THE SHORT WAVE MAGAZINE

WORLD WIDE COMMUNICATION

FOR THE RADIO AMATEUR AND AMATEUR RADIO
LOWE ELECTRONICS

TRIO 2m FM Transceiver

The rig with all the options
2 Metre FM mobile transceiver TR7200G

The TR7200G is now the best selling two metre FM mobile transceiver in Europe. It has always been a favourite all over the world among radio amateurs who demand the very best in performance and construction. Now with a complete range of accessories, the TR7200G offers the ultimate in fixed station and mobile FM operation.

Performance plus

High receiver sensitivity (typical measured performance 0-3µV for 15dB quieting) gives you a solid readable signal from long distance stations. Also it helps to combat flutter on the received signal when you are mobile in a town since the limiting threshold is superbly low. Minimum transmitter output of 10 watts (typically 14-15 when on the move) together with carefully tailored audio response and a new integrated circuit limiting amplifier gives your signal that outstanding quality that makes people listen. The matching Trio dynamic microphone supplied with the rig further adds to the signal quality and readability.

Repeater access tone

Generated by the Trio exclusive tuning fork controlled 1750 Hz oscillator. This is the tone generator that does not drift even when the interior of the transceiver is being cooked through sitting in a hot car on a summer's day. Stabilised amplitude output for constant deviation under all conditions. Access first time, every time.

Superb squelch performance

Utilising the very latest in noise signal detection techniques for a squelch sensitivity of better than 0-5µV. This simply means that you can be sure that the weakest usable signals will open the squelch when with other rigs, you always wonder if you are missing something with the squelch in operation.

Switched TX output power

1 watt or 10 watts by the touch of a button. Dial illumination colour change to indicate power level in use. Fully variable PA protection which gradually reduces power input to PA with increasing SWR. This allows you to continue operating when your mobile antenna gets wet (and rain really does change the SWR on most antennas).

Features, features

The 22 channel dial is engraved with all R and S channel numbers so you don't have to wonder "did I put R6 in chan 11 or 12?". It also, incidentally, has channels designated A, B, C, etc. for your Raynet or local frequencies. The LED under the channel number is RF powered and only lights on the channels fitted with a receiver crystal. The "on air" lamp is also RF powered but from the transmit crystals so you know precisely what crystals you have in the rig. Best engineered mobile mount on the market gives instant slide in/slide out installation with no nasty little screws to fiddle with. Just in case someone else wants to slide out your rig, there is provision for a padlock through the mounting slide to prevent it (of course he could remove the entire dashboard complete with rig). The TR7200G case is dust tight and waterproof and reflects the Trio no compromise design approach. Public address facility. Switchable receiver sensitivity. Helical front and filter, etc., etc. It's the best mobile FM transceiver on the market. Now look at the price, £110 (VAT exc.) fitted 5 channels.

VFO 30 G External transmit/receive VFO

Matching VFO for TR7200G with some superb construction. Gives full 144-146 MHz band coverage with built-in 600 kHz repeater shift at the touch of a button. Illuminated dial and centre zero tuning meter for easy operation. Built-in calibrate facility allows accurate dial setting against TR7200G crystals. Low frequency heterodyne type VFO for first class stability under all conditions.

PS5 power supply

To complete the station, the PS5 allows home operation of the TR7200G from 120—240v. AC mains supplies. Electronically regulated 13.8v. DC at 3-2A with tyristor secondary protection. Built-in digital clock with 24 hour timer.

Sole Importers:
LOWE ELECTRONICS
Cavendish Road, Matlock, Derbyshire
LOWE ELECTRONICS

THE SHORT WAVE MAGAZINE
August, 1975

LOWE ELECTRONICS
IS NOW AVAILABLE
IN THE SOUTH
EAST

TS900
TS700
TS520
TR7200G
QR666
TR2200G

NEW BRANCH OPENING

Over the last year, there has been a growing demand from the South London area, for a Lowe Electronics branch to be sited there. The price of petrol, and the general increase in the cost of motoring has made it difficult for the average radio amateur to justify a long journey taken just to see the latest amateur radio equipment. We have done what we could to help by making appearances at the major rallies and attending club evenings to demonstrate and talk about equipment but we were aware that there was a need for a permanent home South of the river.

We are delighted, therefore, to announce the opening of a new Lowe Electronics branch in Carshalton. This will be operated by Peter Burton, G3ZPB, who will be stocking and selling the complete range of Trio equipment together with all the other popular Lowe Electronics lines.

Those of you who know Peter will be aware of his courtesy, kindness and reputation for fair dealing. Those of you who have not yet had the pleasure of meeting him, should rush down to Carshalton and press money into his hand in exchange for numerous goodies.

The Office is on the main A232 Sutton Road, just past Carshalton Ponds on the other side of the road.

LOWE ELECTRONICS
SOUTH EAST BRANCH  39 POUND STREET, CARSHALTON, SURREY
OFFICE HOURS : 10 a.m.-6 p.m. MONDAY-FRIDAY
LOWE ELECTRONICS

TRIO
TS900 and AC power supply £480.00
DS900 DC power supply £64.00
VF900 external VFO £40.00
TS900 filter £29.00
TS520 transceiver £290.00
VFO520 external VFO £55.00
SP520 optional external speaker £21.00
TS520 CW filter £21.00
TS700 2m. all mode transceiver £300.00
Fixed channel crystals for TS700 £32.00
VOX unit for TS700 £15.00
TR7200 2m. car transceiver £110.00
TR2200G hand held 2m. transceiver £80.00
Crystals for TR7200G or TR2200G, each £2.32
Crystals as above per channel £4.20
VF530 external VFO for TR7200 £35.00
VF0900 external VFO £160.00
TRIO
AGENTS
Alan GW3YSA, 35 Pen-Y-Waun, Efail Isaf, Nr. Pontypridd. Tel. Newton Llantwit 3809
John G3JYG, 16 Harvard Road, Ringmer, Lewes, Sussex. Tel. Ringmer 812071
Sim GM3SAN, 19 Ellismuir Road, Bailleieston, Nr. Glasgow. Tel. 041-771 0364

 microwave modules
MMC144/28 LO £16.30
MMC70/28 £15.20
MMC432/14 £18.10
MMC432/24 £18.20
MMC1296/28 £24.00
MMC1296/144 £24.00
MMC1296 £24.00
MV1062 £25.00

GALAXY
R1530 General coverage receiver £750.00
HALLICRAFTERS
FPM-300 Mk. II Transceiver £290.00
Mobile kit for FPM-300 £200.00

VENUS SLOW SCAN TV
SS2 slow scan station receiver £230.00
SS2 slow scan station monitor £155.00

C-1 camera £255.00
F-1 single frame cassette £2.00
T-G grey scale tape £3.00
T-C checkerboard tape £3.00
P-1 Polaroid camera hood £17.00
V-1 viewing hood £7.00

ANTENNAS
2m. "J" BEAMS 50 ohm impedance only £14.30
5Y/2M 5 element Yagi £4.30
8Y/2M 8 element Yagi £5.60
10Y/2M 10 element Yagi £6.00
5PB-912M 5 element parasbeam £11.00
5PB-6K7 5 element parasbeam £11.00
10PB-912M 10 element parasbeam £14.10
10PB-92 10 element parasbeam £16.10
5PB-8Y7 5 over 5 slot fed Yagi £7.92
5PB-8Y8 5 over 8 slot fed Yagi £10.50
PMH12/2 2 wave phasing harness £2.85

SVMK/2M 2M mounting kit £2.20
X/D/2M crossed dipoles £5.75
UGP/2M Unipole and ground £4.15
PMH12/2M 2 wave phasing harness £3.95
PMH14/2M 4 wave phasing harness £9.15

70cm. "J" BEAMS £110.00
D8/70 5 over 8 slot fed Yagi with 32" boom £9.00
MBM46/70 46 element multibeam £12.00

2m. MOBILE WHIPS
"J" Beam £12.00
1.65 wave vertical swivel mount £6.50

G-WHIPS
Tri-band 20, 15 and 10m. £12.30
Multimode 20, 15 and 10m. £14.30
160, 80 or 40m. coils for the above each £4.10
Top hf spigot for the above £1.10
Base mount for all G-Whips £1.65

H.F. BEAMS
Hy-Gain TH3 1500 £74.00
Hy-Gain Mk. 3 20, 15 and 10m. £99.90

VERTICALS
Hy-Gain AVQ 20 20, 15 and 10m. £25.50
Hy-Gain 14AVQ 40, 20, 15 and 10m. £36.00
Hy-Gain 18AVT/WB 80, 40, 20, 15 and 10m. £56.00

All Prices Exclude VAT and Carriage

HEAD OFFICE
119 Cavendish Road, Matlock, Derbyshire. Tel. 2817 or 2430 9 a.m. to 9 p.m.
BRANCH OFFICES
Goring Road, Steyning, Sussex. Tel. Steyning 814466
Soho House, 362-4 Soho Road, Handsworth, Birmingham Tel. 021-554 0708
AGENTS
Alan GW3YSA, 35 Pen-Y-Waun, Efail Isaf, Nr. Pontypridd. Tel. Newton Llantwit 3809
John G3JYG, 16 Harvard Road, Ringmer, Lewes, Sussex. Tel. Ringmer 812071
Sim GM3SAN, 19 Ellismuir Road, Bailleieston, Nr. Glasgow. Tel. 041-771 0364
OPENING HOURS: 9-5.30 TUESDAY TO SATURDAY INCLUSIVE

73 from BILL G3UBO/VE8DP, ALAN G3MME, JOHN G3PCY/5N2AAC, IAN G3ZYC
introduce the NEW
FT-221
with the following features:

- Covers 144-148 MHz in 8 bands
- AM - CW - USB - LSB - FM
- Full Repeater and Reverse Repeater
- VFO or II Channel options

Price? Well the best always costs a little more so at £330 (exc. VAT) This is the connoisseur's choice.

TO MATCH THE PERFORMANCE OF YOUR FT-221!

BANTEX/FIBREGLASS MOBILE ANTENNAS
(Carr. 75p) (Ex-Stock) + VAT

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Type</th>
<th>Description</th>
<th>Price (ex. VAT)</th>
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<tr>
<td>70/1 70 MHz</td>
<td>BGA</td>
<td>Fibreglass mobile antenna</td>
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<tr>
<td>144/144 MHz</td>
<td>BGA</td>
<td>Fibreglass mobile antenna</td>
<td>£2.85</td>
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<td></td>
<td>Magnetic mount</td>
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GEM-QUAD. FIBREGLASS 10-15-20m. QUAD

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<td>2 ele.</td>
<td>3 ele.</td>
<td>Fibreglass quad</td>
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HY-GAIN (Carr. paid) + VAT

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<th>Type</th>
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<tr>
<td>Hy tower</td>
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<td>10-20m.</td>
<td>Antenna</td>
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J BEAM (Carriage 75p and VAT extra)

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<th>Description</th>
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<tr>
<td>TAS 5/8</td>
<td>Pivoting mobile</td>
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MOSLEY (Carr. £2) (Ex-Stock) + VAT

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<tr>
<td>Mustang</td>
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<td>TAJ 3 Jnr.</td>
<td>'E' for 2&quot; mast</td>
<td>£53.00</td>
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<td>SWL</td>
<td>Listeners dipole</td>
<td>£16.00</td>
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<td>TAJ 2 Jnr.</td>
<td>'F' for 2&quot; mast</td>
<td>£27.00</td>
</tr>
<tr>
<td>TAJ 3 Jnr.</td>
<td>Rotary dipole</td>
<td>£23.00</td>
</tr>
<tr>
<td>HU8/2m</td>
<td>Dipole</td>
<td>£4.00</td>
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</table>

Price ! Well the best always costs a little more so at £330 (exc. VAT) This is the connoisseur's choice. Delivery? Our first consignment left Tokyo early July so should be available early September.
The first supplies of this new multi-mode transceiver from INOUE will be with us this month and we will be having regular monthly deliveries after that. The quota for August has already been sold but there are still a few left for September. We have had a couple of samples for testing for the past two months and find that the 201 fully lives up to our expectations of a multi-mode rig from INOUE and has been well worth waiting for! Note that it does not have AM, although of course you can resolve AM as a sideband signal if necessary.

Note that it does not have AM, although of course you can resolve AM as a sideband signal if necessary.

Compare these features with other multi-mode rigs:

- **CENTRE-ZERO meter on FM.**
- **NARROW FILTER on FM for 25 kHz channel spacing.**
- Good, well-limited FM, 600 kHz shift of Tx. using DUPLEX for working repeaters.
- **AUTOMATIC tone-burst introduced on DUPLEX.**
- **TWO-SPEED GEARBOX giving easy rapid tuning.**
- Good, well-limited FM.
- VOX. Fully adjustable (works on FM if you really want it).
- 600 kHz shift of Tx. using DUPLEX for working repeaters.
- **CW side-tone.**
- **AUTOMATIC tone-burst introduced on DUPLEX.**
- **Full BREAK-IN on CW (separate VOX delay controls for CW and SSB).**
- **Frequency Range**
  - **Weight**
  - **Dial accuracy**
  - **I.F. Frequencies**
  - **Carrier Suppression (SSB)**
  - **Sensitivity**
  - **Squelch sensitivity (FM)**
  - **Bandwidth**
  - **Audio output**
  - **RF GAIN CONTROL by adjusting the coupling of two helical filters.**
  - **EXCELLENT NOISE BLANKER.**
  - **R.I.T.**
  - **MIC GAIN control on front panel.**
  - **DIAL-READOUT TO 1 kHz-accurate to 2 kHz or better.**

The IC-22A is becoming very popular as THE mobile rig for both simplex and repeater operation. See last month's advert for brief specification or contact us or one of our agents for more details.

5 channel version. FITTED 145, S20, S21, S22, S23 = £115 + VAT

8 channel version. FITTED above channels + 3 repeaters or 2 repeaters and S24 = £125 + VAT

The IC-201 — AT LAST!!

The IC-201 is becoming very popular as THE mobile rig for both simplex and repeater operation. See last month's advert for brief specification or contact us or one of our agents for more details. Fitted with an Automatic tone burst which operates on repeater channels only, the IC-22A comes fitted with 5 or 8 channels. The maximum number of channels available is of course 22.

5 channel version. FITTED 145, S20, S21, S22, S23 = £115 + VAT

8 channel version. FITTED above channels + 3 repeaters or 2 repeaters and S24 = £125 + VAT
AMATEUR ELECTRONICS UK

SWAN ELECTRONICS

THE 700 CX SWAN'S 700 WATTER

PLANET 808
SUPERB NEWSPEECH PROCESSOR!
STILL AT THE ORIGINAL VAT INCLUSIVE, POST PAID PRICE OF £33.04

ATLAS RADIO
ATLAS-210 80 thru 10
ATLAS-215 160 thru 15

NEW MODELS!

AMATEUR ELECTRONICS UK ARE DIRECT IMPORTERS OF YAESU, SWAN and ATLAS EQUIPMENT AND MANUFACTURERS OF PLANET PRODUCTS

SOUTH WALES/BRISTOL AREA. We are pleased to announce that ROSS CLARE, I.E.R.E., GW3NWS, has been appointed as our agent. Ross is located at Caerleon, near Newport and will be carrying an excellent stock of equipment backed up by first-class test gear and the ability to use it. For friendly, helpful service contact Ross at CAERLEON 422232 in the evenings and weekends—you'll be delighted!

