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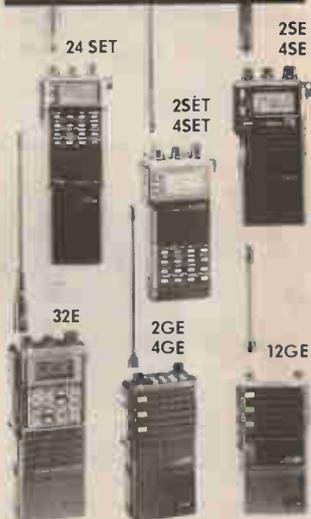
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# REVIEW: Jupiter 2 Handheld scanner

The Jupiter II is a wideband monitor receiver covering 25MHz to 550MHz, and 800MHz to 1300MHz, with selectable FM and AM modes of reception. As such, at the time of writing it is the handheld scanner with the widest frequency coverage available, on par with many dedicated 'top of the range' base station scanner receivers. A glance at some of the many frequency guides on the market

set when in portable use. An external 12V DC socket is provided to allow charging of nicads, as well as powering the set itself provided any internal dry cells (such as alkaline manganese, if fitted) are removed. A telescopic whip terminated in a BNC connector is supplied as a portable aerial, which may be extended up to a maximum length of 510mm, and an alternative aerial may be connected in

by the use of Up/Down buttons, the tuning increment being selectable to either 5kHz, 10kHz, 12.5kHz, 25kHz or 30kHz steps, with the display changing accordingly.

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*Handheld scanners now cover a wide range, so we checked out the latest to appear in the UK.*

---

shows the wide range of services the Jupiter II is capable of receiving, such as 27MHz and 934MHz CB, cordless phones, VHF, UHF and Band III two-way radio, VHF and Cellular Radiophones, civil and military aircraft, VHF marine users, and the 29MHz, 50MHz, 70MHz, 145MHz, 433MHz and 1296MHz amateur bands.

Do however remember that in the UK, deliberate monitoring of some of these frequencies is strictly speaking illegal, although in other countries where HRT is also read even military frequencies such as the 300MHz aircraft range may be openly monitored. Amateur radio frequencies may of course be received, and reception of the civil aircraft bands and marine communications (excluding telephone links) is usually accepted by some authorities without the fear of user prosecution, but do be warned!

## Features

The set measures 67mm (W) x 175mm (H) x 40mm (D), with an internal battery compartment housing 4 AA size cells which power the

place of this if required for home or mobile use. A tactile keypad is provided for digital control of the set's functions, a large lcd (liquid crystal display) showing the set's frequency, mode of operation, memory state and so on, this display may be backlit for night time use. An internal speaker is fitted on the case front, which is supplemented by a 3.5mm external speaker socket on the top panel. Concentric rotary volume and squelch controls are fitted on the top panel, next to a push button on/off switch.

## Frequencies

Receive frequencies may be entered directly using the set's front panel keypad, by simply keying in the required frequency followed by a press of the 'Enter' key. The reception mode may be toggled between AM and Narrow-Band FM by use of a 'Function' key followed by the 'AM/FM' key, 'AM' being indicated on the lcd when this mode is enabled. A useful feature of the scanner is that once a frequency has been entered, you can manually tune away from it



Ten pre-programmed bands, each with their own upper and lower frequency limits, steps and modes, may be used for searching out active frequencies within a pre-defined frequency range. Although these are marked as 'AIR VHF 1', 'AIR VHF 2', 'MARINE', 'CAR TEL' and so on, they may be modified or programmed to any user requirements within the frequency range of the set. A press of the band number button, followed by the 'Search' button will then initiate a search of the appropriate frequency range in the programmed steps, the scanner halting on active frequencies. Alternatively, a search of the entire frequency coverage range of the scanner can be made simply by pressing the 'Search' button.

### Memories

100 memory channels are available, organised into 5 banks of 20 channels each. Each bank may be scanned individually or any number of banks may be selected to be scanned one after another. Memory information can be entered directly simply by entering the frequency, followed by the desired memory channel number and a press of the 'Function' and 'Memory Write' buttons, any previous information being overwritten. Alternatively new frequencies found to be active when searching a pre-programmed frequency range can be directly entered into consecutive memory channels by repeated presses of the 'Function' and 'Memory Write' buttons.

### Scanning

A single button push will commence the set scanning all the required memory channels, a further press stopping the scan. The speed of the channel/frequency search may be switched to either fast or slow depending on individual requirements, these corresponding to either 8 or 20 channels per second. While in scan mode individual memory banks may be toggled in and out of the scan sequence simply by pressing the bank number key. A 'Skip' facility lets the set either halt on active frequencies for the duration of the received signal, or halt only for 7 seconds before resuming regardless of activity. In a similar manner to other scanners, a 'Delay' function may be toggled in or out of use, when the set either continues scanning immediately the received signal

drops, or pauses for a few seconds on the frequency before the scan resumes. Finally, to prevent the scan or search locking up on silent carriers, an 'AFD Scan' may be enabled where the receiver will pause for 1 second only if a blank carrier is found and then resume the scan or search.

Any number of channels will be locked out of scan mode if required, by using a channel 'Pass' function, this still allowing manual selection by direct channel number entry. A 'Priority' scan function is also fitted, here any required channel may be designated as the 'Priority' channel which is checked every 5 seconds for activity, the set locking onto it when active.

When monitoring a single frequency, a 'Battery Save' mode may be enabled if required. Here the receiver is effectively switched off for approx. 5 seconds, then on for 2 seconds, with this cycling mode being temporarily defeated whenever the activity is present on the channel.

### Accessories

The Jupiter II at £299 comes supplied as a basic unit with a carrying strap, with a range of optional matching accessories being available if required. These include a flexible helical whip, belt clip and protective carrying case, a plug-in 12V power cord and nicad charger, together with nicad cells themselves. A well written 14 page user manual comes supplied with the scanner, this gives comprehensive operating instructions and technical specifications but no circuitry information. As with most VHF/UHF scanners, what is almost a necessity is a good frequency guide, this often forming the most useful accessory for a scanner. 'The Complete VHF/UHF Frequency Guide' (Spa Publications, featured HRT June 1989) gives very concise details and is well recommended. Other specialised publications such as airband and marine frequency/usage guides also exist.

### In Use

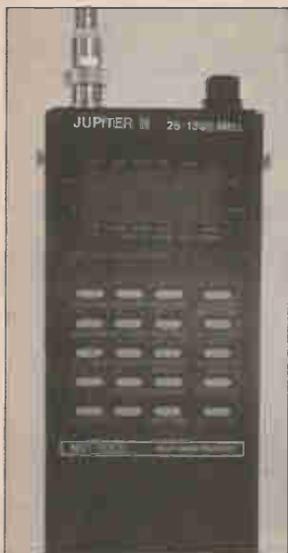
After a short nicad charge I switched the receiver on, and within seconds the semi-local 2m repeater was coming through without even having to open the instruction manual. Using the supplied telescopic whip, I was surprised to note the good sensitivity of the set, and by

altering the length of this to roughly that of a quarter wave at the main frequency of interest, it was possible to 'Peak' reception a little further. The audio quality from the small internal speaker was excellent, with few problems of distortion or cone 'rattle'



as one sometimes finds with small receivers of this type. There was ample audio level for reception in fairly noisy surroundings, such as when walking along a busy road or when travelling in a saloon car.

I sometimes felt that I would have preferred a more flexible aerial, such as the optional helical, than the standard telescopic whip for portable use. Besides sometimes being uncomfortable when the set was operated in an inside jacket pocket, I feel it would only be a matter of time before the inevitable happened and the telescopic whip would become broken. Although not quite as small as some of the tiniest handheld



scanners now available, the set was very light and was hence quite easy to carry around without being too incumbent. The nicads provided several hours worth of listening before a recharge became necessary, the lcd giving a 'Batt' indication to warn of this.

### Reception

Taking the scanner out and about with me confirmed it was very sensitive indeed, better than many other handheld scanners. In use this allowed reception of quite weak signals that otherwise would have been difficult to copy when operating portable with a short whip aerial. When listening on VHF with the telescopic whip at full length, once or twice I noticed some wideband FM breakthrough over a period of a few weeks, although this usually didn't affect reception once other signals were present. At first this effect puzzled me, as the set was not used in the immediate vicinity of any FM broadcast stations, but this was later found to be a minor problem.

### At Home

Using the set inside the house, connected to an external 25-

1300MHz discone gave very good results with reception of several distant signals, but sometimes with the odd problem of blocking which of course is not surprising considering its intended use. It wasn't anywhere near as bad as a previously reviewed wideband handheld scanner, which just gave up the ghost when connected to an external aerial.

Coupling a vertically polarised Create 105 1300MHz log-periodic yagi to the scanner gave good results, the yagi being beamed towards the wanted signal in each case. The receiver selectivity appeared quite reasonable, with stations separated by 25kHz being attenuated well, this however could require 5 or 10kHz offsets to be programmed into the scanner for better reception when monitoring certain aeronautical services operating at pre-determined offsets from the nominal frequency.

Viewing the lcd from above when the set was placed on a table top was rather difficult, the set had to be tilted backwards to see what was happening due to the viewing angle determined by the manufacturer, likewise when used in a car with the set clipped onto a vertical shelf edge with the belt clip. However mounting the set horizontally but within viewing distance gave an acceptable display.

### Inside the Box

The set is constructed using a two-piece plastic cabinet, with a further small clip-on lid over the battery compartment. Inside the case three main printed circuit boards are used, for the control, the power regulator/charger, and the main RF circuit functions. The control pcb is very well screened to prevent micro-processor interference to the RF circuits, and the sensitive voltage controlled oscillators on the RF pcb are also well screened to prevent unwanted pickup. Surface mounted 'chip' components are used in great profusion to keep the set's size down while increasing reliability.

Individually screened tunable coils are used for the RF front end stage on VHF and the lower UHF ranges, the upper UHF range employing open wound coils. A first IF of 45MHz is used to ensure good image rejection, a pair of monolithic dual crystal filters being used here to provide the bulk of the receiver selectivity. Downconversion to the

usual second IF of 455kHz is used, further selectivity here being provided by a 6 pole 12kHz bandwidth ceramic filter.

### Laboratory Results

In general, the RF performance was good for a handheld scanner, of note was the excellent sensitivity across the entire range. This good sensitivity can sometimes cause other problems, and although the dynamic range was also quite good in CB terms bearing in mind the set's intended use, the threshold for blocking effects and the like is of course that much lower as well, as sometimes found when connecting an external aerial.

The image rejection at VHF and the lower UHF ranges was very good indeed, far better than many other scanners of this type. This is due to the 45MHz first IF which removes the image frequency by 90MHz, but the measured rejection suffered at the upper frequency ranges where zero rejection was found due to limitations in front end selectivity. In practice, this wouldn't cause many problems in this upper frequency range unless an unfortunate mix of frequencies occurred in your area.

Few spurious responses were noted, but at the 45MHz IF this was 40dB relative to the wanted signal when measured at 145MHz, which exceeded the good image rejection here of 61dB. The IF rejection changed by less than 10dB across the measured frequency range. With sporadic-E reception of Band 1 signals during some seasons and times, this is the most probable explanation of the occasional wideband FM breakthrough noted in use, this would only be a minor problem in most cases.

### Conclusions

The set appears to be a handheld 'World First' in its wide coverage range, offering almost complete coverage of 25-1300MHz. It only misses out the 550-800MHz range used for TV sound/vision which, not having a wideband FM mode, the set cannot usefully receive in any case. From comments received from other users of the Jupiter II scanner, the set is sure to be popular amongst scanner enthusiasts.

The receiver sensitivity is excellent for a handheld scanner, the

overall technical performance of the set also being quite good. I would however advise caution against using a wideband amplified base or mobile aerial, or using an external aerial in the proximity of strong transmissions such as in large towns or city areas, as blocking problems could sometimes occur. We understand, incidentally, that there will soon be a base

station version of the Jupiter II available, having a 12V DC supply capability and being fitted with a switchable attenuator to reduce any blocking problems. We're looking forward to trying the set out!

Our thanks go to Waters and Stanton Electronics for the kind loan of the review scanner and accessories.

## LABORATORY RESULTS:

**Sensitivity:** Input level required to give 12dB SINAD

29MHz 0.22uV pd (FM)  
51MHz 0.24 uV pd (FM)  
80MHz 0.19uV pd (FM)  
120MHz 0.42uV pd (AM)  
145MHz 0.26uV pd (FM)  
170MHz 0.23uV pd (FM)  
250MHz 0.46uV pd (AM)  
435MHz 0.35uV pd (FM)  
934MHz 0.37uV pd (FM)  
1296MHz 0.44uV pd (FM)

**Blocking:** Increase over 12dB SINAD level of interfering signal modulated with 400Hz at 1.5kHz deviation to cause 0dB degradation in 12dB SINAD on channel 145MHz signal

100kHz 17dB  
1MHz 23dB

**Intermodulation Rejection:** Increase over 12dB SINAD level of two interfering signals spaced by 50kHz giving identical 12 dB SINAD 145MHz on channel 3rd order intermodulation products

43dB

**Maximum Audio Output:** Measured at 1kHz on the onset of clipping, 8ohm load:

121mW RM5

**Image Rejection:** Increase in level of signal at first IF image frequency over level of on-channel signal to give identical 12dB SINAD signals:

175MHz 61dB  
934MHz 0dB

**Current Consumption:**

Power Saver Mode: 36mA av  
Standby Squelch  
Circuit: 118mA  
Receive, Mid Volume: 163mA  
Receive, Max Volume: 184mA

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# The Rally at WOBURN

The annual Radio Society of Great Britain National Mobile Rally made its appearance at Woburn Abbey in Bedfordshire on Sunday 6 August, right on cue. As I hadn't been to the Rally for a couple of years, the first thing I noticed was the savannah-like aspect of the rolling parkland, dried to the colour of dust by the favourable

what we found wasn't junk at all, and much of it — mostly accessories and computer bits and pieces — was boxed. There were a few useful looking bits ready for either reconditioning or stripping down, though; not at dirt cheap prices, either. We heard our name being bandied about: "*Ham Radio Today* project, read it in

in/homebuilt ecology. But wherever two or three are gathered together, the debate on whether black boxes are the death of true amateurism crops up sooner or later.

Some dealers feel the same way. Naturally, it depends whether they depend for their livelihood mostly on components, mainly on shiny boxed items, or whether they also have a mixed ecology. I'll come back to that later.

As might be expected at the mobile rally, the components and accessories market was represented more comprehensively than the black box market, but there were plenty of both about. G3YZW picked up a set of solar cells for charging a 12V battery for just over a tenner, a set of rechargeable batteries (which represent a kind of addiction to people who come to believe in them) and holder and spent some time conversing about a toroidal inductor in the hope that it would be suitable for a 12V 10A switched mode power supply.

We were pleased to see MuTek showing off their range of linear transverters and amplifiers. MuTek was taken over a year ago after much planning by Mike Dorsett when four-

## *The Editor grabs backpack and engineer and goes to see what is happening at the Abbey.*

weather we've been having. No wellies needed for the main marquee.

The second thing we noticed was an official with a handheld trying to clear two vanloads of dealers off the property in lieu of £27ses which had apparently not been paid earlier in the day. The vanloads were severally protesting that they would cheerfully have paid their £27ses in the morning had they been asked for them, but didn't feel like doing so at lunchtime, and further seemed indisposed to go anywhere. Funny, because we understood that all the spaces had been pre-booked. The hapless official mentioned Park Staff firmly and tried to herd the audience away from the tempting piles of salvage, but it drifted inexorably back in behind him. We decided that this was a trade dispute, and that no-one was going to dot anyone on the nose, and went in search of some junk ourselves. In the evening the vanloads were still there. We never found out what became of the £27ses.

### **Street Cries**

In the junk dealers' tent, most of

Chris Lorek's book," — Street Cries of Old England, no. 401 — and sidled up to see if we could extract some home truths (which we call "market research"). And we did, too. Perhaps the most significant one — which I raise here because it continued to manifest itself in other, practical, ways during the day, could be called "People either love Black Boxes, or they don't".

Let me explain hastily that I don't believe that this is a real-life situation. Most amateurs run a mixed bought-

MuTek offer the chance to customise the black box to your own requirements.



der designer Chris Bartram G4DGU became ill. Chris is still designing for the company, who were showing off the new TVVF 50c MkII 25W transverter and have a replacement front end board for Icom IC202 series portables in the pipeline. MuTek are my idea of a mixed-ecology company, because they offer home-installable add-ons for proprietary rigs. In a sense, of course, so does every dealer who offers accessories and components alongside made-up stuff.

### Sunbathing

So we found G3YZW at the Garex stand drooling over the small Revco on-glass aerial (2m and 70cm versions there for £49.95 – “Not the cheapest, just the best.”) The question “How’s business?” prompted a generally satisfied response from Peter Longhurst and crew, with the proviso that the good weather had rather more people out sunbathing somewhere than is ideal for a radio fair. Gradually nostalgia crept in, and we wondered what had become of the crowds thronging three deep waiting to thrust money into the dealers’ hands a few years back (a customer gave a demonstration with



The Standard scanner receiver with built in spectrum analyser.

a tenner at this point). The unholy rise in mortgage rates was generally blamed for the lack of people actually throwing money. Most of us are in the same boat there. I wonder if Steve Ireland G3ZZD has managed to sell up yet?

A discussion on the hows and whys of installing on-glass antennas was hi-jacked by an authority who held that the only way to install a mobile aerial was to drill a hole in the centre of the roof of the car and hard-



Aerials and accessories moving faster than black boxes at Garex.

wire it on. Listen, we know the rig is the most important thing, and all that, but some people don't want to drill holes in their cars, or just feel more secure having discreet aerials. Having had a 2m whip on a stout magmount blown off the roof of the car a while back (admittedly it was just outside York, where even the roads have windsocks) we are looking at alternatives.

People with large displays of Japanese and American boxes (NOT 'box-shifters', as we heard one chap mutter. All the dealers we know of give a fair back-up service.) on the other hand were making satisfied noises about turnover, and we saw a fair number of glossy carrier bags blazoned with “Yaesu” and “Icom” walking about, so the money's there somewhere.

Why do we always talk Japanese, anyway; some folk, it seems, are still

overlooking Navico's excellent AMR 1000 2m Tx on the grounds that they are 'new', or not foreign, or something. Navico, of course, are not new — they've been making professional marine radio for years.

### Crime Wave

Dressler had a display of boxes two trestles long and three boxes deep, and had just sold their last Icom IC2-SE when we rolled up. The only blot on the landscape was that apparently a rig had been stolen a few minutes earlier. We saw the Standard scanner receiver with built in spectrum analyser. To check on a big signal you simply move the cursor across the liquid crystal dot matrix screen to select the peak you want, and the receiver is tuned to it. We also encountered the new Icom IC-45 UHF 70cm single-band transceiver, the smallest we've seen so far.

The Navico AMR 1000 was showing at a number of tables, including RN Electronics'.



