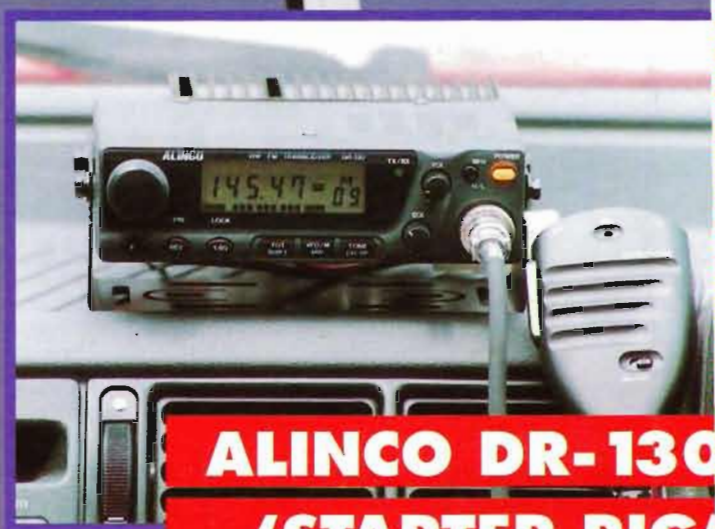
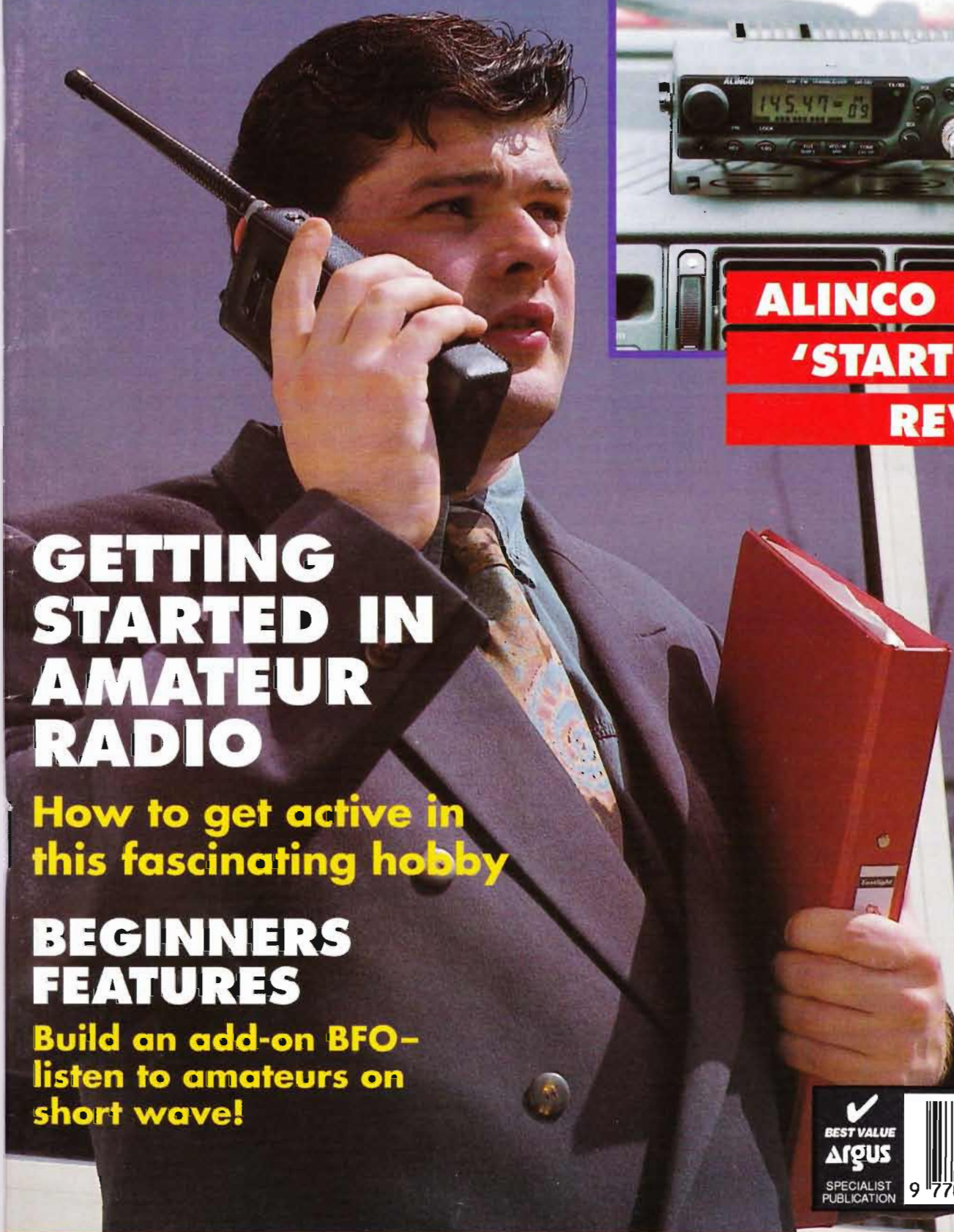


HART

**Incorporating
SCANNERS**

HAM RADIO TODAY

OCTOBER 1993 £1.70



**ALINCO DR-130
'STARTER RIG'
REVIEWED**

GETTING STARTED IN AMATEUR RADIO

**How to get active in
this fascinating hobby**

BEGINNERS FEATURES

**Build an add-on BFO-
listen to amateurs on
short wave!**

Hundreds
of beginners
bargains
in our free
readers ads

Where
to find
your local
amateur
radio club


BEST VALUE
Argus
SPECIALIST
PUBLICATION


9 770269 826031

10

NOVICE • PACKET • REVIEWS • PROJECTS • SATELLITES

HRT

CONTENTS

VOLUME II NO.9 OCT 1993

REGULAR COLUMNS

ORP CORNER	36
Dick Pascoe G0BPS builds a simple CW audio filter, and shows how you can manage over a billion miles per watt with just a three component transmitter!	
FROM MY NOTEBOOK	38
Geoff Arnold G3GSR continues his series on commonly found mechanical fixings used for radio work	
SATELLITE RENDEZVOUS	40
Richard Limebear G3RWL with this month's AMSAT-UK updates on the satellites	
PACKET RADIO ROUNDUP	42
Our packet SysOp G4HCL answers most commonly asked questions	
VHF/UHF MESSAGE	44
Geoff Brown GJ4ICD says "What a month on 6m!"	
HF HAPPENINGS	46
Don Field G3XTT with a guide on how to get started in contests	
FREE READERS ADS	53
Helplines, For Sale, Exchange and Wanted. Published free	

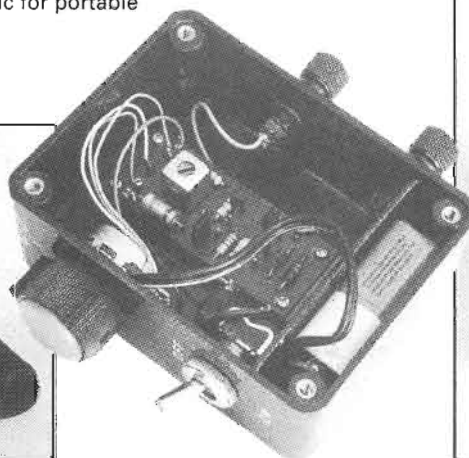
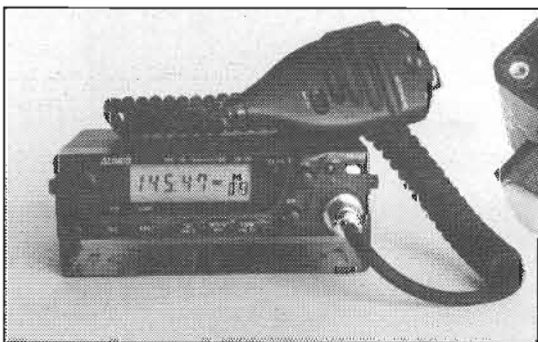
REVIEWS

ALINCO DR-130 REVIEWED	13
Chris Lorek tests a 'mini-powerhouse' mobile that comes at a beginner's price	
'GETTING STARTED' VIDEOS REVIEWED	23
You've got your licence but you need to know more? Well here's one way of finding out!	
RAMSEY 80M RECEIVER KIT REVIEWED	33
Budding Novice Steven Lorek builds the Ramsey 80m Direct Conversion receiver kit	

PROJECTS

ADD-ON BFO UNIT	20
Raymond Haigh describes an add-on for your AM-only HF receiver to allow amateur radio station reception	
SPEAKER MICROPHONE	25
Alex Clark 2E1BGX builds a low cost speaker mic for portable transceivers	

Alinco DR-130 reviewed



Projects – Add-on BFO unit (centre) and a speaker mic (below)

FEATURES

GETTING STARTED IN AMATEUR RADIO	16
An introduction to what the hobby's about and how to get involved	
GO NATIVE	26
Steve Ireland G3ZZD/VK6VZ goes 'native' Oz style with a novel way of erecting wire aerials with ease	
SCANNERS INTERNATIONAL	29
The Editorial team help you to choose which receiver to buy, plus new products, scan news, and free ads	
ORV CONTESTS	48
Stan Crabtree G30XC takes a satirical look at CW contest operating techniques	

NEWS AND VIEWS

CQ de G8IYA EDITORIAL	5
Abuse of the airwaves, even a repeater group chairman's doing it!	
LETTERS	6
HRT readers have their say	
RADIO TODAY	8
G3ATC at the 1993 Royal Tournament, and much more besides	
CLUB NEWS	49
Dynamic go-ahead clubs and voluntarily-run RAE course contact details. Is your club listed? If not, why not!	

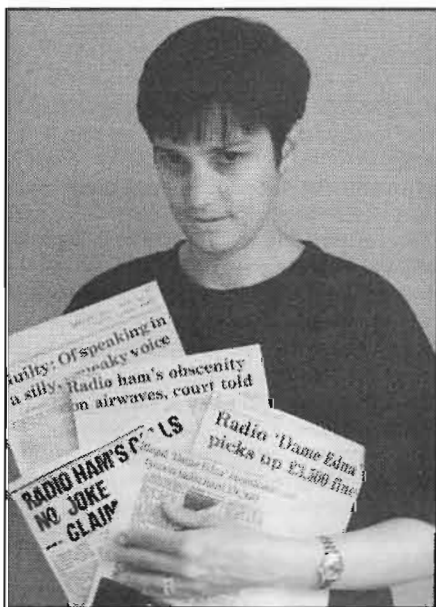

**SUBSCRIPTION
& BACK ISSUES
HOTLINE**
0737 768611

All reasonable care is taken in the preparation of the magazine contents, but the publishers nor the Editor cannot be held legally responsible for errors in the contents of this magazine, or for any loss however arising from such errors, including loss resulting from the negligence of our staff. Reliance is placed upon the contents of this magazine at readers' own risk.

CQ de G8IYA

Editorial

Abuse of the airwaves, even a repeater group chairman's doing it!



I must start this month by thanking the many readers who've sent in their completed reader's questionnaires from the August issue. It's nice to see that you generally like what we're doing here, and I'll certainly be acting on your comments to make the magazine even better.

When I took over the Editorship of Ham Radio Today a few years ago, I decided on a 'change of image', which included a 'new look' to the front cover, better paper quality, and plenty more inside the magazine including regular monthly columns written by recognized experts in their own amateur radio fields. From your comments, *From My Notebook* is one of the most popular, possibly not surprising as the contributor, Geoff Arnold G3GSR, has a very good background in the amateur radio publications field. Another is the ex-PMR conversions, don't worry, there's plenty more sat here, just waiting for a space to fit them in! I've already acted on some of your suggestions, and you may soon be seeing one or two 'surprises' in the magazine.

Abuse of the airwaves

In last month's *Radio Today*, you'll have seen that no less than three cases

of amateurs abusing the airwaves were brought to court with successful prosecutions of those involved. The 'major' one was undoubtedly that of Robert Hitchcock G1MTT, who was fined £9500 plus the confiscation of equipment. In the court case, it was reported the prosecution said he transmitted conversations peppered with obscenities and remarks about flatulence, the defence saying Mr. Hitchcock "treated amateur radio in a light hearted way", and said that "It's absolutely amazing how grown-up men can make such a fuss about a trivial matter".

Whichever way you see it, he was found guilty of breaking his licence conditions and given a very hefty fine. The media were quick to catch on of course with a number of local newspapers reporting the case.

Different effects

Now this has two effects on the public. The first is to show that the Radiocommunications Agency have, in this instance at least, 'hit down hard' on abusers of the amateur radio airwaves. Another is that it demonstrates this goes on, and that a licensed radio amateur was the cause of it. "Is this the type of person that would be teaching my young son or daughter the Novice licence" the father asks? "No, of course not!" you say, "this is just one amateur, out of a much larger number who do respect the airwaves and don't abuse it".

Repeater abuse?

Many such people choose to transmit such abuse through an amateur repeater, often on 2m, because this provides them with almost a 'captive audience' in a given area. Yes, you can say that if you don't like it, you can simply switch you rig off. You can, but that's not always the answer. Nowadays the RA have chosen, for a number of reasons, to change the method of repeater licensing and to instead licence a repeater as an NoV, a 'Notice of Variation', to an individual amateur's licence. This would typically be a

member of the repeater group committee, and he or she would be responsible for the operation of the repeater and to ensure that it didn't suffer from such abusers. You'd then think that such officials would take great care to ensure that at least their own operation through the repeater was 'whiter than white', and an example to others. Not so.

Repeater Group Chairman abuses own repeater

It was the 13th July, 7.10pm, on one of my semi-local 2m repeaters, when a Novice instructor was demonstrating the use of a repeater to his children. Up comes none other than the repeater group Chairman himself (clearly identified, a well-known voice on the repeater, at the time in contact with another amateur) and starts describing and joking about the intimate parts of a lady's anatomy. The Novice instructor challenged him by saying "The children I have here with me didn't think that was very funny", which the Chairman replied to, repeating in defiance the slang name for the bodily parts on air, adding that he was saying nothing worse than you'd hear on TV nowadays, then challenging the instructor on air to take him to court! The Novice instructor eventually switched his set off in disgust to spare his children any more of this abuser's outpourings, but the damage had been done. The lasting impression in the young potential Novices' minds, will undoubtedly be; 'this is how amateurs operate on repeaters'.

Maybe you *do* hear such language on TV, after a certain hour, but surely there was *no* excuse whatsoever for someone in *this* person's position to have been acting like this on the air? Is this an example, *by the repeater group*, of how the group want their users to operate?

Get used to it?

Some amateurs do occasionally use 'flowery' language on air, sometimes with a 'slip of the tongue' (or during a HF pile-up!), but it's not often they're determined that they're doing nothing wrong and carry on in defiance. Cast your mind back to the first paragraph on this page, *the defence claimed Mr. Hitchcock "treated amateur radio in a light hearted way", and said that "It's absolutely amazing how grown-up men can make such a fuss about a trivial matter"*. He got a 'trivial' £9500 fine for that. It's a bit bad when a repeater group Chairman starts acting in such a manner.

LETTERS

Letter of the month

Dear HRT,

Congratulations on your articles on stolen equipment (August 93 issue). I would, however, contradict your premise that ex-PMR equipment is not worth stealing because of its cheapness. Any equipment is worth stealing to a thief who is hard up for cash. As a police employee I have frequently taken reports of stolen handportable and mobile transceivers, mainly from taxi drivers and public service vehicles. Even emergency services' radios have been known to be stolen – yes police radios too!

Consider this; a thief, coming across your car with an ex-PMR transceiver in the dashboard, doesn't know that you're not a taxi driver, so he smashes his way in and pinches the rig. End of subject.

Regarding the private database of stolen equipment maintained by a radio amateur, the Metropolitan Police maintain their own database of identifiable stolen property, radios and otherwise. However, just because the identifying tags have been removed from your rig, don't think that lets you off the hook. Remember that most police officers are not amateurs, thus a tale about buying it at a rally may not easily satisfy him. He does not understand the vagaries

of buying surplus equipment, and is simply viewing your metal gubbins as possibly stolen. If it has the serial numbers removed from it, what would you as a police officer deduce?

In the current crime climate, its not worth the hassle. Make sure you can account for your gear. Carry your licence validation document with you too, this might avoid a lot more questions on another track. Nuff said!

Name and address supplied, but not for publication.

Editorial comment:

Thanks for your comments, and we agree that some people will indeed steal anything, regardless of the end value. Regarding a 'stolen list', we've found there hasn't been a central UK register of stolen amateur equipment up until now, although as you correctly say the police can and do keep records on a 'county/force' basis. This is why we applaud the move, which is currently under way by Paul Hardy G1ZMQ together with Pat Lee G0IWL (who describes himself just as Paul's 'gofer'), to maintain a register of stolen amateur equipment which is easily available to radio amateurs via their 'Radio Amateur Advertiser', as well as on Paul's local packet BBS, GB7FCI.

Dear HRT,

I am a holder of a City and Guilds certificate in Amateur Radio, but as yet unlicensed as I am awaiting a Morse test. I would like to work on 10m, so therefore I would like to buy a Uniden 2830 as I cannot afford anything else. In August 1988 Ham Radio Today Magazine reviewed the 2830 and concluded that it was a very good radio indeed. So why have the RA banned it?

I telephoned the RA and had a lengthy discussion with a licensing officer and a technical adviser. They both told me that the 2830 had been banned because of its ease in being converted to operate on 27MHz. I find this most unacceptable, as there are many commercial HF radios which can transmit on 27MHz 'out of the box' or with the flick of a switch. Also there are some models that just need to be turned on whilst holding a

button in to enable 0-30MHz transmit capabilities. So why are these legal HF radios classed as legal, when they can transmit just about anywhere (including 27MHz) 'out of the box'.

On a Uniden 2830 you at least need to plug in your soldering iron and know how to use it. How can this radio be classed as a CB radio when it cannot transmit on CB frequencies 'out of the box'. I feel that this is discrimination against the less well off, as there seems to be an assumption that CB operators cannot afford HF rigs, but can afford 2830s. There are many unlicensed operators who own and use Kenwoods, Yaesu, Icom etc., but I bet they won't ban these radios.

It is so annoying that I should be penalised for being poor. How can a radio that does not transmit on 27MHz out of the box like a Uniden 2830 be classed as a CB, whereas a radio that does transmit on 27MHz out of the box (e.g. TS-440s) is not classed as a CB radio. It sounds to me that they have their polarities reversed, and is just typical of the upper class snobbery that still exists today. It looks like I am going to have to break the law. ('Mr. Irate', contact details also supplied!)

Editorial comment:

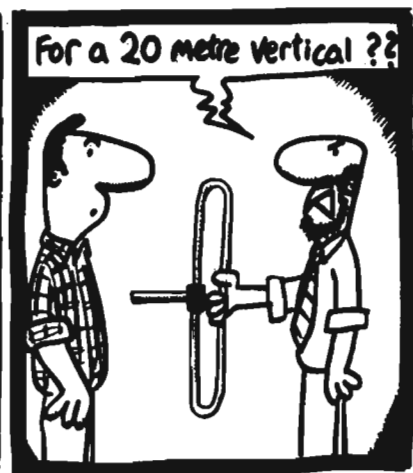
The reason for the 'ban' on the UK manufacture, importation and sale of single-band 10m transceivers such as the Uniden 2830 stems back to the 'old days' where a concerted effort was made to stop the import of illegal CB equipment. Indeed the Tech Ed remembers one amateur radio trader who was 'lumbered' with a large number of the very same model of set which, after the legislation was introduced, he found he then couldn't sell. However, with the 'barriers' now down across the EC to provide for free trade and

£10 for the Letter of the Month

Do you have something constructive to say on the state of amateur radio today? Perhaps you'd like to put your viewpoint to the readers, get some discussion going, or give an answer to one of the issues raised? We'll pay £10 for the best letter we publish each month. So write in with your views, to Letters Column, The Editor, Ham Radio Today, ASP, Argus House, Boundary Way, Hemel Hempstead, Herts HP2 7ST, or fax your letter on 0703 263429.

