this project is a very good idea for any company connected with the radio industry. Icom Incorporated in Japan has its roots in Amateur Radio, its President **Mr Inoue JA3FA**, is an active and well-respected Amateur. We currently have 14 licensed staff, this could mean the Icom UK club callsign **G4ICM** gets more of an airing!"

By the time you read this Icom's candidates will have taken their exam and the *PW* team hope they all did well. As soon as we know the results we'll let you know too!

amateur radio clubs

Keep up-to-date with your local club's activities and meet new friends by joining in!

BRISTOL

Bristol RSGB Group
Contact: Martyn Phillips G3RFX
Tel: 0117-973 6419
Website: http://www.btinernet.com/~g3rfx
The Bristol RSGB Group meets on the last Thursday in the month at the Bristol Lawn Tennis & Squash Club, Redland Green, Redland, Bristol BS6 7HF. The group also has a successful contest group using the call G6YB and they're are also the organisers behind the Longleat Rally held every June.

GREATER LONDON

Surrey Radio Contact Club
Contact Ray G4WAY
Tel: 0208-644 7589
The Surrey RCC have some interesting talks planned for the New Year, so why not join them? **January 7**: DRRM for Surrey & South London. a talk by Paul Berkeley M0CJX; **February 4:** Picatune with Paul Berkelely MOCJX. The club meetings are held at Terra Nova, The Waldrons, Waddon, Croydon, Surrey.

HAMPSHIRE

Horndean & District ARC
Contact: Stuart Swain G0FYX
Tel: 0239-247 2846
E-mail: g0fyx@msn.com
Website: http://www.hdarc.cwc.net
Meeting on the 1st & 4th Tuesday of every month at the Lovedean Village Hall, 160 Lovedean Lane, Lovedean, Hants from 1930hrs, meetings are varied and fun! With Christmas on the way the club will be closed on 25 Dec and 1 Jan, but will resume on the 22nd Jan with their meetings. Visitors and new members are always very welcome.

LEICESTERSHIRE

Loughborough & District ARC
Contact: Chris G1ETZ
Tel: (01509) 504319
Website: http//www.qsl.net/g3ral
The Loughborough and District Amateur Radio Club meet weekly on Tuesdays when they offer a wide and varied program of events. They also get together on Monday evenings for construction, computers, operating and a general chat. All meetings commence at 1930hrs and are held in the Science Lab, Hind Leys Community College, Forest Street., Shepshed, Loughborough. There's just time for you to go along to the club's last meeting of the 2001 on **December 18:** Christmas Fun Quiz and Drink. The Club operates the following frequencies when on the air as G3RAL/G7RAL: 145.425, 433.450, 70.425 and 29.025MHz.

Melton Mowbray RAS
Contact: Geoff Griffiths G3STG
Tel: (01664) 480733
Meetings of the Melton Mowbray Radio Amateur Society are held on the third Friday of the month at the St John Ambulance Hut, Asfordby Hill, Melton Mowbray commencing at 2000hrs. Meetings coming up include: **December 21**: Mini-talks by members followed by Christmas Festivities and **January 18**: Internet & Amateur Radio Married - a talk by G3ZHI.

New President For WACRAL

The World Association of Christian Radio Amateurs & Listeners (WACRAL) welcomes its new president.

Dr. Geoff Peterson G4EZU, has recently been appointed as the new President of WACRAL. Geoff's involvment in radio began when he was introduced at an early age to a crystal set and the hobby of radio by his grandfather.

In latter years Geoff went on to progress into radio and radar instructing in the RAF as a National Serviceman, a career within the chemical industry, and later, teaching. He has also enjoyed instructing students for the Radio Amateurs' Novice Licence. For the past ten years Geoff, with the help of his wife **Jenny**, has been responsible for organising WACRAL's Annual Conference in between making time for his other hobbies of sailing and skiing.

If you'd like to join WACRAL you can contact the Membership Secretary for full details.

WACRAL
51 Alma Road, Brixham, South Devon
TQ5 8QR Tel: (01803) 854504
Wesbite: http://www.wacral.org

The Publishers and Staff of Practical Wireless would like to wish all our Readers, Advertisers and Authors a very Merry Christmas and a Prosperous New Year!

From everyone at PW Publishing Ltd.

Please note that the *PW* offices wil be closed from 21 December until 2 January 2002 when we will return to work refreshed, raring to go and ready to bring you more great radio reading for the coming year.

amateur radio clubs

Keep up-to-date with your local club's activities and meet new friends by joining in!

MIDDLESEX

Edgware & District Radio Society
Contact: Bill G0STR/David G5HY
Tel: 0208-958 1255/(01923) 655284 days/ 0208-954 9180 evenings

The Edgware club meet at 2000hrs on the 2nd & 4th Thursday of the month at The Watling Community Centre, 145 Orange Hill Road, Burnt Oak, Edgware, Middlesex. New members and visitors are always welcome so why not make it your New Year resolution to go along and join in the fun? **January 10**: Annual General Meeting; **24th**: Informal evening - pay your subs!

NORTHERN IRELAND

Bangor and District ARS
Contact: Mike GI4XSF
Tel: 0284-277 2383
E-mail: mike@gi4xsf.freeserve.co.uk
Website: http://welcome.to/bda

The Bangor Club meet on the 1st Wednesday of every month in The Stables, at Groomsport from 2000hrs. If you'd like to join them why not go along to their first meeting of 2002? **January 2**: Annual Quiz Night - this is always a great night out and the members are looking forward to seeing as many visitors, visiting teams and new members as possible. So go on, what are you waiting for?

PLYMOUTH

University of Plymouth ARS
Contact: Den Perryman G7NMA
Tel: (07811) 934845

Plymouth Amateur Radio Society extends a warm welcome to all Radio Amateurs interested in all aspects of the hobby. Meetings are held on the 1st & 3rd Thursday of the month at The Smeaton Building, Room 312, Plymouth University from 1930hrs. The club offers Morse classes, radio shack, talks and visits as well as RAE classes - details from **Bob Griffiths** on **(01752) 343177**.

SURREY

Sutton & Cheam Radio Society
Contact: John Puttock G0BWV
Tel: 0208-644 9945
Website: http://www.scrs.btinternet.co.uk

The Sutton Cheam Radio Society meet on the 3rd Thursday of each month at 1930hrs at Sutton United Football Club, Borough Sports Ground, Gander Green Lane, Sutton, Surrey. They are have very friendly and active radio society who produce an informative newsletter once a month giving details of Guest speakers on club nights and outings throughout the year. A warm welcome is given to all visitors whether licensed operators or Short Wave Listeners. On the first meeting of 2002 the club welcomes *PW* Editor **Rob Mannion G3XFD**, **January 17**: *Practical Wireless* - Past, Present and Future by Rob Mannion G3XFD.

HAYDON Communications

Mail order: 01708 862524 For main product lines see over

PRICES SUBJECT TO CHANGE WITHOUT PRIOR NOTICE. PLEASE VERIFY BEFORE ORDERING. E&OE. NEXT DAY DELIVERY TO MOST AREAS, £10.00.

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1.8-30MHz (200W PEP) mobile antenna – no ATU required. Length 102" (52" collapsed). Fits 3/8 mount (SO239 feed point)
INTRO PRICE **£129.95** delivery £10
Optional magnetic base £24.95
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Roof bar mount requires cable kit.....£9.95
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Q-TEK PENETRATOR

"We've sold 100s all over Europe"

★ 1.8 - 60MHz HF vertical ★ 15 foot high ★ No ATU or ground radials required ★ (200W PEP).
ONLY **£179.95** delivery £10
SEND SAE FOR LEAFLET

Wire version now available 45ft long end fed. (1.8-60MHz) spec. as above. Price £159.95.

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2m	5ele (boom 45"/9dBd)	£49.95
2m	7ele (boom 60"/11dBd)	£54.95
2m	12ele (boom 126"/13.8dBd)	£79.95
70cm	7ele (boom 28"/11dBd)	£39.95
70cm	12ele (boom 48"/13.8dBd)	£59.95

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Delivery £10.00

2m	5ele (boom 63"/9dBd)	£49.95
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2m	11ele (boom 156"/12.7dBd)	£94.95
2m	5ele crossed (boom 64"/9dBd)	£79.95
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4m	3ele (boom 45"/7dBd)	£56.95
4m	5ele (boom 128"/9dBd)	£69.95
6m	3ele (boom 72"/7dBd)	£59.95
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70cm	13ele (boom 76"/12dBd)	£46.95
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Multi-stranded PVC coated heavy duty flexweave wire. All parts replaceable. Stainless steel and galvanised fittings. Full size - 102ft.
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Carriage £6.50.

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STANDARD G5RV

Full size	102ft	£24.00 P&P £6
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1.1 Balun		£25.00 P&P £2
4.1 Balun		£25.00 P&P £2
6.1 Balun		£25.00 P&P £2
40 mtrs	Traps	(a pair) £25.00 P&P £4
80 mtrs	Traps	(a pair) £25.00 P&P £4
10 mtrs	Traps	(a pair) £25.00 P&P £4
15 mtrs	Traps	(a pair) £25.00 P&P £4
20 mtrs	Traps	(a pair) £25.00 P&P £4

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Q-TEK COLINEARS

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Glassfibre construction

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DB-770M	2m/70cm (3.5 - 5.8dB) 1m PL-259	£24.95
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PL-62M	6m + 2m (1.4m) PL-259	£19.99
MA5M	(20 - 10m) 3/8" fitting 5 band	£29.99
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PVC coated earth wire 15m roll .....£10.00 P&P £5
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Copper plated earth rod (4ft) + 10m wire..£18.99 P&P £6

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100m roll of Mil spec RG-58 coax
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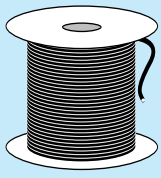

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Rectangular snap-fixing ferrite cores suitable for :- Radio coax/TV/mains/telephone/PC & data cables. Plastic teeth prevent it from sliding on cable. Simply snap close onto cable and job is done!
Bulk purchase hence **2 for £7.95** (P&P £2.50)

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10 for **£10.00** *or* 20 for **£15.00** P&P £3.00
Superb quality

20ft BARGAIN MAST SET

4 x 5' lengths of approx 2" extruded (16 gauge) heavy duty aluminium, swaged at one end to give a very heavy duty mast set.
OUR LOW PRICE **£39.95** Del £10

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2" x 2.5m length	2mm wall thickness	£19.99 P&P £10
2" x 10ft collection only	2mm wall thickness	£24.99
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ALL MEASUREMENTS ARE APPROX

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1½" Dia .....£8.50 per metre *P&P £10*
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Fibreglass available up to 5m lengths.

NB. We can only deliver up to 2.5m lengths

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6 section telescopic masts. Starting at 2½" in diameter and finishing with a top section of 1¼" diameter we offer a 8 metre and a 12 metre version. Each mast is supplied with guy rings and stainless steel pins for locking the sections when erected. The closed height of the 8 metre mast is just 5 feet and the 12 metre version at 10 feet. All sections are extruded aluminium tube with a 16 gauge wall thickness.
8 mtrs **£99.95** 12 mtrs **£139.95** *Carriage £10.00.*
Telescopic mast lengths are approx.

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3-way guy ring		£3.95
4-way guy ring		£4.95
2" mast sleeve		£9.95
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Standard guy kits (with wire)		£23.95 P&P £6
Heavy duty guy kits (with wire)		£26.95 P&P £6
Ground fixing spikes (3 set)		£18.00 P&P £6
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25-1300MHz wideband desktop scanner with turbo scan. (Selectable AM/FM/WFM). Selectable tunning steps + alpha-numeric tagging.

"Our best selling desk-top scanner"

SPECIAL OFFER **£249.00**

NEW AR8600

Extremely versatile all mode receiver (530kHz-2040MHz).

OUR PRICE **£649.95**

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ICOM IC-8500

Next generation wideband receiver. 0.1-2GHz. (All mode)

2 YR G'EE *Latest UK version* 10

SALE PRICE **£1149.95**

ALINCO DJ-X3

Micro-handy scanner. 100kHz-1300MHz. 700 memories/stereo FM (earphones)/ attenuator/bug detector/audio descrambler. AM/FM/WFM/ Selectable tuning steps (incl's 8.33kHz).

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All mode (includes SSB) receiver. 0.1-1300MHz. Real time band scope dual watch, alpha/numeric display. Compact size (58 x 24 x 95mm).

A SNIP AT **£199.00**

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'A first!' TV/video picutre & sound! Certainly a gadget for the future – see things you didn't know existed! A wide-band scanner covering 0.5-2.3GHz (AM/FM/WFM) with "TFT" colour display.

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Case. £17.99

receivers

FAIRHAVEN RD-500VX+

Superb wideband receiver (all mode) with over 50,000 memories capable of holding text. 20kHz-1750MHz.

UK's No1 PERFORMER.

SSP: ~~£999.00~~ SPECIAL OFFER **£749.00**

SONY SW-100E

★ Miniature portable all mode SW receiver ★ Station presets for 50 frequencies ★ Single side band system ★ Synchronous detector ★ Tuning in 100Hz + 1kHz steps ★ Includes compact antenna/stereo earphones/case.

OUR PRICE **£149.95** P&P £10

ACE-30	PSU for above	£24.95
AN-100	Active antenna	£64.95

SANGEAN ATS 909

Superb receiver with true SSB and 40Hz tunning. Sold under Roberts name at nearly twice the price. Features RDS facility, 306 memories and FM stereo through headphones. The ATS-909 is superb value. PWR:- AA batteries not supplied or optional PSU £16.99.

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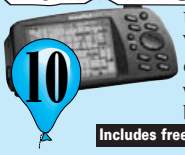
garmin gps

GARMIN STREET PILOT



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NEW GPS MAP 76

New GPS with built-in map database, new improved built-in antenna, 8 meg of spare memory on board (data lead supplied). Auto track log/waterproof and will not sink in water. Accepts mapsource CD data.

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GP-12	£99.95
8 meg data card	£49.95
16 meg data card	£82.25
32 meg data card	£119.95
64 meg data card	£195.00
128 meg data card	£299.99

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SGC-230

200W instant auto ATU. Tune any length of wire with this superb ATU. (Minimum length applies.) Worlds best selling smartuner!

Connect a wire and away you go.

OUR PRICE **£319.00**

Optional earth stake £13.00

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JUMBO WALL/DESK CLOCK.
- Wide screen/2" digit time display
- Barometer
- Calender
- Temp
- Auto RF synch clock from Rugby.

PRICE **£59.99** P&P £5.00

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RADIO CONTROLLED CLOCK.
- 12/24hr alarm function
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Looking At...

The Power Supply (Part 1)

Gordon King G4VFV looks at the way power supplies work and how they are used in modern day transceivers.

Latter-day solid state receivers, transmitters and ancillary kit derive their operating power from the a.c. mains supply. The requirement is commonly for a smoothed and possibly regulated d.c. power supply focused around 12 to 14V. Smaller equipment, such as portable receivers and transceivers, work at lower voltages around 6 to 9V and operating power can be obtained from batteries.

In the past, receivers often required a d.c. supply of 200V or more, while other than low-power transmitters were not all that happy with a supply much below 500 to 1,000V. These were the days of the thermionic valve, when the addition of a heater supply was also demanded. In this age of solid state electronics things have become more relaxed, but we still need to rectify the a.c. mains to obtain a relatively lower voltage, but at a higher current to provide the necessary power.

The power supply contains suitable rectification circuitry which, although often built into the equipment proper, is nowadays not uncommonly a separate item of equipment, known as the power supply unit or p.s.u. The mains supply voltage is reduced before rectification by a 'step-down' mains transformer, which also serves to isolate the mains supply from both the equipment set-up and the operator!

WS1746

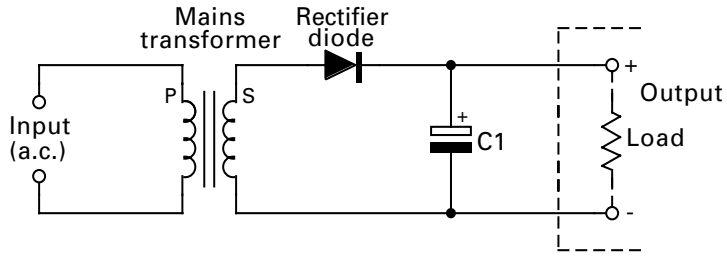


Fig. 1: Simple half-wave rectifier where the reservoir capacitor C1 is recharged once every cycle of mains input.

WS1747

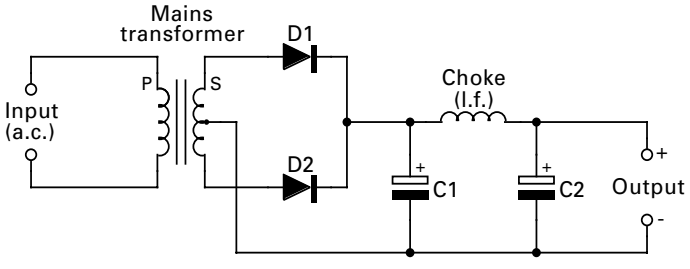


Fig. 2: Full-wave rectifier using two diodes and a mains transformer with a centre-tapped secondary winding. Here the reservoir capacitor C1 is recharged twice every cycle of mains input. the low-frequency choke (l.f.c.) with C2 forms a low-pass ripple filter.

WS1748

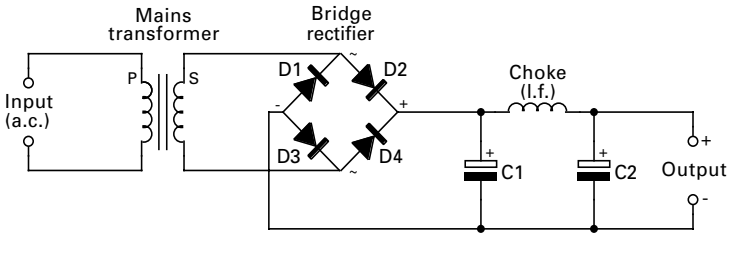


Fig. 3: Full-wave bridge rectifier which avoids the use of a centre-tapped secondary winding.

Rectifier Circuits

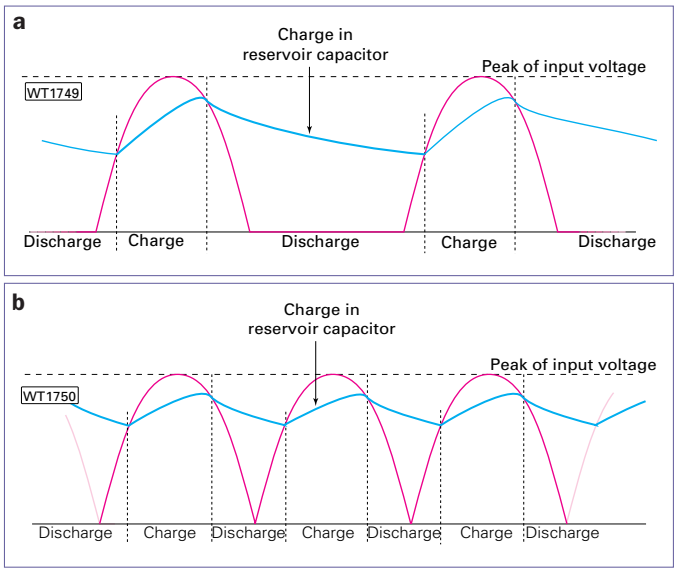
The simplest of rectifier circuits is shown in **Fig. 1**. This uses a solitary rectifier diode fed from the secondary winding (s) of the mains transformer, across whose primary winding (p) is connected the 230V mains supply and whose s/p turns ratio satisfies the output voltage requirement.

During positive-going half-cycles of the mains input, the diode is forward-biased and power is passed to the load, represented by the resistor to the right of the broken-linein the circuit. During negative-going half-cycles the diode is reverse-biased so no power is transferred to the load.

The single diode arrangement constitutes half-wave rectification. Greater efficiency is achieved, though, by full-wave rectification where, as shown in **Fig. 2**, a couple of rectifier diodes are utilised fed from a centre-tapped secondary winding. Relative to the centre-tap, diode D1 conducts on positive-going half-cycles while D2 is reverse-biased, Conversely, on negative-going half-cycles diode D2 conducts while D1 is reverse biased.

A different full-wave rectifier circuit is shown in **Fig. 3,** which uses four diodes but does not require a centre-tapped secondary winding. This is known as a full-wave bridge, where diodes D2 and D3 conduct on one half-cycle and D1 and D4 conduct on the other half-cycle. Although four separate diodes can be used to form the bridge, most equipment these days adopt an 'integrated' component, on which the input is shown by appropriate a.c. symbols and the output by plus and minus signs.

On all three circuits an electrolytic capacitor, denoted C1, connects directly across the d.c. output. This, known as the reservoir capacitor, helps to



● Fig. 4: The charge and discharge cycles of the reservoir capacitor (a) half-wave rectification and (b) full-wave rectification.

reduce the mains 'ripple' on the output.

Although unidirectional, the output is certainly not smooth d.c., but consists of a flow of mains half sinewaves. With half-wave rectification the ripple corresponds to the mains frequency (50Hz in the UK) and to twice the mains frequency with full-wave rectification.

The illustration, **Fig. 4** reveals the reason for this, (a) with half-wave rectification and (b) with full-wave rectification. The 'smoothing' effect of the reservoir capacitor is also shown in both cases when the circuit is under load, the capacitor being charged during the half-cycle conducting periods and discharged during the intervals between them. The output voltage of the rectifier is also increased by the action of the reservoir capacitor, depending on its value and the magnitude of the load.

Peak Value

Under zero load conditions the voltage across the reservoir capacitor reaches the peak value of the a.c. input, which is 1.41 (20.5) times the r.m.s. value of the voltage across the secondary winding, or between the centre-tap and either half of the secondary in the case of the full-wave two-diode circuit. Because of the twice-per-complete-cycle reservoir recharge with full-wave rectification, the ripple output is less for a given load than from the half-wave circuit.

For serious power supply applications, the full-wave circuit, usually in bridge formation, is most commonly used. Moreover, owing to the higher ripple frequency with full-wave rectification a smaller value reservoir capacitor, than required for a given ripple output with half-wave rectification, becomes feasible.

Even so, the ripple still needs to be further filtered where sensitive equipment is to be powered. In the full-wave circuits illustrated such additional filtering is provided by the low-frequency choke (l.f.c.) and the smoothing capacitor C2, arranged in the form of a low-pass filter. In the next Looking At I shall be investigating filtering of this kind in more detail, along with voltage stabilisation and regulation. Cheerio 'till then.

PW

Radio Basics

Having described how to start building the project 'backwards' Rob Mannion G3XFD continues onwards - in the right direction! - by presenting the circuitry for the Radio Basics capacitor/resistance bridge.

In the December 2001 Radio Basics (RB) column I stressed the importance of preparing the largest and easiest-to-read type of control panel and scale you could make to use wit the RB C/R bridge project. Hopefully, by now you've started work on the important physical requirements...so now we can start work on the really simple but extremely important 'heart' of the instrument - the bridge itself, and the associated null reference source and the output amplifier/null indicator*.

As mentioned last month, the bridge project uses circuits regular RB readers will be familiar with. he diagrams in Fig. 1 and 2 (in the December issue showed the LM386 audio amplifier we're to use, along with the simple multivibrator project which featured in the Basi-Probe which appeared some time ago (the BC182s, LM386, switches and the variable resistor were obtained from Sycom, see advert in this issue).

Using circuits we're familiar with is a deliberate ploy. This is because I think by using known 'building block' circuits we can all gain much experience - saving precious hours on the workbench making different projects employing the 'building blocks' we've already built!

* **See the information panel on the Basics Board on page 25.**

Circuits Combined

Now it's time to bring the familiar circuit elements together, and at the same time introduce the 'bridge' circuit which is the actual 'heart' of the unit. Interestingly, the bridge circuitry - shown in part **A** (Upper) of this month's **Fig. 2**, (all the components to the right of C3) was originally published in *PW* around 1960!

However, in the version from 1960 an external alternating current (a.c.) source had to be used. In those days a 6.3V filament heater transformer was recommended. For the necessary 'null' (the point where the bridge goes into balance and the source signal disappears) indication a pair of headphones was suggested.

There's rarely anything new in radio and all I've done is to bring the project up to date to make a very useful little instrument. Instead of the rather harsh a.c. buzz from a mains transformer this project uses the output of the multivibrator which hopefully you've already tried from previous RB columns! The frequencies available are ideal for null indication purposes and I was exceptionally pleased with the very deep null the instrument provided.

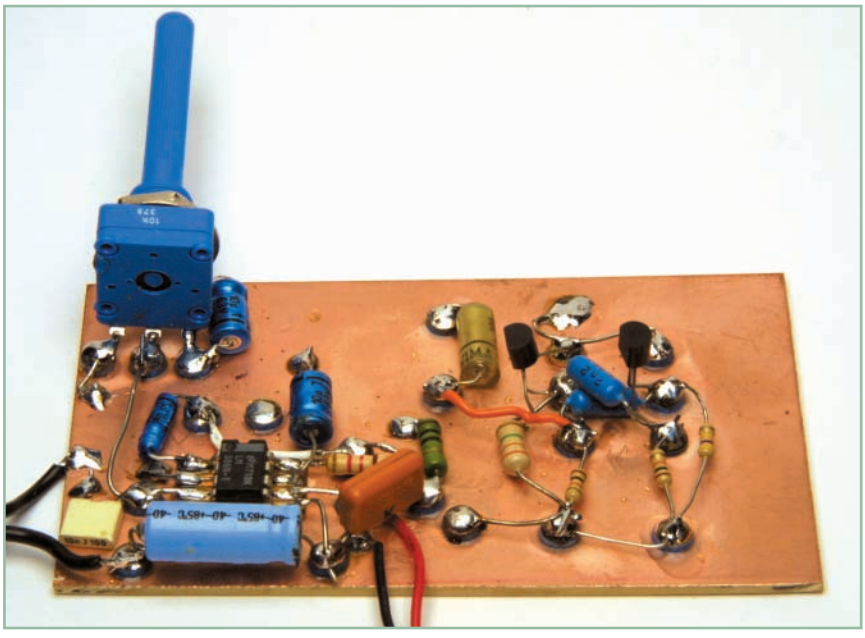


Fig. 1: The null audio amplifier (left) and multivibrator circuitry (right) built onto the same section of laminate using the 'Copper Islands' technique (this system is reviewed on page 49 in this issue, is thoroughly recommended for use by RB readers). However, to ensure complete isolation between the multivibrator and amplifier sections, the ground plane is cut between the two sections immediately to the right of the power leads (centre, solder points hidden under the capacitor) to the audio section (see text). Please also note that although the audio level variable resistor is shown actually mounted on the p.c.b., in practice (when mounted in the instrument) it will be provided with 'flying' lead three wire connectors (see text).

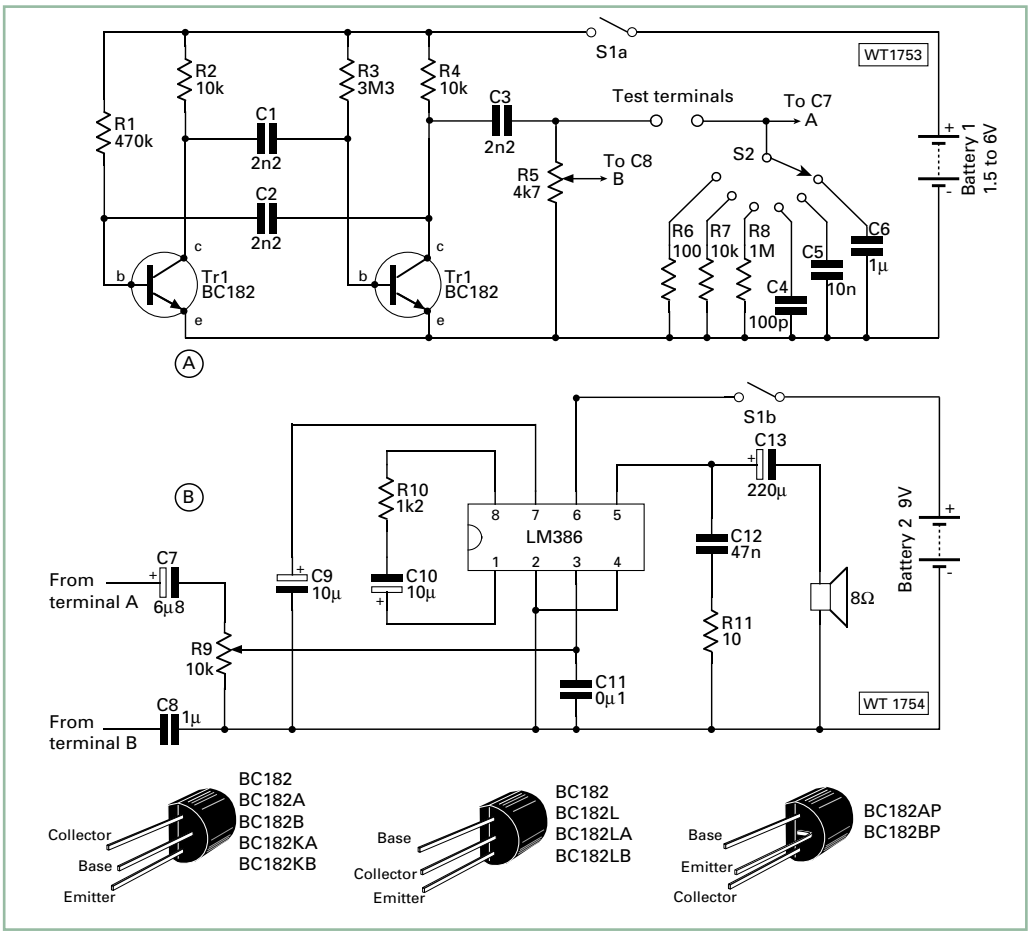
However, the use of the multivibrator, whilst enabling us to make a very simple bridge, suffers from the advantage that the all-pervading non-sine wave output form the multivibrator penetrates to parts of the circuit where it's most certainly not wanted! **It will work** from one common power source...but **unless you are prepared to spend a great deal of time** removing the unwanted signal from the amplifier circuitry by filtering - you'll **still end up with a null which can be difficult to identify**. So, please use two separate supplies as I suggest.