A COUPLE OF STAMPS (WE'LL PROVIDE THE ENVELOPE) WILL BRING YOU OUR LATEST USED EQUIPMENT LIST OR INDIVIDUAL INFORMATION ON SPECIFIC ITEMS—21 PENCE BRINGS THE LATEST GLOSSY SWAN OR YAESU CATALOGUE (FULLY REFUNDABLE AGAINST EVENTUAL PURCHASE)

Northern Agent—JOHN ROWLEY, G3KAE, Scarborough. Tel.: West Ayton 3039
Scottish Agent—RON TURNER, GM8HXQ, Wishaw. Tel.: Wishaw 72172
Economical Mobile/Base Station
FT-201

NOW AVAILABLE WITH
FITTED DC PSU AT
£290 INCLUSIVE

- **SOLID STATE 80 THRU 10 METRE TRANSCEIVER**

YAESU now brings you the newest addition to its growing family of Solid State transceivers: the FT-201. Performance and portability are among the key features of this economical transceiver along with YAESU innovated modules to simplify service and repair. The FT-201 has features which you would expect to find only in units costing much more.

**Features**
- Built-in AC and DC power supplies
- 250 Watts PEP SSB, 180 Watts CW and 80 Watts AM
- Factory sealed, solid state VFO with 1 kHz readout
- Effective Noise Blanker, threshold adjustable, for elimination of noise spikes
- Built-in front panel adjustable VOX
- Automatic break-in CW operation with sidetone
- ±5 kHz receiver clarifier
- Built-in WW dyi reception
- Adjustable carrier level for tune-up and Novice operation
- Indicator lights for internal VFO and clarifier operation
- All mode operation—SSB, CW and AM
- Fast or slow receiver AGC
- Built-in internal crystal control provision and dual VFO adaptor
- Built-in final cooling fan
- Complete line of compatible accessories for flexible station design

**ATTENTION TWO METRE MEN!**
COMING SOON—THE NEW YAESU FT-221 SSB-FM-AM-CW AC/DC TRANSCEIVER

YAESU MUSEN IS ALSO AVAILABLE FROM OUR SELECTED STOCKISTS LISTED HERE
Our 444 base station microphone not only gives you increased talk power, but cuts “splatter” (and QRM complaints) to an absolute minimum! It has superbly tailored response, with sharp cutoffs below 300 and above 3,000 Hz and a rising response characteristic for maximum intelligibility. The 444’s rugged, reliable Controlled Magnetic element has been proved in safety communications, and other tough professional communications applications. It delivers a clean signal to the transmitter at levels as high as crystal units! (And, unlike crystal and ceramic units, the element is totally immune to the effects of temperature and humidity.) The 444 also features an adjustable height stand that makes for comfortable “ragchewing” sessions, an optional-locking bar for push-to-talk or VOX operation, and a practically indestructible Armo-Dur® case. Write:

Shure Electronics Limited
Eccleston Road, Maidstone ME15 6AU
Telephone: Maidstone (0622) 59881
NEW! UNIVERSAL R.F. SPEECH CLIPPER

INCREASES 'TALK POWER' — ELIMINATES 'FLAT TOPPING'

Easy to install — long battery life

⋆ Simply connect in series with your microphone lead. Needs no internal connection to your transmitter. Push-to-talk facilities are retained.

⋆ Can give increased "punch" or "talk power" comparable to a times-ten power increase, plus improved speech characteristics

⋆ Ideal for SSB, AM, or FM.

⋆ Advanced circuit uses optimised combination of digital and analogue techniques for long-term reliability and stability.

⋆ Seven integrated circuits, one transistor, three diodes.

DESCRIPTION: The Datong R.F. Clipper brings the unique benefits of r.f. clipping to any conventional transmitter. It should not be confused with agc-type speech compressors or rf clippers. The Datong R.F. Clipper is a complete closed-circuit ssb transmitter and receiver. Amplitude clipping of the internally generated ssb signal (at 60 kHz) greatly increases the average-to-peak amplitude ratio of the speech input signal. This is achieved without harmonic distortion.

Price, including delivery by parcel post, only £45 plus VAT at 25%.

Add 50p for delivery by registered first class mail.

Write or phone for full information, including a copy of the installation and operating instructions.

DATONG ELECTRONICS LTD.
11 MOOR PARK AVENUE LEEDS LS6 4BT
Telephone: 0532-755579
MAGNUM TWO AND FOUR METRE TRANSVERTERS

Our transverters accept low level drive from most HF transceivers in the 28-30 MHz band (other IF's to special order) and transvert this signal to the corresponding frequency in the 70 MHz or 144 MHz band. Signals being received in either of these bands, are in a similar manner, converted back to the 28 MHz band.

All power requirements are taken from the accessory sockets of the HF transceiver as in the YAESU MUSEN or SOMMERKAMP range, or with very simple modifications to most other gear, either transceivers or separates. If any details on modifications are required please do not hesitate to contact us.

We have incorporated in our design one of the well known and highly respected "MICROWAVE MODULES" Mosfet converters.—Need we say more.

It has been our experience in industrial electronics that printed circuits, when used in valve circuitry, prove to be unreliable in many cases and because of this we have chosen to "Hand wire" the RF section of the transverter. In doing this, we are confident that it improves the stability and reliability factor of our product.

SPECIFICATION

Modes : CW, SSB, AM and FM.
Input Drive : Typically ½ Watt RMS.
Output Power : Minimum of 50% efficiency.
Typically when used with FT 200, 90-100 Watts SSB output.

SIZE

10" x 6" x 7".
No special cooling required.
Our transverters are constructed for good mechanical stability, while providing adequate ventilation.

AGENTS

STEPHEN-JAMES — LIVERPOOL
S.M.C. — SOUTHAMPTON
CRAYFORD ELECTRONICS — KENT

PRICE

£87.96 Plus VAT
Including all valves, relays and power lead to transceiver.
If you already have an M.M. converter in good condition we are prepared to give a generous allowance and use it in the Transverter.

GUARANTEE

12 MONTH UNCONDITIONAL GUARANTEE, but we exclude from this the PA valve, which is covered by the manufacturers own guarantee for 3 months.

For users of the LINER TWO, TRIO, or in fact any low power 2m. TRANSCEIVER, we are now producing a Linear Amplifier/Receiver Preamp.

This unit is entirely self-contained, operating off AC mains and provides a stabilised low voltage supply to operate the transceiver.

SPECIFICATIONS

Up to 100 Watts SSB output.
Self-contained power supply.
Microwave Modules receive PREAMP.
Full input and output relay switching.
PRICE : £82.97 Plus VAT

70 Cm. LINEAR

Compatible with the M.M. Transverter
Drive required—Up to 5 watts Rms.
Output 50 Watts.
PRICE : £36.57 Plus VAT. Complete with valve and power lead.
YAESU from S.M.C. Why?

Experience—We have been importing Yaesu direct for many years. Test equipment costing over £7,000.00 under the personal control of Chris Webster in our NEW improved service department, over £2,000.00 of spares (in the improbable case you need them), all equipment thoroughly checked before despatch and Yaesu sets sent free by Securicor for the non-caller. We also have the largest stocks of masts and antennas, in fact over 500 ex-stock.

24 hours Service. Barclay or Access Card. Just 'phone in quoting your number, we despatch the same day if humanly possible by whatever means you wish including SECURICOR (free for most Yaesu) second-hand equipment and at cost for other items if under 5ft. long and less than 45 lbs. weight.

FOR YAESU ITEMS NOT SHOWN THIS MONTH. Please see our previous adverts for the complete range.

FT101B

£330 + VAT

This de-luxe wireless is the descendant of the world famous FT-101 transceiver. Except for the drive and final amplifier stage, the FT-101B features all Solid State circuitry built on reliable and serviceable "computer type" plug in modules. The 101B is contained in a compact 30lb. package designed to go anywhere. All that is needed for instant "on the air" operation from 160 through to 10m. is either 12v. DC or 100-234v. AC and of course an antenna.

FT75B

£140 (+ PSU) (+ VAT 25%)

The FT75B is a higher power replacement (120W P.I.P.) of the FT75 the unit which along with the 101 has been responsible for the upsurge in HF mobile operation around the world. On bands 80 through to 10 there are 3 VXO controlled crystal channels as well as provision for external VFO operation. The FT75B is all solid state except the final and driver stages. Included is an excellent noise blanker and squelch circuit for quiet channel monitoring. Accessories include the FV50C VFO at £35.00, the VC75 microphone compressor and VOX at £18 and the FT75B AC power supply at £35, and the DC75B at £40 illustrated right. (+ 25% VAT)

FT200

The FT200 is still without doubt one of the "best buys" available. Compare its features with similarly priced units. SPECIFICATION: 260W. P.I.P. SSB/CW; 75W AM 1 kHz readout on all bands 3.5-28-5-29 MHz (3 optional 10m. crystals available). Stability: 100Hz 30 min. after warm up. Sensitivity: 0.5µV 10dB/S + N. Selectivity 2.3 kHz (60dB) 4 kHz (60dB). Solid state FET VFO with excellent linearity (like all Yaesu VFO's). Xtal calibrator. VOX/PTT. Clarifier ± 5 kHz. Break in CW keying. Extra crystals from SMC only £2.20 (+ VAT).

ALL THE ABOVE YAESU IS EX-STOCK IN TOTTON AND DIRECTLY IMPORTED BY US FROM THE FACTORY

PLEASE NOTE—THOSE PRICES DO NOT INCLUDE VAT 25% or 8% Terms:—Cash with order or credit card holders just 'phone in for, if possible, same day despatch. Immediate H.P. available for card owners for amounts up to £150.00. Holders of current U.K. call signs (where references have been provided) can be speedily cleared, or normal H.P. at competitive rates is available.

BARCLAYCARD

ACCESS
HY-GAIN The biggest range from the U.S.A. (Carriage paid) VAT 25%.
Tower 10-80m. Vertical radiator £122.00 TH1MKIII 10-20m. £99.00 DB1015A 10-15m. £76.00
18V 10-80m. Trapped Vertical £45.00 TH2J 10-20m. £87.00 DB104B 20m. £66.00
12AVQ 10-20m. Pulsed Squid £25.00 TH3J 10-20m. £79.00 DB104B 30m. £42.00
14AVQ 10-40m. Pulsed Squid £35.00 TH26XX 10-20m. £109.00 DB204 40m. £21.00
16AVT 10-40m. Pulsed Squid £52.00 Hy Quad 10-20m. £99.00 402BA 40m. £16.00
BNB 1:1 Balun £9.50 LAJ 20m. £87.00 202BA 40m. £9.00
562 Rotary bearing £85.00 LA2 40m. £3.00 103BA 10m. £3.00
SMC Trapped Dipoles (Carriage paid) VAT ON ALL MASTS 8%
Trapped dipole standard 10-80m. £16-85 High Power version of S (HP) £18-75 Portable version of S (P) £19-50

HamTowers (Carriage extra) Galvanised lattice 10ft. sections 30ft. height with climbing steps on one face.
From: £105-90

TeleMasts (England and Wales, carriage £2-00) Galvanised steel Telescopic 10ft. section with or without rigging.
30ft.-£15-00 40ft.-£20-00 50ft.-£35-00
With rigging kits: 30ft.-£29-00 40ft.-£39-00 50ft.-£49-00

VersaTowers (Carriage paid, England and Wales) Tiltover Telescopic post mounted ex-stock. The tilting action allows ease of maintenance and changes of antennas. The relatively low weight eases installation problems.
From: £172-35

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**HW-101 transceiver specifications**

**Receiver section:**
- **Sensitivity:** Less than 0.35 microvolt for 10 db signal-plus-noise ratio for SSB operation.
- **SSB selectivity:** 2.1 kHz min. at 6dB down; 7kHz max. at 60dB down (3.395 MHz filter).
- **CW selectivity:** (with optional CW filter installed) 400 Hz min. at 6dB down; 2.0kHz max. at 60dB down.
- **Input:** Low impedance for unbalanced coaxial input.
- **Output impedance:** 8ohm speaker and high impedance headphone.
- **Power output:** 2 watts with less than 10% distortion.
- **Spurious response:** Image and IF rejection better than 50 dB.

**Transmitter section:**
- **DC power input:** SSB - 180 watts PEP; CW - 170 watts.
- **RF power output:** 100 watts on 80-15M; 80 watts on 10M.
- **Output impedance:** 50ohm to 75ohm with less than 2:1SWR.
- **Oscillator feed-through or mixer products:** 55dB below rated output.
- **Harmonic radiation:** 45dB below rated output.
- **Transmit/receive operation:** SSB, PTT or VOX. CW provided by operating VOX from keyed tone using grid-block keying.
- **CW sidetone:** Internally switched to speaker or headphone in CW mode. Approx. 1000 Hz tone.
- **Microphone input:** High impedance with a rating of -45 to -55dB.
- **Carrier suppression:** 45dB down from single-tone output.
- **Unwanted sideband suppression:** 45dB down from single-tone output at 1000 Hz reference.
- **Third order distortion:** 30dB down from two-tone output.
- **RF compression:** 10dB or greater at .1mA final grid current.

**General:**
- **Frequency coverage:** 3.5 to 4.0; 7.0 to 7.3; 14.0 to 14.5; 21.0 to 21.5; 28.0 to 28.5; 28.5 to 29.0; 29.5 to 30.0 MHz.
- **Frequency stability:** Less than 100Hz per hour after 60 minutes warm-up. Less than 100 Hz for ±10% line voltage variations.
- **Modes of operation:** Selectable upper or lower sideband and CW.
- **Dial calibration:** 5kHz.
- **Calibration:** 100kHz crystal.
- **Audio frequency response:** 350 to 2450 Hz.
- **Power requirements:** 700 to 850 V at 250 mA with 1% max. ripple; 300 V at 150 mA with .05% max. ripple; -115 V at 10 mA with .5% max. ripple; 12 VAC/DC at 4.76 amps.
- **Cabinet dimensions:** 6"H., 14 15/16"W., 13 3/8"D.
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(GB3SWM)

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Communications problems do not distinguish between transceivers. Thus the ICOM concept responds to the necessity of concentrating on the essential: not more expensive but better. As a rule, transceivers of the top international class are measured in four dimensions: design, sensitivity, cross-modulation safety and price. With ICOM a fifth dimension results from the interface of owner and set: image.

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Purpose

We have often enough outlined broadly what might be called the Argument for Amateur Radio in face of the Pressure on Ether Space—it being agreed that the ether, like the air we breathe, is free for all to use, subject to reasonable safeguards.

To deal with some questions so frequently asked when Amateur Radio is under discussion, such as—"What good are amateurs?"—"What do they do?"—"Can they serve any useful purpose?". The quick answer is, of course, that the mere fact of there being some 21,000 of them in the U.K. alone, and over 450,000 in the world of the West as a whole, is by itself a good enough reply to these questions. If no benefits flowed or advantages accrued from the pursuit of Amateur Radio, it could not possibly exist on such a scale—and continue to expand at the rate it does.

It is this fundamental interest in and practical knowledge of radionics that make the radio amateur, and the Amateur Radio movement, so important from the national point of view. As a nation, we are among the leaders in the Electronic Age into which the world has now moved. Amateur Radio is one of the influences by which radionics engineers and technicians of the best type are produced. This is not an imaginary or high-falutin' conception of the value of Amateur Radio, nor even a theoretical appreciation of its potential usefulness, but is actual fact, proved over and over again. These lines will fall under the eye of some of the leaders, senior engineers and executives, of the radio industry, to say nothing of many "lesser lights" in it—let them ask themselves how much they owe to Amateur Radio, and whether it was not as transmitting amateurs that they got their start!

For its educative influence alone, therefore, the healthy development of Amateur Radio is of the utmost importance to the nation. Those who, as juniors, learn the fundamentals simply because they want to get on the air, go on to take out a licence, and then have ideas of becoming professional, are regarded within the radionics industry itself, and by the Services, as being of the very best—provided they progress to getting themselves properly qualified. Amateurs, as amateurs, cannot expect to get far in a professional environment.

