OPEN UP THE EXCITING WORLD OF SHORT WAVE LISTENING

TRIO R 300

170 kHz—30 MHz. AM, SSB, CW.
3 Way AC Mains/Battery Power
Completely Self Contained
+TRIO Quality £184.50 carr. £3

FULL CATALOGUE AVAILABLE—SIMPLY SEND 45p IN STAMPS TO MATLOCK

LOWE SRX-30

New Receiver
500 kHz 30 MHz. AM, SSB, CW
Mains/12v Operation

Drift Cancelling System for Spot On Accuracy

£175.00 carr. £3

For full details of these and many more Receivers contact us now

LOWE ELECTRONICS
119 Cavendish Rd., Matlock, Derbyshire. Tel. Matlock (0629) 2430 or 2817
The TR2300 is an all new 2 metre FM portable which carries on the tradition of Trio top quality transceivers in attractive small packages.

The TR2300 gives you complete band coverage from 144–146 MHz in fully synthesised 25 kHz steps thus eliminating the need for any crystals. Repeater shift and automatic tone burst are provided and an auxiliary channel is included to allow instant QSY on to your favourite net channel.

The TR2300 is the new pacesetter in 2 metre FM portables and it is already selling like hot cakes. If we have any left, you can see it on the stand at Leicester. See it soon.

TRIO

TR7500

THE SENSIBLE 2m. RIG

with every possible feature you require.

TRIO

SM220

THE ULTIMATE STATION MONITOR AND BAND SCANNER

Matching Unit for TS820 or TS520/520S

SM220
LOWE ELECTRONICS LTD

THE TS820 IS THE 160-10 METRE TRANSCEIVER THAT EVERY RADIO AMATEUR WOULD LIKE TO OWN, AND REPRESENTS THE MOST ADVANCED EQUIPMENT FOR THE MAN WHO INSISTS ON THE BEST.

FOR FULL DETAILS, SIMPLY SEND S.A.E. MARKED "TS820" TO MATLOCK

TS520S All Band Transceiver
The TS520S is the finest mid-price transceiver you can buy. Covering all bands from 160-10 metres, the TS520S runs 200W pep on all bands and has a receiver sensitivity of 0.2µV for 10 dB S/N ratio. Trio built-in features include speech processing, 25 kHz calibrator, VOX and break-in CW and operators all over the world will confirm that the TS520S is the most popular transceiver ever. Also shown is the matching DG-5 digital display, unique in having the additional facility to be used as a 50 MHz frequency counter. Like all Trio digital displays, the DG-5 measures true operating frequency at all times by incorporating all oscillator frequencies used in the transceiver. TS520S is £525 including VAT. DG-5 is £134 including VAT.

Big Daddy, the TL922 HF linear. Certainly the best HF linear on the market today, the TL922 covers 1.8-30 MHz operation using a pair of 3-500Z Eimac tubes running 2.5kW pep input. In real finger burning terms, that means 1000 watts output key down. Loaded with safety interlocks and time delay switch off systems, the TL922 is a superb animal and its low drive requirement (80W, for full input) makes it compatible with most HF rigs, not only the TS520S and TS820. Magnificent. TL922 is £763 inc. VAT.

TRIO PRICES — ALL OUR PRICES INCLUDE VAT. WE DO NOT SEEK TO DECEIVE

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS820</td>
<td>£693.00</td>
</tr>
<tr>
<td>R820</td>
<td>£873.50</td>
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<tr>
<td>VFO820</td>
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<td>VFO700S</td>
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</tr>
<tr>
<td>TR8300</td>
<td>£244.30</td>
</tr>
</tbody>
</table>

N.B.—THESE PRICES WILL NOT HOLD FOR MUCH LONGER SO BUY NOW
TRIO
TR7010

If your station is equipped for FM only, and you wonder where other 2 metre operators have gone when conditions are good—just borrow a receiver and listen to the SSB around 144.3. Direct DX contacts with continental stations are commonplace because of the sheer distance covering ability of SSB. With the freedom from channel restrictions and the ability to have multi-station QSO’s with ease, SSB capability can add a new dimension to your amateur radio 2 metre operations.

SSB and CW operation. Following the well deserved success of the TS/700, Trio used its basic design and put together the ideal mobile/fixed station SSB/CW package—the TR7010.

Combining high receiver sensitivity and clean transmitted signal, the TR7010 gives continuous frequency coverage from 144.2–144.4 MHz to cater for all the DX activity. 48 synthesised 5 kHz channels with VXO and RIT ensure crystal controlled stability with the freedom to move around the band.

Design expertise. Both transmitter and receiver in the TR7010 are of the single conversion type using an IF of 10.7 MHz. This gives a clean transmitter signal and a receiver that is free from unwanted image problems. Double balanced mixing is used throughout the transmitter and the carefully tailored audio system in conjunction with a first class crystal filter produces that good signal quality for which TRIO equipment is renowned. The PA stage uses a 30W transistor which is run at only 20 Watts input to give optimum linearity and protection against misuse.

The construction of the TR7010 follows the rugged reliable package style of the TR7200G—and fits the same mobile mount so that one can fit either rig in the same mounting slide.

Fixed (using the matching PS55 supply), or mobile, the TR7010 is the DX SSB/CW rig for everyone.

TR7010, £189 inc. VAT

MIZUHO SB-2M THE ALL NEW 2M SSB PORTABLE

The SB-2M portable SSB/CW transceiver makes a welcome change from the procession of FM boxes and offers the user real DX performance in a small, easily carried package. Power output is around 1W, pep (2.5W, input) and sideband generation is by 76514 double balanced modulator and high quality 9 MHz crystal filter thus ensuring very good carrier and unwanted sideband suppression. A further 76514 is used in the heterodyne mixer to guarantee not only a clean transmission but also a receiver free from unwanted spurious responses.

Frequency control is by a wide range VXO giving 50 kHz coverage from one crystal. As supplied, the SB-2M is fitted with four crystals giving a total tuning range of 200 kHz which is adequate for most operators’ needs. Alternative crystals can be fitted by the user at any time without the necessity for realignment.

The receiver performance is really outstanding and we can normally hear the Wrotham beacon in Matlock using only the telescopic whip on the rig. As a mode comparison, we can seldom if ever, hear the London repeater G83LO even using a 10XY at 40 feet and the most sensitive FM rig available. Real DX is yours with the SB-2M and SB5.

Current consumption is low enough to make operation from dry batteries perfectly feasible. However, a Nicad battery pack and charger are also available at modest cost.

The SB-2M comes complete with manual, microphone, carrying strip, etc., and is fitted with crystals to cover 144.1–144.3 MHz. Other crystals will be available shortly.

Why not try sideband, you’ll really enjoy it after a dose of FM repeater operation. After all, where does everyone on 2 metres vanish to when there’s a lift? You guessed; they’re working the real DX around 144.3 and you can join in with the SB-2M.

SB-2M £155 inc. VAT

Don’t forget to see all this and more at LEICESTER 78 November 2, 3, 4
Ask about the NEW DAIWA ROTATORS NEW TRIO R820 NEW SR9 2 metre FM MONITOR RECEIVER NEW ACCESSORIES ★ and a Grand ★ Clearance Sale ★

HEAD OFFICE : 119 CAVENDISH ROAD, MATLOCK, DERBYSHIRE. Tuesday–Saturday 9 a.m.–5.30 p.m.
Telephone : 0629 2817 or 2430 9 a.m.–9 p.m. Telex 377482.

BRANCHES : Communications House, Wallington Square, Wallington, Surrey. Tuesday–Saturday (morning)
Telephone: 01–669 6700.
27 Cookridge Street, Leeds, Yorkshire. Monday–Saturday 9 a.m.–5.30 p.m. Telephone : 0532 452657.
Soho House, 382 Soho Road, Handsworth, Birmingham Tuesday–Saturday 9 a.m.–5.30 p.m.
Telephone : 021–554 0705.

AGENTS : John—G3JYG. 16 Harvard Road, Ringmer, Lewes, Sussex. Telephone : Ringmer 812071.
NEW: THE "INTELLIGENT" R.F. SPEECH PROCESSOR

MODEL ASP — THE FIRST FULLY AUTOMATIC R.F. SPEECH PROCESSOR WITH CALIBRATED PUSH-BUTTON CONTROLS

No manual input level control required
- Instant selection of 0, 6, 12, 18, 24 or 30 dBs of true R.F. clipping for maximum talk-power enhancement
- Unique ‘TONE’ button simplifies transmitter adjustment
- LO/HI microphone impedance matching

PUSH-BUTTON CONTROL
Model ASP sets remarkable new standards of performance and ease of operation for speech processing equipment. As well as providing the genuine 6 to 10 dBs of talk power improvement without harmonic distortion which has made our Universal R.F. Speech Clipper world famous, Model ASP adds the ultimate convenience of instant push-button selection of the degree of R.F. processing. This ranges all the way from 0 to 30 dBs in 6 dB steps.

Input level adjustments or meter watching are completely eliminated and the automatic control system ensures that you always get exactly the amount of processing that you want despite changes in voice level, or even despite changes in microphone.

With Model ASP you simply select the processing to suit conditions: 0 to 6 dBs for semi-local work; 12 or 18 dBs for DX work; and 24 or even 30 dBs for when the going is really rough.

UNIQUE SET-UP AID
Having eliminated input setting controls, Model ASP goes even further and simplifies the setting of the transmitter microphone gain. Simply press the "TONE" button and the unit generates a sine wave with the same peak-to-peak amplitude as the processed speech output. Once your transmitter mic. gain (or the preset output level control on the back of Model ASP) is set to give the desired peak P.A. current using this tone, it will be virtually impossible to overdrive the transmitter or to radiate a bad signal.

The result is that you can always rest assured that your signal is exactly as you want it, without the need to watch meters or to carefully control your voice level.

TWO PROCESSORS IN ONE
Model ASP really consists of two processors in one case. The first is an audio processor and the second is a true R.F. clipper. The audio processor is not intended to give any speech compression or talk-power enhancement; its job is instead that of an intelligent and unobtrusive yet thorough automatic peak level adjustor which ensures that the subsequent R.F. processor always has an accurately defined peak-to-peak input level, which is directly related to the job of the R.F. processor to boost the talk-power.

PROVEN R.F. CLIPPING TECHNIQUE
The main processor uses the well proven R.F. clipping technique which has been so successful in our Models RFC and RFC/M. A high quality SSB signal is generated at 60 kHz using the phasing technique because of its smooth frequency response and its long term reliability. This SSB is then clipped, filtered, and demodulated back to audio. The result is an increase in the average to peak voltage ratio of the speech waveform yet without harmonic distortion. Unlike some A.F. or R.F. compression systems which make you sound louder without improving your readability, true R.F. clipping actually increases the intelligibility of speech in noise. This effect acts in addition to the simultaneous increase in your average power level.

Connects between microphone and transmitter
- Internal or external supply only 15 mA at 6 to 16 v.
- Eight ICs, eleven transistors, three LEDS
- Elegant appearance complements any rig

ADVANCED AUDIO PROCESSOR
The audio processor has the demanding job of maintaining a constant peak-to-peak speech amplitude despite wide variations in input level and yet without introducing any audible side effects. The circuit has been especially developed for this special purpose and is highly sophisticated. It involves detection of both positive and negative speech peaks to allow for the marked asymmetry of many speech waveforms, and five second "hang" time after speech ceases so that the background noise remains constant during speech pauses. So that the circuit is not fooled into a long term gain reduction by loud transients (such as from dropping the microphone) dual time constants are used in the control loop together with special logic circuitry to discriminate against non-speech sounds.

ACURATE CONTROL
As well as being highly convenient to use, Model ASP gives a far more accurate control of the degree of R.F. processing than processors which refer on the operator controlling his voice level to "talk-up" a meter to a desired reading. Moreover, the self-control needed for the latter method all too often evaporates in the excitement of DX operating. With Model ASP on the other hand, you can afford to get excited; the automatic control continues to look after your signal while you concentrate on the operating.

FULL MONITORING
Even a control system with the wide range of Model ASP has its limits and three light emitting diodes are provided so that you can confirm at a glance that your input is within bounds. If your voice level is too low, the "LO" lamp will stay on. If your voice level is within the correct range the "OK" lamp comes on instead, and after a few seconds of speech (during which the processor will "learn" your voice level) it will stay on for about five seconds after you stop talking. This represents the "hang" time of the pre-processor. Both "LO" and "OK" lamps go off together your input is too large.

As a further refinement, the "SPEECH" lamp should stay on only while speech sounds are present. If it stays on between words, there is too much background noise at the microphone for good intelligibility, and you should talk closer to it.

PRICE: £65 plus VAT (£76.5 total), including postage (UK only)
Availability: October. Data sheet in preparation; reserve your copy now.

SEE MODEL ASP PLUS ALL OUR OTHER PRODUCTS AT LEICESTER!!!

DATONG ELECTRONICS LIMITED
Spence Mills, Mill Lane, Bramley, Leeds LS13 3HE. Tel: Pudsey (0532) 552461.
Unique receiver filtering system including rejection tuning, variable IF bandwidth tuning, and audio peak frequency tuning for the ultimate in unwanted signal rejection.

Digital frequency display with memory circuitry for transmit and receive. Ideal for QSY during net operation, multiplier hunting during contests, or daily schedules. Modern PLL frequency derivation for accurate, stable operation.

Offset tuning for either transmit or receive frequency allows precise zeroing in on that rare DX.

Built-in Curtis electronic keyer. That's one less box to pack along while travelling, and the 8043 chip provides excellent immunity from RF interference.

FT-901DM
COMPETITION-GRADE HF TRANSCEIVER

HIGHLIGHTS
The ham's dream—to have the best—is now reality. Introducing the FT-901DM all mode HF transceiver from YAESU. Designed to give you the competitive edge either at home or on a DX-pedition, the FT-901DM includes these advanced features:

- Digital frequency display with memory circuitry for transmit and receive. Ideal for QSY during net operation, multiplier hunting during contests, or daily schedules.
- Modern PLL frequency derivation for accurate, stable operation.
- Offset tuning for either transmit or receive frequency allows precise zeroing in on that rare DX.
- Built-in Curtis electronic keyer. That's one less box to pack along while travelling, and the 8043 chip provides excellent immunity from RF interference.

Accessibility or attractive H.P. terms readily available for on-the-spot transactions. Full demonstration facilities.

MAIN AGENT ATLAS SOLE Swan ELECTRONICS AGENT RADIO INC.
AMATEUR ELECTRONICS UK
SOURCE FOR YAESU MUSEN!

THE SYMBOL OF TECHNICAL EXCELLENCE

Yes, you get both technical excellence AND copper-bottomed guarantees when you buy YAESU from Amateur Electronics UK. Please remember that only an authorised importer/distributor or one of our appointed dealers can give you the after-sales back up so essential with today's ultra-sophisticated equipment.

As for the YAESU MUSEN range—Well, there's simply nothing to compare and this year's Leicester Exhibition is your ideal opportunity to see all the latest models at close hand on Stand 22 where you'll be sure of a warm welcome from the crowd at Amateur Electronics—Looking forward to seeing you—
KEN PERFECT, '3FIK

The FRG-7000 has opened new horizons for many a dedicated SWL and licensed op. and as for the FT-101E shown here, suffice to say that it's the world's No. 1 H.F. rig in numbers alone, which must say something!

Once again space does not permit anything approaching a description of Yaesu's ever growing range—therefore Yaesu's latest catalogue with our valuable credit voucher is a must—please see our offer below.

HOW TO REACH US (EASY PRIVATE PARKING ON OUR 70ft. FORECOURT)

FROM SOUTH AND EAST. We are located approximately two miles from Junction 5 of the M6 from which follow signposts to Birmingham. Within 1 mile turn right at Clock Garage and proceed towards city. After one mile look for traffic lights at Fox & Goose and immediately over the lights take minor left fork into Alum Rock Road. We are located one mile from this point.

FROM NORTH. Leave M6 at Junction 6 (Spaghetti) and follow left fork down to traffic island beneath motorway complex. Take third turning off to Lichfield. One mile further on follow A440 to the right and within 100 yds. you will again to the right, approximately one mile further on brings you to the Fox & Goose. Turn right and see preceding directions.

FROM THE WEST AND SOUTH-WEST. Follow M5 then M6 to Spaghetti Junction (see above). Alternatively, leave M5 at Junction 4 or 3 and proceed to inner ring road. Turn South on ring road and leave on A47 (East). We are located three miles from this point.

(Please note that we shall be closed at Alum Rock for the duration of the Exhibition (Nov. 2 3 & 4)

SPECIAL VOUCHER OFFER

Here's a 10-1 winning offer if you'd like the latest Yaesu catalogue. Just send us four 9p stamps (36p) and we'll send you Yaesu's latest fully illustrated brochure together with our Credit Voucher for £3.60 against your eventual purchase. A couple of stamps will bring you the latest Atlas or Swan leaflet or our current used/equipment list.

BRANCH: AMATEUR ELECTRONICS, UK—COASTAL, CLIFTONVILLE, KENT. KEN McINNIES, G3FTF, THANET (0843) 291297. 9 a.m. - 10,30 p.m.

BRANCH: AMATEUR ELECTRONICS UK—SCOTLAND 287 MAIN STREET, WISHAW, LANARKSHIRE. GORDON MCCALLUM, GM3UCI. TELEPHONE WISHAW 71382. (EVENING CARLUKE 70914.)

AGENT: WALES & WEST—ROSS CLARE, GW3NWS, CAERLEON, NEWPORT (CAERLEON 422232)—Only 20 minutes over the Severn Bridge.

508-514 ALUM ROCK ROAD
BIRMINGHAM 8 021-327 1497

Telex 337045 6313
SEE THE FULL ICOM RANGE

SIMPLY THE BEST!

IC-202E
£169 inc. VAT

IC-202E
IC202 The 2m. SSB/CW portable which is clean enough to use as a prime mover to drive a linear. The VXO gives continuous coverage over the ranges 144.0-144.2 and 144.2-144.4. The coverage can be extended with extra crystals switchable from the front panel. This is the ideal set to buy if you are thinking of sampling the delights and advantages of SSB on 2m. as it gives full coverage of the SSB and CW portions of the band with easy, continuous tuning.

Available ex-stock, delivered free for £169 inc. VAT.

IC-215E
£159 inc. VAT and delivery

IC-215
IC-215E By far the best 2m. FM portable on the market—with more power (3W) than most and batteries some 4 times as big thus giving a reasonable period of operating use. Add to this, the superb, clear modulation for which ICOM are so famous and a good receiver, plus a solid, reliable construction and you have really good value for money.

Total channel capacity = 15.
Channels fitted = 12 (520, 522 RO-9 inc.
Available ex-stock at £159 inc. VAT and delivery.

IC-240
£198 inc. VAT

IC-240
IC-240 Think of the features you would install in a mobile to provide a combination of optimum usefulness AND SAFETY. You will probably come up with the following requirements:
1. Easy channel selection with minimum knob twiddling—yet with all the normal FM channels available.
2. A fully automatic tone burst which operates only in repeat mode with NO buttons to press either on the front or the back of the set.
3. Instant reverse repeat at the flick of a switch without any re-tuning or memory programming.
4. A very sensitive receiver with a spurious response performance far better than the average and a very clean transmitter with excellent clear, crisp modulation. (We measured a sensitivity of 0.1µv pd for 10dB sinad).
5. A reasonable price—but (more important) a quick, reliable after sales service.

