

The SHORT WAVE Magazine

50p

VOL. XXXIX

OCTOBER 1981

NUMBER 8

ANNIVERSARY 1971 - 1981



10th
NATIONAL AMATEUR RADIO EXHIBITION

THE AMATEUR RADIO RETAILERS ASSOCIATION

THIS YEAR AT **DONINGTON PARK**

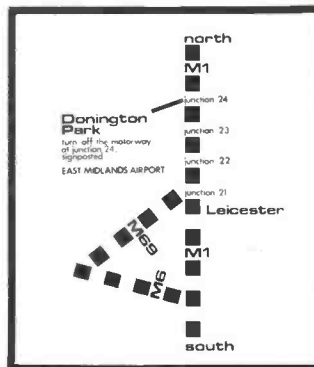
HOME OF THE DONNINGTON MOTOR MUSEUM

THURSDAY 29th OCTOBER
FRIDAY 30th OCTOBER
SATURDAY 31st OCTOBER

Open from 10 a.m. to 6 p.m.

Admission £1.00
 (PARTIES OF 15 OR OVER 80p/PERSON)
 Includes admission to the motor museum

NOTE CERTAIN DEALERS WILL BE REFUNDING ADMISSION COSTS ON SALES OVER £30.00



**NOT AT
 LEICESTER
 THIS YEAR
 AT
 DONINGTON**

welcome to Donington

In 1971, following two or three years with no national amateur radio shows, a group of concerned dealers got their heads together and formed an association with the sole aim of putting on a really representative amateur radio exhibition in the Midlands. The result was the formation of the A.R.R.A. and the first National Amateur Radio Exhibition at the Granby Halls in Leicester.

Everyone now knows that the show went from strength to strength over the years, but in our tenth year it is obvious from comments received from visitors to the show that serious drawbacks arose as the attendance figures increased.

You will remember with horror, the state of Granby Halls at last year's show. No one could be content with such a place and we are delighted to tell you that the show has been moved this year to a superb new site at Castle Donington. All the problems of Leicester have been overcome by the move, and you will no doubt see the wisdom and necessity for leaving Granby Halls behind us.

how to get there

Access to Donington is easy. Simply leave the M1 motorway at exit 24 (East Midlands Airport) and follow the signs to Donington Park. You need only travel about a mile and a half along quiet country roads; quite a contrast to fighting with Leicester city centre traffic.

parking

Parking. You remember the parking in Leicester? At Donington Park there are 2½ acres of free parking right at the exhibition hall entrance. Say no more.

facilities

Cleanliness. The main complaint by visitors and exhibitors alike. When you pass through the plate glass doors, cross the carpeted entrance hall and enter the well lit, clear, warm halls at Donington, you will be amazed at the difference. Facilities in general. Clean toilets and a well staffed permanent restaurant will be quite a change from Leicester, where you needed wellington boots before you dared venture into the toilets.

for you

At Donington, all the main dealers and importers will be putting on an even bigger and better display of all the best for the Radio Amateur and Enthusiast. The only complaint is likely to be from wives and girl friends who may miss the stands selling dolls, balloons and souvenirs. The A.R.R.A. felt that these stands were not in keeping with Amateur Radio and, accordingly, have not allocated them space.

plus

Add to all this the fact that since the new exhibition is taking place at the home of the Donington Motor Museum, and the entrance charge also includes entry to the Museum, you have full and free access to the one of the finest collections of historic motoring in the country.



pacesetter in amateur radio

TR7730 *the new compact 2 metre transceiver*

Once again from Trio an absolutely fantastic 2 metre FM Mobile Transceiver. Compact, simple to operate, full 25 watts output — a truly dazzling piece of gear. Designed by Trio to provide a miniature transceiver, the TR7730 measures 6" wide by 2" high by 8" deep. In providing both first class performance in transmission and reception, Trio engineers have again triumphed. Switch on your Rig and listen for the outstanding signal from a TR7730. The five memories, the band and memory scan facility, together with the up/down mike and comprehensive mobile fixing kit make this the rig you have been waiting for. Remember, sooner or later everyone graduates to Trio equipment.

TR7730 FEATURES . . .

- Compact and lightweight design measuring 147 (5.9) x 51.5 (2.1) x 198 (7.9). Weighing 1.5 Kg (3.3 lbs) such a small compact Rig is easily fitted in any small car or for security can be placed in the glove compartment.
- 25 watts output in high power position for good mobile communications — 5 watts in low position.
- Five memories for either Simplex or repeater operation. The fifth memory is capable of non-standard frequency shift.
- Frequency coverage in either 25 or 5 KHz. steps. Full 2 metre band 144,000 to 145,995.
- Memory scan. Automatically locks on an occupied memory channel and resumes scanning when the signal disappears or when the scan switch is pushed. Scan hold or mike push to talk switch cancels the scan function.
- Band scan. The Rig scans the band in either 25 or 5 KHz. steps and locks on an occupied channel.
- Both mobile mounting bracket and up/down microphone included with the equipment.



£238.00 inc VAT carriage £4.50

TS530S

building on proven success

The all new TS530S is firmly based on the reputation of the TS520 series and incorporates many of the features of the superb TS830S. Included are the three new bands and, of course, the rig has both digital and analogue frequency readout. Also available for the TS530 is a complete range of matching station accessories, the SP230 speaker, the VFO240 and, of course, the AT230 antenna tuning unit.

TS530S features:

- Single conversion receiver and transmitter using 8.83 MHz. I.F.
- LSB, USB and CW on 160-10 metres including the new 10, 18 and 24 MHz. bands.
- Built in digital display with 6 digits and also analogue dial.
- IF shift (passband tuning).
- RIT (Receiver Incremental Tuning) and XIT (Transmitter Incremental Tuning).
- Built in speech processor.
- Narrow and wide filter switching.
- Noise blanker threshold level control.
- Also retained are the rugged reliable 6146B PA valves and the easy to use controls.



Optional Accessories

- SP230 external speaker with selectable audio filters.
- VFO 240 external matching VFO.
- AT230 antenna tuner/SWR and power meter/antenna switch, 160 to 10 metres including the 3 new bands.

Have your thought about selling or trading in your QSL cards?

Not so daft as it seems, since our collectomaniac Director — John Wilson — is willing to buy or trade in QSL cards. They must be postally used, in other words have stamps on, and been sent to you from abroad. Particular interests are cards from former African colonies and places like Ascension, St. Helena, and so on.

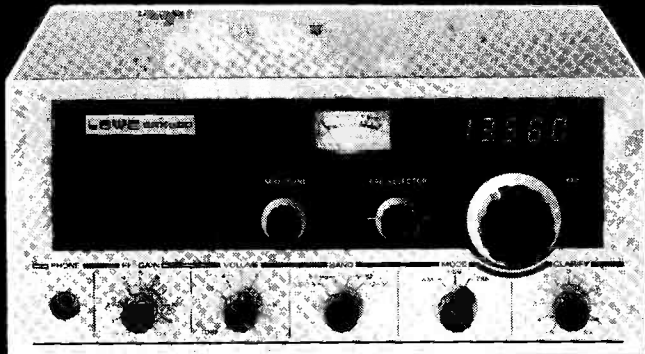
If you are interested, why not contact John Wilson at Matlock; it's an easy way to turn waste paper into money.

£561.20 inc VAT carriage £4.50

LOWE ELECTRONICS Ltd.
CHESTERFIELD ROAD, MATLOCK, DERBYSHIRE. TEL. 0629/2817.

LOWE SRX30D

a familiar name, but a whole new receiver



A familiar name, but a whole new receiver behind it. Building on all the excellent features of the SRX-30, including the drift cancelling system covering 500 KHz to 30 MHz; the selectable sidebands and AM; the easy to use tuning system; we now introduce the all new SRX30D which incorporates the suggestions made by our customers. Outstanding new features are: —

- Extended coverage 200 KHz - 30 MHz.
- Digital readout in large green display units which give true unambiguous frequency information — even when you switch sidebands or use the clarifier.
- All new frequency synthesis using Plessey SL6 1641 double balanced modular ICs for a new high standard of performance.
- All new audio system which produces outstandingly good quality on the built in speaker, and is capable of driving external hi fi speaker units for even better sound.
- All new IF filters with optimum bandwidth for mode in use. Automatic filter selection from mode switch.

There is so much that is impressive about the SRX30D that you have to see it and handle it to really appreciate the performance.

We predict that the SRX30D will be a landmark in low cost, high performance SWL receivers. Just consider how much you should pay for a receiver covering 200 KHz - 30 MHz with accurate digital readout; high performance USB/LSB/AM with switched filters; drift cancelling frequency synthesis; built in mains supply and built in speaker; high quality construction and advanced design — and so much more.

Then look at our price for the SRX30D and you will be even more impressed.

£195.00 inc VAT, Securicor carriage £4.50.

Accessories for the short wave listener.

		Inc VAT	Car
HF5	80-10m vertical. No radials required when on ground post	48.50	4.50
EIS	Small egg insulator. Glazed ceramic 40 cm long30	.25
EIL	Large egg insulator. Glazed ceramic 50 cm long45	.36
SIL	Ribbed strain insulator for dipole end or centre. 70cm long35	.36
MIZUHO			
KX2	Top quality 500 Khz-30 mhz aerial tuner. Perfect match for R1000	29.90	1.50
AX1	Aerial switching system. Handles 6 aerials & 6 receivers	27.03	1.00
APM1	Audio peak and notch filter. Variable bandwidth active filters	33.00	1.00
SR1	Mini rack for above the system	14.09	1.50
MP1	Rack mount for APM1	5.20	1.00

TRIO

pacesetter in amateur radio



The Trio 9500, a 70cm multimode mobile giving SSB, FM and CW operation in a compact rig. Add the spacious 70 cm band to your operating.

TR9500 70 cm multimode.
£482.54 inc. VAT. Securicor carriage £4.50.



TR-9000 The exciting TR-9000 2-metre all-mode transceiver combining the convenience of FM with long distance SSB and CW in a very compact, very affordable package. Because of its compactness the TR-9000 is ideal for mobile installation; add on its fixed station accessories and it becomes the obvious choice for your shack.

TR9000 2 metre multimode.
£371.91 inc. VAT. Securicor carriage £4.50.



TR-7800 Trio's remarkable TR-7800 2-metre FM mobile transceiver provides all the features you could desire for maximum operating enjoyment. Frequency selection is easier than ever, and the rig incorporates new memory developments for repeater shift, priority, and scan. The TR-7800 by Trio, the only FM mobile.

TR7800 2 metre FM rig.
£276.00 inc. VAT. Securicor carriage £4.50.

HEAD OFFICE AND SERVICE CENTRE

Chesterfield Road, Matlock, Derbys. Tel. 0629 2817 or 2430.

Open Tuesday-Friday 9-5.30, Saturday 9-5.00. Closed for lunch 12.30-1.30.

For all that's best in ham radio, contact us at Matlock.

For full catalogues send 70p in stamps with your address. Mark enquiry SWM.



AMATEUR ELECTRONICS UK



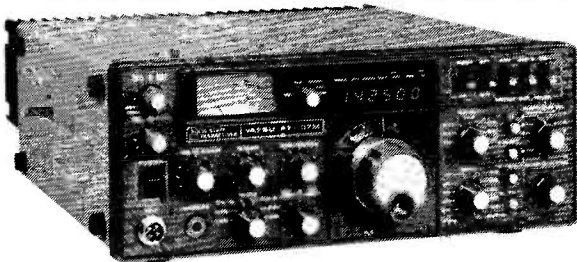
Your number one source
for **YAESU MUSEN**



FT-101ZD Mk III

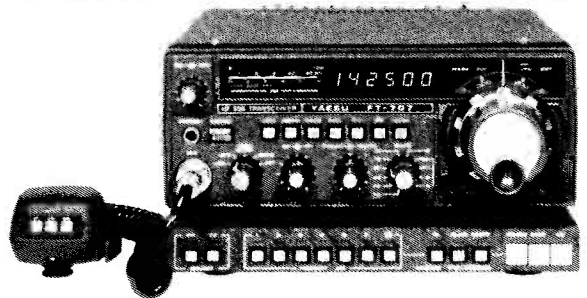
YAESU's FT-101ZD with FM is the most popular HF rig on the market thanks to its very comprehensive specification and competitive price. Incorporates notch filter, audio peak filter, variable IF bandwidth plus many other features.

FT-107M Deluxe solid-state HF transceiver



A real thoroughbred from the YAESU stable - a superb receiver section in combination with a rugged, powerful, solid-state PA. 240 watt PEP input, 12 memory option, latest bands.

FT-707 All solid-state HF mobile transceiver



The definitive HF mobile rig, digital, variable IF bandwidth, 100watts PEP SSB, AM, CW (pictured here with 12 channel memory VFO). Latest bands.

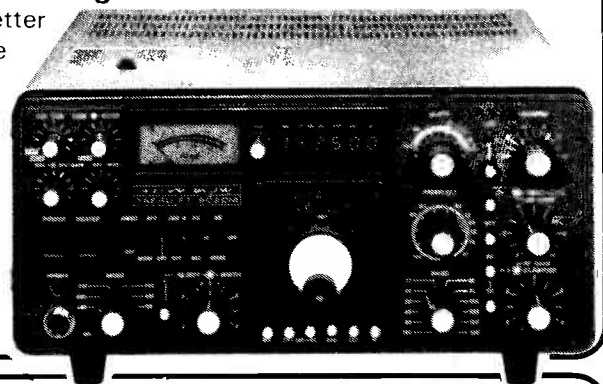
As factory appointed distributors we offer you - widest choice, largest stocks, quickest deal and fast sure service right through-



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

FT-902DM Competition grade HF transceiver

The YAESU world famous pace-setter with the acknowledged unbeatable reputation. 160 thru 10 metres including the WARC bands. All-mode capability, SSB, CW, AM, FSK and FM transmit and receive. Teamed with the FTV-901R transverter coverage extends to 144 & 430MHz.



For full details of these new and exciting models, send today for the latest YAESU PRICE LIST and LEAFLETS. All you need to do to obtain the latest information about these exciting developments from the world's No. 1 manufacturer of amateur radio equipment is to send 36p in stamps and as an added bonus you will get our credit voucher value £3.60p - a 10 to 1 winning offer.

FRG-7 General coverage receiver



The set with the world-wide reputation. YAESU's famous FRG-7 out-performs many a more expensive set. Rugged and reliable, it features high sensitivity and Wadley loop stability - a delight to use for the established amateur and new SWL alike.

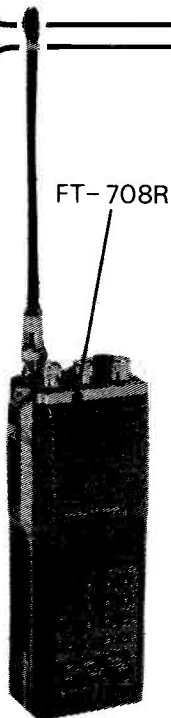
FRG-7700 High performance communications receiver



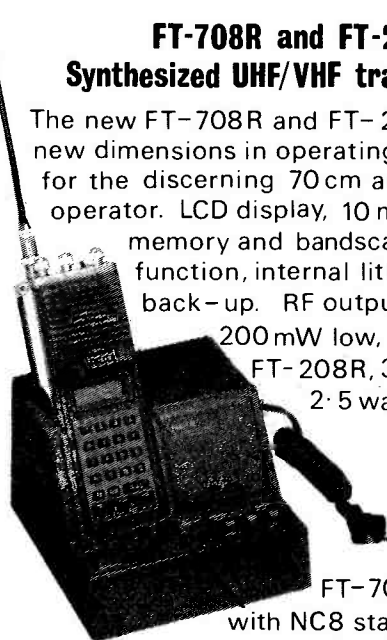
YAESU's top of the range receiver. All mode capability. USB, LSB, CW, AM and FM 12 memory channels with back up. Digital quartz clock feature with timer. Pictured here with matching FRT-7700 Antenna tuner and FRV-7700 VHF converter.

FT-708R and FT-208R Synthesized UHF/VHF transceivers

The new FT-708R and FT-208R provide new dimensions in operating flexibility for the discerning 70 cm and 2m operator. LCD display, 10 memories, memory and bandscan, priority function, internal lithium battery back-up. RF output FT-708R, 200mW low, 1 watt high, FT-208R, 300mW low, 2.5 watts high.



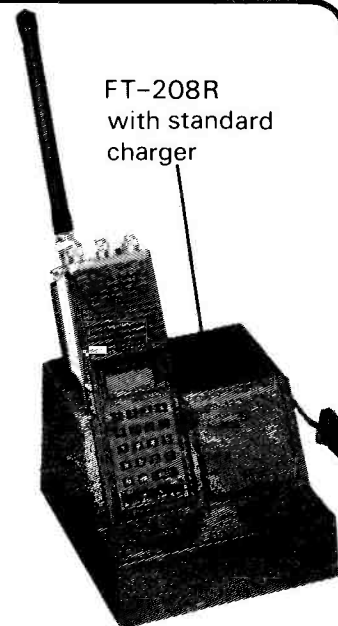
FT-708R



FT-708R with NC8 standard/quick charger/DC PSU



FT-208R

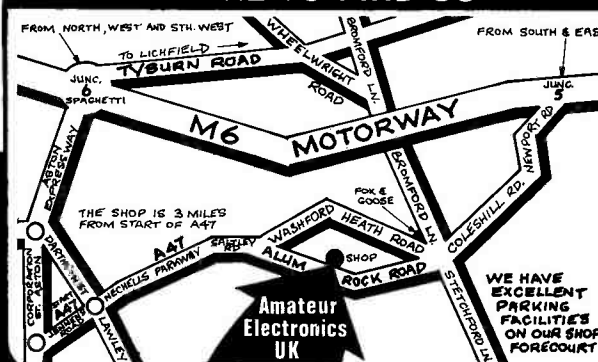


FT-208R with standard charger

AGENTS

- NORTH WEST - THANÉT ELECTRONICS LTD, GOROOD, G3LEQ, KNUTSFORD (0565) 4040.
- WALES & WEST - ROSS CLARE, GW3NWS, GWENT (0633) 880 146.
- EAST ANGLIA - AMATEUR ELECTRONICS UK - EAST ANGLIA, DR T. THIRST (TIM) G4CTT, NORWICH 06925 865
- NORTH EAST - NORTH EAST AMATEUR RADIO, DARLINGTON 0325 55969
- SOUTH EAST - AMATEUR ELECTRONICS, UK - KENT, KEN McINNES, G3FTE, THANÉT (0843) 291297

WHERE TO FIND US



Amateur Electronics UK
508-516 Alum Rock Road · Birmingham 8
Telephone: 021-327 1497 or 021-327 6313
Telex: 337045
Opening hours: 9.30 to 5.30 Tues. to Sat.
continuous - CLOSED all day Monday.

SMC SERVICE

Free Finance on many items. Two year guarantee on Yaesu. Free Securicor on major Yaesu items. Access and Barclaycard over the telephone. Biggest Branch, Agent and Dealer network. Ably staffed, courteous, Service Department. "B Services" Securicor contract at £3.50!! Biggest stocks of amateur equipment in UK. Twenty-two years of professional experience.

GUARANTEE

Yaesu's own warranty does not extend outside Japan. Repairs are the responsibility of the UK dealer selling the set. SMC's two year guarantee is backed, as UK distributors, by daily contact with the factory and many tens of thousands of pounds of spares and test equipment. Avoid hawkers offering sets without serial numbers, spares, service or advice back-up.

FREE FINANCE

On regular priced items from; Yaesu, Ascot SMCHS, CDE, HyGain, Channel Master, Hansen, SMC, MFJ, KLM, Mirage and Hy Mound, on invoices over £100 SMC offers Free Finance! How is it done? Simple, pay 20%, split the balance equally over 6 months or pay 50% down and split the balance over a year. You pay no more than the cash price!!

YAESU MUSEN

As UK Agents, we show some major Yaesu items; a new VHF multimode handportable, 2 general coverage receivers, multimodes for VHF and UHF FM transceivers for VHF, UHF and VHF/UHF, 4 HF transceivers (SSB, CW, FSK, AM, FM) and a fistful of VHF and UHF handhelds. Remember there are 150 accessories to complement these lines . . .

NEW — THE WORLD BEATER FT1



FRG7

- ★ "Industry standard" receiver.
- ★ 0.5-3MHz.
- ★ SSB (LSB/USB), CW, AM.
- ★ Selectivity of ±3kHz at -6dB.
- ★ Wadley-loop triple conversion.
- ★ 10kHz Direct dial readout.
- ★ Well calibrated "sharp" preselector.
- ★ AM Automatic noise suppression circuit.
- ★ Antenna Hi to 1.6MHz, 50ohm to 30MHz.
- ★ 3 position RF attenuator.
- ★ 3 position AF filter (LP, WBP, NBP).
- ★ 110-240Vac and 12Vdc.
- ★ Lights: battery economy switch.
- ★ Illuminated edge type "S" meter.
- ★ Optional Battery holder £5.00.

£199 inc. VAT @ 15% & SECURICOR

- FT1**
- ★ Rx: 150KHz-30MHz. Continuous general coverage
 - ★ Tx: 160-10m (9 bands) or 1.5-30MHz commercial
 - ★ All Modes: AM, CW, FM, FSK, LSB, USB
 - ★ 10 VFO's!!! Any Tx-Rx split within coverage
 - ★ Two frequency selection ways, NO bandswitch
 - ★ Main dial, velvet smooth, 10Hz resolution
 - ★ Tuning rate from 00Hz to 00MHz turn
 - ★ Inbuilt keyboard with up/down scanning
 - ★ Dedicated digital display for RIT offset
 - ★ Receiver dynamic range up to 100db!!!
 - ★ Pair low noise power transistors in Rx RF
 - ★ Ring mixer with LO injection of + 10dBm
 - ★ SSB: Variable bandwidth AND IF shift
 - ★ 300 or 600Hz, 2,400 → 300Hz, 6KHz, 12KHz
 - ★ Audio peak and notch filter. FM squelch
 - ★ Advanced variable threshold noise blander
 - ★ 100W RF, key down capability, solid state
 - ★ Mains and 12VDC. Switch mode PSU built in
 - ★ RF processor. Auto mic gain control. VOX
 - ★ Last but not least FULL break in on CW



FRG7700

- ★ Incredible new receiver.
- ★ 0.15-30MHz.
- ★ SSB (LSB/USB), CW, AM, FM.
- ★ 2.7kHz, 6kHz, 12kHz, 15kHz, @ -6dB.
- ★ Up conversion 48MHz first IF.
- ★ 1kHz digital plus analogue display.
- ★ No preselector, auto selected LPF's.
- ★ Advanced noise blander fitted.
- ★ Antenna 500ohm to 2MHz, 50ohm to 30MHz.
- ★ 20dB pad plus continuous attenuator.
- ★ Constantly variable tone control.
- ★ 110 and 240Vac and 12Vdc option.
- ★ 12 channel memory option.
- ★ Signal meter calibrated in "S" and SIMPO.
- ★ FRG7700M £389. Memory option £83.95.

