

The SHORT WAVE Magazine

VOL. XLI

OCTOBER 1983

NUMBER 8

a professional receiver,
at a price you can afford,
the **JRC NRD515**.



NRD515 general coverage
receiver. . . . £965 inc VAT

If I am absolutely honest, I am not certain whether I own a NRD515 because of its unbelievable performance as a general coverage receiver or just for the sheer pleasure of having and constantly admiring probably the finest piece of equipment available today.

Perhaps it comes down to the same thing, certainly the other NRD owners I have spoken to have all expressed the same feelings, that the NRD515 is a receiver in a class of its own.

As a person not owning the receiver, you may ask what sets this particular one above all the others. This is difficult to define — the feel of the equipment when wandering over the crowded band, its signal handling capability and selectivity can only really be appreciated by use. Technically, the equipment is above reproach. JRC's manufacture and production control methods as applied to other items in the range are equally applied to their amateur products. The other items referred to, only a small part of the vast range, are marine radio equipment, Marisat mobile terminal, Omega navigators, Doppler sonar, echo sounder/fish finders, communication satellite earth stations and a complete range of avionic beacons, radar and associated products. Indeed, a wide range application of electronic and radio technology for land, sea and air.

You may be forgiven for associating such advanced technology with complexity of operation, a piece of equipment that needs an operator with an electronics degree. However, this assumption is incorrect. The NRD515 is easy to use with the minimum of controls to ensure the operator really enjoys his listening time. Digital readouts, MHz, mode and filter bandwidth switches together with a VFO knob that will tune the band continuously without using any other control, from 100kHz to 30 MHz or vice versa. To assist with difficult band conditions the NRD515 has pass band tuning and the medium wave broadcast section to 600 kHz to 1.6 MHz has a preselector control to cope with crowded conditions.

To give real "armchair copy" JRC have introduced the NCM515 remote control keypad. As its name suggests the NCM515 enables frequencies to be quickly keyed into the receiver. Four memories are provided, two rates of frequency stepping in increments of either 100Hz or 10MHz and finally the ability to add to or subtract from the operating frequency by any frequency step. Add the optional 600 Hz CW filter and the 96 channel memory unit and, as the other NRD owners would say, "a joy to own".

| | |
|---|--------------------|
| NDH515 96 channel memory unit. | £ 198.00 inc. vat. |
| NCM515 remote frequency controller. | £ 125.00 inc. vat. |
| NVA515 speaker. | £ 34.50 inc. vat. |
| CFL260 500 Hz cw filter. | £ 39.10 inc. vat. |
| CFL230 300 Hz cw filter. | £ 64.00 inc. vat. |
| ST3 headphones. | £ 42.55 inc. vat. |

LOWE ELECTRONICS

Chesterfield Road, Matlock, Derbyshire. DE4 5LE.
telephone 0629 2817, 2430, 4057, 4995. Telex 377482.

LOWE SHOPS

in Matlock

0629.2817 2430 4057 4995

Lowe Electronics in Matlock, located on the Chesterfield road out of Matlock, that is the A632 and open Tuesday to Friday from 9am to 5.30pm (closed for lunch 12.30 to 1.30) and Saturday, open all day from 9am to 5pm. A visit to Matlock can be an outing for the family, the local scenery, the Heights of Abraham, Lovers Walk etc. Ample free parking in our car park and when you have browsed then lunch in one of the towns pleasant restaurants. Amateur Radio with the family in mind.

in Glasgow

041.945.2626

Lowe Electronics in Glasgow, located at 4/5 Queen Margarets Road, which you will find off Queen Margarets Drive (take Great Western road out of the City and turn right at the Botanical Gardens traffic lights). A quiet sedate part of the city, easy street parking and a warm welcome from Sim, our shop manager. Open all day from Tuesday to Saturday, 9am till 5.30pm during the week and 9am till 5pm on Saturday. Whilst in the area the Botanical Gardens are well worth a visit. The Glasgow Shop has a full display of our range of amateur radio products and a stock room to meet your every demand. For your Amateur Radio needs visit Lowe Electronics in Glasgow.

in Darlington

0325.486121

Lowe Electronics in the North East of England, set in the delightful market town of Darlington, the shop displays the full range of amateur products sold by the company. Our address in the town is 56 North Road, that is the A167 Durham road out of Darlington. Open Tuesday to Friday from 9am till 5.30pm, Saturday from 9am till 5pm (closed for lunch 12.30 to 1.30). A huge free car park across the road, a large supermarket, bistro restaurant and banking facilities combine to make a visit to this delightful market town a pleasure for the whole family.

in London

01.837.6702

Lowe Electronics in London, our shop in the Capital City, easily found on the lower sales floor of the Hepworths' shop on Pentonville Road, within 3 minutes walk of Kings Cross railway station. Open all day Monday to Saturday, six days a week, from 9.30am to 5.30pm during the week and from 9.30am to 5pm on Saturday, a warm and courteous welcome, together with sound advice awaits those who enter. The entire range of amateur products is on display, backed by a considerable amount of stock. When in the City, visit Lowe Electronics.

The TW4000A is the latest step forward in Trio's programme of providing today's radio amateur with the very best in equipment. Following the success story of the Trio TS780 dual band base station transceiver, the TW4000A gives the mobile operator a superb FM transceiver for both 70 centimetres and the 2 metre band. Not only for mobile operation is the TW4000A perfect but also for shack use where the rig with its scanning and dual band facilities enable the enthusiastic amateur to keep in touch with the local scene.

- The TW4000A covers in one compact transceiver both the 2metre band (144.000 to 146.000 MHz) and also the full 10 MHz of the 70 centimetre band (430.000 to 440.000 MHz). Measuring 60mm high, 161mm wide, 217mm deep and weighing only slightly more than 2.0kg, the TW4000A is smaller than most current 2metre transceivers.
- Added to the exceptional receive performance, now a Trio standard by which others are judged, is the TW4000A's 25 watt capability on both 2metres and 70 centimetres. Using the TW4000A not only can hear weak signals on either band but they can hear you too. A HI/LO switch reduces the output power to 5 watts when required.
- A green backlit liquid crystal display gives frequency, memory channel, repeater offset, VFO A or B, scan function, channel occupied and "ON AIR" information. Brightly illuminated, the display can easily be read under unfavourable conditions. All important controls are illuminated for easy operation during darkness.
- Ten memory channels are provided which store frequency, band and repeater offset (on 2 metres minus 600 KHz shift, on 70 centimetres plus 1.6 MHz shift). Memory 1 is used for priority watch, memories 8 and 9 for instant recall and memory 0 for split channel use (cross band operation). An internally fitted lithium battery gives memory backup.
- Frequency scan is extremely versatile in that the rig can be programmed to scan either all memory channels or those holding either 2 metre or 70 centimetre frequencies. The rig can also be programmed to skip those channels which the operator does not wish to monitor. The scan direction can also be changed by using the UP/DOWN switch on the microphone. In order that an important contact is not missed, when in priority watch mode, the rig switches back from the frequency in use to memory channel 1 for one second out of ten. The two most used frequencies can be placed in memories 8 and 9 respectively, common channel scan checking each alternatively for approximately 5 seconds.
- Two VFO's are provided tuning in either 5 or 25 KHz steps, the UP/DOWN shift switch on the microphone providing control.
- Full repeater facilities are included giving the correct frequency shift, 1750 Hz access tone, and of course the essential reverse shift.

OPTIONAL ACCESSORIES

PS430 matching power supply.

VS1 voice synthesiser unit.

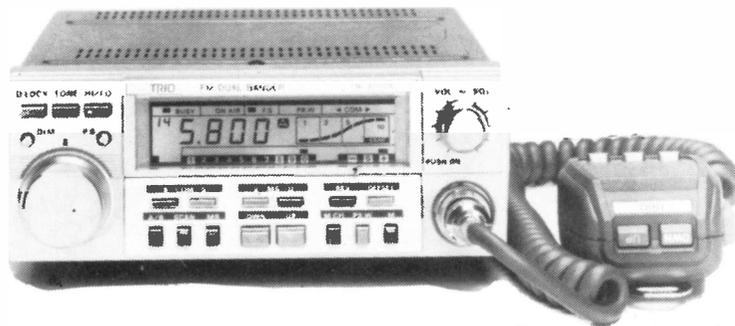
SP40 compact mobile speaker.

MA4000 dual band antenna with duplexer.

SW100B mobile SWR and power meter.

SW200B base station SWR and power meter.

PG3 noise filter for mobile use.



70 centimetres & 2 metres, 2 bands, 1 rig, TW4000A

Now, an opportunity for you to buy at a greatly reduced price the LOWE TX40 c.b. transceiver. Now priced at £29.50 carriage £3.00, the LOWE TX40 is a reliable, well built and popular rig. A de-luxe version of the transceiver fitted with an additional filter is available for an additional £8.50. Take this opportunity to buy at this fantastic price a LOWE TX40 c.b. transceiver.

LOWE ELECTRONICS

Chesterfield Road, Matlock, Derbyshire. DE4 5LE.

Telephone 0629 2817, 2430, 4057, 4995. Telex 377482.

(Delivery of stock items normally by return of post)



TR9130 TWO METRE ALL MODE TRANSCEIVER

This rig is proof, if one needed it, that TRIO do not bring out new models just for the sake of it. The TR9000 is remembered as a classic rig and today people are still asking for second hand ones, even they are a rarity on our S/H shelf. The TR9130 incorporates the improvements that all amateurs asked for, green display, reverse repeater, tune whilst transmitting, higher power, more memories and of course memory scan. TRIO's answer, the TR9130.

TR9130..... £433.32 inc vat.



TS780 DUAL BAND BASE STATION TRANSCEIVER

The TS780 is the perfect base station VHF/UHF transceiver for the enthusiastic operator. The rig has all the necessary control functions essential for operating on both today's busy two metre band and the wide spaces of seventy centimetres. Full repeater facilities plus reverse repeater are included and the transceiver has the usual memory channels (10), two VFO's, up/down frequency shift microphone, IF shift, two priority channels, memory and band scan, etc. A superb rig, I have one myself, ring for a full enthuse!

TS780..... £795.00 inc vat.



TR7930 TWO METRE FM MOBILE TRANSCEIVER

Those who have used or owned a Trio TR7800 will know what I mean when I say that Trio, with the introduction of the TR7930 have improved on the unimprovable. The Trio TR7930 improves on the TR7800 by giving a green floodlight liquid crystal display, extra memory channels, both timed and carrier scan hold, selectable priority frequency and correct mode selection (simplex or repeater). The most significant change is the liquid crystal display, but closely following this must be the ability to omit specific memory channels when scanning and the programmable scan between user designated frequencies.

TR7930..... £305.21 inc vat.



R2000 GENERAL COVERAGE RECEIVER

The amateur bands are only a very small part of the radio spectrum, many other transmissions are available for the short wave listener. Broadcast stations provide an alternative source of current information both political and regarding the life style of the country. Fitted with the internal VHF converter the R2000 covers continuously frequencies from 118 to 174 MHz giving access to amateur two metre transmissions (am, fm, ssb and cw) plus a lot more. Having 10 memories, memory scan and programmable scan the R2000 provides in one rig the perfect receiver.

R2000..... £398.82 inc vat.



TS930S HF TRANSCEIVER WITH GENERAL COVERAGE RECEIVE FACILITIES

Much has been said about the TS930S transceiver and it now has a place high in the affection of those amateurs fortunate enough to own one, indeed it has become the "flagship" of the TRIO range. Providing full amateur bands plus a general coverage receiver (150kHz to 30MHz), the TS930S has every conceivable operating feature for today's crowded frequencies.

TS930S..... £1216.70 inc vat.



TR2500/TR3500 HANDHELD TRANSCEIVERS

Two first class hand held transceivers, one for two metres and the other for seventy centimetres. Ten memory channels, band and memory scan, repeater shift, reverse repeater and a low power position make the rigs extremely useful for the radio amateur who wishes to keep in touch with his local scene. A comprehensive range of accessories, base station charger, speaker microphone, mobile mount, etc, can be added to enhance operation, accessories used with one rig being compatible with the other.

TR2500..... £232.53 inc vat.
TR3500..... £250.70 inc vat.



TS530S HF AMATEUR BAND TRANSCEIVER

A logical progression from the reliable TS520 series the TS530S was the most popular HF rig in the range. I use the term "was" because TRIO decided to cease production and supplies were no more, however the demand from radio amateurs worldwide for the transceiver have continued and TRIO have reintroduced the rig. A standard HF valve transceiver without the frills but providing today's amateur with all necessary facilities for reliable world wide communication, the TRIO TS530S.

TS530S..... £595.00 inc vat.



TW4000A DUAL BAND FM TRANSCEIVER

I have been waiting for this rig for the last three years, now it is here and I am using one, words fail me. Send for details.

TW4000A..... £469.00 inc vat.



just a part of the range

Securicor carriage on the above items £6.00

LOWE ELECTRONICS

Chesterfield Road, Matlock, Derbyshire. DE4 5LE.

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 LEADING RETAILER IN AMATEUR
 RADIO. 20 YEARS SERVING THE
 AMATEUR'S BY AMATEURS
 SPECIALISING ONLY IN AMATEUR
 RADIO EQUIPMENT.

24 HOUR MAIL ORDER SERVICE



The TS930S latest transceiver from Trio Price: **£1,216.00 inc. VAT.**



TRIO TS430's
£736.00



TR2300
£152.00



TRIO R600 RECEIVER
£257.00



TRIO R2000 RECEIVER
£398.00
VHF CONVERTER. £113.00
 Covers 118-174MHz



TRIO TS830S
HF SSB TRANSCEIVER
£697.00

As the North West's only official Trio stockist we carry the full TRIO range of equipment and accessories. Full service facilities. Send s.a.e. for up-to-date information.



ADVANCE INFORMATION
 We are proud to introduce the VHF/UHF communications receiver we have all been waiting for. A glance at the brief specification will tell you why the new AR2001 receiver is going to take the listener by storm.
 * Continuous coverage 25-550MHz (no gaps).
 * Receive modes of AM (for VHF/UHF airband), FM narrow (for amateur radio, CB, business radio) and FM wide (for broadcast and TV FM).
 * Digital display of frequency, mode and memory channel.
 * Memory channels which store frequency and mode.
 * Full range of scan facilities.
 The performance of the AR2001 sets new standards. Gone are the complaints of "deaf" receivers. The AR2001 has typical sensitivity of 0.2 microvolts for 12dB SINAD on FM (N) across the entire 25-550MHz range.
 Finally, the AR2001 is small, light weight, and powered from any 12V dc source, so it can be used at home, in the car, boat or aircraft, and whilst out portable.



J.R.C. NR0515D

General coverage receiver 100 KHz to 30 MHz fully synthesised. Digital readout PLL synthesiser with rotary type encoder pass band tuning - modular construction. **£985.00**

NSD515 TRANSMITTER & AC PSU £1,371.00
NEW 96 CHANNEL MEMORY UNIT.

J.R.C. JST 100HF TRANSCIVER + AcPSU £1,147.50

DATONG PRODUCTS

| | |
|-------------------------------------|---------|
| PCI General Coverage Converter..... | £137.42 |
| Low Frequency Converter..... | £29.90 |
| FL1 Frequency Audio Filter..... | £79.36 |
| FL2 Multi-Mode Audio Filter..... | £89.70 |
| Automatic FR Speech Clipper..... | £82.60 |
| RF Speech Clipper..... | £29.90 |
| D70 Morse Tutor..... | £56.35 |
| AD370 Active Antenna (outdoor)..... | £64.40 |
| AD270 Active Antenna (indoor)..... | £47.15 |
| 2M Converter..... | £39.67 |
| Keyboard Morse Sender..... | £137.42 |

ANTENNA ROTATORS

| | |
|--------------------|---------|
| Diawa DR7500X..... | £113.00 |
| DR7500R..... | £125.00 |
| DR7600X..... | £141.00 |
| DR7600R..... | £156.00 |

KENPRO

| | |
|------------------------------|---------|
| KR400C..... | £116.15 |
| KR800RC..... | £154.10 |
| KR500 Elevation Rotator..... | £97.75 |

Station Accessories

| | |
|----------------------------------|--------|
| Welz SP200 PWR/SWR Meter..... | £61.95 |
| SP300..... | £85.00 |
| SP400..... | £61.95 |
| SP10X..... | £21.96 |
| SP15M..... | £32.00 |
| SP45M..... | £45.00 |
| Welz AC30 Antenna Tuner..... | £59.00 |
| Global SWL AT1000Tuner..... | £34.95 |
| SWR25..... | £12.75 |
| HK 708 Morse Keys..... | £13.50 |
| Diawa 2 way Ant Switch..... | £13.96 |
| SWL 2 way Ant Switch..... | £4.75 |
| V22 2 way Ant Switch..... | £6.00 |
| V33 2 way Ant Switch..... | £10.00 |
| V44 2 way Ant Switch..... | £11.00 |
| DL50 500hm 50 watt D.Load..... | £6.50 |
| DL300 500hm 300 watt D.Load..... | £20.70 |
| DL600 500hm 600 watt D.Load..... | £29.50 |
| DL1000 500hm 1KW D.Load..... | £43.70 |
| DL150 1KW D.Load Wattmeter..... | £56.00 |
| KX3SWL Antenna Tuner..... | £42.50 |

DRAKE

| | |
|-------------------------------|---------|
| MN75 Antenna Tuner..... | £163.00 |
| MN2700 2KW Antenna Tuner..... | £220.00 |
| TV3300 Low Pass Filter..... | £24.85 |

Full range of Drake accessories. Available to order.
 G-Whip Mobile Antennas.
 Microwave Modules, FDk, and other equipment also available, including I.C.S. - Diawa.

ANTENNAS

| | |
|-----------------------------------|---------|
| Hy-Gain 12AVQ 3Band Vertical..... | £50.60 |
| 14AVQ/WB 4Band Vertical..... | £64.40 |
| 18AVT/WB 5Band Vertical..... | £109.25 |
| TH2MK3 2EI. Tribander Beam..... | £169.06 |
| TH3MK3 3EI. Tribander Beam..... | £274.86 |
| TH3JNR 3EI. Tribander Beam..... | £202.40 |
| TH6DXX Tribander Beam..... | £396.75 |
| 206BA 5Element 20m Beam..... | £396.00 |
| Explorer 14. Tribander..... | £325.00 |

Mini Products

| | |
|------------------------------|---------|
| HQ1 Mini beam 10-15-20m..... | £139.00 |
| C4 3Band Vertical..... | £69.00 |

T.E.T.

| | |
|-------------------------------|---------|
| HB23SP 2EL Tribander..... | £136.60 |
| HB23M Triband Mini beam..... | £133.00 |
| HB33M Triband Mini beam..... | £177.00 |
| HB33SP 3EL Tribander..... | £192.50 |
| HB34D 4EL Tribander..... | £222.90 |
| HB35C 5EL Tribander..... | £283.96 |
| HB35T 5EL Tribander..... | £278.50 |
| MV3BH 3Band Vertical..... | £37.99 |
| MV4BH 4Band Vertical..... | £48.90 |
| MV5BH 5Band Vertical..... | £63.96 |
| TE214 14 Element 2m Beam..... | £74.40 |
| MV3BH with Radial Kit..... | £69.00 |

G4MH

| | |
|--------------------------|--------|
| 10-15-20m Mini beam..... | £86.50 |
|--------------------------|--------|

TONNA

| | |
|-----------------------------|--------|
| 4 Element 2m Yagi..... | £13.01 |
| 9 Element 2m Yagi..... | £15.44 |
| 17 Element 2m Yagi..... | £35.19 |
| 19 Element 432MHz Yagi..... | £18.14 |
| 21 Element 432MHz Yagi..... | £28.00 |

Welz Diamond Antennas

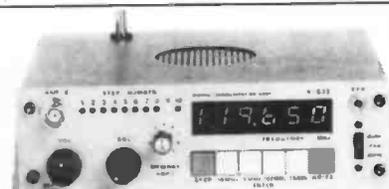
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| DP CP5 Vertical..... | £115.00 |
| KB105 Vertical..... | £79.00 |
| DP CP4 Vertical..... | £89.00 |

Hokasin

| | |
|--|--------|
| 1/4 wave 2m Whip mobile..... | £1.65 |
| 5/8 wave 2m Whip mobile..... | £9.00 |
| 7/8 wave 2m Whip mobile..... | £13.77 |
| 5/8 wave Base Station antenna..... | £15.50 |
| GPV-5 2m Base Station Co-Linear..... | £33.90 |
| GPV-7 70cm Base Station Co-Linear..... | £29.00 |
| GPV720 144/432MHz dual base station..... | £33.90 |
| GDX2 50-480MHz Disccone antenna..... | £46.50 |

JAYBEAM

| | |
|--------------------------------------|--------|
| LW5 5EI 2m Yagi..... | £14.37 |
| LW8 8EI 2m Yagi..... | £17.82 |
| LW1010EI 2m Yagi..... | £24.15 |
| LW1616EI 2m Yagi..... | £36.08 |
| PBM1010EI Parabeam..... | £44.85 |
| PBM1414EI Parabeam..... | £56.78 |
| C5/2m 2m Co-Linear..... | £54.63 |
| D5/2m Double 5Element Slot Yagi..... | £25.30 |
| D8/2m Double 8Element Slot Yagi..... | £34.50 |
| Q4/2m 4Element 2m Quad..... | £29.33 |
| Q6/2m 6Element 2m Quad..... | £39.10 |
| Q8/2m 8Element 2m Quad..... | £44.85 |
| C8/70cm 432MHz Co-Linear..... | £62.00 |
| D8/70cm Double 8Slot Yagi..... | £25.88 |
| PBM 18/70cm 18EI Parabeam..... | £32.20 |
| PBM 24/70cm 24EI Parabeam..... | £42.56 |
| LW2424EI folded dipole..... | £27.00 |
| MBM2828EI multibeam..... | £21.28 |
| MBM4848EI multibeam..... | £36.66 |
| MBM8888EI multibeam..... | £48.88 |
| 8XV/70 Crossed 8Yagi..... | £42.55 |
| 12XV/70 12EI Crossed Yagi..... | £52.90 |
| 5XV/2m Crossed 8EI Yagi..... | £28.18 |
| 8XV/2m Crossed 8EI Yagi..... | £36.65 |
| 10XV/2m Crossed 10EI Yagi..... | £46.00 |



The R532 fulfils all these requirements with ease, and combines them with simplicity of operation, and the staggering reliability which Signal Communications build into all of their equipment.

SPECIFICATION.
 Frequency range: 110 to 136MHz, i.e. all NAV/COM channels.
 Number of channels: 1040 (25KHz steps).
 Sensitivity: Better than 0.75 microvolts 10dB /SN.
 Memory channels: 100 (10 banks of 10). Memories can be scanned automatically or selected manually.
 Power required: 12V dc negative earth 300mA typical. (Display can be switched off to reduce consumption when operating portable). Size: 160 x 45 x 130mm.
 Weight: approx. 1kg. (including memory backup batteries).

QRM KILLERS

see us at
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Doncaster Oct. 6, 7, 8

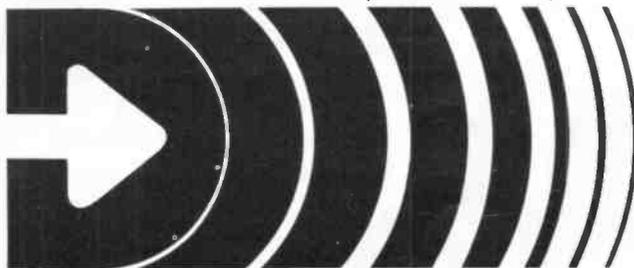


MODEL SRB2

is the definitive and long awaited answer to the Russian Woodpecker. Others claim to solve the problem of the distinctive RAT A - TAT TAT of the Russian radar system. **DATONG are the first to succeed with a fully automatic blanker.**

With the introduction of model SRB2 the Woodpecker is dead. Completely automatic in operation, SRB2 locks onto the Woodpecker within a second or so of its appearance and blanks it out completely. SRB2 adjusts automatically and continuously to changing pulse widths and phase changes that defeat the manual blankers. SRB2 can even deal with more than one Woodpecker at a time. User selectable between 10 and 16hz repetition rates, SRB2 connects in series with loudspeaker and antenna leads, and is equally effective on SSB, AM and CW. A power supply of 10 to 16 volts @ 150 ma is required.

Price: **£75.00 + VAT (£86.25 Total)**



DATONG ELECTRONICS LIMITED

MODEL ANF

The value for money, stand alone automatic notch filter that doubles as a CW filter. Model ANF is small in size but neat in looks and big in performance. Simply connect model ANF in series with the loudspeaker lead of your receiver and from then on heterodynes, whistles and other steady tones that often make listening on the crowded amateur and short wave bands hard work will vanish automatically, as model ANF notches them out.

A bargraph LED display shows you the frequency of the offending interference. At the push of a button model ANF becomes a good CW filter eliminating all but the signal you want to hear. Manual or automatic operation in notch and peak modes, plus automatic frequency control, makes model ANF extremely versatile and easy to use.

A power supply of 10 to 16 volts DC @ 100 ma is required. Model ANF is supplied with connecting leads, and is identical in size to model SRB 2

Price: **£59.00 + VAT (£67.85 Total)**

ORDER FORM

Please send me the following

I enclose CHEQUE/POSTAL ORDER No.

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Address Tel
Town
City Post Code

| Model | Qty. | Unit Price | Unit Total |
|-------|------|------------|----------------|
| SRB2 | | £86.25 | |
| ANF | | £67.85 | |
| | | | Total £ |

..... for £

Please debit my VISA/ACCESS account.

Card No

All orders sent by return, 1st class parcel post. Any delay will be notified to you immediately.



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YAESU - Latest...

Latest news from YAESU - Expected soon is the new **FT-757GX** all mode HF transceiver - 160 thru ten

of course plus general coverage RX. FM and all options fitted including dual VFO's, eight memories, programmable memory scan, full break-

in on CW, 100 watts PEP/DC output at 100% duty cycle and all this in a package measuring 238W x 93H x 238Dmm!

KEEP AHEAD WITH THE YAESU FT-102!

STOP PRESS

We are pleased to announce a new price break through on this superb transceiver — phone or write for details.



FRG-7700 HIGH PERFORMANCE COMMUNICATIONS RECEIVER



YAESU's top of the range receiver. All-mode capability, USB, LSB, CW, AM and FM 12 memory channels with back-up. Digital quartz clock feature with timer. Pictured here with matching FRT-7700 Antenna tuner and FRV-7700 VHF converter.

FT-780R/208R SYNTHESIZED UHF/VHF TRANSCEIVERS

- NC-7 - Standard charger
- NC-8 - Standard/quick charger/DC Power supply
- NC-9C - Compact charger (220-234V)
- PA-3 - Car adapter
- YM-24A - Speaker/microphone
- FL-2010 - 10 watt power amplifier for FT-208R
- FL-7010 - 10 watt power amplifier for FT-708R

FT-290R/790R 2m & 70cm PORTABLES

10 memories, 2 VFO's, LCD display, C size battery, easy car mounting tray, FT-290R 0.5 low/2.5 high watts out FT-790R 0.2 low/1.0 high watts out (incorporates speech compressor).



FT-230R/730R 2m & 70cm FM MOBILES

- Two independent VFO's
- 10 memories
- Priority function
- Memory and band scan
- 12.5/25KHz steps (25/100KHz FT-730R)
- Large LCD readout.



FT-480R/780R 2m & 70cm MOBILES

The most advanced 2 metre and 70 cm mobiles available today — USB, LSB, FM, CW full scanning with priority channel, 4 memory channel, dual synthesized VFO system.



AMATEUR ELECTRONICS UK



THE SYMBOL OF TECHNICAL EXCELLENCE

Your number one source for YAESU MUSEN

FT-980 ALL MODE HF CAT *

This incredible new transceiver incorporates the highest level of microprocessor control ever offered in an HF all solid-state radio. Including a general coverage (0.15-30MHz) receiver with its own, separate front end, this amateur transceiver offers a new dimension in frequency control; whereby frequencies can be entered by either front panel keypad or tuning dial, and then scanned in selectable steps either freely or between any two programmable limits. Twelve memories include four with special protection, and two large digital displays allow full flexibility and control for split frequency operation while two meters allow full transmitter information.

Additional controls include IF Width and Shift on concentric controls, AMGC (Automatic Mic Gain Control) to set microphone input threshold, RF Speech Processor, ALC Meter Hold function, IF Notch and Audio Peak filters, Transmit Monitor, Noise Blanker and CW Full Break-in. Controls



* Computer-Aided Transceiver

are also provided for FM Squelch and CW Keyer Speed when the optional FM and Keyer Units are installed.

The most important feature of the FT-980 is that practically all of the above features can be controlled by the user's separate personal computer, when connected through an optional Interface, also available from Yaesu. Where up to now the

few amateur transceivers that offered any kind of computer interfacing at all permitted only frequency control, the FT-980 permits almost total control of all functions from a separate micro-computer, including Mode; IF Width and Shift; Scanner Step, Speed and Limits; and switching of most other functions. (Microcomputers are not available from Yaesu.)

FT-77 THRIFTY HF TRANSCEIVER



UTILIZING THE NEW CAD/CAM* MANUFACTURING TECHNIQUES, YAESU PRESENTS THE FT-77 AS A NEW MILESTONE IN RELIABILITY, SIMPLICITY AND ECONOMY IN HF COMMUNICATIONS.

Thrifty

Featuring efficient, all solid-state, no-tune circuitry, the FT-77 offers a nominal 100 watts of RF output on all amateur bands between 3.5 and 30 MHz, including the WARC bands. New CAD/CAM techniques plus the simple design of the FT-77 add up to one of the smallest, lightest HF transceivers ever; both in your hands, and on your wallet.

Simple

The front panel control layout and operation are actually simpler than some VHF FM transceivers, with only essential operating controls; while the simple circuit design leaves fewer parts that could cause problems. Nevertheless, all of the essential modern operating features for HF SSB and CW are included, along with extras such as dual selectable noise blanker pulse widths (designed to blank woodpecker or common impulse noise), full SWR metering, and capabilities for an optional internal fixed-frequency channel crystal, narrow CW filter and FM Unit.

Reliable

Computer-aided design of the circuit boards in the FT-77 ensures the most efficient component layout possible in the smallest space, while automatic parts insertion and soldering greatly diminish the chance for human error. Reliability and quality control are thus improved and simplified beyond the degree previously attainable in amateur equipment. This means longer equipment life with less chance of breakdown.

Expandable

The extremely compact size and simple control layout make the FT-77 ideal for mobile operation, or as the heart of a complete base station with the optional FP-700 AC Power Supply, FV-700DM Digital Scanning VFO and Memory System, FTV-700 V/UHF Transverter and the FC-700 Antenna Tuner. The competitive price of the FT-77, coupled with the expansion capabilities presented by these accessories, make this transceiver the perfect choice for those new to amateur HF communication, or as a practical second rig for old-timers.

*Computer Aided Design/Computer Aided Manufacture.

FT-726R VHF/UHF Multi-bander



Combining all of the best features from Yaesu HF and V/UHF transceivers, the FT-726R opens a new world of operating ease and flexibility for FM, SSB and CW on the 50*, 144 and 430/440 MHz amateur bands. The design of the FT-726R integrates the individual operating requirements of each of the three operating modes into one unit, and the user can then select which of the optional plug-in band modules he desires.

The VFO-A/B scheme has ten programmable memories, and can be tuned in 20Hz steps for CW and SSB operation, or in selectable steps for FM. FM tuning is accomplished by an indented tuning knob. IF Width and Shift controls are provided for CW and SSB operation, while both preset standard and user programmable repeater offsets can be selected for all modes. An optional Satellite Unit makes the FT-726R into a full duplex cross-band satellite transceiver.

*144 MHz Unit installed, other Units available as options according to local regulations.

For full details of these new and exciting models, send today for our latest SHORT FORM CATALOGUE. All you need do to obtain the latest information about these exciting developments from the World's No.1 manufacturer of amateur radio equipment is to send 36p in stamps and as an added bonus you will get our credit voucher value £3.60—a 10 to 1 winner!

