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- 500kHz - 1300MHz
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- Switched FM/AM
- Alphanumeric
- CTCSS Auto Read
- 29 user programmes
- Extended Receive

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AT-600 offers Airband AM Receive
Gives you the ability to monitor airband signals throughout the entire AM VHF airband.

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You have the choice of naming each memory channel and switching between name and frequency.

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The AT-600 can actually read the CTCSS tones from an unknown repeater and download for immediate use.

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Now you can tailor the radio to operate exactly as you wish - the possibilities are endless.

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- 5W on 13.8v
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* 108 memories

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* Auto repeater load

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- 30 / 300W power meter - PEP / RMS
- Antenna selector, by-pass etc.

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- 1kW Dummy Load
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- 50 Ohm
- 300W
- OK to 450MHz
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- SO-239
- Totally enclosed
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A selection from our used equipment list

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<tr>
<th>HF TRANSCEIVERS/AMPLIFIERS</th>
<th>MARCH/APRIL 1997</th>
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<tbody>
<tr>
<td>FT01E Yaesu HF Transceiver 100W, Gen, FM + filters £725.00</td>
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<tr>
<td>FT747GX Yaesu HF 100W gen/Tx (two available) £745.00</td>
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<tr>
<td>FT77 Yaesu HF 100W gen/Tx £1295</td>
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<tr>
<td>FT700 Yaesu HF antenna tuner £169.00</td>
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<tr>
<td>FP07 Yaesu 12V PSU £99.00</td>
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<td>VFO120 Kenwood Ext VFO (for TS830) £99.00</td>
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<td>HT115 Yaesu HF 10W 15mtr mobile SSB/CW s/h £249.00</td>
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<td>HT180 Yaesu HF 10W 80mtr mobile SSB/CW s/h £249.00</td>
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<tr>
<td>IC737 Icom HF 100W gen. cov (as new) £1195.00</td>
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<td>IC726 Icom HF 100W gen cov + 6mtr £899.00</td>
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<td>IC729 Icom HF 100W gen cov + 6mtr s/soiled £1060.00</td>
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<td>FT01E Yaesu HF transceiver 100W gen £675.00</td>
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<td>FT757 Yaesu HF transceiver 100W gen £585.00</td>
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<td>FT890AT Yaesu HF transceiver, boxed £1250.00</td>
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<td>TS520SE Kenwood HF transceiver 100W gen £335.00</td>
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<tr>
<td>FT767GX Yaesu HF transceiver gen cov £1450.00</td>
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<td>IC765 Icom HF transceiver £1699.00</td>
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<td>TS130S Kenwood HF transceiver 100W £395.00</td>
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<td>FT747GX Yaesu HF 100W 10-80mtrs gen £450.00</td>
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<td>FT901 Yaesu HF transceiver 5 band, pre WARC £335.00</td>
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<td>FT101Z Yaesu HF transceiver £260.00</td>
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<tr>
<td>FT776GX Yaesu HF transceiver £495.00</td>
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<td>FC757AT Yaesu Auto ATU with memo s/h £250.00</td>
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<td>FT980 Yaesu HF transceiver £625.00</td>
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<td>TS690S Kenwood HF/6m transceiver £1175.00</td>
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<td>TS430 Kenwood HF transceiver £525.00</td>
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<tr>
<td>TS940SAT Kenwood HF transceiver £995.00</td>
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<tr>
<td>TS440SAT Kenwood HF transceiver (2 models available) £750.00</td>
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<tr>
<td>TS520 Kenwood HF transceiver £2600.00</td>
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<td>IC729 Icom HF 100W gen £695.00</td>
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<td>IC761 Icom HF 100W gen £995.00</td>
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<td>IC725 Icom HF 100W gen £525.00</td>
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<td>IC726 Icom HF 100W gen £1850.00</td>
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<td>IC720 Icom HF mobile £365.00</td>
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<tr>
<th>VHF/ UHF TRANSCEIVERS</th>
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<tr>
<td>FT736R Yaesu 2mtr/70cm multi-mode 25W, ex-demo £1295.00</td>
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<tr>
<td>FT290RII Yaesu 2mtr multi-mode portable £375.00</td>
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<tr>
<td>FT690RII Yaesu 6mtr multi-mode portable £375.00</td>
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<tr>
<td>FT4700RH Yaesu 2mtr/70cm mobile 45W £329.00</td>
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<tr>
<td>FT2700R Yaesu 2mtr/70cm mobile 25W £279.00</td>
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<tr>
<td>FT290M Yaesu 2mtr mobile 45W (as new) £279.00</td>
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<tr>
<td>FT51R Yaesu 2mtr/70cm handheld (no box) £235.00</td>
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<tr>
<td>FL2025 Yaesu 25W matching L/amp for FT290RII £119.00</td>
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Please mention Practical Wireless when replying to advertisements
I've had a particular interest in the history of this century. And close friends tend to be aware of my tendency to 'live in the past', with fond memories of things I've grown up with (a Grandfather's privilege perhaps?). These include railways, my boyhood travels on my bike in the Hampshire countryside and the many hours spent roaming (quite freely in the 1950s) in Southampton Docks with its varied collection of huge passenger ships, steam engines and other things to interest a more than adventurous young man.

With my activities in radio well under way in the 1950s, I always took a particular interest in the various transmitter sites I came across when out and about on my bike. And in particular, I have in mind the low power regional BBC stations at Tichfield (my mother's home village) just outside Fareham (between Portsmouth and Southampton) and Bartley. Bartley, located on the very edge of the New Forest near Cadnam, transmitted the medium wave West Region programmes. It was the first transmitter I picked up on my homemade crystal set. But this transmitter, unlike the Tichfield (Fareham) transmitter which is still in use, has long since been closed and demolished.

However, in my travels around the UK, I still take a great interest in the various transmitter sites I come across. Having worked in broadcasting myself, I'm still fascinated by these magnificent 'memorials' to radio engineering and the splendid antennas which I could do much with!

You might think I'm a little strange, but I really do get a thrill when I see the extensive antenna arrays at the BBC's h.f. transmitter site such as Woolferton (this historic transmitter is so close to the country border I'm not sure if it's in Hampshire or Dorset!) whenever I stay at a nearby 'Motor Lodge' Motel. The Motel is built on the trackbed of the long-closed Woolferton to Totton Wells railway. And I always know I have arrived at the Motel - because as I approach the front door, the familiar voices and theme tunes of the BBC World Service can be heard coming from the front door security telephone! (And we think we've got EMC problems?).

**Engineering History**

I've had a great interest in British broadcasting and of course this naturally meant mainly the BBC because of the way broadcasting was organised in the UK engineering history. When I needed help for further research, PW played a part when I advertised in the magazine for a copy of BBC Engineering History 1922-1972 by Edward Pawley. And as I hoped - a reader had a copy of this extremely rare book which he sold me.

If you share my interest in the world of broadcast engineering, you may have shared my concern and feeling of great loss when the BBC SOLD ITS TRANSMITTERS recently. At one stroke - which drew remarkably little publicity or attention (even though it was certainly not 'hushed up') 70 or so years of engineering history was sold to an American company based in Texas...and to me, this action came as a profound shock.

The trend of broadcasters leasing 'airtime' on transmitters not owned by themselves, or in fact not being able to transmit their own programmes is not itself unusual. Transmission by a 'third party' has been the rule with ITV in this country and the service is now (famously enough perhaps) transmitted by National Transmission Corporation NTL...nowadays itself also an American owned company. But for the BBC to do the same way seemed to me to tragically break a long tradition.

In the future when I pass the famous broadcasting transmitter sites formerly owned by the BBC I'll stop and think. I'll remember the long and proud tradition provided by many engineers over the decades providing service, innovation and loyalty to their broadcaster.

Perhaps I'm really 'old fashioned', but despite the benefits of money raised being used for other purpose (Digital Audio Broadcasting included) I am really concerned. Speaking for myself, I'm sure that the BBC has lost a wonderful and valuable asset by 'selling' their irreplaceable years of experience along with the associated staff and transmitters.

Not a lot to do with Amateur Radio you might think - but many amateurs work in broadcasting. The BBC has provided careers for many radio enthusiasts and has always been in the forefront of development.

I fervently hope that the engineering opportunities do not lessen in the future. And I also wonder what will happen if the BBC and the transmitter owners cannot agree terms in years to come. Would the BBC go QTG? I fervently hope not!

**Writing For PW**

We receive a steady stream of ideas from budding authors wishing to write for Practical Wireless. All the articles we welcome, but sometimes authors get very cross at me for sending them back - even when they've not actually been turned down! (We often advise the author to re-submit their work incorporating cuts and modifications).

By far the most common reason for the rejection of an article is not that it's unsuitable or PW is that every written for another magazine may well be unsuitable or PW is that every magazine has a different approach and style.

Very occasionally I see articles from authors who may have never seen PW or have not read it for many years. And of course, they are very unlikely to succeed writing for us. But despite the 'doom and gloom' we really do need your articles!

Please don't be discouraged, I'm only trying to help and you help us all by just bearing in mind the following tips:

Firstly, check with us that we need or would be interested in your idea. If not we can perhaps advise you on other similar ideas. Please read PW and try to write your article to the style of the magazine, remembering that the magazine is not an academic journal and our hobby is enjoyable! So, an informal, informative and friendly style will help.

Bear in mind we have a need for smaller constructional ideas and articles to keep the 'practical' side of the hobby alive. In contrast, we always seem to have plenty of historical articles.

And please remember that we cannot consider or accept unsolicited equipment reviews. For obvious reasons, authors who are to undertake research for reviews are chosen by myself in a determined effort to ensure impartiality.

Finally, the best advice I can give to encourage authors to submit work, is to ask us to send them a copy of our Author's Guide. Packed with information, the guide will help you prepare the idea and will encourage you to talk to us for further guidance.

So, on behalf of the Editorial team I wish you luck in writing for PW. And although our guide cannot guarantee we will publish your article...it will help the author involved and the PW team do the best we can for our readers.

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**Another Grandfather's privilege!**

Granddaughter Georgia (one year old on 4th May) and 13 year old Labrador Mandy who average 12 PW club visits a year!


**The Star Letter**

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.

**RECEIVING**

PW's Postbag. If your letter is published you'll win a prize.

**Reviving PW Blueprints**

Dear Sir

A recent writer was asking about old PW blueprints, this prompted me to write this letter. There must be lots of old circuits stored away. I think it would be of great interest to revive some of these in a special article.

Back in the 1950s PW published a design for a one valve receiver using an ECL801 in a reflex circuit covering medium waves. This prompted me to buy my first soldering iron, a 25W costing 7/6d (35p). Using a first soldering iron, a 25W ECL801 valve receiver using an

**Enamelled Wire**

Dear Sir

With reference to my letter in the January issue of Practical Wireless regarding preparing enamelled wire for soldering, let me first say thank you to the Editor and Mr Duncan J. Walters for their advice. I have tried both methods and regrettably I find neither very satisfactory.

Burning off enamel insulation with a methylated spirit flame has two snags. One is overheating the wire to melting point (remember these are thin wires, 30s.w.g.) and the second is trying to get the wire from the match into the 'meths' before its cools off. Mr Walters' idea works very well with thicker wires but is extremely difficult with thin stuff.

No doubt I shall find a solution and I once again thank these two people for their help.

John Noble

Kent

Editor's reply: Can anyone else come to John's rescue with ideas?

**Lasers & Belfries**

Dear Sir

That an august technical journal as is Practical Wireless should deem fit to publish an article encouraging the use of laser beams to further the cause of amateur radio while, seemingly, remaining wholly indifferent to their effect on belfries, leaves me more than somewhat puzzled.

Bats are not concerned about their own influence on the environment and, indeed, like most other animals, they do not recognise 'human rights'. Moreover, this project disregards some quite fundamental aspects, such as what happens to the bat-guide beam when it is running cats and dogs?

Practical Wireless will be well advised to seek expert opinion before making any further, although admittedly amateurish, research into this highly sensitive field of biology - perhaps from Batsman himself. There is much to commend a journalistic licence and the 'Bats in their Belfry' in particular.

However, that this specific paper is published in your issue of April the 1st - of all dates - leaves quite a wide margin for any legitimate doubt of the mental sanity of us all. (Just joking Ed!)

**Electromagnetic Radiation**

Dear Sir

I am writing to you to question the controversial issue of the non-thermal effects of electromagnetic radiation (EMR). I have heard many differing opinions on the subject from different sources, but I am still not clear on 'safe levels' of radiation.

Firstly, has anything been done to establish any firm action levels in relation to such a radiation field? Are we aware of the dangers of exposure to such radiation?

Secondly, has anything been done to establish any firm action levels in relation to such a radiation field? Are we aware of the dangers of exposure to such radiation?

Thirdly, has anything been done to establish any firm action levels in relation to such a radiation field? Are we aware of the dangers of exposure to such radiation?

Fourthly, has anything been done to establish any firm action levels in relation to such a radiation field? Are we aware of the dangers of exposure to such radiation?

Fifthly, has anything been done to establish any firm action levels in relation to such a radiation field? Are we aware of the dangers of exposure to such radiation?

Sixthly, has anything been done to establish any firm action levels in relation to such a radiation field? Are we aware of the dangers of exposure to such radiation?

Seventhly, has anything been done to establish any firm action levels in relation to such a radiation field? Are we aware of the dangers of exposure to such radiation?

Eighthly, has anything been done to establish any firm action levels in relation to such a radiation field? Are we aware of the dangers of exposure to such radiation?

Ninthly, has anything been done to establish any firm action levels in relation to such a radiation field? Are we aware of the dangers of exposure to such radiation?

Tenthly, has anything been done to establish any firm action levels in relation to such a radiation field? Are we aware of the dangers of exposure to such radiation?

Eleventhly, has anything been done to establish any firm action levels in relation to such a radiation field? Are we aware of the dangers of exposure to such radiation?

Twelfthly, has anything been done to establish any firm action levels in relation to such a radiation field? Are we aware of the dangers of exposure to such radiation?

Thirteenthly, has anything been done to establish any firm action levels in relation to such a radiation field? Are we aware of the dangers of exposure to such radiation?

Fourteenthly, has anything been done to establish any firm action levels in relation to such a radiation field? Are we aware of the dangers of exposure to such radiation?

Fifteenthly, has anything been done to establish any firm action levels in relation to such a radiation field? Are we aware of the dangers of exposure to such radiation?

Sixteenthly, has anything been done to establish any firm action levels in relation to such a radiation field? Are we aware of the dangers of exposure to such radiation?

Seventeenthly, has anything been done to establish any firm action levels in relation to such a radiation field? Are we aware of the dangers of exposure to such radiation?

Eighteenthly, has anything been done to establish any firm action levels in relation to such a radiation field? Are we aware of the dangers of exposure to such radiation?

Nineteenthly, has anything been done to establish any firm action levels in relation to such a radiation field? Are we aware of the dangers of exposure to such radiation?

Twentiethly, has anything been done to establish any firm action levels in relation to such a radiation field? Are we aware of the dangers of exposure to such radiation?

I am currently studying for the May RAE with the help of some friendly amateurs and s.w.l.s from the local club (I have passed my Morse) and I hope myself to become a radio amateur and join the many other amateurs already involved in this exciting hobby.

Well done with the fantastic magazine. I especially enjoy the rig reviews and the new 'Antennas In Action' section. Please can you help me with my puzzling dilemma on EMR?

Ian M. Hutchinson (s.w.l. aged 14) Inverness

Editor's reply: Ian has raised some extremely interesting points. There's much speculation on the subject is he's raised and in the various medical journals I read it's obviously under investigation. But apart from reading about strong 'near fields' causing microorganisms to mutate (in closely controlled laboratory experiments) I have not seen any direct reference to the effect on humans. Personally, I try to 'play safe' with any radio frequency radiation under MY CONTROL.
Thanks for a good monthly read and with kindest regards.
Ken Jones
Italy

Editor’s reply: Having seen a certain church tower located in the Italian town of Pisa Ken...I think certain experimenters ‘learned’ a little too hard on the power of their lasers! However, we hope everyone who wrote in appreciating our April fool ‘spool’ article. And although we hope to continue stimulating the radiation of response and interest from readers, the laser beam is now switched off and the correspondence on the subject closed!

Bulgarian Request

Dear Sir
I collect pictures of ‘Corals’ reefs and I would be very happy if any of your readers, my fellow radio amateurs, could send me any coloured photographs or pictures from old magazines of ‘Corals’. They are very hard to find in Bulgaria, I use these pictures to copy from and paint onto canvas.

Ivan Hristov IZ2LP
PO Box 25
5500 Lovech
Bulgaria

Editor’s comment: Please send any contributions direct to Ivan. However, PW will NOT be responsible for the ‘kidnapping’ of old National Geographic magazines from Doctor’s or Dentist’s surgeries!

Antennas In Action Appreciated

Dear Sir
I have just come home from the shop with my copy of the May issue and I have to say how much I am enjoying reading it. I have written to you in the past and have been very, very critical so it seems only fair to send praise when it is due.

I particularly like the way that PW is living up to the ‘Practical’ part of its title. The whole magazine is full of people doing things. Of particular interest to me is the ‘Antennas In Action’ bi-monthly section. I only have a very small garden and am constantly experimenting with antennas (should that be antenacae?). I find the guidance and encouragement given very useful.

My main mode is RTTY - I hardly do anything else, but I do operate c.w. (Sometimes odd one out when you once you can plug in a microphone and talk to people!). Operating RTTY is rather a minority interest and whereas the s.s.b. and c.w. enthusiasts can write in with loads of reported DX, us RTTYers are lucky to work one or two new DX stations a week so we tend not to write in. Maybe we need more encouragement - does the ‘HF Far & Wide’ column want RTTY reports?

Going back to c.w., I was very interested to read the letter from Ray Hoves G4OWY on improving Morse copying speed. My own experience does seem to bear out what he says. I had got stuck writing at about 15w.p.m. and wanted to go faster when I ‘bumped into’ another c.w. enthusiast on packet. He advised doing away with the pencil. It has worked for me and I can now copy 25w.p.m. if the sending is good. So I have ditched off my copy of ‘NuMorse’ which I got from PW and am running it at 30w.p.m. I’ve only been trying this for a few days but it seems to be working. Indeed, my speed has made a major discovery.

Thanks again for a really useful and practical edition.

Peter Halls G4CRY
York

Editor’s reply: Thx. Editorial team are delighted to hear you enjoy ‘Antennas In Action’ Peter. And of course, Leighton

Smart the compiler of ‘HF Far & Wide’ will be very pleased to have DX reports from RTTY operators.

Morse Advice

Dear Sir
In July, I shall be 52 years of age and I remember some of the quaint sayings, from my childhood, spoken by my Elders, especially my Aunty. Why have these memories come to the fore, and why have I taken the trouble to set them down in writing at this time of my life? Simple, such sayings as: ‘There’s none so blind as those that can’t see’ or: ‘They’re too blind to see the woods for the trees’ are as pertinent today, in amateur radio, as they were in my childhood.

Take the constant stream of letters that carp on about abolition of Morse code, from amateur radio, wherein do these people get this poorly considered idea? The proposal is only for the abolishment of the 12w.p.m. Morse test and not Morse code. Yet, time after time, in one amateur magazine or another, there’s another letter pleading that Morse code should be kept. Please people, all that is being asked for is the abolishment of the 12w.p.m. Morse test for you or anyone else to obtain an ‘A’ class licence.

I would also like to take unbrage at the suggestion, implied, that Morse code can be simply learnt from sitting and listening to it on one’s receiver. I think this is total rubbish! If you do not know the Morse code, how can you learn it by sitting, with your ear glued to a receiver? You have to learn the Morse code, the old, tried, true and tested way, after all that is the way, the successful way that it has been done, since old Sam Morse invented the code. Of course, once you have learnt it, then there is nothing stopping you from improving your receive speed by sitting for hours at a receiver. However, that will not improve your transmit speed and you can confirm that by listening to the poor sending that is often passed off as good Morse. Basically, what we all need for learning Morse code is patience, fair to excellent co-ordination and lots and lots of time!

So, pay no attention to the well meaning club member, or anyone else who says that he or she has a new way, a better way. If you stick to the basics, you can’t go wrong, as far as learning Morse code is concerned. Converting what you hear, back into the written word, etc., is the major problem we all go through. Some find it quite easy, others struggle a wee bit as they hit a hump or two at various speeds, others, unfortunately, go nowhere, no matter how hard they try and its usually co-ordination that is the problem. Nobody can teach that, its something you have to practice yourself and it can take months, even many years.

Once you have the 12w.p.m. pass certificate and your ‘A’ class licence, should you wish to climb up the dizzy heights, above 20w.p.m., then again that comes with practice, practice and more practice, both sending and receiving. Again, it comes down to that very real problem of co-ordination, the faster you go, the harder it is to write it down, or like some, you can read the Morse like you do a book, that is if your memory is also good and the message is short.

Above all else, no matter who or what you read, he this letter, or others in chats at clubs, rallies and on the air, the one and only major contributing factor, above all else is time! The time you set aside for learning, for practicing, for improving all facets of Morse code, from the day you first start to the day that you reach the goal that you have set for yourself, and even then, you can’t let up, you’ve still got to work on it, air, daily!

J Davies-Hollon G4XPP
County Durham

Channel Spacing

Dear Sir
I have noticed very little correspondence about the 12.5kHz numbering of channels agreed at the IARU Conference. The idea of working this out from division from a specific frequency is to prove confusing and to my mind totally unnecessary.

When the native channels went to 25kHz spacing all that happened was a prefix ‘6’ was added. Ch: 6. 156.300MHz had its ‘add-on’ 25kHz, 156.325MHz becoming Ch: 6b Ch: 8b 156.475kHz + 25kHz Ch: 6b 156.4525MHz.

Why not, for the amateur bands? Say add a 5 so S20 + 12.5kHz becomes S25. Rb + 12.5kHz = R6 or is this too easy?

Having to divide down frequencies before a QSY will be a pain and whilst I am equipped for 12.5kHz on 144 and 430MHz, I vow that I will always state a frequency and not the new channel numbering.

I would be interested in any comments favoring the IARU decision.

W. Symes G8AV, Merseyside

Practical Wireless, July 1997
Nevada News

News has arrived from Portsmouth based Nevada that the latest h.f. transceiver has arrived from SGC in the USA. As the UK agents for SGC Inc. Nevada has informed the PW Newsdesk that the SG 2000 ‘Power Talk’ h.f. transceiver with digital signal processing (DSP) is now available.

Reflecting SGC’s military equipment background the new SG 2000 h.f. transceiver is ruggedised and is particularly suitable for maritime mobile, heavy duty or home-base use. The transceiver features a removable control head, and the manufacturers claim that the DSP is of advanced design.

Retail selling price of SGC’s newest transceiver is £1895 including VAT. For further details contact Nevada Communications at 189 London Road, North End, Portsmouth, Hampshire PO2 9AE. Tel: (01705) 662145, FAX: (01705) 690626.

Editorial note: Practical Wireless will feature a review on this transceiver in the near future.

Yorkshire Day

The Scarborough Special Events Group will be activating GB3YD from 1 - 3rd August in connection with the annual Yorkshire Day celebrations. A special QSL card has been produced for the event showing Robin Hood’s Bay in North Yorkshire and will be No 16 in group’s souvenir card series.

The main event for the station will be active on 3725kHz and there will also be activity on c.w. and 144MHz. All contacts made will be acknowledged via the Bureau and listener reports are also welcome. Anyone who requires a direct card call should apply via the club call G0000.

GB2YD

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Another League

The Shortwave Shop who are based in Christchurch, Dorset, have taken amateur radio into another league by sponsoring a football strip. Bob Burrows, proprietor of the Shortwave Shop, was only too happy to sponsor Chirk School Junior School’s football team strip, as both he and his children attended the school.

Bob says it was a good opportunity to put something back into the school and community. The team has played several games in their new strip and so far has not lost a game! Obviously the magic of Amateur Radio extends far further than the airwaves.

Radio Club the 50MHz (6m) repeater GB3RR was finally put on air on 1 May 1997. The repeater is located 12km NW of the City Centre of Nottingham and is operational on 51.320MHz (input), 50.820MHz (Output) and has a CTCSS access tone on 71.9Hz.