NEW MATCHING ATU, LPF AND SIX VHF CONVERTORS

£309 inc. VAT @ 15% & SECURICOR



SOUTH MIDLANDS COMMUNICATIONS LIMITED

S.M. HOUSE, OSBORNE ROAD, TOTTON, SOUTHAMPTON, SO4 4DN, ENGLAND
Tel: Totton (0703) 867333, Telex: 477351 SMCOMM G, Telegram: "Aerial" Southampton

AGENTS: G, GW, GM, GI, GJ.
G3ZUL Brian Stourbridge (03343) 5917
GI3KDR John Bangor (0247) 55162
GM8GEC Jack Edinburgh (031665) 2420
GI3WVY Mervyn Tandragee (0762) 840656
GW3TMP Howarth Pontyodkin (035287) 846/324
GW8EBB Peter Swansea (0792) 872525
GJ4ICD Geoff Jersey (0534) 26788
G4EQS Simon Redcar (0642) 480808

LEEDS
S.M.C. (Leeds)
Colin Thoms, G3PSM
257 Otley Road,
Leeds 16, Yorkshire.
Leeds (0632) 782326
9-5.30 Monday-Saturday

CHESTERFIELD
S.M.C. (Jack Tweedy) LTD
Roger Baines, G3YBO
102 High Street,
New Whittington,
Chesterfield (0246) 453340
9-5.00 Tuesday-Saturday

WOODHALL SPA
S.M.C. (Jack Tweedy) LTD
Jack Tweedy, G3ZY
150 Homcastle Road
Woodhall Spa, Lincolnshire.
Woodhall Spa (0528) 52793
9-5.00 Tues.-Sat. (+ appointments)

- ★ 144-146MHz (144-148 possible)
- ★ Multimode USB, LSB, FM, CW
- ★ 2.5W PEP, 2.5W RMS/300mW out
- ★ LED's; 'ON AIR', 'BUSY'. MC meter; S.P.O
- ★ Integral telescopic antenna
- ★ Bandwidth 2.4KHz and 14KHz @ - 6dB
- ★ Optically coupled main tuning
- ★ 100 Hz backlit LCD Frequency display
- ★ 10 memory channels "5 year" backup
- ★ FM: 25KHz and 12.5KHz steps
- ★ SSB: 1KHz and 100Hz steps
- ★ Any TX & RX split with dual VFO's
- ★ ±600KHz repeater split 1750Hz burst
- ★ Mobile mounting bracket available
- ★ Matching 10W linear Amplifier
- ★ Up/down tuning from microphone
- ★ AF output 1W @ 10% THD
- ★ 58 (H) x 150 (W) x 195 (D) (1.3kg)
- ★ Rx; .70mA, Tx; 800mA (FM maximum)
- ★ 8 'C' Ni cads or Drys. 8.5-15.2V DC External



LOOK

£229 inc.
VAT @ 15% & POSTAGE

SMC 2.2 A/Hr
NiCd £2.70 inc

FULL RANGE
OF MATCHING
ACCESSORIES

FT208R

- ★ 144-148MHz (144-148 possible)
- ★ 12.5/25kHz synthesiser steps
- ★ 4 bit CPU synthesiser control
- ★ Keyboard entry of frequencies/splits
- ★ LCD digital display with backlight
- ★ Ten channels of memory
- ★ Memory back up '5 year lifetime'
- ★ Up/down manual tuning
- ★ Manual or auto scan for busy/clear
- ★ Priority channel with "check back"
- ★ Memory scanning feature
- ★ Scan between any two frequencies
- ★ Scan with auto pause/restart
- ★ Any split + or - programmable
- ★ Quick change NiCad pack
- ★ 1750Hz tone burst
- ★ ±600kHz repeater split
- ★ Built in condenser microphone
- ★ 500 mW AF to int/ext speaker
- ★ External speaker/mic option
- ★ 2.5 or 0.3W RF output
- ★ Rx; 20mA squelch 150mA max AF
- ★ Tx; 800mA at 2.5W RF
- ★ 0.25µV for 12dB SINAD
- ★ Dual conversion 16.9MHz & 455kHz
- ★ Keyboard provides 16 tone DTMF
- ★ 168 (H) x 61 (W) x 49 (D) mm
- ★ C/w NiCad pack and helical



FT208R
£195 inc.
VAT @ 15%
& POSTAGE

FT708R

- ★ 430-440MHz (440-450 option)
- ★ 25KHz synthesizer steps
- ★ 4 bit CPU chip frequency control
- ★ Keyboard entry of frequencies/splits
- ★ LCD digital display with backlight
- ★ Ten channels of memory
- ★ Memory back up 5 year lifetime cell
- ★ Up/down manual tuning
- ★ Manual or auto scan for busy/clear channels
- ★ Priority channel with search back
- ★ Memory scanning feature
- ★ Scan between any two frequencies
- ★ Auto scan restart
- ★ Any split + or - programmable
- ★ Quick change NiCad pack
- ★ 1,750Hz tone burst
- ★ ± 7.6MHz EU split standard
- ★ Built in condenser microphone
- ★ 500 mW AF to int/ext speaker
- ★ External speaker/mic available
- ★ 1W or 100 mW RF output
- ★ RX: 20mA squelch, 150MHz (max AF)
- ★ TX: 500 mA at 1W RF
- ★ 0.4µV for 12dB SINAD
- ★ Dual conversion 46.255MHz & 455KHz
- ★ Keyboard offers 16 tone DTMF
- ★ 168(H) x 61(W) x 49(D) mm.
- ★ C/w NiCad pack, helical



FT708R
£199 inc.
VAT @ 15%
& POSTAGE

FT207R

- ★ 144-148MHz (144-148 possible)
- ★ 12.5KHz synthesizer steps
- ★ 4 bit CPU chip for freq. control
- ★ Keyboard entry of frequencies
- ★ Keyboard lockout safety features
- ★ Digital display to hundreds of Hertz
- ★ Display auto shutdown timer
- ★ Four Channels of memory
- ★ Memory back up disable
- ★ Up/down manual tuning
- ★ Bands can for busy or clear channels
- ★ Memory scanning features
- ★ ±600KHz split built in
- ★ Any split + or - programmable
- ★ Easy change Ni Cad packs
- ★ BNC antenna connector
- ★ "On Air" and "Channel Busy" LEDs
- ★ Built in condenser microphone
- ★ 200mW AF to internal/external speaker
- ★ External speaker/mic available
- ★ 2.5/0.2W of RF output
- ★ Rx; 35mA squelch, 150mA full vol.
- ★ Tx; 250mA low, 800mA high
- ★ 0.3µV for 20dB quieting
- ★ Double conversion 10.7MHz and 455KHz
- ★ Two tone encoder built in
- ★ 1.7 (2.2)" D x 2.5 (2.7)" W x 6.7 (7.2)" H
- ★ C/w NiCad pack, helical and case



FT207R
£169 inc.
VAT @ 15%
& POSTAGE

FT202R

- ★ 144-146MHz (144-148 possible)
- ★ 6 channel capability
- ★ 1 watt of FM RF output minimum
- ★ Rx; 30mA/200mA - squelch/500mW AF
- ★ Tx; 400/500mA - 300mW/1W
- ★ Dual Conversion 10.7MHz and 455kHz
- ★ 67 x 49 x 171mm
- ★ Built in speaker and mic, remote option
- ★ Operates on 'AA' NiCads or drys
- ★ C/w helical, case, xtalled S20, 21, 22

FT404R

- ★ 430-440MHz (Tx 2MHz, Rx 5MHz Spread)
- ★ 6 Channel capability
- ★ 2.5W of FM RF output
- ★ Rx; 7mA/160mA - squelch/400mW AF
- ★ Tx; 400/500mA - 200mW/2.5W
- ★ Dual conversion 21.4MHz and 455KHz
- ★ 68 x 55 x 171mm
- ★ Built in speaker and mic, remote option
- ★ Operates on quick charge NiCad pack
- ★ C/w NiCad pack, helical, case, 1 Channel



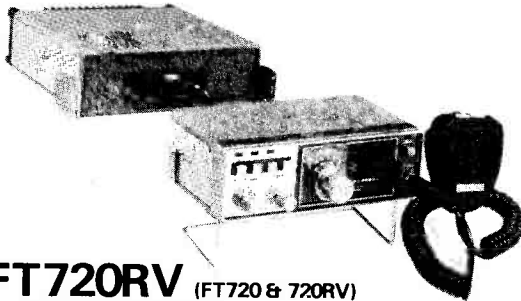
FT202R £109 inc. **FT404R**
VAT @ 15% & POSTAGE VAT @ 15% & POSTAGE



FT780R

- ★ 430-434 MHz (440-445 possible)
- ★ USB-LSB-CW-FM (A3J, A1, F3)
- ★ Input; 30W (PEP A3J + A1/F3)
- ★ GaAs Fet RF for incredible sensitivity
- ★ NMOS four bit micro control
- ★ Bandwidth 2.2KHz and 14KHz @ -6dB
- ★ 'Dial set' clears non integral steps
- ★ Very bright blue display to 100Hz
- ★ Display indicates Tx and Rx (inc RIT)
- ★ Manual tone switch on microphone
- ★ String LED displays for S and PO
- ★ Digital receiver independent tune (± 10 KHz)
- ★ Advanced effective noise blanker
- ★ FM; 100KHz, 25KHz, 1KHz, steps
- ★ SSB; 1,000, 100, 10Hz steps
- ★ Repeater access by use of dual VFO's
- ★ Four easy write in memory channels
- ★ Memory scanning with slot display
- ★ Up/down tuning from microphone
- ★ Priority channel on any memory slot
- ★ Satellite mode allows tuning on Tx
- ★ Scanning for busy or clear channels
- ★ Size (case): 10" D, 2.3" H, 6.9" W
- ★ LED's on air, clear, hi/low, FM mod
- ★ FP80 mains PSU + SC1 console available

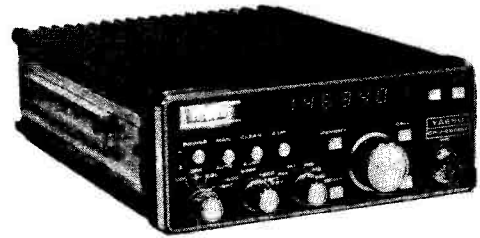
£409 inc. VAT @ 15%
& SECURICOR



FT720RV (FT720 & 720RV)

- ★ FT720 Control Head
- ★ For easy write-in memory channels
- ★ Rx priority channel (auto check)
- ★ Scanning of band/memory for empty/busy
- ★ Up/down tuning/scanning from mic.
- ★ Optically coupled tuning control
- ★ Manual and automatic tone burst
- ★ String LED's for 'S' and PO, status LEDs
- ★ 1½ W of audio to internal/external speaker
- ★ 3.3 (4.3)" D x 6" W x 2 (2.2)" H
- ★ 720RV 10W, 2M deck 720RVH 25W, 2M deck
- ★ 144-146MHz (144-148MHz possible)
- ★ 12½ KHz synthesizer steps, 600kHz Shift
- ★ 0.3µV for 20dB quieting
- ★ Rx 0.5A, Tx RV 3.5A, RVH 6.5A
- ★ 5.8 (6.5)" D x 6" W x 2 (2.2)" D
- ★ 720RU 10W, 70cm. deck
- ★ 430-434MHz
- ★ 25KHz synthesizer steps, 1.6MHz Shift
- ★ 0.5µV for 20dB quieting
- ★ Rx 0.5A, Tx 4.5A
- ★ 5.8 (6.5)" D x 6" W x 2 (2.2)" D
- ★ S72 Switching box
- ★ Pushbutton bandswitching between two decks
- ★ Auto change of synthesizer steps/splits

£245 inc. VAT @ 15%
& SECURICOR



CPU2500RS

- ★ Covers 144 to 146 or 148MHz
- ★ 25/3 watt or 10/1 watt model(s)
- ★ CPU controlled digital synthesiser
- ★ 10KHz (+ 5KHz up) synthesised steps
- ★ Optional 25KHz steps in St version
- ★ 6 digit readout + memory channel number
- ★ Main tuning, by optically coupled encoder
- ★ Up/down tuning/scanning from microphone
- ★ Scanning for empty or occupied channels
- ★ Band scanning up or down the band
- ★ Four normal memory channels
- ★ Further memory for 'odd' split
- ★ Can scan memory channels only
- ★ ± 600 KHz plus any split (to 4MHz)
- ★ Sub audio tone squelch option
- ★ Manual (EU) and Auto (UK) tone burst
- ★ High or low (1/10) power switch
- ★ Low noise mosfet RF stage
- ★ LED's for: - 'on Air' and 'Busy channel'
- ★ VSWR and reverse polarity protection
- ★ Punch in frequency on keyboard mic (K)
- ★ 0.5A Rx, 2.5A LTx, 6 A HTx (25). 13.6V DC
- ★ Case; 7" wide, 2¾" high, 10½" deep
- ★ Sensitivity: 0.3µV for 20dB 5Q
- ★ Selectivity: 12KHz ★ - 6dB (2:1SF)

£235 inc. VAT @ 15%
& SECURICOR



FT480R

- ★ 144-146MHz (143.5-148.5 MHz possible).
- ★ USB-LSB-CW-FM (A3J, A1, F3).
- ★ 30W PIP A3J, 10/1 W our A1 F3.
- ★ Bandpass filter no tune design.
- ★ Excellent dynamic range sensitivity.
- ★ Bandwidth 2.4kHz and 14kHz at -6dB.
- ★ Semi break in with side tone.
- ★ Very bright blue 100Hz digital display.
- ★ Display shows Tx and Rx freq (inc RIT).
- ★ String LED display for "S" and PO.
- ★ Digital receiver offset tuning.
- ★ Advanced effective noise blanker.
- ★ FM; 25 12½, 1kHz steps.
- ★ SSB; 1,000, 100, 10Hz steps.
- ★ Any TX Rx split with dual VFO's.
- ★ ± 600 kHz standard repeater split.
- ★ Four easy write-in memory channels.
- ★ Memory scanning with slot location display.
- ★ Up/down tuning/scanning from mic.
- ★ Priority channel on any memory slot.
- ★ Satellite mode allows tuning on Tx.
- ★ Scanning for busy or clear channels.
- ★ Size (Case): 8.3" D, 2.3" H, 6.9" W.
- ★ LED's; "On Air" Clar, Hi/Low, FM mod.
- ★ Matching PP80 Mains PSU available.

£359 inc. VAT @ 15%
& SECURICOR



FT101ZDFM

- ★ 160-10 metres including new allocations.
- ★ Variable IF bandwidth 2.4kHz down to 300Hz.
- ★ 8 pole filters for razor edge selectivity.
- ★ Selectable CW fixed bandwidth CW-W and CW-N*.
- ★ Semi-break in with sidetone for excellent CW.
- ★ Digital plus analogue frequency displays.
- ★ 6146B PA's with 6dB of negative feedback.
- ★ 180W PIP and — 31dB 3rd order intermod.
- ★ RF speech processor fitted — adjustable level.
- ★ VOX built-in and is adjustable from the front panel.
- ★ Wide dynamic range for big signal handling.
- ★ High usable sensitivity, for those weak ones.
- ★ Superb noise blanker — adjustable threshold.
- ★ Attenuator; 0-10-20dB, front panel switch.
- ★ AGC; slow-fast-off, front panel switchable.
- ★ Clarifier (RIT) switchable on TX, RX or both.
- ★ Low level transvertor drive output facility.
- ★ Universal power supply 110-234V AC and 12V DC*.
- ★ Incredible range of matching accessories
- ★ 4 models; Digital/Analogue — AM/FM

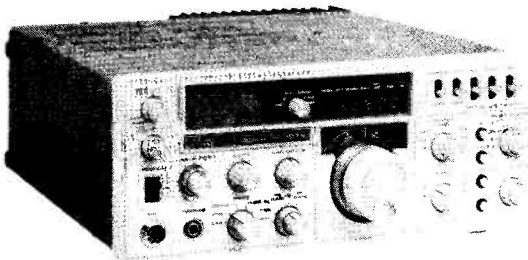
*Option. **£599 inc.** VAT @ 15% & SECURICOR



FT902DM

- ★ 160-10 metres including new allocations.
- ★ Variable IF bandwidth 2.4kHz down to 300Hz.
- ★ Audio Peak and independent notch controls.
- ★ AM, FSK, USB, LSB, CW, FM, (TX and RX).
- ★ Semi-break in, inbuilt Curtis IC Keyer.
- ★ Digital plus analogue frequency displays.
- ★ 6146B's with negative feedback.
- ★ VOX built-in and adjustables.
- ★ Instant write in memory channel.
- ★ Tune up button (10 sec, of full power).
- ★ Curtis Keyer — Iambic, single or straight.
- ★ Switchable AGC and RF attenuator.
- ★ Optional 350 or 600 Hz CW, 6kHz, AM filters.
- ★ Clarifier (RIT) switchable on TX, RX or both.
- ★ Audio Peak and tunable notch filter.
- ★ Plug in modular, computer style constructor.
- ★ Fully adjustable RF Speech processor.
- ★ Ergonomically designed with necessary LEDs.
- ★ Incredible range of matching accessories.
- ★ Universal power supply 110-234V AC and 12V DC.

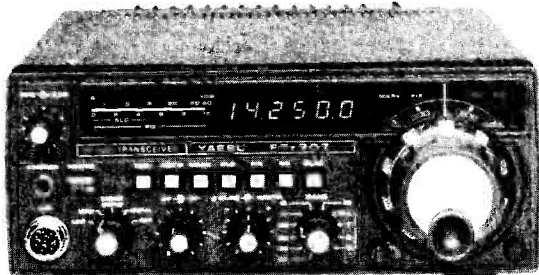
*Option. **£799 inc.** VAT @ 15% & SECURICOR



FT107M

- ★ 160-10 metres (including 10, 18, and 24MHz).
- ★ USB-LSB-CWW-FSK-AM multi-mode.
- ★ Full broad band "no tune" power amplifier.
- ★ 240W PIP. 75 per cent power output at 3:1 VSWR.
- ★ 12 memory channels with clarifier on memory.*
- ★ Digital Memory Shift gives offset from memory.*
- ★ Up/down scanning control from microphone.*
- ★ Variable IF bandwidth — 16 poles of selectivity.
- ★ Bandwidths: 6kHz*, 2.4kHz-300Hz, 600Hz-300Hz.*
- ★ Selectable CW "fixed" widths CW-W and CW-N.*
- ★ Tunable Audio Peak (AFP) and Notch filter.
- ★ Diode ring mixer for very high Rx dynamic range.
- ★ Noise blanker — front panel adjustable threshold.
- ★ AGC; slow-fast-off switchable from the front panel.
- ★ Attenuator 0-20dB, plus RF gain on front panel.
- ★ RF speech processor fitted — front panel adjustable.
- ★ Digital (100Hz) plus analogue frequency displays.
- ★ Meter Reads; Vcc, Ic, ALC, Compression and SWR.
- ★ Semi-break in with side tone. Vox built in.
- ★ Choice of built-in or separate power supply units.

*Option **£690 inc.** VAT @ 15% & SECURICOR



FT707

- ★ 80-10 metres (including 10, 18 and 24MHz bands).
- ★ USB-LSB-CWW-CWN-AM (Tx and Rx operation).
- ★ 100W PEP. 50% power output at 3:1 VSWR.
- ★ Full "broad band" no tune output stage.
- ★ Excellent Rx dynamic range, power transistor buffers.
- ★ Rx Schottky diode ring mixer module.
- ★ Local oscillator with ultra-low noise floor.
- ★ Variable IF bandwidth — 16 crystal poles.
- ★ Bandwidths 6kHz*, 2.4kHz-300Hz (600-350)Hz*-300Hz.*
- ★ AGC; slow-fast switchable from the front panel.
- ★ VOX built-in and adjustable from the front panel.
- ★ Semi-break in with side tone for excellent CW.
- ★ Digital (100Hz) plus analogue frequency display.
- ★ LED Level meter reads: S, PO and ALC.
- ★ Convenient concentric AF/FR gain controls.
- ★ Indicators for: calibrator, fix, int/ext VFO.
- ★ Receiver offset tuning (RIT-clarifier) control.
- ★ Advanced noise blanker with local loop AGC.
- ★ 25kHz crystal calibrator feature.
- ★ Internal, xtal or external VFO control.

*Option **£529 inc.** VAT @ 15% & SECURICOR



SOUTH MIDLANDS COMMUNICATIONS LIMITED

S.M. HOUSE, OSBORNE ROAD, TOTTON, SOUTHAMPTON, SO4 4DN, ENGLAND
 Tel: Totton (0703) 867333, Telex: 477351 SMCOMM G, Telegram: "Aerial" Southampton

BRANCHES: LEEDS, CHESTERFIELD, WOODHALL SPA. AGENTS: G, GW, GM, GI, GJ.

RADIO SHACK for *BARGAINS*

and
more

BARGAINS

at



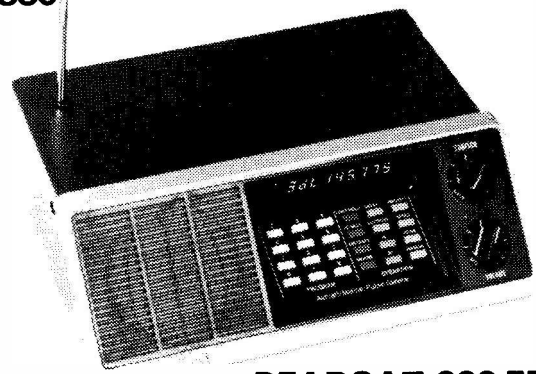
DRAKE TR-7



COLLINS KWM-380

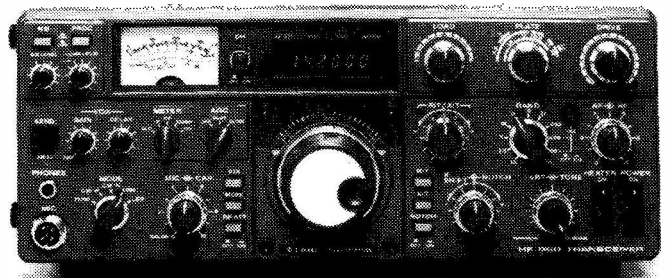
**DONINGTON
PARK**
October
28, 29, 30th.
THE BIG SHOW

**Spend over £30
and get your
entrance fee
refunded**



BEARCAT 220 FB

Details of gear and full list
sent for 30p stamps.



TRIO EQUIPMENT

RADIO SHACK LTD.

(Just around the corner from West Hampstead on Jubilee Line)
188 BROADHURST GARDENS, LONDON NW6 3AY

Giro Account No. 588 7151

Telephone: 01-624 7174

Cables: Radio Shack, NW6

Telex: 23718



DATONG PRODUCTS

DESIGNED BY ENTHUSIASTS FOR ENTHUSIASTS!

SEE US IN HALL 3A
A.R.R.A. EXHIBITION,
29th-31st OCTOBER
DONNINGTON PARK

KEYBOARD MORSE SENDER - THE ULTIMATE KEYBOARD - CHECK THESE FEATURES

- CONVENIENCE: no need for a power cable, four internal pen cells last for 300 hours and give continuous memory back up.
- EXCLUSIVE COLOUR CODED KEYBOARD DESIGN: Separate key switches beneath a tough polycarbonate membrane combine excellent "feel" with a splash proof wipe-clean surface.
- LAVISH MEMORY: four 64-character memories with auto-repeat and programmable "pause" function for all the routine sending.
- BUFFER MEMORY: ensures perfect sending despite less than perfect typing.
- COMPREHENSIVE CHARACTER SET: includes punctuation, procedure signals, accented letters. Plus a "merge" key for making any non-standard character.
- BEAUTY AND STYLE: only one inch thin and with four-colour panel Model MK looks every bit the thoroughbred it is. Model MK is supplied with output leads and spare connectors but without batteries (four HP7 pen cells).



Model MK

MODEL ASP - THE "INTELLIGENT" RF CLIPPER

Model ASP modifies your speech signal direct from the microphone and makes it more effective at modulating your transmitter. The effect is as if the transmitter peak power were to increase by between two and three times. "Intelligent" means that unlike other speech processors, Model ASP automatically senses your voice level and reacts accordingly to always maintain the degree of true r.f. clipping selected (in decibels) by the panel push-buttons. Special circuitry does this without the undesirable side effects of simple a.g.c. devices. Adding a Datong r.f. clipper to a normal SSB transmitter has a similar effect to adding a linear amplifier but without the high cost and risk of TVI.



Model FL2
Model PC1
Model ASP

Reviewed
Mag. July

GB's - ARE YOU MISSING OUT?

Unless you can monitor the other bands you are missing a lot. If you have 2 metre all-mode receiving set up, just add Model PC1 in series with its antenna and you have a superb general coverage receiver. What better way to listen in to all the non-VHF amateur bands, not to mention everything else from 60 kHz to 30 MHz? For sheer value for money there is no better way to get high performance general coverage reception. After all what a waste it is if your expensive 2 metre all-mode rig covers one band only!

ATTENTION VHF SCANNER OWNERS! Did you know that Model PC1 will extend the coverage of your SX 200 type scanner to include all the long, medium and short wave bands as well? This is an excellent way to listen to your favourite short wave broadcast stations without the extra expense of a complete new receiver.

MINIATURE RECEIVING ANTENNAS

If you don't have enough space to put up traditional receiving antennas, our active antennas are the answer. They need no tuning yet have constant sensitivity from 200 kHz to well over 30 MHz. Results are quite comparable to full size conventional antennas but the space saving is enormous. The indoor version (AD270) is 3 metres long and the outdoor version (AD370) is 2 metres long. A TV-type feeder cable of any reasonable length can be used yet because the antennas are balanced dipoles any interference picked up by the feeder is rejected. Because of their wide frequency coverage Datong Active Antennas are ideal accessories for modern general coverage communications receivers.

Model AD370



Model DC144/28

YET ANOTHER 2 METRE CONVERTER?

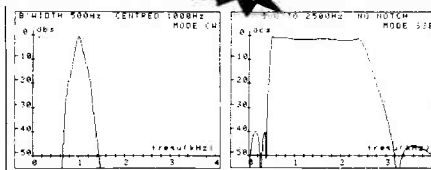
Yes but not just another. Model DC144/28 is designed to overcome the overload and spurious signal problems experienced by conventional converters. It uses a Schottky diode balanced mixer with about 7dbm of local oscillator drive. This, coupled with a 3SK88 r.f. amplifier, gives an excellent combination of low noise figure and strong signal handling capability. Its input and output gain controls also help you get the best out of your main receiver without flattening it with excessive gain. Model DC144/28 is available either as a complete cased unit (die cast box, SO239 connectors) or as a ready built and tested PCB module.

MODEL D70: THE GO-ANYWHERE MORSE CODE TRAINER

For building up your morse code reception speed there is no better method than the Datong "Morse Tutor". You learn the code with the characters at normal speed but with an extra delay between each one. As you improve you reduce the "DELAY" control until, with it fully reduced, you find you are reading code at the chosen speed and with correct spacing. An important feature is that the unit is completely portable. This allows you to practise wherever and whenever you find it most convenient. The all-CMOS design gives about 60 hours of practice from a lowcost PP3.



Model D70



VARIABLE SELECTIVITY FOR ANY RECEIVER
Have a look at these curves (and the others in our data sheet) and you will see why a U.S. reviewer commented that the FL2 is "incredible - it's like having a tunable crystal filter!"

With Model FL2 connected in series with your speaker you can wipe out off-tune "monkey chatter", unwanted tones and sundry "burbles" from SSB, while for CW the ultra-sleep skirts allow you to use wider bandwidths for a given rejection of off-tune signals. This makes tuning easier and reduces listening fatigue. Model FL2 costs little more than a single special accessory filter yet it offers better performance, extreme versatility, and can be used with any receiver.

*R. S. Dicks, 73 Magazine, July 1981 p 119.