COMPARE THIS LIST WITH PREVIOUS ADS FOR VARIOUS TRANSCIEVERS AND YOU WILL SEE THAT THE 240 WINS EVERY TIME.

WE NOW STOCK THE J-BEAM RANGE OF ANTENNAS AT HERNE BAY

AGENTS (Phone first—All evenings except Norfolk and Burnley)
London—Terry G8BAM (01-556 9366) Scotland—Ian GMBDOX (0786 822 212) Norfolk—Ted G3FEW (05088 632)
Wales—Tony GW3JKO (0222 702982) Burnley—(0282 38481) Midlands—Tony G8AVH (021 329 2305) North
West—Gordon G3LEQ (Knutsford (0563) 4040) North—Peter G3TPX (022678) 2517

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THANET ELECTRONICS
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Direct Ansafone line (evenings) 64283
AT THE
LEICESTER SHOW

WITH THE TECHNICAL KNOWLEDGE AND EQUIPMENT TO
SERVICE THEM PROPERLY BOTH BEFORE AND AFTER SALES

IC-211E ▼
£549 inc. VAT
Giving you FM/CW/USB/LSB, all produced from the amazing ICOM synthesizer and patent LSI chip. Frequency read out is to the nearest 100Hz and it is amazingly stable and accurate. You can use the two frequency stores as separate VFOs or for any repeater shift required. The tone burst is automatic, of course, and reverse repeat is available at the flick of a switch. Add a keypad (we will give you the circuit to make your own or you will be able to buy one shortly) and find a new facility which is quite impossible with old-fashioned rigs. The original waiting list has now been dealt with and you can now have one from stock.

IC-245E ▲
£396 inc. VAT
This truly amazing little box gets you mobile on FM, USB or (if you really think it a good idea) CW! The synthesizer is the same as the IC-211E and can be tuned to the nearest 100Hz, again with amazing accuracy. Of course such a versatile little box will often be used as a base station and facilities such as keypad operation can be added. They are now ex-stock!

IC-701 £999 inc. VAT

The HF rig to beat them all. HERE THIS MONTH. * A solid state including the finals ★ 100W RF output Continuous Duty on All Bands. All Modes ★ All bands 18-30 MHz ★ USB, LSB, CW (narrow), RTTY ★ Double balanced Schottky Diode mixer used in both Tx and Rx ★ Fully synthesized with Digital readout to 100Hz and two stores to enable split frequency operation ★ ICOM’s unique bandpass tune ★ VOX, Semi-break-in CW, RIT, AGC, Noise Blanker ★ Built-in RF speech processor ★ Extremely compact ★ All filters built in ★ 12v. or mains operation ★ Electret desk mic. NO EXTRAS TO BUY.

The popular “SLIM JIM” SJ2
144-146 MHz — High efficiency 2 metre omnidirectional vertical
An omni-directional 2 metre aerial developed by T & T from a design by F. C. Judd (G2BCX). Derived from the "J", the SJ2 is a free space aerial with better than 50%, greater efficiency than conventional ground plane types due to the very low angle radiation field. The aerial is slim and compact (58 inches long) and as there are no radials it is unobtrusive and has low wind resistance. Supplied complete with mast clamp, £135-50 inc. VAT (carriage £1.00).

Although we specialise in ICOM—Note that the following are available from Herne Bay—with the same Back-up Service:

YAESU  LESON
J-BEAM  MICROWAVE MODULES
T & T  ASP

Plus a whole range of bits and pieces

DURING THE EVENINGS AND AT WEEKENDS WHEN CALLS ARE CHEAP, WHY NOT USE OUR ANSAFONE TO RECORD YOUR REQUESTS FOR DATA, ETC. (02273) 63850
FOUR MORE GOODIES FROM ICOM

(1) IC-402 £288 inc.

A 70cm, VERSION OF THE FAMOUS IC-202. IC-402: Utilizing a tunable second oscillator, the IC-402 provides the stability and band spread needed for SSB operation on 430. Crystals are provided for two of the four bands which can be selected from the twenty-six 200 kHz segments between 430 and 435.2. Listen to the signals from OSCAR VIII, mode "2" with the superb 0.5uv receiver on either lower or upper sideband.

(2) IC-202S £215 inc.

THE IC-202 WITH LOWER S/B PLUS CW sideband and an even better receiver. Specifications:

<table>
<thead>
<tr>
<th>IC-202S</th>
<th>IC-402</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opp. Sideband Suppression: Better than 40dB/1kHz</td>
<td>Better than -60dB</td>
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<tr>
<td>Spurious Radiation: 600 ohms Single Superheterodyne</td>
<td>Double Superheterodyne</td>
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<tr>
<td>Intermediate Frequency: 10-7 MHz</td>
<td>576-578 MHz, 1st I.F.</td>
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<tr>
<td>Receiver Sensitivity: 0.5uv at 10dB SINAD</td>
<td>Better than -60dB</td>
</tr>
<tr>
<td>Spurious Sensitivity: Better than -60dB</td>
<td>Better than -60dB</td>
</tr>
<tr>
<td>Selectivity: ±1.2 kHz or better at -6dB</td>
<td>±1.2 kHz or better at -6dB</td>
</tr>
<tr>
<td>Audio Output: More than 1W</td>
<td>More than 1W</td>
</tr>
<tr>
<td>Audio Output Impedance: 8 ohms</td>
<td>8 ohms</td>
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</tbody>
</table>

(3) IC-RM3 £99 inc.

COMPUTERISED REMOTE CONTROLLER
The remote controller you have all been waiting for to add to your IC-211E, IC-245E and IC-701 to provide facilities which are just not possible with competitors' rigs. YOU CAN:

★ KEY IN any frequency within the operating range of the rig concerned (it even organises the band changing in the IC-701).
★ Store the frequency away in any one of FOUR memories for instant retrieval.
★ Step up or down the band in variable steps.
★ Scan continuously up or down the band in variable steps.
★ Operate forward or reverse duplex from the keypad.
★ Have remote readout of frequency in case you want to hide your rig in a cupboard.

(4) IC-280E £279 inc.

THE ULTIMATE IN 2m. FM SYNTHESIZED RIGS
For the man who wants all the channels in 2m. from 144-146 complete with digital readout of frequency ICOM have produced the IC-280E which has a few interesting extras not provided by the opposition. Such as:

★ THREE memories programmable from the front panel (thus giving you four easy-to-switch-to channels without taking your eyes off the road).
★ 25 kHz per step to avoid winding for hours!
★ Normal and reverse repeat without using up memory space.
★ AND (wait for it!) A FRONT PANEL WHICH CAN BE REMOVED FROM THE RIG AND MOUNTED, COMPLETE WITH ALL CONTROLS, METERS AND DISPLAYS, ELSEWHERE IN THE CAR!!!
★ Plus of course the high-quality performance, crisp clear transmission and very hot receiver for which ICOM are so famous as leaders in the quality VHF mobile field.

ICOM..... Simply the Best
FROM YOUR UK DISTRIBUTOR THANET ELECTRONICS HERNE BAY KENT
Two VFO's BUILT-IN
The second VFO, which is an optional tack-on with most other transceivers, is an integral feature in every IC-701. Now you can work those Yanks on 40 and 80 metres!

Optically Coupled VFO
A VFO with no variable capacitors! Made under arrangement with Collins Radio, the IC-701 maximises digital readout with positively no time lag or backlash in display stability, even when using 100Hz steps. The IC-701's free wheeling dial is instantly co-ordinated with the high speed, computer controlled six digit readout using an optical chopper. There is absolutely NO mechanical connection between the smooth bearing mounted flywheel knob and the two dual-tracking VFOs.

Computer Compatible Interface
External microprocessor control from a PIA interface is possible via the 24-pin accessory socket on the rear panel of the IC-701. The IC-701 can even be interconnected with the companion 2 metre IC-211 to track frequencies for Oscar work.

Remote Control Facility
The IC-701 can be remotely controlled via the new optional RM-3 computerised remote controller. This unit includes scan, duplex, memory and tone functions plus a touch-tone pad with digital readout. You can select frequencies and automatically change bands with this CPU controlled accessory.

Continuous Operation
The IC-701 features continuous operation with a full 200w. pep or 200w CW input on all bands and all modes. No need to worry about timing key-down operations as the IC-701 is designed to handle the maximum power continuously! If the heat sink starts to warm-up a built-in fan automatically switches on. If a temperature danger point should ever be reached the fan doubles its speed and the digital display flashes to tell you to quit transmitting!

No Tuning Necessary
Just select the required band and frequency and start transmitting!

All Solid State
While the others are still fooling around with valves, ICOM have produced a solid-state HF transceiver including protected transistors in the final.

Cross Modulation Minimised
Cross modulation—a fact of life with some rigs—is minimised with the double balanced Schottky diode mixer used for both transmit and receive.

Small Enough for Mobile
The IC-701 is extremely compact with dimensions 111 by 241 by 311mm (HWL) and weighs only 7-3kg. No more need to struggle with heavy rigs impossible to mount under-dash!

Full Metering
The front panel meter includes swr, power, ALC, compression and collector voltage/current measurement.

Desktop Microphone as Standard
A high-quality condenser electret desk microphone is included as standard equipment with your new ICOM IC-701.

Variable Power Output
In CW and RTTY modes power output can be continuously varied from zero to maximum 200 watts input. SSB output can easily be adjusted for novice use.

Ideal for the CW and RTTY Buff
The IC-701 includes narrow CW filter as standard plus semi-break-in and sidetone facilities. The IC-701 has switching to select either narrow or wide RTTY shift rates.

Thanet Technical Back-Up
Your new IC-701 from THANET comes complete with the THANET one year warranty plus technical and spares support THANET staff have been factory briefed on the service and alignment procedures.

Plus—
* Separate front and RF stages using dual gate MOSFETs for each band, providing optimum performance.
* Diode matrix to define band edge parameters.
* Operation on all bands 1.8 thru 30 MHz includes WWV.
* Modes include USB, LSB, CW, CW-N (narrow), RTTY.
* Unique ICOM bandpass tuning.
* VOX, Semibreak in CW, RIT, AGC, effective noise blanker.
* Built-in speech processor using advanced circuitry.
* All filters built-in.
* Automatic front panel light dimming to suit ambient light conditions.
* Separate VCOs for each band to reduce spurious and birdies.
* Receive triple conversion.
* Built-in DC power supply, external AC PSU with speaker.
* Full line of matching accessories to come.
* Internal speaker.

Compare the IC-701 With the Others!
And see what extras you DON'T have to buy.

Complete with AC PSU as shown £999 inc. VAT IC-701 alone £837 inc. VAT.

The Ultimate! IC-701 state of the art

Thanet Electronics for ICOM
RADIO SHACK LTD for BARGAINS!

STAND No. 6
ARRA SHOW LEICESTER

You know a bargain when you see one!

Our special package deal cash price for a Drake TR-7 Digital Transceiver with power supply is a talking point around the world. It is not a price that can last forever!

BARGAINS  BARGAINS  and more  BARGAINS

We still have a few more SPR-4 Receivers left at £450 inc. VAT.

Always worthy of consideration is the famous R-4C

at £427.50 inc. What other amateur receiver could possibly compare?

BRING YOUR USED GEAR TO OUR STAND TO TRADE-IN

Full range stocked of Trio amateur and test equipment, Astatic microphones, Shure, Hustler, Barker & Williamson, Ameco, G-Whip, Atlas, Standard, Viking Keys, Ten-Tec, Barlow-Wadley, Microwave Modules, Decca, RMS Window antenna mounts, Telex Headsets, Vibroplex Keys, Hy-Gain, CDE Rotators, Jaybeam to name just a few.

Radio Shack Ltd
188 BROADHURST GARDENS, LONDON NW6 3AY
just around the corner from West Hampstead Underground Station.
Telephone: 01-624 7174
Open Monday-Friday 9-5, Saturday 9-12.30. Closed for lunch 1-2
The brigantine, The Eye of the Wind, will have aboard a Drake TR-7 transceiver with the co-operation of the R. L. Drake Co. and Radio Shack Ltd.
Midland and North West distributors for the XCR30 unique crystal controlled receiver. This receiver is designed to provide precision frequency tuning over the full short wave spectrum from 1 to 20 MHz. Stability for both AM and SSB. Separate tuned whip antenna.

XCR-30 FM Receiver with FM band 87-108 MHz. £170.00 inc. VAT

Mk.1 MULTI TUNER. Designed and manufactured by us. 50 tunable switched positions for antenna lengths over 5 metres in the 2-20 MHz range. Five different circuits to give an excellent performance in your receiver and antenna. Now in use in over 35 countries.

Price £17-90 including VAT and Postage

S.T.E. Prices include VAT and postage

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arac 170 receiver, 10m. and 70 cm.</td>
<td>£127.00</td>
</tr>
<tr>
<td>Audio Module for AR10</td>
<td>£14.10</td>
</tr>
<tr>
<td>AD4 FM Discriminator</td>
<td>£6.00</td>
</tr>
<tr>
<td>ALB Linear Amplifier</td>
<td>£77.00</td>
</tr>
<tr>
<td>AG10 Tone Generator</td>
<td>£4.50</td>
</tr>
<tr>
<td>ATAL 2m, AM-FM Tx</td>
<td>£127.00</td>
</tr>
<tr>
<td>AR AC102 receiver, 28-30 MHz</td>
<td>£127.00</td>
</tr>
<tr>
<td>AM-SSB-FM-CW</td>
<td>£127.00</td>
</tr>
</tbody>
</table>

ARAC 102 receiver, 28-30 MHz, 144-146 MHz.

Price £100.00

AR10 Master receiver. 28-30 MHz Double conversion superhet. RF and amplifiers stages are gate protected modules for good sensitivity and low intermodulation. Noise limiter and squelch circuits. AM, SSB and CW reception. 12v. DC.

Price £39.50

ARID Mod. receiver.

Price £127.00

**ALDA 103**

* The latest Solid State Transceiver *

**80-40-20 metres**

- Quality engineering gives you all these convenient features:
  - Broad Band Power Amplifier
  - SSB 250 watts PEP Nominal
  - CW 250 watts DC Maximum
  - Built-in CW Monitor
  - 6 pole Crystal Filter
  - Semi Break-in CW
  - Dual Speed Vernier Dial
  - Modular Plug in Circuit Boards
  - Built-in Speaker
  - 13.5 V DC Input at 15 AMPs

Send S.A.E. for full specifications. Price £399.00 inc. VAT

**TECHNICAL ASSOCIATES**

As from 1st May we shall be sole distributors or the whole range of Technical Associates products. This is to combine with our Multi Tuner range to give all the accessories needed for the serious DX listener and licensed amateur.

- Rx Band Pass Filter, 9 l.C.s. 1 watt output* 8 switched positions of filters* High pass 2.5 kHz-2.0 kHz 1.0 kHz-15 kHz-200 Hz-110 Hz-80 Hz-60 Hz-30 Hz-20 Hz Ideal for increased selectivity with FRG7, FRG3, ETC ... Price £29.75

Printed Circuit Module including rotary switch ... ... ... Price £17.25

- RX Peak and Notch Filter. Gores between RX and speaker* All I.C.s* By-pass switch* Notch width control for optimum width of notch ... ... ... ... ... ... ... ... ... ... ... ... ... ... Price £29.75

Printed Circuit Module including all pots and switch ... ... ... Price £17.25

- Pre-Selector. Coverage 1 MHz to 51 MHz* Three switched bands* Type I with antenna changeover relay for Transceiver op

Type 2 for SWL without relay Price £29.75

- Crystal Calibrator. Seven ranges down to 1 kHz. Selected from front panel. Complete with antenna. ... ... ... ... ... ... ... ... ... ... ... Price £21.85

These prices include VAT and postage.

**STEPHENS-JAMES LTD.**

47 WARRINGTON ROAD, LEIGH, LANCs. WN7 3EA

See our entire range at the LEICESTER EXHIBITION

ABOVE PREMISES CLOSED 31st OCTOBER—6th NOVEMBER
WILLIAM MUNRO (Invergordon) LIMITED
DISTRIBUTORS FOR NEC AMATEUR RADIO EQUIPMENT

CQ—P2200E
2 METRE FM PORTABLE TRANSCEIVER

SPECIFICATION

General
Frequency range: 144.00—146.00 MHz.
Channels: 12
Microphone: Dynamic type (10KΩ)
Speaker: 3W 8Ω
Supply voltage: Built in batt. DC 12v, HP11 x 8, external power supply 13.5v.
Current consumption: 900mA at transmission, 110mA at reception.
Semiconductors in use: 29 transistors 3 FET's 16 diodes 2 IC's 1 LED.
Dimensions: 196(w) x 69(h) x 219(d) mm.
Weight: Approx. 2.6kg. (including batteries).
Transmitter
Emission type: F3
Transmitting power: 3W. (at HIGH, approx. 1W. (at LOW)

This is a very well built piece of equipment with robust case and strong webbing carrying strap. All controls are on the top face making operation easy and comfortable. The built-in extending rod antenna can be used at ½ or ¾ wave whip depending on the number of sections used. The battery compartment is recessed from the bottom of the unit and is held by one bolt giving easy access to compartment and the battery pack slides out without any connecting wires. External antenna socket is recessed into base. The microphone is particularly comfortable to hold and is the right shape and size.

The 1750 Hz repeater access tone operates on release of the P.T.T. switch thus giving a tone at end of transmission. The transmitted output is switchable 3w. or 1w.

The meter serves as "S" meter on receive, and battery check on transmit. An LED "ON AIR" Indicator is provided.

RIT is fitted.

FETS are used for RF stage and an IC for IF stage giving excellent sensitivity, cross mod. and limiting characteristics.

3 Channels £179 (VAT incl.)
9 Channels £197 (VAT excl.)

(we will fit the channels of your choice—limit of 12)

USED EQUIPMENT — Let us know your requirements

We also stock a range of MICROWAVE MODULES, POLAR ELECTRONIC DEVELOPMENT PRODUCTS—ANTENNAS, etc.

IN ADDITION TO OUR OWN SHOWROOM YOU CAN TEST AND EXAMINE NEC EQUIPMENT AT:

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8 Lock Close, Debenham, Suffolk IP14 6RS
7 Moorland Crescent, Mapplewell, Barnsley, S. Yorks.

Tonny Blackmore
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0222-71-351
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Tel. 0222-71-351
Tel. 072886-214
Tel. 0226-782517

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Established for more than two decades
Open Monday - Saturday
Telex 298765
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London’s largest stockists of Yaesu Antenna specialists.

F.R.G. 7—digital display
Yes. The world famous F.R.G.-7 is now available with digital read-out
fitted by Lee Electronics in place of kidz dial

Special Price £218.50 + VAT

For customers who already own F.R.G.-7’s we can supply the digital read-
out complete with installation instructions...