The repeater project started in October 1994 when the Hucknall club were asked to submit an application. In the month’s that followed Jon G4TSN and John G0LBW started to put the hardware together and start trials. The main challenge they faced was in the construction of a duplexer.

The Hucknall Rolls Royce ARC look forward to receiving reports from users of GB3RR and would like to thank all those involved in getting the repeater operational. In particular thanks go to Dan NSMRG, Richard G1SLE, Fred G4SPR and Ian G0RD1 for their technical support and Steve G0LCG who managed to persuade his boss at Anchor Supplies Limited to sponsor the project.

For more information on GB3RR contact Jon G4TSN or John G0LBW, QTHR and if you can offer support or donations please contact Steve G0LCG on 0115-975 5252.

Yaesu’s New Mobile

The new Yaesu FT-8100R dual-band fm mobile transmitter will be available in the UK very soon. Yaesu (UK) have announced that the transceiver incorporates a demountable front panel, true dual band receive capability with cross-band repeat built in.

Also featured on the FT-8100R is Yaesu’s ‘Smart Search’. This facility automatically ‘sweeps’ a band and loads active Amateur Radio frequencies in dedicated memory banks. The manufacturers state that this is a “useful facility” for the occasions you visit new areas.

Equipped with a built-in duplexer unit the FT-8100R can be used with a dual-band antenna and provides r.f. outputs of 50W on v.h.f. and 35W on u.h.f. A dedicated packet radio jack socket is available on the rear panel.

For further details on Yaesu’s new import, contact them direct at: Unit 2, Maple Grove Business Centre, Lawrence Road, Hounslow, Middlesex TW4 6DR. Tel: 0181-814 2001 or FAX: 0181-814 2002.

Editorial note: We hope to review the new Yaesu transceiver as soon as they are available.

Into The Millennium

Dortech Electronics Limited are the distributors for the new Millennium Bios Board, the software for which has been written by American Megatrends Inc. of Georgia, USA and Femlink 2000 Limited. The Millennium Bios Board has been specifically designed to overcome the problem of the date not changing correctly when the year 2000 comes around.

Dortech say the board is unique and easy to install even for the inexperienced, non-technical user. The board is supplied with clear instructions and is said to be as simple to install as a video card.

The card fits into any spare 8 or 16 bit Industry Standard Architecture (ISA) Expansion Bus Slot. The software installs itself into the first available area for BIOS extensions in the Upper Memory Blocks. There’s a set of jumpers on the Board to allow the end user to adjust the position in memory if they wish.

The Millennium Bios Board costs £69.99 plus VAT & P&P and discounts are available on large quantity orders. For more information contact A. Lewis on (01202) 693214 or to place orders contact Dortech Electronics Limited, Unit 2, 13 Blacksmith Close, Corfe Mullen, Wimborne, Dorset BH21 3QW. Tel: (01202) 776300 or E-mail: Sales@dortech.demon.co.uk

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Copyright Derrick Penman
Somerset News

The Lopen is the latest product to be added to the Walford Electronics range of kits and takes the shape of a 1.5W c.w. transmitter which operates from 1.5 - 15MHz. It’s primary purpose is to give full band c.w. coverage when used with Walford’s Martock receiver. The Lopen when used with the Martock the v.f.o. drives the TX and a special offset circuit allows the frequency to be adjusted either up or down to suit the receiver side-band being used. The Lopen can also be used with its own crystal oscillator and the kit is supplied with a 3.582MHz ceramic resonator for 3.5MHz allowing the offset preset to be used a tuning control. An external v.f.o. can also be used to drive the Lopen. The Lopen kit costs £29 plus £1 P&P and is supplied with semi break-in TR control, antenna changeover, muting and a side-tone oscillator, together with all the hardware for joining it to the Martock. The Lopen and Martock when ordered as a pair cost £62 plus £1 P&P.

To place your order or to find out more about the Watford range of kits contact Tim Watford G3PCJ, Upton Bridge Farm, Lung Sutton, Langport, Somerset TA10 9NJ. Tel/FAX: (01458) 241224.

Valuation Service

David Cole G3RCQ has recently set-up a division within his Accountancy Practice to deal with the valuation and sale of deceased Amateurs’ and Short Wave Listeners’ radio equipment. David is a qualified accountant with 40 years of radio and electronics experience having passed the RAE in 1962 and then traded in the business under the banner of G3RCQ Electronics.

David will negotiate and advise on a one-to-one basis with Solicitors, Accountants and relatives and make arrangements for the speedy sale of radio equipment. He recognises that the passing of friends and relatives is traumatic enough and feels it important that radio equipment is professionally valued if the beneficiaries are to receive full value.

For more information contact Cole & Co. Accountants, 9 Troopers Drive, Harold Hill, Romford, Essex RM3 9DE.

Address Change

Chris Page G4BUE of Adur Village Press has recently notified the Newsdesk of a change of address. As from immediate effect Adur’s new details are: Highcroft Farmhouse, Gay Street, Pulborough, West Sussex RH20 2HJ. Tel: (01798) 815711, Mobile: (0410) 054906, FAX: (01798) 813054 or E-mail: g4bue@adur-press.prestel.co.uk. Why not contact Chris for full details of his range of products which include QSL cards and magazine binders?

Howes Homepage

The latest company in the Amateur Radio business to join the Website world is C.M. Howes Communications. The Howes site contains catalogue pages, data sheets, background information about the company, contact details and an introduction to the Howes professional design and consultancy services. To catch the Howes Homepage you should point your web browser at www.howes-comms.demon.co.uk.

Practical Wireless, July 1997
If you wish to have your Rally featured in Radio Diary, all you have to do is to put together as much information about the Rally as possible, i.e., date, location, time, who to contact, etc., and send it to Zoe Crab at the PW Editorial Office.

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.

If you have any queries about a particular event, please contact the organisers direct.

Editor
Assembled PCB modules: £27.60
MB1 56. 156 to 162MHz marine band active antenna system {the brother of AB118!}
Assembled PCB modules: £27.90
Kit: £18.80
Assembled PCB modules: £28.90
Kit £19.90
Kit: £8.90
Assembled PCB module: £14.90
DC52
CH2
AP3
£1499.95 RRP. AVAILABLE ON 12 x £83.33 monthly repayments. ZERO APR.
PHONE NOW FOR OUR CASH PRICE!
Kit: £8.90
Assembled PCB module: £14.90
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£1499.95 RRP. AVAILABLE ON 12 x £83.33 monthly repayments. ZERO APR.
PHONE NOW FOR OUR CASH PRICE!
A superb compact all mode 100W HF transceiver covering all HF bands plus 6 metres. Excellent receiver with narrow filters fitted as standard.

- All HF Bands 100W output
- 50MHz 100W output
- General coverage receiver
- Removable front panel
- Receiver pre-amp
- Filters fitted as standard
- Superb TX audio and RX
- Good RX sensitivity
- Full break-in on CW
- Speech compressor
- All modes: USB, LSB, CW, AM, FM
- All mode squelch
- Noise blanker, Scan facilities
- Quick offset for DX pile-ups
- IF shift control
- Separate antenna sockets for 11F+ 6 Meters

High Power 100W 6 m + 10W RF Transceiver

**new! DX-70 TH**

679.50

DX-70T 100W HF + 10W 6 m Transceiver

Alinco's 100W on 6m transceiver. Narrow receive filters and CTCSS fitted as standard. **Unbeatable value for money!**

**new!**

only 56W x 94H x 10.6Dmm

weighs only 75g!

**actual size!**

ALINCO Star dealers ★ ★ ★ ★ ★ ALINCO Star dealers ★ ★ ★ ★ ★ ALINCO Star dealers ★ ★ ★ ★ ★

**DR-MOG 6 Meter Mobile**

6m PM mobile - 50-54MHz. Get on six metres now!!! 10W of PM - ideal for either Simplex or repeater working. A simple to operate mobile and includes CTCSS tones.

DJ-C1 144MHz

DJ-C4 430MHz

A water thin pair of transceivers that slip into a shirt or coat top pocket. DJ-C1 features transmit coverage.

- 300mW RF output
- Extended receive coverage
- Supplied c/w earphone
- Repeater offsets

DJ-65 Dual Band Handheld

A brilliant twin hand held set that does everything including spectrum display of adjacent channels. The receiver has a superb front end that does not suffer with breakthrough like other handhelds and has CTCSS/DTMF built in as standard.

- Spectrum channel display
- Optional extended receive including Airband
- Optional extended receive including Airband
- Full VHF/UHF Duplex
- Over air cloning
- Cross band repeat
- Up to 5W RF output
- 100 memories

DJ-C1 430MHz

DJ-C4 144MHz

£249.95

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  - A no nonsense rugged 50% 144MHz mobile transceiver that's easy to use on the move and comes with CTCSS as standard
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- **HFM-1** HF stainless steel mobile
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Recent Approval For Scouts

Torfaen Scouts ARC (GWOUKT), located in Cwmbran, Gwent, have recently received approval from the City & Guilds of London Institute to conduct the Novice Radio Amateurs' Examination (NRAE) and Radio Amateurs' Examination (RAE). The radio club holds regular Novice Training Courses and RAE classes, as well as Morse practice.

Membership to the club is open to anyone interested in the hobby and not just members of the Scout Association. One of the aims of the club is to encourage young members of the community into the hobby, and the links with Scouting help provide the ideal opportunity.

Many of the club's outdoor activities are held at various Scouting events. Also, the club station is regularly used for Jamboree.

On The Air (JOTA) and Thinking Day On The Air (TDOTA).

Adult members (licensed and non-licensed) are needed to help develop the aims of the club and to maintain the standard that the founder members have established. All enquirers are welcome and can be made to the Club Secretary Richard GW0WAV, QTHR on (01633) 483277 or E-mail: l06177.253@compuserve.com

Diary Date

The Royal Naval Amateur Radio Society Radio Rally (RNARS) is being held this year on Saturday 21 June. Last year, over 2000 members of the Amateur Radio fraternity visited the RNARS mobile rally. Joined by some 4000 members of the general public who had come to enjoy a spectacular day out in HMS Collingwood (the RN Communications & Radio School), they also had the opportunity to watch some top military display teams and bands, visit the fun fair and sideshows. In other words, plenty of fun for everyone on the day.

The rally this year, on the above date, will have a similar format - plenty of action for all the family, including a free full parachute team jump, the Hampshire Police Motor Cycle display team, plus all the usual radio rally features. The Radio & Communications museum will also be open throughout the afternoon.

Transport will be provided from the main car parking area for equipment to be moved across to the Bring & Buy stand. The day is dedicated to enjoying action packed events in the arena, browsing around the radio stands and catching up with the latest on the equipment front and maybe buying that new or second-hand piece of equipment.

The radio rally has been growing in size this year to provide everyone more room to view, buy, chat, drink, eat and move around. The traders will be able to have access from Friday pm and the public will be admitted from 10.30 to 17.30 on the Saturday. For further information, traders please contact Alan Owen G4POW on (01705) 353404 or Mike Matthews G3JFF on (01705) 365003.

Irish Celebrations

The Irish Air Corps is celebrating its 75th anniversary this year. As part of these celebrations, the Signals Amateur Radio Club, EI2V, will be activated.

The Air Corps will be hosting an Air show for all Defence Force personnel from Friday 4 July until Sunday 6 July 1997. This will be located at Casement Aerodrome, South west of Dublin City.

During this weekend, the club station will be on air throughout the h.f. bands (s.s.b. and c.w.). One of the aims is to contact as many foreign Air Force radio clubs as possible. The club would also like check-in calls from all Air Force/Military radio clubs over this weekend.

Operation on s.s.b. will be centred around the following frequencies: 7.055 and 14.275. Whilst c.w. operation will be centred around 3.560, 7.020, 14.020 and 21.020MHz.

Braintree & DARS

The Braintree & District Amateur Radio Society meet every 1st and 3rd Monday of the month at The Clubhouse, Braintree Hockey Club, Church Street, Braintree, Essex. The Team 'Meet' is held at The Clubhouse, Braintree & DARS Inverness Club

News From Norway

"Carrying On The Practical Way" - that's the lesson learned by Form EL1A of Orsta videregående skule in Norway who pictured with their teacher Norleif LAF9G (second from right). The other "essential ingredient" was Inger Rotvatn (Form EL1A's English teacher) and as she missed the photo - "Carrying On The Practical Way" - that's the lesson learned by Form EL1A.

"Our teacher in electronics, Norleif Bjørneseth who holds the callsign LA9FG is a regular PW reader. He showed us the article by G3RJV and the project began by the translation of the article into Norwegian. This was done under the guidance of our English teacher Inger Rotevatn before we actually built the radio. We divided the class into groups and built the h.f. and l.f. sections on printed circuit boards. After a few problems we got good results and in the evening we picked up several European stations - using a 30m long wire antenna. Thank you for providing us with the inspiration and Form EL1A sends greetings to everyone at P11/ and of course G3RJV."

And from 'Club Spotlight' and PW, we wish everyone in Form EL1A success in the future.

Zoë says:
"keep the News and those Club magazines coming!"

Compiled by Zoë Crabb

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And from 'Club Spotlight' and PW, we wish everyone in Form EL1A success in the future.
The Spotlight's On Again!

Yes, it's true, this is the 2nd year of the Spotlight Trophy, awarded to the Radio Club magazine of the year by Practical Wireless and Kenwood (UK). Last year, the Hoddesdon Club won, but who will have their club name engraved on the cup this year?

How did it all start I hear you ask? Well, David Barlow GS3PLE, a retired Marketing professional and former member of the Birmingham Press Club, who now lives in Cornwall, wrote to Rob Mannion G3XFD, Editor of PW, and myself, suggesting a special trophy for the best radio club magazine or newsletter.

Both Rob and I thought David's idea was an excellent way of encouraging the often (hard-pressed) magazine and newsletter editors. David Wilkins G5HY of Kenwood (UK) thought so too! So, a new competition was born!

So, let's see your club magazine, whether it be weekly, fortnightly or monthly, glossy, duplicated A4, PC produced or whatever. They're all of interest and yours could win!

To enter your club magazine for the award, all you have to do is to send in two of your most recent club magazines and details of how they're published to the PW Editorial Offices. Most importantly, remember to mark your envelope 'Spotlight Club Magazine Competition'.

The panel of judges (as last year) are: Dave Wilkins G5HY, myself, (Zoe Crabbs), Jim Bacon G3YLA, David Barlow GS3PLE and last, but certainly not least, Rob Mannion G3XFD. We're all looking forward to receiving and reading your club magazines, and as we want to receive more than last year's ten entries, you'd best get busy, the spotlight's now on!

Closing date is July 25th - so hurry!

Lagan Valley's Rally

The Lagan Valley Amateur Radio Society (LVARS) held its annual rally on 22 March this year at the Lagan Valley Hospital Recreation Room with the usual traders, Bring & Buy, bookstall and refreshments. Numbers through the doors were up on last year showing that interest in Amateur Radio is alive and well in Northern Ireland.

The President of the RSGB, Ian Kyle G1BAYZ (and a member of the club) made a presentation to QSL Manager Edward Barr, who does sterling work for amateurs. (The society would like to express their pleasure to acknowledge his contribution. Often, some of these services are taken for granted.)

Club events during the year were talks on air traffic control, expeditions to Antarctica, and coming shortly is a talk by a Banger member on his yachting adventure crossing the Atlantic!

However, perhaps the highlight of the year was the joint Irish Transmitters Society (ITS) and RSGB 'Shannon-Enn Armdhe'. Nine boats crewed by operators from clubs all over Ireland sailed along the Shannon and Upper Lough Erne activating many rare WAB and WAQ squares.

A total of 273 contacts were made by LVARS and the 'crack' was powerful, Crew members were David G4SNA, Norman G4ZSP, Victor G4LKG, Ed G1GKI, Seamus G4RKC, Ray G1NFH, Peter s.w.l. and Ron GI4NT0.

Further information can be obtained from Ron GI4NT0 on (01846) 619141 or E-mail at Pat.Ron@virgin.net

The President of the RSGB, Ian Kyle G1BAYZ, making a presentation to QSL Manager Edward Barr GI7FFF.

(to r) Ray G4NFH, Seamus G4RKC, David G4SNA and Ron GI4NT0.

Don't forget to send in two of your most recent club magazines to be entered into the Spotlight Club Magazine Competition. Closing date is 25 July 1997, so you'd better get a move on!

Club Reminders

The Blackwater Radio Society meets on the 2nd and 4th Tuesdays of every month at St. Patrick's GAA Club, Edenmore, Derry. Visitors are always welcome. For further information from Maurice (station call sign unknown) G3GKE on (048) 573456.

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*Discount for Scouts*  
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### Garmin GPS

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- **Moonlight Mini** Sleek, miniaturised design – only 5.5“ long. **£259.00**

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**Prices from £699.00**

- **ITT QUEST 100** **£699.00**
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**NEW** **ITT QUEST 300** **£POA**
(VIDEO CAMERA ADAPTABLE)

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**Next day delivery available. Quantity discounts available. Export enquires welcome. Trade customers call for best prices. All prices shown include VAT.**
This month Rob G3XFD is 'back on course' after discussing a useful source of components last time. This time he's explaining the basics of generating electricity by chemical means and if you've got yourself a test meter you can join in!

In the March issue of PW I discussed the basics of electron flow, and provided some comparisons using the 'pipe and tennis ball' analogy. This time I'm pressing on ahead to start explaining - in simple terms - the methods used to generate electron flow which are open to the everyday radio enthusiast.

Basic principles, the method that can be practically used by the enthusiast include acid (from the tin via solar panels), chemical (via groups off cells forming batteries), heat (via thermocouples) and from mechanically rotating sources ('generators' either in the form of alternators or 'dynamos').

And by far the simplest, but certainly not the safest (if you use corrosive acids as the pioneer tool is the 'primary' cell. So, let's take a look at a modern method of reproducing the same effects SAFELY to create a primary cell.

The Primary Cell

The basic principle behind the primary cell is simple - it's controlled corrosion, Fig. 1. The necessary electrons are provided by immersing a metal in a corrosive fluid (usually a fairly strong solution of acid) and the metal dissolves fairly rapidly and in doing so many electrons are literally liberated by being 'torn' from their established orbits (see page 18 March issue) or are moved so as to effect others (see Fig. 2 March issue).

Unfortunately, 'primary' cells have distinct disadvantages. Firstly they use dangerous chemicals (do not on any account try to re-create the idea using acids. They can cause extremely serious burns) and secondly they 'polarise'.

Polarisation is caused by the very same action which is distolling the metal. As it dissolves, the metal and acid act together to form gases (the gases formed depend on the metal and corrosives used). And microscopic layers of the gas bubbles then build up on the electrodes in the battery (particularly on the + (positive) plate) and eventually cause a complete cessation of electron flow.

If the gas bubbles are removed, the electron flow could start again, only to stop again when the gas builds up once more. It's a problem that we have to live with for the battery continues to be used without replacement of the fluid. 'Primary' cells should not be used by the public or students.

Fig. 1: Controlled corrosion behind the primary cell (see text).

Fig. 2: Cross section of a simple 1.5V dry cell.

Fig. 3: Making a simple cell is easy, all you need is an acidic fruit, a sliver of p.c.b. laminate and a galvanised nail (see text).

Fig. 4: Acid dissolves the metal 'shewing' electrons

Disulphide metals

Acid electrolyte

Fig. 5: Gas bubbles causing polarisation

Fig. 6: 'Galvanising' action

Anode Carbon rod

Zinc Case

Aode Carbon rod (with metal cell)

Zinc Case tip (tightly dissolving)

Galvanising agent (bonds to the gas)

Acidic gel electrolyte

De-oxygine agent (in the gas)

Lemon

Fig. 7: Feeding (plug)

Fig. 8: Doliparising agent (bonds to the gas)

Galvaninning agent (in the gas)

Lemon

Fig. 9: Copper nail or short piece of p.c.b. material

Fig. 10: Dissolving agent (bonds to the gas)

Lemon

Fig. 11: Anode Carbon rod (with metal cell)

Acidic gel electrolyte

Doliparising agent (bonds to the gas)

Galvaninning agent (in the gas)
CruDe but effective -

The No. 17 Transceiver

By Billy Williamson GM8NINIA

Silly Williamson GM8MMA reminds us that not all military radio sets were highly sophisticated and recalls in particular the simple but effective No. 17 Transceiver.

Any mention of military radio usually conjures up visions of highly sophisticated, state-of-the-art equipment. Many of the radios built in the 1940s are still capable of giving modern equipment a run for its money, albeit at much greater size and weight. Not all of the radios of the Second World War era were made to the same high standard, however. And surely one of the crudest of the time was the No. 17 transceiver.

Searchlight Stations

The No. 17 transceiver was designed for use between searchlight station headquarters and detachments. It was housed in a wooden box measuring 16 x 15 x 9.5in.

The simple transceiver used only two valves, one AR6 and one ARP12. It was powered by two 60V h.t. batteries in series and a 2V accumulator.

If a smaller version of the accumulator was used then the batteries could be fitted internally making the whole thing self-contained except for the antenna. Although it was hardly a walkie-talkie as it weighed around 40 pounds!

When the No. 17 set was used in receive mode the first valve acted as a self-quenched super-regenerative detector and the second as an audio amplifier. In the transmit mode the second valve was the speech amplifier and the first was a sort of oscillator and p.a. combined.

The transceiver could be tuned continuously over a range of 44 to 61MHz and the quoted output power was 0.3W!

Three types of antenna could be used with the No. 17 set. These were a dipole, a dipole with reflector or a rhombic antenna. These were stated as giving ranges of 5, 13, and 24km respectively.

It was possible to increase the range slightly by connecting the dipole to the so-called special dipole terminal, although the manual sternly warns that this may cause interference to other stations and should only be resorted to in an emergency. There was also provision for what the manual describes as 'pin earth small'.

Only Three

In contrast to the bewildering array of knobs that were fitted to many Ex-WW radios of
the Second World War period there were only three controls on the No. 17 Set. These were a tuning knob, a three position switch off/receive/transmit, and a 'regeneration' control. The dial was calibrated only in divisions so there was no indication of what frequency the set was actually tuned to. A wavemeter was available but from the brief details given it appears to have been an absorption type and so would not have been highly accurate.

The lack of calibration was perhaps less of a disadvantage than might be supposed. The selectivity of super-regenerative receivers was notoriously poor and the very basic coil arrangements must have allowed a large amount of transmitter splatter, so 'tuning-in' was probably not too difficult.

**Effective Practice**

So, just how effective were the No.17 transceivers in practice? In answer I know the receiver was quite sensitive. I used to be interested in long distance TV reception and used one to monitor TV Band I for Sporadic-E signals.

The receiver could be used today to monitor 50MHz but be warned even in receive the No.17 set radiates plenty of interference! But the simple circuit it used made it easy to tune to 70MHz.

I once tried some experiments on the 70MHz band. Contact was reliably maintained with one station at 4km, but another at 5.5km proved unworkable. Neither station was within line of sight.

Although often advertised in *Practical Wireless* and *Short Wave Magazine* it seems unlikely that the No. 17 Set was ever used by amateurs to any great extent. Apart from the inconvenient power supplies required, extensive modifications would have been needed to reduce the TVI to an acceptable level.

**Why Made?**

It's interesting to speculate as to why the No. 17 Sets were made in the way they were. They must have been cheap to produce of course, but the military have never been noted for trying to save money.

The speed of production may have played a part but it's likely that one of the main reasons was the need to conserve battery power. The 17 Set used only two valves, whereas a more conventional set-up of separate transmitter and superhet receiver would have required perhaps four times that number.

The advantages in battery economy are obvious and were probably thought to compensate for the relatively poor performance that the No.17 Set gave. Perhaps you know better? It would be interesting to hear from a '17' operator!