"TONE" BURST

By GEMEN



passage of goods, we ask whether this UK legislation could still be upheld?

Dear HRT

I bought an Alinco DJ-580e from a local supplier just over two weeks ago. To cut a long story short, after a couple of days I found it had a problem with 70cm, a lack of audio. So I contacted my local supplier who was very good, he changed it immediately. So I left the shop feeling very relieved with my second DJ580e.

The next day I thought I would work some 70cm and called a friend, after a few minutes of transmission my friend told me my audio had gone, but I was giving a strong carrier. So after checking it with another radio and finding my audio had disappeared, I contacted my supplier again. He was again very sympathetic and said I was very unlucky to have a second set with a fault, and replaced it immediately. So again I left the shop with my third new Alinco DJ580e.

A couple of days later I was talking to a station on 70cm and when I passed it over to him he advised me that I had lost my transmit audio but was still giving out a carrier. So when I checked it out, sure enough I had no audio or toneburst, then it sprang back to life and died again.

I contacted Waters and Stanton on the phone and told them about my experiences with the DJ580es and how helpful my local supplier was, they put me through to an engineer who told me that they were aware of a bad batch of Alinco DJ580es and were testing their sets in stock!

Surely, this bad batch should be recalled and not continue to be sold, as the fault is intermittent it is very difficult to test for unless the radio is actually used for a few days or more?

So here I am now with a defective DJ580e and somewhat short of pocket as the distance I have to travel to my local supplier is a round trip of 75 miles. Maybe this is why 70cm is so quiet?
Ricky G0SBV

Waters and Stanton reply; Regarding your reader's problem with the DJ-580, I'm afraid we did have a problem with a batch of these transceivers recently. A quantity produced at the factory in May and distributed by us in June each had a UHF VCO which tended to develop a fault after a period of use.

When our dealer swapped radios for your reader he was obviously trying to resolve the problem as quickly as possible but, of course, the replacement was from the same batch and this again subsequently developed a fault.

As soon as we were aware of the problem we contacted the factory, who stopped further production until new VCOs from another batch had been fitted. We are now having no further problems and the radios are back to their previous high level of reliability.

Your readers may be interested to know that earlier this year I had the chance to visit the Alinco factory in Toyama, Japan, and saw rack upon rack of handheld transceivers undergoing 24 hours 'soak-testing'. Every single one is tested to winkle out 'first use' faults. It's much more difficult, of course, to spot a problem which occurs after a period of use.

We regret this problem occurring but know each radio has been sorted with minimum inconvenience to our customers.

Dear HRT

Some of your readers may, or may not, be interested in the method

I used to support my 50ft wire aerial, allowing me to easily move it thus changing its angle and enabling me to take the pole with me should I, as I am hoping to do, move house.

I had previously obtained two (approx.) 9ft lengths of water pipe, one of a diameter that it would slide inside the other. I drilled a hole about 2ft 6in from the top of the larger diameter pole to allow the inner one to rest on a bolt and then intended to fix the base in the ground. However, I was concerned that with two or three feet of pole in the ground the remaining length would be a little low. I live next door to a garage and noticed a large pile of old car tyres, the owner informed me that he would be more than happy if I took some away, so I took four.

Placing the tyres on top of each other I inserted the pole in the centre and filled the remaining area with concrete and rubble. Leaving the concrete to dry for a while I now have a solid foot with a 2-1/2 inch by 9 foot metal tube sticking out of the top - total cost about £11.

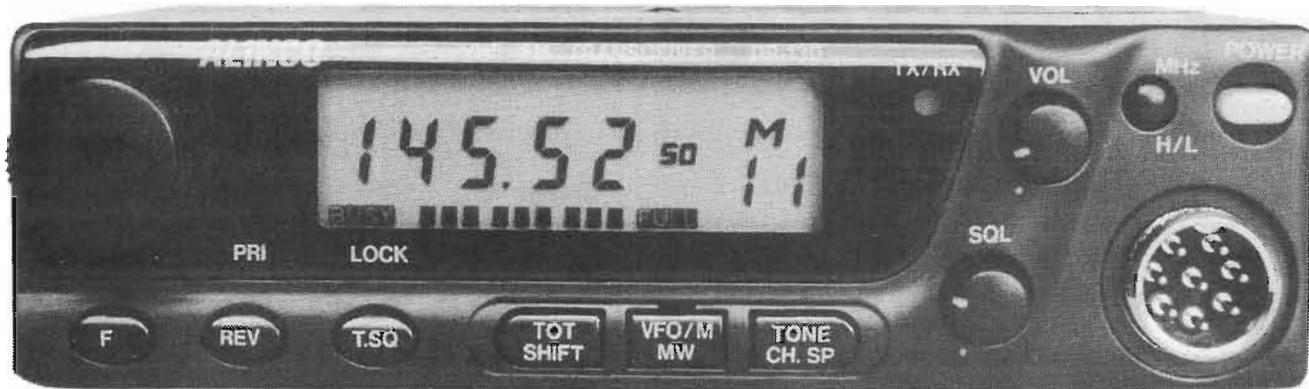
I can, with a bit of effort, move the foot about to my heart's desire, experimenting as I go and safe with the knowledge that nothing short of a small earthquake will cause it to fall over.

Leaving the top three inches clear of concrete I packed the top with earth and popped in some hangy type 'border' plants, so it is more than just an aerial support using recycled materials, but a flower pot as well.....

Titus Drummond

Editorial comment;

Thanks for sharing your novel aerial mast support method with us Titus, no doubt several HRT readers will be trying this one out!



Alinco DR-130 Review

Chris Lorek G4HCL tests a 'mini-powerhouse' mobile that comes at a beginner's price

The 50W Alinco DJ-130 2m mobile rig was launched in Europe at the Friedrichshafen rally this year, within a few days of returning from this I was very happy to find one being delivered for review in Ham Radio Today!

Repeaters – get in first time!

For its UK retail price of £349 you get a ready-to-go 2m transceiver with a remarkably high transmit output power of no less than 50W, the first 2m mobile to have reached this power level to my knowledge. No messing around with weak signals into your local repeater here! It even has a programmable transmission timer (30-450 secs) which, after giving you a five second warning, can shut your transmitter off to save you 'timing out' of your local repeater - this is just the thing we enthusiasts 'knocked up' as accessories for our rigs in the 'early days'!

As well as the usual 1750Hz toneburst for repeater access, you also get a built-in CTCSS (Sub-Tone) encoder as standard with 38 selectable tones, useful for current UK repeater access plans and already in practice on some 'boxes' around the country. 'Reverse repeater' (e.g., listen-on-input)

comes at the push of a button to help check if you're in simplex range quickly, and the receiver has a performance to match the high power transmitter, with good sensitivity to let you hear those weak signals coming back. Pressing the 'Function' button on the front panel for half a second automatically opens the receiver squelch for you to save fiddling with the squelch control on the move.

Extensions

For general monitor use as well as amateur radio chats, the receiver covers the range of 130-174MHz, and the set has the ability to display either the operating frequency or a large channel number indication on the front panel LCD, this being selected from the front panel keys. It comes equipped with the capability of storing up to 20 memory channels, but if that's not enough you can extend this to 100 channels by adding a plug-in board, which should be enough to satisfy most amateur's needs! The various channel features such as frequency, TX/RX shift if any, CTCSS tone and so on can be stored in each memory channel.

Without the transmitter's PA heatsink, which forms almost half the

set's size, the 'electronics' part of the box measures a small 139mm (W) x 40mm (H) x 93mm (D) – 150mm deep including the heatsink, the rig weighing 1.2kg in total, a tiny set for such a 'powerhouse'!

Controls

The front panel is simple and uncluttered, important when you're on the move, the various buttons having a positive 'click' feel to them when they're operated. A 'priority' feature can check a given channel for you every few seconds automatically if you wish, also the 1750Hz 'toneburst' button can be toggled between this mode or a quick-access 'Call Channel' selector button if you prefer, for quick access to a given channel. The hand mic has the usual Up/Down buttons for frequency or memory channel change, keeping either of these pressed for a second or so starts a channel scan, the set halting for a few seconds each time it finds an active frequency, before resuming the scan.

On the air

After switching the set on and tuning around, I was surprised to hear unexpectedly good audio from the set's small internal speaker. I often use an external speaker connected to my rigs when I'm on air from the car, but with the DR-130 on top of the dashboard, I found the internal speaker was quite OK. The receiver pulled in distant stations very well, and (possibly needless to say) the 50W transmitter gave a good account of itself in getting my signal into the distant receiver! The set's controls were quite easy to use on the move, the only thing I'd have wished

for was a microphone-mounted 1750Hz toneburst button for easier repeater use.

At home, when connected to my roof-mounted vertical, I found I had few problems from other strong signals on the band, although my very local (300m away and very 'clean') 2m packet node did lift the squelch, even at maximum setting, with the set monitoring on one of my semi-local 2m repeater channels. But otherwise, even with a high density of amateurs around me as well as some constant-carrier fire brigade 146MHz transmitters around a mile away, no problems.

The S-meter was a rather 'coarse' display, having three 'segments' of three 'dots' each plus a 'full' segment, so variations in signal strength changed this in fairly large steps. However I didn't find this much of a problem (S

meters on FM rigs often tend to be notoriously 'full or nothing' in any case).

Lab tests

The set's receiver did indeed give a good technical performance, showing it should be capable of receiving those weak signals you find whilst being 'bombarded' by other strong unwanted stations. On transmit the set gave ample power output, especially so when the supply voltage was low as might occur with a weak car battery in the middle of a winter's night - many transmitters drop power at a great rate of knots in such cases!

Conclusions

Overall I found the set was very easy to use, I'm told it was indeed

designed to be a 'simple-to-use' set, and it gave a good account of itself on the air. I can't complain, and at its realistic selling price I feel it should catch the eyes of plenty of amateurs either starting out on 2m mobile operation, or upgrading to a higher powered dedicated mobile rig to reach those 'hard to get' stations.

The DR-130 is priced at £349, and my thanks go to the UK Alinco distributors, who are Waters and Stanton Electronics (22 Main Road, Hockley, Essex, SS5 4QS, Tel. 0702 206835), for the timely loan of the review transceiver.

LABORATORY RESULTS:

All measurements taken on 145MHz, high power TX, using stabilised 13.2V DC source connected to supplied length DC lead, unless otherwise stated.

RECEIVER;

Sensitivity;

Input level required to give 12dB SINAD;	
144MHz;	0.14µV pd
145MHz;	0.14µV pd
146MHz;	0.14µV pd

Intermodulation Rejection;

Increase over 12dB SINAD level of two interfering signals giving identical 12dB SINAD on-channel 3rd order intermodulation product;	
25/50kHz spacing;	80.2dB
50/100kHz spacing;	77.9dB

TRANSMITTER

TX Power and Current Consumption;

Freq.	Power	10.8V Supply	13.2V Supply	15.6V Supply
144MHz	High	41.1W/8.55A	52.0W/9.45A	54.5W/9.80A
	Low	5.25W/2.95A	5.30W/3.00A	5.40W/3.05A
145MHz	High	41.1W/8.45A	51.5W/9.15A	54.0W/9.45A
	Low	5.20W/2.90A	5.25W/2.95	5.40W/3.00A
146MHz	High	40.6W/8.25A	51.5W/9.10A	53.5W/9.25A
	Low	5.20W/2.85A	5.25W/2.90A	5.30W/3.00A

Toneburst Deviation;

2.59kHz

Adjacent Channel Selectivity;

Measured as increase in level of interfering signal, modulated with 400Hz at 1.5kHz deviation, above 12dB SINAD ref. level to cause 6dB degradation in 12dB on-channel signal;	
+12.5kHz;	48.4dB
-12.5kHz;	45.3dB
+25kHz;	72.0dB
-25kHz;	70.9dB

Blocking;

Increase over 12dB SINAD level of interfering signal modulated with 400Hz at 1.5kHz deviation to cause 6dB degradation in 12dB SINAD on-channel signal;	
+100kHz;	82.5dB
+1MHz;	95.5dB
+10MHz;	96.4dB

Peak Deviation;

5.58kHz

Maximum Audio Output;

Measured at 1kHz on the onset of clipping, 8 ohm load;	
3.34W	RMS

Squelch Sensitivity;

Threshold;	0.9µVpd (4.5dB SINAD)
Maximum;	0.22µVpd (23dB SINAD)

Image Rejection;

Increase in level of signal at first IF image frequency (-34.4MHz), over level of on-channel signal, to give identical 12dB SINAD signal;	
57.2dB	

S-Meter Level

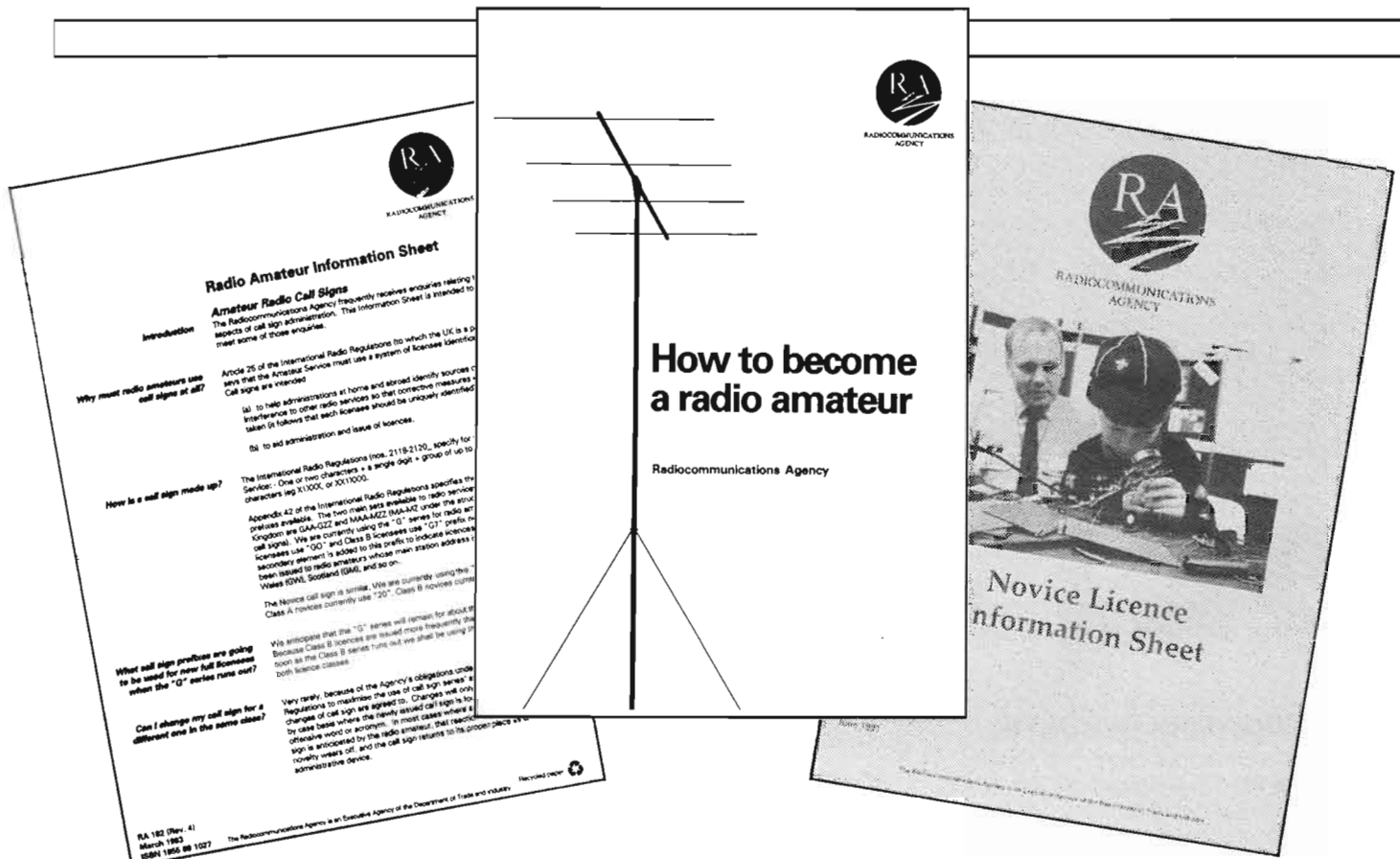
Indication	Sig. Level	Rel. Level
3	0.32µV pd	-9.8dB
6	0.49µV pd	-6.1dB
9	0.99µV pd	0dB ref.
Full	2.36µV pd	+7.5dB

Harmonics;

2nd Harmonic;	-81dBc
3rd Harmonic;	-76dBc
4th Harmonic;	-84dBc
5th Harmonic;	<-90dBc
6th Harmonic;	<-90dBc
7th Harmonic;	<-90dBc

Frequency Accuracy;

-708Hz



Free leaflets and booklets, yours for the asking from the Radiocommunications Agency

Getting Started in Amateur Radio

The HRT Editorial team give an introduction to what the hobby's about and how to get involved

Maybe you're reading this after having picked up this magazine on the newsagent's shelf, thinking 'This hobby sounds like it could be interesting'. Maybe you've already heard some radio amateurs on your scanner, probably around the 145MHz or 433MHz frequencies, and you'd like to know a bit more. Well, we can't hope to cover everything in a small space such as this, but hopefully you'll be able to find out a bit more, and also be given a few 'pointers' in the right direction to get more information!

What is Ham Radio?

Amateur Radio, or 'Ham Radio' as it's more commonly known around the world (a 'Ham' means 'a licensed radio amateur'), is a hobby shared by like

minded people around the world, who communicate with each other using special frequencies, or 'wavebands', set aside for their use by national and international agreement. It knows no political boundaries, nor has any 'class distinctions'. One day you may be chatting to someone in the same town with the same job as you, another day to someone on a remote desert island or across the other side of the world, with a totally different lifestyle. You can, if you're lucky, also have the chance to talk to a king, even an Astronaut on board a US Space Shuttle or a Cosmonaut on the MIR Space Station (as indeed our children did a couple of years ago). One UK amateur, earlier this year, was surprised to find himself taking to the Duke of Edinburgh!

Not just speech

Radio Amateurs don't just use speech to communicate, although this is the most-often used method. If you're interested in computers and Bulletin Board stations, then you'll have a whale of a time on 'packet radio', and it's all free, no phone bills! (see this month's *Packet Radio Roundup*). By using 'spectrum efficient' modes that get through when speech can't, like some modern data modes linked to your computer, or more simply an uncomplicated Morse code station, you can directly communicate around the world with a low power transmitter and just a small aerial. Also, either on speech, data, or Morse code, you can even use the orbiting amateur radio satellites to help you chat around the world with!

Listening In

Unlike the 'old days' of the hobby where 'short wave listening' was the starting point, many beginners nowadays start off either by overhearing their local amateurs chatting on VHF and UHF, or by 'direct introduction' by a friend or relative already in the hobby. Whichever way, if you have a scanner or a receiver which includes VHF 'Airband/Marine', as many radio-interested people nowadays do, try tuning around 145MHz to 146MHz, and you'll no doubt soon come across radio amateurs on FM. If you have a short wave receiver (you'll need one with a 'BFO' fitted, i.e., a switched position to receive either 'SSB' or LSB/USB on), try tuning around 3.5-3.8MHz on a weekend morning to hear amateurs around the UK, or around 14.0-14.35MHz during the day to listen in to amateurs from different countries. If your short wave receiver has these bands but no BFO, don't worry, you can add one very easily, see the feature elsewhere in this magazine.

Meet your local amateurs!