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TRANSVERTERS FOR 2 METRE TRANSCEIVERS

| MODEL No. | MMT28/144 | MMT70/144 | MMT432/144-R | MMT432/144-S | MMT1296/144 | MMX1268/144 |
|--------------------------|--|-----------------|---|--|---------------|---------------|
| Output Frequency Range | 28-30MHz | 70.025-70.5 MHz | 432-434 MHz 433.6-435.6 MHz (Repeater Mode) | 432-434 MHz 434-436 MHz (Satellite Mode) | 1296-1298 MHz | 1268/1270 MHz |
| Input Modes | SSB, FM, AM, CW | | | | | |
| Input Requirements | 10 Watts with standard attenuator - MMR15/10 (3 Watts with alternative attenuator - MMR7/3) | | | | | |
| Output Power | 10 Watts | 10 Watts | 10 Watts | 10 Watts | 2 Watts | 2 Watts |
| Conversion Principle | SINGLE | DOUBLE | DOUBLE | DOUBLE | SINGLE | |
| Receive Gain | 15dB | | | | | |
| Receive N.F. | 2.0dB max. | 2.0dB max. | 3.0dB max. | 3.0dB max. | 1.2dB max. | |
| Input & Output Impedance | 50ohm | | | | | |
| RF Connectors | SO239 | SO239 | SO239/BNC/N | SO239/BNC/N | SO239/BNC/N | SO239/BNC/N |
| Power Requirements | 13.8V at 2.1A | 13.8V at 2.1A | 13.8V at 2.1A | 13.8V at 2.1A | 13.8V at 0.5A | 13.8V at 0.5A |



TRANSVERTERS FOR 10 METRE TRANSCEIVERS

| MODEL No. | MMT70/28 | MMT144/28 | MMT432/28-S |
|--------------------------|---------------------------------|---------------|--|
| Output Frequency Range | 70.025-70.5 MHz | 144-146 MHz | 432-434 MHz 434-436 MHz (Satellite Mode) |
| Input Modes | SSB, FM, AM, CW | | |
| Input Requirements | 5-500mW (Continuously Variable) | | |
| Output Power | 10 Watts | 10 Watts | 10 Watts |
| Conversion Principle | SINGLE | SINGLE | SINGLE |
| Receive Gain | 30 dB | | |
| Receive N.F. | 2.0 dB max. | 2.5 dB max. | 3.0 dB max. |
| Input & Output Impedance | 50 ohm | | |
| RF Connectors | SO239 | SO239 | SO239/BNC/N |
| Power Requirements | 13.8V at 2.1A | 13.8V at 2.1A | 13.8V at 2.1A |



PRICES - including VAT

| | | | |
|-------------|---------------------|--------------|---------------------|
| MMT70/28 | : £129.95 P&P £3.00 | MMT70/144 | : £129.95 P&P £3.00 |
| MMT144/28 | : £109.95 P&P £3.00 | MMT432/144-R | : £184.00 P&P £3.00 |
| MMT432/28-S | : £159.95 P&P £3.00 | MMT432/144-S | : £184.00 P&P £3.00 |
| MMT28/144 | : £129.95 P&P £3.00 | MMT1296/144 | : £199.00 P&P £4.50 |
| MMX1268/144 | : £135.00 P&P £3.00 | | |

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DOWN



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|-------|-------|----------|------------|
| FTONE | £1450 | Now only | £1395 inc. |
| FT980 | £1215 | Now only | £1150 inc. |
| FT102 | £839 | Now only | £685 inc. |
| FT77 | £515 | Now only | £459 inc. |
| FT775 | £435 | Now only | £399 inc. |
| FT707 | £515 | Now only | £499 inc. |

| | | | |
|--------|------|----------|-----------|
| FT726R | £699 | Now only | £675 inc. |
| FT290R | £285 | Now only | £249 inc. |
| FT790R | £349 | Now only | £299 inc. |
| FT230R | £255 | Now only | £239 inc. |
| FT730R | £299 | Now only | £259 inc. |
| FT708R | £229 | Now only | £209 inc. |



FT290R
2m Multimode

| | | | | | | | |
|----------|------|----------|-----------|---------|--------|----------|-----------|
| FV102DM | £250 | Now only | £230 inc. | FC700 | £99.65 | Now only | £85 inc. |
| FC102 | £225 | Now only | £200 inc. | FV707DM | £200 | Now only | £170 inc. |
| FRG7700M | £399 | Now only | £389 inc. | FC707 | £88.55 | Now only | £85 inc. |

NEW FROM YAESU



FT757GX

Frequency range 160-10m Tx general coverage Rx. 10Hz VFO steps and 500 KHz band steps. Modes, USB, LSB, CW, AM, FM all as standard. Power output 100W SSB, CW, FM 25W carrier AM, 3rd order products -40dB at 100W on 14 MHz. Dynamic range better than 100dB CW(N) at 14 MHz. Frequency stability better than ± 10ppm after warm up. Dual VFO's and 8 memories with VFO/memory transfer feature allowing more flexible split frequency operation. Programmable memory scanning with scanstop threshold adjustable with the RF Gain control. All accessories installed including AM, FM, Marker, Speech processor, shift filters, 600Hz CW filter and keyer. New heatsink design and ducted cooling system allow 100W o/p at 100% transmitter duty cycle. Selectable semi break-in or full break-in and built in inambic keyer with dot-dash memory. Three microprocessors control most of the switching and adjusting functions normally done by hand and on optional CAT interface unit allow further operating flexibility with an external computer.



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Only authorised Yaesu dealers have direct contact with the factory in Japan, and only if you buy your radio from an authorised dealer can you be assured of spares and service back up. So BEWARE of grey importers who offer sets a few pounds cheaper, they may not be around if your set goes wrong!

LEEDS
 SMC (Leeds)
 257 Oley Road
 Leeds 16, Yorkshire
 Leeds (0532) 782328
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CHESTERFIELD
 SMC (Jack Tweedy) Ltd
 102 High Street
 New Whittington, Chesterfield
 Chesterfield (0246) 453340
 9.5 Tues-Sat

BUCKLEY
 SMC (TMP)
 Unit 27, Pinfold Lane
 Buckley, Clwyd
 Buckley (0244) 549563
 9.30-5.30 Tues-Sat

STOKE
 SMC (Stoke)
 76 High Street
 Talke Pits, Stoke
 Kidsgrove (07816) 72644
 9.5.30 Tues-Sat

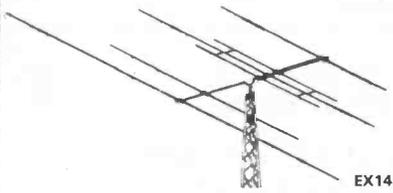
GRIMSBY
 SMC (Grimsby)
 247A Freeman Street
 Grimsby, Lincs
 Grimsby (0472) 59388
 9.30-5.30 Mon-Sat

JERSEY
 SMC (Jersey)
 1 Belmont Gardens
 St. Helier, Jersey
 Jersey (0334) 77067
 10-7 Mon-Sat

EDINBURGH
 SMC Scotcomm.
 23 Morton Street,
 Edinburgh EH15 2HN
 Tel: 031 657 2430
 10.5 Tues-Fri, 9-4 Sat

HF ANTENNAS

S.M.C. have the greatest range of H.F. antennas eg., Multi Beams/Quads, over 20 models. Shown below is the sensational new Explorer 14 — contact us for full details.



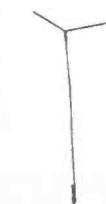
EX14

| Model | Description | Inc VAT | P&P |
|-----------|-----------------------|----------|--------|
| EX14 | Explorer 10-20 | £325.00 | £5.00 |
| TH3JN | 3 Ele 10-20 | £202.40 | £3.50 |
| TH2MK3 | 2 Ele 10-20 | £169.06 | £3.50 |
| TH3MK3 | 3 Ele 10-20 | £274.86 | £5.30 |
| TH5DXX | 5 Ele 10-20 | £419.75 | £6.70 |
| TH7DXX | 7 Ele 10-20 | £511.75 | £8.75 |
| TB3 | 3 Ele 10-20 Jaybeam | £181.70 | £5.40 |
| HQ1 | Mini Quad 10-20 | £139.00 | £4.00 |
| G4MH | Mini Beam 1-20 | £82.50 | £4.00 |
| TA33JNR | 3 Ele 10-20 Moseley | £161.00 | £3.40 |
| Mustang 2 | 2 Ele 10-20 | £177.10 | £3.50 |
| Mustang 3 | 3 Ele 10-20 | £220.80 | £3.70 |
| GO2E | 2 Ele 10-20 Quad | £189.75 | £5.40 |
| GO3E | 3 Ele 10-20 Quad | £313.95 | £9.20 |
| GO4E | 4 Ele 10-20 Quad | £446.20 | £12.00 |
| Hyquad | 2 Ele 10-20 | £171.35 | £6.70 |
| LP1007 | Log Periodic 13-20MHz | £1474.30 | DIST |
| 3Y1015D20 | 3 Ele 10-20 | £134.95 | £5.00 |
| DB10/15A | 3 Ele 10-15 | £198.95 | £4.80 |



TB3

| Model | Description | Inc VAT | P&P |
|-------|--------------------|---------|-------|
| 103BA | 3 Ele Yagi 10M | £67.85 | £3.50 |
| 105BA | 5 Ele Yagi 10M | £155.25 | £3.75 |
| 153BA | 3 Ele Yagi 15M | £90.85 | £3.50 |
| 155BA | 5 Ele Yagi 15M | £236.90 | £5.90 |
| 203BA | 3 Ele Yagi 20M | £178.25 | £4.90 |
| 204BA | 4 Ele Yagi 20M | £286.35 | £7.30 |
| 205BA | 5 Ele Yagi 20M | £396.75 | £9.40 |
| 402BA | 2 Ele Yagi 40M | £247.25 | £6.50 |
| 18TD | Dipole Tape 10-80M | | |



HF5V



HF5R

| Model | Description | Inc VAT | P&P |
|----------|-----------------------|---------|-------|
| 12AVQ | Vertical 10-20M | £50.60 | £2.75 |
| 14AVQ | Vertical 10-40M | £64.40 | £2.75 |
| 18AVT/WB | Vertical 10-80M | £113.85 | £2.75 |
| 18V | Vertical 10-80M taped | £36.22 | £2.75 |
| C4 | Vertical 10-20 | £59.00 | £2.50 |
| SMCHF5 | Vertical 10-80 | £54.80 | £2.50 |
| SMCHF5P | Radial Kit for above | £34.90 | £2.50 |

| Model | Description | Inc VAT | P&P |
|----------|-------------------|---------|-------|
| SMCTD/HP | High Power 10-80M | £43.41 | £2.50 |
| SMCTP/P | Portable inc coax | £59.80 | £2.50 |

| Model | Description | Inc VAT | P&P |
|-------------|------------------|---------|-------|
| Tribander | 10-20M Slide sw. | £25.88 | £1.50 |
| Multiband | 10-20M | £30.48 | £1.50 |
| Flexiwhip | 10M only | £18.11 | £1.85 |
| Bases | For above | £5.75 | £1.00 |
| Extra Coils | For above to 160 | £5.70 | £1.00 |

NB: PRICES INCLUDE VAT AT 15%
Carriage extra, mainland rate shown

POWER METERS

POWER/SWR BRIDGES P.E.P., R.M.S. 1.8-440 MHz

The Hansen range covers 30 quality models with top-of-the-line the FS710. This is a flat frequency response peak envelope power and average in-line wattmeter with many novel features. Notable being the 'power independent' SWR scale — nor forward power calibration knob, just direct reading SWR.



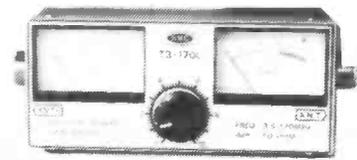
HANSEN FS500H

| Model | Description | Inc VAT | P&P |
|---------|------------------------------|---------|-----|
| FS710H | 1.8-80 MHz 15/150/1500W Pep | £89.70 | FOC |
| FS710V | 50-150 MHz 15/150W Pep | £89.70 | FOC |
| FS50HP | 1.8-80 MHz 20/200/2000W Pep | £89.70 | FOC |
| FS50VP | 50-150 MHz 20/300W Pep | £89.70 | FOC |
| FS500H | 1.8-80 MHz 20/200/2000W Pep | £89.75 | FOC |
| FS500V | 50-150 MHz 20/200W Pep | £89.75 | FOC |
| FS300H | 1.8-80 MHz 20/200/1000 | £46.40 | FOC |
| FS300V | 50-150 MHz 20/200 | £46.40 | FOC |
| FS200 | 1.8-150 MHz 5/20/200 Pep | £50.80 | FOC |
| FS601M | 1.8-30 MHz 20/200W Pep | £51.35 | FOC |
| FS601MH | 1.8-30 MHz 200/2000W Pep | £51.35 | FOC |
| FS602M | 50-150 MHz 20/200W Pep | £51.35 | FOC |
| FS603M | 430-440 MHz 5/20W Pep | £51.35 | FOC |
| FS210 | 1.8-150 MHz 20/200W Auto SWR | £55.20 | FOC |
| FS301M | 2-30 MHz 20/200W | £35.65 | FOC |
| FS301MH | 2-30 MHz 200/2000W | £35.65 | FOC |
| FS302M | 50-150 MHz 20/200W | £35.65 | FOC |
| FS711H | 2-30 MHz 20/200W Head | £36.80 | FOC |
| FS711V | 50-150 MHz 20/200W Head | £36.80 | FOC |
| FS711U | 430-440 MHz 5/20W Head | £36.80 | FOC |
| HB1 | FS711H Coupler | £23.75 | FOC |
| VB1 | FS711V Coupler | £23.75 | FOC |
| UB1 | FS711U Coupler | £23.75 | FOC |
| FS5E | 3.5-150 MHz 20/200/1000W HF | £37.20 | FOC |
| FS5S | 1.8-150 MHz 20/200/1000W HF | £37.95 | FOC |
| FS7 | 145 & (432 MHz) 5/20/200 144 | £41.00 | FOC |
| SWR3E | 3.5-150 MHz 20/200/1000W HF | £25.00 | FOC |
| SWR3S | 3.5-150 MHz F/S Meter ant. | £26.45 | FOC |
| SWR50B | 3.5-150 MHz Twin Meter | £26.45 | FOC |
| FS20D | 3-150 MHz 5/20W | £37.95 | FOC |
| FS-800 | 1.8-150 MHz 6/30/150W | £115.00 | FOC |

| | | | |
|-------|---------------------|--------|-----|
| JD | | | |
| JD110 | 1.5-150 MHz 10/100W | £13.80 | FOC |

| | | | |
|--------|-----------------------------|---------|-----|
| MIRAGE | | | |
| MP2 | 50-150 MHz 50/500/1500W Pep | £100.00 | FOC |

| | | | |
|---------|----------------------|--------|-----|
| SMC | | | |
| S3-30L | Mini CB | £8.80 | FOC |
| T3-170L | 3.5-170 MHz Relative | £14.95 | FOC |



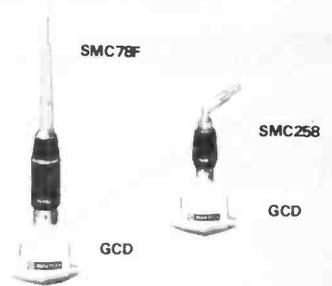
SMC T3170L

NB: PRICES INCLUDE VAT AT 15%
Carriage free (surface post) worldwide

SMC-HS

HF, VHF, UHF ANTENNAS MOBILE VERTICALS

SMC-HS Mobile Elements, tabulated below, feature an inbuilt PL259M connector, which mates with the SO239M on any of the four standard mounts. This arrangement is ideal for easy removal — band changes, comparative test, car wash, and anti-vandal, system checks from the feed point, portable operation and for ease of garaging, etc. All models have fold over bases (either lift and lay or locking collar) except the 78B which has an inbuilt ball in case the mount must be fitted askew.



SMC78F

SMC258

GCD

GCD

| Model | Description | Inc VAT | P&P |
|-------------|---|---------|-------|
| 3.3 | SMC-HS MOBILE ANTENNA | | |
| SMC6P2T/PL | Telescopic 2M PL259 fitting OdB% | £3.45 | £0.60 |
| SMC6P2T/BNC | Telescopic 2M BNC fitting OdB% | £5.00 | £0.60 |
| SMC2H/PL | Helical 2M PL259 fitting | £3.45 | £0.60 |
| SMC2H/BNC | Helical 2M BNC fitting | £5.00 | £0.60 |
| SMCHS430 | 70cm 1/2 wave BNC fitting 2.5dB% | £6.90 | £0.60 |
| SMC2QW | 2M 1/4 wave OdB% 1.6' | £2.30 | £1.50 |
| SMC2NE | 2M 1/2 wave fold 3.0dB% 4.3' | £6.90 | £1.80 |
| SMC2VF | 2M 1/2 wave fold 3.0dB% 3.5' | £11.50 | £1.80 |
| SMC78F | 2M 1/2 wave fold 4.5dB% 5.7' | £13.80 | £2.00 |
| SMC78B | 2M 1/2 wave ball 4.5dB% 5.6' | £13.80 | £2.00 |
| SMC78SF | 2M 1/2 wave short 4.7' | £13.80 | £2.00 |
| SMC88F | 2M 8/8 wave 5.2dB% 6.5' | £18.80 | £2.00 |
| SMC118M | Colinear 2M 11/8 wave fold 7dB% 9.7' | £29.90 | £2.50 |
| SMC258 | 70cm 2 x 1/4 fold 5.5dB% 3.1' | £12.65 | £1.80 |
| SMC358 | 70cm 3 x 1/4 6.3dB% 4.7' | £16.85 | £1.80 |
| SMC70N2M | Dual band 2M 2.7dB% 70cm 5.1dB% | £16.85 | £1.80 |
| SMCHS770 | 144/432 Duplexer 50W | £15.35 | £1.50 |
| SMC20SE | 20M 1.72M 'fold over' 100W PEP | £17.65 | £2.00 |
| SMC15SE | 15M 1.72M 'fold over' 130W PEP | £14.55 | £2.00 |
| SMC10SE | 10M 1.72M 'fold over' 200W PEP | £13.80 | £2.00 |
| SMC17SE | 17M 1.915M 'fold over' 200W PEP | £15.70 | £2.00 |
| SMC12SE | 12M 1.915M 'fold over' 200W PEP | £14.20 | £2.00 |
| SMCGCCA | Gutter clip 4mtrs cable | £9.95 | £1.80 |
| SMCSOCA | Cable assembly 4M | £5.00 | £1.20 |
| SMCSOCAL | Cable assembly 6M | £5.35 | £1.20 |
| SMCTMCAS | Trunk mount c/w 6M cable | £8.45 | £1.80 |
| SMCSOMM | Magbase c/w 4M cable | £9.95 | £1.80 |
| SMCSOWM | Adjustable wing mount | £4.20 | £0.90 |
| SMCGCD | Gutter clip deluxe | £4.60 | £1.20 |
| SMCBSB | Bumper strap deluxe | £8.80 | £1.20 |
| HS88BK | Bumper mounted extension for 144 MHz ant. | £18.80 | £1.80 |

SOMM

HS770



NB: PRICES INCLUDE VAT AT 15%
Mainland delivery rate shown

SMC BRANCHES AT TOTTEN (SOUTHAMPTON), CHESTERFIELD, STOKE, GRIMSBY, LEEDS, BUCKLEY (N. WALES), JERSEY, EDINBURGH

SMC STOCK CARRYING AGENTS WITH DEMONSTRATION FACILITIES

Stourbridge Andrew G4EJY (0384) 390916

Bangor John G13KDR (0247) 55162
Tandragee Mervyn G13WVY (0762) 840656

Neath John GW4FOI (0639) 52374 Day
(0639) 2942 Eve

ROTATORS

The finest range: be it Kenpro, C.D.E., Channel Master, S.M.C. has over 19 models to choose from. Ask the experts for the right model to suit your requirements — it should save you money. Write, phone or call.



| Type | Core | Light Duty | Price |
|----------|--------|------------|---------|
| RLD3 | Bell | 5 Core | £40.25 |
| 506 | Bell | 5 Core | £40.25 |
| AR30 | Offset | 5 Core | £56.35 |
| KP250 | Bell | 6 Core | £54.91 |
| 9502B | Offset | 3 Core | £56.92 |
| AR22 | Bell | 4 Core | £67.85 |
| 9508 | Offset | 3 Core | £80.21 |
| AR40 | Bell | 5 Core | £90.85 |
| BT1 | Bell | 5 Core | £91.43 |
| KR400 | Bell | 6 Core | £97.75 |
| KR500 | Thro | 6 Core | £112.12 |
| AR50 | Bell | 5 Position | £113.85 |
| KR400RC | Bell | 6 Core | £114.94 |
| CD45 | Bell | 8 Core | £136.85 |
| KR600RC | Bell | 8 Core | £163.30 |
| HAM IV | Bell | 8 Core | £258.75 |
| KR2000RC | Bell | 8 Core | £314.52 |
| T2X | Bell | 8 Core | £327.75 |
| H300 | Bell | 8 Core | £493.35 |

| Control Cable | Way | Price/mtr | Carriage |
|---------------|------------------|-----------|----------|
| RC4W | 4 Way | 29p/mtr | £1.80 |
| RC5W | 5 Way | 33p/mtr | £1.80 |
| RC6W | 6 Way | 51p/mtr | £1.80 |
| RC8W | 8 Way | 55p/mtr | £1.80 |
| 9523 | Support Bearing | | |
| 9502 | | £15.81 | £2.50 |
| KC038 | Lower Mast Clamp | | |
| KR400/600 | | £12.07 | £2.50 |

Prices including VAT and Carriage, but accessories are extra unless sent with rotators.

ANTENNA ACCESSORIES

MASTS & TOWERS

| | | | |
|-------|--------------------------|---------|-------|
| TT24 | 79' Tower c/w rigging | £626.00 | DIST |
| TT30 | 101' Tower c/w rigging | £730.00 | DIST |
| SMC16 | 16' Portable c/w rigging | £21.28 | £2.20 |
| SMC24 | 24' Portable c/w rigging | £25.88 | £2.20 |
| SPK16 | 16' Light duty portable | £17.25 | £2.20 |
| 10P30 | 30' Telesc. Versatower | £388.00 | DIST |
| 13P40 | 40' Telesc. Versatower | £436.00 | DIST |
| 13P60 | 60' Telesc. Versatower | £534.00 | DIST |
| 16P40 | 40' Telesc. Versatower | £650.00 | DIST |
| 16P60 | 60' Telesc. Versatower | £739.00 | DIST |

COAXIAL CABLE (per metre)

| | | | |
|-------|--------------------------|-------|-------|
| UR43 | 50 ohm 5mm | £0.27 | £2.20 |
| UR76 | 50 ohm 5mm Stranded core | £0.29 | £2.00 |
| UR67 | 50 ohm 10.2mm low loss | £0.67 | £2.40 |
| LDF2 | 50 ohm 1/2" Foam Heliax | £2.85 | £2.50 |
| LDF4 | 50 ohm 1/2" Foam Heliax | £3.56 | £2.50 |
| 307EP | 75 ohm Economy | £2.21 | £2.00 |
| UR70 | 75 ohm 6mm | £0.30 | £2.00 |
| UR39 | 75 ohm 7.8mm | £0.44 | £2.40 |
| UR57 | 75 ohm 10.2mm low loss | £0.69 | £2.50 |
| 302 | 75 ohm Galv. twin | £0.17 | £1.50 |
| 306 | 300 ohm Galv. twin | £0.23 | £1.50 |

ANDREWS HELIAX CONNECTORS

| | | | |
|------|--------------------------|--------|-------|
| L42W | 'N' Plug male LDF2/50 | £12.07 | £0.65 |
| L42N | 'N' Jack female LDF2/50 | £12.07 | £0.65 |
| L42P | UHF Plug (PL259) LDF2/50 | £12.07 | £0.65 |
| L44W | 'N' Plug male LDF4/50 | £12.42 | £0.65 |
| L44N | 'N' Jack female LDF4/50 | £12.42 | £0.65 |
| L44P | UHF Plug (PL259) LDF4/50 | £11.09 | £0.65 |

2M ASCOT ANTENNAS MOBILE

(The keenest prices)

| Complete with bases and cable | Price |
|-------------------------------|--------------|
| 340COM 1/4 X Standard | £6.10 £1.50 |
| 310COM 1/4 X Swival | £8.10 £1.50 |
| 344COM 1/4 X Sprung | £10.38 £1.50 |
| 440COM 1/4 X Standard | £7.71 £1.50 |
| 330COM 1/4 X Swival | £10.00 £1.50 |
| 341COM 1/4 X Sprung | £12.31 £1.50 |
| 092 Magnetic Mount | £10.75 £1.50 |
| 350 1/4 X Standard | £14.26 £1.50 |
| 351 1/4 X Sprung | £15.01 £1.50 |
| 091 Magnetic Mt 1/4 X | £10.75 £1.50 |



J-BEAM

4 METRES

| | | | | |
|---------|-----------------------|------|--------|-------|
| 4Y/4M | Yagi 4element | 7dBd | £29.90 | £2.20 |
| PMH2/4M | Phasing harness 2-way | | £16.10 | £1.50 |

2 METRES

| | | | | |
|----------|--------------------------|---------|--------|-------|
| HQ/2M | Halo head only | 0dBd | £5.98 | £1.20 |
| HM/2M | Halo with 24" mast | 0dBd | £6.55 | £1.50 |
| C5/2M | Colinear omni vert | 4.8dBd | £54.62 | £2.50 |
| LW5/2M | Yagi 5element | 7.8dBd | £14.37 | £2.50 |
| LW8/2M | Yagi 8element | 9.5dBd | £17.82 | £2.50 |
| LW10/2M | Yagi 10element | 10.5dBd | £24.15 | £2.50 |
| LW16/2M | Yagi 16element | 13.4dBd | £35.07 | £3.20 |
| 14Y/2M | Yagi 14element | 12.8dBd | £36.23 | £3.20 |
| PBM10/2M | 10ele Parabeam | 11.7dBd | £44.85 | £3.20 |
| PBM14/2M | 14ele Parabeam | 13.7dBd | £56.77 | £3.20 |
| Q4/2M | Quad 4element | 9.4dBd | £29.32 | £2.50 |
| Q6/2M | Quad 6element | 10.9dBd | £39.10 | £2.50 |
| Q8/2M | Quad 8element | 11.9dBd | £44.85 | £2.50 |
| D5/2M | Yagi 5over 5slot | 10dBd | £25.30 | £2.50 |
| DB/2M | Yagi 8over 8slot | 11.1dBd | £34.50 | £2.50 |
| 5XY/2M | Yagi 5ele crossed | 7.8dBd | £28.17 | £2.50 |
| 8XY/2M | Yagi 8ele crossed | 9.5dBd | £35.65 | £2.50 |
| 10XY/2M | Yagi 10ele crossed | 10.8dBd | £46.00 | £2.50 |
| PMH2/C | Harness cir polarisation | | £9.77 | £1.50 |
| PMH2/M | Harness 2-way 144MHz | | £12.65 | £1.50 |
| PMH4/2M | Harness 4-way 144MHz | | £28.75 | £1.50 |

SEVENTY CM

| | | | | |
|----------|------------------------|---------|--------|-------|
| CB/70 | Colinear Omni Vertical | 6.1dBd | £62.10 | £2.50 |
| DB/70 | Yagi 8over 8slot | 12.3dBd | £25.87 | £2.50 |
| PBM18/70 | 18ele Parabeam | 13.5dBd | £32.20 | £2.50 |
| PBM24/70 | 24ele Parabeam | 15.1dBd | £42.55 | £2.50 |
| LW24/70 | Yagi 24element | 14.8dBd | £27.02 | £2.50 |
| MBM28/70 | 28ele Multibeam | 11.5dBd | £21.27 | £2.50 |
| MBM48/70 | 48ele Multibeam | 14.0dBd | £35.65 | £2.50 |
| MBM88/70 | 88ele Multibeam | 16.3dBd | £48.87 | £2.50 |
| 8XY/70 | Yagi 8ele crossed | 10dBd | £42.55 | £2.50 |
| 12XY/70 | Yagi 12ele crossed | 12dBd | £52.90 | £2.50 |
| PMH2/70 | Harness 2-way | | £10.35 | £1.50 |
| PMH4/70 | Harness 4-way | | £22.42 | £1.80 |

1296 MHz

| | | | | |
|-----------|------------------|---------|--------|-------|
| CR2/23CM | Corner reflector | 13.5dBd | £40.25 | £2.50 |
| PMH2/23CM | Harness 2-way | | £31.05 | £1.50 |

NB: PRICES INCLUDE VAT AT 15% Carriage extra, mainland rate shown

10M FM CORNER



£49.00 inc. SMC OSCAR 2 10M FM

Join the many others who have found that operating 10M FM can be a pleasant alternative to the overcrowded 2M band. The SMC Oscar 2 10M gives you 40 channels, channel 1 being 29.310 MHz and channel 40 29.7 MHz, a power o/p of 5 watts minimum and a receive sensitivity of better than .3uV for 12db sinad. Also for your enjoyment when the band opens up, we have incorporated a — 100 KHz repeater shift (by using the original front panel Hi/Low power switch), so from the car or at home you can enjoy 10M FM without having to pay £500 for an HF transceiver.

| ACCESSORIES | INC | P/P |
|-------------|------------------------------------|--------------|
| SMCGP27 | 1/2 Wave vertical with radials | £24.15 £2.50 |
| SMCVA27 | 1/2 Wave vertical no radials | £20.70 £2.50 |
| SMC11VHS | Glass fibre shortened ground plane | £29.90 £2.50 |
| SMC10SE | 10M Mobile whip | £13.80 £2.00 |
| SMCGCCA | Gutter mount and cable for 10SE | £9.95 £1.80 |
| SMCSOCA | 4M cable assembly for 10SE | £5.00 £1.20 |
| FLEXI 10 | G. Whip mobile 10-80M | £49.00 £2.00 |
| MULTIMOBILE | G. Whip mobile 10, 15, 20M | £30.48 1.85 |
| FLEXIWHIP | G. Whip 10M mobile | £18.11 £1.85 |
| GW BASE | Base for all G. Whip antennas | £5.75 |
| SMCT3170L | Twin meter SWR bridge | £14.95 FOC |
| SMC100LP30 | Low pass filter | £5.30 FOC |
| SMCRU120406 | 4 Amp DC power unit | £15.00 £2.00 |
| FSP1 | Extension L/S | £11.15 FOC |

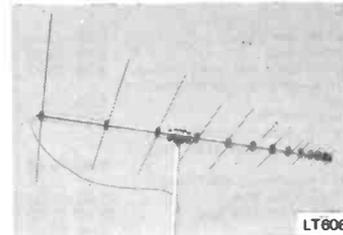
NB: PRICES INCLUDE VAT AT 15% and carriage by post or Securicor



SMC-HS

HF, VHF, UHF, BASE STATION ANTENNAS

SMC HS range of base station antennas covers from 80M through to 70cm. All have SO239M connectors and are supplied complete with all required mounting hardware.



| | | | |
|-----------|--------------------------------------|---------|-------|
| SQ144 | 2M Swiss Quad Vertical Mounting | £57.60 | £2.50 |
| GP2M | 2M 1/4 c/w ground plane 3.4dB 1/4 | £18.00 | £2.50 |
| GP144W | 2M 2 x 1/4 colinear 6.5dB 1/4 | £27.60 | £2.50 |
| GP23 | 2M 3 x 1/4 colinear 7.8dB 1/4 | £39.85 | £2.50 |
| GP432 | 70cm 3 x 1/4 colinear 6.8dB 1/4 | £29.90 | £2.50 |
| 70N2V | 2M/70cm colinear 2.8dB 1/4/5.7dB 1/4 | £29.90 | £2.50 |
| HS770 | 2M/70cm Duplexer 50W 30dB isolation | £15.35 | £1.50 |
| VHFL | 65-520MHz Discone Rx only | £15.70 | £2.50 |
| GDX1 | 80-480MHz Discone 3dB 1/4 | £40.25 | £2.50 |
| GDX2 | 50-480MHz Discone 3dB 1/4 | £49.45 | £2.50 |
| GDXA | 100-480MHz Discone 3dB 1/4 | £33.75 | £2.50 |
| LT606 | 50-500MHz Log Periodic 7-8dB | £115.00 | £2.50 |
| HFSV | Trapped Vertical 10-80M 5 bands | £54.80 | £2.50 |
| HF5R | Loaded Radial Kit | £34.90 | £2.50 |
| 3Y1015D20 | 3 ele 10, 15M Dipole 20M | £144.90 | £5.00 |

NB: PRICES INCLUDE VAT AT 15% Carriage extra, mainland rate shown

MORSE EQUIPMENT

HK908



MORSE KEYS

| | | | |
|-------|---------------------|--------|-------|
| BKU1 | Squeeze Key | £30.30 | £1.20 |
| HK703 | Straight Key | £25.70 | £1.20 |
| HK704 | Straight Key | £17.65 | £1.20 |
| HK706 | Straight Key | £14.60 | £1.00 |
| HK707 | Straight Key | £13.75 | £1.00 |
| HK710 | Straight Key | £36.40 | £1.75 |
| HK808 | Straight Key | £45.60 | £1.75 |
| HK908 | Key Mounting | £29.50 | £1.50 |
| HK711 | Mechanical Bug | £22.25 | £1.75 |
| BK100 | Single Lever Paddle | £25.25 | £1.60 |
| MK701 | Single Lever Paddle | £26.45 | £1.60 |
| MK702 | Squeeze Key | £25.96 | £1.75 |
| MK703 | Squeeze Key | £22.60 | £1.75 |
| MK705 | Squeeze Key | £19.50 | £1.75 |
| MK706 | Squeeze Key | £9.95 | FOC |
| IKP60 | Iambic | £12.65 | FOC |
| SR1 | Straight Key | | |

MORSE EQUIPMENT

| | | | |
|-------|--|---------|-------|
| KP100 | Squeeze CMOS 230/13.8V | £69.00 | £2.00 |
| KP200 | Memory 4096 Multi Ch Mem Back Up 230/13.8V | £156.25 | £2.50 |

Datong

| | | | |
|-----|-------------|--------|-----|
| D70 | Morse Tutor | £56.35 | FOC |
|-----|-------------|--------|-----|

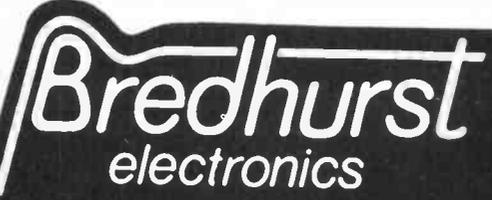
MICROWAVE MODULES — RTTY EQUIPMENT

| | | | |
|-----------|-------------------------------|---------|-----|
| MM2001 | RTTY to Demod./Convertor | £189.00 | FOC |
| MM4001 | RTTY Transceiver | £219.00 | FOC |
| MM40001KB | RTTY Transceiver c/w keybd | £299.00 | FOC |
| MMS1 | 'Morse Talker' | £115.00 | FOC |
| MMS2 | Advanced 'Morse Talker' | £155.00 | FOC |
| MM1000 | ASCII to Morse Convertor | £69.95 | FOC |
| MM1000KB | ASCII to Morse conv c/w keybd | £89.00 | FOC |

PRICES INCLUDE VAT AT 15% Mainland carriage where applicable

H.Q., Showrooms: S.M. HOUSE, RUMBRIDGE STREET, TOTTON, SOUTHAMPTON, SO4 4DP, ENGLAND AND MAIL ORDER Tel: Totton (0703) 867333. Telex: 477351 SMCOMM G. Telegram: 'Aerial', Southampton

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 WE DO THE REST!