**Inside the No.17 Set, note the two valves and simple antenna coupling system.**

---

*Practical Wireless, July 1997*
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Practical Wireless, July 1997
We've had a handful of Procom (of Denmark) catalogues featuring their antenna and related products. The catalogues are: Portable Antennas, Marine Antennas, Base Station Antennas, Mobile Antennas, Filters and Dual-hand Mobile 50/44MHz Antennas. The Procom brand of antennas and ancillaries are available from Communication Technical Services Ltd., Unit 15 The Gatwick Metro Centre, Balcombe Road, Harley, Surrey RH6 9GA. Tel: (01293) 822602 or on FAX: (01293) 822602.

Welcome to AiA!

Welcome to another issue of 'Antennas in Action', the bi-monthly section of Practical Wireless featuring radio related items that start after the r.f. output socket of your rig: be it cable, feeder, accessory or antenna.

This month in 'Antenna Workshop', David Butler G4A5R tells you the advantages of, and how to integrate coaxial relays into your antenna set-up, while Jack King G4EMC says 'Old antennas never die'. To fill in the rest of course there's some A-i-A news, and I start 'Tex Topics' by giving away the first copy of More Out Of Thin Air, before turning to follow up ideas about previous 'A-i-A' articles.

But don't forget, to make 'A-i-A' successful, we want your ideas. The first idea has been rewarded. Will your idea be the next one? If you don't write in, it will never be!

8 pages of antennas

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'Tex' Swann G1TEX

Welcome to A-i-A!

Special Sale

Michael Hurst in our Book Store, after a tidy-up, has come across some copies of the ARRL Antenna Book (17th edition) that he thinks will be just right for readers of 'A-i-A'. As a special offer he's knocked £5.00 off the price of the book if you order it now. Instead of costing £21.95 +£1 P&P, readers can have a copy for £16.95 +£1 P&P - a saving of £5.00 over the normal price.

To get your copy of ARRL Antenna Book (17th edition) use the form on page 90 of this magazine, or call (01202) 659930 to place your order. Not to be missed at that price!

Three From W&S

Along with a new Tonna F9FT catalogue comes two items from the MFJ stables, all available from Waters & Stanton. The MFJ items are: the MFJ-969 Versa Tuner II antenna matching unit and the MFJ-1788 Tuned loop antenna.

The New Versa Tuner II is just right for the new breed of h.f.+50MHz rigs such as the Icom IC-706 and the Alinco DX-70. With coverage of 1.8 to over 50MHz the MFJ-969 can cope with 300 watts of power due to an air-cored multi-turn roller-coaster inductor. Complete with an inbuilt 4:1 balun for balanced feeder antennas and a dummy load the Versa Tuner II is available for £179.

On h.f. the MFJ-1788 loop antenna (developed from the successful MFJ-1786) covers 14 to 21MHz. With a remote control unit the huge butterfly tuning capacitor covers the bands with ease. Being capable of loft mounting the antenna is suitable for areas where no outside antennas are allowed. The MFJ-1788 with full mounting kit, costs £349 including the p.s.u. and control/k.w.r. meter box.

All of the above are available from Waters & Stanton Electronics, 22 Main Road, Hockley, Essex SS5 4QS. Or you can use their freephone number (0500) 737388.

The enormous butterfly capacitor on the MFJ-188 Loop Antenna.
FOLLOW JACK KING G4EMC’S ADVICE AND YOU TOO COULD BREATHE NEW LIFE INTO THA

old antennas never

I moved to my present location, about 17 years ago, and I also had the opportunity to make a few changes to my antenna system. During the alterations, I made up a couple of brackets and bolted them to the gable end of the house. The bracket supported a length of aluminium scaffold pole.

The scaffold pole supported the middle point of an h.f. trap dipole and a home-brew two element electrically steerable vertical for 144 MHz (2m). A little while after these changes, I was fortunate in obtaining an elderly rotator so, the old scaffold pole was changed to a six metre length of aluminium pole, and re-mounted on self-aligning bearings.

With the help of Peter G3JRP, a small home-brew two element beam for 14 and 28 MHz was designed and constructed. Until it was destroyed in a storm, the new antenna worked fairly well, despite its attention from birds (and the subsequent damage!). At the same time a home-made 144 MHz 5/8 vertical was mounted on a stub mast attached to the top bracket. Almost immediately a problem was noted, in that raising and lowering the pole with the antennas fitted needed not only a long ladder but also a good friend (or two) with a head for heights!

Storms and strong winds destroyed my original beam so, I decided its replacement would be a new Altron Mini-beam. This antenna worked quite well to VK whilst the sunspots were 24

Jack King G4EMC describes how, with perseverance and a little bit of luck, a ‘piece of junk’ has been resurrected to become an excellent antenna system.

The Mini-beam antenna was refurbished, and with a new rotator obtained at the Pickets Lock show, up it all went. The antenna farm grew - the new mast was supporting not only the Altron antenna but also a second-hand 8x8 beam for v.h.f. DX, with the home-brew 5/8 for 144 MHz on top for local working. The h.f. trap dipole was changed to a home-made G5RV, so that 1.8 MHz (Top Band) could be tuned, by strapping the feeder. Soon after, I had a letter from the local council. Someone had complained about the mast and beams. It was in fact no higher than before, but it was about four metres closer to the back door.

When the council official came to view the “Beastly thing”, and having realised that I’d been using the same beam for the last nine years or so, all was well. (Yes time flies when you are having fun!). The old bent scaffold pole was recycled by cutting it into two, one half concreted into a corner of the front garden, and the rest, minus the kinkly bond clamped to it support one end of the G5RV. I decided to apply for full (council) planning permission on all the masts, including a home-brew 1.25m high tilting mast in the back garden. All went extremely well, the only problem to be resolved was deciding what colour to paint the pole in the front garden!

Maidstone YMCA

Some years before, I had been a member of the Maidstone YMCA radio club, upon whose three section mast was mounted a three element h.f. beam. This beam, apparently had not been working very well, but one day, upon starting to raise the mast, the host cable snapped, and down it all came in a rush. Needless to say the rotator cage floor got a bit bent, and the 3-ele antenna tool it was decided to scrap the beam, and buy a new one. I remember helping to take the broken bits-apart, and watched as they were removed for scrapping.

Several years later, the member who had taken the ‘junk’ away, rang to ask if I wanted the bits of scrap beam he had just found under the weeds behind his duck pen. The bits hadn’t reached the scrap heap, and the surviving parts duly arrived, and were taken apart and carefully examined. Apart from quite a bit of mess, the elements looked straight, and came apart fairly well. The driven traps were taken apart, and found to have ‘Mosley USA’ covers on the ends.

A letter was sent off to Mosley USA to try to identify it, and get details. To this day, I am still waiting for a reply. Careful measurements of the trap diameters, lengths, etc., were sent also to Mosley UK who revealed that they thought it might be a Mosley Mustang T33. A booklet from Mosley containing a spares list and prices, showed that the same antenna and parts were still available. Since then I have found that the beam is actually the ‘MP’ (more power) version, with heavier gauge wire in the traps on the driven elements. It should certainly handle the power I can put into it!

All four driven element trap end seals were loose, and looked perished, some corrosion had taken place on the thin alloy trap tubes, both internally and externally. The coils themselves were...
OLD ANTENNA SYSTEM.

All complete, and the sealing varnish was all but gone. But on dismantling the antenna further, the self-tapping screws clamping the coils, were found to be rusty. This of course gave a high reading on an ohmmeter, perhaps that’s why it didn’t work too well before!

The traps, shown in Fig. 1, were left for some weeks against a hot radiator in the shack to thoroughly dry out, assuming that during the years under the weeds, damp could have penetrated into the formers, altering their resonant frequencies. The director and reflector traps, are designed to be hermetically sealed to prevent damp getting in and altering their resonant frequencies. The end seals on these were in a worse state than the driven ones, so each assembly was taken apart, thoroughly cleaned and dried in the same way. The screws on these too were rather corroded.

Once all the trap formers and coils were thought to be thoroughly dry, they were given a coat of light lacquer varnish, and the ends of the tubes resealed with outdoor silicon sealer. New trap end seals, which are now made from a thermo-plastic material were obtained from Mosley. These were softened in boiling water, as recommended and then moulded over the end of the trap tubes. The renovated traps should be weather resistant and ultra-violet light proof too. The alloy elements were well rubbed down with a very fine abrasive paper, and a stiff wire brush. All the old varnish and corrosion was removed. A light coat of grey primer has taken off the ‘shiny new’ look, which might catch the eye of passers by, who might take fright and make a fuss to the powers that be! A square block of insulating material was purchased, and a new driven element support made, tapping out the holes to eight millimetres. A new length of 1.25 in (32) diameter aluminium boom was purchased, and a new rectangular mounting plate was made from a piece of aluminium plate, of approximately 200x150mm. This new plate was drilled to take two suitable exhaust clamps and two, 50mm exhaust clamps to mount the beam onto the mast as shown in Fig. 2.

I had to wait some time, as the weather left a lot to be desired, before I could actually assemble it and try my luck! However, the opportunity eventually arrived, and now the resurrected collection of bits is in situ and working. A few minor adjustments need to be made to improve the matching on 14MHz, but 21, and 28MHz are quite respectable. The overall dimensions are as shown in Fig. 3.

Should you be fortunate in obtaining what looks like a load of scrap bits, from a junk sale, boot fair or wherever, take a little time to assess what you have and the possibilities of resurrecting it. As the title says, “Old antennas never die”. Being mostly made from aluminium, they certainly don’t rust away! I now have, to all intents and purposes, an almost brand new full sized three element beam for 14, 21 and 28MHz, at a far less cost than beams that are available new. With the Sun spot cycle at its lowest level at the present time, things can only improve.

Fig. 3: Basic dimensions of the old antenna that Jack G4EMC ‘inherited’. It turned out to be a Mosely Mustang T33.
David Butler G4ASR shows you how the humble antenna switching relay can have many clever uses.

antenna workshop

I'm going to take a look at one very important component that's often found in an antenna system. I refer to the humble antenna switching relay. Simple it may be but it can have clever uses!

A relay consists of an electromagnetic coil controlling a switching mechanism. A signal energises an electromagnet which attracts a hinged and spring-loaded element called an armature. Output contacts attached to, but insulated from the armature, are opened and closed by movement of the armature. There are many different types of relays of differing shapes and sizes. Some switch signal level voltages, some switch power (a.c. or d.c.) and some switch radio frequency (r.f.) signals. However, the type I'm looking at this time is the electromechanical coaxial relay specifically designed to handle v.h.f., u.h.f. and microwave frequencies.

Coaxial relays are readily identified as an r.f. switching device because, unlike other (low frequency) relays, they usually have coaxial sockets mounted on the body of the relay. Some types of relays have three sockets, other types (transfer relays) have four such sockets, although some relays don't have any sockets at all. This latter type is designed so that coaxial cables can be connected directly into the relay.

Coaxial relays are constructed so that they maintain a characteristic impedance to match the coaxial cable used in an antenna system. You may ask why is that? The answer is that if you were to use a normal d.c. switching relay in your v.h.f. antenna system the (voltage) standing wave ratio (s.w.r.) could become very high, producing reflections in the feeder system. This high mismatch may cause the transmitter amplifier to fail, particularly if it uses a semiconductor device. Similarly high values of s.w.r. are not recommended on the receive path as this may introduce additional front-end losses.

The most basic use of a coaxial relay is to switch an antenna between a receiver and transmitter. I can hear the question "why are 'normal' relays used inside most modern v.h.f./u.h.f. transceivers?" Well it's a juggling act, by the

David Butler G4ASR tells you how to choose a coaxial relay and integrate it correctly within a v.h.f. or u.h.f. antenna system.

Fig. 1: Using four coaxial relays with one single feeder line to the masthead unit and antenna.

Fig. 2: Using two separate coaxial cables saves two coaxial relays.

Fig. 3: Using a second small coaxial relay at the masthead gives a measure of r.f. protection for the low noise pre-amplifier.

Characteristic Impedance

Coaxial relays are constructed so that they maintain a characteristic impedance to match the coaxial cable used in an antenna system. You may ask why is that? The answer is that if you were to use a normal d.c. switching relay in your v.h.f. antenna system the (voltage) standing wave ratio (s.w.r.) could become very high, producing reflections in the feeder system. This high mismatch may cause the transmitter amplifier to fail, particularly if it uses a semiconductor device. Similarly
manu. ier, between an acceptable receiver performance and commercial profit. So, providing the relay has a vaguely strip-line construction (allowing switching is limited to low power they can get away with it.

Because of their low mismatch, coaxial relays are commonly used in weak signal (s.s.b. and c.w.) operations to switch parts of the antenna system in or out of circuit. So, if you intend to use a separate power amplifier (p.a.) or mast-head low noise amplifier (l.n.a.) you'll need an external coaxial relay to control the system. You also need to use it correctly to save blowing up your expensive l.n.a.

Other applications for coaxial relays include the switching of transverters in and out of circuit or even switching different v.h.f./u.h.f. antennas down one piece of coaxial cable.

**Important Considerations**

Whatever you intend switching, there are several important considerations you need to think about when choosing a coaxial relay. The factors are: impedance, v.s.w.r., isolation, insertion loss, power handling, switching time, c.f. connectors, coil voltage and auxiliary contacts.

Let's look at the impedance first. Most coaxial relays are normally designed with an impedance of 50Ω. But beware though, there are other types, such as 75Ω, also available (and often inadvertently bought at rallies)! There's always a residual mismatch introduced by the best relay. It can be caused by impedance discontinuities in the sockets and switching blade. The mismatch of a coaxial relay varies with frequency, but the closer to 1:1 (s.w.r.) in your chosen band, the better.

**Insertion loss** is defined as the loss measured between the two active ports in a switched path. The insertion loss also varies with frequency, rising as the frequency rises. Typical figures for a surplus relay could be 0.1dB at 50MHz rising to 0.8dB at 430MHz.

Obviously the lower the insertion loss the better.

The power handling capability, a very important specification, is often specified as the maximum power handling at a number of frequencies. As the frequency increases so the power handling reduces. For example, one coaxial relay currently advertised is capable of handling a power of 400W at 30MHz may handle only 20W at 1.2GHz. Be aware that there are two ways of specifying power handling, 'through power' and 'switching power' and there's a considerable difference between the two. A relay capable of withstanding in excess of 500W of through power may only have a switching power of 100W or less.

**Switching time**: Depending on your specific application it may be necessary to determine the switching time of the relay. This is the time taken for the relay to go from one position to another. It usually lies in the range between 10 to 100ms. Switching time can be important for some digital modes of operation. It is also a factor that needs thinking about if you are contemplating building a sequential transmit/receive changeover system.

**Connectors**: Quality connectors are essential to ensure adequate power handling and low s.w.r. ratings at the frequency in use, with N-type connectors a good choice up to the middle microwave bands. Relays with SMA connectors are an ideal choice for all microwave operation. That's because their design is normally optimised and consequently have a low v.s.w.r. in the microwave region. I think you should steer clear of coaxial relays that use BNC or SO239 connectors particularly if you are going to use

**All the coaxial relays shown are available from**

Piper Communications, 4 Severn Road, Chilton, Didcot, Oxon OX11 0PW. Tel: (01235) 834328.
Coil voltage: Many relays operate from a 12V supply which is very convenient when interfacing with current equipment. Some relays, however, particularly those used for microwave operation may have a 24V coil. So you should ask when buying a surplus relay. It's a fairly simple matter though of building a voltage doubler, but another cunning technique is to switch into the coil circuit a capacitor charged to a value of around 12V. This may be added (temporarily) in series with the 12V supply to the coaxial relay. The technique relies on the principle that although 24V is required to pull in an armature, the holding voltage can be considerably less.

If you can afford them, then I'd recommend that you obtain a coaxial relays that have an auxiliary set of d.c. switching contacts (tell-back contacts). These contacts can be used to control other parts of the station system during the switching process (see below for an explanation).

How To Integrate

Now it's time to look at how to integrate it into your antenna system. There are many combinations depending on whether you have a separate power amplifier and/or a pre-amplifier located at the antenna, in the shack or don't have one at all. One typical, but slightly messy configuration, is shown in the diagram, Fig. 1. It requires the use of four coaxial relays, although two may already be present in a commercial rig. Ensure that the coaxial relays around the l.n.a. rest in the straight-through path when in the un-energised state.

The layout in Fig. 1 has two advantages. If there's lightning static present (when you're not in the shack) it can reduce the risk of damaging the l.n.a. and should either coaxial relay or the l.n.a. should fail then you can still utilise the main feeder to keep you on the air until repairs can be made. One disadvantage of this system is that some commercial l.n.a.s are unable to handle power approaching the legal limit and additional front-end receiver losses will be added by the switching around the power amplifier.

The diagram in Fig. 2 shows an 'optimised' system that many serious DXers prefer to adopt. A high quality coaxial relay is located close to the antenna feed point. Very low-loss feeder, such as large diameter LDF5-50, is used on the transmit side to keep the power losses to a minimum. The l.n.a. is mounted at the mast-head, to eliminate feeder losses. The receiver feeder can now be slightly higher loss as all the front-end sensitivity and gain is provided by the pre-amplifier.

Even so, most DXers will still use a reasonably good cable for the receive path. Ideally the main station transceiver should have separate r.f. connectors for transmit and receive but this may not always be achievable. So you may need to use another quality coaxial relay in the shack to switch between the receive and transmit feeders.

Very Expensive

If you can afford it then buy a high quality relay with 60dB of isolation and 24W through power handling but be warned that it will be very expensive. If like me, money doesn't grow on trees, then you'll need to provide some additional form of protection for both your coaxial relay and pre-amplifier. This is particularly important if you are considering running high r.f. power on v.h.f. or even moderate power on the u.h.f. or microwave bands. The diagram, Fig. 3, shows one method of protecting the l.n.a. from excessive r.f. power.

The main switching relay A, needs to be able to handle the through r.f. power you are going to apply to it. Relay B, can be very small (as it doesn't handle any power) and is used to provide the additional isolation required to protect the l.n.a. A 50W load is connected to one port so that when transmitting the l.n.a. input is correctly terminated. To achieve maximum isolation with the two relays you need to join them together with a cable one quarter wavelength long at the frequency band in use. The actual length isn't too critical but you'll need to consider the velocity factor of the cable and make some estimate of the effective lengths inside relay A and relay B.

To protect your main coaxial relay (and l.n.a.) you must never switch between transmit and receive with high r.f. power present. This is called 'hot' switching and failure to observe this requirement will lead to arcing and serious damage to the relay contacts. In a typical station consisting of a transceiver, a power amplifier and changeover relay (often co-located in the p.a.), when you push the press to talk (p.t.t.) button on your microphone or hit the morse key everything flies into action simultaneously. Power is being generated before the coaxial relay contacts stop bouncing. In many cases r.f. will be present before the relay has actually closed. Is it any wonder relay contacts are burned and the pre-amplifiers often become dummy loads!

Sequential Switching

A method of control called 'sequential switching' should therefore be used. When changing from receive to transmit events should occur in the following sequence. Turn off the receiver, change over the coaxial relay(s), turn on the drive and energise the amplifier. Similarly when going from transmit to receive the amplifier should be turned off first. Then the drive disconnected, the coaxial relays changed back and finally the receiver turned back on.

The circuit in Fig. 4 shows a very simple sequential control system. It has no fail safe mechanism to confirm that the coaxial relays have changed over but it does provide separate switched 12V feeds to the receiver and transmitter (if required) and controls the coaxial relays and amplifier in a sequential way. The coaxial relays are energised on receive as I mentioned earlier.
IN THIS MONTH’S ‘TEX TOPICS’ I HAVE THE PLEASURE OF GIVING AWAY THE FIRST COPY OF MORE OUT OF THIN AIR TO DAVID GOLZW FOR AN IDEA FOR A SIMPLE DIPOLE ANTENNA FOR V.H.F. WORKING. LESS PLEASURABLE THOUGH, IS THAT I MUST ADMIT TO A SLIGHT ‘TERMINOLOGICAL INEXACTITUDE’ (NO! NOT A HOUSE OF COMMONS FIB, BUT THE WRONG USE OF A TECHNICAL TERM). I FIND A BOOK THAT I CAN RECOMMEND, AS IT ANSWERS MANY QUESTIONS ON BALUNS. AND FINALLY I ALSO HAVE TO ASK FOR HELP ON A LOADING COIL QUERY. - SO READ ON.

Back in the first ‘A-i-A’ in January of this year I said that I would be giving away copies of More Out Of Thin Air to the authors of the best idea published each month. And it is my pleasure to be sending a copy out to David Riddick Golzw of St Albans for his simple idea for reusing telescopic antennas from portable radios. The general idea is shown in Fig. 1. All you need is a 35mm film canister, which you can probably get by the bucketful from your local film processors, and you can probably get by the bucketful. The T2FD Antenna

The article on the T2FD antenna, by Glen Ross G3MWIR, in the March 1997 issue of ‘Antennas in Action’ has created a heavy postbag, which pleases me as it shows that the section is being read. Keep up the good work! The T2FD antenna has been around since the late 1940s when Capt. G. L. Countryman W3HH described a series of experiments that he, and others, carried out on the Terminated Folded Dipole. W3HH’s original article appeared on page 34 of QST for June 1949.

I’m indebted to Roy GW3KZW, for photocopies of two subsequent articles about the antenna, along with results of his own experiments. “However, I must say that when I tried a T2FD, constructed to the given criteria, at any given frequency, the performance on both TX and RX was some 30dB down, relative to a plastic banana, despite the claims”. That would seem to put the opposing view most succinctly I believe - unless you know better!

Whilst on the subject of the T2FD antenna, I had letter from John Heys G3BDQ, who has also covered the T2FD antenna in his Practical Wire Antennas book noted that he managed to get hold of an ex-services 400Ω resistor although it was expensive. But he had also made up a load using 24 watt carbon film resistors that had coped well with S.S.B. transmissions of 30W. He also said that using 450Ω ladder twin and a balanced a.t.u. was the preferred option as far as he was concerned.

John also mentioned that another ‘easy’ possibility was to use 600Ω twin feeder and a 600Ω load, again using a balanced a.t.u. He said that he wouldn’t recommend using lower resistance loads as their values become critical. John also confirmed that the values shown in Fig. 2 of Glen’s article are those suggested in 1953 by W3HH himself, and that coaxial cable shouldn’t be used to feed the antenna directly. My thanks for the long letter John, and yes I could read your scribble.

Another article that has generated much post was the ‘High as a Kite’ project a balun is desired as the antenna is balanced, and that a balun does not necessarily provide an impedance transformation. Conversely an impedance transformer does not provide conversion from balance to unbalanced. And I have to agree with you Tony that in a technical hobby the accuracy of a statement (or article) is a must if it is to be used to inform. Mea Culpa! That one should not have slipped through.

The same ideas were penned by Tony G3NXC, who noted that a similar item in another article by John Heys G3BDQ, in the same issue was correctly termed as an impedance transformer. Tony mentioned that in the ‘High as a Kite’ project a balun is desired as the antenna is balanced, and that a balun does not necessarily provide an impedance transformation. Conversely an impedance transformer does not provide conversion from balance to unbalanced. And I have to agree with you Tony that in a technical hobby the accuracy of a statement (or article) is a must if it is to be used to inform. Mea Culpa! That one should not have slipped through.
Now An E-Mail

An E-mail from Peter G4CRY arrived on my desk with a variety of comments and queries for 'A-i-A'. In the E-mail Peter says: "I think I understand why we need a balun and in theory you should use one when feeding a dipole with coaxial cable but I find that there does not seem to be any need the dipole works very well without it. If I was using coaxial cable from the TX out to the garden and then balanced feeder up to the dipole, I would use a balun where the twin feeder and coaxial cable join". That is the correct theoretical point to fit a balun Peter, but it depends on the actual location and surroundings that can distort the antenna radiation pattern as to whether it make very much difference at any particular location.

Peter then says: "Now I know, from the readings from my MFI-259 antenna analyser that the impedance of various antennas at resonance can be anything but 600 (or whatever) so you might need either an impedance transformer or a balun or both to feed such an antenna. I have seen designs for a 1:1 and 1:4 antena but I see there is a design for a 1:6 balun in the May issue. Can baluns be any ratio at all? If so, how do I design one?"