Model FL2

Products not shown in this advertisement
Model Datest 1 Transistor Tester
Model Datest 2 Transistor Tester
RF Speech Processor Model D75
Model RFC/MRF. Speech Processor PCB Module
Model MPU Mains Power Unit
Accessory Leads
Model VLF
Model FL1

NEW PRODUCTS PREVIEW

- Model DF1**
Direction finder attachment for FM, VHF receivers/transceivers, gives directional readout on circle of LED's. Connects to loudspeaker and antenna jacks.
- Model RFA**
R.F. switched broadband preamplifier. Boosts gain and noise figure of receivers from 30 to 200 MHz.



INGENIEURBÜRO ULRICH HANSEN

VHF & UHF PREAMPLIFIERS: A range from Ulrich Hansen of West Germany. A range of high quality in-line preamplifiers for 2 metres or 70 cms. featuring ultra-low noise figures and state-of-the-art design. The range includes R.F. switching capability from 60 watts P.E.P. to 500 watts P.E.P. and choice of silicon low noise devices or the latest gallium arsenide MESFETs for the best possible noise figure. Indoor or mast mounted options are also included. Full details free on request. These units represent a cost-effective way of improving your DX receiving capability.

PRICES: All prices include delivery in U.K. basic prices in £ are shown with VAT - inclusive prices in brackets.

FL1	59.00 (67.85)	VLF	22.00 (25.30)	AD270	33.00 (37.95)	MPU	6.00 (6.90)
FL2	78.00 (89.70)	D70	43.00 (49.45)	AD370	45.00 (51.75)	DC144/28	31.00 (35.65)
PC1	105.00 (120.75)	D75	49.00 (56.35)	AD270 + MPU	37.00 (42.55)	DC144/28 Module	25.00 (28.75)
ASP	69.00 (79.35)	RFC/M	23.00 (26.45)	AD370 + MPU	49.00 (56.35)	Keyboard Morse Sender	140.00 (161.00)

DATONG ELECTRONICS LIMITED
Spence Mills, Mill Lane, Bramley, Leeds LS13 3HE, England. Tel: (0532) 552461

WATERS & STANTON ELECTRONICS

18/20 MAIN ROAD, HOCKLEY, ESSEX. Tel: (0702) 206835

INTRODUCING AZDEN PCS 3000



ONLY £219

142-150MHz option

DON'T FORGET

THE ANNUAL AMATEUR RADIO RETAILERS ASSOCIATION EXHIBITION HAS BEEN MOVED FROM LEICESTER TO CASTLE DONINGTON (ADJACENT M1)
DATES: — 29, 30, 31 OCTOBER

At last here is a fully synthesised 2m FM mobile rig with full band scan and eight channel memory — AT A SENSIBLE PRICE! The fabulous AZDEN PCS 3000 is a new 25 watt transceiver which combines the latest technology inside with an easy to use exterior.

★ The front 2½ inches is completely detachable and with the optional extra cable kit, the main unit can even be mounted in the boot! YOU NEED NEVER BE AFRAID TO LEAVE YOUR CAR IN THE CAR PARK AGAIN!

The control head fits easily into your briefcase, jacket pocket — even the wife's handbag!

- ★ Full 144-146MHz coverage in 25kHz steps or 12½ kHz option.
- ★ Computer controlled touchpad for frequency selection.
- ★ Multi function microphone gives up/down tuning and memory recall.
- ★ Repeater shift and tone burst.
- ★ Complete with mobile bracket, microphone and leads.
- ★ Control buttons back lit.

NEW ITEMS NOW AVAILABLE:
Yaesu FT290, FT208, Trio TS530S, TR7850, TR9500, TR8400.

INTERFERENCE?
HP4A FILTER
NO MORE TVI FROM CB OR AMATEURS
The HP4A provides a highly effective solution to TVI and simply connects to any UHF TV receiver.
Global HP4A £5.95 Post free.

BRAND NEW ITEM
Global PS-15 Power Supply Unit
12-15v.
5.2A (5.8 max.)
with volts/amps meter
Price £31.95

SHORTWAVE LISTENER A.T.U.
GLOBAL AT1000
£31.95 carriage free
The ultimate in ATU's, specially designed to enhance the performance of all short wave receivers — no other model can approach its performance.

ARE YOU THINKING OF TAKING THE RADIO AMATEURS EXAM?
There's only one way to learn procedure — Listen in!
FDK TM56B
£89 inc. VAT + delivery.

The TM56B is a highly sensitive VHF monitor receiver for listening to the popular 2 metre FM transmissions from radio hams throughout the U.K. Hear your local amateurs transmitting from their cars, from home, or through one of the many repeaters sited around the country. 230v AC or 12v DC operation is possible, and a built-in auto-scan circuit monitors 4 priority channels. The receiver is supplied with the ten most popular channels fitted. Extra channels are available at £3 each.

SPECIAL OFFER WITH EVERY TM56B ORDERED THIS MONTH WE WILL SEND YOU A COPY OF THE AMATEUR RADIO EXAMINATION MANUAL — FREE!

MONDAY — SATURDAY 9 - 5.30

WATERS & STANTON ELECTRONICS

EARLY CLOSING WED 1.00 p.m.

WARREN HOUSE, 18/20 MAIN ROAD, HOCKLEY, ESSEX

Telephone (0702) 206835/204965

Telex 897406

PHONE ORDERS

ACCESS

BARCLAYCARD

MAILORDER

RETAIL CALLERS

MAIL ORDER SLIP to: Waters & Stanton Electronics, Warren House, Main Road, Hockley, Essex. "Such Friendly People"

Name Goods required

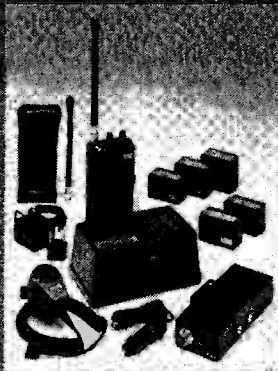
Address

Please rush me the above. Cheque enclosed for £

Please charge to credit card No.

Thanet Electronics

IC-2E



The Largest Selling Amateur Transceiver in the World

CHECK THE FEATURES

FULLY SYNTHESIZED — covering 144-145.995 in 400 5kHz steps

POWER OUTPUT — 1.5W with the 9V rechargeable battery pack as supplied — but lower or higher output available with the optional 6V or 12V packs

ENC. ANTENNA OUTPUT SOCKET — 50 ohms for connecting to another antenna or use the Rubber Duck supplied

SEND/BATTERY INDICATOR — Lights during transmit but when battery power falls below 6V it doesn't light indicating the need for a recharge

FREQUENCY SELECTION — by thumbwheel switches, indicating the frequency

+5kHz SWITCH — adds 5kHz to the indicated frequency

DUPLEX SIMPLEX SWITCH — gives simplex or plus 600kHz or minus 600kHz Transmit

HIGH-LOW SWITCH — reduces power output from 1.5W to 150mW reducing battery drain

EXTERNAL MICROPHONE JACK — If you do not wish to use the built-in electret condenser mic an optional microphone/speaker with PTT control can be used. Useful for pocket operation

EXTERNAL SPEAKER JACK — for speaker or earphone

This little beauty is supplied ready to go complete with nicad battery pack, charger, rubber duck.

A Full range of accessories in stock.

ICML1

10 Watt Mobile Booster For IC 2E	£49.00
BP5 11 Volt Battery Pack	£30.50
BP4 Empty Battery Case For 6 x AA Cells	£5.80
BP3 Standard Battery Pack	£17.70
BP2 6 Volt Pack	£22.00
BC30 Base Charger For Above	£37.00
BC25 Mains Charger As Supplied	£4.25
DC1 12 Volt Adaptor Pack	£8.40
HM9 Speaker/Microphone	£12.00
CP1 Mobile Charging Lead	£3.20
LC 1/2/3 Cases	£3.50 each

IC-251E



IC-451



ICOM produce a perfect trio in the VHF base station range ranging from 50 Metres thru 2 Metres to 70cms. Unfortunately you are not able to benefit from the 5M product in this country, but you CAN own the 251E for your 2 Metre station and the 451E for 70cms.

Both are really well designed and engineered multi mode transceivers capable of being operated from either the mains or a 12 volt supply. Both contain such exciting features as scan facilities, automatic selection of the correct repeater shift for the band concerned, full normal and reverse repeater operation, tuning rate selection according to the mode in use, VOX, or SSB, continuous power adjustment capability on FM and 3 memory channels. Of course they are both fitted with a crystal controlled tone burst and have twin VFOs as have most of ICOM's fully synthesized transceivers. These two transceivers have now become really popular throughout the world — so why not pop a note on our ansafone for more details?

Thanet for



ICOM

See the final page of our advertisement regarding prices.



the amateur's professional friends

These excellent new products from Icom are now available, and it really looks as if they are going to prove winners as they seem to have everything right!

IC-290E

AVAILABLE NOW!



The IC-290E incorporates all the features you could want in a multimode mobile to make it easy to use when driving. A standard 800kHz repeater offset shift is built into its computer memory but if necessary this can be altered from the front panel by unusual shifts that may be required (such as say 1.5MHz for some transvertors). There are five programmable memories and these can be used in either simplex or duplex mode. Any one of these memories can also be designated as a PRIORITY CHANNEL which can be checked once every five seconds if you wish for that private message you may be expecting. Scanning can be controlled either from the front panel or from the HM10 microphone. There are options to scan the whole band, any selected part of it or just the memory channels. You do NOT lose the repeater shift when scanning or using either of the VFOs in simplex. Unlike many of its competitors you do have TWO VFOs which can also prove a very useful feature. Further improvements include a higher frequency readout, an LED bar-type S-Meter and power output meter and the ideal tuning rates of 25kHz per step on FM and 100Hz per step on SSB. Both these rates can be changed to 1kHz steps by use of the TS button on the front panel. For repeater operation both + and - shifts are available and it is possible to listen on the repeater input channel merely by pressing a button. Internal controls allow you to vary scan speed, scan delay times, etc. Semi break-in CW and CW sidetone are also available.

Put all these features into an attractive case, add the world wide renowned ICOM quality and performance, and you must see that this is the choice for you. And just as an extra, remember that you get a full two years warranty if you purchase your transceiver direct from THANET or one of our agents listed in this advertisement.

IC-25E

AVAILABLE NOW!



Again ICOM seem to have got everything right with its new 25W FM mobile. It is one of the smallest around and yet is packed with features which make it really handy to use while still maintaining the very high quality expected in ICOM transceivers.

Like its bigger multimode brother, the IC-25 has TWO VFOs, FIVE MEMORIES (which can be used in either simplex or duplex mode), a PRIORITY CHANNEL (which can be any one of the frequencies stored in the memories), full DUPLEX and REVERSE DUPLEX operation and a crystal controlled tone burst. Again the display is brighter and there is an LED-Bar-type S-Meter and relative power output meter. The choice of frequency steps is 25kHz and 5kHz. Like the IC-290 multi-scanning functions are available either from the front panel or remotely using the HM-10 scanning microphone.

Again we feel that this beautifully designed and constructed piece of equipment is bound to sell like hotcakes — and again remember that if you buy one directly from Thanet you will get a full two years warranty and any work will be carried out in our excellently equipped workshop. One of our engineers has been out to ICOM in Japan for a two week course to learn the 'tricks of the trade'.

What about other new products — well you may well ask but we won't be giving too much away just yet. But how about a 70cm version of the IC-2E and a fully automatic antenna tuner to start off with?

Buy direct from us and get two years warranty on all equipment and benefit from our superb technical experience and after-sales service

Thanet for ICOM

143 RECVLVER RD., BELTINGE, HERNE BAY, KENT. Tel: 02273 63859

See the final page of our advertisement regarding prices.

Thanet Electronics

£599
incl.



Following the success of the Tono 7000E communications computer, we are now able to announce the arrival of a completely new machine on the market. The CWR 685 Telereader.

Best features are — Transmits and receives (via a suitable transceiver) CW, RTTY and ASCII — Built in 5" green display monitor. It will handle the alphabet, numerals, symbols and special codes on CW. On RTTY — 5 unit baudal (CHT 2). On ASCII the standard 7 unit code.

Speeds — CW — 3 wpm to 50 wpm with automatic follow up. RTTY and ASCII — 45.45, 50, 56.88, 74.2, 110 and 300 bauds. (300 bauds speed is possible when external modem or TTL input is used)

Input — AF input for CW, RTTY and ASCII at 600 ohms (useable from 8 to 1000 ohms) 30 mv. to 2 v. TTL input RTTY and ASCII and can be used for RS232C interface. At frequency of 800 Hz ONCW with an active PLL filter.

Display output — RF output and composite video output 1V P-P 75 ohms.

Printer interface — Centronics compatible parallel interface built-in.

Output for oscilloscope — RTTY and ASCII impedance 200K ohms 1V P-P.

Number of characters display — 512 characters x 2 pages — total 1024.

Power source — 13.8 VDC

Complete with full size keyboard.

RECEIVE ONLY VERSION CWR 680 — £169 inc.

Tono Theta 7000E A great computer on offer from Thanet



£499
incl.

The new THETA means that every Amateur can enjoy the visual display of CW, RTTY and ASCII in both transmit and receive modes. Just connect the TONO to any TV set via the antenna terminals or to a page printer from the parallel port provided.

Bring up your CW speed in receiving or sending by either watching receiver sent or from recorded cassette. Connection to the transceiver is via the key, phone and mic sockets.

Some of the Outstanding Features

COMMUNICATIONS COMPUTER THETA 0.7000E

UHF and Composite Video Output Printer interface. Wide range of transmitting and receiving speeds 10CW speeds + 8RTTY. Built-in demodulator for high performance for 170.425 and 820 Hz shift. Crystal controlled modulator for ASFK Hi or Lo tone. Convenient ASCII key arrangement. Large capacity display memory.

— 2 pages 32 chr x 16 lines split screen to Rx and Tx if required. Automatic transmit/receive switch. Anti noise circuit. Battery backed up memory 7 channels of 64 chrs. Send function. Buffer memory 53 character type ahead, rub out function. Simultaneous access of the memory — 53 character type ah.

LF (line feed) cancel function. Cursor control CR/LF 172, 60 or 80 chrs per line. Echo function.

Word wrap around function. Transmit/receive in ASCII mode or RTTY. CW identification function. Mark and break (space and break) system. Monitor circuit & CW practice function. Variable CW weights. Cross pattern checking output terminal. log computer output provided. Test message function (Ry and @BF). Phone or write for the price list of accessories for this unit.

Prices of other Tono quality products



All inclusive of VAT.

Green Display Monitor CRT 120G

£119.00

Dot Matrix Printer HC-900

£425.00

Printer Socket SK7

£8.50

Linear Amplifiers:—

UC 70

£139.00

2M-50W (2m)

£65.00

2M-100W (2m)

£115.00

MR-150W (2m)

£159.00

MR-250W (2m)

£249.00

MR-28LB (26-30 mhz)

£65.00

Mast-Head Pre-Amps:—

RX 144 (including control)

£60.00

RX 430 (and psu box)

£65.00

THE PRICES MAY BE SUBJECT TO CHANGE, DEPENDING UPON THE STATE OF THE £.

Tel: 02273 63859

PROFESSIONAL EQUIPMENT FOR THE AMATEUR



IC-720A

IC-2KL



The main problem that the amateur of today has to deal with is deciding just which one out of the many excellent products available he is going to choose. Technology is advancing at such a rapid rate and getting so sophisticated that many cannot hope to keep up! Perhaps one way of dealing with the problem is to look at just what each model offers in its basic form without having to lay our ever more hard earned cash on "extras". The IC-720A scores very highly when looked at in this light. How many of its competitors have two VFOs as standard, or a memory which can be recalled, even when on a different band to the one in use, and reset in instant returning AND BANDCHANGING of the transceiver? How many include a really excellent general coverage receiver covering all the way from 100kHz to 30MHz (with provision to transmit) there also if you have the correct licence? How many need no tuning or loading whatsoever and take great care of your PA, should you have a rotten antenna, by cutting the power back to the a safe level? How many have an automatic RTT which cancels itself when the main tuning dial is moved? How many will run full power out for long periods without getting hot enough to boil an egg? How many have band data output to automatically change bands on a solid state linear AND an automatic antenna tuner unit when you are able to add these to your station?

Well you will have to do quite a bit of hunting through the pages of this magazine to find anything to approach the IC-720A. It may be just a little more expensive than some of the others — but when you remember just how good it is, and of course the excellent reputation for keeping their secondhand value you will see why your choice will have to be an IC-720A!

To compliment the excellent IC720A HF Transceiver ICOM have produced the IC2KL linear amplifier. It is of a similar size and matches the IC720A perfectly. It produces 500W output on SSB, CW, AM and RTTY, needing 60-100W of drive. As with the IC720A, it will operate from 1.0MHz to 30 MHz continuously at full output power, but you still need an antenna that matches. It will follow the IC720A, automatically changing bands WITH NO TUNING — the operating is done from the prime mover. This automatic facility can be overridden for use on rigs other than the IC720A, but can be added to the IC701 and the IC720. The IC2KL employs a heat pipe cooling system for the heat sink of the power transistors. This is a new technology used to transfer the heat to a high conductance, several hundred times that of copper and a very quick response. The use of this system enables a very compact design, for which ICOM is the leader. This advanced design includes protection circuits against Mismatching, Overheating, Overcurrent, Overdriving, Over Output Power, and the PA units unbalancing. Its spurious emissions are more than 60 dB below peak power output and third order distortion more than 30 dB below each tone of a two tone test, could a valve linear ever be as good as this? The IC2KL has a matching power supply the IC2KLPS delivering 40VDC at 25A continuous for 10 minutes maximum.

Thanet for ICOM

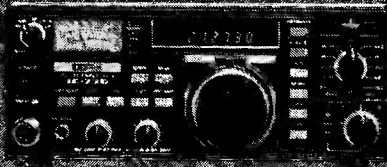
AGENTS (PHONE FIRST — All evenings and weekends only, except Barnsley and Burnley)
 Scotland Jack GMBGEC (031-665-2420) Midlands Tony G8AVH 021-329 2305 or 0874-3992
 Wales Tony GW3FKO (0874 2772) North West Gordon G3LEQ (Knutsford (0565) 4040)
 Burnley (0282 384811)



See the final page of our advertisement regarding prices.

TWO YEARS WARRANTY ON ALL EQUIPMENT

IC-730



ICOM's answer to your HF mobile problems — the IC730. This new 80m—10m, 8 band transceiver offers 100W output on SSB, AM and CW. Outstanding receiver performance is achieved by an up-conversion system using a high IF of 59MHz offering excellent image and IF interference rejection, high sensitivity and above all, wide dynamic range. Built-in Pass Band Shift allows you to continuously adjust the centre frequency of the IF pass band, virtually eliminating close channel interference. Dual VFO's with 10Hz, 100Hz and 1KHz steps allows effortless tuning and what's more, memory is provided for one channel per band. Further convenience circuits are provided such as Noise Blanker, Vox, CW Monitor, APC and SWR Detector to name a few. Provided the IC730 is kept connected to its supply, its CRU will remember your instructions — even when turned off. Built-in fan keeps the final cool and remember there is no tuning up to be done. A built-in Speech Processor boosts talk power on transmit and a switchable RF Pre-Amp is a boon on today's crowded bands. Full measuring, WWV reception and connections for horizontal and linear control almost completes the IC730's impressive facilities. Use this rig as a high class mobile or with a suitable 13v pen as your main base station. Give us a ring and ask for a full spec to be sent to you.

IC-202S



The IC 202S is a very well designed 2m SSB portable. It offers 3W pep output on USB, LSB and CW. Large Battery capacity (HP11 type) or Nicads if you wish. A special VFO circuit to provide smooth tuning and crystal stability needed for SSB operation on 2m. Each of the four 2000 Hz band positions allows operation anywhere in 2m (Supplied with 144.144.2 and 144.2-144.4). Top of the band Oscar xtal's available for "cross band working". It has a DC socket and 202S sockets for mobile or base station working. Horizontal and a 360 degree swivel. Mobile mounting brackets. Nicad packs, chargers, cases all available options. You must agree, a very versatile well proved rig. The 70cm twin of the 202S having many similar features covering the frequency range of 432-435.2 MHz. Their versatility is well worth an enquiry.

We apologise for not quoting prices this month, this is because at the time of writing this ad, the £ seems to be going down a hole and we don't know what it's going to do. Please contact us for up to the minute prices.

IC-24G



The famous IC240 has been proved, given a face lift and renamed the IC24G. Many thousands of 240s are in use and its popularity is due in part to simplicity of operation, high receiver sensitivity and superb audio on TX and RX. The new IC24G has these and other features. Full 80 channels (at 25KHz spacing) are available and received is by channel number — selected by easy to operate press button thumbwheel switches. This readout can clearly be seen in the torchlight of sunlight. Duplex and reverse duplex is provided along with a crystal controlled tone call HI-LOW and 10W RF output is available along with a 120KHz upshift should the new channel spacing be necessary. The old IC240 proved to be the most reliable rig we have ever sold — the IC24G has, since it is so similar, looks like following that tradition. Remember for mobile use a rig MUST be easy to operate to be sold. Send for technical details.

Remember we also stock
Yaesu, Icom, Daytona
Webb, G-Whip, Western
TTL, Bearcat
RSGB publications.

Thanet Electronics



143 RECVLVER RD., BELTINGE, HERNE BAY, KENT. Tel: 02273 63859

SHORT WAVE MAGAZINE

ADVERTISERS' INDEX

	Page
Amateur Electronics UK	402, 403
Amateur Radio Exchange	418
Amateur Radio Exhibition	445
Amateur Radio Retailers Association	<i>front cover</i> , 453
Amcomm Services	449
J. Birkett	459
Bredhurst Electronics	447
British National Radio and Electronics School	459
Catronics Ltd.	452
Colomor Electronics Ltd.	448
Datong Electronics Ltd.	409
Gemini Communications	450
G2DYM Aerials	456
G3HSC (Rhythm Morse Courses)	456
D. P. Hobbs Ltd.	460
K.W. Communications Ltd.	453
Lee Electronics Ltd.	457
Leeds Amateur Radio	454
Lowe Electronics Ltd. <i>inside front cover</i> ,	401
M&B Radio	450
M.H. Electronics	448
Northern Communications	457
North West Communications	458
P.M. Electronics Services	448
Quartslab Marketing Ltd.	452
Radio Shack Ltd.	408
R.T. & I. Electronics Ltd.	455
S.E.M.	458
Small Advertisements	454, 455, 456
South Midlands Communications Ltd.	404, 405, 406, 407
Spacemark Ltd.	460
Stephens-James Ltd.	446
S.W.M. Publications <i>back cover</i> , <i>inside back cover</i> ,	455, 456, 460
Thanet Electronics Ltd.	412, 413, 414, 415, 416
T.M.P. Electronics	460
Tuition	460
Uppington Tele/Radio (Bristol) Ltd.	448
Reg Ward & Co. Ltd.	459
Waters & Stanton Electronics	410, 411
Geoff Watts	456
Western Electronics (UK) Ltd	450, 451
W. H. Westlake	448
Williamsons	456

(GB3SWM)

ISSN: 0037-4261

Vol. XXXIX

OCTOBER, 1981

No. 456

CONTENTS

	Page
Editorial — Exhibitions	419
Communication and DX News , by E. P. Essery, G3KFE	420
A Speech Amplifier with Tone Burst , by I. D. Poole, G3YWX	422
Circuit Operation and Alignment of the FRG-7 Receiver, Part II , by J. L. Linsley Hood, M1EE, M1MC	424
Simple L-Section Impedance Matching , by Ian H. Moth, B.Sc., G4MBD	427
The Visitune , by J. Brown, G3LPB	429
Clubs Roundup , by "Club Secretary"	433
Quick Two-Metre Gutter Mount Antenna , by J. V. Moss, B.Sc., G4ILO	438
Some Good Turns	438
"A Word in Edgeways" — <i>Letters to the Editor</i>	440
VHF Bands , by N. A. S. Fitch, G3FPK	441

Editor: PAUL ESSERY, G3KFE/G3SWM
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: £7.50, 12 issues, post paid
Overseas: £7.50 (\$17.00 U.S.), post paid surface mail

Editorial Address: Short Wave Magazine,
34 High Street, Welwyn, Herts. AL6 9EQ, England.

Prices shown in advertising in this issue do not necessarily constitute a contract and may be subject to change.

AUTHOR'S MSS

Articles submitted for Editorial consideration must be typed double-spaced with wide margins on one side only of A4 sheets. Photographs should be lightly identified in pencil on the back with details on a separate sheet. All drawings and diagrams should also be shown separately, and tables of values prepared in accordance with our normal setting convention — see any issue. Payment is made for all material used, and it is a condition of acceptance that full copyright passes to the Short Wave Magazine, Ltd., on publication.

Short Wave Magazine Ltd.

E. & O. E. VAT Reg. No. 239 4864 25

417

AMATEUR RADIO EXCHANGE



October again, and that means Leicester Exhibition time. This year — for rather complicated, "political" reasons — there will be two shows in the month, the official A.R.R.A. one, and the independent one in the Granby Halls on 23rd, 24th and 25th October where we shall be exhibiting. For 1982 we hope that this rift in the industry will be healed and that ALL retailers will have the opportunity of showing together under one roof at the same time. Because only in that way can you, the radio enthusiast, really choose your

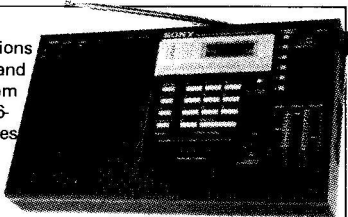
equipment properly, with all the makes, all the models, side by side . . . to try for yourself and decide which suits you best. But then, that's the choice we've always tried to give you at Ealing . . . at rallies up and down the country . . . and now at our new branch in St. Helens too . . . the best range, and the best deal!