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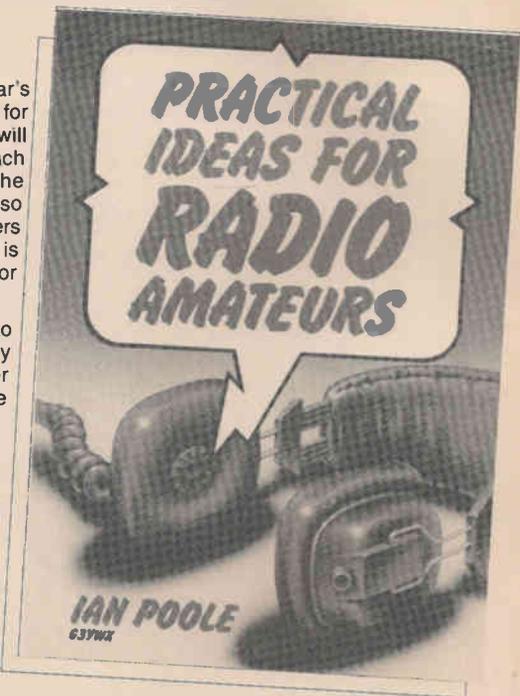
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Please allow 28 days for deliver of your gift. To guarantee receipt of gift subscriptions before Christmas, orders **MUST** be received by the closing date.

ARE had a magnificent spread of rigs including the little Yaesu FT 470 and FT 72B, Kenwood TS680S and the magnificent Icom IC-R7000 which we wrote up in February, culminating in an embarrassing incident when the review model was apparently tampered with and beaten up on its way back to ARE. It makes a person slightly twitchy, knowing that things can be 'got at'.

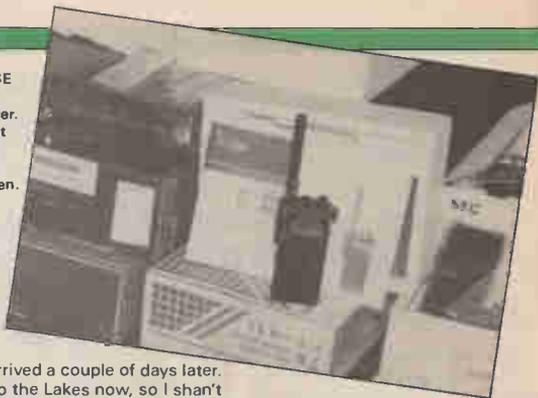
Both R A Kent and G4ZPY Paddle Keys had a fine array of morse keys for the discerning (as well as G4ZPY's craft stonework for the mantelpiece) on display. Morse people will have seen Ian Poole's write-up of the Kent Straight Key in last month's HRT, and G4ZPY is already getting his Christmas special offers into gear (see *Radio Today*. Sorry, Gordon — almost exactly a month too late for the October issue, but you just caught the bus for November).



Waters and Stanton field a fine array of books, as well as all the hardware.

Waters and Stanton confirmed that black box business had been good. They also had an impressive array of books on display, including Argus's *Scanners 2 — a VHF/UHF Listener's Guide*, and the international version, both by Peter Rouse GU1DKD. *Scanners 3* is due out soon. No sign of Chris Lorek's *Surplus 2-Way Radio Conversation Handbook*, so we reminded them about it. Argus started mail order sales last month as I write and it's doing well after only house advertising. They promised us a copy of their recent Ben Nevis Expedition loan video,

The IC4SE 70cm transceiver. This must be the smallest we've seen.



which arrived a couple of days later. I'm off to the Lakes now, so I shan't look at it till we get back. No point reminding myself what the weather can do when we'll be finding out soon enough!

Greetings both in advance and in arrears to anyone we meet On The Tops, by the way.

Although there will be a bigger roster of imported rig dealers (and nearly everything else) at Leicester in October, there seemed to be one of most items available at Woburn somewhere, and the sun and beautiful surroundings and easy parking made for a most pleasant day. Even with many of the side panels up it was hot inside the marquee, but think how much worse it would be in town in August.

The refreshments tent is never the strong point at Woburn — there's nothing wrong with the supplies, but there are no seats and the ground gets soggy with a toxic mixture of tea and lager even in dry weather. However, there are sources of food, drink and seating not far away in the grounds at reasonable prices, so the Tea Tent, which is right by the marquee, has an excuse for being minimal.

As the rustle of boxes and packing paper grew to a crescendo we grabbed the quiet moment to take our photos and left. People were trickling away slowly, so no traffic jams. Very pleasant. Thank you, RSGB.

G1ZVB with the new Jupiter MVT500 scanner, 25 to 1300MHz in a hand held format.



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# Alinco DR-110E

## 2m mobile

Alinco have a reputation for providing transceivers with good performance at a realistic price, the DR-110E being their latest offering for the 2m FM operator. With today's car dashboards becoming smaller and smaller, the need is often for a set to fit in a small space, yet still have an 'easy' read display together with sensibly placed controls for easy operation on

into a local BBS or Network Node.

The transceiver which is priced at £299 cover 144-146MHz as standard, and the UK importers have pointed out they can if required, extend the receive only coverage to 135-170MHz plus 340-380MHz and 870-890MHz at no extra cost, the latter modification no doubt appealing to the scanner enthusiasts among

or internal details.

### Mobile Ease

It's been previously shown in HRT, and confirmed by an independent professional study, that controlling a sophisticated mobile transceiver while driving is considerably more hazardous than simply using a hand held microphone to talk into. So the need for simple, easy to use controls is of paramount importance for a mobile rig, likewise the need for easy identification of the set's controls and functions. To this effect, the Alinco's separate rotary volume and squelch controls are placed in an easy-to-locate position next to the mic plug, the larger rotary channel knob being at the opposite side of the fascia, again easily located by feel alone. All these controls are backlit for location in dark, even the large on/off power switch is illuminated for night time use. The set's operating frequency, memory channel number, and S-meter level are shown in different colours to help quick recognition while on the move. This would normally require only a quick glance at the display to 'home in' on the required information needed rather than a longer search of the display being required ("Sorry officer, I was looking at my radio rather than the car in front").

### Piano Keys

Along the bottom of the fascia is a row of push buttons to control the set's other functions. From left to right, these switch in a 'Second Function' and Memory Write, a MHz shift for large QSs, VFO/memory channel operation with a second function of channel spacing control, a 'Reverse Repeater' check with a control 'Lock' second function, optional Sub-tone control and audible beep on/off, Priority channel monitoring, Scan initiation with a channel

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***A multi-coloured micro mobile with 45W of power to boot, tested by the HRT Review Team.***

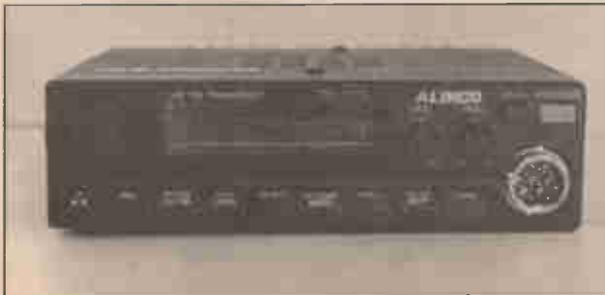
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the move. Does Alinco's latest 2m mobile rig fit this description? . . .

### Small Size

Measuring 140mm (W) x 40mm (H) x 170mm (D) it should certainly find a home in even the smallest car interiors, flying leads for the aerial and DC power connections helping it fit into a limited depth. Yet it still has a hefty maximum transmitter output power of 45W to reach those fringe stations and to make the best use of the many compact types of mobile aeriels now available. For local operation or to save drain on your car battery, a switchable low power mode of 5W is provided, also useful for packet radio operation from home

us. As well as operating in normal VFO mode in selectable 5, 10, 12.5, 15, 20 and 25kHz steps, all the usual facilities of memory channels and VFO/memory scanning are provided, together with a programmed band scan and off-offset Tx/Rx operation if needed. 11 memory channels are fitted for storage of your favourite operating frequencies, together with a further three channels for programmed scan limits and the like. The transceiver comes with mobile mounting hardware, a fused DC power lead, and a fist mic with up/down tuning buttons together with a small up/down button 'lock' switch. The instruction booklet gives operating information but no circuit





'skip' second function, and finally a 1750Hz repeater access tone key. Again all these key functions are illuminated for night time use, and to aid location a series of small individually lit segments illuminate the keys themselves.

### On The Air

Placing the set in operation from the shack, coupled to a rooftop colinear and powered from a hefty external AC power supply, proved the set to be quite a capable performer with its high output power. Distant repeaters were easily workable, and quite good audio reports were received on the transmission quality. On receive, audio from the small speaker positioned at the top of the case seemed rather on the 'topy' side, but was quite readable. With the speaker in this position, it was possible to lay the set down flat on a shelf rather than needing to allow space beneath the set as is the case with many sets having the speaker pointing downwards.

For general communication, I did find a slight limitation in the number of memory channels, but it was possible to program all the repeater channels plus a few locally-used simplex channels into the available memory channels. In use, to avoid a lot of repeater shift switching, I programmed the repeater channels RO-R7 into the memory channels, together with S20 and the programmed VFO scan limits, and used a combination of VFO/Memory switching operation instead.

Testing the set on 2m packet radio connected to my TNC and computer, showed that it communicated well with the local Network Nodes, a TXDelay of less than 100mS being used showing the set had a fast switching time. I did however notice a bit of distortion from the receiver on well deviated stations, suggesting a

narrow receiver bandwidth in the set. Testing this further on speech channels showed the set to have very good rejection of signals when tuned 12.5kHz off frequency, this of course being useful in areas where 12.5kHz channelling is used.

### Mobile Use

Once the required memories for my local area had been programmed, I installed the set in my car; due to the set's small size and speaker position it was possible to place it on top of the dashboard on the centre shelf position, the set's display and controls then being at eye level to reduce the amount of eye travel distance needed while operating on the move. An added advantage of this mounting position was a good sound reflection from the speaker in my direction due to the angled windscreen, and even when driving at high speed I didn't feel the need for an external speaker.

The set's control illumination at night was excellent, the frequency display itself being very easy indeed to read without causing excessive glare. Locating the VFO/M switch along the keyboard row was reasonably easy, but I would still have preferred mobile operation by just using the main tuning knob or the up/down microphone buttons. The 1750Hz tone button was very easily located though, this being at the extreme right of the key row next to the microphone socket, but again I would really have preferred this duplicated on the microphone itself as with the majority of other sets.

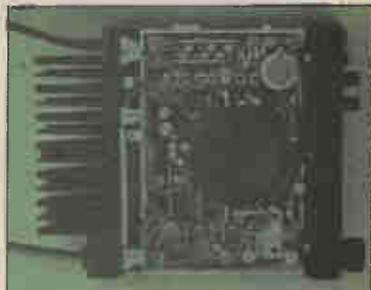
While operating mobile in fringe areas, I found the high output power to be very useful in achieving 'solid copy' of my signals at the other end, although I sometimes had a bit of difficulty receiving one or two distant stations. Due to this few dB 'extra' power over the usual 25W, replacing my usual ¼ or ½ whip with one of the

tiny 25cm long affairs still allowed good coverage to be obtained while keeping a low profile. This also allowed me to use multi-storey car parks without the need for an aerial tilt-over job each time!

When using the set for long mobile QSOs throughout the hot summer weeks, the set's large heat-sink became quite warm but never too hot to worry about, although I was careful to avoid placing the rig in a confined position. The S-meter often read full scale on moderate strength signals, with weak but perfectly readable signals giving no indication, but this is often the case with FM-only sets, and I've often come to the conclusion that today's S-meters are little more than a relative indication.

### Inside The Box

Opening the set up shows a solid die-cast chassis has been used, this being far better in standing up to mobile operating conditions of heat and vibration than the common bent-in chassis used for many sets nowadays. Several small 'daughter' boards are fitted to a main RF 'mother' board, surface mounted



components being used to improve reliability. The large block transmitter power amplifier is bolted directly onto the rear heatsink, the delicate control circuits being fitted at the opposite end of the chassis on a separate pcb surrounded by the front panel moulding. A very high standard of construction has been used, the accuracy of component placing suggesting that many of the pcbs have been assembled by machine rather than by human beings!

### Laboratory Tests

The receiver sensitivity seemed fairly reasonable, not poor by any

## Laboratory Results

### Receiver:

**Sensitivity:** Input level required to give 12dB SINAD:

144MHz: 0.19 $\mu$ V pd  
145MHz: 0.18 $\mu$ V pd  
146MHz: 0.21 $\mu$ V pd

**Image Rejection:** Increase in level of signal at first IF image frequency over level of on-channel signal to give identical 12dB SINAD signals:

57dB

**Adjacent Channel Selectivity:** Measured as increase in level of interfering signal, modulated with 400Hz at 1.5kHz deviation, above 12dB SINAD ref. level to cause 6dB degradation in 12dB on-channel signal:

+ 12.5kHz: 54.0dB  
- 12.5kHz: 53.0dB  
+ 25kHz: 70.5dB  
- 25kHz: 72.0dB

**Blocking:** Increase over 12dB SINAD level of interfering signal modulated with 400Hz at 1.5kHz deviation to cause 6dB degradation in 12dB SINAD on-channel signal:

+ 100kHz: 88.0dB  
+ 1MHz: 96.5dB  
+ 10MHz: 98.5dB

**Intermodulation Rejection:** Increase over 12dB SINAD level of two interfering signals giving identical 12dB SINAD on-channel 3rd order intermodulation product:

25/50kHz spacing: 67.0dB  
50/100kHz spacing: 68.0dB

**Maximum Audio Output:** Measured at 1kHz on the onset of clipping:

3 ohm load: 1.60W RMS  
8 ohm load: 910mW RMS  
15 ohm load: 540mW RMS

### Squelch Sensitivity:

Threshold: <0.05 $\mu$ V pd (<2dB SINAD)  
Maximum: 0.23 $\mu$ V pd (16dB SINAD)

### S-Meter Linearity:

Indication	Sig.Level	Rel.Level
S1	0.72 $\mu$ V pd	- 7.6dB
S2	0.72 $\mu$ V pd	- 5.8dB
S5	1.05 $\mu$ V pd	- 4.2dB
S7	1.31 $\mu$ V pd	- 2.5dB
S9	1.72 $\mu$ V pd	0dB ref.
S9 +	2.11 $\mu$ V pd	+ 1.8dB
S9 + +	2.47 $\mu$ V pd	+ 3.1dB

### Transmitter

#### TX Power and Current Consumption:

Freq MHz	Power	10.8V Supply	13.8V Supply	15.6V Supply
145	High	34.3W/8.1A	45.6W/9.2A	48.6W/9.1A
	Low	4.81W/3.1A	4.82W/3.1A	4.81W/3.1A
145	High	33.5W/8.1A	45.6W/9.1A	46.3W/9.6A
	Low	4.75W/3.1A	4.68W/3.1A	4.76W/9.6A
146	High	32.3W/8.0A	43.0W/9.1A	45.0W/9.2A
	Low	4.70W/3.1A	4.68W/3.1A	4.67W/3.1A

#### Harmonics/Spurii:

2nd Harmonic: -74dBc  
3rd Harmonic: -85dBc  
4th Harmonic: <-90dBc  
5th Harmonic: <-90dBc  
6th Harmonic: <-90dBc  
7th Harmonic: <-90dBc  
Spurii: <-90dBc

#### Frequency Accuracy:

-180Hz

#### Peak Deviation:

5.42kHz

#### Toneburst Deviation:

2.92kHz

means but a few dB down on one or two other 45W mobiles. Of note though was the very good 12.5kHz adjacent channel rejection, this should allow the set to operate very well in areas where this is commonly used due to congestion. The S-meter dynamic range, as found on air, was very limited.

On transmit, the power output was accurately set and well regulated

across the band, the low power output also being a reproducible level for external transverter driving and the like if required. The harmonics were very well suppressed. The peak deviation was set a shade higher than the recommended 5kHz absolute maximum, although this should not cause problems with 25kHz channeling as is generally used. This would normally need to be reduced of course by an internal 'tweak' for 12.5kHz operation if this is adopted in the future.

### Conclusions

Overall, a good value transceiver for the amateur looking for a high power set to use when mobile. The set is small enough to allow fitment in many nooks and crannies, the flying power and aerial leads also reducing the effective depth needed to mount the set.

The well placed controls and easy to read display simplify operation when on the move, and the set offers very good receive performance on 12.5kHz channel spacing for use in busy areas of the country. Some amateurs who travel about a lot may find the 14 memory channels a limitation, but for many users these are often quite sufficient.

*Our thanks go to Waters and Stanton Electronics for the loan of the review transceiver.*



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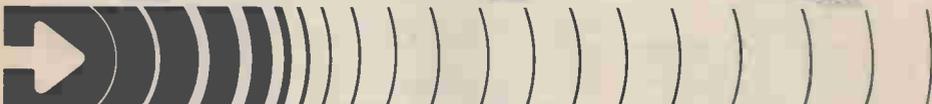
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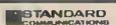


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# 80 metre QRP transmitter

This transmitter was designed for use with a synthesised short wave portable receiver, of which there are quite a number on the market, from such well known names as Sony, Philips,

allows a complete 80m CW station capable of covering all of the UK and Europe to be popped in a briefcase or taken along hiking in your rucksack.

As this transmitter was a de-

The 'dead bug' technique was widely used, a much maligned but easy to build and modify approach with components self supporting on the copper clad board ground plane. You could call this the poor man's surface mount technology! Now let's deal with the circuit (Fig.1).

*This little 80w CW transmitter travels in Graham Packer G3UUS's rucksack*

Panasonic and Matsui.

Of course it is just as happy sitting on top of a FRG-7/7700 or even an old R1155 (remember them?), but when combined with a small CW receiver, a couple of lantern batteries and a length of wire for an antenna it

velopment project no detailed constructional information is given (it is 80m, not VHF!) and constructors must choose for themselves the case and facilities that suit them best (Figs.6&7 provide some suggestions).

## Crystal Oscillator

The miniature toggle switch SW1 selects one of two crystals, 3.560 MHz which is the International QRP Calling Frequency and 3.5795459 MHz (well, let's settle for 3.580MHz), a widely available microprocessor clock crystal.

There are other microprocessor crystals in the 3.5-3.6MHz CW portion of the 80m band, and it may be a good idea to use a small six-position

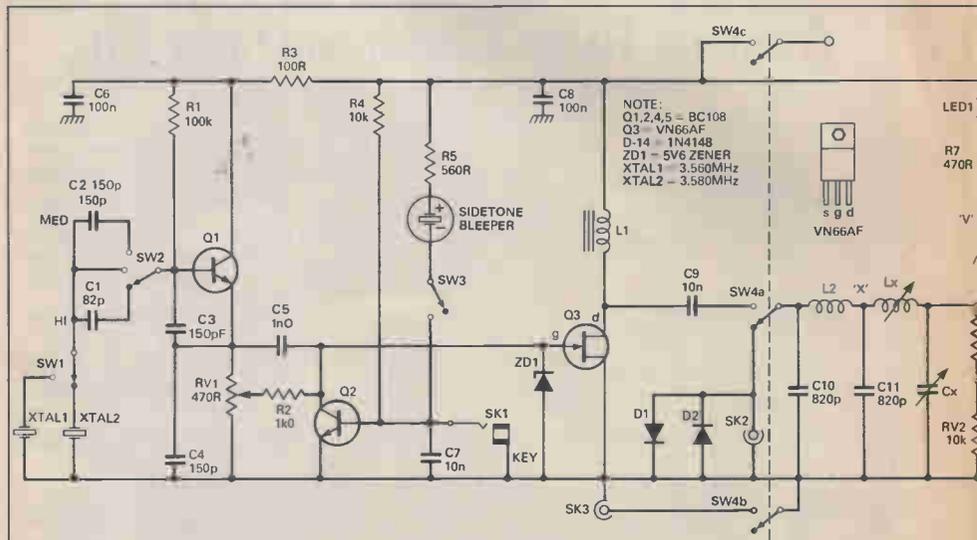


Fig.1. The circuit diagram.