TRIO TS-430S £736



| TRIO | | £ | c&p |
|---------|--|---------|--------|
| TS930S | 9 Band TX General Cov. Rx. | 1216.00 | (-) |
| AT930 | Int. Auto A.T.U. 80-10M Bands | 141.90 | (-) |
| SP930 | Ext. Speaker with audio filters | 59.00 | (1.50) |
| TS830S | 160-10M Transceiver 9 Bands | 697.00 | (-) |
| TS530S | HF Transceiver | 596.00 | (-) |
| AT230 | All Band ATU/Power Meter | 136.00 | (2.00) |
| SP230 | External Speaker Unit | 41.00 | (1.50) |
| TS430 | 160-10M Transceiver | 736.00 | (-) |
| PS430S | Matching Power Supply | 112.00 | (3.00) |
| SP430 | Matching Speaker | 29.44 | (1.50) |
| MB430 | Mobile Mounting Bracket | 11.27 | (1.50) |
| FM430 | FM Board for TS430 | 34.50 | (1.00) |
| TS130S | 8 Band 200W Pep Transceiver | 569.00 | (-) |
| TS130V | 8 Band 20W Pep Transceiver | 456.00 | (-) |
| SP120 | Base Station External Speaker | 26.40 | (1.50) |
| AT130 | 10W Antenna Tuner | 93.00 | (1.50) |
| PS20 | AC Power Supply — TS130V | 57.96 | (2.50) |
| MC50 | Dual Impedance Desk Microphone | 30.00 | (1.50) |
| MC35S | Fist Microphone 50K ohm IMP | 14.70 | (0.75) |
| MC30S | Fist Microphone 500 ohm IMP | 14.70 | (0.75) |
| LF30A | H.F. Low Pass Filter 1kW | 21.00 | (1.00) |
| TL922 | 160M-10M 2kW Linear (inc. valves) | 724.00 | (-) |
| TR9130 | 2M Multimode | 433.00 | (-) |
| TS9500 | 70cm Multimode | 419.00 | (-) |
| BO9A | Base Plinth for TR9130 | 39.30 | (0.50) |
| TW4000A | 2M/70cm mobile | 469.00 | (-) |
| TM201A | 2M 25W mobile | 269.00 | (-) |
| TS780 | 2M/70cm all mode transceiver | 843.00 | (-) |
| TR2300 | FM Portable | 152.00 | (-) |
| VB2300 | 10W Amplifier for TR2300 | 36.50 | (1.50) |
| MB2 | Mobile Mount for TR2300 | 21.00 | (1.50) |
| TR3500 | 70cm Handheld | 250.00 | (-) |
| TR2500 | 2M Synthesised Handheld | 232.00 | (-) |
| ST2 | Base Stand | 51.90 | (1.50) |
| SC4 | Soft Case | 13.80 | (0.50) |
| SCM25 | Speaker Mike | 16.10 | (1.00) |
| PB25 | Spare Battery Pack | 25.00 | (1.00) |
| MS1 | Mobile Stand | 31.90 | (1.00) |
| R600 | General Coverage Receiver 150kHz-30MHz | 257.00 | (-) |
| R2000 | Gen. Cov. receiver + mem. + scan | 398.00 | (-) |
| VC10 | VHF Converter to fit R2000 | 113.00 | (-) |

| FDK | | £ | c&p |
|-------------|------------------|--------|-----|
| Multi 725X | 2M FM Mobile 25W | 199.00 | (-) |
| Multi 750XX | 2M Multimode | 299.00 | (-) |

| ICOM | | £ | c&p |
|---------|---------------------------------|--------|--------|
| IC751 | New H.F. transceiver | 969.00 | (-) |
| IC740 | H.F. 9 Band Transceiver | 769.00 | (-) |
| IC720A | H.F. Tx + Gen. Cov. Rx | 949.00 | (-) |
| IC-PS20 | P.S.U. for above with Speaker | 155.00 | (-) |
| IC-PS15 | P.S.U. | 119.00 | (-) |
| IC2KL | H.F. Linear 500 Watts O/P | 915.00 | (-) |
| IC2KLP | P.S.U. for above | 256.00 | (-) |
| ICAT500 | 1.8-30 MHz Auto A.T.U. | 349.00 | (-) |
| ICAT100 | 3.5-30 MHz Auto A.T.U. | 249.00 | (-) |
| IC271 | 2M Multimode base | 569.00 | (-) |
| IC290H | 2M Multimode Mobile | 433.00 | (-) |
| IC25E | 2M FM Mobile 25W | 269.00 | (-) |
| IC2E | 2M Handheld | 179.00 | (-) |
| IC4E | 70cm Handheld | 199.00 | (-) |
| ICBC30 | Base Charger | 46.00 | (1.50) |
| ICHM9 | Speaker — Microphone | 12.00 | (1.00) |
| ICML1 | 10 Watt 2M Booster IC2E | 59.00 | (1.00) |
| ICSM5 | Desk Mic. (8 pin for Icom only) | 29.00 | (1.00) |
| ICR70 | General Cov. Receiver | 499.00 | (-) |

| TELEREADERS (CW & RTTY) | | £ | c&p |
|-------------------------|--|--------|-----|
| TONO 550 | | 299.00 | (-) |
| TONO 900 | | 699.00 | (-) |

| YAESU | | £ | c&p |
|-----------|---|---------|--------|
| FT1 | Superb H.F. Transceiver | 1395.00 | (-) |
| FT102 | AM Band Transceiver | 895.00 | (-) |
| SP102 | Matching Speaker | 49.00 | (2.00) |
| FC102 | Matching A.T.U. 1.2kw | 200.00 | (2.50) |
| FC902 | All Band A.T.U. | 135.00 | (1.50) |
| SP901 | External Speaker | 31.00 | (1.50) |
| FT77 | Economy H.F. Transceiver | 459.00 | (-) |
| FP700 | Ext. P.S.U./Speaker | 110.00 | (3.00) |
| FC700 | Antenna Tuner | 85.00 | (1.00) |
| FRG7700 | 200kHz-30MHz Gen. Coverage Receiver | 335.00 | (-) |
| FRG7700M | As above but with Memories | 399.00 | (-) |
| FRT7700 | Antenna Tuner Unit | 42.55 | (1.00) |
| FT206R | 2M FM Synthesised Handheld | 199.00 | (-) |
| FT706R | 70cm FM Synthesised Handheld | 209.00 | (-) |
| NC7 | Base Trickle Charger | 30.60 | (1.30) |
| NC8 | Base Fast/Trickle Charger | 50.60 | (1.50) |
| NC9C | Compact Trickle Charger | 8.00 | (0.75) |
| FNB2 | Spare Battery Pack | 19.95 | (0.75) |
| PA3 | 12 DC Adaptor | 14.20 | (0.75) |
| FT480R | 2M Synthesised Multimode | p.o.a. | (-) |
| FT780 | 70cm Synthesised Multimode (1.6MHz Shift) | p.o.a. | (-) |
| FT790R | 70cm Portable Multimode | 299.00 | (-) |
| FT290R | 2M Portable Multimode | 249.00 | (-) |
| MMB11 | Mobile Mounting Bracket | 24.90 | (1.00) |
| CSC1 | Soft Carrying Case | 3.85 | (0.75) |
| NC11C | 240V AC Trickle Charger | 8.80 | (0.75) |
| FL2010 | Matching 10W Linear FT290R | 59.00 | (1.20) |
| Nicads | 2.2 amp HR Nicads Each | 2.50 | (-) |
| FT726R(2) | Multimode Base Stn. | 675.00 | (-) |
| FF501DX | HF Low Pass Filter 1kW | 25.70 | (1.00) |
| FSP1 | Mobile External Speaker 8 ohm | 9.95 | (0.75) |
| YH55 | Headphones 8 ohm | 9.95 | (0.75) |
| YH77 | Lightweight Headphones 8 ohm | 9.95 | (0.75) |
| QTR240 | World Clock (Quartz) | 31.00 | (0.75) |
| YM24A | Speaker/Mic 207/208/708 | 18.40 | (0.75) |
| YD148 | Stand Mic Dual Imp 4 Pin Plug | 22.60 | (1.50) |
| YM38 | Stand Mic Dual Imp 8 pin | 27.20 | (1.50) |

| HEADPHONES | | £ | c&p |
|------------|-------------------|-------|--------|
| HS4 | Trio economy | 11.27 | (1.00) |
| HS5 | Trio deluxe | 23.00 | (1.00) |
| HS6 | Trio lightweight | 16.79 | (0.75) |
| YH55 | Yaesu standard | 9.95 | (0.75) |
| YH77 | Yaesu lightweight | 9.95 | (0.75) |

| TV INTERFERENCE AIDS | | £ | c&p |
|------------------------------------|--|-------|--------|
| Ferrite Rings 1 1/2" dia. per pair | | 0.80 | (0.20) |
| Toroid Filter TV down lead. | | 2.50 | (0.50) |
| HPF1 | High Pass Filter with braid breaker | 6.30 | (0.50) |
| BB1 | Braid Breaker (very low insertion loss) | 6.75 | (1.00) |
| TNF2 | Tuned Notch Filter (State frequency of interference) | 7.50 | (0.50) |
| HPF2 | High Pass Filter with tuned notch filter (State frequency of interference) | 6.40 | (0.50) |
| Trio Low Pass Filter LF30A 1kW | | 21.00 | (1.00) |
| Yaesu Low Pass Filter FF501DX 1kW | | 25.70 | (1.00) |
| LP30 Low Pass Filter | | 3.95 | (0.50) |

SX 200N



VHF-UHF receiver £299.00

DATONG D70 MORSE TUTOR



£56.35

DATONG PRODUCTS

| | | £ | c&p |
|----------|---|--------|-----|
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(GB3SWM)

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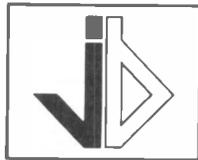
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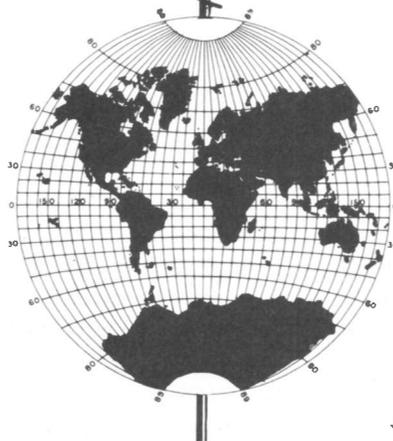
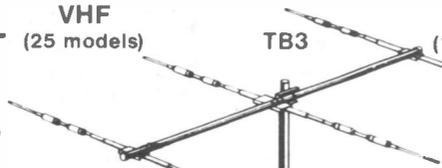
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FOR THE RADIO AMATEUR AND AMATEUR RADIO

The
SHORT WAVE
Magazine

EDITORIAL

Operating

Of late years, on the 'phone bands particularly, there has been a fall off of operating standards. Since we are into communication, operating standards are a part of our basic skills, even though not tested in either RAE or Morse — a case for a third part to the tests? — and so if we operate badly on the air we are falling down on a basic skill of our hobby.

What sort of things are we talking about? There are two categories; firstly, the little idiocies like saying at the end of a CQ call 'and by for any possible call'. Whoever habitually says that — most of us do it in moments of aberration — stamps himself as either a copier or as an illiterate.

The second kind of bad operating is more serious by far. For example, the long CQ call without either a break to listen, or even a mention of the callsign save once at the end. Or on HF, calling CQ at all from a country like U.K. or U.S.A., unless it be on a suspected 'dead' band; even then it only needs a short 'three by three' before a listen and, if needed, another three by three routine. Again, trying to ragchew with a DX station unless he wants to — and trying to stop the DX station having a ragchew if so chooses. At VHF, when a DX station appears, sending out verbose calls; far more use to say "G3SWM, G3SWM", and then listen!

In sum, common courtesy, common sense.

*John
Robinson
G3KFE.*

WORLD-WIDE COMMUNICATION

VHF BANDS

NORMAN FITCH, G3FPK

The Satellites

CONSIDERING the number of stations heard using *Oscar-10*, there were few reports from readers of what has been heard and worked; no doubt you are all too excited and busy operating to spare the time to write.

As a transponding satellite, *O-10* is a 100% success and no praise is too great for Dr Karl Meinzer, DJ4ZC, and his team for turning what looked at first like a disaster into what must now be one of the greatest achievements by a team of radio amateurs, in the history of our hobby. It is worth mentioning that this satellite was wholly designed and built by amateurs, not highly paid professionals, and largely funded by donations from fellow enthusiasts. By contrast, the failures to launch the *Phase 3A* spacecraft and to get *O-10* into the planned orbit were entirely due to the failures of the professionals.

Sadly, *O-10* is already being abused by what are known as "The Alligators", those with all mouth and no ears. They are the operators with poor receiving systems on 145 MHz who cannot hear their own signals unless they run very high power on 435 MHz. As with any receiver faced with a large input, the AGC then reduces the gain so that the weaker signals are just not received by the 435 MHz receiver on board the spacecraft. The telemetry from the engineering beacon has indicated some 26 dB of attenuation at times! It seems that the prime culprits are certain North American stations who appear to be using *E-M-E* set-ups for the uplink.

AMSAT recommends that an *e.i.r.p.* of 500 to 1,000 watts at *apogee* is quite sufficient, reducing as the satellite gets closer and the path loss less. This means that 50 to 100 watts of RF at the antenna, and something like the *Jaybeam* 8XY/70cm crossed *Yagi*, should be quite sufficient. You do *not* need a K2RIW amplifier feeding eight 21-ele. *Yagis*. Anyone using that amount of *e.i.r.p.* will have a "commanding signal", but will find only one or two other alligators to work. All the nice, juicy DX he would like to work will not get a look in and likely switch off in disgust. It is up to those users who follow AMSAT's advice and "play the game" to try to persuade, or shame, these selfish operators into mending their ways.

To illustrate what can be achieved with QRP when the alligators are out of range, Sheldon Hands, GW8ELR, reports a very successful SSB QSO with F1JG using *three watts* to an 88-ele. *Multibeam*. On the various nets, many others have mentioned making quite enjoyable contacts using transmitters running about 10w. You should try to keep your signal the same strength as that of the beacon on 145.81 MHz. If you are significantly louder, then reduce power.

As with previous satellites, AMSAT has designated every Monday, from 0000 to 2359 GMT, as QRP days, so do *not exceed* 50-100w *e.i.r.p.* (N.B. *e.i.r.p.* is effective *isotropic* radiated power. The gain of an antenna expressed in dBi is 2.15 dB more than the gain over a dipole, dBd.). The success of this proposal will be deduced from the telemetry data referring to receiver attenuation, of course.

Keith Hayward, G6PFR, (Beds.) and Tim Kirby, G6TTU, (Gloucs.) have been listening to *O-10*, and Richard Britton, G8FUO, (Berks.) has been using it. He runs the new *Yaesu* FT-726R and 100w. amplifier. The antennas are two 21-ele. *Yagis*, stacked, at 45ft. *a.g.l.* for the uplink and a 14-ele. at 42ft. for the 145 MHz downlink. During Aug. 29/30 in a low westerly pass, he worked W5VY and N5CEP in Texas, KC7GY (Wash.), WB6LLO and N6ARE in California, W4LQE (Tenn.) and WD4FAB (Fla.). During the next orbit on the 30th, in an easterly pass, H44PT in the Solomon Is., VK5ZDR in Adelaide, VK4AJI in Cairns, 9M2CR near Kuala Lumpur and JY9CF in Jordan were worked. That should whet the appetite for many! Richard uses horizontal polarisation and mentioned the rapid QSB which reduced readability. Clearly the recommended right-hand circular polarisation would eliminate this effect.

The Mode "L" transponder was due to be switched on on Wednesday, Sept. 21 and each Wednesday thereafter. It will be on for three hours total, being 90 mins. either side of *apogee*. The uplink band is 1,269.050 to 1,269.850 MHz and the downlink band is inverted, 436.950 to 436.150 MHz. The engineering beacon is on 436.040 MHz and the general one on 436.020 MHz. Reports of any stations heard or worked would be much appreciated. The satellite's Rx antenna gain is 14 dBi, by the way.

NASA's STS-9 Space Shuttle mission is still scheduled for an Oct. 28 launch, which coincides with publication day for the November *Magazine*. If "lift-off" is exactly on time, orbit no. 1 should cross the equator at 16h.26.29m at 98.62°W longitude. The planned inclination of the orbit is 56.99°, the period 89.4 mins. and the track separation 22.71°W *per* revolution. Amateur radio operation in the 2m. band with W5LFL from the spacecraft is currently expected to be

limited to one hour a day. *GB2RS* and the *RSGB's* telephone news service will have the latest information.

Contest Notes

The last big multiband 1983 contest is the *IARU* and *RSGB* Coordinated UHF/SHF event on Oct. 1/2, a 24 hour stint which commences at 1400 GMT. The rules for each contest are the same being a Single-op. (no clubs) or all-other, two section affair. Exchanges to be RS(T)/serial number and QTH locator, nothing else, and the scoring is one point *per* kilometre, but in the *RSGB* section, you can claim half points for crossband QSOs on 2.3 GHz and above.

The 432 MHz *Cumulatives* start on Oct. 7, 1930-2200 GMT, the next session being on the 23rd, from 2030-2300 GMT. The 1,296 MHz *Cumulatives* start on the 16th, 1930-2200 GMT, with the next leg on the 31st, 2030-2300. The rules are identical for both bands; single section, all modes, radial ring scoring and RS(T)/serial number, QTH locator and location to be exchanged.

For CW fans, the Marconi Memorial Contest is on Nov. 5 from 1400, lasting 24 hours. Inside it is the *RSGB* event from 0800-1400 on the 6th. Both are either Single-op. or Multi-op. affairs with radial ring scoring in the *RSGB* one and one point *per* kilometre in the longer one. Only RST/Ser. no. and QTHL required.

DX-Pedition Results

The *HADRABS* members put on a good show from Andorra, again, commencing on July 16 with some *E-M-E* contacts. The first was K1WHS, completed in 22 mins., followed by K1MNS, W5UN, SM2GGF, WA1JXN and VE7BQH. On the 17th, N4GJV and WA4LYS were worked and the next day SM7BAE and OZ1EME after which Force nine gales terminated operation. Considerable damage to the antennas occurred, but they were QRV again on the 19th to make the first 50 MHz QSO, with G4IJE, *via* MS in just 20 mins.

There were two Field Aligned Irregularity events on the 20th which enabled QSOs to be made with 30 YUs with a QTF of 45°. On the 21st, between 0503 and 0647, 15 YU and two I stations were worked *via* FAI mode, 16 more YUs from 1830-1930, then eight YUs and 11 Is between 2035 and 2154. At 2300, GW3LDH was worked on 50 MHz MS and at 2351, G4HUP was S5 and GW3LDH S9 *via* tropo. No contact was made on 50 MHz with G5KW or GU2HML. On the 22nd, they had an MS QSO with SP6FUN (IL53c) on 2m. which, with a contact with GM4CXM (XP09g) on the 18th, were "firsts". In a short FAI opening on the 22nd, at 1819, two YUs in IF and JF were contacted. At 0426 on the 22nd, a QSO was completed on 50 MHz

with G5KW, but signals were only RS41 each way.

On the 23rd, there was a visible temperature inversion to the south-east and I2FAK (EF77) was worked at RS59 each way. During another FAI event between 1627 and 1812, 26 YUs and an Italian were worked, and another YU at 1903, bringing the total of YUs contacted via FAI to 98! On the final day, the 24th, a 50 MHz QSO was completed with GI3ZSC (WO19e) at S9 each way, then via E's, with C31XV/P on 50 MHz, crossband QSOs were made with GW3MHW, G4JCC, G4BPY, G5KW, GW4HBZ and GW4XHO who were on 10m., since TV had started. They closed down at 1100 GMT.

The 50 MHz beacons 5B4CY and GB3SIX were copied daily. They made QSOs with 20 countries and 79 squares and are claiming 2m. E-M-E "firsts" from Andorra with W, VE, OZ, and SM, a C3/GI E's 50 MHz "first", and C3/G and GW "firsts" via 50 MHz MS. Thanks to Robin Lucas, G8APZ, for the foregoing notes and congratulations to all the operators for such a fine performance.

Walt Davidson, GW3NYY, has written with details of the very successful operation from XN square. He says:—"We struck it lucky with conditions again this year; MS, tropo and Aurora all 'came up with the goods', but no sporadic E!" The station, GB2XN, was set up at Mynydd Bodafon in Anglesey, 172m. a.s.l., thus very screened to the south-east by Snowdonia. They found the *Perseids* shower very good to Scandinavia, but not outstanding to the east and south-east, with the peak in the late evening of Aug. 12.

The expedition was from Aug. 6 to 14 and, in addition to Walt, there were GW8TVX, GW8VHI, GW6EWA and G8TFI. Operation was on 2m., 70cm. and 23cm. On 2m. 1,045 QSOs were made with 26 countries in 83 squares, including 40 completed MS contacts. Best DX was OH5LK (NU37g), close runners up being UK2RDX (MT), SK2KW (KY) and SM2CKR (KX). The SK2 "tail-ended" one of their skeds and a complete QSO at 20 w.p.m. with RST 599 reports, plus QTH and names exchanged was made, during a two minutes burst. In a brief Aurora at 2200 on the 7th, UQ2GMD (LR73c) and OZ1FGP (EQ68a) were worked on CW. On the 9th and 10th, tropo conditions to DN, EN, EO and FO squares brought very many QSOs, the best being Y30CLA (GO61e) on CW.

On 70cm., 270 QSOs were made with nine countries in 33 squares, the lift on the 9/10th providing most of the contacts into Holland and Germany. On 23cm., 39 QSOs were made in six countries and 18 squares. Up to the 13th, only 1.3w to 4 x 23-ele. Yagis was used, but thereafter 175w was available. Even so, the QRP brought six countries and 13 squares. A contact

ANNUAL VHF/UHF TABLE

January to December 1983

| Station | FOUR METRES | | TWO METRES | | 70 CENTIMETRES | | 23 CENTIMETRES | | TOTAL Points |
|---------|-------------|-----------|------------|-----------|----------------|-----------|----------------|-----------|--------------|
| | Counties | Countries | Counties | Countries | Counties | Countries | Counties | Countries | |
| G3UVR | 59 | 7 | 89 | 25 | 64 | 16 | — | — | 260 |
| G8TFI | — | — | 58 | 16 | 60 | 15 | 23 | 7 | 179 |
| G8FMK | — | — | 58 | 14 | 45 | 11 | 37 | 7 | 172 |
| G3BW | 42 | 6 | 57 | 21 | 37 | 6 | 5 | 4 | 169 |
| G6DER | — | — | 63 | 16 | 52 | 12 | 15 | 4 | 162 |
| G2AXI | 34 | 6 | 58 | 14 | 38 | 9 | 6 | 2 | 159 |
| G8PNN | — | — | 56 | 14 | 43 | 11 | 25 | 9 | 158 |
| GD2HDZ | 42 | 5 | 44 | 12 | 35 | 11 | 4 | 4 | 149 |
| G4FRE | 39 | 5 | 17 | 9 | 56 | 18 | 16 | 7 | 144 |
| G4MUT | 30 | 4 | 50 | 16 | 29 | 10 | — | — | 139 |
| G4ROA | — | — | 49 | 10 | 41 | 11 | 18 | 8 | 137 |
| G4ARI | 28 | 2 | 83 | 18 | 1 | 1 | — | — | 133 |
| G3PBV | 3 | 1 | 42 | 22 | 39 | 14 | 11 | 4 | 132 |
| GW3CBY | 25 | 7 | 56 | 15 | 21 | 6 | 3 | 2 | 130 |
| GW8UCQ | — | — | 61 | 15 | 40 | 12 | — | — | 128 |
| G8ULU | — | — | 43 | 20 | 34 | 13 | 11 | 7 | 128 |
| G6HRI | — | — | 67 | 12 | 35 | 8 | — | — | 122 |
| G4NBS | 12 | 1 | 43 | 11 | 37 | 12 | 15 | 2 | 120 |
| G4FRX | — | — | 59 | 16 | 31 | 7 | — | — | 113 |
| G8KAX | — | — | 34 | 11 | 35 | 8 | 15 | 5 | 108 |
| G6PFR | — | — | 64 | 14 | 22 | 6 | — | — | 106 |
| GW4TTU | — | — | 74 | 26 | 1 | 1 | — | — | 102 |
| G6ECM | — | — | 71 | 30 | — | — | — | — | 101 |
| G3FPK | — | — | 80 | 20 | — | — | — | — | 100 |
| G4STO | — | — | 39 | 12 | 27 | 4 | 9 | 4 | 95 |
| G4DEZ | — | — | 66 | 24 | — | — | — | — | 90 |
| G3FIJ | 17 | 1 | 39 | 10 | 18 | 2 | — | — | 87 |
| G6TTU | — | — | 66 | 16 | — | — | — | — | 82 |
| G8XTJ | — | — | 54 | 12 | — | — | — | — | 66 |
| G8VVF | — | — | 47 | 15 | — | — | — | — | 62 |
| G8KMT | — | — | 47 | 12 | — | — | — | — | 59 |
| G4NRG | 4 | 1 | 29 | 12 | 8 | 4 | — | — | 58 |
| G8RWG | — | — | 42 | 8 | — | — | — | — | 50 |
| G6HDD | — | — | 37 | 10 | — | — | — | — | 47 |
| GW4HBK | 36 | 6 | — | — | — | — | — | — | 42 |
| G4FKI | 7 | 1 | 20 | 2 | 1 | 1 | — | — | 32 |
| GM4CXP | — | — | 18 | 12 | — | — | — | — | 30 |
| GU4HUY | — | — | 23 | 6 | — | — | — | — | 29 |
| G2DHV | 5 | 1 | 4 | 1 | 4 | 1 | — | — | 16 |

Three bands only count for points. Non-scoring figures in italics.

with G8PNN (ZP52d) gave Gordon a new county, country and square on the 13th. This year the weather was excellent, apart from the usual strong Anglesey winds, and the group thoroughly enjoyed themselves. The only problem on the equipment side was a rather capricious generator which failed on numerous occasions, necessitating battery powered operation.

As promised, Mike Nagle, G4RZI, operated from the southern Irish Republic as EI2VNS/P between July 27 and Aug. 11, on 2m. He made 350 contacts during the family holiday. At first, tropo conditions were good to southern England but later were poor when he travelled further west. From UM square, Mike worked nobody. He mentions a group of French amateurs who were operating from UN square but who steadfastly refused to work anyone except French stations. It certainly seems that EI activity on VHF is on the increase and G4RZI mentions EI2BBB (VM) in Co. Limerick; EI5AVB (WM) in Co. Wexford; EI2GZ (WM) in Waterford; EI2BZB (VL); EI4AEB in Dublin and EI1BS in Cork, (VL).

Four Metres

Denis Jones, G3UVR, (Wirral) worked G4JNY (S. Yorks.) and EI9BG (Co.

Clare) on Aug. 8 and 14 respectively, for a couple more Annual Table points. He reckons he could work 66 counties and two more countries based upon unworked stations known to be active. Tim Raven G4ARI, (Leics.) worked G3UVR for Merseyside on the 8th, plus G3YJX (Cnwl.) and GW3UAX/P (Dyfed) on the 26th. For Dave Robinson, G4FRE, (Suffolk), GM3UKV/P (XO) was the only station worked on Aug. 5. On the 11th, GU2HML was heard calling "CQ GM". for the Trophy Contest on Aug. 14, Dave went to Wales to see how they work it all and concluded it was much easier than it is from the east coast.

Bill Kitchen, G4GHB, (Cheshire) was on in this contest using a Pye Bantam running 250 milliwatts from a 12y battery, with a home made 3-ele. Yagi. From a 1,200ft. a.s.l. site, he worked another Bantam user, G4HPH, on Winter Hill, 26 miles away. An RS59 report was received from GW4ERP/P, near Wrexham (70 miles). Other nice contacts were GM3WOJ/P (Mull of Galloway) and GM4LIP/P near Moffat at 140 miles. Bill found this contest enjoyable as the contestants were prepared to have a chat during the event.

Arthur Breese, GD2HDZ, notched up

three more table points on the 14th, with GM4LIP/P, G4MTL/P (Herts.) and G4ADV/P (Cnwl.). During a lift on Aug. 5, Dave Lewis, GW4HBK, (Gwent) contacted G3VNU (Gtr. Man.), GM3UKV/P and G3UVR. In the contest, the GM portables were very strong, '3WOJ and '4LIP being worked, and EI9Q heard. On the 16th, CT1WW and OZ9QV were worked crossband on 10m., as was F0FDB on the 19th.

Six Metres

With the *E*'s season over, there is very little activity to report on 6m. GW4HBK made crossband QSOs, 6/10m., with SM6PU on Aug. 5, 14 and 18, and with EA3ADW on the 18th. Dave heard GI3RXV on SSB at 2304 on the 15th. At the beginning of September, tropo conditions were good in a north/south direction, so Ken Ellis, G5KW, reports from Cornwall. On the 5th, he was heard by GM3DOD at 0620, and by 0632 had completed a two-way QSO with GM4FZH. This was repeated in the following two days. At 0635 on the 7th, GI3RXV was heard calling "CQ". On the 8th, Ken was heard by GM4FDT at 0630 and a QSO was completed by 0702. A crossband QSO with CT1WW was made shortly after.

So far, the 6m. experiment does not seem to have caused any problems to the TV service. In any case, the only channel affected is B2. Consequently it would seem logical to widen the scope of the experiment by permitting more licensees to use the band, with priority given to those areas where there is no Channel B2 operation. Also there are large areas of the country where an extension of operating hours would be unlikely to cause any interference to broadcasting services.

In the months of October through December, past experience has shown that transatlantic propagation on 50 MHz *via* the F2 layer is possible. However, this is a daylight phenomenon so would require special permission for carefully selected stations to operate during TV hours. Unless something along these lines is considered, it seems pointless in continuing the experiment with so few participants and little else to explore.

Two Metres

Eamonn Gilmartin, EI8EF, (Co. Donegal) has been active on SSB for about seven months and has done reasonably well despite a low site and being screened by the Sligo mountains to the south-east through south-west. His station comprises an Icom IC-251E, Nag amplifier and a 17-ele. *Tonna Yagi* at 65ft. on a GI3TLT tilt-over tower. To date 16 countries and 57 squares have been worked, best DX being IW4ARD (GE) *via* MS in the *Perseids*. Other shower completed QSOs were SM7FJE (GQ), I3LGP (GF), F6DKQ (DH), Y22ME (HM), DK6AS (FM) and

DK8ZB (EJ). During the superb tropo lift of Aug. 26 to 30, Eamonn worked 150 stations in six new countries and 20 new squares. It began at 2330 on the 26th with OZ in EP. On the 28th, LAs in CS were contacted around 1300, and from 1620, 24 Dutch and 14 German stations were worked. By 2000, SMs and OZs were favoured. On the 29th, more PA, OZ and east coast Gs were worked, and again the next day, plus SM and D. Best DX of the period was OZ1CSI (HP). All QSLs have been despatched for this rare square, VO.

EI8EF mentions the following as active from western Ireland:— EI7EQ (VO) in Co. Donegal, and EI8EV (UO) in Co. Mayo, both being permanent residents. Eamonn promises to be active on SSB at every opportunity so asks Gs to turn their beams his way since most of the time 144.300 is quite dead. He aims to install a *muTek* masthead preamplifier but will not consider a larger array due to the very strong winds.

George Haylock, G2DHV, (Kent) now has an *MX-2* QRP transceiver to complement his *MX-4* for 4m. John Heys, G3BDQ, comments on this summer's long periods of anti-cyclonic calm, so different from other years. These "highs", laying from the Azores to Scandinavia, have produced long spells of fine tropo DX to the latter area and John has worked 72 OZs, 65 SMs and 13 LAs between June 18 and Aug. 30. By contrast, there was nothing to the east and south-east at comparable distance, unlike "normal" years, when HB and OE stations could be worked. John wrote his letter during the Sept. 3/4 contest since the band is virtually unusable during these events; the Hastings area is very popular with visiting portables.

Bill Hodgson, G3BW, (Cumbria) is another reader whose Rx gets a hammering from portables, this time those operating from the Mull of Galloway. Most of his DX-ing is by MS mode and he has now modified his *Philips* N2234 cassette recorder to cater for CW speeds up to 1,000 *l.p.m.* In the run-up to the *Perseids*, he made four QSOs, with a further 15 in the shower, the best of which was likely LA8N (EV57a). Bill finds that skeds up to the 2,000 km. QRB are quite successful but that over that distance it is a bit of a struggle. In end-of-August Scandinavian tropo lift, he found they were all looking for EI, GD and GI and remarks that he cannot recall hearing so many EIs before, on the band.

In spite of the wet and windy, low pressure weather over Sept. 3/4, the band was surprisingly good to the south as Brian Bower, G3COJ, (Bucks.) and many others, noted. Between 2300 and 0000 GMT on the 3rd, he worked F6GZC/P (BC33f) and EA3JA (BC44c) and EA2LY/P (ZD74c) was also very loud. John Hunter, G3IMV, (Bucks.) worked four EA portables in this event including EA1EH/P in YB, (Note: EA1EH and not

EA1EA as many seemed to think), plus two in YC. John found the *Perseids* quite good at times but disappointing in the daytime. He got six new squares out of it, EV, IC, IU, LQ, NV and VC. On Sept. 2, he completed an MS CW QSO with YU7AU/5 in KA05h — very rare.

Dave Sellars, G3PBV, (Devon) reports good conditions on Aug. 6/7 in the Spanish SSB contest to BC and ZD squares, but nothing from western Spain. In the Sept. 3/4 event, again good to the south with EA1EH/P the only new square, though. Towards the north-east, on Aug. 10, an OZ and SM were heard weakly and on the 25th, OZ1GOK (EP) was a weak S4 in YK32b, but S9-plus in Tiverton, YK03. The big opening started late on the 28th. Best DX was on the 29th with SM4AIQ (HT) at 1,481 kms., and SM4CJK (GT) at 1,464 kms. Signals were declining on the 30th.

G3UVR reckons it possible to work 92 counties this year and 26 countries. *Via E*'s on Aug. 4, Denis worked EB5CPX (ZX) for a new square and notes EI9FE in Tipperary on SSB on the 7th. Aug. 25 and 28/29 produced many OZ and SM QSOs plus D and LA. John Quarmby, G3XDY, (Suffolk) now has a 44ft. crank-up tower and "proper" antennas thereon, so has been able to get after the recent Scandinavian DX, including SM7DLZ (IQ) on Aug. 31. G4ARI lists G6UPZ (Northumberland) on Aug. 8, GI6DCC (Tyrone) on the 28th and EI4BVB (Waterford) on the 30th as new ones for the table, from Leicestershire.

Peter Atkins, G4DOL, (Dorset) is now convinced that MS mode *does* work, after hearing OKIMBS for six secs., and YU1EW for four secs. in the *Perseids*. He reckons the CW is the only sure way, though. *Via* tropo on Aug. 13/14, he worked French stations in BG and CG, GM4CLA/P (YP), F1KNO/P (BC) and two EIs in WM. In spite of only having 3w with a 5-ele. *Yagi*, G4FRE did get down to EA2LY/P (ZD) and F6CJG/P (BF) on Aug. 6 and to Gms in YR and ZR on the 8th. On the 11th, Dave managed GB4ULX (XJ).