And in the larger context, can it be seriously suggested that tens of thousands of radio amateurs, in daily communication with one another all over the world—and to a lesser degree the correspondence, personal contact and mutual interest which such communication entails—do not together contribute anything to international understanding and co-operation?

The fact is that the true potential of Amateur Radio is only dimly realised even within the circle of its own adherents!
THE short wave magazine

August, 1975

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

The combination of low conditions at the bottom of the sunspot cycle, the summer weather which will have made many a shack a torture-hole with the heat and humidity, the S9 static when thunder is in the air and tight deadlines mean a somewhat "thin" offering this month—but, alas, 'twas ever thus for the August piece!

A certain QRP bias may have been detected in the writer's offerings of late months... true enough, but a home-brewed one-upmanship perker using the name WFY2 statted in the columns of this magazine is being buckled to the ancient Eddystone 888 to form a complete separate fleapower station for Top Band is bringing back much of that peculiar savour of the Amateur Radio game which is lost when one makes the decision to "go commercial." However, all is not entirely light and joy, although the device does work, the KFE junk box holds but one Top Band rock, allegedly 1800/1850 kHz according to which of the pins (there are three) are connected. Luckily, it occurred to this old pessimist to check the contraption on a frequency counter, as no amount of rock, allegedly 1800/1850 kHz according to which of the pins (there are three) are connected. Murphy strikes again! And to think of all those nice rocks we disposed of when the XYL said the junk-box was filling the house... oh, well! All this constructional activity is, of course not unconnected with a change in the Big Rig, which now does not cover the 160m. band, concentrating its constructional activity is, of course not unconnected with a change in the Big Rig, which now does not cover the 160m. band, concentrating its activity down all round; however, on the overall picture he was able to celebrate a 17th birthday by knocking off country number 100. On Top Band, Roger seems to have confined himself to the stations within the U.K.

The Bands

At the moment of writing, the temperature, well on into the evening, is almost up to 80°F, and the humidity strongly suggests an imminent thunderstorm, and indeed the static crashes coming out of the car-radio on the way home from work were of such nature as to make your scribe hasten straight to the shack and check that all aerials were well earthed down against static build-up. However, over the last few days, our spy in the VHF camp tells us interesting things have been happening on Ten. Ten might be the sound rather as those Eighty-to-Ten. As you are no doubt containing the 2S-520 remains at the bottom of the stairs unopened, such is our devotion to duty.

The Top Band

With the release of the younger element of the licenced amateurs quite a marked increase in activity is to be noted—the O and A level exams not to mention Technical College and University ones, certainly ramp the style during the spring while revision is being done in preparation.

G4CTR (Poole) was one who had to face exams, which kept activity down all round; however, on the overall picture he was able to make at least as many as the K4ASR go, at least as many as the K4ASR go, although a kindly Editor dropped his score into the requisite slot. GM3YOR (Kirkcaldy) reports at length, both on the NFD pickings and the activity from home once the rig was returned after the Field Day. NFD first, and here they worked nothing, although FY1RO was heard down at the low end. Once home again, attention was switched to the counties; a couple of new ones were GM2HCZ for Dumfries & Galloway and G3XVF for Norfolk on the key, while SSB found Merseyside in the form of G3DVI. This leaves a situation on CW where all that is required for a "full house," at least as far as English areas go, are Lundy and the Scillies—DX-peditioners please to note! G3MK2F and G3OLK themselves did a bit of expeditioning in July, unfortunately at very short notice, but overing Harris/Lewis, North Uist, South Uist, Benbecula in the Outer Isles, plus Sky and Mull in the Inner Islands, and some mainland operating on the way there and back.

The G4OHH (Bury) letter just missed the deadline last time round, although the kindy Editor dropped his score into the requisite slot. Chris—like the others who have exams, and things—found he was not able to get on the air at useful times, but a few points were picked up here and there.

A letter from G4ASV indicates that the Oxford University group will be running their annual DX-pedition this year to Guernsey, from August 28 to September 9, SSB and CW, Top Band and Eighty, using various members' callsigns and the call G3JQUR/P.

Now we come to G2HKU (Isle of Sheppey) who has a new problem on his hands. It seems some hedgehogs reside beneath the workshop and have been wandering around in daylight, much to the annoyance of the family hound(!); however bad this may be, what is far worse is that said hedgehogs have discovered the G2HKU radials and are well entertained in the practice of digging them up! However, Ted managed his regular stint of contacts, and on Top Band he worked PA0PN, PA0RYS and PA0OSL, the latter using a three-metre whip aerial.

G4AY (Moir) is still pressing on with his 600 milli-watts on the band, and this time is able to report three more new ones, in North Yorks, South Yorks and Kent—this with the admittedly QRP signal also under the handicap of being crystal-controlled.

Only eight more points, sorrowfully reports G2BJY (Walsall), out of which three were tickled up by working Herts. on AM; and in addition, a misreading of the AM/SSB contact ruling alters the point total, as far as the European DX fraternity are concerned.

GM3YOR (Kirkcaldy) reports at length, both on the NFD pickings and the activity from home once the rig was returned after the Field Day. NFD first, and here they worked nothing, although FY1RO was heard down at the low end. Once home again, attention was switched to the counties; a couple of new ones were GM2HCZ for Dumfries & Galloway and G3XVF for Norfolk on the key, while SSB found Merseyside in the form of G3DVI. This leaves a situation on CW where all that is required for a "full house," at least as far as English areas go, are Lundy and the Scillies—DX-peditioners please to note! G3MK2F and G3OLK themselves did a bit of expeditioning in July, unfortunately at very short notice, but overing Harris/Lewis, North Uist, South Uist, Benbecula in the Outer Isles, plus Sky and Mull in the Inner Islands, and some mainland operating on the way there and back.
meantime, what small amount of time there was on the band was to take over the OM's rig, and give things a thorough working-over; but also by the act of lowering the aerial wire a little so as to keep it out of sight, when the combination of reduced tension and a high wind was enough to fetch the lot down!

Eights

One can sometimes feel that this band is spoilt by the few louts from being a pleasant activity for the vast majority of users, whether AM, SSB or CW. However, we must yet again ask for the co-operation of all in keeping the SSB and AM out of the CW end of the band, which is so popular for QRP operators—and others for that matter—for inter-G working. Please, adhere to the Band Plan, for the benefit of all.

G3RJV (Cleethorpes) mentions his own results on Eighty QRP. As a result of the impending move of QTH, George has been playing around with five watts to a Joystick worked against a counterpoise, which last is zig-zagged for the last third of its length to make it fit the space available. Among the QSO’s were G3TLX, G3FMW, G3NEO, PA00CM, and on SSB, right through the evening QRM. G4DKP of Dudley reported the five watt Sideband as R4 although VK4CI, PY1EJW, PY1DXF/8, PY7RX, OAA4HZ, TF3AW, UA2FAU, UD6AR, UD6DFY, UL7GBN, UL7JAA, UL7MC, UM58BA, UA9CFV, UA9AFR, UK9UBN, VE1-3, W1-4, W8, W9, VK3FC, VK3MR twice, VK3VJ, VK3XB, VK7CV, VP2PI, ZL3YW and ZD6AW. That was Forty!

G2NJ (Peterborough) is another of the QRP stalwarts. Nick reckons his best one of the month was to work G3IGU (Doncaster) who was exhaling a fine 300 milliwatts on a frequency which has been used by AM stations for a net, namely 3575 kHz. Another one was a QSO with G2CAS/M who was keying from the area around the southern end of Lake Windermere—a rarity, a CW mobile.

No DX, says G4DMN sadly. However, Richard is eagerly awaiting the end of the exam period, when he can escape home, take over the OM's rig, and give things a thorough working-over; meantime, what small amount of time there was on the band was devoted to the WAB nets.

There are far too many QSO's on Eighty QRP to report all of them; this is the summing-up on the G3CED/G3VFA (Broadstairs) log. However, George worked all round Europe with a maximum of one watt input and often rather a lot less, into the Joystick, both in the normal way and also in an experimental coax-coupled set-up. Whatever one may think of QRP operating, or of DX-chasing, a scrutiny of the amount of information packed in to the G3VFA log pages is quite surprising, and this must make the value of the old log as a memory loginger much greater and more of a pleasure. For example, one notes that a certain station was worked on CW “using his left foot” or “no operation in DL QRP contest due to visitors—always some damn thing!” In addition a code is used to summarise the state of the band at the time of a QSO, and much other information is packed into each page.

Nothing worked in NFD, reports GM3YOR; and one suspects that wild horses wouldn't get him on to the band from the home rig! Still the old FT-100 who was aching from the area around the Southampton total was reduced, not just by the onset of exam-fever, but also by the act of lowering the aerial wire a little so as to keep it out of sight, when the combination of reduced tension and a high wind was enough to fetch the lot down!

The QRP at G4HKU is now down to one watt, and at that level Ted reports working OK2BGW/P and PA9TB/P, both at 579 both ways.

Forty Metres

This is a very good but much neglected band. While CW DX is by far the most common, it is also true to say that there is no lack of DX on Sideband, and at sensible hours, too—which is not to say that Forty isn’t a band worth combing over in the early mornings. All the G3KJE propaganda on this prompted G4XCM to give Forty his almost undivided attention for a month, so as to see just what could be done. The programme worked out something like this: 0500-0600 was found good for W6, W9, W5, South America and ZL; 0600-0700 showed South America, VK, ZL and W1-5. Later in the day, 1900-2000m S.E. Asia, Africa and VK, peaking 1945-2015. From 0000 to midnight zulu, S.E. Asia, Middle East, Africa, Carribbean; while the period from midnight to 0200z was devoted to Africa, East Coast W’s, Central and South America and the Caribbean countries. Times not mentioned were no doubt occupied by eating and sleeping. The actual CW QSO tally shows CO20M, CO5DM, CM2RF, DJ9UN/OHQ, G6ZY/CN/M, HI1JEI, H18NYA, KPEA6K, KV4CI, PY1EJW, PY1DXF/8, PY7RX, OAA4HZ, TF3AW, UA2FAU, UD6AR, UD6DFY, UL7GBN, UL7JAA, UL7MC, UM58BA, UA9CFV, UA9AFR, UK9UBN, VE1-3, W1-4, W8, W9, VK3FC, VK3MR twice, VK3VJ, VK3XB, VK7CV, VP2PI, ZL3YW and ZD6AW. That was Forty!

Only one SSB contact is mentioned by G2HKU, namely with F0NR/P, which turned out to be G3BA and G3BHT (of VHF fame) off on a trip—Ted always seems to work this pair wherever they go. CW QSO’s were made with PY7BOS, UM5MAX, UL7BPN, W2NZ, K3JH and 9Y4TR.

G4CTR didn’t have a lot of luck on 40m., working only G’s and DMB00, while the only GM3YOR operation was in NFD, when they worked W11H, WA1KKN, W1AFQ, W4BLL, W4UICF, K5REI/4, W5RER/4, WASZNY and 9J2NFD/P.

Not a lot of forty-metre operation is to be noted by G3CED/G3VFA but the U.K. O1A5F, LZ15Z/MM (in the North Atlantic), FS5C, E9CN, DJ4WP, DK8FD and others were all worked with the tiny rig.

A final cryptic comment on Forty comes from G4DMN—“the darn DX is either too late or too early!”

Twenty Metres

Which is where the G3NFO report from Yeovil starts—Don is hardly ever heard on other bands. He reports quite reasonable conditions at times, but much short skip. No VK/ZL’s have been logged at 0600, although conditions to W6 and 7 and VE6 and 7 have been good, some of the W7’s being in till 1000; East Coast W’s were sometimes also audible, to bring them to a right-round-the-clock status. Around 1600 other G’s reported hearing the Africans, while late evenings have seen openings to North and South America and the odd longpath VK’s and ZL. Gotaways included A6XR, FL80M, KH6OT, KM5EA, VP2ABA, VP2SV and 5U7BA, but that didn’t...
deter G3NOF from putting his SSB successfully to A4XF, C31JB, CYCNQ, FC6CXP, F57AN, FC7AO, FC9CP, K6DXX, K6RH, K7BZK (Montana), K4FZ, M1D, O5C5A/K (on the Golan Heights), OJ0AM, S9JWL (Morokulien), UJ8JGI, UL7LEZ, VE3HEY/SU, VE7BHV, VK6GU, VP11L, VP2SP, W6BDI, W7RS (Oregon), W7TQ (Nevada), W7EQL (Oregon), W7GML (Oregon), W9HDW and W9N1L (both in Montana), W7FRI (Washington), WA8FY, WA6HCL, ZS6AWU and ZS6VFD/P all on Fifteen, plus UB5LU, NFD mayhem brought forth ZEIJL, ZE3JO, ZS5FC, ZS6SVB/P, and LU7VO, had to suffice on 21 MHz for GM3YOR, although the fired up on Fifteen. Actual 21 MHz QSO's were with LAIZM and ZSIXG. Among them owing to his long-standing TVI problem, so his only were audible around 2300, and the mid-afternoon on July 4 was also a tale of short-skip conditions, although sometimes W4 stations WOHVQ, all of them on July 4's opening. As for 21 MHz, it was W1BFA, WIFZ, W2MB, W4KN, W8NIX, W8FER, W8KBU and VE3HFO, WA2FUL, WA3INW, WA4IHW, WA8RLY, K1BCG, K1VW, K2MEV, K3DML, K3SD, O5VNS, VE3HFO, WA2FUL, WA3INW, WA3TRI, WA4IFW, W8ARLY, W1BFA, W1FZ, W2MB, W4K, W8NIX, W8FER, W8KBU and W9VHO, all of them on July 4's opening. For 21 MHz, it was W1BFA, WIFZ, W2MB, W4KN, W8NIX, W8FER, W8KBU and VE3HFO, WA2FUL, WA3INW, WA4IHW, WA8RLY, K1BCG, K1VW, K2MEV, K3DML, K3SD, O5VNS, VE3HFO, WA2FUL, WA3INW, WA3TRI, WA4IFW, W8ARLY, W1BFA, W1FZ, W2MB, W4K, W8NIX, W8FER, W8KBU and W9VHO, all of them on July 4's opening. For 21 MHz, it was W1BFA, WIFZ, W2MB, W4KN, W8NIX, W8FER, W8KBU and VE3HFO, WA2FUL, WA3INW, WA4IHW, WA8RLY, K1BCG, K1VW, K2MEV, K3DML, K3SD, O5VNS, VE3HFO, WA2FUL, WA3INW, WA3TRI, WA4IFW, W8ARLY, W1BFA, W1FZ, W2MB, W4K, W8NIX, W8FER, W8KBU and W9VHO, all of them on July 4's opening. For 21 MHz, it was W1BFA, WIFZ, W2MB, W4KN, W8NIX, W8FER, W8KBU and VE3HFO, WA2FUL, WA3INW, WA4IHW, WA8RLY, K1BCG, K1VW, K2MEV, K3DML, K3SD, O5VNS, VE3HFO, WA2FUL, WA3INW, WA3TRI, WA4IFW, W8ARLY, W1BFA, W1FZ, W2MB, W4K, W8NIX, W8FER, W8KBU and W9VHO, all of them on July 4's opening. For 21 MHz, it was W1BFA, WIFZ, W2MB, W4KN, W8NIX, W8FER, W8KBU and VE3HFO, WA2FUL, WA3INW, WA4IHW, WA8RLY, K1BCG, K1VW, K2MEV, K3DML, K3SD, O5VNS, VE3HFO, WA2FUL, WA3INW, WA3TRI, WA4IFW, W8ARLY, W1BFA, W1FZ, W2MB, W4K, W8NIX, W8FER, W8KBU and W9VHO, all of them on July 4's opening. For 21 MHz, it was W1BFA, WIFZ, W2MB, W4KN, W8NIX, W8FER, W8KBU and VE3HFO, WA2FUL, WA3INW, WA4IHW, WA8RLY, K1BCG, K1VW, K2MEV, K3DML, K3SD, O5VNS, VE3HFO, WA2FUL, WA3INW, WA3TRI, WA4IFW, W8ARLY, W1BFA, W1FZ, W2MB, W4K, W8NIX, W8FER, W8KBU and W9VHO, all of them on July 4's opening. For 21 MHz, it was W1BFA, WIFZ, W2MB, W4KN, W8NIX, W8FER, W8KBU and VE3HFO, WA2FUL, WA3INW, WA4IHW, WA8RLY, K1BCG, K1VW, K2MEV, K3DML, K3SD, O5VNS, VE3HFO, WA2FUL, WA3INW, WA3TRI, WA4IFW, W8ARLY, W1BFA, W1FZ, W2MB, W4K, W8NIX, W8FER, W8KBU and W9VHO, all of them on July 4's opening.