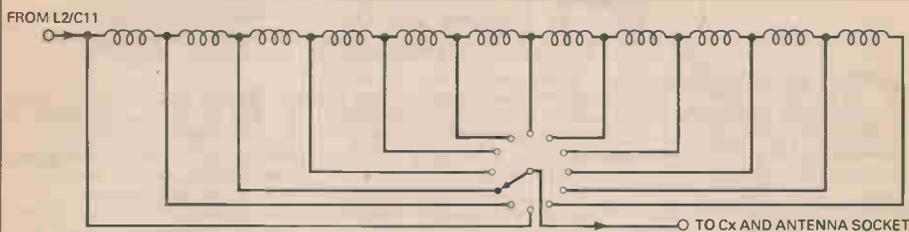


Fig. 2. Detail of Lx.

rotary switch for SW1, giving the opportunity to use crystals of random frequencies picked up at rallies or in magazine advertisements. Position 6 could be brought out to a miniature crystal socket on the front panel to give even further flexibility.

SW2 allows a small frequency shift to be applied to the crystals to dodge QRM. About 2kHz was obtained in this circuit. Most published designs use a variable capacitor, but for the sake of miniaturisation a three-position toggle switch proved satisfactory. Newcomers might like to build this part of the circuit first to get their hand in, listening for the signal

on their portable receivers.

### Power Amplifier

A VN66AF power FET was chosen for the PA. It is capable of producing up to 5W output in this circuit, but for reasons of battery economy, heatsinking, and the lack of a desire to blow it up, was throttled back to 2 to 3 watts.

Build this section next, disregarding for the moment Q2 and its associated keying components (connect C5/R2 direct to ZD1/Q3) and the sidetone bleeder/SW3. Q3 is mounted on a small heatsink, which for a CW transmitter doesn't need to be very big. If you have visions of using this Tx as a D/F source, or running RTTY, then pay a little more attention to heatsinking. No need to bother with Lx, Cx etc for now. Just terminate 2/C11 (ie point 'X') in a 50 ohm load or (preferably) a power meter that can read accurately to below 5W.

Adjust RV1 to the bottom of its slider and apply 12V from a power supply through an ammeter. Ensure the oscillator is running, then carefully adjust RV1 until 250mA (approx) is being drawn. At least a watt of RF should be indicated on the power meter. Carry on with the keying stage.

### The Keyer

Various techniques have been used with QRP transmitters to achieve clean, chirp free keying. Keying the oscillator by inserting the key in the emitter circuit works quite well, but can cause 'chirp' at extremes of crystal 'pulling'. A key inserted in series with the PA transistor is acceptable up to the 100 mW level, but 1/2 amp through all but the most rugged of ex-MoD keys will soon burn the contacts. Some circuits use a

series PNP keying transistor in the PA supply lead, but this causes a considerable voltage drop and degradation of PA efficiency.

Finally a blocking transistor approach was decided upon, which only allows DC bias and RF drive to reach the PA when the key is down.

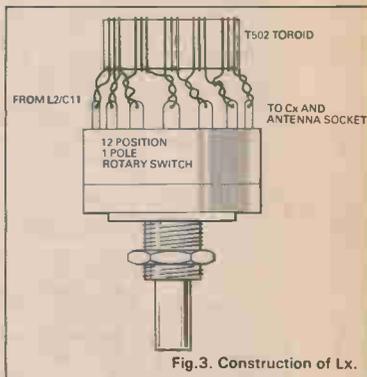


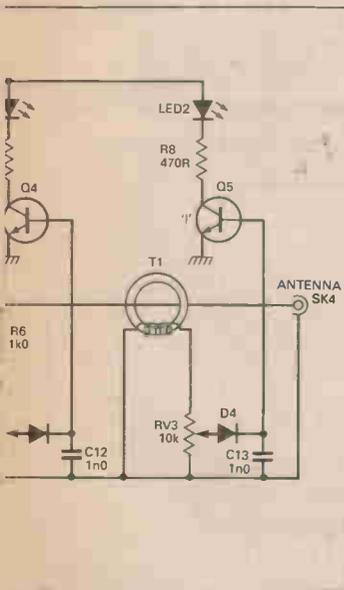
Fig. 3. Construction of Lx.

### The ATU

Most modern transmitters are designed for a 50ohm output, requiring an extra vswr meter and atu. What's the point in building a tiny transmitter such as this one, then lugging around add-on goody boxes which are as large and heavy as the transmitter they serve?

Lx and Cx allow matching to a wide range of impedances while the two tuning leds give a more than adequate indication of maximum power transfer into the antenna.

There is no need for a measurement of vswr, merely an indication of maximum current flow into the antenna, which corresponds to the maximum radiated power. (Remember, long before the days of vswr



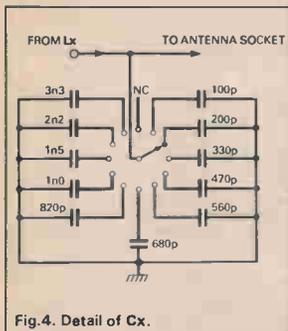


Fig. 4. Detail of Cx.

meters and '50 ohm Systems', every amateur used an RF ammeter for tune-up).

### The Rest

Tx/Rx switching is taken care of by a four pole, two-way miniature toggle switch. SW4a allows the antenna to be switched between the PA and the associated receiver. D<sup>1</sup> and D<sup>2</sup> serve to protect the receiver

against transmitted energy, although at the 2-3 watt level there is little likelihood of damage. SW4b is wired to provide a closure on transmit so as to 'Mute' the receiver, but some receivers need an open circuit instead. Wire this as appropriate. SW4c provides main power switching.

### Adjustment

Connect the transmitter to a power meter and switch on. Adjust Lx and Cx for maximum power into the meter. This should occur close to the centre position of the two rotary switches. Check the output; it should be close to the power achieved earlier when testing without the 'atu'. Similarly the total power drawn from the supply should be about the same.

If desired, carefully advance RV1 to give a maximum power output of 3 watts. There is very little difference in communications performance between 1 watt and (say) 5 watts, so choose a power level that satisfies your ego, but doesn't gobble up the lantern batteries too rapidly.

Next adjust RV2 and RV3 for medium brilliance from their associ-

ated leds.

Finally select a value for R5 that give a pleasant level of sidetone from the small piezo bleeper.

### Tuning Up

As mentioned earlier, the actual antenna impedance is of little consequence, as long as it is within the matching range of the built-in atu. Point 'X' in Fig.1 is nominally a 50 ohm point, but cannot be 'got at' when the transmitter is operational, so knowledge of the vswr at this point isn't going to improve your signal. Your only concern is get the maximum power into the antenna, and this will occur when the maximum antenna current is flowing. Fig.5 the tuning led 'truth table' has been included as a guide to the antenna impedance and any piece of wire close to a ¼ wave (or dipole close to ½ wave) should produce a 'medium impedance' indication.

### Conclusion

This transmitter has given good account of itself on hiking and camping expeditions. The usual antenna is

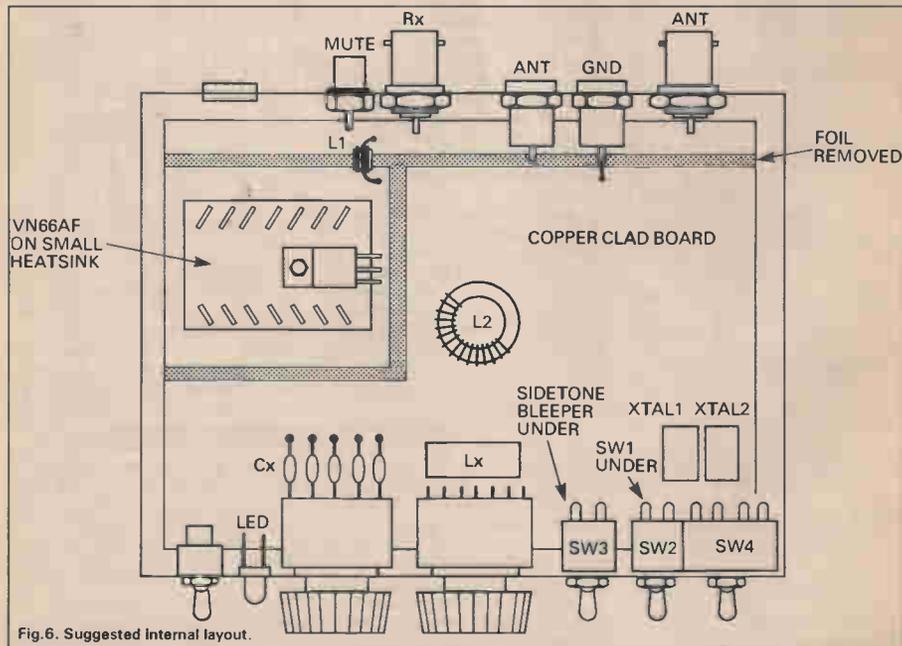


Fig. 6. Suggested internal layout.

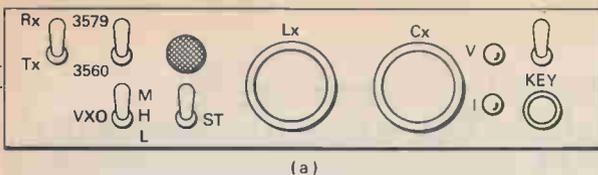


Fig. 7. Suggested front panel layout.

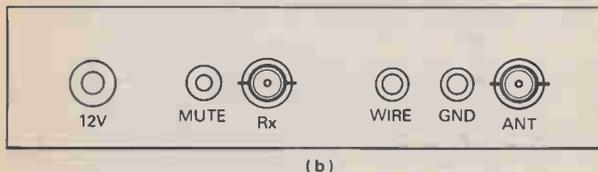


Fig. 8. Suggested rear panel layout.



a nominal quarter wave of wire thrown over a tree (ie 20m), with another quarterwave laid out on the ground as a counterpoise. Carry a much shorter length of wire with a crock clip on one end for using barbed wire fences and other 'natural structures' for a counterpoise when out 'in the field'.

By all means go for a full size dipole fed with thin coax, but trying to erect a dipole without proper supports can be interesting in the extreme!

(a)

(b)

### Lx and Cx

To save cluttering the circuit diagram (Fig.1) Lx and Cx are drawn merely as variable components.

Lx comprises 30t of 24 swg PVC covered wire, tapped every three turns. This is wound, like L2 on a T-50-2 toroid (Fig.2). Dress the taps down the side of the toroid such that they solder directly onto the pins of a 12 position, single-pole rotary switch. Fig.3.

Cx is another 12 position, single-pole rotary switch, selecting a range of miniature ceramic capacitors (Fig.4).

### Parts List

#### Resistors

(All 1/4 W)

R1	100k
R2,6	1k
R3	100R
R4	10k
R5	560R
R7,8	470R
RV1	470R min trimpot
RV2,3	1k min trimpots

#### Capacitors

All ceramic

C1	82pF
C2,3,4	150pF
C5,12,13	1nF
C6,8	100n
C7,9	10n
C10,11	820pF
Cx	See text

#### Inductors

L1	6t 30swg enamel copper wire on ferrite bead
L2	20t 24swg pvc/ptfe covered single stranded connecting wire wound on T-50-2 toroid
L3	See text

#### Semiconductors

Q1	BC108
Q2,4,5	Any small Si npn
Q3	VN66AF Power fet
ZD1	5.6 Zener 100mW
D1,2,3,4	1N4148 or similar
D5,6	Leds (one red, one green)

#### Miscellaneous

SW2	on-off-on min toggle
SW3	on-off min toggle
SW4	pole 2-way toggle
	Suitable case, 2 BNC sockets, phono socket.

### Component Suppliers

#### Toroids:

Cambridge QRP Components  
340 Rookery Close  
St Ives  
Cambridge PE17 4FX

#### QRP Calling freq crystals:

Golledge Electronics  
Merriott  
Somerset TA16 5NS

Please send SAE with enquiries.

LOAD	Current Led	Voltage Led
Open Circuit	Out	Very Bright
High Impedance	Dim	Bright
Medium Impedance	Bright	Bright
Low Impedance	Bright	Dim
Short Circuit	Very Bright	Out

Fig. 5. Tuning led 'truth table'.

# HAM RADIO TODAY

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VOLUME 7 NO 11 NOVEMBER 1989

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Rumours have been flying for some time that Kenwood were about to announce a significant new HF transceiver, and finally here it is. The TS-950S will be available later this year, but in the meantime we thought you might like a few tempting details.

Designed to be the new flagship of the Kenwood range, the TS-950S represents several real advances on previous models. Perhaps the most important of these is the optional DSP-10 digital signal processor unit which gives enormous advantages in use, such as an immediate improvement of 10dB in carrier and unwanted sideband suppression; selectable signal bandwidths; clickless CW keying with selectable rise times of the keying waveform; digital audio filtering which is synchronised with the IF slope tuning; and digitally derived FSK.

Equally important are notable advances in receiver performance, and the inclusion of a second receiver which will receive any signal within  $\pm 500\text{kHz}$  of the operating frequency, and will "listen-through" when the TS-950S is transmitting.

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TS-950S price not yet set

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73 John Wilson G3PCY 5N2AAC

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# Packet Radio

## Roundup

On the 28th July, over 200 delegates from 20 countries and four continents, yours truly being one of them, converged on the University of Surrey for the annual RSGB Data Symposium, a part of DataSpace '89. This excellent venue is used for many international conferences, and full marks must go to the RSGB and AMSAT-UK for their organising efforts. After we'd all had our fill of morning coffee and chocolate biscuits (nice after an early journey!), Mike Dennison G3XDV, the Chairman

a QSO with G1ZZZ who is a two-node hop away. At each end, 144.650 or 144.675 MHz at 1200 baud is typically used as the user port, but the nodes pass information to and fro using 1299 MHz at 9600 baud rather than the alternative path on 2m which normally also exists as a lower quality route. The same goes for BBS forwarding, a 'trunk route' being used, with dedicated National Trunking System mailboxes, with user access on the satellite BBSs fed from the NTS BBS.

neighbouring nodes. If you can, get some gear for other bands to provide a linking service, otherwise think hard whether you're providing a service or just more QRM!

### Speeding Things Up

The symposium message to end users suffering from congestion could be summed up as:

- 1) Spread Out — all packet activity doesn't have to be on just one channel or band, we do have multi-frequency BBS user ports in many areas and interlinked nodes with several user frequencies from a site.
- 2) Use Microwave Bands — these can be very useful for high speed point to point datacomms links.
- 3) Use Quieter Bands — Surplus two-way radio equipment is available for only a few pounds, perfect for frequencies such as 4m, and transverter for the home constructor.
- 4) Use A Beam — if you're linking into your local network node or BBS, beam at it instead of using an omnidirectional aerial, with associated reductions in transmitter power and receiver gain/squelch level.
- 5) Run Duplex — If you have the facility for this then on a quiet channel it can provide a high data rate (it is however VERY antisocial to set your TNC to FULLDUP ON on a busy channel).

### Chris Lorek G4HCL puts the word around about getting better coverage out of the system.

of the RSGB Packet Working Group, opened the symposium which dealt with topics such as 'AMTOR Joins the Network' by G3PLX, 'A UK Answer to Mailbox Software' by Steve G4YFB (who was described as the man who "thinks in machine code"!), 'AMPRNET — One Year On' by G6KVK, and 'Packet Radio in Scotland' by G4AUP. These subjects brought us up to lunch. The comprehensive papers for these will be published in the DataSpace '89 proceedings, available from the RSGB or AMSAT-UK. The afternoon was taken up mainly with future developments, such as 'Packet Radio, Which Way Now?' and 'How To Speed Up The Network'.

### Interlinking

As many of us will know, packet radio communication using just one frequency can be very slow. Throughout the UK, and indeed the world, network node and BBS system operators are adding new frequency ports to 'spread the load' as well as providing high speed 'trunking' routes. A typical node example is shown in Fig.1. Here G1AAA is having

### Messages to Sysops

The most prominent message given to delegates at the Symposium was to get links off the busy end-user frequencies of 144.650 and, in some areas, 432.675. The word to node and BBS sysops was "Switch off your wide coverage 2m port and go and do something more useful instead". It was recommended that user access nodes should be placed in the middle of towns, not on top of hills, with the addition of "It is absolutely crazy to provide a digital repeater on a mountain top — these sites should instead be used for microwave inter-node links". I myself know of at least one network node that shifted QTH to a hill top giving a wide coverage, the result — it became so 'slow' as to be almost useless, and an attenuator had to be fitted in the receiver together with a reduction in the transmitter power. Local factors must of course be borne in mind here, each area must be planned individually. But if you run a single port node or digipeater, especially from a good RF location, think 'network' and talk to the sysops of your

### The Evolving Network

Maybe soon we'll be running our TNC and RF beamed just into our local network node; an example of this is the Wakefield area where the GB7WRG mailbox is hidden away on 1299MHz, and is linked to the local nodes WP2 (2m), WP4 (4m) and WP7 (70cm), as well as via RF links to other local nodes. All a user needs to do is connect to any of the nodes, then enter 'CGB7WRG' or 'CWRGBBS' and the network automatically handles the routing. My thanks to Ken G3SPX for this information. Ken is the Secretary of

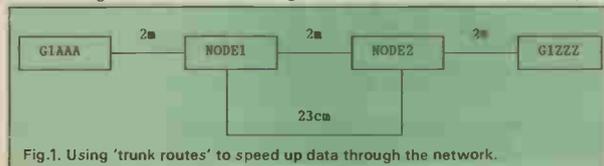
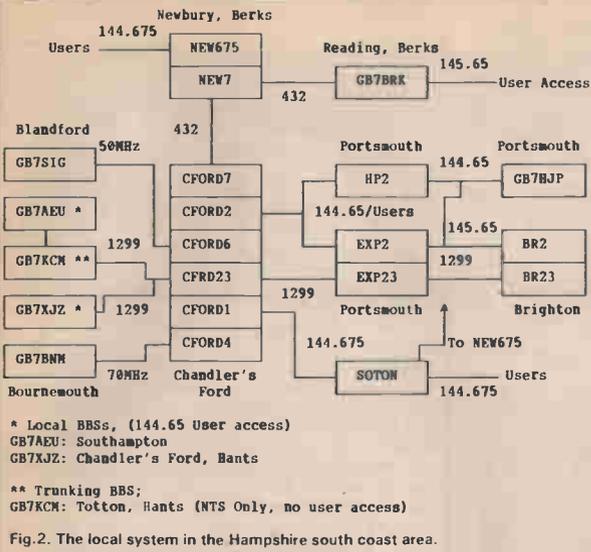


Fig.1. Using 'trunk routes' to speed up data through the network.



Wakefield Repeater Group who run the BBS and WP nodes as a free service for all users.