John Cleaton, G4GHA, (Dorset) has personal and family health problems so enjoys amateur radio for the relief it can bring. On July 7, he worked CT4PI (VZ) for a new square and earlier *E*'s contacts in June have boosted his squares tally to 108. Jon Stow, G4MCU, (Essex) thought the *Perseids* during the day the poorest for years. In six skeds, two failed due to equipment faults at the other end, three more were not completed and one probably was. Last year's *Geminids* shower was much better. On tropo, John lists OZ, SM and Y stations on July 30, portables F1KBF (ZC) and EA2LY (ZD) on Aug. 6 and OZ and SMs on the 29/30th. Heard on the 29th on CW was SM5CNQ (HS).

Roger Greengrass, G4NRG, (Essex)

worked EA7ID (WX) via E's on Aug. 4 at 1730 and worked Fs and EAs in the Pyrenées on the 6th. Dave Crisp, G4OAE, (Berks.) found G3UJB/MM (BM) for a new square on Aug. 9, but his main activity has been on MS on Aug. 8, 11, 13, 16 and Sept. 4. Assorted YU, I, OE and SM partners were worked in EF, FD, FF, GF, HF, HI, and IT. I5MZY (FD) gave 6b, 5p in one hour at 800 l.p.m. running just 50w to 15-ele. on Aug. 8. Dave Dibley, G4RGK, (Bucks.) reports SSB MS QSOs with I4MKN (GE) and SM1BSA (JR) on Aug. 12 and 13 respectively.

The main event chez G4ROA, (Coventry) was on Sept. 4 in the shape of an eight pound boy, Adam, for whom Adrian Chamberlain suggests reserving his old call G6ADC! Apart from this, Dad added a further seven points to his 1983 band total with assorted GDZ. Martyn Jones, G4TIF, (Warks.) was another who got F1KBF/P in ZC on Aug. 6; those Paris Club chaps certainly put on a good show. During the extended tropo opening to the north-east, SM4AIQ (HT) was a new one on Aug. 29.

Keith Hewitt, G6DER, (S. Yorks.) completed on SSB in 12 mins. via MS on Aug. 13 with OK2KZR (IJ) but nothing was heard from EA or YU partners. Tropo on the 30th brought SM7MBH (HP) and SM7IWG (HR) for new squares. For Richard Mason, G6HKS, (Norfolk) August was a good month with EA7AJE (YW) via E's on the 4th, at 1611, but EA4QR (YA) at 1636 incomplete. "Terrific tropo" on Aug. 6 brought the F and EAs others reported, while the 10th brought OZ6FH (ER) for a new square. On the 24th he lists five LAs in CS, CT and CU, and the next day, SM6GWA (FS) and LA9KM (FT). On the 29th, Richard worked EI2BBB (VM), SM4AIQ and SM5CNQ, and the 30th gave SM7IWG to bring his squares total to 142.

Welcome to Roger Parry, G6NWF, (Cheshire) whose station comprises an Icom IC-251E with muTek board, 90w amplifier and 14-ele. Parabeam at 12m. a.g.l. He enters the squares table. Keith Hayward, G6PFR, (Beds.) got into YQ and ZR on Aug. 8, to DL4BBV (DN) on the 9th and DF2ZC (EO) on the 10th. Although many Scandinavians were heard on the 29th, he reckons the conditions bypassed Luton. In the Sept. 3/4 contest, Keith made 95 QSOs. He listened in the *Perseids* but did not find the reflections particularly good.

Tim Kirby, G6TTU, (Gloucs.) managed XI and YI on Aug. 6 for new squares and PEs in CM and DM on the 9th. On the 13th, GJ6WMX was contacted — Jersey at last! Best DX on the 28th were LA6HL and LA9RAA in CS. Ken Willis, G8VR, (Kent) is now up to 237 squares the latest being YU7AU/5 (KA) on Sept. 2, at about 2,000 km. very good for sporadic meteors. They used one kilowatt but reflections

were weak and short. The 1,000 l.p.m. keying speed thus helped a lot.

John Moxham, G8KBQ, (Somerset) lists EA7AJX (YX) on Aug. 4 as his last E's QSO in 1983, thereafter he worked all the tropo others have mentioned, the best being LA6ZW (ES), SM4AIQ (HT), and SM5CNQ (HS) on the 29th. The "surprise opening" to Spain on Sept. 3 gave EA1RCR (YC78j), plus ZD and BC squares. August brought another four squares for Jim Rabbitts, G8LFB, (London):— BC, ER, GT and ZC and on Sept. 4, F6ETI in YH, a somewhat elusive area. Gordon Emmerson, G8PNN, (Northumberland) worked F6BSJ (CG24f) on MS, but did not give the date. It was a new square.

Michael Wright, G8SRL, (Surrey) re-enters the squares table. On Aug. 29 he worked into DN, EO, EP and ES, and later on, SM4CJG (GT) and SM6CMU (FR). John Fitzgerald, G8XTJ, (Bucks.) finally worked into Scandinavia to SK6HD (GS) on Aug. 10 and OZ1GKU (EQ) on the 28th. With only 50w to a 6-ele. beam at 14ft. it is not too easy to crack the pile-ups, even in good conditions. Even so, John got GM6TKS/P for his first QSO with YP.

August was a good month for GD2HDZ bringing Arthur three more countries, OZ, SM and Y, and another 13 counties. He did not hear any LAs in the lifts, though, although many were worked from other locations. He comments on, ". . . the rather futile practice of everyone calling 'CQ' on 144.300 MHz". He does not reply to such calls since inevitably his reply is blotted out by another station calling "CQ" so he very sensibly suggests that "CQs" be made between '275 and '325. Your scribe echoes these sentiments.

Philip Murphy, G14OMK, (Belfast) made his first attempt at SSB MS and was rewarded with seven new squares on Aug. 12-14, D, F, HB9, SM and Y were worked, the best DX being on random SSB on the 12th, DL8MCC (GH). The tropo of Aug. 28/29 was very good but the QRM to the east was "murder!" He has a local just 200 yards away so they have to work in tandem. Even so, Philip managed nine new squares in D, LA, OZ and SM.

From Jersey, Geoff Brown, GJ4ICD, made 600 QSOs in the Sept. 3/4 contest, best DX being EA2BAK (ZA05a) square number 230. Many other EAs, HB9s, PAs and Ds were worked in bad conditions. Andy Renouf, GJ8SBT, had a long stint in the *Perseids*, which did not seem very good this year. He completed eight QSOs. All skeds to LA and SM failed with better results to the east. Going back to June 2, he confirms he heard a station TA3EAQ at 1234 for a couple of minutes, but suspects it was a bit of a "wind up!"

Before the XN operation, Walt Davidson, GW3NYY, (Swansea) completed SSB MS QSOs with I2FAK (EF) on Aug. 2 and HB9CRQ (EH) on the

QTH LOCATOR SQUARES TABLE

| Station | 23cm. | 70cm. | 2m. | Total |
|---------|-------|-------|-----|-------|
| G3JXN | 64 | 104 | 160 | 328 |
| G8PNN | 40 | 72 | 114 | 226 |
| G3COJ | 38 | 89 | 163 | 290 |
| G3XDY | 34 | 93 | 139 | 266 |
| G4NQC | 32 | 61 | 146 | 239 |
| G8TFI | 28 | 104 | 126 | 258 |
| G8FMK | 26 | 63 | 77 | 166 |
| LA8AK | 25 | 62 | 200 | 287 |
| G8FUO | 23 | 98 | 88 | 209 |
| G4FRE | 23 | 85 | 37 | 145 |
| G8KAX | 22 | 57 | 82 | 161 |
| G8ULU | 21 | 73 | 109 | 203 |
| G4STO | 20 | 44 | 113 | 177 |
| G3PBV | 18 | 92 | 171 | 281 |
| G6DER | 17 | 53 | 92 | 162 |
| G4ROA | 16 | 54 | 61 | 131 |
| G8ATK | 15 | 81 | 129 | 225 |
| G4NBS | 14 | 75 | 94 | 183 |
| GD2HDZ | 13 | 50 | 91 | 154 |
| GJ8KNV | 12 | 76 | 191 | 279 |
| G8HHI | 12 | 70 | 133 | 215 |
| G2AXI | 9 | 76 | 121 | 206 |
| G8KBQ | 8 | 94 | 188 | 290 |
| G4ERX | 7 | 61 | 132 | 200 |
| GJ8SBT | 7 | — | 177 | 184 |
| G3BW | 6 | 36 | 220 | 262 |
| GW3CIBY | 5 | 24 | 85 | 114 |
| G8VR | 2 | 24 | 237 | 263 |
| G4HMF | 2 | 35 | 144 | 181 |
| G6DDK | 2 | 13 | 127 | 142 |
| G4RSN | 2 | 22 | 76 | 100 |
| GJ4ICD | 1 | 108 | 230 | 339 |
| GW8UCQ | 1 | 45 | 100 | 146 |
| OZ1EKI | — | 101 | 338 | 439 |
| G3VYF | — | 117 | 307 | 424 |
| G3IMV | — | 79 | 340 | 419 |
| G3POI | — | — | 404 | 404 |
| DK3UZ | — | — | 317 | 317 |
| G4IJE | — | — | 314 | 314 |
| EA3LL | — | 30 | 261 | 291 |
| SP2DX | — | — | 280 | 280 |
| G3UVR | — | 74 | 192 | 266 |
| G4IGO | — | 19 | 246 | 265 |
| G4ERG | — | 16 | 243 | 259 |
| GW3NYY | — | 48 | 201 | 249 |
| G4DEZ | — | — | 240 | 240 |
| GM4COK | — | 28 | 204 | 232 |
| G3CHN | — | — | 230 | 230 |
| G4TIF | — | 72 | 156 | 228 |
| G4MCU | — | 58 | 168 | 226 |
| G8RZO | — | 75 | 148 | 223 |
| G4RZP | — | 76 | 147 | 223 |
| 9H1BT | — | 11 | 210 | 221 |
| G4JZF | — | 68 | 140 | 208 |
| G4OAE | — | 31 | 174 | 205 |
| GW4EAI | — | — | 205 | 205 |
| G4AWU | — | 50 | 150 | 200 |
| G3FPK | — | — | 196 | 196 |
| G4PCI | — | 28 | 167 | 195 |
| G3KEQ | — | — | 194 | 194 |
| GM4CXP | — | 26 | 163 | 189 |
| G3NAQ | — | 58 | 128 | 186 |
| G4HFO | — | 60 | 112 | 172 |
| G6ADH | — | 35 | 135 | 170 |
| G6ECM | — | — | 165 | 165 |
| G8LFB | — | — | 164 | 164 |
| G8WPD | — | 24 | 139 | 163 |
| G4NQX | — | 47 | 113 | 160 |
| G4MUT | — | 60 | 96 | 156 |
| G6HKT | — | 60 | 89 | 149 |
| G8TGM | — | — | 144 | 144 |
| G6HKS | — | — | 142 | 142 |
| GM4IPK | — | — | 139 | 139 |
| G4LUX | — | 30 | 105 | 135 |
| G6ADE | — | 64 | 70 | 134 |
| G8SRL | — | 35 | 98 | 133 |
| G4TJX | — | 40 | 87 | 127 |
| G8WPL | — | 44 | 83 | 127 |
| G4MJC | — | 12 | 110 | 122 |
| G3FIJ | — | 29 | 92 | 121 |
| GW4TTU | — | 2 | 115 | 117 |
| GM8OEG | — | — | 115 | 115 |
| G8XIR | — | — | 115 | 115 |
| G4MEJ | — | — | 114 | 114 |
| G4RCK | — | 28 | 83 | 111 |
| G4GHA | — | 2 | 108 | 110 |
| G4DOL | — | — | 100 | 100 |
| G8WUU | — | 27 | 72 | 99 |
| G8VJV | — | — | 97 | 97 |
| G14OMK | — | — | 96 | 96 |
| G6JNS | — | 3 | 93 | 96 |
| G4MWD | — | — | 95 | 95 |
| G4NRG | — | 19 | 74 | 93 |
| G4FRX | — | 29 | 58 | 87 |
| GM8BDX | — | 33 | 53 | 86 |
| G6DFT | — | — | 85 | 85 |
| G8RWG | — | — | 84 | 84 |
| G6HTJ | — | 17 | 66 | 83 |
| G6ABB | — | — | 80 | 80 |
| G8XQS | — | 4 | 76 | 80 |
| G6ELQ | — | — | 69 | 69 |
| G6NWF | — | — | 67 | 67 |
| G6PFR | — | 13 | 50 | 63 |
| G4PEM | — | — | 63 | 63 |
| G6CNX | — | — | 63 | 63 |
| G6HRI | — | 18 | 44 | 62 |
| G8XTJ | — | — | 61 | 61 |
| G8ZYL | — | — | 54 | 54 |

Starting date January 1, 1975. No satellite or repeater QSOs. "Band of the Month" 70cm.

4th, with F1KBF/P (ZC) *via* tropo on the 3rd. July brought MS QSOs with LA6HL/TF (RZ), and PA0OOM/SM1 (JQ) on the 5th and 16th respectively, and *via E's* on the 7th with I0SNY/EA9 (XV). Kelvin Weaver, GW4TTU, (Gwent) in a P.S. to his letter, wrote:— "Now addicted to MS!" As proof, he details 22 stations worked in the *Perseids*. To pick out a few:— SP6FUN and SP6GZZ (IL) on the 11th; SP9AI (JJ) and HG6XT/P (JH) on the 12th; HG4KSO (IH) and IT9GSF (GX) on the 13th and EA6FB (AY) on the 14th. All on SSB but CW MS is planned. On the 29th, five OZs are listed worked with one watt as the amplifier blew up after the MS! Planning permission for the tower has come through on which two 17-ele. *Yagis* are to be grafted.

Seventy Centimetres

E18EF (VO) hopes to be on the band soon with 10w, initially, and an 88-ele. *Multibeam*. G3COJ found a beacon OZ2UHF on 432.865 MHz at 2330 on Aug. 28, so it seems to have changed from its previous QRG of 432.450 MHz. G31MV caught the good, southerly tropo lift on Aug. 6 and worked F1KBF/P (ZC) for a new square, a QRB of 1,001 kms. Other nice ones included GB2XN (XN), GW8ROU/P (XM), GB4ULX (XJ) and GMs in XO and YP. In the Aug. 28/29 period John worked some OZs and SMs.

G3PBV now has a *muTek* MGF1202 *Gasfet* preamp in line. On Aug. 28, Dave worked OZ1HDA and 1CFO, both in ER and the next day, OZ2UHF (EP03h) was audible all day but no activity as it was not a Scandinavian Bank Holiday. However, a number of OZs and SMs were contacted in the evening including OZ5BZ (EP) running 10w to a 19-ele. beam resting on his garage roof; SM6CMU (FR) with 4w to 2 x 17-ele. beams, and SM4CJK (FS) at 2235, QRB 1,464 kms. 6CMU was the fellow who worked 65 Gs last year on 100 milliwatts, Dave recalls. He mentions how unstable conditions were in this event. On the 30th, GB3ANG was heard for the first time in the early evening, but only weak OZs and SMs were copied, the only QSO being G6CBN, a first Co. Durham QSO.

G3UVR added another 13 squares in August and another four points for the Annual Table comprising Cornwall, Dyfed, Sweden and East Germany. The 25, 28 and 29th Aug. provided numerous Scandinavians and DB7NW/A (FK). On the 25th, SK4UHF (HT55j) was copied for three hours up to S6, but no stations in that area could be raised. Similarly, OZ4UHF (HP75j) was up to S8 for an hour on the 30th, but no QSOs were made to HP. G3XDY added seven more squares in August, CS, ER, FS, GQ, GR, GT and XM, to bring John's tally to 93.

G4FRE is up to 85 squares now and lists similar LA, OZ and SM stations to those worked by other readers. Dave heard

beacons SK5UHF (IU79g), SK6UHF (GR41d) and SK4UHF on the 29th, plus all active OZ beacons. G4MCU also heard SK6UHF, plus DF0AAD (FO64a) and LA3UHF (ES71a) on the 29th, his best DX being SM4CJK at 1,192 kms. Other QSOs over the 1,000 kms. mark were SM6HYG (FS), SM6GWA (FS) and LA3VW (FT) all on SSB. G4OAE worked GW8ROU/P (XM) on Aug. 13 and LA6HL (CS) on the 24th.

G4ROA lists G6CGY (Cleveland) on the 7th, and G6CBN and GJ3RAX on the 29th, with FS, FK, GR and EQ new squares the previous day. G4TIF added YQ, XN, XJ and YP, thanks to various G expeditions, and F6HMQ/P (XI) on Aug. 27. The 28th brought SM6FYU (GQ) for a total of six new ones. G6PFR did not spend much time on the band but did contact F6EAS (ZJ) on the 6th, PE1HQO (DN) on the 9th, and GB2XN and GW8ROU/P on the 13th. G8KBQ also worked the F6 using just 5w, plus F6HMQ/P (XI) on the 27th and three OZs and DF6HT (FN) on the 28th. G8VR put up a home made 19-ele. *K2RIW Yagi* on July 30 ready for the contest and the first station heard was SM6HYG at S9-plus. In two days, Ken worked eight countries, 22 counties and 24 squares with a modest 10w; his first real attempt on the band.

G8SRL lives on the side of a hill which screens him to the north, so Michael was pleased to contact SK6AB (FR) on Aug. 29 and OZ1DBR (EP) the next morning. GD2HDZ added D, OZ and SM on the 25th, plus six G counties on July 31, for the Table tally. On the 29th, GJ4ICD worked 19 OZs, eight GMs, 16 SMs and lots more, but Geoff remarks that all were coastal stations. He is now up to 108 squares on the band.

Geoff Toulalan, GW8AAP, had planned to operate from AN square in the July 31 contest, but this was quite literally a wash-out and he sent some photos to prove it; trees felled by lightning, a flooded camp site, etc. After going back to Prestatyn, he left for Scotland on Aug. 5, starting operations on the 7th from YQ. LA1YCA/P (DS32h) was the first LA worked in disappointing conditions, but the next night, it was much better with

eight PAs, four ONs and a DB6 worked in three hours. On the 9th, G2CIW (Kent) was worked. The following operation was from an 1,100ft. *a.s.l.* site in Dumfries (YP) from which 14 G and GM stations were worked.

Gigahertz Bands

On 23cm G3PBV now has 30w output from a UPX-6 cavity. G3XDY worked into LA on Aug. 24/25, SM on the 28th and OZ on the 31st despite a "sick" transverter. G4ROA worked into EO on the 25th, FS on the 28th and ZO the next day for three new squares. G6DER is another with an ailing transverter which has been at the mender's during recent lifts. G8FUO added eight more squares in August including G8AAP/P (AN) on the 17th and Swedes in FS and FR on the 28th and 29th.

John Lemay, G8KAX, (Essex) runs 35w to 23-ele. and got F1KBF/P (ZC) on Aug. 6, plus Fs in AI and BJ, and on the 29th, GJ8SBT. G8KBQ with 1.3w to four 23-ele. *Yagis* at 18ft. got GB2XN on the 11th and GW8ROU/P (XM) on the 18th. G8PNN added six more squares and counties and is getting things together for 13cm. soon. GJ8SBT monitors 1,296.200 MHz all the time now so as not to miss any lifts. During his GM trip, GW8AAP made QSOs with many of the continentals worked on 70cm. as well as with a number of Gs.

John Tye, G4BYE, (Norfolk) reports SM6HYG now QRV on 6cm. working G3ZEZ at 972 kms. and G3LQR on 6cm. and 9cm. for two "firsts" with a 23cm, contact with F1BUU a new DX record of 1,690 kms. LA8AE (FT) is looking for Gs on 13cm. G4BYE has worked SM6HYG on 9cm. for square no. 9.

Apologies for the abbreviated reports but space was at a premium again.

Deadlines

Oct. 5 is next month's deadline and for December, it will be Nov. 2. As usual, everything to:— "VHF Bands", SHORT WAVE MAGAZINE, 34 High Street, WELWYN, Herts., AL6 9EQ. 73 de G3FPK.

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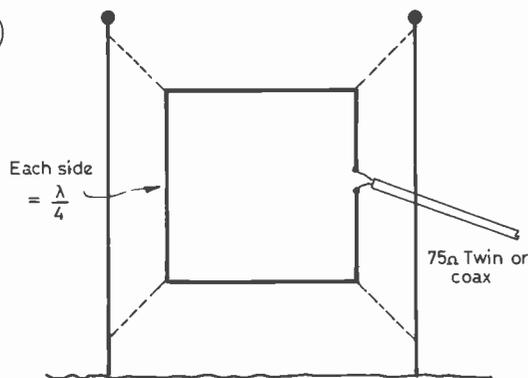
LOOKING AT LOOPS

SAMUEL POLSON, GM3RFR

FOR many years I have made use of Loop antennas on all amateur bands between 3.5 MHz and 28 MHz. During these years, I have come to the conclusion that loops are probably the most readily useful of all antennas. They certainly have a number of advantages well worth considering.

- (a) They are easily erected, easily maintained and, should they be blown down, easily replaced.
- (b) They require no adjunct devilries such as radials which are such easy trip-lines for the unwary.
- (c) They are easy to feed with ordinary coax or simple twin feeder.
- (d) They require two supports, but masts need not be tall. I have for years relied on a number of nineteen foot bamboo poles as quad-loop supports; these bamboos are light, wind resistant, and easy to erect by tying them to some convenient support. Avoid metal supports for these can seriously affect antenna resonance.
- (e) Loops work well near ground, especially if vertically polarised — *i.e.* feed them at the middle of one or other vertical side, not at the top or bottom. I generally operate with feed points not much more than ten feet above ground.
- (f) There is very little strain on the wire, so virtually any form of light conductor can be used. This, combined with the fact that the antennas need not be high above ground makes them very inconspicuous. With loop antennas you can 'DX it' without being shadowed by prying planners or narky neighbours.

E 072



| Band | Overall length (ft) |
|-----------|-----------------------|
| 1.9 MHz | 518 |
| 3.5 MHz | 280 |
| 3.8 MHz | 260 |
| 7.05MHz | 140 |
| 10.10MHz | 94 |
| 14.20MHz | 69 |
| 18.07MHz | 54 |
| 21.20MHz | 46 |
| 24.90MHz | 40 |
| 28.50 MHz | 35 |

Dimensions of Quad loops for HF bands

Fig.1 SQUARE QUAD LOOP

(g) Loops are harmonic antennas *i.e.* a 14 MHz loop will work on 28 MHz as well and a 7 MHz will work quite well on 14, 21 and 28 MHz. Of course, as the table indicates, it is a larger antenna. A 3.5 MHz loop will work on all the higher bands but, unfortunately, if you cut your loop for 3.8 MHz, it will be resonant on 7.6 MHz, 15.2 MHz, 22.8 MHz and 30.4 MHz, and can only be a one-band affair.

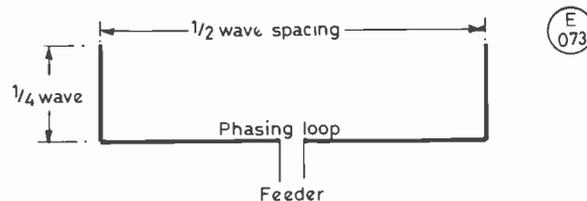


Fig.2 TWO BROADSIDE FIRING PHASED VERTICAL ANTENNAE

(h) Loops are capable of real DX. For many years I have been operating with two watts only to the antenna. I have mainly used loops, and I have never had any form of commercial beam. I have so far had contacts in nearly 150 countries including VK, KX6, CE, ZS, 9M2, VP8. 9M2 was worked on 14 MHz using a loop, and in the midst of a cacophony of European high-power specialists. I have, indeed, acquired a QRP DXCC trophy, I believe the first in Europe for SSB, and many of the hundred were contacted *via* loop antennas. So I feel justified in advocating them as being very efficient radiators!

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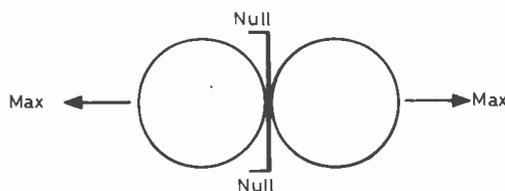
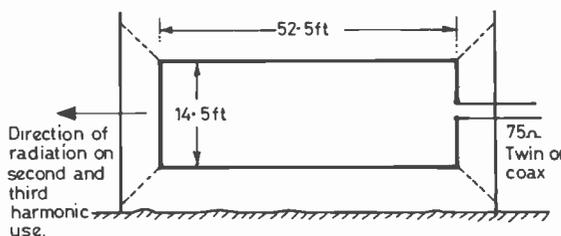


Fig.3 POLAR DIAGRAM FOR PHASED VERTICALS IN FIG.2

I have come to believe that loop antennas are virtually equivalent in gain and behaviour to a pair of phased verticals so positioned as to produce broadside radiation (Fig. 2). Of course, the phased verticals can, when sited at half-wave apart, and when fed simultaneously, produce pronounced nulls off the ends (Fig.

E 075



| Band | Horizontal length | Vertical length |
|--------|-------------------|-----------------|
| 3.5MHz | 105 feet | 35feet |
| 3.8MHz | 97 feet | 32.3 feet |

Dimensions of similar antennae for 3.5 and 3.8MHz.

Fig.4 ELONGATED BEAM LOOP

3). This cannot be done with one-wave loops because, if the loop is truly square, the vertical sides are only a quarter wave apart.

However, I have recently been experimenting with an enlarged and elongated loop (Fig. 4). This interesting antenna shows very distinct, uni-directional beaming propensities when operating on the harmonic frequencies of 14 MHz and 21 MHz.

A check with two local stations (one to left, the other to the right of my QTH) showed a gain of two S-points to the left and a loss of two S-points to the right when using this antenna on 21 MHz. The comparison antenna was a one-wave 21 MHz square

loop. It would appear that the elongation of the antenna has produced a situation in which there is a uni-directional in-phase summation of radiation. For those with space this looks a useful cheap beam.

Finally a word on the well-known Delta or Triangle-shaped loops. I have tried these, but never found them as efficient as the square or rectangular varieties. Their advantage is, of course, that they require only one mast, but that must be taller. By the way, a Trapezium-shaped loop seems to do quite well, but I have had no success with Parallelograms.

A LOW-COST BOOM MICROPHONE FOR MOBILE OPERATION

A. G. HARGRAVE, G6VBM

AFTER one or two exciting moments using a fist microphone while driving, I quickly decided that a boom microphone was a desirable (if not essential) aid to mobile operation. I therefore checked the advertisements for a suitable unit and promptly recoiled in horror at the prices being quoted by various amateur radio equipment retailers! It became immediately obvious that if I wanted a boom microphone, I should have to build one.

A trip to my local *Tandy* shop resulted in my obtaining an electret microphone insert for just £1.29. The recommended supply voltage was 4-10 volts and although I would have preferred a microphone using a single 1.5 volt cell for reasons of compactness, I was seduced by the price. Also the output impedance of 1K ohms was a reasonable match for my Trio TR-7730 transceiver which has an input impedance of 500 ohms. Finding a 6-way free socket to connect into the Trio was the most difficult (and the most expensive) part of the project. One was finally obtained at a price of £1.65.

A single pole on/off switch was all that was required for the p-t-t function, but in order to switch off the battery supply to the microphone when not transmitting, it was decided to use a double-pole switch; this enables the one switch to perform both functions. Although a long toggle switch of the type used in many cars would have been preferable, those readily available are mostly single-pole types and I finally used a double-pole slide switch that was already to hand.

All connections were made with two-core screened pick-up cable which proved quite adequate and is readily available at low cost.

Fig. 1 shows the point-to-point wiring details. I had hoped to accommodate the 10 μ F electrolytic capacitor inside the metal cap of the microphone free socket but it proved to be too large. In the end it was inserted into the cable at the point where the boom is attached to the mounting clip. In order to avoid making unnecessary joins, the plastic covering of the cable was removed using a soldering iron and the screen simply untwisted to reveal the inner cores. The blue core was cut and joined to the two capacitor leads and the whole assembly was bound with insulating tape. Connections to the 6-way socket were made in the same way, only the blue core being cut and connected as shown in Fig. 1.

The boom is simply a suitable length of polythene tubing (I sacrificed one of my wine-making syphon tubes) stiffened by insertion of a piece of coat hanger wire — see Fig. 2. The wire is attached to a 'bulldog' clip with a screw, two nuts and a couple of large washers; the 'bulldog' clip attaches to the sun visor and the wire can be swivelled about the screw to enable the correct position for the microphone to be found. The microphone insert proved too large in diameter to be pushed into the end of the polythene tube so it was butted up to the tube and taped in position.

The double-pole slide switch was mounted on the front of a small purpose-made metal box which is attached to the lip on the bottom of the car's fascia panel. The box also houses a small 9V battery. A 9V supply was tried first simply because it was easy to connect and has proved so successful that other voltages in the recommended range of 2-10V were not tried — there is room for experimentation here!

In operation, the system has worked extremely well and has been well worth the small amount of cost and effort involved in

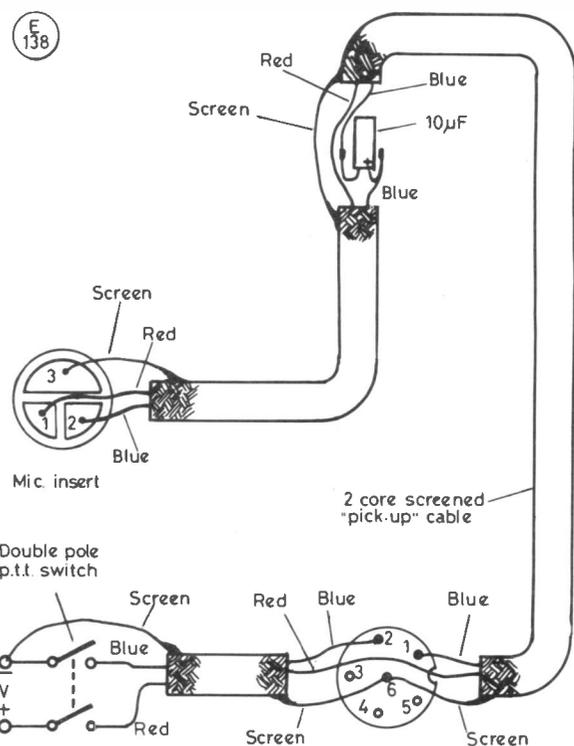


Fig.1 POINT-TO-POINT WIRING DIAGRAM

constructing it. Reports received during numerous QSO's indicate that the audio quality is at least as good as when using the original fist microphone supplied with the transceiver.

Other methods of mounting the components will no doubt suggest themselves to the reader. For example, it may be possible to house the electrolytic capacitor inside the plastic tubing. Also, if a suitable type of tubing could be found, it may be possible to bend it while hot so that it retains the desired shape when cold. Alternatively, flexible metal tubing of the type used for map lights could be employed.

The simplest way to determine the correct connections to the microphone socket is to remove the cover from the fist microphone and trace the connections from the socket to the p-t-t switch, microphone, etc., using a resistance meter. A word of warning — be careful when removing the cover; the p-t-t switch return spring on my Trio fist microphone tried to leap to freedom!

While the system described in this article worked well with the Trio TR-7730 transceiver, it may require modifying for use with other equipment. Various microphone inserts are available having different impedances and operating voltages.

I make no claim whatsoever for originality — there are many home-built boom microphones in use already. I just hope that this article will encourage others to 'have a go'.

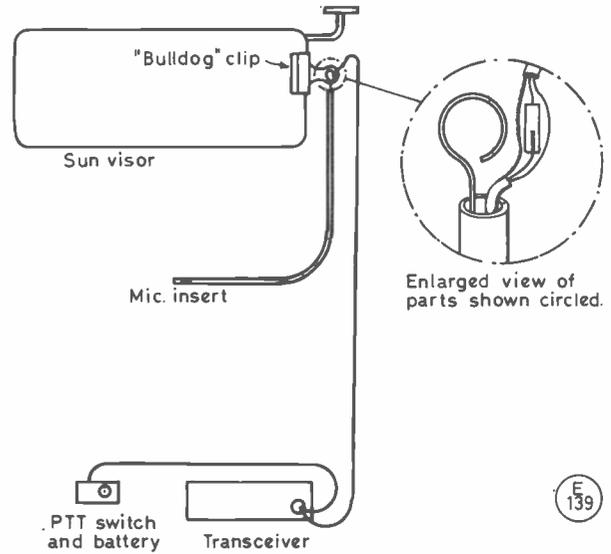


Fig. 2 GENERAL LAYOUT AND CONSTRUCTIONAL DETAILS.

HOME-MADE TOROID RINGS

P. PAINTING, G3OUC

IN many amateur radio construction projects toroid type inductors are often specified. Sometimes these are of the iron dust core type as opposed to those of ferrite material. The cost of both iron dust or ferrite rings is often quite high and can add considerably to the outlay of home-constructed equipment.

It is possible to circumvent this state of affairs by making one's own *iron dust* rings for producing tuned toroids for the LF amateur bands. Certain types of low frequency IF transformers (e.g. 465-455 kHz) as used in the earlier type of transistor radio are constructed using an 'iron dust pot' form (see Fig. 1). A pair of iron dust rings (12mm. x 5mm.) can be made from each pot unit by dismantling the transformer and removing the iron dust pot. This can be then sawn in half with a 'junior' hacksaw, the two pieces cleaned up with a fine file and the piece with the small hole through enlarged with a round file. The rings can be varnished or treated with clear model aircraft dope prior to winding for use.

A source of suitable IF transformers is the more elderly defunct transistor radio often seen at jumble sales, etc. The IF transformers in these sets are quite large and usually in round screening cans; it should be noted that the modern miniature radio sets have unsuitable IF systems for making toroid rings. Also note that some transformers have a 'pot' system of what *seems* to be ferrite material.

To identify the core type remember that iron dust material is grey in colour with a matt finish, it can be cut with a file or saw and is suitable for making up tuned circuits for narrow band use.

Ferrite material is hard, brittle and resistant to normal methods of cutting or filing.