Brenda (G8SXY) and Bernie (G4AOG) look forward to welcoming you to their Stand at the Granby Halls.

SONY ICF-2001

This unique HF communications receiver with keyboard entry and LCD covers AM/SSB/CW from 150kc to 30MHz and FM from 76-108MHz with six station memories. A masterpiece of compact modern technology at only

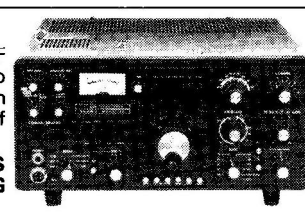
£159.



FT-101 Mk.III

The tried and tested Yaesu HF base station, now with audio peak filter and reject/notch filter as standard, and choice of AM or FM.

PHONE FOR PRICES INCLUDING FREE COOLING FAN AND MIC.



TWO SUPER-VALUE SCANNING RECEIVERS

Top-grade technical specifications and very special prices make this an opportunity not to miss.

MR-1000A

VHF FM pocket-size scanner, 10 channels, and allowing scan or manual tuning across selected crystal-controlled channels. Complete with Nicads and charger.

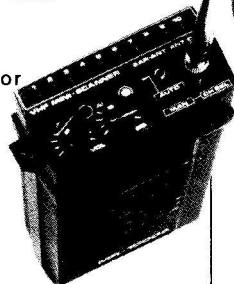
SPECIAL POST-FREE PRICE OF £39 INCLUDING 10 CRYSTALS (from stock only) OR JUST £29 WITHOUT CRYSTALS.

MK-10

VHF FM scanning receiver covering 144-152 MHz. Scan or manual tuning through up to 12 crystal-controlled frequencies. OR VFO control on main dial. Automatic lock-out facility. Sensitivity 1µv (25db S/N). 12v only.



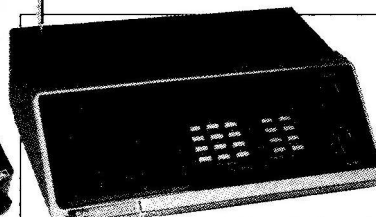
SPECIAL POST-FREE PRICE OF £69 INCLUDING 10 CRYSTALS (from stock only) OR JUST £59 WITHOUT CRYSTALS.



BEARCAT 220FB

The super scanner which brings you all the excitement of the VHF and UHF frequencies . . . aircraft, marine, amateur, plus so much more.

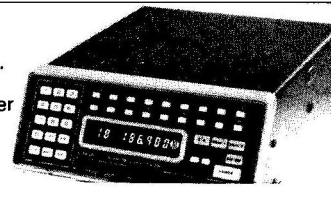
£258.75 inc. VAT



SX-200N

Another of our sophisticated scanning receivers. Similar functions to the BEARCAT, but even wider coverage, and with AM and FM right across its range.

£262.75 inc. VAT



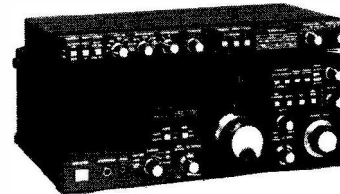
FRG-7700

Yaesu's latest receiver with FM right across the band now offers all these optional extras ● Memory facility ● FRT-7700 Aerial Tuning Unit at only **£34.75** ● Four VHF converters running from 50MHz up to 170MHz.

BASIC RECEIVER £299 inc. VAT and FREE HELISCAN AERIAL.

Converter specifications ● **Phone for prices.**

FRV-7700A	118-130MHz	130-140MHz	140-150MHz
FRV-7700B	118-130MHz	140-150MHz	50-60MHz
FRV-7700C	140-150MHz	150-160MHz	160-170MHz
FRV-7700D	118-130MHz	140-150MHz	70-80MHz



YAESU'S LATEST

. . . the new all-mode 2m portable FT-290R. So many features ● 10 memories ● Memory scan ● 2 VFOs ● Band scan ● Clarifier ● FM/LSB/USB/CW ● LCO readout ● Real S-meter ● Priority channel ● 2.5W out. **PHONE FOR PRICE**



LICENSED CREDIT BROKERS * Ask for written quotation.
INSTANT HP AND 6-MONTHS NO-INTEREST HP TERMS AVAILABLE
FOR LICENSED AMATEURS AND BANK/CREDIT CARD HOLDERS



Credit card sales by telephone

Because of currency fluctuations etc. some prices are unknown as we go to press, and others may vary by publication date. Please phone for latest information. All prices include VAT, but p&p/carriage are extra.

2 NORTHFIELD ROAD, EALING, LONDON, W13 9SY.
Tel: 01-579 5311 Closed Wednesday, but use our 24-hour AnsaFone service. So easy for Overseas visitors. Northfields is just seven stops from Heathrow on the Piccadilly Line.

136 GLADSTONE STREET, ST. HELENS, MERSEYSIDE. Tel: 0744 53157
Our North West branch run by Mike (G8EWU). Just around the corner from the Rugby Ground.

FOR THE RADIO AMATEUR AND AMATEUR RADIO

The SHORT-WAVE Magazine

EDITORIAL

Exhibitions

Once again the autumn exhibition season is nearly upon us, with two important ones at the end of October. These are the Amateur Radio Exhibition at the Granby Halls, Leicester, October 23/24/25; and the 10th A.R.R.A. Exhibition, at its new venue Donington Park, October 29/30/31. Sadly, we shall not be having stands at both of them, for the reason that they occur so close together: we cannot maintain our production schedules and spare such a relatively large chunk of total staff-time away, all at once. However, we shall be at Donington (we received their invitation first!), but we wish every success to the Leicester exhibition – which we shall be visiting and reporting on.

If you have the time, both exhibitions should be well worth a visit.

While at Donington we shall be looking forward to meeting friends old and new; and of course we shall have plenty of copies of the *Magazine* for sale on our stand. This brings us to our next point which is that nowadays *S.W.M.* is posted, both to direct subscribers and newsagents, well before publication date, so that the great majority of subscribers receive their copies 'on the dot'. Regarding bookstall copies, however, we do know that there are some readers who have considerable difficulty in obtaining their copies on time from their newsagents, which is usually the result of a delay between wholesaler and retailer – and about which we can do very little. We know that sometimes weird and wonderful tales are told to angry readers about the non-arrival of their copies! Not that this means to imply that the news sale trade as a whole doesn't give readers (and us) good service, because indeed it does.

But if you can't get your *Short Wave Magazine* without threatening your newsagent to a duel, why not take out a subscription? At least that way you'll ensure as far as possible that you get your copy on time. Think about it – and we'll have plenty of subscription forms at Donington!

*Bill
Adkins
G3KFE.*

WORLD-WIDE COMMUNICATION

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

AS THIS comes to be written, the nights are drawing in, the mists hang over the water at night, and the change from summer to autumnal conditions alters our expectations of the bands. But, of course, expectations are funny things; like at long last we made our decision as to which tree exactly the new Top Band aerial would be attached to . . . only to find that our tame archer has cracked a thumb on one side and dislocated his shoulder on the other!

News

Firstly, that Andaman operation signing VU7AN; it would appear that it was a couple of JAs stationed in India and holding VU calls. K5VT worked 'em from Seychelles and the beam was in the right direction . . . but there is at the time of writing some indication that the documents were not so hot.

The San Felix business seemed to be pulling together and the problems of gear had, we understand, been ironed out. There remained the question of U.S. licences for the SV chaps on the trip, and if these were not forthcoming in time there were some Ws standing by to replace them.

We must now turn to the question of the Burma operation, XZ5A and XZ9A. There is no argument that the stations are there and active, but there is also no argument that the stations were not licensed by the central government of Burma, but by the local province governors. Point number three is that they have been on the air for a long time, and no-one seems to have jumped on them for piracy, which argues that the local authority permission is valid in the eyes of the locals. *But* ARRL has been told that amateur radio is still forbidden in Burma and therefore it would seem that anyone working them hasn't got a legal Burma QSL to show for it. It seems to this old greybeard that ARRL could well do to sit back and shut up rather than involving the State Department of the U.S.A. in piddling enquiries of this nature. If they did, then maybe they would have time to put ear to receiver and listen to some of the "list" jobs – and then to bar any "QSO" with a DX station arising from the operation of a list. If it takes a station an hour to make a list of sixty stations, then the DX station should be able to shift more than that *on its own account*, certainly on the HFs. There may be some justification for the old LF DX nets, but even there we doubt if the arguments in favour are

valid. After all, sixty an hour wouldn't rate the winner's listing for any of the major SSB or CW contests.

Letters

A thin pack this time, with most of the regulars on holiday. However, the common factor seems to have been the ire of the writers over the problem of CB stations spreading over into Ten – "the band the amateurs don't use". It has been increasingly evident that many of the now illegal CB-ers are going to remain illegal (in that they have openly declared they don't intend to pay for a licence when it becomes available), and that it therefore follows that they aren't going to be put off operating on Ten by the fact that it isn't their band. The Home Office has done little save wring its hands, while awaiting a directive from the Government, RSGB can't do more than make rude noises at the Home Office; and letters to MPs are answered after a time by an apologetic note and a copy of the letter the MP has received from Timothy Raison – and that letter from Mr. Raison is a standard and a bromide. None of them know what to do about the situation they are faced with.

Top Band

Now here is an interesting band, and it is all the more frustrating to be able to read about all the DX, to have a good site and a rig available, and yet not be able to get the aerial up until our archer recovers his mobility and returns from his holiday. Such is life.

G4AKY (Harlow) still confines his operating to the hours around midnight and on, for how long on a particular night depends on the fell for conditions. Again this month five out of the six continents were worked, but Dave notes, like so many of us, that conditions are changing with the season. In the gotaway line there were EZ6DAD and VO1HP, while CW made it to the following: PY1ARS, PY1ZAE, LZ1KDP, LZ1KSN, UK6DAJ, EZ6GAW, RG6GAW, RG6GBX, UL7CBM, UL7PBY, EZ9ABW, UA9AMH, UA9SAX, UK9UBC, C31LM (QSL *via* EA3BDW), FC0GQQ (QSL to DJ6ZM), DL8NU/OH0, GJ3OQR, LU9EIE, OY7ML, ZD8TC, and VE1ZZ. SSB was also tried, to work GD4BEG, GJ3VLX, and OH5NG.

Next we come to G2HKU, who reports his ankle repairs are well in

hand; but it seems the doctor suggested a body transplant and the XYL suggested a head transplant, which sounds as though they are a sympathetic lot on Sheppey! Just to add insult to injury, the wasps came back, and before he could get at them they dug-in over the kitchen door and *inside* the eaves, and seemingly not going to move for anything short of dynamite! We would suggest poking a couple of aerial-ends into the next and a quick CQ – that should shift 'em (and maybe get some DX too). Legpulling apart, Ted offers SSB to PA0PN, PA0ZQ, and PA0WVV; and CW managed SP1DA, E19J, OE9SLH/3, UT5AB, and, again, E19J.

Ten

Here of course the Sporadic-E manifestations haven't helped, insofar as it has brought loads of CB-ers onto the band and on occasion buried the "proper" DX. G3ZPF (Dudley) reckons that if the Home Office asked magistrates always to exact the maximum penalty (four hundred quid and seizure of the gear) they'd soon be in profit; meantime, SSB manages to get out to PT7YS, C31LM, G3MUV/CE0, VK6PM, VK6NS, ZB2FK, and VE3NFR/4U who says he counts as YK and is operating from the Golan Heights . . . Turning to the CW, we note HB0ALO, DL2VK/ST3, XT2AW (for an all-band, all-time new country), LU8DQ, and LU1AO. The adhesive of the G3ZPF fingers wasn't quite sticky enough all the time, as he failed to land S79WHW.

G2HKU used his QRP CW rig to work just the one station, namely YU3TLZ.

From Newbury, G3OUC reports on the results obtained with his home-brew 40 watts input SSB rig, all solid state, used with a mobile whip from the Ford Escort: ZS1ES, ZS1CS, RQ2GGI, 4X6DS, 4X6AS, C31NL, A4XGC, UA9CFC, ON5JE/P/IS, and loads of Spanish and German stations. Pat has a new angle on the problems of the CB invasion; apart from the normally expected QRM from them, they are often to be found operating from the "good sites" locally, which puts the QRM onto an unpleasantly close footing. Were that not enough, a local SWL has just obtained G4MLG – and by local Pat means next door! This gets interesting when they both take part in the local Sunday Top Band net! But the

best of luck to them both.

On now to G4HZW in Knutsford, who has a two-element home-brew quad at 24 feet, fed with a TS-820. Ten wasn't all that good during the month but in the few days before writing things picked up no end, with ZS6BRK, OD5QR who used to live in Knutsford, VK6NS, VK6NXX, UJ8JKO, 5H3TM, VE3NFR/P/4U, OA4AXK, 8R1J, WB0VHH, G3MUV/P/CE0 (Easter Island), VK3KBC, the first JAs of the season on August 29, UA9CIY, P29CH, A4XGY, FP8HL, more VKS, VP8QG, and five minutes before the letter was started N6COV was worked for an hour in a band full of W6/7s.

G3NOF is another to observe that things are picking up a bit. Don mentions SSB contacts with A4XGC, FP8HL, JA5AQC, JH3CGR, JR6MBW, PT7RNP, PY2ABO, RF6FFT, VE3NFR/4U/YK, and a shoal of Ws, including WD0BFT in Colorado, plus XZ9A and 4X6CA.

21 MHz

We had to chuckle at the letter from G3ZPF in Dudley; David found Ten dead so went up to 21 MHz and raised a couple of JAs. Fired with ambition, he decided to join the pile-up on FO0FB. This gave him the pleasure of seeing his target "slipping like the bride of Orpheus, gracefully but inexorably into the murk". Such lyricism! There was some of a different sort when, having rather mis-used the TS-520 some bulbs needed replacing and it took an awful long time to find out just how to achieve the desired end; and as no bulbs were available from the local dealer, David swapped some good ones over only to have them also curl up, for some more Anglo-Saxon language. So—at the second try . . .

All QRP at G2HKU, and CW, for QSOs with LU8DYH and K8IF. Ted mentions a local CB merchant telling over the air where he lives, and where he keeps his 2½ kilowatt after-burner!

From G3NOF in Yeovil, we hear about his doings on the band; conditions were not so good as at the same time a year ago, the log says, particularly in the evenings. Mornings, however have seen some very good openings to VK and sometimes ZL; the North Pole route has been open around 0800z to KL7 and thence the Pacific, and East Coast Ws have been around between, say, 1100 and till band closure, while the West Coast stations have been around in the early evening albeit not as well as last year. As to Africans they have been heard around 1700z, in amongst YB, DU and VU. SSB QSOs were made with AH3AA, AH8AA, C31LM, DU1PJs, DU6RCL, FO0FB, G3WNZ/MM, G3JOA/TR8, HL9KH, HS0HS, JAs,

JT0LAJ, OH6JW/OH0, P29NGG, SV2JL/5, UK1PGO, VKs, VK2KE/MM off Timor, VK9NYG, VP8AGY, VS5DD, VS6JW, VU21OC, Ws, WA6HAE/HB0, YB8AEG, YU7QGC/HB0, ZS6BNZ, ZS6BSA, ZB2GR, 5T5ZZ, 9Y4TM, DA1CM/HB0 and DA1GE/HB0.

Contests

The Big Ones are almost upon us. Biggest of all, we hope, our own MCC—the dates are October 17/18 and detailed rules in the September issue on p. 379.

From W1WY, as always, we get the good gen on all the contests that matter. October 11 sees the RSGB 21/28 MHz contest, and earlier in the day the 21 MHz CW contest which clashes as to date but not time with MCC.

The VK/ZL contest this year has its Phone leg on October 3/4 and CW October 10/11, in each case starting 1000 GMT Saturday till 1000 on the Sunday. Score two for VK or ZL contacts, one for anyone else in Oceania, and the usual serial number starting with 001. Multiplier is the sum of the VK/ZL call areas worked on each band. Logs to be in the hands of the contest committee by January 31 1982, with the usual declaration, addressed to WIA Contest Committee, c/o Neil Penfold, VK6NE, 388 Huntriss Road, Woodlands, 6018, West Australia.

The CQ WW DX Contest is also upon us, the Phone leg being on October 24/25, and the CW November 28/29. Rules as last year, but a couple of clarifications appear. Copy or computerised logs will be acceptable but it is open to the contest committee to call for the original if they wish to check further. An extension of time on the deadline for logs is also possible provided there is a written request and if the circumstances are considered by the committee to justify the request. Logs to go direct to CQ Contest Committee, 76 N. Broadway, Hicksville, NY 11801, U.S.A., and be clearly marked on the outside as "CW" or "Phone". Note this is not the addressing arrangements used last year but a reversion to the earlier system.

The ARCI QRP contest is on the same weekend as MCC; from noon on the Saturday to 2359 on the Sunday, and this year they have come down to acceptance that QRP is five watts or so. Contacts with a member count 5 points, with non-member two points, with stations outside W/VE four points and with Novices three points. Same station may be worked on each band for multiplier and QSO points credit. The exchange will consist of RST and State, Province or Country, members add their membership number, non-members their power *output*. There is a power multiplier of $\times 10$ below one watt, 1-2

watts $\times 8$, 2-3 watts $\times 6$, 3-4 watts $\times 4$, and 4-5 watts $\times 2$. In addition bonus multipliers are available: $\times 2$ for solar or wind power, $\times 1.5$ for battery power. Score is QSO points times (states + provinces + countries) times power multiplier times bonus multiplier. Favoured frequencies to look for contacts are: 1810, 3560, 7040, 14060, 21060, 28060 kHz, and VHF. Logs to be received by November 20, to William Dickerson, WA2JOC, 352 Crampton Drive, Monrow, MI 08161.

"CDXN" deadlines for the next three months—

November issue—October 1st
December issue—November 5th
January issue—December 3rd

Please be sure to note these dates

Eighty

Not many reports this time. G2HKU worked RK9XBB with the Big Rig, and then took to QRP to work G3RJV and G3PDH.

G2NJ (Peterborough) notes that he has again been able to have a session of CW and VHF mobile operation, with G5NX at the wheel, operating the Uniden rig from the back seat. G2NJ/M on CW is a sure way to get a pile-up going. On another occasion, G2NJ was at home but in QSO on CW with G5NX/M, while the latter was *en route* between Sheringham and Newark: for G2NJ the description of the aircraft lined up while G5NX was passing Cranwell brought back memories. Cranwell, of course, was the original home of the R.A.F. Amateur Radio Society in the pre-war years and indeed for a long time after the war, before it was moved to its present location at Locking. On a totally different tack, Nick observes that G3RJV in his recent offering mentions the W3EDP aerial, and he says he used it often on 7 MHz pre-war and on occasion after; and a recent CW QSO with GW6AQ indicates he is another W3EDP aerial addict, having used it to work a *lot* of DX on eight watts of CW.

Twenty

On the few occasions your conductor has been able to look in the mornings, it has been its usual bright and perky self—far more pleasant than the evenings and the attendant QRM!

Let G2HKU take up the cudgels first—he needs practice if he is to deal with those wasps! Ted starts with SSB, which mode was used to work 7X2AC, ZL1VN, ZL3SE, ZL3FV, G4LBK/MM

who was near the coast of Spain, K5VRX/SV5, KV4AA, IE9UZA, and VP2MIX; CW managed LU2KO and SV1NA/9, and the QRP CQ hooked LU2KO again and also UH8HBZ.

From 0600z says G3NOF, the band has been good to W6/7, followed a little later by the VKs on Long Path who remain until about 0900. Around 0800 some over-the-pole openings to KL7 and the Pacific, plus ZL, were observed. In the matter of action, Don scored with AH3AA, CE0AE, FK8DD, HB0AQW, IE9UDB, IE9UZA, IT9HLO/IF9, J3AAE, J88AB, JX7FD, KH7FD, KH3AB, KH6LW/KH7, KH6MD, KL7G, KS6DV, TG9NX, TIIFAG, UK1PGO, VE7CWG, VKs, VK2AGT/LH on Lord Howe Is, VK9YC, VS5DD, WA4YPJ/AM, W6s and 3X1Z.

Forty

Sadly neglected, we feel, but having said that we must admit to not having turned to it this time for even a quick listen. On the other hand, a competent observer in the shape of G3NOF did investigate the state of things, largely to

improve his country score on that band, and he heard A4XGC, and made SSB contacts with CN8CU, LU6FAE, VE1KG, VP2MCK, and UA9TE, all between midnight and 0100z. On a different note, G3NOF confirms the remarks of G3PKS last time round about odd fading, and adds an observation of his own, which is that the band will fade right out around 1200, and make a return to life again about an hour later.

Looking at his letter, it seems that G2HKU is the chap who has done most on this band: SSB to RK9X/1, UR2TAX, UA3AKC, and UB5WCW, not to mention the CW obtained for calling PY1MAG, UA9SGW, UL7CAL, UK9ADS, and UA9SHU. Then there was the QRP CW, and this managed to find its way to HB0ALO, UP2BCG, and UL7JAW, the power input being just four watts.

Here & There

We've already mentioned the Andaman's operation; well, we now have it for sure they weren't licensed, and the same goes for their appearance

from the Laccadives.

Again some late news, which indicates the San Felix operation has hit snags – possibly political – and that they may have to postpone, or even reverse, the operation, with Juan Fernandez first and a final quick blast from San Felix, which might be both very quick and possibly even all-CW.

On the other hand, K5VT did manage to get his permit and person on from S9VCT although it was understood to have been brief.

Old-Timers will need no reminder that W4BPD is a lad to watch if he has owt to say about an expedition; he has indicated his presence at the DXPO 1981 in October, so his projected long round-the-world cruise and expedition has clearly slipped back a bit – like from July to November. We hope he won't sully his name with a busted flush.

Finale

Lots of reports, please, for next time – deadlines in the 'box', addressed to your scribe, "CDXN", SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ. 73 *es DX*.

A SPEECH AMPLIFIER WITH TONE BURST

I. D. POOLE, G3YWX

WHEN it was decided that the best way to get back on to two metres, after selling the previous rig, was to build a transmitter, thoughts went to the various options open for the individual sections: design the audio stage, experiment with various well known circuit configurations for the 8MHz oscillator, FM modulator and tripler, and then take the easy way out and drive this into a standard RF strip to give about 2 watts output at 144 MHz from the input at 24 MHz.

AF clipping was used in view of the good results which could be obtained using a minimum of components, provided that adequate filtering is provided after the clipper stage.

The accepted bandwidth for communications purposes is taken to be 300 Hz to 3kHz. In fact the lower frequencies contribute very little to the intelligibility of the signal, adding mainly to the naturalness. Accordingly it was decided to reduce the lower frequency response by staggering the breakpoints of the R/C networks used to control the low frequency response, so that it would fall faster below 300 Hz than above it. It was also thought that it would be advantageous to filter the high frequencies before clipping in order to reduce any intermodulation distortion caused by out of band frequencies, and to generally limit the overall high frequency response.

The clipping process not only introduces intermodulation distortion as mentioned earlier, but also harmonic distortion and the products which lie outside the permitted audio bandwidth must be removed. This is accomplished by using a low pass filter having a cut-off frequency of 3 kHz.

Tone burst was required as repeater operation was envisaged; a CMOS circuit which had previously proved to give good results was incorporated.

Circuit Description

The circuit, which is shown in Fig. 1, is designed to operate from a supply of around 12 volts, although this is not particularly critical.

The input stage consisting of TR1 and TR2 gives a fairly high input impedance for use with most microphones, and provides a gain of ten. The two RF chokes are included to remove any stray RF which may have been picked up in the microphone lead, causing instability. These chokes are constructed out of three turns of enamelled wire on a ferrite bead; C4 and C3 give roll off at high and low frequencies respectively.

VR1 provides pre-clipping gain control, and this is followed by a stage using a 741 operational amplifier in a non-inverting configuration, giving a gain of about 100. Therefore with VR1 fully advanced the gain should be more than enough for all but the most insensitive of microphones. This stage again incorporates filtering at low and high frequencies, and this is accomplished by C7 and C8.

