
HRT
HAM RADIO TODAY
Incorporating SCANNERS INTERNATIONAL
JUNE 1992 £1.70
YAESU FT-890 Reviewed
INTERNATIONAL SHORT WAVE LEAGUE
WEEKEND PROJECT
CW TESTER
YAESU HF TRANSCEIVER FT-890
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AN ANGUS SPECIALIST PUBLICATION
NOVICE • PACKET • REVIEWS • PROJECTS • SATELLITES

HRT HAM RADIO TODAY

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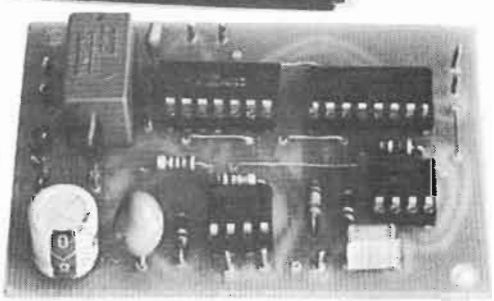
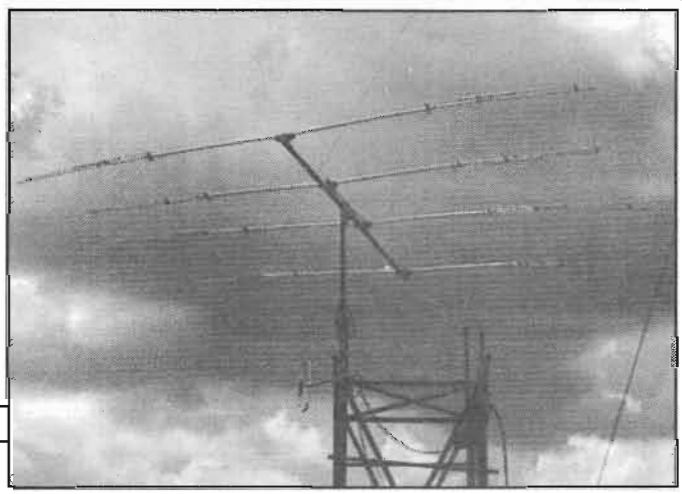


Right: CW transmitter tester PCB

Below: The KT-34A HF beam aerial

The ISWL featured



CQ de G8IYA

Changes to UK licensing? It's up to you!

This month I seem to have been swamped with information on the work which amateurs, and amateur clubs, are doing. Yes, the Editorial team *have* been burning the midnight oil collating it all, and there's still more destined to be included in next month's issue. Could all this have been due to last month's 'CQ de G8IYA' Editorial? Well as I write this, with production timescales, it hasn't appeared in print yet. So it looks like I'll be even busier next month!

Active Amateurs

This month you'll see a feature, which I've been planning for a while, on the International Short Wave League and the amount of voluntary work they do for the benefit of their members. Their international QSL bureau is reputed to be one of the most efficient in the world, and is appreciated by many amateurs. Who said there was only *one* QSL bureau for UK amateurs to use? We were pleased to meet several of the ISWL officials last week, giving us a chance to thank them for their very quick and comprehensive replies and packs of information they've sent in response to our letters and phone conversations.

We often get invitations from clubs and organisations around the UK to visit them, sometimes to give a talk, sometimes just to meet the members. This month the HRT staff were also kindly invited for an arranged annual day out at the RIS's monitoring station in Baldock, and next month we've been invited to visit the newly decorated headquarters of our National Society, the RSGB, so watch out for a few photos of the faces behind the callsigns. Whether you love or hate the RSGB, they're our national society, and if you don't like what their people do on our behalf, then you have a vote, to change things. That's if you're a member of course.

Incentive Licensing

Our recent meeting with the RA, as reported in 'Radio Today' last month, revealed that there are likely to be changes for the better with licensing in the UK. The fact that the vast majority Novices were not going for the Novice Class A licence could mean one of many things. Firstly they either can't, or don't want to, learn the CW at 5WPM to obtain the Class A privileges. Now 5WPM is fairly easy for many people, it's *knowledge* rather than *proficiency*. Maybe another, possibly more valid, reason could be that, once licensed, they *must* use low power, *and* on a restricted range of frequencies, *and* they aren't allowed to use modes such as SSB on most bands.

Maybe you think Novices shouldn't be allowed to have too much 'freedom'. However our hobby needs to recruit 'new blood' lest it dies, and as we reported, the RA are asking *you* for *direct* input on what you think the best way forward would be. I'd suggest that possibly a given but restricted range of frequencies, on all the 'main' HF bands but without mode restriction, could be one method of progression. With a greater availability of modes, the opportunities for experimentation are better, as well as these acting as a greater 'carrot' for the Class B. Once we've attracted newcomers in the first place, *then* we can show them the best modes to use for their particular needs. Before you think we're 'one sided', as some readers may have mistakenly thought in the past, then open your eyes and take a look at who make up the HRT Editorial team. You'll find it's one Class A amateur, one Class B amateur, and one currently unlicensed person. What could be a better 'cross section'? (incidentally, Donna in our HRT advertising department is also having her arm twisted to go in for the Novice course!). Although I hold a Class B, I can use any mode on HF with up to 400W, virtually anytime from the legal-limit station I share with my OM, so in my case I'm not missing out on HF!

The RA currently allows Class B amateurs to go for the 5WPM test and providing they've had their Class B for a year, they can then hold a Class A Novice call for HF use with the limited Novice segments and modes. In case you're not aware what these are, they're Morse, Telephony, RTTY and Data on a 50kHz segment of 160m, Morse only on a 20kHz segment of 80m, Morse only on a 10kHz segment of 30m, Morse only on a 49kHz segment of 15m, Morse, RTTY and Data on 165kHz of 10m and Morse and Telephony on a further 200kHz of 10m.

It looks like things *are* going to change, because, quite simply, it hasn't worked in the way some people wished it would. A Morse test is going to stay as a UK requirement for HF for the immediate future if not in the distant future, as it's required by the ITU. But if a more 'attractive' range of modes and/or frequencies are provided for the Class A Novice, this could benefit both the take-up of the hobby in the first place, *and* be a useful achievement of 'incentive licensing' by allowing all Class B amateurs access to a more attractive range of HF facilities.

But let the RA have *your* views, send them direct to; Karen Everett, Secretary of the Novice Licence Review Group, Room 615, Radiocommunications Agency, Waterloo Bridge House, Waterloo Road, London SE1 8UA.

First with reviews

UK amateurs 'in the know' realise that if there's a new type of equipment out, it's invariably HRT who are the first to review it, certainly in the UK, often worldwide. This month for example you'll see a variety of reviews included, not just of transceivers. There is, of course, little point in simply reviewing different 'band' models of the same transceiver, such as VHF/UHF mobiles except when these are reviewed in the same article. So we use the magazine space to feature new rigs and accessories, including measured technical results where appropriate, even though this normally takes my regular equipment reviewer a considerable amount of time with the test gear!

We're proud of our team of regular contributors, who are all established authorities in their specialised field of amateur radio. Even at this year's annual VHF convention, the concluding statement of Dr. Geoff Grayer G3NAQ's lecture on VHF/UHF propagation to confirm the dialogue was "Ask GJ4ICD"!

Through HRT we'll keep on trying, we'll keep on burning the midnight oil. Why not write in with your comments or ideas, either to my direct Editorial office address of P. O. Box 73, Eastleigh, SO5 5WG, or to the Argus Specialist Publications head office address at Hemel Hempstead marking your letter for the HRT Editor's attention. If we take up your comments in the mag one month with an article, such as a 'Novice Notes' subject, I'll send you a small radio-related gift as a 'thank you'. See you next month!

LETTERS

Letter of the month

Dear HRT,

As a trader, I may in the short term expect to make more and more money, as higher and higher power becomes normal, but as an amateur I am horrified. Not long ago the RSGB told us they had obtained permission for UK amateurs to use 400W on CW, now they pat themselves on the back that they have got the DTI to allow QRO on part of the 160m band. Some of us see these moves as backward steps, one customer's reaction was "that's it, I resign!" Do we really need this kind of power for amateur radio? The only reason I run 100W is that everyone else does, and I do not want my signals to be much weaker. If others could be persuaded to do the same, a worldwide limit of 10W would suit me down to the ground!

By and large contacts are not lost due to weak signals, they are lost due to interference from other amateurs. 'I'll switch the linear on and cut through the QRM' really means 'I'll blast the other station off the frequency'. The biggest 'turn off' in amateur radio is local EMC problems (TVI, BCI, burglar alarm interference, you name it), but higher power just makes those problems much worse. We are coming to the stage where to go on the air in the evenings with a competitive signal, one must either live in a house in its own grounds, or have a skin as thick as a rhino.

If much lower power was to become the norm many EMC problems would disappear, and perhaps it would be possible for the average amateur in a terraced house to go on the air in the evenings with 5 or 10W, without having his signals swamped with 5 and 9 plus 20 competition. A pipe dream? Well how about incentive licensing? The present technical standard of the 'A' and 'B' licences is about right for 10W!! How about a much tougher technical exam for a 100W or 400W licence? Certainly the average amateur has not enough knowledge to use very high power. I sell a second hand FL2100 and it comes back with the PA valves blown, "no I didn't do anything". In the end I have just had to say 'sorry I won't sell them anymore'. No commission sales of high power HF linears at this shop, nor do I repair them any longer (unless it's one that I sold in the past).

Frankly what it boils down to with high power valve linears is, if you haven't got enough knowledge to repair them, you haven't enough knowledge to use them. Anyway, are they amateur radio? Do we need them at all?

Your faithfully,
Harry Leeming, G3LLL

Editorial comment;

It's refreshing to hear a dealer's point of view, which we're sure is shared by many readers. Dick G0BPS in his monthly 'QRP Corner' often shows us just what can be worked with low power on an interference-free frequency. Propagation often requires us to use high power levels, but in a 'wide open' band it can indeed just become a ratrace! So what is the answer? Comments please to 'Letters Page'!

Dear HRT,

With reference to the CQ de G8IYA editorial in the March 92 issue, Sheila will be pleased to hear that homebrew is alive and well, and has quite a kick even in the Far East! My shack is mostly homebrew, I even have a new version homebrew Baycom modem up and running.

Yours faithfully, Steve Beesley VS6XMQ Hon. Secretary Hong Kong Amateur Radio Transmitting Society

Editorial comment;

Our Tech Ed's gear is mainly either homebrew or converted PMR, including the synthesised digital readout 2m rig he designed and built himself. But unfortunately, few amateurs have either the time or skills required, hence the usefulness of small 'weekend projects' like those we consistently feature in HRT. Indeed you'll see one this month, and next month you'll find a 'versatile shack accessory' (we'll leave you guessing) to specifically help home-brewers and experimenters.

Dear HRT,

With reference to your comment in answer to D. Boardman's letter in the April 92 issue of HRT.

As far as I am aware, there is some practical work on the Novice licence course, in as to say one makes a single band radio and a preamp which is part of one's training. Whether there is any mention of Varactor diode remains to be seen!

I do agree with Bob Price's letter, but one thing which would have to alter, and that is that the tutors would need, and rightly so, payment for their time and any other expenses. One cannot take out without putting something back into it. The tutors do an excellent job, without them where would the hobby of amateur radio be.

If Mr. D. Boardman is eager to get onto radio, may I suggest that he considers trying out the 934MHz band, there he will receive a warm welcome, and will be in contact with many doing what he wishes to do in the future on the amateur bands. This particular CB band is not abused as far as I can recall, and I have been on it since 1985. I can put people in touch with the sellers of second hand transceivers for this if they write to me, via HRT editorial, enclosing an SAE. I must stress that I am in no way making any gain from this, it is just to help those looking for a sensible conversation on radio.

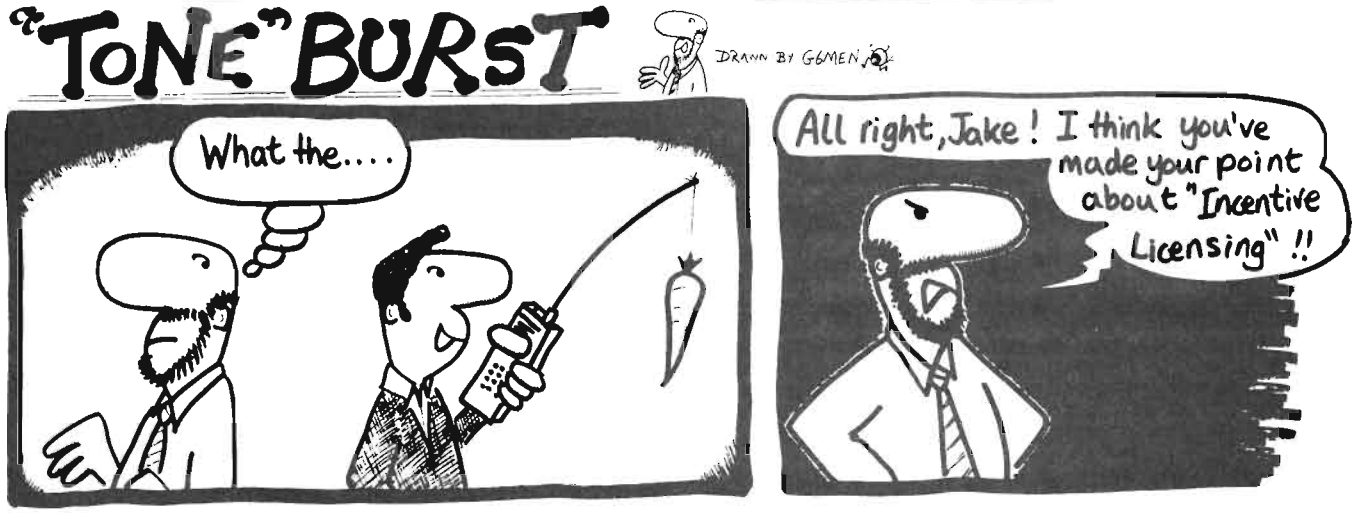
Yours sincerely,
M. B. Marsden

Editorial comment;

During a recent trip to a local hilltop with portable 23cm gear including a small mast-mounted beam, I was surprised to see at least half a dozen 934MHz enthusiasts doing the same! They clearly seem to be a devoted bunch. A general introduction to

£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. P.O. Box 73, Eastleigh, Hants SO5 5WG.



hobby radio, albeit on receive only, could be the use of a scanner listening to 70cm for example, or a second hand HF receiver, where many interesting QSOs can be heard. The burning 'goal' then would be to get one's licence to reply to the many stations heard!

Dear HRT,

I think that it is about time that amateurs in the UK took as much pride in their call-signs, as do our friends in all other amateur nations.

Just lately, I have noticed a steady increase in the number of G stations who, for want of a better word, are suffering from 'Defective Call-sign Pronunciationitis'. What you hear is obviously a G call-sign, but, and this is the hard part, just what the dickens comes after the word 'Golf' is anyone's guess (that is if they are using the standard international phonetic alphabet!).

Some mumble the number and letters, some do it with a fast gargle and others come up with some weird and idiosyncratic phonetic code words that have never ever been published in this world or the next. Surely the idea of having a call-sign is so that any and all stations that are listening out on either a specific calling channel or frequency can, in as short a time as possible, identify the country of origin of the calling station as well as the callers status.

This can only be done, if, like our fellow amateurs outside the UK, we here in the UK clearly, and in the correct and accepted international phonetic alphabet, state our call-signs so that each letter and the numeral are pronounced individually and not jumbled up. This should apply to the domestic 10, 6, 4, 2m and 70cm bands as it is to the DX scene.

Yours sincerely,
J. D. Bolton, G4XPP

Editorial Comment

We're taught the phonetic alphabet as part of our RAE / Novice RAE training, yet many people still feel they can do better. One 'DX Guide' actually recommends the amateur to use such phonetics as 'Guatemala', 'Yokohama' and so on instead of the 'normal' ones, presumably to 'stand out'. Maybe, as with the subject of running QRO, it's all down to a matter of education!

Here's a couple of letters we received on the subject of abuse on the airwaves following our recent report on this;

Dear HRT,

I must take issue with Mike G0KDZ's assumption that it is the Morse test that is largely to credit for the comparative lack of abuse on the HF bands. This assumption is a gross insult to class B operators as it infers that they are mostly or solely to blame for the abuses on VHF. But with so few people actually prosecuted, does this accusation really stand close scrutiny?

The foul language and jamming referred to in Mike's letter is most prominent on the VHF repeater network, which by its very nature is easily jammed, has a large audience, and acts as a magnet to every idiot in the area. Amateurs incite jammers to continue their activity by pandering to their ego by referring to their activities on air, and by threatening what they, or the DTI will do to them if they are caught.

Since the majority of amateur radio rigs that are stolen are 2m mobiles, many of them will find their way into the hands of unlicensed people who, having probably obtained them thinking they were CBs and having found that they are no use for that band, discover a new sport in winding up radio amateurs by swearing and jamming the band.

There are fewer HF sets in the hands of unlicensed people, these are mainly in the hands of pirates who work the 45m and 11m bands, and generally do not want to draw attention to their activities. I believe that this is the main reason for the lack of jamming and foul language on HF, and nothing to do with Morse code. The Morse test is now as outdated as the artificial aerial licence, I fail to see that having scraped through a Morse test, I am now a better amateur than I was as a class B operator.

73s
Len GM0ONX (ex GM6JIC)

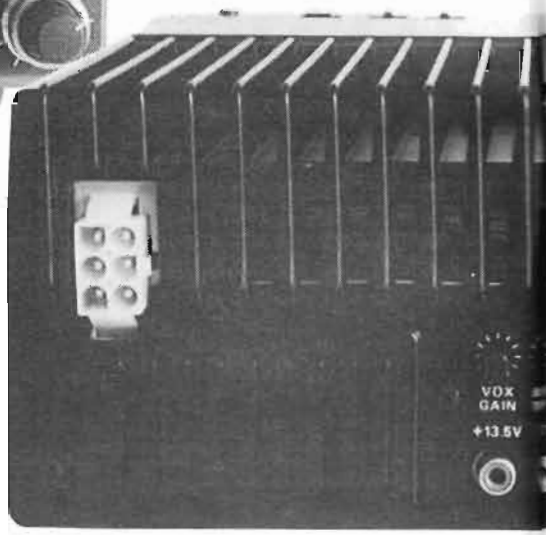
Dear HRT,

Congratulations to Mike Shread (March '92 edition) for putting the Morse myth in perspective, with his far sighted and realistic letter.

A black mark however, for Mike G0KDZ's sideways insinuation that abuse of the 2m band, repeaters etc. is limited to class B licensees. There is evidence to show that class A licensees are also responsible for the various abuses that take place. It is wrong to assume that only class B licensees operate on the VHF/UHF/SHF bands, or that their operating practices are any worse than that of a class A.

It is also utter bunkum that knowledge of Morse makes one, (a) a better radio amateur, (b) less likely to swear on the air, (c) curb repeater abuse and all the other mystical properties that people seem to attribute to it.