£139.50 + VAT
F.R.G.-7-Digital £226.50 + VAT
F.R.G.-7 from analogue dial £187.50 + VAT
F.R.G.-7 Persepolis illustrated £35.00 + VAT
All plus 12.5% VAT

Yaesu MUSEN Prices (All Available for Immediate Delivery)

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>FP301/IDPSU/SP/Clock/</td>
<td>£451.00</td>
</tr>
<tr>
<td>FT301/IDPSU/Speaker</td>
<td>£410.00</td>
</tr>
<tr>
<td>FT901/PSU/SP/SP/Clock/</td>
<td>£415.00</td>
</tr>
<tr>
<td>FT901/PSU/SP/SP/SP/SP/SP/</td>
<td>£475.00</td>
</tr>
</tbody>
</table>

Yaesu Mobile and Base Station Antennas

Special Offer A.S.P. £166.50 - VAT

Yes we can now supply the FT227R with auto-scan facilities, designed and manufactured exclusively for us—note these star-features:

- Scans 40 channels
- 2 speed scan rate
- Locks out unwanted channels
- Automatic tone burst for repeater operation
- Reverse repeater facility
- Scans between 145-146 MHz in 25 kc/s steps
- Scanning facility

Controlled by switch fitted to microphone (not illustrated)

Price: £253 + VAT

Yaesu FT227R + Lee Electronics auto-scan

Free delivery in U.K.
NEW—WIDER CHOICE FROM Western

AND TRIO

NOW AVAILABLE AT COMPETITIVE PRICES . . .

* LATEST FULL SPEC. MODELS . . .
* FULL 1-YEAR GUARANTEE . . .
* FREE SECURICOR DELIVERY . . .
* ALL PRICES INCLUDE VAT . . .

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRIO TS-820S</td>
<td>INCLUDES FACTORY-FITTED DIGITAL READOUT!</td>
<td>£789</td>
</tr>
<tr>
<td>TRIO TR-7500</td>
<td>FULL EUROPEAN SPECIFICATION; 1750Hz TONE; 25 kHz CHANNELS</td>
<td>£215</td>
</tr>
<tr>
<td>TRIO TS-700S</td>
<td>BUILT-IN DIGITAL READOUT—THE LATEST VERSION</td>
<td>£549</td>
</tr>
<tr>
<td><strong>YAESU</strong> FT-901 DM</td>
<td>ALL-MODE, ALL-BAND WITH DIGITAL READOUT AND MEMORY</td>
<td>£899</td>
</tr>
<tr>
<td><strong>YAESU</strong> FRG-7000</td>
<td>DIGITAL READOUT; CLOCK/TIMER; 250 kHz–30 MHz</td>
<td>£345</td>
</tr>
<tr>
<td><strong>YAESU</strong> FT-225R</td>
<td>ANALOGUE READOUT—DIGITAL OPTION; 25 WATTS OUTPUT</td>
<td>£529</td>
</tr>
</tbody>
</table>

PAYMENT: Cash or cheques, ACCESS (Mastercharge), VISA (Barclaycard), GIRO TRANSFER (A/c 288 6154) HP and Credit arranged.
TOWERING SAVINGS!
On WESTOWERS, ROTORS and ANTENNAS...

PICK A Western PACKAGE...

... AND SAVE 10% ON LIST PRICES!

Yes! Really BIG savings on list prices by following these simple Instructions ...

* CHOOSE a Tower (Box A), Rotator (Box B) and Antenna (Box C)
* ADD price of Cable/Mast Package (Box D)
* DEDUCT 10% — YES! 10% — to give final price*
* SEND cash or Credit Card number to secure order

* Carriage extra to Devon/Cornwall, Scotland, N. Ireland — see below.

<table>
<thead>
<tr>
<th>A</th>
<th>TOWERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Westower Standard Post Mounting</td>
<td></td>
</tr>
<tr>
<td>1S/P 25ft./7.75m.</td>
<td>£264.60</td>
</tr>
<tr>
<td>2S/P 42ft./12.75m.</td>
<td>£361.80</td>
</tr>
<tr>
<td>3S/P 58ft./18.75m.</td>
<td>£430.92</td>
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<td>4S/P 75ft./22.75m.</td>
<td>£500.04</td>
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<table>
<thead>
<tr>
<th>B</th>
<th>ROTORS</th>
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<tbody>
<tr>
<td>Emoto 103LBX</td>
<td>£95.62</td>
</tr>
<tr>
<td>Emoto 502CXX</td>
<td>£145.12</td>
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<tr>
<td>Emoto 1102MXX</td>
<td>£208.12</td>
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<tr>
<td>Emoto 1103MXX</td>
<td>£212.62</td>
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(NB 103LBX not recommended for 4-el HF beams)

<table>
<thead>
<tr>
<th>C</th>
<th>ANTENNAS</th>
</tr>
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<tbody>
<tr>
<td>Western DX-31 rotary dipole, 10/15/20m.</td>
<td>£43.31</td>
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<tr>
<td>Western DX-32 2-ele. beam, 10/15/20m.</td>
<td>£67.50</td>
</tr>
<tr>
<td>Western DX-33 3-ele. beam, 10/15/20m.</td>
<td>£92.81</td>
</tr>
<tr>
<td>Western DX-34 4-ele. beam, 10/15/20m.</td>
<td>£121.50</td>
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<table>
<thead>
<tr>
<th>D</th>
<th>CABLE/MAST PACKAGE</th>
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</thead>
<tbody>
<tr>
<td>This comprises:</td>
<td></td>
</tr>
<tr>
<td>3m. (10ft.) 1 29/32&quot; heavy duty aluminium masting</td>
<td></td>
</tr>
<tr>
<td>30m. (100ft.) RG8/u low-loss 50 ohm coax cable</td>
<td></td>
</tr>
<tr>
<td>30m. (100ft.) 8-way rotor control cable</td>
<td></td>
</tr>
<tr>
<td>Price: £33.15</td>
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</tbody>
</table>

PLEASE NOTE:  
Only equipment shown above qualifies for this offer. Orders must include tower, rotor, antenna and cable/mast package. Extra cable is available at list prices. Hire purchase is not available for this offer. Due to distances involved, carriage is extra for:—

<table>
<thead>
<tr>
<th></th>
<th>Devon</th>
<th>Cornwall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scotland (S. of Pitlochry)</td>
<td>£54.00</td>
<td>£86.40</td>
</tr>
<tr>
<td>Scotland (N. of Pitlochry)</td>
<td>£54.00</td>
<td>£86.40</td>
</tr>
</tbody>
</table>

This should be added to the final price.

JUST TO REMIND YOU ... GOOD STOCKS OF EQUIPMENT ARE HELD BY OUR AGENTS IN GM, GI and SOUTHAMPTON
**WATERS & STANTON ELECTRONICS**

Den Tron MLA 2500
160-10m, 2kW PEP
£695 inc. VAT
In Stock Now

- 1kW DC continuous
- ALC circuit
- 3 speed cooling
- Military specifications
- 234v./117v. AC
- 2 of EIMAC 8875 tubes

Den Tron Military MT 3000A
160-10m, 3kW
£275 inc. VAT
In Stock Now

- Antenna selector (S)
- Exciter dummy load (250W)
- 3kW continuous
- 3 core balun
- Tuner by-pass switch

**FRG7 RECEIVER**

- R.F. Wattmeter RMS/VAT
- Size 5¾” x 14” x 14”
- Weight 47lb.
- Ideal for SSTV/RTTY
- 3rd order down 30dB +
- 40 watts drive for 1kW

**FT901DM TRANSCEIVER**

Choose From The Yaesu Range:

- FRG7: £210
- FRG7000: £367
- FT901DM: £690
- FT901DE £788

**FRG7000 RECEIVER**

ADONIS MICROPHONES—NEW MODELS

Microphones come in all shapes and sizes and many of you will be familiar with the MM202G mobile microphone designed to make driving safer. These, incidentally, are now in stock again. But now we have the pleasure of introducing the new base station models. The MB202G is a goose neck design of heavy chrome construction employing a condenser element for really superb quality. A single battery cell gives several months of operation and there is a built-in compressor for the man who wants to sit back and not be hunched over the microphone. Feather touch buttons operate a latching circuit for either press to talk or “lock-on” and an LED flashing light indicates “on air.” The MB202G offers even more. A 3-way switch provides normal operation, medium or high compression. A meter built into the base monitors the compression. The same high quality condenser insert is enclosed in a noise cancelling housing and 3 switched outputs are provided so that the microphone can be fed to 3 different transmitters. Each output has its own output level control. If you want a microphone to match that new rig then we have the answer.

Your last chance to buy the Microwave Modules MMD 050/500 Frequency Counter. Reduced from £65 to £63-00
WATERS & STANTON ELECTRONICS

MULTI 8000-25 WATTS

THE MOST ADVANCED FM RIG!

Over 25 watts of high quality FM output at your finger tips. Consider its features and learn why more people are trading up to the 8000. Frequency control is electronic from the centre master control—no rotating dial switches to wear out. Remote frequency control is available from the new "up/down" microphone buttons. Bright LED readout gives true frequency display in 5 kHz steps. True frequency counter reads both transmit and receive frequencies in use. True non-volatile memory that lasts even with power off! 144-148 MHz coverage for 70cms. transverting. Additional programmable frequency shifts. Simple auto-scan modification available. Remote digital "head-up" display for dash board mounting. Solid block power module.... There are cheaper rigs available, but is that really what you want?... Send an S.A.E for the answer I

FDK Quartz

16

10 watts 10 channels fitted, tone burst—all accessories 2M. FM Only £169 inc. VAT

HP Terms:

deposit £34

Multi-

U11

10 watts 70cms. FM Auto scan 10 channels fitted tone-burst — RIT £259 inc. VAT

HP Terms:

deposit £52

IN STOCK!

FDK PALM II

2M FM

SIZE: 6" x 2¾" x 1½"!

WEIGHT: 1 lb. 3 oz.

COMPARISON VALUE

COMPARISON FEATURES

- Smallest held-held available
- Over one watt output
- High receiver sensitivity
- 6 channel capability
- Simplex or ± 600 kHz switch
- BNC aerial socket
- Flexible whip supplied
- Single xtal per channel
- Extra channels cost £24-45!
- AC charger included
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SHORT WAVE MAGAZINE

(GB3SWM)
ISSN: 0037-4261

Vol. XXXVI OCTOBER, 1978 No. 420

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Advertising: Charles Forsyth

Published at 34 High Street, Welwyn, Herts. AL6 9EQ, on the last Friday of the month, dated the month following.
Telephone: 04-3871 5206 & 5207

Annual Subscription:
Home: £5.50, 12 issues, post paid
Overseas: £5·50 ($10·00 U.S.), post free surface mail


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EDITORIAL

Delay

We apologise to Readers and Advertisers for the late publication, for reasons entirely beyond our control, of this issue of Short Wave Magazine. The November issue will be a little late (owing to upset schedules), but the December issue should appear on time.

The A.R.R.A. Exhibition opens at the Granby Halls, Leicester, on 2nd November, and promises to be the most successful yet. As a showplace for finding out 'what's new' and an opportunity for meeting the people behind the well-known names (and for meeting your friends!) it is second to none, and we strongly recommend all those who have an interest in Amateur Radio, however mild, to pay it a visit. Short Wave Magazine will not have a stand this year as our policy is to exhibit every second year, but members of our staff will be attending, and we look forward to meeting many of our friends there.

It is with great sadness that we have to report the death of Tom Darn G3FGY. Apart from being Organiser of the A.R.R.A. Exhibition, Tom was a much loved and respected man in the Amateur Radio fraternity; he was always prepared to put in more than he got out, towards both individuals and the movement as a whole. An obituary will appear in an early issue.

WORLD-WIDE COMMUNICATION
VHF BANDS

NORMAN FITCH, G3FPK

VHF NFD

OVERALL winners of this year's VHF NFD were the March and District RAS folk with 3542 points. In second place were the Martlesham and Ipswich clubs with 3243 points, while the third spot was claimed by the Bracknell, University College of North Wales (Bangor), G4ERP Contest Group, with 2581 points. Individual band scores were as follows:

70 MHz: 1, GM3WOJ/P—1490; 2, G3UUT/P—1208; 3, GW4ERP/P—1127.
144 MHz: 1, G3PMH/P—5692; 2, G4BPO/P—5493; 3, GW8BH/P—5027.
432 MHz: 1, G4BEL/P—1323; 2, G4CFI/P—1219; 3, G3NNG/P—1205.
1296 MHz: 1, G3DY/P—6783; 2, G3XYD/P—5565; 3, GW4BRT/P—4023.

Congratulations to all concerned and acknowledgments to the GB2RS News Bulletin Service.

VHFCC Awards

Another three readers have won 2m. VHFCC certificates this month. No. 301 goes to Len Bailey, G8NQU, from Wellingborough, who started as a short wave listener in the early 1950's with an ex-RAF receiver. His main interest initially was broadcast band DX listening but in 1976, Len bought a Yaesu FRG-7 Rx and began listening on the amateur bands. Reception reports produced a 95 per cent QSL return. In August 1976 a 2m. converter was bought and, after one evening's listening, Len was sold on the idea and took his R.A.E. in May 1977. The current station is a Trio TS-700G and 6-ele. quad at 22ft., but as he is studying CW, activity is limited.

Richard Hook, G8LVB, wins certificate no. 302, for operation from Ash in Hampshire. Licensed in August 1976, he began with a Pye Cambridge FM10B, bought for £100, modified from low band for six channel operation. In February 1977, a Belcom Liner 2 was bought and the dipole changed to 4-ele. quad. In November 1977, his wife bought him a Yaesu FT-221R for his birthday and the aerial was then changed to an 8-over-8 slot fed yagi. Future plans include getting a G4 licence, and RTTY and SSTV. Richard is a founder member of the Surrey Police Radio Society and, on July 29/30 last he put on the first GB8 special event station, GB8SPF.

Julian Moss, G8ILO, receives VHFCC certificate no. 303 for operation from Thorpe Bay in Essex. He was first licensed in February 1974, the first QSO being a mobile one using a Hudson AM-108. Initial operation from the home QTH was on FM with all home-built gear to an indoor dipole. Hearing HG5AIR at S9-plus-40 dB in July 1974 convinced Julian that the only way to go was SSB, so a Yaesu FR/FL50B with QM70 transmitter was acquired. This 2 watts provided the first continental DX using a 5-ele. indoor yagi. From October 1975, sessions at Lancaster University provided opportunities for portable operation from fell tops with an Icom IC-202 and Modular Electronics 25 watts linear. The present home station comprises an Icom IC-201, 50 watts amplifier with the 5-ele. beam now rotatable, outdoors, at 30ft. Some satellite operation on Mode "A" is indulged in using a 29 MHz quad aerial with the FRG-7.

Beacon News

In the 23 cm. band the Edinburgh beacon is now operational on 1296-99 MHz. The e.r.p. is 25 watts to two corner reflectors beaming NE and NW. Reception reports should go to GM8BJF at 8 Corrennie Drive, Edinburgh 10.

Two Metres Super DX

The article in the August issue on the transceptrual tests on 2m. between the Mediterranean and southern Africa has produced some further fascinating details. Roland Whiting, 5B4WR, reports that the tests have continued without a break but that, unlike the earlier 6m. tests, there does not appear to be any marked seasonal dependence so far. He writes:—"In signal reception since the end of May no significant Doppler shifts have been observed and I now consider this as a secondary and possibly equinoctial phenomenon and not directly related to the main mode of 2m. propagation, which seems to be dependent on a 'noisy' sun."

Openings between 5B4WR and ZE2JV occurred on June 12, and July 2, 7, 10, 15, 21, 22 and 30, while on July 12, there was a good opening between ZE2JV and SV1AB but with nothing heard in Limassol. ZE2JV was copied in Israel on July 10 at 1805-1845z.

In DUBUS Informationen issue 2/78, Edgar Mueller, YV5ZZ, writes that Joe Reisert, W1JR, and other U.S. experts suggest this long distance propagation is not via TEP at all, but by a new kind of propagation called "FAI" or Field Aligning Irregularities, not known until now.

Mediterranean readers should note that the ZS6LN beacon operates from 1200-1600z daily with up to 700 watts to a 48-ele., array on 114-115 MHz. ZS6DN operates on 144-130 MHz with 800 watts to a 48-ele. array, times being 0600-0900, 1500-1930.

A New QTH Locator System

To the serious VHF/UHF operator, the familiar five-character QTH locator is as important as the call-sign. However, it is not unique. Consequently the idea of a world locator system is being discussed. The two systems being considered are first the Georef Fields wherein the primary squares are 15° by 15° and second the EA8EX one, modified by SM5AGM, in which the primary squares are 10° East-West and 5° North-South. To give examples, G3FPK's world locator in the Georef version would be MKQG5436, and in the EA8EX system, HST7LS.

Before examining these proposals further, readers' opinions are sought as to whether such a locator system is really necessary, bearing in mind great circle distances can only be calculated by reference to latitude and longitude in degrees. So why not use these in the first place in those few instances when these larger QRB's need to be calculated?
VHF in Iceland

Alistair Simpson, GM8NCM, has sent a detailed account of the Glenrothes and District ARC's operation from Iceland. Poor locations for VHF in the first week led to disappointing results, the first MS success being with G3POI on August 27 from a site near Reykjavik (PY72b). The next sked with G4DEZ was not completed in spite of a promising start. The next site near Hella in the southwest was another very poor location. The first good one was RX06J where from they operated on August 1 and 2 and made complete MS QSO's with DK3XT (FN), DK3UZ (EO), DJ9CZ (DL), SM4FVD (GT), SM4DHN (GU), OZ1OF (EQ) and G4FUJ (AL). The last QSO from here was with SK6AB (FR) before they moved to the final location in SY28j on August 3. That was a cliff top site on the southeast coast.

The first completed sked was with SM3BIU (HX) at the end of which a 15 minute aurora occurred (QTF 80°) during which they worked SM3FGL (HV) and SM3AKW (IW), then SM3BIU again. Thereafter MS skeds were resumed with DK5AIA (FL33b) at 2,100 kms. Later on the 4th they worked G3SEK and PA2DWH, ending up as they started with G3POI.

All this was the culmination of 57 skeds and some 117 hours of MS operation. During the trip, the boys visited the Icelandic Radio Association's club in Reykjavik and caused a considerable stir when they revealed working G the previous night. There is some 2m. activity through a local RØ repeater and it is to be hoped that some of the TF's might now try for some real DX.

Meteor Scatter Round Up

Edmund Ramm, DK3UZ (EN20c) sent a list of 18 completed MS QSO's made between June 18 and August 3 in 14 different squares. These included RA3YCR (RN52f); 9H1BT (HV03f); LZZJT (MD79h) and GM3YOR/TF (RX06j) which was completed in 45 minutes and gave Edmund 2m. country no. 35. But he complains, "... if only those QSL's would come in."