One of the best steps you can take is to pay a visit to your local amateur radio club. Those we feature every month in *Club News* are all active, go-ahead clubs (because we don't list those that aren't!) and all these welcome newcomers with open arms. As well as meeting other like-minded folk, and learn something from the club talks and activities, you'll often be able to 'listen in' using the club's station, and maybe even pass a greetings message on this to other radio amateurs while one of the club members operates the station for you!

More information

There are plenty of 'Beginner's Guides' available, including the videos we've reviewed in this issue. A useful 'basic introduction' is the book 'Amateur Radio for Beginners', you can get this for £3.50 plus £1.00 UK p/p (£2.50 overseas p/p) from the Radio Society of Great Britain, their contact details follow the 'Club News' section each month. They'll also be pleased to send you an information pack just for the asking. An introduction to the licensing side of getting started is the 'Guide to Amateur Radio' booklet and the 'Novice Licence Information Sheet', both free from the Radiocommunications Agency (details, again, following 'Club News' each month). You'll also find your local amateur radio store is often a mine of in-

formation as well as a source of beginners guides, the staff there are often happy to chat to you if you call in, especially during less busy times, check the adverts in this issue, including the 'Retail Network' at the rear of this magazine, for your nearest one.

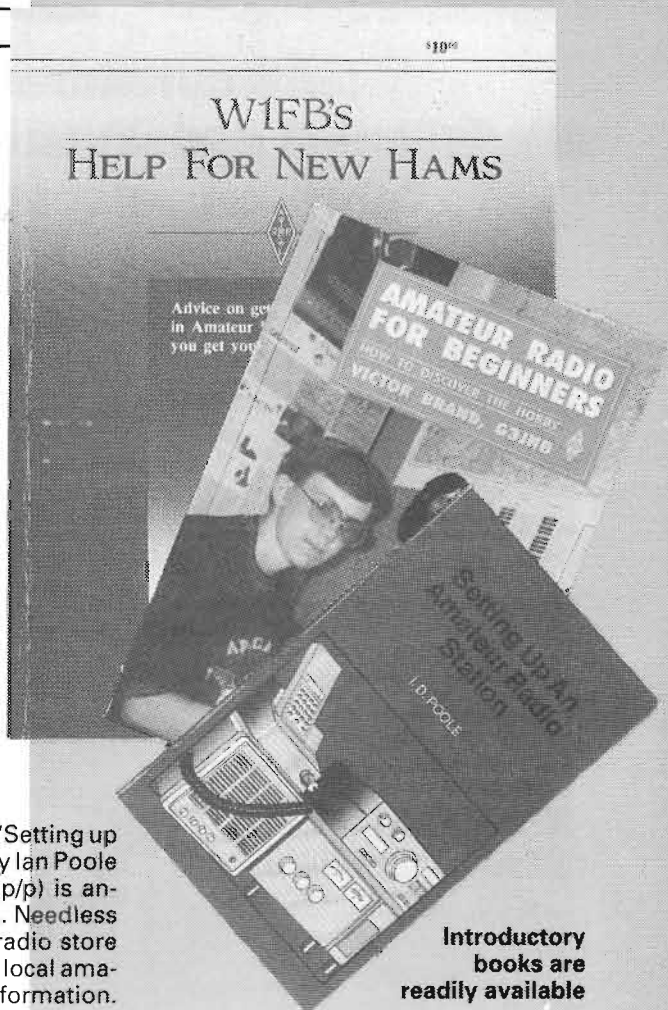
If you're thinking of getting a station together, either receiving only or transmitting as well, then as well as the monthly features in HRT try the excellent US book 'W1FB's Help for New Hams'. This costs £5.75 plus p/p (but check first as prices change with currency rates), and is available from Poole Logic (49 Kingston Road, Poole, Dorset, Tel. 0202 683093), they also stock a comprehensive range of books on amateur radio for both beginners and advanced alike. 'Setting up an Amateur Radio Station' by Ian Poole (Babani, BP300, £3.95 plus p/p) is another you may like to obtain. Needless to say, your local amateur radio store (with leaflets etc.), as well as local amateurs, can all be a mine of information.

What does it all cost?

Quite simply, as much or as little as you like! To listen into amateurs, you don't need a licence, just a receiver which you may already have, which effectively costs you nothing! There are, of course, some radio amateurs who have 'monster' stations with shelves full of expensive new gear and large aerial systems. Others, indeed the vast majority, have more modest setups, some just use a single 'walkie talkie' for their station. Some amateurs build all their own equipment, often combining this with 'QRP' (low power) operation, which gives them a 'challenge' in communicating that's missing from 'push-button black-boxes'. Using ex-PMR (surplus Private Mobile Radio) equipment which you've converted yourself through the regular HRT articles, you can get on the air for less than £10, all in, and this opens up the world of local communication as well as allowing you to link your computer up to the radio via an interface for packet.

Licensing

If you'd like to transmit as well as just receive, you'll need an amateur radio licence, and for this you'll have to pass



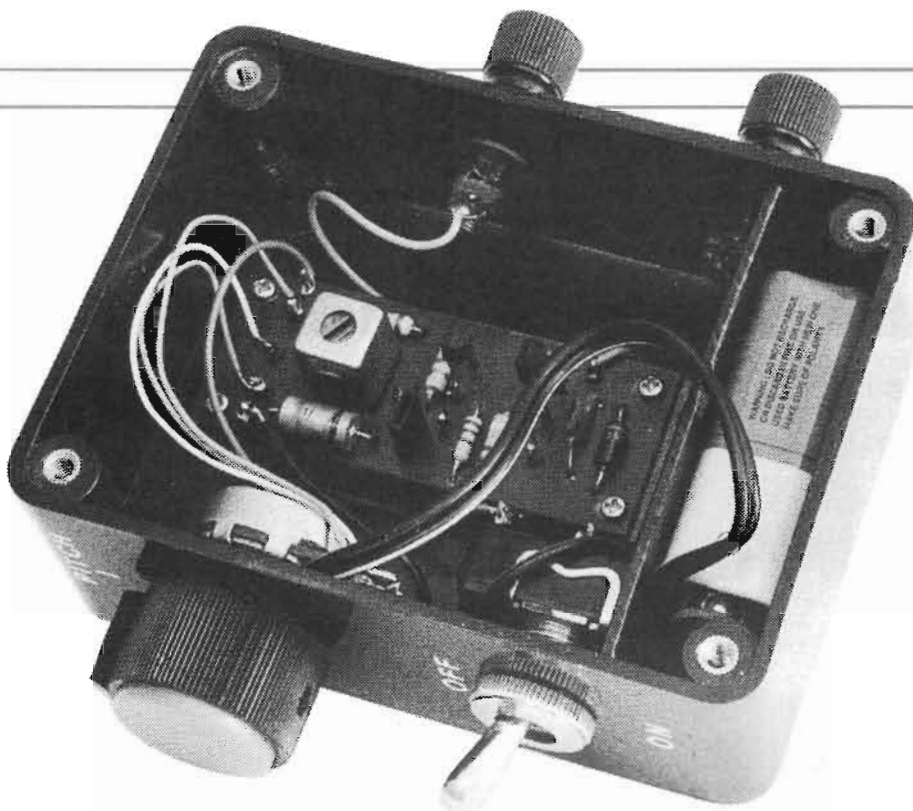
Introductory books are readily available

a multiple-choice exam to show you know what you're doing (like not transmitting on the wrong frequencies!). Contact your local club for information on this, many run courses for beginners, and you should be able to get through and pass the exam within a few months. The RSGB also publish good exam manuals and revision notes for these. One option is the 'Novice' licence, based on 'hands-on' instruction followed by a simple exam, another is the 'full' licence which is based on either self-study or in a class, followed by a more difficult exam but with greater operating privileges (like more frequencies and more power). Once you've passed the exam, if you're under 18 a Novice licence costs you nothing each year, otherwise a 'full' or 'Novice' licence costs just £15 a year, and let you to use the relevant amateur-allocated frequencies above 30MHz (i.e., VHF and UHF) for communication. Currently, a further optional test is a practical 'Morse code' exam, which if you pass allows you to use allocated Short Wave frequencies (those below 30MHz) as well as the VHF and UHF ones.

We hope this has given you a brief insight, and remember there's plenty of information out here. You just need to get it, and we've shown you how to.....

Many transistor portables have a short wave range which covers the 7MHz and 14MHz amateur bands, but only rarely do they incorporate the BFO (Beat Frequency Oscillator) circuitry needed to make SSB (Single Side Band) transmissions intelligible. Although these radios lack the high selectivity and slow tuning rate of communications equipment they are capable of receiving distant amateur signals, and the add-on unit described in this article restores the missing carrier so that the diode detector can process them in the usual way.

Short wave listeners who are confined to the broadcast bands by the lack of a BFO facility will find this unit represents a simple and inexpensive introduction to the world of amateur radio. Seasoned amateurs might care to use it to provide a 'standby' or 'holiday' receiver, or to incorporate the circuit into their own communications receiver designs.



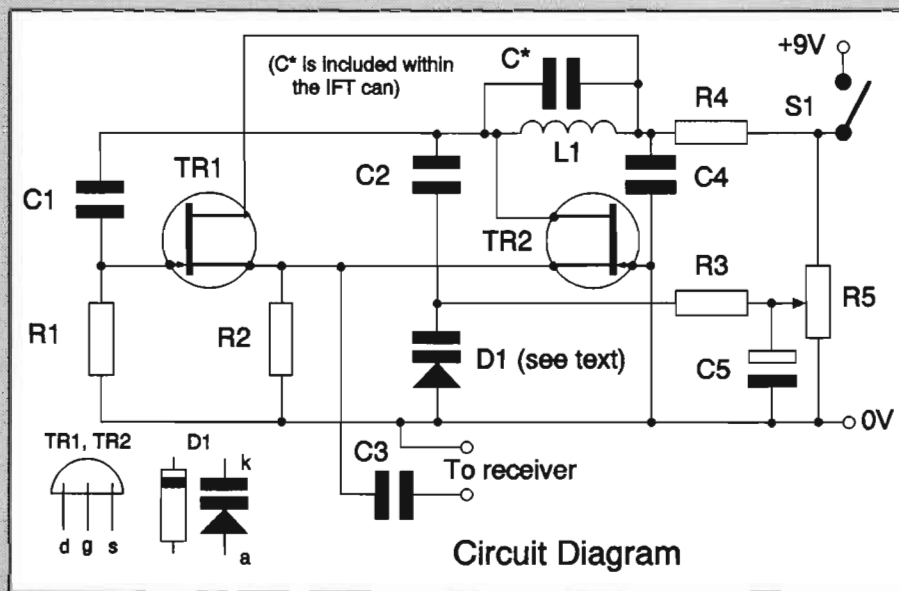
An Add-On BFO Unit

Raymond Haigh describes an add-on for your AM-only HF receiver to allow amateur radio station reception

The Circuit

The circuit is given in Fig. 1, where TR1 and TR2 are the active devices in a source-coupled oscillator. The frequency of oscillation is determined by L1 and C, the tuning components in a standard 450-470kHz IF transformer. C1 is the feedback capacitor, and the output is taken from the common source resistor, R2, via DC blocking capacitor, C3. A source coupled oscillator was chosen because it does not require feedback windings or tapings on the tuning coil, thereby leaving the constructor free to use any IFT with a 450-470kHz tuning range.

The oscillator frequency has to be set very precisely and some means of fine tuning L1 has to be provided. A low value (typically 10pF) air-spaced variable capacitor is usually connected across the inductor, but in this circuit the varicap action of a reverse-biased silicon rectifier diode is exploited to obtain the necessary tuning shift. This arrangement is less expensive and the tuning potentiometer can be mounted in any convenient position – a useful feature for anyone wishing to incorporate the unit into communications equipment. Potentiometer, R5, sets the reverse bias on D1, thereby varying the



capacitance at its junction. This varying capacitance is connected across L1 via DC blocking capacitor, C2, and RF bypass capacitor, C4. Electrolytic capacitor, C5, decouples the diode bias supply and eliminates potentiometer 'noise'. Much larger values than the one specified will make the tuning action spongy.

Components

None of the components are particularly critical. Several IFTs salvaged from transistor radios were tried and they all proved satisfactory. If a salvaged component is used, check the continuity and resistance of the tuned

winding before soldering it into circuit, the resistance should be of the order of 5Ω , tuned windings with a much lower resistance than this indicate a 10.7MHz IFT. If a new component has to be purchased, it is best to obtain the Toko IFT specified in the components list. This transformer, which has a 140 turn tuned winding, could be adjusted to suit the IFs of all of the transistor portables tried with the BFO unit. Toko IFTs with 165 turn windings (coded YRCS) could not be set at a high enough frequency for some receivers, no doubt this was due to the additional capacitance presented by the fine tuning system.

Most small silicon rectifier diodes will function as varicaps in this circuit, a 1N4003 was used for the prototype and worked well. Constructors wishing to try a true varicap should fit a BB405B. This diode and the IFT are both available from Cirkit.

Construction

With the exception of the tuning potentiometer, R5, and on/off switch, S1, all of the components are mounted on a small PCB. Component placement and track layout are shown in Figs. 2 and 3. Veropins inserted at the lead-out points aid off-board wiring, and the use of pins for the transistor leads makes it easier to check these devices by sub-

stitution.

After testing, the completed board, together with the switch, potentiometer, output terminals and battery, can be mounted in a small plastic box.

Testing and Alignment

Check component placement, particularly the orientation of the transistors, the diode and the electrolytic capacitor; and check for bad joints and bridged tracks. If all is in order, connect up a fresh 9V battery. Current drain should be approximately 4mA.

Switch on your portable radio and tune in a signal at the low frequency end of the long-wave band, or if the receiver does not cover this, tune in a station at the low frequency end of the medium-wave band. Connect the BFO unit to the receiver's telescopic aerial. Set R5 to mid-travel, switch on the BFO and adjust the core of L1 until the oscillations beat with the incoming signal on the radio. There will probably be more than one setting of the core which produces whistles in the receiver, but the correct one gives by far the strongest response. Zero beat is the point of silence (or a low fluttering) between the whistles (heterodynes) on either side of the receiver's intermediate frequency. Rotate R5 to the left and right and the whistle should reappear as the BFO is tuned above and below the re-

ceiver IF by the action of the varicap diode.

It is important to tune in a low frequency signal when adjusting the BFO unit, as this eliminates the possibility of setting the core of L1 to a harmonic of the actual signal, rather than the receiver's IF.

Using the BFO unit

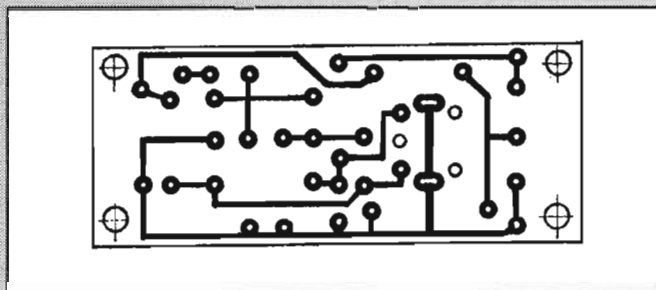
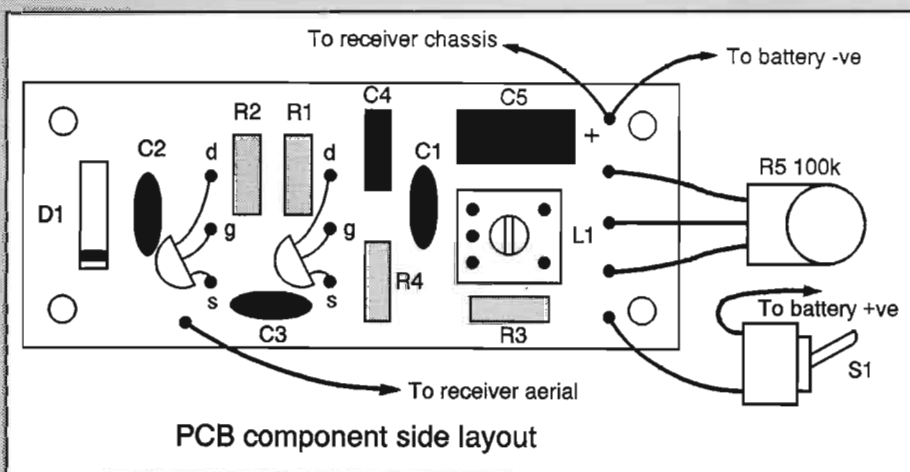
The dials of non-digital domestic receivers are not usually accurately calibrated, and frequency markings on these can only be regarded as approximate. It should, however, be possible to locate the amateur bands by carefully tuning around the 7MHz and 14MHz markers. Connect an extra 3m or so of wire to the set's telescopic aerial to increase signal input and, if the band is reasonably busy, it should be possible to tune in amateur SSB transmissions. Before processing they sound like very badly distorted speech. Sometimes the amateur bands are completely dead, but there is usually activity on 7MHz during the late afternoon or on Saturday and Sunday mornings. Connect the output of the BFO unit to the receiver aerial and slowly rotate R5 until the signal clarifies. The setting is quite critical.

The BFO unit has been tried with seven transistor portables, ranging from vintage models to receivers currently in production, including sets with digital frequency read-outs. Worthwhile results were obtained with them all. The core of L1 must, of course, be set to suit each individual radio.

Experiment with the connections between the BFO unit and the receiver. In some cases direct connection to the aerial works best; in others, just wrapping the wire around it to reduce the BFO input gives better results. Performance can sometimes be improved by making a second connection between battery negative on the BFO unit and the 'earth' side of the receiver's wiring. Experiment by making the connection to either the receiver's positive or negative battery terminal - C3 acts as a DC blocking capacitor, and no harm will be caused to the receiver or to the BFO unit.

The tuning control on most portables is not really fine enough for resolving SSB transmissions. However, with care, satisfactory results can be achieved. Potentiometer, R5, simulates a fine tuning control as it shifts the BFO from signal to signal across the receiver's IF passband, and it is not too difficult to resolve the transmissions in practice.

Very strong signals may resist clarification, even with the BFO unit connected directly to the aerial. When





this happens, disconnect any additional aerial wire, or just wrap the wire around the telescopic sections to reduce signal input.

Constructors who wish to incorporate the unit into a communications receiver should connect the output to the product detector or the RF side of the diode detector in the usual way, reducing C3 as necessary. Output from the unit is approximately 2V peak-to-peak (in this application most of the BFO signal is attenuated by the receiver's front-end tuned circuits, and only a small amount reaches the IF strip). The action of the tuning potentiometer, R5, can be made very gentle by reducing the value of DC blocking capacitor, C2, to 10pF. This arrangement would be more appropriate for communications receivers with highly selective IF stages. It would also be desirable to stabilize the BFO power supply in these more demanding applications.

Parts List

Resistors (all 5% tolerance, 1/4 watt rating)

- R1 1M
- R2 470R
- R3 100k
- R4 560R
- R5 100k linear pot

Capacitors

- C1 and C3 10pF ceramic
- C2 47pF ceramic
- C4 100nF (0.1µF) ceramic
- C5 1µF electrolytic

Semiconductors

- TR1 and TR2 2N3819
- D1 See text

Inductors

- L1 Toko IFT type YHCS1A589R (see text)

Misc.

PCB materials, Veropins, connecting wire, on/off switch, control knob, battery connector, terminals and standard ABS plastic box, 100 x 76 x 41mm or larger.