The inclusion of C8 in the negative (-) ground connection between the bridge/multivibrator unit and the amplifier provides d.c. isolation. Please ensure that you do treat the two halves of the circuitry **as separate halves** - linked only by C7 and C8. **Note: This is why the two units are not shown linked in Fig. 2, to emphasise that the only electrical connection is via C7 and C8.**

Practically speaking, if you adopt the Copper Islands Construction Outfit (I've now nicknamed it the CICO system) techniques, and build section A's circuitry on the same board as the amplifier as I've done - you must make a saw cut on the ground plane, removing the copper between them to ensure full d.c. isolation.

Bridge Circuitry

Don't worry too much that the bridge circuitry looks as if it also has to be built onto the same section of board...it doesn't! Instead, in practice it's mounted on and around the single pole six-way switch, S2 (the use of which I discussed in



● Fig. 2: The circuit in the upper (A) part of the diagram shows the multivibrator (null signal generator, comprising all the components to the left of the coupling capacitor C3) which is provide by two BC182 transistors (pin-outs for known BCI82 variations are shown in section C of the drawing). All the components to the right of C3 are part of the bridge circuitry itself. The on-off switch S1a in this section is 'ganged' to S1b in the amplifier circuitry - lower section of the diagram (B). (Two power supplies -one on/off switch). The lower diagram (b) is of the amplifier circuitry, using the LM386 audio i.c. Please note that the two sections of circuitry are d.c. isolated from each other by C7 and 8 (see text).

Figs. 1, 2, 5 and on pages 22 and 23 of the November 2001 issue of *PW* to help you prepare). Please refer to the issue if you're not confident in making use of the single pole six-way switch used for S2. Hopefully it should re-assure you!

Depending on how you build your bridge's front panel...you'll have a choice on where and how to place S2 (the range change switch as shown in Fig. 3 (December issue). If you've chosen the suggested as-large-as-possible approach you should have plenty of room to place the bridge circuitry on and adjacent to S1, mounting the test terminals in the position occupied (in December's Fig. 3) On/Off switch. It's entirely up to you, the size of the finial unit you're making and ease-of-use for the owner. (Obviously, I'm biased towards 'left-hand' drive - and if you're not fortunate enough to be left-handed (Hi!) you can overcome this by transferring S2 to the right!

A small loudspeaker, working in conjunction with a switched headphone socket could also be mounted in the side of the cabinet/box. There's not a great deal of audio output from the unit but it's more than adequate for our use so I recommend you do include a miniature (a 65mm diameter 8Ω unit is ideal) speaker in your version of the project.

Power Supply

In practice, a 9V battery will provide a more than adequate for the audio amplifier and will last for a long time. In my second prototype I dispensed with a battery holder and stuck the battery underneath the front panel.

The multivibrator will operate satisfactorily on voltages between 1.5 and 9V. However in practice I've found 4.5V to be ideal - mounting three 1.5V cells in series within the cabinet and attached with adhesive - removing the need for a battery holder. This can be done because the multivibrator will only be on for short periods and the batteries will last a very long time.

Both power supplies are switched on and off by S1. This (although not shown on the diagram by the usual dotted line linking them) is a double pole single throw (DPST) type (see RB November).

So, good luck building your own project...and you'll soon be ready for the next job...setting up and calibration: This will be covered in the next issue of Radio Basics but don't worry...it's simplicity itself. Cheerio until then!

PW

Basics Board

Project update: In use the C/R bridge will enable you to compare (with known 'standard' values) the value of unknown or suspect capacitors and resistors. In use the unknown/suspect component is placed across the test terminals and the user rotates the main control until a 'null' (sound disappears or is reduced greatly) - reading off the values from the previously calibrated scale. It's particularly useful in identifying capacitors with difficult-to-decipher markings!

The standard 'Reference' components are best purchased new especially for use in the bridge and fortunately none are expensive!

The user can opt to use either headphones or a small loudspeaker to identify the null. incidentally, this circuit provides a very deep null, and with the components shown for the multivibrator, together with the supply voltages suggested - the note is pleasant to listen to.

With practice the user will very quickly identify values to very narrow margins of accuracy. However, the ability to identify very small positional changes of the control knob (and the subsequent null) and the final read-out depends entirely on the size of the instrument's scale. So, take my advice and make your scale as large as you practically can! Time taken to prepare a large scale ready for calibrating we be repaid very handsomely indeed.

● Tough and tiny...but a good performer. Rob Mannion G3XFD - once he'd seen this amazingly little performer - enjoyed using it and coined the phrase "It's as tough as tank' - hence this month's front cover on *PW*!

Yaesu's Tough & Tiny Talker

The chance to try out Yaesu's rugged-looking little FT-1500M transceiver came just as G3XFD took delivery of his new car. Since 1 September 2001 Rob's driven almost 5000 miles...and the Yaesu's been with him all the time!

days of taking delivery of the car on the first of September, *PW*'s News and Production Editor **Donna Vincent G7TZB** suggested I take on the job of reviewing the Yaesu FT-1500M as it fitted so well in the roof compartment above the driver's seat.

At the time of writing this article - in mid-November 2001, I've driven almost 5000 miles in the Toyota. It's proved ideal for my portable radio operations and as a result the Yaesu transceiver has had much use and had also proved to be as tough and reliable as it looks. So, in answering the question "How long have you had the rig on review"?, I can answer...almost 5000 miles!

To be quite frank...some pseudo-military/Amateur Radio equipment concepts don't work out. In the recent past I've openly criticised the approach of manufacturers who - in my opinion - have tried to redirect military look-alike equipment in the direction of unsuspecting Amateur Radio enthusiasts. On those occasions I was critical because there often seemed to the disadvantages of what was originally designed as military and marine equipment - with no real consideration for our hobby's special requirements. Only my personal opinion of course...and I fully realise (from the correspondence received from those who disagree) that other people have differing opinions!

But this time my finger's not pointing at Yaesu because although there may be some comparisons with militarily-style transceivers the FT-1500M transceiver is a little thoroughbred. It's a no-nonsense Amateur rig built (externally) in a similar way to military equipment, with the necessary reliability for when it's used in the field....and priced at an Amateur Radio level.

Weighing in at 1kg (2.2lbs) the transceiver feels surprisingly 'chunky' for the physical dimensions of 127 x 35 x 126mm (5 x 1.4 x 5in). Another surprise is that this little package can provide up to 50W output, and it was because of this and the

● Needing to convey the size of the Yaesu FT-1500M to readers, Rob G3XFD asked Donna G7TZB to 'Lend a hand' and she took him literally! Donna's hand is truly ladylike in size and so it's possible to get a good impression of the transceiver's neat format.

My new Toyota Yaris Verso mini-MPV car is deal for the Radio Amateur as it's full of little nooks and crannies (my Grandson Freddie - who'll be three in January - says it's full of "Crooks and Grannies" for my radios). Because of this and literally within

Interesting Concept

The Yaesu FT-1500M is an interesting concept and I was reminded of Yaesu's promotional material referring to its military type styling when it first appeared on the market several years ago. However, for some reason the chance to review this interesting little rig never came my way then, but better late than never!

convenient size that Donna and I thought it would be ideal to try out in my Toyota.

Designed around a double conversion receiver with a (surprisingly low) first i.f. of 21.7MHz and second i.f. of 450kHz, Yaesu claim a sensitivity of better than 0.2µV (for 12dB SINAD) and a selectivity (-6/ -60dB) at 12 and 28kHz (see 'On Air' comments later).

For mobile use a good audio output level is required...and despite its miniature looks this little transceiver provides an impressive 3.5W into 4Ω (again more on this later).

Facts & Features

Let's now look at the basic facts and features offered by the FT-1500M - and they're far from basic! I'm not listing them all - but only those which I regard as being really noteworthy. If you want check everything - please check out an FT-1500M when you next attend a show, rally or Yaesu dealer!

Power levels are controllable from 50 to 25, 10 and 5W easily using one of the top mounted switches. There's also expanded receiver coverage (137-174MHz - not within the scope of this review as I'm concentrating on the Amateur Radio aspects of equipment), keyboard entries from the microphone, packet radio capability via a rear panel mounted jack, 130 memories to store repeater shifts, CTCSS tones, with user-tagged alpha-numerical labels for channel recognition. There's built-in CTCSS encoder/decoder circuitry (becoming a necessity with many repeaters beginning to use CTCSS nowadays).

The 'Smart Search' feature was very helpful indeed! Although many features of this kind aren't used by grey-beard G3XFD...this one was! The (up to the usual Yaesu standard) manual says :"The Smart Search Feature, which automatically sweeps a band and loads active frequencies into dedicated memory banks, is ideal for identifying active repeaters". And it did so very well too!

I used Smart Search, it can be commanded by operating P2 button on the microphone (Control button P1, next to P2, on the microphone operates the 1750HZ tone burst) when I was driving from Dorset to North Yorkshire for a club visit, and then onwards to Rochdale for the QRP Convention with impressive results. The feature soon enabled me to listen in to 144MHz local 'chat' frequencies as I passed by on my 780 mile (1255km) round trip... a great way to enjoy listening in to other Amateurs.

● Access to the insides of the rugged and robust casing - its wouldn't be a fair description to refer to it as a 'shell' or 'cover' as neither term adequately describes the impressive looks - is via an Allen key. But, despite the miniature control buttons the transceiver is exceptionally neat, and even with his larger fingers G3XFD had few difficulties operating the radio.

On The Air

As I've already mentioned, the Yaesu FT-1500M was on loan to me for much longer than is usual for reviews and on the air appraisals. I was grateful for the opportunity to use no-nonsense simple-to-install rig to use while I got used to using the new car and sorting out what equipment was to be semi- installed.

Very few of my QSOs are actually 'mobile' nowadays because, apart from the usual safety factors it's exceedingly difficult for me as I use hand-controls to drive. I've now graduated from the purely mechanical push-pull lever for brake and accelerator (the accelerator control is now in the form of an Italian-made 'Guido Simplex' inner ring on the steering wheel itself, operating the vehicle's throttle via a servo motor which I'm pleased to say doesn't seem to have any EMC problems when I'm transmitting on h.f. or v.h.f).

The brakes are controlled from a custom-designed mounted hand-operated lever next to my left knee! Very comfortable to drive yes, but leaving no room - in all senses of the word - for operating on the move. I only mention these facts because I know there are many other disabled Amateurs and they may well pass on some of their own ideas to help myself and others in the same situation.

My usual practice is to take a break on journeys and go on to the h.f. or v.h.f. bands...and I can be on either within seconds of stopping. To help, the FT-1500M had been mounted above my head in the high-roofed Toyota, placed in a useful parcel shelf, ideal for the purpose. Large ventilation holes in the bottom of the shelf allow for natural cooling to take place, and the audio from the relatively small loudspeaker is reflected downwards towards me.

Incidentally, the audio from the FT-1500M is surprisingly good bearing in mind just how small the speaker is and (in my car) I was listening from below, to a speaker mounted on the upper casing, directing the output towards the inner roof of the car. Additionally, the audio output power was more than adequate when on the move because, although I rarely transmitted when mobile...I listened a very great deal.

On my various trips to visit clubs and also for personal travel, I tend to time my breaks at favourite high spots so I can get the best results on the air. I've no doubt that many of you know Birdlip Hill in Gloucestershire, Clee Hill in Shropshire, and the Hills around Llangollen - all are favourite G3/GW3XFD operating sites often used when I pass through.

Unfortunately though, many of my favourite high spots are also occupied by high power v.h.f. /u.h.f Private Mobile Radio (PMR)

Product

The Yaesu FT-1500M 144MHz v.h.f. f.m. 50W mobile transceiver.

Pros & Cons

Pros: An amazingly compact, rugged and easy-to-use 144MHz f.m. transceiver. Ideal for those who don't want to dominate their car with Amateur Radio gear but who want a potent transmitter. Fit, forget it's there...and use it as much as you like....tough as a tank in looks and circuitry!

Cons: Very small control buttons which are slightly 'fiddly', l.c.d. screen could be brighter.

Company

Yaesu (UK) Ltd.

Contact

Sales
Telephone (01962)866667

Price

£229 inc. VAT

Summary

In my opinion the Yaesu FT-150M is a reliable 'go literally anywhere' f.m. transceiver. It's so small and neat it could be fitted in literally any car, lorry or boat. I've even seen one mounted on a bicycle...the FT-1500M is that versatile!

Thanks

My thanks for the extended loan of the review FT-1500M go to ***Yaesu UK, Unit 12, Sun Valley Business Park, Winnall Close, Winchester, Hampshire SO23 0LB.***

The Yaesu FT-1500M is provided with a fist microphone providing many facilities. Rob G3XFD - having come across this method before - soon became adjusted to using the special P1 button to provide a 1750Hz tone burst where necessary. The microphone is illuminated for night time use and the built-in keypad provides many control functions. Particularly useful is the 'Smart Search' control button P2 (See text).

transmitters and the dreaded wide area paging systems - famed for their effects on modern v.h.f./u.h.f. equipment. A 144MHz rig has got to have adequate cross-modulation characteristics nowadays because paging transmitters are to be found everywhere - particularly on what we also consider to be good v.h.f. sites!

I'm mentioning my operating choices because I was pleased to find that the FT-1500M coped extremely well with nearby paging transmitters on several of my favourite hill-top sites. Additionally, not far from my temporary home in Ferndown in Dorset, there's a nest of potent PMR, paging and other v.h.f. /u.h.f. transmitters within 500 metres or so of the house. And even when I had the '1500M in the shack monitoring the band as I worked on the bench...there was minimum break-through observed.

Bearing in mind that the FT-1500M has a relatively low (for modern equipment) first i.f. of 21.7MHz, image problems and general selectivity were also impressive. I had adequate proof of this one Saturday when operating from the car park at Birdlip Hill (not far from the Air Balloon pub) on the way home from North Wales. In the distance either side of my spot I could see two other Amateurs who were also working on 144MHz. We were all within 500 metres of each other and my own QSOs were completed satisfactorily. Needless to say I was impressed.

The audio from the FT-1500M is extremely good on transmit - many friends commented during QSOs that they immediately recognised my voice. "Clear & crisp" was the most often heard report.

Whilst up in North Wales, when parked in Caernarfon, overlooking the Menai Strait, using my 5/8λ mobile whip (normally only employed when stationary) I heard the Limerick Repeater in south-west Ireland coming through at S8 over the long sea path. However, despite trying...I didn't work anyone in EI although (on the simplex channels) I heard the usual gang of EI stations based in and around Clonmel in County Tipperary. Quite oblivious of how far their f.m. transmissions were travelling - my friends in the **Tipperary Amateur Radio Group** (TARG) weren't looking out for DX stations! On the other hand - the sensitivity of the FT-1500M, together with the 50W output would have certainly helped in a QSO.

Finally, I should mention the FT-1500's blue background l.c.d. screen. This was more than adequate for inside the car in the screened (from the direct sunlight) position I had it mounted into. However, mounted on the dashboard with bright ambient light, I think the blue background colour placed the screen at a disadvantage.

Don't be deceived - there's much more inside an FT-1500M than you think on first glance! In the review G3XFD comments on the surprisingly good audio available from the FT-1500M's relatively small speaker (Underneath the released top casing - on the right in this photograph).

So, my advice for anyone contemplating fitting an FT-1500M - is to place it away from the direct influence of bright ambient light. But to be fair, I've also had to be careful positioning the main screen on other equipment n my car - those with a yellow tinted background also losing apparent contrast due to direct light. With some thought given to positioning it should not be a problem.

The main rotary controls were very straightforward in everyday use, but the very small control push-buttons (set above the main screen on the top edge of the front panel) are rather small. I soon got to know which was which by remembering what they were and where they were...but personally, I'd like them to be slightly more 'proud'. In this way even the largest fingers could locate the wanted control easily, especially if the transceiver was mounted in such away to take advantage of a small parcel, or some other narrow shelf. It would make the transceiver even more versatile in my opinion! PW

The antenna socket provides an extra clue to just how small the Yaesu FT-1500M transceiver is. This photograph also graphically illustrates the massive heat-sinking effect provided by the chunky - but still very neat - outer casing. Even with prolonged use G3XFD found that the rig was extremely reliable with surprisingly good quality audio from the small internal speaker.

Albrecht. Albrecht 10 Metre Range

Take your hobby everywhere !!!

These 10 metre radios cover a frequency range of 28.000 Mhz to 29.699 Mhz (expandable) straight through with channel intervals of 1, 10, 100 kHz. The shift for repeater operation is programmable anywhere up to 600 kHz. "A" - channels, display can be switched to indicate channel or frequency. All these radios function in the operating modes AM, FM, SSB and have a clarifier for frequency adjustment, changeover switch for RF gain and mic gain, low power back up and tone call. The AE 485 S mobile unit and the AE 497 S base station also have five freely programmable memory channels.

AE 497 S

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★ Frequency : 28.000-29.699Mhz
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The *PW* International Beacon Project

Electronic Timer Part 2

The prototype completed by G3XFD to G4JCP's design, operating from internal rechargeable batteries this unit is extensively used for portable operations, providing evaluation of propagation conditions in a very convenient form.

Phil Cadman G4JCP continues, in Part 2, the description of the circuitry of the electronic timer 'clock'. The project provides very accurate individual 10 second 'slots' for monitoring the propagation for each IBP transmitter during their Internationally co-ordinated continuing three minute cycles, which operate 24-hours per day.

Welcome to Part 2 of the *PW* IBP 'clock' project! I hope you'll be building one for yourself, and if you are...both the Editor and I would be pleased to hear from you.

Looking through my copy of the December 2001 *PW* which carried Part 1 of this project, I read through the 'Guide to Building Logic Circuits' again and realised that I should add some extra information to assist you to build the clock.

With a little more reflection and thought, it occurred to me that my way of wiring the interconnections isn't widely practised (as far as I know). So a little explanation and a photograph (**Photo 1**) showing an enlarged view of a small area of the underside(solder side) of the DIP board.

Wiring Logic

When wiring logic designs I find it best to use a 12 or 15W miniature soldering iron with a 0.5mm conical bit. However, soldering connections to the Vss and Vdd tracks, which present a lot of copper to heat up, is much easier if a more powerful iron is also available.

Alternatively, a 30 to 50W thermostatically controlled soldering iron, with a choice of bits, will handle both types of work with ease. **Soldering tip** (Clever wording eh?): **Use only enough solder to provide a good joint and no more**, as too much solder can easily lead to short circuits.

If you have the luxury of choice, I recommend that you use 22 gauge (or finer) solder. Anything heavier than the gauge suggested is really too thick for the kind of work we're undertaking as we build this project.

Making interconnections in the way shown (**in Photo 2**) is a little unconventional, but I find it's better that any other method. **The advantages are that it looks neater and removing/adding interconnection is quite easy**.

Ultimately, if you decide to scrap a project built using the method shown, it will then be a simple matter to remove all the interconnections and re-use much of the board. A significant consideration given the high cost of DIP boards!

So, with that taken care of let's now take an in-depth look at the circuitry employed to produce our sequentially switching, 10 seconds at a time, 18 l.e.d indicator, three minute repeating cycle unit. However, behind that rather stark description there lies a reasonably complex circuit, aimed at producing a simple method to help you monitor the beacons...whether you're at home or working away from the mains in a portable/mobile environment.

Timing Crystal

The circuit timing, **Fig. 1**, is derived from a 32.768kHz miniature watch crystal connected to a CD4060B counter. The CD4060B is actually a 13-stage divider whose input circuitry includes an invertor. This invertor can be used to make either a resistance/capacitor (RC) or crystal oscillator.

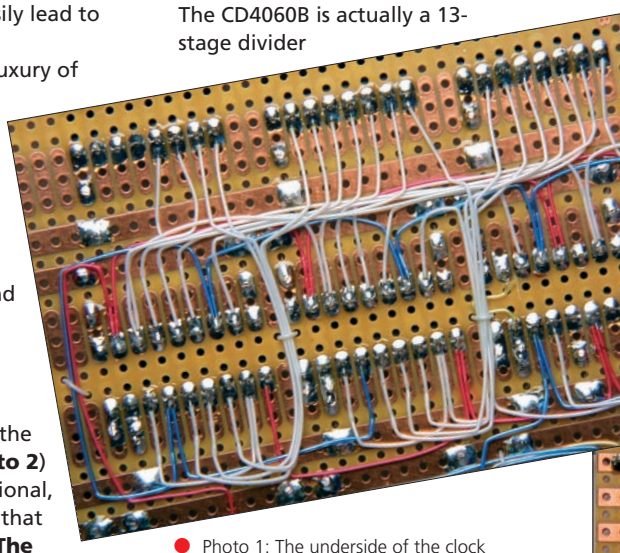

Photo 1: The underside of the clock timer's main board, assembled on Vero DIP format matrix board. (see text for comments and suggestions).

Please don't forget that the circuitry associated with the crystal, particularly around pin 11 of IC1, **is high impedance and should be kept clear of all other circuitry and any source of noise**. For trouble free operation you really do have to bear this in mind. I'm stressing it

only because it is so important and because I also realise that the IBP clock timer will be the very first logic project for some constructors. (We really do want you to succeed and enjoy using the project).

If you've got access to an oscilloscope drive to the crystal can be seen at pin 10 of IC1. To check this out on screen...a divide-by-ten oscilloscope probe which presents an impedance of at least 10MΩ is strongly recommended. **Even so, please be aware that even a 10MΩ oscilloscope probe attached to pin 11 will stop oscillations**.

Although it's possible to reduce the value of R2 should the crystal not start, it's most unlikely that this will be necessary. If problems are encountered, then another crystal should be tried first. (As you may have occasionally found with crystals ground for h.f. operation - it's possible to find one which is reluctant to oscillate - so always be prepared to find a 'lazy' crystal even on frequencies as low as this!).

To measure the oscillation frequency you must use the buffered output on pin 9 of IC1. Use a frequency counter with a 10s or longer gate time (to get the highest accuracy and adjust C1 to give a reading of exactly 32.768kHz. Later on, C1 can be precisely adjusted by comparing the IBP clock to an accurate external clock over a 24 hour (or longer period).

In the unlikely event that C1 does not provide sufficient adjustment try substituting either a 10pF capacitor (to increase the crystal frequency) or a 33pF capacitor (to decrease the crystal frequency) for C2.

Squarewave

The output from pin 3 of IC1 is a squarewave at a frequency of 2Hz, which is the crystal frequency divided by 16,384. The 2Hz squarewave is then divided by two using half of IC2; a dual D-type flip-flop. The invertor between IC1 and IC2 is only there to

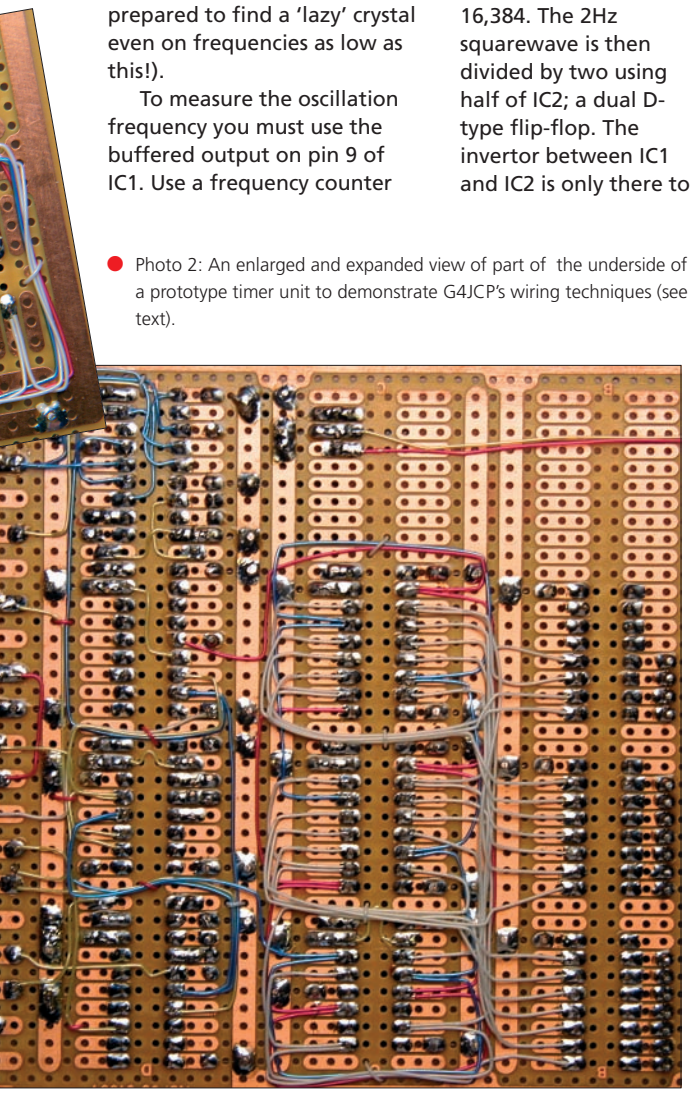

Photo 2: An enlarged and expanded view of part of the underside of a prototype timer unit to demonstrate G4JCP's wiring techniques (see text).

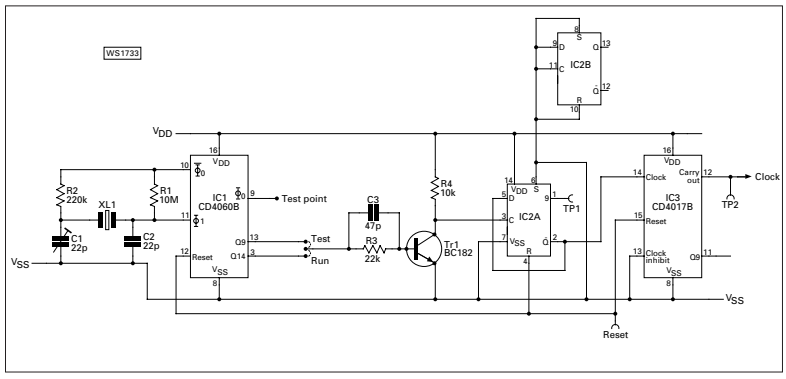

Fig. 1: The very 'heart' of the G4JCP International Beacon Project (IBP) l.e.d. electronic 'clock'. The timing circuit which ultimately illuminates the 18 separate l.e.d. indicators - each representing one of the 18 IBP transmitters located around the world) uses a 38.768kHz miniature electronic watch crystal (see text).