During the Perseids, Fausto Minardi, I4EAT (FE60f) worked SM3AVQ (IU27a); UK3AAC (SP); UA3LBO (QO21h) and F6EMT (ZH) plus G8KRZ and G8LGL on random SSB. Phil Johnson, GJ8KNV, mentions contacts with I1, OE, SM and YU stations in the same operation. The only successful sked for Paul Broadhurst, G8LGL (YL46c) was that with OESVHL (GI). Those with HI1KTC and I7DMP brought only a few short bursts and pings. The I4EAT QSO included a 40 seconds burst from Fausto, half of which was S9-plus.

Ken Osborne, G8KSS (Bristol), completed a Perseids sked with I4EAT in 1 1/4 hours using 50 watts. He heard and called LX1DB, YU1NAC, UR2RQ (30 sec. burst) and DJ5RQ with many others heard. Ken complains of the poor timing of overs by some stations on the random frequency. Keen listener Mike Allmark from Leeds reminds us that the random MS calling frequencies of 144-100 for CW and 144-200 for SSB are used all year round and that tropo, operators should avoid them. The Perseids produced three new countries and 14 more squares for Mike bringing his scores to 33 countries and 151 squares. T9TAL (GY) at 2,100 kms. was his best DX and other interesting ones heard included UR2CV (NS); YO2IS (KF); OH5NW (NU); YU1NWP (KE) and SM2CRK (KK).

Clive Penna, G3POI (AL51g), stuck to skeds in the Perseids and worked UR2NW (LT); SM2BYC (MZ); LZZKB (LD); SL2CU2 (KC); UA3LBO: SM2UE (IZ); SM4ANQ (HU); SM3BZS (HY) and HB0Q (EH68d) in Liechtenstein, which latter also worked G3SEK and GW4CQT. Clive's sked with SV1AB (LY) did not produce a QSO although George did get a 20 seconds burst from him. Indicatively, SV1AB does not make MS skeds any more. Gotaways were UA3LAW (PO) and ZB2BU from whom only two tiny bursts and two pings were received in spite of a prime time sked. Nothing at all was heard from UA3OG in UR15f but that was on the limit anyway.

General opinion is that this year's shower was not as good as that of 1977. Bursts were of shorter duration. G3POI says his longer distance skeds were quite rewarding but that results over the shorter distances were more disappointing. Another point was that some of the offsets for optimum beam headings were quite large, a factor to be carefully considered when using very narrow arrays.

Eric Grosssmith, G3WOH (Merseyside), mentions a keen interest in 70 cm. MS along with Tim Hughill, GW4FJG (Dyfed). Eric points out that RF amplifiers for 432 MHz with noise temperatures of as low as 80°K are now available at about the $40 mark, so the construction of a really sensitive Rx is that much easier now.

Twenty-three Centimetres

Bob Short, G3GNR (Devon), would welcome skeds for 2000-2200 local time on the band, CW or SSB. The gear comprises a 2C39 high level mixer and 2C39 PA giving 25 watts output to a quad loop yagi 40ft. a.g.l. The site is 484ft. a.s.l. 14 km. NW of Okehampton. Bob's pre-amp is a two stage affair giving 24 db gain to a Microwave Modules converter. Stations worked so far include G3COJ, G3JXN, G3KMS, G8AGU and GW4ASR/P.

G3WOH is busy sorting out a low level mixer for the band. John Tye, G4BYV (Norfolk) took advantage of the lift on August 18/19 and worked PA0EZ in Hilversum at RS 59 as did G8EVU in Southend and G3ZEZ in Clacton, Essex. John got an S4 report from ON5FH in Sint-Amandsberg. The PA0HQN beacon in CM53j was audible both on 23 cm. and 13 cm. GJ8KNV has just started assembling gear for this band as a longer term project with 10 watts of solid state RF in mind. A 34-16e. Q-L-Y aerial for the home station has been made. Finally, Arthur Breese, GD2HDZ, asks that Roger Taylor, G4BEL, reconsider his decision to drop out of the All-Time Table.

Seventy Centimetres

Some paralysing radar interference has "clobbered" the band lately. On Aug. 23, GD8EXI reported it as originating off Anglesey and the following night Richard and Syd Harden, G2AXI (Hants.), calculated it was off the Lizard. County seekers will be glad to learn that Jerry Goldsmith, G4CJG, plans to put Durham on the 70 cm. map very shortly, both from home and -/P.

Colin Wooff, G3SPJ (London), has added Cheshire, G8AWS and Cumbria, G3JYP, to his score.
With G3OSS as “Ringmaster,” Bill, G3JYP and Colin made it using 10 watts of CW. Alan Scott, G4BYP, writing probably for the last time from Liverpool, had not caught any lifts and hopes that the new and more elevated Cheshire QTH will reveal more activity.

During the Aug. 18/19 lift period, G4BYV worked DC2XK/OZ (ER) who was using just 10 watts and G8HVY/M in Dorset. On Aug. 27, Walt Davidson operated as G3NNY/P from Lincolnshire in AN51f and gave this rare square to John Woodham, G8BKR, John Pilags, G8HHI and others. Tony Oakley, G8IWA (N. Humberside), was unable to work HB9AEN/P when the latter QSY-ed from 2m. to 70 cm. in the evening of Aug. 25. The ensuing pile-up and QSB made work a couple of new counties for the table. The next day produced GM4CNV/P for another new county and square.

Paul Melbourne, G8GML (Cambridge) has spent much of this year getting going on 436 MHz fast scan TV “... on Channel 16‡ as we call it...” The PA runs 20 watts with a “Lynx” camera. He reports much increased ATV activity in the area and recently trapped 50 viewers at once at the Cambridge club, including the Lord Mayor of Cambridge and representatives of the Heidelberg club who were visiting during “Twin City” festivities.

Regarding interference from the Syledis radio location system, the licence requires that transmissions be screened from the land. The aerial has a 90° beam width.

Two Metres

On tropo, Jack Kay, G3CO (Essex), sums it up when he wrote, “... there have been one or two openings to the south east which have brought in one or two HB9 stations and southern French calls.” Aug. 19-21 produced QSO’s with HB9AMH/P (DH66c); LX1BK/P and HB9AMO/P (DG32a) as well as F’s in AF, AG, BF, BH, DF, DH, DI and DJ squares. Bob Mackean, G4HAO (Liverpool), found conditions quite good from Aug. 23 when he worked EI9Q. G8BKR’s best DX were HB9AMO/P and F6CUR/P (DF11j) on the 26th.

I4EAT (Faenza) confirms Sporadic
OK3. In the E's event on the 8th, time, caught the very short E's opening GI8EWM, confirm the latter's E's GW4HDF heard confirms says he could not positively identify from 1005 to 1036 but figures all the so many kms. from so-and-so! waffling on about his QTH being OE whom others could have worked, HG5AIR on the 15th and heard an plus the Gibraltar beacon, ZB2VHF, in a very short opening. G4HAO QSO with I4VOS/4 was on June 3 Both G8GHU, G8KMH, GJ8ORH, E contacts on July 8 and 10 with operating GB3TCF at about the event via 20m. and F1KBF in Paris was taped on heard was probably F6FHP (AE) heard Monday, Aug. 28. most conveniently on Bank Holiday not mention any SV/G QSO's on G4BHL and that SV1DH worked G3FPK was GM3JIJ (YS71e). Derrick Danse, GM4CXP (Borders), mentions GB3LER being Ar on Aug. 18 from 1850-1854z at QTF 25°, also on the 30th at 1630-1635 and 2350-0015z. L8AYB (FT13a) was worked at 0007z on the 31st (30°) and another phase occurred from 1555-1620z when G8BCL (ZN11d) and GW4GSS (YN75j) were contacted. (45°). Your scribe heard only GM8NCM contacted. in addition to the usual RST and serial number. In the 308 entries last year there was not one from the British Isles—shame!

During the Aug. 8 opening, Roger Thorn, G3CHN (Devon), copied the IS0A beacon (EA08a) in Sardinia from 1005 to 1036 but figures all the IS0's were still in bed! SV1AB says he could not positively identify any British calls in the July 10 event due to the colossal QRM. He confirms that SV1KH worked G4BHHL and that SV1DH worked GW4CQT that evening, but did not mention any SV/G QSO's on the 8th.

A very intense Aurora occurred most conveniently on Bank Holiday Monday, Aug. 28. First station heard at G3FPK was GM3JJJ (WS69e) whose "CO" was answered at 1313z. The most southerly station heard was probably F6FHP (AE) and F1KBF in Paris was taped on SSB. Bob Nash, G4GEE, got a tip-off from an SM in the morning about the event via 20m. He was operating GB3TCF at Stoneleigh later and worked a number of U.K. stations on SSB and CW between 1343 and 1514z.

Bill Duckett, G8BKF (Salop) came in on it at 1335 and worked PA0FRE (CL03j); GBKSS; DB1BP (DN36b); DC9DX (FN53f) and PE1AIU (DN63f). QTF's were 45° but, although GB3VHF was copied Ar, GB3LER was not. G8BKR worked G8HPW in Tyne and Wear plus a few others. G8HHI logged the start at 1319 and worked several G, GI, GM, GW and German stations at QTF's between 45 and 67°. F, EI and ODZ were heard with fade-out at 1523z. GI8WA first heard G18JPG, then worked DC1BP (DN36b) followed by DC5BP in EM25h getting RS 59A from each. Due to very heavy QRM, G8GLG only heard a GI and some Midlands stations in this affair.

GD2HDZ was pleased to work GM3JFG (XR40c) who is otherwise impossible to work via tropo. Art Smyth, GM3XNE (Ayrshire), "tripped across" his first Ar of the year having just hoisted a 6-ele. quad aloft. From 1458-1546, 14 CW QSO's were made including GW4EON (YJ48h) and GM3BCOA (YS71e). Derrick Danse, GM4CXP (Borders), mentions GB3LER being Ar on Aug. 18 from 1850-1854z at QTF 25°, also on the 30th at 1630-1635 and 2350-0015z. L8AYB (FT13a) was worked at 0007z on the 31st (30°) and another phase occurred from 1555-1620z when G8BCL (ZN11d) and GW4GSS (YN75j) were contacted. (45°). Your scribe heard only GM8NCM contacted. in addition to the usual RST and serial number. In the 308 entries last year there was not one from the British Isles—shame!

Satellite News

On Sept. 9 your conductor received news from AMSAT-UK Secretary Ron Broadbent, G3AAJ, that there must be no more Mode "B" use of Oscar 7 until further notice due to battery problems. Mode "A" use is not affected and it may be used when in this mode on days when it should be on Mode "B" apart from Wednesdays, of course.

Printed circuit boards for the 29 MHz pre-amp. are available from G3AAJ for 60p plus 9in. x 4in. s.a.e. Anyone wanting an Oscar 8 cursor for the polar projection map should send him 28p in stamps. (QTHR.)

Final

Sorry no Squares Table this month due to lack of space. Next month it will be order of 2m. scores. The deadline for November is Oct. 5 and for December, Nov. 2—very early so please mark it in your diary. Everything to: "VHF Bands," SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts., AL6 9EQ.
LEICESTER, 1978

ONE OF THE MOST IMPORTANT AMATEUR RADIO ANNUAL EVENTS IN EUROPE

Many of our well-known advertisers will be showing their wares at this year's National Amateur Radio Exhibition at the Granby Halls, Leicester (organised by the Amateur Radio Retailers Association). The event this year is on the 2nd, 3rd and 4th of November.

Amateur Electronics UK of Alum Rock Road, Birmingham, who as main importers of Yaesu Musen, Swan and Atlas products will be displaying a large range of units by these three major manufacturers and featuring in particular a completely new line by Swan Electronics of Oceanside, California. The ever-growing Yaesu Musen range is, of course, well known to readers and this year in particular has seen the release of many new models. For the mobile operator the new Swan 100MX Transceiver will be of particular interest. Apart from the major equipment, a complete range of accessories and ancillary gear will be on display on the Amateur Electronics stand, and G3FIK points out that the Leicester Exhibition is also the highlight of the year for him as this is his main opportunity to meet many old friends.

Lowe Electronics of Matlock, the sole importers of Trio equipment, are showing as usual several interesting new products, but undoubtedly the star of their show will be the new Trio TR2300 two-metre portable FM Transceiver. For the dedicated HF man they will be showing the no-compromise R820 Receiver, designed to complement the incredibly successful TR820 Transceiver. Also new from Trio, is the SM220 Monitor Scope, the outstanding feature of which being that it can monitor band activity as a "panadaptor," showing at a glance what's happening across the band in use. On the stand, you will find the new Mizuho 2-metre SSB portable, new Daiwa rotators, a new 50 MHz counter for less than £40, and a regulated 13.5v. power supply for less than £17. Much more to see, but simply be there and sample the delights for yourself—because there is no room to mention all that will be on show on the Lowe stand.

Thanet Electronics of Herne Bay are introducing the new IC-701 HF transceiver, which is Icom's first venture away from the VHF and UHF market for many years. The IC-280 is their latest addition to the 2-metre mobile market (giving digital frequency readout) plus the IC-RM3 which is the microprocessor-controlled remote controller for use with the IC-211E, IC-245E and the IC-701. There is also the IC-202S, a portable SSB rig, which will be very popular with those people who are interested in working through OSCAR. The IC-402S is the new 70cm. version of the IC-202, and no doubt this will be used by many who have caught the "SSB or 70" bug. Datong Electronics Ltd. of Leeds will have two new products at this year's show. As usual, this highly inventive firm will be running excellent working demonstrations of all their products, which include the Model FL1 Frequency Agile Audio Filter, the Model UC1 Up-Converter, the Universal RF Speech Clipper, the Datest 1 and Datest 2 Transistor Testers, and the Model AD170 Active Receiving Antenna. The major new product on show is the Model ASP: this, as far as we know, is the world's first RF Speech Clipper which is completely automatic and which therefore needs virtually no setting up for optimum results. The second new product is the Model IB5 Interface Unit for use with the Model AD170. S.E.M. from the Isle of Man have recently expanded their popular "Sentinel" range of receiver pre-amplifiers to include auto-models to cover the HF/VHF/UHF ranges. Aerial matching arrangements seem to go in and out of fashion, but there can be little doubt the "Z-match" circuit remains the primary one: S.E.M.'s Model SO-239 is their variation of the Z-match circuit, with an addition so that the circuit can either be balanced or un-balanced.

The new Trio SM-220 Station Monitor which will be displayed on the Lowe Electronics Ltd. stand.
John Birkett of Lincoln will once again bring along one of the most popular displays at the Exhibition, and if you can get near enough you will find all those small components that you have been looking for, plus a fine range of test equipment, etc.

The FDK Palm 11 is a new hand-held two-metre transceiver at a size to suit both your hand and your pocket: this is being shown by Waters and Stanton Electronics of Hockley, Essex, the main importers and distributors of FDK equipment. Fast mail order service backed by large stocks have helped to bring this firm into the top league of Amateur Radio suppliers. Other items to be shown include the very best of British equipment, plus imported goods from around the world. Mini-Products antennas and the Dentron range of linear amplifiers and antenna tuners will all be on show on their stand.

Another popular stand is that of B. Bamber Electronics of Cambridge. They show a wide range of ancillary equipment including Weller soldering equipment, die cast boxes, vinyl covered and aluminium boxes, Eagle multimeters and test equipment, plus Spiralux and Draper tools for the electronics enthusiast. Their main attraction is, as always, their selection of surplus equipment—they are renowned for providing anything from a petrol generator to an RF transistor—and the friendly staff are always on hand to advise customers about the bargain they wish to purchase. They will also have a large supply of Mail Order catalogues available.

Western Electronics (UK) Ltd. of Louth, Lincolnshire are one of the countries leading suppliers of Amateur Radio equipment. They carry large stocks of the famous Yaesu Musen range, plus many products which they have designed and produced themselves. Their test equipment is world famous and it's not unusual to hear that DX station say that he is using a Western tower and beam. We are promised new items at this year's exhibition, though there is no advance information—so be sure to visit their stand.

Yet another very popular exhibitor at Leicester is Stephen-James Ltd. of Liverpool. New products on show will be a three-band Solid-State HF Transceiver for fixed or mobile use, with an input of 250 watts p.e.p., a 2-metre tunable pre-amp, and a Solid-State AM Receiver. All this, plus the products of Yaesu Musen, STE Milan, Technical Associates, Barlow Wadley, etc., on the Stephen-James stand.

Radio Shack Ltd. of London will be showing the full range of Drake equipment, plus equipment from many other manufacturers. Pride of place must go to the new Drake TR-7 Transceiver, which is surely one of the finest pieces of gear ever produced by Drake, and should be one of the stars of the show. Radio Shack will also have
on display products from, amongst others, Trio, Telex, Prestel, Cushcraft, Ten-Tec, Shure, Jaybeam and Hy-Gain.

What can be said about the stand of South Midlands Communications Ltd.? The line-up of new and established equipment is so impressive that it is impossible to list it all here. As a random selection, there will be a full range of Mobile Antennas, the new Telewriter, a 1296 MHz Transvertor, a new General-Coverage Receiver, many new items of test equipment, masts, rotators, Versatowers, and of course all the latest Yaesu Musen equipment, plus much more. With so much to see this stand could be an exhibition on its own! There will also be the stand of their branch S.M.C. (Jack Tweedy) Ltd. Here again another wonderful range which will excite any radio amateur enthusiast.

Microwave Modules Ltd., Catronics Ltd., Amateur Radio Exchange, C.B. Electronics Ltd., Polar Electronic Developments Ltd., John’s Radio, Hilomast, Crayford Electronics, Modular Electronics, Radio Society of Great Britain, International Short Wave League, Radio Invalid and Bedfast Club, British Amateur Television Society, RAEN, British Amateur Radio Teleprinter Group, and many more, will all be at Leicester this year. No doubt to see everything you will need to be there for all the three days of the Exhibition!

Advertising Feature

AMATEUR RADIO—COMMUNICATION OR TECHNOLOGY, OR BOTH? PART VI
CONTINUING THE THEME OF A RETURN TO HOME-BREW WITH THE DESCRIPTION OF A GENERAL PURPOSE HF TRANSMITTER

N. H. SEDGWICK, G8WV

A prime factor of home-brew activity is not to waste time and money on making something which is really not wanted, or which will not be adaptable to changing conditions or capable of reasonable modification to extend one’s interests as they develop. On the bookshelf in this shack is a 1937 amateur publication which describes and shows photographs of an “ideal” 150-watt transmitter: it is built on a wooden baseboard with all controls mounted on individual pieces of Ebonite screwed to the edge of the board, with no screening whatever, or protection against the user killing himself by contact with high voltage. At the time this publication was in regular use for reference by home-brewers the writing was on the wall, for the BBC was already transmitting television on VHF from Alexandra Palace, and many London amateurs were already in trouble with TVI.

Times have indeed changed, and home-brewing of HF transmitters requires expertise in a number of techniques and crafts. A project needs careful thinking out as regards the operational and functional philosophies of the proposed device and the actual technical and mechanical design of it, before setting drill to metal. So let us go through the process of specifying, designing, and making the home-brew HF transmitter adaptable to developing interests in the various modes of operation in that field, and using straightforward non-gimmicky components, choice of which may largely be determined by the fact that they are already in possession. First we do the thinking...