Highly Recommended

In answer to Peter's question (and bearing in mind the comments made by Tony G3JXG) baluns may have any impedance ratio and may be designed to give (almost) any transformation ratio desired. I can highly recommend the book Building and Using Baluns and Ununs by Jerry Swik W2FM. This is a splendid book for anyone interested in this type of matching device. With more than 120 pages of data and designs to suit most circumstances. And judging by the fact that most of the designs feature a ferrite core of some description, Jerry doesn't think that saturation is going to be a problem.

Peter's other question "Would it be possible to build a variable ratio balun" is a splendid one though. The answer - Yes, but it would be difficult keeping the balancing correct as the turns ratio was changed. I suppose that the nearest thing would be the variable transformers described by Anthony Langton GM4HTU on pages 58 and 59 of the November 1996 issue of Practical Wireless. But even the variometer has a limited 'transformation' ratio available. The variometer however, has a balanced output though, by virtue of the the fact that the secondary winding is completely separate from the primary.

Another problem Peter is experiencing is with a half wave vertical for 14MHz that was feature in John Heys' Book Practical Wire Antennas. After adapting the 'Jumbo lay' design Peter is having great difficulty getting the tuned feeder part to work properly. Perhaps one of our readers may have an answer and would like to share it with us all. Over to you readers!

Base Loading Coils

'Antennas in Action' reader Gordon Lines G5ORH has asked for some information about base loading coils on low-band vertical antennas. He asked specifically "How do you calculate the inductance of a coil (in pH) to bring a short antenna combination back into resonance at a particular frequency?"

And I have to admit Gordon I've come up against a brick wall here. All the books I've consulted (and there are many in my library) all confirm that a loading coil placed in the lower part of any length of antenna element will alter its resonant length - but none of them are definitive. But first let's look at the problem itself.

One of the main problems of operating on the lower hf. bands is that few amateurs have a large area to put up full sized vertical antennas. By making an antenna seem longer than it is. A 'capacity hat' at the top - or a variometer however, has a limited 'transformation' ratio available. The variometer has a limited free-space). But I found that antenna idea you've 'been using for years'. You never know it might get you a "More out Of Thin Air for an equivalent value voucher to spend in the PW Bookstore if you already have a copy. So get writing. 

Building and Using Baluns and Ununs
Practical Designs For The Experimenter

Practical Designs For The Experimenter

by Jerry Swik, W2FM

by Jerry Swik, W2FM
LONGLEAT -
40 Years & Counting!

This year marks the 40th anniversary of the first Longleat Rally. And it’s remarkable to think that many of the people who organise and attend this event - present Manager included - were not even born when it started!

Back in the late 1950s, the event originally planned was termed a ‘Mobile Rally’. Essentially, it was a pleasant summer’s day outing for Radio Amateurs who used to operate ‘Mobile’ from their cars. In those days, this usually meant ‘Top Band’ (1.8MHz) operation.

Early photographs of the event show the large antennas which are necessary for 1.8MHz mobile working. But over the years, mobile operation has moved almost entirely to v.h.f. and u.h.f., and it is now quite rare to see people arrive with mobile l.f. antennas.

The size of the attendance at the early Longleat Rallies was not great. 50 or 60 to start with. Attendance during recent years always exceeds 5000…quite a change.

A shower of rain at one early Rally forced everyone to shelter in the only tent on site - the flysheet of Ted G3JMY’s frame tent! The Raffle table was in there too!

Splendid Antenna

We had a splendid antenna for our Top Band talk-in one year. It was a half-wave of aircraft dirighy antenna attached to a 4 foot diameter weather balloon.

When it was packing up time, Vic G3CHW swiftly unhitched the wire from the a.t.u. I was outside the tent at the time, about to reel in the wire. To my amazement, and the hilarious incredulity of the surrounding onlookers, it was snatched from my fingers by the balloon, which swiftly disappeared in the direction of France!

We used to run a ‘Concours D’Elegance’ for those mobile operators with pride in their rigs. Vehicles of all types from bikes and motor scooters to Jaguars and Bentleys were presented.

Marks were awarded for originality, appearance, neat arrangement of gear (few, if any visible wires, etc.) ergonomics of controls and a few more which escape me. Some really impressive mobile rigs were entered. The proud winner received his prize in the late afternoon, when Raffle and other prizes were presented.

Travelling Farther

There was, at first, a prize awarded for the amateur travelling the furthest to attend the Rally. It started quite modestly with the Midlands, then Scotland.

The ‘travelling furthest’ award seemed to peter out when it was seen that amateurs from say, Canada, etc., had clearly not travelled that far to attend the Rally. However, there has always been a recognition of the attendance of amateurs from distant places.

Some very enterprising amateurs turned up with unusual antenna systems. One in particular I remember was that of Chris G3GYQ. (Harry G6GN’s son-in-law). It was a stacked omni cloverleaf for 144MHz based on a QST magazine design - very eye-catching.

Some of the loaded whips for 1.8MHz were auto-tuned, using motor driven, sliding contacts on the huge loading coils. There was evidence of painstaking work at a time when craftsmanship was the driving force.

Other Attractions

There were ‘other attractions’ and games for the children to play and things for them to do at many of the rallies. There was an ‘Electronic Maze’ (a corkscrew of copper wire and a metal loop that had not to touch as it was guided along the corkscrew).

There was also a ‘Treasure Hunt’ - put a peg in the ground inside a marked out rectangle. The ‘Balloon Race’, with small hydrogen-filled balloons was always popular. One balloon landed in France, with a prize awarded to launcher and finder.

In the early Rallies, Raffle prizes were mainly donated by firms in the Bristol area. Lord Bath assisted at those relatively informal Rallies by presenting the prizes at the close of the Rally. It was always a very laid back affair in those days.

When the time came to cope with really big attendances, the Committee had to devise a more satisfactory method for distributing the tickets for the Raffle prizes, which by then had greatly increased in number and value. Some 1000 tickets were necessary.

Eventually, the present system was

By Shaun O’Sullivan G8VPG and Ted Halliday G3JMY

Present Rally Manager
Shaun O’Sullivan
G8VPG and Founding Committee Member Ted Halliday G3JMY

Looking back on 40 years of the ever popular Longleat Rally and providing an insight into the planning work ‘behind the scenes’.

Far right: Celebrating 25 years in 1982. The Marquis of Bath presenting a commemorative plaque to Founding Committee Member Harry Gratton G6GN.

The business side of the extremely busy ‘Brig & Bay’ marquee, showing helpers G3ECS and G4FMH during the 1989 Longleat Rally.

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introduced. It involved every Committee member (‘Uncle Len’ G4UIZ was Chairman) in many hours of fitting five unrelated tickets into each envelope. The winning numbers used to be ‘invented’ by the Radio Amateur and their families.

It was realised early on that a separate Raffle was required for the ladies. One such Raffle resulted in a lady winning a somewhat flimsy nylon garment. When the ticket was drawn, the embarrassed Vic offered to pay for the garment! Decorum was satisfied by a polite refusal!

Heavens Gate

The top of the hill by the main entrance to Longleat (Heavens Gate) had been the site for many of the Rally Talk-in stations. While on the topic of talk-in stations, I remember one year when I ran a 3.5MHz talk-in from my caravan. The antenna was a quarter-wave vertical in the shape of a 50 foot ‘Telomast’ with a 17ft whip (derived from an Army field antenna) on the top.

The antenna was, without doubt, a very satisfactory installation. The wire fence around the Hippo pen was used as an untuned ground plane!

Longleat’s Lions

There was always plenty to interest everyone at the Longleat Rallies and I remember when the Marquis of Bath first introduced the Lions, with the attendant ‘white hunters’.

The Marquis of Bath was on the gate himself (taking the money) when we went through. The antics of the Morris Dancers on the side lawn, near the lake. The House was the focus of a lot of attention (that was where the only toilets were located for one thing). Among the competitions I remember was the ‘Top Band Aerial Field Strength Competition’. This was devised and run by G3CHW. The competing station would radiate from Heaven’s Gate, having been entered for the contest via the talk-in. Vic would be down on the site, with suitable equipment to measure the field strength of the signal.

When the winner was announced it resulted in a rush of amateurs to view the loaded vertical on the winner’s vehicle. I did wonder on a few occasions how many watts of power had actually been generated to produce some of the amazingly strong signals!

Trade Show

The trade show at the original Rally was very small and was not intended to be the main attraction. As time progressed, the trade show has increased enormously in size and scope, and the event is now termed as an Amateur Radio Rally.

However, the original intention of providing a pleasant summer’s day out for Radio Amateurs and their families was never forgotten. Longleat is a wonderful venue for a family expedition, with its pioneering and now famous Safari Park - something which the Rally preludes by several years. It’s not too long before people attend the Rally every year and take pride in recounting how they ‘haven’t missed it for 20 or more years’. Many of the local B&B establishments take repeat bookings years in advance, assisted by the fact that the event is held consistently on the last Sunday in June each year.

Camping & Caravanning

Another popular facet of the Rally is the camping and caravanning facilities, and it’s fortunate that visitors are able to set up camp immediately adjacent to the Rally for the entire weekend. On Friday night, the makings of a small mobile village begins to assemble, and many a barbecue and party is held by old friends who meet on the campsite each year.

Like most (but not by no means all) Rallies, Longleat is organised by a voluntary group of Radio Amateurs for the benefit of their fellow amateurs. The proceeds of the event help to finance the activities of the RSGB Bristol group, including their increasingly successful Contest Group.

However, much assistance is obtained from the many Clubs in and around the Bristol area, and some of the proceeds are distributed to these. Other Groups, such as Repeaters and Beacon keepers, RAIBC and the St. John’s Ambulance Brigade (who provide the first aid) have also received grants.

Planning The Event

The work of planning the event begins in the Autumn. Having confirmed dates and the format of the event with the present Lord Bath’s Agent, the organising committee arrange contracts for the major items of equipment to be hired.

The hire items include marquees, mobile toilets, tables, chairs, public address system, crowd barriers, generator, etc. These represent the major cost of organising the Rally and need to be fixed before exhibition and admission fees are set.

The major income to cover the costs comes from exhibition fees paid by traders. But smaller amounts are also derived from visitors admission fees, commission from the Bring & Buy stand, on-site caterers, etc.

Running a large event is no small undertaking, with costs running well into five figures and hence the financial arrangements need to be carefully considered.

In January, a large mail shot is sent to the traders. We canvass about four times as many traders as usual in March. This work is undertaken by someone who is well known to many visitors, the Bookings Manager Gordon Lindsay G0KGL, assisted very capably by XYL Maureen.

Prior to Gordon, yours truly (Shaun GBVPG) undertook this role for some years. And I was, in turn, succeeded by Brian G0FABB, who for 11 years was known as Mr. Longleat!

Arranging a large Rally is a demanding task, which requires considerable commitment of your personal time. The number of telephone calls received can easily exceed 20 a day, and despite all our pleas, these are not always at very sociable hours. The record for lateness is 11.30pm, and for earliness, 6.20am!

Computer Equipment

Many visitors to Rallies comment on the amount of computer equipment now being sold. And it’s interesting to see how the development of computers has been mirrored by their use in managing the event.

In the early 1980s, an attempt was made to use the then popular simple word processors. Despite using a large amount of the expensive little rolls of especially coated paper that the primitive Sinclair printers demanded, the task was beyond the machine.

In the late 80s, the task was successfully implemented on my Amstrad CPC machine. These worked well and saved an enormous amount of manual addressing and writing of letters.

When Gordon took on the role of arranging bookings, the application was transferred to a PC. Fortunately, we are lucky to have a number of Computer Professionals amongst the committee members.

The ‘computer professional approach’ provides many of the features of a professional marketing system, with sharply produced letters and the ability to provide the committee with regular reports. Traders booking late can be sent reminders at intervals.

Although the Rally is arranged by volunteers who might be correctly described as Amateurs in some respects, we cannot afford to be anything but professional in our management of the event.

As far as computers at Rallies are concerned, their presence simply reflects the demand which is present. Many Radio Amateurs have enthusiastically embraced computers as an extension of their hobby and Radio oriented computing is a significant sector of the home computer market.
However, there are still many companies selling 'pure' Radio products. In the early days of the event, these dominated the trade show.

**Government Surplus**

The 1950s and 1960s were the era of the Government surplus equipment and many traders sold ex-MOD equipment for a fraction of its original cost. This formed the heart of most Amateurs stations.

These days, Government Surplus equipment is quite rare and its collection and restoration has become a specialist interest of the hobby. And while on the subject of restoration and, I should mention that for some years now, the Rally has been pleased to host an exhibition from the well known Journeaux Collection of historic radio equipment.

Throughout the 1960s the growth of s.s.b. produced a new range of equipment and techniques that was less suited to home construction and modification of Government surplus equipment. The original dominance of British and American manufacturers was replaced by the Japanese names that we are now so familiar with. Alongside these, the large national dealers developed and these companies usually have the largest stands at most Rallies.

**Bring & Buy**

The largest stand at Longleat is always the Bring & Buy. One large marquee is devoted to this, and the sea of faces pressed up against the crowd barriers around it testify to its popularity.

For those volunteers that run the stand, it’s a very high pressure task and many of them are so completely absorbed that they miss the Rally altogether! Large queues build up as soon as it opens, with all manner of equipment being booked in for sale.

The stand operates on a commission basis, with 10% being deducted from goods sold. Over recent years, about 400 items are sold from the stand, with a total value in the region of £12,000.

Although the Rally can be planned by a handful of people, a much larger number are needed over the weekend on which it’s held. Saturday is preparation day.

During the previous four days, contractors will have erected the marquees and delivered the equipment. In one day, we will then have to set up the trader’s tables, fence the site, erect signs and position the large number of outside traders. Besides the Radio Rally, we also now feature a Craft Fair, an attraction that has provided popularity with Radio Amateur’s families.

**Loyal Supporters**

The RSGB City of Bristol RSGB Group are very fortunate that many of the Amateur Radio clubs in our area are loyal and enthusiastic supporters of the Rally. Without their help, it would be impossible to organise the event. In return for their help, a proportion of the proceeds from the Rally is donated to Clubs, in proportion to help received from them.

We have no doubt that everyone who has attended will have their own memories of that Rally of Rallies......the Longleat Mobile Rally! So, if you have not yet been to Longleat, why not pay us a visit this year?

We look forward to seeing friends old and new at the 40th Longleat Amateur Radio Rally to be held on Sunday 29 June 1997. The show opens a 9.30am - so don’t be late in case you miss some of the 40th anniversary fun!

**Happy 40th Birthday Longleat Rally**

Practical Wireless & Short Wave Magazine would like to congratulate The City of Bristol RSGB Group as they prepare for their 40th rally on

**Sunday June 29 1997**

We are proud to sponsor the 40th anniversary rally and as usual we’ll be there in strength. So come and chat to the editorial teams during the rally on our usual stand where there’s a great welcome waiting for you!

We don’t have any lions, nor penguins but we have got Kathy Moore, Rob Mannlon G3XFD and a Swann (in the shape of Tex Swann G1TEX) - who’ll be delighted to help you in any way they can!

So....come and join us at Longleat’s ‘roaring’ 40th rally!
Gordon King G4VFV takes a look at an interesting trio of Kenwood instruments which he thinks could provide an economical way of obtaining that luxury ‘dream machine’ - a Spectrum Analyser.

Kenwood’s Test Bench

Gordon King G4VFV

By Gordon King G4VFV

The formation of a spectral display, showing a minor response of -45dBm at 1.75MHz, a major response of -17dBm at 3MHz and a 'noise floor' around -50dBm.

A fascinating aspect of our hobby is the display of signals and their harmonics over a particular frequency spectrum on the screen of a calibrated cathode-ray tube. The facility is of tremendous help in designing and working with radio communications equipment.

Of course, the ideal becomes possible with a suitable spectrum analyser. But instruments of this kind are generally beyond the reach of most of us because of their elevated price, often in the tens of thousands of pounds region.

Nevertheless, if you have a reasonable oscilloscope in the shack then it's possible to obtain quite commendable displays at a remarkably lower outlay merely by hooking it to Kenwood's SAE 1001 Spectrum Analyser Adapter. This will set you back less than £600 but will provide many happy and technically rewarding hours of interesting spectral investigation.

In addition to the adapter, I was also sent for review and application evaluation Kenwood's 20MHz dual-trace oscilloscope, the CS-4125. This partners (like a glove!) the SAE 1001, the connected pair having exceptional potential.

Kenwood's FCE 1131 handheld counter, with a 5Hz to 1.3GHz capability, also arrived at the same time. Although this is not essential for the primary task, it does represent an attractive addition by allowing accurate calibration of the test set-up and frequency identification of the signals.

Spectrum Analyser

A spectrum analyser is basically a radio receiver whose output, rather than driving a loudspeaker, causes the trace of an oscilloscope to deflect upwards (in the Y direction) by an amount dependent on the strength of the tuned signal.

Deflection is usually arranged to be logarithmic, rather than linear, to cater for as wide as possible dynamic range, typically 70dB or even more. The Y sensitivity often corresponds to 10dB per vertical division of the display's graticule, but on some instruments it can be more or less than the 10dB.

As the scanning spot of the oscilloscope moves from the left to the right linearly across the screen (in the X direction) so the ‘receiving’ frequency is caused to increase in synchronism. The horizontal sweep is calibrated in terms of frequency by horizontal divisions on the display's graticule.

So if there are (let's say) ten divisions and each one corresponds to 1MHz, then the sweep would rise linearly to 10MHz from its starting frequency. It would then return to commence the scan again.

The formation of a spectral response can be gleaned from Fig. 1. Here the horizontal scale goes from zero to 4.5MHz, with 0.5MHz per division, while the vertical scale goes from 0dB (dB milliWatts) down to -70dBm, with 10dBm per division.

As the analyser filter is swept from zero frequency at the start upwards, the system 'noise floor' can be seen around -50dBm until the filter 'tunes' the main signal at 3MHz which causes the substantial response peaking around -17dBm.

A much smaller response around -45dBm can also be seen at 1.75MHz, rising just above the noise floor. (This isn't a display from the Kenwood pair, but purely an indicative example from my own spectrum analyser).

Analyser Adapter

The Kenwood SAE 1001 Analyser Adapter has a frequency sweep at least from 400kHz to 1GHz. It has a 10-turn centre frequency control with the frequency being indicated by a clear liquid crystal display (i.e., in) a 20 x 45mm window.

The adapter is switched on/off
from the mains supply by a press button. A similar button activates a calibration marker which yields a fundamental of 50MHz and a multiplicity of harmonics at 50MHz intervals virtually to the instrument's upper frequency.

Another knob provides adjustment of scan width from 10MHz (1MHz per division on the 'scope') to 1GHz (100MHz per division on the 'scope').

A third knob adjusts the scan rate from 0.5 milliseconds per division to 35 milliseconds per division. This is required so that the scan rate can be reduced to ensure that the response amplitude is not being impaired by the rate being too fast for the filter to track. (The swept filter has a -6dB bandwidth of nominally 250kHz.)

A couple of front panel BNC sockets provide oscilloscope drive. They partner perfectly with a 'scope whose X and Y sensitivities are both 500mV per division, such as on the Kenwood CS-4125.

There's a third BNC socket which accepts the signal input across an impedance of 50Ω. The amplitude range is from 0dBm down to -70dBm, corresponding to 225mV down to 70pV potential difference (pd) across 50Ω. The adapter will accept a maximum of 10dBm (corresponding to 10mW or 707mV pd across 50Ω).

The amplitude response is logarithmic and with the Kenwood 'scope the vertical display corresponds to 10dB per graticule division. But, of course, a more magnified amplitude can be achieved merely by stepping up the Y input sensitivity.

The calibration marker at 50MHz corresponds to an output of 30dBm. However, the harmonics vary in amplitude depending on their order.

**Attractively Presented**

The SAE 1001 is attractively presented in a dark grey enclosure and light grey from panel with an adjustable plastic stand. Dimensions are 360mm width, 88mm height and 235mm depth, excluding handle and feet.

Main powered, the input to the SAE 1001 via a three connector socket at the rear and it runs on either 230V or 115V mains (50/60Hz), which is adjustable internally. Power consumption is 10VA and Kenwood state that it’s EMC compliant.

**Dual-Trace Oscilloscope**

The Kenwood CS-4125 as already briefly mentioned, is a dual-trace 'scope and makes an excellent partner for the spectrum analyser adapter. This partnership is significantly aided by the 'scope's X-Y facility, which is activated by the press of a front button, allowing direct connection to the adapter.

In X-Y mode the channel 1 input provides the Y or vertical deflection, while the channel 2 input provides the X or horizontal deflection. For spectrum analysis, therefore, the X output of the adapter is connected to channel 2 and the Y output to channel 1, with the X-Y button depressed.

Vertical sensitivity on both channels in 'normal' mode is switchable from 1mV to 5V per graticule division by a pair of 12 position attenuator switches. Input impedance corresponds to 1MΩ across 22pF.

The scope's frequency response is up to 20MHz to the -3dB point from 5mV upwards and to 5MHz from 1 to 2mV attenuator positions. The low end goes down to d.c. or to 5/10Hz in the AC position of an associated channel switch, each one of which also has an Input Earth position, which can be handy.

Horizontal sensitivity is the same as the vertical sensitivity as also is the input impedance. But the bandwidth is only up to 0.5MHz and down to d.c. or 10MHz (-3dB).

The X-Y phase difference is no more than 3° up to 50kHz. This is an excellent parameter when it comes to the display of Lissajou figures and phase shift measurements.

A 20 position rotary switch gives sweep times from 0.5ms to 0.5s per graticule division. This works in conjunction with a Fine control.

The sweep can be arranged either to free run without an input signal or to trigger with a signal. There's the usual external trigger socket, of course.

Trigger source is selected by a five position switch. And a similar switch selects the Trigger Mode: Auto, Normal, Fix, TV field and TV line, the latter two useful for TV signal examination.

There are also controls for Triggering Level and Slope Gain.

**Brightness and Focus**

(but no 'astigmatism' adjustment on the front) and Vertical and Horizontal position. A connector at the front delivers a 1kHz square wave at an accurate amplitude of 1V peak-to-peak and is useful for calibration.

A Vertical Mode switch provides for Channel 1, Channel 2, Alternate, Chop and Addition. So, in some ways, the 'scope will perform as a dual beam instrument.

Three front panel BNC sockets accept Channel 1, Channel 2 and trigger inputs and a pair of similar sockets at the rear cater for Channel 1 output and Z axis (this allows the beam to be intensity modulated, including the possibility of TTL level intensity modulation).

The CS-4125 comes complete with a precision high impedance probe with a 'one' and 'ten times' switch. This is useful for signal chasing where lead capacitance could be important.

The cathode ray tube (c.r.t.) face measures around 80 x 100mm. And a calibrated graticule is provided with ten horizontal and eight vertical divisions (80 10mm squares) with sub-divisions and percentage lines.

The instrument is enclosed in a pale blue cover with a grey front panel. The carrying handle seconds as a useful external trigger socket of the usual type.

Power consumption is about 30W. Dimensions are 300mm width, 140mm height and 415mm depth overall. Weight is around 7kg.

**Concluded on page 26**
Remarkably Portable

The Kenwood FCE 1131 is a remarkably portable counter. It's not much bigger than a hand-held calculator and has excellent specifications.

Two inputs are provided. Input A has a measurement range from 5Hz to 25MHz across an impedance of 1MΩ/25pF and an input sensitivity of 15mV over 10Hz to 20MHz. And Input B which has a measurement range from 20MHz to 1.3GHz across 50Ω impedance and an input sensitivity of 10mV (r.m.s.) over 20 to 700MHz and 50mV to 1.3GHz.

The FCE 1131 has a large 11.5mm eight digit liquid crystal display (I.C.D.) and the electronics are based on the reciprocal counting technique, which is notable for high resolution. The timebase features a 10MHz crystal oscillator which has exceptional stability.

Measurement time is indicated on the I.C.D. and can be set for 100ms, 1s or 10s. It's normal for seven significant digits of result to be obtained per second.