The output from this stage is applied to D1 and D2 which symmetrically clip the signal applied; the signal output after clipping is about 1.2 volts peak to peak. This is passed through a low pass filter consisting of R13 and R14, and C11 to remove some of the unwanted distortion products. Further reduction of the unwanted distortion products is provided by C12. IC2 not only serves to amplify the signal, reduce unwanted high frequencies,

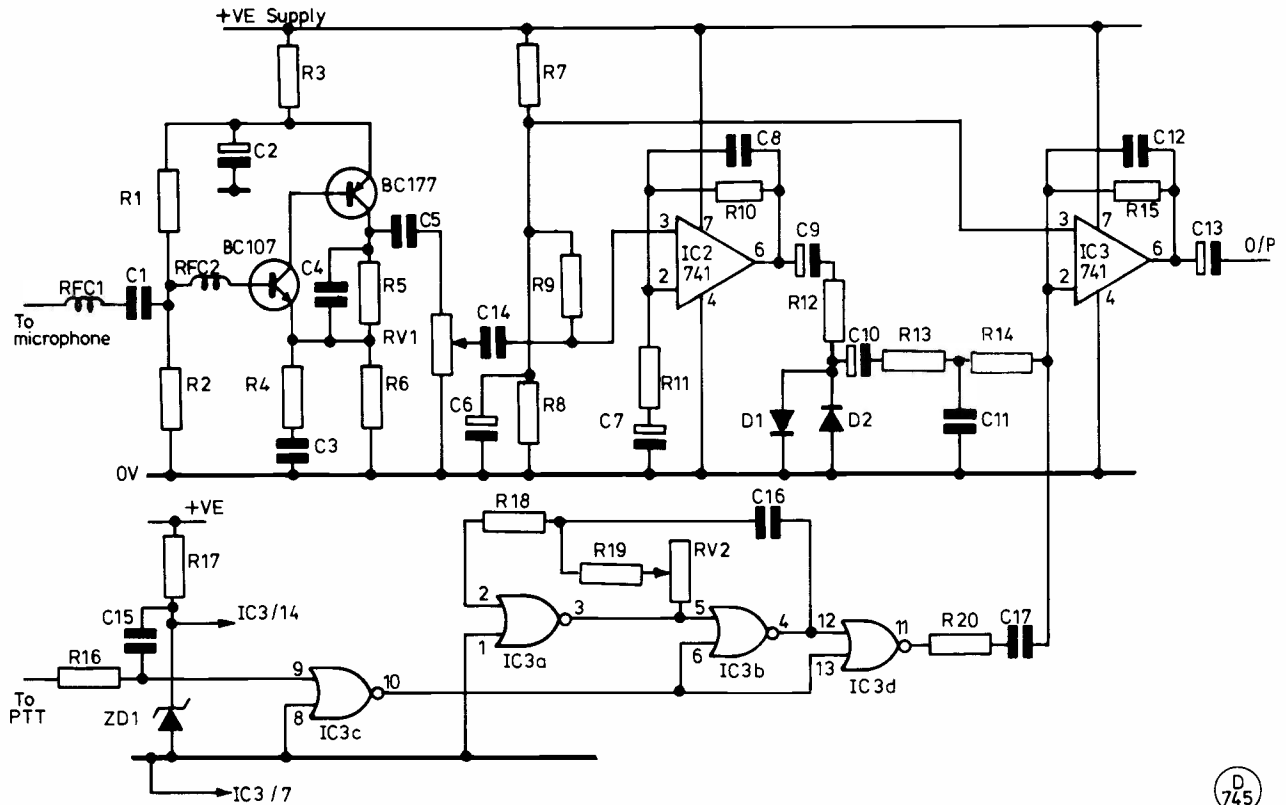


Fig. 1

D
745

Table of Values

Fig. 1

- | | |
|-------------------|----------------------------------------------------|
| R1, R9 = 82K | C1, C4, C5, C14, C16, C17 = 0.01µF |
| R2 = 33K | C2, C6, C7, C9, C10, C13 = 25 µF |
| R3 = 8K2 | C3, C15, = 0.1 µF |
| R4 = 470R | C8 = 330 pF |
| R5, R6 = 4K7 | C11 = 0.047 µF |
| R7, R8, R15 = 10K | C12 = 4700 pF |
| R10 = 100K | VR1 = 50K |
| R11 = 1K | VR2 = 5K |
| R12 = 680R | ZD1 = 8.2v. |
| R13 = 2K2 | TR1 = BC107 |
| R14 = 1K2 | TR2 = BC177 |
| R16 = 8M2 | IC1, IC2 = 741 |
| R17 = 390R | IC3 = CD4001 |
| R18 = 1M | D1, D2 = 1N914 or equivalent |
| R19 = 27K | RFC1, RFC2 = 3 turns of enam. wire on ferrite bead |
| R20 = 39K | |

Note: All capacitors, must have a working voltage of 15v. or more.

Tone Burst

The tone burst is a well tried and tested design which the author has used several times over the past few years and has always operated well. The design is based around a CD4001 quad NOR gate. When the transmitter is in the receive state it is assumed that the press-to-talk switch connection will not be earthed and pin 9 on the IC will rise to a voltage which will give a logic 'one', and accordingly the output of IC3(c) will be approximately zero volts. This will put a logic zero onto an input of IC3(b) thus enabling the audio oscillator based around IC3(a) and (b). VR2 is used to set the frequency which can be measured either by using a frequency counter or by testing access to a repeater. Once set the tone burst has been found to be very stable with respect to time.

When the transmitter is placed in transmit the press-to-talk connection will be earthed causing C15 to charge up and the voltage to fall on pin 9 of IC3. The rate of fall of voltage is determined by the time constant of R16 and C15. When the voltage falls to the logic zero level the output on pin 10 will go to logic 'one', and inhibit the oscillator; thus the oscillator is inhibited at a time after the press-to-talk switch is pressed determined by R16 and C15.

Conclusion

The circuit has been on the air and has received some favourable comments saying that the audio was "punchy" without being too harsh. Careful adjustment of the clipping level will obviously be required to achieve best results. However when this has been done the circuit should give very acceptable results.

CIRCUIT OPERATION AND ALIGNMENT OF THE FRG-7 RECEIVER, PART II

RECEIVER ALIGNMENT PROCEDURES

J. L. LINSLEY HOOD, MIEE, MIMC

IN THE first part of this article I tried to provide a 'conducted tour' through the electronic circuit of this receiver, partly as a means of providing a greater insight into its way of operation, so that the user could have a greater appreciation of its potential strengths and limitations, and partly as a necessary preamble to clarify those areas under consideration if the user wished to improve or restore the alignment of the tuned circuits in the instrument.

While some of the more simple adjustments can be done, without misgivings, without the benefit of the Yaesu owner's instruction manual, and with little more than one or two small screwdrivers by way of equipment, it is urged that any more comprehensive adjustments should not be attempted without a copy of the manual, a reasonable collection of small tools, a frequency counter which will cover the range up to 100 MHz, an adequate HF signal generator, with an output attenuator, and a high impedance (preferably electronic) voltmeter. With these, and a bit of patience, wonders can be done!

Since I can remember well what it was like not to have a good collection of instruments (which didn't, I recall, stop me from wanting to do those things which the subsequent possession of those instruments made a lot easier), I will start with the easy ones — with the caution that some of these would be worth leaving until later if one has better test equipment. I will indicate when this is the case.

RF Stage Alignment

The initial tuning of the receiver is a single tuned circuit on the input to the RF stage preceding the first mixer. This is the part controlled by the 'Band' switch and the 'Preselect' knob on the far left of the front panel of the unit. This should give a scale reading appropriate to the frequency to which the Rx is tuned, so that if one is on, say, 21 MHz, the 'Preselect' dial should indeed read this figure when the S-meter shows maximum signal. However, this is easy to arrange.

Looking at the upper half, with the case removed from the receiver, the RF section is on the PCB to the left of the mains transformer and behind the twin-gang 300 pF RF tuning capacitor. (Although only a single 300 pF is used, separate gangs are used for the MW and the three SW bands.) The adjustments required are to the coil trimmers T101-104 and the trimmer capacitors TC101-104. These numbers are marked on the PCB, and on the diagram on page 13 of the manual. In each case, the preferred adjustment is to the inductor, first, at the bottom end of the band, followed by the trimmer capacitor at the high frequency end. While a signal generator makes this task a little easier, it is far from being essential, since a suitable signal can almost always be found near the desired spot on the lower frequencies, and aerial noise will serve quite well on the higher ones (though here, do not rely on the ear to judge maximum, but use the voltmeter on an AC range across the LS terminals as a 'noise strength' meter).

While on this subject, I would recommend that an external, longer scale, instrument should be connected across the internal S-meter, where possible, since this makes accurate adjustments easier. However, the main moral is — don't judge by ear! This

organ is very uncritical of small changes in loudness, and a series of nearly correct adjustments can rapidly add up to a very inferior final result.

The procedure is simple. On band 'A' find a suitable signal at or near 0.5 MHz, and adjust coil T101 until the S-meter shows maximum deflection when the input signal has been reduced on the generator, or by other means, so that the reading is at about half-scale. Too large a signal input will make the meter difficult to read, and will modify the receiver response unfavourably for this purpose. When this has been done, repeat the exercise at 1.6 MHz with adjustment to the capacitor TC101. (A trimmer screwdriver with a small, insulated, blade such as the RS 543-399 and 543-334 "Trimtool" is desirable here.) The same procedure is then carried out for the other input ranges, at 1.6-4 MHz, 4-11 MHz and 11-30 MHz. If one has perfectionist inclinations, each range can be checked over twice — by going back to the bottom end again after the top end has been tuned and then returning to the top.

Sadly, this exercise is likely only to be cosmetic, unless the tuning is so far out that signals at the extremes of the range could not be properly tuned on the input. However, it is nice to have things right.

The Main Tuning Scale

Only do this adjustment at this stage if you do not intend to check the operating frequency of the BFO. If you do, leave it to later.

Firstly, set the 'Fine' tuning knob to vertical, and anchor the sliding 'Dial Set' cursor so that it is in the middle of its travel with a piece of adhesive tape. Then with the 'MHz' scale set to 29, and the 'Preselect' range set to 'A' (to limit the amount of unwanted aerial signals present), tune the main scale to a reading of 1000; this will effectively tune the second, variable frequency, part of the receiver to 2 MHz. If the 'Mode' switch is now turned to the 'LSB' position, a whistle should be heard due to the receiver picking up a very small amount of one of the harmonics of the internal 1 MHz crystal. For most practical purposes, it is sufficient to adjust the third oscillator frequency (Q403) so that there is a zero beat, by adjustment of the ferrite core slug of T403. If the upper and lower VFO frequencies have been adjusted, a neater style of adjustment is such that the beat note for the LSB and USB switch positions is identical.

The main tuning is then set to '0' and the exercise repeated with TC403. This, of course, is to set the receiver tuned stage to 3 MHz.

The Main Oscillator "MHz" Scale

It will be recalled from the first part of this article that this part of the circuit a Colpitts oscillator covering the range 55.5-85 MHz, tuned by a single variable capacitor (this is actually two 30pF capacitors connected in parallel). Although a signal generator is helpful, it isn't absolutely essential for this adjustment, provided that the receiver is not too far in error. To proceed with this, find a signal as close as may be practicable to 3.5 MHz, and tune to this; adjust the slug in coil T201 gently (some delicacy in this is desirable, as well as a low-capacitance trimmer tool) until the 'lock' lamp extinguishes with the 'MHz' tuning scale at the middle position of the scale 'blob' marked '3'. Now look for another signal at around the 27.5 MHz mark, and tune to this. Then adjust the trimmer capacitor TC201 until the LED lamp labelled 'lock' extinguishes in the middle of the 'blob' labelled '27'. A little care is necessary here not to get a complete 1 MHz step out; however, one can count up from the bottom to make sure that the lamp extinguishes the right number of times.

Because of some small errors in the law of the capacitor, or the engraving of the 'MHz' dial, it will probably not prove possible to achieve the desirable result of the 'lock' lamp extinguishing in the middle position of every MHz calibration, but one can get near this. As in the case of the RF stage alignment, these adjustments are only 'cosmetic' and will not

The author's FRG-7 and home-built digital frequency meter.



do more than make the receiver tuning behave as intended. Nevertheless, they do help make using it more satisfying. For tangible performance benefits, the equipment listed above is very desirable, though the resourceful and competent may achieve much with limited facilities. I assume, though, that those wishing to proceed beyond this point will have access to necessary apparatus.

The BFO

This injects into the diode ring-modulator at the end of the 455 kHz 3rd IF chain, through an emitter follower buffer stage. The required operating frequencies are 457 kHz in the LSB position of the mode switch (set by adjustment to the coil slug T406) and 453 kHz in the USB position (set by trimmer capacitor TC404, which only comes into operation on this switch position). A frequency counter is desirable for this, connected to TP405.

The 3rd IF, 455 kHz

The procedure recommended by Yaesu makes the assumption that the 455 kHz mechanical filter FL-1 is correct, and proposes that one should merely tune to a signal generator set to 7.5 MHz, and then adjust the coils on the output of the 1st and 2nd 455 kHz IF stages (T404 and T405) for maximum S-meter reading. I prefer to dangle a short length of insulated wire connected to the signal generator output in proximity to the transistor Q402 (the 3rd mixer), with the signal generator tuned to 455 kHz, and rely on enough pick up or breakthrough. However, this isn't a very critical adjustment since only T404 is at all sharp in tuning; T405 is very damped, which makes it difficult to be sure of optimum adjustment.

The 2nd IF, 3-2 MHz. Variable (Tuned) Frequency

Some benefits can be gained from setting this correctly, but keep in mind the point that the tuning works 'backwards', so that the coils are adjusted apparently at the higher input frequency, and the trimmer capacitors at the lower. Having said that, it helps to adjust these a little way in from the end of the tuning range. The Yaesu recommendation is to tune to 7.1 MHz to adjust the trimmer capacitors TC401, TC402 and then to tune to 7.9 MHz to adjust the coils T401, T402. This adjustment is,

inevitably, repetitive until the optimum setting is achieved, but should show some improvements in general receiver performance.

The 1st IF, 54.5-55.5 MHz Bandpass

The purpose of this stage is to amplify, uniformly, a slab of signals 1 MHz wide, plus a bit at either end. To achieve this, four separate, individually screened, coils are used with external coupling capacitors (2 and 3pF respectively) to achieve the desired over-coupled double-hump response. These tuned circuits are on the inputs to the IF amplifier (a dual gate MOSFET) and the second mixer (a junction FET).

If one has access to a wobulator covering the 55 MHz band this task is relatively easy. (A simple DIY job is not too difficult to make: I use the one I described in the VCO article in *Wireless World*, September 1979, as an add-on mod to a cheap and cheerful commercially made signal generator). However, even in the absence of such a piece of kit, it is still straightforward, though more laborious. The procedure is to inject a signal in the desired frequency range into the first mixer (Q102-Q103), via test point TP103, with the receiver tuned to 20.5 MHz and the aerial removed, and measure the output from the stage, at the end of the strip, at TP104 using a good 'scope.

A method which is slightly less demanding of equipment is simply to swing the signal generator frequency up and down over this frequency range and measure the output — either by tuning in on the main tuning knob and using the S-meter, or by means of the simple gadget shown in Fig. 1, which allows a high impedance voltmeter to act as a crude RF meter; a sensitive meter helps. However, keep the RF leads short, and let the DC leads be the longer ones. The aim in tuning these coils is to get the flattest response over the 54.5-55.5 MHz band, compatible with sensitivity. Some method in the adjustment procedure is essential, and I would commend the tuning of T106 and T105 to a maximum at 54.8 MHz, and T107 and T108 to a maximum at 55.2 MHz.

As a final check on the extent to which one has achieved the desirable end of a uniform sensitivity of the receiver across the whole 1 MHz band covered by the kilohertz tuning scale, one can tune to the top band of the Rx (29-30 MHz) and check that the aerial noise is reasonably constant across this swing. However, prepare to be a bit disappointed in this. Nevertheless, some useful improvement in Rx sensitivity will probably be made by setting these coils to the compromise optimum.

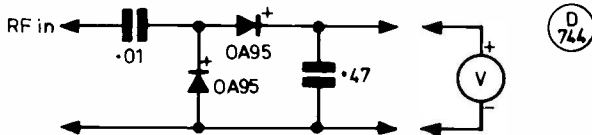


Fig.1 Simple circuit to allow monitoring of RF signal levels using sensitive high impedance DC voltmeter

The 52.5 MHz Selective Amplifier

I have left to the last the adjustment which is likely to bring about the biggest improvement in receiver sensitivity of all these tuning adjustments, which is the alignment of the 8 coils in the three-stage selective amplifier which feeds the second mixer oscillator input.

This mixer, Q105, is an N-channel junction FET with the signal input from the 55 MHz IF stage applied to its gate and a local oscillator RF signal applied to its source. For good conversion efficiency, at least 0.5v. r.m.s. is needed as this input, and the task of the selective amplifier is to extract a signal of this magnitude, at around the 52.5 MHz frequency mark, from the miscellaneous RF rubbish generated at the pin 3 output of the *Texas* SN76514N double-balanced modulator IC. To recap. from *Part 1* of the article, the input to this IC is provided by the first oscillator, and also the output from the 2-33 MHz harmonic generator driven by the internal 1 MHz crystal.

To accomplish the alignment of these tuned stages, it is necessary to remove the LO input, either by disconnecting or by earthing it at TP101; a 52.5 MHz input can then be fed from the signal generator into the input stage of the selective amplifier at TP107. Ideally, the output as measured with the gadget shown in Fig. 1 connected to TP109, at the output of the selective amplifier, should be constant over a bandwidth of some 100 kHz centred on 52.5 MHz, and adjustments to coils T109-T116 — situated in a double row on the right-hand side of the RF unit PCB — should be made until this is achieved as well as possible.

The reason for the attempt to attain a flat-topped frequency response from this amplifier chain, is that too sharp a tuned response would make the setting of the 'MHz' knob too critical, and would emphasise changes in sensitivity arising from small drifts in the local oscillator frequency, which is undesirable. There is, I think, little cause for worry on this score, since a 52.5 MHz amplifier cannot readily achieve a selectivity much better than this unless some incipient instability is present which would indicate a faulty component.

For this reason, when the centre frequency of the amplifier has been established correctly, the local oscillator input can be restored, and the RF signal voltage produced at TP109 can be monitored as the "MHz" knob is adjusted — with a little delicate tweaking of the coil adjustments to optimise the output. If wished, at this stage, the setting of the DC threshold of the 'lock' level monitor can be adjusted, by VR102, so that the extinction of the LED is reasonably precise, without being too fussy. In my experience, the influence of the oscillator signal input to the second mixer, and derived from this chain, is so great — both in its effect on the receiver sensitivity and upon the elimination of spurious signals 1 MHz remote from the chosen tuned frequency — that the whole Rx performance can be noticeably improved.

Sundries

The only other adjustment which it would seem worthwhile to make, while the receiver is out of its case, is the adjustment to the balance of the mixer. This is done by disconnecting the aerial,

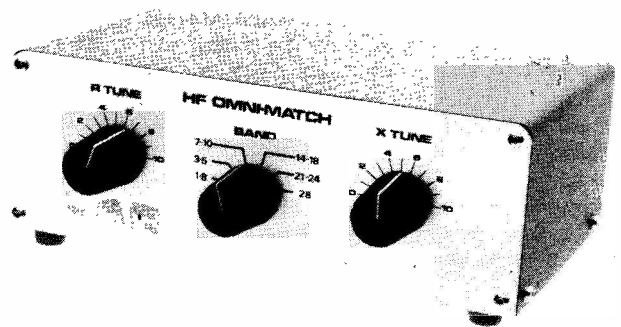
setting the 'MHz' knob to '0', and tuning to the internal spurious signal at 910 kHz; VR101, at the front of the RF unit, can then be adjusted to reduce the magnitude of this on the S-meter. It is a fairly flat adjustment, with a minimum of about 5-6 on the 'S' scale. The manual also refers to TC105, but this control no longer exists in the circuit.

For a receiver which is as sensitive as the FRG-7, when aligned as the designer had intended, the adjacent channel selectivity is only marginally adequate for use on the SW broadcast bands, where very strong signals can exist in close proximity to weaker ones of interest, and where the agreed 8 kHz separation between stations is frequently ignored. In these circumstances, particularly if reception conditions are good, some improvement in the 3rd IF selectivity is a good idea, and several DIY mods. have been proposed to this end. In my own case, I made a direct replacement of the LFC-6 455 kHz filter with a *Murata* CFG4551, which has given as high a selectivity as would be practicable for general purpose broadcast listening.

However, every mod. brings problems, and the snag in this case is that it becomes very difficult to be absolutely certain of the frequency to which one is tuned, since the selectivity is now several times better than the allowed lateral movement of the tuning cursor, or even the precision of calibration of the kilohertz dial, so a digital frequency display then becomes the next requirement. At this stage it is sensible to ask whether it would not have been better to have bought a more expensive model incorporating a digital frequency meter in the first place!

For those, like me, to which this piece of wisdom came a little late in the day, there are add-on frequency meters, both as commercial units and as DIY jobs, of which one that comes to mind, at once, is that in *Short Wave Magazine*, Jan-Feb 1980. My own, very simple, frequency meter — for which no magic whatever is claimed — solved those operating problems which arose when I improved the selectivity of the design, and is shown on top of the FRG-7 in the photograph.

In conclusion, I can only say that the FRG-7 is a good receiver, of more than adequate sensitivity, and free from many of the shortcomings so often found in such receivers. It is clearly very popular as a general purpose instrument, and I think deservedly so. concluded



The new LAR Modules HF Omni-match which will tame a VSWR as high as 5:1. It is available from them at their 60 Green Road, Leeds LS6 4JP address, price £71.00 including VAT and post/packing.

For anything radio you want to buy, sell, or exchange, use the Readers' Advertisements columns in "Short Wave Magazine"

SIMPLE L-SECTION IMPEDANCE MATCHING

IAN H. MOTH, B.Sc., G4MBD

THIS article is intended to shed a little light onto some of the electronic engineer's black art and is therefore written very much for the beginner and not the practitioner.

It is commonly understood that transistors, valves and most other electronic devices must have "proper impedance matching" to function correctly. The reason why designers aim for this is invariably to prevent waste of signal energy, since energy flowing along a path will be diluted by encounters with abrupt changes in impedance, a proportion being reflected back whence it came. Most amateurs will be familiar with one example in particular, the problem of antennas which are not of the correct impedance. The solution here is to provide a matching network, or impedance transformer, between feeder and antenna to transform the one impedance to the other, and therefore "conceal" the impedance discontinuity. This article presents a set of equations by which the inductances and capacitances of simple L-section impedance transformers can be calculated. Networks of this kind are particularly useful in matching into and out of high power transistors of low impedance. The derivation is given in two ways, so that the reader may have the opportunity of extending the mathematics to his own requirements. S.I. units are used throughout.

Series to Parallel Conversions and vice versa

The first method depends on circuit conversions. A complex impedance is a concept of an electrical component having both a resistance and a reactance; either capacitive or inductive or (as we shall see in a moment) both. Taking the usual terminology let R be resistance and X be reactance. Referring to Fig. 1, each of the two circuits has a property of impedance. If R1, X1, R2 and X2 satisfy the four equations given in the caption to Fig. 1, then the circuits will be identical, i.e. their impedances will be the same. These equations are the standard "parallel to series" and "series to parallel" conversions given in the textbooks, including *Radio Communication Handbook*. Since X is a function of the frequency of operation, the equations will only hold for one frequency at a time. Let

$$X = \frac{-1}{2\pi fC} \text{ and/or } X = 2\pi fL,$$

where *f* is frequency in Hz, C is capacitance in Farads and L inductance in Henrys. Thus, reactances which the mathematics turn out negative will be capacitive and the positive ones, inductive.

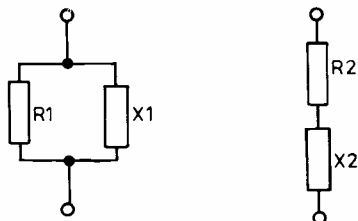


Fig. 1

Fig. 1. Series and parallel equivalent circuits.

$$R_1 = \frac{R_2^2 + X_2^2}{R_2}, \quad X_1 = \frac{R_2^2 + X_2^2}{X_2},$$

$$R_2 = \frac{R_1 X_1^2}{R_1^2 + X_1^2}, \quad X_2 = \frac{X_1 R_1^2}{R_1^2 + X_1^2}$$

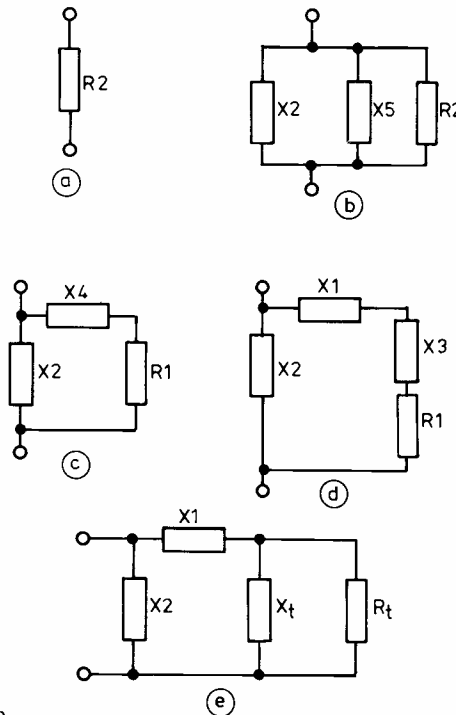


Fig. 2

Fig. 2. Progression to simple network. The equations which govern each stage are:

$$X_2 = -X_5, \quad R_1 = \frac{R_2 X_3^2}{R_2^2 + X_3^2},$$

$$X_4 = \frac{X_3 R_2^2}{R_2^2 + X_3^2}, \quad X_4 = X_1 + X_3,$$

$$X_3 = \frac{X_1 R_1^2}{R_1^2 + X_1^2}, \quad R_1 = \frac{R_1 X_1^2}{R_1^2 + X_1^2}$$

Fig. 2 shows a progression from a single resistor to a network of impedances. If the equations given in Fig. 1. are used then each circuit is equivalent. The first stage is a simple resistor. Next, two reactances equal in size but opposite in sign are added; one of those reactances is then combined with the resistor in a parallel-to-series conversion. The reactance found is then split into two, a portion going into a series-to-parallel conversion with the resistor. The form is convenient because any transistor's input or output can be approximated as a resistor in parallel with a reactance. Therefore the values of X1 and X2 can provide the values of inductor and capacitor required to design an impedance transformer to match such a device to a purely resistive source or load.

The equations relating all the components in Fig. 2 are given in that Figure's caption. It is a simple matter to manipulate these equations to cancel out various components, leaving the equation set in Table 1. It can be seen that if Xt and Rt, the transistor's parameters (these are given in the relevant manufacturer's data sheets) and R2, the source or load resistance is known, then X1 and X2 fall out of the chain. An example may make things clearer.