Similar systems are of course used in other areas, where the local BBS runs a computer-handled node as well as a BBS, the BBS ID being 'HJPBBS', 'KCMBBS', 'BNMBBS' etc. of which you may see examples of when requesting a 'nodes' listing on your local network node. If a local packet group provides the funding for the local nodes and/or BBS you regularly use then do consider joining.

### Typical Local Area Network

Fig.2 shows the local system in the South Coast area around Hampshire, as promised in last month's roundup (note some nodes are currently being set up and hence may not be in use at publication date). This is a typical example of a local network which is still evolving and expanding, but progress is being made in getting BBS forwarding and Inter-Node traffic off the busy 144.650.

Taking the example of National Trunk System (NTS) BBS forwarding, NTS mail comes into GB7BRK at Reading, this goes through the dedicated forwarding port on 432MHz to NEW7 in Newbury, from there again on 432MHz to CFORD7 in Chandler's Ford, then via an RS232 link to CFRD23 and out on 1299MHz to BG7KCM who acts as a dedicated NTS BBS, acting purely as a sorting office. He then distributes mail to his

'satellites', for example messages or bulletins destined for GB7XJZ users go through a dedicated 1299MHz link to CFRD23 and then onto GB7XJZ again on 1299MHz. This means that someone can be using GB7XJZ on the user port of 144.65 even while high-speed forwarding to and from the BBS is taking place, very often the entered message has been automatically forwarded even before the user has disconnected from the BBS!

Let's now take the example of a User QSO between stations in Portsmouth and Southampton. G1AAA in Portsmouth connects to his local node EXP2 on 144.650, he then enters 'Connect SOTON' at his terminal. EXP2 then automatically links to EXP23 via its RS232 link, then on 1299MHz to CFRD23, then through its RS232 link to CFORD1, then via 144.675 to SOTON, when this has been done (the connection typically taking only a few seconds) G1AAA gets the 'Connected to SOTON:G4VAS-4' reply. He may then connect on to G1ZZZ who's TNC is waiting on 144.675. All the Inter-Node routing is performed automatically.

### Hardware

I have recently received a PacComm PC-320 TNC, kindly loaned to HRT by Andrews Computer Services. This is a 'TNC on a pcb' that simply fits in a standard size expansion slot inside an IBM PC or clone. It offers

facilities for user interface to either COM1, 2, 3 or 4 ports, even if these are not physically fitted on the rear of your computer, and gives a personal message store facility similar to other PacComm TNCs as well as all the normal commands. Two RF ports are provided, these having separate audio and ptt switching lines to both your HF and VHF rigs may for example be wired up without the need for lead swapping operations. Unlike other PC TNCs, the PC-320 has a separate 13.8V DC input connection provided, although in normal use the pcb is powered from the computer. This facility may be used for a backup supply, keeping your packet station operation for personal message handling when the computer is off.

### 9600 Baud

Following the G3RUH 9600 baud modem information given last month, I have received numerous requests for sources of supply of these. Modem pcbs as well as eproms and ready built units are available from G3RUH direct (he is QTHR) but remember to enclose an SAE or equivalent if requesting details. Alternatively, units may be obtained from UK distributors such as Siskin Electronics and AMDAT.

It is interesting to note that TAPR in the USA are currently designing a five-channel 25W 2m rig with an inbuilt K9NG 9600 baud modem, to interface with a standard TNC.

### End of Message — CTRL-Z

Well that's it for this month, next month I'll be giving details on Digicom, or in other words how to get going on packet with just your Commodore computer and a simple interface pcb, giving you packet communication, a personal mailbox, node, and digipeater, all without the need for a TNC. I'll also be featuring the activities of DANPAC, the Derbyshire and Notts Packet Group, with details of the network in that area.

Thanks for your many messages through the packet BBS network, please do keep them coming as this is a two-way feature. I can be reached via packet with a message routed to G4HCL @ GB7XJZ. If you prefer pen and paper, then letters addressed to Chris Lorek, c/o HRT Magazine at the editorial address will also get to me, but please note that my callbook address is not correct. Till next month, 73 de G4HCL.

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See review October issue

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# QRZ

By the time this QRZ is read, the decisions made by the ARRL's DX Advisory Committee regarding all the new DXCC countries which have been activated during the last few months should have been made. In the last QRZ, I reported that there had been well-mounted expeditions to two of these, Banaba Island, part of the Republic of Kiribati, the Conway

Reef, one of the outlying Fijian islets. Since then, news has come of two more planned expeditions to these locations: my old friend Erik, SMOAGD, was planning a trip to Banaba, and had been issued with the call T33AG. If he made it, he should already have been active by now. Pekka, OH1RY, was one of several Finnish operators who are

planning to be in the Pacific area this Autumn — they should be using the call 3D2RY from Conway Reef between 3rd and 13th November. (Why is it always the Scandinavians that seem to go to the exotic spots?!)

Indeed, the team led by Pekka will be visiting various other exotic DX locations during their Pacific trip, which will be between 19th October and 23rd November, including YJØRY callsign, and made over 6500 QSOs during the 48 hours of the CQ World Wide DX Contest, resulting in a score of about 9 million points. (This makes my efforts from Cocos Keeling — 3000 QSOs and just over 3½ million points — pale into insignificance! Well done Pekka.)

*Amateur radio can be a lifesaver even in these hi-tech days, as Steve Telenius-Lowe tells in a tale from Revillaigedo.*



Pekka, OH1RY, is expected to be active from Vanuatu as YJØRY again in October.



Hans, DK9KX, was one of the 3D2CR Conway Reef expedition operators, and hopes to give a slide show at the RSGB HF Convention.

## HF Convention

The previous operation from Conway Reef, 3D2CR, was by DJ9QN and Hans, DK9KX. Between them, they made about 14,700 QSOs, roughly half on CW and half on SSB. There is a very good chance that there will be a slide show and presentation on this expedition at the RSGB's HF Convention, to be held, as usual, at the Belfry Hotel, Milton Common, near Oxford, on Sunday 1st October — Hans, DK9KX, has been invited and has presented very interesting slide shows there in the past. Other highlights should include a lecture on HF yagis by John Devoldere, ON5UN; "Are Our Rigs Good Enough?" by Peter Chadwick, G3RZP; a Question and Answer Forum, chaired by John Forward, G3HTA; and the "Young Amateur of the Year" presentation. Apart from the Conway Reef slide show, there will also be presentation on the Marquesas and Austral Islands expedition by Paul Granger, F6EXV and the recent Revilla Gidedo DXpedition, XF4L. I have also been asked to give a presentation on last October's AX9YG/VK9YG Cocos Keeling expe-

The XF4L operators: N7NG, OH2BH, OH2BU, XE1L, W6RGG, JH4RHF, XE1XA, XE10H.



Operators LA1EE and LA2GV hope to be activating Bouvet Island in December.

dition. The doors open at 0930 and the entrance fee is £3.50. I have attended the last three HF Conventions and all have been very enjoyable occasions and an excellent chance to meet your fellow HF enthusiasts. The event really starts on the Saturday evening, however, as many DXers travel long distances to attend and stay overnight at the Belfry Hotel or nearby — the bar areas are usually packed with people wearing callsign badges by mid evening on Saturday. Quite often there are also informal slide show presentations until well into the wee hours.

In the last *QRZ* I mentioned the XF4L expedition to Revilla Gigedo and said that they made about 30,000 QSOs. Well, the final tally was almost 48,000. It was good to receive a letter and photo of the intrepid DXpeditioners from Jarmo, OH2BN, who is the unfortunate individual who is dealing with all the QSLs for the XF4L trip. Jarmo's letter gives some interesting details about these islands:

"Revillagigedo Islands are located 450 miles off the coast of Mexico in the Pacific Ocean. The archipelago consists of three small islands and two adjacent rocks. The island of Socorro is 24 miles long and 9 miles wide and its volcanic peak rises slightly over 3700 feet. The island is manned by a small military garrison . . . Following a four-hour flight, our Beechcraft King Air plane touched down (with) a strong tailwind, barely managing to pull up on Socorro's short runway. A total of 6600 pounds of gear and supplies were set up on three separate sites high up on a

volcano to provide clean operating on CW and SSB simultaneously, and to take advantage of narrow propagation windows. The tent and generator-based XF4K was in action . . . While not on operating duty, the XF4L team members participated in a variety of activities all the way from fishing and climbing the peak of the volcano to socialising with residents of the local naval base."

However, Jarmo says that they think their greatest achievement was training and making operational Fernando, the island's military commander, who has been given the callsign Xf4F. Icom and the Northern California DX Foundation provided a complete station for Fernando to use, which was set up and left behind by the XF4L team.

As a postscript to this highly successful DXpedition, it is reported that in June Fernando managed to save the lives of two people, when he used the amateur radio equipment for emergency traffic. He contacted XE3EB and asked the navy to send a plane to the island to pick up a sailor with a lung problem and a lady who had a miscarriage. Official communications had failed, but amateur radio saved the day. If it had not been for the DXpedition and the training given to Fernando by the DXpedition team members, these two people's lives could well have been lost.

### Bouvet Island

What is generally regarded as the second rarest DXCC country in the world (second only to Albania) looks like being activated in December and

January. This is Bouvet Island, which has the dubious distinction of being the most isolated island on earth. Uninhabited, it lies in the South Atlantic, about half way between the southern-most tips of South America and South Africa, and close to Antarctic waters. The island belongs to Norway and Einar, LA1EE; Kaare, LS2GV and Erling, LA6VM hope to be the DXpedition operators on what sounds like being one of the most ambitious expeditions for many years. They have formed the Club Bouvet in order to raise sufficient funds for the trip — the LA-DX Group is providing the equivalent of 12000 US dollars for starters, but much more will be needed. However, if anyone can make it happen, these three should be able to — readers will remember that the same team activated Peter 1st Island (another Norwegian Antarctic island) for the first time ever in 1987.

Bouvet, however, sounds anything but welcoming. Club Bouvet write that the island is "surrounded by a virtually endless, cold ocean. Sea and air temperatures are near freezing point. Visibility is poor most of the time . . . Strong, frightening gusts of wind on the lee side of the island, "impossible" landing conditions with worst case ocean wave heights up to 30 metres making . . . especially departure very difficult. Multitudes of living creatures, weighing up to 5 tons, will be guarding the shore (Bouncers? Rogue elephants? Huge truckers wielding CBs??). They are savage, do not love DXing and will

The base of the 150 metre high tower at the GJ6UW QTH on the cliff tops in Jersey.

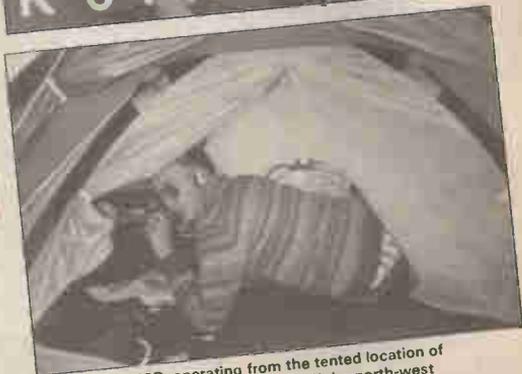


attack us during the landing. The smell of the penguin colony is disgusting . . . It sounds like a real fun trip, and I wish them well.

During July I was fortunate enough to have been operating from near Bodrum in Turkey as TA3/G4JVJ, along with Drew, TA3/G3YOR. We were operating under the conditions of the new CEPT licence, which has recently also been agreed by Turkey: indeed, we believe we were probably the first foreign amateur to have taken advantage of this in Turkey. Before the trip, I was a little apprehensive of the reaction we might get from customs and immigration people in Turkey, but in the event there was no problem. I had taken the precaution of taking an open letter, written in Turkish, explaining that we were entitled to operate amateur radio equipment in Turkey, what amateur radio was all about, and that the equipment we were importing would be re-exported again two weeks later. As it happened, nobody was interested in even looking at the letters, and waved us through without any delay. We took single Kenwood TS-430S transceiver and PS430 power supply (carried as hand baggage on the charter plane), a Butternut HF2V vertical antenna which, although 32 foot long when erected, packs down into a box only



"QSL of the month" from Ken Miller, K6IR, of Rockville, Maryland.



Andrew, G0HSD, operating from the tented location of GB0FLA from the Flannan Islands, off the north-west coast of Scotland.

5 feet long by 4 inches square, and dipoles for 10, 15 and 20 metres. The Butternut vertical performed impressively, with several intercontinental QSOs being made on 40 and 80 metres (as well as many European ones), with only 100 watts, and during flat midsummer conditions. In all, we made about 3000 QSOs with about 80 countries: not a record-breaking expedition, but a fun holiday with amateur radio included, and it was very pleasant to give a new country to quite a few operators. Anyone working/hearing TA3/GM3YOR can QSL direct to Drew Givens, 56 Myrtle Crescent, Kirkcaldy, Fife, Scotland; or TA3/G4VJG direct to my address at the end of QRZ.

While Drew and I were in Turkey, a group of six Gs were active from the Flannan Islands as GB0FLA and St Kilda as GBOSK. The journey from the Flannans to St Kilda, in a small yacht, sounded horrendous, as the yacht's inboard motor failed during a force

eight storm and, at the same time, the navigation equipment failed. However, they eventually arrived safely and put on a very successful operation, making a couple of thousand QSOs from both locations, much to the pleasure of both the WAB hunters and the Island on the Air (IOTA) chasers — the Flannan Islands had never been activated before.

The BBC Monitoring Service, at Caversham Park near Reading, was set up in August 1939 and therefore is celebrating its 50th anniversary as this is being written. A special call-sign, GB50MON, has been obtained for the occasion, and an impressive station, consisting of a TS-430S, 400 watt linear amplifier and TH5DXX 5 element beam, along with a 60 foot tower and verticals for 40 and 80 metres, has been put together. Special QSLs, entitling recipients to a free copy of the BBC Monitoring Service's publication "World Broadcasting Information" are being printed, and I have agreed to act as

QSL manager for this station. Anyone hearing or working GB50MON can QSL to my address at the end of *QRZ* — please enclose an aae.

As usual, the last weekend of October this year is the annual CQ World Wide DX Phone contest — the BIG one. This is the contest with perhaps more activity than any other weekend of the year. I have covered the rules in a number of other issues of *QRZ*, so will not go over them again, but will encourage as many readers as possible to at least have a dabble, and, if at all possible, put in a serious entry — the more the merrier. Putting in a serious contest entry in the CQ world Wide contests often means planning weeks or even months ahead, in order to make sure you have absolutely nothing else planned for the weekend — no shopping trips or walking the dog or visiting the in-laws! Many DXers use the weekend of the CQ World Wide contest as their main holiday of the year, and go on expeditions, preferably somewhere sunny and warm (the Caribbean islands are particularly popular with American amateurs

toward the end of October every year).

In Finland, the first snows of the winter often fall by the end of October, so Pekka, OH1RY is off again to Vanuatu, as reported earlier, and should be putting out a big signal as YJORY. A little closer to home, there is to be a mass invasion of Jersey again this year, as something like a dozen Englishmen prepare to operate as GJ6UW during the contest. I have described the GJ6UW QTH previously — suffice to say that it is in one of the best locations in Europe, on a cliff top, almost surrounded by sea paths, and with a 150 metre high tower at their disposal. This year, conditions are expected to be excellent, with the peak of the sunspot cycle expected soon, and the GJ6UW operators will be going all out for the British Isles multi-operator, single-transmitter record score. However, we understand that the GW8GT group, who are celebrating their 10th anniversary this year, will also be trying for the same record, so it looks as if there will be some good competition for once.

My "QSL of the month" this time is from Ken Miller, K6IR, who is often heard in contests and in the pile-ups calling the DX. Ken's QSL (which is in full colour) shows his most impressive station, consisting of a TS940S and Alpha 77SX linear. Outside, the antennas are equally impressive: a 5 element yagi on a 30 metre high tower.

Even if you do not have such an impressive station, it is well worth having a good look round in the CQ World Wide contest, as there is always some interesting DX to be worked. Indeed, it is often easier to work rare DX during such contests, particularly if you do not have an especially competitive station yourself, simply because there is just so much DX about that people are spread out more thinly than when there is only one DX station on the band and everyone is calling it. Give it a try, and please let me know what you work. The address is: Steve Telenius-Lowe, G4JVG, "Penworth", Tokers Green, Reading RG4 9EB (and that is also the address for VK9YG, TA3/G4JVG and GB50MON QSLs.

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# LETTERS

## Letter of the Month

As a regular reader of HRT, at last I put pen to paper to air my views on the readers' ads column. Month by month we get an assortment of colours, blues, reds, greens, etc., and though the red and the green may be OK, the blue, and especially the grey, I find most difficult to read.

There must be lots of your readers who find the grey and the blue difficult to read — I've come across several, some who even ignore the advert columns those months, so I hope you'll

do something about this.

I remember learning "it's not the letter we read, it's the colour behind it that makes it stand out," so now we know why the black print and the grey colour "mix" together — so have pity on our eyes and give us some good clear reading.

— Charles Whitaker, Scarborough, N. Yorks.

We'll have a word with the art department and see if we can get them to use fewer dots.

## Postal Pain

Ever ordered anything from one of the advertisers by post? What a palaver! In the last few months I have tried a few of them — the results leave a lot to be desired. First off, I like to check the goods are available, so I always ring up and check first.

This saves time wasted in a reply to say they are not available, but it seems some of these companies will tell you the items are available when they don't have them, presumably to get your money sent on the off-chance they can get the goods.

Take one company — (who we shall not name) — "Yes, we have what you require, and the service manual". So I sent off a cheque for £32 post haste.

Three weeks and numerous phone calls later they tell me they don't have the items.

After complaining, my cheque was returned — uncashed.

Why do they do this? It only causes irritation and bad feelings. I certainly will think twice before I give them my custom again.

A phone call and cheque to another company for an item they assure me is in stock produces no results after two weeks.

This just isn't good enough. Whatever happened to the return post system we used to get?

Come on suppliers, buck up. Give us better service by mail.

— David Bull G6PJE, Wisbech, Cambridge.

## Not Goodie Enough

I write as an ardent reader of Ham Radio Today and CB Magazine since

the first issue of both. Isn't it time that we got a fair deal from the adverts we are forced to read month by month in both magazines?

My experience as a disabled OAP goes like this: I sent a cheque and waited for months. Then I got the wrong item, for which I had to pay 49p return postage, as well as 60p return to the nearest post office. No refund of postage, etc.

Secondly, I buy a scanner for £240, and ask for a battery pack and mobile supply lead months ago. After repeated phone calls and letters I have had no answer. Why?

Both suppliers were well known names in different areas. Isn't it about time someone told these dealers that it is not good enough just to have "goodies" sold over the counter at rallies, money grabbed and 'farewell'? I'm being polite. It's obvious that as in antiques, if you ask for ham radio gear, they think, here is another 'sucker'. I've had enough rip-offs. Thanks for the mags.

— Ray Williams, Grantham, Lincs.

## Doesn't Add Up

I recently sent for a scanner for which post and packing was £10. When the unit arrived it came in its

*We regret that Ham Radio Today cannot reply to queries individually. Every month we publish a section of the most interesting. We will endeavour to answer straightforward queries about the back issues index if readers enclose an SAE and much patience. It helps if letters and back issue enquiries arrive on separate sheets of paper, although the same envelope can be used.*

own packing box and covered in one sheet of brown paper and some sticky tape, postage rate unreadable.