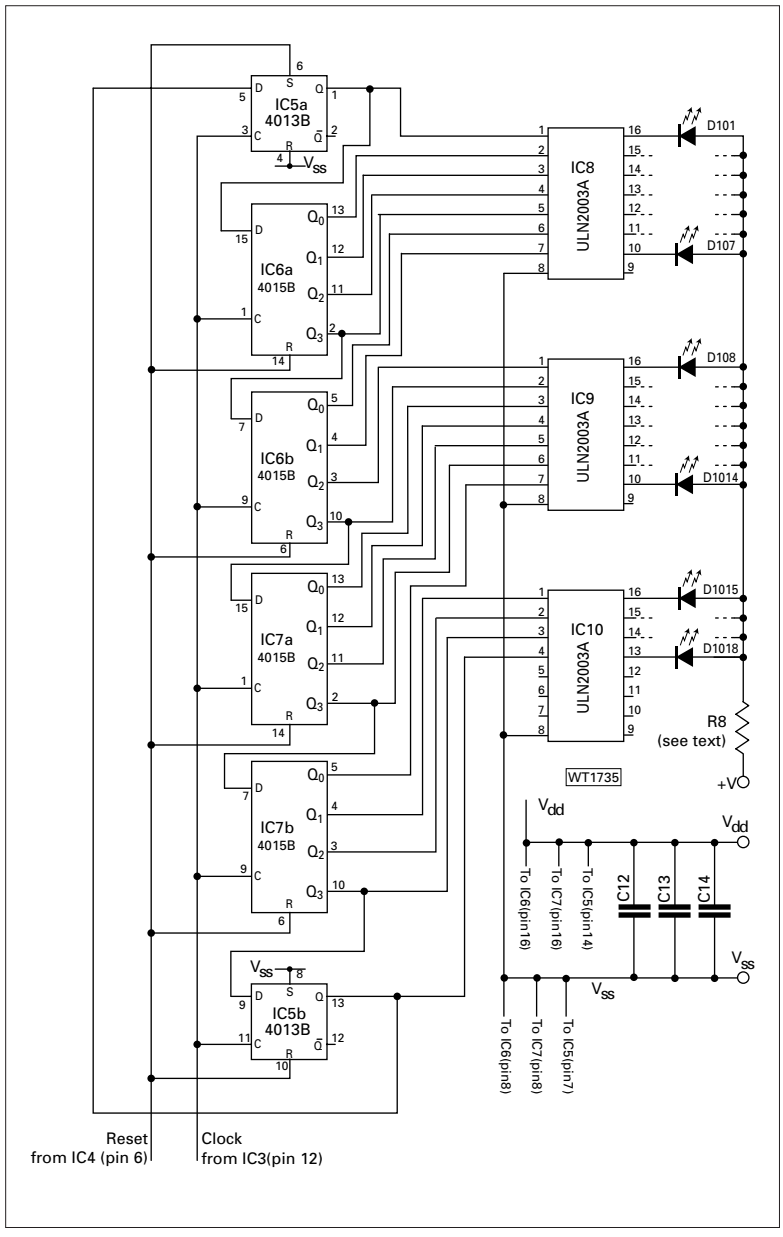

Fig. 2: The decoder, driver and l.e.d. indicator output stages of the IBP timer. Connections to other sections of the circuit are labelled for reference purposes. For clarity in the circuit presentation on the l.e.d. driver stages only six representative diodes are indicated. The 18 l.e.d.s are referred to as D1001 to D1018 and the wiring for those not shown is straightforward - diode D1010 is connected to pin 14 of IC9 for example. Resistor R8 - please refer to the text regarding evaluation of the value of this component.

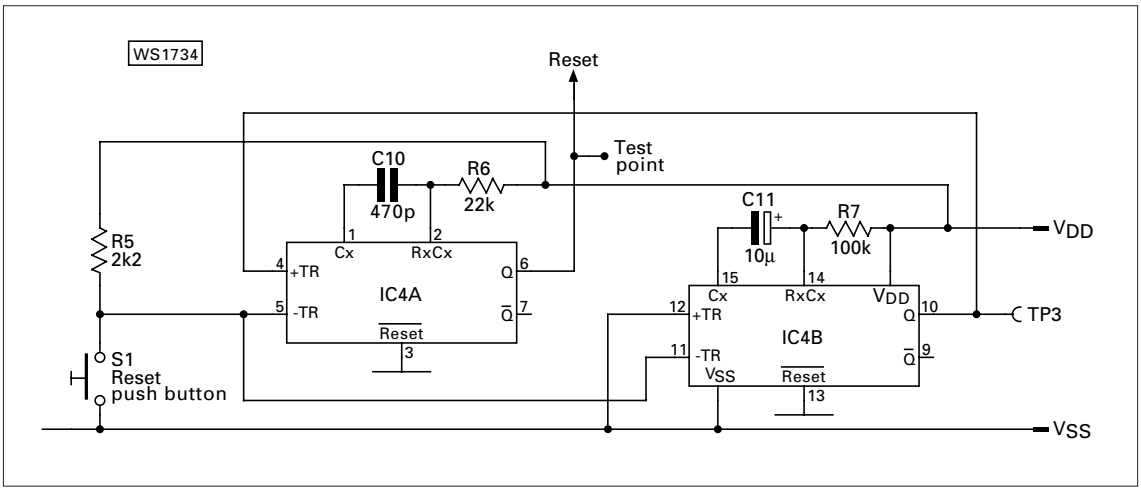

Fig. 3: The re-set circuitry for the IBP clock timer. The reset facility is necessary so as to enable accurate setting of the electronic timer to a reliable time reference source (see text). On the prototypes the re-set button is mounted on a flying lead, enabling it to be placed for operator convenience (see text). The test points (TP) are included to help fault-finding in case of problems.

make the D-type clock on negative edges.

The resulting 1Hz squarewave is fed into a CD4017B divide-by-10 counter, IC3. This has ten outputs, each of which goes high, in turn, for one second. There is also a carry output which produces a 1/10Hz square wave.

The carry output from pin 12 of IC3 clocks an 18-stage shift register, **Fig. 2**, comprising IC5, IC6 and IC7. The first stage of this shift register is set to a logic high by the reset signal from IC4. At the same time all the other stages are set low.

After 10 seconds the carry output from IC3 clocks the logic high on to the next stage. After a further 10 seconds the high progresses to the third stage, and so on. After 180 seconds (one complete IBP three-minute beacon cycle) the high is fed back to the first stage and the sequence repeats.

The outputs from the shift register can only supply around 1mA at 5V. This is amplified by the open collector Darlington arrays of IC8, IC9 and IC10. The re-set circuitry is shown in **Fig. 3**.

Diode Supply

Each Darlington output can sink up to 500mA and withstand an off-state voltage of 50V. However, please take note that the l.e.d. supply - marked as +V in Fig. 2 - can be independent from the logic supply so long as they both share a common 0V rail.

As only one l.e.d. is illuminated at any one time, the l.e.d.s can share a common limiting resistor - R8. Choose the value of R8 to give the required l.e.d. current. The following formula will give an approximate value:

R8 = (l.e.d. supply - 2V) / required l.e.d. current

The prototype used a 1kΩ, 0.5W resistor which gave roughly 10mA from a 12V l.e.d. supply. **But please remember to work out the power dissipated in R8 and choose its power rating accordingly**.

Soldering & Wiring Checks

The usual soldering and wiring checks are of supreme importance with this project. You really do have to be careful - because one solder splash could mean much wasted time as you try to locate the fault.

If this is your first logic based project...please read the section 'Hints on building logic based circuits 'on pages 30 and 31 in the December 2001 issue. Forewarned is forearmed!

Don't forget the use of i.c. sockets is mandatory. Don't forget also to have a check list as you connect each wire, and be very careful with your soldering. Patience and careful work will repay you with a project that works. Finally, make your final inspection (for solder blobs, bridged contacts, etc., a very careful one!

Setting Up & Monitoring

Once you've checked the wiring, and made all the necessary checks, you'll be able to switch the unit on. Press the reset push button, and if everything is in order **No. 1** l.e.d will illuminate. This l.e.d. is the reference point for setting the timing and represents the **4U1UN** IBP beacon which is located in New York.

When you're initially testing the clock, rather than having to wait a full three minutes for the cycle to complete, temporarily drive the base of Tr1 from the Q9 output (pin 13) of IC1. In other words, move the link shown in Fig. 1, from the 'Run' position to the 'Test' position. The clock will then run at 32 times the normal rate, making it much easier to see that the l.e.d.s illuminate correctly throughout the cycle. When you're happy with the results, all you need to do is to move the link back to the 'Run' position.

Setting the actual timing is crucial for accuracy and ease-of-use, but there are several little tricks that both Rob G3XFD and I can pass on to help you use your timer. More of these later...let's first look at setting the timing and the various methods you can use.

Teletext: From the very beginnings of the *PW* IBP monitoring timer projects G3XFD has used the broadcast (terrestrial) **analogue (Note analogue...not digital!)**

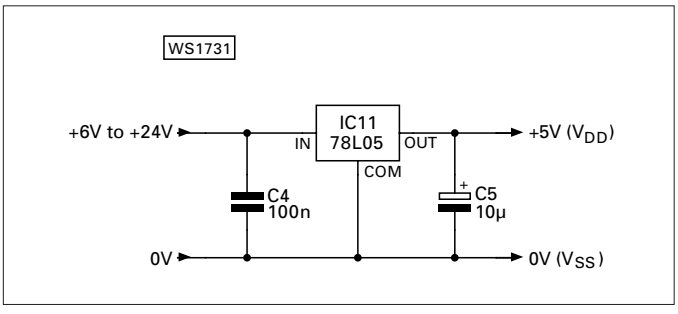

Fig. 4: A suitable voltage regulator circuit for use with the G4JCP IBP timer unit (see text).

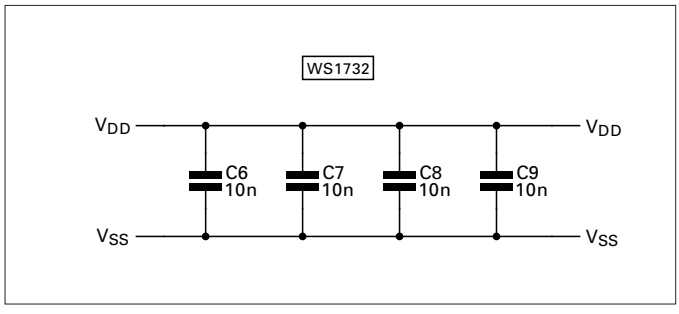

Fig. 5: Filtering and decoupling circuitry (see text).

Shopping List

Resistors are 0.25W rating unless stated otherwise

1kΩ	1	R8 (0.5W for 12V l.e.d. supply - see text)
2.2kΩ	1	R5
10kΩ	1	R4
22kΩ	2	R3, 6
100kΩ	1	R7
220kΩ	1	R2
10MΩ	1	R1

Capacitors

Variable

22pF	1	C1 trimmer (for clock crystal, see text)

Fixed capacitors (type as detailed) 32V minimum unless stated otherwise.

22pF	1	C2 polystyrene or ceramic plate
47pF	1	C3 ceramic plate
470pF	1	C10 polystyrene or ceramic disc
10nF	7	C6, 7, 8, 9, 12, 13, 14 16V ceramic disc
100nF	1	C4 ceramic disc
10µF	1	C5 16V electrolytic
10µF	1	C11 16V tantalum or equivalent

Semiconductors

Transistor

BC182	1	Tr1

Integrated circuits

CDD4060B	IC1	
CD4013B	2	IC2, 5
CD4017B	1	IC3
CD4098B	1	IC4
CD4015B	2	IC6, 7
ULN2003A3		IC8, 9, 10

Regulator

78L05	1	IC11 (Voltage regulator - see text)

Quartz Crystal

32.768kHz	1	XL1 miniature watch crystal (see text).

Light Emitting Diodes

Indicator l.e.d.s	18	Standard l.e.d. type 10mA nominal working current (Colour your choice, red or green best).

Miscellaneous

Single pole, push to make switch (for S1). Vero DIP board, length of 0.25mm, 30 a.w.g*. (*American Wire Gauge) silver-plated wire with Kynar insulation (as RS Components 209-4827, etc.) 2 off 14-pin DIL i.c. sockets. (Most items available from Bowood Electronics).

8 off 16-pin DIL i.c. sockets. Optional items : Veropins for test points and connections to external wiring. 0.1 inch, 3-position pin strip plus 0.1 inch jumper. Length of 0.6mm (approx.) tinned copper wire.

service to advantage. During our - often very lengthy - telephone conversations during the development stages of the projects - Rob has mentioned how useful the BBC1 clock has been for him when the various prototype clock/timer needed to be set.

However, despite Rob's success, several readers have contacted him to say that their own local television transmissions **don't provide accurate teletext clock timings**, being in some case many seconds slow. Most adverse comment on this point seems to originate from readers who receive transmissions from the Sandy Heath - Station No. 124.00, Landlord NTL*, grid reference TL 204494 and Tacolneston, Station No. 114.00, Landlord BBC, grid reference TM131958. (Both these high power main stations and their associated relay stations serve eastern England).

However, despite the problems mentioned by readers- generally Rob considers that the teletext system from terrestrial sources to be reliable enough as it certainly has been as far as he's concerned. Generally though, it seems that many readers own radio-controlled clocks - which are either synchronised with MSF from Rugby or via its equivalent station in Germany. So, both he and I think that readers will solve the problem for themselves!

Rob explains the two methods he uses for setting the time on the mechanical (the Radio Basics mains-driven version) in this way: "For the original electro-mechanical 'clock' I leave it with the No. 1 beacon 4U1UN position set opposite its marker point ready to switch on. Then, using the stop-watch which was bought for use with the projects, I start the stop-watch (taking the timing off the TV indoors) exactly one minute **before the start of the three minute beacon cycle**. This I normally prefer to do on the hour. I then take the stop-watch out to the shack and start the timer's motor when the minute is up. That version of the timer is then accurate enough (to within two or three seconds) to be left alone for anything up to a day or so in practice.

Rob and I also discussed the slightly different method used with the electronic, l.e.d. presentation timer because this time you can take that with you to the television receiver! There, you'll wait for one of the three minute 4U1UN cycles to begin, starting at 0 minutes (on the hour) and at 3 , 6, 9, 12, 15, 18, 21 minutes past the hour and so on.

That's all there is to it - all you then have to do is to monitor the band you require. If it's to be 18MHz, you'll only need to rotate the rotary dial (Page 28, December 2001 issue) one position to the right. This moves 4U1UN to (in effect) an l.e.d. which illuminates 10 seconds later than that on the reference -which is of course set to monitor the 14.1MHz timing of 4U1UN as mentioned. In consequence, if the band is 'open' you'll hear 4U1UN transmit - starting 10 seconds after it had started on 14MHz.

***Note:** The individual u.h.f. Band IV and V television transmitters are actually all owned either by the BBC or NTL (successor to the IBA). Where a station is owned by NTL the main site is shared with BBC transmitters and a common antenna is used, and vice versa when it's the BBC who own the site. (This information is provided to help any readers contact the necessary authority if they think there may be a problem in their areas).*

Personalised Settings

Once you've got used to using the IBP timer in conjunction with a good receiver, you can start setting the timing to a 'personalised point, using a neat little trick. Let me explain!

Depending on how quick your reaction is in setting the timing (pressing the re-set button whilst watching your timing source) - you may well end up with the timer illuminating each l.e.d. at the same time, or the smallest of a fraction of a second after the beacon's transmissions are heard. However, as you become more experienced, you may well prefer to have the l.e.d. illuminating **a tiny fraction of a second before** the actual beacon is due to transmit (this is how G3XFD prefers it).

In our discussions Rob and I have compared the timing preferences to the way different operators prefer to adjust traditional lever 'Up & Down' Morse keys. Some operators like a big gap on the key...others prefer a narrow gap. It's purely personal and it's the same with the IBP timer's setting!

On Air Monitoring

On the air monitoring is straightforward. With your monitoring receiver tuned to the appropriate IBP frequency on the band in question - all you need to do is rotate the bezel to the band you require and listen.

In practice it's best to listen for two or three complete cycles (six or nine minutes) and you'll be really surprised how quickly conditions can change. The more beacons - and less gaps you hear in the complete cycle - the better conditions will be.

Additionally, you can get a good idea of just how good (or bad!) conditions are by listening to each beacon's four 'dashes'. These are sent firstly at 100, then 10 and then 1W. The final transmission before the beacon goes silent is at 100mW. If you can hear the four transmissions...get busy on the band whether it be on s.s.b. or c.w!

Enjoy using your IBP monitor- it's different, it'll be yours and we hope you'll also get far more out of your hobby by spending a little time using it. Good luck and good DX too!

PW

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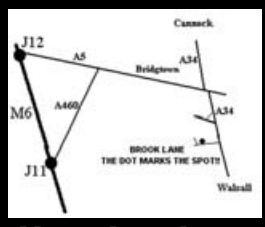

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ICOM	IC-3230H	2-70CM MOBILE TRANSCEIVER	£160
ICOM	IC-471E	70CM BASE MULITMODE TRANSCEIVER	£299
ICOM	IC-490E	70cms MULTIMODE MOBILE TRANSCEIVER	£265
ICOM	IC-728	HF TRANSCEIVER	£399
ICOM	IC-730	HF TRANSCEIVER MINT!	£400
ICOM	IC-735	HF TRANSCEIVER	£400
ICOM	IC-737	HF BASE BUILT IN ATU 100W	£595
ICOM	IC-737	HF inc ATU BASE STATION TRANSCEIVER	£575
ICOM	IC-746	TRANSCEIVER	£899
ICOM	IC-756	HF / 6m All Band Transceiver	£999
ICOM	IC-756PRO	ICOM TRANSCEIVER	£1,699
ICOM	IC-765	HF BASE TRANSCEIVER	£800
ICOM	IC-775DSP	HF 200W BASE STATION TRANSCEIVER	£1,499
ICOM	IC-820	2-70CM BASE STATION 50Watt	£599
ICOM	IC-821H	VHF / UHF MULTIMODE TRANSCEIVER	£699
ICOM	IC-910	2/70 CM BASE TRANSCEIVER + 23CM UNIT	£1,100
ICOM	IC-R2	HANDY SCANNER	£99
ICOM	IC-R3	SCANNER + TV	£299
ICOM	IC-R7000	RECEIVER MINT! CONDITION	£550
ICOM	IC-R72	RECEIVER	£399
ICOM	IC-R75	HF / 6m RECEIVER	£475
ICOM	IC-T81E	QUAD BAND HANDY 2m/6m/23cm/70cm	£250
ICOM	IC-T8E	HANDY TRANSCEIVER	£175
ICOM	IC-W21E	HANDY TRANSCEIVER	£199
ICOM	PCR-1000	COMPUTER SCANNER	£200
ICOM	PS-15	20A POWER SUPPLY FITS ALL ICOM	£110
ICOM	PS-85	POWER SUPPLY	£175
ICOM	R-75	HF RECEIVER	£400
ICOM	SP-20	SPEAKER	£120
ICOM	SP-21	LOUDSPEAKER, BOXED	£55
ICOM	T-7E	2/70CM HANDY TRANSCEIVER	£170
ICOM	T-8E	2/70CM 6M HANDY TRANSCEIVER	£185
ICOM	UT-84	TONE SQUELCH UNIT	£25
ICOM	IC-2SET	2M HANDY	£89
ICOM	IC-R71E	RECEIVER	£399
JRC	JST-245 DSP	HF 50MHz 1500w AC BASE TRANSCEIVER	£1,295
JRC	NRD-535	HF RECEIVER	£600
KANTRONICS	KAM PLUS	TNC	£220
KENWOOD	DFC-230	FREQUENCY CONTROLLER	£70
KENWOOD	PS-20	10A POWER SUPPLY FITS TR-9130 ETC	£55
KENWOOD	PS-430	POWER SUPPLY	£100
KENWOOD	PS-50	POWER SUPPLY	£145
KENWOOD	R-5000	RECEIVER	£499
KENWOOD	SP-950	LOUDSPEAKER	£90
KENWOOD	SW-2000	SWR METER	£60
KENWOOD	TH-22E	2M HANDY TRANSCEIVER	£89
KENWOOD	TH-25E	HANDY TRANSCEIVER	£49
KENWOOD	TH-47E	HANDY TRANSCEIVER	£100
KENWOOD	TH-75E	2/70 HANDY TRANSCEIVER	£125
KENWOOD	TH-78E	2/70CM HANDY TRANSCEIVER	£175
KENWOOD	TH-79E	HANDY TRANSCEIVER	£189
KENWOOD	TL-922	HF LINEAR AMP 1Kw (AS NEW!)	£899
KENWOOD	TM-231E	2M MOBILE TRANSCEIVER	£120
KENWOOD	TM-241E	2M MOBILE TRANSCEIVER	£120
KENWOOD	TM-251E	MOBILE TRANSCEIVER	£140
KENWOOD	TM-255E	2m MULTI-MODE MOBILE TRANSCEIVER	£400
KENWOOD	TM-455E	70CM MULTIMODE MOBILE TRANSCEIVER	£495
KENWOOD	TM-733	2/70 MOBILE TRANSCEIVER	£225
KENWOOD	TR-751E	2M MULTIMODE TRANSCEIVER	£350
KENWOOD	TR-851E	70CM MULTIMODE MOBILE TRANSCEIVER	£395
KENWOOD	TS-120	HF SOLID STATE MOBILE	£225
KENWOOD	TS-450S	HF TRANSCEIVER	£499
KENWOOD	TS-450SAT	HF BUILT IN ATU EXCELLENT TRANSCEIVER	£575
KENWOOD	TS-530SP	HF MAINS 100Watt TRANSCEIVER	£275
KENWOOD	TS-680	HF 6M MOBILE/BASE TRANSCEIVER	£400
KENWOOD	TS-690SAT	HF 6M Inc ATU	£650
KENWOOD	TS-711E	SM BASE STATION TRANSCEIVER	£399
KENWOOD	TS-790E	2/70CM BASE STATION TRANSCEIVER	£699
KENWOOD	TS-790E	2m / 70cm MULTIMODE BASE TRANSCEIVER	£799
KENWOOD	TS-811E	70cms MULTIMODE BASE TRANSCEIVER	£399
KENWOOD	TS-830S	HF TRANSCEIVER	£325
KENWOOD	TS-850SAT	HF TRANSCEIVER MINT!	£800
KENWOOD	TS-870SAT	HF/DSP-IF-100W BUILT IN ATU TRANSCEIVER	£999
KENWOOD	TS-950SD	HF/ 150W DSP BASE TRANSCEIVER	£1,100
KENWOOD	TSB-2000	LATEST KENWOOD - COMPUTER CONTROLED	£1,299
KENWOOD	VFO-120		£50
KENWOOD	VFO-180	EXTERNAL VFO	£75
KENWOOD	VS-1	VOICE SYTHESISER	£30
KENWOOD	VS-2	VOICE SYTHESISER	£30
KENWOOD	YG-455CN-1	270Hz CW CRYSTAL FILTER	£100
KENWOOD	YK-88A-1	AM FILTER	£40
KENWOOD	YK-88C-1	500Hz CW NARROW FILTER	£40
KENWOOD	YK-88CN1	270Hz CW FILTER 8.83MHz IF	£40
KENWOOD	YK-88S-1	2.4KHz SSB NARROW FILTER 8.83MHz IF	£40
KENWOOD	YK-88SN	1.8K SSB FILTER (TS-440 /R5000)	£40
KENWOOD	YK-88SN-1	1.8KHz SSB NARROW FILTER 8.83MHz IF	£40
KENWOOD	PS-430	POWER SUPPLY	£120
LINEAR AMP	CHALLENGER II	CHALLENGER AMPLIFIER 11 2kW	£1,400
LOWE	HF-150	SW RECEIVER	£150
LOWE	HF-250	INCLUDES REMOTE CONTROL	£300
MCL	MCL1100	EASY READER	£75
MFJ	MFJ-414	MORSE CODE TRAINER	£120
MFJ	SET-UP	971-9015-4114 PORTABLE 21MHz	£299
MICROSET	PT-135	POWER SUPPLY	£80
MICROWAVE MODULES		28/144 TRANSVERTER 28/144	£125
PACCOM	TINY 11	TNC	£99
PACCOM	TNC-320	TNC	£90
PLESSEY	PR-2250	HF RECEIVER BEST QUALITY CLASSIC!	£1,200
QM 70		28/144 TRANSVERTER	£100
RACAL	RACAL 1792	HF RECEIVER	£499
REALISTIC	PRO-2037	SCANNER BASE	£99
REALISTIC	PRO-394	HF RECIEVER	£99
SGC	SGC-2020	HF TRANSCEIVER	£450
SOMMERKAMP	FT290R	2m MULTI-MODE TRANSCEIVER	£180
SONY	ICF-SW77	FM/SW/MW/LW PORTABLE AS NEW!	£250
SONY	SW-100E	FM/SW/MW/LW PORTABLE	£90
ST3 HEADPHONES		DELUXE HEADPHONES	£45
SYNCRON	PS-1220VU	20 AMP POWER SUPPLY	£60
TAGRA		22AMP POWER SUPPLY	£70
TENTEC		SCOUT + MODULES	£350
TIMEWAVE	DSP-9+		£125
TOKYO HY-POWER		HL-30V 2M and 25W AMPLIFIER	£75
TOKYO HY-POWER		HL-37V LINEAR AMPLIFIER	£60
TONNA	7000E	TERMINAL	£130
TRIO	R-2000	RECEIVER + CONVERTER	£300
TRIO	TR-9130	2M ALL MODE TRANSCEIVER	£250
TRIO	TRIO 9130	2M MOBILE MULITMODE TRANSCEIVER	£250
TRIO	TS-780	DUAL BAND BASE TRANSCEIVER	£275
WELZ	AC-38M	200W MOBILE MATCHING NETWORK	£50
WELZ	SP-15M	SWR & POWER METER	£20
YAESU	FC-102	1.2KW ATU WITH 4 WAY SWITCHING UNIT	£200
YAESU	FC-20	AUTO ANTENNA TUNER FOR 847/FT100	£175
YAESU	FC-902	ATU 500W	£140
YAESU	FL-2100Z	HF AMPLIFIER	£450
YAESU	FP700	POWER SUPPLY	£100
YAESU	FP-757HD	HEAVY DUTY POWER SUPPLY	£120
YAESU	FRG-100	HF RECEIVER	£300
YAESU	FRG-7700	HF RECEIVER	£220
YAESU	FRG-8800	RECEIVER INCLUDES CONVERTER	£399
YAESU	FRT-7700	ATU MINT!	£75
YAESU	FRV-7700	UHF CONVERTER MINT!	£80
YAESU	FT-1000MK5	200W DSP HF TRANSCEIVER	£2,600
YAESU	FT-1000MP AC	HF BASE DSP TRANSCEIVER (Late serial no)	£1,550
YAESU	FT-1000MP DC	BASE TRANSCEIVER	£1,200
YAESU	FT-101ZDmk111	HF TRANSCEIVER inc FM	£375
YAESU	FT-225RD	2M BASE MULTIMODE CLASSIC!	£399
YAESU	FT-23R	HANDY TRANSCEIVER	£180
YAESU	FT-2500M	MOBILE TRANSCEIVER	£190
YAESU	FT-290RMK1	2M ALL MODE TRANSCEIVER	£180
YAESU	FT-290RMK11	MOBILE 2M MULTIMODE TRANSCEIVER	£275
YAESU	FT-411E	2M HANDY TRANSCEIVER	£99
YAESU	FT-41R	HANDY TRANSCEIVER	£120
YAESU	FT-470	2/70CM HANDY TRANSCEIVER	£140
YAESU	FT-650AC	26-50MHz 100w BASE SATATION TRANSCEIVER	£599
YAESU	FT-690MK11	6M MULTIMODE MOBILE TRANSCEIVER	£295
YAESU	FT-690RMK1	6M MULTIMODE MOBILE TRANSCEIVER	£250
YAESU	FT-690RMK11	6M PORTABLE	£375
YAESU	FT-726R	2 / 70 / HF TRANSCEIVER	£400
YAESU	FT-726R	2 / 70 / 6m TRANSCEIVER	£575
YAESU	FT-730R	70CM MOBILE TRANSCEIVER	£120
YAESU	FT-736R	2/70/6/23CM TRANSCEIVER	£1,050
YAESU	FT-736R	2m / 70cm TRANSCEIVER	£650
YAESU	FT-736R	2m / 70cm / 6m TRANSCEIVER	£750
YAESU	FT-7400	70cm MOBILE TRANSCEIVER	£160
YAESU	FT-747GX	HF TRANSCEIVER	£399
YAESU	FT-747GX	TRANSCEIVER	£299
YAESU	FT-757GXMK11	TRANSCEIVER MINT!	£400
YAESU	FT-757MK1GX	HF TRANSCEIVER	£375
YAESU	FT-767GX	HF BASE 100watt built-in ATU	£599
YAESU	FT-77	INCLUDES FM MINT!	£275
YAESU	FT-790R	70CM MULTIMODE MOBILE TRANSCEIVER	£225
YAESU	FT-7B	HF 50W MOBILE TRANSCEIVER	£199
YAESU	FT-80C	0-30MHz COMMERCIAL TRANSCEIVER	£375
YAESU	FT-8100	2/70cm MOBILE TRANSCEIVER	£249
YAESU	FT-811E	70CM HANDY TRANSCEIVER	£99
YAESU	FT-847	HF / 2 / 6 / 70cm BASE TRANSCEIVER	£999
YAESU	FT-900	HF TRANSCEIVER	£550
YAESU	FT-902DM	HF BASE TRANSCEIVER	£400
YAESU	FT-920AF	HF/6M BASE WITH DSP	£899
YAESU	FT-980	HF TRANSCEIVER	£495
YAESU	FT-990AC	HF BASE STATION TRANSCEIVER	£750
YAESU	FT-ONE	HF BASE TRANSCEIVER	£450
YAESU	FTV-901	TRANSVERTER Inc 2m Mod	£165
YAESU	FV-707	VFO UNIT	£99
YAESU	SP-8	LOUDSPEAKER Including Audio Filters	£100
YAESU	VFO-102	MINT CONDITION!	£199
YAESU	VR-5000	TOP RANGE SCANNER RECEIVER	£500
YAESU	VX-5R	2 / 70 / 6 HANDIE 5W	£220
YAESU	XF-114SN	2KHz SSB FILTER	£60
YAESU	YO-100	SCOPE VERY RARE!	£150
YAESU	YS-60	SWR METER 1.6 - 60MHz	£30
YUPITERU	MVT-7000	HANDY SCANNER	£99
ZETAGI	B-132	10 / 11m LINEAR AMPLIFIER, MAINS	£60

One man mini DXPedition

Experienced DXpeditioner Phil Whitchurch G3SWH spent a weekend operating from Les Iles Chausey, here he takes up the story....