Specification

(a) To be capable of continuous-wave operation at about 150 watts input with Class-C operation of the PA for high efficiency.
(b) To be switchable to linear operation, preferably Class-B since the drive power has to be available to meet requirement (a), and this mode has the best efficiency in linear modes.
(c) To cover all the HF amateur bands. (Here the writer admits to regarding 28 MHz as a 'stunt' band requiring luck with sunspots rather than any degree of skill in working DX. Hence it has been omitted from the transmitter to be described, but there is no reason why the home-brewer should not include it in his personal design).
(d) To have frequency agility within the bands, (i.e. provision for use with VFO).
(e) To have an internal drive source for CW operation, but capability of being externally excited by other sources using any common narrow-band form of modulation—F1, A3j etc. and to permit mixing the external source with a VFO to produce the final radiated frequency, or to accept an external source at the final radiated frequency.
(f) To be completely screened and protected from radiation of harmonics directly from the transmitter as distinct from the aerial.
(g) To have fixed impedance coaxial output to permit use of low pass filtering in the output lead to reduce TVI risk.
(h) To have pi output tank and aerial coupling circuit, thus ensuring that there is always a relatively high capacity in shunt to harmonics directly across the output.
(i) To be ‘modular’ in construction to make easy major modification or repair of major faults.
(j) To be of mechanical construction that can all be done in the shack using common hand tools and a pistol drill.
(k) To be simple of operational adjustment.

The next step is to decide what valves and major components should be used, and this calls for a survey of what is already available. The PA valve determines how much drive is required, power supply, etc., so choice of that must be the first consideration.
Survey

1. PA Valve. There are lots of long established valves with the necessary power handling capacity that can be used, but most of them require anode voltage exceeding 1000 volts, which ‘ups’ the cost of all associated components. There are also lots of pentodes and tetrodes which can be used in parallel pairs or push-pull to handle the required power with anode voltages of the order 600-750 volts. Note that push-pull PA operation complicates pi-tank arrangements, and parallel operation is preferred nowadays.

Fig. 2 shows a selection of valves of the right sort of rating which were available in the shack at the survey. The Allies probably won the last war with the 807, and it is still one of the most rugged and reliable of valves. The 6146 has slightly higher ratings and is much shorter, although it takes up the same amount of chassis area; it is an expensive valve, particularly in the ‘B’ version, and less rugged than the 807, although the short electrode leads are an advantage in terms of stability. The EL38 was designed for video amplification and has very high mutual conductance which makes it well suited for Class AB1 linear operation, but its high sensitivity also makes it liable to retroactive instability in HF use, where the practice is to use up to 750 volts on its anode, and it can die very suddenly in such circumstances; it is also rather tall with long electrode leads which do not help the stability problem. The 829B was originally the ‘must’ valve for VHF: it is a twin tetrode rather akin to two 807 valves in one envelope, but fat and short in build so that it does well in a transmitter constructed with the modern rather small components. The transmitter shown in the photographs uses an 829B and has a front panel only 54 inches high; it was really the shape and dimensions of the 829B that made it first choice.

2. Ratings and Tank Circuit. Choosing the PA valve sets the main HF voltage, and in the case in point it was made 650 volts which gives 150 watts input at 230 mA and the maximum permissible anode dissipation of 40 watts at 73 per cent efficiency. This is quite practicable in Class-C, but running CW in Class-B at 65 per cent efficiency requires reducing input to 114 watts to keep the anode dissipation at 40 watts maximum, in which case output will be 74 watts as against 110 watts for Class-C mode. The p.e.p. rating for SSB speech can be made higher than the Class-B CW rating, depending on one’s brinkmanship, but in any case not so high as to run into non-linearity on peaks; this information fixes the output impedance and enables the pi-tank circuit constants to be calculated. The method of doing this is given in both RSGB and ARRL handbooks, and there is no point in repeating it. However, the reactances of inductance and capacitance are the same for the impedance match into the load irrespective of frequency, so if L, C1 and C2 are worked out for 3.5 MHz they will be halved in value for 7 MHz, quartered for 14 MHz, and divided by 6 for 21 MHz. It is usual to work on a loaded ‘Q’ for 10 or 12 for the tank circuit, and this limits the frequency tuning range of any particular inductance/variable-capacity combination. This is no worry to the amateur as the bands are narrow and he expects to change tank coil for each band.

With a single-ended pi-tank circuit it is difficult to get an anti-phase RF voltage to feed back to the grid, so it is better to use a centre-capped grid coil tuned by a split-stator capacitor, and feed back to the anodes from the end of the coil opposite to the grid connection. This same end can be connected to the anode of the driver valve via a DC blocking capacitor to help balance the electrode capacities across each half of the coil; a neutralising voltage for the driver valve can then be picked up at the PA grid.

Neutralising for the PA is by a stout wire projecting from the driver coil through the chassis near to the 829B anodes (at a point well clear of the load end of the tank circuit) and cut to length to give good neutralising without any actual connection being made to the anode.
FIG. 4a. G8WV HF TRANSMITTER - MODULE 'A'
FIG. 4b
G8WV HF TRANSMITTER - MODULE 'B'
HF amateur bands, and something like a 2-gang 150 pF ratio is set at just over 2:1. Two ranges will cover all the tuning of the two stages can be ganged. If the tuning of the voltage amplifier will provide sufficient selectivity, the VFO voltage. Of the latter will be distorted when the peaks exceed the signal source voltage, as otherwise modulation to the signal grid. The VFO voltage must always firmly oscillator grid and the signal source (modulated or CW) 6BE6 or EK90 with the VFO connection to the normal frequency agility. Be a mixer to allow introduction of the VFO to give negative when the key contact is open. Valves in Morse code operation by switching the amplifying class, in which case a vari-mu type can be agreed that the preceding valve in the chain 4. Valves to be simply a voltage amplifier, and so requires and so easily provide adequate drive. Class-A operation will give more than 4 watts of the valve. The system means that only half the RF driving power of any of the modes.

4. RF Voltage Amplification and Keying. Having agreed that the preceding valve in the chain may be a voltage amplifier, that puts it into the receiving RF amplifying class, in which case a vari-mu type can be used and one can control the drive level to the 829B by varying the grid bias to this valve; it can be a 6BA6 or EF93, or similar type. One can also arrange to key this valve in Morse code operation by switching the screen grid voltage through the Morse key, and to make quite sure the valve is cut off when the key is at 'space' one can connect the screen grid via a high resistor (say 330K) to the negative bias supply so that it is biased well negative when the key contact is open.

5. Mixer. Preceding the voltage amplifier there must be a mixer to allow introduction of the VFO to give frequency agility. This calls for a pentagrid such as a 6BE6 or EK90 with the VFO connection to the normal oscillator grid and the signal source (modulated or CW) to the signal grid. The VFO voltage must always firmly exceed the signal source voltage, as otherwise modulation of the latter will be distorted when the peaks exceed the VFO voltage.

6. Tuning. Tuning of the anode of the mixer and anode of the voltage amplifier will provide sufficient selectivity to pick the right frequency out of the mixer, and the tuning of the two stages can be ganged. If the tuning ratio is set at just over 2:1 two ranges will cover all the HF amateur bands, and something like a 2-gang 150 pF variable capacitor is required. This tuning cannot, however, be ganged to the grid tuning capacitor of the 829B as this will be a centre-tapped circuit requiring a similar capacitor arranged as a split-stator device, placing its two sections in series across the grid coils and thus halving the maximum capacitance across the tuned circuit.

7. Drive Coils. It is a good idea to use toroidal coils for the centre-tapped grid coils. These tend to be better balanced than straight former wound coils and have the advantage of a closed magnetic core circuit, so that the magnetic flux is contained within the coil and they should not need screening. However, they must be shunt coupled, for DC current in the windings will change the core permeability and alter the tuning.

8. Drive Source. If the VFO is 5 to 5-5 MHz, which is common for use with 9 MHz SSB exciters, one needs a 9 MHz oscillator to provide 3-5 and 14 MHz signals (9 - 5.5 = 3.5, 9 + 5 = 14), a 12.5 MHz oscillator for 7 MHz (12.5 - 5.5 = 7), and a 16 MHz oscillator for 21 MHz (16 + 5 = 21). These can be from fundamental crystals switched into an oscillator by the frequency band switch selecting the mixer and voltage amplifier tuned circuits. The oscillator can be a twin triode with separate cathodes, such as a 12AU7 valve with one half connected as a Pierce oscillator and the other half as a cathode-follower to provide a low impedance output.

An HT switch to the oscillator/cathode-follower can be labelled "INTERNAL/EXTERNAL" and the external drive input connected direct across the cathode follower output resistor. It will be necessary to unplug the external drive when the internal drive is used, and similarly to switch off the internal drive when the external drive is used; if this requirement is not acceptable it means an RF type switch to change the connection into the signal grid of the mixer, but it will still be necessary to have the HT switch to allow the internal oscillator to be switched off when not in use. The external drive frequency can be at a frequency suitable for mixing with the VFO in the mixer to produce the wanted radiation frequency, or it may be on the frequency to be

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**Table of Values**

<table>
<thead>
<tr>
<th>Circuit Designations</th>
<th>Resistor Values (in ohms)</th>
<th>Capacitor Values (in pF)</th>
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</thead>
<tbody>
<tr>
<td>R1 = 22K</td>
<td>RFC2</td>
<td>C8, C9</td>
</tr>
<tr>
<td>R2, R3 = 180K</td>
<td>RFC3</td>
<td>C12, C14</td>
</tr>
<tr>
<td>R4, R7 = 33K</td>
<td>RFC4 = 1.5 mH</td>
<td>R22 = 0.1 μF</td>
</tr>
<tr>
<td>R5, R20 = 820R</td>
<td>RFC4 = 2 mH</td>
<td>C22 = 0.01 μF</td>
</tr>
<tr>
<td>R6, R8</td>
<td>M1 = 200 μA FSD</td>
<td>C22, C14</td>
</tr>
<tr>
<td>R9, R12 = 100K</td>
<td>M2 = 20 μA FSD</td>
<td>C22, C14</td>
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<tr>
<td>R10 = 150R</td>
<td>M3 = 300 μA FSD</td>
<td>SK1 = external drive</td>
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<td>R11 = 10K 3W</td>
<td>D1 = 0.95</td>
<td>SK2 = VFO input</td>
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<tr>
<td>R13 = 6R</td>
<td>D2, D3 = OA202</td>
<td>SK3 = PA output</td>
</tr>
<tr>
<td>R14 = 4K</td>
<td>ZD1 = 18v. 400mW</td>
<td>S1 = 4-pole 4-way</td>
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<tr>
<td>R15 = 33K</td>
<td>RV1 = 5K variable</td>
<td>S2, S3 = 2-pole 4-way</td>
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<tr>
<td>R16, R17 = 8K2</td>
<td>T1 = pri. 6-v., sec. 20v.</td>
<td>S4 = S.P.D.T.</td>
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<tr>
<td>R18 = 47K</td>
<td>C1, C5, C8, C9</td>
<td>L1 = 74 μH</td>
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<td>R19 = 47R</td>
<td>C6, C7</td>
<td>L2 = 3.7 μH</td>
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<tr>
<td>R21 = 220R</td>
<td>C13, C16 = 330pF</td>
<td>L3 = 1.85 μH</td>
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<td>R22, R23 = 10K</td>
<td>C2, C4</td>
<td>L4 = 1.23 μH</td>
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<td>R24, R25 = 27R</td>
<td>C10, C15</td>
<td>L9, L11 = 0.5 μH</td>
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<tr>
<td>V1 = 12AU7</td>
<td>C23, C24</td>
<td>L10, L12 = 1 μH</td>
</tr>
<tr>
<td>V2 = 6BE6</td>
<td>C25, C34</td>
<td>L5 = 16 μH 48 turns</td>
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<tr>
<td>V3 = 6BA6</td>
<td>C33, C36</td>
<td>L6 = 26 s.w.g. C.T.</td>
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<tr>
<td>V4 = 5763</td>
<td>C37, C38</td>
<td>L7 = 22 μH 18 turns</td>
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<td>V5 = 825B</td>
<td>C41, C42 = 0.1 μF</td>
<td>L8 = 26 s.w.g. C.T.</td>
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<tr>
<td>RFC1</td>
<td>C3, C45 = 220pF</td>
<td>X1 = 9 MHz</td>
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</table>

* The two halves of each coil are bifilar wound; cores are 'Amidon' obtainable from T.M.P. Electromics. T68 = 2 cores.
Your Invitation to the SMC Stand at Leicester '78

See some of SMC's selection from a Hundred Manufacturers in ten countries

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>Gross Major Yaesu items</td>
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<tr>
<td>Rotators</td>
<td>1 Doz.</td>
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<tr>
<td>Frequency Counters</td>
<td>4 Doz.</td>
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<tr>
<td>Crystal and Ceramic Filters</td>
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<td>Crystal Frequencies</td>
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<td>Riggings and Fittings</td>
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<tr>
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<td>1 Doz.</td>
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<tr>
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<tr>
<td>VHF Antennas</td>
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<tr>
<td>Coax Cables</td>
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<td>Masts—Tubular</td>
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<td>Antenna Wires</td>
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<td>Balun Transformers</td>
<td>1 Doz.</td>
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<tr>
<td>VHF Antennas</td>
<td>6 Doz.</td>
</tr>
<tr>
<td>Coax Cables</td>
<td>1 Doz.</td>
</tr>
<tr>
<td>Masts—Tubular</td>
<td>1 Doz.</td>
</tr>
<tr>
<td>Coax Plugs/Sockets</td>
<td>4 Doz.</td>
</tr>
<tr>
<td>Antenna Wires</td>
<td>4 Doz.</td>
</tr>
<tr>
<td>Balun Transformers</td>
<td>1 Doz.</td>
</tr>
</tbody>
</table>

REMEMBER: YAESU the choice of the discerning SMC your only single stop source

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++ FROM SOUTH MIDLANDS COMMUNICATIONS LIMITED ++

FT901DM

THE FT901DM TRANSCEIVER OFFERS UNPARALLELED RECEIVER PERFORMANCE COMBINED WITH STATE-OF-THE-ART TRANSMITTER DESIGN. THE RECEIVER FEATURES REJECTION TUNING, DUAL FILTER VARIABLE-BANDWIDTH TUNING, AND AUDIO PEAK FREQUENCY TUNING FOR MAXIMUM REJECTION OF UNWANTED SIGNALS. THE TRANSMIT SIDE INCLUDES A BUILT-IN CURTIS 8043 IC KEYER, RF SPEECH PROCESSOR, AND A TEN-SECOND "TUNE" POSITION TIMER WHICH PREVENTS DAMAGE TO YOUR FINALS DUE TO EXCESSIVE "KEY DOWN" PERIODS DURING TUNE UP. OTHER ADVANCED FEATURES INCLUDE FREQUENCY MEMORY FOR INSTANT RECALL OR SPLIT OPERATION, AN ADVANCED NOISE BLANKER, AND OFFSET TUNING FOR EITHER TRANSMIT OR RECEIVE FREQUENCIES. YAESU'S UP-TO-DATE MODULAR CONSTRUCTION UTILIZING PLUG-IN CIRCUIT BOARDS MINIMIZES SERVICE TIME. ALL MODES (USB, LSB, CW, FSK, AM, AND FM) AND ALL BANDS (160-10 METRES PLUS MSF RECEIVE) ARE PROVIDED.

FREQUENCY RANGE: 10-160m. CB, MSF (RX)
POWER REQUIREMENTS: 100/110/117/220/226/224v, 50/60Hz
VHF: 200/240/260v, 50/60Hz
AC: 220/230v, 50/60Hz
DC: 12v, 13.5v, 15v, 18v, 24v, 28v, 32v
MODES: RX, TX, RX+TX, RX-TX
MODES (TX and RX): LSB, USB, AM, CW, FM, FSK
DIMENSIONS: 135 x 6 x 135 = 40 lbs.

REMEMBER: THE FULL LINE OF MATCHING ACCESSORIES.—FT901 ATU/Power meter. FY901 External VFO with 40 memory channels. Manual 3 speed tuning and scanning. Y0901 monitor scope with RF, IF, AF facilities. 2 tone oscillator and panadapter facilities. A0901 monitor scope with RF, IF, AF facilities. 2 tone oscillator and panadapter facilities. A0901 monitor scope with RF, IF, AF facilities. 2 tone oscillator and panadapter facilities.

FROM SOUTH MIDLANDS COMMUNICATIONS LIMITED
NEW! FROM YAESU CPU 2500R

THE CPU2500R IS THE ULTIMATE IN 2.5 METRE FM TRANSCEIVER DESIGN. FREQUENCY CONTROL IS POSSIBLE EITHER BY THE OPTICALLY COUPLED MAIN TUNING KNOB OR BY CONTROLS ON THE MICROPHONE. FOUR MEMORY CHANNELS ARE AVAILABLE WITH SCANNING PROVISION OF DIAL OR MEMORY FREQUENCIES. THE CPU2500R COMES IN FOUR VERSIONS (DETAILED BELOW), 10 OR 25 WATT, STANDARD MICROPHONE (CONTAINING UP/DOWN REMOTE ELECTRONIC TUNING CONTROLS) OR KEYBOARD MICROPHONE (ALLOWING REMOTE INPUT OF DIAL OR MEMORY CHANNELS, PROGRAMMING OF REPEATER SPLITS, SCANNER CONTROL AND TONE PAD FACILITIES). AUTOMATIC BURST AND LONG EUROPEAN REPEATER ACTUATION TONES ARE BUILT IN.

CPU2500R Standard mic 25W/ CPU2500RK Keyboard mic 25W/ CPU2500RS Standard mic 10W/ CPU2500RKS Keyboard mic 10W.

FT227R, FT227RS, FT223, 2015R, Dig. II ON THE STAND

+ + LINEAR AMPLIFIERS WITH 80, 160, 280+ WATTS OUTPUT FROM SOUTH MIDLANDS COMMUNICATIONS LIMITED + +

FT 255 RD

YAESS’S STATE OF THE ART, FULLY MODULAR (PLUG IN BOARD) MULTIMODE, 2 METRE TRANSCEIVER OFFERS UNPARALLELED FLXIBILITY OF USE : IN FREQUENCY READOUT (ANALOGUE AND DIGITAL SCALES), IN FREQUENCY SETTING (ON THE STABLE VFO, OR THE MEMORY OR ONE OF THE 11 CRYSTALS (22 FREQUENCIES OVER 2 MHz)) IN SIMPLEX (25W. PEP ON SSB AND 1-25W. OUT ON FM) AND IN REPEATER USE (±600 KHZ, ± AUX. SPLIT AND XTAL TONE BURST).

THE USE OF A 134 MHZ VCO AND SINGLE SIGNAL MIX PRODUCES AN EXCEEDINGLY CLEAN SIGNAL AND MAINTAINS GOOD SIGNAL HANDLING IN THE OUTSTANDINGLY SENSITIVE RECEIVER.