Yours sincerely,
Bob Mersh, G8JNZ



Chris Lorek G4HCL looks at Yaesu's tiny do-everything HF rig

Yaesu FT-890 Review

Just prior to the Leicester Exhibition last year, I was given a chance to quickly test the only FT-890 in the country, this being an early sample just 'passing through'. This was briefly featured in the 'Radio Today' section of the Jan 92 HRT with a promise that a review was already planned. As you know, we keep our word, and as soon as stocks arrived in the UK we were there waiting!

Just like its FT757GX predecessor the FT-890 packs in an all-mode 100W HF transceiver, this time adding the option of an internally-fitted automatic ATU. The FT-757GX was incredibly popular, I even have a (rather battered!) early specimen here, which having been to Africa and back has had many knocks but still continues to offer good service. I purchased this secondhand some time ago as a 'do-everything' HF transceiver, and up to now I've found little to beat it in its size. Yaesu *must* have modelled the FT-890 on the success of this plus its 'face-lifted' MkII version, as they've come up with a set in an identical size but offering better performance with a Direct Digital Synthesiser, a quad FET mixer with RF front end amplifier bypass facility, FM repeater operation with built-in CTCSS encode, all in a lightweight 5.6kg. It comes at a list price of just over the £1000 mark.

DXpedition Rig?

With the summer holiday season coming along, I was very tempted to ask the HRT management if I could test the FT-890 in a true 'DXpedition' location, such as one of the Pacific Islands. This of course was purely for technical reasons to see how it performed in such a location using a 'slung-up' dipole with the set's internal ATU. As you can see from this month's front cover, I'd done my preparations, but unfortunately, the HRT managers started telling me I'd have to pay my own fare and accommodation expenses, and work by knocking out the odd article there during my spare moments, so I eventually settled with testing it in the UK. Seriously though, if you're one of the many taking advantage of low-cost 'long haul' holidays now available, a rig such as this could prove quite handy.

Mobile Options

Measuring 238mm x 93mm x 243mm, it operates from an external 13.8V supply, requiring around 20A maximum on transmit. It comes equipped for quick base station use with an internal speaker on the top, and a tilt-up bracket on the base to raise the set's facia when you're sitting it on a desk top. For mobile use an optional mounting bracket lets you fit it in your car, and an optional FC-800 remote ATU lets you automatically match a mobile whip to the set as an alternative to the optional internal ATU. As such you can also 'sling it in the car' just as easily, connecting your G-whip or whatever onto your existing gutter mount, and instantly go HF mobile. A variable-level noise blanker is fitted to save ignition QRM drowning your received signals. As well as a 'frequency lock' function, you can alternatively lock all the front panel controls with the exception of the tuning knob, to save you accidentally pressing the wrong buttons whilst on the move.

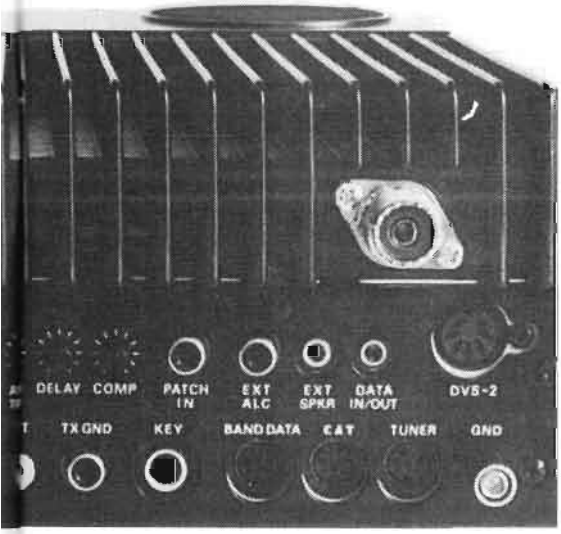
Operation

The set covers all the usual HF bands on transmit, with a wideband receiver covering 100kHz to 30MHz, with TX/RX modes of CW, LSB, USB, AM and FM. The transmitter section can run 100W continuous carrier (25W on AM), with its large fan-assisted heatsink keeping the PA stages cool, and a rotary RF power control on the front panel lets you turn this down if you'd like to conserve your battery or indeed just run QRP.

To make the best use of the available power, you can switch in a built-in RF speech processor to give those extra few

dB of talk power on SSB (or even AM if you wish), and a unique feature is that you can even alter the passband of this, by up to -300Hz or +500Hz, to suit your own voice characteristics.

For CW enthusiasts, as well as the DDS giving fast TX/RX switching for full break-in, a built-in lambic keyer lets you plug either a paddle or a straight key into the rig without extra electronics. Small controls on the transceiver lid control the speed, keyer switching, and full or semi break-in keying.



A 'real' IF notch coupled with an IF shift lets you do battle against QRM on the bands, and a switchable RF attenuator gives extra protection to mega-strong signals as well as the 'IPO' button which switches the RF preamp out of circuit to guard against overloading.

Connectors

The rear panel sports a multiplicity of connectors for all manner of external add-ons, something you normally only see on 'top-of-the-range' rigs. Digital modes are catered for with connections for packet, RTTY, and Data TNCs, as well as the usual external speaker and microphone 'patch' input jacks. External linear control lines also provide band data for use with automatic band-switched linears, and a 'PTT' output gives switching control for either a QSK linear such as the FL-7000, or via. an internal relay output for normal linear switching. For DX chasers, the optional DVS-2 Digital Voice Recorder (about the size of a TV remote control) can be plugged in, letting you automatically record incoming audio as well as providing pre- recorded transmit messages such as 'CQ contest' and the like.

With the growing use of computer control, a rear panel *CAT* (Computer Aided Transceiver) connector lets you control most of the rig's functions via. an optional RS-232 interface, the manual supplying full details of all the data 'strings' needed if you fancy writing your own program. There are now quite a few 'off the shelf' programs available for this, many of which are shareware, we'll be testing some in future issues of HRT.

Operating Manual

Most instruction manuals I've seen give a good all-round description of how to operate the rig, often with worked examples. However with the growing use of more and more esoteric functions in today's rigs, it isn't surprising that many of the functions on these rigs confuse newcomers. But after having a read through the FT-890 manual, I must say I was very pleased indeed to find it also gave very good advice on how to get the best out of the set as well, something that's normally learned by 'trail and error'. For example, here's a section from the manual dealing with the receiver;

"When looking for weak signals on a quiet band you will want maximum sensitivity, so the *IPO* and *ATT* buttons should both be switched off. This situation is typical during quiet times on frequencies above 20MHz, and when using a small antenna on other bands.

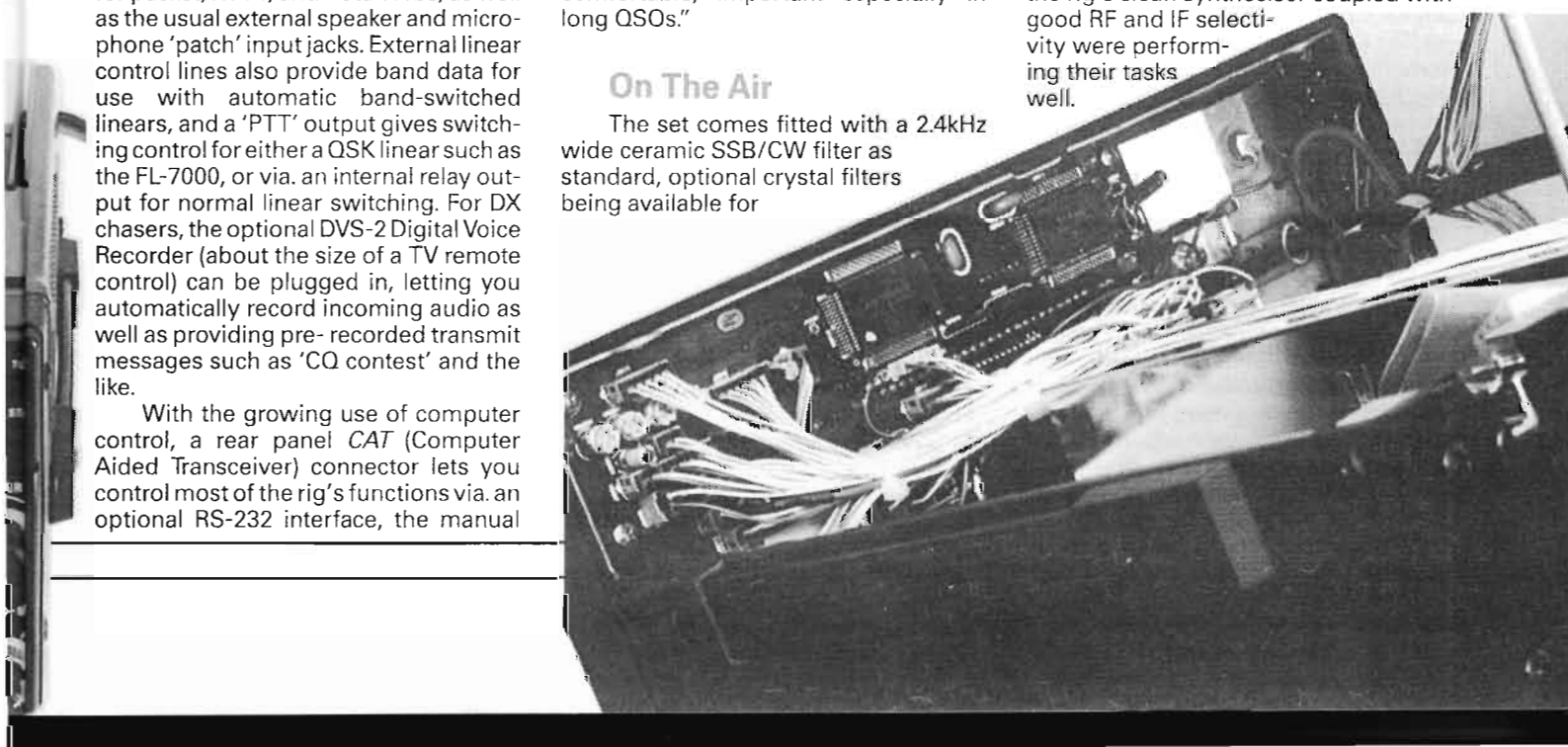
"If you notice intermodulation from strong signals on other frequencies, turn on the *IPO* (Intercept Point Optimisation) function to bypass the RF amplifier. Sensitivity is reduced slightly, but intermodulation immunity increases.

"Even with the *IPO* function on, very strong signals can still overload the mixer. So if you still notice intermodulation, or if the signals you want to listen to are very strong, you can press the *ATT* button. This reduces the strength of all signals (and noise) by 12dB (about 2 S-units), and can make reception more comfortable, important especially in long QSOs."

On The Air

The set comes fitted with a 2.4kHz wide ceramic SSB/CW filter as standard, optional crystal filters being available for CW (250Hz or 500Hz) and SSB (2.6kHz) if you'd prefer better selectivity. The early FT-890 I tested last year had just the ceramic filter fitted, however wishing slightly better performance I asked the suppliers to fit the optional SSB crystal filter in the rig for review.

I tested the set on a variety of aerials, ranging from a wire slung (literally!) between my shack window and the fence at the bottom of my garden, an inverted-L fed against an extensive earth mat, and a tower-mounted rotatable HF multi-band yagi. Overall, I found that for such a small and lightweight set, it gave a very good account of itself. I must say the unit I initially tested with the ceramic filter did suffer some degree on noisy bands such as 40m, where very strong adjacent signals occasionally got the better of it, however the set fitted with the crystal filter performed impeccably, the tuning being very smooth without the usual 'synthesiser glitches' I'd come to expect from some rigs. I found the audio quality on SSB receive to be extremely good, normally suggesting a fairly 'wide' and hence poor bandwidth performance in terms of rejection on busy bands. But signals came and went very cleanly as I tuned around, showing the rig's clean synthesiser coupled with good RF and IF selectivity were performing their tasks well.



Switching Bands

On tuning between amateur bands I was pleased to find that, as with some of the more expensive rigs nowadays, the set returned to the last-use frequency, mode and so on as I switched from band to band, the now-usual memory channels of course being handy for an initial 'scout around' each band when first switching on.

The auto-ATU had a number of self-contained 'memories', remembering the settings for each band. With the set in use, I could sometime hear it quietly tuning itself to match my aerial as I switched between bands, or between segments of a given band.The result was a very, very fast tune-up when I pressed the tuner 'Start' button, in fact sometimes the tuner LED extinguished virtually the moment I'd enabled the ATU!

I received reasonable reports on my transmitted signal, although (naturally) not quite as good as those from my 'normal' transmitter with its more-linear valve PA. Switching in the rig's speech processor certainly did improve readability when I was a weak signal, although shouts of 'turn it off' were normal during ragchew QSOs!

Operating on 10m FM was very pleasant, and I found that by using the set's built-in CTCSS encoder I could access several 10m USA repeaters which I simply couldn't work before. Many amateurs find that Intercontinental FM-quality QSOs whilst driving to work are something to be heard to be believed, that's when the phase distortion due to propagation doesn't degrade things too much!

Inside the Box

Two Direct Digital Synthesisers under microprocessor control are used in the rig, tuning in 10Hz steps controlled by a magnetic rotary encoder coupled to the main tuning knob. On receive, the front end uses a pair of parallelled FETs in a constant-gain grounded grid configuration, these feeding an active double-balanced quadruple FET mixer for 'bomb-proof' performance.

LABORATORY RESULTS:

RECEIVER:

All measurements carried out in standard SSB mode, with attenuator and IPO off, unless stated.

Selectivity:

	SSB/CW	AM/FM
-3dB	2.5kHz	5.8kHz
-6dB	2.7kHz	7.7kHz
-20dB	2.9kHz	9.9kHz
-40dB	3.5kHz	11.7kHz
-60dB	4.3kHz	13.9kHz
-80dB	5.0kHz	20.1kHz

Sensitivity:

Input level in uV pd required to give 12dB SINAD, bracketed figures measured with IPO enabled;

Freq. MHz	*SSB/CW*	*AM*	*FM*
1.8	0.18 (0.53)	0.28 (0.65)	—
3.5	0.08 (0.23)	0.21 (0.57)	—
7.0	0.10 (0.25)	0.20 (0.50)	—
10.1	0.09 (0.19)	0.21 (0.55)	—
14.0	0.09 (0.20)	0.20 (0.51)	—
18.1	0.09 (0.21)	0.21 (0.54)	—
21.0	0.09 (0.21)	0.20 (0.48)	—
24.9	0.09 (0.25)	0.21 (0.52)	—
28.5	0.10 (0.21)	— —	0.13 (0.26)
29.5	0.10 (0.22)	— —	0.14 (0.26)

Blocking:

Measured on 21.4MHz as increase over 12dB SINAD level of interfering signal, unmodulated carrier, causing 6dB degradation in 12dB SINAD on-channel signal;

	IPO Off	*IPO On*
+/-50kHz;	104.0dB	103.8dB
+/-100kHz;	106.2dB	106.1dB
+/-200kHz;	107.4dB	106.5dB

3rd Order Intermodulation Rejection:

Increase over 12dB SINAD level of two interfering signals giving identical 12dB SINAD on-channel 3rd order intermodulation product, measured at 21.4MHz;

	IPO Off	*IPO On*
50/100kHz spacing;	94.0dB	91.9dB
100/200kHz spacing;	92.2dB	92.3dB

Image Rejection:

Increase in level of signals at the first IF image frequency, and the first IF itself, over level of on-channel signal to give identical 12dB SINAD signals, bracketed figures measured with IPO enabled;

Freq. MHz	**Image Rej.**	**IF Rej.**
1.8	86.6dB (72.8dB)	95.8dB (81.2dB)
3.5	96.9dB (80.5dB)	102.8dB (91.4dB)
7.0	95.3dB (79.5dB)	103.2dB (88.9dB)
10.1	93.3dB (80.5dB)	102.1dB (91.7dB)
14.0	92.6dB (79.8dB)	103.4dB (92.4dB)
18.1	97.4dB (83.0dB)	105.3dB (92.4dB)
21.0	93.9dB (81.6dB)	105.3dB (90.7dB)
24.9	96.0dB (81.8dB)	104.8dB (88.2dB)
28.5	94.0dB (84.6dB)	96.0dB (89.2dB)
29.5	93.7dB (85.0dB)	102.4dB (88.9dB)

A large heatsink is used for the transmitter power amplifier, this is cooled by a thermostatically-controlled fan when the temperature stats increasing. The set is constructed in a similar fashion to Yaesu's FT-767GX, and uses surface mount components to achieve it's small size as well as increasing the set's reliability to guard it against the knocks of mobile or portable life.

Laboratory Tests

Measuring the receive performance showed the set to have a good sensitivity, coupled with good strong-signal handling across its range. This was perfectly OK to allow the attenuator etc. to be switched in without losing most wanted signals. When I measured the single-signal selectivity, with my low-noise cavity- tuned signal generator feeding the set, I was pleased to see the receiver was very clean indeed. The selectivity slope fell off nicely as I tuned away, without the usual 'hacksaw' noises and 'rumbles' I'd come to expect. An earlier test with the set fitted with the standard ceramic filter also showed a clean response, although this did start to broaden out at around the -60dB/-70dB mark whereas the optional filter-equipped set continued right past -80dB, -90dB, down to the level where I was starting to measure the performance of my test equipment!

On transmit, the two-tone linearity confirmed the on-air reports of reasonable audio, although switching in the RF processor degraded this somewhat. Throughout the transmit tests, the set kept very cool, even after nearly half an hour of continuous transmission.

Conclusions

It looks like the FT-890 is a worthy successor to the FT- 757GX range (that is, if it's meant to be!), it has an extremely versatile performance with features to satisfy most people. With it's small size it lends itself nicely to use at home, mobile, and portable. If you're a DX chaser, I'd recommend the addition of the optional crystal filter, as I feel the set is possibly let down otherwise. The internal auto-ATU worked very well indeed, I was most impressed especially considering the overall size of the set. I'm sure the set will be popular, although when doing your sums do remember you'll need to budget for the cost of a 20A power supply unit for base use if you don't already have one in your shack.

My thanks go to South Midlands Communications for the loan of the review equipment.