The writer has recently constructed an 80 and 160m. transceiver using iron dust cores obtained as described. The rings made from

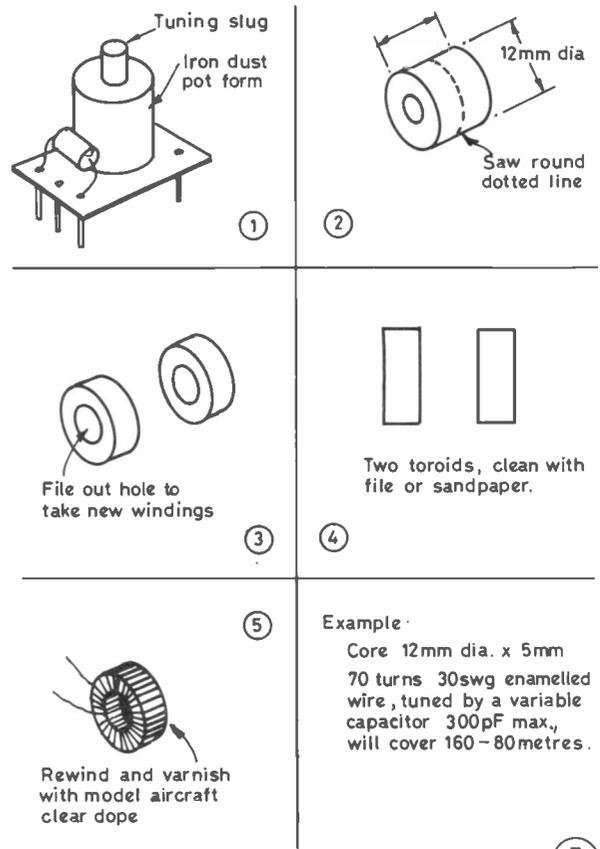


Fig. 1 IRON DUST TOROIDS FROM IF TRANSFORMERS

IF transformers seem equally as good as the commercial types of like size *at the frequency used* (1.8-3.8 MHz). I have no knowledge of the "K" factor or frequency limits of the material used; however, it is possible that tests can be made to determine this.

GETTING STARTED IN SHORT WAVE LISTENING

STEPHEN READING, G4LZD

OVER twenty years or so as a short wave listener I have noticed that very little advice has been written to assist the newcomer to our hobby. With the advent of Citizens Band radio I believe that more of these disillusioned enthusiasts will turn to amateur radio and indeed short wave listening; so it is with these in mind that I am writing this piece. It will be by no means the full story, but it may persuade the potential listener to take a little time in deciding what he or she might need in the way of equipment and how effectively to use it.

Before investing money in your station, you must ask yourself certain questions, such as, what is my long term plan, do I wish to stay as a listener or do I want to get my 'ticket'; what do I hope to get from this hobby, what am I prepared to put into it? What money am I prepared to spend on it?

As I see it, whether you remain a listener for life or if you sit the Radio Amateur's Examination you can be sure that you will have a lifetime hobby. You can take it up early or late in life, it will still be there when you retire and well afterwards. Not all hobbies fall into that category. Whether you are disabled or fit you will find that you can pursue the hobby entirely at your own pace and gain whatever satisfaction you desire. You may pursue it as an individual or join a local, national or international society — whatever takes your fancy. You can spend next to nothing or invest a lot of money; it is up to you.

Assuming the basic questions have been self-answered, our thoughts must now centre on the area of our hobby which will be our primary interest. Shall it be LF/HF work, VHF/UHF/SHF or a combination? Which mode are we interested in, single-sideband, carrier wave (CW), television, teleprinter, or a combination? Are we proposing to operate a base station exclusively, go mobile, use satellites? Monitor broadcast stations exclusively? Questions indeed!

Versatility — The Key

If I were about to join the short wave listening fraternity as a newcomer now, I would have no hesitation in planning LF/HF operations as my primary interest knowing that with the modern technology available to me today, upgrading my station into the VHF/UHF sphere would be relatively simple and at minimal cost — which is a godsend to a family man.

Briefly, LF/HF single-sideband listening on the amateur service is relatively easy to handle provided one has a reasonable working knowledge of the English language together with a listener's guide, a breakdown of the RST reporting code and the all important 'Q' code. One should also have to hand a copy of the valid country identification callsign list and a decent logbook. In time, the newcomer will become familiar with the phonetic alphabet and "ham terminology".

Carrier wave operations (Morse code) is a different prospect for the untrained; until recently, one would assume a great deal of sweat and tears would be the norm in mastering this difficult art, perhaps best left to the experts? Not so I say, technological advances have produced the solution, albeit in some eyes

"cheating". I refer of course to the Morse decoder which will decipher the dits and dahs, convert it to a message format and visually display it for you. In this world, you do not get something for nothing, it will cost you in terms of money, and, if you ever decide to sit the RAE and want a G4 call, you will need to handle the code for yourself. As an alternative to the decoder, you can buy yourself a Morse tutor; I believe they are good although I have never needed one myself for I was trained at Her Majesty's expense.

Finally under this versatility heading, one has to determine the means by which reports will be despatched to stations intercepted; it is a much more lengthy problem than one first imagines and I do not intend to say much apart from pointing out that you will need a card or report form to a familiar layout and content. For more information I would draw the reader's attention to an article recently published in *Practical Wireless* (Nov. 1982 issue), where the subject is outlined in some detail.

Your First HF Rig

There are numerous sources open to the newcomer for the purchase of equipment, you only have to look at the advertisements in this magazine to see the range. Some of you may wish to purchase second-hand, either through dealers or *via* private advertisements, or perhaps at a mobile rally. More experienced persons may choose to build their own in the long run and can take advantage of the RX80 receiver recently featured in *Radio Communications*.

The major item to be purchased of course, for a listener, is the general coverage receiver. If this is to be purchased new, one can be sure it is excellent in terms of size, sensitivity, stability and festooned with knobs, digital readouts, etc., etc. But remember, if you cover yourself, you cannot go wrong; determine from the dealer the guarantee period, whether it includes parts and labour, whether or not the dealer has his own workshop facilities and whether spares are easy to obtain. Bargain dealers may not provide that all essential servicing backup.

Purchasing second-hand can sometimes be a bit problematical. Dealers have often got on their shelves second-hand receivers for sale which may have guarantees with them, but, remember, VAT will be added to the sale, whereas, if you purchase privately, you will not have VAT added. In this case, you must ensure that the equipment being sold is the property of the seller and not equipment presently owned by a hire-purchase/credit company. This is most important, you could lose your equipment and your money! Ask the seller to produce a bill of sale, for servicing records to study, view the goods yourself whenever possible and do not part with the money in advance of getting the goods.

Be cautious in purchasing goods labelled "homebrew"; they might be fine to use, but they will not give you a good return when you come to sell or part-exchange.

As to the make or type of receiver you could buy, this is of course a matter of personal preference after some study of leaflets and/or specification sheets. In the private columns you will find magical names like Eddystone 840, Racal RA-17, AR88D-LF; really fine receivers though technologically out of date, but well worth considering as starter rigs. Valves, although practically phased out, are still available but for how long we cannot really be sure.

For my own part, I would go for the modern solid-state designs, for example Yaesu FRG-7700, or IC-R70 from Icom, or possibly the Lowe SRX-30D; if I wanted a "rolls royce" I would pick the JRC NRD-515 but that would be out of the question in terms of money.

Finally, on receivers and what you might be looking for, study the filter specifications, a good SSB and CW filter is essential as is a good digital readout as opposed to analogue reading. Check that you can easily insert converters for future operations. (On a personal level, if any of my purchased equipment possessed the SO239 socket, I would change it immediately to the 'N' type or get my dealer to do it. In my opinion, they are an abomination!)

What About Antennas?

There is much written on the subject of antennas, as you will see if you turn to the back cover of this magazine. The books are good value for money, written by experts on both sides of the Atlantic. It is true that the listener can use a piece of wire and get results, but you can never retreat from the fact that the antenna is the first important aspect to consider next to the receiver.

Basically, we can categorise antennas: horizontal or vertical polarisation, omni-directional or directional with a gain factor added. Some may be almost invisible, when erected, others are massive installations which can cause the neighbours jaw to drop in dismay. They can be simple and cheap or complicated and expensive. You must assemble the facts/specifications, view your operating requirements, survey your site and choose wisely. No matter how efficient your antenna will be, you will not hear all that there is to hear because of conditions prevailing or the method of radiation employed at the transmitting end, but, rest assured, if you plan well, erect well and learn your skills well, you will not be disappointed in the long run.

Before proceeding further on antennas, it should be mentioned that any structure erected (in the United Kingdom) 10 feet or higher above ground is subject to planning approval, but more about this later.

Long wire, dipoles, inverted vee's, delta loops, etc., are antennas which are relatively simple to construct and erect. The higher they are positioned the better. Anchor points are needed, of course, but they are generally less conspicuous and easy to maintain. Trap dipoles are on the market relatively cheaply and single or multi-band versions are often favoured by UK amateurs. Custom built versions, anti-TVI dipoles and rotary dipoles are available too. You can also build them yourself at minimal cost.

Leaving aside dipoles and venturing into verticals, this category will almost certainly require planning permission. They do however, look relatively unobtrusive and the space needed to erect them on ground posts is small. Erecting quarter-wave verticals on masts do require radial wires which of course increase the space needed. Half-wave verticals are more expensive and unlike their sister quarter-waves, can be mounted on a mast without the need for radials. Trap versions of the quarter-wave worth looking at are the 12-, 14- and 18- AVQ, the Cushcraft AV3, AV4 and AV5 or the HF5 (with a radial kit).

If the vertical is to be mast mounted, particular attention must be given to the supporting system: a 1½" mast can be supported between angle iron supports, driven well into the ground and cemented. Positioning ¾" stainless steel bolts through support and mast with a centre bolt is a fairly good method. The centre bolt can be the pivot, a most essential provision for raising and lowering the entire system for maintenance. Be advised, if this type aerial is erected, ensure that your insurance for public liability is in good order; when they come down in high winds and do some damage, your neighbour will look to you for compensation.

The final group of antennas we shall look at are quads, miniquads, beams and multi-band full size beams. Since all these antennas require means of rotation, you will have the expense of a rotator to add to your budget (unless you can rig some form of rotating tackle). Although the huge beams like the Mosley TA-33jr or TH6DX 6-element beams are the ultimate, for my money the mini-beam would be my buy as would a mini-quad, but alas, I do not have the room.

As an alternative, if you have the money and the room, you could start your antenna system with the Mosley rotary dipole, and although it would require a rotator it need not be of the really heavy duty variety initially. One can add the other elements at a later date and effectively complete a 3-band beam. The dipole itself is for 10-15-20 metres.

Planning Permission

Under existing legislation, any structure over 10 feet high above the ground will require planning approval. To fail to obtain this



approval is foolhardy and no-one is exempt (unless H.M. forces fall into that category). I can hint at the danger by outlining a story appearing in a local newspaper, where a budding amateur invested in equipment in the region of £1000 which included a Versatower and suitable antenna. It was duly erected and the inevitable happened; the neighbours complained bitterly about the effect on property values, how it spoiled their environment and how much of an eyesore it was. The amateur in question bleated when the instruction was issued to remove same installation forthwith. He *had not* obtained planning permission, he did not think it was *necessary*; how was he going to operate his expensive equipment without an antenna? It might surprise you to discover, he was a retired planning officer!

If you want planning permission for your antenna, contact your local authority planning officer, outline your requirements and ask for guidance. He will forward to you copies of the relevant planning guidelines, together with a set of forms which must be filled in quadruplicate. Keep a copy for yourself in addition. You will also be required to submit plans (same number), although it is advisable that you increase the plans to 6 copies as these will be circulated to many departments.

Canvas your friendly councillor, especially if he/she is on the planning committee, and seek his advice. Ask him if, as the installation could be made portable, the matter could be dealt with under the "Delegated Powers" procedure. Seek the agreement, in the first instance at least, of your neighbours.

Whichever means is used to determine the outcome, sooner or later you will be given an answer. If the answer is no, you are entitled to appeal against the decision, and at this stage the Secretary of State for the Environment enters the match. If the answer is yes it might be accompanied by conditions or restrictions; these too may be appealed against, but, if it is determined by the Secretary of State and points are thereafter modified, you might find yourself with more restrictions or conditions on your hands than there were in the first place. Also there are fees to be paid in planning applications so be sure you know how much you are letting yourself in for.

The Radio Society of Great Britain¹ can assist any listener having difficulty with the procedure for planning permission — which rings me to the point of suggesting that newcomers should consider joining that Society or, as an alternative, the International Short Wave League² (who specialise in the interests of listeners). Even as a "hermit", one needs an avenue in times of difficulty! To cut a long story short, send a stamped addressed envelope to either of these bodies for more information.

Basic Ancillaries

Modern receivers often have in-built speakers which are very well manufactured; some come with extras like a good pair of earphones. I think, in the home, you need both these facilities. Nothing is more soul-destroying than to have to listen to

background noise at the time you are struggling to pull in the weak signal. Equally aggravating of course to the spouse is the chatter, whines and crashes from a rig operating while a favourite TV programme is showing.

Do ensure that you provide your rig with a good earth system. Don't be satisfied with wrapping a wire round a water pipe (you would be surprised at the number of people misled by plastic pipes). The best arrangement is to drive copper clad rods deep into the ground and make a firm mechanical connection with a well-soldered finish. Some amateurs I know relied upon stripping old cable and using the copper braiding to bury under the soil. This might provide some earthing, but electrolysis soon eats it up.

What else you might decide for the ancillaries may well depend on costs and real need. An audio filter such as the Datong FL2, which, when connected between loudspeaker and receiver audio output, may improve things inasmuch that the desired signal is extracted from background whistles, off-tune SSB signals and closely spaced CW stations. A broadband pre-amplifier could be used especially with older receivers, but perhaps are just a little unnecessary with modern ones with one exception; when covering 28 MHz a pre-amp might be useful and AMSAT-UK produce a small printed circuit board for less than £1 as a do-it-yourself project. Aerial tuning units, commonly referred to as "matchboxes", designed to assist in matching impedances, may be useful but, again, to be a choice of the individual in his situation.

Going up?

Once the HF station is established, introducing VHF/UHF facilities are best achieved by converters purpose-built by such manufacturers as muTek and Microwave Modules; these are moderately priced units which are readily available and capable of extending your facilities considerably. Of course, you will need to invest in an antenna for the frequencies which are involved but they, too, are moderately priced.

Such is the technology today that one may broaden the capabilities with converters in the mode spectrum; RTTY to TV with the Microwave Modules MM2000 in league with your HF receiver displaying FSF/AFSK on your domestic TV, etc.

Getting Your Licence

This is often the greatest challenge for the SWL; plucking up courage to sit this examination. Contrary to some ideas, having a multi-choice examination does not increase the degree of difficulty in reaching your passmark, at least in my opinion. You have more chance of logically eliminating answers than if you had to formulate your own answer longhand!

If you decided to sit the examination, firstly send for the leaflet "How to Become a Radio Amateur".³

Examination are held at various centres thrice-yearly — March, May and December. There is an entrance fee for the examination and a charge for each of the two parts of the examination. Should you fail one portion, you will be required only to re-sit the failed portion. If you have difficulty in attending an examination centre through transportation reasons, why not have a word with the community tutor at your local comprehensive, it is possible he might be able to assist by having his school registered as a temporary centre. If you are disabled in any way seek advice from the City and Guilds Institute, for there is provision for assistance in this category.

When you pass the RAE, you may apply for the "B" licence, which will permit you to operate above 30 MHz; to qualify for the



A new compact 8-band receiver from Sanyo is the RP-8900, shown above. The radio covers 530-1605 kHz, 87.5-108 MHz FM, and 5.95-21.75 MHz in six short wave ranges; price is £59.95 inc. VAT.

"A" licence, it is obligatory to sit and pass the Morse test which is held at various locations such as Radio Surveyor's offices, certain coastguard stations and stations dealing with ship-radio, e.g., Ilfracombe and Penzance. There is a fee, of course, for the examination and you are required to apply in advance.⁴

Should you wish to train in CW at home, the Radio Society of Great Britain broadcast slow Morse practice sessions and details may be found in *Radcom* or direct from Headquarters. The Royal Naval Amateur Radio Society's broadcast Morse proficiency tests on the 80-metre band on the first Tuesday of each month (write for details). Certificates are awarded for one-hundred-per-cent accurate copy commencing at 15 words per minute, a good guide to whether or not you would pass the test.

References

1. Radio Society of Great Britain, Alma House, Cranborne Road, Potters Bar, Herts. EN6 3JW.
2. International Short Wave League, 88 The Barley Lea, Coventry.
3. Department of Trade and Industry, Radio Regulatory Branch, Waterloo Bridge House, Waterloo Road, London.
4. As 3 above.
5. Royal Naval Amateur Radio Society, 21 Sandifield Crescent, Cowplain, Portsmouth, Hants.

THE PYE 'BANTAM' ON FOUR METRES

B. KITCHEN, G4GHB

MANY items of surplus equipment have been described in past issues of *Short Wave Magazine*, including the Pye Cambridge, Westminster and Vanguard modified for the 2-metre band. This article describes modifications to the Pye Bantam for the 4 metre band.

A number of surplus low-band Bantams have appeared on the market recently, though they are of the "P band" type of 79-101 MHz. The Bantam is a portable piece of equipment, having an AM input of about 1 watt DC and complete with a microphone and aerial. The original shoulder-strap aerial has been removed and a telescopic aerial fitted for better efficiency. Crystals required are 29.78 MHz (X1) and 8.7825 MHz (X2) for operation on 70.26 MHz, and cheap HC6U crystals can be fitted into the Bantam by removing the existing HC25/U sockets; the earth side of the socket has to be soldered on to any accessible point on the earthy side of the copper track.

The frequency conversion consists simply of adding extra capacitance to all the tuned circuits as shown in Fig. 1. All that needs to be done is to re-tune the cores of the coils (see Fig. 2). Start with T201, tune the core until a signal appears at point 'a'; this should be 17.565 MHz. Point 'b' on T202 is 35.13 MHz, and point 'c' on T203 will be 70.26 MHz. This is passed to T204, through to point 'd' and on to the amplifier stage. The last two coils are then tuned, firstly on point 'e' and then on point 'f' which connects *via* the relay to the aerial. With the aerial connected these last two, 'e' and 'f', will probably need re-adjustment. All these points can be easily checked with the use of a frequency meter and/or a wavemeter using a short length of wire between the coils and the wavemeter.

The receiver can be tuned by using the 8.7825 MHz crystal in a separate oscillator, connecting a voltmeter to TP101 and tuning all the cores for an increase in the voltmeter reading. If a GDO or signal generator is available this can, of course, be used.

The set can now be air tested if all the circuits seem to be on

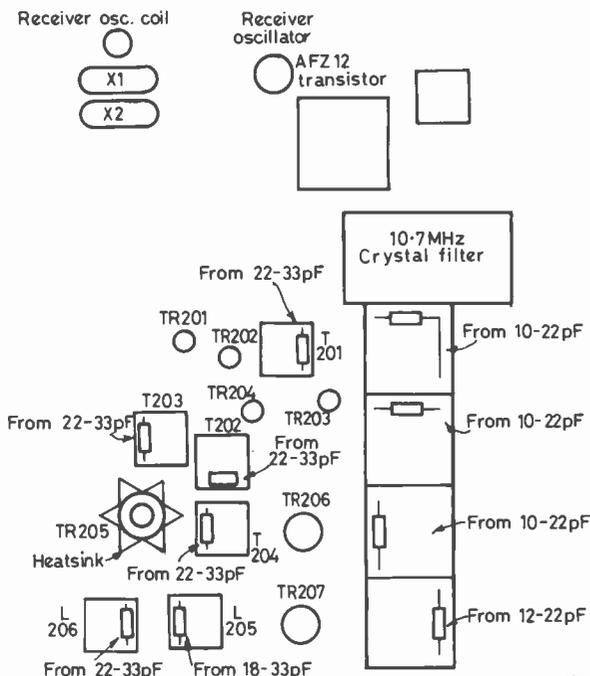


Fig. 1 VIEWED FROM COMPONENT SIDE

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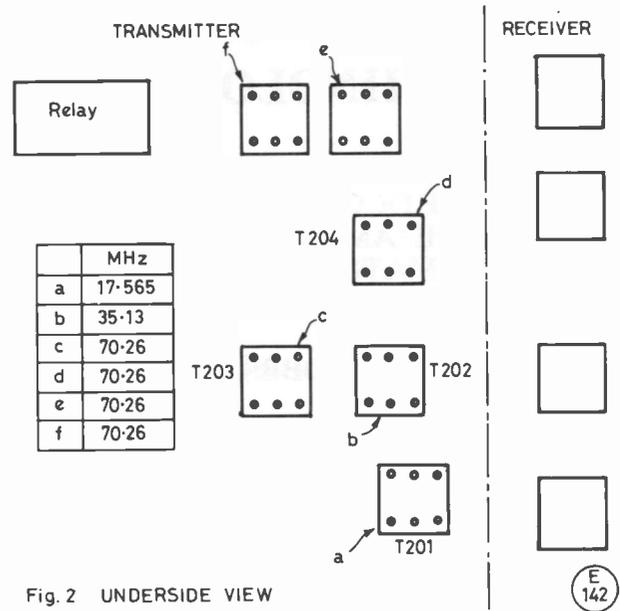


Fig. 2 UNDERSIDE VIEW

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frequency, making sure especially that the transmitter is in the 4-metre band.

A beam aerial for this band is a useful addition to go with the set for base station use. Described is an aluminium 3-element beam using a gamma match. The boom is 1 1/4" x 60", the elements are 1/2" diameter with lengths as shown in Fig. 3. The shorting bar is made from a piece of 4" x 1 1/2" x 1/4" aluminium with two 1/2" holes on 2 1/2" centres. An identical insulator is made from perspex to support the gamma rod at the end nearest to the boom; the variable capacitor is 50pF.

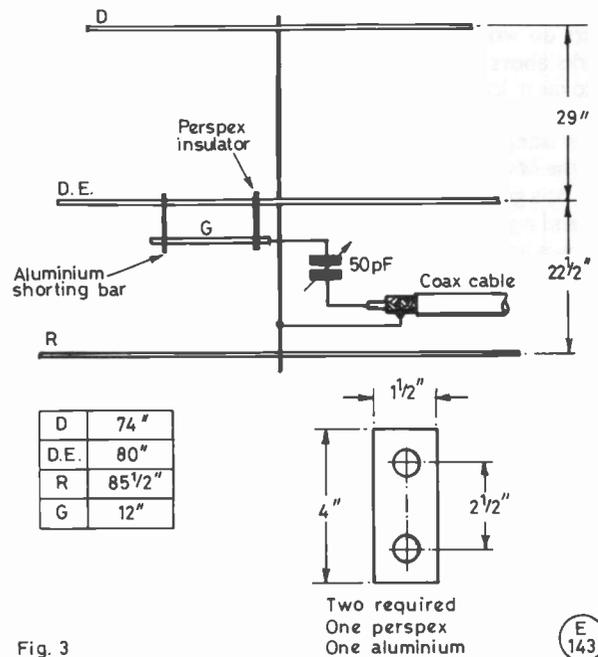


Fig. 3

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The beam can be set up by adjustment of the position of the shorting bar and tuning the variable capacitor whilst observing the wavemeter used as a RF field strength meter, simply tuning for maximum RF, or by using a VSWR meter if one is available.

The results whilst portable so far have been rewarding considering the power output, and encouraging results when using the beam aerial at the home QTH in North Wales.

“KITCHEN-TABLE TECHNOLOGY”

A SERIES OF OCCASIONAL ARTICLES TO PUT THE ‘AMATEUR’ BACK INTO AMATEUR RADIO

REV. G. C. DOBBS, G3RJV

No. 2: The “Acme Foolproof” Twenty-Metre Transmitter

“MY only constructional experience is building a power supply . . . it didn't work”.

“I'd like to build a transmitter, but I can't seem to get VFOs to work or stay stable”.

“Most of the articles in magazines seem to use homemade PCBs and I don't want to etch a board”.

“Crystal controlled transmitters are nice and easy to build but they are so limited on the air”.

“Nice circuit but can one get the components”.

“The ideal project is one that costs only about ten quid for components, can be built in a weekend and should work first time”.

One thing about writing for *Short Wave Magazine* is that readers do write back to comment and offer suggestions. The remarks above are typical of some of the things that have been said to me in letters from *S.W.M.* readers. So the good readers of *S.W.M.* seem to want simple, inexpensive, easy-to-get-to-work circuits using standard bits and pieces. (What I must have just saved the *Magazine* in market research!) An HF band transmitter would be a good choice, useful, easier to build than a lot of other items and a great source of satisfaction when making QSOs with one's own handiwork. The 20m. band seems about the best bet; it is possible to work *something* a lot of the time, even DX, and a

couple of watts will easily get into Europe with a dipole or other simple antennas. Variable frequency oscillators can be tricky and crystal controlled transmitters limit the usefulness of a transmitter. It should be possible to “VXO” a crystal to give a useful coverage on 20m. The old problem is getting in-band crystals but when I heard that *Golledge Electronics* were selling 20m. CW band crystals in 10 kHz steps light appeared at the end of the tunnel.

A 20m. VXO transmitter using a range of available crystals, with the oscillator arranged to swing enough to fill in the gaps between the crystal frequencies, seemed to be the answer. Use a reliable, standard component, circuit that should function first time. Design it for a *Veroboard* layout for those who do not like etching printed circuit boards. The result: The “Acme Foolproof” Twenty Metre Transmitter. Where does the name come from? If you have children like mine who modify your viewing habits towards Pop Eye and Road Runner cartoons then you will know; if not, ask someone who has.

Circuit Description

Fig. 1 shows the circuit diagram of the “Acme” Transmitter. A lot to it for a simple circuit, you might say. Not all of it need be included but it is a fact of amateur radio life that the circuits with the fewest components are not always the easiest to get to work. The first advantage of this circuit is that it is a “good goer”. It may have a familiar look to it for old hands of QRP transmitter building; that is because it is an Anglicized version of the famous

Table of Values
Fig. 1

| | |
|------------------------------------|---|
| R1 = 10K | TR1 = 2N706 |
| R2 = 4K7 | TR2, TR3 = see text |
| R3, R4 = 220R | M1 = see text |
| R5, R6, R7 = 51R, see text | D1 = germanium diode |
| R8, R9 = 1K | LED = general purpose red LED |
| R10 = 890R | RFC1 = 10t, 32 swg, on ferrite bead |
| VR1 = 4K7 preset | L1 = 25t, 32 swg, on 1/16" former plus slug |
| C1, C3, C4, C10, C11, C12 = 0.1 μF | L2 = 27t, 26 swg, on T-50-6 core plus 3t link |
| C2 = 33 pF, s/m | L3 = 12t, 22 swg, on T-50-6 core |
| C5, C6 = 210 pF, s/m | FB = ferrite bead |
| C7 = 1 nF | X1 = 14 MHz crystal, see text |
| C8 = 0.01 μF | S1 = 1-pole, 1-way, min. toggle |
| C9 = 100 μF, 25v. | S2 = 2-pole, changeover, toggle |
| VC1 = 60 pF, see text | |
| TC1 = 3-60 pF (as VC1) | |

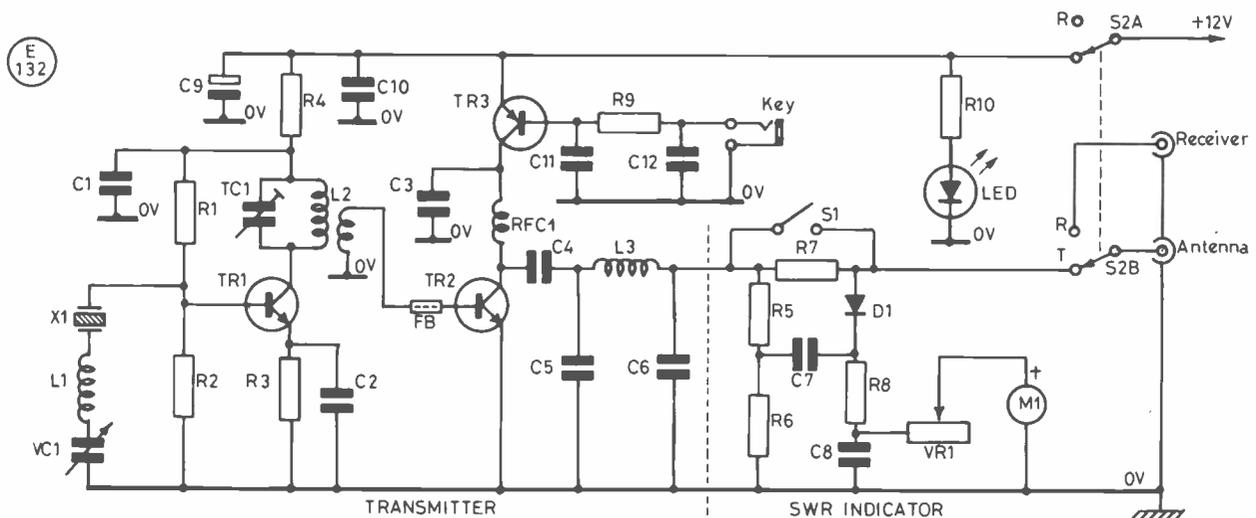


Fig1 ACME TRANSMITTER CIRCUIT DIAGRAM.

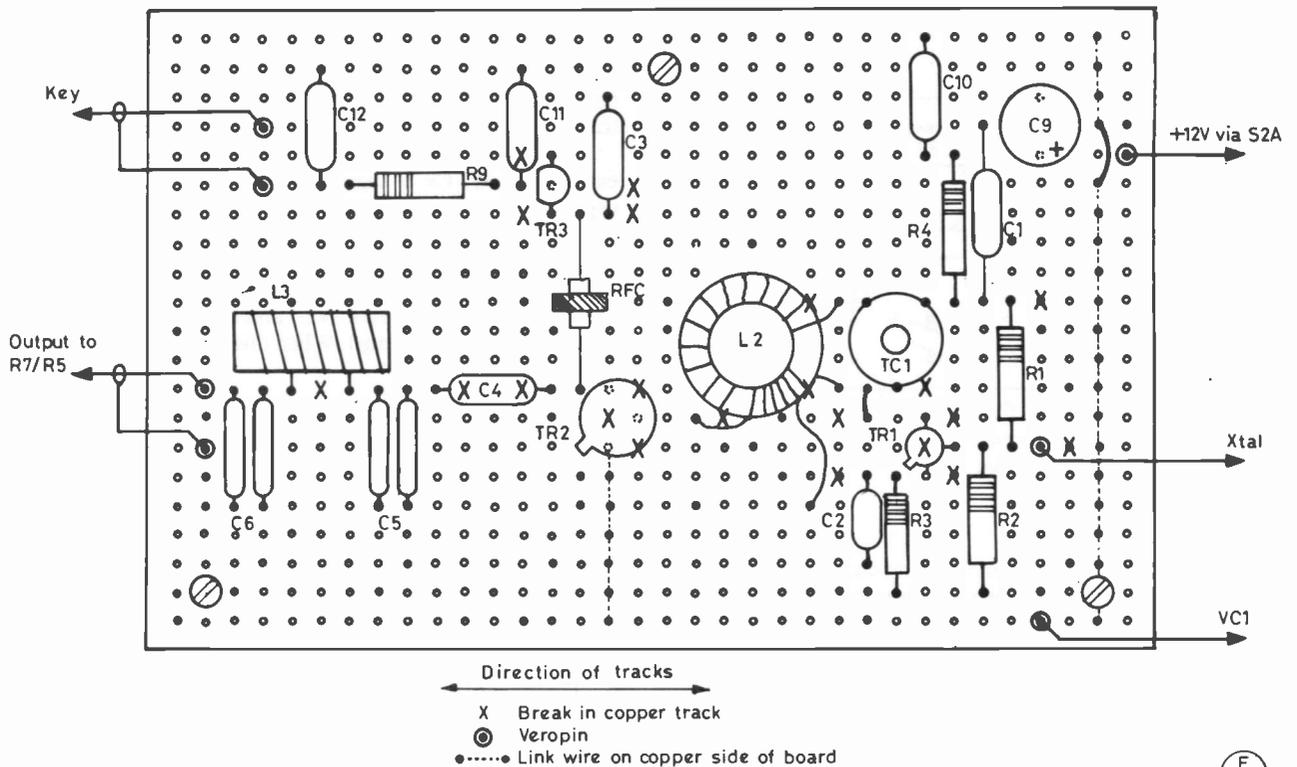


Fig. 2 ACME TRANSMITTER VEROBOARD LAYOUT

W7ZOI Universal Transmitter. The basis for the circuit uses U.K. bits and pieces, interstage couples a little differently, has a transistor keying circuit, and uses a VXO circuit in the oscillator.

TR1 is a crystal controlled oscillator with L1 and VC1 providing some degree of frequency shift of the crystal. With the value of inductance given by the winding on L1 and a capacitance swing on VC1 of some 3-60pF, the crystal can be made to cover 10 kHz of the band with ease. The prototype more than covered this swing with all the range of *Golledge Electronics* 20m. crystals. The actual coverage for the 14060 kHz crystal (the international QRP calling frequency) was from 14059 kHz to 14074 kHz. So it is possible to work usefully on the band with just one crystal but a range of crystals would give extensive coverage. The variable capacitor for VC1 need not be an expensive problem as we will see later.

The output from TR1 is tuned by L2/TC1 and fed to TR2, a simple QRP power amplifier. For CW work we require plenty of drive to get TR2 into Class C, so TR1 wants to be capable of being a healthy little beastie. A whole range of non-silicon transistors can be used for TR1 but I found that the common, cheap, 2N706 did the job very well. TR2 can be chosen from quite a range of medium powered silicon *nnp* types; 2N3553, 2N5859, 2N4427, BLY33, BSX61 are amongst the main contenders. Also useful, but probably with less power output, are 2N3866, 2N3053, and BFY51. I suggest that a BD131 would probably give a good account of itself in the circuit but I couldn't find one to hand to try it.

A small ferrite bead is slipped onto the secondary winding from L2 as it goes to the *Veroboard* hole and another ferrite bead is used to wind the RF choke that forms the load for the PA transistor collector. When the transmitter is switched on, the oscillator runs the whole time and the PA stage is keyed; this keying is done *via* a DC switching transistor, TR3. This enables the 12 volt line to the PA to be keyed with respect to ground. If the constructor does not mind using a hand key with 12 volts across it, on key up, TR3 could be omitted and a key placed between the top of RFC1 and the 12 volt line. A little shaping is added to the keying by the

network, C11/R9/C12 to soften the switching action and improve the CW note. An LED in the 12 volt line indicates when the transmitter is switched on. TR3 is a silicon *pnp* type such as 2N2905, BCY70, 2N3906, etc.