The BLY62 requires 1W in to give 5W out at 145 MHz, and its input can be approximated as 4.6 ohms in parallel with 7.1nH. If this is used, for example, as the first stage in a PA for a 1W output transmitter, then this must be matched to 50 ohms resistive to suit the transmitter.

Turning to Table 1, with Rt = 4.6 and Xt = +6.5,

$$X_3 = +2.173$$

$$R_1 = +3.055$$

$$X_5 = +12.755$$

$$X_2 = -12.755 = 86\text{pF at } 145 \text{ MHz}$$

$$X_1 = +9.803 = 10.76\text{nH at } 145 \text{ MHz.}$$

The circuit is therefore as shown in Fig. 3.

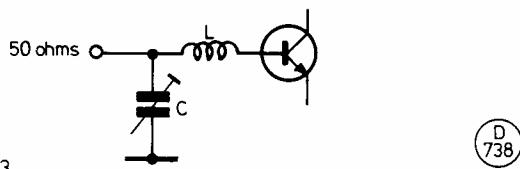


Fig. 3

Fig. 3. Input matching to BLY62 at 145 MHz, worked example.
 L = 10.79nH C = 86pF.
 Bias arrangements would depend on mode, etc., and are not shown.

j Notation

A more rigorous and helpful description of an impedance is got by handling resistance and reactance in one composite expression. Thus a resistance, R, in series with a reactance X is expressed R + jX. Note that the components have to be in series for this to hold true.

Fig. 4 shows a device Rd + jXd with an impedance transformer X1 and X2; j is necessary to label the quantity associated with it as a reactance, and although it is a label it can be treated as if it were an algebraic unknown. The impedances can be summed exactly as resistors, i.e. R = R1 + R2 if in series, and 1/R = 1/R1 + 1/R2 if in parallel. The reader is invited to check the expression given in the caption for the total effective impedance.

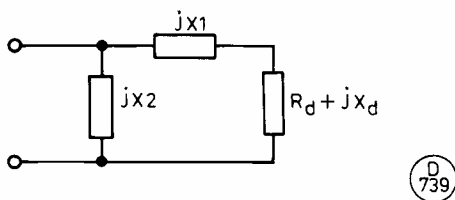


Fig. 4

Fig. 4. Network of impedances. Total impedance = jX₂ in parallel with Rd + j(X₁ + Xd)

$$= \frac{jX_2 R_d + j^2 X_2 (X_1 + X_d)}{R_d + j(X_1 + X_d + X_2)}$$

The expression is simplified by ordinary algebraic manipulation and by letting j² = -1; j is therefore a number which your calculator will tell you can't exist, but, as the reader will discover, pretending that it does can be very useful. The expression boils down to the form given in Table 2 and then (if one assumes that the network can be equivalent to a simple resistor and no reactance) to the equations which ultimately derive X1 and X2. Using these to repeat the worked example of the BLY62, the Rt, Xt, must first be converted to the series form, therefore Rd = 3.055 and Xd = +2.1725. The intermediate stage A = 11.9757 and so X1 = +9.8032 (10.76nH), and X2 = -12.755 (86pF) as before.

Table 1

Simplified "Progression" Equations.

$$X_3 = \frac{X_t R_t^2}{R_t^2 + X_t^2}, \quad R_1 = \frac{X_3 X_t}{R_t}$$

$$X_5 = \sqrt{\frac{R_2^2 R_1}{R_2 - R_1}}, \quad X_2 = -X_5$$

$$X_1 = \frac{R_2^2 X_5}{R_2 + X_5^2} - X_3$$

Table 2

Calculation of circuit values from Fig. 4 expression.

Fig. 4 Total Impedance =

$$\frac{-R_d X_2 (X_1 + X_d) + X_2 R_d (X_1 + X_d + X_2)}{R_d^2 + (X_1 + X_d + X_2)^2} + j \left[\frac{R_d^2 X_2 + X_2 (X_1 + X_d) (X_2 + X_d + X_2)}{R_d^2 + (X_1 + X_d + X_2)^2} \right]$$

= R_{total} + jX_{total}

= 50 + j0 (say).

This assumption creates two equations, which simplify to:

$$50 = \frac{-R_d X_2 A + X_2 R_d (A + X_2)}{R_d^2 + (A + X_2)^2},$$

0 = Rd² + A(A + X₂).

Let A = X₁ + X_d, then

$$A^2 = \frac{(50R_d - 2R_d^2) + \sqrt{(2R_d^2 - 50R_d)^2 - 4(R_d^4 - 50R_d^3)}}{2}$$

and X₁ = A - X_d, X₂ = $\frac{-R_d^2}{A} - A$

Q Factor

The Q factor of these circuits may be calculated by considering the effective series resistance on either side of the inductor X1. In the worked example the value of the resistance on the transistor side has already been shown to be 3.055 ohms. The series resistance on the other side works out to the same value, i.e.

$$R = \frac{R_2 X_2^2}{R_2^2 + X_2^2} \text{ (from Fig. 1 caption),}$$

$$\text{so } R = \frac{50 \times 12.755^2}{50^2 + 12.755^2} = 3.055.$$

Since Q = $\frac{X}{R}$ then Q in this case is 3.21.

If the designer prefers a higher Q then this can be achieved by using a larger inductance than the calculated value of X1 would indicate and compensating for it by mounting a series capacitor. The circuit then becomes as Fig. 5.

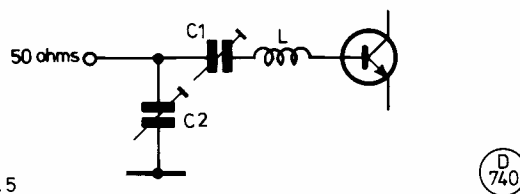


Fig. 5

Fig. 5. Higher Q input matching to BLY62 at 145 MHz, worked example.
 L = 33.53nH, C₁ = 53pF, C₂ = 86pF, Q = 10.

Conclusion

There are a large number of possible configurations to use in transistor interstage and input/output coupling. Each has its advantages and disadvantages in various types of application, and only many years experience (for which there is no substitute) can guide the designer to the best choice. However, the procedures given here will provide a starting point and help with the analysis of different networks of components.

THE VISITUNE

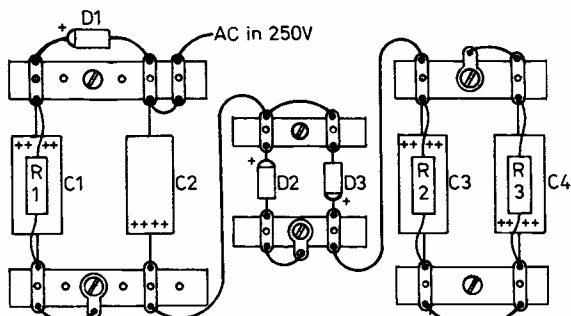
A MODERN AID FOR CORRECT TUNING OF RTTY SIGNALS

J. BROWN, G3LPB

THERE is a great need these days for ever more selective receivers, and even if we can get this, for some modes we still require an even more accurate tuning. Casting the mind back to the old AM days, we used to tune for the best audio quality. Then along came SSB, and even by tuning the BFO we still found it a difficult task; however, the advent of the product detector made it easier once again to tune simply for best audio. Progressing along the way, tuning of SS/TV was made easier by gadgets using 'magic eye' LED's or meters, all of which are in about the same category of usefulness: so — we turned again to tuning for best resolution!

Now, coming to RTTY we find a new problem, arising from the need to use narrow shift ('shift' was defined in an article by the author in the April, 1981, issue). The difference now is only 170 Hz, whereas in the earlier days we used 850 Hz shift which allowed a little latitude in tuning the receiver. In RTTY, we cannot "tune for best readout" — there are many things to consider, such as the shift being used by the other station, and also of course the rate of drive of our receiver tuning. These days, most stations possess a decent receiver or transceiver — the days of the HRO, AR88, and CR-100 are all but over, though they are still in some areas stalwarts of amateur radio. The writer has tried numerous methods to obtain correct RTTY tuning. One was the meter method, found to have snags; then two 'magic eyes', one for Mark and one for Space, which meant going almost cross-eyed during tuning. Thus, thoughts were turned to using an oscilloscope, which obviously had considerable advantages, though this implied the 'scope being tied up for this particular task and not being available for any other work without considerable disruption of the station.

The set-up given here is already known to some, but is probably new to many who have great need of a method to tune RTTY. Various circuits were tried, including transistor circuits, but the final design shown here is a complete instrument in itself, self-powered, needing only two (screened) leads for input and, of course, mains connection. The consumption is very small and it can therefore be allowed to run at all times when RTTY is in use. As far as RTTY goes, it is the most respected instrument in the shack.

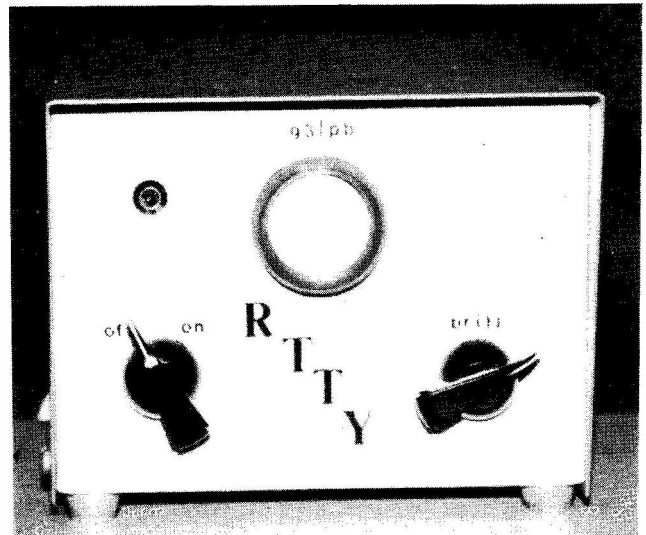


Solder tags taken to earth via screw and pillar

Fig.1 POWER SIDE LAYOUT

Refers to Fig. 5.

D 713



The Visitune.

Circuit Description

See Fig. 8. A first look at the circuit may make some wonder "why this or why that". Perhaps we had better start by explaining some of the reasons. The thing was largely evolved around the selection of a suitable CRT, and one that is possible to obtain fairly easily. The writer had a few CRT's about: 2AP1, 3AP1, an old Mullard of unknown type, a DG7 by Mullard and a few others. All were tried, and there were problems with every one. EHT required was 800-1000 volts, which implied voltage tripling, which is a bit of a problem constructionally and component-wise. The type eventually chosen was a 1CP1 (or with a different phosphor, the 1CP31); a CV2302 or Mullard DH3/91 is equivalent.

On the other hand, if one gives a little thought to the matter of reversing PSU components to get a negative EHT, one can easily see ways of using one of the many small CRT's about; for instance, the VCR22.

Use of transistors as amplifiers, drivers and timebases were all tried; the best result comprised three transistors and was quite good, but of course generated another snag, in the need for either another DC supply or use of high resistors from the HT supply — or even high-voltage zener diodes.

Power Supply

After some thought it was decided to build a power supply first, Fig. 5, to see how decent EHT could be accomplished; the attack here was to utilise existing transformers and see how they would behave. An ex-TV pre-amp. transformer was ideal, giving some 240 volts DC after rectification at some 30 mA, and there was also a 6.3 volt heater winding capable of about 2 amps AC.

The power supply was built-up, see Figs. 1 and 3, using component strips (*RS Components* reference 433-781). They were modified by removing some of the little metal tags, so giving holes through which the strip could be mounted, obtained after cutting it to the desired size using a hacksaw. The method of mounting them on the base-plate is by the use of tapped

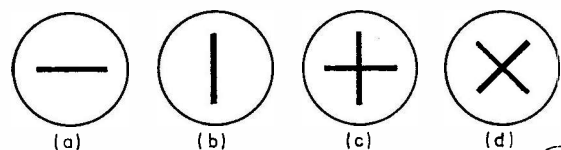


Fig.2 TRACES AVAILABLE ON CRT FACE

D 714

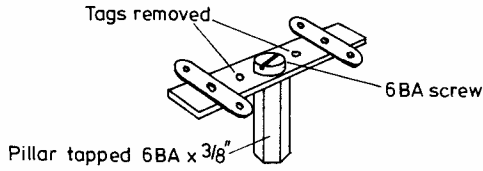


Fig. 3

D 715

hexagonal pillars — 3/8" long and with an internal 6BA thread right through. The idea is to drill the base and mount using a short 6BA screw, locking the pillar well down, and then to fit the mounting strip on top using more 6BA screws. This gives a good solid mount, insulated and stood-off nicely from the base. Such pillars come in plastic or plated brass — this design uses the latter variety.

Two alternative approaches to the power supply, with different transformers, are shown in Fig. 6.

After completing the power side it was run on dummy loads to ensure that all would be well in use. The resistors across the capacitors do to some extent regulate the supply voltage, and also serve to discharge the capacitors when the unit is switched off. A separate on/off switch was fitted so the brilliance control could be left alone; the original idea was to combine the brilliance control with the on/off switch to reduce the chance of burning the CRT face. In fact, the two resistors and a separate on/off switch see to the problem and enable the brilliance setting to be left alone. So — with the PSU working OK, thoughts were turned to the other requirements.

Visitune Construction

Returning to the TU itself, the ideal situation is where the output of the two filters *via* the discriminator are exactly equal, *i.e.* mark and space voltages are the same. In many TU's the take-off is by way of two high value resistors, resulting in the need for amplifiers to be high-impedance. An arrangement was tried using an FET and two other stages, which worked nicely, but of course required another DC supply. This would have meant another transformer, more cost and not a lot gained. So, rambling back through the years G3LPB recalled the days when he used an 813 in the PA for AM, with series-gate modulation by a 12BH7, the audio being amplified to the required level by a single 12AX7 (ECC83). A start was made trying to remember the values used, and after a long search a Brimar valve book of about 1955 yielded "the necessary", and we were away. A search-around presented a couple of double triodes, including a 12AX7. Base data is shown in Fig. 9.

The idea was to mount the valve (Fig. 4) so that leads to components were short and so that the latter were firm (no birdsnest for us!), and use was made of an *RS Components* mounting strip reference 433-680. Again this comes in standard lengths, so the desired length of eight pairs of tags was cut off, and mounted using pillars as before. The metal bracket was bent up from a bit of aluminium, and drilled as necessary for the valve-holder and

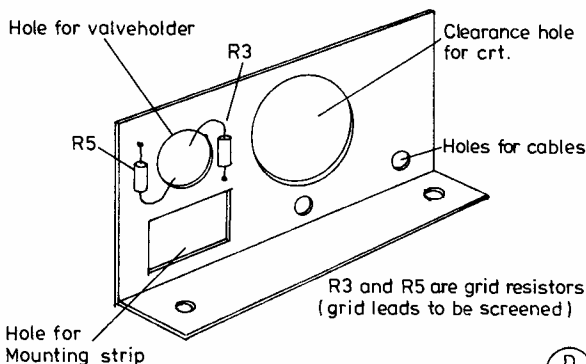


Fig.4 VALVE MOUNTING BOARD

D 716

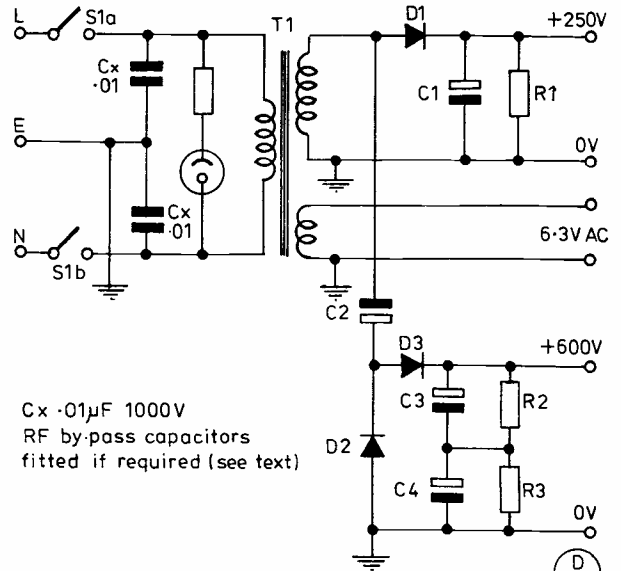


Fig.5 POWER SUPPLY

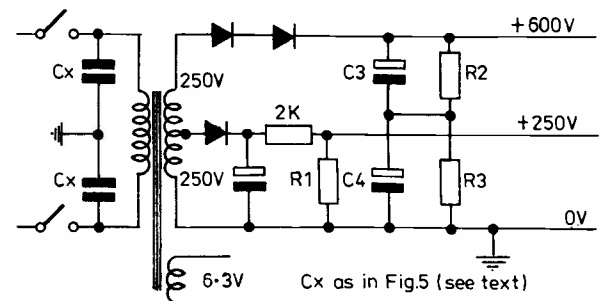
D 717

the mounting strip, together with a hold for the CRT, and its mounting. The latter was a capacitor clamp with some sponge rubber fitted to avoid smashing the CRT. As an alternative, a slight redesign and a *Terry* clip could be used to hold the CRT.

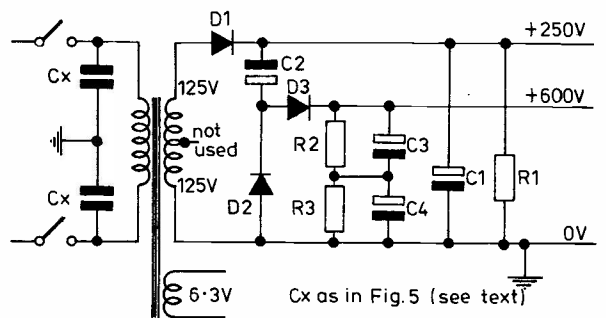
Wires were run from the holder to the components on the strip, and interconnections between components made at the back of the strip. Long wires were fitted as necessary before mounting everything up — see Fig. 7. The long leads are marked, and go to other parts of the circuitry — make 'em plenty long at this stage.

This lot, once made up, was again tested for long periods and found to be happy enough.

Next, we needed shift connections and voltages, so that the spot could be centred; also, we required to be able to make due allowance for the different output from different TU's, so gain potentiometers were incorporated in the circuits. Thus we had two gain controls, and two shift controls, one of each for mark



(a) Using a 250-0-250V Transformer



(b) Using a 125-0-125V Transformer

Fig. 6 ALTERNATIVE POWER SUPPLIES

D 718

Table of Values

Figs. 5 and 6

D1, D2, D3 = BY127 silicon or equiv.
 C1, C2 = 16 μ F, 300v.
 C3, C4 = 32 μ F, 350v.
 Also: mounting strips, pillars, nuts and bolts.

Fig. 8

R1, R4 = 1M
 R2, R6 = 220K
 R3, R5 = 2K2
 R7 = 2M2
 R8, R9 = 82K
 R10, R11 = 1M
 C1, C2 = 0.01 μ F
 C3, C4, C7, C8 = 0.005 μ F, 1000v.

R1 = 120K, 2W carbon
 R2, R3 = 270K, 2W
 Transformer = see text
 C_x = see text
 C5, C6 = 0.01 μ F, 500v.
 C9 = 0.001 μ F, 1000v.
 RV1, RV2 = 500K
 RV3, RV4 = 1M
 RV5 = 500K
 V1 = 12AX7 and holder
 CRT = 1CP1, also see text

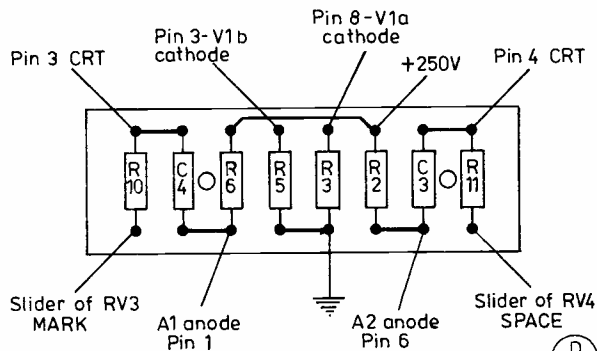


Fig.7 COMPONENT MOUNTING STRIP

Refers to Fig. 8.

D 719

Note: RV1 to RV5 are carbon pots, preferably with insulated spindles. Also required: one 8-way double-ended mounting strip; mounting strips for components on the power side; pillars, solder tags, nuts and bolts.

Most components available from J. Hartley, 78B High Street, Bridgnorth, Salop. Valves and CRT's available from Zaerix Electronics Ltd., 46 Westbourne Grove, London W2 5SF.

and the others for space. It was intended that these, which would not need attention very often, should be fitted at the back of the case; and also have the two inputs (mark and space) in screened connections, along with the mains-lead input, all on the back. A case was hunted for; the writer ended up by making one, but the one shown is an RS case (reference 509-709) which is reasonably cheap, and though not perfect for the task fills the bill quite nicely. Various panel layouts were tried, the outcome being as shown. As already indicated, all the rarely-used controls are at the back; the pots can be normal volume controls or even ex-TV set ones will serve, while the screened inputs are the so-called phono-sockets.

This leaves the front panel free for the CRT face, on/off switch, and the brilliance control — the mains neon was an

afterthought to remind us when the shack lights were put off that maybe we'd left the RTTY gear switched on, being all driven from the TU mains switch.

Having mounted up everything mechanically, it was then taken all to bits again! The case was cleaned off, and given a few coats of aerosol undercoat, allowing time to dry off completely between coats (this refers to the 'bottom' which includes front and back panels — the other half is already adorned with blue PVC). A final top coat series was applied, in white; one mounting hole was cleaned off to guarantee a good earth, between the bracket and the case. The front panel and back were now lettered. All this was done after the holes had been drilled, not forgetting those for the four rubber feet on which the case sits.

After the lettering was completed, using Letraset, it was all given a coat of lacquer which keeps the Letraset in good condition and prevents the case finish from getting to look scruffy too quickly.

The mounting bracket was also stripped and given the same treatment with undercoat and white finish as the case — one could even Letraset the component references in if desired.

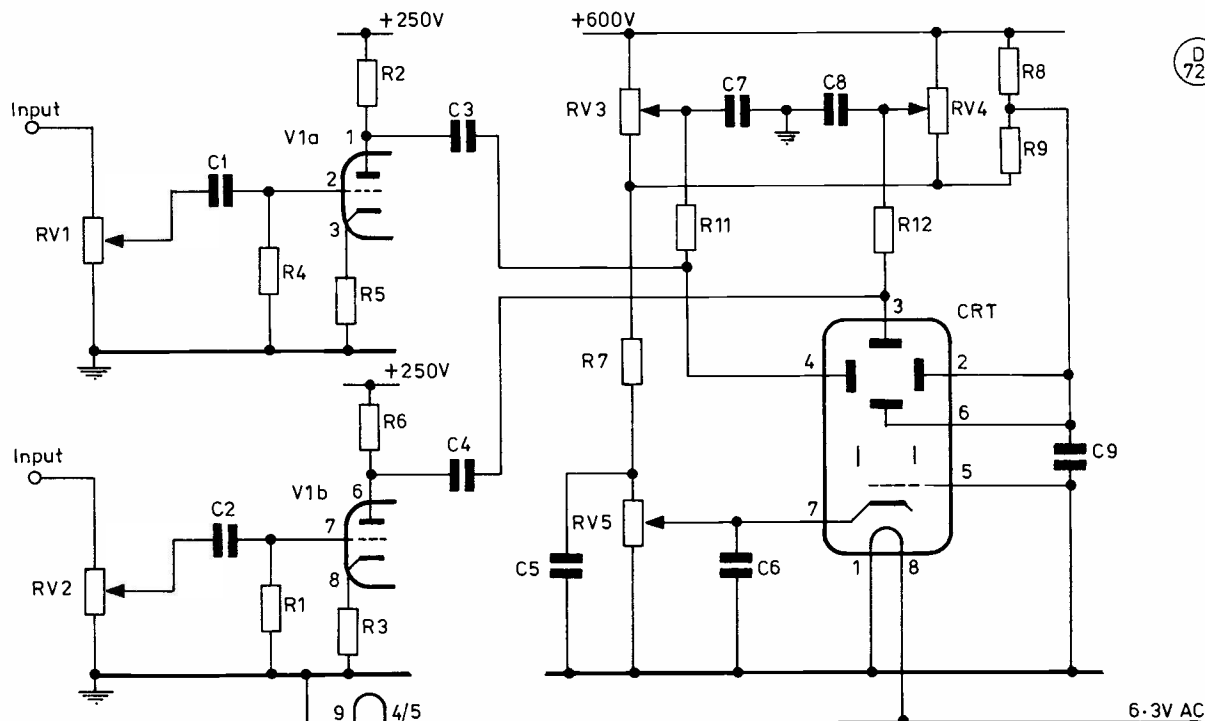
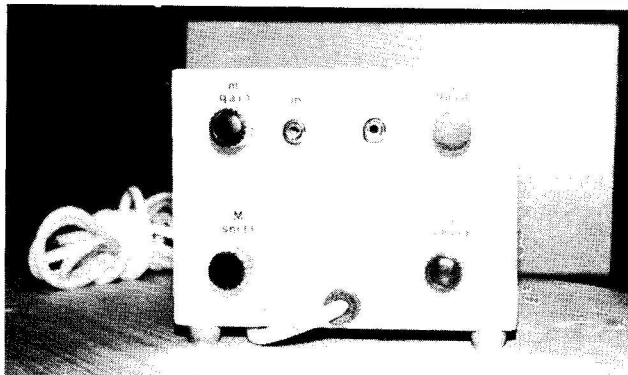


Fig. 8 CIRCUIT OF 'VISITUNE'

D 720



Rear view showing input sockets, gain and shift controls.