S-Meter Linearity

Measured at 14.25MHz;

Indication	Sig. Level	Rel. Level
S1	1.42uV pd	-32.2dB
S2	1.75uV pd	-30.3dB
S3	2.35uV pd	-27.8dB
S4	3.58uV pd	-24.1dB
S5	5.27uV pd	-20.7dB
S6	8.38uV pd	-16.7dB
S7	13.2uV pd	-16.7dB
S8	23.6uV pd	-7.7dB
S9	57.2uV pd	0dB ref
S9+20dB	642uV pd	+21.0dB
S9+40dB	5.14mV pd	+39.0dB
S9+60dB	54.2mV pd	+59.5dB

S-Meter S9 Level;

Freq. MHz	Sig. Level
1.8	152uV pd
3.5	67.7uV pd
7.0	63.3uV pd
10.1	61.0uV pd
14.0	57.2uV pd
18.1	55.9uV pd
21.0	63.4uV pd
24.9	68.9uV pd
28.5	83.5uV pd
29.5	92.9uV pd

TRANSMITTER;

TX Power;

Freq MHz;	Power;
1.8	109W (17.8A)
3.5	111W (18.0A)
7.0	112W (17.5A)
10.1	113W (18.9A)
14.0	113W (19.9A)
18.1	113W (19.2A)
21.0	114W (17.8A)
24.9	112W (20.2A)
28.5	109W (17.9A)
29.5	109W (17.8A)

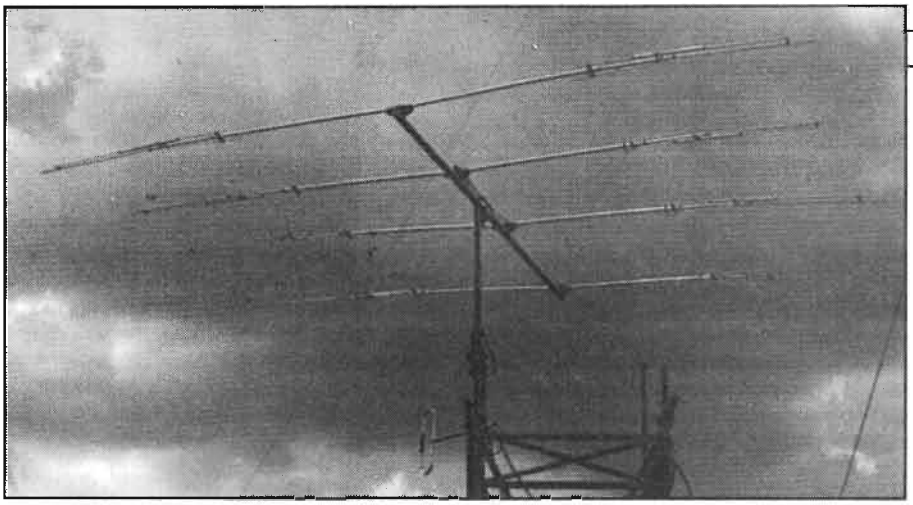
Harmonics;

Freq. MHz	2nd	3rd	4th	5th	6th
1.8	-64dBc	-72dBc	-79dBc	-68dBc	-78dBc
3.5	-73dBc	-71dBc	-85dBc	-72dBc	-87dBc
7.0	-69dBc	-64dBc	-79dBc	-81dBc	<-90dBc
10.1	-73dBc	-63dBc	-83dBc	<-90dBc	<-90dBc
14.0	-68dBc	-68dBc	<-90dBc	-75dBc	<-90dBc
18.1	-58dBc	-72dBc	-79dBc	-80dBc	<-90dBc
21.0	-69dBc	-73dBc	<-90dBc	-73dBc	-69dBc
24.9	-62dBc	-86dBc	<-90dBc	-69dBc	-68dBc
28.5	-60dBc	-76dBc	-69dBc	-63dBc	-63dBc
29.5	-59dBc	-82dBc	-67dBc	-64dBc	-64dBc

SSB IMD Performance;

Measured on 14.25MHz with a two-tone AF signal, results given as dB below PEP level;

	3rd Order	*5th Order*	*7th Order*	*9th Order*	*11th Order*
ALC Onset	-22dB/ -22dB	-39dB/ -44dB	-44dB/ -43dB	-50dB/ -47dB	-63dB/ -65dB
Mid ALC	-21dB/ -22dB	-33dB/ -38dB	-43dB/ -42dB	-47dB/ -45dB	-57dB/ -57dB
Proc On Mid ALC	-17dB/ -14dB	-30dB/ -28dB	-37dB/ -38dB	-44dB/ -52dB	-50dB/ -53dB



KLM KT-34A HF Beam Aerial Review

Steve Telenius-Lowe P29DX, G4JVG, reviews the KLM KT-34 HF beam

In England I'd not been able to put up a beam aerial, but when I knew I'd be moving to Papua New Guinea, a good HF beam was required. The one I bought was a KLM KT-34A.

Listening to signals from DX stations on 10, 15 and 20m, apparently the biggest signals come from monoband aerials, either quads or yagis. However quads, especially on 20m, are rather cumbersome, and most amateurs don't have the space or the resources to put up individual yagis for 10, 15 and 20m. The best compromise, and one which most amateurs able to put up a beam end up doing, is to use a tribander yagi. There are of course many different manufacturers of HF triband yagis, and talking to amateurs around the world it's apparent that some beams have very good reputations, whereas others definitely do not!

One beam with a good reputation is the KT-34A, made by the American firm of KLM. The KT-34A is probably their smallest HF aerial, although it's still somewhat larger than the average 3-element HF beam, e.g. the Mosley TA-33, the Hy-Gain TH3, the Cushcraft A3 or the Jaybeam TB-3.

The KT-34A is a 4-element beam, with two driven elements, on a 4.9m long boom (most 3-element triband beams have boom lengths of 3.6m to 4.3m), and the four elements are active on all three bands, 20, 15 and 10m. The boom is 75mm outside diameter, so this is somewhat larger than that of the average tribander. A conversion kit, consisting of an extra 4.9m of boom, a monoband director for 10m, and a further triband element, is available to convert the KT-34A into a KT-34XA later if needed.

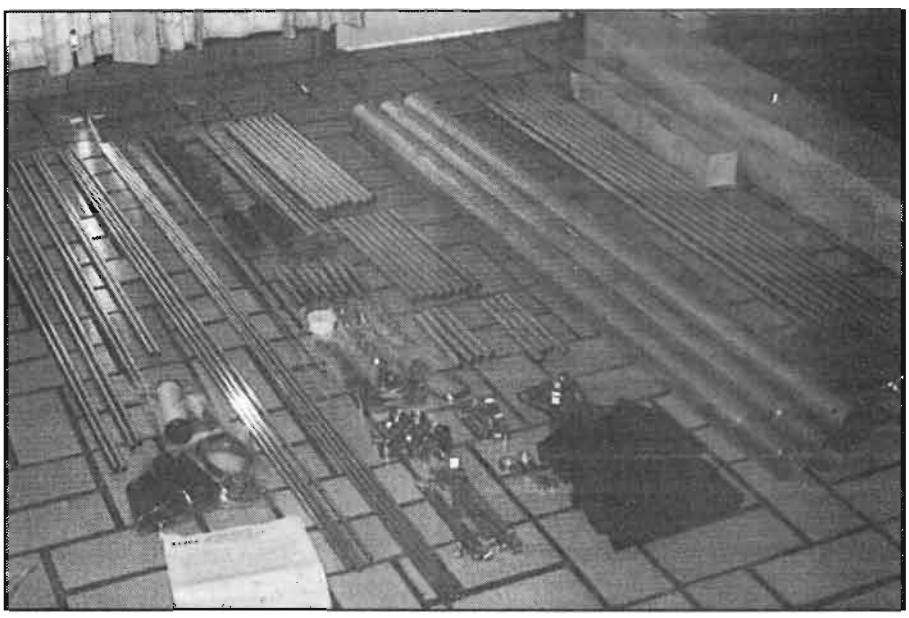
In designing the KT-34A, KLM have done away with the traditional triband coil-and-capacitor trap design. Instead, linear loading is used with air-spaced capacitors that consist of lengths of aluminium tubing slipped over the elements, with a high claimed efficiency. The beam can handle as much power as you can legally generate, and then some. It's reassuring to know that if you should just exceed the 400W level for a fraction of a second you're not going to fry your beam.

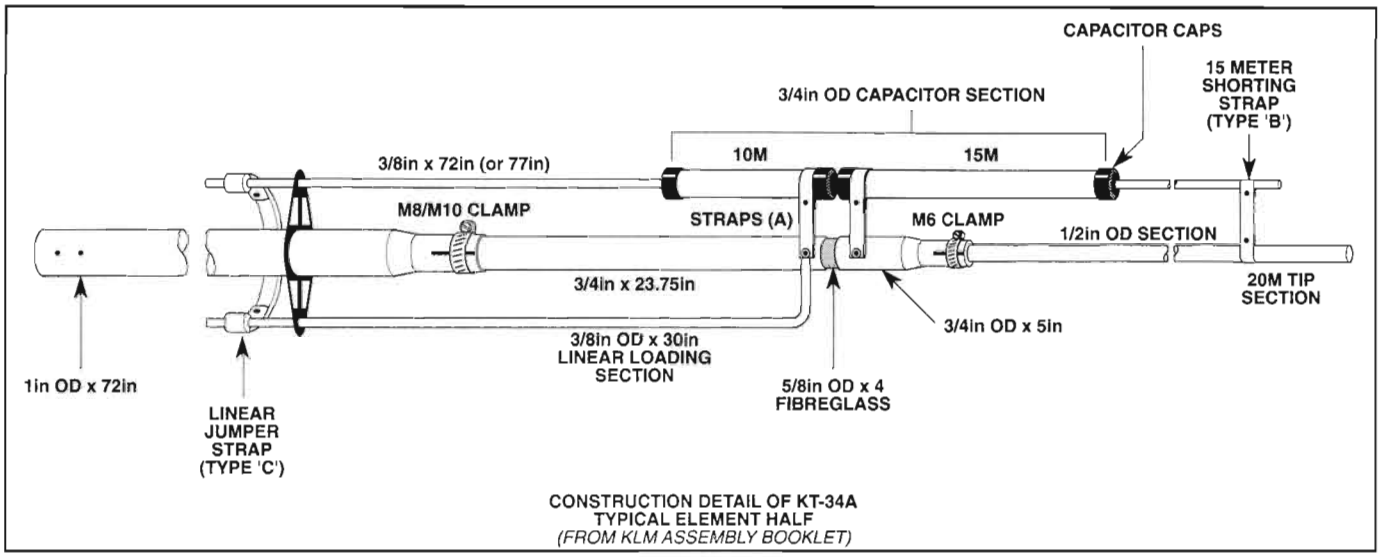
KLM summarise the electrical design as; '10m is a full-sized element using a trap formed with a small amount of linear loading (also used to shorten 20m section) and an air capacitor. 15m uses a tuned decoupling stub with another air capacitor and is also a full-size element. 20m is approximately 75% of full size and is defined by the element extending beyond the 15m decoupling jumper.'

By using a pair of driven elements it's designed to give wider bandwidth, giving low SWR at both the CW and SSB ends of the band. Even if you only use a single mode this is useful, because it also means that no tuning is required. So when it's been assembled, it should be resonant where you want it to be. There's nothing more frustrating than spending a whole day or more getting your aerial on to your tower, only to find that it's resonant 300kHz away from where you wanted it to be!

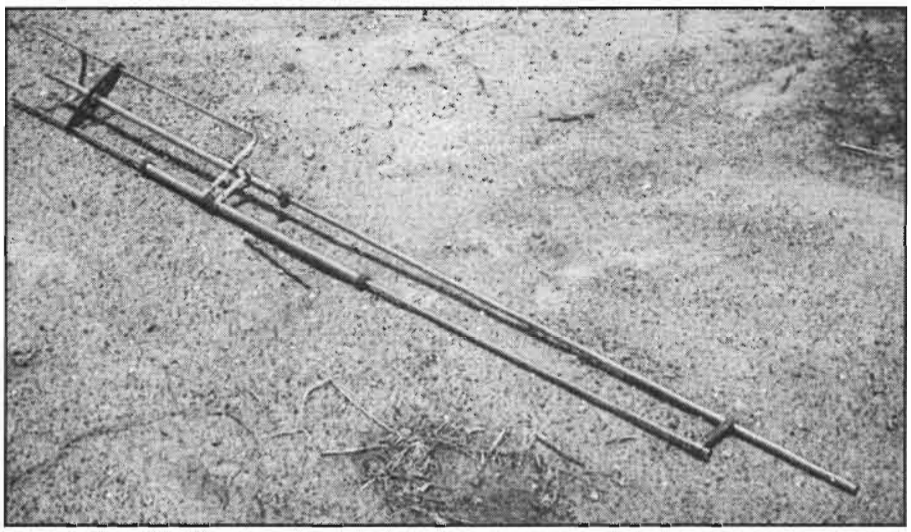
Assembly

With almost a sense of trepidation I unpacked the box, for the KT-34A has the reputation of being a most difficult and time- consuming beam to assemble. If you add up the individual pieces, including all the nuts, bolts, washers etc., there are over 600 pieces, right down to some conductive paste to be applied to all metal-to-metal connections in the aerial. Most of the hardware is packed in six plastic bags and one cardboard box, which makes identification of the required parts relatively easy despite their vast number!





CONSTRUCTION DETAIL OF KT-34A
TYPICAL ELEMENT HALF
(FROM KLM ASSEMBLY BOOKLET)



One half-element completed

All that's required for assembly is a screwdriver, a wrench and socket set (an adjustable spanner would just about do) and a tape measure. Being American, all dimensions are given in feet, inches and fractions of inches. This didn't worry me, but for the European or the younger UK amateur it would have been useful if dimensions had been given in metric units as well.

There were only one or two 'funnies', where the instructions tell you to do something and you find later that you have to undo it again to fit two pieces together, but these examples were rare and only mildly annoying. For example, if you follow the instructions exactly, one element should be attached to the boom exactly over one of the boom joints, which is not possible because of the protruding bolt heads. Fortunately, there was enough leeway on the boom to allow all the elements to be shifted back an inch or two to overcome this problem and still give the correct element spacing.

In my case, working alone it took me about eighteen hours to assemble the beam, this time being reckoned from the opening of the box until it was ready for erection on the tower. I must add that the latter part of the assembly I did outdoors in direct sunshine with temperatures of over 30 deg. C, and included frequent breaks for liquid refreshment!

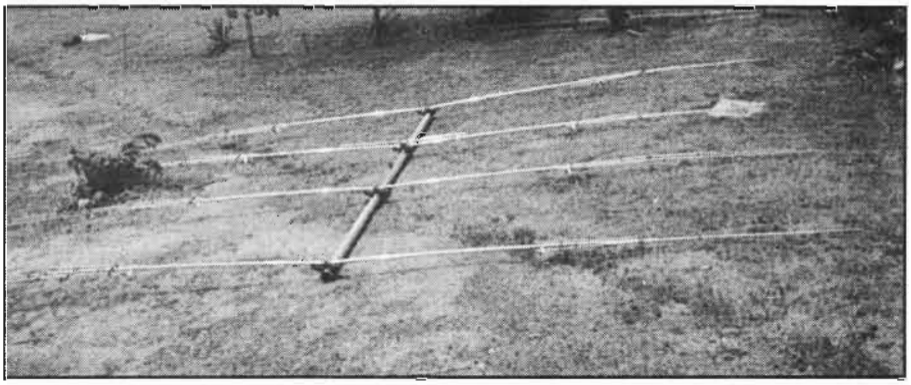
Performance

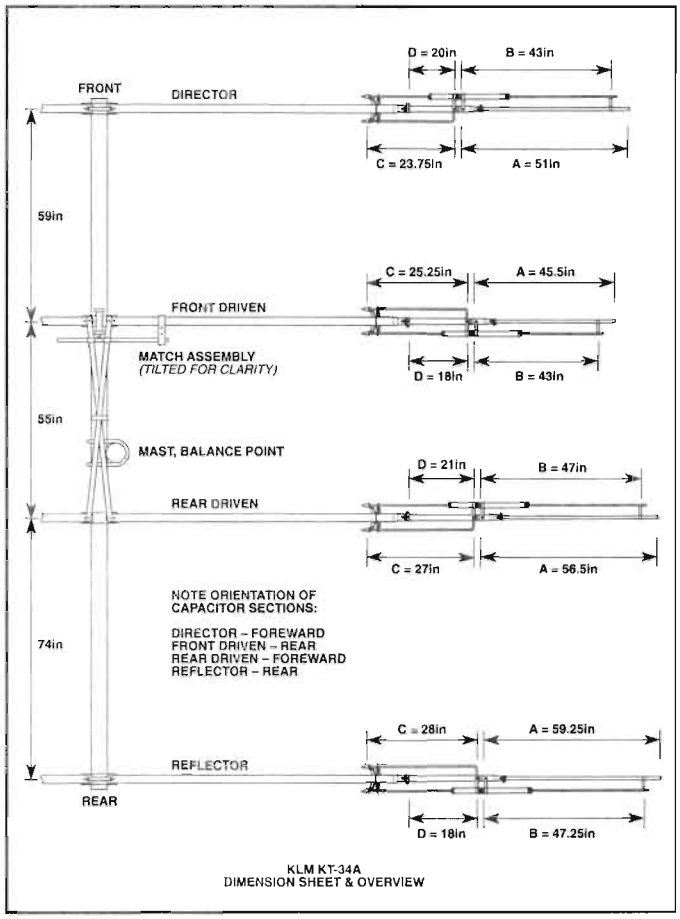
The instruction booklet recommends a minimum height above ground of around 14m for excellent performance, although it says that it should work from about 10m (a half-wavelength at the lowest frequency), I had to settle for a height of only 9m above ground.

I wondered if the performance may be degraded, especially on 20m, because of the low height. I needn't have worried, my first test transmission with 100W brought a pile-up of European stations on 20m long-path, one of whom gave me a report as I rotated the beam through 360 degrees. My signal varied from about S5 or 6 and difficult copy to S9+10 dB and perfect copy. I found similar results later on receive.

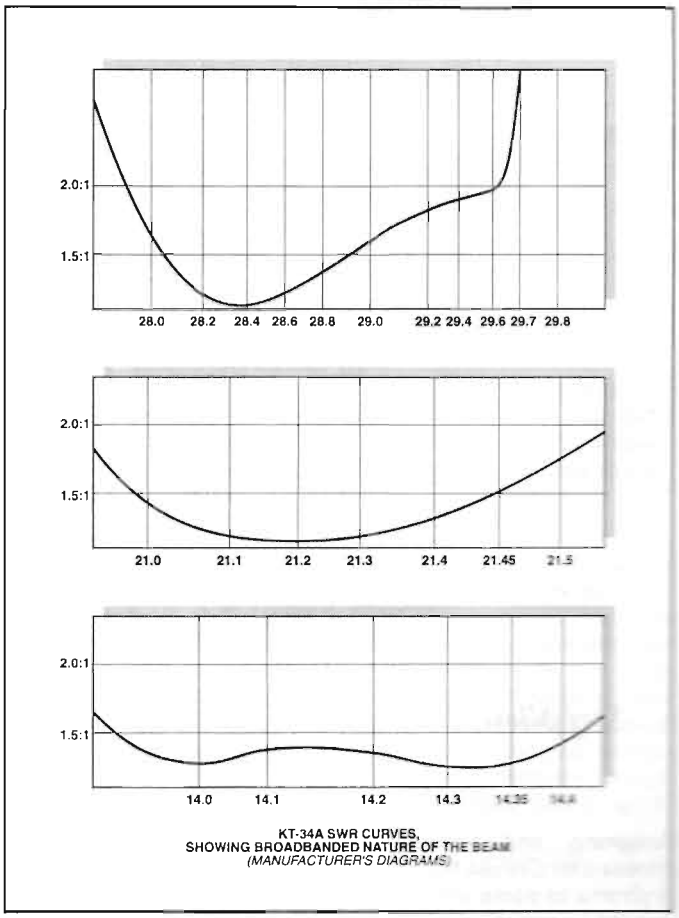
The KT-34A got its first real airing during the CQ World Wide SSB contest at the end of October 1991. Even if you dislike contests, they are unquestionably the best time to test new aerials. Weak signals get trampled on and you would get nowhere. During this one weekend I made over 1100 QSOs with 101 countries on 20m, 940 QSOs with 108 countries on 15m and over 1500 QSOs with 95 countries on 10m, i.e., over 3500 contacts on this one aerial.