To ensure that low frequency measurements are not affected by high frequency signals or spurious signals, the switching in of a low pass filter (50kHz cut-off) is achieved by depressing the time and hold button simultaneously. By pressing the hold button alone, the most recent reading can be 'frozen' on the display.

The FCE 1131 also allows the measurement of period over 5kHz to 25MHz with a resolution of 10 to 7ns (nanoseconds) to 1μs depending upon the measurement time and input frequency. Measurement time is selected by pressing a button labelled Time adjacent to the hold button.

The period mode is also activated by a press button and the input in this case is fed to socket A. Both sockets are of the BNC type.

Although the instrument can be switched on and off normally by a slide slider switch, it can be brought into operation for about 15 seconds before automatically switching off again by pressing a frequency or period button. This is useful for battery conservation.

The I.C.D. also indicates the selected mode, and if the result calls for more than eight digits an 'overflow' arrow comes up on the display. There's also an indicator denoted 'Trig' which appears when a signal is detected and the counter is ready for measurement.

Power is provided by a 9V PP3 alkaline battery which goes into a small compartment at the rear of the instrument. Typical life span is 12 hours, but when the battery life falls to 10% remaining, the indication 'Bat' appears on the I.C.D.

The counter meets the requirements of the appropriate EMC (electromagnetic compatibility) directive. It's housed in a nicely styled plastic (ABS) case, which has a lift up bench stand at the back. Dimensions are 81mm width, 178mm length and 30mm depth. Weight is 190g excluding battery.

Potent And Low Cost

I found it remarkably easy to connect the 'scope and spectrum adapter together to yield a potent and low cost set up. The diagram in Fig. 2 shows the X-Y button on the 'scope which facilitates the partnership.

The illustration in Fig. 3 shows the two instruments connected up on the test bench with a 50MHz signal applied to the SAE -1001 and tuned to screen centre. I then introduced other signals to produce 'side frequencies', while the zero starting response can also be seen aligned to the far left vertical graticule line.

See Special Offer on page 39 of this issue to get your own 'test bench trio' at a really special price.

The little group of closely spaced responses on the extreme right of the screen represent the Band II f.m. radio signals from my local transmitter. I found that it was possible to resolve the subcarriers on some of the f.m. signals by zooming into just one or two of the signals. So that the subcarriers occupied the centre of the screen. I adjusted the scan width control towards maximum clockwise (e.g. minimum scan width).

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In Fig. 6, each response is spaced by 50MHz, yet the sweep suffers some compression as it goes from left to right. However, this does not effect the accuracy of the frequency measurements at the distant line on the graticule as indicated on the l.c.d.

The non-linearity of display becomes more apparent on wide sweeps. This effect is a function of the non-linearity of 'scope sweep and of the analyser's oscillator sweep linearity.

It's possible to employ the adapter with almost any 'scope, even one without amplified X-Y facilities, by using the external trigger input (e.g. connecting this to the adapter's X output). I tried this arrangement with my own 'scope and found some improvement in X linearity, though the combination was less easy to set up than it was using the Kenwood instrument.

If you require to analyse signal sources which will not tolerate 'looking' into the adapter's 50Ω impedance, then the 'scope probing can be made to a standard 'scope probe. I found the probe which came with the CS-4125 ideal for this purpose, allowing coupling direct to high impedance circuits without adverse loading effects.

**Important Applications**

One of the most important applications of the Kenwood 'combination' in the Amateur Radio shack is being able to look at the harmonics being produced by your transmitter. And I found the best way of doing this was by the use of a small test antenna connected to the adapter's input.

'Looking' at your transmitter's output in this way facilitates establishing a 0dBm datum on the fundamental. It also helps identify spurious signals or harmonics to see by their response on the screen whether any radio, TV or commercial transmitters at near-by frequencies could be affected!

My Yaesu FT-480R 144MHz transceiver at 10W produced a second harmonic at -90dB, a third at -60dB and a fourth at -95dB with no detectable spurious signals. My Icom IC-740 running at 10W at 21MHz produced a second at a mere -25dB (I must be looking into this soon!), a third at -60dB and a fourth at -75dB. Again, there was no sign of spurious signals. And a DNT M40FM converted CB transceiver running at 4W on 29.6MHz gave only a second harmonic at -60dB.

It isn't generally possible to resolve normal sideband components unless they are adequately removed from the carrier because of the fixed filter bandwidth of 50kHz (-6dB points). Nevertheless, certain third order inter-modulation components can be displayed.

I was pleased with the adapter's sensitivity corresponding to about 70μV p.d. across 50Ω which, in some cases made it possible to check 'off air' transmissions from other nearby, powerful Amateur Stations to assess their harmonic or spurious signal production.

It would be possible to introduce a wideband pre-amplifier to enhance the instrument's sensitivity, but this would need to have a very low noise figure to improve the low level dynamic range. A more selective pre-amplifier would provide better results over a small part of the spectrum.

**Significant Value**

The set-up I reviewed also has significant value for the investigation of EMC problems. And although an instrument of this type cannot be expected to provide definitive information, it is certainly extremely helpful in determining the effectiveness (or otherwise!) of measures taken with the aim of minimizing or resolving EMC problems.

For example, there are various ways (sadly, outside the scope of this present article) of ascertaining the magnitude of transmitter c.f getting into the mains supply system. For this test, a special 'anti-coupling' is made to the power line allowing connection to the adapter.

Local signal fields can also be determined in the 'near field' with a special probe or magnetic pick-up loop. Anyway, having possession of this sort of equipment in the shack will undoubtedly bring to mind a multiplicity of ways it can be used for a wide variety of tasks. This is not to say that professional use should be discounted! And I would certainly be very happy with the trio of instruments permanently in my lab!

**The Spectrum Analyser**

Adapter has a price tag of £581.63, the CS-4125 Oscilloscope, £351.33 and the FCE 1131 Hand-Held Counter, £116.33, all prices include VAT. The instruments are available from Vann Draper Electronics Limited, Unit 5 Premier Works, Canal Street, South Wigston, Leicester LE18 2PL. Tel: 0116-277 1400.

My thanks go to Tim Coates of Vann Draper Electronics Ltd. for the loan of the items. It has provided a very interesting project and one which I am sure will be of much interest to our readers as it was to me!

See Special Offer on page 39 of this issue to get your own 'test bench trio' at a really special price.
This month we've teamed up with Vann Draper Electronics suppliers of Kenwood test equipment to bring you an offer on three pieces of test equipment which when used together offer an economical way of obtaining that ‘dream machine’ spectrum analyser.

**FCE 1131 Hand-Held Frequency Counter - Only £110!**
This portable counter with its large eight digit display has a range of 5Hz to 1.3GHz and a measurement time that can set for 100ms, 1s or 10s depending on the users requirements. It’s housed in a plastic case with a lift-up stand for sitting on the workbench.

The FCE 1131 gets its power from one 9V PP3 alkaline battery giving a typical operating time of 12 hours. It measures 175 x 81 x 30mm and weighs 190g excluding battery.

The FCE 1131 normally retails for £116.33 inc. VAT, plus postage however if you take advantage of our offer you can get yours for £110 inc. VAT plus £5.58 postage.

**CS-4125 Dual-Trace Oscilloscope - Only £335!**
This dual trace scope makes an excellent partner for the SAE 1001 Analyser Adapter particularly due to its X-Y facility, when activated by the press of a button allows direct connection to the adapter. The CS-4125 comes complete with a high impedance precision probe with a ‘one’ and ‘ten’ switch and has a cathode ray tube measuring 80 x 100mm.

The overall unit weighs approx 7kg, measures 300 x 140 x 41mm. The power consumption is around 30W and the CS-4125 also has a carrying handle with ‘doubles-up’ as a bench stand.

The CS-4125 normally retails for £351 inc. VAT, plus postage however if you take advantage of our offer you can get yours for £335 inc. VAT plus £5.58 postage.

**SAE 1001 Analyser Adapter - Only £550!**
Offering a frequency sweep of at least 400kHz to 1GHz and an 10-turn centre frequency control this attractively presented piece of test equipment displays frequency information in a clear 125 x 20 x 45mm window. The SAE 1001 is mains powered and can run on either 230 or 115V (50/60Hz) which is adjustable internally and has a power consumption of 10VA.

Measuring 360 x 88 x 235mm, this versatile piece of equipment is presented in a dark grey enclosure with a light grey front panel and an adjustable plastic stand.

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For a more in-depth description of this test bench trio see Gordon King G4VFV’s review on page 34 of this issue.

To take advantage of this offer just fill in the form provided or call the Credit Card Hotline on (01202) 659930.

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John Worthington GW3COI looks back at his days in the Royal Air Force during the Second World War and the Morse traffic he handled.

By John Worthington GW3COI

As might well be imagined, 99% of the traffic passed on c.w. in the RAF during the Second World War was encrypted for obvious reasons. Yet the Morse course devoted at least 50% to plain language and many instructors would pull out their morning paper and send passages from it.

Our class soon realised that we were getting quicker on this material than we did on reading coded signals which consisted of mixed random figures and letters. The reasons were primarily that we could guess familiar words that lay ahead and as we could write in longhand that it was much easier than capital letters.

Naturally the RAF insisted on capitals for the code as a mistake of just one letter or figure was enough to render a message into gibberish. When the Morse course was finished, all who passed the final exam emerged as being perhaps 15% quicker at plain language and were posted hither and yonder to their various squadrons or whatever, ready to take on whatever c.w. was thrown at them.

Accuracy Paramount

There were many who subsequently never logged a single word of plain speaking and everybody settled down to a life of 'gobbledegook' where accuracy was paramount and anybody who made even scarce errors was given the 'chop'. Given the amount of QRM both via the antenna and between the 'cans' and your ears, the amount of concentration was so intense that it carried a man over into his off duty life so that it was quite common to see operators walking from the mess hall like the proverbial zombie.

Then one night at a station of Coastal Command, they had to deal with a civilian aircraft that had been diverted because of bad weather. This aircraft had on board a grizzled veteran who may well have known Morse himself and he was also wielding a bug key.

Now, bug keys were unheard of in UK forces until nearly the end of the war, but they came to be heard when the US operator visited the cabin to distribute a large carton of 'Camel' cigarettes to the lads, they all told him how they were now resolved to reactivate their plain language Morse reading skills! Meanwhile, I hadn't the heart to tell them I preferred a pipe!!

Unfamiliar Language

Anyway, the civilian aircraft's crew threw the entire signals office into a right 'tizz' as first one and then another op tried to copy down the unfamiliar plain language that was coming at them at a speed of 35 words per minute. Eventually, the four lads were scribbling away and between them, managed to get the gist of what Morse's contemporary was saying.

Apparently, the large flying boat (for such it was) had been unable to see the lights of the little dinghies denoting the safest landing stretch on the water due to the foul weather (it was a gale of wind and snow) and was urgently requiring something better as an indicator. The arrangements for this were made swiftly without fuss and the best operator of the watch passed the information as if "he was to the manner born."

Modesty dictates that his identity be not revealed, but later when the US operator visited the cabin to distribute a large carton of 'Camel' cigarettes to the lads, they all told him how they were now resolved to re-activate their plain language Morse reading skills! Meanwhile, I hadn't the heart to tell them I preferred a pipe!
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Many eons ago (it feels as if it was when dinosaurs still ruled the earth) I started playing with computers. The first machine I played with for two hours a week, was a room-filling 'mini-computer' that probably had less power than the scientific calculator I now use. The programming language I used then was the 'high-level' (like English) language Algol-70, the forerunner of Pascal.

In modern terms, programming a computer is done in such esoteric languages such as 'C', 'C++', Pascal, Pascal+, Object Oriented Programming Languages (OOPS?), Visual Basic, (and Visual C and Pascal) and of course the new one for the 'world-wide-web' - Java (wasn't that west of Krakatoa before the big bang?). All of these tend to be huge languages, often needing a CDROM to hold all the program parts.

So, what place is there for a low-level language that comes with its own in-built smart text editor and takes up just over a third of the space on a single 720k IBM PC disk? Not much you may say - but that would be a gross understatement of the power of Brunning Software's 'Brunword MCA' package.

Teaching Package
Peter Brunning has put together a whole teaching package based around a simple text editor and program 'compiler' for the 80x86 series of central processing units (c.p.u.) that's at the heart of almost every IBM PC or clone. The programming language is called 'Assemble', a language normally used when interfacing to hardware in the computer (see separate panel).

So, let's have a look at what you get in the whole package which consists of a 300 page ring-bound book called Experimenting with PC Computers, and a box of goodies with which to carry out the experiments.

Let me look at the book first, as it's available separately. In format the 300 page ring-bound book is well laid out in 16 chapters (containing 49 'experiments') and five appendices. There are many circuit diagrams scattered throughout the book.

The Hardware
Now, after the 'paperware', let's turn to the hardware in the box. In the box are some 20 packets of individual components. There are passive components, resistors and capacitors, both simple and electrolytic.

Each value of resistor is in its own small resealable bag with the value written on the white label stripe, so making them easy to find.

Also in the box are various semiconductors. There are dividers (Zener and normal signal diodes), transistors (npn and pnp), and a 'hyperbright' I.e.d. There are also some short pre-stripped wire links...
6. Using a Ladder Network

Fig. 1. The well laid out diagram of a ladder network for producing a 456 step analogue signal from an 8-bit digital one.

All Ages & Abilities

The overall package could be used by people of all ages and abilities. Although the speed with which the course is completed will vary with typing skills and knowledge.

As I mentioned earlier, even with a month to play with the package and some previous knowledge of assembler, I didn't complete all 40 experiments. So, it does mean I've got some enjoyment to come.

My thanks go to Bruning Software for the chance to regain control of my computer once again! Experimenting with PC Computers is available for £24 and the associated kit for £46 from the PW Book Store.

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ASSEMBLER LANGUAGE EXPLAINED

If you've not heard of the Assembler language (usually just called assembler) before, then it's going to seem to be almost incomprehensible. But keep on with it, it's actually easier and simpler than you think now!

Each microprocessor maker has their own idea what each command should be called. But as this particular software is to run on an IBM PC (or clone) the assembler language used is Intel's own.

The 8086 assembler language is full of such acronyms as 'mov', 'equ', 'cnd', 'inc', 'dec', 'clear interrupt flag and 'inc'- meaning increment or add one to a number. These and many others are explained in the latter 100 pages of the 300 page book that accompanies the 'course'.

One thing tends to baffle most newcomers to low level programming is the method of counting used. In assembler you may use numbers (0-9 to 9 in base-10 or decimal) or the rather strange looking Hexadecimal which has a base of 16. A hexadecimal number has a small 'h' added at the end to distinguish it.

COUNTING IN HEXADECIMAL

Counting in Hexadecimal (base 16, not base 10) is actually quite simple (although it may at first sight not seem so). The hexadecimal numbers are: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E and F (the character 'F' has a decimal value of 15). So stick at it and don't be put off!

You must not let this apparent backwards step discourage you. When using assembler language you have the whole power of the e.p.u. at your command. And if you think this is an idle boast - look at an old 16MHz clock speed 80286 machine running the GEM graphical system (producing Windows by several years) at a reasonable clip. We now have graphical systems that run subjectively very little slower than this two decades old computer system. So keep on with it!

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As you work your way through the thick book from front-to-back (and you must do this as many 'experiments' build on techniques and files used in preceding parts) the experiments become more and more complex.

Working your way through the whole package is certainly not a task that you'll finish in a short time. Even within the month that I had to 'play' with BWA package, I didn't complete the whole course. So be aware that this isn't the simple and easily completed package this appears at first sight to be - it's very comprehensive.

However, having said that it isn't quick to compile, overall the whole package was left me with a rather pleasant glow of satisfaction after each experiment was completed. And though I write this review before 'the end' of the course so to speak, I have to say that the BWA experience is satisfying in a way I though I'd lost.

in a separate packet.

The wire links are to be used on the included, beautifully presented, 'patch panel'. The circuits are built up on a solderless circuit board with two sections of 30x6 contacts as shown in Fig. 3. My only real quibble was that some of the links could have been just a little bit longer, making wiring up an slightly easier job.

Low Density Disk

Last but not least, in the box is the low density (720k) IBM PC formatted disk with the software on it. In these days of commercial software needing at least one CDROM, it comes as a bit of a shock to find a single disk hiding in the box. Even more of a shock was that the active program is apparently so tiny (I've seen word processor text files bigger!).

Tiny it may be though, the Brunword Assembler (BWA) is both fast and capable. You get a build-in text processor that has an assembly line checker incorporated. If the line cannot be assembled a sound 'trill' indicator alerts you to the error before it begins the next line.

When you've written (and saved) the assembler text to disk you can create the machine code program. A neat touch here is that BWA uses the same first part of the name that you use for the assembler text (giving the machine code program the 'COM' extension).

As you work your way through the thick book from front-to-back (and you must do this as many 'experiments' build on techniques and files used in preceding parts) the experiments become more and more complex.

Working your way through the
F.A.Q.

FREQUENTLY ASKED QUESTIONS

SERVICE DEPARTMENT ON SITE WITH QUALIFIED ENGINEERS?
ONLY SERVICE DEPARTMENT AUTHORISED BY ALL FIVE MANUFACTURERS - STANDARD, YAESU, ICOM, KENWOOD & ALINCO?
TWO CUSTOMER SERVICE PERSONNEL TO DEAL WITH AFTER SALES ENQUIRIES?
TURNAROUND ON SERVICE WORK WITHIN FIFTEEN DAYS?*
COLLECTION OF FAULTY EQUIPMENT THE SAME DAY ANYWHERE IN THE UK?**
ONLY U.K. DEALER APPROVED BY DOMESTIC & GENERAL AND A.R.I.S. FOR REPAIRS?
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SERVICE CENTRE OPEN 5 DAYS A WEEK? (YOU'D BE SURPRISED HOW MANY AREN'T)
DEDICATED CUSTOMER SERVICE HELP LINES?
NO “FIXED” SERVICING COSTS YOU ONLY PAY FOR THE TIME TAKEN

* SUBJECT TO PARTS AVAILABILITY
** IF REQUESTED BEFORE 10.30AM

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- 500W output on 2/70
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Possibly the ultimate HF transceiver with SIX metres, not only is the new JST-245 aimed at the professional user, but it now incorporates a mains PSU and offers 150 watts output from 1.8 - 54MHz.

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Deposit £239 & 12 x £183.68
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Cost of loan £137.68
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Add 5 years warranty for only £159!

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**RRP:** £1699
**ML Price:** £1499
150 deposit & 12 x £123.89
Cost of loan £137.68
or 24 x £67.58
Cost of loan £273.03
or 36 x £49.00
Cost of loan £155.33
Add 5 years warranty for only £159!

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**Yaesu IC-756**

After reading the review by Peter Hart last month, its little wonder he was so impressed he bought one himself!

The very latest news, equipment, gossip, lists of used equipment, gossip, information and much more has earned the Martin Lynch & Son web site as "one of the best" in the world for Ham Radio. Visit us on www.martin-lynch.co.uk today! If you are not on the web and would like some info, please call Steve Jelly on 0181 566 1120.
This month in his popular and widely read 'sermon on practical radio'... the Rev. George Dobbs G3RJV describes a 'wide range' variable crystal oscillator for the 3.5MHz band.

Over the years the amateur radio QRP literature has produced a mighty body of simple transmitters. The sort of thing that the beginner can use to put their first home generated signal on the air.

A surprising number of the seasoned constructors in amateur radio began by building a simple transmitter to give them a watt or two on the h.f. bands. It's the stuff of real Amateur Radio.

The usual limitation of all these little transmitters has not been their output power so much as the fact that most of them are crystal controlled. It can be frustrating to be tied to a single frequency when the whole amateur radio world seems to be operating on every other frequency.

I suspect that many crystal controlled transmitters have been built but have seen little real use. Although in my own case I must say I've found crystal control very useful at times. It comes into its own when I have been monitoring a band from my workbench.

It can be quite interesting to listen on just one frequency and call anyone who 'passes by'. I have been surprised at what does turn up in the course of an evening on one point on a band.

If I use a v.f.o. controlled rig the temptation is to hear stations on the edge of the passband. I tune to work them and before I know it I'm tuning up and down the band working stations and never complete my work on the bench!

In the Beginning

In the beginning, most constructors start with a crystal controlled transmitter because of the problems of building a stable variable frequency oscillator. Those problems are probably overstated but they can be difficult for the beginner.

One solution is to use a variable frequency crystal oscillator (VXO). This is usually done by adding a variable capacitor, sometimes with a little added inductance, in series with the crystal.

The VXO circuit allows a small degree of movement in frequency. As our American friends say... it makes the transmitter 'frequency agile'.

Although VXO circuits are useful, there are also some problems. The main one being the limitation of frequency shift.

The amount of shift depends upon the frequency of the crystal. Several kiloHertz of shift are possible with crystals of 10MHz or higher, but on 3.5MHz the maximum shift is typically 1 to 1.5kHz. Any attempt to shift the crystal frequency too far will result in degraded stability. So a 3.5MHz VXO transmitter is only marginally better than a crystal controlled transmitter on the band.

Ceramic Resonators

Recently many constructors have been turning to ceramic resonators in place of quartz crystals. Although slightly less stable than a crystal in an h.f. oscillator circuit, they have two distinct advantages. They are also much cheaper!

A ceramic resonator from Maplin Electronics costs around 60p. They also have a lower Q which means they can be shifted over a great frequency range.

An added bonus is that there's a readily available ceramic resonator at a frequency of 3.580MHz - in the '80 metre' band's c.w. sector. Several circuits have appeared in recent times using this resonator for applications on 80'. My experience with them suggests that they are a good way to obtain a stable 'frequency agile' signal.

The diagram, Fig. 1, shows the circuit for a ceramic resonator VXO for 3.5MHz. The circuit follows ideas from VK6SA, SM7UCZ and others who have commonly used resonators in h.f. projects.

In the simple form illustrated, a 3.580MHz resonator will tune from 3.50 to 3.60MHz. This provides coverage of the whole c.w. sector of the 80 metre band.

The VXO is based on the well known, and well loved Colpitts Oscillator with a variable capacitor in series with the resonator to provide the frequency shift. An inexpensive three terminal regulator chip produces a stable 8V supply for the oscillator.

I used a BC182 because I have a lot of them but any similar PNP transistor will serve the purpose. The output is taken from the emitter of Tr1.

I also included a preset potentiometer as the emitter load resistor to allow adjustable output from the oscillator. And on checking...
the output on an oscilloscope I had in excess of 2V output from just below 3.5MHz to about 1.4V at just above 3.6MHz.

**Stability Good**

Short and long term stability were both good. The worst drift occurred at the very high end of the frequency range.

To obtain the amount of frequency shift required, C1 must be in the order of 150pF or more. I used a Polyvaricon variable capacitor culled from an a.m. transistor radio. Not the best component to use in a frequency determining circuit but the stability was better than I expected.

The oscillator could probably be used to drive a small transmitter or a direct conversion receiver, or perhaps even a superhet with a 455kHz intermediate frequency. I may press it into use for another project in this column.

With some of these ideas in mind I tried a little buffer circuit added to the VVXO. This is shown in Fig. 2, moved the output level control to the emitter of the buffer amplifier. For only a few extra parts this little circuit offers a very useful buffer stage for the VVO circuit.

So, here’s another easy and cheap to build circuit to add to the armoury of the home constructor. Let me know what you use it for!  

PW

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**Errors and Updates**

**Carrying On The Practical Way (PW April 1997)**

Two of the pins of IC2 in George Dobbs G3RJV’s ‘FF7’ receiver were inadvertently misnumbered on the drawing of Fig. 1, on page 50 of the April 1997 issue of PW. The two audio inputs to IC2 should be on pins 2 and 3 (not pins 1 and 2), and the positive of feedback capacitor C16 should go to pin 1 of IC2 (not pin 3 as shown in the diagram).

**Dip Meters - Dutch Style (PW May 1997)**

In Wim de Ruyter’s ‘dip’ oscillator article on page 51 of the May 1997 issue of PW, due to misinterpretation of the author’s drawings, two errors were made. One component was shown in the wrong position and one resistor was left out of the circuit.