QUANTEK ELECTRONICS

YUPITERU MVT 7100



- ★ 530 KHz - 1650 MHz
- ★ 1000 CHANNELS
- ★ NFM/WFM/AM/LSB/USB
- ★ SUPPLIED WITH: NI-CAD BATTERIES, UK CHARGER, ANTENNA, DC CIGAR LEAD, CARRYING STRAP, BELT CLIP & EARPHONE

SPECIAL OFFER £399 inc P&P

AOR 1500EX



- ★ 500KHz - 1300 MHz
- ★ 1000 CHANNELS
- ★ NFM/WFM/AM/SSB
- ★ SUPPLIED WITH: NI-CAD BATTERIES, UK CHARGER, ANTENNA, LW ANTENNA, DRY CELL BATTERY CASE, SOFT CASE, EARPIECE.

SPECIAL OFFER £339 INC P&P

OPTO ELECTRONICS 2300



FREQUENCY COUNTER/FINDER AN EXTREMELY SENSITIVE HAND HELD FREQUENCY COUNTER - IT WILL DISPLAY THE FREQUENCY OF A 2 WATT TRANSMITTER AT 100 FT!

- ★ 1MHz - 2.4GHz
- ★ FAST/SLOW GATE TIMES
- ★ HOLD SWITCH
- ★ SUPPLIED WITH: NI-CAD BATTERIES, UK CHARGER & ANTENNA

SPECIAL OFFER £149 INC P&P

STARTEK ATH - 15



ULTRA HIGH SENSITIVITY FREQUENCY COUNTER/FINDER WITH SIGNAL STRENGTH BAR GRAPH DISPLAY

- ★ 1 MHz - 1.5 GHz
- ★ SENSITIVITY LESS THAN 1µV
- ★ 10 SEGMENT BAR GRAPH DISPLAY SHOWS SIGNAL STRENGTH UP TO 4 GHz
- ★ 3 GATE TIMES
- ★ ULTRA FAST RESPONSE TIME LESS THAN 80 MILLISECONDS
- ★ AUTO TRIGGER & HOLD
- ★ SUPPLIED WITH NI-CADS, UK CHARGER AND ANTENNA

SPECIAL OFFER £199 INC P&P

SCANNER AUTO-VOX

CONNECTS TO & WORKS WITH ANY RECEIVER WHICH HAS AN 'EAR' SOCKET & SQUELCH CONTROL. SIMPLY PLUG THE AUTO-VOX INTO THE 'EAR' SOCKET OF THE RECEIVER, THEN PLUG THE OUTPUT LEADS FROM THE AUTO-VOX INTO THE MICROPHONE & REMOTE SOCKETS OF A TAPE RECORDER. THE AUTO-VOX WILL THEN AUTOMATICALLY SWITCH THE TAPE RECORDER ON WHEN A SIGNAL IS RECEIVED & OFF WHEN THERE IS NO SIGNAL PRESENT - RESULT A TAPE FULL OF ALL THE ACTION!

SCANNER AUTO-VOX KIT £15.95 ASSEMBLED £24.95 INC P&P

SCANNERS

YUPITERU MVT 7000	£329
YUPITERU MVT 8000	£349
YUPITERU VT 125	£179
YUPITERU VT 225	£249
FAIRMATE HP2000	£289
NEVADA MS1000	£269
AOR 3000A	£899

PLEASE ADD £5 P&P

WISE BUY BARGAINS!



TRIO/KENWOOD 801 12v. Mobile Dashmount for 70cms 12ch. Synth. 30W. RF out with kit of parts and full mod info £85
 COMMUNIQUE CX900 Dashmount 12v. 30W RF. 3ch. Crystal Controlled supplied with brief info, no mic or L/S £38
 SMC 1045L2 very small dash UHF 2ch. Crystal. + Brief info £33
 YAESU FT4610 v. small dash UHF 7ch. 12W O/P + Brief info £33
 DYMAR 2000 12v synthesised dash. Mobile 100ch. 15w RF/OP with full mod info, parts, eproms etc £50
 DYMAR 2000 as above, but unit only. IE. no eproms etc £35
 DYMAR 2000 Crystal 10ch version of above OK packet etc £25
 STORNO 5114S 12ch synth for 2m. these have been used for data use so no mics or L/S with full into to mod to 2m £28
 PYE M296 "T" band for 70cms with mic L/S 6ch £45
 PYE MX293 synth. "E" band (86-98mhz) A.M. + mic etc £45
 PYE MX293 as above in multiples of 10 a £25 ea + VAT
 PYE MF5FM 3ch 12v Crystal ideal packet etc for 2m + mic £29
 PYE MFSU 3ch. "T" band for 70cms 12v £30
 STORNO 600 series UHF dashmount for 70cms units only £20
 STORNO 700 series UHF dash mount with mic £30
 EX PMR radios are sold "as is" but are checked for completeness before despatch
 Discounts for callers ie less post/packing
 We now welcome Access/Visa orders via the Telephone/fax.

G.W.M. RADIO LTD

40/42 PORTLAND ROAD, WORTHING, SUSSEX BN11 1QN TEL: 0903 234897 FAX: 0903 239050

ATTENTION ALL NORTH AMERICAN READERS!

Did you know that you can order an annual subscription to this magazine direct from our official U.S. subscription representative?

For more information and rates contact:
 Wise Owl Worldwide Publications,
 4314 West 238th Street,
 Torrance, CA 90505
 Tel: (310) 375 6258



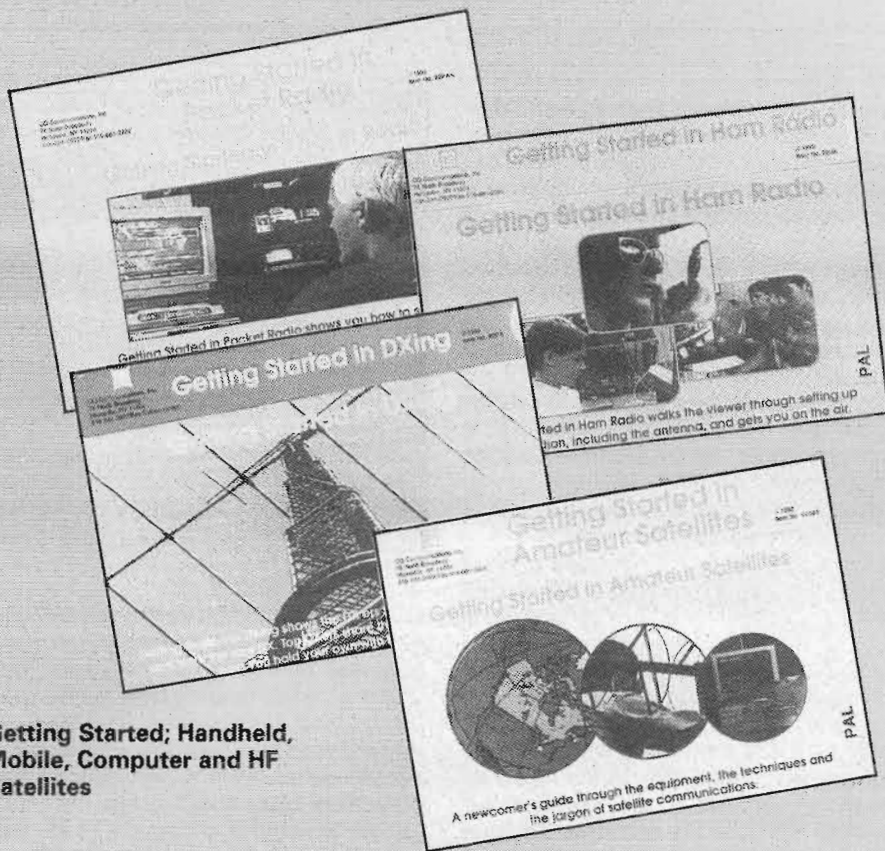
QUANTEK ELECTRONICS
 3 HOULDEY ROAD, BIRMINGHAM, B313HL



OPENING HOURS
 MONDAY-FRIDAY
 9.00AM-5.30PM

CREDIT CARD ORDERS
TEL: 021 411 1821
FAX: 021 411 2355

ALL PRODUCTS
 GUARANTEED FOR
 12 MONTHS



Getting Started; Handheld, Mobile, Computer and HF Satellites

'Getting Started' Videos – A Review

*You've got your licence but you need to know more?
Well here's one way of finding out!*

The 'traditional' way of getting into amateur radio was often by first doing a lot of listening on the air, visiting other amateurs or a local club, and, possibly enthused by all this, finally taking the required exam and getting an amateur licence. From this you'd already know what equipment you'd like, and the speciality modes you're already interested in. But not everyone has a welcoming local club, or an amateur radio 'Elmer' living round the corner, and instead 'make it on their own'. Monthly amateur magazines, such as HRT, help immensely of course, with up-to-date information, equipment reviews, and the like. To complement these sources, last year the US firm of CQ Communications brought out a series of 'Getting Started' VHS videos for the US market, and these are now available in PAL format which can be used in UK (and many other European countries') video players.

Each is very professionally produced and narrated, the scripts being written by three-time Emmy Award

winner Rich Moseson N2WL, a former producer and writer for the US TV station CBS News. Virtually all of the videos 'overlap' to some extent in presenting some common information, like packet and satellites both coming within DXing, but this means that each specific video gives a comprehensive guide to its subject. Let's take a brief look at what's in each one;

Getting Started in Ham Radio

Aimed at newly-licensed US amateurs, this describes the four main 'entry routes' into first getting going on air, the most popular (in the UK also) being the handheld, the mobile station, the computer station, and finally (which the video describes as the "traditional" route, i.e., in the old days) the HF station. It includes choosing your equipment and setting up your first station, typical mobile and fixed station layouts, and the basics of soldering. Some

of the details given are not applicable in Europe, for example the VHF/UHF frequencies used, autopatch telephone connections and 'reverse split' repeaters, you'd need to know this already (a 'Catch 22' situation?) as otherwise you could be misled by the video (it makes no attempt at any distinction between US operating privileges and anywhere else in the world). But overall a reasonable amount of information is presented, which can be quite useful as long as you're aware of the differences across the Atlantic in the hobby.

Getting Started in Packet Radio

The video introduces with the statement "Computers have brought a spark to a hobby that was getting on in years and set in its ways", and with its addition of "This is not your father's Ham Radio" the video is clearly aimed at the young and/or forward-thinking amateur! It provides an excellent intro-



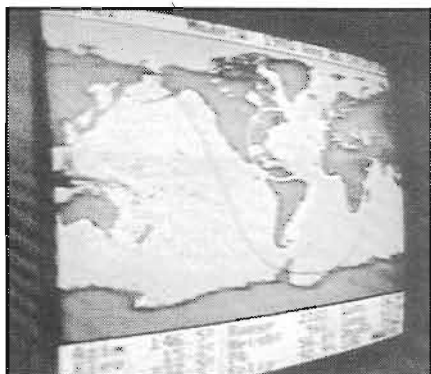
Packet Radio

duction to what you can do on packet, what you need, how to set up your packet station, and how to operate through digipeaters, nodes, and BBSs, explaining each term as it goes along. The use of packet for DX Clusters and satellite communication is covered together with HF packet operation, and the 'future' such as packetized speech communication is hinted at. Although it describes BBSs as a useful 'equip-

ment buying and selling place' (not legal in most European countries), it otherwise provides a very accurate guide and useful introduction to packet operation for UK and other European use.

Getting Started in Amateur Satellites

If you've ever been fascinated about amateur satellite operation, but haven't 'dipped your toes' into it, this one's definitely for you! It provides a good introduction to virtually all the



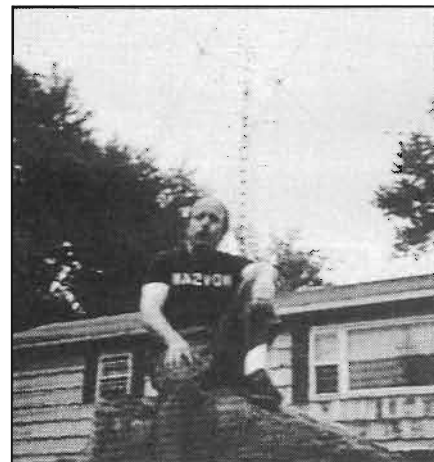
current amateur satellites, explains the 'jargon' such as Apogee, Perigee, Mode B, Mode J etc. very clearly, and details

the various types of analogue and digital satellites in orbit and how to operate through them. Individual satellites and their operating frequencies are described, together with live examples of operating. Added to this is communication with manned orbiting stations such as the MIR space station and the US Space Shuttle, and the video includes a 2m FM QSO between JY1 and the US shuttle.

The content is applicable worldwide, and the video concludes with a very nice 'plug' for the amateur satellite movement, AMSAT, without which there would, of course, be no amateur satellites to operate through.

Getting Started in DXing

In this video, a selection of experienced DX operators share their tips and give advice to potential DXers in how to operate, and what the most important part of a DX station comprises. This ranges from the aerial, to the receiver, to the experience of the operator! Although the video is concerned primarily with HF DXing, the use of 6m, and amateur satellites, for DX operation is also introduced. As well as plenty of verbal 'tips' such as getting the 'competitive edge', and the secrets of



DXing

QSLing, a significant part of the video is devoted to the DX PacketCluster system and how this can be used. The video ends by showing how, with experience and persistence, DX can be worked with relatively low power and a simple aerial system. Virtually all the content is applicable worldwide.

Each video is priced at £19.95 plus p/p, and our thanks go to Nevada Communications (189 London Rd., North End, Portsmouth, Hants, PO2 9AE, Tel. 0705 662145) for the loan of the review tapes

ARE YOU MISSING OUT EVERY MONTH?

Are you having trouble getting a copy of your favourite HRT magazine every month? Are you missing out on the great news, views and features that we pack in these pages? Are you losing the race to grab the new issues? Do you want to help yourself or a friend keep in touch? If the answer to any of those questions is yes then simply fill in your name and address on this coupon and hand it to your local newsagent and he will order or save a copy just for you!



Dear newsagent,

Please deliver / save me a copy of Ham Radio Today Magazine every month.

Name

Address

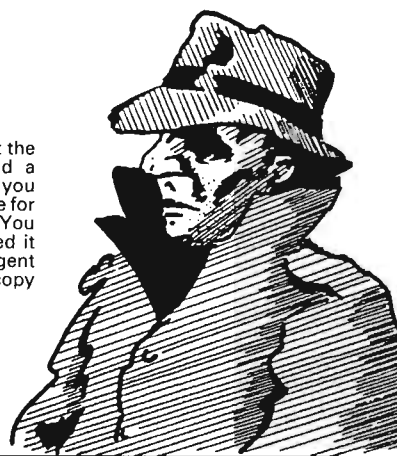
Ham Radio Today is available from SM Distribution

PUT YOUR AGENT ON THE TRAIL

You need the facts, just the facts mam. You need a steady source to feed you information. Don't settle for a second-rate squealer. You need HRT and you need it good. Put your newsagent on the trail - order your copy today.

HRT is distributed by SM Distribution Ltd.
Tel: 081 677 8111.

ISSN No. 0269-8269



Last Month in HRT

Reviews:

Icom IC-Δ1E triband FM portable
Kenwood TM-742E triband mobile

Projects:

50W amplifier for 6m (part 2)
QRP 'Pen Transmitter' amplifier

Features:

Rally 'Special';
Friedrichshafen Show report
Dayton Show report
1993 Elvaston Castle Rally
Scanners Buyer's Guide
RSGB Open Day
and much more besides

If you missed this exciting issue, then turn to page 35 and order your copy today. Why not also take out a subscription (page 4) so you don't miss any of the great issues still to come!

'Short Circuit' – Speaker Mic

*Alex Clark 2E1BGX builds
a low cost speaker-
microphone for portable
transceivers*

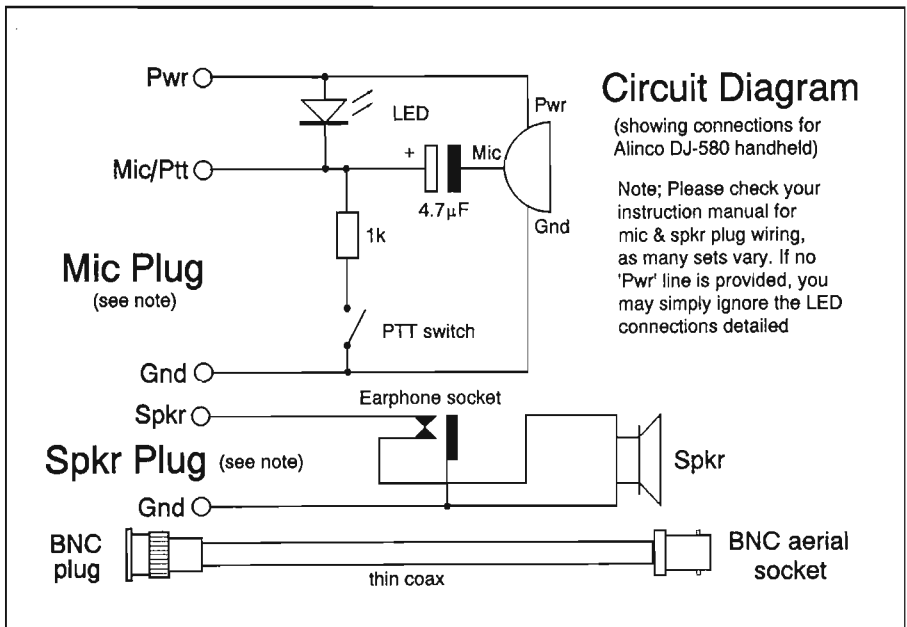
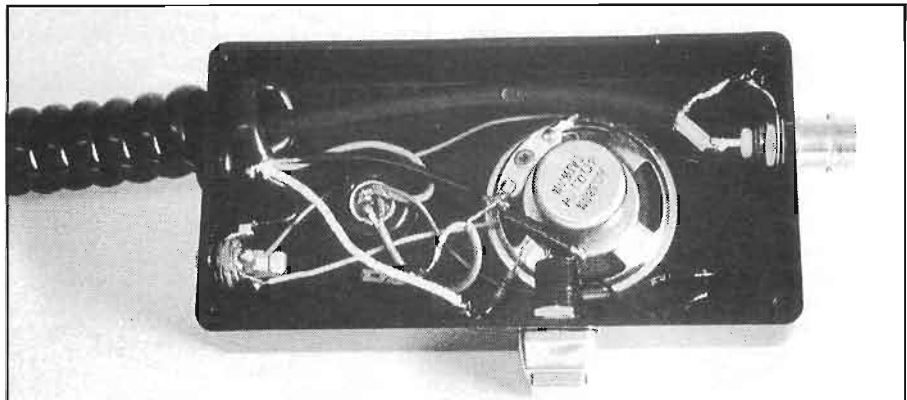
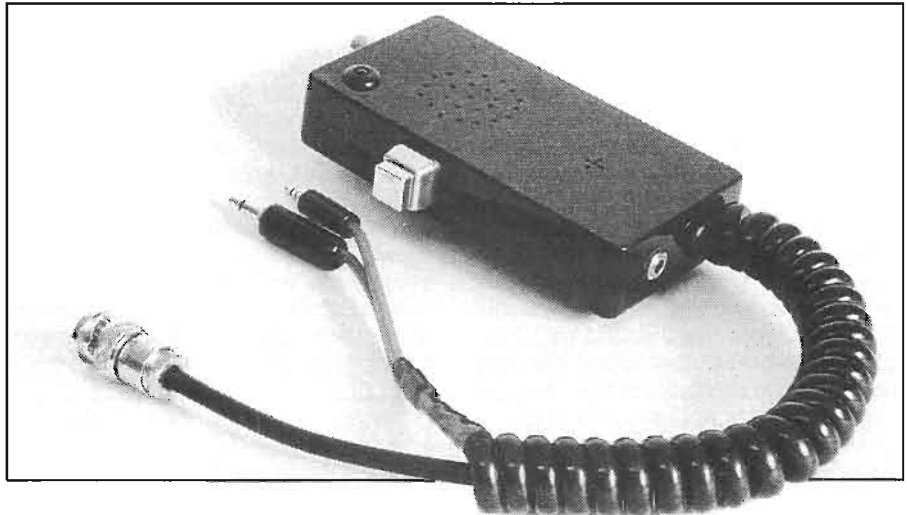
After discovering the price of a new speaker mic for my 70cm handheld, I decided to design and build my own, keeping the cost to a minimum in mind, adding an aerial connection for ease of use and flexibility.