Despite the undoubted 10 dB advantage of a P29 callsign, these

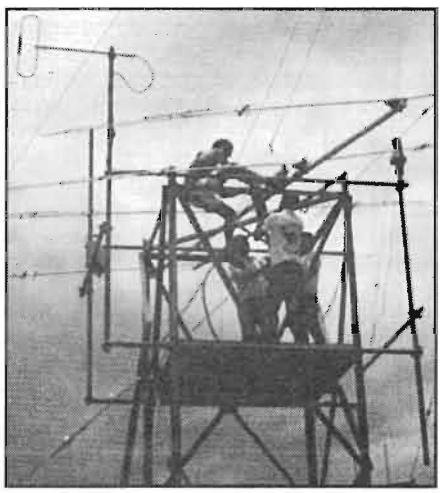




KLM KT-34A
DIMENSION SHEET & OVERVIEW



KT-34A SWR CURVES,
SHOWING BROADBANDED NATURE OF THE BEAM
(MANUFACTURER'S DIAGRAMS)



figures speak for themselves — it may not be a record- breaking contest score, but I was definitely getting out and getting out well. Even big pile-ups were cracked relatively easily, more often than not at the first attempt. During the whole of the contest, I only heard two stations on these three bands that I could not work; one was a ZA (Albania) and the other a TL8 in Africa, which is the most difficult part of the world to contact from Papua New Guinea. Both had enormous pile-ups. This is the sort of performance I would have expected from monoband beams; to achieve it in a tribander, and not a particularly large one at that, was almost unbelievable. This aerial really works!

Summary

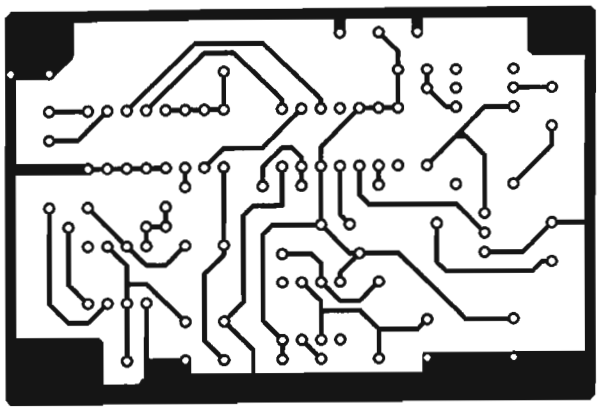
The KLM KT-34A should appeal to any amateur who wants to put out a big signal but who cannot put up big monoband yagis or quad aerials. It is considerably smaller than many other triband yagis, its trap design without the use of coils ensures high efficiency, and the dual driven elements ensure virtually flat SWR curves over almost all of the three bands.

Gain is proportional to boom length, so all other things being equal, you won't get as much gain from the KT-34A as from larger aerials. However, not all other things are equal and I believe the KT-34A would probably out-perform many larger tribanders using the more conventional trap design with coils. Also if you later find you can put up a larger aerial, you can convert the aerial into a KT-34XA 6-element beam with the optional conversion kit.

My thanks go to Ed Kopman P29EK, Kisen Polu P29KP, John King P29KJK, Carl Paonga P29NCP and Ben Kaidoga for their hard work in high temperatures while erecting the beam.

Frequency of Operation:
20m = 14.0 — 14.35 MHz
15m = 21.0 — 21.45 MHz
10m = 28.0 — 29.75 MHz
Elements: 4 on each band
Max element length: 7.31m
Gain: 7 dB over a dipole reference
F/B: 20m; 25dB, 15m; 22dB, 10m; 20dB
F/S: 30 dB or better
Feed impedance: 200 ohms bal., or 50 ohms with 4:1 balun supplied
Power rating: 5 kW PEP
Wind area: 0.557 sq. m.
Wind survival: 100 MPH.
Turning radius: 4.57m.
Weight: 45 lbs.
Boom length/dia.: 4.88m/75mm
Mounting: 50mm mast.

Project — CW Transmitter Tester

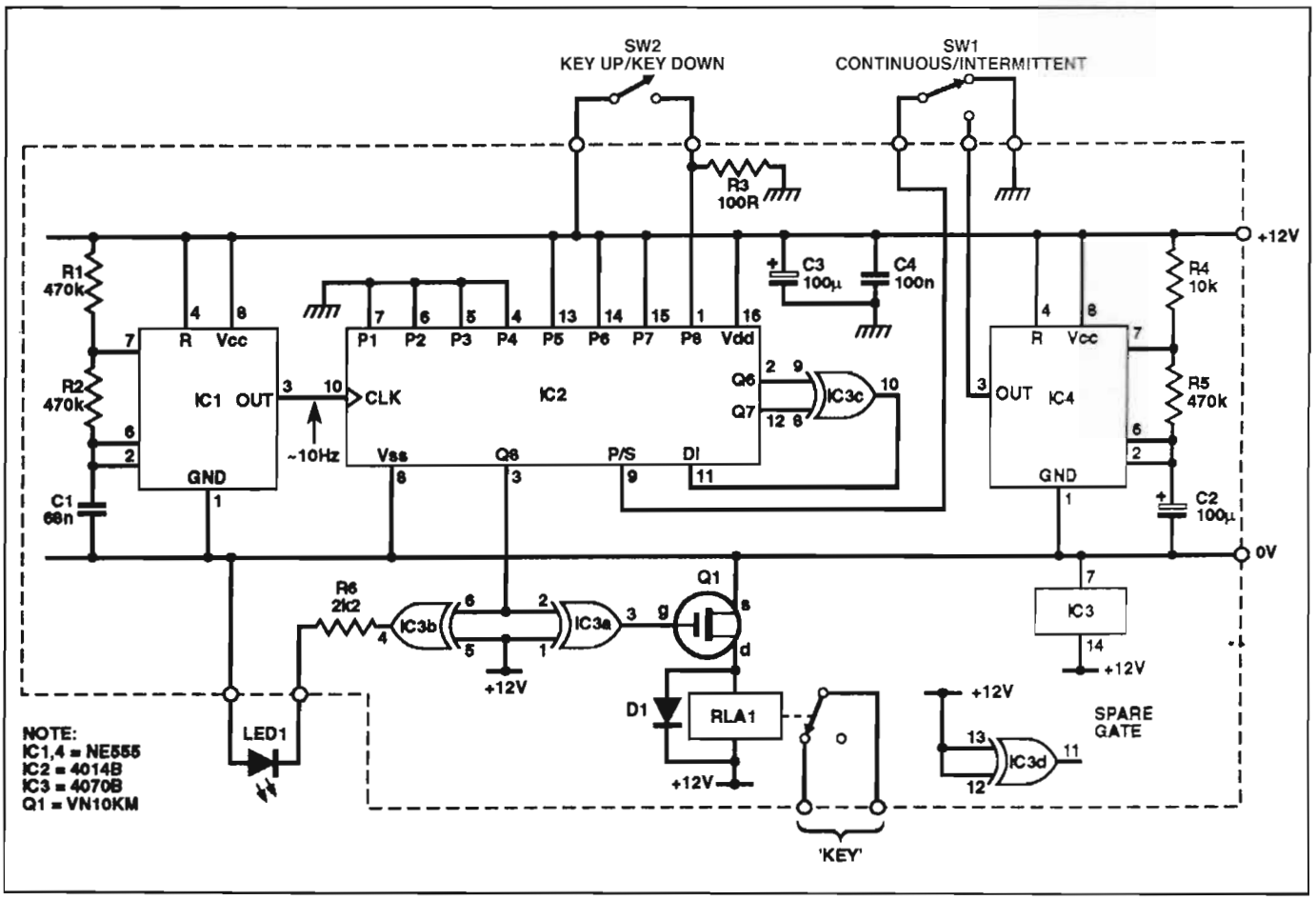


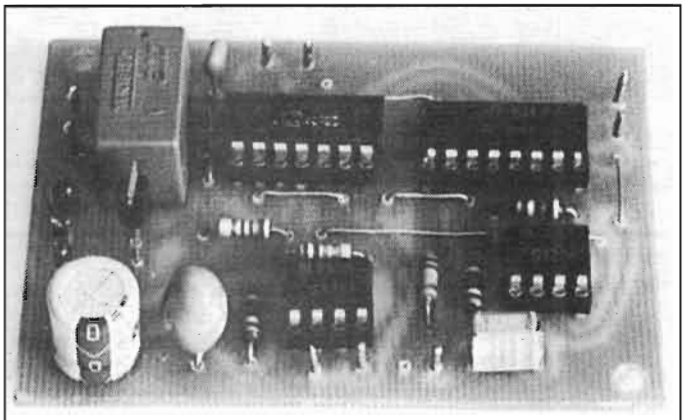
PCB pattern, full size, viewed from track side

Stef Niewiadomski describes a CW simulator to test your rig

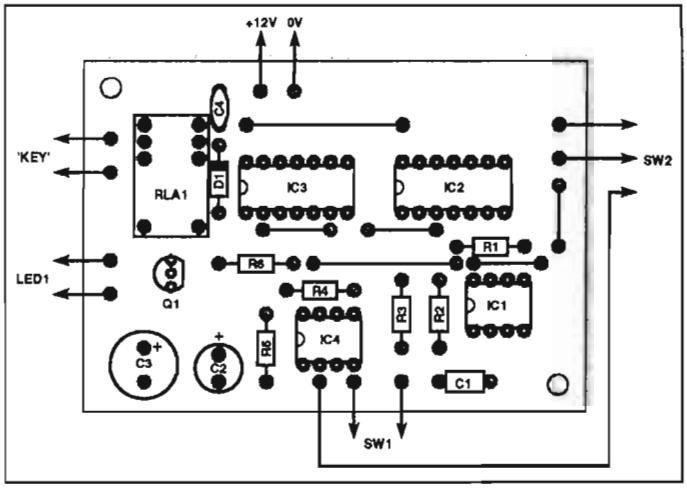
Designing and testing transmitters intended for CW use have always caused problems to some extent. The intermittent nature of their use, from the point of view of the dot/dash and transmit/receive duty cycles, makes it particularly difficult to predict the heatsinking requirement of the PA transistor(s) at the design stage, and difficult to assess that whatever is chosen is adequate when the transmitter has been built. Apart from heatsinking requirements, there are other difficulties which occur when testing. The first of these is checking whether the transmitter suffers from key clicks, and the second is setting the transmit/receive changeover timing in automatic systems.

What is needed of course, is a 'robot' which patiently keys the transmitter at a constant rate, stopping and starting to simulate the transmit/receive periods. Although this design does not claim to be a robot, it does perform just these functions. The 'Morse' it generates is in fact a pseudo-random sequence of 'dots' and 'dashes' which, although it doesn't exactly mimic real Morse, is sufficiently close to give confidence that the transmitter will behave itself under real Morse conditions.





The completed CW Tester PCB



Circuit description

Referring to the circuit diagram, IC1 is a NE555 timer configured to produce a continuous square wave output. Its external components, R1, R2, and C1, set its oscillation frequency at about 10Hz, which gives 'Morse' from the unit at about 12 words per minute. This rate can be varied by altering C1. IC2 is a CMOS 4014B 8-bit shift register with parallel load data inputs. It is configured here with an exclusive-OR gate, IC3c, as a 7-bit pseudo-random pattern generator. The Q6 and Q7 outputs of IC2 are exclusive-ORed together and form the serial data input fed back into the shift register. This configuration produces a pseudo-random data pattern of 127 bits, which gives a reasonable length sending 'Morse' sequence.

The Q8 output of IC2 drives the gate of TR1 via IC3a, which inverts the driving signal. TR1 operates RLA1, whose contacts simulate the 'key' action to the transmitter. There are advantages in using a relay here, rather than keying the transmitter electronically; firstly, the relay simulates the metallic contact of a normal key, thereby exhibiting an amount of contact bounce which the click suppression circuitry of the transmitter should suppress, and secondly, there are no restrictions (within reason!) on the type of transmitter this tester can be connected to.

D1 prevents back-EMF from the relay coil from damaging TR1. Another exclusive-OR gate, IC3b, drives LED1 via current-limiting resistor R6, giving a visual indication of the keying action. R6 and LED1 can be eliminated if they are not wanted.

IC4, another NE555, forms an oscillator running at a much lower frequency than IC1. The output of IC4 has a period of about 30 seconds high / 30 seconds low, set by R4, R5, and C2. When the output of IC4 is connected to pin 9 of IC2 (that is, S2 is in the *intermittent position*), IC2 is switched between parallel load and serial shift modes with high/low period of IC4. When IC2 is in serial shift mode (that is, pin 9 is low), the input to IC2 pin 1 (the P8 parallel load input) is ignored and the pseudo-random pattern is generated and appears on the Q8 output of IC2. However, when IC2 is in parallel load mode (that is, pin 9 is high), the logic state present on its P8 data input (pin 1) is forced to its Q8 output.

The time when IC2 pin 9 is low can be equated to the *transmit* period and when it is high, this is the *receive* period. Normally S2 would be set so that in the *receive* period RLA1 is not operated, and therefore the transmitter is not being keyed. If S1 is set to the *continuous* position, the transmitter is keyed on and off with the position of S2. This can be useful if the worst-case continues dissipation of the transmitter being tested needs investigating.

Components list

R1, 2, 5	470k
R3	100k
R4	10k
R6	2k2
All fixed resistors are 0.25W 5% carbon film type	
C1	68n polyester layer (7.5mm lead spacing)
C2	100u tantalum bead
C3	100u miniature radial electrolytic
C4	100n disc ceramic decoupler
IC1, 4	NE555
IC2	4014B
IC3	4070B
RLA1	ultra-miniature 12V coil relay
TR1	VN10KM or similar (not critical)
D1	1N914/1N4148
LED1	Miniature red LED
8 pin dual-in-line sockets for IC1, 4 (if required)	
16 pin dual-in-line sockets for IC2, 3 (if required)	
S1	single pole toggle switch
S2	single pole changeover switch
Printed circuit board	
1mm terminal pins	
Connecting wire	

A Twelvemonth of Noviceship

Jack Hum G5UM takes a contemplative look at the progress of the new Novice Licence, and offers friendly advice to Novices on their 'first steps'

By now, a year since the Amateur Radio Novice Licence was introduced in Britain, it is possible for observers to form an opinion on how they think it has progressed. Many have done so already in the amateur radio media, the opinion formers have been at work. As so often happens in debatable contexts their comments have been emphatically extreme, either 'for' or 'against'. It must be said that a few have taken the middle course of suggesting that it would be no bad thing to let time decide.

First of all then, what has been the take-up of Novice permits, and in what proportions of 'A' licence and 'B' licence equivalents? In other words, how many have opted to take the Morse test, and how many not? Overwhelmingly, most applicants have stated their preference for the 'B' equivalent, meaning no Morse to be learned nor test to be passed. The disparity between the two options has been made apparent every weekend during the GB2RS broadcasts, when the latest callsign blocks to be issued are announced. The situation looks rather like this: During the Novice twelvemonths barely fifty applicants have decided they would go for the 20-- Morse required licence. There are 26 callsigns in the 20AAA to 20AAZ block, all had been issued by the beginning of January and a start made on the 20ABA to 20ABZ block, another 26.

At the same time, by contrast, nearly 250 no-Morse licences had been issued to Novices in the 21AAA to 21AJA series. The figure should be well into the 300s by the time this piece appears. To date, no information is available on how many 'B' equivalents have decided to swot up the Morse and go for the 'A' licence equivalent. Some may have done so. Others may have decided that while they were about it they may as well go the whole hog and aim for the full ticket and its needful RAE pass.

A majority for 'no Morse'

What it comes to is that there is a decided majority of Novice licensees, who have made the choice to confine themselves to the metrewave bands. In practical terms of getting on the air quickly this means that Novices will choose the 6m and 70cm bands on which to make their debuts.

Question: what equipment will they use, remembering the power restrictions under which they work, 5W maximum DC input and 3W PEP output? Not many commercial transceivers for '6' or '70' operate at such low power levels. This suggests that the Novice who wishes to start transmitting may well think about starting on an intensive session of home construction if he (and increasingly she) is to observe the legal power limits. How many have done so, have 'rolled their own' as the phrase had it when people smoked, would be very enlightening to know, and might indeed form the basis for practical and valuable constructional articles in HRT 'for the encouragement of the others', as the French say.

On a visit to G5UM, David Whetstone 2E1ADH proudly displays his ex-PMR handheld transceiver for 433MHz, frequently used in his father's vehicle. Back home the rig is connected to a gainy vertical aerial and achieves considerable range.

The 'how' of operating

To Novice licensees their mode of operation, the way they sound on the air, will very much add to their credit or discredit where transgressions are overheard. A transgression doesn't mean breaking the licence terms, it means behaving stupidly on the air. It must be emphasised that Novices are by no means prone to stupid behaviour. There is all too much of it audible day by day from the fully fledged, and it is no example to the young. From what your G5UM has observed in months of listening and working Novice callsign holders, is their responsible behaviour when they address their microphones. The unvoiced thought seems uppermost that '...I've worked hard to get this licence and I'm going to do it justice'. A second unvoiced thought might be 'you never know who's listening'.

One of his local cynics said to G5UM; 'Novices? All they want is a handheld rig and a crutch called a repeater', there was some validity in his acerbity. Through-repeater operation is an all too easy way to generate a conversation. No, delete 'conversation' and substitute 'exchange'. Repeaters are substitutes for the real thing. Their primary purpose is to help mobiles to whom topography and aerials only a metre or two from the deck, deny the pleasure of a real QSO and a relaxed conversation. But for the home station the motto should be 'keep it short, others are waiting'.

Always then, a repeater contact should be regarded as a fleeting thing, and no more than a prelude for setting up a real QSO, a simplex one. These should preferably not be on an SU channel likely to be occupied, but somewhere else in the 70cm band with its enormous availability of frequencies where an operator can chat away to his (or her) heart's content. Something else that flows from through-repeater operation is this; never send a QSL card. The repeater has given you a by-proxy QSO, not a real one, and your QSL should be withheld until a simplex QSO is achieved. Because the repeater is doing the work IT should be the recipient of any QSL, but it would be pretty silly to send one (even if you knew it's address).

Although the local repeater can listen and talk it cannot read or write, and is in no position to send a QSL back in return.