Les Iles Chausey are a group of French islands situated in the Gulf of St. Malo, just south of the Channel Islands. There are 52 islands permanently above sea level and 365 are uncovered at low tide, which rises and falls by some 14m, making it the highest in Europe, and third in the world. Only La Grande Ile, which is about 2km long and 700m across at its widest point, is inhabited today.

As there is more than one island, it counts as a separate group for the Radio Society of Great Britain's Islands on the Air Award (IOTA), reference EU-039. There is also a French Islands award promoted by REF called DIFM and La Grande Ile counts as MA04. So, I was keen to arrange a mini-DXpedition to the group of islands.

After carrying out some research I discovered that there was a small, self catering apartment block on La Grande Ile called La Ferme de Chausey which was available to rent at a reasonable rate (for France) over a weekend in March. We would also be allowed to put up antennas.

I found out that travelling to the island would be fairly easy, as there was a non vehicular ferry from the mainland port of Granville to the island on a daily basis. By catching the overnight cross channel ferry from Portsmouth we would arrive in Caen early enough to be able to drive the 115km to Granville in good time to catch the island ferry at 1000hrs on the Saturday, returning at about 1900hrs on the Sunday. This would allow sufficient time to make the return journey from Granville to Caen in time for the 2300hrs sailing.

Bookings Made

Everything seemed to fit together nicely, so I co-opted **Chris Burbanks G3SJJ** and began to make the necessary bookings. We chose the weekend of 23/24 March, as it was free of major contests and was late enough in the year to stand a chance of reasonable weather.

Chris arranged to borrow a Yaesu FT-900AT from G3NUG of the IOTA Committee and I arranged to take my ever faithful and well travelled Yaesu FT-101ZD. Our plan was to run two, 100W c.w. only stations for our 24 hours or so on the island, using the callsigns **F/G3SWH/P** and **F/G3SJJ/P**. We agreed that I would handle the QSLing arrangements for both callsigns.

We publicised our trip as much as possibe using the *DX News Sheet,* the *CDXC Newsletter*, on the PacketCluster and on the BBS system and exchanged many Cluster mail messages about antennas, food, transport, etc,. Chris and I arranged to meet at Rownham's Services on the M27 between Portsmouth and Southampton at 2100 hours on Friday 22 March, which gave us enough time to park Chris' car, transfer his kit to mine and get to the ferry terminal by the latest check in time of 2200hrs.

I arrived at the services and waited until 2140, but Chris failed to turn up. I then made the decision to carry on to the ferry terminal in the hope that, if he had been delayed he would meet me there. I resolved that I would go to Chausey on my own if he failed to show.

Chris lost almost an hour the M3, arriving physically and mentally exhausted at the services literally minutes after I had left, then lost vital time finding out that I had already gone to the ferry terminal. The result of this was that by the time he got there it was too late to get on board the ferry, especially as he was carrying (by hand) all his own kit.

With the benefit of '20-20' hindsight vision (what a wonderful thing!), the first stage of our trip to the ferry terminal was where the weakest part of our arrangements were. The moral seems to be that some sort of communications, such as a mobile phone or even 144MHz f.m. could have helped save the day!

On the air! Although originally organised by Phil and Chris G3SJJ, due to unforseen circumstances the trip ended up as a 'one-man band' operation with just Phil making it to the island.

Arrival At Caen

On arrival at Caen at 0600 on the Saturday, I took a deep breath, muttered "Drive on the right" and headed off down the autoroute towards Granville, arriving safely and in plenty of time to catch the ferry. The boat trip of about 15km took about an hour or so and I was met at the landing stage by **Monsieur Guery**, the manager of La Ferme, with his tractor and trailer.

The site of Monsieur Guery with his tractor and trailer was most welcome, as in addition to the FT-101ZD (weighing 19kg) and the laptop computer, I had a cold box full of food, a camera bag and a holdall with coaxial cable, antennas, Vibroplex key, headphones etc., as well as my personal effects in it. I wasn't offered a lift, but had to walk the 500 or so metres to La Ferme, where I was met by **Mme Guery** who speaks quite good English. We completed the final formalities and she showed me to the tiny studio apartment which I had rented.

The complex of La Ferme is built on an open square with a grassy central courtyard. The buildings on the north and south sides have two storeys and are about 7m high; those on the east and west sides are single storey and are about 5m high.

My first thought was of how I was going to set up the antennas. I am a great believer in simple, wire antennas and have successfully used a number of resonant wire dipoles on a common coaxial feeder on previous expeditions and had brought the same arrangement with me on this occasion.

There didn't appear to be any suitable looking trees or other central supports within a sensible distance, so my only option was to use the ridges of the roofs of the higher buildings. This resulted in the centre of the antennas being in the clear, but only about 6m above the ground.

I had brought a catapult, a golf ball with a 4mm hole drilled in it and a reel of 40lb breaking strain monofilament fishing line to rig the halyards up. The catapult proved to be useless and I got much better results by throwing the golf ball with the fishing line attached over the roof ridges.

The 3.5MHz dipole fitted quite nicely when run diagonally across the square. The only problem I encountered was with rigging the antennas, when the golf ball got caught in a guttering and I very quickly had to learn the French for "a ladder please" before I could borrow one!

Wonderful Weather

The weather was wonderful and so rigging the antennas took about an hour and a half or so and I was all set up and ready to go by just after 1400 hours. I decided to try the 10MHz band for starters, one of my favourite bands.

The first CQ call I put out was answered immediately by **DJ3XG**. Conditions were generally disappointing but, apart from short breaks for calls of nature, cups of tea and light snacks I was then on the air continuously, using mainly 3.5, 7 and 10MHz until I closed down just after 2200, having made 491 QSOs!

As I was operating alone I had rather more sleep than I would have otherwise done, as I was more than a bit concerned at being over tired for the drive back to Caen the following evening. I resumed operating just after 0600 on the Sunday morning.

Contacts Made

The antenna I'd set up for use on the 14MHz band proved to have a problem, as it would not resonate and gave a constant SWR of >3:1 over the whole band. I agonised over whether to take it down and try to fix it, which would have taken at least an hour, or to continue to work stations at an average rate of better than 50 an hour on the other bands. Given the very short operating time available, I decided to leave things as they were and thus had no QSOs at all on 14MHz.

The 7MHz band was also something of a disappointment, as I only managed to work one USA station on that band, out of a total of 484. I only worked eight on 3.5MHz, 11 on 10MHz and two on 18MHz.

All in all, I worked very little DX (stations outside Europe), during my time on La Grande Ile. The most likely reason for this was the relatively low centre height of the antennas, although several UK stations commented on how strong my signal was on 3.5MHz.

I used my rather ancient Compaq 286 based laptop computer running K1EA's CT version 7 program in DXpedition mode and used the computer keyboard to key the radio via the COM1 port.

On the Sunday I was on the air more or less continuously until 1600 when I had to close down to give me enough time to take the antennas down and get packed up ready to catch the ferry back to Granville at 1815. Again, the weather was wonderful.

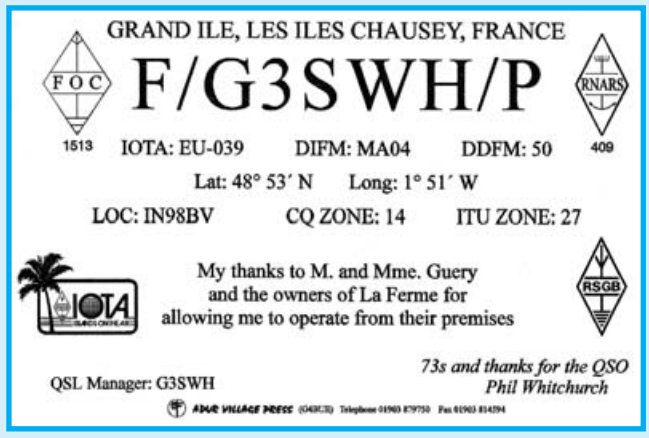
So my mini DXpedition to Les Iles Chausey went well with many contacts made, despite the fact that it had turned into a one-man operation!

PW

Total Contacts Made

Band (MHz)	3.5	7	10	14	18	Total
QSOs	170	484	412	0	2	1068

● Total contacts made from La Grande Ile.



● Operating as F/G3SWH/P Phil Whitchurch made a total of 1068 contacts during his short stay on La Grande Ile.

● La Ferme was home for Phil G3SWH for his 24 hour mini DXpedition.

● All set-up and raring to activate the bands!

Talking Dangerously....

DELVING DEEPER

Pat Hawker G3VA - undoubtedly one of the most experienced and respected Amateur Radio journalists based in the UK - comments on a *PW* article, and provides some of his own fascinating memories of Clandestine Radio operations in the Second World War.

Signalman Pat Hawker G3VA in March 1942. (Author's collection).

I first wrote to the Editor to offer my congratulations following the publication of **Ben Nock G4BXD's** article (August 2001 *PW*) about the Special Operations Executive (SOE) S-Phone. But, following the Editor's suggestion, because of the nature of the subject, my original letter has evolved into this article.

Ben's original article gave a clear and well-illustrated description of this pioneering equipment that amply proved its worth in the Second World War. However, I feel that readers may be interested to learn a little more about the timetable, credits, role, and other airborne clandestine radio-telephone (RT) equipment, etc. At the same time I would also like to correct any impression that the S-phone was preceded by the work of the late **Al Gross W8PAL**.

Al Gross, who, as a member of the American Office of Strategic Services (OSS) project team, was largely responsible for the development of the compact SSTR5 hand-held ground unit of the 'Joan-Eleanor' (SSTR6/SSTR5) air-to-ground RT system. And in fact the J-E was not developed until several years after the S-phone and had a different role.

Cover Name

It was in October 1940 that the SOE, then still SO2 and using the cover name 'Inter-Services Research Bureau' (ISRB), formulated a requirement for equipment that would provide an R/T link from an aircraft to a resistance group. This would assist in the reception of supplies or agents at a dropping zone (DZ) or at a secret landing strip.

At that time the SOE believed (almost certainly wrongly) that the Germans had used such a system during their May 1940 attack on France, Belgium and Holland.

The task was given to **Colonel Schroetar**, then in charge of Station IX (The Frythe, Welwyn in Hertfordshire). As a result, the u.h.f. (circa 350MHz) S-phone, which permitted full duplex conversation over short ranges, was designed by **Captain 'Bertie' Lane** and then extensively flight-tested by **Flight Lieutenant Charles Bovill** assisted by **Lieutenant Richard Hilton**.

The 'homing' facility for the aircraft was added later by **Victor Jones** in collaboration with Standard Telephones and Cable Company (STC). The system probably became operational during 1942.

Proved Effective

Once in service the S-phone proved effective for guiding aircraft the last few miles to a DZ or landing strip provided that the plane could be navigated fairly closely to its final destination. But with the limited radio-navigational aids available in 1941, it could not solve the problem of accurately locating a field after a flight of hundreds of miles, for example to Poland, Czechoslovakia, Norway, etc.

The requirement to help provide the necessary precise navigation was met by the development at the Radar Establishment (TRE) by **R. Hanbury Brown** of a longer-range secondary-radar-type

Talking dangerously - the Section VIII Control Station at Upper Weald working to Clandestine stations in France and Belgium. Wireless telegraphy only was used at the time the photograph was taken but soon afterwards (1943) tests were carried out using the Ascension radio-telephone system (see text). Photograph from G3VA collection.

Editorial Acknowledgement:

Pat Hawker G3VA's original response to **G4BXD**'s article was in the form of a letter. However, to do full justice and to pay respect to Pat's knowledge, memories and work during the Second World War (and since) he kindly agreed to agree to have it published in article form. I feel privileged to publish something from Pat on this subject because there are many extremely poignant memories hidden under the technical facts and tragic history. On behalf of readers I offer my grateful thanks to Pat for his response.
Rob Mannion G3XFD.

● Sergeant Pat Hawker G3VA in 1946 - photographed outside the MI6/SIS Section VIII 'hostel' near Bletchley. (Author's collection)

● An SCU9 station at Eindhoven, Holland, late 1944. Equipment includes a National HRO receiver, SCU Mark III (using 6V6 and 807 valves) transmitter and (on top of the HRO) the Mark VII/2 'Paraset' Agent transmitter-receiver which used 6SK7-6SK7/6V6 valves. (Author's collection)

● Airborne S-phone equipment in use as a relay station in Holland during 1944-45. (Author's collection)

system known as Rebecca-Eureka working on about 215MHz.

Rebecca was the interrogator and Eureka the ground beacon (responder). The Mk I equipment was first demonstrated in the UK in February 1942.

Hanbury Brown based the suitcase-carried Eureka 10W (peak) responder (with a super-regenerative receiver) on his earlier work on Identification Friend or Foe (IFF) equipment for the RAF. Twelve units were supplied by TRE to SOE in 1942 and subsequently a number were manufactured by **Monitor Radio** in Birmingham. The system was further developed (Mk II and III) and adopted by Airborne Forces, etc.

However, once out 'in the field' the Eureka beacon apparently did not always prove popular with the Underground and some are said to have been dumped in rivers or lakes! Incidentally, the system didn't include an RT facility and did not supersede the S-phone.

Czech Mission

One of first Eureka beacons was flown to Czechoslovakia during the night of 27/28 March 1942. It went with a three-man team (with the mission name 'Out Distance') that included **Sergeant Karel Curda**.

Out Distance was one of a number of Czech missions (trained and equipped by SOE) between December 1941 and Spring 1942. Others included the 'Anthronoid' mission to assassinate Reinhard Heydrich (known to the Germans as the Reich Protector in Czechoslovakia). It was dropped at the same time as the 'Silver A' team with a Whaddon Mk III transmitter and Hallicrafters *Skyrider* communications receiver to restore a radio link between the Czech underground and the SIS-built, Czech-operated control station at Woldinham, Surrey.

The Eureka beacon was **intended to provide** guidance for RAF bombers attacking the Skoda factory at Brno but was found by a farmer and given to the Germans. Curda went into hiding but, in the aftermath of the Heydrich assassination and the frightful reprisals inflicted on Czech civilians with thousands killed, gave himself up on June 16 and became an informer.

CEASE EMERGENCY W/T WATCH FOR ME

● A cartoon from the Whaddon Section VIII *Stable Gossip* newsletter. The 'Gallows' humour reflected the often tragic fate of many Clandestine operators working 'In the field' behind enemy lines. (Author's collection)

Curda then betrayed the Jindra resistance group which had been sheltering him. This action lead indirectly to the well known (Several films - both in English and Czech have been made on the subject) fatal battle in the Karel Boromejsky church in which eight of the parachutists were either killed or died by their own hand, after resisting a massive German attack for some six hours. Curda was subsequently court-martialled after the Second World War and executed by the Czechs.

Several documentary programmes presented on British Television in recent years clearly showed the reprisals - graphically documented on film by their meticulous newsreel units - carried out by the Germans following Heidrich's assassination - including the total destruction of two complete villages and many of their inhabitants. However, files in the Public Record Office show how SOE directors tried to distance themselves from their involvement in the Heydrich assassination.

Extensively Used

Once they were established, S-phones were extensively used in most theatres of operations between 1942-45. Interestingly, they were not only used for short-range ground-to-air communications, but also for ship-to-shore two-way links during secret beach landings, to rendezvous with clandestine vessels and for a secret RT link between Denmark and Sweden, etc.

The late **Charles Bovill** once told me that the S-Phones were used in Yugoslavia on C47 aircraft of the 60th Group United States troop carriers. On the occasion, Charles was recalling the time when some 100 aircraft were flight-controlled by S-phones during a very large supply-dropping operation in August 1944.

Longer Range System

The S-phone was essentially an SOE development, but a much longer-range secret RT ground-to-air system was developed during 1942 by **Alfie Willis** and **Wilf Lisburn** at the Whaddon headquarters of SIS Section VIII, headed by **Brigadier Gambier-Parry**.

Once developed, the new system was flight-tested and organised by **Squadron Leader**

Maurice Whinney under the generic name Ascension. It operated on frequencies between 30-35MHz with some 20W of r.f. power and used frequency modulation (f.m.). Incidentally this was the only operational use of f.m. by the British during the Second World War.

Unlike the S-phone, the role of Ascension was to allow a Secret Agent in occupied territory to pass their reports to an operator (who was equipped with a wire recorder, the predecessor of the tape recorder) in a high-flying aircraft circling, off-centre, at distances of up to 100-150 miles. A drawback with this system was that the pre-arranged flight schedules could be disrupted by poor weather, aircraft mishaps, etc.

● This special S-phone was developed for use on the secret radio-telephone link operated between occupied Denmark and neutral Sweden. (Author's collection)

Ascension was quite widely used during 1943-45 in France, Belgium and Holland and also in the Middle East. Initially, it was used to make contact with the small ships transporting Agents and mail to and from Brittany, although it was later replaced for this role by h.f. wireless telegraphy (WT). Notably, Ascension was used in addition to Whaddon Mk VII h.f. WT. equipment for the major SIS/OSS/BCRA intelligence operation 'Sussex' in support of the Normandy campaign.

● A 50th year anniversary 'Memory' special QSL card commemorating Czech operations sent to G3VA for a QSO on 29 December 1991. It bears the wording "OM5MCP is a Memory Station. Worked as part of the Celebration of the 50th Anniversary of the first Parachute Groups sent to Czechoslovakia from Great Britain during World War II".

Ascension Revealed

It was in 1943, during the early planning stages of the Sussex operation, that SIS revealed to the Americans the existence of Ascension. It appears that as a direct result of this disclosure, OSS initiated the development of Joan- Eleanor with Al Gross largely responsible for the compact hand-held ground unit (Eleanor/SSTR6).

The J-E equipment, in the same way the Ascension equipment, was intended to allow an intelligence-gathering Agent to pass traffic to an aircraft equipped with a wire-recorder. Initially for this work the Americans used the versatile British-built de Havilland Mosquito aircraft, a fast and rugged aircraft, well known for being built mainly of wood.

On the air J-E worked on about 230MHz and the very compact battery operated hand-held transmitter-receiver unit (equipped with a super-regenerative receiver) had a built-in carbon microphone and battery. However, it wasn't a cheap system!

The airborne Joan, including wire-recorder, cost US$1913. This was roughly four times the cost of their standard suitcase SSTR-1 h.f. WT radio (US$450) with Eleanor (SSTR-5) another US$325.

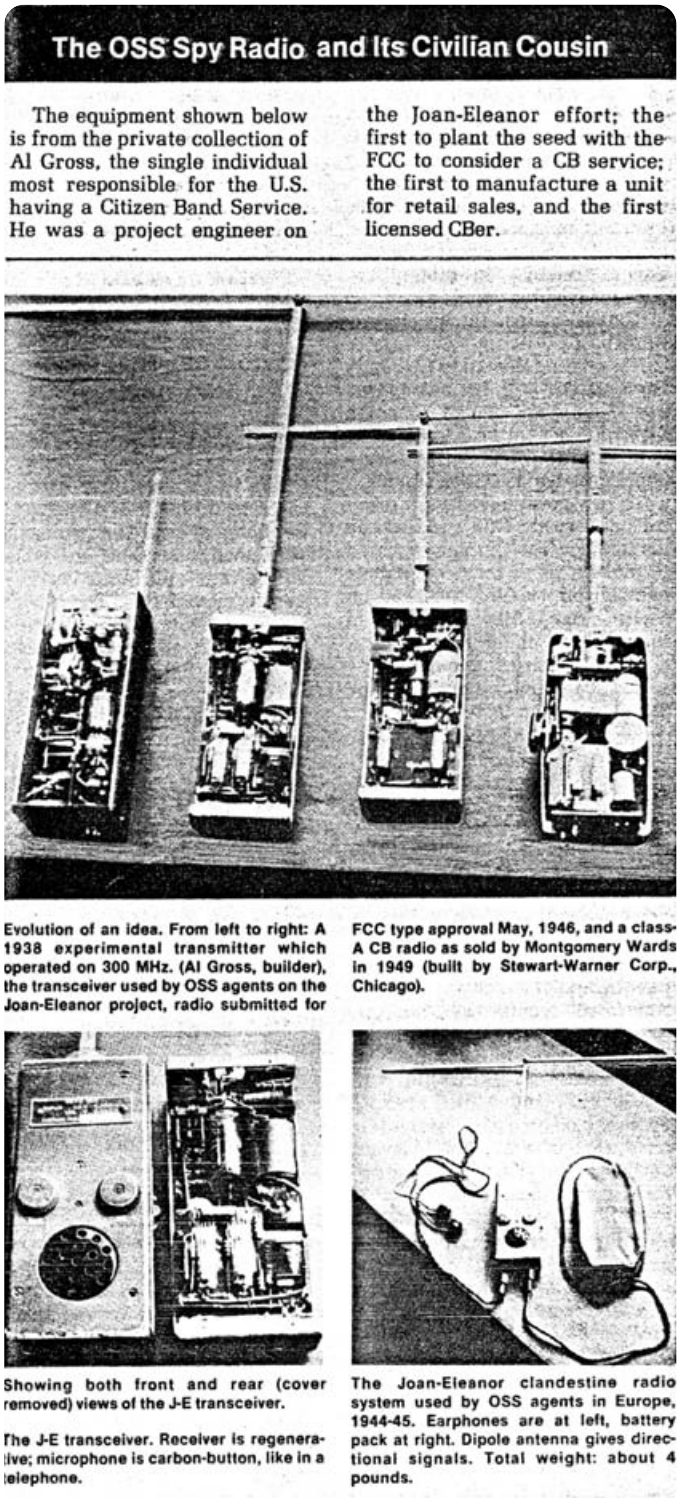
Additionally, the range of the airborne Joan was much less than Ascension. This of course increased the risk to the Agent since the aircraft then had to fly fairly close and could thus disclose their approximate location.

First Time

The J-E system was used operationally for the first time on 10 November 1944 to allow **Lieutenant-Commander Steve Simpson** to speak directly to an agent ('Bobby') in the still-occupied north of Holland. Later, in the final months of the war in Europe, J-E was used to talk to a number of OSS-SI Agents dropped into Germany.

Several of the Agents dropped into Germany later turned out to be Communist activists. And indeed, details of J-E had already been transmitted to Moscow from the UK by that redoubtable Soviet radio-agent **Ruth Werner** - nee Kuczynski - (Sonya).

Later on the J-E also saw some use in the Far East but its operational value in the Second World War did not compare with either Ascension or the S-phone. Though for all three systems I would firmly echo Ben Nock's tribute to the brave individuals who used them in the field. *PW*



● Illustrations showing the collection of transceivers designed and built by the late Al Gross W8PAL. Much involved with the American OSS effort's during the Second World War he was the main driving force behind the introduction of the original Citizen's Band in the USA. (Author's collection)

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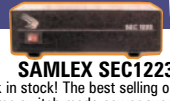

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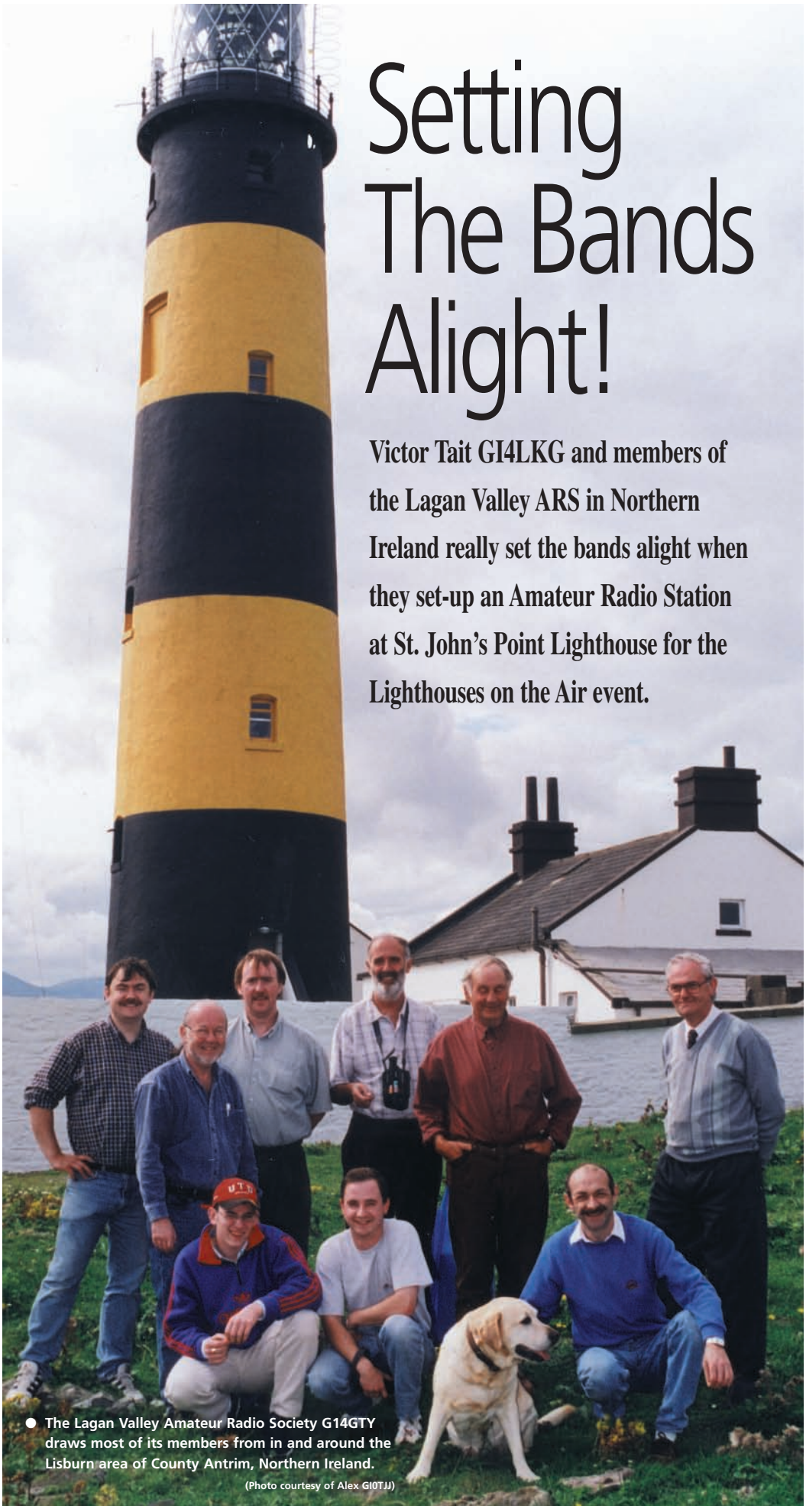
Setting The Bands Alight!

Victor Tait GI4LKG and members of the Lagan Valley ARS in Northern Ireland really set the bands alight when they set-up an Amateur Radio Station at St. John's Point Lighthouse for the Lighthouses on the Air event.



● The Lagan Valley Amateur Radio Society G14GTY draws most of its members from in and around the Lisburn area of County Antrim, Northern Ireland.
(Photo courtesy of Alex GI0TJJ)

The story starts in the springtime of 1998 when I travelled to Belfast to take part in an inter-club quiz,with other members of the **Lagan Valley Amateur Radio Society** (GI4GTY).

The Lagan ARS had been invited to go along by **Richard GI0OUM**, Secretary of the **Belfast RSGB Group**. During the customary tea and buns break from the highly competitive contest, Richard casually mentioned the Lighthouse On The Air event.

Richard explained that the Belfast group had been invited to take part in the Lighthouses on the Air Event, but owing to the fact that they were already committed to another event wouldn't be able to join in. So, Richard asked if the LVARS would be interested in taking up the challenge in their place. We accepted.