C4 couples the RF output from the PA into a single stage pinetnetwork acting as a low pass filter. The tuning of the oscillator output by L2/TC1 allows us to get away with a single-section filter in the PA. L3, like L2, is wound on an iron dust toroid core, type T-50-6. These do have to be bought, suppliers are named in the references, because surplus ferrite toroids which are cheap and easy to obtain are not really suitable for this circuit. C5 and C6 are non-standard values and will probably have to be made up from 2 or more capacitors in parallel. Good silver mica types should be used for the filter and the miniature ceramic plate types ought to be avoided because they can hardly handle the power in the circuit.

The output at the junction of L3/C6 could be taken directly to the changeover switch, S2B, but a simple standing wave indicator has been added to the circuit. The output matches 50 ohms so is suitable for a half-wave dipole, or requires an ATU for matching into bits of wire or other types of antenna. The SWR indicator is a useful addition to the circuit, being made up from a few cheap components; the circuit is that of an impedance bridge based upon R5/6/7 and the impedance of the antenna. When the antenna impedance is 50 ohms the meter will indicate a null. VR1 is a meter sensitivity control which allows a range of cheap meters to be used

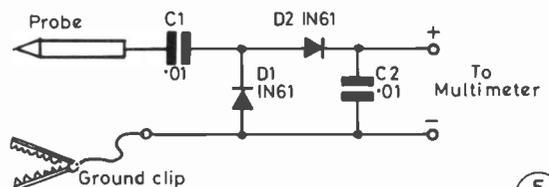


Fig. 3 RF PROBE CIRCUIT

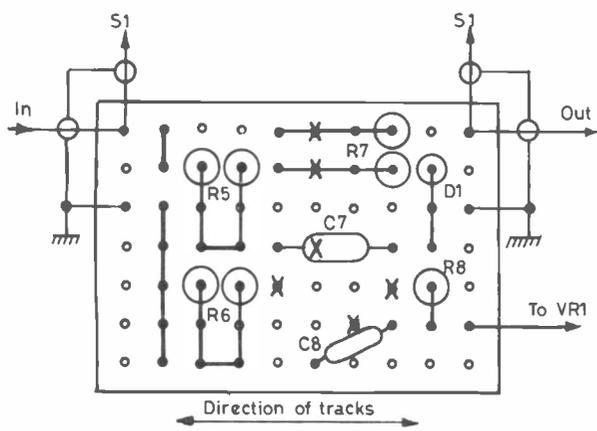


Fig. 4 ACME TRANSMITTER SWR LAYOUT

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for M1. The meter should be any moving coil movement of less than 1mA. There is a whole range of surplus tape-recorder meters with movements in the order of 200-300 μ A which would be ideal in this circuit; meters are expensive so look around for something cheap. S1 switches the bridge out of the circuit for transmitting. The bridge has the advantage that some load is offered to the PA within safe limits during the tuning-up operations.

Building and Testing

The layout for the board is shown in Fig. 2. The prototype was built as shown on 0.1" pitch Veroboard but keen circuit board etchers could use a similar layout for their PCB. The crosses mark the breaks in the track, made with a twist drill tip — and note the dotted lines which join up copper strips under the board to form them into a ground mat around sections of the circuit. I am not fond of Veroboard, but many constructors swear by it . . . others at it! Do ensure that the tracks are cleaned well until bright copper shows before any solder connections are made. I used 'Veropins' to connect the leads to the board but these are

expensive and small lengths of stiff copper wire may be used although they have a nasty habit of slipping through the holes when being soldered. The board is fixed to the base plate of the case by three 6BA nuts and bolts with stand-off pillars to hold the tracks off the bottom of the case.

Build the oscillator first so that it can be tested. The layout is easy to follow. C9 is spaced for a PCB mounted electrolytic capacitor but there should be enough room on the board for one with axial leads. The trimmer capacitor TC1 is a Mullard or similar type of semi-airspaced trimmer. L2 has two windings and when counting turns on a toroidal core each pass of a wire through the hole represents one turn. VC1 and the crystal holder are both mounted on the front panel. When this stage has been completed

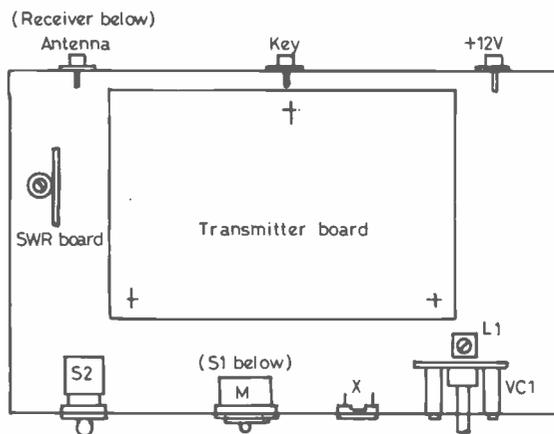


Fig. 6 ACME TRANSMITTER - PROTOTYPE MOUNTING

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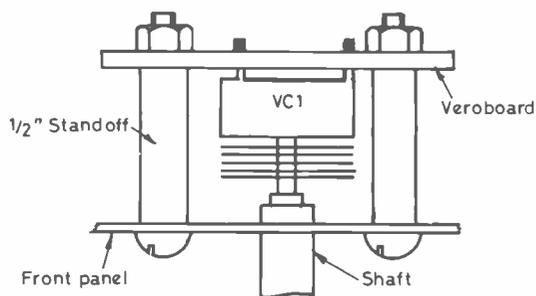
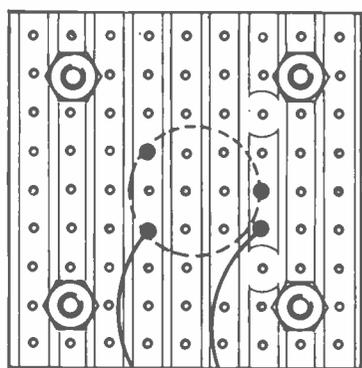
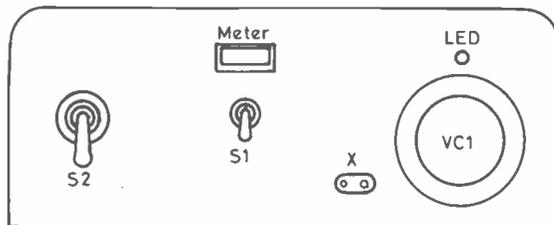
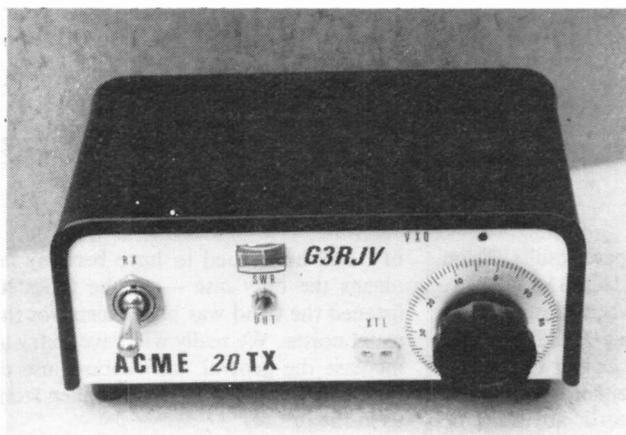


Fig. 5 ACME TRANSMITTER - DETAIL OF VC1

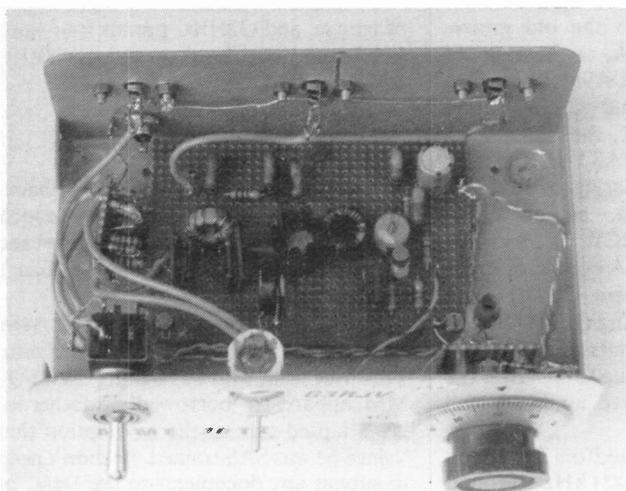
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it can be tested with a receiver and an RF probe. Ignore the VXO arrangement for the time being and just connect a suitable 14 MHz fundamental crystal to the leads which go to X1 and VC1. After checking out the wiring against the circuit and the layout drawing, connect up the 12 volt supply. It should be possible to hear the oscillator on a receiver tuned to the correct frequency. L2/TC1 need to be tuned for maximum output and the simple RF probe shown in Fig. 3 may be used with a multimeter. This circuit, with a simple way to build it, was discussed in my article "Plug in Your Soldering Iron and Begin Here, Part IV" in *Short Wave Magazine* for September 1982. All we need to say here is that the probe is connected to the output wire of the smaller winding on L2 and a multimeter on a low voltage range is connected to the other end of the probe. The meter will indicate peak RF voltage and TC1 can be adjusted for a peak in the reading.

The rest of the circuit may now be built. Take care when winding the turns onto the ferrite bead for RFC1. It is a tight fit and enamel can be scraped off the wire causing shorted turns. (I look for ferrite beads with big holes at rallies). It is a good idea to leave the top of RFC1 unconnected and test the DC switch, TR3, as a separate circuit. Connect up the 12 volt line, put a meter to the collector of TR3, key the keyline and see if 12 volts appears on the meter. The winding of L3 should be spaced to occupy about three-



Two views of the completed "Acme" transmitter. photos by Jo-Anna



quarters of the core. TR2 will probably require a small heatsink, the star type is ideal.

The basic transmit board can now be tested but this must be done with a load on the output. A 50-ohm non-inductive resistor, capable of handling about 2 watts is required. Two 100-ohm, 1-watt, resistors in parallel would do the job nicely. The probe and its meter are connected across this load and the RF output checked. Listen for it on a receiver. Does it key cleanly? Back off the receiver gain controls so that the front end is not overloaded or this may be mistaken for a bad note from the transmitter. The same test can be done with an RF power meter and a suitable circuit for this is described in the earlier article mentioned above.

We now have the basic transmitter: now let us add the "bells and whistles" as our transatlantic friends say. The little SWR indicator fits onto a very small offcut of *Veroboard*, using the layout in Fig. 4. It is a nice little circuit this one, and can be fitted onto the output of any QRP transmitter in the HF range. It is important to use screened leads for the RF inputs and outputs; this includes the shorting out switch S1, which is a front panel control. VR1 can be a preset variable resistance and soldered directly onto the back of the meter. The layout is a little cramped so watch out for solder blobs shorting across the tracks.

VC1 could be the single most expensive component in the whole project if an airspaced variable capacitor was to be used. If the constructor has a suitable airspaced capacitor in the junk stock,

between 50 and 75pF, then by all means use it, but Fig. 5 shows a cheap alternative. The semi-airspaced trimmers of the type used for TC1 are quite suitable for this application but they require screwdriver adjustment. The drawing shows how one of these can be firmly mounted and a shaft added to make up a control which can take a tuning knob. The trimmer, 3-60pF, is soldered onto an offcut of *Veroboard* which is then mounted behind the front panel, as shown, on standoff pillars with 6BA nuts and bolts. The shaft is made from a piece of 1/4" shafting taken from a potentiometer; these usually come with shafts which are too long, so choose one with a long plastic shaft and remove the required amount. A recess is drilled into one end to give a snug fit onto the screw of the trimmer. This is secured with either *Superglue* or *Araldite*; I prefer *Araldite* for this job. With a little care, a presentable and usable variable control can be made very cheaply.

The casing for the 'Acme' is shown in Fig. 6. I used a case bought at a radio rally which is 6" x 3 1/2" x 2" deep . . . work out the metric for yourself, if you must. A suitable commercial case is suggested at the end. S2 is quite a large toggle switch but a miniature toggle switch would serve. The LED is placed above the scale (which happened to be on the knob I used for VC1). The main board is placed centrally and the SWR board is mounted vertically close to the output. I used a 6BA solder tag bent 90 degrees and soldered to a ground point on this board, with the screw hole used for fixing it to the bottom of the case. All of my terminations on the back panel are phono sockets, the standard termination at G3RJV, but individuals will use sockets appropriate to their own set-up. The RF leads are all screened leads as is the lead for the key. L1 was soldered in free space behind the *Veroboard* holding VC1.

The transmitter is designed for use with a station receiver on 20m. and at G3RJV several European countries were worked in the first session of operation into the station G5RV antenna *via* a homebuilt 'Z' match. Using the range of crystals quoted below it is possible to cover most of the 20m. band. Even with just one or two crystals useful operation is possible on the band; it is surprising how many stations come passing by if one is monitoring quite a small area of it. I like to use a transmitter like the "Acme" when doing some construction work. Leave the receiver on the channel with a fairly open bandwidth, get on with soldering and building and call whatever comes by which is of interest. This is much better than having a VFO controlled rig on standby because the temptation to tune up and down a little to find some stations becomes so great that little construction work gets done.

Have a go at the "Acme". It's simple to build. The circuit is a real goer. With just a little effort and cost it is possible to share the enjoyment, and respect of other operators, gained from working an HF band with homebuilt equipment.

Component Sources

20m. CW portion crystals are available from *Golledge Electronics*, Merriott, Somerset. Frequencies available are 14030, 14040, 14050 and 14060 kHz in HC25U holders at £3.75 each including VAT and postage (£3.00 to G-QRP Club members).

T-50-6 toroid cores are available from *Ambit International* or *TMP Electronics*.

Cases for the "Acme" can be obtained from *Minffordd Engineering*, Sun Street, Ffestiniog, Gwynedd LL41 4NE. Either the A48 Aluminium Box at £1.16 or the J6 Instrument Case at £1.64. (50p postage on each).

PA transistors type 2N4427 are available from *Greatch Electronics Ltd.*, Hay Lane, Braintree, Essex CM7 6ST, at £1.00 each plus VAT and 60p postage.

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

THE continuing hot weather (though changing a little as this is written) and consequent noisy band conditions, have resulted in the smallest crop of reports to this piece that the writer can recall for a long time; and it must be admitted that your scribe has found it rather too much of a trial to settle down in the shack for our daily — normally — session at the rig. In addition, there have been some matters of home-construction, a week away, and the inevitable gardening to take off the available time for radio activities. The hot weather, in addition, doesn't seem to have coincided with a spell of good conditions, so perhaps we haven't missed too much.

Top Band

First we have to mention a letter from W1BB. Stew has by the sound of things not made as much progress as he would have liked, but he remains the cheerful, happy soul that all those who recall his *Bulletin* will remember. As to the chance of a revival of the *Bulletin*, which did so much for the Top Band DX world, it seems rather remote. That being the case, we shall have to consider very carefully just what can be done to fill the vacuum; it will probably have to be a co-operative effort between several of the gang. If anyone feels they could help, perhaps they will drop a line to your scribe, who will try at least to co-ordinate the first few steps.

Elsewhere, we carry news of the death of G3XTJ; Ed had, from the day he first came on the air, been a fan of this band and had a lot of fun in the early years, when we ran a counties table, chasing after GDX in the summer months — not to mention the real intercontinental stuff as well. The writer knew G3XTJ years before he became licensed, when he was a youngster active in the Southgate radio club, and feels a keen personal sense of loss.

G4AKY (Harlow) has been looking at a new QTH, not too far from his present abode, but so far nothing has firmed up. As Dave is up to about 86 countries confirmed on the band by now there seems a good chance that he will be able to collect the full 100 countries confirmed before the move comes off. If that is achieved, then it will have happened from what, on the face of it, is one of the most unpromising-looking spots for Top Band DX — but it is interesting to notice that it is only yards from where G3RKJ used to catch everything going on the band a decade or more ago! Like so many others, G4AKY has had a holiday break, at Fowey, Cornwall, and

it is instructive to compare results. From home, Dave found K2GM / SM3, PA0GAM/OH0, U3WS, followed a few minutes later by hearing PY1ZAE, and also hearing SM6EHY calling CE6COR, apparently on a sked; neither Dave nor the SM seem to have heard anything of CE6COR. Then there was UA9S JL and UL7MAR, before setting off for Cornwall. The first QSO from there was with G3TLF, oddly enough an old Harlow operator now up in Hull, followed by a couple of Gs in the London area, then OL1BGA and DL1RK. Upon return, G4AKY went back to the old groove again, with SM5HUA, a hearing of LA8FK (Trondheim), UA9FKW, and on August 23 G3RPB and G3YUV were heard working 3D6AK, the latter being only just audible to G4AKY at RST 129; more Europeans, a hearing of G3LYW calling VP8ANT and, on an early-morning session, W2HCW at 58 calling CQ DX on Sideband. A couple of interesting QRP signals were OK1KFQ, in Liberec, with one watt, and OK1DTM who used just twenty milliwatts to lay down a 579 signal, which came up to well over the S9 mark when he jacked up to the full power limit.

Other stations reported on Top Band have been CX8DT, on 1831 kHz at around 0200, and 6Y5FS surfacing around 0400 on 1827 kHz, both at weekends of course; thanks to *DXNS* for noting these. From the same source, we note the ZL Top Band allocation is now 1803-1950 kHz, while the East Germans have 1810-1900 for CW, plus 1900-1950 kHz for CW and SSB. From September 1, those few who have not yet worked VK on Top Band can address themselves to the problem in earnest: VK6HD will be operational at his sunrise on 1821 and 1849 kHz from that date. H44DX, VK9NS, ZL4OY/C are all QRV at the time of writing, VK0GC and P29PR may well be on by the time this reaches print, and there are threats of activity from VS5DD.

The reason for the low activity at G2HKU (Sheppey) is in part, Ted says, the weather, but more so because he has been removing, and burying for the benefit of Top Band, the household hotwater cylinder. Of course the new one was metric, and the house had to be adjusted to fit the tank! Ted managed SSB to PA0PN, and CW to OK1DLE, UQ2GME, DL1RK, OZ1W, and W4MJ/MM in Eastern Atlantic.

As for your scribe, just a look at the noise level was quite enough to put him

off, and he seemed to have been by no means the only one — at the times he listened the band was bare except for the usual noises. We really will have to try to increase the general, knockabout use of the band if we are not to see it taken from us in the future.

Eighty

Is another band in the summer doldrums. G4AKY made just one foray on the band, to work G4AAW.

This band is the haunt of the QRP types, of course, and G2HKU put his four watts of CW to work to hook up with GM3RKO and SM6OPN.

Crystal Ball

A very useful accessory for the shack, this, for guessing when and where to look for the DX, when the band is 'giving' and various other things — more use than a transmitter in fact!

Firstly, some gleanings from *DX News Sheet*. That trans-Atlantic yachtsman, Tom McClean, who was signing G3WFQ/MM, apparently 'borrowed' his father-in-law's lapsed call on the assumption that "since he was SAS trained, he didn't need to submit any documents to the Dept. of Trade and Industry". The editor of the *Daily Express* was highly critical of DoTI's pointing out to various UK amateurs that McClean was, to put it bluntly, a pirate, and telling them to stop keeping skeds with him. Clearly he didn't realise the situation. For starters, we can't believe that McClean could have known of the callsign of his father-in-law and not known about RAE, Morse, and licensing; and for a second thing, if DoTI know a call is a definite phoney, then to warn against it is only protecting someone else's ticket. While we have often advised in this piece that if one hears, for instance, a 'ZA' one should work him first and worry later, on the principle that the signal *could* be genuine and only the QSL Bureau will tell, the position when the word has been passed round is somewhat different; in the latter case you know you are working a pirate because the DoTI have told you so. If McClean was so good an operator, why didn't he apply for a licence for his boat, rather than pirate a call? As a sailing man himself, the writer admires the man's achievement in getting over the Pond in such a small boat — he wouldn't have been able to straighten out to go to sleep, even, throughout the voyage — but as a radio

amateur, it seems that the *piracy* of G3WFQ/MM was just plain arrogant and needless.

FB8ZP is now QRT, back in France after a mishap while mending his aerial . . . there, but for the grace of God . . . !

That Pribilof Is. expedition got there OK, and stirred up the bands somewhat; while the general consensus of opinion is that it will not be a 'counter' for DXCC, the Alaska DX Association has written a letter to *The DX Bulletin* in which they indicate that they believe they will make it into a 'new country' — they reckon they have not used the same arguments in their submission as were used in the past, and they think their own, new, arguments for granting DXCC status to Pribilof Is. are quite valid. About all we can do is sit on the fence until ARRL/DXAC come forth with their pronouncement.

Back with *DXNS*, we hear that 8Q7BT is now in UK on leave; he will be returning to 8Q until March 1984, and while he is operational on the higher bands, on return he hopes to get going on 80 and 40m. too.

TI2CF says, according to *DXNS*, that he hopes to go again to Cocos Is., TI9, and that this time his operation will be slanted towards the CW segment which had a thin time last operation.

Turning to *The DX Bulletin*, it is amusing to note over the past three issues how the attitude has changed towards XU1SS which came on and stirred things up in the last few days of August. Starting from "this one won't count", to "maybe" to "very possibly" about sums it up. It does seem as though, after the relief operation is over, there will be some Cambodian nationals left who have been issued licences; the only remaining questions will be of the validity of the issuing authority and *that* seems to this old scribe to be a Good Question. The only answer, once again, is to work them, get the QSL card, and then wait for the ARRL/DXCC pronouncement, knowing that at least preliminary documentation is with them at the time of writing.

Looking a little forward, there is the continuing saga of J28AZ and the projected South Yemen operation. About all we can say is that the likely date is around the beginning of October.

If you are looking for a Rodrigues contact, we hear that 3B9FK will be active until December; and for that ever-difficult Zone 23, WAZ-hunters may think of looking for U0Y, throughout October and November. We think he will do good business!

About the same time, operators needing St. Paul could keep an eye open for VE1SPI, while using the other one on VK2WU who is to be on Lord Howe Is. between October 23 and November 3. Also in November, Bouvet action, to continue for some ten months. Turning to the Kermadecs, we hear that ZL3AFH will have arrived there by the time you read

this; and Jim Smith, VK9NS's expedition to the same place should be 'on' for February next year.

10 MHz

As usual, not a lot of reports. G4ITL (Harlow) has been 'persuading' his ATU to load up the half-size G5RV aerial on to the band, and describes what he heard as in the nature of 'bubble and squeak' — so far Bernard has worked DK7CY and DK7UY, plus hearing HB9ATX, OZ1, and OE5. However, G4ITL found the long fades enough to make QSOs fragmentary — they don't come back up out of the noise until you've given them up for lost! Bernard is intrigued by this and proposes a further investigation.

A new reporter is G4OWY (Weymouth) who says that to date he's not found any DX, neither has been able to get his leave-chit signed for a few 0200 sessions on the band! GM4RFE is the only G station heard on this band, but Ray has worked DL1DQ, DK5CP, DJ4JIT / FOZ, DL3AO, DL7AI, DF3TB, DJ5FD, and many others were noted; LA7YI, LA9MF, LB9JB, LA0ED, OZ1FJB and OZ1ANE also figure in the log.

"CDXN" deadlines for the next three months:

November issue — October 6th
 December issue — November 3rd
 January issue — December 8th

Please be sure to note these dates

A somewhat less happy situation is reported in *DXNS* which says, in issue 1078, that VK2LS is apparently running an SSB net daily on the band at 0700 — about all we can say to that is that we hope no-one from U.K. checks in — it seems a dangerously irresponsible sort of thing altogether and as likely to lose us the band as not. The pity of it is that if more of the stations who would like to try CW, or who are rusty, were to get on the band and give it a try, then it would both increase the activity and in addition avoid that futile feeling that occurs when one is mug enough to make a first try on, say, 14MHz. This was a service that Top Band did for many a G up until a decade ago, with patient and slow operating helping the build-up of confidence.

Ten Metres

With the provisional sunspot number down to below half its value at the peak, Ten is but a shadow of its old self; but it is a salutary thought that the figure for the sunspot count reported for July is in fact higher than some 1976 predictions of the

value at the peak! It is also worth recalling that back in 1976, the sunspot numbers being talked about were not in the eighty region, but below ten, and that the bottom of most cycles comes at a count that seems almost invariably to be five or less. However, on the good side, the enormous rise in ten-metre local activity must do something to avoid the covetous eyes of the commercials being cast too greedily at our band. "Use or Lose" is as true now as ever.

G3NOF (Yeovil) has found the band dead for long periods; sometimes there has been short-skip with strong European signals, and occasionally around 2100z there has been the odd South American; the only actual QSO Don made was with ZP0MJO.

G2HKU seems to have rumbled one of these short-skip events while listening round with the QRP rig, and as a result he has a low-power contact with DL8CT to show.

A real 28 MHz addict is G4HZW (Knutsford); Tony uses his TS-820 and Cubical Quad on no other band. The ZS6PW beacon was often heard, but activity in Africa is very poor; there were some good openings to South America, but Tony heard no VP8 signals, surprisingly enough. It adds up to 9Y4RD/SU, CE3DNP, CE6DHY, CX1SC, CX4GL, CX6CK, FM7BX, FY7KRU, J37AJ, PT2PPP, SU1BA, LU3DIQ, VP2MM, ZD8JT, ZP5CF, ZP5RG, and lots of Europeans by Spor-E.

Fifteen

On this band, says G3NOF, not much was heard from the Pacific, although on one morning FO8JP (Bora Bora) was heard at 0739z with ZK2JS at 0859z, both over the North Pole. Later, around 1000z, this path has also opened for KD7P/KH2, YJ8TT, and ZK2JS. Between 0730 and 1700 many JAs came in over the short path, with YBs, even on some poor days, appearing between 1400 and 1600z, sometimes with 9M2s and 9Vs intermingled. The North American stations would come in for short periods and then fade out anywhere between 1200 and 2200. Generally, the rapid changing of conditions was very noticeable during August. In terms of SSB contacts, Don made it to A4XGY, A71AD, CE2DCR, DF3GX/VP2V, DL1DH / MM, EC8AC1, EF1ISG (Sisargas Is.), FH8CQ, FM7BX, FO8JP, G3OLV/5V5, G4LJF/EA9, G4LJF/HB9, HC1BP, HK5FIR, HL1AHW, HZ1AB, IT9HLO / IH9, J37AH, many JAs, KA4BFT / HP1, KB7UD, KB7YS (Arizona), KC7EG (Idaho), KD7P/KH2, KG4DX, LA9PX (Hitra Is.), NS6A, OH2AQ / OH0, PYs, P29NSF, UA9MBC, TR8CR, TR8JP, UM8MKF, V2AN, V3TV, VE7DGI, VE7FLA, VK2HD, VK6AJW, VP8ANT, VU2PMP, VX1IF, W2NQ/7, W0MKX (Colorado), WB3KBZ / VP9, WL7E,

YB7AK, YC3EV, YC4FU, YB0BW1, YB0CN, ZS1VL, ZS6BXA, ZS6BYL, IZ9B, 3X4EX, 4U1UN, 5H3DM, 5H3MI, 5N8ACH, 5N8YPM, 5Z4CI, 5Z4DJ, 5Z4DP, 6W8BG, 6W8EX, 8P6BS, 8Q7BT, 9J2BO, 9M2BB, 9V1UC, 9V0OK, 9V0VM, and 9Y4BA.

Turning now to G2HKU, Ted used his CW to contact K6OU, N4VZ, W0TIV, K9BG, K4LS and K4KQ; this was enough of full power operating for him so he then got out the flea-power rig, and four watts was sufficient to key with UK9FER, UK9MAR, UL7CT, UK9ADT, VE2GVS, K4KQ, KS0U, N4LS, W4BXI, IV3MIG, W0TIV again, W2FC, K9BG, KB8DV, W3LPL, N4VZ, and K6OU.

G4AKY, while on holiday, came up with the local club (St. Austell) and they were out portable with a five-element Yagi at eighty feet, which Dave was permitted to hook his rig to for a while; as he remarks, this sort of aerial system makes amateur radio into a new ball game altogether! KD7P / KH2, HL5BGB, JE71EU, G3WKF, YC4FNO, and T77C were all raised during his short spell with this aerial on SSB, before he had to reluctantly give up.

We turn now to G6QQ (Hoveton) who seems to be working his way through the entire *Call Book*, one way and another! If we disregard the Ws, the JAs and the small fry, CW raised 8R1J, 4Z4NUT, ZS6MEB, VE3JPS, VE2HQ, CX8BBH, HH2VP, PY1ARS, PY1HQ, LU1EWL, ZS6AVB, while SSB managed to find W6USG, KB7RV, W0LVW, G4HRN / W5, VE1BLS, VU2JXO, PY2LRE, ZS6BBN, VE1FA, VE2EBK, 4Z4GM, ZS5NZ, and ZS3BI / P, again discounting the more common USA states and the JAs. On a different tack, David received a letter from G8PX: years back G8PX visited G6QQ when the latter was in Oxford, and was the first amateur station this young SWL had ever seen! By 1937, G8PX was licensed, just in time for the first phase of G6QQ to have been completed by a move and a QRT until 1983. Interestingly enough they both have copies of an Oxford amateur group, taken about 1934, including at least one other active amateur today in G2DU. Now, of course, G6QQ and G8PX have their regular chats on Eighty.

Twenty

Nothing if not noisy! G2HKU managed to recover his ZL skeds from the mud, so his tally reads: ZL3FV and ZL3RS on SSB, CW contacts with T77C, AL7BK, UA9ADQ, UF6FFF, VK3GA, TU2CJ, W3TB/TF, HH2VP, VU2BX, KA4BFT/

HP1, NL7G, DJ6SI/OH0, and OY6FRA; plus QRP to SP8ZHY / 8, and I6UTR.

Now to G6QQ; like almost everyone else, David preferred 21 MHz, but he did put some time in on the band; K4NDH, W8CTP, W3BIM, W3ARK, W0PRQ, K4LTA. In the All-Asian contest 4X6FR, HL4XM, YC0VM, JAs, UAs and other small fry on CW, plus SSB contacts with KA9IBG/PJ4, HI3AAI, and an early-morning one with W6FR.

G3NOF listened on the band between 0530 and 0900; at the start the band is often poor, but then it opens up to VK/ZL, peaking around 0730z, but often fading out quickly after 0800; KL7R on Pribilof Is. was on around 0620 on several mornings, and sometimes W6-7, KH6 and FO8 mixed in with the VKs and ZLs. SSB contacts were made with AI6V, EDIISG, EA8YO, FO8BI, G4JMB/CT3, HB0CIQ/M, I2DMK/IA5, JY9CZ, KC4AAA at the South Pole, T77C, TE32J, U5LAA, VKs, VS5GF, ZLs, IZ9A, and 3X4EX.

From home, G4AKY had a little dabble on Twenty when he could spare the time from Top Band and work (in that order!) to key with N4NO, PY4FV, W1ASH, KB4CCG.

Odds

A couple of letters first; we have one from Carlos Garcia Castaneda, Apartado Postal 30, Sagus La Grande, Villa Clara, Cuba, who is 23, a Spanish and English speaking DX listener, who heard about us through the BBC Latin-American Service and would like to correspond with others of like mind; his other interests are rock music, films and electronics.

The second one is from Ian Parker, G6PMO, 27 St. Audries Road, St. Dunstan's Close, Worcester WR5 2AL; his telephone number is Worcester 352843. Ian has bought a 1981-vintage rotator for his beam, which he describes as an H4/CD4511 type. He says the rotator has been in a salty atmosphere for a couple of years and he would like to refurbish it before he puts it up aloft. However, he has no data on the beast and would like to hear from anyone who might know some more about it so that he can tackle the work.

On the contest front, W1WY notes the VK/ZL contest; no mention of Oceania this year. For those outside VK/ZL, score two points for each VK or ZL contact, and use the number of VK and ZL call areas worked on all bands as the multiplier. Contest exchange is RS(T) plus serial number beginning at 001; the dates are, for the Phone leg, 1000z Saturday, October 1

to 1000z Sunday, October 2, the CW leg being down for the weekend October 8-9. Include a summary sheet with your name and address in block letters and a signed declaration; logs to be in the hands of the VK/ZL Contest committee, c/o Greg Williams, VK3BGW, 1 Noorabil Court, Greensborough, Victoria 3088, Australia, by January 31, 1984. Note this is the date to arrive. There is also an SWL section. Phone and CW scores are combined for the final score.

J-O-T-A this year is between 0001 and 2359 local time for the group concerned, October 15-16.

October 8-9 is also the date for the RSGB 21/28 MHz contest this year. Note that in this one *unmarked duplicates* will be penalised ten times the points claimed for the QSO, and logs with more than five unmarked dupes will be disqualified. This one is a Phone contest, and details can no doubt be obtained from RSGB Hq; logs go to P. Miles, Box 73, Lichfield, Staffs., marked for the attention of the Contest Committee to be received by December 1. This one is followed on October 16 by the CW leg, which is 21 MHz only; both contests are shorties, to run 0700-1900 GMT. While the Phone contest has a multi-op section this year, the CW one remains a single-operator job; Logs to be received by December 31, addressed to D. S. Booty, G3KKQ, 139 Petersfield Avenue, Staines, Middlesex TW18 1DH, again for attention of the Contest Committee of RSGB.

Results for the 1982 CQ WW Phone contest: for the main classes there's nary a G to be seen in the whole list; but in the QRPP (five watts) category, the tenth place goes to G4FTO with 122,570 points. Congratulations to our only placed entrant!

Finale

Nowt on 7 MHz or the 18-24 MHz bands this time. Reports — and let's have some more, please! — to arrive with your scribe by the dates in the 'box', addressed as always to "CDXN", SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ. Meantime, good DX-ing.

"Short Wave Magazine" is available to order
through any newsagent.

Edwin Hodson, G3XTJ

IT is with deep regret that we report the death, on August 30, of Edwin Hodson, G3XTJ, at the early age of forty. Although he had fought a battle with ill-health for many years — he was only just over thirty when he retired from his work on medical grounds — Ed continued with great zest to enjoy life, and amateur radio, as much as possible. Indeed, only a couple of weeks before his death he was planning, with G3YDX, another entry in the CQ WW Top Band CW contest; their claimed score in the 1983 contest would have put them at world top in the multi-operator

single transmitter category, and top European entry. Licensed in 1968, Ed had been an SWL long before that; even as a schoolboy he was an active member of the Southgate radio club. Since becoming licensed, and particularly after his retirement, G3XTJ lived for his hobby. When he entered hospital for the last time, he lacked just one QSL for a complete set of all the currently-available countries; and that one was brought to his bed for him to see before he died. Ed was a member of FOC for many years, and had held their Augie-Nichol Trophy.