144-148 MHz inclusive Coverage Multimode SSB-LSB-FM-AM-CW AC mains or 12v. DC working Smooth Dual speed VFO Digital readout to 100 Hz Mode sensitive digital readout Analog readout to 1 kHz

FREQUENCY RANGE:
144-148 (4 x 1 MHz)
±600 KHZ + another shift
AUX OUT:
2W. (int. or ex. 4) speaker
AUDIO DISTORTION:
10% at 2W.
SENSITIVITY:
0-5µV for 20dB S/N (SSB)
0-35µV, for 20dB QS (FM)
1-0µV for 10dB S/N (AM 30%)

Front Panel FM power control Front Panel sensitive squelch Front Panel VOX/MOX/Control Front Panel Mic. Gain control Switchable effective noiseblanker Switchable AGC—Slow or fast Switchable lights/Readout brightness

FREQUENCY STABILITY:
100Hz/30 mins. (A.W.U.)
20Hz for 10% line change
SPOUSIOUS RADIATION:
Better than -60dB
AUDIO RESPONSE:
0-15-2kHz ± 3dB
POWER REQUIREMENTS:
RX 30VA Tx 160VA DC-11-5-16-0v. Neg.
Ground RX 1-2A TX 6-5A

SELECTIVITY:
2.3 kHz at 6dB (1:78:1 SF)
12 kHz at 6dB (2:33:1 SF)
SIDEBAND SUPPRESSION:
Better than -40dB
OUTPUT POWER:
25W. PEP A3
8W A3

22 Fix Channels (2 x 11) (2 MHz)
Maximum Option 5 or splits use "5"/centre zero/P output meter Switchable 20dB RF attenuator Switchable XTal cont. tone burst Switchable Meter function on Rx. Accessory rear panel DIN socket

DIMENSIONS:
13" (34cm) x 10" x 5" (6"
Weight approx. 20 lbs.
SPURIOUS RESPONSES:
Less than 1µV
IMAGE RESPONSE:
Better than ±40dB
MODES:
USB, LSB, FM, AM, CW
READOUT RESOLUTION:
Digital to 100Hz
Analog to 1 kHz

FT225R, FT221R, YC221, M27000 ALSO ON THE STAND

+ + LINEAR TRANSVERTORS FOR 432, 1296 FROM 144 MHz FROM SOUTH MIDLANDS COMMUNICATIONS LIMITED + +
THE SHORT WAVE MAGAZINE

SOUTH MIDLANDS COMMUNICATIONS LIMITED PROVIDE FOR ALL YOUR HF ANTENNA, ROTATOR AND MASTS NEEDS

FRG 7000

The FRG7000 is a high performance all solid state communications receiver designed to cover the entire high frequency spectrum of 0.25 to 30 MHz. With bright 1" seven segment LED's providing digital readout to 1 kHz. Also included is a 24 hour digital clock for both local and GMT time, with a timing feature for automatic receiver (and/or tape recorder through rear panel relay contacts) on/off switching.

The Barlow Wadley loop (Triple conversion superhetodyne) system used, offers extremely stable (better than 500Hz/hr. A.W.U.) performance. Ceramic IF filters with a 6dB bandwidth of 3 kHz for SSB and 6 kHz bandwidth for AM (14 kHz at 50 dB) and 6 kHz bandwidth for FM (14 kHz at 50 dB) provide optimum intelligibility coupled with good rejection of interference.

The Mosfet RF amplifier offers an outstanding sensitivity of 0.7uV for 10dB S/N on SSB and 2uV for 10dB S/N on AM, without sacrificing strong signal performance. Wide provisions are made for antenna connections: for M.W. broadcast 0.25-1.6 MHz a high impedance binding post, for 1.6-30 MHz 75 ohm unbalanced coaxial feed (for random low impedance length S.W. antenna). Also on the antenna terminal strip is the earth and a mute (earth for standby) connector.

Audio output of up to 2 Watts drives the internal speaker, but plugging in an external 4 ohm unit or headphones (2.5 Jack) disables this. A socket for tape recording produces about 50mV independent of the volume control setting. A built in mains power supply allows operations from 100/110/117/220/230v. AC (50 or 60Hz). To reduce the power consumption (of 25W) the front panel lamps and displays may be extinguished.

For high reliability FET's and IC's are used extensively throughout the receiver providing maximum performance within a compact cabinet (36(w), 12.5(h) x 20.5(d) and 7Kg.).

Accessories included are the handbook, plugs (for every socket in the receiver) and 3 and 10m. wire antennas.

FRG7, FRG7D, SMC73, FR101 also on the stand

NEW! FT202R BY YAESU

The FT202R is a multipurpose, six channel, hand-held, 2 metre, FM transceiver, that offers the highest of performance in a lightweight, completely portable, package. The receiver is a double superhet—Mosfet RF, FET mixer, 2 stage of 10.7 MHz ceramic filtering, integrated circuit, IF and audio stages which produces a half a Watt of crisp clear audio. The transmitter provides over a Watt of output to the top panel BNC socket, into which may be plugged, the supplied helical, a mobile whip, or the home station antenna. Dry cells or Ni Cad's can be used, and a charger is available, which not only re-charges the batteries, but with a suitable DC source permits base station operation with external microphone (with PPT) and speaker.

1 Watt RF minimum
6 channel capability
BNC Antenna socket

Includes 3 (or 6) pairs of crystals.
Complete with Leatherette carry case.
Complete with a dummy battery.

VOLTAGE REQUIREMENTS:
9-6v. DC ± 10% (max. 12v.)
CURRENT CONSUMPTION:
30MA SRX, 200MA RX 500MA TX
BATTERIES REQUIRED:
8 AA Ni Cad or 7 Dry cells

TX POWER OUTPUT:
1 Watt or more
Deviation:
Up to ±5 kHz
SPURIOUS RADIATION:
-60dB or better

RX SENSITIVITY:
0.3 uV for 20dB quieting
SELECTIVITY:
11 kHz at -6dB
AUDIO OUTPUT:
500mW at ±10% T.H.D.

KP202, MS2, MR2, MR3 (U & V) also on the stand

SSB, FM, CW, AM OR FSK FROM TOP TO TWENTY-THREE FROM SOUTH MIDLANDS COMMUNICATIONS LIMITED

++ SSB, FM, CW, AM OR FSK FROM TOP TO TWENTY-THREE FROM SOUTH MIDLANDS COMMUNICATIONS LIMITED ++
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BUG KEYS
COAX SWITCHES
QUARTZ CRYSTALS
MORSE KEYS
POWER METERS
ROTARY BEARINGS
ANTENNA TUNERS
VHF WATTMETERS
MOBILE WATTMETERS
CRYSTAL FILTERS
VHF PREAMPS
COAX SWITCHES
COAX RELAYS
VHF PREAMS
BOOM MICS
POWER SUPPLIES
ANTENNA TUNERS
SWR METER

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Dentron
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Electronic Developments

Failing this, send a large SAE for Yaesu Catalogue, 22 page stock list, etc.

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radiated, when the VFO should be unplugged and the mixer used as a straight amplifier.

9. Monitoring for Tuning. It will be necessary to have a diode RF voltmeter to indicate RF peaking to the grid of the 5763 driver, as the 829B grids are separately tuned; the latter will be monitored on the normal grid current meter. Class-C operation requires 12 mA grid current and 45 volts of bias, and Class-B requires 18 volts of bias and grid current adjusted to give rated anode current. The grid current meter can be 0 to 20 mA and the anode current meter 0 to 300 mA. The initial drive meter needs no calibration as it is simply a peak indicator for tuning. The meters will need screening, as otherwise they make a large gap in the protection against radiation of harmonics and possibly TVI direct from the transmitter, thus bypassing the filtering in the output circuit and lead.

Rather than extend the meters and their screens back through the panel it will be very convenient to mount them in a small die-cast box and to screw that box onto the front panel, so grouping the meters and screening them very successfully. A fortunate advertisement in Short Wave Magazine offered 200 micro-amp edgewise meters at 90p each, and these turned out to be of German origin fitted with dB scales which dropped into slots in the plastic frame. The scales were easily removed and replaced by hand-written ones on slips of cartridge paper and stuck into place. The necessary shunts for the grid and anode meters were wound in Eureka wire on carbon resistors of much higher value, and set by trial and error with a battery, variable resistor, and universal meter. These meters were one of the few purchases made specially for the transmitter in the photographs, and they were well suited and very cheap at £2.70 for the three!

10. Bias Supply. A small 6 to 20 volts 50 Hz transformer came to light in the survey. This is a typical example of adapting design to what is available, and certainly there would have been no point in having such a thing specially made for this job. There are many ways of producing the bias voltages, but it so happened that the 6 volts AC was in the transmitter for the heaters, and the 20 volts AC fed into a voltage doubler consisting of two OA202 diodes and two 15 mF 63 volt electrolytics; this produced just the 45 volts needed for Class-C operation, and when loaded with a resistor and 18 volt Zener also produced the Class-B bias, and two resistors in a voltage divider circuit produced the 7.5 volts bias for Class-A operation of the 5763. It was a gift from the junk box! However, such gifts can lead to later sorrow if the rare and unexpected component becomes faulty and the design of the home-brew device has been centred on it, so that replacement is essential and probably very expensive as a special one-off to order job. It is often better to leave one's options open and stick to readily obtainable stuff, but in this case rewinding a small transformer with low voltage primary and secondary winding in fairly thick wire by hand is quite practicable, and the beauty of iron-cored transformers is that the cores never catch fire, so they can always be rewound!

11. Chassis and other Metal Work. The remains of an old Government surplus power supply unit yielded an alloy panel ½ in. thick and measuring 19 x 14 inches, and it was possible to cut a relatively hole-less panel measuring 16 x 5½ inches from it for the transmitter front panel. This factor clinched the choice of the 829B as PA valve as it was just the right height, and suggested the use of two die-cast boxes each measuring 6½ x 4½ x 2 inches, which were already in stock, to serve as very robust chassis for the two modules: one housing the low power stage up to and including the 5763 valve, and the other housing the PA valve and its circuitry (except that the tank coils assembly and rotary selector switch were mounted directly to the front panel at the side of the PA module).

A second small die-cast box was screwed to the rear panel behind the tank coils assembly, and the power supply cable entry made into the transmitter behind that box, in which each lead was decoupled by suitable capacitors before the supply leads enter the body of the transmitter. Some 18 s.w.g. aluminium panels were bought quite cheaply from radio components specialists to form sides, back and top and bottom panels; these were cut to size and half-inch flanges bent along their edges as necessary to allow them to be screwed together to form the outer screening box with the front panel. Strips of ½ in. aluminium angle ¾ in. thick were screwed
along the rear top and bottom of the front panel to provide the flanges to which the top and bottom panels could be screwed (the aluminium angle was found in a model shop and one would not wish to buy much of it at the price!).

Self-tapping screws Size 4 were used throughout on the outer screening, and another piece of 18 s.w.g. aluminium was fitted to serve as a screen between the two modules. Air circulation about the 5763 and 829B valves was arranged by cutting holes directly above and below the valves in the top and bottom panels, and covering them with perforated metal sheet rivetted to the panels and firmly clamped around the perimeters to ensure complete electrical bonding to earth.

All these details had to be thought out during the survey to get the size and positioning of components, etc., just right and to make use wherever possible of materials already available. The reader may well assume that no piece of metal, however small, is ever thrown away at G8WV!

12. Painting. It is so easy these days to buy an Aerosol paint spray at a garage, and the metallic finishes are excellent for amateur radio equipment. Before painting make sure all the necessary drilling is done, assemble the metal work as far as possible, clean off grease and dirt, and then spray evenly. Once sprayed it should be left to harden for at least twenty-four hours before handling. Use of undercoat, etc., is advised on clean metal, but if the metal has been cut from existing equipment and has been commercially finished there is not much point in priming it.

14. Labels. The XYL's Dymo machine used to label the 'specials' in her greenhouse will also produce most of the stick-on labels for the front panel, though it will not do labelling that needs setting on an arc to denote rotary switch position functions. These latter can be done on coloured card with mapping pen and Indian ink, and stuck to the panel with impact adhesive.

That concludes the survey. Whilst most technologists will accept the fact that the choice of final amplifier for an amateur 150 watt transmitter still lies with valves rather than semi-conductors, there are sure to be some eyebrows raised at the low-level stages of the transmitter being valved in this article. Consideration was given to hybrid design, and in fact the crystal oscillator was initially made with a transistor followed by an FET untuned amplifier. It worked all right, but needed its own 12 volts supply which was obtained from a voltage doubler rectification circuit working from the 6 volts heater supply, but any accidental earthing of either side of the heater wiring immediately burned up some of the doubler diodes. Agreed, it was the method of providing the 12 volts which was the trouble, but any alternative method would require an isolating transformer. Looking into this problem, it was noted that the biggest thing about the oscillator circuit was the switch wafer selecting the crystals, and this would be the same for valve or transistor circuitry. Supplies for a valve existed in the module and there was plenty of room, so a twin triode was the obvious answer. There was simply no merit in using semi-conductors in the circumstances so they were replaced by the valve.

Fig. 5. Top view of the modules and tank assembly.
Fig. 6. The transmitter from underneath, with bottom plate removed.

Had the remainder of the low power module been transistorised the argument above would have been reversed, but use of a transistor driver to the PA had been considered and rejected for a number of reasons. First it would have required a 'high power' transistor to serve as driver (which would have run pretty hot and dissipated its heat into the chassis), and the output impedance would be very low and a considerable transformation upwards would be needed to satisfy the grid drive voltage needs of the PA valve. The 829B input capacitance of 29 pF shunted across a fairly high transformer untuned secondary impedance (remembering that the impedance ratio is the square of the voltage ratio in a transformer) would cause a falling-off of the drive voltage as frequency was increased. This could be prevented by tuning the secondary so that the valve input capacitance is lumped into the tuning capacitance, but this would immediately introduce neutralising problems for the driver transistor as its input would also be tuned.

Secondly, the low gain of RF amplifying high-power transistors (5 dB minimum in case of BLY84) would necessitate more than one amplifying stage inserted between mixer output and driver input; the couplings between them would need to be tuned because of the multiplicity of signals at the mixer output arising from sum and difference mixes from fundamentals and harmonics of the frequency sources, and the high harmonic content present in the outputs of transistor big-signal RF amplifiers. Tuning of the couplings would involve tapping or double winding of coils and so additional switching requirements, and also neutralising of each amplifier stage. Controlling the gain of the amplifier to provide correct drive for the 829B whilst retaining linearity for SSB at all levels could also give trouble.

The case for valves with their high impedances directly suited to the tuned circuits, internal screens between input and output circuits, high gain compared with RF power transistors in practical applications, and no real worry about heat generation, given air circulation, seemed overwhelming in the context of 'shack' manufacture. It is conceded that hybrid construction using a solid state module to drive a valve module may have merit for commercial products because of the suitability of solid state devices for mass production techniques, but the high degree of design and production development work required for such purposes is quite inappropriate to one-off model-shop productions, which is really what home-brew amounts to.

There is more to be written concerning such matters as marking-out and bending sheet metal, the making of holes both large and small, the relationships of holes and screws and taps, and the horrible fact that there has emerged a metritocracy that would discredit the inch and the vulgar fraction and make obsolete such life-long friends as our micrometer, steel rule, and the ARRL formula for the length of a half-wave dipole! Tracking of ganged circuits, the delicate and maddening art of neutralising tetrodes, and the insidious infiltration of parasitic oscillations have all played their parts and will be offered for your consideration.

_to be continued_
MULTI-MODE WITH THE
NR-56 FM MONITOR RECEIVER
L. G. RIX, B.Sc., G3XJW

AFTER some years of inactivity the writer decided to
investigate the possibilities of 2m. mobile operation,
and to assess the situation the NR-56 monitor receiver
was installed in the car. Before long, though, it was
smuggled back indoors and the idea of using it to resolve
SSB transmissions emerged.

The 455 kHz second IF lends itself to a simple BFO
incorporation, but the integral FM limiter and discrimina-
tor are not optimised for side-band! Obviously some
modification was required but the thought of butchering
new, tidy equipment was enough to provoke a search for
another option.

The result was the scheme described,
which is in the nature of an add-on unit, with connections
to the power feeds and transposition of audio leads (the
only changes to the basic equipment). Nonetheless, the
unit is totally contained in the receiver case and the
outboard mode-switch could be obviated by swapping
the normally open relay connections to the normally
closed ones and replacing the squelch pot (10K LIN)
with a component including an on-off switch which
breaks the relay supply line when fully counter-clockwise.
The squelch action, although audio-derived, is of little
use on SSB anyway.

Fig. 1 shows the circuit of the converter which is
completely straightforward. The Ferranti ZN414 micro-
radio IC is used as IF amplifier, demodulator and audio
drive to convert a 455 kHz SSB signal to AF applied to
the NR-56 volume control; the BFO circuit is standard,
and this stage and the ‘receiver’ both used IF trans-
formers from a junk-box portable as their tuned circuits.
The potential 72 dB gain of the ZN414 depends on the
exact supply voltage applied, and the input signal con-
trols the supply current—thus through load resistor R7
there is an AGC system. The BFO signal constitutes
part of the input signal and by adjusting the degree of
injection and the signal pick-up from the NR-56 IF
strip, optimum results may be obtained on an SSB
signal and the resulting audio signal maximised.

The construction of the unit is on the copper side of
a piece of printed circuit laminate nominally 50mm. x
25mm., cut to fit in the available space against the
channel oscillator socket in the NR-56.

The IF transformers are attached to the board by
spot-soldering their cans flat to the board, one at each
end, so that with the board vertically fitted the adjusting
slugs are accessible through the hatch in the NR-56
base panel. Most of the components are soldered direct
to the IFT pins or to the decoupling capacitors, which
may be soldered flat to the board and serve as stand-off
mounts. Supply and coupling components may be
mounted with their leads through holes in the board,
the copper lamina cleared with a Vero spot-face cutter
or small drill; all leads must be kept short to prevent

Table of Values

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
<th>Remarks</th>
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<tbody>
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<td></td>
</tr>
<tr>
<td>R2</td>
<td>5K</td>
<td></td>
</tr>
<tr>
<td>R3</td>
<td>1K</td>
<td></td>
</tr>
<tr>
<td>R4</td>
<td>1K</td>
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<tr>
<td>R5</td>
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<td>R6</td>
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<td>R7</td>
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<td>R8</td>
<td>220 ohm</td>
<td></td>
</tr>
<tr>
<td>R9</td>
<td>22K</td>
<td></td>
</tr>
<tr>
<td>R10</td>
<td>560 ohm</td>
<td>(all 1 w. 10%)</td>
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<tr>
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</tr>
<tr>
<td>C5</td>
<td>25 µF 25v.</td>
<td>electrolytic</td>
</tr>
<tr>
<td>C6</td>
<td>0.1 µF, polyester</td>
<td>Zener 8.2v.</td>
</tr>
<tr>
<td>C7</td>
<td>1 µF 3v., tantalum</td>
<td></td>
</tr>
<tr>
<td>C8</td>
<td>10 µF 6v., tantalum</td>
<td></td>
</tr>
<tr>
<td>C9</td>
<td>25 µF 25v., electrolytic</td>
<td></td>
</tr>
<tr>
<td>TR1</td>
<td>PBC108</td>
<td></td>
</tr>
<tr>
<td>IC1</td>
<td>Ferranti ZN414</td>
<td></td>
</tr>
<tr>
<td>D1, D2</td>
<td>General purpose</td>
<td></td>
</tr>
<tr>
<td>RLA</td>
<td>2-pole changeover, 12v. operation</td>
<td></td>
</tr>
<tr>
<td>S1</td>
<td>on/off switch, single-pole</td>
<td>Copper laminate, screened lead, Blu-Tack, etc</td>
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</table>

FIG. 1 CIRCUIT DIAGRAM OF ADD-ON I.F. UNIT
instability particularly around the ZN414.