Richard supplied us with all the information the Belfast Group had been sent about the event, which included a letter from the co-ordinator of the event, **Mike GM4SUC**. Mike. who's based in Ayr, Scotland, has been involved with activation of Lighthouses around Scotland for many years and after representations from far and wide, a similar world-wide event was eventually born.

So the dates for the event were eventually set as Saturday 22 August, starting at 0001UTC until 2359UTC on Sunday 23rd August 1998. However, I was left wondering whether the Lagan Valley ARS would be up to the challenge and whether I could drum up **enough interest and operators**.

During the following days, I contacted members of the LVARS and discussions took place to find out if there was enough interest. Fortunately several members were keen to have a go so we were on our way!

Operation Lighthouse!

After ascertaining that we had enough members interested in taking part the next item on the agenda was to find out if Amateur Radio operation would be allowed from within a lighthouse complex around the coast of Northern Ireland and I'd already thought of a location because I had, on many occasions, from the shore around Newcastle in County Down, watched a bright beam being emitted from across Dundrum Bay.

The light I had often sat and watched was the one being emitted from St. John's Point

Lighthouse. This I thought would be a great location for our radio operation. However, with no knowledge at all about St. John's, I decided that I should really try to make contact with the 'keepers' of the light, before things progressed any further.

It was fortunate that I had a work colleague who had experience of lighthouses and their workings. He very helpfully put me in contact with Mr Henry Henvey at St. John's.

Mr Henvey was helpful, providing lots of details and informed me that I would need to obtain official permission from The Commissioners of Irish Lights in Dublin to allow the LVARS to operate an Amateur Radio Staion from St John's.

So, I set about writing to The Commissioners of Irish Lights Head Office in Pembroke Street in Dublin and after an exchange of letters containing details of our equipment and the installation of antennas plus insurance cover, etc., permission was finally granted. We had a green light!

Discussions And Details

During the following weeks, discussions took place at the club shack regarding the Lighthouse Activity Weekend. Many questions were asked, "What bands would be operate on"?, "What modes would we use"? and, of course, the antennas and their installations.

There were many other aspects to be considered before we could take part in the event. These ranged from accommodation and sleeping arrangements (don't even think about it!), to cooking and washing facilities.

I think it was finally agreed that we would, in the main, use two lower h.f. bands, namely 3.5 and 7MHz. We also agreed that we wanted to operate on the 14, 21 and 28MHz h.f. bands if conditions allowed and that a trapped dipole should be erected.

A 144MHz station was also set-up to be used for local contacts on 145.550MHz. This would also be used for contact with members coming and going from the site. It was also agreed that a 50MHz radio and antenna should also be made available.

The main mode of operation would be 'phone (voice), but some SSTV (slow scan television) would be tried. Computers would be used to log all the contacts. made during the event and one computer would be used to maintain connection to the European DX Cluster Network (see below for more information).

Once we had decided on what we wanted to do, I spoke again to Henry Henvey at St. John's and arranged to visit him again, this time to talk about our requirements for setting up the Amateur Radio station. So, together with some of the other club members we set off for St John's a few days later.

Mr Henvey was most helpful with regard to our intended operation and needs. We all wanted it to go well because this would be the first time a GI station would be active from a lighthouse in Northern Ireland.

The arrangements were finalised. Everything was now in place for what we hoped would be a good Lighthouse Activity Weekend.

Antennas & Delivery

Several members of the Lagan Valley Amateur Radio Society GI4GTY headed for St. John's Lighthouse to begin the installation of antennas and deliver some gear ready for the event. We attached the apex of two large delta loops for the 3.5 and 7MHz bands and just below the lantern of the lighthouse.

As the antenna apex was about 120ft (36.5 metres) above the ground and there was a large ground space below, it meant that we had a near perfect triangle. The other end of the trapped dipole was tied off and the three feeders ran to the operating points. Checks and air tests confirmed all was well with the antennas and equipment.

By now it was well into the evening of Friday, so some members began operating and continued into Saturday morning. Many contacts were made in the first few hours.

Most of the early contacts made were with British, Irish and Mainland European stations. Some included other Lighthouses and Lightships, so things were looking good.

Mid-morning on Saturday saw the arrival of more members of the LVARS and operating continued all through the day and into Sunday, when other members called by. Many cups of tea and coffee were consumed and a barbecue was set up during both Saturday and Sunday afternoons, which was enjoyed by all.

St. John's Point

Just south of Ardglass, on the coast of County Down, is St. John's Point. There has been a lighthouse here since the middle of the 19th Century. The light was first established on 1 May 1844, with an occulting characteristic - 45 seconds flash, 15 seconds dark, 62ft (19m) above high water.

The tower was originally painted white. The light was changed from white to red in 1860 and in 1875 a gas works was built at the station when the light source changed from oil to coal gas.

During the 1880s, there were many requests from mariners to improve the marking and lighting of the Co. Down coast. As part of a general effort to achieve this, the height of the tower at St. John's Point was raised to almost double its original height, from 62ft (36.5m) above high water, to 120ft above high water.

A fog signal was established and an auxiliary light (directed over Dundrum Bay) was exhibited in one of the tower windows, on the third floor. In 1902, the colour of the tower was changed, from white, to white with three black bands. In 1909, the main light was improved, with the introduction of a biform lens and incandescent paraffin burners instead of gas jets. The colour was changed from red to white and the character to Group flashing (2) every 7.5 secs.

There was a further colour change to the tower in 1954, to black with two yellow bands. On 18 February 1981, the light was converted to electric and an electric horn replaced the siren as fog signal. The station was de-manned on 31 May 1981.

European DX Cluster

The DX Cluster is a Network of computers linked together by Amateur Radio links all across Europe and beyond. This allows any station connected to the network to type information which is then sent to all other connected stations. This information is normally about stations who are active on the Amateur radio frequencies and will include their callsign, time, frequency and mode of operation.

It was decided around 1800hrs on Sunday to start dismantling the stations and antennas. We had worked over 500 other Amateur Radio stations around the globe! So at around 1930hrs we packed the vehicles and headed homewards.

After the taking part we all agreed that the weekend was a great success and the 'crack' (chatting) was mighty at times. So the question was raised of Will the Lagan Valley Amateur Radio Society attend a similar event again? Of course we would! PW

The Lagan Valley ARS presented Henry Henvey (Harry) of St. John's with a framed photograph of the lighthouse. Pictured are (Back L-R) Norman GI4SZP, Mark MI1AZL, Victor GI4LKG, Mr Henvey, David GI4SNA and Eden GI4AIO. (Front L-R) Peter s.w.l., Andrew MI0BPB, Finn GI4dog and Seamus GI4RKC. (Photo courtesy of Alex GI0TJJ)

Lagan Valley ARS

The Lagan Valley ARS GI4GTY meet on the 2nd Wednesday of the month at the Harmony Hall Arts Centre, Harmony Hill, Lisburn, Co. Antrim. Meetings start at 2000hrs. For more information on club activities contact **Ron McCaughey GI4NTO** on **(01846) 601941**, E-mail: p**at.ron@virgin.net** or **Victor Tait GI4LKG** on **(01846) 60104**, E-mail: **victor.tait@virgin.net** Alternatively check out the club's website at **www.geocities.com/SiliconValley/Peaks/9197**

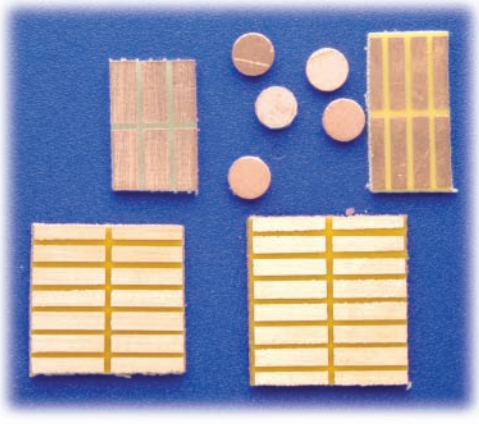
Copper Islands

Rob Mannion G3XFD has discovered radio treasure trove in the form of a 'Copper Island' construction outfit. And despite the name it's manufactured in Nottinghamshire... a long way from the sea!

Despite my encouragement, many Radio Basics (RB) readers avoid using standard printed circuit board (p.c.b.) etching techniques. However, I quite understand the objections to the chemical processes involved...having stained fingers in the past myself!

So, when regular *PW* correspondent and author **Duncan Walters G4DFV**, well known in QRP and home-brew circles, presented me with a sample of his Copper Islands Constructional Outfit...I thought it such a good idea to help readers...a review was essential!

The basic principle behind the Copper Islands construction technique is extremely simple: the builder, using Super Glue just has to stick specially made contacts onto a sheet of p.c.b. laminate to provide very convenient raised, insulated soldering and mounting points.



A selection of the Copper Islands supplied in a prototype outfit. Production 'Islands' do not require cut edge-finishing (see text).

One of the projects built by G3XFD - a multivibrator and audio amplifier unit (see text).

The so-called 'Islands' are different forms of cut or punched 'pads' with the bright copper facing upwards. They're directly fixed to the p.c.b copper laminate using the extremely rapid setting adhesive (**more on this later**).

Once the pads, or pre-formed mini-boards - designed to accept integrated circuits (i.c.s.) - are in place they provide excellent soldering points. **It's much neater** than my traditional wooden bread-board and drawing pin method and (as I've found) is suitable for both h.f. and v.h.f. constructional projects.

Presentation Pack

The Copper Island kit is presented in a compartmented plastic box (heading photograph) and comes with excellent instructions, suggestions for projects and starter laminate boards. The photograph, **Fig. 1**, shows a selection of the various 'Islands' supplied in the kit (In the prototype these i.c. mini-boards required minimal cut edge finishing with sand-paper. Later versions don't require finishing).

The basic starter kit provides a very good selection of mini-boards and Islands and all you need to start, including a hold-down stick (more on this later), tweezers, cleaning block and adhesive and re-fill packs are available to keep you going.

On the bench, using myself as the 'worst case scenario'- I can honestly say I found the system extremely useful and extremely easy-to-use. Very encouraging for all!

Adhesive warning: If you've never used Cyanocrylate adhesives - or Super Glue - before...**it's wise to be careful!** Fortunately, Duncan provides well-worded advice, suitable tweezers and the already mentioned hold-down stick to minimise possible contact between you, the work and the adhesive. Following the instructions and using these will minimise problems, and even the digitally-compromised G3XFD had no problems whatsoever!

I have no hesitation in recommending the G4DFV Copper Island Construction Outfit to readers. I've already used it, **Fig. 2**, and you'll see the results in the Radio Basics series very soon indeed! *PW*

Product

The Copper Island Construction Outfit

Pros & Cons

Pros: Extremely easy to use, straightforward and reliable. Suitable for audio, l.f., h.f. and low v.h.f projects. Ideal for beginners and experienced constructors alike.

Cons: Don't get stuck to the job! Follow the excellent safety tips to avoid problems with the adhesive (suitable tools included).

Price

Full 'starter' outfit £17.95 inc. P&P.
Refills (example) 200 5mm round pads £5, 20 8-pin i.c. pads £4.

Summary

Ideal for prototyping, one-off and permanent projects. Delight to use, neat final job. Excellent instructions, ideal for beginners and advanced constructors alike.

Thanks

My thanks for the sample outfit go to **Duncan Walters G4DFV, 11 King George V Avenue, Mansfield, Nottinghamshire NG18 4ER. Tel: (01623) 465443 or E-mail: pentode@ntl-world.com**

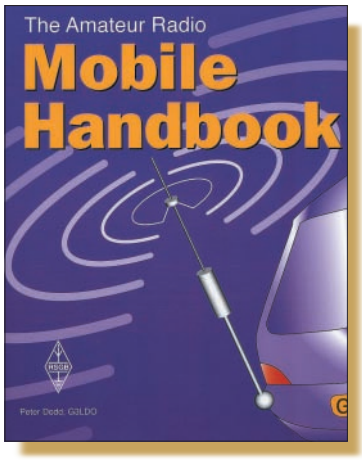
The Copper Island construction outfit produced by Duncan Waters G4DFV. In his review G3XFD says he thinks it's an ideal technique for any constructor - bridging the gap between bread boarding and full printed circuit boards with minimum effort.

Book Profiles

It's some time since Rob Mannion G3XFD took a look at the growing pile of books on his

NEW!
The Amateur Radio Mobile Handbook
Peter Dodd G3LDO
£13.99

This newly available book has been a rather long time coming and will be much appreciated by the many Radio Amateurs whose operational activities are concentrated on mobile working - together with the occasional mobile operator. **Peter Dodd G3LDO** is well known as a *PW* author - particularly for his work on antennas - and his input on the antenna aspects of mobile working are dominant throughout the book.

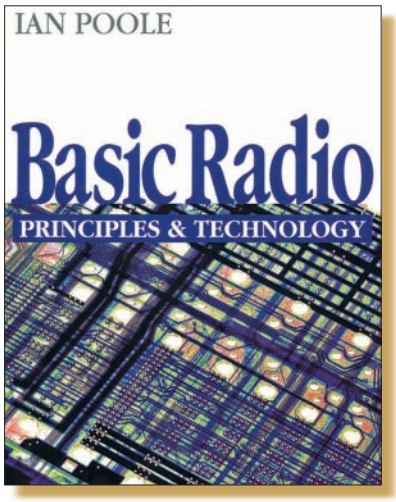


Literally every aspect of mobile working is covered - from basic bicycle mobile to the maritime operations for the keen sailors who abound in our hobby. Extremely well illustrated with many photographs, diagrams and charts (however, although the majority of the illustrations are obviously good, the printing process has resulted in a lack lustre minimum contrast, which is also noticeable in the printed text). Chapters include: going mobile, mobile operating, installing equipment, mobile antennas, fixing antennas to vehicles (very useful indeed!), kite and balloon antenna supports, bicycle h.f. mobile, maritime mobile, experimental activities, walkabout mobile.

In my opinion this book really fills a need and will no doubt be reprinted regularly. **Highly recommended**.
Order Code: ARMOBH

Basic Radio Principles & Technology
Ian Poole
£15.99

Ian Poole G3YWX is of course extremely well known to *PW* readers through his long running series 'What Is A....'? and particularly his ground breaking series 'Specifications Explained'. I mention these popular articles because this book in particular follows Ian's usual format of a easy-to-digest read but packed with information approach. An ideal beginner's book this paperback volume provides a lightweight introduction to the science of radio which is helped by the inclusion of many clear and concise illustrations. In particular, I've liked the chapter on radio waves and propagation because these in my opinion provides excellent diagrams, illustrations and explanations which help the student to understand some difficult concepts. **A good all round beginner's book.**
Order Code: BRPRIN



HALF PRICE!
The G-QRP Club Antenna Handbook
Compiled & Edited by G3PDL
£3.50

Low power operating offers a challenge and a good antenna is always necessary. The argument is just what makes a good antenna! The G-QRP Club has gone some way towards answering the question for keen QRPers by offering this compilation of antennas and related project of special interest for followers of this ever-growing specialist subject.

All the material published in this soft-back booklet have been published in *Sprat*, the club's own journal. They range from low power s.w.r. indicators and field strength meters to full Delta loops and specialised compact loops and portable designs. All are presented in the typical Sprat 'home spun' drawing style.

There's a tremendous amount of material in this book - enough to keep you going for years and they've all been tried and tested by some of the keenest Radio Amateurs to be found on the bands. **Thoroughly recommended**.

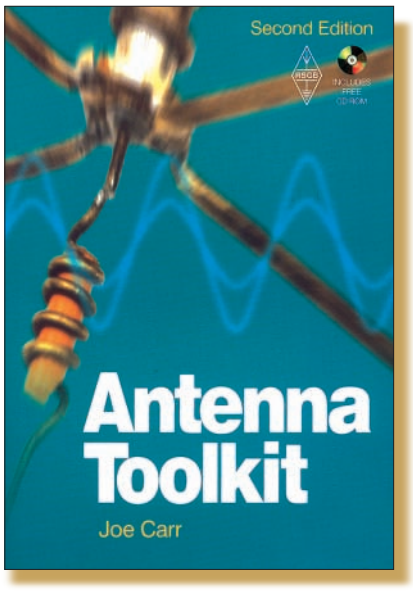
desk. However, he's found time to do so...just in time - hopefully- to get some of them into your Christmas stocking!

NEW!
Antenna Toolkit
Joe Carr
£24.99

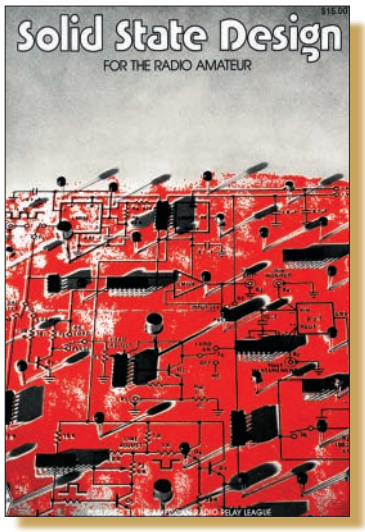
The late Joe Carr was a master when it came to discussing antennas. His expertise, interest and bubbling enthusiasm really showed through no matter how technical the subject. This enthusiasm helps the reader because Joe's enthusiasm rubs off - and that's a great help when you're dealing with the complex abstract concepts behind antenna work!

The chapters include: radio signals on the move, antenna basics, wire connections, doublets, dipoles, limited space antennas, wire arrays, small lops, yagis, instrumentation and measures. This is truly a mini-manual and it also comes with a CD Rom packed with extra information. However, in my opinion this book would be worth buying for just the first three chapters...let alone everything else!

Not sure of propagation or how an antenna actually radiates? If the answer is yes - you'll find Joe's approach extremely helpful indeed. Superbly illustrated with economical, non-fussy and exceptionally easy to understand drawings, **this book comes as very highly recommended**.
Order Code: ANTOOL



Solid State Design For The Radio Amateur
Wes Hayward W7ZOI & Doug DeMaw W1FB
£11.50

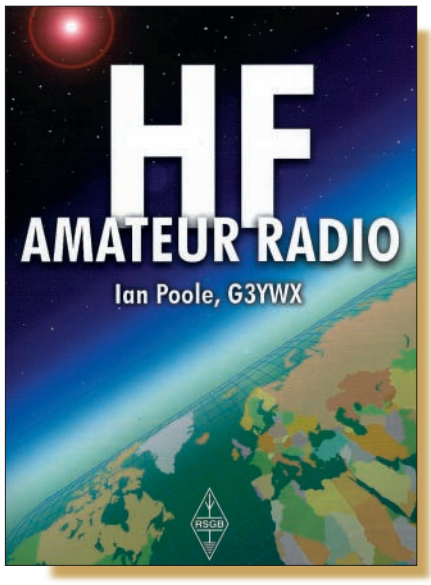


This book is an absolute classic! Although it's been around for many years now - it should be in everyone's library as far as I'm concerned! Covering literally every aspect of solid state design this book is really a guidance manual for anyone who wants to learn how to design, adapt, build and operate their own equipment.

I'm very keen indeed on promoting the 'building block' idea where favourite circuits can be built, modified and used where the individual constructor needs them and this book is packed (literally) with hundreds of them. Open its pages and you'll find something to help you whether it be an amplifier, oscillator or complete project.

The various chapters include : Semiconductors and the Amateur, basics of transmitter design, more transmitter topics, power amplifiers and matching networks, receiver design basics, advanced receiver concepts, test equipment and accessories (some very useful ideas here), etc. Altogether this book comes as **very highly recommended** and...I wouldn't be without it in my workshop.
Order Code: SSDRA

NEW!
HF Amateur Radio
By Ian Poole G3YWX
£13.99



In essence this book by **Ian Poole G3YWX** should be considered as the natural 'follow on' volume to accompany his *Basics Radio Principles & Technology* volume. because it takes up where the other leaves off. Aimed more at the active Radio Amateur who is just beginning to get to grips with their new h.f. transmitting station - I think it will appeal to the newcomer....especially those taking advantage of the easier access to h.f. provided by the recent licence changes.

Chapters include topics on introduction to h.f., radio wave propagation, types of transmission, receivers, transmitters, antennas, bands and band plans, on the bands, setting up a station, abbreviations and codes. In approach this book should be considered as a newcomer's h.f. manual - and it will make an ideal gift for anyone venturing onto h.f. for the first time. **Very useful h.f. operator's handbook/manual**.
Order Code: HFAR

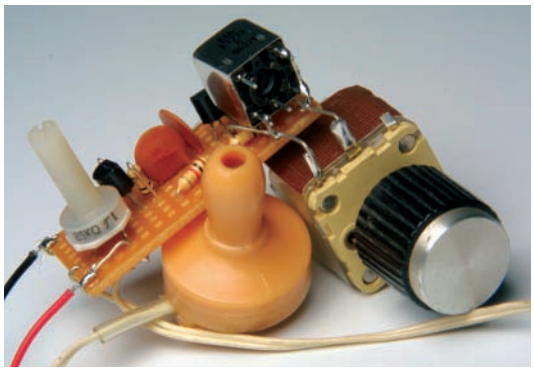
To order any book from these pages please use the Order Form on page 84 or call the Credit Card Hotline on (01202) 659930. Please quote the codes where applicable.

Carrying On The Practical Way

The Rev. George Dobbs G3RJV has plans for you at this festive time of year! George says "Here's a Christmas radio for the children and peace of mind for you at the same time"... after you've read the quotation of course!

"I am beginning to learn that it is the sweet, simple things of life which are the real ones after all".

Laura Ingalls Wilder



● A Christmas radio treat for the youngsters using the MK484 single i.c. radio chip. It could also perhaps to re-awaken memories of your own early radio days!

Welcome to tha festive edition of Carrying On The Practical Way (COTPW) and I'm starting off by looking back with vivid memories of the time when I listened to an account of the Russian invasion of Hungary in 1956...using a zinc galvanised bath! This came about because my grandparents lived in the Lincolnshire hamlet of North Thoresby and each weekend, in the 1950s, I cycled out to spend my Saturday nights staying with them in the countryside.

My visits took place during the early period of my experiments in short wave radio and that weekend my saddlebag contained my latest two valve short wave receiver. I connected up the new receiver to the long wire I had already erected across their long garden and settled down to monitor short wave broadcast stations.

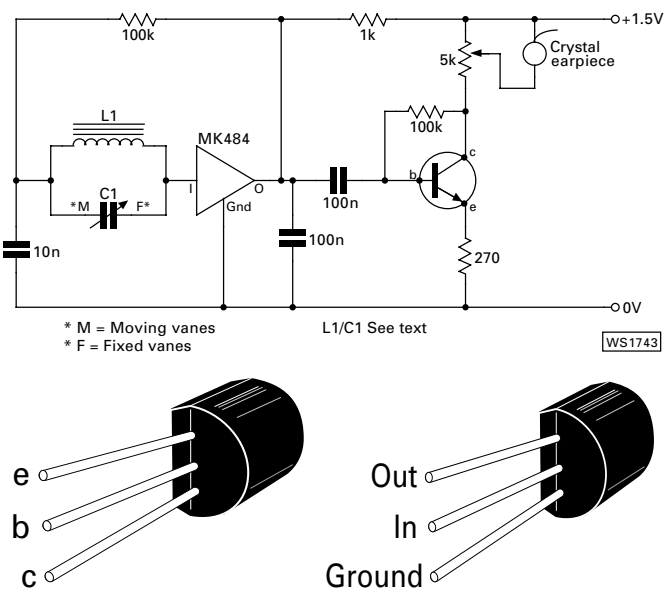
The receiver performed quite well but lacked audio gain and since I was only using a single high impedance headphone, even listening to Radio Moscow was a strain on the ears. I figured that without adding further electronic amplification, an interim improvement in audio output might be possible by altering the headphone arrangement.

What might help could be a larger diaphragm for the headphone. Outside the back door, hanging on a hook, was the family 'tin bath' – the largest piece of thin metal around the house....and it was ideal!

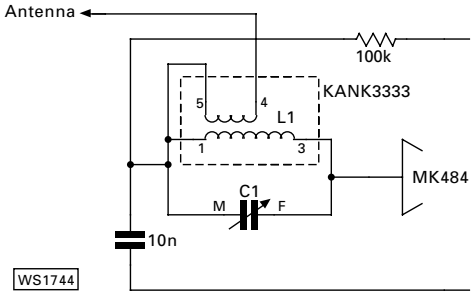
I brought the bath into the kitchen, suspending it bottom-up, on two wooden stools my grandfather had made and placed the headphone, minus the metal diaphragm, on the bottom of the bath. Then, by placing my head inside the bath I could hear Radio Moscow giving its account of why there were Russian tanks in Hungary!

But the audio wasn't much louder and the news from Moscow wasn't very convincing either, even to a young boy. So my beliefs in politics and experimentation in radio both received a setback in one evening!

Like many people I came into Amateur Radio by the magic of short wave listening - tuning across a dial wondering just who or what I would hear next. Nowadays, though the short wave bands have changed and in some ways are not quite as exciting now. Modern technology has taken away some of the stations and traffic, but they can still be a source of wonder for the young.



● Fig.1: The basic circuit of a simple receiver using the MK484 integrated circuit (i.c.), based on the circuit that came with the chip. Shown as insets are the pin-outs for the MK484 and the BC180 devices (see text).



● Fig.2: Despite the fact it's primarily designed for use below 2MHz, you can use the MK484 on short waves! All that's required is a change of tuned circuit and this circuit shows one of G3RJV's methods using of an off-the-shelf inductor from the Toko 10K range (see text).

Traditionally Christmas

Traditionally, at Christmas time I aim to devote COTPW to a project for the children. Something which the reader can build for a younger member of the family, at a family time, and perhaps even an excuse to leave the cold turkey and heat up the soldering iron!

In previous years I've described the building of crystal sets for the young and had intended, this year, to describe a short wave crystal set. My first experiments with this idea did suggest that the idea would probably cause more frustration than pleasure for a radio newcomer.

However, if *PW* readers wish to refute this and send me their favourite short wave crystal set ideas, I would be delighted. But for the Christmas idea this year I decided to try something a little more reliable and usable.

The ZN414 Chip

Several years ago I introduced some school children to radio construction using the ZN414 radio chip. This

complete tuned radio frequency (t.r.f.) receiver on one chip proved to a good way to quickly build a radio which yielded reasonable results.

The original Ferranti ZN414 has now been replaced by the MK484. This article is about how quickly and simply a short wave receiver might be built using that chip but does not exhaust the possibilities using this remarkable little i.c.

The diagram, **Fig. 1**, shows the basic circuit of a receiver using the MK484. It's based on the circuit that came with the chip. Incidentally, my MK484 chips come from **Kanga Products** (see footnote) who supply the chip in the UK for about £1. The circuit is for a simple medium wave receiver.

The ZN414 was a ten-transistor t.r.f. receiver was designed and produced by Ferranti and was introduced in the early 1970s. The concept was to provide a simple a.m. receiver with very few external components and it appeared in many projects over the years.

Nowadays, the replacement MK484 still requires only six extra components to produce a simple medium wave tuning receiver...including automatic gain control (a.g.c.) control. **No setting up is required** beyond providing a good tuned circuit for the desired frequency coverage.

The MK484 is capable of driving a good pair of high impedance headphones* but as these are not common any more, a simple audio amplifier has been added which will drive a crystal earpiece. This even has a rudimentary volume control by making the load resistor of the transistor a variable resistance.

Editorial note. *Earpiece inserts from redundant telephones make ideal earphones for the MK484, provide suitable loading and consequently excellent audio output levels, often to the extent that an extra audio output stage is not required for use on long and medium wave reception. See Radio Basics January 2001.*

Quickly Built

I quickly built up the basic circuit on a piece of Perfboard using the medium wave coil from a scrapped radio together with a polyvaricon variable capacitor from a similar radio. Wanting to make the unit smaller I broke off a shorter section of the ferrite rod to insert into the coil. The little receiver worked surprisingly well from its 1.5V supply and I was able to hear a good selection of the stations on the medium wave band.

There are a few useful points to remember in using the MK484. As in all radio frequency construction, the leads should be kept as short as possible...especially the connection to the coupling capacitor from the MK484.

The tuned circuit is also best kept some distance away from the audio output of the circuit. The moving vanes of the capacitor (those connected to the control shaft) **should be connected at the 'earthy end' of the circuit** and connected to the junction of the 100kΩ resistor and 10nF capacitor.

In the circuit diagram these are shown as M (moving) and F (fixed). The 1kΩ resistor sets the a.g.c. action and there's some benefit in ensuring that this value gives enough a.g.c. action to prevent strong stations swamping the weak ones and yet achieves a good signal-to-noise ratio.