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The missing component, a 1MΩ resistor (labelled R8), should be fitted between the gate of Tr1 and the 0V line and capacitor C4 should be moved. In the circuit diagram of Fig. 1 on page 51 of the May 1997 issue, delete C4 from its present position and, insert it in the position shown.
Sterling Excellence!

The Icom IC-207H Dual-Band Mobile Transceiver

By Richard Newton G0RSN

The Icom IC-207H is an Amateur Radio dual-band mobile transceiver covering 144 to 146MHz and 430 to 440MHz. It's supplied with a d.c. power cord, mobile mounting bracket, spare fuse, instruction book and a rather impressive looking DTMF multi-functional fist microphone.

One of things I look for in a mobile transceiver these days is a detachable front. It’s so difficult to fit even the smallest radios into modern cars.

The Icom IC-207H has the detachable front facility and is very easy to use. Sadly there is no facility to plug the microphone into the display head. It has to remain in the main body of the radio.

The obvious reason for detaching the head is to make it easier to mount the radio in the vehicle. To do this you have to purchase an optional extra, the extension cord.

The mounting bracket for the head seems to be a separate optional extra as well. If you have placed the main radio in the boot you will then need the optional extra that extends the microphone cord. In this case you will also have to purchase the speaker extension cable. (another optional extra) or you could make your own!

The plethora of optional extras that are needed in order to separate the head from the body of the IC-207H may seem excessive. However, if you give Icom the benefit of the doubt, you will consider, as I did, that it gives the customer the choice. You do not have to shell out on an expensive kit only to find you need one or two items from it for your particular situation.

The head when detached really is very small and neat. It can be easily placed in a shirt pocket or handbag. Even if you do not mount the IC-207H radio separately, the easily removed head is a wonderful security feature.

The microphone plugs into the main unit using the now familiar modular type plug. The microphone is very impressive. Most of the radio's controls, certainly all the ones I found I needed, could be controlled from the microphone.

The buttons are very well back lit. They are translucent and all controls can be seen even at night.

**Function Controls**

The function controls on the main unit are well labelled and easy to operate. On the uncluttered rear panel you will find the standard power cable fly lead socket.

You will also find on the rear panel a speaker output and Data socket. This will support 1200 or 9600bps Packet operation.

Icom seem to have departed from the ‘norm’ with the antenna socket. This is a chassis mounted SO239 type.

Unlike some dual-band radios, the IC-207H only allows you to operate one band at a time. (I’m used to operating dual-band radios that will monitor both bands at the same time).

I must confess I missed being able to monitor the local 144 and 430MHz repeaters on the way to and from work. The only way I could find to do this was to either programme both frequencies into memories and then scan. (The Icom IC-207H scans memories of both bands at the same time), or to use the ‘Priority Watch’ facility.

The Icom IC-207H has four power settings, Low (5W), Mid-Low (10W), Mid-High (20W) and High (50W on v.h.f. and 35W on u.h.f.). I liked this choice of settings.

Most mobile radios I have seen recently seem to have just three settings for transmit power, these are usually 5, 10 and then a massive jump to something like 50W. I have often wished for something in between the mid and high settings. Icom must have read my mind!

The Icom IC-207H has all the...
facilities you would want to see on a modern radio. It supports DTMF transmission, and although it does not appear to support DTMF paging itself, it could be used to send DTMF tones to a radio equipped with DTMF paging.

The IC-207H has an amazing 150 memories, in addition to this it has a 'CALL' channel for each band. This is a dedicated memory that can be accessed at the touch of a single button.

The rig also has five 'scratch pad' memories. During v.f.o. operation, the transceiver automatically memorises operating frequency information, it will remember the last five frequencies you operated on! That's impressive, I don't think I could remember the last five frequencies I operated on'. (That's impressive, I think I could remember the last five frequencies I operated on!).

The IC-207H is very easy to operate, the memories are easy to programme and the radio can be configured with ease. There is no need to tinker with advanced settings if you don't want to, the radio will perform beautifully as soon as you turn it on. It's a radio you can enjoy straight away and even more as you learn about everything it can do for you.

**Caught My Eye**

There are a certain features on the IC-207H that really caught my eye. Icom have put a fully functional CTCSS encoder and decoder function on this radio. No optional extra here! Excellent move, and I hope others take note.

To compliment the fully functional CTCSS encode and decode function on this radio, Icom have incorporated something that I have seen in commercial p.m.r. circles but never received him or accepted it. It's a radio you can enjoy straight away and even more as you learn about everything it can do for you.

**On Air**

So how did it fare on air? Well in actual fact it did extremely well.

The first station worked was John G0TZW. John was mobile and my able assistant, Steve G1YNY, worked him through GB3SC.

John checked us on input having given us a very good report through the repeater on audio. John was even more complimentary on the audio when he heard our very strong signal on the input.

The next was a mobile-to-mobile simplex contact with Gary G4UED in Amesbury. From our location in Bournemouth this was a distance of some 64km. Again I received more compliments on the audio and enjoyed a very pleasant contact.

I also heard G8LVC giving the RSGB news broadcast who was an end stop signal from Chandlers Ford, something in the region of 48km away.

Finally I worked Ian G8MLC on the Northern side of the Isle of Wight. Using locations we worked out this was a distance of 48km.

Ian passed the following comments totally unsolicited at the very start of the contact. "Very good audio, excellent. Very clear and distinct". This was coupled with an extremely good report on the signal.

I had a very enjoyable chat with Ian, I used every transmit power setting. He gave me a good report even on the 5W setting and then dropped his power to 1W. The Icom still received him without hesitation.

**Excellent Impression**

The over riding impression I got from this radio was one of excellence. Especially with the transmitted audio quality. Everyone I spoke to on this radio commented on the excellent audio quality.

I found it easy to use. It has some good features and I'm sure it would give sterling service.

My thanks go to Dennis Goodwin G4SOT of Icom UK Ltd., Sea Street, Herne Bay, Kent CT6 8L.D. Tel: (01227) 747741 for the loan of the IC-207H which retails for £439 and is available from all Icom approved dealers.

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**Manufacturer’s Specifications**

**General**

- **Mode**: f.m.
- **Antenna Impedance**: 50Ω
- **Scanning Speed**: 16 Ch/sec (programmed scan)
- **Memory scan**: 8 Ch/sec (memory scan)
- **Power supply**: 13.8V d.c. ±15%
- **Usable temperature range**: -10°C to +60°C
- **Dimensions**: 140(w)x40(h)x184.5(d)mm
- **Weight**: 1.17kg

**Transmitter**

- **Modulation System**: Variable reactance frequency modulation
- **Max. Frequency deviation**: ±5.0kHz
- **Squelch sensitivity**: < than -60dB
- **Microphone impedance**: 600Ω
- **Output power current drain**: 50W (v.h.f.) 20W (v.h.f./u.h.f.) 50W (v.h.f.)
- **IHF**: 12A (u.h.f.) 11A
- **IHF**: 6.5A
- **IHF**: 5.5A
- **IHF**: 5W (v.h.f./u.h.f.)

**Receiver**

- **Receive system**: Double conversion superhet
- **Intermediate Frequencies**: 1st 46.05MHz, 2nd 450kHz
- **Sensitivity (for 12dB SINAD)**: 0.18µV
- **Squelch sensitivity (40dB)**: 0.18µV
- **Selectivity**: 12kHz/6dB
- **Spurious response rejection ratio**: > than 60dB
- **Audio output current drain**: 2W at 10% distortion with internal speaker
- **Max rated audio current drain**: 80mA

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Practical Wireless, July 1997
Chip In & Build....
Your Own Shack Desk

By Noel Orrin G3BBK

Noel Orrin G3BBK describes the construction of an attractively simple but pleasing shack desk. It only requires simple butt joints and Noel thinks the project is well within the 'average skill level'. So let's see that workshop!

You too can have a professional-looking shack desk if you follow the example set by G3BBK.

Every shack has some sort of working area for equipment and writing space. Most of us will usually start our amateur radio activities with little hardware, probably a 144MHz rig with power supply, an s.w.r./power meter and off you will go, using whatever comes to hand as a working area.

The 'whatever is to hand' approach is fine if you're the type who never collects any hardware. But invariably you will! And what happens when you can't expand sideways? - you'll start piling black boxes on top of each other! It's then that things begin to get out of hand, look ugly, and the working surface begins to develop a noticeable sag.

Opportunity To Design

I fell into the same trap of using any surface myself, so when we moved house some years ago, I took the opportunity to design something. It had to be simple to build, useful, look good to me and suit my needs.

The first thought was to just make something which would be strong and have a large enough area to accommodate everything on one level, in fact some sort of rectangular table. That's fine, but if you've got a fair amount of equipment (and probably also a computer) and accessories which you want to keep close to the radio gear, you've got to have long arms to reach everything without moving your chair.

Sitting at the centre of a semi-annular (ring shaped) desk, with a swivel chair at the centre would be theoretically ideal as this would maintain everything equally accessible. But to construct a desk to this format would not be an easy task for a d.i.y. enthusiast.

Following on my line of thought, it was obvious that a near enough ideal solution would be to make an 'L' shaped desk. This shape would be far more practical.

The design which follows is intended to be simple. It doesn't require more than the usual tools found at home (screwdriver, power jigsaw, hand plane, hammer and drill).

The dimensions given may of course be amended to meet your specific requirements. However, I would caution you against reducing the depth (front to back) of the desk, as you'll need to be able to position most equipment at the back and have a good clear working area in front of it for logbook, notes, computer keyboard, etc.

Functional Details

The functional details are shown in the heading photograph which shows my finished desk. It's complete with radio equipment on the left-hand side and computer items on the right. Note that there are no power sockets on the desk.

I considered that power points take up too much room, collect dust and are accessed rather infrequently. Therefore, in my version they're mounted as multiple strips of four outlets on narrow planking.

All the sockets were pre-wired prior to mounting the planking underneath the desktop at the rear. This has proved very satisfactory and I think this makes for a neater looking surface as all cables lay neatly over the back of the desk.

The desktop is actually constructed as two discrete items, i.e. the left-hand side (l.h.s.) and right-hand side (r.h.s.). They may be built in your workshop or garage and bolted together with two carriage bolts, on final assembly in the shack. This makes handling much easier, as when the desk is assembled the desk it's quite heavy.

The working surface may be finished to your choice. I decided to use plastic Vinyl sheeting in imitation gained leather appearance, as found in some car seating. This material is readily available from soft furnishing shops.

The front of the desk has generously rounded edges. This has three purposes: firstly it's much more comfortable to rest the arms on, secondly it obviates an otherwise sharp edge (which could lead to premature wear of the Vinyl) and finally, I think it looks better!
Construction Dimensions

The construction dimensions for the working surface, are shown in Fig. 1. All measurements are in millimetres unless otherwise stated. Naturally, you will vary the lengths to suit your own shack space, with the principle of construction remaining the same.

In essence, it's a 'table-top' mounted on a 'table-top', with cut-offs in the lower 'top'. This is to allow the desk to stand firmly on the three box-like legs.

The upper and lower table-tops are cut from sheet chipboard. As I envisaged heavy loads, I used 19mm thick sheeting for both and the dimensions given assume that. You may change to 12mm chipboard if you wish to lighten the construction.

Four sheets are cut to identical size for tabling. Because they can be unwieldy to handle in a small working space and because it's important to have straight cuts, you may prefer to order all sheeting cut to size from your local timber merchant (as I did) and the extra cost is very small.

Designate two of the sheets as 'lower surfaces' and remove the areas shown, Fig. 2, in both of them. Mark out, and drill a starting hole where necessary and use your jig saw (or borrow or hire one!).

You may wonder why the cut out at the angled end is so far back from the 'front' at 235mm. The answer is simple - it's to allow plenty of knee room when swivelling about in a chair.

The two curved cut-outs (which are only done to one piece) are to provide access for tightening the two carriage bolts underneath. These hold the two halves of the desk together on final assembly.

Mounted Above

The desk top proper is mounted above its respective facsimile, but separated from it by a frame of ready-planed 20 x 30mm timber. The 20mm sides being in contact
with the desktop. The diagram, Fig. 3, illustrates this, and including a reinforcing piece across the centre of the desk in each half.

Drill clearance holes through the chipboard for countersink screws, and countersink the chipboard appropriately. Before assembling drill clearance for 38in diameter x 2in carriage bolts.

Ensure that you drill both the l.h.s. and r.h.s. at the same time with them clamped together. This is to ensure you have no alignment problems when joining the two halves of the desk together.

Before screwing the top of the desk on, tap the carriage bolts into position. Their heads will self ‘lock’ into the framing and temporarily put their nuts on loosely, so they can’t be accidentally knocked back and lost inside.

Put a screw about every 200mm. No ‘fancy joints’ are required at the corners, just ‘butting’ the joints is adequate as the main purpose of the framing is to give depth to the surface top for the ‘legs’. (all joints, screw heads, etc., will eventually be covered over).

Note, that the rounded cut-outs need only be made in the surface which will be on the lower side where the nuts go and provide access for fitting and tightening the nuts to the carriage bolts on final assembly of the two halves. Using a jigsaw it’s easy to cut roughly elliptical as this is easily done in one ‘sweep’ of the machine.

To complete the woodwork on the desk tops, before bolting together and using countersunk screws, you should fit a strip of wood (70 x 200mm if a 19mm desk surfaces is used) to the front sides of the desk, then planing them to a smooth curve at the top and bottom. Note: Screwing them in position first makes it easier to plane the wood, as they don’t flex.

**Box Legs**

Now for the box legs. These are three identical open ended boxes, made to be a loose fit in the rectangular holes in the lower desk surface. (The boxes are loose to allow for hole tolerances and also to allow for Formica type laminated covering, if you wish).

So, to start you need six pieces of 19mm chipboard, each 740mm high by 610mm wide for the broad faces of the boxes. These are screwed to the 19mm thick chipboard, which are 740mm high by 85mm wide. Again, space the screws about 200mm apart and countersink (Fig. 4 refers).

You now have to decide whether you will just paint the box legs or finish them in laminate as I did, using mahogany grained surface. If you decide to cover them with laminate, using contact adhesive, the legs should still fit easily into their desk holes.

Note that the desk just stands in the legs, no screwing is necessary. If your desk is on a level surface, you’ll find it rock steady and there’ll be no flexing even if you stand on it!

**Working Surface**

I recommend finishing the working surface with grained Vinyl, as mentioned earlier. Originally, I was going to stick it on with contact adhesive, but this can be tricky with a large area to handle, as it’s not possible to slide the covering into position.

After a little thought, I opted for using a staple gun and with the help of a friend stretching the material, I stapled it on the underside of the desk top halves. Note this is done before joining the halves together.

Using small scissors and a sharp knife, it’s easy to cut ‘V’ notches in the Vinyl at the rounded ends of the desk and fix with contact adhesive. Make sure you overlap all end edges as this way, as it makes for a professional looking finish.

Finally, to improve appearance, prevent things sliding off the ends of the desk and to cover up the wrapped over edges of Vinyl there’s a little fine carpentry needed! Firstly you need two pieces of nicely grained wood, of 800 x 90 x 20mm dimensions. Then round off all edges, stain and polish to choice and fit to the ends of the desk with a couple of well countersunk screws.

The finished wood edging should be fitted so that there is a balanced overlap all round of approximately 10mm. This gives a modern look to the desk. Hide the screw heads with a bit of dowelling glued in and stain to match. (See Fig. 5).

All that now remains is to position the box legs in the shack, lower the desk halves into position and bolt together firmly, using large washers to spread the nut loading. Screw the planking strips holding your mains power sockets, referred to at the beginning of this article, to the lower rear faces of the desk.

Now stand back and admire your handy work!

PW
On Secret Service....

With G6TW & 'Skyranger'

By Leon Platt

Leon Platt, who formerly held the callsign G3RPU pays tribute to his late friend G6TW's contribution to Second World War intelligence gathering in Britain's darkest hour.

As a result, a secret enemy base on Heligoland was bombed.

This is a true account of the events experienced by my friend Joe Noden G6TW. He was one of the very first licensed Radio Amateurs in the early days of radio, and his secret activities considerably helped to reduce our shipping losses during the Second World War.

Sadly, my friend is no longer with us. Joe became a 'Silent Key' in the early 1960s. Personally I have been a radio enthusiast for quite a number of years. But in the early days, I was just a short wave listener.

My friend's callsign 'George Six Tokyo Whisky' was much more to me and a great inspiration. His knowledge of radio was unsurpassed and I would visit him at his radio shack when he was on the air. Everything was hypotised by what I saw and heard. I knew that one day I would be on the air myself!

However, to get back to the story. At the beginning of the War, the Government Radio Services Dept., operated then by the GPO, launched a blitz on all sources of communications equipment/apparatus, as deemed necessary by the War Department.

The GPO vans would come round and take away all the equipment they could find. They issued a receipt, labelled the equipment and took it into security stores for the duration.

It was later realised, however, that radio monitoring was essential to the Secret Service for vital information. So it was decided to establish specialised individual listening centres throughout the country.

Radio Amateurs would be ideal for the listening. Consequently, the longest established and trustworthy Amateurs were recruited and subject to clearance and signing of the Official Secrets Act; they were recruited into Service, for that particular function.

As a result, my friend Joe G6TW was recruited and allowed to keep his treasured 'Skyranger' receiver in situ. He was issued with a new spare set of valves and some replacement parts, for maintenance.

The procedure was that allocated short wave frequencies had to be monitored constantly, and everything heard taken down. Of course, this was in Morse code and made no sense, obviously, and was sent mainly in tiresome groups of letters and figures, which had to be de-coded.

**Secret Service Captain**

An Army Secret Service Captain was in charge, and would pay frequent visits. He'd inspect the radio station and take the written work away, for analysis and de-coding.

The listening hours were allocated throughout the area and my friend Joe's times were from 8pm until midnight, on certain days of the week. He had previously been experimenting with certain types of aerials, and this was in fact a good time to try them out.

One night at about 8.15pm, Joe was monitoring in the 7MHz band and heard a Morse transmission which sounded familiar to him. He had heard that particular preamble and key-style before on a previous night at the same time.

The following night the signal was there again, same frequency, same style. He was so impressed that he decided to inform the Army Captain in case there was some significance.

The Captain arrived one evening and heard the transmissions for himself. Instructions were given that Joe must keep on to this transmission each night and miss nothing and continue using his very effective antennas. A further visit was made and the transcripts sent immediately for decoding on a priority basis. The frequency was also made priority and all else ignored until further orders.

The other listening stations throughout the area were not receiving this signal, only with much noise, which made reception too poor.

Therefore, all operators were instructed to construct antennas as a replica of the one Joe was using. The exact measurements, orientation etc. were taken. Only one other station had any reasonable success.

One evening, about a week or so later, the signal disappeared from the air abruptly, and could not be detected again. Even Joe was not allowed to know what had happened until some time later.

**Vital Information**

The signal was coming from a secret hide-out somewhere in Heligoland and it was transmitting vital information about our shipping movements to Germany. At this time, our shipping losses were heavy.

The Secret Service had been very busy and had located the course of transmission by means of direction finding technology and other means. When the signal disappeared from the air, it was due to the location being bombed by the RAF and completely destroyed.

It was indeed entirely due to my friend's Joe's perception, sensitivity and expertise in radio communication that this operation was very successful. As a result, at the end of the war he received from King George VI, a special commendation for his valuable service to his Country. A fitting tribute indeed for G6TW and his Hallicrafters 'Skyranger'.

PW
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<th>Plan Name</th>
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Rob Mannion G3XF D looks at some interesting Amateur Radio books from the USA. And judging by what he says....Rob enjoyed reading them!

**Low Profile Amateur Radio**
*By Jim Kearman K1RS*

Only the Americans could come up with a ‘fun’ book like this! And if you’ve got any memories from the 1950s and 1960s where Radio Amateurs (quite innocently and legally) transmitting from beaches or hilltops often attracted the attention of the police and were considered to be spies...you'll enjoy the concept.

And the concept of the book is the actual operation of an Amateur Radio station from almost anywhere – be it a hang glider (not allowed in the UK of course), camping, on holiday in an apartment. In other words...literally anywhere!

Chapters are provided covering interference and tackling the problem, techniques for low power voice, c.w., APTOR, packet and v.h.f./u.h.f. operation, and low visibility antennas for h.f. and v.h.f., you can build yourself. Altogether this is a fun book and even the cover is in low profile ‘camouflage’ style! Highly Recommended at just £7.50!

**Hints & Kinks For The Radio Amateur**
*Edited by Robert Scholten K17G*

This book will certainly appeal to PW readers. It’s the 13th edition and is packed with ideas, circuits, suggestions, techniques and modifications. Most have been printed in QST and are being re-presented in book form.

In fact, the Hints & Kinks series of books are so good I’ve made a point of collecting them over the years. I don’t have any of the pre Second World War editions but this one is already in my collection.

With sections covering tips and modifications to AEA, Ameritron, Collins, Drake, Heath, Icoms, Kenwood, MFJ, Radio Shack, Yaesu and home-built equipment there’s a lot to read. Other sections cover batteries, generators, mobile and portable equipment, construction, test gear and antennas, EMC (e.l.f. and e.m.i.) and a suppliers list. Highly recommended.

Hints & Kinks is available for £9.50.

**Transmitter Hunting - Radio Direction Finding Simplified**
*By Joseph Moell K8OV & Thomas Curlee W8DQZ*

Radio direction finding as an Amateur Radio ‘sport’ is certainly a minority interest here in the UK. However, I’ve always been interested in the subject and this book makes fascinating reading.

This book which provides excellent “armchair reading” on the subject (along with being a very good textbook on the subject) taught me a very great deal on the subject. With sections covering history, theory, techniques, practical circuits and projects, it’s an excellent book.

But I must say I was intrigued at the thought of night-time DF hunts as they seem to be popular in the USA! (I wonder how many DF Hunters have been accidentally shot during night-time hunts!). Highly recommended. Transmitter Hunting costs £20.95.
Solid State Design For The Radio Amateur
By Wes Hayward W7ZOI & Doug DeMaw W1FB

In my opinion this is a book that PW readers must have on their bookshelves. Bursting with circuits and ideas, it's really a manual for 'home-brewing' in disguise. And I’ve no doubt that if you're a keen follower of George Dobbs G3RJV's work - you'll already have a copy.

A list of the contents says it all: semiconductors and the amateur, basics of transmitter design, more transmitter topics, power amplifier and matching network, receiver design basics, advanced receiver concepts, test equipment and accessories, test equipment and modulation methods. Particularly interesting for me is the section on field operation, portable gear and integrated stations.

A thoroughly good read, this is a book to inspire the amateur radio constructor, which will also teach a great deal and be a constant source of reference. My copy is very 'dog eared'! Very Highly Recommended and at just £10.50 it should be easily affordable too!

All About Ham Radio
By Larry Heims AA6FW

Although very American in approach, this book could provide a helpful introduction to our hobby. Providing a good, light approach to Amateur Radio it's the sort of book which should be on school and general library shelves.

It also makes a very good 'first' text book and would certainly be useful for a science student. Helpful and informative, All About Ham Radio costs £13.50.

Shortwave Receivers Past & Present (1945-1995)
Second Edition
By Fred Osterman

I had not seen this high quality (well prepared and excellent printed) book until asked to evaluate it on behalf of readers - and now that I’ve seen it, a copy will be joining my reference library. It will interest any listener or transmitting Radio Amateur.

Covering all the famous names (and quite a few I had not heard of before) each receiver dealt with has a photograph, technical details, rarity, dates of manufacture and 'scarce' comments recorded. Although Shortwave Receivers Past & Present is an American book it covers European receivers (including Eddystone, and KW who get a brief mention) and personally I found it very interesting.

I can see a lot of these books going back to the USA as PW readers travel to the Dayton Hamvention - it would certainly help identify some of the more unusual receivers on sale in the 'flea market'! Highly Recommended at £23.95.
As you enter PW's 'vintage wireless shop' this month the historical 'air' is almost tangible. This is because our resident radio historian Charles Miller is taking his turn and continues telling the fascinating story of valve developments and John Scott-Taggart.