Re-building

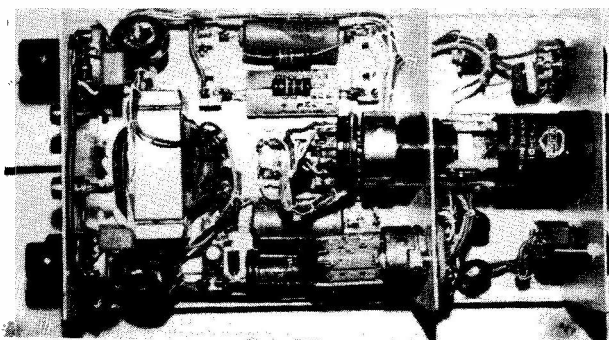
Now, to put it all together. This must be done with care, remembering we have 610 volts of EHT at the high-voltage pin of the smoothing capacitor to ground, plus 250 volts DC for the valves, and 6.3 volts AC for the heaters. First fit the bits on the back side, the pots (watch you get the right values in the right places!), the mains lead with a P-clip or other restraint to stop it being pulled out of the case again and rubber grommet to avoid chafing, the two input sockets, and the four feet. Turn now to the front and fit the Brilliance pot, the on/off switch and the neon. Now the bracket, after first remounting the various bits. A tip here is that if you are careful, the valvholder, the tagstrip and all the components and wiring will all come away as a piece, and they can go back likewise.

Now the power transformer, and the strip of PSU bits already wired-up are assembled in their allotted places. Make sure those pillars are tight as some of them may be providing earth connections. Now we must wire up what is left, and this is where the significance of the long wires comes in. If you arrange them to travel most of the way along the same route, you can end up with a nice looking cableform if you care to use some lacing-twine or the more modern cableform ties. If you lace, don't forget that where you leave one tie for the next, the departing piece of string should go *under* and on, so that if you have to unlace a part later on the whole cableform won't fall apart.

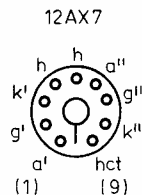
Thoughts

If you haven't built anything with a valve or CRT for a long time (or perhaps never), don't forget the voltages. The capacitors in the doubler circuit need care, both as to polarity of wiring and how they are mounted. While you have the "care" idea in mind, check over all the soldering, for dry joints, and 'spikes' of solder which might be the cause of a problem. And, of course, those valve and CRT pins are counted from the underside going round clockwise from the marker point.

The decision to use this particular CRT is simply that it is an



Looking inside the Visitune from the top.

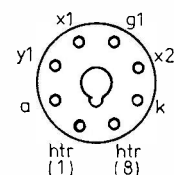


Join pins 4 and 5 and connect to earth.

Pin 9 connected to 6.3V AC

g' and g'' cables screened from back controls

CRT - DH3-91 (ICP1)



Pin 1 connected to earth.

Pin 8 " " 6.3V AC

Join pin 2 to pin 6

Fig 9 BASE DATA (from underside).

D
721

ideal size for the job, and is current. Additionally, it is also designed to run with a positive supply on the anode, and it is self-focussing. The transformer defines the power supply, and the use of the valve arrangement helps to hold the volts on the CRT from going too high for comfort. The valve heater on the 12AX7 and similar double triodes is a 12.6 volt one with a centre-tap, so you can either run it at 6.3 volts or 12.6 volts.

If you have a negative-supply type CRT, use the PSU's shown in Figs. 5 and 6 with diodes and electrolytics reversed.

Setting-up

Check the wiring again, and check that the HT line and the EHT line aren't wired to an earth tag! Seriously, it isn't at all a bad idea to put everything together but leave the valve and CRT on the bench when one first switches on. If nothing "goes west" you can switch it off again, let the supplies discharge, and then plug in the valves and CRT. At least that way, if it blows up you'll have a fair idea where to look!

Wind up the brilliance and centre the spot, then wind down the brilliance to a reasonable level. Now plug in the leads from the 'scope connections of the TU to the two sockets at the back. If the spot won't centre, defer plugging in the TU outputs until you find why the spot won't play; most likely R8 (or R9) will need to be checked to see if it is what it appears to be... or a wiring error.

Now you've got it right, the two leads from the TU are plugged in. The spot should start leaping madly about, the degree of madness being affected by receiver tuning, Visitune gain settings, and of course receiver gain control setting. All this says your handiwork is at least trying. Now, switch on the receiver or station crystal calibrator; remove one input to the Visitune, and tune the receiver until the calibrator appears both audibly and as a trace on the CRT — it should be a line, and we can now twist the CRT round until the line is vertical. Adjust the gain of the receiver and the Visitune such that the receiver is set as you normally run it and the Visitune gain is set to make the line fill the screen. Now, without touching the receiver or the TU in any way, unplug the input from its socket on the Visitune and transfer to the other socket. You should now have a horizontal line which you can set to just sweep the screen — thus the vertical line and the horizontal are of equal length for an equal signal. Call the horizontal Mark and the vertical Space, and plug the appropriate connections from the TU into the proper sockets for this convention.

Now you just tune so that the lines are equal in length, see Fig. 2. Fig. 2(d) shows what happens if you swing the CRT through 45 degrees — but the writer prefers the cross as it is easier to remember which one is which.

Conclusions

The Visitune has been used with just about all the TU's there are — BARTG, SRD1, ST5, ST6, the M.K. set-up, all with equal success. All the bits and pieces are available. C_x on the mains side need only be fitted if one has an RF problem — they should be marked at least 1000 volts DC or 250 volts AC.

CLUBS ROUNDUP

By "Club Secretary"

AN enormous pile to get through this time – so we'll have to be as brief as possible! However, a quick moan is indicated on the subject of the sending-in of data for this piece. If you send in a newsletter (and we really do enjoy reading them), please be sure that the dates, venue, Hon. Sec's address are all there, clearly marked; and of course the programme detail if you have it. If we are to have more than one newsletter in the month under review, please indicate which is the most recent. We had three of one club's newsletters this time, and it took quite a time to sort out the latest gen.

The Mail

Acton, Brentford & Chiswick first; October 20, G30JX on his experiences with the Argonaut 515, at Chiswick Town Hall in Chiswick High Road.

Addiscombe are mainly a contest club; find them in their new base, the Woolpack, 154 Gloucester Road, Selhurst, Croydon, every Tuesday from about 9 p.m.

Ashford, in Kent, is well settled in its hideaway at the top of Hart Hill, where they foregather on Tuesdays. None too easy to find, they say; so we suggest you contact the Hon. Sec. first for directions. He is in the Panel.

A talk and film by G8AGE on D/F Hunting is the subject for **Aylesbury Vale** on October 6, at Elmhurst Youth Centre, Fairfax Crescent, Aylesbury, with talk-in on S20 and the local repeater.

A.R.M.S. – one for the mobile operators, with all sorts of things to offer. Details from the Hon. Sec., at the address in the Panel.

This month sees the start of the RAE classes which are being run by **Axe Vale** group. They have Hq at the George Hotel, Axminster, on the first Wednesday in each month.

Monday to Thursday evenings are all used at **Barking**, with the main session on Thursdays; the venue is Westbury Recreation Centre, Ripple Road, Barking.

At **Bishops Stortford** the group are to be found in the British Legion club at the top of Windhill on the third Wednesday of each month.

For **Brighton** it's junk sale time: October 7, at 47 Cromwell Road, Hove, where the group meeting is on alternate Wednesdays.

B.A.R.T.G.: if you operate RTTY, as SWL or transmitter, this is the group for you, and if you are thinking of starting, even more so! Details from the Hon. Sec. – see Panel.

We could say the same words, applied to amateur TV, for **B.A.T.C.** They will be having an Exhibition and Open Day on October 4th, at the Post House in Leicester. Admission free, and all welcome – and there is good parking nearby.

Bromsgrove now, at Avoncroft Centre, for the main date of October 9 (a talk on UHF), with the informal at the Parkgate Inn slated for 27th.

The publicity lad at **Bury** can certainly turn out a fair bit of lettering; and it tells us that they are to be found on Tuesdays at the . . . oh, dear, he forgot to say! Luckily our records come to the rescue and say Mosses Community Centre, Cecil Street, Bury. Incidentally, the 'main' meeting is usually the second in each month.

Cheltenham have a place at the Old Bakery, Chester Walk, Clarence Street, which we believe is behind the library.

October 1 is a junk sale, 16th a natter, and on 30th they have a coach trip to Donington set up.

A belated congratulation comes from the **Chesham** scribe to all members who passed the May RAE. They get together on Wednesdays at Chesham's Whitehall Centre.

October 6 is club-night for the **Chichester** lot, at Lancastrian Wing, Chichester High School for Boys, Basin Road, Chichester; at the time of writing no details, but doubtless by the time this appears the new committee will have something sorted out.

Chiltern are still based on the canteen at the John Hawkins' furniture factory, Victoria Road, which is off the A40 Oxford Road in High Wycombe. The next date we have is October 28, when Werner Kolterman of British Telecom will be talking informally about radio interference.

Every Friday evening the **Clifton** lads foregather at the New Cross Inn, which lies at the junction of New Cross Road and Clifton Rise, New Cross, London. On October 2 they have some films, and on 9th the AGM.

Now to **Conwy Valley**. This is the correct, Welsh, spelling of what we Gs would call Conway Valley, as the Hon. Sec. kindly confirmed for us. They have a very nice Hq at Green Lawns Hotel, Bay View Road, Colwyn Bay, where they will be found on the second Thursday of each month.

Cray Valley have a junk sale on October 1, and a natter on 15th, both meetings being at Christchurch Centre, High Street, Eltham.

Don't forget MCC, October 17/18! Rules in September issue, p. 379. Get in and have a go; and don't forget a challenge to the gang up the road – show 'em who's best!

Another junk sale – they are popular this month! – is at **Crystal Palace** on October 17; the venue is Emmanuel Church Hall, Barry Road, London SE22.

At **Derby** the Hq is the top floor at 119 Green Lane, Derby, where they meet every Wednesday. Particularising, October 7 is a junk sale, and on 14th there is to be a talk and demonstration of fast-scan TV. G4AFJ takes up October 21, to discuss his own personal views on aerials, leaving October 28 for G3OUF to talk about RSGB.

Next we have **Dudley**, and Dudley Central Library is the club Hq. October 13 is the AGM, and on October 27 they are going to visit the motorway control centre at Great Barr.

We like the way they have the committee meetings at **Edware** – all present but the Agenda! Nevertheless, to be able to admit to a hang-up of that sort indicates the members are happy enough with the results, and that's what matters! October 8 is an informal, and on 22nd G4HMD will be talking about his QRP activities.

Ex-G, we hardly need to say, is the club for those who were born in UK, and now resident abroad; and this includes amateurs with British parents or who have become naturalised UK citizens. The UK Hon. Sec. is the chap to get in touch with, and his name and address is in the Panel.

A full programme for the rest of the year comes in from **Fareham**, and from it we see that on October 7, the microprocessor and RTTY will be discussed by G4FJO, and on 14th the G8VOI audio filter project takes over. A natter is down for October 21, and on 28th G8HND will be talking about "Making Bits for 10 GHz". All this, and much more, at Room 12, Portchester Community Centre, at 7.30 p.m.

Now **Farnborough**, where as far as we know they still have a place at the Railway Enthusiasts Club, Access Road, off Hawley Lane. October 14 is down for a pre-AGM discussion, and on October 28 there is the "Ron Ham" evening.

Our next stop is at **Gloucester**, where they head for Hq every

Names and Addresses of Club Secretaries reporting in this issue:

- ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, Acton, London W3 8LB. (01-992 3778)
- ADDISCOMBE: P. J. Hart, G3SJK, 42 Gravel Hill, Croydon, Surrey CR0 5BD. (01-656 9054)
- ASHFORD: J. A. Clarke, G3TIS, Yeomans Cottage, The Street, Brook, Ashford, Kent. (Wye 812888)
- A.R.M.S.: N. A. S. Fitch, G3FPK, 40 Eskdale Gardens, Purley, Surrey CR2 1EZ.
- AXE VALE: Mr. & Mrs. Retter, G4JBG, 48 Fairways Rise, Chard, Somerset TA20 INT. (Chard 4163)
- AYLESBURY VALE: M. J. Marsden, G8BQH, Hunters Moon, Buckingham Road, Hardwick, Aylesbury, Bucks. (0296 64 783)
- BISHOPS STORTFORD: B. J. Salt, G4ITL, 135 Kingsland, Harlow, Essex (Harlow 20478)
- BRIGHTON: J. Trimmer, G4JDM, 7 Dale Crescent, Patcham, Brighton.
- B.A.R.T.G.: J. Binning, G3AJS, 293 Perry Street, Billericay, Essex.
- B.A.T.C.: M. Cox, G8HUA, 2 Holme Lane, Bottesford, Scunthorpe.
- BROMSGROVE: G. Tayler, G4HFP, 6 Marlborough Drive, Stourport-on-Severn, Worcs. G4HJH.
- BURY: M. Bainbridge, G4GSY, 7 Rothbury Close, Bury, Lancs. BL8 2TT. (061-761 5083)
- CHELLENHAM: G. Cratchley, G4ILI, 47 Golden Miller Road, Prestbury, Cheltenham. (Cheltenham 43891)
- CHESHAM: A. Scott, G8PUC, 8 Lynton Road, Chesham, Bucks. HP5 2BU. (0494 785625)
- CHICHESTER: S. Talbot, G8FCX, 31 Pier Road, Littlehampton, W. Sussex BN17 5LW. (Littlehampton 5082)
- CHILTERN: P. B. Stears, G4LMM, 127 Hughenden Avenue, High Wycombe, Bucks. HP13 5SS. (0494 24095)
- CLIFTON: R. A. Hinton, 42 Sutcliffe Road, Welling, Kent. (01-301 1864)
- CONWY VALLEY: J. H. Wright, GW4KFI, Eleven, Bryn Derwen, Abergele. (Abergele 823674)
- CRAY VALLEY: P. J. Clark, G4FUG, 42 Shooters Hill Road, London SE3. (01-858 3703)
- CRYSTAL PALACE: G. M. C. Stone, G3FZL, 11 Liphook Crescent, London SE23 3BN. (01-699 6940)
- DERBY: Mrs. J. Shardlow, G4EYM, 19 Portreath Drive, Darley Abbey, Derby DE3 2BJ. (0332 556875)
- DUDLEY: N. Rock, G3RLY, 28 Conway Avenue, Kingswinford, Staffs. (Kingswinford 277617)
- EDGWARE: H. Drury, G4HMD, 39 Wemborough Road, Stanmore, Middx. (01-952 6462)
- Ex-G: F. W. Fletcher, G2FUX, 53 St. Ives Park, Ringwood, Hants. (Ringwood 3561)
- FAREHAM: B. Davey, G4ITG, 31 Somerville Drive, Fareham, Hants. PO16 7QL.
- FARNBOROUGH: I. Ireland, G4BJQ, 118 Mytchett Road, Mytchett, Camberley, Surrey. (Farnborough 43036)
- GLOUCESTER: E. A. Perkins, G3MA, 40 Calton Road, Gloucester GL1 5DY.
- GUILDFORD: Miss H. Davies, G8SXB, 23 Foreman Park, Ash, Aldershot, Hants. GU12 6JN.
- G-QRP: G. C. Dobbs, G3RJV, 17 Aspen Drive, Chelmsley Wood, Birmingham B37. (021-770 5918)
- HARROW: C. D. Friel, G4AUF, 17 Clitheroe Avenue, Harrow, Middx. HA2 9UU. (01-868 5002)
- HARWELL: Mrs. A. E. Stevens, G8NVI, 78 Whitehorns Way, Drayton, Abingdon, Oxon. OX14 4LJ. (Drayton 430)
- HEREFORD: S. Jesson, G4CNY, 181 Kings Acre Road, Hereford. (Hereford 3237)
- HOME COUNTIES AMATEUR TV: M. Sanders, G8LES, 11 Denleigh Gardens, Thames Diton, Surrey. (01-398 4618)
- IPSWICH: J. Tootill, G4IFF, 76 Fircroft Road, Ipswich, Suffolk IP1 6PX.
- IRTS: C. Yeates, E17AAB, 126 Beech Park, Lucan, Co. Dublin, Eire.
- ISLE OF WIGHT: I. Moth, G4MBD, "Claygate", Colwell Road, Freshwater, I.o.W. (Freshwater 753948)
- JERSEY: S. Smith, GJ8EZA, 19 Parade Road, St. Helier, Jersey.
- KILMARNOCK & LOUDON: W. Strachan, GM3ZRT, 38 Loudon Avenue, Galston, Ayrshire. (Kilmarnock 820052)
- LIVERPOOL: R. Simmons, G3PNS, 62 Daneville Road, Liverpool L4 9RG.
- LOUGHBOROUGH: J. S. Smith, G4DZL, c/o 91 Anson Road, Shepshed, Loughborough, Leics LE12 9PT. (Letters only)
- LOUGHOR: T. Griffin-Thomas, Riverside Manor, 77 Castle Street, Loughor, Nr. Swansea, W. Glamorgan. (Swansea 893392)
- LOUTH: R. D. Wilson, G4IPE, 112 Upgate, Louth, Lincs. LN11 9HG. (Louth 602220)
- MAIDENHEAD: J. Patrick, G3TWG, Bedford Lodge, Camden Place, Bourne End, Bucks. (Bourne End 25275)
- MEIRION: Mrs. J. Jones, GW8SYX, 25 Fford Dyfrig, Tywyn, Gwynedd. (Tywyn 710402)
- MIDLAND: N. Gutteridge, G8BHE, 68 Max Road, Quinton, Birmingham B32 1LB. (021-422 9787)
- MID-SUSSEX: J. Brooker, G3JMB, 20 Farnham Avenue, Hassocks, Sussex.
- NORFOLK: P. Gunther, G8XBT, 6 Malvern Road, Norwich NR1 4BA. (Norwich 610247)
- NORTH BRISTOL: W. E. Bidmead, 4 Pine Grove, Northville, Bristol BS7 0SL. (Bristol 691685)
- NORTHERN HEIGHTS: R. Harker, G4CMK, 11 Buck Street, Denholme, Bradford. (Bradford 844442)
- PLYMOUTH: Mrs. P. L. Day, G4KYY, 46 Beatrice Avenue, Saltash, Cornwall, PL12 4NG.
- PONTEFRAC: N. Whittingham, G4ISU, 7 Ridgedale Mount, Pontefract, West Yorkshire WF8 1SB.
- R.A.I.B.C.: Mrs. F. Woolley, G3LWY, 9 Rannoch Court, Adelaide Road, Surbiton, KT6 4TE.
- R.A.O.T.A.: Miss M. Gadsden, 19 Drummond House, Font Hills, Long Lane East, Finchley, London N2.
- R.A.T.E.C.: R. Marsh, G8TYH, 43 Jenny Lane, Woodford, Cheshire SK7 1PE.
- READING: C. Young, G4CCC, 18 Wincroft Road, Caversham, Berks. RG4 7HH.
- REIGATE: C. S. Barnes, G8FCE, 25 Hartswood Avenue, Woodhatch, Reigate, Surrey RH2 8ET.
- R.A.F.: The Admin. Secretary, R.A.F. Amateur Radio Society, R.A.F. Locking, Weston-super-Mare, Avon BS24 7AA.
- ROYAL NAVY: M. Puttick, G3LIK, 21 Sandyfield Crescent, Cowplain, Portsmouth, Hants. PO8 8SQ. (Waterlooville 55880)
- ROYAL OMANI: N. Edwards, A4XIQ, EIT, P.O. Box 81, Muscat.
- SAFFRON WALDEN: P. Carter, 84 Little Walden Road, Saffron Walden, Essex. (Saffron Walden 21697)
- SEFTON: L. Gurney, G4LBJ, 1 Endbourne Road, Orrell Park, Liverpool L9 8DP. (051-523 6077)
- SILVERTHORN: C. J. Hoare, G4AJA, 41 Lynton Road, South Chingford, London E4 9EA. (01-529 2282)
- SKEGNESS: J. Joslin, G3NPY, 150 Roman Bank, Skegness, Lincs. PE25 1SE.
- SOUTH BIRMINGHAM: Mrs. G. Apperley, G4GZI, 35 Denise Drive, Harborne, Birmingham 17.
- SOUTHDOWN: R. E. Holtham, G4EKS, 2 Benbow Avenue, Eastbourne, E. Sussex BN23 6AB. (Eastbourne 31620)
- S.E. KENT YMCA: T. Cassidy, G8PZA, Firbank, Guston, Dover, Kent CT15 5ET. (Dover 204856)
- SOUTHGATE: Mrs. V. Austin, G4MCD, 89 Chaseville Park Road, Winchmore Hill, London N21. (01-360 5832)
- STOURBRIDGE: M. Davies, G8JTL, 25 Walker Avenue, Quarry Bank, Brierley Hill. (Lye 4019)
- SURREY: R. Howells, G4FFY, 7 Betchworth Close, Sutton, Surrey SM1 4NR. (01-642 9871)
- SUTTON & CHEAM: G. Brind, G4CMU, 26 Grange Meadow, Banstead, Sutton Coldfield, W. Midlands B74 4PW. (021-353 2061)
- THAMES VALLEY: M. C. Bull, G8RLB, 6 Park Road, Hampton Hill, Middx. TW12 1HD. (01-977 6122)
- THANET: I. B. Gane, G8HLG, 17 Penshurst Road, Ramsgate, Kent. (Thanet 54154)
- THORNTON CLEVELLEYS: A. Parr, G31WP, 43 Argyle Road, Poulton-le-Fylde, Blackpool.
- TORBAY: H. Davies, G4DZH, 18 Bowland Close, Paignton, Devon, TQ4 7RT. (Paignton 523063)
- TYNESIDE: J. Dingwall, G4ILW, c/o Amateur Radio Society, Community Centre, Vine Street, Wallsend, Tyne & Wear.
- UK HORIZONTAL FM: A. Dorsett, G8YLH, The Coach House, Dogmersfield Park, Dogmersfield, Hants. (Aldershot 850678)
- UNIVERSITY OF CAMBRIDGE: C. Budd, G8OPB, St. John's College, Cambridge.
- UNIVERSITY OF NORTH WALES: S. Brown, GW3UCB, Amateur Radio Society, Dept. of Electronic Engineering, Dean Street, Bangor, Caerns.
- VALE OF WHITE HORSE: A. Lovegreen, G4FLX, 16 Church Lane, Wallingford. (Wallingford 37482)
- VERULAM: G. Dale, G3PZF, 16 Palfrey Close, St. Albans. (St. Albans 57665)
- WAKEFIELD: R. C. Sterry, G4BLT, 1 Wavell Garth, Sandal Magna, Wakefield. (Wakefield 255515)
- WEST KENT: B. P. Castle, G4DYF, 6 Pinewood Avenue, Sevenoaks, Kent TN14 5AF. (0732 56708)
- WIRRAL: G. O'Keefe-Wilson, G4MIA, 20 South Drive, Upton, Wirral. (051-671 1531)
- WORCESTER: M. Tittensor, G4EKG, 16 Duncott Road, Evesham. (Evesham 41105)
- WORTHING: R. Poore, G8LBN, 30 Melbourne Avenue, Goring-by-Sea, Worthing, W. Sussex.
- YEOVIL: D. L. McLean, G3NOF, 9 Cedar Grove, Yeovil, Somerset. (Yeovil 24956)

Thursday evening. Hq is at Chequers Bridge Centre, Painswick Road. For more details, contact the Hon. Sec. - see Panel.

At Guildford they have the second and fourth Fridays at the

Model Engineers Hq in Stoke Park. We don't have the October data, for which we must refer you to the Hon. Sec. at the address in the Panel.

Of the G-QRP club what can we say? Over 1100 members

and – the final accolade – a GW3COI cartoon on the front page of SPRAT, the club magazine. If you like working with flea-power, this is the club for you. Details, of course, from the Hon. Sec. – see Panel for his address.

The **Harrow** newsletter puts all the essentials on the front cover – Friday evenings at Harrow Arts Centre, Harrow Weald.

Harwell have their meetings on the third Tuesday of each month, at the Social Club of AERE, Harwell. More details of this group – membership isn't restricted – from the Hon. Sec. – see Panel.

On we go to **Hereford**, where they are based at the County Control, Civil Defence Hq, Gaol Street, Hereford on the first and third Fridays of each month.

We have already mentioned BATC, and now we come to the **Home Counties Amateur Television Group**, who are going to meet at the Swan Hotel, High Street, Iver, on the fourth Wednesday in each month. (G3KFE recalls that he was first licensed /T, and he wonders why local ATV groups have not been formed before).

Ipswich have booked October 14 and 28 at the "Rose and Crown" at the junction of the A45 Norwich Road and Bramford Road; the former is for planning their J-O-T-A activity and the latter is set apart for G3XAP to talk about aeriels.

If you want to know anything pertaining to amateur radio in Eire, then you have to get in touch with **IRTS**; for details of the current meetings schedule we must refer you to the Hon. Sec. again – his address is in the Panel.

Change is the word for the **Isle of Wight** group, who changed their officers round at the AGM. They are still to be located, though, at the Unity Hall, near the "Sloop Inn", Wootton Bridge, on Friday evenings.

Jersey are based at the Communicare Centre, St. Brelade, on the second Wednesday in each month; and in October they are also to take part in J-O-T-A at the Scout Hq Tower, St. Ouen, signing GJ4HXJ.