The value of 1kΩ seems to be appropriate for the circuits described here but the reader might like to experiment. (Indeed, the original Ferranti booklet on the ZN414 and the information sheet suggests experimental value above and below the 1kΩ value for best results where the receiver will be operated from).

On Short Wave?

So how does the MK484 function on the short wave bands? The data suggests that it functions up to about 6MHz and thankfully it's very easy to try this out.

In fact all that's required is a change of tuned circuit and **Fig. 2**, shows my first attempt. This used an off-the-shelf inductor from the Toko 10K range.

My polyvaricon capacitor had a maximum capacitance of some 340pF and in conjunction with the KANK3334 provided a tuning range of some 3.8 to 25MHz. This is perhaps rather too much range on one tuning control **but in practice I found that many of the stronger short wave broadcast stations were received with great ease**.

The usable frequency range certainly appears to be much higher than suggested, **perhaps due to the Q of the Toko inductors**. A KANK3333 inductor will give a range of around 1.2 to 10.5MHz, which can be a useful coverage for broadcast stations and nearer the suggested frequency range of the MK484. Should the polyvaricon capacitor you've got available have a smaller capacitance swing (5 to 220pF is common) the tuning range would still be in the order of 1.6 to 10.5MHz.

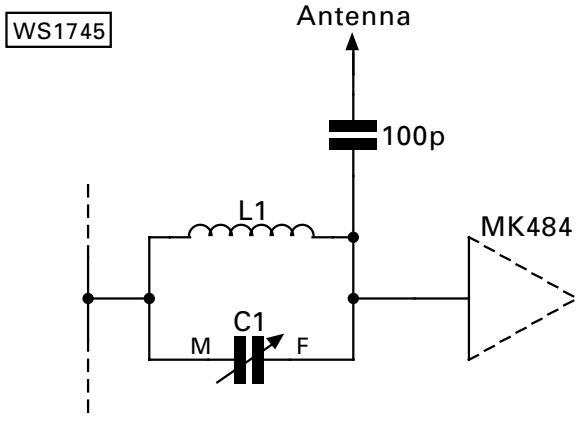


Fig.4: Coupling the antenna wire to the MK484 end of the tuned winding using a capacitor. In practice G3RJV found that a value of 100pF seemed to do the job well but experimentation is suggested for best results (see text).

Link Coupling

The diagram, Fig. 2, shows link coupling to the antenna. This is a simple option with the Toko 10K range as they come complete with a link winding.

One end of the link winding is connected to the 'earthy end' of the tuned circuit – the moving vane side of the variable capacitor as explained earlier. The other end of the winding is connected to the antenna - and for this I used one side of my doublet antenna.

An alternative idea is shown in the diagram, **Fig. 3**, showing the windings required to make a home-made coil to replace the Toko inductor if one is not available. This inductor is wound on a T50-2 toroidal core.

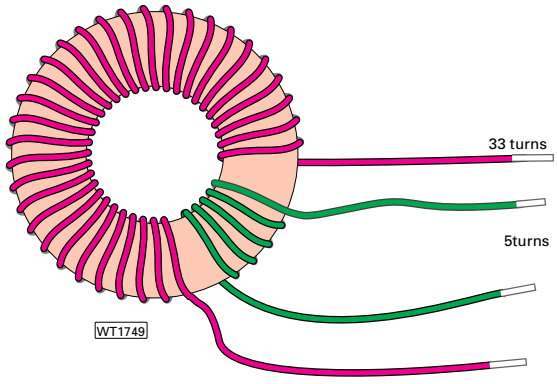


Fig.3: Showing the windings required to make a home-made coil to replace the Toko inductor if one is not available. The inductor is wound on a T50-2 toroidal core (see text). Note: The windings are shown seperately for clarity. In reality the link winding should be wound over one end of the main winding.

The tuned winding is 33 turns wound to occupy about three-quarters of the core and the link winding is five turns over the 'earthy end' of the main winding. A small diameter (say 30s.w.g.) enamelled wire is required (approximately 550mm of wire should be enough to make the main winding).

Impedance Matching

Usually a link winding is used for impedance match purposes, typically matching the tuned circuit to the common 50Ω impedance used in Amateur Radio antennas. In this case it merely provides a light coupling from a random wire antenna over a large frequency range. Not exactly rocket science but it does work!

An alternative is shown, **Fig. 4**, to couple the antenna wire to the MK484 end of the tuned winding using a capacitor. A value of 100pF seemed to do the job well but readers could experiment or even use another variable capacitor to couple the antenna to the receiver.

So, there it is...a simple short wave broadcast receiver you can build at little cost in less than an hour to amaze the children and keep the soldering iron warm over Christmas. And along with providing a generous little gift, you could also present them with a hobby to last a lifetime!

PW

Antenna Workshop

David Butler G4ASR, a very keen v.h.f. operator and VHF DXer columnist, describes five antennas for the very much under used 70MHz band.

This time around I'll describe a set of five antennas for the 70MHz band ranging in size from a diminutive two element beam on a 560mm boom, to a much larger six element Yagi with a boom length of 3915mm. So, if you're interested in DXing with c.w. or s.s.b., chatting to locals on a.m. or f.m. or playing with digital modes there may be a 70MHz antenna here to suit your requirements.

The mechanical construction of a Yagi array depends largely on the weather conditions you are likely to experience in use. For portable use in the summer a lightweight form of construction can be used.

However building a Yagi to survive several years of winters in exposed locations is quite another matter. The Yagis described here all use 25.4mm (1in) square booms and 12.7mm (0.5in) diameter elements. These construction materials should be adequate for most purposes.

I've found the materials used are light enough for portable use but they will also stand up to the rigours of winter in most of the UK. Indeed I constructed the six element Yagi shown in the photograph **Fig. 1** over six years ago.

When I checked the antenna after six years, apart from some superficial discolouring (which was easily cleaned off) the antenna had stood up remarkably well. My location, located some 230m above sea level (a.s.l.) near the Black Mountains on the Welsh border, is often subject to gale force winds during winter.

Same Materials

The Yagi designs described and shown here, all use the same materials and method of construction. The **only difference** between each model is the element lengths and element spacing. With each of these designs the element spacing remains constant and the elements reduce in length from back to front.

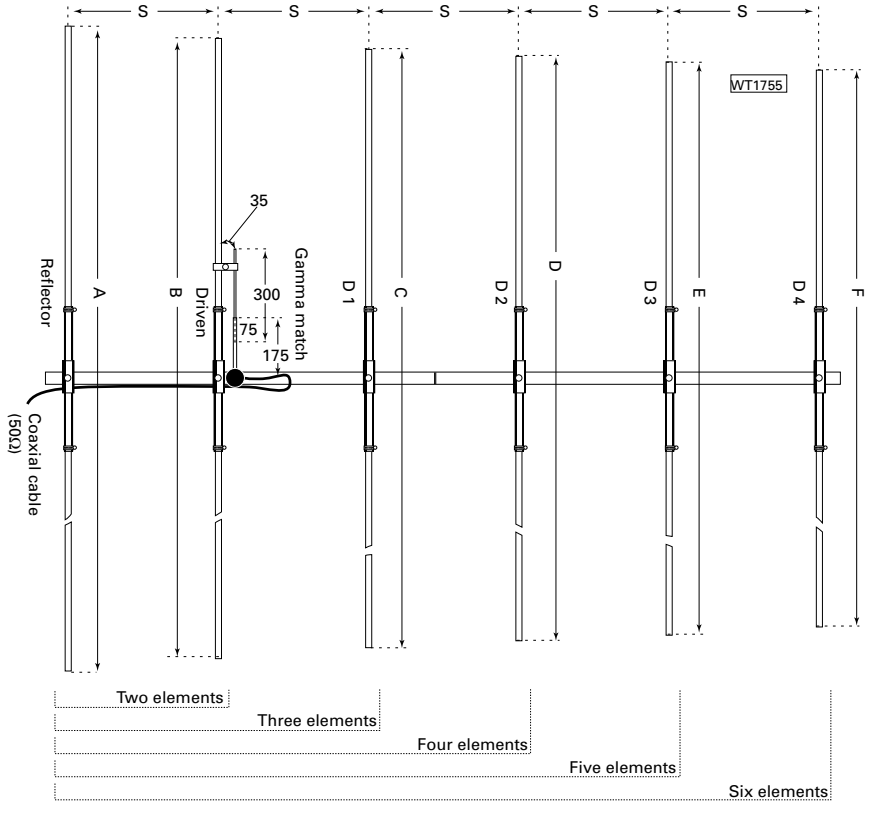
As you would suppose, the reflector is the longest element and the final director the shortest. The diagram, **Fig. 2**, shows all the antenna designs combined into just one diagram. The legend at the bottom of the diagram shows which elements are needed for each design.

The table of dimensions, **Table 1**, should be read in conjunction with Fig. 2, which shows the general layout of the antennas. Read the table for all the dimensions, element lengths, spacing and boom length, then you can make a start!

● This table provides the dimensions for each design that in in Fig. 1 (see text).

Table 1

	Ref	2-ele	3-ele	4-ele	5-ele	6-ele
Gain (dBd):		5	7	8	9	10
Reflector (mm):	A	2013	2197	2197	2197	2185
Driven (mm):	B	1892	2013	2013	2013	2013
Director 1 (mm):	C		1898	1898	1898	1880
Director 2 (mm):	D			1880	1892	1842
Director 3 (mm):	E				1880	1803
Director 4 (mm):	F					1765
Spacing (mm):	S	520	795	795	806	775
Boom length (mm):		560	1630	2425	3264	3915



● Fig.2: The overall designs formed into just one diagram. (See Table 1 for the various dimensions.)

Square Tube

Let's start the construction with the boom which may need to be fabricated from one, two or even three pieces of square tube joined together. When measuring the length of the square aluminium tubing, you should allow a 20-25mm as overhang at each end of the boom.

The smaller, two, three and four element Yagi designs use a single length of square boom. However, the two designs for the five and six element versions will require two (or even three lengths) of square tubing joined together with boom joints.

The boom joints consist of a 200mm length of 22mm (7/8in) round (or square if available) tubing inserted inside the 25mm boom and fixed with self-tapping screws. If using round tubing as a joiner, then you must make sure that the flats of the outer, square tube, form a single plane. Otherwise the plane of the elements will not be 'true'.

Measure, mark out and drill holes for the elements as shown in the tables. **Note:** A tip here is to measure all spacing dimensions from the reflector position rather than measuring separately between each element. By referencing all dimensions to one starting position you greatly reduce inaccuracies along the length of the boom.

Another tip is to mark out all the positions first before drilling the holes for the antenna. Then I suggest you go away and

have a coffee (or tea). After the break, check the measurements again and if all is well, then drill out the various holes to size.

Various Elements

Now let's turn to making the various elements needed for the antenna. Each element is made from two lengths of 12.7mm (0.5in) outside diameter aluminium tubing telescoped into a 380mm (15in) centre section of 15.9mm (5/8in) tubing for strength.

Four short slits (25-30mm) are cut in the ends of the centre sections with a hacksaw and the joints secured with hose clamps. (This permits easy adjustment for frequency if required.) Alternatively, you can cut each element to the overall length and fix through the centre section with two self-tapping screws.

The element (saddle) clamps used to join 12mm elements onto 25mm square booms, shown in the photograph **Fig. 3**, are commercially available from a number of sources. But I've found that Sandpiper Communications‡ one of the best suppliers for these relatively specialised parts.

Gamma Matching

The driven element is matched to the 50Ω coaxial feeder cable by a gamma matching system shown in the photograph **Fig. 4**. Additionally, to provide the necessary series capacitance a length of 3mm (1/8in) diameter rod 300mm long is partly telescoped inside a 6mm (1/4in) diameter tube 175mm long.

Fig.1: Pointing the whole antenna skywards by clamping it to a wooden workbench makes adjusting the matching arrangement fairly easy.

The tube is lined with p.t.f.e. sleeving which acts as a dielectric and provides a sliding fit. The sleeving can be obtained from a model shop or from Sandpiper. Failing that I have successfully constructed a gamma match by carefully wrapping plumbers p.t.f.e. tape around the rod until it is a snug fit inside the tube. Then insert 75mm of the gamma rod into the tube.

The outer end of the gamma matching rod is clamped to the driven element 250mm from the centre line of the main boom. The spacing between the rod and the driven element is set at 35mm by the fixing clamp. Coaxial cable is connected to the gamma rod in a waterproof junction box and the outer of the cable is securely connected to the centre line of the boom as close as possible to the driven element mounting.

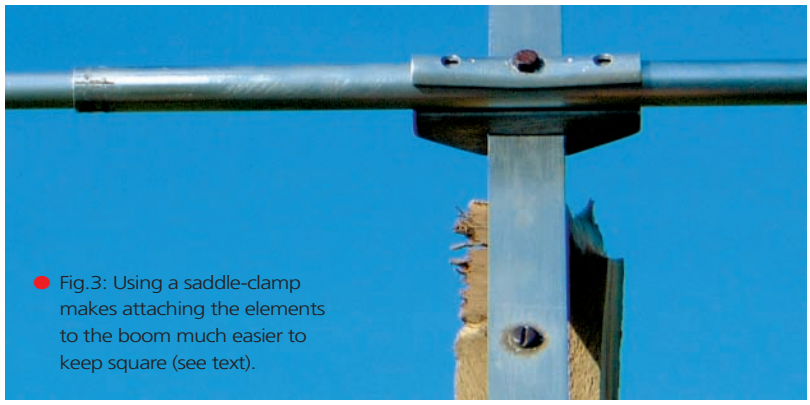


Fig.3: Using a saddle-clamp makes attaching the elements to the boom much easier to keep square (see text).

Shorting Clip

The position of the shorting clip and the length of rod inside the tube are adjusted for the lowest reflected power. The easiest way to carry out matching adjustments is with the antenna pointing straight up as shown in the photograph, Fig. 1.

After carrying out the matching adjustments, any excess gamma rod cut may be cut off. Finally, the joints between the tube and the rod should be waterproofed with heatshrink sleeving. Now all that remains to do, is to install the antenna on the mast with a suitable clamp located at the balance point.

The shorter designs are self supporting, but the five and six element Yagis will probably require some support to prevent drooping of the main boom. For these designs an inexpensive yet effective method is to use a draylon cord, tied to front and back of the boom and passed over a small clamp one metre or so above the main boom on the stub mast.

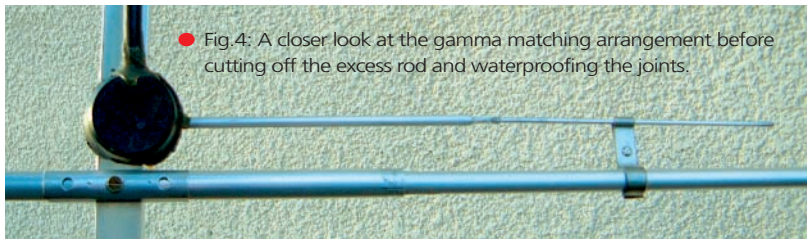


Fig.4: A closer look at the gamma matching arrangement before cutting off the excess rod and waterproofing the joints.

To do a complete job of finishing off, I suggest that rubberised caps can may be fitted to the ends of the boom and the antenna elements if you want to. So, that's all there is to it, you're ready to go. And don't forget that Tuesday evenings are activity nights on 'Four'. *PW*

Sandpiper Communications of **Unit 5, Enterprise House, Cwmbach Industrial Estate. Aberdare, Mid-Glamorgan CF44 0AE, Tel: (01685) 870425**, can supply element fixing clamps, aluminium tubing, gamma match assemblies and other antenna mechanical items. Please check with **Jane, Chris** or **Mark** for prices and availability of individual items for the antenna you make.

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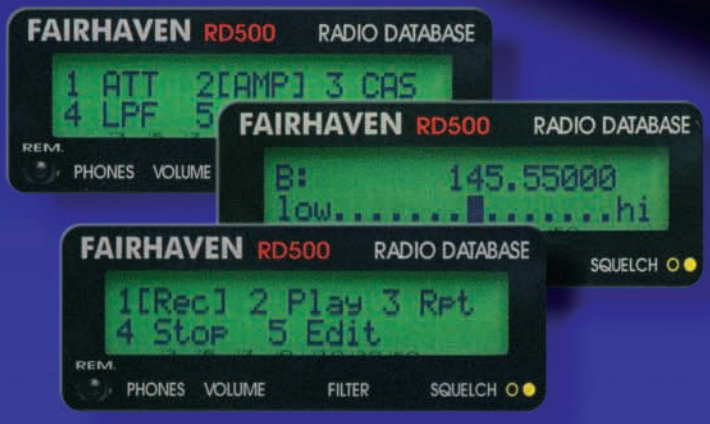

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Valve & Vintage

Charles Miller continues the fascinating story of 'Getting Started in Radio' from his last turn of duty in the *PW* 'wireless shop' and reaches the point where he received the dreaded National Service 'Call Up'!

Towards the end of 1949 my employer's house of cards finally collapsed when one of his creditors demanded instant repayment. This brought about a rapid chain reaction as all the others jumped in with their own claims, and the inevitable liquidation followed.

The immediate result as far as I was concerned was that I was out of a job at the start of 1950. However, as my late employer's demise had left a lot of people in the town needing repairs to their radio sets I was prompted to start up on my own account, with the assistance of Delbert. In that sort of situation we could hardly go wrong and the work flowed in very satisfactorily.

Dreaded Call Up

Unfortunately, however, HM Government nipped the idea in the bud by sending me a request that I couldn't refuse...my dreaded National Service 'Call Up' had arrived! I had to present myself at the Royal Air Force (RAF) recruiting centre at Padgate and I have no doubt that the mention of that name will strike a chord - if not terror and revulsion - in many a breast.

Padgate is at the top end of Cheshire, near Warrington. And although it may well be a pleasant place, entitled in Summer to call itself the Pearl of the North, to the unwilling 'Erk' in January 1950 it seemed as remote and, on inspection, as cheerless as Siberia!

As directed, I travelled by railway to Padgate where I was met at the station by an enormous RAF single-decker bus, for which I was the sole passenger. I was thus delivered in lonely apprehension to what turned out to be, in effect, a monster sausage factory taking in unwilling, confused and resentful civilians a one end and turning out unwilling, confused and resentful embryo airmen at the other.

Other buses arriving here must have been considerably more laden with passengers because there were hundreds, if not thousands of fellow-conscripts wandering about apparently aimlessly. Eventually we were herded into a vast administration building for an orgy of form-filling and then divided into batches of about 30 and allocated living quarters in wooden huts.

It appeared that none of us in our particular hut had ever lived away from home before. Some were singularly ill-prepared for the experience, being unable even to make their own beds and having to be assisted by the rest of us.

That first night was not a happy one for anyone, and it so depressed a lad in a nearby hut that he tried to commit suicide by leaping from the top of a water-tower. It was either his good or bad luck that he succeeded only in breaking a leg and ended up in hospital to be restored to full health and then to face a Court Martial for attempted desertion by killing himself. That episode probably added at least a year to his time in the RAF.

Allegedly Porridge

The following day we were awakened at six a.m. and after a breakfast of what was alleged accused to be porridge, marched hither and thither around the site to be issued with uniforms and other kit. Padgate was in the grip of the hardest winter in years and every time the order to halt was given we skidded on the icy paths and went sprawling on the ground.

It took a bruising week for us to complete our new wardrobes, after which we were despatched by train to Henlow, Bedfordshire for two month's 'square-bashing'. Actually this wasn't too bad a time as far as I was concerned, because I fell victim to influenza and spent about ten days in the excellent camp hospital being attended by real Women's Auxiliary Air Force (WAAF) nurses.

Every other inch an airman: Chas Miller as staunch defender of the British Way of Life. Note nonchalent pose with forage cap tucked into belt notable for dirty buckle. That hand which appears to be coming over his shoulder to pick his pocket actually is his own!

I was then given a week's sick leave, at the end of which I was hopelessly out of synchronisation with the rest of my intake. Only two options were open to the authorities...either to 're-flight' me and make me start all over again, or to lose me in the system.

They chose the latter! So, along with two others in the same boat I was appointed permanent billet orderly, which meant that all we had to do was to keep well out of the way until the end of the course.

Another agreeable aspect of Henlow was that it was on a direct 'bus route to London. Now, leaving the site at weekends was strictly forbidden but three of us of anarchistic nature found out how to sneak past the guardroom and spend Saturday afternoon and Sunday in the big city, courtesy of London Transport.

One of our number had been a junior Civil Servant before being called up and he wangled us into a hostel for provided by the Service. It was a girls' hostel but who was complaining? I've often wondered what punishment we would have incurred had we ever been found out both by the RAF and the Civil Service - we might still be in the Tower of London for such a heinous crime!

Radio School

At last, in early Summer, I was posted to the Radio School at Yatesbury, Wiltshire, another name that must arouse memories for many. Although a lot of the tuition was superfluous as far as I was concerned, it was still enjoyable and of a very high standard.

In fact, it couldn't possibly have been what they

call nowadays cost-effective to lavish it for months on conscripts. This was because they were due to be discharged not much more than a year after completing the course.

For some of us, picked out to become Ground Radar Mechanics (GRMs), the training was extended even further by a spell at the then highly secret radar establishment at Bawdsey Manor in Suffolk. Before we were let loose in this hallowed place we were required to sign the Official Secrets Act and to swear a powerful oath of allegiance to the Crown that was so all-embracing that I fear I may be breaking the law by even mentioning it, even so many years later.

Eventually, in September we were turned out as fully-fledged GRMs, fit and able to maintain the country's first line of defence, the mighty Chain Home (CH) radar system. Ah, yes, the good burghers of Britain could sleep easy in their beds o' night in those days, safe in the knowledge that we were there protecting them from sudden attack by the Red Hordes!

The particular part of the UK to which I was assigned to keep freedom alive was Lincolnshire, by means of the radar station at Stenigot, near Louth. This was on the highest piece of ground in the county...and even if the Russians didn't send us any bombers, our weather came straight from them. We again lived in wooden billets, about 20 men to each, with the only heating provided by a centrally placed coke-burning stove. It was perishing.

Elderly Transmitters

In fact, the CH radar gear was elderly - some of it dated from 1937 - and the transmitters in particular were in a pretty ropey condition. They were due to be replaced in a year or two by more modern types but meanwhile they somehow had to be coaxed along.

The maintenance was not work for highly trained, pure-minded persons of immense technical ability. Instead it was the province of born codgers and improvisers, and a friend called **Derek Oakes** and I rose to the challenge.

We discovered that if a certain vital set of heavy-duty relays didn't 'make' properly they could be operated manually with an ordinary plastic comb. And when the filaments burned out on the water-cooled power valves we learned plumbing techniques, dismantled them and fitted replacements.

Together Derek and I persuaded superannuated vacuum pumps to make Herculean efforts to evacuate the repaired valves. We then checked the results with a Heath-Robinson arrangement involving a Victorian sparking coil and a bottle of ether!

We also found out how to by-pass safety interlocks so that we could make - with the transmitter in operation - certain checks that would have been valueless with it switched off. Additionally we determined by trial and error just how much Extra high tension (e.h.t.) we could apply to the output stage before it went mad and blew out all the safety trips!

With these and other ploys we contrived to keep these 800kW dinosaurs on the air. (On the air throughout a truly horrible winter during which at one time the station was snowed up for 11 days!).

During the time we were snowed in, the food dwindled down to a few tins of beans. As it became colder and the occupants of our billet were reduced to burning the bedside lockers to keep warm (honest!).

Midget Radio

Somehow or other during the year I had found time to build another midget radio for use in the billet. With this we did at least some contact with the outside world!

For the new set I had abandoned my bizarre 'short' superhet and progressed to something a little more orthodox (but not completely, of course). A grateful Government was paying me 28 shillings* per week for my invaluable services to the nation so economy was essential.

***Miller's money matters:** For those of you who don't remember pre-decimal currency, a direct conversion of 28s into **£1.60 is totally misleading**; petrol then cost about 2/7d a gallon...so on that basis it's true value equates to about £40 today.*


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● Need a suitable cabinet for your own radio? Nowadays you'd have to make one for yourself...but in 1950 Charles Miller bought one. However, the chassis inside was made from an old petrol pump dial (see text).

Petrol Pump Chassis

The chassis was made from the aluminium dial of a defunct petrol pump. This was found lying on the ground outside a long-closed filling station on the road between Lincoln and Louth and again...the cabinet one of those cheapo wooden affairs advertised in the columns of this very magazine back in the early 1950s.

The components and valves had of necessity to be available from stock, i.e., my junk boxes (and of course not the RAF's!) at home and once again I used Wearite P coils and Weymouth midget i.f. transformers.

A suitable dial came from the same source as the cabinet and the tuning condenser was driven via a small epicyclic gear. I had managed to dredge up a 12K7GT frequency-changer, a 12K7GT i.f. amplifier, a 12Q7GT double-diode-triode. But the only 0.15A heater output valve available to me was a 12A6, which was prolific in American ex-government radio gear at the time.

To make matters worse, Uncle Sam did not find it necessary to conscript a decent rectifier such as the 35Z4GT or 35Z5GT into their armed services. So I had to make do again with one of those compact selenium types, of which I still had a few.

My enforced choice of valves meant that the heater chain was again of low total voltage, only 50.4V. This necessitated another of my lengthy resistive line cords, this time of a whacking 12 feet (approximately 4m in EU speak). If there is anyone left out there who is wont to chunter on about the heat generated by resistive line cords, I suggest you spend a winter in a wooden hut on the top of the Lincolnshire Wolds and then form an opinion...!

To be continued.....

PW

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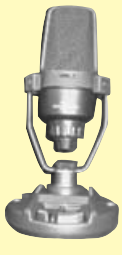

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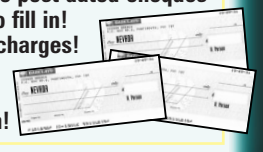

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REPORTS & INFORMATION BY THE LAST SATURDAY OF EACH MONTH.

Although Solar Cycle 23 peaked sometime in mid-2000 there has recently been an upsurge in solar activity with some people suggesting that there might be a double peak to the current cycle. This gives some hope that solar activity this winter may match if not better last year's levels.

There is also a greater likelihood for north-south trans-equatorial propagation (t.e.p.) across the geomagnetic equator and much longer east-west contacts via F2-layer propagation. The recent upsurge in solar activity has been breathing some life back into the 50MHz band and it's surprising how the passing of a few weeks can make dramatic changes in the characteristics of the band.

Take for example Sporadic-E (Sp-E) propagation. This occurred on the 50MHz band every day during August from somewhere in the UK. Much of it was the normal single-hop mode enabling contacts to be made within Europe with stations up to 2000km away. Stations in Africa were contacted via multi-hop events and the band was also open on nine continuous days to Canada, USA and the Caribbean area.

During September the Sp-E propagation was greatly reduced with brief single-hop openings being reported on only eight days during the period. Sp-E propagation, as expected, was virtually non-existent during October. However, there has been an increase in t.e.p. openings to Africa and a dramatic start to worldwide F-layer propagation.

PROPAGATION TO AUSTRALIA

The big news of the month is that the 50MHz band has been open to Australia and the Far East via F2-layer propagation. It all started on October 17 with reports of Malayan video signals being heard on 48.239MHz. Then from 0730UTC the Australian beacon VK6RSX (50.304MHz) was being copied all over Europe. I've had reports that it was heard in Belgium, Croatia. Denmark, France, Germany, Netherlands, Poland, Spain and Switzerland.

Although the beacon only runs 50W into a dipole antenna it was heard peaking 599 at some European locations. By 0840UTC propagation had extended into the UK with a number of stations in south-east England (IO91, JO01) copying it over the 14000km path. Unfortunately the VK beacon is located in an area without any active 50MHz operators and no two-way contacts were made.

Conditions were better on the following morning, October 18, with video signals from Australia, Malaysia and Thailand being copied from 0730UTC with signals peaking well over S9. The Australian transmitter being heard is located in the VK4 call area and operates on 46.171MHz.

The Thailand transmitter was operating on 48.260MHz. Again the opening extended over much of Europe with stations making c.w. contacts in the lower part of the band with operators in Australia (VK), Japan (JA) and the Philippines (DU). From 0810UTC signals from the Far East reached the UK and a small number of operators made c.w. contacts with the stations of DU1EV, JA9IPF, JE1BMJ, JH0BBE and VK6JQ.

THIS MONTH DAVID BUTLER G4ASR HAS NEWS OF CONTACTS BEING MADE ON THE 50MHZ BAND WITH STATIONS IN AUSTRALIA, MALAYSIA AND JAPAN.

Hab JE1BMJ reports making ten contacts with stations located in the UK, Belgium, Germany, Netherlands, Italy and Sweden. All contacts were made on c.w. around 50.100MHz between 0830-0930UTC.

Although Australian television signals were detected on the morning of October 19 the propagation was rather poor due to the effects of a large solar flare. The disturbed conditions culminated in a period of auroral activity peaking on October 21-22 but by October 24 the geomagnetic activity had reduced considerably.