I should like to know how they arrive at this charge. Assuming the postage to be about £3, then the sheet of paper appears to be charged at £6 (allowing £1 for wrapping time).

I sent an order for a kit and two tuning capacitors at the same time for which p&p was £1. The order arrived in two cardboard boxes, and the stamps attached amounted to 96p, which leaves 4p for the two boxes, sticky tape and time.

There seems to be something wrong somewhere.

By the way, thanks for a good magazine (not blarney).

— W Roberts, Retford, Notts.

## Parted For Eternity

I hope that through your magazine you will allow me to express my views, since I can see no other form of complaint to make at the treatment I have received.

I bought an aerial tuner. After approximately two months it went wrong and failed to work. I sent it back for repair and had confirmation that it had arrived safely. I allowed the normal three to four weeks and then made enquiries.

At this point I was presented with the excuse that they had engineers on holiday and would I ring back later. One week later another enquiry resulted in more excuses and so it continued. Then I was told that they had backlogs and couldn't tell me when work would be carried out. Similar enquiries resulted in more and more excuses until six months later I learned that they had sent the tuner to a main dealer since they couldn't repair it. Finally the main dealer tells me that they are awaiting parts from Japan.

Eights months after I sent the tuner for repair I still have not received it and there is no immediate hope.

I hope you will print my letter not only to enable some form of complaint to be made, but to highlight the plight of trying to get some form of action when there is no complaints department to address when persistent and unacceptable excuses are given.

— Mark Matthews, Southall, Middx.

# MORSE FORUM

Technology and the ever increasing complexity of electronic goods seems to be apparent in all walks of life today. Cars are less DIY orientated than they used to be, and how many of us would like to dive into the back of a tv or video recorder?

Amateur radio is following suit. One only has to listen on the bands to

to a piece of home built equipment. Fortunately the variety of kits available to the amateur seems to be on the increase now and home construction is very much alive.

One kit manufacturer is Lake Electronics. They produce a number of kits, including their DTR3 80 metre CW transceiver. This is a compact

£126.50 including carriage if it is ready built and air tested. Further details of the DTR3 or other Lake kits can be obtained from Lake Electronics, 7 Middleton Close, Nuthall, Nottingham NG16 1BX. Tel. 0602 382509.

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## *Ian Poole G3YWX hears about the biggest CW party of the European year.*

---

hear people announcing what they are using — this rig or that with dozens of memories and so forth.

Many people do not want all this complexity and it is often refreshing to use equipment which is simple and effective. It is possible to do this using CW. It has been said that an engineer can do for a few pence what anyone else can do for a few pounds. This is very much the spirit of amateur radio and CW in particular.

CW as a mode has the elegance of simplicity while retaining its efficiency. I have proved this time and time again. It is possible to make DX contacts on CW where sideband would have been a hopeless case.

For the home constructor there is also the possibility of being able to build the whole station comparatively easily. A direct conversion receiver and a QRP transmitter are within the reach of many people. But how many could build a full sideband transceiver? Even for trained electronics engineers the time and cost factors make it prohibitive.

### **Shop window**

Building kits is one way in which a professional finish can be brought

QRP transceiver intended for base station or portable operation. The construction has been simplified by the use of modular techniques. Each board is built and tested separately so that any faults can be found more easily.

The transmitter includes a VFO which covers 3.5 to 3.6 MHz. The output delivers 1.5 watts to the aerial and it is well filtered to remove any harmonics. In addition to this the keying is shaped to prevent any key clicks, and there is an adjustable sidetone.

The receiver is a direct conversion type featuring a dual gate mosfet fed via a double tuned filter. There is also an input attenuator which can be switched in to prevent overloading if there are strong signals around. The receiver also boasts a sensitivity better than 1 microvolt and a passive audio filter which has a 250Hz bandwidth at 6dB down and is 45dB down at 3kHz.

The transceiver comes in an attractively finished black PVC coated steel case with aluminium chassis. The front and rear panels have white printing on a black background. This makes it look very neat.

And the price? £74.25 plus £2.00 post and packing for the kit or

### **FOC joins EUCW**

From 1st August 1989 FOC (the First Class CW Operators Club) has become a member of the European CW Association. This means that all the major UK and European CW clubs are members of EUCW.

FOC is an active club whose members are expected to demonstrate very high standards of CW and operating practices when on the air. In fact it is a great honour to be invited to join FOC especially as its membership is limited to only 500 worldwide.

An EUCW representative said that he was delighted to welcome FOC to the ranks of EUCW and he felt that they could make an important contribution to the cause of promoting amateur CW operation.

### **Correspondence**

Angie Sitton G0HGA wrote to comment on the "his/her" remark on the G-QRP Certificate. It seems from her certificates from most other organisations and her QSL cards that she has changed sex. On top of this a lot of people on the air refer to her as "Dr OM Angie . . ."! Maybe we will have to introduce a new abbreviation OP for old person to replace OB, OM etc, etc.

Stephen Pearson had some interesting comments about computer methods of sending and receiving morse. He says that having had considerable success with a computerised morse reader there should be little need now for "manual" reading of the code. In fact, he takes the argument further by saying that there should not be any need for a

morse test on the bands today if morse can be fully automated. An interesting point, but I dare say it is one which is rather controversial. It would be interesting to hear what other people have to say about this.

## News and Events

The European CW Association is holding its annual "Fraternising CW Party" over the weekend of the 18th and 19th of November. The idea of the party is to give an enjoyable weekend of CW activity. Although the event is framed within a contest set-up, people are free to treat it as they want. It can be a time to meet and chat to old friends or a contest.

The make-up of the CW Party is a little more involved than some, but it has been done in this way to enable it to be as enjoyable as possible for most people.

The frequencies are 3520-350 kHz on 80 metres, 7010-7030 kHz 40 metres and 14020-14050 kHz on 20 metres between 1500 and 1700 GMT and switches to 80 metres and 40 metres between 1800 and 2000 GMT. On Sunday 19th November 40 and 80 metres are used between 0700 and 0900 GMT with operation on 40 and 20 metres between 1000 and 1200 GMT.

There are four different classes of operation and the serial numbers for each can be different. EUCW organisation members using more than 10 watts output or 5 watts output send RST/QTH/Name/Club/Membership Number, as do those using QRP. Other licenced amateurs send RST/QTH/Name/NM (not a member). The final class of operation is for short wave listeners who have to log the exchanges for both stations in the contact.

Stations can claim one point for each contact with one's own country and three points for stations in other countries. Short wave listeners claim three points for each complete logged contact. There is also a multiplier of one for each EUCW member organisation contacted or logged per day and band.

Certificates will be awarded to the first three stations in each class. Logs must show the date, time (in GMT), band, information sent and received and the points claimed for each contact. A summary sheet must

be included and should show name, address, callsign, score and details of the rig, including the power used. Finally, a signature is needed. The logs should be sent not later than the 20th of December 1989 to Geunther Nierbauer DJ2XP, Illingerstr 74, D-6682 Ottweiler, Federal Republic of Germany.

Then, just as a reminder, there are a number of RSGB CW contests. On the 15th October there is the 21MHz CW, and the 4th of November is the 1.8MHz CW, then on the 9th of December there is the 50MHz CW contest followed on the 10th December by a 70MHz event.

It is good to see some VHF CW contests because it is one way of increasing the level of CW activity. NFD was very disappointing from a CW point of view. May be the RSGB could make some form of incentive to increase the level of CW activity in mixed mode contests.

## Band Report

Band conditions have been quite variable. CW has been good on two metres with plenty of DX via sporadic E, which I missed as usual! With the good weather there has also been plenty of tropo.

HF band conditions have been a little variable. Ten has been "off colour" quite a bit. In spite of this the path to South America has often been open even when the band has appeared dead because there were only a couple of Europeans audible via sporadic E.

Possibly the good old faithful DX bands — fifteen, twenty and forty — have been best. There have been a number of DXpeditions for those with big aeriels or lots of patience, and a fair number of good contacts for those without.

A couple of reports were received this month. The first was from Angie Sittton G0HGA. Unfortunately she was virtually off the HF band because of problems with the HF equipment. This meant that her 2 metre equipment was put to good use making contacts with DL1EF, F1JLQ, F5WD, F6BLE, F6CWW, FD1MZ, F6KBF, GU0BDV, GW0DLW, LZ1KDP, LZ2XU, ON4ADI, ON4APZ, ON4ASL, ON4ARC, ON4CW, PA3EDN, PA3EQZ, PA3FIQ, PB0AIM, PE0MAR, SM6DWF, YU1AFS and YU7CV.



Lake Electronics DTR3 80m CW Tx.

A few of these contacts were cross mode: Angie on CW of course! But it just goes to show what can be done with 15 watts, a 4 element at ten feet and CW. (No ruddy computers, either, says your Editor bitterly. It's just swallowed the last hour's work.

Richard Everitt proved that two of the old faithful HF bands were in good shape. On forty metres he managed contacts with D68TW, FH5R, HC2G, V17T and YY1D. Then on twenty he hooked AP2ZA, HL9JZ, JX7DFA, VP5P, ZF2NE/ZF8, ZX2A, 4J1FS and 5H1NK. For all these he was using 100 watts fed to an 8 metres ground mounted vertical.

## Sign Off

Well, that's all for now. For everyone who want to write in the address is QTHR, but for anyone without a call book it is: 144 Worple Road, Staines, Middlesex TW18 1EQ. So, until the next time BCNU es 73s de G3YWX.



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Sticking power or normal fit. The latter can be used for a permanent fit. REVCO

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# 3.5-4MHz Superhet Receiver

## Part 2

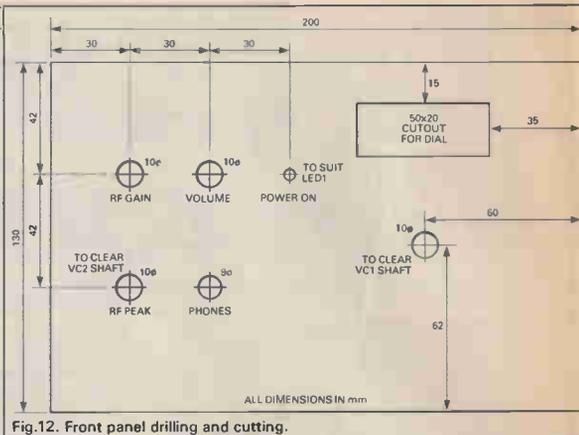


Fig.12. Front panel drilling and cutting.

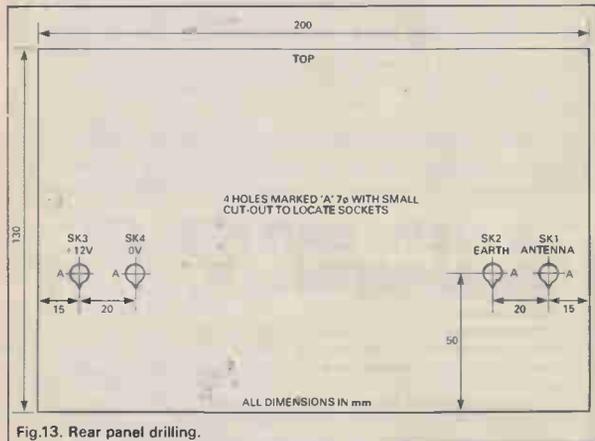


Fig.13. Rear panel drilling.

*S. Niewiadomski's plans  
for the assembly of the  
superhet receiver.*

### Assembly

A ready-made case is used to house the receiver, greatly simplifying the metal working required. A general idea of the placement of the major components in the receiver can be gained from the photographs.

Drilling and cutting details for the front, rear and bottom panels of the chassis are given in Figs 12, 13 and 14. It is best to obtain all the components which have to be mounted on the chassis

before starting work because physical details might differ from those used on the prototype, necessitating slight dimensional modifications. Any type of led can be used as the Power On indicator, or it could be omitted altogether if a saving of the 10mA or so it consumes is required.

On the prototype, no holes were drilled in the cover for the case "to let the sound out" from the speaker. This was found to be unnecessary and means that the potentially risky business of drilling the nicely-finished outside of the case is avoided.

The VFO box is also an off-the-shelf item and is supported above the main chassis by two identical brackets (brackets A), one at each side, the dimensions of which are shown in Fig.15. Similarly, the loudspeaker is supported vertically near the right hand side of the chassis by a further bracket, bracket B.

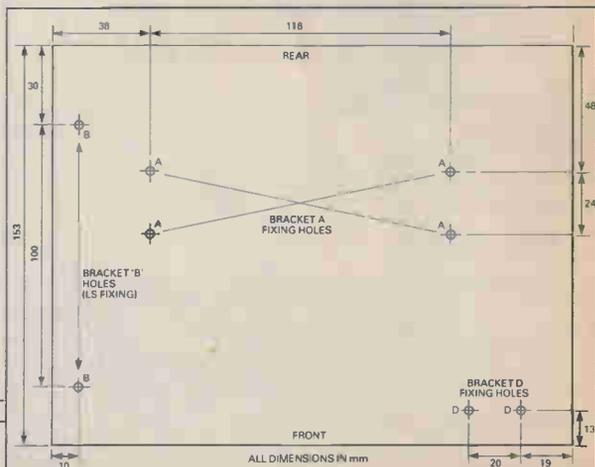


Fig.14. Bottom panel drilling.

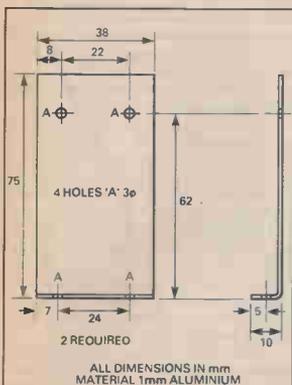


Fig. 15. Bracket A (VFO box brackets).

This is shown in Fig. 16, but the exact dimensions may have to be varied to suit the speaker used.

Fig. 17 shows details of bracket C, which is used to mount VC2, the peak control. Exact dimensions of the bracket, especially the positioning of the capacitor fixing holes, will vary with the capacitor used. The variable capacitor used on the prototype had a built-in slow-motion drive, which helps with the accurate peaking of signals. If such a capacitor cannot be found, a separate slow-motion drive can be incorporated.

Pcb 1, 3 and 4 are mounted on an upper deck consisting of an aluminium sheet screwed to the lid of the VFO enclosure. Mechanical details of this sheet are shown in Fig. 18. Pcb 4, the carrier insertion oscillator board, is enclosed inside an aluminium screening bracket (bracket D), which is shown in Fig. 19. The positive supply for Pcb 4 passes through bracket D via a bolt-in

feedthrough capacitor.

There is room on the upper deck for an additional pcb, if necessary. This could be an AGC circuit or perhaps a converter to extend the frequency range of the receiver.

### The Slow-Motion Drive

The slow-motion drive arrangement for the receiver main tuning is shown in Fig. 20. By using two 6:1 reduction drives

tates at the same rate as the rotor of the capacitor. Disc B (shown in Fig. 21, along with the dial, disc A) transfers the motion of this flange outside the body of the front 6:1 drive so that disc A can be attached using lengths of 6BA studding. Disc A therefore also rotates at the same rate as the rotor of the tuning capacitor, so a calibrated scale can be drawn on disc A to give an indication of the received frequency.

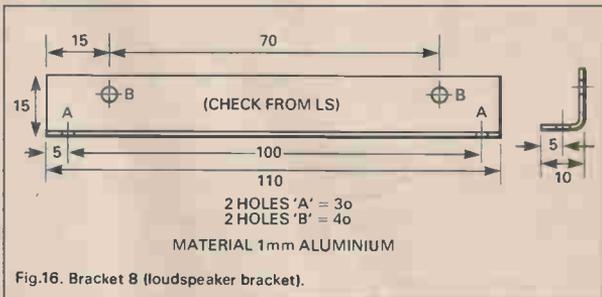


Fig. 16. Bracket B (loudspeaker bracket).

in series, a total reduction of 36:1 is achieved. In practice these drives tend to have a reduction ratio of more than 6:1, so typically the total reduction can be more than 40:1. With a tuning rate as slow as this, no fine tuning control for the VFO is necessary, which can be an embarrassingly difficult control to find room for on a front panel. The usual problem with using cascaded slow motion drives is that no tuning dial can be fitted because the front drive prevents a dial being fitted to the rear drive which is the one which indicates the position of the moving vanes of the VFO tuning capacitor. The mechanism to overcome this problem is as follows:

The 6:1 reduction drive closest to the tuning capacitor has a flange which ro-

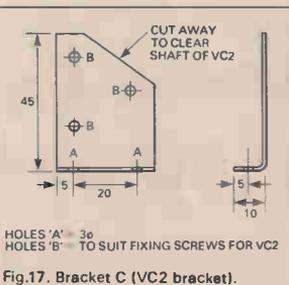


Fig. 17. Bracket C (VC2 bracket).

Many materials are suitable for making discs A and B. Any rigid sheet material, such as aluminium or brass can be used, or as in the prototype, unetched pcb sheet.

Fig. 22 shows how pcb 2, the VFO tuning capacitor VC1 and the power supply wiring to the VFO are arranged in the VFO aluminium box. The exact placements are not critical, as long as VC1 is presented to the slow-motion drive to give the correct position on the front panel. The connections to pcb 2 are soldered to the board via 1mm pins, rather than using the plug and socket system used for other boards.

### Test and Align

Being a single band receiver, testing and alignment is relatively simple. The first module to tackle is the VFO. If a milliammeter is available, monitor its supply current. When power is applied, the current should be about 28mA. If it is

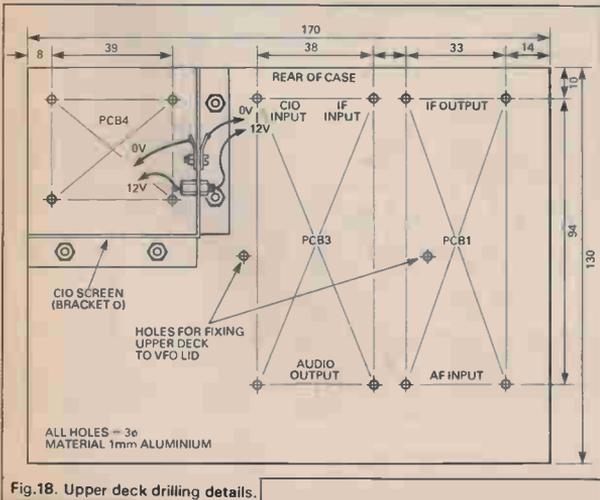


Fig. 18. Upper deck drilling details.