The speaker mic is made from a plastic box with a BNC socket on the top, to connect to a small flexi type aerial. On the side of the box is a push-on push-off switch (locking type), the idea being that you don't have to keep your finger on the PTT all the time. I added a red LED (2mA type) to indicate TX mode, so I didn't leave it keyed up and flatten the nicad pack, this was powered from the power supply provided on the handheld.

The audio comes from a small 8 ohm speaker which is superglued into the box, below that is a small electret condenser type mic element which is placed into a small rubber washer which is glued in (and not the element), this should be a good tight fit into the washer. Also there is a 3.5mm socket for headphones, external speaker etc, which cuts out the internal speaker when plugged in. I have added a belt clip so you can clip the mic to your jacket etc. which adds a nice finish to the project.

The cable to the unit from the handheld consists of a curly mike cable (4 core plus screen) with the coax cable running through the centre. A small rubber grommet in the base of the unit secures a good fit for the cables. The connectors on the other end go to your handheld (*these may differ from those stated, you should use the right type for your handheld – check your rig's instruction manual for this and for the actual mic / speaker / PTT wiring required*).

You'll see that this project is very easy to put together and would be ideal for anyone with a handheld wishing to have a speaker mic without spending a lot of money.



'Go Native'

Steve Ireland G3ZZD/VK6VZ goes 'native' Oz style with a novel way of erecting wire aerials with ease

As a teenager, living in suburban south east England, I was very envious of those radio amateurs who lived in the country. Whereas I had barely room to swing a 20m dipole in a treeless pocket handkerchief of a garden, my rural counterparts seemed to have acres of land, with mighty oaks at each corner and room for 160m half waves. To make matters worse, when I visited the friends I had made over the air in the West Kent area, I discovered that although many had gardens similar in size to my parents, like the country cousins they all seemed to have trees that dwarfed the 6m tall larch poles holding up my aerials.

When asked why they were not taking advantage of the trees, I invariably received the same answer from the owners. "How can I get a line over the branch?...I'm too old to climb trees and I couldn't reach that branch anyway...That's as far as I could throw a tennis ball/old boot/lump of wood...". I must confess my response was often the thought, "what a bunch of wimps". However, years later, when I was living in a flat in London, with a large tree at the bottom of the garden, I found myself feeling more sympathetic to their predicament.

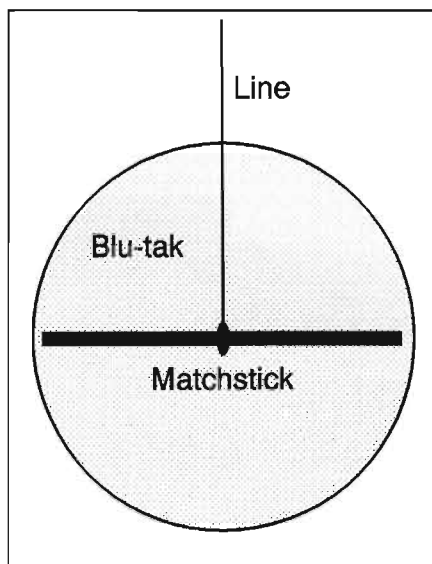
My rented flat was on the top floor of an old Victorian terraced house and, at the bottom of the 20m long garden, was a large beech tree. The idea I had was to sling a 40m half wave dipole between the house and the tree. Unfortunately, the garden backed closely onto the side of another house and in the exact position where the tree stood was a very large stained glass window. Clearly, the tennis ball/wellington boot/lump of wood approach was going to have to be done very carefully to pay off. After a few such attempts had nearly written off the window, I decided a different approach was called for.

Gone Fishing

As a child I had been a very keen fisherman, able to cast 70 or 80m with decent equipment. Later, going on field days with the local radio club, I often volunteered my services to cast a line over the top of trees to support our aerials. Although good fishing gear is

expensive, fishing shops, Woolworths and, quite often, toy shops sell 'Fishing kits for Beginners'. I decided to purchase one of these toy rods, which complete with a small package of hooks, floats and weights, sell for a few pounds.

In use, I tied the end of the line tightly around the middle of a matchstick and a lump of Blu-tak about the size of a two pence piece moulded around the matchstick with its ends broken off. No sharp edges should



Blu-tak blob with matchstick – note that for safety reasons the matchstick should not protrude outside the Blu-tak

protrude! Blu-tak is used instead of fisherman's weights or a piece of stone because it is much softer and so less likely to damage anything it comes into contact with. A practice in the local park is then recommended, checking there is no-one anyway near you, particularly in the direction you are casting.

After five or six such attempts, I found I could cast in a horizontal direction about 70m. It was then time to try my hand at semi-vertical casting and get the line over a few tree boughs. I realised it was important to keep well away from the base of the tree, and about at a 45 degree angle or less to the branch I was trying to cast over. After a couple of hours of practice, I could cast my Blu-tak blob reasonably accurately

over branches up to 20m high.

The Big One

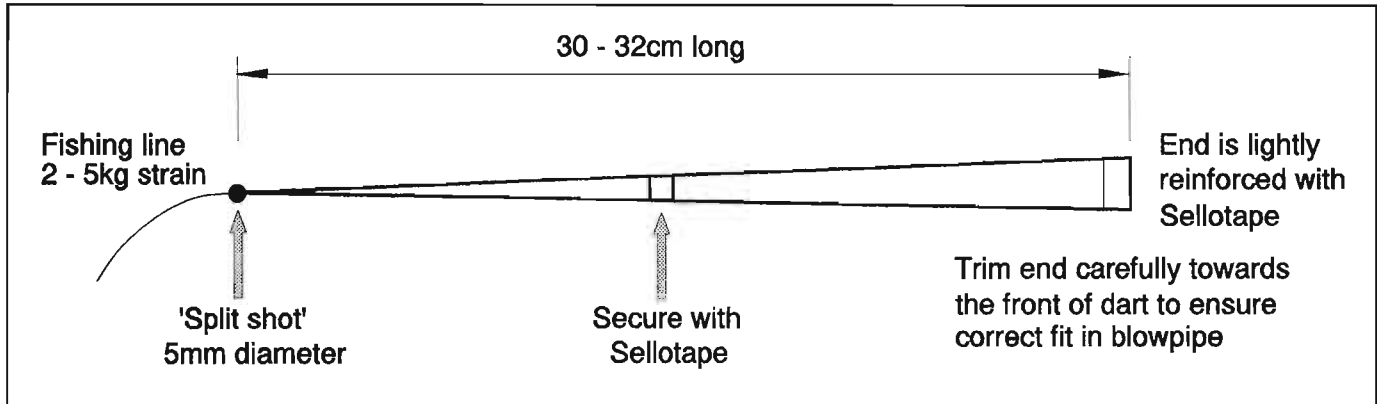
A few days later, I arranged with my landlady to try my hand with the fishing rod. As soon as I chose a bough to cast over – about 15m above ground and easily within my range – I discovered a snag. I couldn't get far enough away from the tree to allow me to be front on and at 45 degrees angle to my chosen bough without going into the next door neighbour's garden, which was a total jungle. After some thought and a lot of cursing under my breath, I set my sights lower on a branch about 10m above the ground and cast the line over on the second attempt. The subsequent dipole worked fine, bringing regular contacts with North and South America on 7MHz CW, but there was always the thought at the back of my mind that I could have got the aerial up higher. It was about ten years later that I found the solution.

Going Native

By then, I had emigrated to Australia, to Perth in Western Australia where I currently reside. My wife Debbie and I had moved to a suburb to the north of the city where, in her words, we bought "a large block of land with a large tree and a house attached". The tree was indeed a fine specimen, a tall lemon scented gum with great potential as an aerial support. The tree was in one of the corners of the block and looked fairly suitable for an attempt with rod and line, although I could see there would be a similar problem with the branch I desired to the one I had experienced in London. Just as I was about to go and scour the fishing shops for a suitable rod, I found a brief item by Ray Fry, VK2FRY, in an aerial book I had bought (Dipole Installation Made Easy by Ray Fry, VK2FRY, Syme Magazines) which started me off in a different direction altogether.

One of VK2FRY's sons had suggested to him that the answer to his problem of getting a halyard for his dipole aerial over a tree was to use a blowpipe. VK2FRY had fabricated a blowpipe and a dart to his son's instructions for a dollar or two and had used this, along with some fishing line, to successfully do the job. The item gave pretty precise information about materials to use for the blowpipe and dart, so I decided to give it a try. When I mentioned the idea to some of the local amateurs, no one had tried it or even heard of the idea before but, like me, they were very intrigued.

Following VK2FRY's advice, I went out to buy a piece of conduit tube about



Preparation of the paper dart

20mm in diameter and 1.5m long. Ray had specified plastic but I used steel conduit, with a 15mm diameter. The diameter of the conduit isn't critical but shouldn't be smaller than 15mm because this makes the construction of the dart difficult. The material doesn't seem to matter, as long as the conduit is perfectly circular and very smooth inside. To finish my blowpipe off, I filed both ends of the conduit smooth, and ran a piece of sellotape around the lip of the blowing end to protect my lips from any sharp edges the file had missed.

The next step was to make the dart, the most critical part of the equipment. It is worth spending a bit of time experimenting here, as a well made dart, fashioned from the right materials can double the distance it is possible to blow a dart. This is made from semi-stiff paper, from a cover of a magazine like this one, by rolling the paper into a long narrow cone. The dart should be about 300-320mm long, with the wide end (i.e., the opening) being approximately the same size as the conduit and the other end finishing in a point.

The dart was held together initially with a small piece of sellotape and inserted into the blow pipe to test it for a good fit. The dart should fit into the blow pipe in such a way so that if the pipe is held vertically, the dart does not slide down the tube unless the tube is firmly shaken with a vertical motion. If the dart is either too loose or too tight, this will reduce the length of its flight. The dart should then be unrolled and re-rolled until a good fit is obtained. This is a lot easier than it sounds and only took me a couple of tries, the best way is to make the dart a bit too big and 'fine tune' it by carefully trimming the wide end with a pair of scissors. Once the dart was at the right size, it was firmly secured by a small strip of sellotape wound around its narrow end. Another small strip of sellotape was carefully placed inside the wide end of the dart as a reinforcement.

The next step was to attach a reel of

2-5kg fishing line to a circular fishing-type lead split-shot of around 5mm diameter. The split-shot was then lightly but firmly sellotaped to the pointed end of the dart. At this point, I was almost ready to go.

Taking Aim

Standing underneath the tree, with enough fishing line unreeled to take the dart up to and down from the branch I had in mind – the branch was about 15m high so I had peeled off about 30m of line and laid this carefully on the grass – I lowered the dart into the top of the blow pipe. The dart was then shaken down the blow pipe until it was a few cm above the 'mouthpiece'. Holding the blowpipe, I aimed the end of the pipe slightly above the branch in question. After checking carefully that no one was in the vicinity and could be hit by the dart, I took a deep breath and blew sharply, with a puffing motion, into the tube. To my surprise, and pleasure, the dart shot 10m high into the air, directly in the direction of the branch.

After 'fine tuning' the dart, my fourth shot sailed cleanly over the bough. A few shakes to the fishing line bought the dart back to the ground and I cut the line and carefully tied on my 5mm nylon halyard. About an hour later, my new aerial, a 7MHz ground plane made of wire was up the tree and in action.

Since then, I have used the blow pipe several times to put up aerials and can fire a dart 15 to 18m almost vertically without difficulty, within a few cm of my target. Yes, it is *that* accurate. Comparing the two techniques – fishing rod vs blow pipe, they both have advantages under different circumstances. The blow pipe is better for situations where you have very little space to manoeuvre in, such as the suburban garden, and are also concerned with the safety aspects of aerial erection. A paper dart will do much less damage than a lump of Blu-tak and can be propelled much more accurately. That being said, care should always be taken at all times when blow piping. There are limitations on how high the paper dart can be shot, even by the practised, and for field day situations when you are in open country with no one around, the fishing rod takes a lot of beating with its ability to put a line over a 20m-plus high tree.

Good luck in taking advantage of the natural aerial supports that nature has bought to your garden. It might take you a bit of effort to start with, but the cost is virtually nothing, no planning permission is needed and it will definitely bring you lots of DX.

The VK6VZ residence showing the 20m high lemon gum tree, currently supporting a 40m full sized ground plane



SCANNERS

INTERNATIONAL

From the Editor's Desk

Scanners features plenty of reviews of wideband receivers and VHF/UHF scanners, together with periodic 'buyers guides' to give you a roundup of what's available. However the most common question which readers write and phone in with is "Which is the best receiver to buy?". In this month's issue you'll see we've tried to give you a brief 'starter's guide', the Editorial team hope you'll find it useful. In this, amongst other things you'll see reference to the technical results of our reviews, and that these really *do* mean something rather than just being gobbledegook figures! Sometimes, they have *very* significant implications...

New Products

New MFJ-8100 HF Receiver

MFJ have just introduced a new short wave receiver, available either ready-built or as a kit. Based upon a regeneration design, the receiver covers the range 3.5-22MHz in five switched ranges.

The kit is supplied with all components, metalwork, case, knobs etc., plus a detailed instruction manual running to 40 pages. The UK distributors, Waters and Stanton Electronics, tell us the set features sensitive FET RF amplifier and detector stages, smooth regeneration, a 6:1 slow motion dial, true AM-SSB-CW reception, dual headphone sockets, low current consumption using a PP6 battery, and excellent signal strengths using even a short length of wire. Pre-set controls are provided to adjust for smooth regeneration and aerial matching, and great attention has been taken to isolate the aerial from the detector to avoid oscillator radiation.

They add that because the receiver is designed for short end-fed wires, it is able to provide a performance similar to that obtained from an active aerial, and gives youngsters the chance to obtain good short wave signals from very modest aerials.

ScanNews

Bill Robertson with the latest on the receiving scene

A strange case of images

In last month's issue, you'll have seen the reason for missing 'gaps' in the 800-900MHz range from many scanners destined for US use, these corresponding to the US cellular telephony bands, as it's recently become illegal to import or sell scanners over there covering these ranges. But why did US *Radio Shack* stores (similar to our *Tandystores*) recently pull most of their scanners with these missing gaps off the shelves of their New Jersey outlets?

If you've been following the technical reviews in *Scanners* you may have seen how the 'image rejection' of many scanners in the UHF region is quite poor. This means, simply, that it's possible to receive a given signal at two indicated frequencies on your set, the first being the 'true' frequency, the second being typically 21.4MHz or 21.6MHz away from this (equal to twice the first *IF*, or *Intermediate Frequency*, you'll usually find this in your receiver's specification sheet).

Radio Shack got a letter from the New Jersey Attorney General's office telling them that several of the firm's Realistic scanners received cellular telephone conversations outside the cellular bands because of this. Possibly surprising to European readers, is that the office had received a complaint it was acting on, and following tests of the scanners the office said that people who wanted to listen in to police and ambulance communications (legal over there) would be frustrated by the interference of cellular communications! So

you see, those strange 'Image Rejection' figures in *Scanners* reviews *do* mean something after all!

Man gets awarded £5500 for not having a receiver

It's been reported that an Edinburgh court awarded Mr. David Guest a total of £5500 for his legal expenses against the TV Licensing division. The report stated the division claimed they had observed a flickering light from Mr. Guest's window at night, but that they couldn't obtain a search warrant to enter his premises to see if he was using an unlicensed TV receiver. Mr. Guest reportedly said that he and his wife Alison replied to numerous enquiries by mail, and finally gave up after 17 years of answering their insistent pleas for money, adding that his lack of response brought a series of house calls by (in his words) "unsavoury and heavily-built men who were not too polite" - Mr. Guest is now seeking compensation payment for harassment.

Coincidentally the *Scanners* Editor tells me, after having also suffered harassment in the past and threatening the same division with legal proceedings, that she has a written and signed document from the TV Licensing division saying that a householder need not answer *any* queries from their staff, and can simply totally ignore their enquiries or any personnel who turn up at the door (you don't even need to open your front door or even speak to their people). So now you know!

Priced at £71.95 for the kit, or £99.95 ready built, p/p £5.00 for either, it's available in the UK from Waters and Stanton Electronics, 22 Main Road, Hockley, Essex SS5 4QS, Tel. 0702 206835

Lowe PR-150 HF Preselector

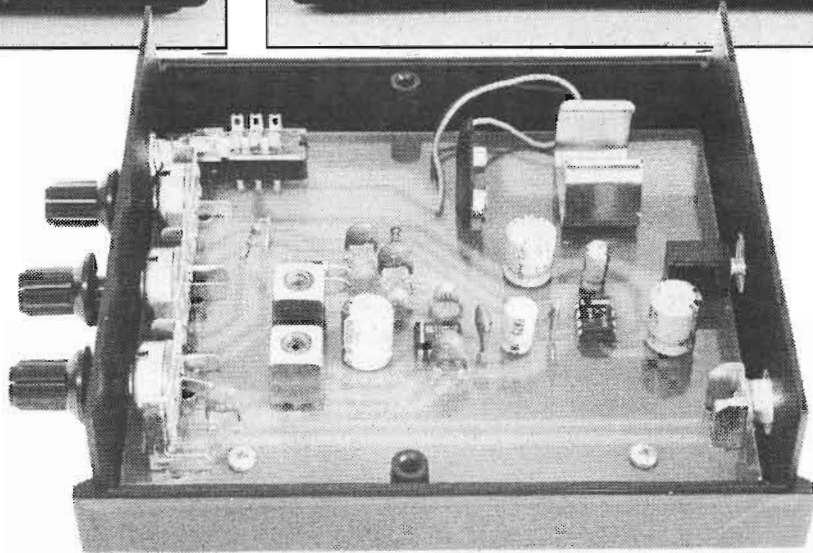
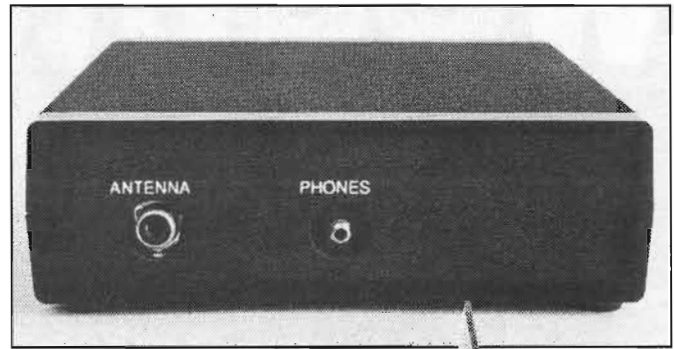
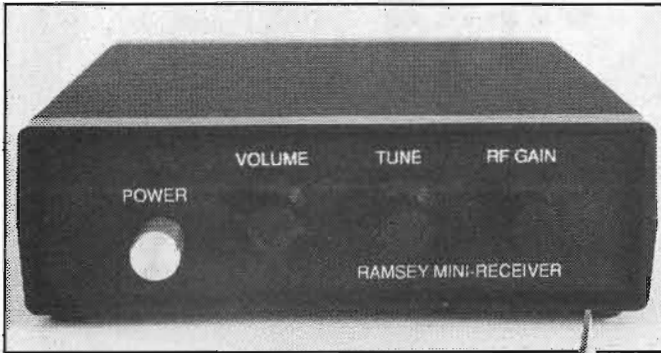
Revealed at this year's Friedrichshafen 'Ham Radio 93' exhibition was the new PR-150 high-performance HF preselector from Lowe Electronics. Designed to be used with any HF receiver with a 50Ω aerial input, the preselector covers the 100kHz-30MHz frequency range with seven electronically switch bands ranges, and matches the cabinet styling and size of their popular HF-150 receiver. Designed with similar high technical per-

formance in mind, the internal filters are relay switched for good strong signal handling rather than being diode switched, and filter bandwidths are given as 10% of tuned frequency to -6dB points, and 50% of tuned frequency to -30dB points, with 5-8dB insertion loss. A switched 16dB attenuator and 10dB preamplifier are fitted, and the aerial input can be switched between either 50Ω coax, or 600Ω balanced or unbalanced, the output to your receiver being via a 50Ω SO-239 coax socket. Power required is 12V DC at 50mA, either from an external supply or on a 'loop through' from Lowe receivers.