Although there were no reports of Australian signals, many operators did report working the stations of E30NA (Eritrea) and PY0FM (Fernando de Noronha) during the morning of October 24. Then from 1200UTC the band opened up to North America with operators throughout England, Ireland, Wales and Scotland reporting contacts with stations in Canada and the USA. At my QTH (IO81 Herefordshire) c.w. and s.s.b. contacts were made with the stations of VE1RG, VE1YX, K1KI, N1RZ, W1JJM, W1LP, K2MUB, AJ3K, K3KYR and W3EP.

The propagation on the 50MHz band in the following days was excellent. The solar flare activity a few days earlier had really charged up the ionosphere!

From as early as 0730UTC on October 25 stations in the UK were reporting Asiatic Russian and Australian television with very strong signals. Then from 0800UTC through to 1100UTC there were reports of contacts being made with the stations of DU1EV (Philippines), DU1/GM4COK/MM located off the Philippine coast but not counting for any DXCC country, JE1BMJ and JA7WSZ (Japan), UN6P (also signing UN9P on c.w.) and UN3G both in Kazakhstan, VR2BG and VR2LC (Hong Kong), VK6JQ (Australia) and YB5QZ (Indonesia). Interestingly although some of these countries are quite large there were very few operators actually being heard in Europe. As a consequence the competition to work a new country was very intense!

From 1030UTC the station of PY0FM (operated by Peter PY5CC) was heard working dozens of UK stations including a number of low power novice stations. From 1200UTC the band opened up to North America with stations mainly in the north of England and Scotland making many c.w. and s.s.b. contacts.

Propagation in the period October 26-28 was very similar with contacts being made into Australia, Hong Kong, Indonesia, Japan, Kazakhstan and Philippines. However, there were also the stations of EK6AD (Armenia), UK9AA (Uzbekistan) and 9M2TO (Malaya) to spice up the action for those who can read c.w.!

Surprisingly the stations of VE1YX (Canada) and VR2IL (Hong Kong) could both be heard in central UK at the same time around 1300UTC on October 27. It was amazing! But not as good as October 29. That was even better!

How about D44CF (Cape Verde), HK3AVR (Colombia), HP2CWB (Panama), KP4EIT and WP4KJJ (Puerto Rico), OD5UT (Lebanon), PT7NK (Brazil), PY0FM (Fernando de Noronha), TG9NX (Guatemala), TI2RPT (Costa Rica), YS1RR (El Salvador), ZF1DC (Cayman Islands), 9G5AN (Ghana) and 9M6US (Sabah). Then it opened up to North America. All continents in six hours!

Trans-Equatorial propagation was reported on 18 days during October with many c.w. and s.s.b. contacts being made deep into the

African continent. This is in contrast to the previous month when only two t.e.p. openings were reported. From your reports I notice that the 50MHz band was open to stations such as C91RF (Mozambique), J28FF (Djibouti), TR8CA (Gabon), TT8DX (Chad), ZR5ADQ (South Africa), Z21FO (Zimbabwe), 3DA0DF (Swaziland) and 5N41EAM (Nigeria). **Chris Gare G3WOS** was operating the station **VP8DBL** (Falkland Islands) and reports working a number of stations in southern UK on October 23 and 24. He was using c.w. on 50.117MHz and was worked around 1600UTC on both days.

AURORAL OPENING

Many auroral openings occurred on the v.h.f. bands during October with intense events being reported on October 2, 3, 21 and 22. These provided some reasonable DX on all bands from 50MHz through to 430MHz.

Colin Smith GM0CLN (IO85 West Lothian) mentions making 35 c.w. contacts on the 144MHz band in the opening on October 3. Running a Trio TR751E transceiver and a 100W solid-state amplifier into a 14-element METYagi he contacted stations in Czech Republic (OK), Sweden (SM), Switzerland (HB9) as well as the more usual contacts into Belgium, Germany and The Netherlands. Fourteen stations were over 1000km away, the best of the DX being the stations of DH7FB (JO620 1159km, DG5CST (JO60) 1182km, HB9DFG (JN37) 1194km, DK5YY (JO60) 1212km, OK1DUG/P (JO60) 1272km and DF1CF (JN57) 1318km.

The first station heard at my QTH (IO81 Herefordshire) on October 3 was GM4VVX (IO78) who was calling CQ on 50.137MHz. Following a quick c.w. contact at 1305UTC I then moved up to the 144MHz band where I made a further 20 QSOs in the c.w. section of the band.

No great DX was worked, my furthest contacts being DL1SUZ (JO53) at 1000km, DJ8MS (JO63) at 1035km and SM6CQU (JO67) at 1142km. Other contacts included DF0WD (JO42), DK1KO (JO53), DL4BBE (JO43), DL9QB (JO44) and over to the West the stations of EI5FK (IO51) and EI5HJ (IO52). The latter two contacts were made on a beam-heading of 30° whereas the true heading is normally at 290°.

To make auroral back-scatter contacts you must point at the auroral ionisation and **not** at the station you are contacting! Different stations require different beam-headings.

For example, to contact G7RAU (IO90 Isle of Wight) located to the south of my QTH at 140°, I needed to point my beam at 50° for maximum auroral signals. **Dave Edwards G7RAU** has reported working many c.w. stations including LA1T (Norway) and SK4BX (Sweden) on October 2 and YL3AG (Latvia) on October 3.

Andreas Broeker DL6YEH (JO32) uses an Icom IC-735 transceiver into an SSB Electronics LT-2S transverter. This then drives a 4CX250B amplifier running 350W into a pair of 2.2 wavelength DJ9BV Yagis.

Andreas made a total of 30 c.w. contacts during the aurora on October 3 with stations located in Denmark (OZ), Germany (DL), Norway (LA), Poland (SP), Russia (RA), Sweden (SM) and Ukraine (UT). His best DX from these countries included RA3DRC/1 (KO55) at 1555km, RA3LE (KO64) at 1628km and UT8AL (KO61) at 1783km. He also reports making c.w. contacts with the stations of GM0CLN, GM1XOI, GM4VVX, G3LTF, G4BRK, G4KWQ and G7RAU.

HIGH PRESSURE

Tropospheric conditions are normally good during the month of October when high pressure systems move over the UK and continental Europe. Unfortunately these conditions seem to be getting less and less, possibly due to global warming. The only tropo event worthy of note commenced during the evening of October 11 continuing through to October 13.

The opening enabled contacts to be made on all bands from 144MHz up through the microwave region with stations located as far away as Austria. **Reg Woolley G8VHI** (IO92 Warwickshire) reports that contrary to popular opinion there is life on the u.h.f. bands.

On the 430MHz band Reg uses a Yaesu FT-847 transceiver into a 100W SSB Electronics solid state amplifier. The antenna system consists of a pair of 23-element Cue Dee Yagis with a co-located SSB Electronics masthead pre-amplifier. His recent s.s.b. contacts on the 430MHz band have included operators in Belgium, France and The Netherlands.

Reg also seems to have a good path into Germany having recently contacted the stations of DK0BN, DK0MU, DL0KM, DL0VR, DL0GL/P, DF1EQ, DF2VJ, DG2NBN, DK3OS, DH4FAJ/P, DB5KN, DL5KCI, DJ6JJ and DC9KU. He is also active on the 1296MHz band with a Microwave Modules transverter driving a Down East amplifier to 35W output. The antenna is a 67-element Wimo Yagi with an MGF1302 low noise amplifier in the shack. During October he made s.s.b. contacts around the UK and the nearer reaches of continental Europe.

MAGAZINE FOR VHF

If you're interested in construction or the technical aspects of v.h.f., u.h.f. and microwaves then you may be interested in the quarterly Amateur Radio magazine *VHF Communications* edited by **Andy Barter G8ATD**, which caters specifically for developing technologies at these frequencies.

Recent issues of *VHF Communication* have covered a microwave multi-band feed for 1.3, 2.3, 5.7 and 10GHz, a helix antenna for orbiting weather satellites and a down-converter for Meteorsat satellites. Amateur television is also covered with details for the conversion of a Pace satellite receiver for a.t.v. reception, a 5.7GHz a.t.v. converter and a u.h.f. television masthead pre-amplifier. Other articles have included a 144MHz s.s.b. and c.w. transceiver, a simple t.n.c. for megabit packet radio links, a 4GHz frequency counter, an antenna impedance meter and a microwave tracking generator.

● The station of Frank Novak KJ2N who operates on the 50MHz band.

A subscription to *VHF Communication*s for 2002 is £20 including P&P in the UK. Individual issues are available for £5. Back issues are available for £4.70 plus P&P for issues in the previous year and £18.50 plus P&P for a complete previous year volume. Back issues prior to the previous year are £1 each plus P&P. There's also a set of issues 1972 - 2000 (55 magazines) for £50 plus P&P. Full details are on the VHF Communications Website, **http://www.vhfcomm.co.uk** plus a complete index from 1969 to present day.

DEADLINES

That's it again for another month. Have a Happy Christmas and I hope you all have a DX filled New Year. Please forward any news, views, comments or photographs to the address and by the date given at the top of the column.

Thanks for your letters and good luck with the DX. See you again next month.

73, David G4ASR

DX contacts mentioned in this column are made using either morse (c.w.) or s.s.b. telephony in the appropriate sub-bands for each mode. On v.h.f. and u.h.f. this equates to contacts being made in the bottom 200kHz or so of each band.

HF HIGHLIGHTS

CARL MASON GW0VSW

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REPORTS, INFORMATION AND PHOTOGRAPHS TO ME PLEASE BY THE 15TH OF EACH MONTH.

CARL MASON GW0VSW ROUNDS UP YOUR REPORTS FROM THE BUSY HF BANDS.

A few QSL cards were received here this month confirming several new countries for me on the WARC bands. It was interesting to see some of the stamps used by the DX operators on the envelopes. I must admit that when I send my cards 'direct' I do try to send some of our more colourful commemorative postage stamps wherever possible. With new issues coming from the Post Office each month this is not hard to do. Many people around the world collect stamps and even if the operator or QSL manager doesn't, they can always pass them on.

One operator who has made good use of the stamps in his collection is **Roland Burkhard HB9BQR**. He has used them on his QSL card to good effect. I am sure there are many DX stations who are pleased to have Roland's card as part of their collection. It certainly brightens up my shack wall.

DX NEWS

Just enough space this month to mention **Eric T30ES** who is a Peace Corps volunteer on Butari Tari Island. Eric can usually be heard on Tuesdays and Thursdays around 1000-1200UTC on 14MHz. Try looking for him around 14280kHz and as he is on the island for another year you should stand a good chance of working OC-017.

● A novel use of stamps is adopted by Roland HB9BQR to brighten up his QSL card.

Eric runs a TS-430 on batteries that are charged via a solar panel, which he borrows from a friend. The antenna is a dipole hanging between two coconut trees. QSLs are via **CARA, POB 3441, Danbury, CT 06813, USA.**

YOUR REPORTS

All of our reporters have enjoyed improved conditions this month with openings on most bands throughout the day. **Roy Walker G0TAK,** Cleveleys near Blackpool has been very busy again operating on several bands with just 5W of c.w. Roy's QRP contacts on 7MHz included SM7ZI (Sweden) 0836, GD0IFU/P (Isle of Man) 1445, MM0CTS (Scotland) 1857, PA4PCH (Netherlands) 2029 and LA4ZL (Norway) 2217UTC using a TS-570 and G5IJ antenna.

THE 10 & 14MHZ BANDS

On to the 10MHz band now where all c.w. man **Ted Trowell G2HKU**, Isle of Sheppy in Kent worked ZL7/G3SXW (Chatham Islands) at 0500UTC using his IC-746 and G5RV antenna.

Robin Trebilcock GW3ZCF, Bishopston near Swansea spent a short time on 10MHz working 4F2KWT (Philippines) at 2203 using his IC-775DSP with 100W of c.w. to a 40m horizontal loop. Robin found h.f..conditions "Outstanding on some days making up for the rather disappointing sunspot maximum last winter".

I also managed to operate on 10MHz and can only agree with Robin. The propagation one afternoon was changing very quickly and strong signals were heard from UK stations enjoying the short skip.

My first CQ call was answered by Roy G0TAK/QRP at 1541UTC. Roy had an excellent 579 signal before fading out around 1549UTC. Shortly after this, I worked several Japanese stations at 559 to 579. The strongest signals I have heard from this part of the world on my inverted G5RV. As you can imagine, these operators had many European stations waiting to work them!

After picking up an MFJ-9420X s.s.b. rig at the Donnington show **Peter Lowrie MI5JYK**, Newtownabbey, Northern Island, has been active on 14MHz using QRP. Despite not having a dedicated antenna for this band Peter worked DL1ZU/P (Germany) on Fehmarn Island EU-128 at 1656 with a 5/7 report and special event station OG5ZZ (Finland) at 1704 using an a.t.u. and 40 meter sloper antenna.

Later Peter was surprised to hear KH6/SP2QVS (Hawaii) and managed to work him with a 5/7 report. However, the DX Cluster later flagged this station as a pirate. I guess you can't win them all Peter!

THE 18 & 21MHZZ BANDS

Over to **Don McLean G3NOF** now in Yeovil, Somerset who has been very busy again this month. Amongst his bag of s.s.b DX on 18MHz was FW5ZL/P (Fortuna Island) 0857, BA4CH (China) 0959, SV8/ON5CT (Greece) Samos Island EU-049 1544, YJ8UU(Vanuatu) 1902, T88AY (Belau) 1904 and 7Z1AC (Saudi Arabia) at 2110UTC. All contacts were made using a TS-950 and trapped dipole antenna.

The c.w. of Ted G2HKU found VP2EKS (Anguilla), 4S7NE (Sri Lanka), PJ2/PA0VDV (Netherland Antilles) around 1900UTC followed slightly later at 2100UTC by FR5FD (Reunion Island). By coincidence I have just received a QSL from Pat FR5FD, confirming a 500mW c.w. contact with him on 28MHz in October last year.

The reverse of Pat's card say's "Sorry for this simple QSL card. Since September 1999 I have sent out more than 14000 QSL cards and the price of these is important to me. One International Reply Coupon (IRC) covers just the price of airmail but not the price of the QSL card. If you want my other (Colour) QSL please send $1 or 2 IRCs." There you have it. You can get further details from Pat's website at **http://perso.wanadoo.fr.FR5FD/**

The QRP of Roy G0TAK found OH/SM5AQB (Finland), 9A2YM (Croatia) and T94B (Bosnia-Hercegovina) all around 1900UTC.

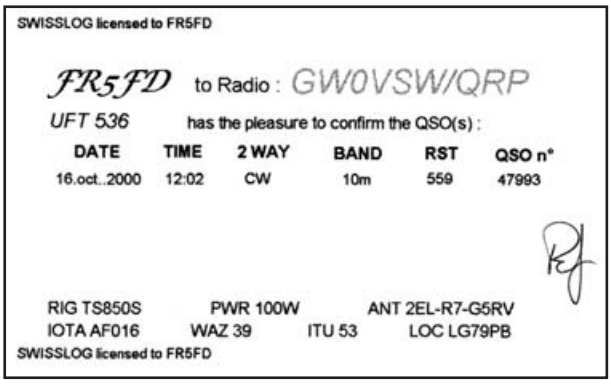
The 21MHz band provided plenty of PSK31 contacts for Robin GW3ZCF. An afternoon operating between 1415 and 1712 bagged some very good DX including DS5RNM (South Korea), VK5NLI (Australia), J28FF (Djibouti), VU2WLP (India), YK1AO (Syria), HC8N (Galapagos Island), VR2BG (Hong Kong) and KH6ND (Hawaii). Robin also tried s.s.b. working JY4NE (Jordan)

1312, DU8DJ (Philippines) 1606 and EM1KCC (Antarctica) at 2013UTC.

Using s.s.b. Don G3NOF worked a long list of DX including CP6XE (Bolivia), FY/F8DEG/P (French Guiana), HS1NGR (Thailand), KL0FZ (Alaska), UA0ZC (Asiatic Russia), VU2ABE ((India) and 4S7SW (Sri Lanka) between 1900 and 2154UTC.

THE 24 & 28MHZ BANDS

The 24MHz band has also had a good deal of activity on it and several reporters spent a fair amount of time here. One of these was **Mike Baker G3SUK**, Stowmarket, Suffolk who has had a "Fairly quiet month" recovering from suspected food poisoning but still managed the time to send in a report.


SWISSLOG licensed to FR5FD

FR5FD to Radio : GW0VSW/QRP

UFT 536 has the pleasure to confirm the QSO(s) :

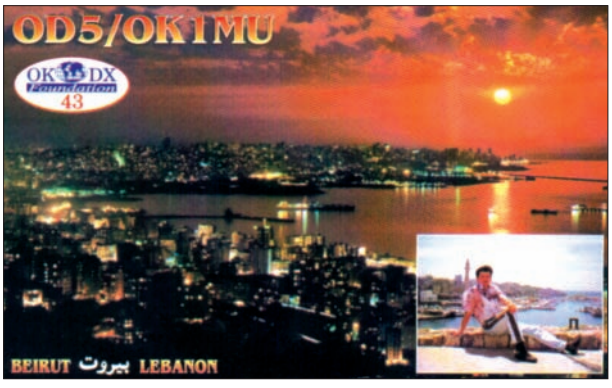
DATE	TIME	2 WAY	BAND	RST	QSO n°
16.oct..2000	12:02	CW	10m	559	47993

RIG TS850S PWR 100W ANT 2EL-R7-G5RV
IOTA AF016 WAZ 39 ITU 53 LOC LG79PB

SWISSLOG licensed to FR5FD

● Carl recieved this very simple QSL card from Pat F5FD together with an explanation for its simplistic design (see text).

Mike's s.s.b. log includes SV8/DL8MCA (Greece) on Skiathos Island EU-072 and



● Peter Roper G3MII is welcomed to the h.f. fold this month as he joins Carl's band of regular reporters.

UY5QC (Ukraine) at 1001UTC followed later by 9H0VRZ (Malta) 1505, AA4V (U.S.A.) 1529 on the Isle of Palms NA-110 and a new country C98DC (Mozambique) at 1636UTC using an IC746 80Wand a Carolina Windom. I hope you're well on the road to recovery now Mike?

A warm welcome now to new reporter **Peter Roper G3MII** who lives near Truro in Cornwall. Using a TS-850 'on the key' with a G5RV antenna Peter logged 3B8DB (Mauritius) 1535, PZ1AP (Surinam) 1537, BV3/DJ3KR (Taiwan) 1358 and OD5/OK1MU (Lebanon) at 1647UTC during one afternoon's operating. Good to talk to you Peter and I hope to hear from you again soon.

A change of band now for Peter MI5JYK who used his Albrect AS458E on 28MHz for s.s.b. QSOs with 9H1DE (Malta) 1035, D2BB (Angola) and KP2/EI2CA (U.S. Virgin Islands) both new countries around 1200UTC. One surprise was working DL9GX/M on f.m. Nothing unusual here except it was via a Boston (USA) repeater!

Running Data modes once again was Robin GW3ZCF who used 50W and PSK31 or RTTY to work JH4UYB (Japan) 1301, HS0/G3NOM (Thailand) 1421, CX2AQ (Uruguay) 1602 and LW5HBE (Argentina) 1919UTC.

Finally, to the log of Ted G2HKU, who's key has been busy once again. Best DX on this band includes ZP5KO (Paraguay) 1300, 9K2USA (Kuwait) 1400, TG0R (Guatemala) 1500 and HP1/DL7CM (Panama) at 1800UTC.

QSL CORNER

Here is this month's list of QSL information starting with 7Z1AC via WA4JTK, C98/DJ7ZG via DL7AFS, CE6TBN via **PO Box 1234, Temuco, Chile**., CN2JS via F6BEE, CX4AT & CX5BE via EA5RD, FO0ARE/A direct only to **Karoly Szabo HA8IB, Fuzesgyarmat, Aradi U. 42, 5525 Hungary**, IH9/IN3QBR via IN3XUG, IR7GM via IK7JWX, J75J via KR4DA, J79WB direct only to **Robert Schenck N2OO, POB 345, Tuckerton, USA**. LV2V via EA5RD, TG0R via EA4URE, TG/DB2TR via DL1SBF, VK8AN/6 direct only via **Alan Roocroft VK4AAR, PO Box 421, Gatton 4343, Australia**. VU2ABE via JA4DOB and finally ZD9IR via ZS6EZ. Thanks to **Ted G2HKU**, **Don G3NOF** and **Ted Mirgliotta** and the *OPDX Bulletin* for the QSL information.

SIGNING OFF

Well that about wraps it up for this month and of course this year! Let's hope these better band conditions stay with us over the winter months. Special thanks to all our reporters for their logs and to all of you who have sent me letters or emails throughout 2001. Keep them coming! I hope you all have a great Christmas and I wish you all a very Happy New Year.

73, Carl GW0VSW

PW Listening & operating Watch List. (All times UTC)

Sean Gilbert G4UCJ operates most days around 0700-1100 and 2200-0200 on all bands using an IC-746 and 50W into a half-size G5RV, WARC inverted vee or HF6 vertical.

Rob Mannion G3XFD listens and operates weekdays and weekends, 1800-1830 on 3.7MHz with 100W s.s.b. and 3.530 or 3.560KHz and 18.105KHz QRP c.w. using an Alinco DX-70 transceiver and a long wire or mobile whips.

Carl Mason GW0VSW listens and operates on 7.030 and 14.060MHz most evenings at 1800 with a Ten Tec Argonaut 2 and inverted G5RV.

Don McLean G3NOF operates 1030 Saturdays on 3.685KHz on the ISWL Net or 1030 Sundays on the Yeovil ARC Net on 3.665KHz using a Kenwood TS-950 and trapped dipole antenna.

Leighton Smart GW0LBI operates most weekday evenings on 28.500KHz s.s.b regardless of conditions using a President Lincoln transceiver with 20W output to a 11m half-wave vertical.

Brian Williams GW0GHF operates on h.f. most afternoons around 1400. He also simultaneously monitors 70.200KHz s.s.b. and 51.510KHz n.b.f.m at this time and is looking for weekly skeds especially on 70MHz. Contact Brian QTHR.

George Woods G3LPT operates an open net on 29.630KHz n.b.f.m. 0930 Tuesday to Friday.

Jon Wheeler G0IUE monitors 29.600KHz n.b.f.m. every evening between 1730 and 2230 regardless of conditions using a Yaesu FT-920 transceiver running 100W and 2-element tri-band beam.

Brian Parsons GW0KZK listens and operates on 14.250KHz 1000-1200 and 7075KHz 1400-1600 most days using an Yaesu FT-1000MP and 100W into a Inverted G5RV.

KEYBOARD COMMS

ROGER COOKE G3LDI
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NORFOLK
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PACKET: G3LDI @ GB7LDI

ROGER COOKE G3LDI SHARES THE LATEST IN DATA COMMS IN HIS MONTHLY ROUND-UP.

I'll start by wishing you all an early HNY, that's a c.w. abbreviation for Happy New Year! My tongue is in my cheek of course, but then again c.w. is the most basic of our data modes and one that is being gradually eroded from our h.f. licence requirements.

However, in the guise of progress I must accept the changes with a modicum of grace. But, for the foreseeable future, I think c.w. will still be around. Take a listen on the c.w. end of any h.f. band, especially in a contest, or when there is a new entity working a pile-up and you'll see what I mean. **The most basic data mode is alive and very well!**

CLUSTERMASTER

Interest in packet operations is changing with a noticeable decline in sending mail and using a BBS to other types of operation, such as the DX Cluster and positioning software such as *APRS* and *UI-View*. The following description is of a program written by **Tony I0JX**.

Full information can be found on his Web site at:
http://www.geocities.com/gvernucci/full450.html See **Fig. 1** or take a look at Tony's home page:
www.geocities.com/SiliconValley/Pines/5440/ which is shown in **Fig. 2.**

ClusterMaster is a terminal program for Windows 3.1 or 95/98 specifically customised for ham radio PacketCluster ©1990 operations, in conjunction with any plain TNC-2 compatible packet radio Terminal Node Controller (TNC). It is quite harmless to install, will not affect the registry and is just as easy to uninstall.

Summary of main program features:

- you can separately visualise your own traffic and monitor the general PacketCluster traffic in two distinct windows.
- you can quickly send most common PacketCluster commands by means of 30 pre-defined buttons.
- incoming DX spot callsign and mode are voice spelled.
- your transceiver can be automatically set on the DX spot frequency and on the corresponding mode (e.g. FSK for 14085kHz).
- your antenna can be automatically pointed to a DXCC country heading.
- you can show and print a station callbook address.
- you can quickly search a given callsign across a great number of DX bulletin files, to be stored in a directory of your hard disk, to get relevant information, e.g. QSL manager.
- you can quickly visualise the DX spots, the Talks and the Announcements arrived until then. A greeting message can be automatically sent upon arrival of a Talk, if you are not at the station.
- you can immediately and accurately identify DXCC countries. Complete information is given for the identified country.
- you can store your DXCC standing (countries worked/confirmed in each band/mode and the station callsign), and immediately visualise the DXCC profile for a country.
- you can make various queries concerning your DXCC standing
- you can define conditions whereby a DX spot should be regarded as a new country. The arrival of a new country is notified by the voice spelling facility and by an asterisk in the DX spots list.
- you are notified the presence of user-defined strings in the incoming text.
- you can prevent showing text lines containing user-defined strings.
- program can automatically reconnect the PacketCluster upon an unintentional disconnect.
- the large majority of program features work also if you operate disconnected from the PacketCluster, simply monitoring the general traffic.
- comprehensive help file, both in English and Italian.

Hardware requirements
PC

- **memory and processing power**: any modern PC will have no problem running *ClusterMaster.*
- **serial ports:** you need one serial port for the connection to the TNC, a second port (optional) for transceiver control, and, presumably, a third port for the mouse. All ports shall have a separate address and IRQ. Full RS-232 wiring is required for the connection to the TNC if you activate the RTS/CTS handshaking option.
- **soundcard:** needed for DX spot callsign & frequency voice spelling.
- **antenna pointing board:** to turn the antenna to the desired heading you should either install a Kansas City Tracker (KCT) board, a product of **L. L. Grace Communications Products Inc., Box 1345, Voorhees, NJ 08043 USA Tel: (+1)-609-751-1018 or (+1)-314-391-5323** for technical support; or connect an RCI board to a parallel port of your PC. The RCI board can be obtained from **EA4TX.** Contact him at his callbook address.

TNC

- **configuration:** the TNC must be compatible with the original TAPR TNC-2 instructions set (no special EPROMs, no KISS or HOST mode). Most TNCs support the TNC-2 mode, but not all do.
- **parameters:** the TNC must support the MFILTER command the way the original TAPR TNC-2 does. Otherwise the program can only work in the ONE WINDOW mode, and you will not be able to monitor the general PacketCluster traffic in a separate window.

Transceiver frequency & mode control

- **Kenwood radios:** require the Kenwood IF-232C interface.
- **Icom radios** require the Icom CT-17 interface, in most cases.
- **Yaesu radios** option not currently supported, but hopefully will in future program versions.

Software requirements
PC

- **operating system:** the PC shall run Windows 3.1 or Windows 95. With Windows NT, antenna pointing does not work due to the need of special driver not

today available.

- **support files**: program is written in Visual Basic 3. This requires some support files (DLLs, VBXs) which are automatically loaded by the v4.50 installation.
- **environment:** for maximum program performance, set the environment variable TZ (the same used by the satellite tracking program InstantTrack) in AUTOEXEC.BAT, by adding line SET TZ=UTC*n*, where *n* is the difference between GMT and your PC time (e.g. for USA East Coast: SET TZ=UTC5, for Italy: SET TZ=UTC-1). Change the TZ setting when Daylight Saving Time is instated.
- **fonts:** program uses fonts MS Sans Serif, Courier New, Arial and Fixedsys, which are normally already installed in Windows.
- **antenna tracking:**
  KCT board: run the software driver (DRV.COM) provided by the manufacturer PRIOR to booting Windows (i.e. while still in DOS). You may put it in the AUTOEXEC.BAT file. The program does not currently support the KCT 16-bit Windows driver written by KC6WYG;
  RCI board: run the board control program (ARSWIN.EXE) concurrently with *ClusterMaster*.

TNC

- **data word:** program supports 8bit, no parity and 1 stop.
- **parameters:** should be set such as to permit monitoring while connected (see Help files).

PROGRAM INSTALLATION

The full v4.50 installation consists of three ZIP files. After download has completed, proceed as follows:

- copy the three downloaded .ZIP files in an arbitrary directory.
- unzip the three .ZIP files in the same directory.
- run SETUP.EXE and follow the instructions given by the installation program.
- after install has completed, you may delete the arbitrary directory and its content.