Comments

G4CTR says he has now obtained a CTR for his SS/TV monitor, and the “just about works—some more fiddling should produce a picture!” We know the feeling, only too well. W4WFL/G5AYL/A has one problem about his DXing—it seems that every time he racks up a score approaching the 300 countries mark, he moves and so has to start all over again. This time his comment was simple—“worked 26 countries, only 74 more for DXCC!”

G3CED added a note at the top of one of his copy log pages to the effect that the “geese were gagging again; My log would look more impressive if I weren't such a confounded rag-chewer.” Looking down to the marked log entries we see what George means—he certainly must do a lot of rag-chewing on CW, something which not a lot of G3XSE (Harlow) does not often rate a mention in this piece, being largely a VHF operator, but he did raise a chuckly one day when he managed to scrounge a 1048-bit PROM and wanted to do something with it. A keyer was decided on, which would provide all the needful for the “rubber stamp” type of CW QSO. After a bit of head-scratching between your conductor and G3XSE a suitable combination of words was thought up and then programmed (the while offering up a silent prayer that it was right—PROM's are still expensive!) to key out the specified phrases. An hour or so later, there was a little two-inches square board with one PROM and about a half-dozen discrete components on it and a couple of wires going off to a Katsumi monitor in one direction and a bench PSU in the other, busily banging out perfect CW for all of one end of a complete rubber-stamp QSO with no one in attendance. It was quite amusing to see people coming in to look for the Morse, finding it and then realising there were no Morse keys or operators in sight!

A long letter from W1BB writing from his “Villa Mon Repos” which is a 182-year-old farmhouse in the country, 325 miles from Boston and with 25 acres of woodland around it, where the man-made electrical noise is at a minimum, but gardening at a maximum after his Pacific trip. The silence on Top Band is quite startling after the home (water-tower) operating spot, so that W1BB wishes he could operate all the time from W1BB-in-the-country. The two

Ten & Fifteen

On the evidence of the propagation forecasters and of one’s own ears over the previous weeks one would have expected both to be pretty puny, with Ten indeed absolutely dead; but it has not been so—very much the reverse, all things considered. Certainly much of it was short-skip, but there were other things.

First in this time is G4DMN, who found LX1SA on 21 MHz, and CT1QN, CT1WW, DK3LQ, ISVEC and IS6NZA, all on Ten. There were a couple of openings to North America, on the afternoons of June 21 and July 4, both of which Don of G3NOF reckons to be a bit odd— openings of this nature in the peak of the sunspot cycle used often to show around midnight in the summer; some of the W's reckon the openings might have been Sporadic-E due to the hot weather on both sides of the Atlantic. This is Ten we are talking about, on which band working was greatly improved the summer season. This is Ten we are talking about, on which band working was greatly improved the summer season.

In this time G3CED added a note at the top of one of his copy log pages to Ten & Fifteen...
Beverage aerials, each 1100 feet long, had to be repaired in seven or eight places after the winter ice storms, but they are now OK again. As Don says, the big resonant aerial not only picks up signals but also may well result in reduced signals but better signal/noise ratio.

Contests are the forte of W1WY—reporting them, that is, not necessarily working in them! This time, Frank’s copy includes the European CW DX Contest over August 9-10, which clashes with the Argentine Phone affair. August 16-18 shows the QRP ARC Contest (the U.S. QRP club, not the U.K. one) and the All-Asian CW. After which we go as far ahead as September for the European DX Phone leg on September 13-14.

Further ahead we notice, courtesy 9M2FK, a contest to publicise the SEANET Convention, this year being held in Kuala Lumpur over November 7-9. However, the contest is being played off earlier, over 30-31 August, 901 on 30th right through to 2359 on 31st. Logs and summary sheets go to 9M2FK, Ismail Razak, 281-c Jalan Pekekilling, Bukit Glugor, Penang, Malaysia, postmarked not later than September 30. The same address will provide a full set of rules covering the contest and the Worked All Malaysia Award.

9G1DY writes in to say that after 19 years in Ghana he is being transferred to Sierra Leone after a leave in U.K. A 9L1 ticket has been applied for so activity should be resumed soon. On a different tack, 9G1DY made a SSB SBDXCC from Ghana, but still lacks the cards from several countries on 3-5 MHz before his application can go in. Incidentally, should anyone need a 9G1DY card, it can be obtained by writing to: N. T. G. Price, Barclays Bank of Sierra Leone Ltd., P.O. Box 12, Freetown, Sierra Leone, after September 30.

It was nice to hear again from G3YRR (Grimsby) who says he has obtained 9G1DY cards from several countries on 3-5 MHz before his application can go in. Incidentally, should anyone need a 9G1DY card, it can be obtained by writing to: N. T. G. Price, Barclays Bank of Sierra Leone Ltd., P.O. Box 12, Freetown, Sierra Leone, after September 30.

The recent RTTY contest organised by BARTG had the usual low U.K. entry! The leading station, I1PYS, racked up all but 23000 points, all continents and 33 countries in 199 QSO’s. The hardest continent to find was, it seems, Africa, the others all being well represented. Eleven stations made all continents.

Now a horrible bit of news. From G3NBU/DL, via Mobile News we get it that the Germans have now got permission to use their 27 MHz Citizens’ Band walkie-talkies without a licence of any sort. However, there is still a slight control in that the sets must bear an official test number. Home-station type gear is also now approved and tested, and this equipment can be used without the “special reason” needed previously, although the licence costs 13 DM a month. One wonders just how long it will be before that lot splash over into our bands.

Talking of Citizens’ Band, it is understood that one of the ideas behind the present restructuring of the licence classes in U.S.A. is to make it possible for some of the Citizens’ Band occupants who now—quite illegally—chase BC/DX to make their mark on our bands.

Incidentally, the sharp-eyed may have noticed the talk (in some American magazines) of additional amateur allocations, on frequencies between our present bands. This is a cause worthy of support by all countries. The more national authorities support this proposal the better when the next conference becomes due; and even if it does fail at the final reckoning it will have most probably done something to save any more erosion of our present small band-space. Some high-pressure lobbying seems to be called for, all over the world, and while we are on the subject, it would be no bad idea to press at the next conference for restoration of amateur licensing in all the countries where it is at present not allowed, as a prior condition to allocation for other frequencies.

It is not yet clear to what extent the turmoil in Portugal—with the authorities having promulgated a decree “taking over all radio stations”—may have affected CT operation on the amateur bands. Though the CT1/CT2/CT3 stations have never been very active, there are plenty of them shown in the Call Book listings.

Here’s to The Next Time

No, it’s not Henry Hall writing this piece! But a “next time” there most certainly will be, and for the deadline will be August 12 latest, addressed as always to “CDXN,” SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ. Meantime, suggest we all pray for sunspots!
Panoramic scene, West of England Mobile Rally, Longleat, Wilts., June 29.

* * * THE MOBILE SCENE * * *

MORE REPORTS AND PICTURES

First, to correct a stupid error in this space last month, where it was suggested, on p.264, that the North Midlands Rally had been at Trentham Gardens (where it used to be) instead of at Drayton Manor Park (where it actually was)—this raised a few horse-laughs, but nobody was too unkind, and anyway the argument was not in any way affected.

The outstanding feature of last month’s meeting was, of course, the marvellous summer weather—at least until the week-end July 12/13, when the First Test started. There have been huge attendances at some of the Rallies and the notes following give some idea of what has been going on.

For the sixth Elvaston Castle Rally on June 8, they offered at 5p a well-produced lucky-number programme of events—and in perfect Wx had a bumper attendance “in the region of 4000-5000 people, with 1236 vehicles paid through the car park,” no less than 29 firms being represented round the trade stands! It was found that most of the talk-in traffic was on two metres (G3ZBI/P) and that SSB was needed on Top Band (G3EEO/P) with few mobiles using AM. The Group have come to the conclusion that they will have to re-cast their talk-in arrangements for future events, probably concentrating more on FM/SSB for the VHF bands, where the greater part of the /M action now is. In addition to the prize draw and the tombola, with £150-worth of prizes to be won, there were various side-shows of general interest. All Rally arrangements and the provision of facilities for visitors were made by members of the Nunsfield Association Amateur Radio Group, and Ian Cage, G4CTZ, the hon. secretary and his helpers are to be congratulated on a very successful day—with, we hope, something into the kitty for Club funds.

This year’s “Longleat,” on June 29, organised by the Bristol Group and the 18th in their series, was again an outstanding event, the perfect weather undoubtedly contributing to its success. Their statistics are astonishing: No less than 4,100 visitors actually signed...
in—the count in the Rally car park at 2.30 p.m. 2,166 cars and 12 coaches—and 50 tent/caravans with overnight campers. The talk-in stations worked 22 mobiles on Top Band, 40/M's on Eighty, and 116 two-metre mobiles, which seems to speak for itself. Visitors came in from all parts of the country, including GM and GW, and there were several interesting callsigns of overseas amateurs on holiday in the U.K. On the trade side, stands were taken by 27 firms, who reported “complete satisfaction and brisk trading.” Other organisations represented were the GPO, with their TV sleuthing rig; the 50th Signal Regiment, Royal Signals, showing some of the latest Army equipment; and the Club groups included the R.N. and R.A.F. Amateur Radio Societies, the A.R.M.S., the R.A.I.B.C. and the local arm of the Red Cross, who each year look after the medical side and take care of any casualties.

Of course, Longleat is the ideal setting for a Mobile Rally, particularly if the weather is right—it has everything, in beautiful and carefully maintained surroundings. Nevertheless, a big Rally event calls for careful organisation and much forward planning, involving a great deal of hard work—and can be expensive. However, with their years of experience, Brian Croker, G3ULJ, Longleat organiser, with his team, can be relied upon to make the West of England Rally a Good Show.

Lest it be thought that we are only interested in the big Rally occasions, let it be said that we are just as glad to hear about the smaller Rallies around the country, each of which we know also involves a great deal of work and preparation. All reports that we receive will be publicised in this space, on the lines of the foregoing. And, of course, pictures are also always wanted to illustrate this feature.

THE RALLY CALENDAR

August 3: RSGB Mobile Rally in the Coach Park, Woburn Abbey Estate, near Luton, Beds., with all the attractions of this well-known stately home. You pay 25p to get in. Details: N. Miller, G3MVV, QTHR.


August 17: Derby & District Radio Society annual event at Rykneld School, Bedford Street, Derby, as in previous years. Location just off the A.5111 Derby Ring Road, between junctions A.38 Burton Road and A.516 Uttoxeter. All the usual attractions and a monster “junk-sale,” with talk-in by G2DJ/A on Top Band, G3DBY/A for two-metre AM/FM and G3ERD/A doing the 2m. SSB. Free admission and parking—but please note no opening before 12 noon. Any further details from T. Darn, G3FGY, QTHR.

August 24: Torbay Amateur Radio Society Rally at Newton Abbot Ruby Club ground, as in previous years.—L. H. Webber, G3GDB, QTHR.

August 31: Preston Amateur Radio Society Mobile Rally at Walton-le-Dale Secondary School, Brindley Road, Bamber Bridge (off M.6 at Junc. 29) with talk-in on two metres and Top Band. 

Another Longleat impression—one of the Trade stands in the warm sunshine of June 29, when they had some 5000 visitors (see report). We are also told that there were some of the light-fingered gentry about, in the shape of large women with capacious shoulder bags, scooping up the unconsidered trifle. Apparently, they were soon spotted and hustled out of the ground!
stands, bring-and-buy stall, refreshments and ample parking. Details: G. W. Earnshaw, G3ZXC, QTHR.

August 31: Pembroke & District Group annual “bucket-and-spade” party at Regency Hall, Saundersfoot, near Tenby, with talk-in on S20/FM and 144-30 MHz SSB. Discussion of the West Wales repeater project. Car parking free and venue near beach. Further information from: J. Hogg, GW4AKO, 2 Pembroke Road, Pembroke Dock, Dyfed, West Wales.

September 21: Peterborough Mobile Rally at Walton School, Mount- steven Avenue, Peterborough, Cambs. Information from: A. H. Jackson, G8GNV, QTHR.


To keep in touch with the world of Amateur Radio, read “Short Wave Magazine” regularly

Independent, Unsubsidised and now in its 33rd volume.
GOING QRP ON EIGHTY
KITS FOR LOW-POWER TRANSMITTERS

G. C. DOBBS (G3RJV)

ANY reader of Short Wave Magazine will have realised that QRP activity is not only alive and well on today’s bands, but growing in popularity. The advent of commercial rigs like the Health HW-7 and the Ten-Tec transmitters has increased the number of operators intrepidly exploring the bands, armed only with a few watts of RF. Not only is QRP operation a boon to our polluted bands, but it has brought many operators back to the oft-lamented art of home construction. QRP may also herald a return to real operating skill on the bands—it is difficult to be a bully with a couple of watts!

Another advantage of QRP working is that it is possible to achieve good results with simple and inexpensive gear. Many such operators are active on 80m. CW, often spreading the RF far and wide with milli-watts of power. This article shows how it is possible for a small outlay in money and time to get on to the QRP bandwagon. The majority of the construction is down using inexpensive kits, with simple home-built additions.

The Amtron Kits

Amtron, a branch of the American International Crystal Manufacturing Company, have released a series of small kit units to the U.K. market, J. Birkett being the suppliers. These kits are relatively inexpensive and contain a printed-circuit board, all the components and even solder to build up simple circuit modules. The kits are supplied with a four-page instruction manual, making it possible for anyone with a soldering iron to make up a “work first time” module. There is a wide range of these kits but we are only concerned with two modules. The UK 905 RF Oscillator and the UK 930 RF Power Amplifier. Both kits are built up on a 1½in. square printed-circuit board and can be constructed in about an hour.

Fig. 1 shows the circuit of the UK 905 Oscillator, a crystal oscillator for the 3-20 MHz range. The usual output is about 1 milli-watt into 50 ohms, but it is easy to modify the circuit to give more output to drive an RF amplifier. The UK 905 is easy to build and is complete with a choice of three coils, according to the desired frequency. For the 80m. band, the “White Coil” is required. The kit is best built up in its original form and tested by finding the output on a receiver. Using a sensitive Rx very little coupling, if any, is required to hear the output signal. The coil core requires peaking. This can be done from the receiver S-meter reading or checking the current of the power supply. The RF output indicator, as described in the July issue, can also be used.