Fig. 1a & b: The arrival of the screened grid valve made a great difference to the performance of wireless sets in the 1920s. But the early version (Fig. 1a) was soon replaced by the more convenient 'single ended' S215 (Fig. 1b).

neutralised h.f. stages there was trouble!

The second grid literally acted as a screen between the control grid and the anode thereby sharply reducing the capacitance. By putting a positive voltage on the screen grid the electron stream passing through it to the anode was accelerated, the result being, improved sensitivity.

Round's screen grid valve appeared in 1926, and it's important to mention here that there had been previous valves with more than one grid. They dated right back to 1913 but these did not have the same properties.

The first attempt appears to have been the American scientist Langmuir's 'space charge' triode. Langmuir had discovered that around the hot filament of a valve was a cloud of negative electrons (the space charge) which provided the actual source of the current that flowed through the control grid to the anode.

Langmuir came up with the idea that the bigger the space charge, the greater the amount of anode voltage needed to draw anode current through the valve. So reducing the space charge would enable smaller anode voltages to be used.

Fig. 1b.

THE ORIGINAL BRITISH SCREEN GRID - THE S625

NOTE 3-PIN BASE THIS END AND 2-PIN BASE AT THE OTHER

To The Rescue

To the rescue came H. J. Round of the Marconi Company who appears to have been one of the few really genuine and likeable innovators. His answer was the 'screen grid valve' in which a second grid was interposed between the usual grid and the anode.

The second grid literally acted as a screen between the control grid and the anode thereby sharply reducing the capacitance. By putting a positive voltage on the screen grid the electron stream passing through it to the anode was accelerated, the result being, improved sensitivity.

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Langmuir came up with the idea that the bigger the space charge, the greater the amount of anode voltage needed to draw anode current through the valve. So reducing the space charge would enable smaller anode voltages to be used.

What he did was to place a finely-meshed grid around the filament between it and the control grid. This
extra grid had around 10V positive applied to it with respect to filament, which in turn made it possible to run the anode too at a very low voltage.

Unfortunately though, apart from the saving in battery power, the space charge triode had no advantage over the ordinary variety as regards stability at h.f.

Next Contestant
The next contestant was Schottky, who in 1916 in Germany produced something that was much nearer the concept of the 'real McCoy' - a screen grid. Schottky fitted what he called a 'protective net' between grid and anode, to be supplied with a voltage just below that of the anode.

The Schottky valve also had a space charge grid between filament and control grid so it really qualifies to be called a pentode. (It's a pity Schottky didn't think of doing just that, as it would have spared Philip's guess about 15 years later as we shall see in due course).

In fact, due to the protective grid not completely encircling the control grid, the internal capacitance was not reduced. As a result the valve, although more sensitive than a triode was still not suitable for h.f. amplification.

The Bi-Grid
During 1920 H. J. Round introduced a variant of the space charge triode known as the Bi-grid. Essentially this valve had two control grids to just one anode.

The Bi-grid valve was a versatile device; each grid could be used to act as control grid. This made it handy as a self-oscillating mixer for early superhets, or the inner of the two grids could be run at a low positive voltage to make it act as a space charge triode.

In the latter role it was employed by such designers as Scott-Taggart in receivers that needed only one low tension (l.t.) battery for both filament and anode supplies.

Over the next few years there seems to have been genuine parallel, but independent development going on in England, by H. J. Round, and in America by A. W. Hull and N. H. Williams. What was to emerge eventually was the genuine 22-carat, 18-jewel screen grid valve.

The two Americans seem to have got there first by about a month. This occurred in April 1926 when General Electric (for whom they worked) announced a tetrode valve in which the auxiliary grid really did reduce the grid/anode capacitance.

Two alternative ways of making the screen grid were used. One used a series of tiny metal slats, with the other using conventional fine wire mesh.

The first type reduced the internal capacitance to around 0.0006pF and enabled stage gains of 40 to be obtained at broadcast band frequencies. Oddly enough, GE had at that time no plans to produce these valves commercially.

Rattling Pace
Back in England, Round must have been working at a rattling pace. Not only did he apply for a patent for his S625 screen grid (in May 1926) by the following year the valve was on general sale.

The S625 most certainly realised all the requirements for an h.f. amplifier. With a grid/anode capacitance of only 0.022pF it had a slope of 0.65mAN and an amplification factor of 110.

As the type number indicated the valve had a 6V filament that drew 0.25A. It was double-ended with the filament and control grid connected to a 3-pin base at one end and the screen grid and anode to a 2-pin base at the other.

The original (expensive to make) physical arrangement was dropped the following year. Instead a standard four pin base for filament, control grid and screen grid, and a top cap screw connector for the anode.

At the same time the filament requirement was reduced to 2V at 0.15A. This new valve was called the S215 and very soon most of the other British manufacturers were making equivalents.

The vast increase in stage gain offered by the screen grid valves killed the neutralised triode stone dead, as far as commercial manufacture of radio sets was concerned. However, they did linger on for a time in home constructed sets where cheapness as more important that outright performance.

By 1928 it was possible to buy a decent three-valve (screen grid h.f. detector and output) set, that had a performance far and away better than multi-valve sets of only a year or two earlier.

At this point an unexpected by-product of the screen grid valve was revealed. It also did away with the superhet, which up to then had been the only effective way to get reasonable sensitivity from a triode infested set.

Early Superhets
Early superhets used up to eight triodes and had separate tuning for the aerial and local oscillator stages and intermediate frequencies ('long wave amplifiers') working at around 50kHz. They were friendly, difficult to handle, ruinously expensive on batteries and were all too likely to act as powerful transmitters of weird howls around the neighbourhood...so the misfortune of other listeners.

Only dyed-in-the-wool musochnuts of substantial means, could have wished to go on using 'dodgy' devices at r.f. frequencies once similar results could be obtained with half the number of valves.

As a result little more was heard of the superhet for about five years. Then the screen grid did an about face and made the new, improved superhet a practical proposition. So keep tuned and find out the details!

Beastly Charles?
Meanwhile, I am told that some people are saying that I was, rather beastly to John Scott-Taggart in my last little piece. Well, my shoulders are broad and anyone wishing to have a go at me is welcome to try their luck!

Oh, and by the way, after all that, advertising about ST valves being far and away better than anyone else's, there's an interesting postscript to the story. It seems that they were actually made for him by Mullard. You can make what you like of that! So, cheerio until next time.

Cheerio from Charles, see you in October.

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The AR-5000 advances the frontiers of performance providing excellent strong signal handling, high sensitivity and wide frequency coverage with microprocessor facilities to match including five independent VFOs, 1000 memory channels, 20 search banks, “Cyber Scan” fast scan and search rates, alpha-tag memory and search banks, frequency offset, step adjust and auto-mode tuning to name just a few. AOR have been synonymous with pioneering receiver design for many years and this tradition continues with the all new AR-5000 “Cyber Scan” 10kHz-2600MHz. RRP £179.95

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UK’s best selling SW receiver. It outperforms any other receiver below £600.

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Communication receiver covers 30kHz-30MHz. Complete with power supply and long wire aerial.

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ORDER YOURS TODAY AND CLAIM FREE P&P.

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DPS-9 +
DPS-59 +
DPS-599ZX
MFJ-784B

RRP £239.95 OUR PRICE £149.95

OUR PRICE £269.95

OUR PRICE £325.95

OUR PRICE £239.95

NEW PRODUCT NEW PRODUCT NEW PRODUCT

GET THE BIG RED QUAD

A superbly constructed 26e cubical quad for 10m heavy duty construction consisting of fibre glass encapsulated elements along with reinforced modular ‘cross-overs’ which will provide many years of trouble free operation even under the worst environmental conditions.

Spec: 10m. Boom length: 1.1m. Reflector: 2.9m square. Director: 2.8m approx. PWR rating: 2kW.

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Miniture frequency finder covers 10MHz-2.8GHz. Includes nicads, charger and antenna. RRP £139

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Auto ATU. £239.95
Ed Taylor NOED tells us how the new US vanity callsign system works and also talks to a well-known British expatriate who is making his mark in American business.

I mentioned last year that Americans would soon be able to get callsigns they had chosen themselves. The scheme has now been put into operation, and I have joined thousands with my new call, NOED. Here's an outline of how the system works.

There is a ranking system in US callsigns, in which more desirable ones (shorter) are obtained by passing examinations and getting a higher class of licence. 'Vanity' callsigns are being issued first to the most highly qualified, then moving down the hierarchy, with a 'Gate' for each grade. The next Gate does not open until applications from the previous one have reached a fairly low level. This avoids overloading the licensing authorities.

Eligible applicants can ask for a callsign corresponding to their licensing authorities, and all have been previously allocated. They supply a list of up to 25, and are issued the first available.

Most of the calls initially requested by US amateurs have been of the '1 by 2' variety, for example, W0DZ or N7DR. These are available to Extra class licensees, and all have been previously allocated. There is generally a two year wait after a call is issued.

Burst Of Applications

There was a mighty burst of applications on the day the scheme began. It took a while to process the 5000 requests that arrived in the first few weeks. The lucky ones, like me, who got their number one choice want on the air straight away to show off their new personalised callsigns!

So, what is the cost, hundreds of dollars? No, just 30US$, for a licence valid for ten years. What a bargain!

As well as allowing amateurs to bring back some of the nice short callsigns that hadn't been heard for years (sometimes, more than 50), people chose initials, nicknames, and letters which 'sounded' good on their favourite mode.

An unexpected side-effect of the vanity system is some welcome new activity on the air. It's easy to ignore the rig in favour of something else when the h.f. bands are suffering poor conditions. There has been a bit of an increase in US activity, perhaps because of interest generated by new callsigns.

Similar Scheme

Could we have a similar scheme in the UK? I don't see why not.

The licensing authorities (I suspect) have no vested interest in amateur callsigns, as long as they can tell who owns a station, and where it is located. They might balk at the extra paperwork, although the high cost of UK licences ought to pay for more than the current straightforward book-keeping exercise. Let me make a few suggestions.

The UK licence is not really hierarchical, except the only amateurs who have access to everything on offer are full Class A licensees. Initially, vanity callsigns might only be available to them. I expect that most applicants would want a '1 by 2' call, such as G0ED or G4AA. Outside England, a station would probably have to be content with a '2 by 2', such as GM0ED.

There are two 'pools' of callsigns available: those that have never been issued, and those that have been issued and lapsed. In the first category, a few ground rules would easily establish valid callsigns.

In the second category, perhaps an amateur should wait (say) ten years after a previously issued call has lapsed. It would be for the applicant to prove this, old callbooks might be used, since computerised records may not hold information going far enough back.

It could be desirable to limit the scheme to those who have held a licence for a certain length of time, say five years. In the initial rush, applications would probably just have to be dealt with at random. New callsigns could easily be allocated by an organisation separate from the issuing and renewal body. Perhaps the RSGB could take on the task, for a one-time application fee reflecting costs.

For example each week they could send SSL (or whoever the contractor happened to be) a list of old and new callsigns, for example, G3SDX has become GM0ED, and so on. The procedure then is almost identical to that in which a Class B upgrades to a Class A.

I think there would be a great deal of interest in such an idea. It does not seem as infeasible as it might a few years ago, given that '1 by 1' callsigns are now being issued for contests.

Dave Wilson President of Alpha/Power welcomes Ed Taylor NOED to the company's offices and manufacturing facilities.

Dave shows off the Alpha 87A, the 'Rolls Royce' of linear amplifiers.

Alpha Power

If you ask leading contesters and DXers which h.f. linear amplifier they use, some will say one of the Alpha range. If you ask them which amplifier they would like, most will sigh, and wish they could use an Alpha!

The company making these high-class amplifiers is American, but the person running it is British. Dave Wilson is well-known for his operating skills on both sides of the Atlantic, and for almost a year he has been applying other skills as President of Alpha/Power, Inc.

Dave used to operate as G3SZA, and was very successful on the lower bands, particularly 1.8MHz (160m). Now he lives in Longmont, Colorado, and is continuing to burn holes in the ionosphere as AA6RS. I talked to him about his radio interests, and his experience of business life making equipment for fellow amateurs.

Sunset Openings

Dave works long hours, but not necessarily nine to five. "I try to get home from work for the 'sunset opening' on 160m, still a big interest." He has taken advantage of the availability of land to set up big antennas.

"I use a Four Square: four towers
Challenging Opportunity

So, how did Dave become involved with Alpha/Power?

"In the middle of last year, I was talking to a couple of local hams. They knew I didn't like my current job, which was not fun or challenging, and suggested I talk to Dick Ehronof ETQ Alpha," Dave says. Dick created ETQ/Alpha in 1970, and was planning to retire. A recent link with a larger company turned out not to be beneficial, because the amateur radio product line represented only a small part of their business, and received less attention than it needed. Dave decided to try three months on trial and says: "I started working there with two objectives, to separate the amateur and commercial sides, and to fix the service backlog. "We had 50 or 60 amplifiers waiting for repair, some going back a year or more. All the good technicians had migrated to the commercial stuff, which made business sense.

"The company's high reputation among radio amateurs was waning. Amateurs are not easy people to deal with, and I was getting several irate 'phone calls every day." In a remarkably short time, Dave started to make progress. His years of working in manufacturing industry, and his home-brew experience were paying off.

"We think that both amateur and commercial applications exist. Its operation is dependent on testing for the amplitude of signals in the RF range. We will use the Alpha name, to pick-up any associated goodwill."

Thanks for that Dave, it's great to see a British amateur making a success in a very competitive environment, and confounding the saying "You cannot make money selling to Radio Amateurs." By the way, you can monitor the Alpha/Power company's progress on their web site at www.alpha-power-inc.com.
Sigma Wire Antennas

Trapped Dipole Antennas*

SD-32 20/15/10m 2 Trap 27' long £79.95 5.95 P&P
SD-34 20/15/10m 4 Trap 24' long £135.95 7.95
SD-42 40/20/15/10m 2 Trap 55' long £84.95 5.95
SD-44 40/20/15/10m 4 Trap 47' long £139.95 7.95
SD-52 80/40/20/15/10m 2 Trap 102' long £99.95 7.95
SD-54 80/40/20/15/10m 4 Trap 97' long £154.95 7.95
SD-56 80/40/20/15/10m 6 Trap 82' long £209.95 9.00
SD-68 160/80/40/20/15/10m 8 Trap 154' long £279.95 10.00
SD-610 160/80/40/20/15/10m 10 Trap 140' long £359.95 10.00
SD-162 160/80/40/20/15/10m 2 Trap 208' long £119.95 7.95

Baluns

Lightweight, sealed and weatherproof with Solid Brass rustproof terminals. No so

SPB-1 is a 1:1 impedance ratio "voltage" balun that matches 50-75 ohm coax to 50-75 ohm load. 3 - 35MHz, 1.5kW. Offer Price £27.95 p&p £4.95
SPB-1C is a 1:1 impedance ratio "current type" balun that matches 50-75 ohm coax to 50-75 ohm load. 3 - 35MHz, 1.5kW. Offer Price £29.95 p&p £4.95
SPB-4 is a 1:4 impedance ratio "voltage" balun that matches 50-75 ohm coax to 200-300 ohm load. 3 - 35MHz, 1.5kW. Offer Price £29.95 p&p £4.95

Traps

These 600W deluxe traps are made of heavy duty components and housed in weatherproof sealed enclosures. No soldering or jumper wires are required.

Use 2 traps for a dipole, or 1 trap for a Vertical slope.

ST-10 28MHz trap Offer Price £27.95 each p&p £4.95
ST-12 24MHz trap Offer Price £27.95 each p&p £4.95
ST-16 21MHz trap Offer Price £27.95 each p&p £4.95
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ST-40 7MHz trap Offer Price £27.95 each p&p £4.95
ST-80 3.5MHz trap Offer Price £27.95 each p&p £4.95

Receiving Dipole

Shortened Dipole Antennas*

SLS-40K 40m 36' long £63.95 5.95 P&P
SLS-80K 80m 69' long £74.95 6.95
SLS-160K 160m 100' long £79.95 7.95

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SPB-4 is a 1:4 impedance ratio "voltage" balun that matches 50-75 ohm coax to 200-300 ohm load. 3 - 35MHz, 1.5kW. Offer Price £29.95 p&p £4.95

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ST-20 14MHz trap Offer Price £27.95 each p&p £4.95
ST-30 10MHz trap Offer Price £27.95 each p&p £4.95
ST-40 7MHz trap Offer Price £27.95 each p&p £4.95
ST-80 3.5MHz trap Offer Price £27.95 each p&p £4.95

Receiving Dipole

Shortened Dipole Antennas*

SLS-40K 40m 36' long £63.95 5.95 P&P
SLS-80K 80m 69' long £74.95 6.95
SLS-160K 160m 100' long £79.95 7.95

Co-ax Connectors

SCE-1 is a 1kW centre insulator/connector for a dipole antenna. Offer Price £13.95 p&p £2.75
SCE-1B is a 1kW insulator/connector for a vertical sloper antenna. Offer Price £13.95 p&p £2.75

Shorteners

Antenna ‘Shorteners’ are excellent where installation space is limited. The shorteners

are housed inside weatherproof, sealed enclosures, so no periodic cleaning is required.

Two are needed for a dipole array for a vertical sloper.

SLC-40 Offer Price £18.95 each p&p £2.75 Shortens a 40m Dipole to 38'
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AUTEK RF ANTENNA ANALYSERS

RF1 HF £159.95 P&P 7.95
RF5 VHF/UHF £289.95 P&P 10.00

*Protective Case £14.95 P&P 2.75

FREE UNTIL 12th JULY with RF1 or 5

The pocket sized RF1 is designed to check and adjust antennas, feedlines, and RF networks. It includes a microprocessor, A/D converters, and a low-distortion, levelled, sine-wave generator, with 4 digit frequency readout, continuously adjustable from 1.2 to 35 MHz in 6 bands. It measures RF values of true impedance (0-2000W), SWR (1 to 6:1), and its INSTANT SWR mode finds the frequency of minimum SWR (or Z) on command automatically. Its digital readout of all parameters is unique in its price range. It instantly reads out impedance and SWR at any frequency in its range. Antennas are easily trimmed after noting their resonant frequencies with its miniature ‘transmitter’, minimizing trips to the antenna. Feedline loss and phasing, L and C are measured at the RF frequency of interest not at 1kHz measured and adjusted for best performance, even by inexperienced users. L and C are measured at the RF frequency of interest, not at 1kHz or 100 MHz as with other LC meters. Basic accuracy is 2.5% to 5% over most of its range. The unit fits in the pocket, and runs on a standard 9v battery (or 7 - 15v).

RF ANALYST® RF5

The RF5 has a 4 digit frequency readout, continuously adjustable from 35 to 75 MHz, and 138 to 500MHz (typically 520MHz) in 3 bands. It measures RF values of true impedance (0-600W), SWR (1 to 6:1), and its INSTANT SWR mode finds the frequency of minimum SWR (or Z) on command automatically. Its digital readout of all parameters is unique in its price range. The unit fits in the pocket, and runs on a standard 9v battery (or 7 - 12v).
PERSONALISED CALLSIGN CLOCK
£39.95  £34.95
These quartz clocks, hand finished with INDIVIDUAL CALLSIGN printed on the face are ideal gifts for Radio Amateurs.
They are not only an attractive and useful addition to any radio shack, but also a valuable aid to an H.F. operator using a rotary beam antenna system. A large 9 inch (23cm) diameter face gives excellent visibility across a radio room. The hour is indicated in 12 and 24 hour format. The central area of the clock is in three colours with a blue sky effect background. A global map shows countries with their bearing, in degrees.

Prices include World-wide delivery
Models are available centred on other parts of the world

STATE CLEARLY, CALLSIGN & AREA OF WORLD

DELTA 1.5kW COAX SWITCHES

2 WAY SO239 to 600MHz  £67.95  5.95 P&P
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4 WAY SO239 to 600MHz  £92.95  5.95
4 WAY N TYPE to 1300MHz  £105.95  6.95

Mosley Antennas are renowned the world over, for stable and dependable operation. All Mosley Antennas are pre-drilled and colour coded, for easy assembly. For long term reliability, all hardware is stainless steel, and tubing is aircraft grade, drawn, aluminium. Mosley’s advanced trap designs mean less trap assemblies giving better structural stability. A Mosley 3 element, tri-bander, has six trap assemblies - others make need twelve! Using a higher grade of tubing means a perfect fit for telescopic sections - and none of those horrendous hose clamps!

So why pay more for an inferior antenna when you can have a MOSCEY ANTENNA for less?

STANDARD SERIES

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HEAVY DUTY SERIES

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ADD ONS:

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HEAVY DUTY VERTICAL ANTENNAS

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This month David Butler G4ASR reports on propagation openings, activity reports, 50MHz repeaters and proposals for a new digital sub-band.

Large Solar Eruption

On April 7 a large eruption on the Sun was detected by the Solar and Heliophysical Observatory (SDHO) spacecraft. Scientists said that the ejected matter was travelling through space as an interplanetary magnetic cloud and would strike a "glancing blow" to the magnetic field that shields the Earth more than 100km above its surface. They reported that although the coronal mass ejection (c.m.e.) was a strong one for this low point of the 11-year solar cycle it was not as strong as events we can expect in three to four years time when solar activity peaks.

If you are like most operators you may feel a certain amount of nervousness during this period and you may wonder if a solar storm will disrupt your activities. As luck would have it, however, that many television, radio and newspaper commentators picked up on these reports and suggested that there might be damage to communication satellites, electrical power blackouts and auroral displays when the emitted material reached the earth three or four days later. This was all media hype.

In a Packet radio bulletin John Bragan G4HJG reported sporadic-E (Sp-E) openings had occurred on the 50MHz band even though there was relatively little activity on the 50MHz band during this period. As luck would have it, however, that many television, radio and newspaper commentators picked up on these reports and suggested that there might be damage to communication satellites, electrical power blackouts and auroral displays when the emitted material reached the earth three or four days later. This was all media hype.

A small auroral opening was reported on the 50MHz band but no activity other than the GB3RMK and GB3LER beacons were reported. The opening lasted a few hours from 1700-1900UTC and there was a T9 note indicating auroral-E. This was followed by aurora and some auroral activity. A small auroral opening was reported on the 50MHz band but no activity other than the GB3RMK and GB3LER beacons were reported. The opening lasted a few hours from 1700-1900UTC and there was a T9 note indicating auroral-E. This was followed by aurora and some auroral activity.

Fig. 1: The new UK 50MHz f.m. repeaters.

Fig. 2: The nine CTCSS repeater tones being used in the UK.

Fig. 3: Proposed 50MHz digital sub-band.
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**Practical Wireless, July 1997**
Activity Reports

Emil Pecock W3EP will be active on the 50MHz band from locator GNO5 and neighboring localities during the period June 14-15. He will be using an Icom IC-7000 receiver capable of monitoring the 70MHz band for any possible cross-band activity.

The expedition group CY9AA activating St. Paul Island, Canada, will also have 70MHz cross-band capability. The group led by Mike Smith VE9AA will be active on the high bands and the 50MHz band between June 26 to July 4. You may recall that in the May issue I reported that Andy AD5AM who will be operating G9V2Z/MM was going to attempt a moon-bounce (e.m.) contact with WSUN on the 144MHz band. Well I'm pleased to report that Andy did indeed complete this contact with the North American station.

The c.w. contact took 15 minutes with signals from WSUN peaking at 53. The location of the Royal Research Ship (RRS) Charles Darwin, which time was in the Arabian Gulf (EL7S) approximately 100km north of Dubai.

The weather was marginal, wind force four with a mild swells. Andy and I heard WSUN calling CQ on 144.240MHz during a couple of minutes of moon-time before the GSO could be completed. (Running out of moon-time normally means that the moon has gone down below the horizon.) The following day was initially from LB6 but weather conditions with a 40 knot wind and a two metre swell prevented any further e.m. contacts being made although WSUN was heard again.

Andy reports that his next cruise will commence on June 30 setting sail from Southampton, via the Irish Sea, Hembroid, Shetland Islands to a working area west of Norway. There will be three main working areas in locators JP02, JP42 and JP47 with two intermediate port calls in Norway.