Another point about repeater use is; avoid multi-way contacts if possible, least there should be others drumming their fingers on their steering wheels waiting for it all to stop, and to give them their chance to insert their pennyworth on 'the box'. To be in a multi-way via a repeater confers the responsibility of allowing ten second breaks between overs to enable others, probably more disadvantaged, to pop in. Multi-ways are best organised not via repeaters but on some of those unsequestered frequencies on 'seventy', well away from the busy SU channels. A multi-way can be effectively started by putting out a call on the established calling frequency of SU20 (433.500MHz) where others may be listening ready to transfer operations elsewhere. The same reasoning applies where 'six' is concerned, a big expanse of unused frequency, half a MHz of it, is there to be occupied on FM in the Novice segment. There are no repeaters on 'six', every QSO is a real one!

Talk-through

One of the special delights of metrewave operation is duplex. Novices who have yet to try it would find it to be an ideal medium for the swift exchange of information from one station to another. If the duplex QSO-partner is on a non-Novice band such as 'two' or 'ten', great care must be taken not to allow the Novice's callsign to be heard through the other party's microphone. Headphones help. To be heard even inadvertently on a band for which one is not licensed is inviting the licensing authority to descend with a heavy hand and the proverbial classroom cane backing up the exhortation 'don't do it again'.

Ideally, duplex operations should be conducted on bands wholly available to Novices, 433MHz to 51MHz is the obvious format. Properly used, duplex is an engaging (in both senses of the word) means of instant conversation. There are operators who confess to being slightly nonplused when they try it. They expect to be given 'an over'. Instead, they are offered full talk- through. The advice to any who feel that way is to remind them that '...it's just like the landline telephone except that there is no metallic link between us', and you don't get a bill!

Read all about it

No discussion of the Novice scenario would be complete without a reference to a recently published 6 page booklet 'A Closer Look at the Novice Licence'. It summarises most of the regulations contained in the Novice licence while avoiding it's turgidities (i.e., it simplifies the conditions). It was prepared by G0KKL with the co-operation of G4JKS. A free copy may be had from G4JKS by sending an A5 sized SAE to; Mrs. H. M. Claytonsmith, 115 Marshalswick Lane, St Albans, Herts AL1 4UU.

Where to find the Novice licensees on the metrewaves

The schedule to the Amateur Radio (Novice) Licence B lists the following metrewave bands as available for use by the Novice operator;

50.620 to 50.760MHz	primary user; Allocated for data.
51.250 to 51.750MHz	secondary user; Morse, Telephony, Data.
433 to 435MHz	secondary user; Morse Telephony, Data.
1240 to 1325MHz	secondary user; Morse, Telephony, RTTY, Data, Facsimile, Slow and Fast Scan TV.
10,000 to 10,500MHz	secondary; modes as 1240MHz.

SCANNERS
INTERNATIONAL

Amigasat Review

A versatile weather satellite system for use with the Commodore Amiga, reviewed by Peter Rouse GU1DKD

The usual method for reviewing equipment is that the importer, manufacturer or a dealer loans us equipment and we put it through its paces. In this case I saw Amigasat being demonstrated and immediately purchased it, so you can tell from the start I was impressed!

Amigasat comprises a tiny box of electronics that has a socket for the audio output of the satellite receiver, a short ribbon cable and plug that attaches to the Amiga's parallel socket, software, and a well-written and produced manual. It will work with the Amiga 500, 1000, 1500 and 2000 models, but at least 1 Megabyte of RAM is needed and in order to use all the facilities it is advisable to have at least 2 Megabytes of memory. The system works with any version of kickstart.

This is not a 'turnkey' system (i.e. just switch on and leave it running). It is clearly aimed at the enthusiast who wants to have a range of post-processing facilities such as filtering, contrast stretching, zooming and so forth. The Amigasat software by Geoff Hatto provides all these facilities, and many of the parameters can be user defined and saved and loaded onto disc. I must say at the outset that Geoff has produced a stunning piece of software, which must surely push the Amiga to its limits. All current weather satellite formats are catered for, and the system even detects the new digital headers on Meteosat and displays them as the default save name.

Up and Running

From boot-up the mouse driven menu offers 'load from disk' or 'sample new picture'. You can then select the satellite type, and the number of sampled lines can even be altered at this stage. Once selected, another menu appears which prompts for a sample, and then checks the incoming signal to select audio level and synchronisation tone.

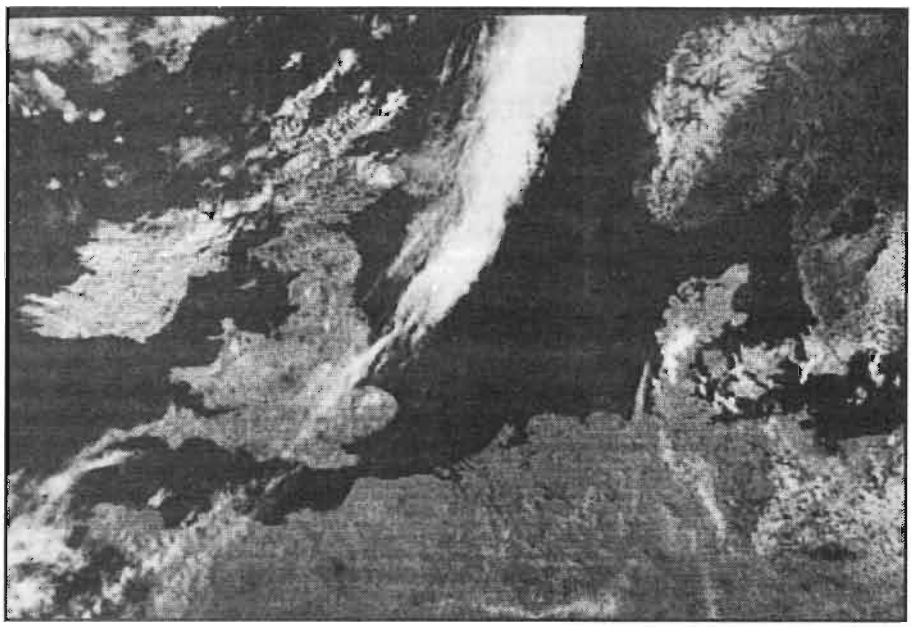
Once sampled, the program then goes to a black screen and either waits for a start tone or the press of a mouse button to start the incoming picture. This is displayed in medium resolution with just eight grey scales, which is enough to determine whether the picture is coming in correctly. When reading to screen, the program is also saving the entire picture information, and this must surely be a remarkable piece of programming. Once complete, the program prompts for a 'save', which can be to disk or RAM. Quitting after the save then causes the picture to rewrite to screen with the full 16 grey scales in high resolution (you can also go interlace if you wish). 16 shades of grey is not ideal, but that is the limit on the Amiga. You can then start altering the contrast either by choosing one of the four preset formulas, or simply by using the mouse to shift grey scales on a scale (this latter facility is very effective for fine-tuning the picture). All pictures are automatically aligned on the screen, and in the case of NOAA formats the visible image appears on the left and the infra-red on the right. After that, a host of filtering options are available including edge enhancement, anti-fade for dropouts, median, line fix, etc.

Colour and Zooming

One of the most impressive features is the ability to artificially colour the pictures. Simply by using the mouse to chose areas of land, sea and cloud, it is then possible to use a red/green/blue slider scale to produce whatever colour you want. One of my favourites is a picture of the Sahara desert in various shades of brown, and the Nile valley in green with deep blue for the Red Sea. Enhanced pictures can be saved to disk in IFF format.

Zooming is achieved by selecting the x2 roving window, or user-defined where the pointer is dragged to create a box for the viewing area and so allowing near infinite close-ups.

There is also a facility for merging pictures using a variety of mathematical



NOAA visible image. On screen major built-up areas such as the city of Paris can easily be seen

weightings. However, I must confess that I found the description in the manual a little confusing and this is one facility I have yet to try out.

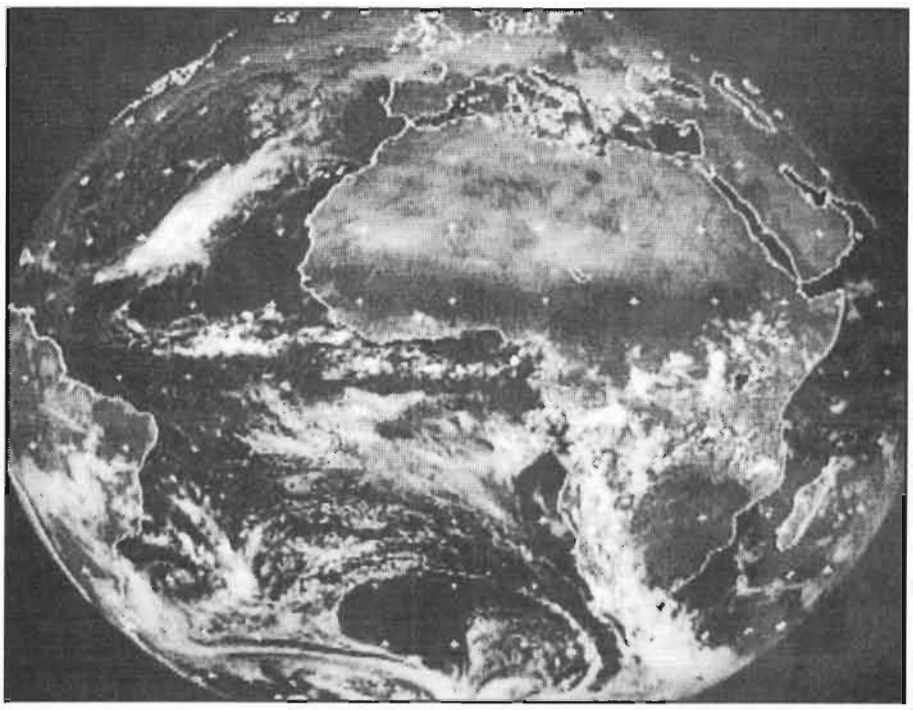
Conclusions

The software is exceptional and Geoff is to be congratulated on it. Updates are produced at regular intervals and I understand that in the near future there may be the facility to decode Fax pictures as well. The only other feature I would like to have seen included is a rolling picture mode. Unattended operation can be quite useful with Meteosat and it's nice to be able to leave a weather satellite system rolling in the shack and watch each new picture coming in, even if it is only in medium resolution with eight grey scales.

My only real criticism of the system concerns the electronics. There appears to be little or no filtering and despite the effectiveness of the digital filtering in the software there is no compromise for cleaning up the signal at source. Indeed when I took the audio feed from the filter output of my Cirkit weather satellite system there was a noticeable improvement in picture quality. The unit is also fairly fussy about the signal that is fed to it and in some instances can have difficulty in establishing synch lock (particularly with Meteor and Cosmos formats).

But overall I have to say this is a remarkable product that squeezes the last ounce of performance out of the Amiga, which is not quite as wonderful a machine as some published hype would have you believe. The system is not as good as that available for PCs with VGA graphics, but then you really cannot compare the two. Given the price of both the Amiga and Amigasat, this is a system that should keep many weather satellite enthusiasts happy.

Amigasat is available from Martelec Communications Systems, priced at £139.50 plus VAT, not including the receiver.



Meteosat Whole Disc showing cloud height. The image has been subject to contrast enhancement

Review – AOR Base Scanner Aerials

Chris Lorek reviews a pair of ultra-wideband aerials matching today's super-wideband scanners

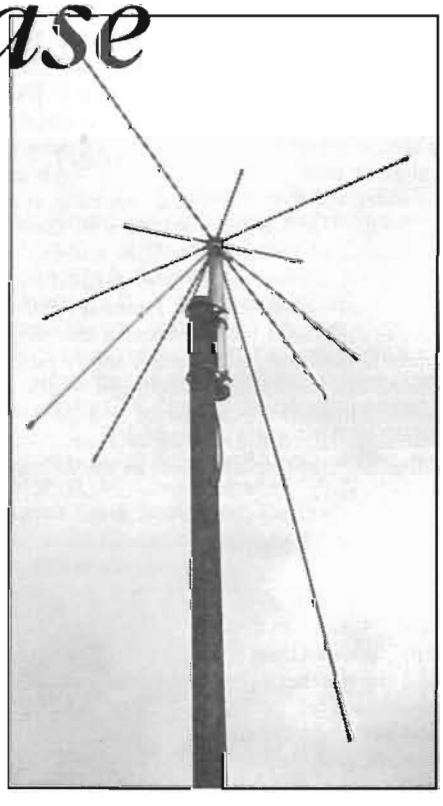
Our recent guide to scanner aerials, published in *Scanners International* a few months ago, must have whetted some appetites! No sooner than it was in print, the editorial team had been asked to review a couple of base station types for the benefit of readers. For this, they chose a pair of very different wideband aerials from those scanner specialists AOR, the DA-3000 discone and the amplified WA5000 versions, these arriving at the door within a few days of asking — that's service for you!

Following this, AOR were also kind enough to loan me their latest AR-3000A 100kHz-2036MHz scanner (reviewed in last moth's issue) which provided a useful 'test bed' for comparison with my existing scanner aerial systems over a slightly longer period.

The DA3000 Discone

The usual form of discone you see is made up of a number of rods, simulating a horizontal 'disc' above a 'cone' of elements, the disc and cone elements being of given individual dimensions. The ratio of the disc/cone dimensions, plus the physical size of this in the first place, decides the frequency coverage of the aerial. This normally encompasses around two octaves of frequency, i.e., 100-400MHz, or 150-600MHz, and so on. 'Staggering' the element dimensions, i.e., by having 50% of these shorter than the other, may be used to achieve a wider overall bandwidth.

However AOR have gone a few steps further, and from the accompanying photo-



The DA3000 25MHz-2000MHz wideband discone

graph you may be able to see that widely differing element lengths are used, with a large minimum/maximum ratio to thus give a wide bandwidth. Inductive loading on one element is even used to attain the lower frequency range, the overall result being a specified 25MHz-2000MHz receive range.

Physical Features

The DA3000 has 16 elements in total, these being made of stainless steel to protect against the ravages of the weather. It is, of course, designed for outdoor mounting, and the termination moulding for the disc/cone elements is also well-sealed. The coaxial termination is fitted within the 300mm supporting tube supplied, to again protect it from the elements. A pair of supplied mast clamps let you fit the assembly onto a support pole of up to 52mm diameter (see the accompanying photo).

As for the size of the aerial, well its maximum dimensions are given as a height of just over 1m with a diameter of 0.9m, although the different length elements did cause me to give up trying to accurately measure it! The whole assembly is fairly light, weighing in at just over 1kg which should make installation fairly easy, and to help you further a preassembled and terminated 15m length of 50ohm coax is also supplied. The discone took me around 20 minutes to put together, clear pictorial instructions being supplied which made the job far easier than I'd have first expected.

On Air

I connected the DA3000 to a four-way aerial switch at my 'listening post' end, the other switch positions being connected to my 145/435MHz colinear, a 'normal' discone, and a wideband 14MHz-30MHz HF dipole system. Careful listening and noting down signal strengths showed the DA3000 to have an excellent all-round performance. Not quite as good as separate 'dedicated' aerials for the extremes of frequency range, but certainly better all- round than any single narrow-band aerial.

In use, I wouldn't like to think the VSWR (i.e. the impedance match) would be consistently low across this range, for example to allow it to be used with a transmitter. Indeed AOR warn that it is a *receiver-only aerial* (yes, their UK-produced leaflets speak in English by not calling it an antenna!) so don't try using your transmitter into it if you value your power amplifier circuit! This is unlike some of the 'traditional' discones, which cover a much narrower frequency range band but can be used for transmit reasonably safely.

Conclusions — DA3000

After a period outdoors, unlike my other discone (where the elements tended to fall off after being used as a handy bird perch for the local starlings) it continued to work well, although I'd possibly hate to think what might happen if a large seagull or the like was to take a fancy to it. It provided a good performance across a wide frequency range, and being a 'passive' (rather than amplified) aerial it should guard against the possible scanner receiver 'overloading problems' of smaller 'active' aerials with built-in wideband amplifiers. If you can manage to get one up, I'd certainly recommend it.

The WA5000

If you haven't got the room for a discone, or you simply don't like the aesthetics of one, then an wideband aerial such as the slimline WA5000 may be the answer. Specified as covering an outstanding frequency range of 30kHz (yes!) up to 2000MHz, it should even help those without room for the proverbial 'wire slung down the garden' for HF reception.

The WA5000 aerial comes in a narrow fibreglass encapsulated tube, just 1.3m in overall length, the lower metal tube section mounting onto a vertical pole of up to 60mm diameter again using a pair of supplied clamps.

HF Preamp

A MOS power FET is used inside the base to provide amplification over the HF range of 30kHz to 30MHz, to make better use of the aerial's short length, wavelength-wise, over this range. The specifications state a 3dB maximum gain up to 30MHz, with a 0dB maximum gain over 30MHz-2000MHz, although no reference measurement is given for these. An interface unit is used in line with the coax at your scanner receiver end, to provide the DC supply for the preamp through the coax feeder. This needs 12V at 100mA which comes from a supplied AC plug-in wall adaptor to make life easy. AOR must certainly like making things simple for users, as again they supply a 15m length of terminated coax cable, ready for you to plug into the interface, a short coax lead from the interface being terminated in a BNC plug to fit your scanner.

In Use

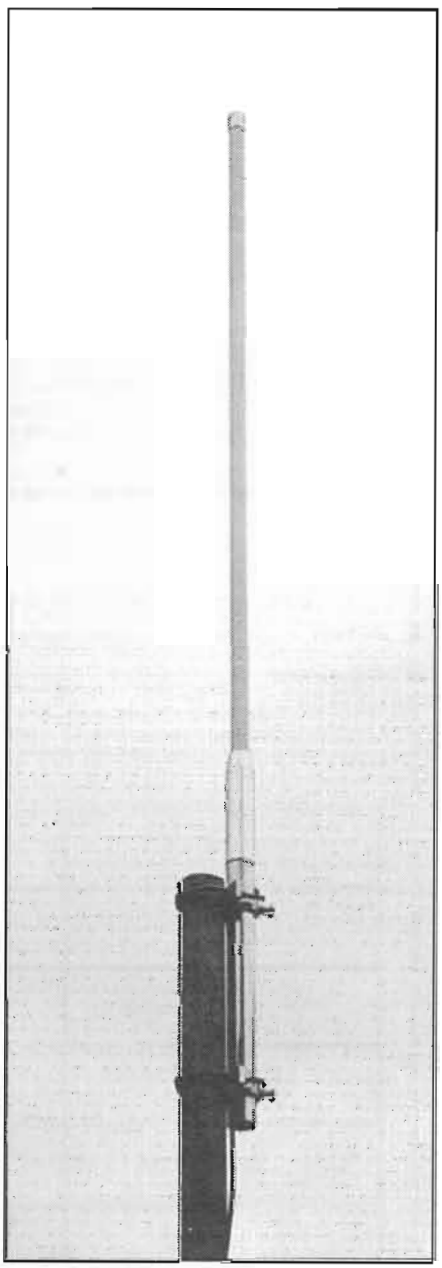
At first, the thoughts of an amplified wideband aerial caused me to shudder somewhat, my location being in close proximity to a number of other HF, VHF, and UHF transmitter sources. But I needn't have worried too much, because the preamp was only active on the HF range, a switch on the interface unit removing power to this when it's not needed. On the VHF/UHF bands, as I expected it didn't of course perform quite as well as my dedicated high gain 2m/70cm vertical, but the WA5000 certainly worked a lot better than this did on the HF bands!