The UK 930 RF power amplifier is equally simple to build. It covers a frequency of 3-30 MHz with a choice of three coils. For the 80m. band, once again the “White Coil” is used. The only slightly tricky part of making up this kit is the winding and wiring of the output link coil, but this is clearly described and shown in the makers’
booklet. Using a 12-volt supply, the UK 930 is capable of about 200 milliwatts of RF output. The unit requires very little drive for full output, the requirement being well within the capabilities of the UK 905 oscillator. The two units were, in fact, designed for mutual use. The coil once again requires peaking which can be done in the same way as for the UK 905.

**Simplest QRP Transmitter**

The UK 905 oscillator, keyed in the negative power lead, could form a very low output transmitter. Using it with the original low-output impedance circuit, it can be matched into an aerial for local contacts. Modified for higher output impedance, the UK 905 can be fed into the UK 930 to provide a very simple 200 milliwatt transmitter. The modification to the UK 905 is quite easy and is described in the booklet supplied with the UK 930 unit. The circuit of the modified UK 905 is shown in Fig. 2. The original output capacitor (C2) is removed and a 100 pF capacitor, which is supplied with the UK 930 kit, is wired to the collector tag of L1. This capacitor now provides an output to match the UK 930. This modification is shown on Fig. 3.

The method of connecting the two modules is shown in Fig. 3. The 9-volt supply to the UK 905 is keyed and a 12 volt supply is used for the UK 930. The UK 930 does not draw any current in the key-up position. This simple arrangement can be tested by feeding the output into a 6-3 volt panel lamp. The coils can be peaked until the bulb gives the greatest light output. (If you can light a bulb with R.F. you can get out on the air!). Armed with this little mite of a transmitter and a carefully matched aerial, it should be possible to get your feet wet on 80m QRP.

**Setting Up**

The usual method of tuning the output stage, in this case adjusting the coil, for a current dip can be confusing when using really low power. It is better to have an indication of the RF power actually going up the spout. The RF indicator circuit shown in Fig. 5 will show the actual RF output. This little device has been found invaluable in QRP work as a relative power indicator at RF. The writer uses a cheap Japanese ex-tape recorder level meter with FSD of 250 µA, but almost any moving coil meter of 1 mA or less is suitable. RV1 is set according to the level of RF power to be monitored.

These two simple modules used “bare-back” are really attempting to go QRPP, or ultra low-power but a more viable QRP rig can be made by adding a simple single transistor PA stage.

**The PA Stage**

Fig. 4 shows the circuit for a basic PA stage capable of handling an input power of one watt or a little more, depending upon the gain of the transistor used. Surplus BFY51’s and BFY50’s were tried in the prototype. In spite of the simplicity of the circuit, and its lack of protection for the PA transistor, none of the transistors tested went up in smoke. If a simple transistor tester is to hand, it is a good plan to test the Hfe of individual transistors if surplus types are used. If the gain is found to be excessive (say 80 plus) avoid using such transistors. An effective form of protection is to wire in a 36 volt, 1 watt zener diode into the collector circuit—positive end to collector and negative to earth.
The UK-930 RF amplifier which complements the UK-905, as discussed in the text by G3RJV.

![Diagram of PA stage]

The PA coil is wound on an iron-powder toroidal core Type T-68-2 (T.M.P. Electronic Supplies). These cores offer high permeability and excellent "Q" figures. The main tuned winding should be wound almost to cover the whole circumference of the core, as shown in the diagram. Each time the wire goes through the hole, one turn has been wound. The winding should not be too tight, the 22g. wire being stiff enough to hold the turns in place. L4 is bifilar wound between the 12× end of L3 and the collector tapping. The 30g. section is laid carefully between the turns of the L3 winding. The makers of the core advise mounting them with their nylon screw kit. An epoxy resin did the job as well without any apparent ill effects.

With the key up the PA passes no current. Short wiring and adequate by-passing is important for stability. The PA can be checked for parasitics by metering the supply current and tuning C3, without RF drive to the stage. Any slight meter flicks will indicate parasitic oscillation.

The prototype PA was wired up on a perforated board measuring just over 2in. square. The whole rig was fitted on an aluminium base with a bent-up front panel to carry C3 and a key socket. A tin-plate screen was placed between each stage. All of this adds stability, although the rig appeared to function quite well sprawled about the bench.

The Tx must be fed into a low-impedance source, so some form of ATU is desirable. Tuning up can be...
done by field strength. It is better to tune for RF output, rather than PA current dips. Here the RF output indicator in Fig. 5 comes into its own, and can be connected directly across the output. Excessive levels of PA current can be cured either by choosing a lower-gain transistor, or by reducing the supply to the UK 930.

Well—there it is, basic and rather “rule of thumb,” but a simple rig capable of providing a lot of challenge and fun on 80 metres. A few tips for QRP operation—be patient: Don’t call “CQ” and expect the world to come back to you; wait for a calling station, or tail-end an existing QSO; if in doubt arrange a sked to test the rig. You will be surprised and delighted with what can be done with QRP.

DX FROM EDAY IS., ORKNEY
SOME INTERESTING EXPERIENCES

J. M. ROBSON (GM3CFS)

When a decision was made to “radioactivate” the Orkneys in 1973, it was not realised how much would be entailed in putting out a worthwhile signal from this small, bleak and windswept Island. The experience required a lot of hard physical work, there were many frustrations, but it was worth the effort. Many stations got their first Orkney QSO, and the antenna system gave excellent results on the bands 80 to 10 metres.

Eday Island, Orkneys

This Island belongs to the northern group and has a population of around 150. There is no water or electricity supply, the former being got from a well or rain-water barrel, the latter from a diesel generator. The Island is served four times a week by both inter-Island steamer and plane, the latter being the aptly named “Islander” which brings the mail and smaller cargo items. No trees grow on these Islands due to the savage climate and the land suffers from “sea blasting” caused by heavy seas crashing against the rocks and sending salt spray a considerable distance inland. The coastline is generally rocky, but there is one fine beach close to the grass airstrip. The seas are extremely treacherous with strong tide rips, which, with the wind in opposition, can result in some dangerous steep fronted seas. Bird life, however, is prolific and varied, with lapwing, oyster catcher, curlew, gannet, tern, eider duck and black-backed gull. The Islanders are friendly and helpful, very resourceful, but taciturn on occasions. There is a community centre for social events and one church. There is also a modern school despite the dwindling population.

Most of the populace run a car, most of them M.o.T. rejects, as it is not necessary to have a certificate on the Islands. Despite this, the local constabulary (from the main Island) make unexpected visits to the Islands. When this occurs, the “bush telegraph” performs admirably, and the unlicensed and unroadworthy cars are hurriedly pushed into barns or buried in haystacks. Cars unfit for further movement litter the farms, or are dumped in the rubbish excavation tip.

The QTH was situated on a promontory pointing north and encompassing about 180 acres. Surrounded by the sea in three directions, exposed to the elements in four directions, it was nevertheless an ideal spot for an antenna “farm”. It was decided to use the Sprite caravan as the shack, as more suitable living accommodation was shortly to be available. Meanwhile, a decision to use a multiband inverted-Vee three half-waves long on 80 metres was made, as the very high winds precluded the use of any kind of beam array. The 70ft. mast to support the antenna consisted of 14 sections of 2ft. steel tube with nylon guys. A series of trestles was made to ease the lifting of the mast and the mast laid on them. It was now a matter of awaiting a calm day for the lifting operation with gin pole and support stays connected ready.

Disaster!

The raising of the mast the first fine day did not work out as expected. With the tractor pulling strongly and ten men holding the guys, the mast went up quite well, but at about two thirds up, a double kink suddenly formed and the lot dived earthwards. The total damage was two badly bent and three slightly bent poles. The next step was the purchase of a 60 feet “Hamtower” which proved itself well. The freightage was considerably less than that quoted for a telescopic one, that being in the region of £120. So, apart from the lack of facilities on an Island, there are crippling freight charges to contend with. Diesel oil for example cost 28p. a gallon (in 1974) which caused our electricity to be about three times as expensive as on the mainland.

Work was commenced on excavation of the site for base and anchors. Rock was struck after a depth of only 2½ feet, but this difficulty was surmounted by driving in stakes to “key” the cement to the rock. Hardcore for the cement was obtained by taking the tractor and trailer to the nearest point above the shore and hauling up the stones bucket by bucket and emptying into the small trailer. Sand, on the other hand, could be got at the beach without much fuss. Mixing the cement on site and pouring into base and anchor points took nearly three very exhausting days, and it was with relief that base and anchors were dropped into the wet cement.

Erection of the tower presented little difficulty using a simple gantry. Bearing in mind the strength of the winds the tower was only taken up to 50ft. with a further 8ft. of steel tube at the top, the total height including base and tube mount being about 60 feet. As planning permission (yes, even there!) had been sought and granted, the only other proviso was a check with the plane operators. The day they were informed that the tower was complete, the Islander flew over the tower in acknowledgement, his wing tips seemingly about to be lopped off by the steel guys. Following local advice, three additional guy wires were added using fencing wire and three sections of the ill-fated mast served as ground anchors.
Installation of the Vee

The extremities of the antenna were terminated in two 15ft. poles made up of 6 sections of the original 70 foot mast. The open wire line was made up of 12 gauge aluminium using 4-inch ebonite spacers tied in with copper wire. (This was to have very unfortunate results some time later). In deference to the salt-laden atmosphere, the feeders were given two coats of marine varnish. They were taken down fairly close to the tower until about six feet from the ground and then led off to the caravan. As the horizontal distance was about 90 feet, some vertical support was given as well as judicious straining of the feeders to avoid “flexing” in strong winds. The only way that open wire line could be brought into the caravan, was to drill the window. This was accomplished after three and a half hours using carborundum and steel drills. It was the worst job of all.

The Shack

As the caravan was to be used in this role for some time, it was positioned close to a 5 foot stone dyke to afford some protection from the elements, and raised on to concrete blocks, before being tied down to anchors. To accommodate the FT-401, home made Z-match, HA1 keyer, etc., it was necessary to extend and strengthen the existing window table. The only remaining thing to do was to bring the “juice” into the shack. The generator of the juice was an ancient Lister single-cylinder diesel, hand cranked, and of 8 h.p. coupled to a 5 kW generator. Turning over this brute was beyond my powers at the beginning, and this, coupled with the engine’s fondness for an “Aerosol” sniff via its air cleaner before showing any willingness to start, made it necessary for me to enlist the services of one of the locals. However, practice makes perfect, and within a couple of weeks, the problem was overcome, except on the odd occasion when the engine persisted in running backwards.

Operating

Operating in the caravan, although cramped was comfortable enough, but at times during gales, there was some vibration and movement despite being tied down. Opening the door brought the sound of the wind tearing through the many guy wires, setting up a banshee wail and increasing in pitch as the wind gusted to storm force or higher. During the first leg of the ARRL CW contest in 1974, the winds were over 90 m.p.h. in the squalls with the caravan shaking badly. Frequent snow flurries added to the discomfort when going outside to top up the generator during the night. Brewing coffee and getting it into the shack intact, required a very special skill, cooking facilities within the caravan having been terminated. The second day of the contest dawned with no break in the weather, but a break in the feeders was noticed, fortunately close to ground level, but was nevertheless not any easy job to repair under those conditions. These feeders were destined to last less than another 3 months due to electrolytic action between the copper binding the spacers to the aluminium feedline, despite a liberal coating of marine varnish.

Antenna Performance

The 418 foot inverted-Vee produced results which were extremely satisfactory. In the direction of the main lobes on the higher frequencies, results were comparable to a 3-element beam or similar antenna. In other directions, there was, of course, some fall off, and to offset this, three 1½ wave Vees for 14/21/28 MHz were installed in the same plane as the big Vee, using a balun and a common low impedance feedline. On 7 MHz results were exceptional, with good reports from VK and ZL and all the W7 districts worked during the ARRL contest. On 80 metres many 599 reports were received from U.S.A. and good reports from PY, LU, CX, UA9, etc. The smaller Vees performed as expected with some gain over a dipole—up to 7 dB on 15 metres, with effectively nine half-waves.

As far as versatility is concerned, the inverted-Vee fed with tuned line has a lot to commend it. Apart from being operable on five bands, one can tune the entire band using a tuning unit and have no fear of a high SWR being presented to the transmitter. The lengths of the Vee legs are not critical and the losses are negligible with open wire line even with long runs. Also, it is an easy antenna to install and requires only one strong central support.

Despite the many frustrations and difficulties in operating throughout the period, a great deal of experience was gained, i.e., mechanical stresses on mast and
Applications

The writer on several occasions, and the answer is that—ohms after all? You will have found that any adjustments that never quite 1 : 1? You will have found that any adjustments that can alter this figure, either way. The conditions, height above ground and so forth which can produce at great cost.

So it is, but it gets a bit difficult when the aerial is in situ tens of feet up in the air.

Then there is the impedance at the feed point. To assume, for example, that the impedance at the centre of a half-wave dipole is 75 ohms is to ignore local conditions, height above ground and so forth which can alter this figure, either way.

Oh, yes, your SWR bridge in your 75-ohm line may show a low reading, but have you wondered why it was never quite 1 : 1? You will have found that any adjustments made at the transmitter end of the line made no difference. Perhaps the antenna impedance is not 75 ohms after all?

You may say it does not matter. The reply is that it does. Remember those hard-earned watts of RF, and where they are going?

Methods

Enter the antenna noise bridge. An instrument from which you can read your antenna impedance directly, and the resonant frequency from your receiver. The unit comprises an RF source of very wide bandwidth ("white noise") as a signal, which drives the bridge. The bridge compares the unknown (antenna) impedance against a calibrated potentiometer, and the receiver is used as a (tuned) null indicator.

It was surprising that no Orkney stations were heard over the period on any band 10-80 metres, but doubtless the vile climate is the reason. Finally it was a pleasure giving so many stations Eday Island, Orkney as a "new one" for the log.

For example, the bridge is connected to the aerial feed point, and the receiver to the bridge. With receiver RF gain reduced (the bridge puts out a hefty signal) and AGC off, the tuning is adjusted for a null. This occurs at the resonant frequency of the antenna. Then adjust the noise bridge control for a deeper null, and read off the antenna impedance. Just like that!

Remember trying to tune your mobile whip to frequency? Or adjusting your receiver input circuit coupling for an optimum match? Cutting baluns, or stubs to correct length?

All become easy and routine with the help of a noise bridge. For a full treatment in the use of the bridge the excellent article by G6LX in SHORT WAVE MAGAZINE for July, 1971 is to be recommended.

Construction

Having decided to acquire a noise bridge, then three approaches are open. We can go out and buy one of the commercial models which are available, and which are no doubt excellent, but the prices of which were a deterrent to the author for an instrument which is not in constant use.

The second way is to build one, and certainly the circuit is uncomplicated. Several designs have been published, and usually consist of a zener diode used as a noise generator, followed by two or three stages of amplification. The noise signal is coupled via a wide-band transformer to the bridge circuit which essentially is a calibrated potentiometer.

No problems arise until one reaches the wide-band transformer. This literally is the heart of the unit, and success or failure depends upon it. Its form is a multi-wound toroid, and the choice (and availability) of a suitable ferrite ring, and the correct winding to put on it, determines the upper frequency limit. No problem in reaching 14 MHz say, but what about 144 MHz? This proved another deterrent to the writer.

The third approach opened when it was found that a noise-bridge kit is being marketed by Cambridge Kits, 45 Old School Lane, Milton, Cambridge, for £6.70, inclusive VAT and postage. This includes everything, with the all-important toroid, ready wound.