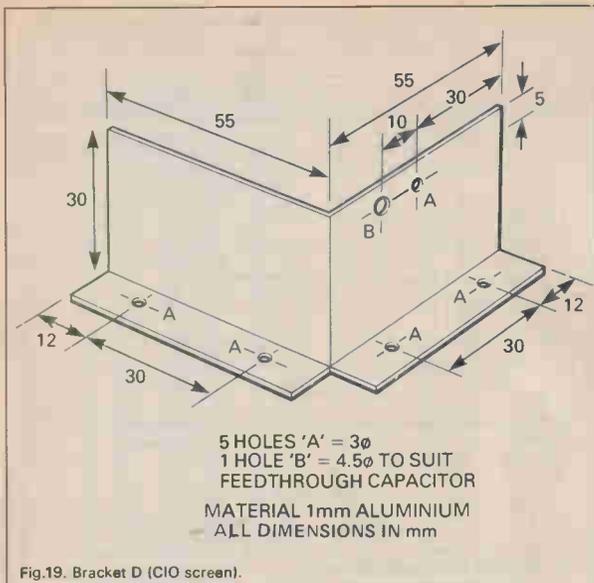


Fig.19. Bracket D (CIO screen).

much more than this, turn off quickly and look for solder splashes, wrong components and so on. When the current looks reasonable, apply an oscilloscope (if available) to the buffer stage output and check for an undistorted sine wave.

Adjust R6 for an output of about 2 volts peak-to-peak. If you do not have access to a scope, set R6 at about mid-position. In practice, this setting is not too critical and it can be experimented with on live signals.

To set the frequency range of the VFO accurately, a frequency meter or a receiver preferably with digital read-out is required. Set VC1 to maximum capacitance, that is with its vanes fully meshed, and measure the frequency of oscillation. Using the correct type of trimmer tool, not a screwdriver which will probably result in a broken core, adjust the core of T1 until the frequency is about 10-20kHz below 3.955MHz. Now swing VC1 to minimum capacitance and again measure the frequency. It should be a few 10s of kHz above 4.455MHz. Fine adjustments of

the core of T1 can not be made until the overlap at each extreme is about equal. If an acceptable overlap cannot be obtained, the values of C2 or C3 may have to be reduced, so that VC1 has more effect on the frequency coverage.

When the correct VFO coverage has been obtained, the dial can be calibrated before the VFO box and slow-motion mechanism are assembled on the receiver chassis. Set the VFO to 3.955MHz and mark the received frequency this will correspond to, 3.5MHz, at the top rear of the dial near to the outside edge. Work upwards in frequency, in say 50kHz intervals, marking the rear of the dial as you proceed. 4.055MHz VFO frequency corresponds to 3.6MHz received frequency, and so on.

A similar procedure can be followed for setting the CIO frequency and level from pcb 4. Again the core of T1 has to be adjusted for the correct frequency. Here the frequency to aim for is 453.5kHz. If a method of setting this frequency accurately is not available, T1 can be adjusted when the receiver has been fully assembled and a signal is being received. The current consumption of pcb 4 should be about 14mA.

No adjustments are needed on pcb 3. The current consumption of this board should be about 19mA with no audio output.

The RF tuned circuits on pcb 1, T1 and T2, can be aligned either using a signal generator at about mid-band, or by peaking them on received signals. T3 needs to be tuned to 455kHz, and again this adjustment can be left until a signal is being received. The core of T3 needs to be adjusted for greater audio output. The current consumption of pcb 1 should be about 22mA.

## Finishing

A pleasing final appearance for the receiver can be obtained by using self-adhesive plastic material such as Contac.

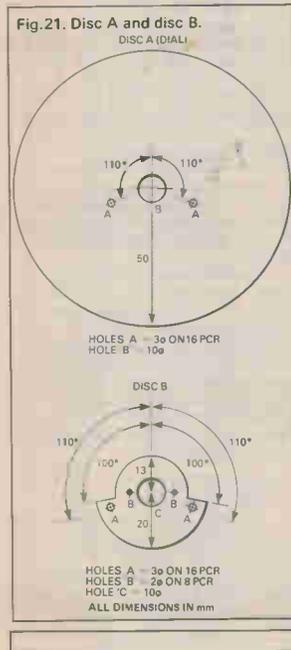
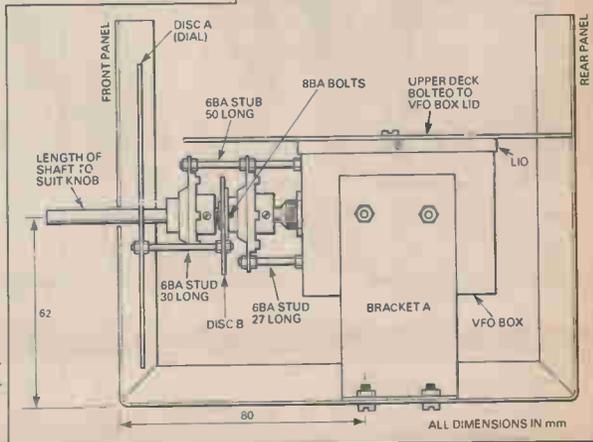
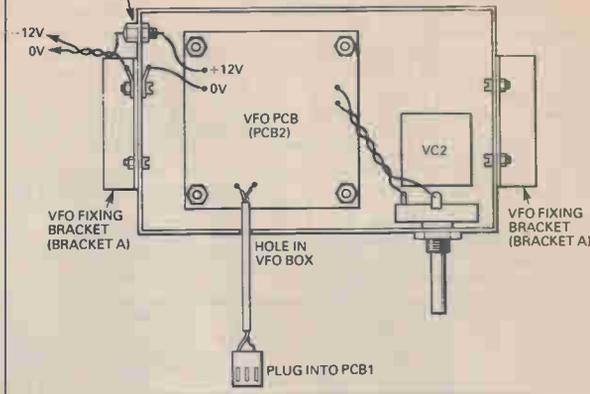


Fig.20. Slow-motion drive and mounting details.



BOLT IN FEEDTHROUGH CAPACITOR

Fig.22. Mechanical arrangement of VFO.



This is applied to a smooth and clean front panel and is much more straightforward than painting. Rub-on lettering can be used to label the controls and a layer of clear Contac carefully applied over the top of the lettering to protect it from scratches.

The dial can be finished off neatly by applying the Contac to the front of the dial, then transferring the calibration marks from the rear to the front. Lettering is then applied showing the tuned frequency and finally a transparent layer applied over the top to protect the lettering.

A sheet of clear plastic, with a vertical line marked on it, can be glued over the front panel cut-out, through which the dial is viewed. Finally, feet should be stuck onto the bottom of the chassis to prevent scratching of any surface the receiver is placed on.

### In Use

The receiver is very simple to use. It requires a stabilised 12 volt power supply of at least 120mA current capability. Connect an antenna, set the RF gain and volume to about one quarter from minimum and adjust the peak control for maximum noise. As signals are resolved, the peak control will need adjusting for maximum signal strength and RF gain setting to prevent any overloading. The tuning rate is slow enough to make tuning of SSB signals easy without the need for a fine tune control.

The results obtained will obviously depend somewhat on the quality of the antenna, but I have had great success with only a few metres of wire. A ground connection will also help to improve reception. In the daytime the 3.5MHz band tends to be occupied by nets of G stations "ragchewing", whereas in the evening many mainland Europeans and signals from further afield appear. Dawn and dusk, especially in the winter, are good times to hear US stations around the 3.8MHz mark. Detailed predictions of band conditions can be found in many radio magazines.

The internal loudspeaker is suitable for most signals, but headphones may be needed to resolve very weak ones.

### Other Bands

The receiver can be used on other amateur bands in one of two ways:

- ★ by modifying the tuned circuits which are specific to the frequency range being covered, that is T1/C1 and T2/C14, and changing the VFO frequency range;
- ★ by constructing a converter for each of the new bands which output in the range 3.5-4.0MHz.

The first option will probably be acceptable up to the 14MHz band, but at higher frequencies two difficulties will be encountered: firstly, it will be difficult to construct a stable VFO, and secondly, image rejection of the receiver may be inadequate because of the comparatively low intermediate frequency of 455kHz. Both of these problems could be overcome by raising the IF to 10.7MHz, which has the effect of lowering the VFO frequency (as long as the VFO frequency is set below the band to be received) and, of course, greatly improves image rejection. With such a high IF, however, the CIO frequency would need to be set by a crystal, rather than a simple LC circuit which gives acceptable results at 455kHz. In total, considerable modifications could be necessary to operate the receiver on a different band.

The second option, the use of converters, has many advantages: the basic receiver does not have to be modified; converters can be built as needed and

when finances permit; and image rejection of a converter working with the receiver will generally be good since the IF between the converter and the receiver is 3.4-4.0MHz.

Fig.23 shows the block diagram of a typical converter. An input bandpass filter selects the band of interest, and passes the signals to an RF amplifier stage. A mixer circuit, similar to the one used in the basic receiver, then converts a 500kHz segment of the band received to 3.5-4.0MHz, which is selected by an output bandpass filter. This output at 3.5-4.0MHz is input to the main receiver.

The conversion process is controlled by the output of a crystal oscillator, whose frequency is chosen to give the desired frequency shift. For example, to convert the 14.0-14.5MHz band to 3.5-4.0MHz, a 10.5MHz crystal could be used. An alternative crystal for this conversion is 18MHz. In general, there are always two crystal frequencies which will give the desired conversion. One will result in sideband inversion, whereas the other will maintain the sideband, of the original signal. If a range of converters is planned for the receiver, it is worthwhile making the frequency of the CIO switchable between 543.5kHz and 456.5kHz, thereby accommodating either sideband. In this way, the converter crystals can be more easily chosen for availability and to minimise the chances of spurious responses.

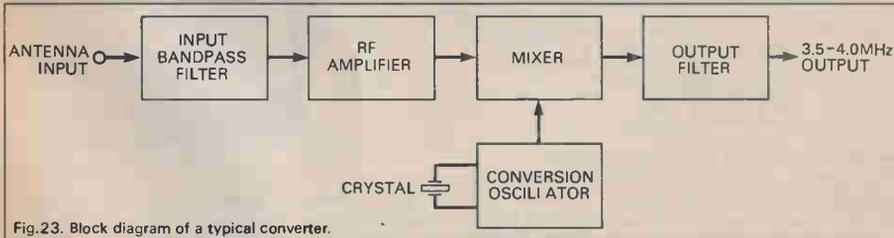


Fig.23. Block diagram of a typical converter.

# RADIO Tomorrow

On these club contacts and forward diary pages, dates are shown approximately from the week of publication to the end of the cover month, and further into the year where dates have been supplied. We need dates at least three calendar months in advance to get them into the nearest issue. For example: the last possible issue for dates from mid-August to mid-September is the September issue. The September issue normally appears on the first Friday in August, and we need club dates by the second Friday in June. Club dates received well in advance will normally be run in more than one issue. Please write and let us know if your club changed its name or contact.

## SCOTLAND

Aberdeen ARS. Don. 04676 251.  
Ayr ARG. Robert Paterson GM4CUB. 0292 262496. 2 Fris, Community Centre, Wellington Sq., Ayr.  
Dunfermline RS. GM0DYD. 0383 413440.  
Galashiels DARS. GM3DAR. 0896 56027.  
Glenrothes DARC. John Hardwick GM4ALA. 0592 742763 (hm) (0506 410677 (wk)).  
Inverness ARC. Brian. 0463 242463.  
Lothians RS. P J Dick GM4DTH 21, West Maitland St., Edinburgh EH12 5EA. Prestel (NOT phone) 314471210. 2,4 Thursdays 7.30pm Orwell Lodge Hotel, Polworh Terrace, Edinburgh. Oct 11 Call my Bluff; Oct 25 Women in radio GM6KAY; Nov 8 Junk sale; Nov 22 A talk GM4DJ.  
Louth DARC. G1IZB. 047286 695.  
Mid Lanark ARS. David Williams GM1SSA, Holytown 732403.  
Waterside SWC. Bernie Lyford. 0703 893937.  
Westmoreland ARS. G. Chapman. 0539 28491.

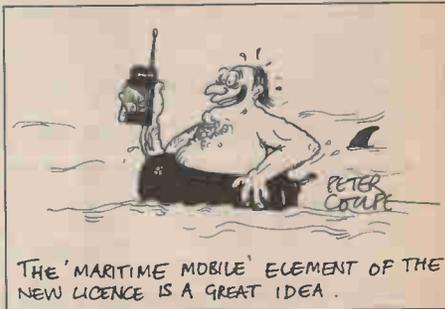
## NORTH EAST ENGLAND

Barnsley ARC. Ernie Bailey G4LUE. Barnsley 716339. Mons St. Mary's Church Hall, Lathes Lane, Barnsley.  
Bishop Auckland ARC. Peter Fawcett G0FBK Bishop Auckland 606819. Most Thurs. Oct 15 Rally Sunnydale Leisure Centre. Shildon Ernie G4TYF B/A 607500.  
Bourne DARS. Vince Cawthron G4ODG. 0778 422795.  
Derby Dale DARC. G3SDY 0484 602905.  
Derby DARC. Kevin Jones G4FPY. 0332 669157. 119 Green Lane, Derby. 7.30pm. Most Weds.  
Doncaster ARC. K McMahon. Doncaster 852938. Mons. Corporation Brewery Taps, Doncaster.  
N. Ferrisby ARS. Frank G3YCC 0482 650410 Fris. NFU Football Club Room, Church Rd., N. Ferrisby, Yorks.  
Hornsea RC. Richard. 0401 62498. The Mill, Atwick Rd., Hornsea. 8pm. Sun Oct 15 Ethoex 1989 Ratley, Floral Hall, Hornsea. N. Humber side 11am Jeff G4IGY 0964 532874 wk. 0964 533331. Trade, bring and buy, displays. Hornsea Potteries Leisure Park nearby.  
Hoyland ARC. M Wardle G0GDC. 11, Sokell Ave, Wombwell, Nr. Barnsley. Weds West Bank House, opp Hoyland Leisure Centre.  
Keighly ARS. K A Conlon G1IGH. Bradford 496222. Weds. 8pm, The Clubroom, Victoria Hall, Keighly, Yorkshire. Oct 17 natter; Oct 31 Junk sale; Nov 7 On air; Nov 14 Film show; Nov 21 natter; Nov 28 Short wave data listener, demo G4ZVD.  
Leeds DARS. G1EBS. 0274 665355.  
Loughborough ARC. Phillip. 0509 412043.  
Maltby ARS. K Johnson G1PQW. Rotherham 814135. : Fris Hellaby Hall, Hellaby.  
Mansfield ARS. J M Coates G4GYU. 0623 27257. Fris.  
Mexborough ARS. D Thomas G6FUM. Doncaster 859654. Fris Harrop Hall, Mexborough.  
Morecambe Bay ARS. G4ZJL. 0524 52042.  
Northern Heights ARS. Stan Catton G0YR. 0274 673116. 1.3 Weds 8.15 Bradshaw Tavern, Nr. Queenbury, Bradford. Oct 18

Visit to Fire Service HQ. Nov 1 Fax and other data modes Jack Birse G4ZVD; Nov 15 Getting started in the 1030s Leslie Cobb.  
Pontefract DARS. Colin Mills G0AAO. 0977 43101. Carleton Community Centre, Pontefract.  
Rotherham ARC. F Moody. Rotherham 552925.  
Rugby ATS. Kevin G8TWH. 0203 441590 David G4DDW. 0455 52599.  
Scarborough ARS G4BP. I G Hunter G4UQP, 46 Station Rd., Scalby, Scarborough, N. Yorks. 0723 376847.  
Sheffield ARC. M Sables. Sheffield 886083. Mons Firth Park Pavilion, Sheffield.  
Sheffield Packet Group. P Green, 6 Yews Close, Worrall.  
Spalding ARS. Terry G4TWR. 0775 2940.  
Stockton DARS. G. Noble c/o Causeway Community Centre, Billingham, Stockton on Tees. Weds Causeway Community Centre 7.30. Regular RAE and Morse tuition.  
Tyneside ARS. G. Lindsay G4KOT, 12 Augusta Court, Harrian Park, Wallsend, Tyne & Wear.  
UK FM Northern. L Loughton G4UNA. Wakefield 822259. East Ardsley Cricket Club, one Sun per month.  
Wakefield: North Wakefield RC. John Hoban 0924 825443. Thurs 8.30 White Horse Inn, Fall Lane, East Ardsley, Wakefield.  
Wigston ARC. G6HAJ. Leicester 403105.  
Workshop ARS. John Huggins G0DZX Sheffield S31 7BX. 0909 565856. The Clubhouse, West St., Workshop.  
Yorks ARS. Keith Call G3WVO, 4 Heworth Village, York. \* Fris 7.30pm, United Service Clubroom, 61 Micklegate, York. 13 Oct AGM; JOTA soon.

## NORTH WEST ENGLAND

Aire Valley RS. G6NPT. 0532 44597.  
Bolton ARC. Deane Sports Complex, New York, Junction Rd., Bolton. Glenn Bates G6HFF 02024 63459.



Cheshire: N. Cheshire RC. C Kirsop G6KSA, Morley Green Club, Wilmslow.

Chester DRS. Dave 0244 336639.

E. Lencs ARS. Stuart 0227 68913.

Fylde ARS. Frank G4CSA, St Annes 720867, South Shore Lawn Tennis Club, Midgeland Road, Blackpool, 2,4 Thurs. Oct 12 Space exploration in 1990s Peter Sullivan; Oct 26 informal; Nov 9 Equipment sale; Nov 23 Construction competition; Dec 14 supper and social.

Isle of Man ARS. J Wrigley. 0624 834257.

Kirkby ARS. Via Weds Kirkby Sports Centre, 17 Valley Rd., Westvale, Liverpool 7,30.

Liverpool DARC. W H G Metcalfe G6VS, 38 Kempton Rd., Wavertree, Liverpool, Tues, Conservative Club, Church Rd. Morecambe Bay ARS. D H Wood G4ZUL. 0524 52042. Tues 7.30 Trimpell Sports and Social Club, Out Moss Lane, Morecambe, Lancs.

Preston ARS. George. 0772 718175.

St. Helens DARC. Carol Wainwright G0CXT 0744 813589. Thurs 7.45 Community Resource Centre, Old Central Secondary School, College St., St. Helens. Regular Morse tuition.

Starfs ARS. Bill G4WTP. 0782 514741.

Stockport RS. John Verity G4ECL. 061 439 3831. Dialstone Community Centre, Lisburne Lane off Dialstone Lane, Offerton, Stockport. 8pm, 2,4 Weds.

Todmorden DARC. E. Tyler GOAEC. Halifax 882038. 1,3 Thurs Queens Hotel, Todmorden. Oct 17 natter; Nov 6 Sun earth and radio by Gordon Adams G3LEQ; Nov 20 Natter; Dec 4 George Dobbs Annual Christmas Lecture.

Warrington ARS. Paul GOCBN. 0925 814005.

Wirral ARS. A Seed G3FOO. 051 644 6094. 1,3 Weds 7.45 Ivy Farm, Arrow Park Rd., Birkenhead.

Wyre ARS. Ian Broadbent GOKMT. 03917 57636. 1,3 Weds Fleetwood Cricket Club, Broadwaters 8pm.

## WALES

Abergavenny and NH ARC. GW4XQH 0873 6655.

Aberporth ARC. GW0DPR. 023987 274.

Bridgend DARC D E George GW10UP. 0656 723508. Nov 19 1989 Rally Bridgend Recreation Centre, Angel St., Bridgend, Mid. Glam. 11am C Trotman GW4YKL 0443 226198 D George GW10UP 0656 723508.