I did find a few problems caused by overloading on HF, however changing from a scanner to a purpose-designed amateur HF receiver cured this, showing the limitation was at the receiver end rather than with the WA5000 aerial system. As a final assurance, my adjacent HF transmitter dipole (around 10m away) with 100W fed to it didn't seem to manage to blow the WA5000 aerial-mounted HF preamp up, so it *must* be bomb-proof!

Conclusions — WA5000

An incredibly wide bandwidth out of such a small, and very neat-looking, aerial is the result here. The aerial is, undeniably, a compromise as it must be, but I feel it is a good compromise. If you can't get dedicated aerials up and you're stuck with needing a 'discreet' solution for receive, something like the WA5000 is worth considering.

The DA3000 is currently priced at £69.00 plus £5 post, the WA5000 at £150 plus £5 post, and my thanks go to AOR (UK) for the loan of the review aerial systems.



The WA5000 30kHz-2000MHz active aerial

QRP CORNER

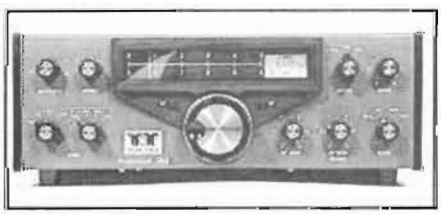
Dick Pascoe G0BPS starts his examination of QRP rigs, and tells of a unique way of getting tower planning permission!

Of the many questions asked of me about low power operations, the most common one is that of 'What equipment to buy?'. Recently in this column I gave a very brief list of the commercial low power radios available on the market, so perhaps now is the time to look a little more closely at some of these.

Over the next few months I'll select one of the commercial QRP radios, giving a brief outline. I won't be giving measured technical performance figures for these, that's more in the line of Chris G4HCL! For this month I've selected one of my own favourites, the Ten-Tec Argonaut 515, indeed the photo shows my personal set.

The Ten-Tec Argonaut 515

This has been in circulation for many years and is still sought after by enthusiasts. This may seem very strange to the uninitiated as it has none of those wonderful applications found on modern offerings from the major companies. The 515 has an analogue readout, not a digital display, which may seem very 'old hat' but it was the way radios were made for many years where the cost of an analogue display was very little compared to a digital one. This radio has only the pre-WARC bands less 160m but it does have all of the 10m band.



If we take a brief 'walk' around the front panel we see a matt black case with the main tuning dial in the centre. Above the tuning dial is the analogue readout split into two, the upper reads 0 to 500kHz, the lower range (only used on 10m) reading 500kHz to the 1MHz position. Five knobs line the lower half of the radio. On the left is the main band switch. This switch is where you may find one source of problems, as this knob is connected to a long rod which rotates several switches. The action is course and rather 'clunky', the twist in the rod does not add to the feel of this switch.

When you select the 10m band, the next switch in line selects the four sections of the band, the usual four 500kHz segments. This switch has a clean movement and is without problems.

To the right of the main tuning dial we have the RF gain selector, next to this the AF gain pot which also acts as the power switch to switch on the radio, *In* being *On, Out* being *Off.*

The bandswitch offers SSB, both normal (LSB when on 40m and under, USB when above) and the provision of a reverse to the norm. A 'lock' position puts the radio into transmit.

After selecting the operation band, the radio must be peaked on receive. This is done by the top left control, the resonator which the book says 'permeability tunes the receiver'. Next in line is the offset control, also known as a clarifier. To the right of the main dial is the meter, acting either as an 'S' meter or an SWR indicator, a switch to the right of this selects either function. The nominal transmitter power is quoted as 5 watts input, this is controlled by the last of the controls at the top right.

The rear panel has aerial, microphone, key and power sockets and also a switch for the internal light. The front has a clean uncluttered look about it, without any bells, whistles or any other 'attractive' feature detracting from a very functional, easy to use transceiver.

Insides

The inside of the case is also uncluttered. In most modern radios you would be hard pushed to find room for the proverbial pin, in the 515 you almost have room to have a party! The internal speaker is OKish but an external one certainly will be a benefit. The amount of modifications published for any radio of this type gives an indication of its performance, there are very many modifications published for the HW7/8/9 series of rigs but suffice it to say that very few have appeared for the 515.

For the technically minded, the handbook gives the following information;

Sensitivity, less than 0.35uV for 10dB S+N/N,
Selectivity, 2.4kHz at 6dB down.
Audio output, 1 watt at 8Ohms.
Spurious response, more than 50dB down.
RF Output power, at least 2 watts into 50 Ohm,
SSB, Normal & Reverse (LSB & USB)
CW, with 'instant break-in

You will gather from this that I like the 515. I love this little radio and take a delight in operating it. I do however have some pet hates about it, i.e., I detest having to reach behind the rig to plug in the microphone and the earphones. I wish that manufacturers would put all facilities on the front of the radio, the only ones required at the rear should be the power and aerial sockets. Am I the only user that wants to change my earphones or my Morse key at times?

Here in the UK, these rigs, although quite old by many standards, do hold their price very well. The basic Argonaut 515 sold by KW appears in their March 1983 catalogue at a massive £350. But these are still so well thought of that they currently attract about the £300 mark when they (rarely) appear in the 'for sale' columns.

For the genuine QRP enthusiast this radio offers a fairly good entry into the commercial side of the QRP market. There *are* others now available with more of those bells and whistles, but I will stick to my old 515 and be happy!

From the Mailbag

Wyn GW8AWT has been in touch to say that several of the keen CB operators in his locality have 'seen the light' and are presently studying for the Novice test. Love it or hate it, this new legislation is certainly getting more new blood into the hobby and at QRP levels.

Readers may remember my earlier comments about aerials. Not all of us are able to erect a 20m tower with a full size triband beam atop it. My planning application for the tower was refused some years ago. I found that the old adage 'if you can't beat them' etc. works. I was elected to the local council and now am a member of the local planning committee. Now, does anyone have a spare 33m tower?

That's it for this month, news and views to me via HRT editorial, via GB7SEK or to 3 Limes Road Folkestone. 72....

From My Notebook

Geoff Arnold G3GSR gives friendly advice on the importance of polarity

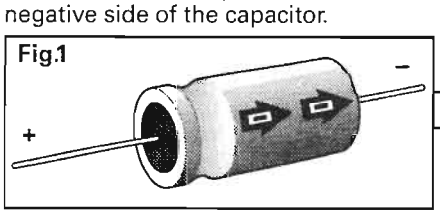
'Fit the components to the board, taking care to observe correct polarity where appropriate' — a throw-away comment along these lines crops up in most books and magazines featuring home- construction radio and electronic projects. No problem for the old hand, but it can leave the newcomer to construction somewhat befuddled. Which are the components it applies to, and how do we know what the correct polarity is?

Capacitors

Aluminium electrolytic capacitors (I'll just call them electros for short) are the first candidate. The larger ones come in cans with the connections made by means of tags or screw terminals fitted to an insulating panel at one end. The connections are usually marked with a colour code, red for positive and black for negative, or if it's a multi-section electrolytic (two or more capacitors within one can with their negative ends strapped together) the positive terminals of the extra sections will be marked with other identifying colours such as yellow or blue, and there will be a list printed on the side of the can to tell you which one is which. The big high-ripple-rating 'computer-grade' electros with screw terminals are sometimes marked with a cross for positive and a dash for negative.

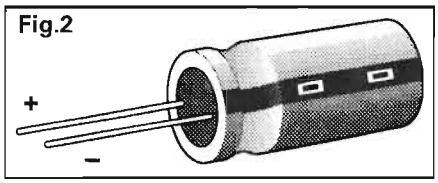
These big electros invariably have their can connected to the negative side of the capacitor, even though there's a negative terminal provided too. Some are made with extra tags or pins allowing mechanical fixing to a PCB, but they are mostly intended to be fixed in place by means of metal clips clamped around the can. Nowadays, virtually all electros have a plastic insulating sleeve on the can, so the clip is isolated from the negative terminal, but it was not always so, and sometimes special arrangements of insulated mounting brackets and the like had to be fitted if a capacitor was used in a circuit where its negative side was not at chassis potential.

Smaller electros have wire connections, rather than tags or screws, and come in one of two forms. First, there are 'Axial' electrolytics (Figure 1), so called because they have their connections at each end, on the axis of their cylindrical shape. You do come across some which have insulating panels at both ends, in which case they are usually colour coded red and black to indicate polarity. More commonly, the aluminium can is closed at one end, and the negative lead simply emerges through that end of the can, or is sometimes riveted to it, however the can is always connected to the negative side of the capacitor.



If the can is closed at one end, that end always carries the negative connection. The other end is the positive, but the insulating panel through which the positive wire emerges may be coloured red or black, seemingly at the whim of the manufacturer. Don't be misled by the colour! The manufacturer marks the capacitor's insulating sleeve to indicate the polarity, usually by means of broad arrow symbols containing a dash, pointing towards the negative end of the capacitor. Alternatively you may come across one with a black ring around the can at the negative end, or a row of 'plus' signs at the positive end.

The other form for small electros is the 'Radial' type (Figure 2). These always



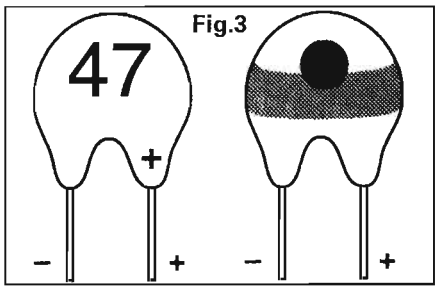
have the can closed at one end, with the connecting wires emerging from the insulating panel at the other end, and arranged across the radius of the cylindrical shape - hence the name. Radial electrolytics are also sometimes called 'PCB-mounting', as they are ideal for mounting on end with their leads straight through the PCB, with the body hard up against the board. That way they will withstand vibration, and also take up a minimum amount of board space.

The favourite method for polarity marking here seems to be a broad band containing a row of dashes, on the side of the can nearest the negative lead. Sometimes, a second band containing a row of crosses appears on the side nearest the positive lead - real 'belts and braces' stuff, this! Occasionally, you'll find just one or two crosses on the side of the can nearest the positive lead.

There are, of course, unpolarised electrolytics, though they are not too common in radio equipment. An ordinary polarised electro connected the 'wrong way round' will pass a very large current, generating enormous internal pressure which will blow the end out of the capacitor. The results, should you be standing in the way, can be highly dangerous. Unpolarised electros are basically two capacitors connected 'back to back' within a single can, so that the one which is the wrong way round is protected from excess current by the other, producing a component that provides a large capacitance in a small volume, yet can safely be used in an AC circuit.

The Tantalum

Another variety of electrolytic capacitor is the tantalum. For the common 'bead' type, there are two methods of indicating which is the positive lead (Figure 3). First, for the variety in which



the capacitance value, etc., is marked by coloured bands and a 'blob', when you look at the side which carries the blob the positive lead is on the right-hand side. Rather difficult if you're one of those people who can never tell their left from their right! Much simpler is the method used for the type where the value is actually printed on the capacitor. In that case, a plus sign appears next to the positive lead.

Before finishing with capacitors, it's worth mentioning those non-polarised types which nevertheless bear markings that appear to indicate polarity. These are wound-foil types ranging from polystyrene to the old paper tubular type. Because the two layers of foil and the intervening dielectrics are wound in a spiral, one of the layers of metal foil obviously finishes up surrounding the other. By connecting the capacitor so that this so-called 'outer foil' is towards the earthy side of the circuit, the inner layer of foil is screened against external electric fields such as hum or noise.

How is the outer foil marked? For polystyrene capacitors, it's normally identified by a red band at the outer foil end, sometimes by a red colouring for the 'bung' through which that lead emerges. For other wound-foil capacitors, a black band is commonly printed around the capacitor body at the outer foil end.

Resistors

No, I'm not trying to tell you that resistors are polarised. The way you fit them to a PCB can, though, greatly affect its final appearance. You do want to be proud of your latest constructional project, don't you?

Not only does it look far more professional, but it also makes the resistance values far easier to read in any subsequent fault-finding if the resistors are all fitted with the ends carrying the coloured bands towards the same edge of the board. All horizontally mounted resistors with their banded ends towards the left-hand edge of the PCB and all vertically mounted resistors with banded ends towards the top of the PCB, for example. For resistors mounted on end, with one short leg and one long leg, fit them so that the bands are at the end furthest from the board, where they will be much easier to see and read.

It makes no difference to the operation of the circuit, but it does make a world of difference to the appearance of the unit.

Semiconductors

Small diodes, whether of the signal, rectifying or Zener variety, come in tubular packages with the cathode end identified by some form of mark — either a ring of paint in a colour which (hopefully) contrasts with the body of the diode, or alternatively the end of the body may be rounded or chamfered off (Figure 4).

The next larger size of diodes comes in what was known as a 'top-hat' encapsulation, where the flange (the 'rim' of the top hat) is the cathode end. Looking at current catalogues, this is a shape which doesn't seem to be in vogue any more.

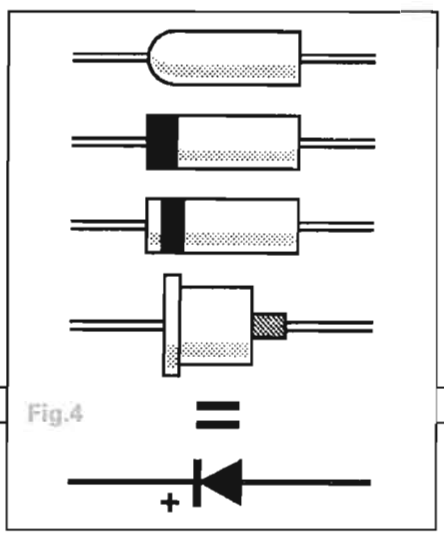


Fig.4

For larger currents still, we move into the realm of stud- mounted diodes, where the threaded stud allows the device to be bolted to a heatsink for increased cooling. At one time it was the convention that the stud would normally be the cathode connection, though reverse-polarity, stud-anode versions were available of some diodes. These reverse-polarity diodes were identified by the addition of the suffix letter 'R' to the type number. Now, a wider range of stud-anode types are available, but look for the diode circuit symbol printed on the body, which should answer any query about polarity when you actually have the component in your hand. Incidentally, stud-mounted thyristors or silicon controlled rectifiers (SCRs) are normally stud-anode. For the connection polarity of tab-mounted diodes and SCRs, you will need to refer to the supplier's or manufacturer's literature.

Which way round is the right way round for a diode? If you have the circuit diagram, that will give the answer, for in the diode circuit symbol, the cathode is the end with the 'bar', and the anode is the end with the arrow-head.

The cathode of a diode is often marked on the circuit diagram with a plus-sign, which ties up with its use as a rectifier, for this is the side that would develop a positive voltage on it. Because a cathode is defined in dictionaries, etc., as the negative electrode, this fact is guaranteed to mystify and frustrate the newcomer. However, the dictionary definition does agree with the fact that if you want a diode to normally be in conduction in a DC circuit, you connect it up with its anode towards the positive side of the supply and its cathode towards the negative.

Where a transistor is used to drive a relay, with the coil connected in the collector circuit (Figure 5), it is common to connect a diode across the relay coil to damp the inductive 'back- swing' voltage generated when the circuit is switched. This back- swing can often reach ten times the supply voltage, and is likely to destroy the transistor. In this case, we want the diode to be normally non-conducting (otherwise it would short circuit the relay coil), so it is connected with its cathode towards the positive collector supply rail in the case of an NPN transistor, or anode towards the collector supply rail for a PNP transistor.

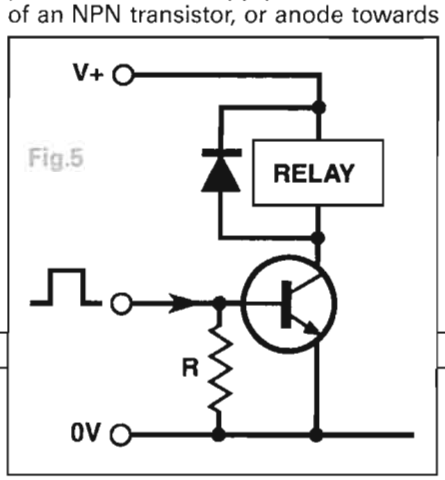


Fig.5

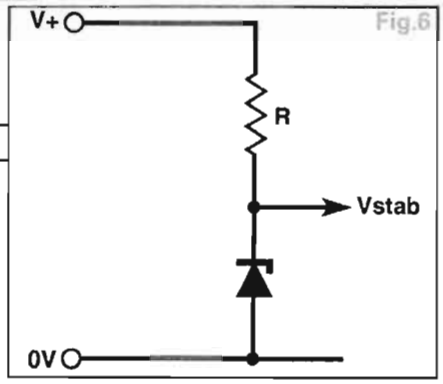


Fig.6

In a way, the Zener or voltage regulator diode is used in a similar fashion, as it too is connected into circuit with the cathode towards the positive supply rail and the anode towards the negative (Figure 6). Here, though, the diode is manufactured so that its insulation will break down at some chosen voltage, and a more-or-less fixed voltage (the regulated voltage) will then exist across it for a substantial range of currents through it. Voltage regulator diodes come in similar encapsulations to conventional diodes, and are marked for polarity in the same way.

Yet another diode which operates with a reverse bias across it is the Varicap, the variable capacitance or tuning diode. The cathode and anode act as the two plates of a capacitor, with the 'depletion layer' produced by the reverse bias forming the dielectric between them. As the bias level increases, the depletion layer forming the dielectric gets wider, effectively forcing the 'plates' further apart and so reducing the capacitance between them.

Finally in the diode range, the light-emitting diode. This operates with forward bias, applied via a current-limiting series resistor (Figure 7). Connecting an LED into circuit the wrong way round stands a very good chance of ruining it, as the reverse breakdown voltage is only a few volts.

The common-or-garden tubular LED generally has its polarity identified in one of two ways, sometimes the two methods are combined (belts and braces again!). The first method is to have a 'flat' or a notch on the side of the body next to the cathode lead, the second is to make the leads of different lengths. In the early days of LEDs, this wasn't standard, and beware that LEDs in fancy panel mountings with bezels and screw-fixings, rather than the standard plastic lump, may come with the anode lead the shorter of the two.

But what about transistors and integrated circuits? Perhaps it's a topic for another month.....