Now there are kits, and kits. One thinks of Heathkit, with their attention to complete detail, and a step-by-step construction system. By comparison, the Cambridge kit is more a collection of parts. This is not criticism, as the kit is complete with components of first-class quality, even including the box and battery. A 100-ohm carbon potentiometer, ready scaled, is supplied, an item you would normally have to search the shops for.

A piece of perforated board is included, together with a practical layout as well as the circuit, on which to build the noise-generator and amplifier. Although this is perfectly adequate, the writer decided to etch a printed circuit board as it looks better. The recommended

NOISE-BRIDGE FOR ANTENNA MEASUREMENTS

USING A COMMERCIAL KIT

A SMALL box with an impressive sounding name. But what can it do? This question has been put to the writer on several occasions, and the answer is that this bridge takes over where the grid-dip oscillator and SWR bridge leave off.

Applications

Aerial theory (for instance) is not everyone's cup of tea, but a certain amount of aerial practice should be. After all, many constructional hours are spent building a transmitter, say (or a considerable amount of money buying one) to produce a number of watts of RF—the intention being to radiate this RF off the antenna. How well we do this depends on the aerial and its feed. Any inefficiency results in power being lost as heat. Power produced at great cost.

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A piece of perforated board is included, together with a practical layout as well as the circuit, on which to build the noise-generator and amplifier. Although this is perfectly adequate, the writer decided to etch a printed circuit board as it looks better. The recommended
layout was followed and the circuit marked out using some cellulose paint as a resist. A few minutes etch in acidified ferric chloride solution was followed by cleaning, drilling and the soldering in of the components. In all, not more than an hour or so's work.

The mini-box lid was drilled for the potentiometer, and the switch and coax sockets were fitted using countersunk bolts which did not show when the panel was completed. All non-critical, but remember to keep connections short between toroid, potentiometer, and the coax sockets. A Terry clip was pop-riveted to the box side to hold the battery and the box then finished in silver hammer enamel. The circuit board was bolted on a spacer to the base of the box, and the inter-connections completed.

Calibration

It is recommended that the potentiometer be calibrated at low frequency (2 MHz, say) by using non-inductive carbon resistors as the load. This was done, and on checking with a Model 8 Avo, the potentiometer resistance was found to agree precisely with that of the calibration resistors. This is as one would expect, but it did suggest that calibration could be done at DC, be merely calibrating the potentiometer itself—angular position against track resistance—and calibration was completed this way. Although a potentiometer with a linear law is supplied, the calibration shows this to be not quite so. Checking various resistors at 144 MHz showed the DC calibration to hold true.

Finish

The difference between amateur and commercial equipment often shows in the finish of the panel. The layout as shown was drawn full size on paper and the letters and numbers applied with dry print lettering. This could have been used as the panel but the writer photographed this using line film, which accentuates black and white, and subdues any intermediate grey shades. The resulting negative, of high contrast, was then printed on to Kentmere Kentint, a photographic bromide paper having a metallic silver base. This gives a silver panel with jet black lettering. It is only paper of course and so a covering of 2-5 mm. clear Perspex was fitted as a protection. It is held in place by the potentiometer, and four countersunk bolts at the corners.

The result is a neat portable unit, with a performance to 144 MHz, and at a very reasonable price.
TEN-METRE AERIAL AMPLIFIER FOR OSCAR'S RECEPTION
W. H. JARVIS, M.A. (GM8APX)

There is nothing original about this circuit or layout, which was inspired by the simplicity of a commercial aerial pre-amplifier intended to improve TV signals over 40-800 MHz. It was thought that such a simple approach would probably not work on 29 MHz—but it does, and very well, too. There is no need for any adjustments, for none are possible!

In the circuit, Fig. 1, C1, R1, C2 and R2, L2 can be said to be optional—this is because, in the prototype, the circuit was on the verge of oscillation, giving about 20 dB of gain at 29.5 MHz, measured by S-meter cum signal generator. So R2, C2 were introduced to reduce the gain of the second stage. R2 is 270 ohms and C2 47 µF. They bring the gain at 29 MHz down to about 12 dB. As this is more than enough, they should be left in. R1, C1 can be removed, as they have approximately the same effect, whereas the circuit is completely stable without them.

Layout is sketched in Fig. 2 and is not critical. However, the earthed length of Veroboard down the middle must provide quite effective screening between the two stages and should be retained. The 330 µF coupling capacitor bridges this screen. The whole amplifier is simply wrapped in a plastic bag held with a rubber band, and can be hung at the “eye” of the 10-metre dipole.

Coil L is 12 turns of enamelled 20g. wire on a ferrite core, enabling the amplifier on the roof just below the aerial—to be powered through its output coax.

It has been noticed that this amplifier continues to give useful gain right down to the 7 MHz area, and would almost certainly be effective lower in frequency if the capacitors were made larger.

There is an increase in background “sharsh” in the absence of signals, but the Q of the tuned circuits of any reasonable 10-metre Rx makes this unimportant. The overall effect of the amplifier is to give a signal about 12 dB up, with a much better S/N ratio.

CHEAP RF OUTPUT METER

This device is intended for the two-metre and 70-centimetre bands and works by inductive pick-up. It is intended mainly for mobile and portable work and, by using a “magnet mounting,” can be held to the bonnet of the vehicle. No earthing is required, as the RF input is from a stiff loop of coax, L1, length not critical and about 50 cm. (20 ins.) is convenient. The inner and outer are shorted at both ends, fitted with 4 mm. plugs for sockets S1, S2. Diodes D1, D2, are 1GP5’s, which appear to work very well up to 450 MHz. Capacitor C is 300 µF or so.

An Eclipse pot-magnet G forms the “sucker” and is secured to a plastic frame carrying the whole instrument. This frame is 65 mm. length of square-section plastic drain-pipe (an off-cut at any builders’ merchant or D-I-Y store) cut in half to form a “U”. A 2½in. length is sufficient. The meter is 0-100 µA.

For best results, L1 should be horizontal if polarisation (E-vector) is vertical, and vica-versa—in other words, try it either way if you are using a halo or 5/8th wave whip. In some cases, better readings can be obtained by disconnecting at socket S1 and straightening the coax to form a whip pick-up, in which case S1 should be earthed to the magnet retaining bolt on the U-piece.

The whole idea is to use the device as a comparative RF indicator. It should therefore always be mounted in the same place on the car and in the same posture when tuning up or making comparisons, and having regard to polarisation when changing aerials.
**VHF BANDS**

A. H. DORMER (G3DAH)

**Twelve-Nine**

It is not often that we have the opportunity, or indeed the basic information, to report on activity on these frequencies. Much monitoring of 70 cm. and 23 cm. during the past few days has elicited the fact that interest, at least on the East coast of this country and on the Continent—in PA particularly—is increasing. It was gratifying to hear this confirmed in a letter from G4BYV (Dereham, Norfolk) who is now active on 13 cm. He reports contacts with G3LQR (Framlingham, Suffolk) and PA0DBQ, and notes that G3LQR has worked the PA0 on both 13 cm. and 9 cm. and found that the QSB was lower on 9 cm. than on 70 cm. over the same path. G8ADC in Bedfordshire has received the G4BYV signal, and is getting a Tx fixed up at the present time. PA0VV has 13 cm. with 9 cm. coming up, and is a potent signal on 70 cm. if you want to arrange a sked.

By careful dimensioning of the antenna and appropriate choice of mixing frequencies, getting on the SHF bands is not as difficult as may at first appear. The bands are harmonically related, so multipliers can produce RF, and the dish antenna of quite modest size can give considerable gain at 23 cm., 13 cm. and 9 cm.

**Twenty-Three**

As will be seen from the All-Time 23 cm. Table this month, there have been some significant additions to the scores recently. Still leading is G8AOD (Ely, Cambs.) who found May to be most productive in view of the G3WDG expedition, which he worked in Shropshire, Powys, Cumbria, Dumfries, Borders and Durham. Add to this a QSO with DJ1WP for a new country and G3HCW in West Yorkshire for a new county, and the countries/countries total jumps to 35, which is going to take a bit of beating! The DX activity from GM should encourage those who claim that 23 cm. operations from the North-West, GD2HDZ found the band to be most productive in view of the G3PMH/A, operating from near Royston, example which illustrates this point is that of G8AOD who made over 100 contacts on the band of this kind. A few Continentals, who has his 23 cm. and 70 cm. antennas up again) could be made. The Jubilee contest at the end of 2m. showed signals from HG and DL, recorded the Sporadic-E opening. This Column has remarked before on the intense Sporadic-E opening on July 2. According to G3NSM (Oxford) he observed two phases, the first between 0915z and 1038z and the second between 1127z and 1133z, the later period being much more subject to deep QSB than the first. He worked YU1EXY, four HG, one OK and LZ1AB, the bottom end of 2m. showed signals from HG and LZ and a GW in Anglesey was heard working OE and HG on SSB. A check with G4CDF.

**Seventy-Centimetres**

Conditions over the period at the end of June and start of July were quite phenomenal, with really good extended tropo. propagation and high pressure systems combining to bring many contacts from the South of this country into GM, GM, S and L.A. A notable feature of this opening was the relatively small arc over which these contacts could be made. The Jubilee contest at the beginning of the month highlighted this in that it was very difficult to get into the West and North-West of the U.K. but as easy as the proverbial log-falling to work the Continent, particularly to Scandinavia. An example which illustrates this point is that of G1P4M1/A, operating from near Royston, who made over 100 contacts on the band of which 75% were Continental.

To bear out the contention of the presence of dyeing which did not terminate in the North-West, GD2HDZ found the band comparatively dead except for DC1XC on what he describes as "the outstanding evening" of June 23. G3BW in Cumbria echoes this report (although he did make it with G3DAH on July 8) and it seems that G3MS (Bolton) was also having a fairly lean time of it, even during the Jubilee contest. Readers who are short of contacts on this band might like to note that the three British call signs mentioned above are to be heard on 432 MHz every evening except Saturday at around 2230 BST in three-way QSO which anyone is invited to join. They usually beam South-east. G3BW now has a 4CX250B on this band yielding about 100 watts of RF to a 68-ele. beam at 45ft., so should be fairly potent over quite an area. If conditions are right you might also hear GW3FKB in Anglesea and G13JLA in Tyrone at around the same time, and the five of them would make a very nice DX haul. GM8FXX (Kincardine) has only low power on 70 cm. but his excellent QTH is helping him to make some good DX contacts. And welcome to G4BWG (London) who is now QRV on 70 cm. This Column has remarked before on the increase in SSB on 70 cm. and the superiority of this mode over others (with the exception of CW) and it was interesting to learn from a report by G2AXI (Basingstoke) that in the eight weeks he has been running SSB he has had more contacts than in any previous year. Verb sap!

**Two Metres**

Probably the most interesting feature of this band during the last couple of weeks was the intense Sporadic-E opening on July 2. According to G3NSM (Oxford) he observed two phases, the first between 0915z and 1038z and the second between 1127z and 1133z, the later period being much more subject to deep QSB than the first. He worked YU1EXY, four HG, one OK and LZ1AB, LZ1BW, LZ1AG, LZ2FR and LZ1FO, the best DX being LZ1AG who is in QRA, G3AVO, G3B/W and G3C/K. All contacts were on CW. He reports also that ZB2VHF was heard as far north as Berwick, but has no further details. His score in the few days around that date was 21 different countries!

Up in Camforth (Lancs.) G4CJZ also recorded the Sporadic-E opening. He first observed signs of it at 1130 BST when Band II was full of Continental FM. The bottom end of 2m. showed signals from HG and LZ and a GW in Anglesey was heard working OE and HG on SSB. A check with G4CDF.

**TWENTY-THREE CENTIMETRES**

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in Scunthorpe confirmed that he was also hearing the opening and had worked into LZ, YZ, and HG on CW at 1000z. From about 1200z, 'CZP was hearing Spanish broadcast stations on Band II and at 1253z, ZB2VHF appeared on 144-144 MHz at up to 5 & 9+20 dB with deep QSB and remained audible until 1310z. Unfortunately, the station was operating in beacon mode and no contact was possible—which is a pity since this would have been a G/ZB2 “First” on 2m.

G4CZP also reports a good lift to EI and GI on June 24 (tropo., not Es of course) and his report indicates more SSB activity from EI than one hears of regularly. He quotes as active: EI7D, EI9CT, EI2AK, EI9Q, EI5BA, EI5BH and EI5P.

The Cambridge Wireless Club operating as GM4CTK/P during June seems to have had a very successful trip and have given contacts on 4m., 2m. and 70 cm. to many operators in the Midlands and the South.

Comment about the superlative conditions on 2m. during June and early July is probably superfluous here—they must have been obvious to nearly all. However, details of outstanding achievements which can be incorporated in this Column next month would be welcome.

Beacons & Repeaters

Here at home, the Wrotham 2m. beacon has been taken out of service for fundamental investigation circuit—at present a 4 MHz xtal—and an investigation into certain spuri on and around the transmitted frequency. The proximity of FM transmissions from the site will probably be found to be responsible for some of these as they carry programme material and there could be all sorts of unexpected mixing effects. The problem is complicated by the apparent directivity of some of the “weirdies”. For example, when GB3VHF was brought on to high power, your scribe did a number of tests with G3COJ, the beacon keeper and, although the signals were well over the RST99 mark at this close range, no spuri could be detected, although they were being reported from Essex and further afield to the North. (Even G4CDF up in Humberside can hear them when the band is open). At one time it looked as if the complainant’s receiving equipment might be at fault in that Liners appeared to be badly affected, but further tests showed that the trouble was not confined to this particular transceiver. It is conceivable, of course, that defective metalwork, guys and so on, may be causing the unwanted radiation—it has happened before—and one must hope that a thorough investigation will be made at the site. Meanwhile, the beacon Tx is being modified to generate the 144 MHz frequency from a 72 MHz xtal and doubler which should yield a cleaner signal. Don’t expect operation to be resumed for some weeks yet.

Continental beacons which were audible in the U.K. during the recent openings and which will be new to many are:- SK6UHF, QRA G7TJ, on 432-053 MHz; LAUHF, QRA FF04I, on 432-07 MHz; DB0UZ on 1296-01 MHz, and O26MBJ, on 432-45 MHz. The latter, in particular, seems to radiate a very good signal into this country and has been audible at up to 5 & 9+ recently for days on end.

GM8BRM reports working through the Norwegian 2m. repeaters recently. They are on Channel R6 and R8 in Bergen and Stavanger respectively. He had five contacts through them using the IC-22S (which has a repeater facility built in) and a ground-plane antenna, also 18 contacts with LA direct, including one with a mobile in Stavanger who was better over the direct path than through the repeater! He has recorded these contacts, and says that if any LA operator who might see this would like a copy, he will send one along.

The Barnsley 2m. repeater is now in restricted operation most evenings, 1730-2100 clock, and most weekends. Callsign is GB3NA on Channel R3 with 1750 Hz access tone. Polarisation is vertical and results from mobile tests have shown good coverage in the Leeds, Sheffield, Rotherham, Doncaster and Goole areas. Further afield, and from fixed stations, reception has been reported from Hull, Beverley and Lowestoft. The gear should shortly be operating on a fully automatic basis and reports or further information may be sent to, or obtained from, G8IWA, QTHR.

An assessment is being made of the requirement for a 2m. repeater in the Tyne & Wear area, and those interested are advised to contact G3WYW, QTHR, in order that the fullest possible account may be taken of local views on the matter.