Priced in the region of £199, you can get further details from Lowe Electronics Ltd., Chesterfield Road, Matlock, Derbyshire DE4 5LE, Tel 0629 580800.

Ramsey 80m Receiver Kit Review

*Budding Novice Steven Lorek build the Ramsey 80m
Direct Conversion receiver*



The HR-80 is a 'direct conversion' 80m receiver, which means it can tune to SSB and CW signals without needing a lot of circuitry. This keeps the cost down so beginners such as myself can more easily afford it, and makes it easy to build. The manual says it uses an NE-602 IC chip for improved sensitivity when tuning into either AM, RTTY, SSB or CW in a 250kHz part of 80m. There are five adjustments in all – a volume control, RF gain control and a tune control, plus two adjustable shielded coils. The kit needs a 9V rectangular battery, which fits into a battery clamp, it also requires a set of micro-earphones with a very small (2.5mm) jack plug and a suitable aerial connector and cable. It can also be put into a neat little case which includes matching knobs as well.

Construction

The assembly instructions were quite easy to understand, but they did not tell me any way of identifying the components, which were quite new to me. Fortunately my Mum and Dad helped me here. Beside some of the steps, it told me how the component that I had just soldered connected to other ones which were already on the PCB. Overall, it took me about one and a half hours to complete the construction. The manual says an alignment tool is needed to tune the two coils, one of these adjusts the tuning range and the other adjusts the signal strength. I found that trying to use a filed-down matchstick to adjust these didn't work, so if my Dad hadn't given me one, I'd have had to go to Tandy's in town to buy an alignment tool.

I also had the optional matching plastic case and knob set, which gave my finished receiver a nice smart look.

Did it Work?

It did work as it should, but it took me a long time to find a signal. The first thing I came across was a foreign broadcast radio station, and nothing else. The reason for this is because the front panel tuning knob was far too small, and I had to turn this very, very slowly to get any signals at all. One Sunday morning, after a long time fiddling with all the controls I finally got an 80m amateur signal, but to my horror it, and all the other signals I could hear, were just boring old men talking about the weather or moaning about how Novices such as I want to become shouldn't be allowed. This didn't give me a very good impression of amateur radio, but fortunately I've heard other younger amateurs, like on 2m and 70cm talking about more interesting things on my local repeaters. I found that I had to be careful adjusting the volume and RF gain controls when tuning, the receiver 'buzzed' a lot if I set these too high, but in the end I could normally receive signals OK if I used a fairly long

wire with a ground or an 80m dipole.

Conclusions

The HR-80 is a neat and tidy 80m receiver, with a well-written instruction manual, which gave me an 'introduction' to what I should be able to hear. I found that the tuning control knob was too small, and that the knob for the power on/off switch kept falling off, although the case made the receiver look quite smart. I think I would have bought a bigger tuning control knob to use, and glued the on/on button onto the switch. However, the kit is easy to build, and can be ideal for people new to amateur radio who want to have a 'listen around' without spending too much money.

The Ramsey Direct Conversion receiver kits are available for 80m, 40m, and 20m, and are distributed in the UK by Waters and Stanton Electronics (Tel. 0708 444765), priced at £31.95 each for the PCB-only version, plus £14.95 for the optional matching case and knob kit (£46.90 total) plus p/p, to whom our thanks go for the loan of the review kit.

QRP CORNER

Dick Pascoe G0BPS builds a simple CW audio filter, and shows how you can manage over a billion Miles per Watt with just a three component transmitter!

Readers will recall my extolling the virtues of contest operation to gain contacts and expand the list of countries worked, this is fine for HF but may cause problems at VHF. Great fun can be had on VHF with this and a sense of achievement gained as the total of squares worked increases. My recent house move necessitated a restart in my squares count, a stolen logbook made life difficult moreover, so this seemed logical anyway. In just 1 week of limited operating in the late evening, I had worked 32 squares from my new home, all with power levels below that required for QRP.

But imagine my horror to find a full legal power contest station (400W?) being set up within a few hundred yards of my home during the weekend of VHF Field Day. The SSB section of 2m became almost useless for everyone in the whole of the local area for the duration, what made it worse was that this station sat right on the SSB calling frequency and centre of activity on the Sunday morning, thus totally prohibiting the band to any other operator. Even during my contest days we always stayed clear of this frequency to allow other non contest traffic to operate. On the back and side of my beam his signal level of in excess of S9 +60dB, even with the RF gain backed fully off his signal was swamping my front end at

about 40dB over S9.

These comments are not all sour grapes, During a lull when he went off the air thankfully, I managed to work into GM with a single yagi and 8 watts of SSB, a couple of nights before into Sweden and Denmark, again with just 8 watts.

This situation only went on to harden my belief that low power works, restricted power levels cause less nuisance to others, less QRM, less interference and permit several stations to work in harmony. Crushing signals of 60dB over S9 or more just prove that more than 60dB of that signal is wasted!

VK CW Operators Club

The club journal of the CW Operators QRP Club dropped through my door last week, This magazine from Australia "Promotes Low Power CW Mode Communications and Homebrewing in the Amateur Radio Service" – a fine sounding title. Their June edition has a fine photograph on the front page of Hollis Button, you may not think this strange, but Hollis's call is WF6U!

The magazine covers a lot of interesting features giving details of awards and contests, several homebrew tips and a delightful 'Walkabout 80m transceiver'. An article on ceramic resonators had been dutifully copied from *SPRAT*, but even

second time around I found it of interest.

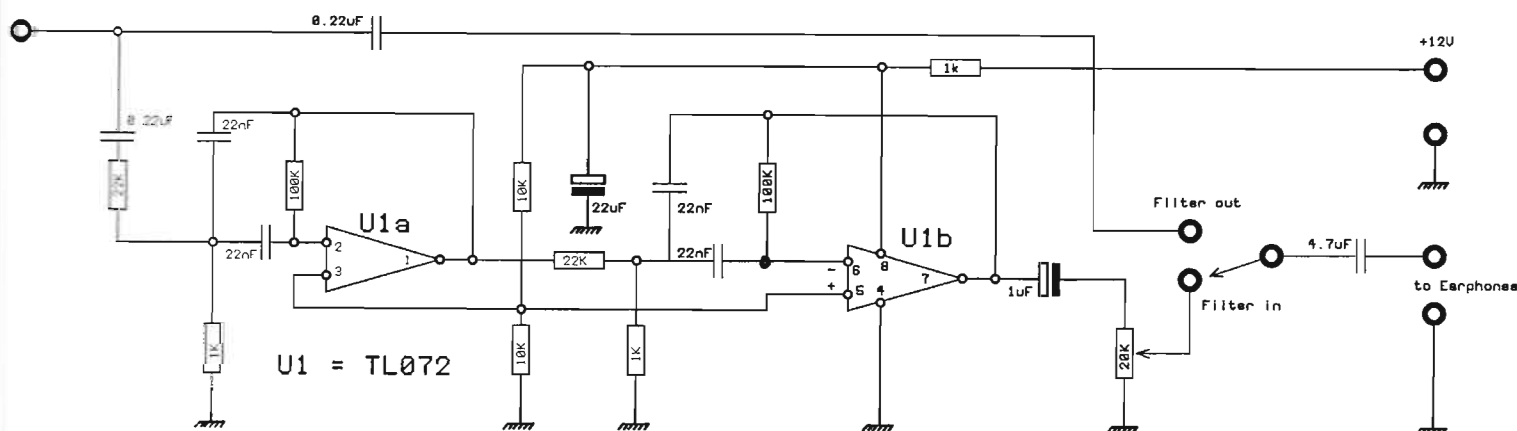
Like all clubs with an interest in low power operating, ideas will circulate and some will gather momentum and reach all parts of the globe, such as the *Two-Fer* receiver which surfaced in the UK disguised as the *Sudden*. The *Oner* transmitter can be found all over the world.

For more details of this interesting club, contact Kevin Zeitz VK5AKZ, at 41 Tobruk Ave, St Marys. SA 5042. Australia. Membership costs \$A 14 for DX members (photocopies of the membership application are available from me, send an SAE with one first class stamp extra to cover the copying cost).

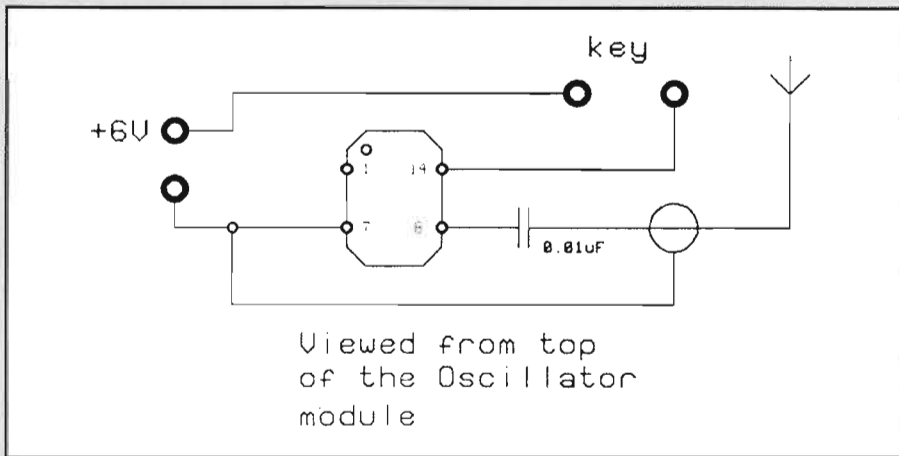
Audio Amplifier

Another simple circuit for you this month, a simple audio filter for CW reception. Most of us could do with a little more filtering of the received signal at times when the signal we want is the second, third or even the fourth one on the frequency. A simple filter fitted between the audio output of the rig and the earphones can at times make a huge difference to the received signal. This one should cost no more than a pound or two to put together, and it can be made 'ugly style' or on a piece of Veroboard, or using the now famous modern equivalent 'Blob Board' or similar.

Simple CW audio filter



CW Audio Filter



The Fireball circuit, over a billion MPW possible!

The circuit is not original (what of this type is nowadays) and is from the pen of Ian VK8CW. It's straightforward enough and easy to build, if required it can be built into a small box with facilities for switching straight through.

Miles-per-Watt

One of the great joys of low power operating is to find out just how low you can go and still maintain the contact. I well remember G3ROO testing a

CW transmitter at what he thought was at the 3W level. A CQ call fed into his two element cubical quad was answered by an American station with a fair report. It was only after the QSO was completed that he found that the PA was still disconnected! A check with the 'scope showed the output power was just 23mW, yes 23 milliwatts!

From this we can calculate the MPW. Suppose the power used was 25mW and the distance between the two stations was just one mile, then the power per mile would be 1000/25 which equals 40. But we are talking 2000 miles, so we have to multiply that 40 by 2000

which equals a huge 80,000 miles per watt, or in this real case, 86,956 miles per watt.

I am reminded from all this about the American *Fireball* transmitter. Many stations in the US have achieved over *one billion* MPW! The 'Fireball' is the simplest of transmitters going, if you thought you had seen these in the last few articles then read on.....

The Fireball is based around a simple computer clock crystal oscillator, they are available for various frequencies, several which fall within the amateur bands. The circuit is simplicity itself, just three components plus the battery and the key. In its simplest form we are only keying the oscillator, the output of which is fed via the 10nF capacitor to the aerial. Power requirements are minimal, just 6 volts to pin 14 of the oscillator.

Readers may be surprised to hear me say, "don't expect to bust the pile-ups with this one!" but with a spot of 'tailending' a few very good QSOs should result. If anyone dares to try this out I would be delighted to hear of the results achieved.

That's it for this month, news and views to me via HRT editorial or via GB7ZAA or direct to me at Seaview House, Crete Road East, Folkestone. 72 de Dick.

THE FLYING SHOP

BIGGIN HILL AIRPORT

THE NEW!!!
YUPITER MVT-7100

- 1000 Channels
- All Mode AM/FM/MW/LSB/USB
- 500kHz-1650MHz
- SSB tuning in 10Hz steps

YUPITERU VT-225
£235 incl V.A.T.

YUPITERU MVT-7000

1MHz-1300MHz
• AM-NBFM-WBFM • Multiple steps
• Better than 0.5uV • 200 memories •
Rotary dial • S-meter • Fast scan speed •
Lockout/priority • Ni-cads • Charger/
AC PSU • 12V lead
The MVT-7000 from Yupiter provides unbroken coverage throughout the spectrum. Each one is carefully tested by us and supplied with a unique power supply that will not only recharge the ni-cads, but also run the set directly from the mains. It's beautifully styled lines and superb engineering make it the best buy for the customer who wants the widest frequency range possible.

£315 incl V.A.T.

YUPITERU VT-125 MkII

- Excellent reception • 108-142MHz
- 30 memory channels
- Illuminated LCD display! 25, 150 or 100kHz steps
- Search scan or direct frequency entry
- Keylock • Keyboard beep tone • LCD signal meter

£165 incl V.A.T.
Complete with 3 AA size ni-cad batteries, 240V mains adaptor. 12V d.c. cigar plug & carry strap.

24 hour delivery £7.50
48 hour delivery £5.00

The Flying Shop, Biggin Hill Airport,
Westerham, Kent TN16 3BN

Tel: (0959) 576370 0900 - 18.00 (Mon-Sun)
(0959) 572352 0700-0900 & 1800-2000
Fax: (0959) 576711 24 Hour

The UK Scanning Directory

New 3rd Edition - Lists over 12,000 Sport Frequencies

Here is the book that every scanner owner has been waiting for! This new 3rd edition has been completely revised and thoroughly updated, and its comprehensive coverage and detail continues to amaze readers. Listing over 12,000 spot frequencies 25 MHz - 1.215 GHz, remains the biggest and best guide on the market, and covers public utilities, security, telephone and lots more we dare not mention!

Price £16.95 incl. UK post, Overseas post add £2 EEC and sea, or £5 airmail.

Monitoring the Yugoslav Conflict *New*

Listen into AWACS, the UN boarding ships, aircraft enforcing the Exclusion Zone, diplomats, press, relief flights and more. Lists over 100 active frequencies and is a must if you want to be in the thick of the action.

Price £4.95 incl. UK post. Airmail add worldwide £1.50

Monitoring the Iraq/Kuwait Conflict

Things are hotting up again in Iraq so the radio traffic is increasing again. The disarmament programme and refugee problem will ensure the bands remain active, and it includes an extensive list of US Air Forces flight frequencies.

Price £4.75 incl. UK post, Overseas post add £1 sea or £1.50 airmail.

Computerized Radio Monitoring *New*

This book explains how to marry radios to computers for tuning, searching, scanning, logging, analyzing, decoding, develop monitoring strategies, plan databases and even remote monitoring, plus reviews software radios and terminal units.

Price £19.50 incl. UK post, Overseas post add £2 sea or £4.50 airmail.

The International Callsign Directory

It has the most comprehensive list of tactical callsigns and their identifications ever published for the US Air Force, Navy, Customs, Marine Corp and foreign Military. Also lists worldwide internationally registered callsigns and their users for aviation, NSAS, military, Interpol, embassies, maritime and many more.

Price £18.50 incl. UK post. Overseas post add £2.50 or airmail £5.50.

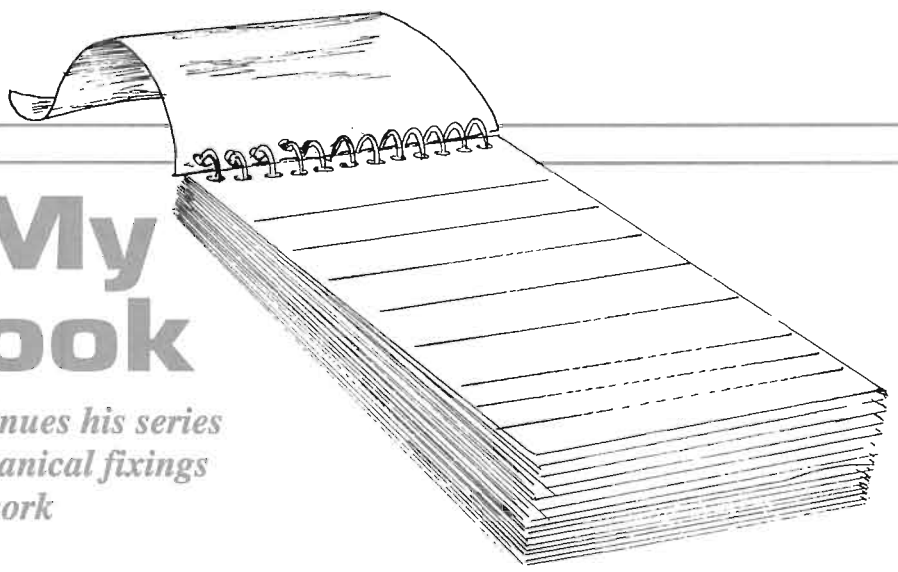
INTERPRODUCTS

H103, 8 Abbot Street, Perth, PH2 0EB, Scotland

Tel. & Fax: 0738-441199

From My Notebook

Geoff Arnold G3GSR continues his series on commonly found mechanical fixings used for radio work



Nuts to fit bolts or machine-screws are almost always hexagonal in form; just a few specialised types are square. Where heavy loads such as large mains transformers are to be secured safely, so-called 'full' nuts are used for maximum strength. For many other radio and electrical engineering purposes 'half' nuts (roughly half the thickness of 'full' nuts) are generally adequate, and in fact some mail-order component stockists offer only 'half' nuts in their catalogues nowadays.

It is good engineering practice always to use a washer of some sort under the nut. This may simply be a 'plain' washer, to provide a bearing surface to protect the component or material being secured, as the nut is tightened, and to spread the load slightly (the plain washer has a larger diameter than the nut). Alternatively, if the assembly is going to be subject to vibration, some sort of shake-proof or locking washer may be used.

Shakeproof washers, with sprung teeth formed on the inside edge of the washer, and locking washers, with the sprung teeth around the outside edge, are fairly common, as are single-coil

spring washers. These all 'dig into' the underneath of the nut and the surface of the workpiece when the nut is tightened, and can mark the workpiece, especially when it is a soft material such as fibre-board or plastic. For this sort of application, there is a special thin spring-steel shakeproof washer whose names aptly describe it – the crinkle-washer, also sometimes known as the wavy-washer. Rather than digging into the surfaces, the crinkle washer relies solely on friction to prevent the nut from coming loose.

In larger engineering jobs (in radio applications these might include aerial towers and rotators), you may come across 'castle' nuts, so-called because of their resemblance to castles with castellated battlements. When fully tightened, a split-pin is fitted through the slots and a hole drilled in the associated bolt, totally preventing the nut from loosening due to the effects of shock or vibration.

The self-locking nut, which might almost be considered as a development of the castle nut, also has a raised top but instead of being slotted to take a split-pin, it contains a nylon insert which

need to hold both the screw and the nut with the appropriate tools.

You may also encounter nuts with 'built-in' washers. There are 'flange nuts', where the bottom of the nut is enlarged and shaped to form either a smooth-faced plain washer, or a washer having a serrated face. There are also nuts with captive plain washers which are free to turn. These are used in some mains plugs, to give a wide, smooth clamping surface for a stranded wire-end with minimal risk of drawing loose strands into the centre, where they might jam the nut on the screw-thread before the wire is properly held.