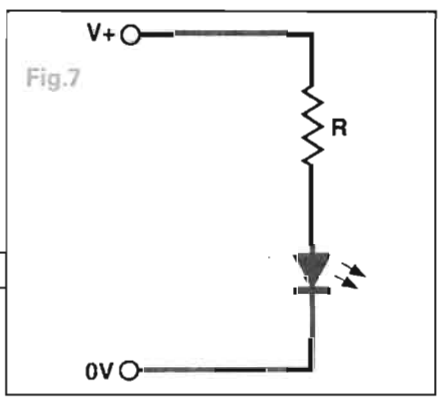
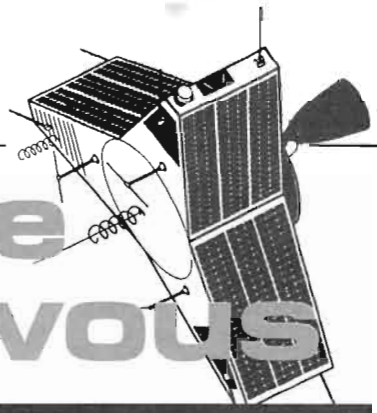
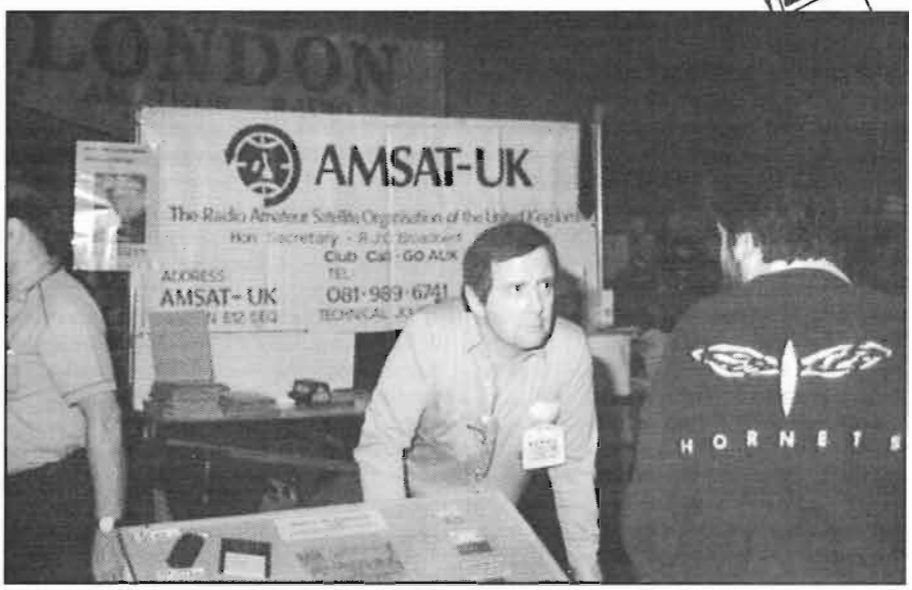


Fig.7

Satellite Rendezvous



AMSAT-UK News from the University of Surrey, Moscow, the USA, and even direct from the Mir Cosmonauts, compiled by Richard G3RWL



The HRT Tech Ed captured this one of G3RWL offering advice at the AMSAT-UK stand at London

UO-22

Following last month's news of UO-14/UO-22, the UO-14 file server was disabled on February 5th, and UO-14's amateur downlink was turned off.

Please remember that the downlink of UO-22 is its 'general beacon'. Messages on the downlink indicate what state the satellite is in, and what operations you can expect to succeed at. Jeff G0/K8KA says he hopes the rapid switch-over didn't inconvenience too many users with messages getting trapped on UO- 14. He adds that the switch to UO-22 had two important advantages which we should keep in mind:

1) More directory entries; 800 to be exact. This means that messages will have longer lifetimes, and we can consider upping the default lifetime to 7 days for bulletins, while recommending shorter lifetimes for other mail. (A release of PFHADD is required). Of course, unless we fill up to 750 messages the lifetimes will not particularly matter.

2) More uplink channels; Because we are not supporting non- amateur activities on UO-22, we can switch both receivers to AMSAT uplink channels. I would recommend that we try to concentrate uplink activity on what was the old UO-14 uplink, 145.975MHz, and use 145.900MHz for overflow. This reduces interference on 145.900MHz to AO-13 users and the Microsats. Jeff thinks the best way to divide uplink activity is to have broadcast requests and other PB operations on .900 while uploaders are on .975. This would be difficult for automated stations, but if manned stations try to do it, then it will improve performance for everyone.

Jeff is working on new software for PB and PFHADD etc. with 'medium' priority; high priority is reserved for the KITSAT-A mission which is moving into the flight-hardware stage *(this should be launched in the near future and will have a FO-20 type transponder on board — Ed)*.

Do you receive UO-11 bulletins?

If you are receiving UO-11 bulletins, the University of Surrey ask you to please drop them a postcard. They are very interested in hearing from folks using the satellite. If you are using the satellite for educational purposes, please send along what you are doing. They will post information in future UO-11 bulletins concerning arend postcards to Greg Jones G0/WD5IVD, UoSat, Elec Eng., Univ. of Surrey, Guildford, Surrey, GU2 5XH, England.

The UoS is also planning an educational competition. This will be primarily for British schools (since the funding is British sponsored, although some type of international side is being planned. More should be released in an upcoming bulletin as details are formalised.

Louis Varney Cup awarded to Jeff Ward G0/K8KA

A piece of 'late news' is that, at the VHF Convention orch, Jeff G0/K8KA was awarded the Louis Varney Cup for advances in space communication, for his efforts with the UoSat project. Unfortunately Jeff couldn't be there to receive the cup in person — most likely he was burning the midnight oil as usual, working with dedication on the satellites!

Oscar 13

The experimental schedule for this satellite, as detailed last month, is continuing until June 8th. Remember that constructive feedback is always welcomed by the command stations. The current schedule is;

Mode-B	: MA 000 to MA 100	Mode-JL ON Mon, Wed
Mode-JL	: MA 100 to MA 120	Fri and Sat UTC only
Mode-LS	: MA 120 to MA 135	S Beacon on 'L days
Mode-JL	: MA 135 to MA 150	S Transp on 'B' days
Mode-B3	: MA 150 to MA 256	
Omnis	: MA 240 to MA 030	BLON/BLAT 180/0

Up to date information about AO-13 operations is always available on the beacons, 145.812MHz or 435.658MHz in CW, RTTY and 400 bps PSK.

Oscar 10

This is currently availabl for Mode B operation when it is view, but remember *not* to attempt to use it if you hear the beacon or the transponder signals FMing. ALON/ALAT for this are; 9th May ALON 304.8, ALAT 13.4, 6th June ALON 301.7, ALAT 12.8, and 27th June ALON 299.3, ALAT 12.2.

A quiet moment at the stand, from left to right; Ron G3AAJ, Jenny G1LIT, and Fred G6ZRU

New Version Of TLMDC with DOVE Telemetry Processing

Jim White WD0E, a member of the AO-16 Ground Command Team, has released the latest upgrade to the MICROSAT Telemetry Decoding program known as TLMDCII. One of the major changes in this version of TLMDCII (V1.2) is that now it will now process DOVE (DO-17) telemetry as well as that from all the other Microsats. The following are some of the enhancements that WD0E has added:

1) Decodes telemetry live and displays it on screen.
2) Decodes and displays some STATUS line information.
3) Displays some important calculated current values, such as battery charge current. A 'limits' feature to optionally alert you to telemetry parameters out of range.
4) Decodes previously recorded KISS format files and displays on screen.
5) Will optionally save the data to one or all of several file formats as follows: Raw Kiss format (useful for further processing). ASCII format (for DOVE) & WOD only (for WEBERSAT only at present)
6) Print formatted data similar to screen display, which can also be sent directly to a printer in real-time.
7) Spread-sheet formatted with either spaces or tabs as delimiters between data fields. Tab'd files can be read directly into Mac spreadsheets and graphs created very quickly.

If you're interested in this program, please get in touch with Ron G3AAJ at AMSAT-UK.

Mir News

Cosmonauts Alexander Volkov U4MIR and Sergey Krikalev U5MIR continue their amateur radio activity, and Leo UA3CR informs us the Moscow Adventure Club's mailbox RK3KP has a download virtually each day from U5MIR. The PMS on U5MIR is actively used by packet operators around the world, UA3CR for example receives mail from LU, VK, VE, TR through this. Although worldwide packet communication is usually in Latin 'English', Sergey has been writing a program for packet information exchange with Russian cyrillic, which he says he's put together to be useful for other amateurs.

In a downloaded packet message, Alexander says; "Mostly we have connections to hams of USA, Canada, Australia and New Zealand. Europe is always 'noizy' when signal is overscaled, so it's difficult to work with them. Japan is terrible". He adds that he and Sergey have become 'real radio amateurs' having over 1000 VHF contacts, and they both hope to continue their hobby when back on Earth.

Short Bursts

A new version of the 2LIN2KEP program, which converts 2-line to AMSAT format keplers, is available now from the AMSAT-UK office. It's a Zip file containing the same program in both *.EXE* and *GW Basic* versions. You can now select whether to generate AMSAT-NA format checksums in the output, it handles the new NASA checksum format, and you can enter filename and checksumming options from the command line if you wish. Please send enough to cover our costs along with your request.

A report from Russian contacts tells us that a new RS is due to go up in late April. It is a single transponder, but there's no other details as yet.

KB9CML has conducted an experiment in the transmission of medical images via UO-22 in order to determine the effectiveness of using the store-and-forward satellite concept to transmit detailed and accurate images. The source of the image was produced by a portable fluoroscopy unit. This is movable X-ray device that produces real-time images which are viewed on a monitor. An image of a fractured hip that had been repaired with a plate was sent up as a 7k .GIF image and subsequently downloaded and produced a good resolution picture.

This is probably the first time that a medical image has been transmitted via amateur radio satellite. Whether or not this concept has benefit has yet to be determined, however, the experiment *does* prove that the potential to move medical images is real.

AMSAT-UK News

Thanks to the many amateurs who came to see us at the London Show, if we managed to fire your enthusiasm then a date for your diaries is the AMSAT-UK Colloquium, over the long weekend of 30 July to 2nd August. Bookings are required if you want to attend - don't leave it too late. We'll all be there of course, and maybe even the HRT Editor might have her arm twisted to join the HRT Tech Ed who'll be there throughout the event, no doubt propping the bar up each evening. (The HRT stand was just across from the AMSAT-UK stand at London but we couldn't get Richard to have *one* pint, very unusual — mind you we saw Ron quite often! — Ed.)

For further information on AMSAT-UK contact: AMSAT-UK, c/o Ron Broadbent, G3AAJ, 94 Herongate Rd, London, E12 5EQ. Big SAE gets membership info. SWLs are welcome.

Keplers

SAT:	OSCAR 10	UoSat 2	AO-13	UO-14	FO-20	AO-21	UO-22	RS-10/11
EPOC:	92041.17489565	92051.06438812	92041.92866162	92051.73469784	92049.37154911	92050.98137782	92050.22358957	92051.04436446
INCL:	26.1239	97.8668	56.8117	98.6456	99.0635	82.9396	98.5252	82.9223
RAAN:	99.6420	91.5572	43.6336	134.5280	350.1971	50.3928	126.8923	235.6780
ECCN:	0.5953039	0.0013502	0.7284831	0.0010831	0.0540790	0.0034073	0.0007062	0.0010884
ARGP:	318.6621	98.1399	277.6202	155.9520	103.9618	289.8881	304.5277	214.2239
MA:	9.1384	262.1326	12.4454	204.2125	262.2207	69.8600	55.5225	145.8215
MM:	2.05884257	14.68184350	2.09712240	14.29517925	12.83202408	13.74458938	14.36500714	13.72259369
DECY:	-5.7E-07	2.925E-05	6E-08	1.007E-05	2.8E-07	2.06E-06	1.362E-05	1.75E-06
REVN:	3714	42580	2806	10849	9513	5306	3117	23358

SAT:	PACSAT	DO-17	WO-18	LO-19	RS-12/13	Mir
EPOC:	92050.42634933	92050.45938151	92052.10462885	92052.06531987	92046.65692590	92051.24962129
INCL:	98.6537	98.6533	98.6501	98.6532	82.9253	51.6015
RAAN:	133.7444	133.8679	135.5494	135.6068	283.6137	119.8959
ECCN:	0.0010967	0.0011142	0.0012324	0.0012168	0.0029828	0.0013938
ARGP:	157.1135	157.6763	152.6727	153.0714	325.3506	164.1506
MA:	203.0488	202.4887	207.5106	207.1094	34.5698	195.9922
MM:	14.29587046	14.29702779	14.29709793	14.29791763	13.73968766	15.62740328
DECY:	1.019E-05	1.111E-05	9.23E-06	9.59E-06	2.17E-06	5.0095E-04
REVN:	10831	10832	10856	10856	5157	34387

Packet Radio

Roundup

Our resident packet SysOp G4HCL looks at disk-based software to help you on packet radio

This month, I've been busy helping to get a few people going on packet radio, during which I took a detailed look at what was available, software-wise, to help on the mode. A chat with Roland Brade of the shareware distribution company Venus Electronics (see later) revealed a wealth of amateur radio related software, some of which I quickly relieved them of! Here's a couple I found which I believe would be of substantial interest to packet operators;

G6BIF Packet

This has only been released for a few months, yet I've already heard comments of 'the best packet program yet' from more than one packeteer, including a member of the packet trade. It's a packet terminal program for use with a PC clone, and works with many TNCs (but not the PK series) which lack a 'host mode' of operation, giving the advantage of multi-window connections as well as other 'niceties'. It has, of course, been specifically written for packet radio, even providing an automatic log-keeping requirement which appears eminently suitable for UK licence conditions.

The work of Peter Amey G6BIF, the program gives you;

1) Multiple-stream 'windows' within your computer screen, for up to ten separate 'streams' of communication to simplify multi- connections.

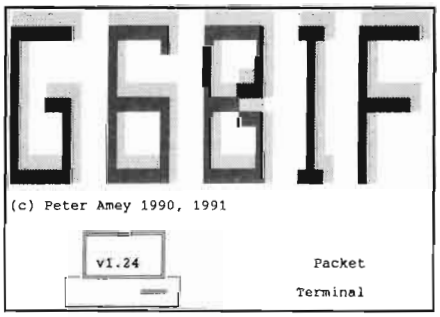
2) Capture of received text to disk file if you so wish, with separate files for each QSO/download.

3) Automatic logbook generation, the program creating a text file on disk with each connection and the times of starting and ending the program.

4) Command files which you may configure, for example, to 'disconnect' if an expected prompt hasn't been received in a given time period.

5) 'Word wrap', so you can just carry on typing without the need to remember to hit a carriage return every so often.

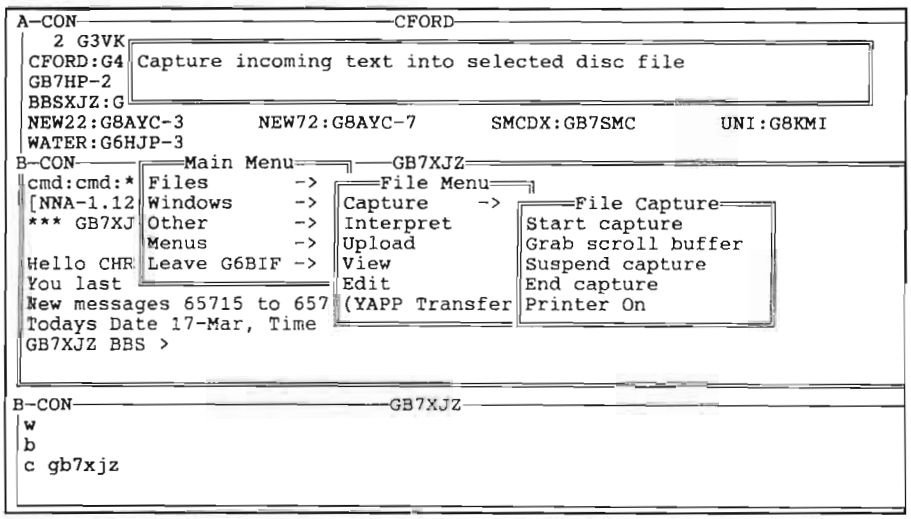
6) A user-programmed list of up to 50 words/callsigns, which are highlighted on your screen as they appear from off-air information.



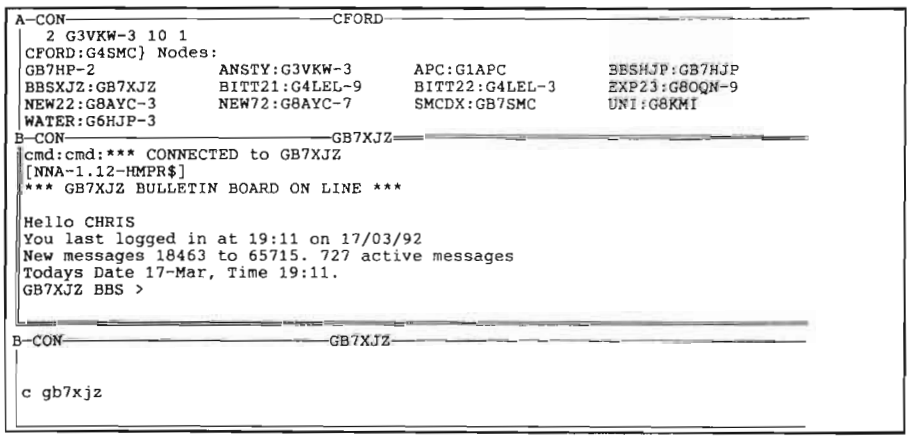
Logbook

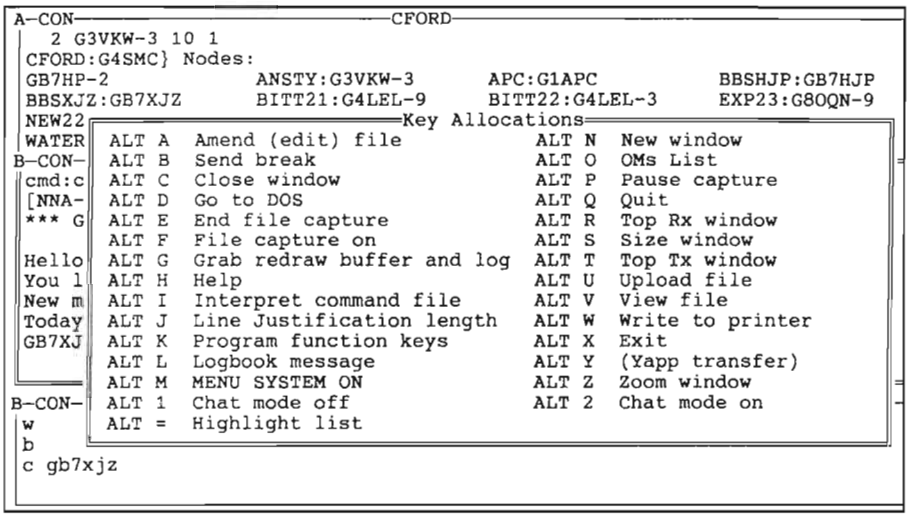
On startup, G6BIF Packet looks for disk drive A: (depending on the setting of your configuration), and writes a default file LOGBOOK.TXT to it with the start and end times/date of each 'connect' you make, together with the time you start and end the program. Storing just this information on a totally separate floppy disk is very useful because if you run the program from, say, your hard disk, you're *not* allowed under UK licence regulations to keep your station log on this. Neither are you, in fact, allowed to keep the log on any packet 'program' disc, the logbook disk must be used solely for that purpose, which the G6BIF program does nicely!