Delyn RC. Stephen Studdart GW7AAV. 0244 819618. Daniel Owen Centre, Mold, Clwyd. All Tues Oct 10 Raynet, what is it? Oct 24 First air by St. John Ambulance Service, Nov 7 Packet radio by Malcolm GW4IEQ; Nov 21 Old members reunion, Dec 5 RSGB video; Dec 19 Mince pie night

Holyhead DARS. D Richards, 9 Queens Park Court, Holyhead, Gwynedd. Forresters Arms, Kingsland Rd, Holyhead 2,4 Suns, 7,30.

Newport ARS. GW7BSC. 0633 62488.

North Wales: Clwb Radio Amatrif Y Ddraig GW4TTA Tony Rees. 0248 600953. Four Crosses, Pentraeth Rd., Menai Bridge 7.30pm. 1,3 Mons. Oct 16 Talk by Dr. Ieuan Jones GW4FQU; Nov 6 Film night; Nov 20 Surplus sale.

## THE MIDLANDS

Coventry ARS. Johnathan Ward G4HHT. 0203 610408. Baden Powell House, 121 St. Nicholas St., Radford, Coventry, Regular On-air and Morse tuition.

Midland ARS. Paul O'Connor G1ZCY. 021 443 5157. Tues 7.30, Unit 16, 60 Regent Place, Hockley Jewellery Quarter, Birmingham. Morse tuition Weds, Raynet, 4 Tues. Oct 17 AGM. MARS Birmingham Rally, Sun 19 Nov Stockland Green Leisure Centre, Slade Road, Erdington. 10 to 5, 50p, free parking. Pete G6DRN 021 326 7515, Bob G4YUI 021 472 79981.

Mid Warwickshire ARS. G4TIL. Southam 4765.

North Cheshire RC. G6USA c/o Morley Green Club, Wilmslow, Cheshire SK9 5NT.

Nuneaton DARC. Paul Bicknell G4JFT. 0203 343412. 4 Tues, Eton Social Club, Meadow St., Abbey Green.

Rugby ATS. Kevin Marriott G8TWH, 77 Lloyd Crescent, Stoke Hill, Coventry, Cricket Pavilion, BTI Radio Station, B entrance. A5 Trunk Rd., Hillmorton, Rugby. Tues 7.30.

Stratford on Avon DRS. David G0HWZ. 0789 750584. 2,4 Mons, 7.30pm, Baptist Church, Payton St., Stratford on Avon.

Stourbridge DARS. C Brunn G1WAI. 0562 885602. Robin Woods Centre, Beauty Bank, Stourbridge, Worcs. 1,3 Mons.

Telford DARS. Tom Crosbie. 0952 597506.

West Bromwich Central RC. Bill Oakes G1QYY. 021 556 3183.

Willenhall DARC. Dave G0EGG 0902 734475 Weds 8pm Brewers Droop Inn, Wolverhampton St., Willenhall, W. Mids. CW tuition, good ale.

Wolverhampton ARS. Keith. 0902 24870.

Worcester DARC. D Batchelor 0905 64173.

Wythall RC. Chris Pettit G0EYO. 021 430 7267.

## SOUTH WEST ENGLAND

Axe Vale ARC. Pat Cross G0GHH. Balls Farm Cottage, Musbury Rd., Axminster. Oct 6 AGM.

Bath DARC. E Otten G4CEV. Bath G832156.

Blackmore Vale ARS. Stuart Branton G0EX1. 0747 840558. 2,4 Tues 8pm Old Coach House, Bell & Crown, A303, Wilts. Oct 24 G4RWB club station on air; Nov 14 Safety in the shack Dave G0GWC; Filter Steve G1ZTO; Dec 12 Christmas dinner.

Bristol: North Bristol ARC. Ray G1YRS 04545 2768.

Bristol: South Bristol ARC. Len Baker G4RZY. 0272 834282.

Whitchurch Folk House, East Bundry Rd., Whitchurch, Bristol BS14 0LN. Weds. Oct 11 ATV activity; Oct 18 Homebrew bring and display; Oct 25 20 metre activity.

Evesham: Vale of Evesham DARS. John G3DEF. Evesham 6407. 1 Thurs at 7.30pm at MEB Club, Worcester Road, Evesham.

Exeter ARS. R. J. Donno G3YBK 0392 78710. 1 Mons, Community Centre, St. David's Hill, Exeter 7.30pm. Oct 9 AGM.

Plymouth ARC. G4SCA. 0752 337980.

Poole ARS. G0EQV. 0202 674802.

Salisbury RES. Neil. 0980 22809.

Salop ARS. Fred Hall G3NSY. 0743 790457. 2,4 Thurs, The Olde Bucks Head, Frankwell, Shrewsbury 8pm.

Stratford Upon Avon DARS. A Beasley G0CXX. 060 882 495. 7.30 Baptist Church, Payton St., Stratford Upon Avon. Oct 9 Ham radio around the world Les Hickingbotham G3HZG; Oct 23 Repeater group talk; Nov 13 Practising projects; Nov 27 visit to Stratford Exchange (tbc).

Thornbury DARC. Tom Cromack G0FGI, Rose Cottage, The Naite, Oldbury on Severn, Bristol, 1,3 Weds. 7.30 United Reform Church, Chapel St., Thornbury, Evesham, Oct 18 HF Activity; Nov 1 Video; Nov 15 Project evening; Dec 6 Quiz.

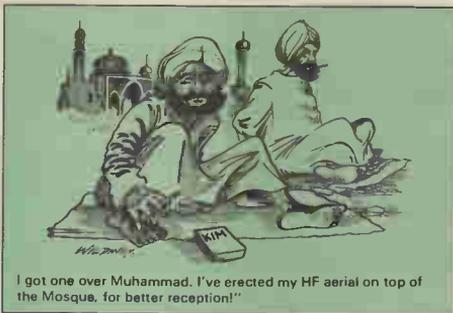
Torbay ARS. G3NJA, GBHJA. Walt G3HTX. 0803 526762. ECC Club, Ringslade Rd., Nr. Highweck. Club nights Fris 7.30. Oct 20 Between the bands; Oct 20-22 Jamboree on the Air; Nov 17 Meeting; Dec 1, 8, 15, 22, 29 Club nights.

Trowbridge DARC. Ian Carter G0GRA. 0380 830383. Most 4 Weds, 8pm, TA HQ, Bythesea Road, Trowbridge. Oct 11 Packet and data communications by Amdat, Bristol. Oct 25 social; Nov 8 Constructors' Cup judging; Nov 22 Social; Dec 6 Christmas party.

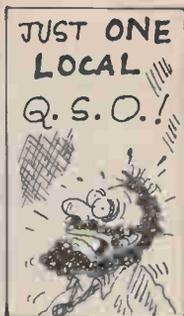
Yeovil ARC. David Bailey G1MNM, QTHR. The Recreation Centre, Chilton Grove, Yeovil. 7.30pm, Thurs. Oct 12 Impedance changing G3MYM; Oct 19 Oscillators G3MYM; Oct 26 Natter; Nov 2 RSGB video. QRP Convention 13 May 1990, more details nearer the time.

## SOUTH EAST ENGLAND

Aylesbury Vale RS. Geoff G3YLC. 0260 817496. 1,3 Weds 8pm. Hardwick Village Hall (A413 N of Aylesbury).



I got one over Muhammad. I've erected my HF aerial on top of the Mosque, for better reception!"



### Woe is Us

These letters of woe are a fairly representative cross-section of the things that can go wrong in mail order buying. That said, when you consider the amount of stuff that changes hands through the mail, complaints are few and far between. I say this with feeling, having both lost important material in the post recently and had stuff damaged on the way back to its owners. It happens — not so often, but too often, you might say.

G6PJE is lucky in one way. He dealt with a company which did not bank his cheque, saving him two potential sets of bank charges. It is easy to make mistakes about stock levels, and it makes sense to wait and see if stocks come in, if this happens. But it is very offputting to be told "it's in", and then be told "it's out".

As well as checking stocks, get an estimate of delivery time. Some companies give themselves a week, others a month. It saves teeth-gnashing.

### Working Units

Mark Matthews was dealing with a business which seems to have genuine staff absences and lack of parts. Even so, being left without a unit

for months, when it should be in warranty, is unacceptable. If this happens, write to the MD of the company demanding a working unit. They have the option to replace, rather than repair it. If this fails, go to your local Citizens' Advice Bureau and find out what options are open to you to get a working unit, and how best to go about them. Take any paperwork, letters, advertisement, etc. with you for reference. Their number will be in the phone book.

### Know Your Options

If you have real problems with substandard equipment, orders not supplied correctly, inaccurate advertising, etc, then speak to your local Office of Fair Trading, who will normally investigate.

If orders are supplied wrongly and you are faced with the expense of returning stuff, again, talk to your CAB, who will know if you are entitled to, for example, demand that the supplier collects the item.

G1ORD doesn't say whether his package was sent parcel post, or by another route, and he also doesn't mention insurance. Also, sending parcels, especially for a VAT-registered

business (virtually any scanner dealer) can be labour-intensive as parcels have to be logged individually with the post office. I think the kit supplier who charged 4p for packing is losing money on it — generous, but not good for the business.

### Survival Tips

At HRT we don't have the personpower or specialist expertise to investigate individual claims, but we would like to hear if anyone has real problems. Tips: check stock/delivery times before ordering, keep copies (stats or written) of all orders, letters, etc. with dates, cheque numbers and amounts; write to the top person if you keep getting ignored; go to a local consumer body for advice if this falls. Do that BEFORE you send solicitors' letters and the rest; they are expensive, and don't achieve much unless they are very clear about the next course of action.

### Genuine Error

Always assume a genuine mistake has been made the first time: suppliers can have insurmountable problems at times. And who knows what they think of us in their darker hours, faced with underpayment, orders with no name, no VAT, goods returned damaged, and sometimes thousands of quids' worth of unpaid invoices (not from amateurs, of course) to give them a headache? Still you are entitled to goods of merchantable quality, within a reasonable time, so press for your rights. Everyone benefits if businesses and customers can rely on each other.

This has been a HAB (humanitarian advice bureau) announcement.

## £10 FOR THE LETTER OF THE MONTH

You've got a gripe about the bandplans, or you're sick of being wiped out by next door's microwave. Or maybe you've been bowled over by the excellent service from your local radio shop.

Whatever you've got to say about amateur radio say it here in the letters column and you could win yourself £10 for writing the letter of the month.

Sent your epistles to: Letters Column, Ham Radio Today, ASP Ltd, Argus House, Boundary Way, Hemel Hempstead, Herts HP2 7ST.

Basingstoke ARC. D Deane G3ZOL. 0734 332777 (hm) 0734 787930 (wk). Forest Ring Community Centre, Sycamore Way, Winkelfbury, Basingstoke. 7.30pm. 1 Mons.

**Bedford DARC.** Ray GOEYM. 0234 244506. **Special Event Stations GB2WW and GB40B** commemorating World War 2 during 1989. Oct 14 Cardington Airfield 60th anniversary of R101 airship.

Biggin Hill ARC. Geoff Milne G3UMI. 142 Hayes Lane, Hayes, 3 Tues, Victory Social Club, Kechill Gardens, Hayes 7.30. Oct 17 Junk sale; Nov 21 Stereo photography.

Braintree DARS. M Andrews 0376 27431. Braintree Community Association Centre, Victoria St. 7.30pm. 1,3 Mons. Club net C6BRH or G4JXG, 2m 2.4 Mons. 8pm.

Bredhurst RTS. G0BRG, G7BRG. Kelvin Fay 0634 376991.

Brighton DARS. Peter. 0273 607737. 1,3 Weds, Roast Beef Bar, Brighton Racecourse, Elm Grove. 8pm.

Burnham Beeches RC. G6ELL. 0628 25720

Cambridge DARC. D Wilcox. 0954 50957.

Chesham DARS. L Cabban. 09278 3911. Stable Loft, Bury Farm, Pednor Rd., Chesham. 8pm Weds.

**Cheshunt DARC.** Roger Frisby G4OAA. 0992 464795. Thurs. 8pm. Church Room, Church Lane, Wormley, Herts. Oct 11 Interclub darts match; Oct 25 Spectrum abuse David Evans G3OUF RSGB; Nov 1, 15, 22 Natter; Nov 8 Junk sale; Oct 22 AGM; Oct 26 Verulam Rally.

Chichester DARC. H Kaminski G1NBX Chichester 781785. St Pancras Hall, St Pancras, Chichester. 7.30 Club net G8WSX S11 Monds 7.15. 1,3 Tues: Also Raynet inf.

Clifton DARS. Martin Brown G0DGC. 01 691 2341.

Coulson ATS. Alan. 01 684 0610

Crawley ARC. Jack. 0293 28612

Dover: South East Kent YMCA ARC. Des Edwards 0304 203073. Dover YMCA, Godwynhurst. Leyburne Rd., Dover. Kent CT16 1SN. Weds. Nov 15 Morse tests.

Dunstable Downs RC. Tony Kelsey-Stead 0582 508259. Room 3, Chews House, 77 High St. South, Dunstable, Beds. Fris. Oct 29 RAE open evening.

Eastbourne EARC. G1BRG 0323 29913.

East Kent ARS. Stuart 0227 68913.

Edgware DRS. Ian Cope G4IUZ, Hatfield 65707. Watling Community Centre, 145 Orange Hill Rd., Burnt Oak, Edgware. 2.4 Thurs

Farnborough DRS. Tim Fitzgerald G4UQE 0276 29231. 2.4 Weds, Railway Enthusiasts Club, off Hawley Lane (M3 bridge), Farnborough, Hants. Oct 11 Annual construction contest; Oct 25 TBA; Nov 8 Surplus sale. Nov 22 AGM.

Felixtowe DARS. G4YQC. 0473 642595

Grafton RS. Rod Harrigan G0JUZ. 01 368 8154. Holy Trinity Church Hall, Stapleton Hall Rd., London N4. 2.4 Fris.

Hastings ERC. Oave Shirley. 0424 420608.

Horsham ARC. P Godbold. Steyning 814516. Guide Hall, Denne Rd., Horsham, Sussex. 8pm. 1 Thurs. Nov 2 Antenna modelling G3LDO. Dec 7 AGM.

Huntingdonshire ARC. GBLRS. 0480 56772. Packet GB7HXA. 1,3 Thurs The Midway Centre, Coneygare Road, Huntingdon, Cambs 7.30am.

Itchen Valley RC. G1IPQ. Southampton 736784.

Kettering DARC. Barry Perrin G7CIV. Rockingham 707071. EMBE Social Club, Eskdale St., Kettering. Tues 8pm.

Loughton DARS: J D Ray GBDZH. 01 508 3434 (ev); 01 5083434 Micronet 800 mailbox, TeleG6 74:MIK1824; packet GBZDH at GB7ESX. Room 14, Loughton Hall, Rectory Lane, Loughton 7.45pm. Fris. Oct 20 Essex Data Group Roadshow; packet demo by Malcolm Salmon G3XVV and Dave Castle G6QQJ

Maldenstone YMCA ARS. G0BUW. 0622 20544. YMCA Sports Centre, Melrose Close, Maidstone, Kent. Fris 8pm.

Sussex ARS. G0GMC. 07918 2937

Swansea DARS. Mike GOERE. 0234 750629.

Torquay ARC. Craig Joly G0BGD 0603 485784 QTHR. Norfolk Building, the Livestock Market, Hall Road, Harford, Norwich. 7.30 Oct 18 News gathering by the RSGB, John Nelson FRX; Oct 25 informal; Nov 1 Project YEAR Victor Brand FRB; Nov 8, 22 informal; Nov 15 Auction 8&8; Nov 29 all amateurs belong to the RSGB? debate.

Weymouth RC. D J Linnell G7CMA 19 Beech Av., Weymouth Kingsthorpe Community Centre, Thornton Hall, Weymouth Park, Kingsthorpe, Thurs.

Wokingham RES. Peter G4PNW QTHR.

Reading DARC. M G Anthony G4THN. 9 Paice Green, Wokingham, Berks

Reigate ATS (IRATS). Alan G1LNT. 0883 44723, Peter G8ITY. 0293 36193 after 7. Conservative Centre, Warwick Rd., Redhill, Surrey. 3 Tues. 8pm. Oct 17 Construction Colloquia; Nov 21 How linear is your line? John Matthews G3WZT.

Reading ARC. Mike G4THN. 7434 774042. 2.4 Thurs. Caversham Conservative Club, Caversham, Reading Berks.

St. Albans Verulam ARC. Walter Crane G3PMF QTHR, RAF Association HQ, New Kent Rd., off Marlborough Rd., St. Albans. 7.30 2.4 Tues. Oct 10 informal; Oct 24 Inter club competition.

Sevenoaks DARS. Barry Leggett. 0732 741222 ext. 245 office hours. Emergency Control Centre, Sevenoaks District Council Office. 8pm 3 Mons.

Shefford DARS. Tom Stellar G6RCT. 0707 372211. Church Hall, Amphill Rd., Shefford. Beds. 8pm.

Southend DRS. S Blunkhorn G1XGP. 102 Lord Roberts Ave., Leigh-on-Sea, Essex

Southgate ARC. Brian Shelton 01 644 9945. Holy Trinity Church Hall, Winchmore Hill, London N21 7.45pm. 2.4 Thurs. Oct 12 Round the World Voyage by Mark Brackenburg; Oct 26 informal; Nov 9 Construction contest jacking; Nov 23 informal; dec 14 AGM.

South Kent (YMCA) ARC. Oes Edwards. 0304 203073. Dover YMCA, Godwynhurst, Leyburne Rd., Dover. Tues.

Stevenage DRS. G6EDA. 0438 724991, 1,3 Tues Sitec Ltd., Ridgemoor Park, Telford Av., Stevenage 8pm 17 30 for tuition)

Sutton & Charn RS. John Puttock G0BWW 01 644 9945 3 Fris, natter 1 Mons 7.30 Down Law Tennis Club, Holland Av., Charn. Sept 15 TBA; Oct 20 Junk sale.

Welwyn Hatfield ARC. Roger Curtis G0CYC 0707 324958.

Lemsford Village Hall, Bracketed Rd., Welwyn Garden City, 1 Mons; Knightsfield Scout HQ, Knightsfield, WGC 3 Mons 8pm. 9th WGC Scout HQ, Knightsfield, WGC. Nov 6 Construction competition; Nov 20 TBA. Regular nets.

West Kent ARS. B Guinness. 0892 32877.

West Sussex ARS. M Mundy. 142 Junction Road, Burgess Hill.

Wimbledon DARS. Nick Lawlor G6AJU. 01 330 2703. 2.4 Fris, St. Andrew's Church Hall, Herbert Rd., Wimbledon London SW19. 7.30pm. Oct 13 AGM; Nov Film night: The Crowded Sky and Nothing on the Clock

## IRELAND

Armagh and Dunganon DARC J Murphy 0861 522153  
 Donegal ARC. E1308 774 57155  
 Mid Ulster ARC. J. Lagan. 0762 851179 2 Suns (not July and Aug) 3pm Gm. 101111 C. Ford. Co Down

## NATIONAL AND INTERNATIONAL

AMRAC. Phil G6DLJ. 0703 847754  
 British Amateur Television Club. G8CJS or G8FOZP QTHR.  
 British Amateur Radio Teledata Group. Ann Reynolds G6ZTF, 169 Ball Green Rd, Coventry, Warks CV6 7GW. SAE for information. G82ATG amateur radio news service transmits on 1 and 3 Sundays on 3.590MHz, 14.080MHz and 144.600MHz. Operated by volunteers. G82ATG welcomes amateur radio news for possible transmission, esp concerning radio data activity IRTTY, Amtor, packet, fax, etc.)  
 International Short Wave League. Y Blain. 167 Wembledon Road, Trench, Salford, Shropshire TF2 6GA. Journal: Monitor.  
 UK FM Group. Northern. L Loughton, Claremont, Main St., East Ardsley.