Threads

Many different screw-thread forms have been devised over the decades for specialised purposes. In the UK, up to about 40 years ago the threads used on screws and bolts of 1/8-inch diameter and larger were Whitworth (later British Standard Whitworth or BSW), or British Standard Fine (BSF), its finer-threaded cousin. In small electrical and radio engineering applications, the British Association (BA) thread-form reigned supreme, with diameters up to slightly under 1/4-inch.

In the 1950s, two systems of 'Unified' threads were devised, UNC the coarse one and UNF the fine one, to replace the old Whitworth and BSF. They were being introduced gradually, with equipment using them often carrying a label "Warning – some threads on this equipment are Unified", but they suffered a premature death at the hands of metrication in the 1960s! They are still around, of course, as are Whit and BSF, causing confusion and all sorts of problems with crossed threads. They can give headaches to equipment maintainers trying to find a nut to replace one lost or damaged.

The designers of the Unified thread systems certainly knew a thing or two about engineering at a 'hands-on' level, for they decreed that the hexagon heads and nuts should be marked with a row of three touching circles to indicate a Unified-thread product. These marks

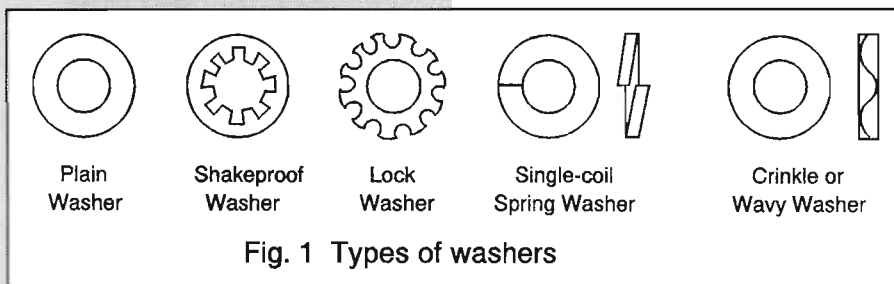


Fig. 1 Types of washers

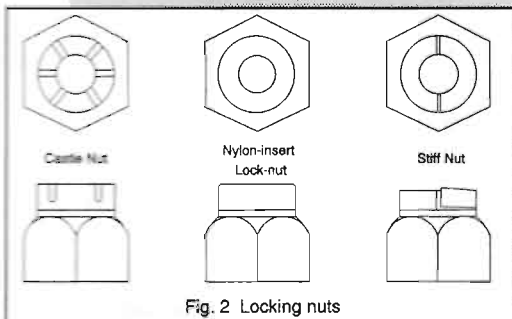
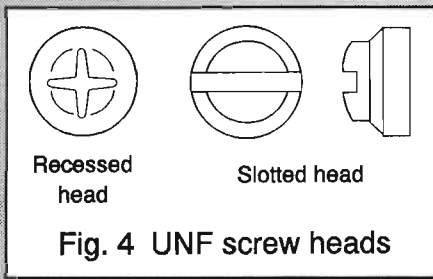
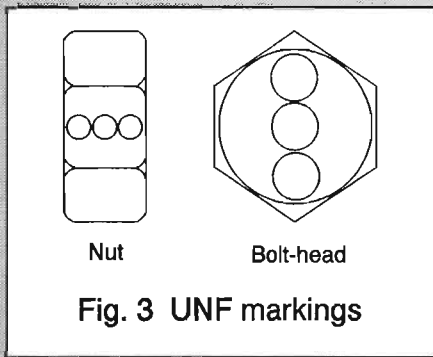


Fig. 2 Locking nuts

grips the thread of the screw the nut is fitted to, preventing the nut shaking loose. This type of nut is often known under the trademark Nyloc.

Another modified design of nut, the stiff-nut, has sprung metal arms at its top to grip the screw-thread and achieve the same purpose. Both the nylon self-locking nut and the stiff-nut achieve quite a good grip on the screw, and it is not possible to run one of them down a screw-thread using your fingers, as you might with an ordinary nut. You



are fairly often encountered, but the designers also said that the slotted-head screws should be identified by a raised centre section, and recessed-head screws were to be marked with circle-segments between the points of the recess. I've never come across any screws marked in these ways.

Self-tapping Screws

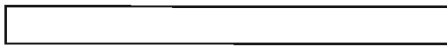
A range of designs for use in different metal, plastic, and wood composite materials are available nowadays, and with some patterns it is difficult to tell the difference between them and the old-fashioned chipboard screws.

One variety, called the self-drilling screw, is very different to the others, in that it incorporates a miniature drill-bit at the tip. When installed using a power-driver, the screw first drills its own pilot-hole in sheet metal up to 5mm thick, then threads it! What will they think of next?

Materials and Finishes

At one time, if you wanted screws or nuts, steel and brass were the only choices open to you. Now, with developments in plastics that have taken place in recent years, there are a number of alternatives, particularly for nuts or other fixings.

For strength and the ability to support heavy loads, steel remains the favourite, although there is always the problem of rusting to bear in mind. Corrosion-resistant finishes, such as zinc plating (often referred to as BZP – Bright Zinc Plating) and passivating coatings are one answer to this, although ultimately the finish may fail due to weathering or damage. For specialised applications, stainless steel provides a corrosion-free, although expensive, solution.



For use in places likely to suffer from shock or vibration – antenna towers and masts, for example – it is advisable to fit high-tensile screws and bolts, which are better able to withstand ill-treatment due to the effects of wind and movement.

Brass screws and nuts provide adequate strength for lighter loads, and have the advantage of being naturally corrosion-resistant. Plated finishes, either cadmium (which has a slightly dull, faintly yellowish tinge) or chromium over cadmium (for a bright, silvery colour), are often applied. These improve the appearance of visible screw-heads, and also guard against possible electrolytic corrosion between dissimilar metals – the screw and an object it is being used to secure – in a damp atmosphere.

Nylon nuts and bolts are highly corrosion-resistant, and although not as strong as their metal counterparts, are still remarkably robust. They are especially useful in high-voltage areas, or anywhere that the electrical through-connection which a metal machine-screw and nut naturally provide would be an undesirable feature.

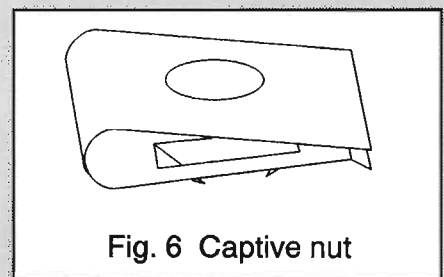
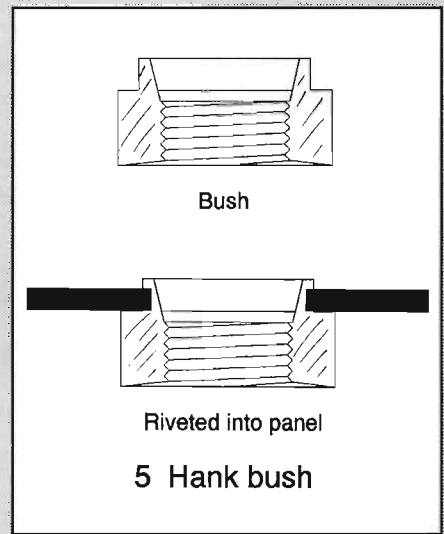
Special Fixings

There are several disadvantages to the standard screw and nut arrangement in some applications, and over the years various sorts of special fixings have been devised in an effort to overcome these.

Take for example, the job of fixing an equipment unit or panel into a rack or cabinet. How do you fit the nut on the end of the screw, when that nut will be inside the equipment? One answer might be to use tapped (threaded) holes in the rack or cabinet itself, taking the place of separate nuts. That's no problem if the rack or cabinet material is suitable and of adequate thickness, but if it's a thin aluminium case, the thread produced may soon be 'pulled out' by the action of tightening the screw. Three traditional solutions are the 'hank bush', the 'caged nut', and the 'captive nut', although there are now plastic fixings doing similar jobs available.

No! Hank Bush is not some obscure Country and Western performer, but a threaded nut or bush incorporating a flange by which it can be fixed into a hole drilled in thin sheet material. After pushing the flanged part through the sheet, it is riveted over using a small ball-pein hammer.

The caged nut is another way of providing a substantial threaded fixing for fixing front panels, etc., on instrument cases and racks. It consists of a square nut housed in a small steel cage with sprung 'ears'. These ears clip into



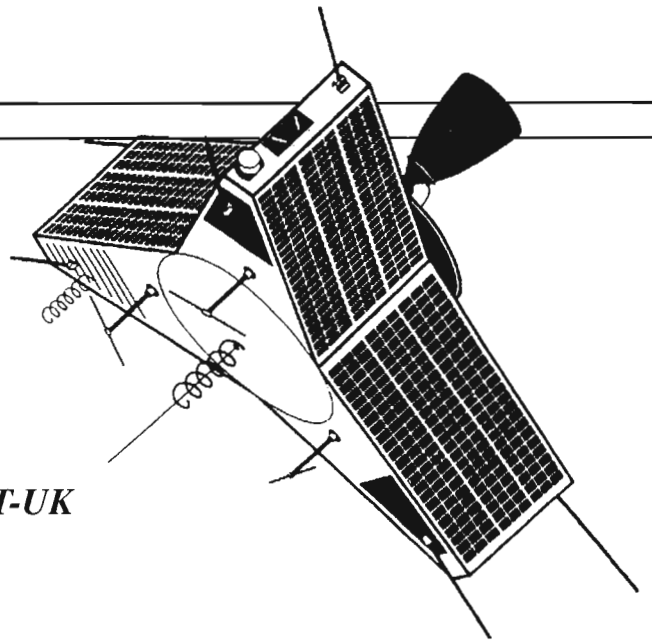
the rows of square holes punched in the fixing flanges at the case or rack fronts.

The captive nut, sometimes known under the trademark 'Spire Nut', is a 'U' shaped metal clip made of spring steel, intended to be slipped onto the edge of a suitably drilled flange or bracket, and having a clearance hole in one leg of the 'U' and a tapped hole in the other. The tapped hole may be suitable for metric or BA screws, or for self-tapping screws, depending on type.

For fixing chassis or loudspeakers into wooden cabinets, as in old-style broadcast receivers, there are a variety of special fixings to ease the problem of providing a removable but reliable anchorage of metal to wood. For chassis fixing, the 'claw nut' or 'tee nut' is in principle rather like the hank bush already described, except that instead of the riveting flange there are spikes which are pushed or hammered into the wood to secure the fixing. In the case of loudspeakers, a headless, double-ended screw, with a machine-screw thread at one end and a woodscrew thread at the other, is sometimes used to secure clamping plates.

How do you drive this strange device into the wood, when it has no head? You could, of course clamp a 'Mole' wrench onto it, but that won't do the exposed thread any good at all! The correct method is to fit two nuts on the machine-screw threaded section, tighten them to lock them together and then use a spanner to turn them and drive the woodscrew end into the pilot-hole in the cabinet. Simple when you know how!

Satellite Rendezvous



Richard Limebear G3RWL gives the latest AMSAT-UK updates on the satellites

Arsene

The Radio Amateur Club de l'Espace (RACE) officially released ARSENE for Mode-S operations on 1st June. The linear transponder uplink frequency is 435.100MHz with a +/-8kHz passband, and the downlink is centred on 2446.540MHz. All modes are possible, CW, SSB, packet, etc. F6BVP suggests that in dealing with the doppler shift on the downlink frequency, one should look for the ARSENE telemetry beacon on 2446.470MHz and then make the corrections in your uplink frequency to find yourself. An uplink power of 500W to 1kW EIRP is apparently sufficient. Mode-S transponder operation will continue until further announcements. A serious investigation is under way by ground controllers to try to understand the failure of the VHF downlink packet radio transmitter.

A few QSOs have been made via the satellite; JH1AOY used a homebrew 2m diameter parabolic dish with a 2.5 turn helix feeding it connected to a 20dB preamplifier. He observed that the PSK telemetry beacon on 2446.46MHz produces S meter levels in the range from S1 to S2, and also the telemetry beacon suffers from spin modulation (ARSENE's telemetry signal is much weaker than AO-13's Mode-S.) The frequencies appear to conform to those published. DD4YR reports that the spin modulation is sometimes very strong, about 10dB between minimum and maximum, with a frequency around 3Hz and about 15dB weaker than the S-band beacon from OSCAR 13.

On 22nd June they turned on the dosimeter experiment which is intended to measure the radiation received by the satellite in orbit.

The battery load has been found quite satisfactory even with the S transponder continuously on. This encouraged the control team to switch on again the mode B simultaneously with

mode S. Although there is still no VHF signal, the three packet transponders, the exciter and the VHF power amplifier are showing normal power consumption. They are still asking folks to listen carefully between 140 and 150MHz for a weak transmission and they will be doing some more tests towards recovery of the packet transponders.

Oscar 13

The demise of the mode-L transmitter makes the previously published AO-13 schedules obsolete. The command team are reviewing the best way to schedule the remaining mode-S and mode-B transponders.

Mode-JL was very power hungry and in order to maintain a full schedule, they had to operate with the Sun angle less than 30 degrees. They can now run comfortably at up to about 40 degrees, which means they can operate Earth pointing from apogee (Alon/Alat 180/0) for 1/3rd longer periods than hitherto, so logically, mode-S can now assume time previously assigned to mode-JL.

At certain times, the attitude is relatively extreme, and the amount of useful transponder time is very restricted. So any mode-S operation is necessarily short. 10 MAs represent about 1/6th of the available time. When the attitude is Earth pointing from apogee, such as in the 3rd quarter of 1993, the mode-S exclusive period can be longer, mode BS can be invoked for some hours, and the S-beacon exercised.

At intermediate attitudes the schedule will be intermediate too. The exact mix will be the subject to power budgets, and as yet they have no real working knowledge of the conditions when free of the heavy mode-L loading. So gathering data will take a little time.

In principle they want to guarantee a minimum of 10MAs mode-S exclusive

at all times, and when optimum attitude and Sun angle conditions allow, they'd like a maximum of 30 MAs, inclusive of beacon. Mode-BS operation will be available whenever possible since it does not affect mode-B in the slightest, yet provides a useful test environment for mode-S experimenters.

Provisional plans will be released shortly. Continuous up-to-date information about AO-13 operations is always available on the beacons, 145.812MHz, 435.658MHz and 2400.646MHz in CW, RTTY and 400 bps PSK.

Oscar 10

OSCAR-10 (AMSAT Phase 3B), launched 10 years ago, is the oldest still operating amateur radio satellite (the first AMSAT Phase 3A satellite was lost three years earlier during the launch accident of the ARIANE L2 rocket on 'black Friday'). Although the onboard computer was lost in 1986 due to radiation damage on the memories, the Mode-B transponder is still functioning with good downlink signals (Uplink; 435.050 to 435.180MHz, Downlink; 145.825 to 145.975MHz). Despite good signals from the transponder, there are very few stations using it. It's currently available when in view, but *please do not* attempt to use it if you hear the beacon or the transponder signals FMing.

Apple Macintosh Software

If you are a Macintosh user and operate satellites, or are interested in operating satellites, there exist two PB-like (broadcast protocol) programs written for the MAC, WX8X is currently beta-testing one version. This means a fully functional PG/PB-like program for

the MAC could be available in the near future. He would like to know how large (or small) the audience is, so if you're either active, or are just interested in the PACSATs - AO16 (PACSAT), LO19, WO18, UO22, KO23, please drop a packet message to WX8X @ N8GTC.#CIN.IN.U.S.A.NOAM with the following information:

- Your callsign and complete packet address.
- Your name and address (optional, QTH please).
- Type of Macintosh.
- AMSAT (or other) membership (if any).
- If applicable, please state that you are interested in PACSATs. - Additional comments.

Russian Satellites

I believe that AO-21 is still in its schedule of 5 min of FM repeater operation, 3 min of recorded voice message, and 2 min of 1200 baud AFSK packet. Downlink is on 145.987 MHz FM.

Mir Frequencies

There's been some confusion over the Mir downlink frequency recently, we thought they had gone to 145.850MHz but apparently this frequency was only temporary and they have since been heard on others, including a 144MHz one. It is hoped that they MIGHT move to 145.875MHz sometime in the near future but until it happens your guess as to a downlink is probably as good as mine - they'll probably still be exercising 145.550MHz for some of the time.

New satellite from Israel

The Israel Polytechnical Institute plans to launch its first satellite, known as Guerwin-1, from Baikonur aboard a Russian rocket. The satellite will weigh about 60kg and will carry a packet radio Bulletin Board System (BBS) for amateur radio operations. This satellite from "Technion," as the Polytechnical Institute is known as throughout the world, was a project which began three years ago and will be placed in orbit as secondary payload along with a Russian satellite and with another German satellite.

Initially, the launch was supposed to occur on an ARIANE launch vehicle, however, because of technical issues which were not discussed, the final agreement was made with the Russians.

There has been no other information about the payload but information about this satellite from the 1991 & 1992 Colloquia says that this project is for a 3-axis stabilised satellite carrying digital and imaging equipment; position reporting by GPS; ion and particle counting; MM (?) wave propagation and ozone observations; and using heat pipes for thermal stabilisation. The BBS should have 2 transmitters on 70cm, five receivers on 2m and five receivers on 1260MHz; modulation types will be

at least: 1200bps AFSK on 2m, 1200bps (Fuji) on 70/23cm, 9600bps (UO14/22) on 24cm. The transmitter power is expected to be in the 3-5W range. Other reports said it would only have three uplinks on 2m and 23cm (it's not sure if that's three total, or three per band). It remains to be seen what will actually fly.

Fuji Oscar 20

FO-20 continues to operate in both digital and analog modes. Normal analog (Mode JA) operations still take place on Wednesdays (GMT) with digital (JD) operations taking place the remainder of the week.

AMSAT-UK news

Did you come along to the AMSAT-UK Colloquium? (which is just about to occur as this column is being put together). If not, you'll have missed a great international gathering of like-minded folk. But not to worry, as you can, as always, get information about AMSAT-UK from: AMSAT-UK, c/o Ron Broadbent, G3AAJ, 94 Herongate Rd, London, E12 5EQ. Big SAE gets membership info, SWL's are welcome, and all new joiners get the USAT-P tracking program on 5-1/4 disk.