Sub-windows are used for commands, a small 'information' window at the top adds a reminder



Multiple 'stream' windows are used to good effect, here the transmit text is placed in the lower window





A large 'help' screen pops up if you need a memory-jogger of the keys' functions

Windows

As well as the multi-window system you can use, including a dual-window 'chat' system (with separate TX and TX windows — very useful), pressing 'Alt-M' brings a 'pop-up' menu system into view. This uses sub-windows, as you can see from the accompanying example, with each sub-window being controlled by either your computer's cursor keys, or by your mouse if you have one connected and enabled. While you're doing this a further explanatory window tells you what's going on, and if you get totally stuck then a large 'help' window also pops up if you enter 'Alt-H', reminding you of what all the keys do!

To start with, G6BIF is configured for use with ordinary monochrome monitors (like my humble packet computer system uses), however with a 'merge' of a couple of the stored configuration files you can set the program to virtually any colour configuration you like. With the program running, the multi- stream windows can easily be 'sized' to your needs. For example, I normally used a small top window to monitor activity whilst connected to my local PacketCluster, with the larger middle window for BBS or general QSO use, a small lower window being used for my transmit text. Quickly adding and then removing another window was very easy if I wanted to quickly call, or answer, someone else.

I found the 'highlight' feature useful for BBS use, so that when the large number of message listing scrolled past the program would automatically highlight what I had asked it to do, i.e. 'PMR', 'SYSOP', 'NODES', 'PROGRAM' and so on. A 'quick connect' facility also allowed me to issue a one-line connect to given stations automatically without needing to remember their particular SSIDs, digipeater path and the like, (i.e. connect to 'BBS', or 'CLUSTER', or 'Keith' etc.), although this couldn't take onward connections via. nodes etc. into account which I had to do manually.

Best of all, G6BIF Packet is a shareware program, with a very nominal registration fee of £8, plus £3 for nicely printed documentation accompanying that on the G6BIF.DOC disk text file. With this, I'm sure Peter's not going to get very rich, and I believe the program is well worth it. The 'shareware' system lets you try a program out for a few weeks to see how you like it, even freely distribute it to your friends if you like, and register your copy if you'd like to subsequently use it. With G6BIF Packet this gives you ongoing support for the program, the author can be contacted at GM6BIF@GB7CQV, or by phone on 0334 838007 between 7.00pm and 9.00pm weekday evenings for help.

WB9LOZ Packet Radio Tutorial

Larry Kenny WB9LOZ must have been hard at work putting this together. It's a complete guide-to-packet 'on disk' in an 18 part text file series, which he's released into the 'public domain', i.e., freely copyable with no seek of recompense by the author. Because it's on disk, you can load it into your computer and read it at your leisure 'on screen' using a listing utility, or of course print the whole lot out! By using a suitable text search facility in your utility program you can usefully get your computer to quickly look for a references to, say, a given text or command.

In his 18 'chapters', Larry starts off with an introduction to what packet is about, what you need in terms of a TNC and so on, RS-232 connections etc. The text goes on to show how to make your first 'connection', use digipeaters, nodes (including BPQ nodes), and a BBS with reference to the W0RLI system. But if you're thinking the text is only aimed at beginners, you'd be wrong, because Larry continues with an easy-to-understand description of matters such as hierarchical forwarding addresses and the like, plus many of those TNC commands you never felt the need to know about, all of interest to existing packet users who'd like to know a bit more. Although some of the references are limited to USA usage, i.e. what 2m frequencies to look for packet on and that many of their nodes have the 'digipeat' facility enabled which UK nodes don't, the vast majority of the information is very relevant to international usage. I found it very useful reading, and I'd recommend it as an easy introduction to the mode.

Shareware Source

The latest document addition to my shack has been the Venus Electronics shareware catalogue. To be fair, this has nowhere near the comprehensive selection of general programs as one or two of the 'major' shareware libraries have. But it *does* have, to the best of my knowledge, one of the *largest* selections of amateur radio related public domain and shareware that I've come across! The proprietor is a licensed amateur, and he points out that he's always looking for shareware program writers. Rally- goers will no doubt have seen his stand at the amateur radio exhibitions. Their disks are currently priced at £2.35 each, £2.10 for 11+, and they're members of the Association of Shareware Professionals and are approved vendors of this organisation, to ensure 'fair play' for all. You can contact Venus Electronics at 26 Penvensey Way, Frimley Green, Camberley, Surrey. GU16 5YJ, Tel/Fax 0252 837860, and my thanks go to them for the supply of the titles reviewed here.

A reminder that you'll be seeing plenty of amateur software reviewed in future issues of HRT, the Editor's already got Don G3XTT as well as myself working away at our computers trying out plenty of disks worth!

CTRL-Z, End of Message

Next month I hope to provide an idea of the on-air performance of the new Baycom plug-in PC-based TNC (I thought I'd give Baycom a rest this issue after last month's momentous feature!), and following a meeting with Tim G4WIM I also hope to be taking a look at his new build-it-yourself 23cm transceiver kit in a future issue, which I'm sure will be of interest to budding SysOps.

Until then, it's 73 from Chris G4HCL @ GB7XJZ

VHF/UHF Message

Geoff Brown GJ4ICD, takes a look at the forthcoming Sporadic E season

The *Es* season as it is known will soon be upon us, and with a little advice on operating, especially on the 50MHz band, you should work some spectacular DX.

Sporadic E

Many propagation experts believe that as we approach the bottom of cycle 22, sporadic 'E' will increase. This mode of propagation will be the workhorse for 50MHz, as F2 will slowly die out. But don't be caught out, as during the past cycle minimum, A22 (Botswana) was worked in the UK including up in GM! With this point in mind we should see an increase of 144MHz 'Es' as during the past years, especially around the peak of cycle 22, there were very few large 'Es' openings on 2m, let's hope we are right.

Band Plans

Most readers, if not all, will know that band plans exist on the VHF/UHF bands. These band plans are set out for many good reasons, the particular band plan on 50MHz always causes problems during the 'Es' season. 50.110MHz is set out as the inter- continental calling frequency, this means that QSOs within your own continent should not take place on this frequency. Many operators of 50MHz mistake the word 'continental' so to clarify this situation, it means continent and not continental Europe.

A typical example heard was a station in Malta calling CQ DX on 50.110MHz, being answered via. Sporadic E by a Class A UK station, who then went on to have a ragchew with him. Underneath their QSO was FR5EL on Reunion Island in the Indian Ocean calling CQ DX. Due to the existing QSO, FR5EL was lost by many, so, if you hear a European calling CQ on 50.110MHz and you would like to work him, then simply call him and ask him to QSY up the band somewhere. Maybe he or you cannot hear real DX but somebody may be able to, as Transequatorial propagation may extend from say South Africa to the southern shores of France, then may be extended via 'Es' to say GM skipping over southern England.

Australian openings again on 'six', could this be the end?

As reported in 'late news' last month, a very big surprise came on the 8th February. Firstly, I heard JAs in the small hours, they were JR6s on Okinawa I think. From 0900 the band was alive with 4X1IF into the UK at S9++, at 1000 weak VK2/3s were heard. Then it happened, at 1100 VK5BC (QF05) was 599++ with half the UK calling him. VK3OT was heard in southern England, Ela G6HKM worked VK6SQ in Perth, and also VK5KK (PF95) for her first VK5. KG6UH/DU1 was S9+ from Manilla, and VK8ZLX in Alice Springs was trying to destroy my 'S' meter. KG6DX on the Island of Guam in the Pacific was pounding into Lancashire, and for the next 90 mins VK6s were blasting central and northern England. After the excitement of the morning there was a good Aurora, Ela G6HKM worked lots LAs, SMs, and other Europeans. During the morning there had been a disturbance on the sun, this destroyed hopes of a repeat on the following day, in fact the 1500 'K' that day was measured as 7, the 'A' being 45, which tells us something nasty up there had happened.

Steve VK3OT faxed me his log for the 8th and said "the best day yet", he worked 44 Europeans in F, DL, OH, OZ, SM, PA, LX, OK. He also reported that VK8ZLX (Alice Springs) worked I, YU, OK, and OE, Steve had to cut things short as he was causing TVI.

News from Neil G0JHC (Lancs), was that VK6RO called him for an FM test on six, after a quick QSY VK6RO was 60dB over S9! Neil was 40dB over S9, for what is believed to be the first FM QSO on 50MHz between VK and G, well done lads.

News from Chris G3WOS (Hants) on the opening of the 8th, was that he worked the pile ups of VK6s but also worked VK5KK in PF95 at strength 7 on SSB. At the same time as this VK opening was going on, KP4BZ and HI8A in the Caribbean were also into the UK, Chris said "I didn't know which way to turn the beam".

Sure enough the 9th was bad as we had expected, the 'A' index was up to 45, and on the 10th it was up to 46. The band recovered by the 11th, the 'A' index was down to 17 and we had action again. Neville G3RFS alerted the warning chain on 80m (3.718MHz) to tell us that VK3AMZ was in at reasonable strength at 0815. G3WOS had lots of JAs in mid morning, along with VK6, and DU. Neil G0JHC worked his first VK4 for a new call area and square. Later in the day the band opened in the other direction towards W1/2/3/4/8 and VE1/2/3.

On the 12th VK8ZLX (PG66) came pounding into GJ, ZL TV on 45.250MHz was also heard at S3, and in the afternoon there was a very extensive UK opening to W1/2/3/4 and VE1/2/3. George GD3AHV reported an opening at 1330 to 5V7JG in Togo, which was going over most people's heads in the UK. The 13th was not very good, however JR6WPT was reported by many at the very late time of 1440. On Valentine's Day JA, VK6 and W/VE were worked around Britain, I tried G0JHC's trick in the morning and worked VK6PA (OG89) on FM at S9+. N5JHV in New Mexico was also heard at 1745.

The next few days brought odd selected openings between the UK and JA, KG6, VK4, 4X, UL7, TU, and PY0, then without warning conditions became disturbed. Between the 19th and 22nd things got quite bumpy solar wise, the 'A' index had risen to 64 and 'K' figures were up to 4. This is usually the time to book your holidays *away from the radio,* as conditions are usually pretty poor unless you want to work Aurora. True to form, a large Aurora took place on the 20th and again Ela G6HKM was in on the action with DL, EI, G, GI, GM, GW, ON, PA0, OZ, and finally SM! However, just to prove we know very little about 50MHz propagation, just read on!

Most amateurs who watch the flux, 'A' and 'K' values, take it for granted that when high levels of geomagnetic activity take place, no propagation is feasible at 50MHz. Well the 22nd proved this one wrong. The 'A' index was reported as being 62 (storm conditions), and the early morning 'K' was reported as 4. However, at 0835 when I switched the radio on, the beacon FR5SIX on Reunion Island on 50.0225MHz was end-stopping. I made several long calls on 50.110MHz and at last worked FR5EL at S9++. The UK warning net was alerted along with a packet warning, FR5EL was nicely into the UK. So the southerly path was open, then UL7GCC reported working JAs, and half an hour later appeared at S9 into most of the UK, followed by reports of ZS6s and 7Q7.

George GD3AHV worked Ralph 4X1IF, and ten minutes later VK6PA came into Europe. Ela G6HKM at last snatched 4X1IF for a new one, and PY0FF and PT7NK were into the south coast. Short TEP brought 5V7JG in at S9+, then more Caribbean stations were heard and worked such as KP4BZ, 9Y4VU, PJ9EE.

Chris GM3WOJ reported 5V7JG in at S9+, 4X1IF heard KP2A, KP4BZ worked Siggy YO2IS in Romania. Others heard during the day were HI8A, A22BW, ZS6WB, PT7BZ, PT7CB, TR8CA, the V51 and ZD8 beacons and ZD8LII. So you see, disturbed conditions do not always mean no propagation.

The 23rd brought similar conditions, even *I* got in on the act, working VK, JA, 5V, PA0, PY0, and KP4 within a time span of 28 mins, yes WAC. G4CVI worked lots of JAs, and a good spread of DX was heard around the UK. These past two days were probably the best so far in the declining (!) cycle 22. I'm now wondering what March will bring?

CQ Contest

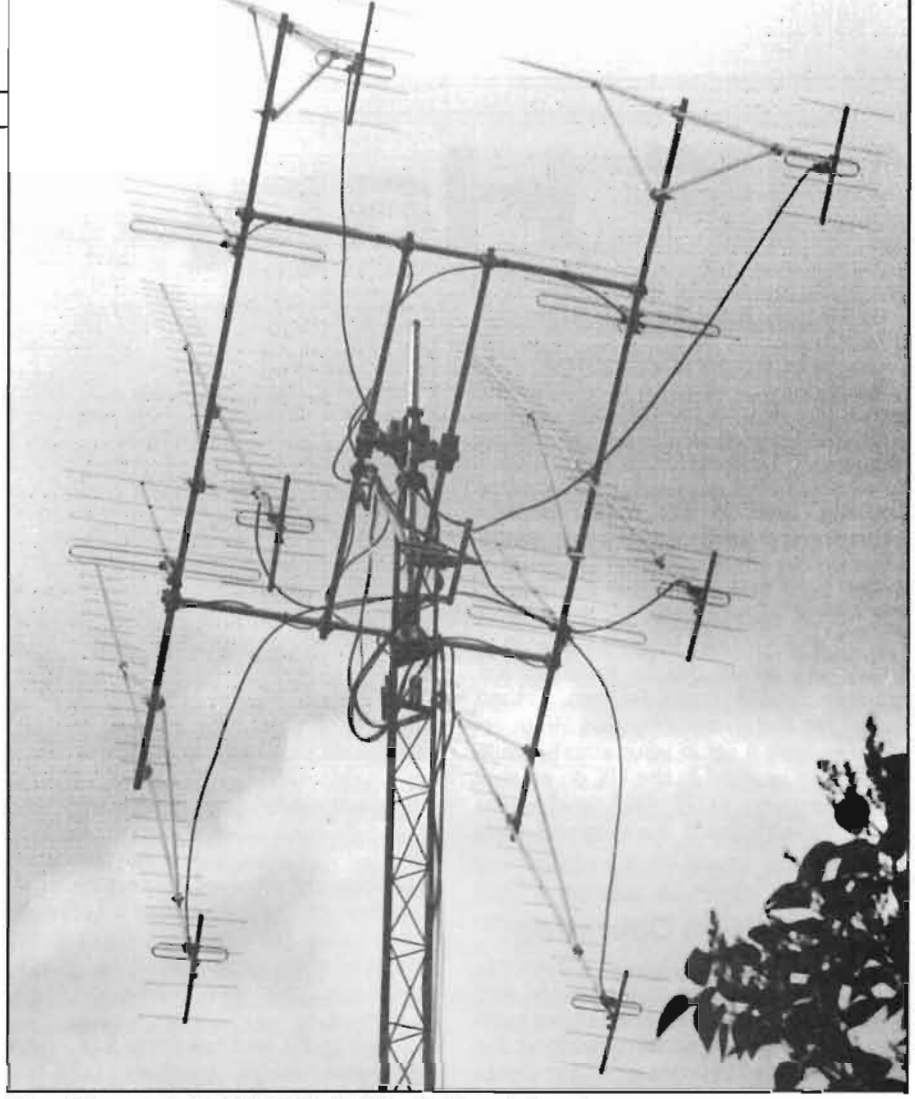
To take advantage of the summer sporadic E on 6m, and the resulting high level of activity, the UK Six Metre Group is to hold it's second summer sporadic E contest on June 6th 1992. The contest is open to all users of 6m no matter whether you are a member or not. If you aren't a member, then maybe you would like to join? If so, contact Mr. C. Gare G3WOS, Old White Lodge, 183 Sycamore Rd, Farnborough, Hants. GU14 6RF.

There are three UK sections in the contest;

1) Single operator fixed stations,
2) SWL section, and
3) All others including portable and multi-op.

There is also one section for Europe, and one for the rest of the world. The contest occurs between 0000 and 2400 UTC on the 6th June, a full 24 hours. It covers two-way QSOs on 6m and cross-band QSOs with countries without 6m allocations, only one contact with each station is allowed. All licence conditions must be observed, and QSOs within your own continent must be outside the DX window of 50.110 to 50.130MHz. Callsign, RST, and membership number (if you have one) and Maidenhead locator (just four digits) are required. Serial numbers are not required.

One point per contact, plus one additional point if it is with a UKSMG member, multiplied by the number of countries, plus locator squares. One contact can count as both a country and square multiplier. Any reasonably written log will be accepted, as long as it is clearly written and includes the required exchange information. Official log sheets are recommended and are available from GW8ZCP (large SAE please). The G8VR cup will be awarded to the overall winner of the UK section, and a goblet will be awarded to the overall winner of the rest of the world section. Certificates will be awarded to all section winners and runners up. Logs must be received post dated no later than July 8th 1992 to; Mrs. M. Wright GW8ZCP, 6 Cwm Eithin, Wrexham, Clwyd, LL12 8JY, UK.



The ultimate in VHF DX? DL6WU's EME aerial system

DXpedition News

Several French amateurs are trying very hard to obtain a permit for 50MHz in Andorra, if they are successful this will be the first legal operation from this rare country. Plans are being made for June or July. Spain and Poland should be also be active on six by mid June of this year, more details later.

144MHz gone a little quiet!

Last month's reports on 2m and 70cm were full of nice exotic DX, but sadly the high pressure systems that brought such good conditions didn't repeat themselves to any large degree in February. There were one or two reports of EA being heard and worked, but these were mainly from the south of England. Ela G6HKM had a QSO with EA1TJ (IN83) but lost EA1KC (IN73) as he went QRT! A weak Aurora was reported on the 9th, and a much better Aurora on the 20th. Ela's catch then included GM7JED (IO68), GM0HSU (IO68), GM7IKA (IO86), EI3GE (IO63) and G1AWP (IO95). There were some good high pressure systems around which did produce a few selective openings, mainly over the sea paths.

23 on 23!

Once again Ela G6HKM reports on activity on 23cm. On the 31st Jan Ela had 23 QSOs on 23cm with stations in JO30, 31, 32, 33, 41, 43, 65, and IO80, the station in JO41 being square number 54. Ela also heard SM7ECM but he had to go QRT for his evening meal. On 1st Feb Ela worked PE1MII who was using just 100mW!

Well that concludes another month of activity, I'm sorry for the heavy 50MHz reports but conditions have never been better, as your mail states. I've got together a short QSL list (thanks to the UKSMG) as requested by many of you in the mailbags. However I am unable to reply to all requests for QSL information unless you enclose an IRC, not a UK stamp as these are invalid in GD, GU, and GJ, this also goes for direct QSLs to the above countries.

My thanks to all contributors this month, who are too many to list, send your reports please to GJ4ICD, TV Shop, Belmont Rd, St Helier, Jersey JE2 4SA, Tel. 0534 77067 switched to fax after 6.00pm.