# ETI

**ELECTRONICS  
TODAY INTERNATIONAL**

**NOVEMBER ETI**  
**OUT OCT 6TH**  
**Price £1.50**

## **IN THE NOVEMBER ISSUE**

ROCK CIRCUS COMES TO TOWN

FREQUENCY METER PROJECT

SMOKE ALARM PROJECT

TELEPHONE SURVEILLANCE

ETI SAVES THE MANX SHEARWATER SEABIRDS



## **IN THE DECEMBER ISSUE**

FREE COMPONENTS FOR SURVEILLANCE BUG

GUITAR PEDAL POWER PROJECT

DIGITAL NOISE GENERATOR

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# RADIO TODAY



## Widest, By Jupiter

The Jupiter II multiband scanner now being supplied by Waters and Stanton apparently has the widest coverage of any model on the UK market. Covering 25 to 550MHz and 800 to 1300MHz, it is AM/FM switchable, has 100 memories in five bands, ten programmable band scan memories, a "Fast" scan rate of 20 modes, manual up/down control, battery saver circuit, adjustable antenna, and runs on four AA cells or 12Vdc. Retail price is £299. Further details from Waters and Stanton, 18-20 Main Rd., Hockley, Essex SS5 4QS. Tel. 0702 206835.

## Living For Engineering?

Reporting that demand for personal mobile two-way radios is increasing steadily, the DTI adds: "There is a worrying shortage of skilled engineers and technicians to produce, install and service the equipment."

The report quotes James Malcolm, chief executive of the Federation of Communications Services, as saying that the mobile radio market is growing at over 10% a year. But a survey of FCS member companies shows that 90% of them need more technician engineers. One industry source estimates that 6,000 more specialist technicians will be needed by 1995.

The DTI press notice then goes on to cite the 'initiatives' available to encourage young technicians to enter the profession: the Enterprise and Education Initiative, which offers work and business experience to children and teachers, Training and Enterprise Councils and Training Access Points. It also cites the Young Radio Amateur of the Year Award, although nothing is said of Project YEAR, which has potentially a far wider catchment area than the Award.

Lack of a structured set of qualifications in mobile radio engineering is also blamed for the shortage.

Nobody at any point mentions lack of career prospects. HRT readers are amateurs and SWLs who have taken to radio for the love of it, but how many readers know a skilled technician or engineer with considerable qualifications and many years' experience who is earning very little more than a senior secretary, and far less than somebody with similar experience and qualifications in public relations, marketing, sales, finance or even computing?

How many readers know a qualified engineer or senior technician who has been forced to 'cross over' into a managerial post where their engineering skills are no longer being fully used (we don't count writing reports) in order to gain seniority and/or a reasonable standard of living?

How many readers know engineers and technicians who are working alongside managers and directors who don't know much about engineering and seem to have difficulty in grasping the importance of engineering practices, especially in R&D?

We just thought we'd ask. We have been told by friends abroad that this relentless splitting of roles into "technical" and "managerial", with most of the plum rewards going to people in sales, accounting and top management, is a purely British phenomenon.

Overseas readers might like to argue with that, but it does seem that to make money you have to be controlling money in British industry.

Technically, the best jobs seem to belong to computing and digital engineering, which are seen as the 'cutting edge' and have a fashionable kudos, although there is still a shortage of skilled engineers in non-digital electronics. And even the 'digitals' — even programmers — find themselves moving into non-technical roles in order to 'progress'.

British industry does well out of engineers who aren't suited to management or who do it for the love of it. But how can it expect to gain or maintain more than a few token leads if it treats the people who are developing the technology as galleys slaves, kept in the basement and thrown the odd food parcel?

If this sounds a bit heavy, well, we've just been comparing an acquaintance's pay packet with his hours and years worked, skills and qualifications. Not for the first time, either.

If the DTI and British industry want more top class engineers and technicians, they should stop talking 'initiatives' and start talking about prospects.

## Tom Lives On

The Appledore DARC in North Devon has taken over the call sign of its late member Tom Ward G2FKO in honour of his memory. Tom was well known in RTTY and computing in amateur radio, and hoped that the club would be able to adopt his call sign when he departed to a higher wave-band.

So if you hear G2FKO calling in the Devon area, you may be forgiven for thinking that Tom's keeping an eye on the neighbourhood, but it's more likely to be one of his fellow clubbers.

## RAE in Cheshire

North Cheshire Radio Club will be running an RAE course in two-hour sessions on Sunday evenings. Enrolment is Sunday September 17, which is too late for this issue, chaps, but call Gordon Adams G3LEQ on 9565 4040 for further information. Lecturers will be Gordon, and Peter Krisop G4WCE.

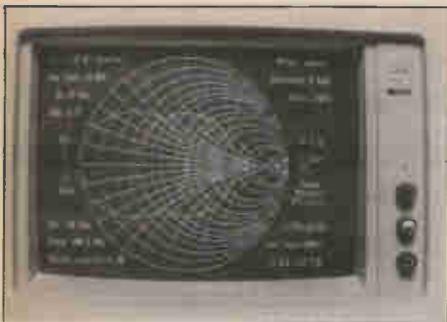
## RSGB Newsletter

The RSGB's special Council Newsletter announces the publication of the Novice Licence Discussion Document, which was presented to the DTI at the Project YEAR Industry Conference on July 20. A summary will appear in RadCom in September. The document itself is available to members for £3 all inclusive. Meanwhile, the ARRL Directors have voted by 9 to 6 to propose a codeless class of amateur licence to the FCC in the United States.

Despite giving its annual show at the National Exhibition Centre a miss this year (for which reasons of cost were given) the RSGB is planning an International Convention and Exhibition at the NEC on 21/22 April 1990. The VHF Convention will be on 13 May at Sandown Park.

The new President for 1990 is Frank Hall G4MBZX. David Butler G4ASR will take over as VHF Manager, and Peter Burden G3UBX as VHF Committee Chairman.

No fewer than six amateur satellites will be launched together on 10 November on an Ariane booster.



### Smith On Screen

Software house Number One Systems have published Z-Match, a program which puts Smith chart techniques on the BBC-B and IBM PC and compatible micros.

Smith charts were invented in 1939 by P.H. Smith and are used — or under-used — by RF engineers to find fast solutions to problems requiring analysis of transmission lines or complex L/C networks. The basic Smith chart itself is based on two sets of circular graphs representing the resistance/impedance of a system and its reactance.

Z-Match covers calculation and conversion of impedance and admittance, parallel and series network equivalents, wavelength, distance, characteristic impedance ( $Z_0$ ), dielectric constants, reflection coefficients, standing wave ratios and Q values. The program's name signifies the Smith chart's efficiency in solving matching problems.

Z-Match costs £65 for the BBC-B and £130 for the PC, and includes a manual with working examples. Further details on Z-Match and its uses from Roger Wareham, Technical Director, Number One Systems Ltd., Harding Way, Somersham Rd., St. Ives, Huntingdon, Cambs PE17 4WR. Tel. 0480 61778.

HRT ran a two-part article called *Secrets of the Smith Chart* in the issues of November and December 1983.

### Ian's Book

A new book by Ian Poole, *An Introduction to Amateur Radio*, has just been published. This is a guide to the hobby and can also be used to help prepare for the RAE.

The book covers the whole range of topics likely to be needed.

It deals with the more practical sides of operating in chapters on the HF and VHF/UHF bands as well as covering callsigns, codes and jargon.

The more theoretical topics are covered in chapters on types of transmission, receivers, transmitters and aerials.

Finally there is a chapter about getting started. Here details of setting up a station are covered together with useful ideas about preparing for the licence.

Priced £3.50, it is published by B. Babani (publishing) Ltd, The Grampians, Shepherds Bush Road, London W6 7NF.

### Keys For Christmas

Gordon Crowhurst of G4ZPY Paddle Keys is revving up his Special Christmas Offer. Now is the time to plan if you want to offer your nearest and dearest Morse key enthusiast a hand-built Morse key for Christmas.

Orders can be placed now with a non-refundable deposit of £5 for Pump (straight) keys, £10 for Paddles and £20 for gold plated keys. £5 discount applies to orders placed during October.

Gordon is also offering gold plated keys on chrome plated bases, £65 the pump key and £110 the Twin Paddle key — cheaper than the fully gold plated keys. And new this month: silver plated Pump key for £60, silver plated Twin Paddle key, £96.

For more information and prices, contact Gordon Crowhurst G4ZPY, 41 Mill Dam Lane, Burscough, Ormskirk, Lancs L40 7TG. Tel. 0704 894299.

### Loughton Rout Red Tape

Loughton and District Amateur Radio Society and the RSGB (Membership Services Department) have been providing each other with the kind of fun which calls for long letters with underlining and sub-paragraphs.

You know the sort of letter: the sort you swear you are never going to write again, until something 'crops up' which demands point, rhetoric and swift answers to important questions.

It began when Chairman Jack Atkinson applied for a special event station call sign GB2LRS, as usual, for its field week 8/9 July. In reply, he received a letter from Tim Charles in the Membership Services Department declining the application and quoting two sets of terms and conditions issued to the RSGB by the DTI in March '89. The gist of these points is that SES call signs should only be issued for events of "special significance" to the public at large, and accessible to them, to avoid issuing special call signs to groups who simply want to "increase the number of call signs at their disposal".

Loughton are a well-established Radio Society, and this went down like a lead brick in a barrel of tadpoles. Especially as their previous event call sign has been issued since the March directive.

Jack G3OPA objected particularly to the RSGB statement that it "acts solely as an agent of the DTI" in these matters, and quoted the Memorandum and Articles to suggest that this was not at all its duty. He also wanted to know why, if it was going to restrict Special Event call signs, the DTI did not vary the club's own license to allow simultaneous operation on all bands and third party messages.

Jack was also concerned, as others have been, about a recent letter from the DTI stating that an A license holder must be elected to the committee if the club was to hold an A license. His investigations apparently culminated in an admission from the DTI that this was not intended.

In reply, Tim G4EZA pointed out that the RSGB is indeed an agent of the DTI in a number of specific administrative respects, and that as of 1 January 1989 (at the same time as the new license conditions) ANY amateur station can operate simultaneously on as many bands as it wishes — removing the need for an SES call sign for this purpose. He proposed to submit the application to the DTI now that it had been made clear that the station was open to the public, but warned that the "special significance" clause might prove a stumbling block.

This looks like sense on the face of it, but is it? Where is an outdoor radio station likely to attract public attention: in the middle of town on an ordinary market day, or in the middle of a crowded county fair with dozens of other attractions? This is a serious question. Answers on a postcard, please.

Jack G3OPA replied with thanks and said that nobody had noticed the change allowing simultaneous operation, especially as the SES application forms still state simultaneous operation as a benefit. He was also a little concerned to read that a club/SES station must be operated "under the direct supervision of the licensee", possibly a tricky operation in a large marquee (or two).

Tim replied that everyone seemed to have overlooked the bit about simultaneous operation, including whoever designed the new SES application form. And we thought they were still using the old ones. He also pointed out that, although nobody could be in two places at once, the person who signs the declaration on the application is responsible for ensuring that the station is run correctly, and must work out how best to achieve that without cloning. This does mean that a class A station must have a class A supervisor — or supervisors, since other members can be allocated this role if their names and addresses are lodged with the DTI.

The RSGB are working with the DTI towards allocating a special prefix for club stations with enhanced facilities including third party messages.

The happy ending is that GB2LRS was granted its application and no doubt a splendid time was had by all. The moral is that when paperwork gets in a tangle, someone has misread something somewhere, and not necessarily where you might think.

## Fe-Three Rod Alert

Sharp people will have realised that the captions to figures one and two were swapped over on September's *Fe-Three Mini Dipole* article. Really sharp ones will have realised that the reference to Fig. 3 at the bottom of page 38 actually refers to Fig. 5b.

More important: author Richard Marris G2BZQ has heard rumours that the coils and rods mentioned may no longer be available from G & P Powles. If this turns out to be the case when you order, Richard has tried and approved Amidon type R-61-059-750 rods, 7/16in by 1/8in diameter. Amidon's USA address is given on page 39 of the September issue.

## 18-24MHz

The text of the Gazette Notice on the Notice of Variation to the Wireless Telegraphy Act 1949 which concerns the 18 to 24MHz bands, mentioned in last month's Radio Today, runs as follows:

"The Secretary of State gives notice pursuant to Section 1(4) of the Wireless Telegraphy Act 1949 to all those who are licensed under the Amateur Radio Licence (A) or (B) which have been issued and remain in force that from 1st July 1989 the Schedule of each such licence for frequencies below 30MHz shall be varied to read as follows:

Frequency bands in MHz	Status of Allocation in the United Kingdom to:		Maximum power		Permitted Types of Transmission
	The Amateur Service	The Amateur Satellite Service	Carrier	PEP	
1.810-2.000	Available on the basis of non-interference to other services (inside or outside the UK)	(Not allocated)	9dBW	15dBW	Morse Telephony RTTY Data Facsimile STTV
3.500-3.800	Primary, Shared with other services				
7.000-7.100	Primary	Primary			
10.100-10.151	Secondary	(not allocated)			
14.000-14.250					
14.250-14.350					
18.068-18.168			20dBW	26dBW	
21.000-21.450	Primary	Primary			
24.890-24.990					
28.000-29.700					

On behalf of the Secretary of State of Trade and Industry, 12 June 1989.

This notice appeared in the Gazettes for 30 June 1989. The DTI, after doing a bit of checking up for us, tell us that there is no firm way of predicting when a notice will appear in the gazettes; they don't necessarily even publish on the day the DTI ask them to. We will be keeping in touch with the DTI to locate texts of changes which may be of interest.

## Paper Round

The UK FM Group (West-ern) quarterly bulletin, Talk-through, contains a short statistical homily on motorway driving from the Lancs Constabulary Accident Prevention division, well worth reading; some history on VHF/UHF development; letters and local news, much of it to the point; amateur radio on the Queen Mary (the old passenger liner, for young folk), an attack on morse for A licensing, local repeater update and some advice on how to combat repeater abuse, and, of course, Aunt Rita, A5, 32pp stapled, free to members, £4 a year to non-members. Queries to Gordon Adams, 2 Ash Grove, Knutsford, Cheshire WA16 8BB.

The Irish Radio Transmitter Society Newsletter, August 1989 covers contest news, SWL reports, articles on coastal stations, ionospheric disturbances, the East Cork 2m Atlantic crossing and news and ads from members and dealers, A4 with photos, 12pp, editor Dave Moore EI4BZ, 12 Castle Avenue, Carrigwohill, Co. Cork.

The Wirral ARS Newsletter

August/September covers mainly club news, articles on bodily RF absorption (interesting) and Radio Mackintosh, A2 corner stapled, 8pp, editor Brian Jordan, 42 Ben Nevis Rd., Tranmere L42 4PD.

CQTV, the quarterly magazine of the British Amateur Television Club, August, contains a great deal, as usual: more than can be enumerated here. A must for anyone interested in amateur TV or technology, A5, stapled, card cover, 100pp, Editor Mike Wooding G6IQM, Membership £6 p/a, Dave Lawton, Grenchurst, Pinewood Rd., High Wycombe, Bucks HP12 4DD, Tel. 0522 703348.

Vital Spark, the journal of the Hastings Electronics and RC, contains articles on 'Interesting Radios', WW II, early history of amateur radio (from Book of Genesis onwards), RF reports, and a recipe for Baked Skunk (in connection with an alleged DXpedition to the St. Lawrence River in 1992), A4, stapled, quite a lot of pages, editor Tim Anderson, 2 Burry Rd., St. Leonards on Sea.

## Wood Workers

The callsigns in the photo are cuts from stout, attractive and nicely-finished pieces of wood by a wood fretting company called Fretique. The samples shown are about 1 1/4 inches (3cm) high.

Fretique specialise in European and exotic (which can imply African, Far Eastern or South American timber, among others) hardwoods and offer plain sanded, oiled, varnished, polished and other finishes. More or less any-

thing that can be fretted in wood, not just callsigns. They will only quote prices individually, but can give over-the-phone estimates, and club or bulk discounts. For a small deposit a full-size sketch and firm quote can be supplied.

Fretiques are members of the Hereford Guild of Crafts. For more information contact John or Kathy Walker on 0432 850274 or write to Fretiques, The Sanctuary, Whitestone, Hereford HR1 3RX.



## Wideband Amp

"Listen to stations you never knew were there" proclaim Nevada Communications of the new wide band scanner amplifier by Abis.

The Low-noise gasfet amplifier has three switchable bandpass filters to get the best performance from each band. A limitation on the lowest band to 25MHz has been included to avoid possible intermodulation problems, apparent on some models covering the shortwave bands, with receivers covering only VHF and UHF.

The variable gain control from -3dB to +20dB, say Nevada, combined with the switchable filters, give amazingly improved performance. The amp will plug directly into hand held scanners or in-line with base scanners. Supply is from an internal 9V battery or

external 2-14V DC source.

The price is £79.95. More information from Nevada at 189 London Rd., North End, Portsmouth PO2 9AE. Tel. 0705 662145.



## Larger Leicester

This year's Leicester Amateur Radio Show at the Granby Halls, Leicester will be much expanded on the last one: the roller skating rink area has been brought into use, and from the plans we have seen, the main entrance will be on the Rink side, nearer to available parking in the area.

The dates are Friday 27 and Saturday 28 of October. HRT will be in attendance, and I am expecting to be there on Friday from morning till mid-afternoon, keeping a close eye on the fried eggs. Circumstances (unconnected with fried eggs, I hope) have called me away on Saturday, but if anyone has any questions the folk on the stand can't answer, jot it down and pass it on.

The move to two halls will allow exhibitors who have been on the waiting list, sometimes for years, to get a showing. There will also be limited conference facilities for clubs and organisations.

Information about stands, etc. from Frank G4PDZ on 0533 553293; see press advertising for time and place details.

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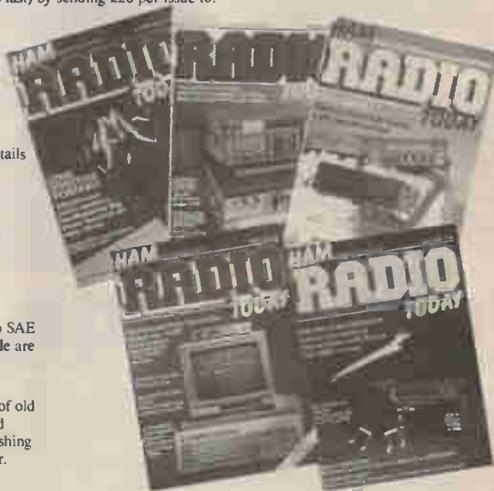
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If you have any questions about the existence or whereabouts of old articles, send them to the Editor with a stamped self-addressed envelope, and twiddle your thumbs for a bit. We will be publishing a complete index, for your assistance and ours, early next year.



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