AO-13 Transponder Schedule, 1993 June 25 onwards

Mode-B	:	MA	0	to	MA	20	
Mode-S	:	MA	20	to	MA	30	
Mode-B	:	MA	30	to	MA	256	
Omnis	:	MA	170	to	MA	10	

During Mode S (MA 20-30) B transponder is off

RUDAK-II Schedule

UTC (Min. MOD 10)	Beacon Mode	Uplink
0...4	FM Repeater	435.016MHz
5...7	Digital Voice	no
8...9	AFSK Telemetry	no
Downlink; 145.987MHz		

KEPLERS

SAT:	OSCAR 10	UoSAT 2	AO-13	PACSAT	DO-17	WO-18	LO-19	FO-20
EPOC:	93172.99302659	93174.01998396	93170.38975377	93173.11208496	93173.10107394	93172.72076532	93173.70191122	93165.52276237
INCL:	27.0628	97.8083	58.0995	98.6201	98.6204	98.6203	98.6206	99.0347
RAAN:	19.5314	200.1544	310.5489	258.2168	258.4183	258.0661	259.2147	22.2147
ECCN:	0.6022546	0.0012710	0.7239097	0.0011106	0.0011308	0.0011835	0.0012176	0.0541319
ARGP:	91.3829	343.2499	317.3921	166.2248	164.5452	167.5050	163.4095	92.6971
MA:	333.9495	16.8283	4.9538	193.9243	195.6074	192.6427	196.7487	273.6184
MM:	2.05882769	14.69012648	2.09726486	14.29837708	14.29973586	14.29953467	14.30043293	12.83220156
DECY:	-1.32E-06	3.21E-06	-2.28E-06	-2.28E-06	7.8E-07	7.9E-07	8.4E-07	-3E-08
REVN:	4739	49757	690	17814	17815	17810	17825	15697
SAT:	INFORMTR-1	UO-22	KITSAT-A	ARSENE	RS-10/11	Cosmos 2123	Mir	
EPOC:	93175.76460433	93172.70202778	93170.84137870	93159.17059438	93173.69733724	93166.81018164	93176.00639778	
INCL:	82.9419	98.4723	66.0771	1.1041	82.9236	82.9213	51.6219	
RAAN:	47.2256	248.7400	318.6262	131.8070	234.5356	283.1359	180.2308	
ECCN:	0.0035790	0.0007416	0.0004589	0.2871288	0.0010773	0.0030924	0.0005627	
ARGP:	3.0271	292.0351	184.8593	138.5695	309.5202	48.5313	127.3880	
MA:	357.1071	68.0047	175.2838	244.7306	50.4968	311.8491	232.7661	
MM:	13.74520653	14.36833420	12.86278854	1.39870846	13.72318862	13.74023327	15.58486021	
DECY:	8.4E-07	1.04E-06	1E-08	-5.1E-07	8.8E-07	3.1E-07	2.517E-05	
REVN:	12048	10131	4018	44	30060	11833	42035	

Packet Radio

—Roundup—



Our packet SysOp G4HCL answers the 'most commonly asked questions'

This month, in line with the 'getting started' theme, I'm kicking off with some of the 'most commonly asked questions' about packet radio.

I'm not interested in computers, so what can packet do for me? Packet Radio has often been described as being an 'answer waiting for a question'. Packet is just a mode of communication, albeit a very powerful and versatile mode, and it can be used for many things in conjunction with your existing or future interests, just like SSB can be used for HF DXing, local ragchewing, satellite communication, 2m 'hilltopping' operation, and so on.

What is a BBS? A BBS, short for 'Bulletin Board Station', is a form of 'electronic mailbox'. There are thousands of these, located all around the world, and they can all automatically forward mail between themselves using VHF, HF, satellites, and the like. You can 'connect' to your local BBS, read the messages of interest to you, e.g., the RSGB News, the latest rally information, local club news, or just the latest amateur radio 'gossip'. You can also send and receive 'private' messages to and from other amateurs, for example to arrange skeds or meetings, or to just send and receive 'electronic mail' about matters of common interest, either to local amateurs, to those in the UK, Europe, or worldwide.

I'm mainly interested in HF but I've heard about DX PacketClusters, what are they? These are a network of packet 'cluster' stations, each with a computer running the required software and linked to each other across the UK and even across Europe. They act as a 'roundtable system' for individual amateurs to connect to and share information with each other in 'real time' using the linked system. For example, if a given DX station appears on a given frequency, one amateur can enter this information on his local cluster, which is quickly distributed to every other



'Live' DPK-9600 demo at Friedrichshafen

amateur who is also 'linked in' to the entire linked PacketCluster network.

Why doesn't Packet suffer from QRM? You'd think that, with lots of packet stations all operating on the same frequencies, they'd cause each other lots of problems! Unlike most other modes, packet radio sends information in small parts, called 'packets', which can 'slot in' between the packets from other stations. Every single packet receives either a short 'acknowledgement' from the receiving station to say it got through OK with no errors or corruptions, otherwise it simply sends it again, automatically. This all ensures the overall message gets through, error free.

What are Nodes and Digipeaters?

These, simply, are automatic packet radio repeaters. If you're out of range of the station you want to link to, you simply 'connect' through either a *digipeater* (which can indeed be any other individual packet station on air at the time), or through a node (which are usually 'networked' stations, often placed on air by packet radio groups). Unlike speech repeaters, the digital

packets don't suffer from any loss of quality or corruption due to QRM, because of the inherent error-detection and automatic retransmission system used to ensure your message gets to its required destination, error free.

Do I need a computer to use packet?

Not at all! With all the automatic retransmission and the like, you'd think that you need some computerized 'intelligence' in your station to do all this. Well you *do*, but this is normally contained in a 'box of tricks' called a *TNC*, or Terminal Node Controller. You'll need some kind of keyboard (to type your message) and some sort of display (to see what you're receiving), together making up a 'dumb terminal', and the TNC plugs in between this and your transceiver. The TNC does all the work for you, and often even incorporates a 'personal mailbox' so you can receive messages at your own station even when you're not in!

But can a computer help? Yes, by utilising the extra power of a computer, you can get it to do additional 'clever' things such as store your received messages to disk, allow automatic mes-

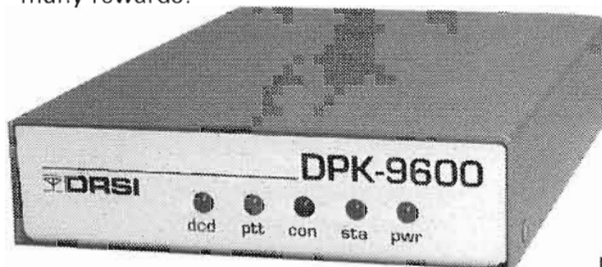
sage transmission, and make some aspects of packet operation that bit easier by 'tailoring' the screen display to your own preferences. Also, by running appropriate software on your computer (such as *Baycom* or *Digicom*), you can connect a simple low-cost modem, rather than a more expensive TNC, to your computer and let the computer software do much of the 'hard work' that the TNC would otherwise do.

Who pays for the packet system I use? We amateurs do. Just like amateur radio repeaters are put on air by repeater groups, packet nodes and BBSs are put on air by either groups, or quite commonly, individuals like you and I. If you regularly use, say, your local BBS, DX Cluster, or of course your local node system, it would be a good move to find out *who* actually *pays* for these, and see if there's either a group you can join, or a 'support fund' you can contribute to. Some area-wide packet groups also act as coordinating groups, so bear in mind that the running costs of individual stations (e.g. a given node system, DX Cluster, BBS etc.) may often not be paid for by such groups.

I've got the equipment and I've connected it all up correctly, but I'm getting nowhere! What do I do now? This, to be quite honest, is the most common question, and I've deliberately left it until last. First of all, *make sure* you've read your TNC instruction manual! OK, I know it's lengthy, but you need to know how to use your equipment. First check that you've set your terminal RS-232 parameters to match that of your TNC, and that you've entered 'MYCALL xxxxx' where xxxxx is your callsign! After that, it's often down to the audio level between your TNC and your rig. Set 'MON ON' and slowly increase your receiver volume control until the TNC 'DCD' LED starts to illuminate when packets are received. Don't worry if each received packet doesn't come up with information on your screen, as depending on the settings of your TNC, sometimes only 'real information' packets will be displayed rather than all 'supervisory' packets. Now, using a separate monitor receiver on the frequency you're operating on, try connecting to one of the stations, and check that your transmitted audio is actually there, and isn't too high in level in comparison with other packets. Overloading your transceiver with excessive TX audio is a common problem, especially so when you're running around 5 to 6kHz deviation and the other station is using a 12.5kHz spacing ex-PMR rig (with +/-3.75kHz filters!). So use the TNC's internal level control to adjust this, around 2.5-3.0kHz deviation is correct (see Packet Radio

Roundup, HRT June 1991, for more details on this).

Hopefully the above should sort out the most common questions, but once you're active, remember that a general packet 'bulletin' on the BBS network requesting advice can often bring many rewards!



The new DRSI DPK-9600 TNC

New DRSI 9600 Baud TNC

Whilst at the recent Friedrichshafen show, I was pleased to meet Andrew Demartini, President of the US TNC firm of DRSI, who are well known for their PC cards and stand-alone TNCs. Their latest product, which was on 'live' demonstration there, is the DPK-9600 high-speed TNC, designed not only for packet radio linking but also for helping the end-user 'break out' of the limits of 1200 baud (indeed I first placed a 2m 9600 baud port on the multi-port node system I run, alias *CFORD*, three years ago, well used by local amateurs).

The DPK-9600 uses a single-chip modem (which is claimed to replace around 30 ICs), and can be jumpered for 4800, 9600, or 19,200 baud on-air data rates, DRSI describe this as being compatible with G3RUH and K9NG systems. The DPK-9600 is TNC-2 compatible, which means you can, if you wish, use TheNET software and the like, and it comes supplied with DRSI's 1.18a 'user' firmware (see the HRT review of the DRSI DPK-2 in the May 93 issue for more details). With its all-CMOS circuitry, the DPK-9600 needs just 50mA (35mA with the front panel LEDs disabled) at 9-20V DC, great for low-power 'systems' use. There's a HRT sample already lined up and you'll be seeing a review in these pages soon. In the meantime you can get further details from the UK DRSI distributors AMDAT (4 Northville Road, Northville, Bristol, BS7 0RG, BS7 0RG, Tel. 0272 699352).

New UK Pactor BBS

Joining the European Pactor BBS of DK0MHZ (and the earlier DF0THW) comes GB7PLY in Plymouth, run by

Chris G3KFN. It's operational daytime during 08.00-20.00 on 7.04345MHz mark, evenings 20.00-23.00 on 3.59145MHz mark, and is linked to the GB7PLY FBB VHF/UHF packet BBS. The four section 'Help' menu can be brought up with a simple 'H' command, and you can further details either from this or via packet to G3KFN @ GB7PLY.#44.GBR.EU

TheNet X1-J

Dave G8KBB kindly sent me the latest beta-test version of TheNet X1, this being version X1-J, with general release planned for the end of July. Dave tells us it combines the 'old' Thenet 1.01 with an IP router and a number of other enhancements, such as support for an add-on deviation meter to show users their transmit deviation on packet. I'm currently testing it here, in the meantime if you'd like a copy or need more information, contact Dave G8KBB @ GB7MXM.#36.GBR.EU

CTRL-Z, End of Message

The latest 'Cluster Duster', the newsletter of the UK Cluster working group, has just dropped through my letter box. This issue has a review of the ELNEC aerial analysis software and the Timeworks DSP-9 Noise Filter, as well as all the usual network and cluster news together with 'Who's Who on the Clusters'. This excellent quarterly, which I always enjoy reading, has also reminded me that I must drop my £4.00 yearly subscription into Maurice G3XKD (15 Glebe Rd., Prestbury, Cheltenham, Glos. GL52 3DG, cheques payable to UKCWG).

Another one recently through the letter box was the latest catalogue from Siskin Electronics. This is quite a useful 'guide' to TNCs and other packet equipment available from PacComm, Baycom, Kantronics, AEA, Symek and others. Yours for the asking, and you can contact Siskin (a very helpful company) at 2 South St., Hythe, Southampton, SO4 6EB, Tel. 0703 207155.

With a reminder that the *SysOp 16'* packet SysOps meeting will be held on the 3rd October at the Old Schoolhouse Hotel, Severn Stoke, Worcs (contact Steve G4FPV @ GB7TCM for details and to let him know if you'll be attending), that's it for this month, so it's 73 from Chris G4HCL @ GB7XJZ, or via post c/o the HRT Editor.

VHF/UHF Message

Geoff Brown GJ4ICD says "What a month on 6m!"

This month, I was going to go into a little detail regarding those treasured QSL cards most people seem to collect for awards etc., however, this month, propagation has to take the priority in the column.

It really is hard knowing where to start this month, or as Ela G6HKM said, "I didn't know which band to operate on sometimes". There have been a record number of reports, letters and faxes regarding June's tremendous

On the 4th, RU1A was widely reported operating from KP40, next day 'ES' never stopped within Europe, and later that same evening there was an opening to VE.

The 8th brought nice new DX on the band, with T95VO (Bosnia) would you believe! This now counts as a DXCC country and his QSL manager is 9A3KK if you worked him. By the 9th things were really hotting up, and it looked like a monthly repeat of what we had in

and in the afternoon 9K2MU (Kuwait) was into the whole of Europe at S9+, and this is a very nice distance. Later that day the OX beacon (Greenland) was copied with the FY7 beacon also heard in Europe. 7Q7 (Malawi) was also into the UK via TEP and enhanced at this end from the Mediterranean with Sporadic 'E', virtually every other country in Europe was worked on 50MHz that day.

The 13th continued with more new countries on the band, UB5BW (Ukraine) in KN39 was worked by your's truly, and later that day Costas SV1DH appeared as SV5/SV1DH in KM46, these were both new countries for everybody who were lucky enough to work them. Andy RA3TES in Moscow called frantically on 28.885MHz for 50MHz crossband QSOs but only managed to complete with myself at S9+!. The MUF




C31HK is now on 50MHz for the first legal QSOs from Andorra

openings on the VHF bands, an overview on the month saw openings to 9K, UB5, SV5, 7Q7, EH8, CT3, JX, C31, EV8/9, T95 (Bosnia), plus a few openings to the USA in areas W1, 2, 3, 4, 5, and many more European countries on 50MHz, plus great openings on 144MHz to SV, CN8, HA, LZ and others.

Six goes wild!

Early June saw fantastic openings to EA8, in fact EH8ACW was reported into the south coast of England nearly every day during the first week. Leo (EH8ACW) also had longer double hop openings into LA, SM and on the 1st June even worked GM4DGT. DJ3OS/EA8 was also heard on the band with a very large pile-up, but beware, Bernd DJ3OS has no permit to operate in EA8, and so if you present his QSL card for an award or claim to the ARRL or RSGB, it will be rejected!

ESTACION DE RADIOAFICIONADO Islas Canarias		[EA8ACW VHF-UHF-SHF]		AMATEUR RADIO STATION Canary Islands			
		EH8ACW					
		BANDA DE SEIS METROS - SIX METER BAND					
Confirmando QSO con Confirming QSO with	Fecha Date			Hora Hour	RST	MHz	Modo Mode
GJ4ICD	Dia Day	Mes Month	Año Year	UTC			
	31	5	93	17:19	55	50	2X SSB
Leoncio Hernández Rodríguez A. P. 860 35080 Las Palmas de Gran Canaria. Las Palmas. ESPAÑA (Spain)				QTH Locator: IL 28 GC 11/89 W/F Zona Zone { 33 WAZ 36 ITU PSE <input type="checkbox"/> QSL <input type="checkbox"/> TNX			

The first legal operation from the Canaries on 50MHz

May was about to happen. SV7CO (KN20) appeared in many log books on the 10th, the next two days seemed to be the peak of 'ES' for the month, with reports of 4X1IF, T97M (QSL via DL8OBC), T91EFR, and the OD5SIX beacon flooding in from everywhere. At 1800z on the 11th there was a very good opening to VE1/2/3 and W1/2/3/4, this opening lasted for over two hours in the south of England.

Early on the 12th and the band was still humming. W5's were heard from EM44 via multi-hop 'ES' around the UK,

(Maximum Usable Frequency) was very high and produced good openings on 144MHz, see later.

That evening (13th) JX3EX (Jan Mayen Island) in the Arctic Circle worked into LA and OZ, and 7Q7CM was S9+ into the UK via the usual double mode propagation (TEP and 'ES').

Neil G0JHC reported a good one on the 14th. At 4.00am Neil got out of bed and switched on his 50MHz receiver, only to find that the GB3IOJ beacon on 50.065MHz was S9+ via short skip 'ES'.

JX3EX (IQ50, Jan Mayen Island and separate country) caused chaos on the band the next day when he was S9 into the UK. G0JHC; G3WOS, G4CCZ,



Dave OZ3SDL operating from JO64



G3SDL with CT1LN in Portugal

GW3JXN plus around ten other stations managed to snatch him during his 15 minute tea break, then he had to go QRT just as he was S3 into GJ! Later that night Cedric CT3FT worked into W4 via double hop 'ES'.

Sporadic 'E' continued to various spots in Europe during the forthcoming week, there were double hop events into 4X1, OD5 and EA8. On the 20th, Ken G4IGO reported hearing SO1AB in the Western Sahara Desert, many of the real DXers on 6m thought it must be a mistake, and so it was SV1AB that was highlighted on the packet radio DX Cluster network. As time went along it became quite clear that we had all been wrong, SO1AB was indeed active, however up to date (the end of June) nobody in the UK has so far worked him.

Dave Ackrill G0DJA sent in a report of his QRP activities on 50MHz. With his 5W some choice DX was worked, including UC2AA at 599 at 2250z on the 10th, EV8A at 599, OEs, OKs and VE1MQ via multi hop 'ES'. Now it really *does* show you that DX *can* be worked without power. However for certain tests (i.e., Meteor Scatter) a little more power is needed, but it would be interesting to try a low power 50MHz MS test, anybody want to try?

Early July saw a quiet 'ES' period, but we hoped that a repeat of May and June would happen, more later.

Ela G6HKM had a great month of activity and notched her 440th square on the band (I think she will get stuck sooner or later with new ones to work, as I'm stuck on 599 and cannot find any new ones).

Interestingly enough, Ela has worked YO4BZC (KN45) which I also have worked, but very few others seemed to have heard him in the UK. When I worked him, UB5BW (KN39) also popped up, so this is the path to watch.

144MHz DX

Although there were fewer openings via 'ES' on 144MHz during June, they were all the same real nice ones.

On the 8th, reports of SV stations (Greece) were reported into the UK from the south coast to Lancashire, French stations also reported working LZ (Bulgaria) at the same time.

Ela G6HKM in Essex had a nice tropo opening at the beginning of June to OZ and LA, on the 10th she had good 'ES' openings to EA7, YO3, LZ, HA5, YU, OK, and SP9. Early on the 12th saw more 'ES' to 9H (Malta), the 13th, well more 'ES' to HA.

More sad news

It is with sad regret that I have to report the passing away of Peter Rouse, a fellow Channel Islander and close friend. Peter had been suffering for the past few years with Leukaemia, but despite this always put on a brave face.

As many of you will know, Peter wrote many articles on scanners and general shortwave radio and was very well respected in this field of journalism, we pass our sincere condolences to his family in Guernsey.

Longleat Rally

I missed out on Longleat last year, so as the weather looked fine I decided to go for it this year, as there is nothing worse than tramping around in thick mud!

I must say that computing equipment is becoming the major display item at some of these rallies. Shareware, software and monitors were in there abundance at silly (low) prices, there was even one stand selling only CD Rom software with over 150 titles from £8.00 each. I just couldn't resist the temptation of purchasing, would you

believe, fourteen CDs! One of these was called 'HAM CALL', this CD contained the entire 1993 ARRL USA and International Callbooks, a massive 996,000 entries with more yet to come!

Some of the CDs contained over 600Mb of amateur radio compressed programs, equalling nearly 1.5 gigabytes of normal software, on *one* CD Rom.

70MHz transceiver go-ahead

You may recall that my G4WIM 50/70MHz transceiver project had been shelved due to the poor quality of the PCBs I had. Lawrence GJ3RAX is now putting together plans for a 70MHz SSB-only TX/RX, I thank you for all your letters regarding this project and will keep you all informed of the developments, I hope to have the prototype running by the year end.

Beacon news

A couple of new beacons have popped up during the past month, these are EA8SIX (IL28) on 50.075MHz, EA8VHF (IL28) on 144.9075MHz which runs 10W, and EA8UHF (IL28) on 432.9075MHz which also runs 10W. My thanks to Leo EA8ACW for this information.

Other beacon news is that we are currently constructing 9M6SMC and 8R1SMC for SMC Ltd. on behalf of the Camel Trophy, and a replacement TF3SIX beacon is also on the cards for later this year.

Well that's it for another month, news and views please to: Geoff Brown, GJ4ICD, TV Shop, Belmont Rd, St Helier, Jersey, Channel Islands, JE2 4SA or Phone/Fax 0534 77067 anytime.