Everything should go smoothly but just a **warning** in case you are **installing *ClusterMaster* v4.50 over an older version**. In this case remember that:

- the files containing your personal DXCC data (i.e. DXCC.DAT and CALLSIGN.DAT) **will be overwritten**. So as not to lose your data, make a back-up copy of these files before re-installing *ClusterMaster*, and restore them into the *ClusterMaster* directory after installation has completed.
- you will have to re-configure the program (take note of your WW locator, Sysops, etc. before starting re-installation). The first time you run the program, you will be on a default configuration; you should then customise it by the Configure menu and save the configuration for next time.
  One of the most important choices is the font. A non-proportional font should be used, although most of them have a poor appearance. For instance, the Courier font is quite bad, while better results can be achieved with the Fixedsys font. One of the best fonts is the Lucida Consol", size 9.6 bold for a 1024 x 768 screen resolution (to install it, you should procure file LUCON.TTF which is however already present in most PCs).

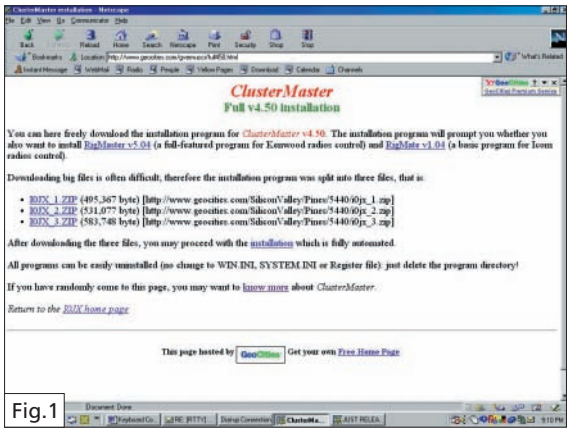


Fig.1

Fig.2

Fig.3

Note: the v4.50 installation can also optionally install two other programs, namely:

- RigMaster v5.04, a full-featured program for Kenwood radios control.
- RigMate v1.04, a basic program for Icom radios control.

DATACOM EDITOR

The new editor of the BARTG *Datacom* is **Paul Thompson M0CPW**. Paul takes over from **Mike Conder** and we all wish him the best of luck with the challenge. I'm sure he would appreciate feedback from you, so why not pen something for BARTG and let us know what you're doing? If you fancy having your picture in *Datacom*, why not send it in for inclusion in the 'Other Amateurs Shacks' feature. It's always interesting to see a picture of other shacks.

I don't know about you, but when I work someone half way around the world, I like to check and see just how many miles my signal has traversed. With PSK's low power and miniscule antennas, it becomes even more intriguing simply because working the other side of the world on 25W is still very satisfying. There is an easy way to get that information now and, once in hand, it gives you more material for your big DX stories! Go to **http://njdxa.org/cgi-bin/dxcclist.pl**

Input your location (long-lat or zip code) and then either print out the ten pages or download the file. If you have a beam, you'll find the beam headings there as well. It's a cool tool and we thank NJDXA for their efforts.

RTTY UPDATE

If you are running the *DL4RCK* program will be interested in an update on the website. Point your browser at: **http://www.rckrtty.de** See **Fig. 3.**

The new features on Version 2.13 of *DL4RCK* are:

- Added TRX control for Yaesu FT-840
- Fixed UTC-difference setup for 0.5 hours input
- Improved some functions of the log edit window
- Extend the ADIF-Export
- Improved the WAEDC-Contest mode
- The number of already worked QTCs with a call sign is displayed immediately.
- Added RCKRtty Web Page access in the main program
- Update PSKCore.dll V1.13
- Added the <CTX> f-keys variable: clear TX-window
- Added the <CRX> f-keys variable: clear RX-window
- Some changes in the Cabrillo log generator
- AutoQSY at the TRX if a PR-DX-Spot is taken-over

That's all for this month, so cheerio until next time.

Roger G3LDI

DX DESTINATION

BY ED TAYLOR G3SQX
C/O PW EDITORIAL OFFICES
ARROWSMITH COURT
STATION APPROACH
BROADSTONE
DORSET BH18 8PW

E-MAIL: ED@G3SQX.NET

ED TAYLOR G3SQX LOOKS AT A SELECTION OF HF ANTENNAS IDEAL FOR TRAVELLING.

This month I've some ideas for multi-band h.f wire antennas. However, as there's no straightforward answer to "What nine h.f. band antenna has good performance and is easy to put up?", I do so hesitantly! It's difficult, compounded by the fact that the impedance of the antenna system must be around 50Ω.

To help, I'm going to suggest three ways of achieving the objective. Most of the designs are actually a variation of one or the other.

Firstly, traps can be used to isolate parts of the antenna not required on the frequency currently in use. I'm thinking of a trap dipole here, although multi-band verticals generally use this principle.

Secondly, you can connect resonant wires to a single feeder, and treat the system as a single antenna. Thirdly, you can ignore antenna resonance, with a doublet that is tuned in the shack.

WHAT IS A TRAP?

A trap is a parallel tuned circuit, which has high impedance at its resonant frequency. This can be used in the middle of an antenna to isolate the end section of wire on a particular band. This makes the wire appear shorter, so an antenna appears to be a different length for each band used.

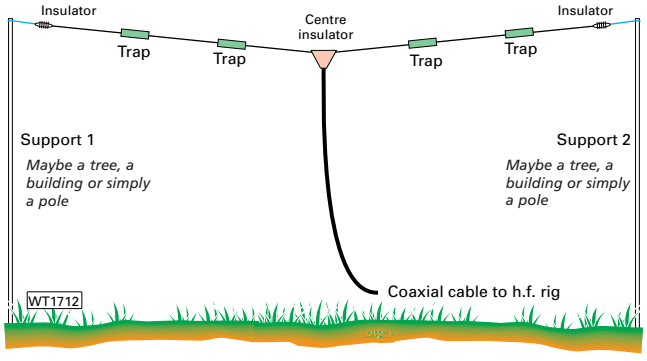


Fig. 1: A trap dipole can work on up to four bands.

You are probably familiar with the trap dipole in **Fig. 1**. Suppose the inner two traps are resonant at 28MHz and the outer two at 21MHz. The inner section of wire is designed to be a dipole on 28MHz and the next section will add length to make it a dipole at 21MHz. The overall antenna length will be such as to form a dipole at 14MHz and so the whole antenna acts as a dipole on three frequencies instead of one.

It's not difficult to calculate trap parameters and wire lengths, but most Amateurs will buy a commercial model. A balun, desirable with this type of antenna, is usually included.

Trap dipoles should offer a good match to 50Ω on up to four bands, depending on the design. A trap dipole can successfully be used as an inverted-vee, being supported at the highest point, in the centre.

However, this apparently attractive system has a few disadvantages, mostly mechanical. There are several points where wires attach to a connector and after flexing in the wind for a while these can break. Even though each trap (a coil and capacitor) will most likely be enclosed in a box to keep out rain, water could seep in, causing losses and detuning. If you are regularly assembling and dismantling this type of antenna, for use on a DX holiday, it can add to the problems. Trap dipoles are hard to fix even when you're at your home station.

MULTI-BAND VERTICAL

Vertical antennas often have a bit of mystery about them. Some Amateurs have a lot of success and some can never get them to work properly.

The general principle is that you imagine a dipole and make it vertical. Then take away the lower half and make a connection to the earth. The theory is well covered in text books, and most medium wave (a.m.) broadcasters use this type of system very effectively.

If you are planning multi-band use, the vertical part will have traps, loading coils and other devices which allow it to resonate on many frequencies. The commercial models can appear quite bizarre, with capacity hats and feeder stubs, but they can cover up to eight or nine bands with one antenna, which is quite an achievement. See **Fig. 2** to get an idea.

For portable operation, there are some worthwhile advantages in using a multi-band antenna. They are frequently self-supporting up to 8 metres or so, being mounted on a section of pole hammered into the ground. Because they use alloy tubing, they are generally fairly sturdy and the space taken by the antenna itself is quite small, although you would normally use radials, wires laid on the ground and connected to the outside of the coaxial feeder.

If adjusted correctly, the antenna will match at 50Ω on many bands, allowing rapid band changing. The angle of radiation is low, so verticals are well suited to DX working.

However, there are some disadvantages. Vertical antennas can be expensive and are really too bulky to take on a plane.

Adjustment in situ can be laborious, and radials may be troublesome. Performance on lower bands (1.8 & 3.5MHz) is often fairly inefficient, because of the relatively short length.

Verticals tend to pick-up more noise from domestic appliances, thermostats, etc. However, when used in a field or large garden, a multi-band vertical can be a very convenient temporary antenna.

PARALLEL DIPOLES

If you want to operate on three bands, take separate dipoles for each band and attach each one to the same coaxial feeder, arrange the wires in a 'fan' like in **Fig. 3**. That's it, you've created a

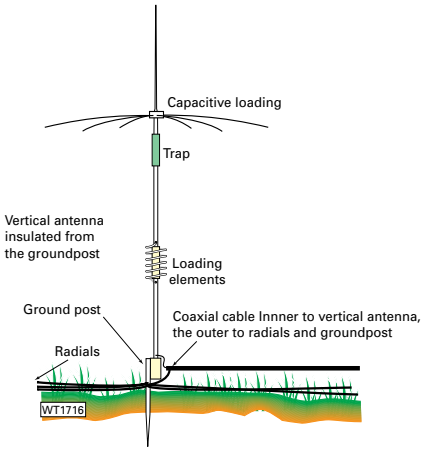
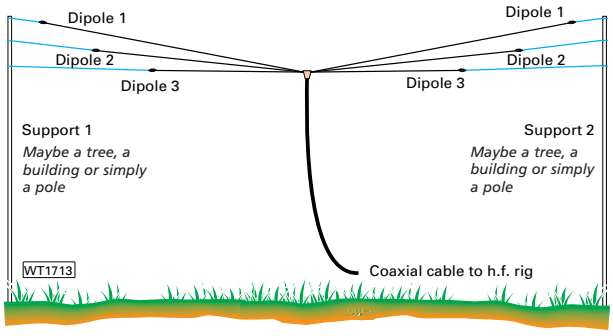


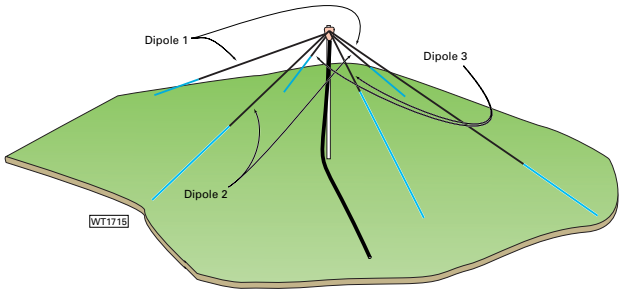
Fig. 2: Multi-band verticals all look different, here's one example.



● Fig. 3: Multiple dipoles - fan arrangement, with two supports (inverted-vee also works well).

multi-band system!

The theory is that each dipole will be accept power only at its resonant frequency, because the impedance of the others will be high enough not to affect its tuning. Is it true in practice? Well,



● Fig. 4: Multiple dipoles in a maypole arrangement.

each dipole affects each of the others, depending on the frequency and disposition of the wires. You can't always get a perfect match on each band and some combinations of bands are not recommended.

But the system works pretty well and I've found that up to three dipoles per feeder is very successful. You can feed the system directly from a 50Ω rig without trouble, with an s.w.r. below about 1.8:1.

However, it can take quite a while to set things up, as small variations in the separation of the dipoles can cause big changes of impedance. Usual procedure is to cut the wires longer than normal and trim the longest dipole first, moving on to the shorter ones.

The interaction can be minimised, if there is enough room, by using a 'maypole' inverted-vee arrangement, shown in **Fig. 4.** The wires are then separated as much as possible from each other. The benfits of parallel dipoles are that you can change bands quickly on air, can be made quite cheaply and is easily repaired in the field.

THE VERSATILE DOUBLET

If you're wondering why I haven't covered the G5RV yet it's because I like to consider it to be a type of doublet, with pre-determined dimensions. A doublet can actually be any length, becoming a versatile multi-band antenna.

Any antenna can be made to radiate at any frequency, providing you can find a way of getting power into it. In many cases, it's easier and more convenient to use resonant lengths, with a half-wave dipole, but a non-resonant antenna will still radiate.

The only real constraint is that as antennas are reduced in length below about 20% of a wavelength, it becomes more difficult to make them accept power. Still, it can be done, albeit at low efficiency, as experimenters on 136kHz are demonstrating.

As a rule doublets are constructed around a half-wave in length at the lowest frequency used. Then the power is fed in at this and higher frequencies and it will work fine. The radiation pattern will not be as predictable as with a dipole, but doublets tend to become more omni-directional if configured as inverted-vee.

Doublets need to be fed with a very low-loss feeder. Coaxial cable will not be successful, because the feeder has to deal with impedances very different from 50Ω In fact, most people are surprised to learn that the feeder is **not** matched to the antenna! There will be a very high s.w.r. on some bands, but the feeder is designed to deal with it.

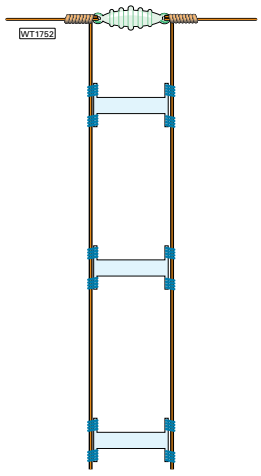
The feeder that does all these things is open-wire or ladder-line and most Amateurs construct their own. It consists of two wires parallel to each other, held about 5-12cm apart, with separators every 30-60cm along its length. The separators can be bought or made from material such as discarded ballpoint pen cases. See **Fig. 5** for an example of this type of feeder, attached to the antenna.

It's possible to buy slotted feeder, moulded from plastic material, with a separation of 3-6cm. This works pretty well, but is not as good as true open-wire and it can be badly affected by rain.

Open-wire has a loss of one or two dB per mile, even when operating with a high s.w.r. Because the dielectric (material between the wires) is mostly air, the losses are very low. This is why some m.w. and s.w. broadcasters use open-wire feeder to move signals from place to place with minimum attenuation.

Of course, you haven't really solved the problem of how to match the antenna to the rig, you've just moved the matching requirement somewhere else. You still have a transceiver which expects to see an impedance of 50Ω and you have a feeder coming in with an unknown impedance. **See Fig. 6**.

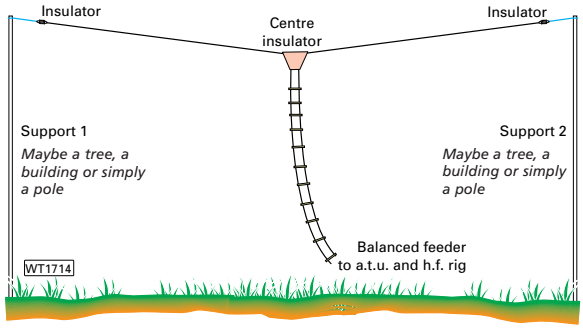
To put power into the feeder and the antenna, you need an antenna tuning unit (a.t.u.) between the transceiver and feeder. I know we are not really tuning the antenna, but the whole system (antenna, feeder and a.t.u.) so that it looks like a 50Ω load.



● Fig. 5: Open-wire (ladder-line) feeder, at its junction with the antenna.

Some rigs have an a.t.u. built in, but this is unlikely to be adequate for the high s.w.r.s that will be seen. In addition to tuning, the a.t.u. must take the balanced feeder and convert it to unbalanced form at 50Ω to connect it to the rig. This usually means it will contain a balun on the antenna side.

For use in the field, the doublet can be carried and put up fairly easily. You are committed to taking an a.t.u., and you may have to play around with feeder lengths to get an impedance that the a.t.u. will cope with on every band. Band changing can be slow, since you have to adjust the a.t.u. each time. Nonetheless, the doublet is simple and effective and many Amateurs use a variant both at home and away.



● Fig. 6: An antenna using open-wire feeder.

SEASONS GREETINGS

Best wishes to all and enjoy your radio activities in 2002! Next time I'll summarise antenna recommendations from the previous two columns.

There will also be a report on some interesting DX destinations from a well-known DX traveller. Your comments are welcome. The deadline for the April column is the middle of January.

73, Ed G3SZX

TUNE-IN

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TOM WALTERS REPORTS ON HOW THE WAR AGAINST TERRORISM IS AFFECTING RADIO BROADCASTING.

The radio waves have of course been busier than ever, what with reporting and analysing the situation in Afghanistan, the aftermath of the twin towers attacks, and anthrax letters. At the time of putting this piece together in early November, the broadcasters who had expanded their schedules to the South Asia region included: **VOA** (in Arabic, Dari, Farsi, Pashto and Urdu), **RCI** (English, 0200-0300 on 7.105MHz, in addition to 15.260, 17.860MHz), **NHK Radio Japan** (in Japanese & English), **BBC World Service** (in Arabic, Pashto, Persian, Urdu), **Deutsche Welle** (in Dari, Pashto, Urdu), **Radio France Internationale, Voice of Russia** and **Radio Pakistan**.

The USA was engaged in a local propaganda war in Afghanistan, dropping leaflets which included radio frequencies to listen to. Afghans could listen not only to the usual short wave transmission but also on medium wave frequencies at 0330-0530, 1230-1730 on 864 and 1.107MHz. Several DXers were struggling to locate the source of a special short wave frequency 8.700MHz upper sideband, available at the same times. The US Air Force C-130 Commander Solo aircraft were apparently transmitting programmes on medium wave 980kHz while flying over and around Afghanistan.

What's coming out of Afghanistan? – not much! There were reports that the **Voice of Shari'ah** in Kabul had been bombed, and was off the air, but transmissions were reported from Mazar e-Sharif on 1584kHz. However, considering the devastation and the previous lack of long-distance radio in the country, that wasn't surprising. An offshoot, as it were, of the conflict was the news that **Radio Free Europe/Radio Liberty** was looking for safer premises in Prague, in case of attack. But at this time, they had not resumed transmissions to Afghanistan.

ENCOURAGING NEWS

News from Canada was a little bit more encouraging. Last June, **Radio Canada International** (RCI) dropped a bombshell announcing major cuts in programming. However, it's good to know that, probably as a result of having to keep up with all the other international broadcasters in these crisis-ridden times, RCI have resumed their live weekend news broadcasts. Other cuts remain in place. Take a look at the **RCI Action Committee's** website at **www.geocities.com/rciaction** to keep up-to-date about the continuing worries for RCIs future.

In spite of the terrible events in New York and Washington and the anthrax scares, with comment issuing forth from every international broadcaster, the **BBC World Service** did not resume short wave to North America. In fact, the situation got slightly worse, as one of the BBC's recommended alternatives, the web site **Audiobasket.com**, ceased transmission. Also at this time **Bob Grove** of **Grove Enterprises** reported a doubling of sales of short wave sets in the fortnight after 11 September.

● Radio Vlaanderen Internationaal announce a new schedule, which it is hoped will help to improve listening conditions for many.

The **BBC** did however take a step in the right direction with an amalgamation of **BBC World Service**, the international television station **BBC World**, and the BBC international **online** services. The idea is to put together a concerted multimedia approach to exploit the BBC's powerful position in international broadcasting. With hundreds of millions of listeners, viewers, readers between them its a good idea and not before time.

There's positive news this month from **Radio Austria International**. The parent domestic broadcaster ORF, after months of anguishing, has decided to keep Radio Austria International on the air. The international service will retain all of its six language services, although the budget will be one third of that for 1999.

Station director **Roland Machatschke** said that 900 letters and E-mails of support from listeners helped preserve Radio Austria International. So, well done, if you were part of that.

END OF AN ERA

It was the end of an era at **Radio Vlaanderen Internationaal**. To avoid future difficulties, RVI has stopped short wave transmissions from the domestic site of Wavre. The station RVI was already using the transmitter sites of Deutsche Telekom (Jülich), Radio Netherlands (Bonaire and Madagascar), and stations in the former Soviet Union (Tashkent and Petropavlovsk). Now they will also be using facilities from Merlin Communications (Skelton, Rampisham and Meyerton, South Africa), and in Russia (Krasnodar and Samara).

Radio Vlaanderen is confident that the new schedule will actually improve listening conditions for a large part of the audience. Full details can be found at **www.rvi.be**, but here is the full English schedule, in case you haven't caught up with it yet: 0400-0430 on 11.985 (Americas, Bonaire); 0800-0830 on 5.985 (Europe, Jülich); 1130-1200 on 9.865 (Asia, Petropavlovsk); 1230-1300 on 1.512; 1400-1700 (Sports Live, Suns) on 13.685, 15.325, Krasnodar, Skelton); 1830-1900 on 1.515, 9.925, 13.685, 13.710 (Europe/Middle East, Krasnodar, Rampisham, Jülich); 1900-2100 on 5.910 (Sports Live, Sats) (Europe, Krasnodar); 2030-2200 on 5.910 (Europe, Krasnodar) and at 2230-2300 on 13.700MHz (Americas, Bonaire).

The Christian evangelical station **HCJB** in Quito, Ecuador, has reduced its shortwave hours in English to North America and Europe. This apparently is because of a smaller English staff, who could be susceptible to 'burn-out' if they try to keep up HCJB's previous programming output!

Radio Korea International's website now has Internet audio 24 hours a day, including all of RKI's 11 languages. English is available at 0200-0300, 0400-0500, 2100-2200. They also offer a 24-hour audio stream of Korean pop music, complete with pictures. The URL is **http://rki.kbs.co.kr**. Reception is a bit intermittent, though.

Finally, a snippet more about the **Voice of Nigeria**. Last month, the word was of refurbishment of old equipment and the purchase of shiny new digital studio gear. Now the news is that an ambitious 18 hour a-day service in English is planned. So, watch this space!

Bye for now, Tom

Trader's Table

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topical talk

This month the Editorial team ask readers to share memories of their own favourite 'classic' constructional projects published in PW over the years.

Very often, following a *PW* Club Visit where our Editor has been to meet readers, the Editorial Team look through the Club Visits comments book which accompany him on the trips. As a team, we all get the opportunity to read what readers have written in the book and some of the comments/suggestions make very interesting reading indeed...and have often resulted in new series or special one-off articles.

One of the most frequently noted requests is for us to re-print some of the older circuit designs, or to offer one of the old - extremely popular - *PW* Blueprints again (they were presented free with the magazine). And although we can't promise to publish all your replies during the year...this month's Topical Talk is devoted to bringing the past alive, via your suggestions...and we'll do our best!

It seems appropriate -bearing in mind the fact that he's mentioned specifically in this month's Keylines editorial, that we feature one of **F.** (Frank) **G. Rayer G3OGR**'s projects to start this occasional series rolling for the 70th anniversary year of *PW*.


TRANSMITTER / RECEIVER
for the LF BANDS
F.G.RAYER G3OGR

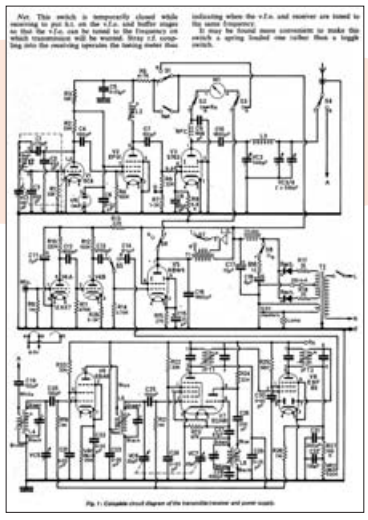
● Fig. 1: The 1.8MHz a.m. transmitter-receiver project by F. G. Rayer G3OGR, which appeared originally in the June 1970 *PW*, appealed to many home-constructors. But did you build it using Denco coils? (see text).

June 1970

The Transmitter/Receiver for the LF Bands by F. G. Rayer G3OGR, Part 1, appeared in the June 1970 issue of *PW*. It was followed by Part 2 in July, with a follow up 'Further Notes' section appearing in the September issue of that year. The last part described how the design could be used on 3.5MHz.

As originally published, the amplitude modulated (a.m.) l.f. transmitter-receiver was only for 1.8MHz 'Top Band' use. It attracted much attention and the Editorial team are left wondering....just how many were built? Did you build one of these transmitter-receivers? Write in and let us know...especially if you've still got one in your shack!

Perhaps you only used part of the design? Or, maybe modified it for your own requirements of to use what you had in your spares box? The Editor mentioned that he was very keen to build one himself and went as far as buying a chassis, doing all the metal work and then couldn't locate all the Denco coils needed! (And there lies a story). But eventually he re-built his into a mobile/portable rig using home-wound coils.



● Fig. 2: The circuitry for the transmitter-receiver was very straightforward. Many constructors opted for 6BW6 valves in the modulator and power amplifier stages. Did you modify the design to suit your own purposes? (See text).

Were you put off a G3OGR project because (mostly) he stuck to using the commercial Denco coil designs rather than resorting to home-brewed coil designs? Or, conversely...did you build his projects because you knew that probably the most difficult part of the design (the coils) were taken care of?

Lots of questions this month...and the *PW* team hopes that readers can help answer them. We're looking forward to reading your replies!

PW

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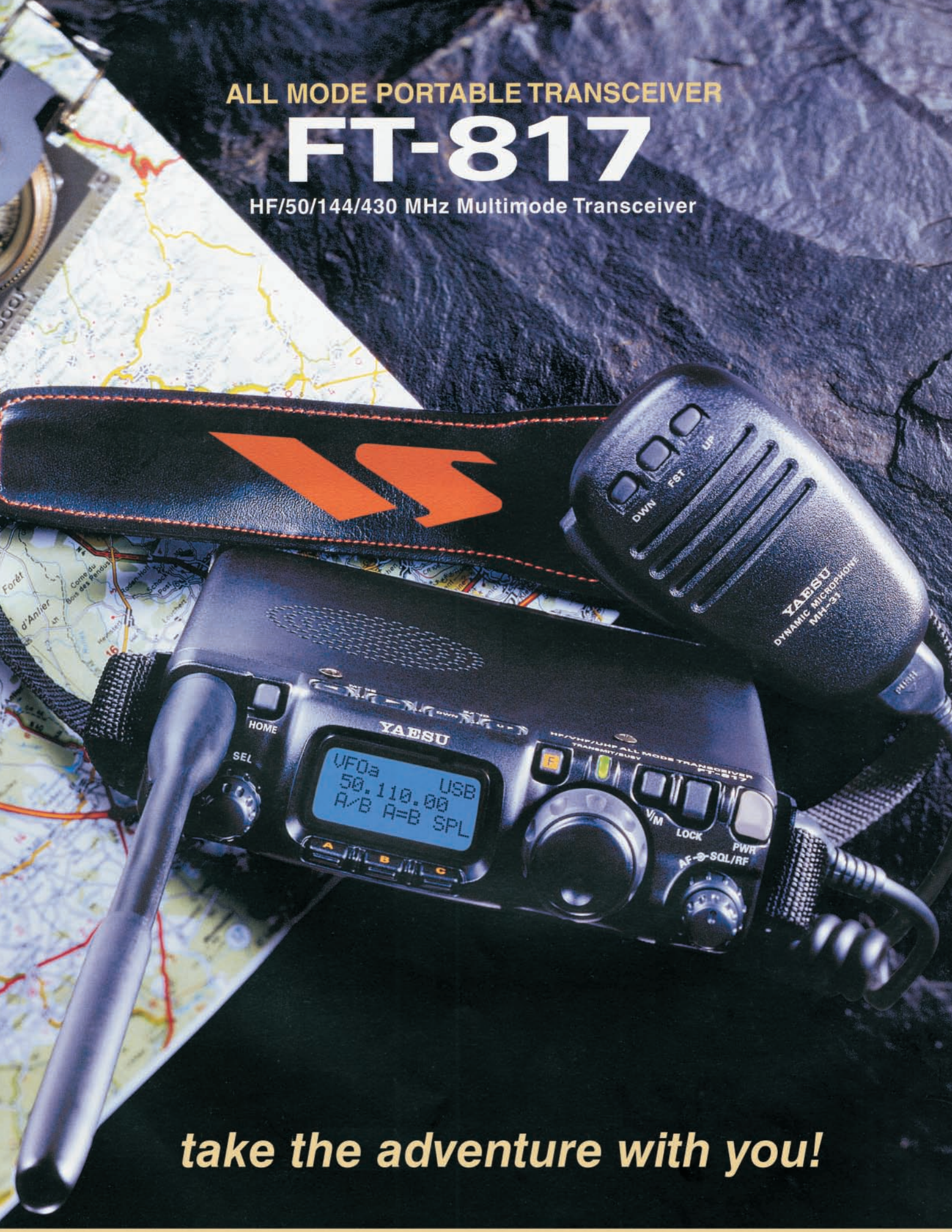

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