On the more administrative side of the hobby, G3XTJ was a member of the RSGB HF Contest Committee, and it was in part this activity which brought his

interest in the mechanics of good accurate log-keeping, particularly in contests.

Although Edwin's sudden death was unexpected, the word was rapidly passed round, and a contingent of over 30 radio-amateurs, with the RSGB represented by G6LX and members of the HF Contest Committee, were able to attend the cremation at noon on September 6 at Enfield crematorium, supported in thought by many of G3XTJ's friends all over the world.

A fine friend, a fine operator — and a fine man; as such will G3XTJ be remembered and deeply missed, and our sympathy goes out to his relatives in their sad loss.

NEW QTH's

This space is for the publication of the addresses of holders of new call signs, or change of address, in EI, G, GJ, GU, GD, GI, GM and GW of stations not already listed. All addresses published here will appear in the U.K. section of the American "CALL BOOK" in preparation. Please write clearly on a separate slip and address to QTH Section. Be sure to give correct County designation and post-code. In the case of direct subscribers needing Change of Address, please state for card index adjustment. Address items for this space to: "QTH Section," *SHORT WAVE MAGAZINE*, 34 HIGH STREET, WELWYN, HERTS. AL6 9EQ.

G3MBHY, R. H. Low, "Moulin", Balmoral Road, Blairgowrie, Perthshire. PH10 7AE. (re-issue) (Tel: 0250-2577).
G3CNR, F. Goodliffe (ex-G6FVG), 7 Lancaster Road, Uxbridge, Middlesex. UB8 1AP (re-issue).
G3GDB, G. A. Bird (ex-G8WOD), 18 Linsted Court, Restons Crescent, Eltham, London. SE9 2JQ (re-issue).
G3JL, A. F. Sephton, 16 Bloemfontein Avenue, Shepherds Bush, London. W12 7BL (re-issue) (Tel: 01-749 1454).
G4K GK, N. Munro, 40 Ribble Avenue, Crossens, Southport, Merseyside. PR9 8NA.
G4LQN, K. Packman (ZL27J), 27 Hunters Hill, High Wycombe, Bucks. HP13 7EW (Tel: High Wycombe 39017).
G4NEX, A. J. H. Hales, 69 Parklands, Coopersale, Epping, Essex. CM16 7RF.
G4NSE, J. H. Rank, 13 Chantry Drive, East Ayton, Scarborough. YO13 9EY.
G4OFO, N. W. E. Baynes (ex-G8VDZ), 47 High Drive, New Malden, Surrey. KT3 3UD.
G4PCW, A. Tucker, 2 H.M. Coastguard Station, St. Just, Penzance, Cornwall. TR19 7NQ.
G4PPK, C. Everley, 5 Fire Close, Hazlemere, Bucks. HP15 7TF.
G4RHZ, B. Coupe (ex-G8GTG), 9 School Lane, Auckley, Doncaster, South Yorkshire. DN9 3TR.

G4RVV, M. W. Stoneham (ex-G6CVG), 8 Darenth Close, Herne, Herne Bay, Kent. CT6 7EX. Tel: 02273-69828).
G4SKV, Capt. V. J. Townsend. D.F.C., Gatwick Aero Club, Mayfield House, Lowfield Heath, Crawley, Sussex. RH11 0QA. (Tel: Crawley 22433).
G4STC, S.T.C. Sports and Social Club, c/o P. J. Poole, 5 River Drive, Strood, Rochester, Kent. ME2 3JW.
G4TGN, B. Newman (ex-G6DCP), 8 Cole Gardens, Hounslow, Middlesex. TW5 9RJ.
G4TOO, M. R. Final, 28 Town Croft, Chelmsford, Essex. CM1 4JX
GW4TUL, F. C. Wybrew (ex-GW6SOM), 11 Clifton Terrace, Blaenavon, Gwent. NP4 9QR.
G4UBP, K. J. Homewood (ex-G8NPC), 73 Hughenden Road, Hastings, East Sussex. TN34 3TF.
G6JNS, P. L. Crosland, Red Lion Cottage, Holt Heath, Worcester. WR6 6TA (Tel: 0905-620041).
G6KHW, J. A. Bultitude, 3 Cambridge Road, Dunton, Biggleswade, Beds. SG18 8RT.
G6NUI, D. J. Chamberlain, 45 Wheatsheaf Gardens, Sheerness, Kent. ME12 1YH.
G6NYA, A. Aston, 6 Gaia Stowe, Lichfield, Staffs. WS13 7LY.
G6QQ, D. Dutton, 55 Stalham Road, Hoveton, Norwich. NR12 8DU (re-issue).

G6TGK, J. W. Hicks, 33 Hayling Rise, High Salvington, Worthing, West Sussex. BN13 3AL.
GW6UUF, S. C. Sier, 141 Merlin Crescent, Bridgend, Mid-Glamorgan. CF31 4QJ.
GW6VJZ, G. Thomas, "Ffaldwen", Heol-y-March, Welsh Saint Donats, Cardiff, South Glamorgan. CF5 6TS.
G6VSV, R. D. McGowan, 5 Wellman Court, Winchester Road, Bassett, Southampton. SO1 7LU.

Change of Address

G3FPD, R. Surman, "April Rise", Cox Green, Rudgwick, Horsham, West Sussex. RH12 3DE.
G3FUF, G. H. Sutherland, 48 St. Peters Way, Porthleven, Helston, Cornwall. TR13 9AZ.
G3KEQ, J. P. Mitchell, 423 Whitehorse Road, Thornton Heath, Surrey. CR4 8SD.
G3KPJ, A. W. Butcher, 160 Lupin Drive, Springfield, Chelmsford, Essex. CM1 5FJ.
G3OFD, J. Walton (ex-Z27JW), 29 Drury Street, Darlington, Co. Durham. DL3 6NE.
G3OOK, J. Plenderleith, "Deroga", Whitwell Road, Sparham, Norwich, Norfolk.
G3PCN, R. P. Bown, 3 Eastcote View, Pinner, Middlesex. HA5 7AT (Tel: 01-866 3300).
G4AQS, M. W. Bliss, 53 Rowallan Drive, Bedford, Beds. MK41 8AS.
G4FRE, D. J. Robinson, 15 Ferry Lane, Felixstowe, Suffolk. IP11 8UR.
G4HBT, M. Foreman, 151 Cromwell Road, St. Andrews, Bristol 6, Avon. BS6 5EU.
G4MZC, B. J. Horsman, "Vale View", Green Lane, Churt, Farnham, Surrey. GU10 2PA.
G6FU, J. H. Cant, "Solana", Polstreath Hill, Mevagissey, Cornwall.
G8FXM, D. A. Toombs (ex-GW8FXM), 45 Poppyfields, Foresters Walk, Welwyn Garden City, Herts.

PRODUCT REVIEW

THE MET 144-6X CROSSED-YAGI TWO-METRE ANTENNA

In the last few years, the VHF amateur radio operator has had an increasing range of products from which to choose, including antennas. Another newcomer to this latter field is the Kent firm **Metalfayre**, who produce a range of VHF and UHF antennas under the brand name **MET**. Models are currently available for the 70, 144 and 432 MHz bands and the one reviewed here is the six element crossed Yagi for 144 MHz, type **144-6X**.

Electrical Design

In a recent *Short Wave Magazine* article⁽¹⁾ reference was made to the U.S.A. National Bureau of Standards's research into Yagi antenna design and the **MET** range is based upon this work. The **144-6X** represents the realisation of two 1.2λ Yagis at right-angles, each with a reflector and four directors. The driven element/reflector spacing is 0.2λ and the driven element/director and director/director spacings are 0.25λ in this design. The driven elements are Gamma matched to 50 ohms coaxial feeder and the N.B.S. and **MET** claimed gain per Yagi is 10.2 dBd.

Packaging and Instructions

The **144-6X** came via Parcel Post in a stout, long plastic "envelope." The smaller items, such as nuts and bolts, PVC boots, matching device components, etc., were packed in sealed plastic bags. The *Assembly Instructions* were on a single A4 sheet folded to four pages and included a parts list. The instructions are clear and the illustrations satisfactory. Also included was a useful map showing all the European two-metre beacons and their frequencies.

Mechanical Design

The boom consists of two unequal lengths of 19mm. square aluminium alloy tube, 1.5mm. wall thickness, and is 2.54m. long overall, when assembled. The two six-element Yagis are staggered by 20mm. and the distance between the front director and reflector of either beam is 2.47m. The driven elements are 6mm. diameter and all parasitic elements are 5mm. diameter alloy rods. The rear boom section is 1.51m. long and the shorter front piece has a piece of channel riveted-in and which fits into the end of the rear section. The actual joint is achieved by inserting the two No. 3 directors and tightening up the nuts.

All twelve elements have drilled-out bolts slipped over the rods, these bolts having been firmly positioned by centre punch at the factory to ensure the elements are symmetrical about the boom. A spare 8mm. nut is included in case you lose one any time. The rear boom has aluminium brackets riveted onto two sides by the driven elements to accommodate the silver plated N-type sockets for feeder connections. These sockets come with a length of threaded brass rod soldered on and which has to be screwed into a PTFE bush in the end of the Gamma match bar. This bar is 13mm. diameter and, with the brass rod inside, forms the capacitor part of the matching device. Preformed aluminium clips are provided for adjusting the match.

The mast clamp is an ingenious design, robustly made in steel, which is cadmium plated and passivated. The fixing bolts and U-bolts are plated, too. There are two adjustments, the first enabling you to clamp the boom so that the elements are vertical and horizontal, or at 45° in the "X" fashion. The second adjust-

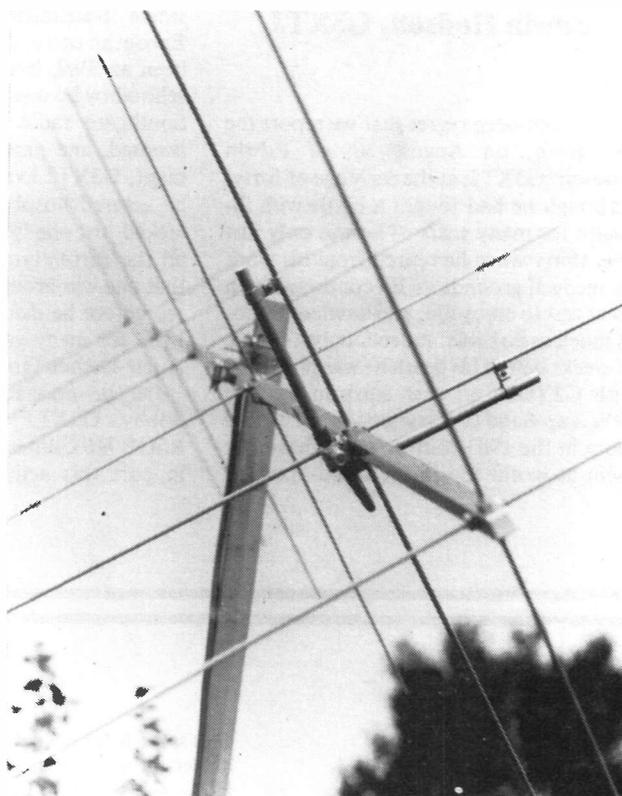


Fig. 1. General view from the rear of the MET Antenna type 144-6X. The mast-to-boom clamp is ingeniously designed to offer either a vertical and horizontal configuration, or an "X" or 45° one as depicted here.
photo: T. Traill

ment enables the boom to be tilted between 0° and 20° to the horizontal by means of slotted holes.

Assembly

The array was assembled without any problems. All the parasitic elements are numbered and colour coded and, if you read the instructions carefully, it will all go together properly.

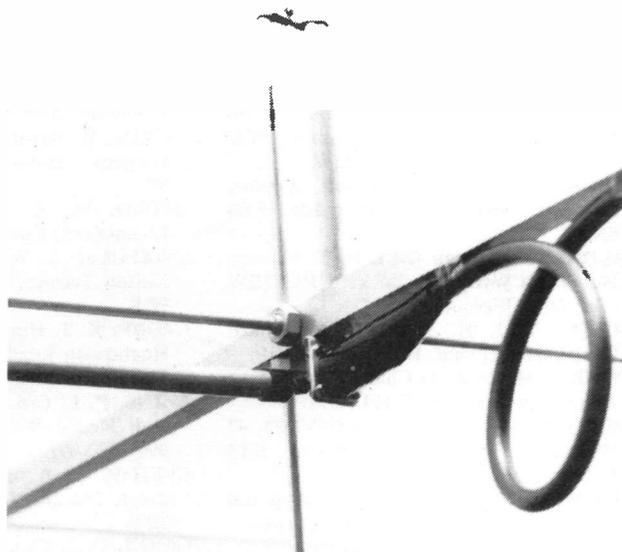


Fig. 2. Close-up of the Gamma match. The brackets for the special N-sockets are already riveted to the boom. The plastic boots are supplied, with a sachet of silicone grease, but not the N-plugs.
photo: T. Traill

Fitting the N-type sockets to their brackets was a fiddly business and it is strongly recommended that assembly be carried out in a garage, or on a surface where you can easily find the smaller items you are bound to drop; *not* on the lawn! Also, be careful you do not injure yourself or any assistant with the numerous elements sticking out on all sides. Little plastic boots are provided to protect the Gamma match connections and must be pushed on to the brass rods before the rather laborious task of screwing on the rods. A small sachet of silicone grease is supplied for smearing inside this assembly.

Figure 6 in the instructions illustrates the method of forming the feeders and the text suggests forming a three-turn, two-inch inside diameter "choke coil" and taping it to the boom. This is none too easy with the popular UR-67 cable and impossible with the fashionable H-100 coaxial feeder. The photographs show a one turn coil only. The feeder to the rear-most Yagi comes out "backwards," so has to be doubled back along the boom to the stub mast. Inevitably, the feeders will look a bit untidy. Large plastic boots are supplied to form a weatherproof cable-to-plug connection, a sort of "belt and braces" effort since the N-plugs are supposedly waterproof. The ends of these boots need to be trimmed back to fit your cable, but you will have to supply your own plugs.

The complete antenna, as supplied, weighs 2.03 kg. and the balance point is 1.12m. from the extreme rear end, about one-third the way from directors nos. 4, towards nos. 3; UR-67 cable will add about 0.5 kg. at the back end, thus bringing the balance point nearer the rear. Therefore you have to accept some bending moment on your rotator.

Using the 144-6X

The antenna was fixed to a short wooden stub mast for the tuning up procedure. The array was in the garden and, with the "shack" upstairs and nobody to operate the Tx, it was a very time-consuming business adjusting the Gamma matches. However, a satisfactory match was made on the first Yagi and the other one was set in the same relative position without further testing. The array was used mainly for reception of the new Oscar-10 satellite's "U" transponder downlink in the 145.9 MHz part of the band. With a 3SK88 preamplifier ahead of the Datong converter and Icom IC-730 transceiver, excellent signals were received from up to 40,000 kms. distance. The benefits of right-hand circular polarisation were evident at high elevations, as predicted by AMSAT.

It would seem sensible when using the 144-6X in the vertical and horizontal configuration, as opposed to the "X" mounting, to use a non-conducting stub mast. Particularly when tilted up, the stub mast is very close to one of the elements and a metallic one is bound to distort the polar diagram somewhat.

Further Analyses

The physical dimensions were compared with design data from the N.B.S. source and, making the appropriate allowances for element diameters and boom thickness and method of mounting the elements, it seems that the design frequency of this array is about 145.6 MHz, thus favouring the repeater and satellite end of the band. Unfortunately the reviewer's antenna noise bridge is only reasonably reliable up to about 100 MHz, so this could not be confirmed by measurement. One odd feature is the length of the driven element, 938mm., equivalent to only 0.455λ; this is about 2% shorter than inferred in the N.B.S. data.

A large bird, such as a carrion crow, is heavy enough to cause permanent bending of thin antenna elements, if it decides to use them as a perch. To put this into perspective, a load of 0.8 kg., about 1¾ pounds, applied towards the end of one of this Yagi's elements, would induce a bending stress in the 5mm. rod approaching the yield stress for the material. In other words, much more than that and the element would not spring back to the original shape. Such a load would cause a calculated deflection of about 130mm. The local crows seem to quite enjoy perching on

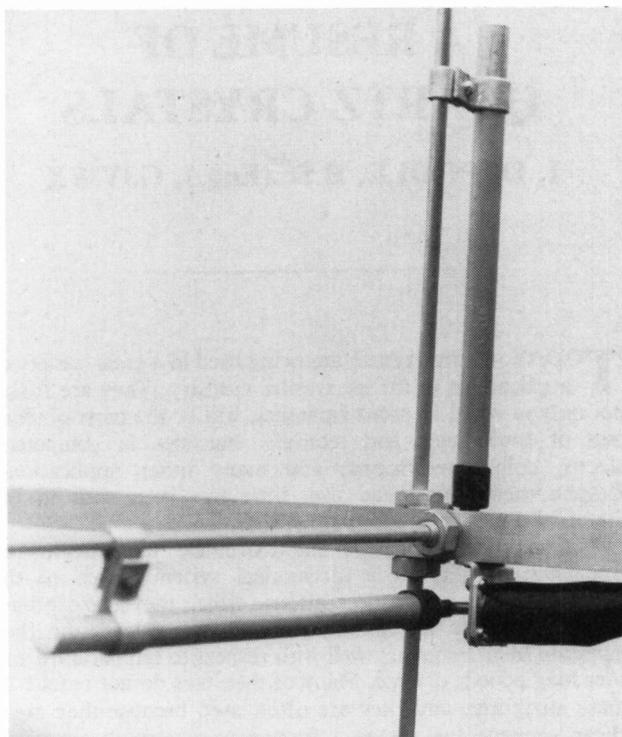


Fig. 3. Another close-up of the driven elements. A threaded brass rod is soldered to the N-socket, as supplied; the plastic boot is pushed onto the rod before screwing on the aluminium Gamma match rod. The boom is 19mm. square tube in two parts joined at elements no. 3; the driven elements are 6mm. diameter and the parasitic ones are 5mm.

photo: T. Trail

very thin, bendy objects, but they are an extreme case since most birds, in spite of their size, are very light.

The manufacturer did not include a comprehensive specification with the 144-6X, so no figures for so-called wind survival can be quoted.

About the only feature I would question is the method of joining the two parts of the boom using a 15 x 15mm. inverted "U" section of aluminium. This section has only 27% of the "strength" of the boom members, whereas a solid square bar inserted inside would have virtually the same section modulus as the boom.

Conclusions

The MET 144-6X antenna is a workmanlike product which should give a satisfactory electrical and mechanical performance. Since all the main parts and fixing bolts are of the same material, there would be no electrolytic corrosion. Even so, it is always a wise precaution to apply a protective coat of suitable varnish to prevent discolouration. For satellite users, this antenna, with a MET 432-17X seventeen-element 70cm. crossed Yagi, would form an ideal array for Oscar-10 "U" mode, if mounted on a horizontal boom through an elevation rotator. As only right hand circular polarisation is required, this could be done aloft, obviating the need for four feeders down the mast.

The 144-6X and other MET range antennas are manufactured by Metalfayre, 12 Kingsdown Road, St. Margarets-at-Cliffe, Dover, Kent, England, CT15 6AZ, to whom thanks are due for the loan of this interesting product. The current price is £37.86, ex-works, including VAT. Postage and packing charge is an extra £2.95.

N.A.S.F.

Reference

1. "VHF Antenna Gain or the Numbers Game," by N. A. S. Fitch, G3FPK, *Short Wave Magazine*, June 1983, p. 191.

A RESUMÉ OF QUARTZ CRYSTALS

I. D. POOLE, B.Sc.(Eng.), G3YWX

TODAY, quartz crystals are being used in a great variety of applications in the electronics industry. They are found not only in what, to radio amateurs, will be the most obvious uses of transmitters and receivers, but also in computers, clocks, colour televisions, and many other applications. Despite their widespread use, little has been seen in the literature about their modes operation.

Quartz crystals provide the extremely high degree of frequency stability of a mechanical system linked to the electrical system by the piezo-electric effect; they also exhibit a very high 'Q' as the losses within them are low, and they maintain their frequency well with respect to temperature and over long periods of time. Many of their uses do not require all these attributes, and they are often used because they are a cheap element for use as a frequency determining element within an oscillator.

The piezo-electric effect mentioned above is exhibited by certain crystalline substances and is the ability to develop an electric charge on their surfaces when subjected to mechanical stress. It is interesting to note that the converse is also true. The effect is found in several substances apart from quartz, and these include Rochelle salt, which exhibits the effect to a higher degree than quartz, and is consequently used in piezo-electric transducers such as crystal microphones and the like. Synthetic piezo-electric transducers are being used increasingly now, often as filters, but their frequency stability is less than that of quartz, and hence they are not used in oscillator applications.

In an electric circuit an element can be described in terms of various components in order to analyse the action of the real element. Accordingly the crystal can be analysed in a similar manner and its operation understood more clearly; the equivalent circuit is shown in Fig. 1. In this, C1 represents the electrostatic capacitance between the electrodes whilst L, C, and R represent the electrical equivalent of the vibrational characteristics of the material; the inductance being due to the mass, the capacitance due to the compliance and the resistance due to the mechanical losses such as friction. Therefore using this equivalent circuit the operation of the crystal can be understood more clearly. The values of inductance, capacitance and resistance are determined by the size of the crystal and the way in which it is cut and mounted.

As mentioned previously, one of the characteristics of quartz which makes it so desirable is its exceptionally high 'Q'.

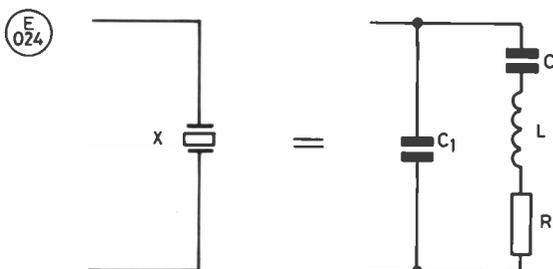


Fig.1 EQUIVALENT CIRCUIT OF A QUARTZ CRYSTAL

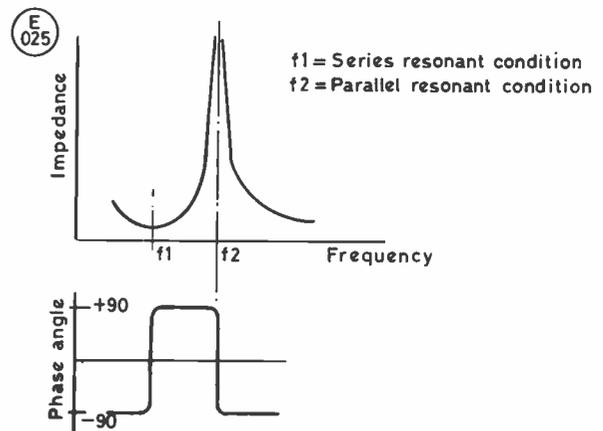


Fig. 2 GRAPHS OF IMPEDANCE AND PHASE v FREQUENCY

Values of 200,000 can always be obtained and in some circumstances it is possible to reach over 1,000,000, thus making it very useful in filter applications where very narrow bandwidths are required. However there are now many ceramic type filters which can be used in many filter applications where the exceedingly high Q's of quartz are not required.

Crystals can operate in one of two modes; parallel or series resonance. It is found that the parallel resonant frequency is slightly higher than the series one as can be seen from the graph of reactance and frequency shown in Fig. 2. In the series-resonant mode the reactances of L and C have equal magnitudes but opposite phases – the condition for resonance; as they are in series their effective total impedance is that due to the series resistance R. It is found that the external circuit conditions have very little effect on the resonant frequency. In the parallel-resonant condition the total reactance of L, C, and R summed is equal and opposite to the reactance of C1. This means that any external capacitance will become part of the resonant circuit, and this is the reason why manufacturers state a load capacitance for the crystal to operate at its stated frequency. The most common load capacitance for amateur applications is 30pF, although other values can easily be obtained.

The actual resonant frequency of a crystal depends on several criteria: mechanical dimensions, mode of vibration, constants of the crystal in this mode, etc., and this is complicated still further by the fact that the constants of the crystal can vary between different orientations, and there are several types of vibration. These different types of vibration can be split into several groups according to their mode of vibration: longitudinal, extensional, flexural, and shear. Also in addition to the fundamental modes there are various overtone modes which add still further resonant frequencies. It is interesting to note that although the 'Q' of these overtone modes is of the same order as the fundamental, the activity of these modes decreases with increasing order of overtone. The other point to note is that the overtone is very nearly, but not exactly, an exact multiple of the fundamental frequency.

It can be seen, therefore, that a crystal can possess very many different resonant frequencies, some related harmonically, and others not. This could lead to a crystal having many spurious oscillations. Fortunately the piezo-electric effect exhibited in some modes of oscillation is very small, and accordingly crystals can be judiciously cut to minimise spurious responses.

Other constraints have to be taken into account when designing a crystal. For example each particular mode of vibration has its own temperature coefficient. This is

dependent upon both the type of vibration involved and also the way in which the crystal plate is orientated with respect to the crystal axes. Some modes have positive coefficients whilst others have negative ones, and it is found that these coefficients themselves vary with respect to temperature. The type of cut used for most amateur applications is known as the AT cut, and this has a very low temperature coefficient over the range 0 to 40 degrees Centigrade, increasing below and above these temperatures.

It is found that the characteristics of a crystal will vary slightly with respect to time. Both the crystal's resonant frequency and its activity will change slightly, especially over the initial months of use. This phenomenon, which is known

conditions must be fulfilled within the circuit. The first is that the amplifier should contain sufficient gain to overcome the feedback network losses, and the second is that the overall loop phase shift should be 360 degrees at the operating frequency. To obtain the best performance the amount of feedback should be adjusted to be sufficient to reliably start and maintain oscillation, but not excessively high, otherwise the spurious outputs within the system will increase.

When using an inverting amplifier the loop phase conditions require that the feedback network supplies a further inversion to produce the overall 360 degrees. In this type of circuit the crystal is usually inductive at its stated operating frequency, *i.e.* its actual resonant frequency with no load capacitance is higher than its stated resonant frequency and requires its load capacitance to be presented to it for operation at the correct frequency. Therefore the operating frequency of the system can be trimmed to the exact frequency required by adjusting the load capacitance; this is the most commonly used type of circuit.

A non-inverting amplifier requires a network which gives a zero degree phase shift. This type of circuit is less commonly used.

As mentioned earlier there is a possibility of an oscillator producing spurious oscillations from other modes of vibration. This can be further reduced by making the oscillator circuit frequency selective. This is especially advantageous if harmonics are not required in the circuit.

Whilst this is by no means an exhaustive description of quartz crystals it is hoped that it has been both of use and interest.



"using a bent antenna here. . . ."

as 'ageing', is mainly due to the irregularities in the crystal surface caused by the cutting and lapping processes in manufacture; these irregularities allow foreign chemicals into the surface which change the properties of the crystal. Ageing is usually reduced by two methods. Firstly by improving the crystal surface, which can be done chemically by etching the crystal surface in hydrofluoric acid, or by optically polishing it. The second method is to mount the crystal in an inert gas or a vacuum to eliminate the possibility of any chemical reaction which would change the crystal surface.

One of the reasons for the widespread use of quartz crystals is the ease with which they can be incorporated into a circuit and made to work. To enable the circuit to oscillate, two



The new Linniplex F1 HF receiver has been specifically designed to give better and simpler access to the short wave broadcasts of the BBC World Service. Priced at £500 ex-works, complete specifications are available from the manufacturer, Phase Track Ltd., 132 Queens Road, Reading, Berks. RG1 4DG. (Tel: 0734-53933).

THE SIX-METRE BAND

A PERSONAL EXPERIENCE

HAROLD ROSE, G4JLH

THE international Six Metre amateur band extends from 50.000 to 54.000 MHz. The extent varies from area to area, for example VK is allocated 52-54 MHz whereas W and VE, JA, etc., are all allocated the full 4 MHz band width. Region 1, with the exception of Africa, Gibraltar and Cyprus, is not allocated the band. The main objection to allocation of band space in Europe by the authorities seems to hinge on the argument that amateur wireless cannot co-exist with the 'haunted fish tank' which also uses the Band 1 range of frequencies, even though it is well known that in Africa and the United States the two have existed alongside each other for many years. There are high hopes that when the BBC gives up its tenure of this band in 1983-86 we may be able to operate once again in this most interesting part of the radio spectrum.

Historical Note: Until March 1949 the amateur radio service was allocated a frequency band of around 58 MHz. Then along came the BBC who appropriated it for their box with its 'magic rays of light'.

On March 31st, 1949, all amateur activity ceased on the old five metre band. An eerie silence has reigned ever since, except during sporadic 'E' openings or sunspot cycle maxima, when occasionally amateur signals could be heard from other parts of the world who were still lucky enough to have been able to hold on to their 50.000 MHz amateur allocation.

However, following discussions between the RSGB and the Home Office, and more recently the BBC, an amateur allocation has been made on an experimental basis in this country, the first 40 permits being issued last February (G4JLH holds one of these permits — *Ed.*). The band of frequencies extends from 50.000-52.000 MHz. This is on a non-interference basis and operation is permitted outside of TV broadcasting hours only; hopefully, when the BBC vacates the band, the operating times will be extended to 24 hours.

Up to the time of writing, results have been encouraging. Many contacts have been made over fairly long distances, with the first two-way transatlantic QSO's taking place on June 19th (see "VHF Bands" in the August issue, p. 299).

Setting-Up a Listening Station for Six Metres

The simplest way to start on six is to build or buy a converter, which will convert signals from 50 MHz down to 28 MHz; this unit is connected to any reasonable 28-30 MHz receiver. The antenna need only be a simple dipole (an old band one television dipole fills the bill admirably).

In the author's case the first receiver used was a Hammarlund SP-600 'Super Pro' which covered the 50-54 MHz band. No band spread was available however, and during a good opening, due to a cramped dial, overcrowding occurred. The author then progressed to an FRG-7, fed by a *Microwave Modules* converter which in turn was fed by a home-brew pre-amp connected to a 2-ele quad at 25ft above ground level. The author's QTH is approximately 170ft a.s.l.

The present station consists of a Yaesu FT-101 Mk. II driving a Yaesu FTV-650B transverter. The transverter has been fitted with

a home-brew pre-amp and this is fed to a home-brew 4-ele quad at 25 feet above ground. The transverter, running a 6146B in the final, delivers around 25 watts RF output.

The height above sea level is not critical, there is at least one station known to the author which obtains excellent results at sea level.

Band Characteristics

The region around 50.000 MHz is probably one of the most interesting in the RF spectrum; this is because it lies on the borderline between HF and VHF. Both HF and VHF propagation characteristics are encountered on the six-metre band.

Because of its large bandwidth, 50-54 MHz, interesting phenomena occur when there is an opening. For example, when the maximum usable frequency (MUF) rises up above 50 MHz it may go up as far as 50.500 and no further, then the F2 layer plays a very large part in the way signals are propagated from point to point. At the same time, the higher frequency part of the band — from 50.500 to 54 MHz will still be 'closed' for long distance working. So the listener is confronted with a situation where a proportion of the band 'opens', and signals can be propagated by various modes, e.g. tropo-backscatter-E's-F2 layer or ducting, or indeed a mixture of two or more of these modes of propagation — whilst at the same moment in time, the rest of the band is still strictly governed by the rules of VHF, i.e. ducting-tropo-E's.

Consequently, the lower end of the six-metre band is the most interesting and is the part where all DX work is undertaken, simply because the MUF rarely rises above 50.500 MHz. The best frequencies to listen on when looking for openings are the LF end of the 6m. band; this is because the MUF rises up from LF to HF and frequencies lower down the spectrum will open before Six. As the MUF rises so it comes into the bottom end of the band and signals will begin to appear.

On the east-west path to the United States, signals will begin to appear as the sun rises on the eastern seaboard. Taking the time differences into account, one should not expect to hear anything from Stateside until midday in United Kingdom at the earliest. Occasionally, propagation does occur to South America during the United Kingdom's a.m. period, but this is by no means a regular occurrence, and should only be regarded as a bonus.

Conversely, in the early morning period, signals may well be heard from Asia or Australia. This is because the sun is just setting in those parts of the world, and just rising in Europe. There then exists a day-light path, and the MUF may well be high enough to allow propagation *via* the F2 layer from Hong Kong, Japan, Australia, etc.

The author's experience is that the six-metre band follows a fairly regular pattern of opening times to different parts of the world. It must be borne in mind that this part of the RF spectrum will only be useful for long distance traffic on a regular basis, at times of high solar activity, i.e. sunspot cycle maxima. The author's experience only covers this present cycle (no. 21). Others older in the game will, no doubt, have had longer experience with better equipment.

However, assuming that the sunspot cycle is at its maximum, the listener should begin to listen for the South African stations from early September onwards. When these stations are heard, the signal strengths on occasions will astound the listener who is new to the band. Propagation from S.A. will probably be *via* the F2 layer and may bear evidence of trans-equatorial flutter.

Around the middle to the end of October, the openings to the south will become more irregular in England. So, at this time, the listener should turn his antenna towards the United States on the short path. At around midday he should notice CW signals in the bottom segment of the 50.000 to 50.100 MHz band; these will undoubtedly emanate from eastern Canada, where there is a hotbed of activity on Six. As the sun moves higher in the sky and rises in more western locations, then signals will appear from eastern USA.

By this time the VE1s and V01s will be heard at exceedingly good signal strength, using SSB above 50.100. As the sun rises even higher and illuminates more of the American continent, then signals will be heard from further west, until eventually W6 and 7 will be audible.

By this time in the United Kingdom afternoon, the sun will be rapidly sinking in the west, and eventually will set. On a day of good conditions on Six, the band can be expected to stay open until about half an hour after sunset in the United Kingdom. At which time very deep fading will affect the eastern seaboard stations until they eventually fade out altogether.

While all this is happening on the 6m. band there is a continual international net in progress on 10m. on 28.885 MHz; this is commonly known as the "Six Metre Information Net". This frequency is also used for European stations to work crossband contacts with six-metre stations.

Most 6m. stations, when calling CQ, will listen on their own frequency and also on 28.885 or thereabouts; they always announce their 10m. listening frequency when they call on Six so the European station can then call in and work him crossband. The six-metre stations worldwide are always pleased to work

heard in the United Kingdom, these stations are consistently very strong, both on phone and CW.