Wire spills (surplus resistor leads) are soldered to the top corners of the board and spiralled around the screened lead audio output and the supply leads for support purposes. The control relay is attached with impact adhesive to the back of the front panel in the large space provided.

To gain access to the innards of the receiver the cadmium-plated underside panel is detached by removing the four black screws (two each side) and one cadmium plate close to the front panel: the base panel is now carefully levered clear and the speaker-lead clips may be detached from the board. To remove the p.c. board and front panel from the remaining casing the two bright screws at the rear of the board are removed, plus the pairs of black screws into the panel and one on the topside of the case. The aerial connector and power leads should be carefully unsoldered. A twisted pair of red/black connecting wires may now be attached to the board, and the grey screened lead from the volume control disconnected as shown. A suitable extension length of screened wire is attached to the audio IC and both screened leads and the power supply wiring led to topside of the board. See Fig. 2. The board and casing are now reassembled and reconnected: with the screened leads connected, function should be as normal.

The power supply and audio leads may now be connected to the relay as necessary and the audio switching of the relay checked; the completed amplifier/BFO board may be checked for short circuits etc. and then mounted as shown using impact adhesive or Blu-Tack. The supply leads and audio output lead should be connected to the relay, and a suitable switch on flying-leads may be used to check the relay function and the switching of supply to the add-on unit.

To set up the SSB function assuming no DC faults have arisen, the receiver is switched on and the relay activated when the white noise from the loudspeaker will reduce in volume; the squelch control should be backed-off to non-function position.

The 'aerial' lead from the ZN414 input coil is now tucked into the NR-56 IF, as depicted, to pick up 455 kHz signal and the input coil is peaked for maximum noise from the loudspeaker; stray BFO injection may 'flatten' the ZN414 characteristic and so whilst setting up the amplifier tuning, the beat oscillator should be well off-tuned. The oscillator is now tuned-in when noise will reduce, since the BFO tends to operate the AGC of the ZN414; the stray capacity coupling may be adjusted by length and positioning of the pick-up wire. Optimum setting is determined by listening to an off-air signal or the main-station Tx running into a dummy load (the minimum junction consistent with demodulation is the setting to aim for). Wax may be used to seal the coil cores and wire locations.

The writer found that the BFO tuning range was inadequate since the IFT integral capacitor when in parallel with transistor capacitance shifted the resonant frequency too far LF. This problem was remedied by carefully cutting away the screening can-top to permit the core to be further unscrewed.

The final work is to mount the mode-change switch on a suitable bracket located with the panel side-screws.

In use the modified receiver works quite well, with the slight oscillator pulling when in VFO mode being tolerable. For a small cost the basic receiver has been made multi-mode to enhance its usefulness as a standby; and, of course, in use with the main rig it permits monitoring of all operational modes as required by the Licence!
THE MONTH WITH THE CLUBS

BY ‘Club Secretary’

Perhaps our first task is to mention with sorrow the early death of G3VAD, Robin Sinclair, as a result of a mishap on the road to work from his home in Hatfield Heath, not far from Bishops Stortford. Robin was never a chap to shirk his part, and had served the Harlow club as Hon. Sec.; and like all intelligent men he had several interests, in all of which he served by putting more in than he could expect to take out. His daily lot was in the field of Education, and there he dispensed not only the set syllabus, but led his students into the beginnings of his own wisdom—something so much more important than mere knowledge.

Help!

We have a letter from Mr. R. D. McClelland, of 257 Causeway Road, Currieseskin, Bush Mills, Co. Antrim, N. Ireland, who wishes to get in touch with any clubs within striking distance of his home. Would the Hon. Secs. of any clubs meeting this requirement please get in touch with reader McClelland at the address above.

The Mails

Here we must note that the recent delays in the postal system resulted in a few clubs being missed from the piece last month, as they came to hand after the copy had gone off for setting. These appear this time.

Westerly

There has been a club at Rhyl for long enough, but it has had, perhaps, more share of the ups and downs of life than one can consider reasonable; but we hear that they are now booked on the fourth Thursday at the Ambulance Rooms, Rhyl Fire Station, Coast Road, Rhyl; and on the other Thursdays there is a local net on 145 MHz. For October 26 there is to be a demonstration of Slow Scan TV. Let us hope they are on the way back up, and can attract all the missing faces and more back into the fold.

Now we turn to Cornish who are at the SWEB Clubroom, Pool, Camborne on the first Thursday in each month. It is interesting to notice that they can show, for the July meeting, an attendance of fifty-five members. That is a fine measure of the amount of organising ability they can call on, and it also means that they have something set up for every meeting—the next one being October 5.

Back over to the Emerald Isle again now, to IRTS Region 1, who have a concentration of Dublincs in their committee and hence a club Hq. in Dublin—not to mention a very good newsletter which notes the activity in all parts of the country. For more details, contact the Hon. Sec.—see Panel.

Hereford seem to have come a long way since the time when they were doubting their ability to survive unless attendances improved; they now have quite a gathering on the first and third Friday in every month at the Civil Defence headquarters in Gaol Street; by the time this reaches you they hope that the modifications to the building which have been going on for a while now will be completed so that they can have a good clean up of their rooms. For more details of their doings, contact the Hon. Sec. at the address in the Panel.

Scotland, North and Midlands

All lumped together this month, and the top of the pile is the letter from Northern Heights where they have just elected G3MDW as their third Hon. Life Member as a gesture of thanks for all the years he served them as Secretary/Treasurer. A well-deserved honour indeed. We also note that the EGM which bestowed this honour on Arthur also agreed that a change of Hq. was in order, and so they are now booked in on the second and fourth Tuesday of every month at the Bradford Sub-Aqua Club Hq., Mountain, near Queensbury—this gives us dates of October 10 and 24.

Another move of Hq. in the same area is being done by White Rose, who have well and truly outgrown their old Hq. at 83 Armley Town Street, and so have had to find a bigger home, preferably with as many of the features of the old place as they could manage. Thus, they have come to an arrangement with the Moortown Rugby club, Far Moss, off The Avenue, Allwoodly, Leeds 17, whereby they use the ballroom for general meetings, and have a bit of land for a club shack and workshop, where they can settle in with a bit of breathing space—find them there any Wednesday evening.

We turn now to Midland, who have their main meeting (on October 17) as the AGM, in Room 110 at the University of Aston, Gosta Green, Birmingham. They also have a date on October 3 at the Brasshouse Centre (on October 17) as the AGM, in Room 110 at the University of Aston, Gosta Green, Birmingham. They also have a date on October 3 at the Brasshouse Centre in Broad Street, which is an informal with a station on the air or whatever.

Deadlines for “Clubs” for the next three months—
(For November issue—September 29th)
For December issue—October 27th
For January issue—November 24th
For February issue—December 29th
Please be sure to note these dates!

The South Birmingham news comes in by way of the same envelope that contained the Midland letter—a good way of saving postage indeed. South Birmingham are open for business on the first Wednesday in each month, but in addition every Thursday evening there is an HF night in the club shack, and every Friday evening they are open from 7.30, for a natter or a call-in over the air. The address where all this happens is Hampstead House, Fairfax Road, West Heath.

Macclesfield is a well-organised and thriving outfit to judge by their Newsletter—but the snag is that they do not mention the Hq. address, so we must point you in the direction of the Hon. Sec.; his name and address appear in the Address Panel.

Over at Coventry the scribe sent us the dates for September, plus the vital bit that they are at Baden-Powell House, 121 St. Nicholas’ Street, Radford every Friday evening; the general arrangement is to have every other date operating the club station, and fill in with talks, films, demonstrations and so forth.
Reading the interesting story of 32 NFD sessions by G3WIO, who served all those years as one of the galley staff, your scribe was amused to note she ended by asking someone to explain just why Wirral have never repaid all their cookery by winning—a very fair question, and we hope she gets a reasoned answer! Perhaps it will be a matter of G3WIO deserting the galley and getting out on to the operating side of things to ginger them up! Meet the gang at the Sports Centre, Grange Road West, Birkenhead, on the first and third Wednesdays in each month.

Avoncraft Art Centre is the Hq. of Bromsgrove, for a talk on October 13 by G8ASO, his theme being that of RTTY. In addition they will be occupied on the October 21/22 weekend with Jamboree-on-the-Air from one of the local Scout groups.

October for Derby is a matter of the normal weekly Wednesday-evening sessions at 119 Green Lane; October 4 and 18th for Night-on-the-Air sessions, October 11 for a natter night, and October 25 for a talk by G3RJV of the G-QRP Club on Lower Power Transmitters.

At Stourbridge the formal sessions are at Longlands School, Brook Street; October 2 for Construction, and 16th for the formal meeting. In addition we understand they have an informal on the first Tuesday of each month at the Bird in Hand, Oldswinford.

October 17 is the date set aside in the Solihull calendar for the AGM, to which all are asked to turn up. The venue, as ever, is the Manor House, High Street, Solihull, and the routine to meet on the third Tuesday each month.

Finally, we must note the formation of a new club in the Leicester area, known as the Wigston radio club, with the name and address of the Hon. Sec. in the Panel. Sad to say, no information on the Hq. or the plan of meetings was included—just that the Hon. Sec. would be pleased to hear from anyone, SWL or licensed, who cares to call, write or phone.

**Nationals**

Here our first one is the Royal Signals group, and they have a very fine Newsletter called "Mercury." This issue was of personal interest in that is indicated where an old friend of some 20 years had moved to, and also some new aspects of the beacon principle, suggesting that one W. Shakespeare was the first officer to give an account of the use of beacons in a play called Macbeth. We live and learn! Seriously, though, a most interesting newsletter, and well worth a subscription to qualified people, these being in the main past and present members of the Corps, plus a few Associate members at the discretion of the committee.

Next we note the Royal Navy; apart from the parent group there is a sub-section at HMS Daedalus, in the Portsmouth area, and another based on HMS Belfast where she lies opposite the Tower of London on the Thames. We hear from the latter a little shout of joy that they have been issued with the callsign GB2RN for the station they have set up aboard.

R.A.I.B.C. come next, and we hear that there is a new Hon. Sec., namely Mrs. F. Woolley, 9 Rannoch Court, Adelaide Road, Surbiton KT6 4TE. We would think that just about everyone in our hobby knows that RAIBC is the group who look after the interests of the invalid and blind members of our hobby; indeed it is not unusual for blind and invalid folk to be introduced to this open window on the world, and then helped with the rig and aerials and, most importantly, the R.A.E. and Morse. Full members we have mentioned, but...
the other two grades are of Supporter and Representative, both drawn from the ranks of the active.

Last on this list we have the G-QRP Club, and here the big news is that the decision of the committee is to award the G2NJ Trophy to G3RJV, who has been the "sparkplug" of the operation right from the beginning until now when the club has several hundred members, all interested in low power working. Oddly enough, if you look in the Address Panel, your eye will be pointed at G3RJV, who is still the Hon. Sec.

Southern

Top of the bill is Southgate, who can be found on the second Thursday of each month at the Scout Hut, Wilson Street, Winchmore Hill, at 7.45. For the October session, they are looking forward to a talk on Oscilloscopes by Tektronix, and the Publicity Officer in his letter makes a point of the welcome they give a visitor, which we can agree with from personal experience.

They have two Hq. places at Sutton & Cheam; one at Sutton College of Liberal Arts, and the other at Ray's Social Club, London Road, North Cheam. Looking at the table in the Newsletter where it is all nicely set out, we see October 11 at Ray's and October 20 at Sutton College, the latter being a change from a Wednesday to a Friday. We understand the programme details are all being settled as this is written.

British Aerospace Dynamics "B" is the new name of the Hq. of the Stevenage gang, which until very recently was Hawker Siddeley Dynamics and before that bore the name of De Havilland (and time your scribe recalls the horror of the staff at the proposal to drop the famous De Havilland name). They are booked in to the Staff Canteen on the first and third Thursdays of each month: this month, October 5 is down for a talk on the GB3PT RTTY repeater, October 11 is a special Wednesday evening session to hear G3LTF give his famous Moonbounce talk, and on 19th there is a Junk Sale.

At Cheshunt they meet every Wednesday at the Church Room, Church Lane, Wormley, Herts.; October 4 and 18 are the natter sessions, with a talk on Signals and Noise by G4DCP on October 11; and on 25th, G3OJII will give a résumé of progress on 10 GHz—we don't know whether that refers to his own progress or to the progress of gear for the band.

Pressing on we come to Crystal Palace, who foregather on October 21 at Emmanuel Church Hall, Barry Road, London S.E.22. At the time of writing, they were still in the process of negotiating their October entertainment, but they will no doubt have something set up in good time. It is nice to hear that the group have a satisfactory inflow of new members to maintain a good attendance; it is the first sign of malaise when new members "don't stick" and conversely a good sign when they do!

The Chichester group have the first Tuesday and the third Thursday every month, the venue being the Lancastrian Wing of Chichester High School for Boys, Basin Road, Chichester—this works out to October 3 and October 19. For more details, contact the Hon. Sec. at the address in the Panel.

Sad to say we have to report that the editor of the Cray Valley Newsletter had a minor stroke while he was still in the process of making up the sheets, so the frontpage is written by one who signs himself Tovarisch Standinski, no less; we wonder about his callsign—is it possibly MOIFFI? The main meeting at Christchurch Centre, High Street, Eltham is on October 5, when G8AYN will be talking about the Post Office microwave radio network; and the natter evening will be on October 19.

Last time we got news of the late change of programme at Southdown just too late to correct the copy; but we have it that October 2 is down for a Junk Sale, at Chaseley Home, South Cliff, Eastbourne.

Now we turn to Surrey where they have a place at T.S. Terra Nova, 34 The Waldrons, South Croydon, and will be found there on the first and third Wednesdays of each month.

On to Silverthorn, who have a place at Friday Hill House, Simmons Lane, Chingford where they can be found every Friday evening. However, we have to admit that it is very noticeable that most of the Newsletter is the work of one hand, and that hand a somewhat disgruntled one—he would doubtless be much happier if someone gave him some material to publish!

Crawley have a date on October 25, at the United Reformed Church Hall, Ifield, Crawley, for G4BLJ of the Post Office, Brighton, to talk about Interference. There is also an informal, dated for October 11, but as this is at the home of one of the members, we feel it would be polite to contact the Hon. Sec. before making plans; he is to be found in the Address Panel.

Although we have the Reigate Newsletter in front of us as we write, we cannot find any details of the October meetings; however we can say there is one at the Constitutional Centre, and another at the Marquis of Granby; for the rest we have to ask you to contact the Hon. Sec.—see Panel.

Now to UK FM Group (London) who get together at the Grove Park Hotel, Chiswick, W.3 at the junction of Spencer Road and Bolton Road. We have, on occasion, felt that we didn't quite agree with their published authors, though they do put out a very fine Newsletter, with, particularly, very good print—a pleasure to read after dozens of the other sort! This month, the best bit by far is the contribution by Pat Spenceley, G8LZA, who describes how she came to be the driver of an Addressograph machine (the UK FM Group one, of course) and what it does and doesn't do, not to mention how the plates wander all round the group before reaching her—quite hilarious. In addition there was a well thought-out editorial (even though we don't agree with it!) and some very useful technical material.

For anything radio you may want to buy, sell or exchange use the Readers' Small Advertisement section in "Short Wave Magazine"—see pp. 322-326
**FROM STORNOWAY ON FORTY METRES**

VINCENT EVANS, G4AVT

A **TWO-WEEK** caravanning holiday on The Isle of Lewis was planned for June this year, with the FT-101 to be included in the luggage. Time for transmitting would be limited to fit in with daily touring out of Stornoway and general holiday activities and it was decided that for static mobile working from the car was the answer.

The 40m. band seemed to be in good shape for G/GM working, so thoughts turned to a suitable antenna for this band, to meet the requirements of the expedition. It would be a loaded vertical of course, but as static mobile was intended it could be larger and therefore presumably more efficient than smaller mobile types. It would have to be quick and easy to erect and dismantle, and compact for stowage.

The best place for a car aerial is on the car roof, with all the metal beneath it: however not everyone wants to mutilate the car roof to fit a base mount. One solution is to make use of the roof rack, and here the constructor is called upon for a degree of ingenuity as there are many different patterns and shapes of rack. Whatever arrangement is made there should be a good DC path from the earth side of the aerial mount (and the outer shell of the co-ax socket) through the roof rack to the car body. Next comes the rubber insulation (the tyres) between this

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**VERULAM** have their main meeting on the fourth Thursday of each month at the Market Hall St. Albans; this gives October 26 for a talk on Vintage Wireless. As for the informals they revert to the R.A.F.A. Hq. in Victoria Street for the winter months. Visitors are welcome to the meetings, but we suggest you contact the Hon. Sec. if you aren’t too familiar with the locality, and he will give you directions for getting there—it’s easy when you know how!

**AMSAT-UK** comes up again as a subject, this time at Acton, Brentford & Chiswick, where G3AAJ will be doing the honours, and doubtless mentioning the group of which he is Hon. Sec. The venue is the usual one of Chiswick Trades and Social Club, 66 High Road, Chiswick, on October 17th.

**Finale**

That’s about the lot for this month. Deadlines are shown in the “box” in the piece, for the next few months. The address is, as ever, “Club Secretary,” SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ.

**Late Ones**

Not, we hasten to add, because they missed the deadline to arrive at Welwyn, but because they were in a packet of mail which was delayed between Welwyn and your conductor.

A.R.M.S. caters for all the mobileers, whether VHF or HF, with, if anything a slight bias in favour of VHF; but items of interest all appear in Mobile News. For details—G3FPK, QTHR.
mass of steel and the good earth; it is a good idea, but not vital, to have a heavy gauge wire from an available fixing point on the car body (bare metal contact, of course) to a short earth rod driven into the ground. This may be practical in the countryside, but a pneumatic drill job in the High Street is not advocated!

The author's solution to the roof rack aerial mount is shown in Fig. 1. The piece of timber should be dry hardwood (oak or mahogany, etc.) and when finished and drilled several coats of exterior varnish applied; the hole drilled to take the lower tube of the aerial should be a good fit, but not so tight as to make insertion and removal difficult. The bracket for the co-ax socket is mounted on a paxolin or perspex pad to break up any moisture film resulting from a damp atmosphere; an independent earth wire is taken from the co-ax bracket to a Jubilee clip on the roof rack (good bare metal contact is required here) and from there to a suitable metal screw or bolt on the car body. This wire should be 5ft. 6in. long and can be conveniently taken through the door jamb to a screw of the interior trim (any other length may affect the tuning and telescopic adjustment).