A c.w. cruise on the RRS Charles Darwin is scheduled to be completed by July 20. There is also a possibility of a two week cruise, west of the Shetlands, on completion of this cruise.

The station of G9V2Z/MM will be active on 144.240MHz on both s.s.b. and GB3VRB repeater units. The new Chairman is Mike Marsden GB9GHO who is GTHR. (For those that don't know what GTHR is... it means the address is correct in the latest callbook.)

Microwave Bands

On April 7 a new world record was established on the 145GHz band. The station of BB2G/CP/TP contacted DL1/UI/CP over a 53km path, breaking the previous record which stood at 16km. Signal strengths were 100dB above noise level and this performance indicates that it is possible to reach more than 68km when conditions are favourable.

50MHz Repeaters

On April 7 the RSGB Repeater Management Committee made the announcement that the Royal Asociations of Radio Amateurs (RA) had given the all clear for Britain's first 50MHz repeaters. The list of repeaters is shown in the table, Fig. 1 and it is expected that service for some will have already commenced by May.

Now that there are a number of 50MHz repeaters operational in the UK it will be useful for those who wish to make use of the facility to understand some of the technical details of the specification for the repeaters and how this will affect access by users. The following information has been provided by lain Philips GORDF for I am most grateful.

The first item to note is that the channel spacing specification is 10kHz and that the maximum peak deviation of the repeater transmitter will be 2.4kHz. Those of you with receivers set up for 25kHz spacing will find that the intermediate frequency filters (I.F.) filters with narrower ones or increase the audio frequency receiver (A.T.) gain. In practice it means that you will need to turn up the volume control to a setting somewhat higher than normal on f.m.

More importantly, the repeater receivers have been designed to accept a maximum deviation of the input signal of 2.4kHz. It will therefore be necessary for you to adjust your transmitter deviation so that to ease your transmitted audio will be 'chopped' on speech peaks. Users will have to experiment to achieve the correct deviation, either by using appropriate test equipment or by on-air tests.

Continuous Tones

For the first time the access method for these 50MHz repeaters has been specified as a continuous tone-coded squelch system (CTCSS) only. The principle of CTCSS is that a sub-audible tone (in the region 67 to 118Hz) is continuously transmitted in addition to the usual speech signal. Being below the normal band of voice frequencies it does not interfere with the received signal.

The objective of the system is to give some form of selectivity to the repeater user. Therefore someone who is located within the coverage area of two repeaters on the same frequency will only activate the repeater appropriate to the CTCSS tone being transmitted. Currently there are one CTCSS tones being used in the UK and these are shown in Fig. 2.

The repeaters will identify which CTCSS tone it requires by sending the appropriate letter in Morse code after the repeater call sign. If you don't have the capability at the appropriate frequency for your local repeater, then you will not open the repeater receiver squelch and will be unable to use the unit.

Digital Sub-Band

As part of the ongoing review of the various v.h.f. band plans, the Radio and Telecommunications Committee of the BCC have agreed to allocate a digital sub-band in the segment 50.500 - 50.700MHz. The table, Fig. 3 shows how the DCC sees the specification for the sub-band and how this will affect access by users. The following information has been provided by lain Philips GORDF for which I am most grateful.

The beacon band plan is implemented. This is a 24-hour event between 0000-2400UTC.

On Sunday June 22 between 0900-1500UTC there is a 50MHz 'phone contest organised by the Auto-Relais (WAB) group. One of the biggest events of the year, the v.h.f. national field day, is being held on July 6.

You'll find a terrific amount of activity on all v.h.f. and microwave bands during the weekend. The contest lasts 24-hours, commencing at 1400UTC.

Deadlines

That's it again for another month. And I'm surprised that no one has provided any input to the annual table.

So, please send me your list of locator squares, counties and countries worked on any band. And don't forget that I'm also including satellite contacts as well.

Forward any news, views, comments or photographs to reach me no later than Saturday June 28. Send them to me at New Tree Cottage, Lower Massacre, Herefordshire, HR2 0HP. You can also contact me via Packet radio @ GB7MAD, the UK DX Cluster @ GB7/M/AP or e-mail via dave@digitaluc.agv.bt.co.uk. Alternatively you can telephone me on 01873 806797.
The month of April brought better conditions on h.f. It seems. A number of our reporters have indicated that 21MHz has been improving steadily over the recent few weeks. However, it appears that the band has been quite flat at certain times, yet DX Newsheet 15 has brought back a DX contact or two. Just goes to show that if we're all listening and not calling, then the band will remain flat won't it? This is certainly true of the higher frequency bands.

I think that after the long sunspot minimum, amateurs tend to listen briefly on the 21, 24, and 28MHz bands finding no activity and assume that the band is 'closed' and refrain from calling CQ.

But it's worthwhile putting out a call for a few minutes just in case there is sufficient propagation to allow two-way contacts to be had. As we begin to approach the upturn in sunspot activity perhaps trying this approach may reap dividends.

Talking of solar activity, there was a massive solar flare at the beginning of April which adversely affected short wave (h.f.) communications. It was even reported on the BBC Evening News, and more than a few of our reporters mentioned it in their logs this month.

Solar flares tend to cause h.f. fade to die out, often completely, sometimes just for a matter of minutes, more often for hours or even days. Thankfully they don't take place too often, otherwise we'd have nothing to report!

News Snippets

Some news 'snippets' now from the RSGB's weekly DX Newsheet starts with news that Mark DN4AVW is active from Rwanda again as 9X4AVW, G3L to DSNT when Charlie K4VUD is hoping to be operational from Blutian (JAS) in July. If you worked 9X4AVW or 9M6STP (Spratly Islands) in March, send your QSLs via KQ1F.

From Iraq, Sanyi HA7VK will be active here as Y9VK from the 12th of May to the 12th of July using c.w. and s.s.b. on all h.f. bands, G3L via H6GWJ. On 'Top Band' Tony 2L2AGY in New Zealand is active on 1.29MHz c.w. between 1530 and 1900UTC (his sunset) looking specifically for European stations.

Balearic Islands

I've recently received a letter from Douglas Byrne G3KPB who is the Honorary Curator of the National Wireless Museum GB3VM. Douglas recently took a holiday in the Balearic Islands, sunny Majorca to be precise, and spent some time in the shack of Pablo EA6BM and Mateo EA6BG.

Both Pablo and Mateo speak excellent English, says Douglas, and particularly enjoy working stations in the British Isles. He also says that judging by the antenna arrays they use, is there any wonder that they put out such good signals? Quite right Doug...they've obviously got excellent stations, as you can see from Figs 1 and 2.

Listening Watch

Steve Locke G6WSSL reports that he has been called a number of times by stations who had specifically listened for him on 14MHz after reading the PW Listening Watch section. The most recent was a Canadian station, who, it turned out was a Welsh ex-kite!

The Canadian amateur it turned out, had lived in the same street as Steve up until the late 1950s! He asked Steve to pass on his regards to a few of the older generation who still live in the village! (Makes you wonder what'll turn up next, I suppose!)

Your Reports

Into your reports now, starting with 1.8 and 3.5MHz First in the 'pile-up' of 11 reports this month comes Ted Trowell G2HKU (Switzerland). PA3BDQ (Netherlands), 0A4CPI (Peru), VP2EUC (Anguilla) at 0252UTC, 0A4CPI (Peru), VP2EUC (Anguilla) at 0252UTC, C56/DK3FW (Gambia) at 0749, and 7X5JF in Algiers.

Steve Locke's log shows 10W c.w. contacts with 7X4AN in Algers, VY2CC (Prince Edward Island), and VY3G (Faroe islands), while 100W s.s.b. accounted for 5K5M (Arizona USA), and 7X5JF (Algeria). Steve's antenna for 3.5MHz is a full sized GSRV dipole up about 30 metres. The 'key' has been taking a bashing again at the shack of Carl Mason GW6VSJ in Swettenham. Carl's 3.5MHz log shows c.w. contacts with W8W (USA) at 0216, and EU1AN (Belarus) at 2318UTC. Also logged were TF3DX (Ireland) at 0649, GW6VLB in the GW QRP Club contest at 1520, and GW3E0 (Jersey) at 1628.

The 7MHz Band

Yet again, '40' has provided some nice DX contacts for Sean Gilbert G4UJC of Milton Keynes, who says although his static level on the 7MHz band has increased of late, he still manages to work some 'rare' stuff. Sean hooked up with XE3RT (Mexico) at 0032, S38RF (Masautus Island) at 0214, P1JUT (Netherlands Antilles) at 0224, V8PS4RS (Turks & Caicos Islands) at 0332, and our very own Ted G2HKU at 2300UTC.

Fig. 1: Pablo EA6BM in his well-equipped shack. A fluent English speaker...he's always on the look-out for stations in the British Isles.
Ted G2HKU offers one contact on the 10MHz band, with TF70LEW in Ireland at 1700 UTC. Carl GW0DSW on the other hand hooked up with GZYH6 (Poros Islands) at 0941, DX1KD (Armenia) at 1816 Gz, via Box 54, 37510, Yerevan, Armenia, and C56KDF/PW (Gambia) at 2150 UTC.

The 14MHz Bond

I'm starting off the 14MHz band reports with a "welcome back" greeting to Don McLean G3NOF of Yeovil, who is now back on the air after a long illness. Glad to hear you're much better Don! Don's monthly h.f. propagation report says this time around that "I've found conditions on the bands rather poor, apart from 14MHz. This has been the best DX band with the best conditions on the short path from 1600 to Australia and Asia up to around 1900 UTC. I've heard nothing on 28MHz, although others have noticed openings there, and on 21MHz there have been some US stations heard, plus some Africans. Meanwhile, 18MHz was open to the Middle East. Around noon there were a few openings to Australia and Japan, with north Americans from noon to around 1700 UTC."

The 14MHz Band

His first log shows his s.s.b. contacts on 14MHz with BV85S (Taiwan) at 1627, D1ULS (Philippines) at 1455, US60UAV (Thailand) at 1839, N1QXCB (Honduras) at 2035UTC (GZL via W7TSQ). Also reported were K07FT (Dominica) at 2158 (GSL via D1FT), SU1EFA (Egypt) at 1348, XU2F6 (Cambodia) at 1474 GSL via N1XJ, and YO1LGX (South Africa) at 1917, K6ASW (Sri Lanka) at 1743, K4FVR (Uganda) at 1919 GSL via K3WS, 91PGA (Ghana) at 1819 GSL via Box 771 Takoradi, Ghana, and 5X/R9/SAH (Rwanda) at 1945 UTC.

It's exam time for arch 'GRPef' Eric Masters GOKRT in Worcester Park, Surrey, so his radio time is quite curtailed. (Good luck with the exams Eric!) He offers c.w. contacts with curtailed. (Good luck with the exams Park, Surrey, so his radio time is quite extraordinary h.f antennas you may well hear them! Ph

Fig. 2: Mateo EA6BG is another fluent English speaker often on the look-out for stations from the British Isles. And as both E4BGM and EA6BG have extremely impressive h.f. antennas you may well hear them! (Photos courtesy of gsmga)

Ted G2HKU has also been spending some time on 18MHz as his logs show. All c.w. is our Ted's approach, and he hooked up with V29VX (Chagos Island) at 1832, 5X1KX (Iraq) at 1400, VP2GM (Anguilla), VY2SS (Prince Edward Island) and XT1A2 (Burkina Faso) at 1500 UTC. However, in a certainly rare moment for Ted, he actually picked up the microphone and worked G5VRM/MM who was on board the Cunard line's RMS Queen Elizabeth II in the Suez Canal. With a new rotator on his TH7 beam antenna (which he says certainly helps) Steve GW0SSL has been lapping up the DX on the higher bands. His 18MHz log includes s.s.b. contacts at 100W with 52X2/6Z (Kenya), CN091X (Morocco), 7K3D (Algeria), 9K3NQ (Kuwait), TA3BP (Turkey), V82VQ (Chagos Islands), and AI41LZ (Oman) QSL via Box 2837, Ruwi, Oman.

For his 18MHz report Don G3NOF, now back on the microphone offers s.s.b. contacts with A61AJ (United Arab Emirates) QSL via Box 15003, Dubai, at 1019, 19W6T (Antarctica) at 1635 UTC (GSL via I9PRA). Also logged were, FG5R (Guadeloupe) at 1251, K4XSA (Egypt) at 1120 QSL via D1IFCM, VP2ED (Anguilla) at 1700, and 5X17 (Uganda) at 1940 UTC.

The 21MHz band

In many ways it's been reassuring to hear that the 21MHz band has been open for some decent DX lately. As usual, our reports are 'quick on the ball' and never let an opportunity pass by if they can help it! Chris MW6ROD reckons 21MHz has got to be one of his favourites since he became an 'A' licensee. He reports 100W s.s.b. contacts on the band with 5W5OM (Martinique) at 0532, and 5S1WT (Argentina) at 1652 UTC.

New reporter Chris Knowles MW6ABD of Bolton in Lancashire has been busy on both the 18 and 21MHz bands of late. His first log shows contacts using 100W of s.s.b. into a home made multi-band antenna. His 18MHz log includes KH3AO (Contact from 100W) and K5PKS (Turks & Caicos Islands) at 1504, KX2V (Mexico) at 1444, and 9K2HJN (Kuwait) at 1600 UTC.

As usual, reports and information (and photos!) by the 15th of each month to: Leighton Smart GWOLBI, 33 Nant Gwyn, Trelewis, Mid Glamorgan CF64 6GB, Wales. Tel: (01443) 710749 (9am - 6pm).
This month Mike Richards G4WNC looks at a text editing program, a useful reference program and has a preview of a spectrum analyser.

O

ne of the essentials for any computer system is a decent text editor. I don’t mean a word processor although these are undeniably a handy tool.

What I mean is a highly flexible text editor that can be used to edit all manner of text files. If you’re in to the Internet and have your own home page, a good example is HTML editing.

Whereas a good HTML editor like Hot Day is great for the original page creation, it tends to be very slow if you just want to make a few changes to your page. Typically you might just want to update the address in a couple of links or maybe just add an extra item. By far the quickest way to do this is to use a text editor.

Even better is a text editor that includes support for HTML commands. This is where TextPad comes into its own as it identifies these files from their extension.

TextPad then opens the selected file in the appropriate editing mode. This really is a quick way to update a Web page.

That’s by no means the end of it as TextPad can handle a huge range of files including hex files for those that want to get into some serious file hacking. You can also use TextPad to simultaneously edit multiple files with up to two views per file.

You can also use TextPad as a straight word processor as it includes an excellent range of formatting tools. It even has a spelling checker that can handle multiple languages as well as having a daunting array of macros and hot keys.

So, as you can see that TextPad looks to be a very powerful utility that’s virtually a must-have - what’s more it’s British. For more information contact Helios Software Solutions either at their Web site http://www.textpad.com/ or by phone on (01722) 324353.

HamCalc

If you’ve ever wanted to try designing an new antenna or maybe to build a simple audio filter you’ll know that you need some form of reference to look up the appropriate formulas. As a few examples picked at random you’ll have to get a computer program that does all the hard work for you.

If you look through any shareware catalogue you will find that all manner of programs are readily available. The problem is having the particular program to hand when you need it.

If you’d like me you won’t have the patience to write away to get a suitable program. Well the answer to the problem could well be found in George Murphy VE3EPR’s suite of amateur programs that can be found under the overall title of HamCalc.

For simplicity, all the programs are written in GWBasic and the package even comes with its own version of GWBasic, so there’s no excuse for not being able to run it.

The other big advantage of using such a simple language is its ability to run comfortably on just about any PC, including many emulation systems.

The use of Basic also means that it’s quite easy to customise the programs if they don’t quite provide what you need. Now what’s really different about this suite of amateur radio programs is the sheer range of topics that are covered.

There are a grand total of 164 main programs and some of them have sub-programs so the full count is even greater! This is a truly huge collection that should cover just about every amateur’s requirements.

The program comes with all manner of options to customise the sampling and analysis process. Although it will work with just about any PC that can successfully run Windows 3.1 or ‘95, a fast PC is required to make best use of the real-time analysis.

In addition to making an excellent tuning indicator, Spectrogram can be immensely powerful for analysing all types of signals. If you have a receiver that can be set to a wide receive bandwidth you can use the Spectrogram to monitor the audio bandwidth usage. Another option is to use the analysis tools to better understand any interfering signal.

As I said, there’s far too much to fit in here. So, just to whet your appetite, I’ve included a screen-shot (Fig 1) of a Morse signal.

For those that can’t wait, you can find the programs at the following locations on the Internet:

http://www.winsite.com/info/jpc/win95/gram32.zip for the Windows ‘95 and


Special Offers

If you’d like a copy of Hamcom/UVFAX, etc. I’ve arranged a very special offer with the Public Domain and Shareware Library (PDSL). They have put together a library set of all five disks for just £12, all inclusive.

Using PDSL also makes ordering simpler as they accept all the usual credit cards so you can order by phone - you don’t even have to write a letter. Please direct all orders and enquiries about this disk set to PDSL, Winscombe House, Beacon Road, Crowborough, Sussex TN6 1UL. Tel: (01892) 663258 and request library volume: H00879abcde.

The software is only available as a set of five disks as follows:

- IBM PC Software (1.44Mb disks): Disk A - JFAX 7.1, HAMCOM 3.1 and UVFAX 2.2, Disk B - DSP Starter plus Texas device selection software, Disk C - NuMorse 1.3, Disk D - UltraPak 4.0 and Disk E - Mscan 1.3 and 2.0.

For those that can’t wait, you can find the programs at the following locations on the Internet:

Fig. 1: A sample of c.w. signal analysis received using the Spectrogram program.

Cheerio for now please keep your news and views coming to me Mike Richards G4WNC at PO Box 9563, Ringwood, Hants BH22 2ZD or via E-mail to mike.richards@dial.pipex.com. You can also visit my Web site at http://www.dial.space.dial.pipex.com/mi ke.richards/
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Practical Wireless, July 1997
There are several key findings on 5 May.

The Australian government submissions have been received by the Australian government.

We will retain our Tok Pisin service to Papua New Guinea. However it will remain on the air, however, with broadcasts via short wave, albeit at a reduced level, plus satellite transmission, including, it is thought, relays to Europe and North America via World Radio Networks English-language satellite service.

Derek White, Radio Australia's General Manager, commented that he was "very, very disappointed. It is at least pleasing that we will apparently retain our English service that we will continue our short wave coverage of the Pacific, and that we will retain our Tok Pisin service to Papua New Guinea. However it would be extremely disappointing if we have to end our services to Asia in the languages which deliver the greatest audience and which play an enormous role in building an image of Australia in the region".

A former Radio Australia head, Peter Barnett, who ran the station during the 1980s said that the budget cuts were "nothing short of a national disaster". Well over 2,000 submissions have been received by the Australian government committee established to investigate the need for international broadcasting from Australia, and all but a handful gave full support to maintaining the service. The Committee was due to report its findings on 5 May.

Cut-back is likely to be the ending of services in five Asian languages: Mandarin and Cantonese to China, plus Indonesian, Khmer and Vietnamese.

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**Planned Cuts**

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**Cf-cut Cuts**

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**Up For Sale**

There is a further closure likely to he sold or leased to other broadcasters.

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**Survived Threats**

Radio Canada International (RCI), which has survived threats of closure each Christmas for the past century, is in the news again. The service's head, Terry Hargreaves, has steered RCI through difficult times and fought for continued funding, was moved suddenly to CBC domestic radio at the end of April.

Terry Hargreaves' deputy, Alan Familliant, took early retirement almost simultaneously. No one knows why this happened, but cynics might venture the opinion that Hargreaves and Familliant spoke out too loudly and too regularly against CBC and the government for some people's liking.

Tune to RCI in English at 1330-1400 on 11.93S, 15.325 and 17.82 (not regularly) at Petrozavodsk, and I wonder how well it can be received, let me know if you can hear the signal: 0200-0300, 0600-0900; 1000-1100 on 9.73MHz medium wave; 1500-1600 on 9.73MHz short wave plus 612, 1088 and 1454kHz medium wave; 1600-1700 on 7.29, 7.35, 9.73, 9.75s, 9.88, 11.675, 15.49 and 15.43MHz plus 612, 999 and 1467kHz medium wave; 1700-1800 on 9.76s, 9.77s, 9.88, 15.40MHz plus 1143 and 1457kHz, 1800-2000 on 7.29, 7.35, 9.75s, 9.77s, 9.88 and 11.675MHz plus 1457kHz, 2100-2200 on 7.29, 7.35, 7.37, 7.44, 9.65s, 9.75s, 9.88 and 11.84MHz plus 612 and 1467kHz medium wave.

That is all I have this time around. Look out next month when I will be testing driving a portable receiver that might suit holiday makers who want to keep in touch without being burdened by lots of heavy listening gear! Until then, enjoy tuning the short wave broadcast bands, and keep me in touch with your interesting finds.
Roger Cooke G3LDI has news of a special presentation in honour of commemorating the site of the original Marconi transmitting station.

When I was in Australia a couple of years ago, I paid a visit to Jo Harris VK2KAA. Jo lives in Wahroonga and is on the committee of the Australian Amateur Packet Radio Association (AAPRA). We swap the occasional message via my Satgate and Jo also sends me the AAPRA bulletin, from which I have quoted in the past, as I’m very active on Packet and can be contacted at VK2OP. She is very methodical and must love documentation. Those books you can see on her shelf in Fig. 1 are a complete VK callbook!

The VK callbook is a callbook that has photographs, full personal details and a potted history of each individual. It did occur to me that possibly this information might be more condensed on a computer! Jo is shown in Fig. 1 with David Ramsay, the President of AAPRA.

Special Trip
Jo is coming to the UK this year, and is making the trip for a special reason. Jo is also the President of the Wahroonga Amateur Historical Radio Association, with the call VK2WAH, and a historian of the Wireless Institute of Australia. She is in communication with Dewi Roberts GW0ABL, shown in Fig. 2. Dewi is the Chairman and Publicity Officer of the Dragon Amateur Radio Club in Gwynedd, close to the site of the original Marconi transmitting station, at Ceunant, between Llanrug and Waunfawr, nr Caernarfon.

Jo was concerned that although the buildings still remained at Waunfawr, this historical event was not commemorated in any way at the old transmitting station. So she voiced her opinion that any such emblem should come from the Australian side.

Working hard to achieve this ambition, Jo commissioned a copy of the original monument, shown in Fig. 3, to be cast in bronze. The figure of Mercury will be standing on a globe of the Earth, just like the original, but the globe will then be mounted on a nine inch square piece of Pacific Maple. This statuette will be three feet high and weigh 15kg. On one side of the globe will be ‘Waunfawr, Wales’, and on the other ‘Wahroonga, Australia’. There will be a plaque on the plinth with the inscription:

"From this site on the 22nd Sept., 1918, Guglielmo Marco transmitted the first direct wireless message to Australia, where it was received by Ernest Fisk at Wahroonga, N.S.W."

In smaller letters will be the words:

"Presented by Jo Harris VK2KAA, on behalf of friends of wireless in N.S.W. Australia, July 1997."

Secure Display
The Dragon Amateur Radio Club will provide a suitable and secure display cabinet so that the replica monument will be permanently shown at the old transmitting station. A copy of the original message that was transmitted from Waunfawr to Wahroonga is shown in Fig. 4.

Jo will be travelling to the UK in June and will be staying several weeks, also making the journey up to Norwich for the annual Norfolk AX25 Group Barbecue as an honoured guest at the end of June. Now that is a long way to come just for a burger! This year will be the tenth anniversary of the Norfolk BBQ, so we are looking forward to a great day. We usually have around 100 people attending and keeping Jo company will be John Bays VK3SB, who will also be visiting the UK.

I hope to have photographs of the actual presentation when it takes place in July and hope to feature them in a future ‘Packet Panorama’. In the meantime, both Jo and Dewi will be corresponding by Packet up until the time she leaves for the UK.

That’s all for this time so happy packeting from me Roger G3LDI@GB7LDI. News can be sent to me can be sent either QTHR, via Internet at mtaylor@uk.mdis.com or by telephoning (01508) 570278.
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