The Kent Repeater Group are progressing rapidly with the design for GB3KR and will be showing some of the equipment and discussing their plans at the next meeting of the South-east UHF/VHF Group at the University of Kent, Canterbury on July 25. The application for the licence has been sent to the Home Office for action. The Essex Repeater Group have reached the stage at which the application for their 70 cm. installation has been passed to the Home Office for approval, and a certain amount of equipment has been procured. This is commercial gear and needs much modification, the more so since they are planning to go for 1-6 MHz spacing between the “transmit” and “receive” frequencies, as recommended by the Warsaw Conference. The antenna is a bit of a monster—a vertical stack of co-axial dipoles 20ft. long which will...
have an estimated gain of 10 dB and should give coverage over the area Brentwood, Grays, Southend, Bishop's Stortford, Halstead, Dunmow and Colchester. They need all sorts of help, and if you are willing to give them a hand please contact G4CUE, QTHR.

There appears to be a certain amount of “foot-dragging” over the issue of the licence for the Central Scotland repeater, application for which was made 18 months ago. Progress with the bits and pieces is rapid now. GM3BF has produced the solid-state Tx giving some 25-30 watts output, and the Rx is now working, which leaves but the logic and control circuits on which progress is slower. A draft specification has been prepared for GB3GL and GB3ED, the Glasgow and Edinburgh 70 cm. repeaters, and will be submitted in due course.

DX-Peditions

The Oxford University Radio Society are mounting an expedition to Guernsey between August 28 and September 9. They will have SSB and CW on 4m., 2m. and 70 cm. and the callsigns will be those of the Society—GC3OUR/P, and participants GC3YGF, GC4ASQ, GC4ASV, GC4BIX, GC4BYB and GC8ICZ. They will be operating mainly in the evenings and are prepared to make skeds for 4m. and 70 cm. only, via G4BIX, QTHR.

GM3BDY, GM3SS and G4CWI are preparing for another trip to GM this year following their most successful effort last season which, in spite of the absence of advance publicity, brought them several hundred contacts on 2m. and 4m. This year they will have three bands available: On 4m.—50 watts, CW/SSB with 4 or 8-ele. Yagi, 2m.—150 watts, CW/SSB with 10-ele. Yagi, and 70 cm.—150 watts, CW/SSB with 8 x 46-ele. Yagis. The itinerary has not yet been finalised, but will start off on August 31 in Selkirk and provisionally include Peebles, Stirling and Kinross on succeeding days. Between September 4—8, they will be organising for, operating in and recovering from, VHF/NFB, in which they propose to participate from a “secret site”. From the 9th to the 14th, they plan operation via G3XYD, QTHR. Times and frequencies are as follows: (All BST) 1800-2000 as GM3XYZ/P on 144 MHz, 0000-2130 as GM3ZSS/P on 432 MHz, and 2130-2230 as GM4CWI/P on 70 MHz. Skeds for 4m. and 70 cm. only may be arranged via G3XYD, QTHR.

We are pleased to report the success of the team of GM8FVC, GM8IZH and G4BWT on scaling the three highest peaks in Scotland, England and Wales in 24 hours, and operating on 2m. from all of them. Readers may recall that bad weather earlier in the year prevented them from making the attempt scheduled for April, but all went well for the weekend of July 5. Congratulations to them on an unusual exploit.

Up in GM

We have been taken to task by GM3AKB for suggesting in our report on the May 31/June 1 contest that there was “an absence of 2m., GM contacts in the South.” Operating /P with a Liner, he made several contacts with portables in QRA ZM and ZL and one supposes that it is a matter of debate just where South ends and Midlands begin. Certainly, one had in mind rather QRA Locators AK and AL when the comment was

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The Table shows claims to date from January 1, 1975 and will close on December 31, 1975. All claims should be sent to: “VHF Bands,” SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ as soon as possible after the start of a new month.
made and, from reports received, it does appear that operators that far to the South were very short of GM contacts, however eagerly they may have been sought. It is always a pleasure for the Southrons to make it with GM, so it wasn’t for want of trying, and one hopes that the converse is equally true. He also comments on the Liner as a popular piece of gear to take on a portable expedition in spite of its (usual) limitation to below 144-35 MHz and suggests that G station operators should be encouraged to look for GM between 144-15 MHz and 144-20 MHz. Now, here we must differ and point out that this is just about the worst area to make Continental contacts on 2m., which we expect of him, and on 70 cm. which is more unexpected since he is only running one watt of SSB. Recent QSO’s on that band have been with G3LQR (Suffolk), PA0VY, DK1KO and G3BHJ and G3DAH in Kent. He reports an enormous pile-up of LA stations on 2m. during these good conditions, with LA3RP and LA3EQ by far the loudest, and notes that LA3EQ should be an even better signal shortly when he completes his 500-watt linear. GM3ZBE (Aberdeen) has also been a very good signal on both 2m. and 70 cm. and has made it on the higher frequency with F9FT, DJ, and OZ among scores of G stations. GM3EJO now has his Microwave Modules transverter working on 70 cm. and is using it for good effect to raise the DX, both direct and via Oscar VII.

Finally, a reminder about the Scottish VHF Convention. Venue is the Treetops Hotel, Aberdeen, date is September 13. Tickets cost 50p for the Convention only and £3 for Convention and Dinner, and may be obtained from GM8FFX or G4BKV, QTHR. More details later.

VHFCC Awards
To Owen Cross, G4DFI of Bexleyheath, Kent, goes Award No. 242 for 2m. The necessary contacts were made between September, 1973 and June, 1974. We congratulate you on your excellent openings and many thanks for your efforts. GW5ZTH, will be leaving the U.K. for South Africa very soon and will have a chance to explore the VHF bands in his new country. Well done, Owen. We wish you all the best in your future operations. 

Deadline
That wraps it up again for this month. Deadline for the next issue is August 9. Please send your reports, news, views and comments as usual to: "VHF Bands", SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ. Cheers for now and very 73 de G3DAH.

For this month's Reader Small Advertisements, see pp. 353-358
THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for September issue: August 7)

The Reports

First we must mention the special-interest groups, such as R.A.I.B.C., who cater for those unfortunate SWL’s and licensed people who are either blind or disabled. Here, perhaps, this time the most important thing is to note the change of secretary—see the address panel—to which new QTH all correspondence should go, as well as subscriptions, which fell due at the end of June.

A.R.M.S. is the Club which caters for the mobile interest, largely through their Mobile News issues, with various other services. Details can be obtained from G3FPU—see Panel.

Then there is the G-QRP Club; devoted to low-power activity on all the amateur bands, with a Newsletter which is usually full of interesting material on the QRP front, home-building QRP gear, improvements to commercial equipment, QRP contests, and so on. For those old-timers who harken nostalgically back to 30 years ago when a transmitter had to be constructed to get on the air at all, and when the “Spirit of Amateur Radio” still meant something, to try QRP operating and building, and join the QRP Club could be just like old times!

Scotland & North

It rather seems that at Glenrothes, playing contests is a major interest, and they in fact had two stations out for Field Day, piling up a handsome score in the process, and enjoying all the fun of a weekend out. For details of the Club’s activities, get in touch with G4CVR, as Panel.

The programme for a course on Basic Electronics is being mapped out this month, for a start to be made in September, says the Star report. The group foregather on Wednesday evenings at the New Inn Hotel, Bramley Town Street, Bramley, Leeds 13.

It looks as though the Sunderland chaps are out of it until September, as their venue at the Sunderland Polytechnic does not re-open until then, so the new Secretary is looking for something better meantime. This being the case, for the very latest information re-open until then, so the new Secretary is looking for something better meantime. This being the case, for the very latest information we must refer you to G3DQA—see Panel.

Then, on Mondays, the VHF and D/F-oriented types have another session, this one being at the Club shack. August 1 is a Club Quiz, August 7 a Discussion on Contest Colour TV System, by G4AOK. This leaves August 2 for a Night on the Air, and the 29th for a mystery lecture.

Midlands

At the time of their last Newsletter, the Midland lads had nothing specific lined up for August 19 or September 16; but doubtless something will have been fixed up since then. The venue is the Birmingham and Midland Institute, which is a place known to just about everyone in the Club catchment area; if you are one who may not, then get in touch with the Secretary, as Panel.

On now to Spalding with a very large membership who keep in touch by way of their very fine Newsletter. August 8 is, we see, the one to mark in your diary for a visit, and the venue is the Ship Albion, Albion Street, Spalding, for a ragchew and sale-and-swap session.

It is all Activity Nights at Nottingham in August, except that August 7 is down for a Forum. On Thursdays, then, you head for Sherwood Community Centre, Mansfield Road.

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Friday is the formal meeting night for South Manchester each week, at Sale Moor Community Centre, Norris Road, Sale; Morse classes precede the main activity. Then, on Mondays, the VHF and D/F-oriented types have another session, this one being at the Club shack. August 1 is a Club Quiz, August 7 a Discussion on Contest Operation, August 15 a complete change by way of a talk on PAL Colour TV System, by G4AOK. This leaves August 22 for a Night on the Air, and the 29th for a mystery lecture.

Up to Wirral we go next, where the routine has for long enough been to get together on the first and third Wednesdays of each month at the Sports Centre, Grange Road West, Birkenhead. August 6 is a “special” insofar as we understand it is a Fox Hunt.

Another Wednesday-favouring group is that at Derby, saying that they do it every week, up on the top floor at 119 Green Lane. A Surplus Sale appears for August 6, and preparations for the famous Mobile Rally are made the priority for the 13th. A D/F Practice session precedes the main activity.

Lots of things are going to happen, or have already happened, to entertain the York group. For example, they had an evening at the University of York Physics Dept. where many interesting experiments had been arranged for them, so much so that a repeat visit seems on the cards. Then there is the special-activity station set up at the National Railway Museum for Opening Day on September 27—for which the committee well and truly earned their keep by clambering all over the roof of the building looking for fixings for the aerials! They also have the Tollerton Show on August 16, just to keep in training.

On top of it all every Thursday evening sees them heading for the HQ, which is the British Legion Club, 61 Micklegate, York. There are a couple of reports from White Rose, and a sample of their Newsletter, which contains quite a good piece on their “Talkbox” for ten metres, and some cartoons of well-known club members. This group are based on 83 Town Street, Armley, Leeds 12, where they can be found on any Wednesday evening, and on the first Sunday morning in each month from 10.30 to 1.30 p.m.

For August, Cheltenham forsake their usual evening at the Royal Crescent, Clarence Street on the first Thursday which they normally have, in favour of a conducted tour of the Dowty-Rotol organisation at Staverton; assemble outside the main gate on the old A.40, at 1930 on Thursday August 7, where G3VTS will meet them.

Most Tuesdays there is an informal meeting of the Bury & Rossendale gang, but the second one in each month is always set aside as a “main meeting” with some sort of talk or whatever. They have now
got their 18AVT up on the top of the Hq. at the Moses Community Centre, and it is being tested prior to putting the Club station back on the air.

That Dud Charman "Aerial Circus" meeting proved well worth while, reports G4AEJ from Solihull, one visitor even coming in from as far afield as Hereford to make the number on parade up to a couple of hundred—not a bad audience even for G6CJ, who always brings 'em in in droves. It will be a bit of an anti-climax only to have a film of a vertical aerial of a novel type. On the question of the August expenditure to somewhere near the £300 mark, and so the committee have any suggestions for a suitable meeting-place, preferably near St. Albans and on a public transport route, capable of holding up to 60 persons, and adequately warm in winter, then pass this on to him as well. In addition to the normal dates, he will be able to tell you about the summer evenings spent at Salisbury Hall, London Colney, The Croydon area is covered by Surrey, from their Hq. at the Ship Gardens, Finchfield, Wolverhampton, WV3, 8LW.

Verulam: H. Young, G3YHY, 93 Leafield Crescent, Watford, Herts.

WHITE ROSE: K. Robson, G3VYT, Flat 7, 34 St. James Drive, Cheadle Heath, Wilmslow, Cheshire.

WIRRAL: H. I. Crofts, G3DLF, 3 Barmouth Road, Wallasey, Wirral.

WOLVERHAMPTON: J. Nicholls, G3GCC, 27 Denham Gardens, Finchfield, Wolverhampton, WV3, 8LW.

YORK: K. R. Cass, G3WVO, 4 Heworth Village, York.

nothing in the nature of a formal meeting in August, the normal third-Monday date being given over to a general natter. This is at the British Legion Club, Windhill, Bishops Stortford.

At Verulam, rising costs have forced up the group's annual expenditure to somewhere near the £300 mark, and so the committee are actively pursuing a hunt for ways of economising, among these being a change of Hq.

As usual, the venue will be the SWEB Clubroom, Pool, Loughborough, Leics., LE11 3LZ.

...so we have to refer you to G3FWR for the gen.
is made and distributed so as to appear finally in the home, and on
August 28, the entertainment will be in the form of a series of mini-
lectures, which are said always to prove of interest.

North Kent have the second and fourth Thursdays of each month
booked at the St. Mary's Institute, 2 North Road, Bexley. For
August, we have no details of the activities, for which you should
contact the Hon. Sec.

For details of the Mid-Sussex group, based on Marple Place,
Leylands Road, Burgess Hill, we should normally refer you to the
secretary—however, G3JMB is laid up following a heart attack, so
this time we are directing your queries to his predecessor—see Panel.
Meanwhile, let us all wish G3JMB a speedy and complete recovery
to health and strength.

A “Members Evening” is the fare for Reigate on August 19,
when members will be bringing along their bits of home-brewed gear
or indeed commercial stuff, to show the others. The Natters are at
the Marquis of Granby, Hooley Lane, Redhill, starting at 8.30, for which
the August date is 5th.

The highlight of the evening for the lads at Acton, Brentford &
Chiswick on August 19 will be a sked with members G3CCD who will
be in France as F0UT. FT-101 transceivers will be used at both ends
of the path. Meetings are at 66 High Road, Chiswick, as usual.

We immediately noted the large letters on the Chilterna newsletter
front page. This advises the membership that after August they will
no longer be able to use the existing venue at the Ernest Turner
works in High Wycombe. Therefore, suggestions are urgently wanted
for a new Hq., and these can be passed on to the committee at the
last couple of evenings at the old QTH, on August 12 and 27
respectively.

Now to Cay Valley, where they have two meetings each month at
the Etham United Reformed Church Hall, 1 Court Road, London
S.E.9, on the first and third Thursdays of the month; the first is
the formal, the second the natter-sessions.

July 30 is an Extraordinary General Meeting, and not as mentioned
last time round, the Cheshunt. In August there are two evenings
dedicated to Morse, followed by informal chatting, these being August
13 and 27. On 6th, G8CXA will be talking about the Telford range
of grids, and on August 20, the subject will be Metalwork for Radio
Amateurs, by G8JKU.

David Grant of the BBC will be at Maidhead on Thursday
August 7, to talk about Microwave Links; this is followed on Tuesday
August 19 by a discussion on the arrangements for VHF/NFD.
Both dates are taken at the British Red Cross Hall, The Crescent,
Maidhead, starting at 7.30 p.m.

**Finales**

We have reached the bottom of the pile once again; so the next
batch of reports will be giving coverage of the September goings-on,
and should be timed to reach us by first post on August 7 latest, which
is the usual 22 days before publication date of August 29. The
address, as always, is “Club Secretary,” SHORT WAVE MAGAZINE,
BUCKINGHAM, MK18 1RQ.

This space is for the publication of the addresses of holders
of new calligns, or changes of address, in EI, GC, 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 and address on a separate slip to QTH
Section. Be sure to give correct County designation and post-code. Address items for this space to: “New QTH
Page,” SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ.