The coil former is a 7\(\frac{1}{2}\)in. length of electricians white plastic conduit tube of 25mm. outside diameter. The two collars which fit inside each end of the tube were moulded using Holts Cataloy resin and hardener, and it will be seen from Fig. 2 that each collar takes a 5 inch length of 1\(\frac{1}{2}\)in. outside diameter aluminium tube (from old TV aerial) to which the ends of the coil are attached.
This method of construction was adopted so that other coils for, say, 80m. and 160m. could at some future date be similarly made, and easily substituted using the one set of top and bottom aerial tubes. One of the 5 inch lengths requires four saw cuts in one end, each cut ½in. long; over this end fits a Jubilee clip of suitable size, to clamp the upper aerial tube.

The mould for the collar into which the resin mixture is poured is shown in Fig. 3. A piece of wood about ½in. thick is recessed to a depth of ¼in. to accept, with close fit, a 1½in. length of the plastic conduit tube. The wood is further drilled to receive the 5 inch length of aluminium tube. The metal tube is pushed through until it is level with the top of the plastic tube, and then resin mixture is poured into the gap between the two tubes until nearly level, and left to harden. The wooden mould and tubes should be treated with release agent before assembly to enable separation when ready (the author used Vaseline as a release agent but the wooden mould had to be carefully split to release its contents, no doubt due to the unpolished surfaces of the drillings). Place the finished collars flush in the ends of the coil former, and drill clearance holes for the metal screws which connect the coil ends to the aluminium tubes: the coil can now be wound on. Clean one inch of the coil wire free of enamel and make an eye; anchor the eye under one of the metal screws and tape the wire to the former ½in. from the end. Wind on 85 turns close wound and tape again. Leave enough wire to reach the screw and extra to make an eye before cutting off.

The bottom aerial tube is a 4ft. 6in. length of aluminium tube, ⅜in. outside diameter; a hole to receive an 8BA bolt is drilled 3in. from one end, for attaching the wire from the coax socket (centre). The other end is sawn with four cuts, each ¼in. long and a Jubilee clip fitted over; this receives the lower coil tube. The upper aerial tube is two feet long and ⅜in. outside diameter and fits comfortably four inches into the coil's top tube, which is already prepared with a Jubilee clip. A surplus telescopic antenna, which extended three feet maximum, was inserted into the top of the aerial and fixed with a metal screw and slight crimping.

The weather shield is an 8½in. length of grey plastic rainwater pipe measuring 1⅛in. inside diameter. Two collars are made ⅜in. thick, to fit inside the ends, and have ½in. dia. centre holes. A wood mould is made on the same principle as the previous one. In this case the recess is made to receive a ½in. deep ring of the water pipe, and further drilled to receive a short length of the ¾in. tube. When finished the collars are placed flush in the ends of the weather shield and drilled for metal fixing screws; the complete coil is shown in Fig. 4.

The aerial can now be finally assembled (Fig. 5) and the telescopic part extended so that the distance from its tip to the top of the weather shield is 42 inches. Tuning is fairly critical and must be done with the aerial 'in situ,' i.e. in its roof rack mounting and on top of the car. A GDO is most useful in these circumstances but the job can be done using a reliable SWR meter and the transceiver. Tune at the middle of the band and raise or lower the telescopic portion one inch at a time for best SWR. The final result should be less than 1.5 to 1 on any part of the band. Make sure by listening that no QSO is taking place at the frequency you use.

The aerial fulfilled its intended purpose and came up to the best of expectations: daily QSO's took place with West Lancashire (the home QTH area), including G4ATM and G4BDM. Other QSO's at good strength were established with G3BLE and G4FCC in Northumberland, G3IES Bristol, G13GRD Enniskillen and numerous continentals.
LAST month, some of the mail destined to be the "building bricks" from which this piece is put together arrived too late to be used owing to the chaos in the postal service at the time. Apologies to those who were left out.

When the sunspot smoothed average (12-month) hit the bottom back in March and June 1976 it was down to 12; the ninety-day running average backwards from August 13, 1978, was showing 135, and the twelve-monthly mean bouncing near the 100 mark—so clearly there is one mighty big change in the scene since the 1976 doldrums. But as usual, "good conditions" in the mind are equated against yesterday or last week, or last month at the most. Thus, we still talk of the summer doldrums even though these periods are much better than the Spring-Autumn peaks of the 1976 activities. This has caused more DX-peditioning, more looking at the possibilities of "new countries" and a rush of blood to the DXCC Desk at ARRL, which reduced the practical maximum score for a new starter in the DX game even further below the "possible" for an amateur who started his post-war DX-ing back in 1945.

All the signs are that by the time you come to read this, the Mellish Reef will be removed from the wanted list of many DX-ers, this one QSL-ing to VK2BJL, Box 85, Round Corner, New South Wales, 2158, Australia. H44JB runs the boat, and the team at the time of writing includes VK2BJL, VK2CK, JA1KSO, and WA8NOA.

As for the 8Z4 Neutral Zone operation, it is reported that the operation by Prince Abdullah and Sheik Ahmed was all-SSB despite the fact that there is considerable evidence of a Phoney CW version.

Southern Sudan operation seems to have been fairly heavy of late, with ST0RK back in business after leave in Germany, K5YY is reported as all but there, and LA6IV is reported to be signing /ST0.

YI1BDG operation continues at a steady level, although it is understood that the FT-560 shipped to them was turned down by the authorities. A close friend of your scribe says that he wants to take a communications receiver to Iraq that doesn't look anything like a communications receiver so that he can have at least a listen-round while he resides in a country where no licences are granted to expatriates; the appearance is required to be thus to avoid the risk of its confiscation at the airport. On his last posting, it was the reverse—expatriates allowed licences, locals barred. We seem to recall a cynic who said that the sum total of the world's human effort at any given time is zero—maybe he wasn't far from the truth!

Clipperton QSL's should from now on be sent to HB9MX only, WA91NK having done his share of the chore.

Burma is a country which doesn't look like seeing much Amateur Radio while the present regime continues; however there is an SP who is posted to the Embassy there and is in for a several-year stint; he is equipped and will be looking for an XZ licence. You never can tell, but SP6AUC just may turn the trick.

Another of the "maybe" category ones is BY; some years ago, it will be recalled, we noted that noises from BY were not to be dismissed as instant pirates. That, with hindsight, was a bit of unjustified optimism, but we know of at least one effort which almost came to fruition as instant pirates. That, with hind-sight, was a bit of unjustified optimism, but we know of at least one effort which almost came to fruition and was not blocked on the Chinese side. It seems that the current Chinese government is steering far closer than its predecessor to creating a scientific and technological interest in the population. What better stimulus could there be than a nice big daffy of genuine BY amateurs?

That 4U1UN which has been wandering around the band for some weeks is still garnering interest—the reason is that country status for the UN Secretariat is being mooted.

Now to a less direct point, namely the brewing up of a big signal. We seem to recall mentioning a fair aerial system on 21 MHz by W6KPC. Now we hear he is going to put up something for 14 MHz—twenty-four elements, no less, with a top height of 190 feet. That should test his receiver and its front-end performance out fairly thoroughly, and other people's too!

Silent Key

We hear of the death of James Pershouse, 9M2DQ. An active amateur for as long as this writer can recall, he was also very helpful to those who were less than well-off to enjoy the hobby. He will be missed, not only locally but in many parts of the world to which his helping hand had reached. A very fine man, and our sympathy to his people in their sad loss.

The Bands

Perhaps we should start again with Ten as it has been in rather a sad state of late. We have two letters from G3NOF (Yeovil); the previous month's report and the current one. The earlier one refers to nothing but short-skip and Russians, while the latest one says no contacts were made at all and only Europeans heard.

"CDXN" deadlines for the next three months—

November issue—October 5th
December issue—November 2nd
January issue—November 30th

Please be sure to note these dates.

G2ADZ (Chessington) is an addict of the band, but even he has to admit that it hasn't been brilliant, and of course the dropping of band conditions have led many back to lower bands and higher activity. Thus band openings are probably overlooked, as people used to 14 and 21 MHz have a listen round and then give up. A CQ on an apparently dead 28 MHz band can be surprising in its results! Bill notes JA8PMF/MM off the Brazilian coast and slowly steaming north, a contact with HV3SJ which appeared to be
due to Sporadic-E conditions and so forth mention, DJ7ST/OHO, VK2AHM who gave out a report of RST 419(!), ZS5UW, CE3ZW, YV4AMG, IA5DKM on Elba, assorted LU/PY, UM8, UH8, UA9, CX1DDI, and OE5CA/YK. G2ADZ comments that the band needs a dose of really good conditions and that it will happen for the very simple reason that he is going on holiday!

G4BHE (Basingstoke) is another confirmed ten-metre man, and Barry has a tally of 125 continents on Ten this year. The present month has seen him booking in QSO's with CE3BZD, CX7BF, EL1I, D68AD, FM7BB, FR7ZL, JY9OZ, KZ5USN, OY7ML, VK3NE, VK2NFR, W1-4, ZD7PV, ZE3JO, 5B4EP, 5R8AL, 7P8AH, 8P6JZ, 9J2CB and 9K2FX. Taking the G2ADZ and G4BHE reports together it is pretty clear that all continents have been workable during the month on this band for the operator willing to keep an ear out.

Forty

A much under-rated band; one needs skill to get the best performance out of the receiver on this band, where one is surrounded by megawatts of commercial power aimed by rhombics, while looking for the microvolt signal underneath. But—it can be done, and is being done: G3KMA is on 215 countries on 7 MHz alone, and we suspect GM3JDR is probably at a similar level, to mention two recalled at random.

G2BJY (Walsall) tackled the idea of a valve direct-conversion receiver for 7 MHz, and found it an excellent little tool, albeit one has to watch out for such things as microphony and hum; the line-up is a 6B7W RF amplifier, into a semiconductor balanced mixer, 6AG5 oscillator, and transformer-coupled AF stages to get enough to drive the speaker with only one AF amplifier into an EL84 in the output. The key to its performance lies in the fact that the oscillator injection is adjustable and the mixer balance also. Trials with an EF184 as the RF stage were run, but the line-up originally chosen was preferred in the end. As Geoff says, much fun, and the whole bag-of-tricks out of the junk-box. Performance is reckoned to be as good as a conventional receiver both in SSB and CW terms.

We don't usually carry SWL reports in this piece, they having Justin Cooper to themselves, but we make an exception for SWL Jean-Yves Camus (Chatenay-Malabry, France) who listens with the help of a Grundig Satellit 2000 and telescopic aerial; several hours of listening to 8Z4 and the associated pile-up brought some philosophising on human nature. The deliberate interference was the bit that annoyed most, being present all the time he was listening. All in all, a most interesting and revealing letter, of which more anon.

G2NJ (Peterborough) notes that the migration of the 3-5 MHz CW merchants to 7 MHz seems, despite generally poor conditions, to have continued, so that the QRP lads can get more use of their favourite stamping-ground.

Nice to hear from G3CED/G3VFA; George has only QRP—Joystick aerial, no earth, PM2, PM3A or HW-7 receivers and transmitters at inputs from 300 mW up to a maximum of two watts, mostly from a car or motorbike battery (good point this, lead-acid batteries probably have the best low-impedance characteristics for QRP rigs). CW into this lot resulted in more activity than he has indulged himself in for months, and some of this was on Forty and covered most of Europe. After a long period of operating with QRP all round George reckons that the best bets for DX are firstly, band-edge CQ calls, and secondly to call "QRO DX" in contests. However, he says that while the DX is good for business "gimme the old homely ragchew—that's what amateur radio is really about!"

G8RY (Newmarket) has for a long time used the usual variants on the co-ax fed half-wave eighty-metre dipole, but then went over to an eighty-metre half-wave fed with open-wire feeders and a Johnson Matchbox for all band to 21 MHz. Trying it on each band indicates the losses to be lower, and by putting a chain insulator in each side at 28ft. 8in. from centre, he ended up with a double extended Zepp on 21 MHz, high at the centre and with the ends drooping inverted-vee fashion. This arrangement is good on 14 and 21 MHz, but also will load on 7 MHz and worked into Germany. The orientation is such that on 21 MHz it fires one way to JA and t'other to South America.

G3PPR (Sherborne) writes again; he and the school club put on a station on the end-of-term day, using 80 and 40 on the grounds that a clear QSO with Yeovil is more impressive than indecipherable monkey-chatter from America or wherever. A lecture to the Sherbourne Round Table was also given which should put our hobby on the map in that town. Back at the ranch, an "aerial of sorts' has gone up for 40 and it has been found good for inter-G working in daytimes and good for CW with Germany by the bucketful in the evening; using it on the third harmonic frequency of the aerial is also satisfactory, but we must mention Rod's "don't go much for these VHF bands!"

G2HKU (Sheppey) stuck to his CW and found EA8FJ, AA4BA, N4OW, UF6FDS, YV10B, UB5MC/U6F and EP2IA. Ted passes on the word that ZL3KN has joined the ranks of the Silent Keys—an Old Times in ZL, keen and effective on HF CW and a good exponent of the arts of home-building of equipment, who will be sorely missed.

Top Band

At a low ebb this year, with no reports of Transequatorial activity, and not a lot of activity. However SWL Jean-Yves Camus says that there is a ten-metre group set up by REF for SWL and transmitting enthusiasts, and he is reckoning on trying to whip up enthusiasm enough to form a similar group in France were the level of interest is even lower than in U.K. at present. On the operating side, Jean-Yves reports hearing G3JMJ and G5BM.

Our only other mention this time comes from G2HKU, who used SSB to PA0JNA and PA6PN, plus CW QSO's with GM3HBT, GM3LWS and OH1MA.

Twenty

Is always the backbone of our long-distance communications. Your scribe was a trifle amused to read in a club newsletter that older G8 + 3 chaps are getting alarmed at the number of newcomer G8's who
regard the G8 as merely a stepping-stone to a G4. Has it ever been anything else? Just as in U.S.A. a Conditional or Novice ticket is just a stepping-stone to an Extra Class, so in this country a G8 is but a part step up to a full ‘A’ licence, and anyone who wants to stay with a G8 must accept that he stays a second-class licensee. Whether he wants to use CW or to operate on 14 MHz is quite irrelevant; since most youngsters today get enough in school physics to give them an R.A.E. pass, it just boils down to a Morse pass being the only thing you can’t buy, at least for those on the right side of 25. And, anyone who has gone down and struggled through a shaky CW QSO will know how much different are the standards of courtesy, something which alone makes Morse worth the getting.

However, we digress from our theme a little! Picking up the letter from G2HKU, we notice the large number of QSO’s he has made; clearly the change of machinery has been the right side of 25. And, anyone who has gone down and struggled through a shaky CW QSO will know how much different are the standards of courtesy, something which alone makes Morse worth the getting.

Odd Notes

With W1WY’s much-appreciated Contest Calendar we have the word that the Navassa DX-pedition is definite for November 25-December 2 with eight operators. Among them Randy Rowe, N0TG, 3237 Connecticut Drive, St. Charles, Missouri 63301 who will handle the QSL’s, for which an s.a.e would be appreciated. The CW mode will be most used, as there has been none from Navassa since the CW DXCC award was instituted, but phone will not be overlooked. Look for them around 3505, 7005, 14030, 21030, and 28005 kHz and CW, with Phone on 3795, 7180, 14205, 21280, and 28550 kHz. The style of operation (transceive, split and listening 5-10 kHz up, districts, US/DX, and so on) will be announced as the operation proceeds.

We have already mentioned most of the contest activity for October in last month’s C.D.XN, but we missed out the ARCI QRP contest over October 7-9, 0200z to 0200z. Exchange RST, and state, province or country, members adding their membership number, non-members their power input. Score 3 for a member, 2 for a non-member, and 4 for a contact other than W or VE. The multiplier is one for each state, province and country worked, plus a power multiplier of one for over 100 watts input, 25-100 watts times 1-5, 5-25 watts times two, 1-5 watts input times three and less than one watt times five. Listen on CW around 1810, 3560, 7060, 14060, 21060 and 28060 kHz, and for SSB 1810, 3985, 7285, 14285, 21385 and 28885 kHz; Novices will be found around 3710, 7110, 21110 and 28110 kHz. The summary sheet will carry details of the scoring, equipment and power used, and a signed declaration, plus large s.a.e if results are desired. Entries to E. V. Blaise, N5BE, 417 Ridgewood Drive, Metairie, LA 70001, U.S.A.

A nice letter comes in from K. H. Show (Swansea) who wrote in first about a year ago asking for advice on getting started; we seem to have pointed in the right general direction because he is now GW8PNR, the call arriving almost a year to the day from his original letter. Smart going that, and congratulations indeed.

Geoff Watts next—he of the Prefix List and D.XN’s. Geoff sponsors a series of IOTA awards,
amateurs for confirmations of QSO’s with meaning “islands on the air.” They IT9JT has all twelve, and is also the South America, IOTA Arctic, IOTA America, IOTA Oceania, IOTA Asia, IOTA Europe, IOTA North IOTA Africa, IOTA Antarctic, IOTA...

Volume XXXVI

...the nearest number of RNARS Belmore Road, Norwich NR7 OPU. notes in DXNS.

...directory of islands, which we know or 5 IRC’s will send you the 18-page... G3BZU (the Hq. station) each worth GB3RM, GB3RNR, GB3HMS, and QSO per band, with the GB3RN, Europeans at 10 points, Class 3 for Mercury award, for contacts with GB2SM-congratulations.

Thus the thinning out, after the afternoon conditions. more of an attraction for daytime... managed to obtain GB2RN as a...

...work with W6 and VE7DGT.

...Tusonway, Lewis.

...Rather seems to have been most HF DX operators idea of a reasonable... GM4DLU were with W’s 8-9-0, W6 and VE7DGT. Turning to G2HKU, Ted seems to have tired himself out on Twenty, but still roused himself to work CW to VU2GOB, G3LGP/W0, and VE3AR.

...for the first time is G2HCP (St. Anne’s) who runs about 24 watts to an HW-8 and a ground-plane. Derek has been using QRP since November ’77 so he wryly remarks that he has got used to a fair amount of fruitless calling! However, he does on occasion ring the bell, to the extent that August gave him QSO’s with some 33 countries in five continents; C31NM and 9A1A were new ones for Europe, while outside Europe lay PY, UF6, UA9, UA0, VE6, W’s 1-2-4-8-9-0 and 4Z2, with EP2IA and ZE1BL hooked in the EU DX Contest. No doubt about the little HW-7 and HW-8 from Heathkit and the earlier Ten-Tec boxes, which certainly appealed to a surprisingly large market, and refined many people’s abilities on the operating side too.

...G8RY’s aerial-pruning/revamping exercise to give an extended-double-Zepp broadside-on to the remarkable results on one day of testing, the crop being 9 JA’s, a brace of Russians, an Austrian, one from down south Brazil, and a CT3 in Funchal. Not a bad day’s loggings.

...That’s all for this time; the deadline dates are in the “box” in the body of the piece, and the more letters the merrier. Address, as ever, to “CDXN,” SHORT WAVE MAGAZINE, 34 HIGH STREET, WELWYN, HERTS. AL6 9EQ. BCNU.
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11 a.m.–6 p.m.

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<td>Twin meters</td>
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