The openings to Africa can last up until late April, and then everything seems to die away and one wonders if the rig is still working!

However, occasionally the listener will hear signals *via* tropo or early E's from Cyprus (5B4CY), or more likely from Gibraltar (ZB2VHF). The Cyprus beacon transmits FSK on 50.501 and the Gibraltar station sends FSK on 50.035 MHz.

The avid DX chaser will listen at regular intervals around this comparatively 'dead' time, and on occasions will be rewarded with openings which can vary in length from a few seconds to an hour or more.

From early May the listener on VHF can expect to experience openings in Europe *via* sporadic-E, and other forms of propagation, *e.g.* ducting or tropospheric. As the month of May advances, the incidence of E's increases, until by the middle or latter part of the month the openings should last most of every day in this part of the spectrum. It has been the author's experience that at this time of the year the openings on Six can begin just after sunrise and continue till well after sunset. Of course, if the 50 MHz band is open *via* this means, there is a possibility of these conditions affecting the higher frequency bands at the same time.

70 MHz is always worth a check, and if found to be open, then the band 2 broadcast is worth a look. If both of these bands are affected, then it is obvious that an opening might well occur on 144 MHz. Due to the extremely high level of activity on 2 metres, vast distances are likely to be worked during an E's opening. However, the openings at these higher frequencies will be of comparatively short duration, whereas the 50 MHz openings, as mentioned above, can last all day.

During these openings it will be noticed that very strong video carriers can be heard, which brings to mind an interesting activity which can be pursued in parallel with listening for amateur traffic on 50 MHz. In any amateur shack, a television receiver is a useful addition. However, if one can obtain a continental standard or a modified British 625-line VHF television receiver, then the listener will find some interesting DX television reception on band one during the sporadic-E season. Using his existing six-metre antenna array, and if necessary the pre-amplifier, the listener (or viewer, as he has now become) will find that 'Euro-television' is already a reality and quite 'long haul' reception is possible. At the author's station, pictures have been received from as far afield as Hungary, Czechoslovakia, Poland, Italy, Spain, Norway and Sweden. All this using a very old, unmodified television receiver of German origin, fed by a 2-ele quad. It should be mentioned at this point that the European television services use a system of 625 lines on Bands 1 and 3. This differs from the British system of 405 lines on Bands 1 and 3. Those wishing to pursue this aspect of the hobby should consult the monthly journals devoted to TV.

The sporadic-E season should last until early or mid August, at which time conditions will become variable until late August when sporadic-E will itself become sporadic or non-existent, and the listener is once again left to wonder if his receiver has 'given up the ghost'. We come now to a period of relatively 'dead' conditions leading up to the autumnal equinox. Ten-metres will begin to improve in September, and talk will abound on and around the 6m. information net frequency 28.885 MHz of the imminent 'bumper' DX season of Six! Once again the antenna should be turned towards the south and hopefully one will be rewarded by hearing ZS, EL and possibly ZD8, etc.

And so, here endeth the DX year on six-metres!

Crossband Working

Readers who wish to work crossband with the 40 permit holders in the UK, should call in on the 6m. net held daily on 80m. Frequency is 3.718 MHz from 07.00 onwards until 09.00. Participants in this net will be informed when and where to listen for a particular station, and which direction to turn the beam. Reports are extremely welcome and all callers whether they be newcomers or old hands, are encouraged to get set up for 6m.

| Frequency (MHz) | Callsign | Location |
|-----------------|----------|---------------|
| 50.010 | ZS1STB | S. Africa |
| 50.020 | GB3SIX | Anglesey |
| 50.030 | ZS6PW | S. Africa |
| 50.035 | ZB2VHF | Gibraltar |
| 50.035 | HC1JX | Ecuador |
| 50.038 | FY7THF | French Guiana |
| 50.050 | ZS6LN* | S. Africa |
| 50.055 | PY2AA | Brazil |
| 50.060 | ZS6DN | S. Africa |
| 50.075 | ZS3E* | S. Africa |
| 50.088 | VE3SIX | Nova Scotia |
| 50.110 | ZD8TC* | Ascension Is. |
| 50.125 | ZS3AK* | S. Africa |
| 50.501 | 5B4CY | Cyprus |

*Beacon operated by individual amateur, active only when operator is in the shack. All others are 24 hour operational.

Some six-metre beacons heard in the U.K. For a full list, contact the UK Six-Metre Group at the address given in the text.

crossband, because they can then gauge where their signals are being heard, by stations in areas where there is no six-metre allocation.

The openings on the east-west path should last through the Christmas and New Year period, and possibly up to February. By February the openings to the United States will become more intermittent and sporadic, and at this time the listener should begin to listen for signals on the north-south path once again. If any are heard in the United Kingdom or Europe the listener should call on 28.885, and the chances are that the African station will reply if he is in the shack. A crossband contact will then result — providing the 6m. signals are strong enough.

There are three stations known to be active on 6m. in Liberia. These are able to use spot frequencies in the lower end of the 50.000 MHz band; the stations are EL2AV, EL2FY and EL2CA. The spot frequencies are 50.030, 50.035 and 50.040 MHz. When

operation in anticipation of the time when the band becomes generally available.

Other frequencies which are currently in use for crossband contacts are as follows: 14.345, 21.385, 28.885, 70.185, 144.185, but the main UK net frequency because of its coverage is 3.718 MHz.

The following band plan (MHz) has been suggested by the UK Six-Metre Group:

50.000 } — CW and beacons only
50.100 }
50.110 — DX calling frequency SSB, CW only
50.200 — Local calling frequency
51.000 } — All modes
52.000 }

The above band plan follows guidelines similar to those in use in Region 2. From the author's QTH most of the English stations have been worked, plus one Welsh station, one Scottish station and one in the Channel Is. During the sporadic-E season this year

it is envisaged that all active 6m. permit holders will be contacted from this QTH.

If after reading this, the reader requires more information on this part of the radio spectrum, he may be interested to know that in the United States there is an organisation devoted entirely to six metres. This is known as the "Six Metre International Radio Klub", or "S.M.I.R.K." as it is commonly known. The address to write to is: S.M.I.R.K., c/o Ray Clark, K5ZMS, 7158 Stonefence Drive, San Antonio, Texas 78227, U.S.A.

A once-and-for-all payment of \$4 will cover postage costs for newsletters and other information which is mailed on a regular basis to all members.

In the United Kingdom a Six-Metre Group has been formed. Information concerning this group can be had by sending an *s.a.e.* to G4JCC, QTHR.

The author hopes the reader has gleaned something from this, and that through this article there may well be new call signs checking into the 6m. nets, and indeed calling "CQ crossband 80 to 6".

For further reading, see "Twenty One Years of TE" by R. A. Whiting and R. G. Cracknell, *Rad Com* June/July and August 1980, p. 626 and p. 785 respectively.

CLUBS ROUNDUP

By "Club Secretary"

HELLO again! Firstly, we must offer the regular reminder about updating your entry, and secondly we do appeal to you to put a date on your letters — after all, if we chuck one out of the pile too quickly you won't like it, and if you lose a new member because your data is obsolete, you won't like it either!

The Mail

Many and many a reader of this piece must have sat and cursed right outside the front door of the Hon. Sec. of Acton, Brentford & Chiswick when trying to get on to or leave the M4-North Circular Road junction; but, unruffled, he continues to be one of the most regular contributors. This month, he says, they are to be found on October 18, at Chiswick Town Hall, for a talk by G3XPC called "Further Experiences in DX Countries".

The Bath crowd have a steadily increasing membership, at the "Englishcombe Inn", Englishcombe Lane, Bath on alternate Wednesday evenings. More details of the doings from the Hon. Sec. — see Panel.

Belfast (College of Technology) membership is open to any interested members of either staff or student body, and they seem to have quite an active programme of events planned. Contact the Hon. Sec. for details.

Turning now to Biggin Hill, they show a meeting on October 18 on amateur radio satellites, the venue for this one being at the Biggin Hill Memorial Library.

Bishops Stortford have their main place at the British Legion club in Windhill on the third Monday of each month; this is the 'formal' affair with a talk or films, or whatever, but in addition

there is an informal get-together in the back saloon bar of the "Nag's Head" on the Dunmow Road going out east of the town.

If you follow that same road out of town, to Dunmow, and onward still, you will come to Braintree where the base is at the Braintree Community Centre, Victoria Street, next door to the bus station. On October 3 they will be organising their J-O-T-A set-up, and on 17th Tony How, G3PLF, will be addressing them in his capacity as the RSGB RR.

The Brighton crowd foregather at the YMCA, Marmion Road, Hove, on alternate Wednesdays. October 5 is down for a junk sale; nothing is yet shown on our list for 19th — but we know that the year in retrospect always shows a *filled* programme! So contact the Hon. Sec. — see Panel — for the latest details.

B.A.R.T.G. caters for all those with an interest in the hobby who prefer to make their contacts by way of a teleprinter keyboard, whether they use the old Creed machines, more modern electrical boxes, computers or AMTOR — all have an interest in joining this one. Details from the Hon. Sec. — see Panel.

British Rail write to indicate that they have an AGM coming up; Stanier House, Stephenson Street (adjacent to New Street Station) is the venue, at 1300, with all members and prospective members welcome. As for the date — they omitted it from the letter but our spies give us October 8. Details from the Hon. Sec. — see Panel.

Lancashire next, and Bury; this means Mosses Community Centre, Cecil Street, Bury, every Tuesday evening; the main meeting is on the second Tuesday, the rest being informals. October 11 should be good: it's the Constructors' Contest.

Next we come to Bromsgrove — they sent in three newsletters without a single mention of the club name! A spot of luck as one of the staff knows the locale well and identified them firmly! For details of the club, contact the Hon. Sec. — see Panel.

At Cambridge the club have their place in the Visual Aids Room on the ground floor of Coleridge Community Centre, Radegund Road, off Coleridge Road, Cambridge, every Friday when the centre is open. For October we are a bit short on the programme details but we see a talk on the Repeater Group down for October 14.

Stanton Room, Charlton Kings Library, Cheltenham, is used as base by the **Cheltenham** group. October 7 is down for a joint meeting with GCARS and SIRS clubs, but nothing for October 21 is shown — therefore to be brought up-to-date we must refer you to the Hon. Sec., see Panel for details.

The Stable Loft, Bury Farm, Pednor Road, Chesham, is the home, every Wednesday evening of the **Chesham** club; all the details from the Hon. Sec. — see Panel.

Cheshunt use the Church Room, Church Lane, Wormley, as their Hq. on Wednesday evenings. October 5 and 19 are natters, while October 12 is down for a talk on writing for amateur radio by G4FAI. On October 26, David Woollard of Rediffusion Engineering will be coming along to talk to members about a satellite receiving installation.

The **Chichester** crew seem to have settled nicely into their Hq. in the Green Room at Fernleigh Centre, 40 North Street, Chichester, where they are to be found on the first Tuesday and the third Thursday of each month. On October 4 they have *Wood & Douglas* to show their wares, and on October 20 there is a junk sale. Between these, the club will be putting on a J-O-T-A station over the weekend October 15/16 at Goodwood racecourse.

Turning to **Chiltern** we had a letter last time round from the Hon. Sec. saying he'd meet the deadline for October — but he missed! Luckily, we can say they foregather on the second and last Wednesdays in each month in the Science Block of the Sir William Ramsey School, Hazlemere, High Wycombe.

Cornish are still sitting in their temporary Hq. at Church Hall, Treleigh, on the old Redruth by-pass, where they will be found on October 6 listening to a talk by G4EIK and G4DTB.

For **Crawley** we have to say we don't know the programme details for October, but the Hon. Sec. will oblige — see Panel. As for the Hq. there is no doubt about that; it has been Trinity Church Hall, Ifield, Crawley, for as long as we can recall.

Cray Valley have a junk sale on October 6, and on 20th there is the usual natter evening; the Hq. is at Christchurch Centre, High Street, Eltham.

October 15 for **Crystal Palace** will be well attended as they have a junk sale; we wonder if someone will try and flog some of the ITA mast sections from the mast over the road — their Hq. is opposite the Big Stick, at the junction of Beulah Hill and Church Road, Upper Norwood.

Turning to **Derby** the big news is that G2CVV, for so long their Hon. Sec., has been seen "gadding about again" although he has not as yet attempted the stairs up to the top floor at 119 Green Lane where the club have their Hq. every Wednesday. For October 5 there is a junk sale, with a night-on-the-air on 12th; *Lowe Electronics* will visit on 19th, and the month ends with a natter evening on October 26.

At **Edgware** the second and fourth Thursdays of the month are the ones for the diary, and the Hq. address is at 145 Orange Hill Road, Burnt Oak, Edgware.

October at **Farnborough** needs you to locate the Railway Enthusiasts Club, Access Road, Hawley Lane, near the M3 bridge, on October 12 for a film night, and October 26 for a surplus equipment sale.

Over to **Fingal** now, and this means the Scouts Hall, Ballygall Road East, Dublin 11, every Monday evening.

The dates for **Fylde** are October 5, for constructional projects, and 18th when they will have a discussion on the 1984 programme. The venue is the Kite Club, Blackpool Airport.

Wednesday evenings are the ones favoured by **Gloucester** members, who head for St. Barnabas Church Hall, Stroud Road. As the AGM was last month we don't have any details of the new programme, for which we refer you to the Hon. Sec. — see Panel.

Turning now to the **G-QRP Club** we are looking at one of the most successful-ever groups — over 2000 members, all united by one main interest, namely that of low power operating and preferably with home-brew equipment. All the details about a great gang from the Hon. Sec. — see Panel.

October's meeting for **Greater Peterborough** is on the fourth Thursday evening at Southfield Junior School, Stanground,



Chesham & District A.R.S. scored a hat-trick this year, when three XYL's of club members passed the RAE with credits in both papers. The ladies have now got their callsigns and are looking forward to working the 2-metre band. Left to right, Linda Aldridge G6ZWG, Liz Cabban G6ETU, and Debbie Orgill G6WYU.

photo: G6LKS

when an 'A' licensee, un-named, will be showing and demonstrating his home-brew transceiver. However, as the letter didn't confirm either date or venue, perhaps a call to the Hon. Sec. — see Panel for his details — would be a Good Idea.

For **Harrow**, the venue is either the Roxeth Room or the Belmont Room, at Harrow Arts Centre, High Road, Harrow Weald, every Friday evening. Unfortunately they haven't given us the up-to-date programme!

There are so many meetings to go to at **Hastings** that we find it hard to sort 'em all out! The third Wednesday in the month is down for the main meeting, at West Hill Community Centre; the rest are at Ashdene Farm Community Centre, and of these we suggest you make a first start with the Friday chat nights.

Fairkytes Art Centre, Billet Lane, Hornchurch, is home to the **Havering** gang. October 5 is the quarterly business meeting, there is an informal on 12th, a talk about the latest happening in G8IXC's shack on 19th; and to round off the month, October 26 sees them having either a film or a video lecture.

Several months after **Hereford** were ousted from their Hq. by some comic-opera health-and-safety officials and their bumbledom, we are pleased to hear that the required work has actually *begun!* Meantime, the gang have been meeting as and where possible. October 7 is down for a normal club meeting, and on October 21st there is the Annual Bonzer Junk and Equipment Sale — for the venue, we must refer you to the Hon. Sec. or the use of a crystal ball — see Panel for G4CNY's details.

It is with some relief that we head for Cameron Youth Club, Planefield Road, **Inverness**, every Thursday evening, where they have several projects on the go at the time of writing.

We have to note, on behalf of I.R.T.S., that the correct dates for the EI/GI Ballymacshanlon shindig are *October 8 and 9* with tickets available from G18AYZ and EI2I — limited for the Dinner on the Saturday evening. The theme of the talks on the Sunday will be QRP, with presentations by members of the G-QRP Club and Con, EI9V — leading to the memorable line in the newsletter, "What more can you want — Wine, Women and Con?"

The **Isle of Man** has a thriving club which is to be found each Monday evening at the Keppel Hotel, Creg-ny-Baa, alternating as far as possible between social evenings and the technical stuff. More details from the Hon. Sec. — see Panel.

We head now for Aggborough Community Centre, Hoo Road,

Names and Addresses of Club Secretaries reporting in this issue:

- ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, Acton, London W3 8LB. (01-992 3778)
- BATH: T. Whitbread, 14 Arundel Road, Bennetts Lane, Bath BA1 6EF. (Bath 319150)
- BELFAST (College of Technology): J. Barr, 121 Kitchener Street, Belfast BT12 6LF.
- BIGGIN HILL: I. Mitchell, G4NSD, 37B The Grove, Biggin Hill, Westerham, Kent TN16 3TA. (09594 75785)
- BISHOPS STORTFORD: B. J. Salt, G4ITL, 135 Kingsland, Harlow, Essex. (Harlow 20478)
- BRAINTREE: Mrs. P. Penny, G6TAF, 13 Newnham Close, Braintree. (0376 26487)
- BRIGHTON: Ms. W. Firmager, 26 Brownleaf Road, Brighton.
- B.A.R.T.G.: E. Batts, G8LWY, 27 Cranmer Court, Richmond Road, Kingston-on-Thames.
- BRITISH RAIL: G. Sims, G4GNQ, 85 Surrey Street, Glossop, Derbyshire SK13 9AJ.
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- EDGWARE: H. Drury, G4HMD, 11 Batchworth Lane, Northwood, Middx. (Northwood 22776)
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- FINGAL: G. Birkhead, EI9DZ, 103 Roselawn Road, Castleknock, Co. Dublin.
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- GLOUCESTER: A. J. Martin, 12 Redwood Close, Podsmead, Gloucester GL1 5TZ.
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- HARROW: C. D. Friel, G4AUF, 17 Clitheroe Avenue, Harrow, Middx. HA2 9UU. (01-868 5002)
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- INVERNESS: R. Irwin, 40 Lavers Way, Kinmylies, Inverness IV3 6NU.
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- ISLE of MAN: Mrs. A. Matthewman, GD4GWQ, 20 Terence Avenue, Douglas, I.O.M. (0624 22295)
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- LINCOLN: Mrs. P. Rose, G8VRJ, Pinchbeck Farmhouse, Mill Lane, Sturton-by-Stow, Lincoln LN1 2AS. (Gainsborough 788356)
- MALTBY: I. Abel, G3ZHI, 52 Hollytree Avenue, Maltby, Rotherham, Yorks.
- MEDWAY: P. J. Poole, G4EVY, 5 River Drive, Strood, Rochester, Kent ME2 3JW. (Medway 76463)
- MIDLAND: N. Gutteridge, G8BHE, 68 Max Road, Quinton, Birmingham B32 1LB. (021-422 9787)
- MID-WARWICKS: Mrs. C. Finnis, G4TIL, 37 Stowe Drive, Southam, Warks. CV33 0NZ. (Southam 092681) 4765)
- NENE VALLEY: L. Parker, G4LPJ, 128 Northampton Road, Wellingborough, Northants NN8 3PJ.
- NEWBURY: M. J. Fereday, G3VOW, Spindlewood, Stoney Lane, Newbury, Berks. RG16 9HQ.
- PLYMOUTH: C. Stevens, 196 Lipson Road, Plymouth.
- PONTEFRAC: N. Wittingham, G4ISU, 7 Ridgedale Mount, Pontefract, Yorks. WF8 1SB.
- QTI TALKING NEWSPAPER: Hon. Sec, c/o 79 Narrow Lane, North Anston, Sheffield S31 7BJ.
- R.A.I.B.C.: Mrs. F. Woolley, G3LWY, 9 Rannoch Court, Adelaide Road, Surbiton KT6 4TE.
- REIGATE: C. S. Barnes, G8FEE, 25 Hartswood Avenue, Woodhatch, Reigate, Surrey RH2 8ET.
- R.A.F. (Lancs.): F. S. Jackson, G6FTB, 27 Prairie Crescent, Burnley BB10 1EU.
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- SHEFFORD: A. R. Little, G4PSO, 41 St. Michaels Road, Hitchin, Herts. SG4 0QA. (Hitchin 57946)
- SKELMERSDALE: G. Rogers, G60MN, 113 Foxfold, Fosters Green, Skelmersdale, Lancs.
- SOUTHAMPTON: K. Stanley, G6CPE, 35 St. Blaize Road, Romsey, Hants. (Romsey 514811)
- SOUTHDOWN: T. Rawlance, G4MVN, 18 Royal Sussex Crescent, Eastbourne.
- SOUTH ESSEX: D. V. Pritchard, G4GVO, 55 Walker Drive, Leigh-on-Sea, Essex.
- SOUTHGATE: J. Fitch, 16 Kent Drive, Cockfosters, EN4 0AP. (01-440 7353)
- SPALDING: I. Buffham, G3TMA, 45 Grange Drive, Spalding, Lincs. PE11 2DX. (Spalding 3845)
- SPEN VALLEY: I. F. Jones, G4MLW, 54 Milton Road, Liversedge, Heckmondwike, W. Yorks. (Heckmondwike 409739)
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- STOCKTON: J. A. Walker, G6NRY, 7 Widdington Court, Stockton-on-Tees, Cleveland, TS19 8UF.
- STOURBRIDGE: M. Davies, G8JTL, 25 Walker Avenue, Quarry Bank, Brierley Hill. (Lye 4019)
- SURREY: R. Howells, G4FFY, 7 Betchworth Close, Sutton, Surrey SM1 4NR. (01-642 9871)
- SUTTON & CHEAM: J. Korndorffer, G2DMR, 19 Park Road, Banstead, Surrey.
- SWALE: B. Hancock, G4NPM, Leahurst, Augustine Road, Minster, Sheerness, Kent ME12 2NB.
- SWINDON: W. Orr, G41YW, 44 Fairlawn, Lidin, Swindon, Wilts. (0793 27227)
- THANET: I. B. Gane, G4NEF, 17 Penschurst Road, Ramsgate, Kent. (Thanet 54154)
- UK FM GROUP (SOUTHERN): T. Emery, G3KWU, Wilverley, Old Lyndhurst Road, Cadnam, Southampton SO4 2NL.
- VALE OF WHITE HORSE: I. White, G3SEK, 52 Abingdon Road, Drayton, Abingdon, Berks. (0235 31559)
- VERULAM: E. Bailey, G4KLQ, 50 Bettespaw Meadows, Redbourn, St. Albans, Herts. AL3 7EW.
- WACRAL: L. Colley, G3AGX, Micasa, 13 Ferry Road, Wawne, Hull, Yorks. HU7 5XU.
- WAKEFIELD: W. Parkin, G8PBE, 14 Cleveland Grove, Lupset Park, Wakefield WF2 8LD. (Wakefield 378727)
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- WIRRAL: N. B. McLaren, G4OAR, 596 Woodchurch Road, Oxton, Birkenhead. (051-608 1377)
- WORCESTER: A. G. Lindsay, G4NRD, 11 Durcott Road, Evesham, Worcs. WR11 6EQ. (Evesham 41508)
- YEOVIL: E. H. Godfrey, G3GC, 60 Chilton Grove, Dorset Road, Yeovil, Somerset BA21 4AW.
- YORK: K. R. Cass, G3WVO, 4 Heworth Village, York.

Kidderminster, where the **Kidderminster** group foregather fortnightly; more details from the Hon. Sec. — see Panel for his details.

Now **Lincoln**, where they have a place at the City Engineers Club, Central Depot, Waterside South, Lincoln; October 5 and 19 are down for the RAE class, October 12 is set aside for a talk on slow-scan TV by G3CCH, and on October 26 they have some nostalgia in the form of a film show of European steam trains.

Turning now to **Maltby** we have a letter from their P.R.O. "enclosing a newsletter" — which we didn't get! However, all is not lost since the lad put the essential stuff into the letter, namely that the club are in session at the Methodist Hall, Blyth Road, Maltby, on October 7 for a talk on telephone systems and October 21 for G3OZN's RTTY lecture/demonstration.

For the **Medway** crowd, the list of dates we have is obviously a notification of the special events, among which we note October

21 for a social evening; the venue is the Number One Hall, St. Luke's Church, King William Road, Gillingham, where they seem to be informally available every Friday.

A very short note advises us of a change of name and address of the Hon. Sec. at **Mexborough** — see Panel. She can doubtless pass on details of the club to any interested new members or visitors.

October 18 is AGM-time for the **Midland** crowd, at 294A Broad Street, opposite the Repertory Theatre in Birmingham; and we believe they are to be found at the same place, certainly on Wednesday evenings, but also on other dates too — try checking with G8GAZ on S17 at any reasonable time of day.

Mid-Warwickshire have their place at 61 Emscote Road, Warwick; find them there on October 4 for a natter, or on October 18 for a Safety talk by G8CXL.

A new club now, at least to our columns, at **Nene Valley**; they have their base in the "Dolben Arms" in Finedon, where on October 5 they will natter and transmit, while on 12th they have a talk by G8MEH on the Aylesbury Vale Repeater Group. They have a station active in J-O-T-A and then on 19th there is an RSGB lecture, hopefully by G3RPE. October 26 will again be a natter evening but with a stall by *Garex* to encourage the home-brewers.

At **Newbury** October 11 is the date and Newbury Technical College the venue, for a talk on RSGB by John Nelson, G4FRX.

Pressing on regardless, we head down to **Plymouth**, and the new Hq. will be at Penlee Secondary School, Somerset Place, Stoke, Plymouth; on October 2 there is the club VHF/UHF contest, and on 3rd they have a talk on computers in amateur radio, leaving October 17 for G3XLU to talk about the complexities of air-sea rescue. Finally on October 31 they have an 'activity night' which implies operating the club rig, home-brew competition and doubtless nattering.

Now up to **Pontefract**; find them at Carleton Grange Community Centre, Carleton, Pontefract, every Thursday evening.

QTI Talking Newspaper group is based at 79 Narrow Lane, North Anston, Sheffield S31 7BJ. As their name implies, they are mainly interested in recording readings from amateur radio magazines for the blind, and they can always use some extra help and new members. Details from the Hon. Sec. — see Panel.

Next we come to **R.A.I.B.C.**, catering for the disabled and blind members of our hobby; and of course here again they could always use supporters and representatives. Details from the Hon. Sec. — see Panel for the address.

On to **Reigate** where the Hq. is at the upstairs meeting room of the Constitutional and Conservative Centre, Warwick Road, Redhill, Surrey on the third Tuesday of each month.

R.A.F.A.R.S. is making attempts to organise regional groups, and among the first is the one in Lancashire, which seems to be based on the RAFA at Preston. More details from the Hon. Sec. — see Panel.

Royal Navy group is open to present and past members of the Royal Navy, of the Merchant Navy and of foreign navies; all the details of this group from the Hon. Sec. at the address in the Panel.

On now to **Sefton**. The club will be in session on October 5 and 19, at Walton Prison Officers Club, Hornby Road, Walton, and every fortnight on Wednesday thereafter.

The absence of **Shefford** from these columns of late is all explained away now; the group continue to foregather at the Church Hall, Ampthill Road, Shefford, every Thursday evening after their summer lay-off.

Also on every Thursday evening is the club at **Skelmersdale**, their Hq. being at Dunlops Sports & Social Club, White Moss Road, Skelmersdale, Lancs.

Now **Southampton** where they have just had an AGM, and are doubtless putting the programme together; the last summer has seen they say, some spectacular successes, including putting on two special-event stations on the same day! They are to be found at Bittern Park School, Bittern, Southampton, every Wednesday evening.



Scenes from the recent Scottish Amateur Radio Convention at Cardonald College, Glasgow. Above, Glasgow's Lord Provost listens on the HF rig, assisted by Anne Hood, GM6PYQ. Below, Morse tests were run by Robert Dixon, GM3ZDH; looking on are, left to right, GM6NOX, GM6IWN, GM6PSN, GM6UHU and GM4DOX.

photos: GM4SRL



On the first Monday of each month, the **Southdown** members all head for the Chaseley Home for Disabled Ex-Servicemen, Southcliff, Eastbourne, Sussex. No data on the latest programme.

The **South-Essex** group have a base at The Paddocks, Long Road, Canvey Island every Wednesday evening; the club newsletter doesn't give details of the forward programme, but we hear that it is a very good and go-ahead club.

It's the second Thursday each month for **Southgate**, the venue being St. Thomas' Church Hall, Prince George Avenue, Oakwood, London N14. The October 13 activity was not finalised at the time of their letter.

October 14 at **Spalding** is a talk on computers and amateur radio, by Terry Roberts, at Maples Room, White Hart Hotel, Market Place, Spalding. Other details from the Hon. Sec. — see Panel.

At **Spen Valley** the club is happy to report that they have just concluded a very successful year with an AGM at which the Hon. Sec. was re-elected (shot-gunned?) for another term. Find them at

Old Bank Working Men's Club, Mirfield, every Thursday evening, or contact the Hon. Sec. for more details.

Stevenage are in session on October 4 and 18; the former is a talk on making a home-brew lattice tower by G8EKU, and the latter date is a talk on batteries by an *Ever Ready* company representative. Both are at *TS Andromeda*, Fairlands Valley Park, Shephall View, Stevenage.

Turning now to **Stockton**, we find the local gang to be meeting at the Oxbridge Hotel, Stockton-on-Tees, every Monday evening. For the other details, including their RAE course, contact the Hon. Sec. — see Panel.

Stourbridge meet nowadays in "The Garibaldi", Cross Street, where they have an informal on October 3 and settle the last details for J-O-T-A as well. October 17 is the main meeting, and at this G4HUP will be talking about meteor scatter propagation at VHF.

Deadlines for "Clubs" for the next three months —

November issue — September 30th

December issue — October 28th

January issue — November 25th

February issue — December 30th

Please be sure to note these dates!

TS Terra Nova, 34 The Waldrons, South Croydon, has a first-floor mess-deck which is home to **Surrey** on first and third Mondays; October 3 is provisionally down for a talk on advanced consumer electronics.

A change of Hon. Sec. is to be noted for **Sutton and Cheam**, to G2DMR — see Panel. October 7 see the group at Sutton College of Liberal Arts for a showing of "The Ham's Wide World" from RSGB; and on October 21 they will be at the Downs Tennis Club, Holland Avenue, Belmont, Cheam, for a surplus equipment sale. This sounds like a change of venue we didn't know about — will someone please confirm?

A prospective **Swale** member should mark down first *Nina's Restaurant*, 43 High Street, Sittingbourne, and then go there on a Monday evening — they are there each week. October 3 sees them having the pleasure of a talk on QRP operating and the G-QRP Club from G3VTT — who better?

Every Thursday the **Swindon** lads go to Park School, Marlowe Avenue, Swindon; for more details on the current programme we must refer you to the Hon. Sec. — see Panel.

The **Thanet** group doesn't mention its Hq. address, but they do say that on October 11 they have an AGM, and on 25th a video evening, not to mention taking part in the J-O-T-A weekend. For the rest we must refer you to the Hon. Sec. — see Panel for his details.

October 5 at **Chineham House**, Shakespeare Road, off Popley Way, Basingstoke, is the detail for **UK FM Group (Southern)**; the activity is a surplus equipment sale.

Turning now to the **Vale of White Horse**, they have a junk sale on October 4, at the Canteen & Social Club, Milton Trading Estate, Milton, near Abington. This is on a new arterial road which runs from the A34 to Didcot; from Didcot end along this road to the Steventon end roundabout and take the last outlet (almost reversing your direction) which is the road to the trading estate. The main gates are about 200 metres along the road on the right; enter and turn left, or ask the security people for the club.

Verulam have their place at the R.A.F.A. Hq., New Kent Road, St. Albans. For the details of the club dates, programme

and so forth, we must refer you to the Hon. Sec. at the address in the Panel.

WACRAL is a group of radio amateurs and SWLs who are all committed Christians; for all the details, contact the Hon. Sec. — see Panel.

At **Wakefield** they have booked October 4 for a talk on computers for beginners; and on 18th they have that popular Northern treat, a Pea and Pie Supper. Both are at Holmfild House, Denby Dale Road, Wakefield.

We don't have the October programme or dates for **West Kent**, most surprisingly, so we refer you to the Hon. Sec. — see Panel for his address.

They had a special-event station going for **Westmorland** at the recent Kendal Steam Gathering, which ended in a thunderstorm and the rapid — and nerve-shattering — dropping of their 30-foot mast as a result! The club meets on the second Tuesday of each month in the upstairs room at the "Strickland Arms", just south of Kendal on the A6, signposted Sizergh Castle which is just past the pub. New members and visitors welcome, of course.

At **Wirral** the Hon. Sec. is about to change his address, so we suggest you try and find them at the "Seven Stars", Thornton Hough on October 5, or on the 19th at the Victoria Lodge, Tranmere; these are the informals as the main meetings are at Irby Cricket Club on the second and fourth Wednesdays of each month.

Worcester's detailed letter ends at the last date in September so we must refer you the Hon. Sec. for the latest details — see Panel. The venues are: for the formals the Oddfellows Club, New Street, Worcester, and for the informals the "Old Pheasant" in the same street.

A change of Hon. Sec. is notified by **Yeovil**; G3GC takes over after doing similar work for years in the London area. Find the club lads every Thursday evening at the Recreation Centre, Chilton Grove, Yeovil.

Finally **York**, where the lads are to be found every Friday evening at the United Services Club, 61 Micklegate, York.

Finale

For another month; the deadlines are, as ever, in the 'box' in the body of the piece and are for your mail to arrive, addressed to "Club Secretary", **SHORT WAVE MAGAZINE**, 34 High Street, Welwyn, Hertş. AL6 9EQ. Be seein' ya!

Mobile Rally

November 5, North Devon Mobile Rally, Bradworthy Memorial Hall (near Holsworthy), 10.30-5 p.m., bring-and-buy stand, etc., talk-in on S22. Details from G8MXI, QTHR.

Special Event Stations

October 8/9, Douglas Valley A.R.S. will be operating GB2WLE and GB8WLE from 10 a.m. to 5 p.m., to publicise Wigan Leisure Exhibition; bands will be 70cm. to 160m.

October 15/16, Tomintoul scouts will be operating GB2ST during J-O-T-A. Tomintoul is the highest village in the Scottish Highlands and this will be highlighted, together with its links with the Glenlivet whisky trade, on a special J-O-T-A QSL card.

W.G.C. RAE Course

In last month's issue we stated that G. L. Benbow, G3HB, was the lecturer for the RAE course at De Havilland College, Welwyn Garden City. This is incorrect, and we apologise to G3HB for the error.

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