**NEW QTH's**

E13CV, J. Daly, St. Kieran's, Rope Walk,
Black Rods, Co. City, Eire.
E17CV, S. Linchan, 9 Oak Lawn, Castle-
knock, Co. Dublin, Eire.
E10CT, W. C. Nolan, 25 Beech Park,
Athlone, Co. Westmeath, Eire.
G4DWO, W. Ingham (ex-G8HZA), West-
field Road, Field Road, Morbury,
Nr. Wakefield, West Yorkshire.
G4DXX, W. J. Gordon, 14 Ashgrove Park,
Strabane, Co. Tyrone, N. Ireland.
G4DYO, P. D. Jones (ex-G8GVT), 43 Broad
Rig Avenue, Hove, East Sussex, BN3 BEW.
G4DYE, E. Machtryre, 22 Olympic Drive,
Strabane, Co. Tyrone, N. Ireland.
G4DZF, M. C. Foulds, 140 Elmstead, Tan-
house, Skelmersdale, Lancs., WN8 6BY.
G4DZK, R. F. MacLeod (ex-GMBHYC),
34 Rutherford Avenue, Knightswood,
Glasgow, G13 2RJ.
G4EAX, J. Gell, 94 Glapton Lane, Clifton
Estate, Nottingham, NG11 8DF.
G4EEB, W. M. Fitzgerald, 79 Saddens
Crescent, Catterall, Preston, PR2 1N.
G4JAC, A. J. Jackson, 27 Ellesmere Drive,
Hamey Green, Sandrether, Orpington,
CR2 9EH.
G4JEJ, B. G. C. Thompson, Tech. (CEI),
21 Arthur Place, Corby, Northamptonsh-
ire, NN18 0LZ.
G4JWS, D. W. Sherwen, 101 Main Street,
Frizington, Cumbria, CA26 3PE.
G4JYB, M.France, 106 Harvey Lane,
Golborne, Warrington, Greater Man-
chester, WA3 3GL.(Tel: (Ashford-
minster 75904.)
G4KDV, R. D. Eager, Darwin College,
The University, Canterbury, Kent, CT1 2NY.
G4MKDY, D. W. Calder, 36 Garforth
Crescent, Tneathar, Kilsby (821967),
Glasgow, G65 9SX.
G4KNK, C. Crouch, 78 Milfield, Hawkinge,
Folkestone, Kent, CT17 1DG.(Tel:
0305-392945).
G4KV, P. M. Jessop, 28 Moor Lane,
Rickmansworth (74446), Heris., W3D
1LJ.
G4KHH, C. F. Young, 70 Upper Close,
Forest Row, East Sussex, RH18 5DS.
G4KHK, P. G. Chapman, 12 Crest Gardens,
Mannering, Mapperley, Nottingham (65283),
NG3 2JG.
G4KHR, B. Robinson, 10 Clevel Drive,
Balderton, Newark, Notts., NG24 3NT.
G3EBR, L. Sisson, 23 Sandgate, Penrith,
Cumbria, CA11 TJJ. (Tel: 0768 3470).
G3GQR, G. A. Burton, 22 Marina Drive,
Spondon, Derby, DE2 7AF.
G3MCX, W. J. Kennedy, 22 Croham Park
Avenue, South Croydon, Surrey, CR2 7HH.
(G8JKU, A. E. Lee, 18 Britton Road, Bexleyheath, Kent.
G3GAD, B. W. Macklin, 4 Foxmoor Close,
Ockley, Basingstoke, Hants.
G4CLZ, J. B. Jenkins (ex-DA2YJIVS9ABJ),
1 Hawthorn Drive, Topcliffe Barracks,
Thirsk, North Yorkshire, Y07 3EY.
G4DPY, D. R. Dabinett, 23 Pool Court,
Forest Vale Estate, Pickering, North
Yorkshire, YO18 8DR.
G4DMQ, M. V. Rubek, 12 Linkfield Lane,
Redhill, Surrey, RH1 1JL. (Tel: 0737
63575).
G4TSX, J. C. Reeve, 16 Junction Road, Milden-
hall, Suffolk, IP28 7BZ.
G5BVR, G. Oddy, 16 Balmoral Court,
Stanwix, Carlisle, Cumbria, CA5 3PW.
G8GTV, B. S. Raby, 69 Edwin Road,
Rainham Mark, Gillingham, Kent.
G4HZEK, A. E. Lee, 18 Britton Road, Bexley-
heath, Kent, 207 1TT. (Tel: 0422
67931).
G4ILL, D. R. Horton, 53 Calstock Road,
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SPECIALS FOR THIS MONTH

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  - £35 Ferrite chloride I lb. 1.63
  - £42.50 TEI5 GDO
  - £52.50 PCL359 in PTFE
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- 6915.55 6968.75 7210 7613.13 7666 7706.08 7722.5 7791.7 7825 7841.7
- 9182.5 9236.25 9390.0 9443.75 9497.5 9551.25 9595 9648.75 9692.5 9736.25

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**READERS**

Selling: Braun 1000-CR Rx, battery/mains portable, giving LW/MW and FM, coverage to 30 MHz in six bands, with bandspread tuning, BFO, RF gain control, tuning meter, filters, tape and phono sockets, built-in antenna for FM and SW reception, price £75.—Ring Scales, G3NRs, Scarborough (0723) 61238 day, or 0723 60623, evenings.

Sale: SB-220, £210. HW-101 with home-built PSU, £155. KW-103, 75 ohm, £12. Multi-7 Tx, 10w, two-metre FM, fitted crystals for 144-48, 144-60, 145-00, channels R5, R6, R7, S20, S22, S23, S24 (xtals alone worth over £57), price £115. Brand new IBM Model-B typewriter (not “golf ball”), long carriage, with remote control solenoids, would make excellent RTTY printer, £35. Buyers to inspect and collect or carriage at cost.—Ring Cragg, Clipston (088586) 307, evenings or week-ends.

For sale: Two-metre Europa, £70. Also 4-metre Europa, £70 and Medco low-pass filter, £5.—Poulter, G3WHK, 279 Aragon Road, Morden, Surrey. (Tel: 01-337 0117).

For the CR-100 receiver, large-scale circuit diagrams, on two A3 sheets, with component values, 50p inclusive postage.—Haig, 29 Kings Ash Road, Paignton, Devon.

Wanted: SSB Transceiver, mains/battery operation, such as FT-101, FT-201 or similar.—Jennings, G3PVW, QTHR, or ring 021-373 2956 (Birmingham).

To be sold Property of The Late G8CIY: Eddystone S.680 receiver, £60. Storno Cam. 19/25, £30. Storno base station, £25. Type 8Y2M J-Beam, £4. TF.1041 VTVM, £15. TF.1152 RF Power Meter, £15. TF.925 Wavemeter, £10. BC-221 at £15. For full list send s.a.e.—Sterry, G3WHK, QTHR, or ring 021-373 2956 (Birmingham).

Wanted: Heath HW-12A transceiver in good condition. Please state details and price.—Reardon, 99 Fereneze Avenue, Clarkston, Glasgow, G76 7RT, Scotland.

Selling: T.W. Communicator for two metres, with mains PSU and several crystals (details on request), £40. Various type crystals for 8020, 8014, 12033, 7500, 5850, 5875, 8093, 5825, 5836, 25, and 6050 at 75p each. “Emupressor”, £6. Pye handset, £4. Converters for 70 cm. and 4m., £5 each. Green & Davies CXTX-2 Tx, £6. Top Band “Command” Rx, 1.5 to 3.0 MHz, £5. T.W. Top Band Tx and PSU, £25. Also various m/c and RF meters, and other items.—Stevenson, G3YN, 19 Johnstone Road, Newent, Glos.

For sale: Pye “Vanguard”, six-channel model, on two metres, with three crystals fitted, runs 25w. AM, price £25 or near offer.—Powrie, G8HPE, QTHR, or ring Romford (Essex) 45733.

**Answer the questions with 'Yes' or 'No'**

- **Yes**
- **No**

September Issue: To appear August 29, single copies at 40p post free will be despatched first class mail on receipt from printers. Orders by August 27, with remittance to: Circulation Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H 0HF.
Would Like to Buy in good condition, Trio QR-666 general-coverage receiver, preferably fitted with crystal marker, though acceptable without. Would consider a Barlow-Wadley XCR-300. Also required a digital-type frequency counter.—Alis, 7 Hillside Avenue, Wembley, Middlesex, or ring 01-902 4358, evenings.

For sale: R.C.A. AR88 general-coverage receiver, £60 or near offer.—Quinn, Betchworth (Surrey) 2974.

Sale: G.E.C. BRT-400E receiver, over-hauled and re-aligned, in first-class condition, with speaker and manual, £95 or near offer.—Ring 01-656 9882 after 8 p.m.

Selling: Codar CR-70A Mk.II, modified but little used and in original packing, £25. Also PR-30 with PSU, £5.—Ring Travis, 01-570 3260, evenings.

For sale: Two-Metre converter, IF 28-30 MHz, with mains PSU, £8. HW-35 5-watt two-metre AM Tx/Rx, £18, Calder, GSMKDY, 36 Garforth Crescent, Twechar, Kilsyth (821967), Glasgow, G65 9SX.

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Sale: Stolle automatic rotator with 50 yrs. 5-way cable, six months old, £29. Heathkit HP.23B PSU, built up but never used, £25.—Robinson, G2KF, QTHR, or ring Par (Cornwall) 2337.

For sale: U450L Tx, transistor Rx, all in smart cabinet, with manual, £50 plus carriage. LC10FM (FM10B), ten-channel, boot mounting, with built-in tone burst, control unit, all cabling and manual, £35 plus carriage. AM.10D, AM/FM, working on two metres, with xtals SO, mic. and manual, £35 + carr. Xtlas: Type HC6/U, 44/4 MHz, also SO, S8, R5, R6. R7, £4 per channel.—Goadby, G8HVY, QTHR, Tel: 0444-7 2893, evenings (Lindfield, Sussex).

Wanted: HRO, CR-100 or similar cheap Rx, also B5F bases, large RFC’s, Mod/HT xformers, air-spaced and vacuum capacitors, finned anode caps for QY-4-400, large paper-block capacitors, in fact anything really meaty for QRO!—Smith, G4DQY, 98A West Green Road, Tottenham, London, N17.

Offering: Yaesu FT-DX40i with matching speaker, also KW-2000A with PSU. Offers?—Box No. 5430, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H 0HF.

Wanted: KW-107 or KW-103 (52 ohm). Digital frequency meter, LM wavemeter, Heath SB-610 monitor, Trio or Lafayette “Precon” preselector-converter, Yeasu FR-50B, and GDO.—Box No. 5431, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H 0HF.

Wanted: Marconi Instruments 1065A 50-ohm Test Set, also Deviation Meter up to 500 MHz. Instruments must be in full working order. Prices and details, please; all letters answered.—Box No. 5432, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H 0HF.
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For sale: KW-2000A with AC/PSU, manual, circuit diagrams, Shure mic., spare valves (including 6146’s), all leads, in excellent condition, original packing, price £140.—Leach, G4AMZ, 27 Grosvenor Road, Heaton Moor, Stockport, Cheshire. (Tel: 061-432 2985).

Wanted: FT-75 or neat Transceiver with all or either 20/40/80m. bands; would consider home built, or W-H-Y? Also Wanted band-change wafers for TCS-12 Rx, or scrap receiver.—Dunn, G3SCD, QTHR, or ring Louth (Lines.) 2327.

Manuals: Pyecat, £4. CAS, £4: 850/4, A41, A42 and C13, £2 each; CT.488, £8.—Brooks, 5 Farrant House, Winstanley Road, London, SW11.

Selling: National HRO-5T, with band-spread coil packs, £25. Miniaturised HRO, with bandspreads, £15. Kokusai mechanical filters, with crystals, £10 or without, £8.50. Wanted: Trio 500S receiver and Lafayette HA-350 receiver.——de la Bertauthe, G3RQO, QTHR, or ring Seaton (Devon) 21016.


Sale: FT-DX150 Transceiver, coverage 10 to 160m., AC/DC operation, ideal portable/mobile rig, £170. Also two 4CX250B’s, £3. Wanted: FT-200 or FT-500, preferably with remote VFO.—Yeaman, GM4ASY, QTHR, or ring Bishopton (Renfrewshire) 2941.

For sale: Drake R4C, with 160m. coverage, MS4, T4XC (plus 160m.), and AC4, all in absolutely brand-new condition, £550. New P40 “Versatower”, as new, £135. Buyers to inspect and collect.—Bray, G3RWQ, 19 Bevers Close, Worcester (54303). Ring after 6.0 p.m.

Offers invited for Telford TC-9, TC-7 and converter, complete two-metre station, also “Microwave Modules” 70-cm. tripler and converter. —Ring Hardy, Nottingham 251455.

Wanted: Heathkit SB-102, with PSU and speaker.—Ring Barwood, Bristol 772804.

Offering: Lattice mast, 26 ft., £5. Coax, similar UR-67, 100 ft. length, £5. VHF beam rotator, £4. Geloso Type 102 VFO, 50p. Valve voltmeter, 50p. All “or near offer”. Wanted: Buy or borrow circuit details of Anglian 1500L linear amplifier.—Cleeton, G3LBS, 173 Station Road, Wythall, Birmingham, B47 6AF. Tel: Wythall (0564) 826072.

For sale: Separately or in bulk copies of “Short Wave Magazine” over years 1953-1963. Offers?—Ring Lindseth, 01-656 5173 (Croydon).

Wanted: Drake SPR4 or R4B/R4C receiver and speaker. Must be perfect and complete with manual.——Sumner, 4 Cherryree Avenue, Leicester Forest East, Leicester. Tel: Kirby Muxloe (05-3727) 2608.

For sale: Lafayette KT-340 Rx, in immaculate condition, coverage 550 kHz to 31 MHz, band spread, calibrated on amateur bands 10-80m., with S-meter, Q-multiplier, manual and home-built 500 kHz crystal spot marker, price £25.—Ring 01-769 4162.
Wanted: FR-50B receiver, or similar. For sale: AR88 receiver, in fair condition.—Fyffe, 23 Mid Street, Kettlebridge, Fife.

Sale: Barlow-Wadley XCR-30 Mk.II receiver, in mint condition (bought April '75), price £98, carriage extra.—Smyth, 234 Dumbarton Road, Partick, Glasgow G11 6TU.

Selling: Fully transistorised 10 MHz dual trace 'scope, with locate facilities, £100 or very near offer.—Morgan, 27 Clun Avenue, Pontyclun, Glamorgan, South Wales.

Sale: National HRO receiver, with six coil gow G11 6TU. mint condition (bought April '75), price £98, carriage Sale: Kettlebridge, Fife.

For sale: Hallicrafters SX-28 communication receiver, Wanted: R.C.A. AR88D or AR88LF receiver, must Street, London, SW1H OHF. condition considered; Wanted: R1155 receiver, type "L" or "N". Any Ring Allinson, Aspatria (Cumbria) 20243. amplifier Type 1085 for Cossor 1076 oscilloscope, £10 or near offer. All units in very good condition. — Ring Allinson, Aspatria (Cumbria) 20243.

For sale: Hallicrafters SX-28 communication receiver, in excellent condition, £45 or near offer. Radiovision "Commander" double-superhet communication RX, nine wave-bands, working but needs a little attention, £28. Eddystone 888A communications receiver, with manual, in original packing. Top Band range needs attention. Few HRO band-spread coil packs, as new, £3.50 each. — Ring 01-590 9366, evenings only, or write Box No. 5436, Short Wave Magazine, Ltd., 55 Victoria Street, London SW1H OHF.

Wanted: R.I.155 receiver, type "L" or "N". Any condition considered; all letters answered. — Box No. 5434, Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H 0HF.

Wanted: R.C.A. AR88D or AR88LF receiver, must be in mint condition and not tampered with, state details and price. — Box No. 5435, Short Wave Magazine Ltd., 55 Victoria Street, London SW1H 0HF.


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