Now we must head north, to **Kilmarnock & Loudon**, and note that they are now foregathering every second Tuesday, at the Buchanan Centre, Riccarton, Kilmarnock.

If you join the **Liverpool** lot, you can also join their RAE course – a good deal in these hard times! The gang are at home to visitors every Tuesday evening, at the Conservative Rooms, Church Road, Wavertree.

Loughborough are based on Brush Sports & Social Club, 18 Fennel Street, every Friday evening, and visitors are welcome.

The new venue for the **Loughor** group is Loughor Scouts Hall, fortnightly on Tuesdays. No details are yet to hand on the programme, for which contact the Hon. Sec. – see Panel.

Louth are in session on October 13, for a constructional evening, which will have been discussed at an earlier meeting. The Hq is understood to still be Pleasant Place, off Ramsgate, Louth.

A brief note from **Maidenhead** tells us that on October 1 there is to be a talk on "Locator Systems" by G4ANB, while on October 20 there will be a talk and demonstration by **CQ Electronics**. The Hq is at the Red Cross Hall, The Crescent, Maidenhead.

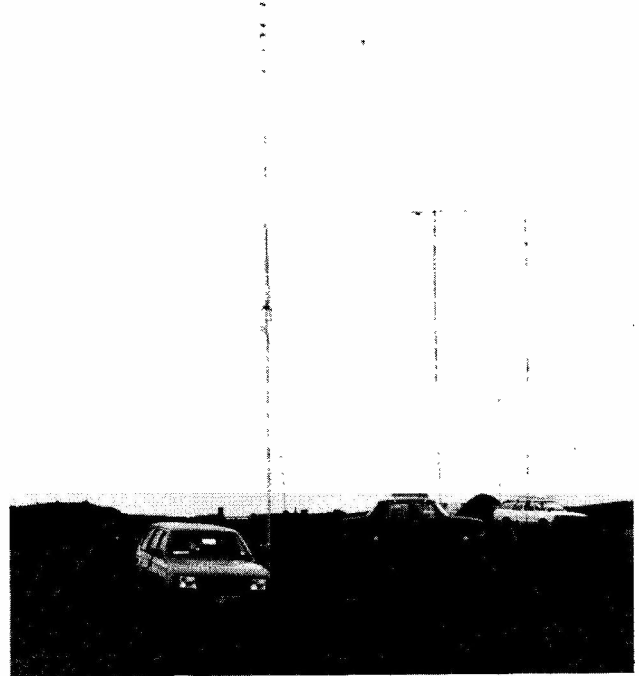
"Speaker's Choice" on October 1 lets John Knight have a free hand at **Meirion**. As to the 'where' – try the Ship Hotel in Dolgellau.

The front page of the **Midland** newsletter this month features the minutes of the first ever committee meeting in June 1931 – fifty years ago. Now they have their own place, at 294A Broad Street, Birmingham (facing the Repertory Theatre). For the rest we must refer you to the Hon. Sec. see Panel.

Now we turn to **Mid-Sussex**, and we admit to missing their old newsletter cover picture of the Marle Place Hq, which is in Leylands Road, Burgess Hill. October 1 is the next meeting date, when G4GKO will be talking about his travels.



The Sutton and Cheam Radio Society 1981 VHF NFD, at Leek, Staffs (ZN71). Above, Brian Cannon, G8DIU, operating the 23cm. station (G3DCZ/P), comprising a TS-700G, Microwave Modules transverter, and a G8DIU home-brew 40-watt output PA using two 2C39A's. Below, the aerial array showing, left to right, 2m. station (G4CQR/P), 4m. station (G4BOX/P), 23cm. station (G3DCZ/P) and the 70cm. station (G4ADM/P).



Norfolk foregather at Crome Community Centre, Telegraph Lane East, Norwich, where they are to be found every Wednesday evening.

A problem has hit the **North Bristol** gang who have outgrown their Hq at S.H.E.7, Braemar Crescent, Northville, Bristol 7, where they meet on Fridays. As a result, they have had to close their ranks against new members at least for the time being.

Wednesdays at the Bradshaw Tavern, Bradshaw, Halifax, is the form for **Northern Heights**; we don't as yet have the new season's programme, as they seem to have a minor hang-up in that area – but doubtless by the time you get to read this, all will have been resolved.

If you want to find the **Plymouth** gang, you must look for Paradise Road, Millbridge, and then Tamar Secondary School; alternate Mondays is the routine.

October in **Pontefract** looks like: October 1 a talk on micro-waves by G3ZIV, October 9 (Friday) a disco dance in aid of Club funds; and on October 15 a talk by G4KYL and her OM, G4AAQ, on "American Ham Radio", illustrated by slides. The Hq is at Carleton Community Centre, the room being on the top floor.

We mustn't forget to mention **R.A.I.B.C.**, the group for those of our hobby who are blind or invalid. If you know someone in those two categories, get them signed up; and, while you are about it, sign up yourself as a Supporter or Representative, send a donation, or get the club to have a whip round for R.A.I.B.C. funds. The contact of course is the Hon. Sec. - see Panel for her name and address.

R.A.O.T.A. membership is open to all those, whether licensed amateur or SWL, who can prove activity in our hobby over a period of 25 years; for an SWL a QSL card would be adequate proof. Details from the Hon. Sec. at the address in the Panel. As an aside, the club call is G2OT, and they have a net on Eighty SSB at 11 a.m. on Thursdays, 3740 kHz.

R.A.T.E.C. is a club in the South Manchester area which has been formed to promote technical involvement in amateur radio, their Hq address being the British Legion, Moor Lane, Woodford, Cheshire. For programme details, please refer to the Hon. Sec. - see Panel.

At **Reading** you have to look for the B481 Reading-Nettlebed Road, and then Emmer Green, where their Hq is a pub called the "White Horse". October 13 is down for a showing of the ARRL film "The World of Amateur Radio", while on 27th they will be seeing the latest products from Wood and Douglas Ltd.

On to **Reigate** and the third Tuesday of each month at the Constitutional and Conservative Centre, Warwick Road, Redhill. For programme, we must refer you to the Hon. Sec. - see Panel.

The Annual General Meeting of the **R.A.F.A.R.S.** is to be held at R.A.F. Locking on Friday November 6; all the members are cordially invited, and talk-in will be provided on S22 and the 'BC repeater.

Having mentioned the R.A.F. we mustn't forget the **Royal Navy**: get the details from the Hon. Sec. - see Panel. Membership is open to all who are serving or ex-R.N., and associate membership is open to those of the mercantile marine or foreign navies.

For news of everything that happens in A4-land, the **Royal Omani** Radio Society Hon. Sec. is the chap to ask; his address is in the Panel.

Closer to home, we have the **Saffron Walden** group, who are in session on the third Wednesday of each month at Debden Village Hall.

Although we have a recent letter from the Hon. Sec. of **Sefton**, we don't have the essential details of the programme. However we do know they have their base at Liverpool Prison Officers Social Club, Hornby Place, Hornby Road, Walton, Liverpool 9, where they foregather fortnightly on Wednesday evenings.

The **Silverthorn** group have Hq at Friday Hill House, Simmons Lane, Chingford, London E4, where, oddly enough, they meet every Friday.

On up to **Skegness**, and here we are advised that the locals head for the "White Swan", Burgh-le-Marsh on the first and third Tuesday in every month. This is another group who have an R.A.E. class planned; details from the Hon. Sec.

South Birmingham have their main meeting on the first Wednesday in each month, the lecture to start prompt at eight, so notices are read five minutes before this; the Hq is open every Thursday and Friday evening. As to the whereabouts, try Hampstead House, Fairfax Road, West Heath, Birmingham.

Southdown now, and the first Monday of the month, at Chaseley Home for Disabled Ex-Servicemen, Southcliff, Eastbourne; October is a junk sale, and November is down to

Mrs. Ham to talk about "Codes and Cyphers".

The club serving the Dover area is called **S.E. Kent YMCA**, and the Hq is naturally enough at the YMCA, Leyburne Road, on Wednesday evenings 7.30 for 8 p.m. October 7 is a natter with emphasis on SWL topics, and on 14th there is a talk on weather forecasting. October 21 sees G3LCK talking about his view of amateur radio, and on 28th they have a slide show.

Looking at **Southgate** we note firstly that we must congratulate the Hon. Sec. for changing her G8 call to G4MCD. For the October meeting on the second Thursday, they are hoping for a talk on RTTY. The venue is St. Thomas Church Hall, Prince George Avenue, Oakwood, N14.

Stourbridge have the third Monday in every month, at Longlands School, Brook Street; the October meeting is to be a talk on Air Traffic Control by G8AIR.

The **Surrey** venue is at *TS Terra Nova*, 34 The Waldrons, South Croydon, on the first and third Monday. Thus on October 5, G3OOHX will be giving his talk on TVI/BCI, and on 19th they have an informal, with the club rig on the air and whatever.

Deadlines for "Clubs" for the next three months -

November issue - September 25th

December issue - October 30th

January issue - November 27th

February issue - December 31st

Please be sure to note these dates!

Having two meeting places, as do **Sutton & Cheam**, is a bit confusing for your scribe, but this month they spell it out clearly: October 9 at Sutton College of Liberal Arts, and October 30, a junk sale at Banstead Institute, High Road, Banstead.

It's quite a while since we heard from **Sutton Coldfield**; they meet nowadays in the public library in Sutton Coldfield on the second and fourth Mondays, and we understand that most evenings have a formal programme, with visitors made welcome.

Thames Valley have their corporate being at Dittons Library meeting room, Watts Road, Thames Ditton, Surrey. The subject on October 6 will be Amateur Slow Scan TV, by G3CDK; a talk and demonstration.

On alternate Fridays, we hear, the Radio Club of **Thanet** congregate at Birchington Village Centre. No details of the programme are given but we understand this new club wouldn't say 'no' to a few visitors or prospective new members.

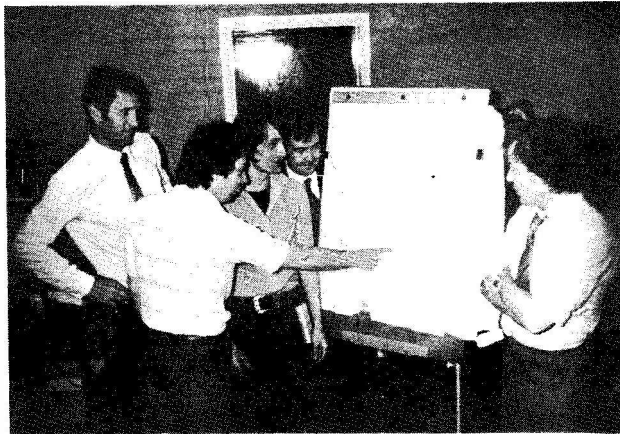
We have to hand the first issue of the new **Thornton Cleveleys** newsletter - quite a nice effort. They now have some 140 members, who are to be found on Monday evenings at the Leisure Centre, Cleveleys.

Torbay say they haven't a lot to report this time; however they still foregather every Friday evening informally, and also have a formal-with-lecture on the last Saturday evening of each month. Find them at Bath Lane, rear of 94 Belgrave Road, Torquay.

Tyneside's home is at the Community Centre, Vine Street, Wallsend, on Monday evenings. They have various activities set up, and a station to put on the air, not to mention making a 'thing' of helping newcomers to the hobby.

UK Horizontal FM Group again mention their contest, on October 18, details of which have been passed to G3FPK for *VHF Bands* mention. Details of the group can be obtained from the Hon. Sec. - see Panel.

University College of North Wales now, based on the UCNW, Dean Street, Bangor, Gwynedd. They are to be found in Room 216 around 1300, or whenever lectures get a bit



G4BEG indicates the coverage of the new 70cm. repeater, GB3VH, during a recent talk to Verulam A.R.C. members, at which he was assisted by, left to right, G8FPR, G8ATO and G4MES. On the far left, club chairman G3JKS.

wearing! The gang want to rope in all possible members, so get in touch with the Hon. Sec. for all the details *and* a free pint!

The **Vale of the White Horse** foregather on October 6, when G3NVO of Siliconix will be talking about VMOS FETs, but they are in the "White Hart" in Harwell village every Tuesday evening anyway. An interesting piece in their newsletter details G4ANB's activities with a bicycle and a hand-held portable rig!

October 27 sees G3ROO of the G-QRP club, talking to the **Verulam** chaps about SSB QRP working. They also have informal meetings on the second Tuesday of the month at the R.A.F. Association, Victoria Street, St. Albans. The main meeting already mentioned, is at the Charles Morris Memorial Hall, Tyttenhanger Green, Tyttenhanger, near St. Albans.

Wakefield have October 6 and 20 booked at Room 2, Holmfield House, Denby Dale Road; the former date is a natter and station evening, while the latter is a home-brew evening.

October 2 at **West Kent** is down for a talk on pulsars by Jocelyn Burnell, and on October 16 they have a talk on the measurement of SSB output power by G3ROO, followed on October 30 by the first part of a talk on colour TV. These are all at the Adult Education Centre, Monson Road, Tunbridge Wells; they also have informals on the Tuesday after each Friday date, which are at the Old Drill Hall in Victoria Road, Tunbridge Wells.

There are hints of possible change at **Wirral**, in the matter of the venue. This being so, we suggest a contact with the Hon. Sec. if you intend paying a first visit—his details are in the Panel. (Congratulations on the G4, OM!). October 7 is a practical demonstration of amateur radio equipment on the air, and on October 21 it is AGM time.

The **Worcester** Hon. Sec. says he isn't going to carry on after the AGM, but is willing to have his name in the Panel until the new chap is in contact—thanks! October 5 is down for G4BVY to talk about receiver performance, at the "Old Pheasant", New Street, Worcester.

Worthing meet every Tuesday evening at Pond Lane Amenity Centre, and have now a membership of above 100. It is also noted that they have the AGM during October, although the actual date is not mentioned.

October for **Yeovil** is quite interesting; October 7 sees G3MYM explaining what power output is, and on 8th they have the tape talk "World at their Fingertips"; October 15 is down for G3MYM again, this time to talk about modulation. October 22 sees a change of speaker, with G3DSS asking them

"Why Balanced Mixers?", which leaves October 29 for a matter. The venue is Building 101, Houndstone Camp, Yeovil.

Finale

That's the lot for another month; the deadlines for the arrival of your news are in the 'box' in the piece as usual. The address is "Club Secretary", **SHORT WAVE MAGAZINE**, 34 High Street, Welwyn, Herts. AL6 9EQ. See you next time!

More R.A.E. Courses

Stevenage and District A.R.S. are running two classes on Tuesday evenings, one for the December exam and the other for the May R.A.E. These classes started in September, but we received notification too late to publish with our main listing in the September issue. Anyone interested should contact Frank Collett, G3OVT, 8 Silam Road, Stevenage, Herts.

The same 'late arrival' story applies to the course being held at Marle Place F.E. Centre, **Burgess Hill**, West Sussex, on Tuesdays 7.30-9.30 p.m., which started Sept. 22nd. Further details from T. Carter, G3BPV, QTHR (tel: Burgess Hill 2501).

Special Event Station

Imperial College A.R.S. (G5YC and G8EYC) will be operating GB2IC at the Imperial College Freshers' Fair on 6th October. Operation will be on 15/40m. HF, and 2/4m. VHF. They hope to have calls from old members of the Society, but QSO's from anyone will be very welcome. Although Freshers' Fair (which introduces new students to the college societies and clubs) is the main reason for GB2IC, this callsign will be used from 1st to 28th October to introduce as many new students as possible to amateur radio. Contact G5YC, QTHR, for further details.

Silent Key

It is with great sadness that we record the death of Frank Rayer T.Eng (CEI) AIERE, G3OGR. As well as writing several books on amateur radio and allied subjects, many readers will know that Frank was a regular contributor to "Short Wave Magazine" over many years, his articles always being on very practical and well-tested projects — introducing many to the fun and satisfaction of home-building. He will be a great loss to amateur radio. We extend our deepest sympathy to his family, in their loss.

**Subscription rate to
Short Wave Magazine
is £7.50
for a year of twelve
issues, post paid**

**SHORT WAVE MAGAZINE, LTD.,
34 HIGH STREET,
WELWYN, HERTS. AL6 9EQ**

QUICK TWO-METRE GUTTER MOUNT ANTENNA

J. V. MOSS, B.Sc., G4ILO

MMAGNETICALLY-mounted mobile antennas are popular for many reasons, for example, to allow the aerial to be removed from the car when it is parked in the street, or simply to avoid drilling holes in the bodywork. However there are occasions, particularly when one is in a hurry, when it is a nuisance to have to set up the antenna before driving off.

The antenna to be described costs next to nothing, particularly if junk box parts are used. It can be made in under half an hour, can be clipped to the gutter in seconds from inside the car, and performs as well as a commercial quarter-wave antenna.

Construction

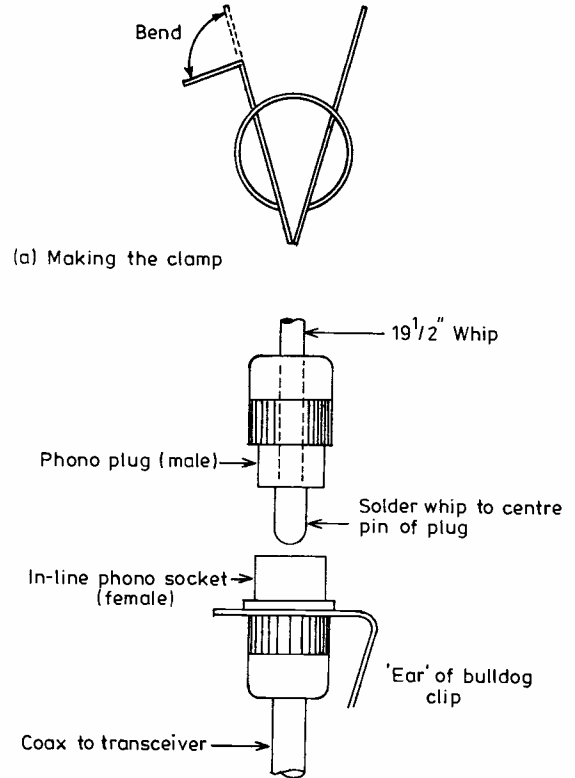
The mount is made from a large 'bulldog' clip, as can be obtained from an office stationers. The one used had 2½" jaws, but one with extra long 5½" jaws could be used for extra grip; these clips have a 7/16" hole in each 'ear'. It will be found that an ordinary in-line phono socket will locate in one of the holes, and can be clamped in position by tightly screwing up the plastic cover. One of the 'ears' is bent outwards through slightly more than a right-angle, as shown in Fig. 1a. The co-axial cable is soldered to the socket which is then clamped in position as described; a suitable RF connector is then fixed to the other end of the cable.

A 19½" length can be cut from an old mobile aerial, or a wire coat-hanger can be opened out and used; this is soldered to the centre connection of a phono plug. The outer ring of the plug should be made slightly oval with pliers to ensure a tight fit on the socket. Whip and mount are assembled and the antenna is ready for use.

Use

The antenna is simply passed through the car window and clipped to the gutter; moving the clip from side to side should establish a secure position and the whip should not fall off at normal driving speeds. Clamping the cable by winding up the window provides additional security. If thin 52 ohm cable is used, it would be possible to pass it between the door and the frame, allowing the window to be fully closed. Such a short length (a few feet) would have negligible loss at 144 MHz.

With the prototype antenna, simplex contacts of 30 miles



(b) Detail showing complete assembly Fig. 1

D 706

have been made, and repeaters 60 miles away accessed, using 2 watts of FM.

Variations

Interchangeable whips for other bands could be made up using additional phono plugs. However I would hesitate to use longer than 20" whips at motorway speeds.

Owners of the popular IC-2E should note that a nut-fixing BNC socket intended for chassis mounting will fit the holes in the 'bulldog' clips: this would allow the use of IC-2E accessory aerials while mobile, although some way of water-proofing the co-ax connection would have to be found.

Finally, with the addition of a quarter-wave wire counterpoise, the aerial can be clipped to a window frame and used from /A locations.

"SOME GOOD TURNS"

A PRACTICAL METHOD OF PRODUCING A USEFUL TAPPED COIL

NOT infrequently in amateur radio one needs use of a large tapped coil, for such coils are extremely useful for aerial matching purposes or incorporating in aerial tuners. The use of physically small coils for such tasks is quite useless except perhaps in QRP sets-ups, and 'air-cored' types are generally to be preferred. To facilitate 'fussy' final turns selection it is convenient if every coil turn is tapped.

It is not easy to locate a source of supply of coils of this kind and even if a few are to be seen occasionally at mobile rallies the prices asked even for 'tatty' items can be quite off-putting to say the least, whilst the once fairly easily obtainable roller coaster units

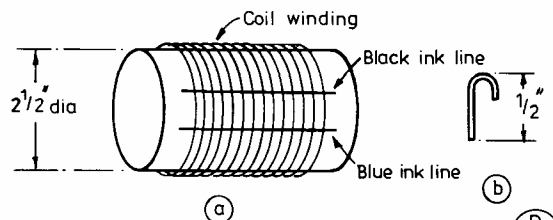


Fig 1

D 732

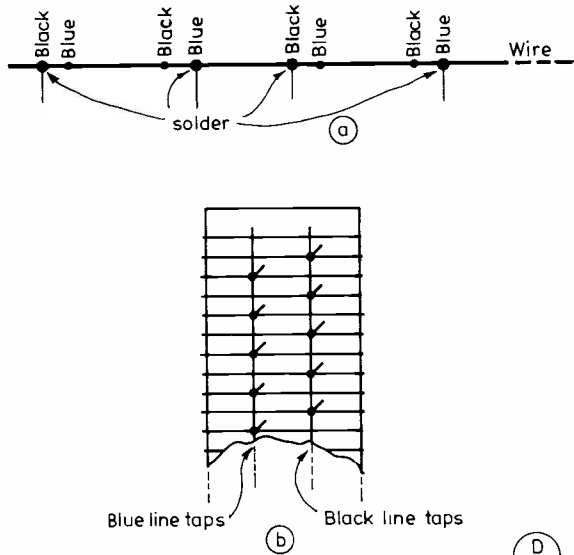


Fig. 2

D 733

have become a rarity, the rarity value being mirrored in the prices asked.

So you walk away still clutching your crisp unhurt £10 note — and why not? After all it is surprisingly simple to construct a good quality coil of the kind required for a very modest cash outlay. ‘But, tapping it at every turn — there’s the rub’, you say! But it’s very easy really and here is a sure-fire way of doing it almost painlessly.

Let’s assume the coil is to be approximately 65mm diameter and is to have about 30 turns and each one tapped. The first item to seek out is a bit of hard plastic drain pipe or other suitable ‘former’, and as the precise diameter is not critical in any way one of those oddments in the corner of the garage or shed that you thought would come in handy one day is now needed.

Now, off to ‘Woolies’, or somewhere similar, for some single-core insulated wire (sometimes sold as ‘bell wire’); the conductor thickness may be around 21 s.w.g. and about 7m. will do, but make sure the insulation is white.

Back home, anchor one end to the ‘former’ and wind on the desired number of turns — and too many is better than not enough — as a trial, then holding the free end firmly draw two lines in parallel along the length of the coil insulation in biro, one in black and the other in blue (or other colour) and about 15-20mm. apart as in Fig. 1a, making certain that every turn is clearly marked in two places.

Now let the wire spring free and straighten out the concertina-shaped muddle! Next make up some plain copper wire tapping hooks something like Fig. 1b and get the soldering iron heated up.

Taking the coil wire which is now marked in two colours evenly spaced along its length, starting at one end nick the insulation with a sharp knife at a *black* spot, part the covering, crimp on one of

the tapping hooks and solder. Move along the wire and locate the next pair of biro marks, and ignoring the black one nick the insulation at the *blue* mark and similarly solder on a tapping hook. Proceed along the wire soldering tapping hooks to *alternate* colours until — blessed relief — the end comes! A wire resembling that shown in Fig. 2a now results. Large blobs of solder are not needed but joints made both mechanically and electrically sound are absolutely essential.

The next step is to hand your jersey or sweater to the nearest obliging female to have all those pulled threads made good, whereupon the coil can be carefully and finally rewound. Any dodgy joints will now show up like your sore thumb, for a little judicious wire twisting will be necessary here and there to make the taps stand free of the windings. When the final anchoring is done a rather neat, tapped coil results, the taps standing clear of each other. The wire insulation provides a small ‘turns spacing’ effect — see Fig. 2b — but if a larger turns spacing is wanted wind thin string with the coil turns; this can be finally removed and the spaced windings locked firm with *Araldite* or other suitable adhesive. The unwanted length of the ‘former’ can then be sawn off, all the tappings trimmed to the same length and the work eyed with satisfaction!

Making it Work

The uses for such coils are already well known and lie mainly in the field of aerial to transmitter matching or aerial tuning. Such a coil can easily handle the output of a 50W transmitter designed to work into a 50-ohm load. The addition of a variable capacitor of, say, 470pF (nominal) value and a small crocodile clip is all that is required to make the coil into a very effective ‘L’ match coupler, capable of matching the transmitter 50-ohm output impedance to a high impedance end-fed aerial wire of non-critical length; it becomes in effect an extension or addition to the transmitter pi-network. The circuit of Fig. 3a is a familiar one and suitable taps are selected for the band in use in conjunction with variable capacitor C1, using a decent SWR meter in the line to the transmitter which has earlier been adjusted for optimum results into a 50-ohm loading dummy; if the device is for use with a receiver only, no SWR indicator is needed and taps and adjustments are made to give maximum ‘S’ meter indications.

The tapped coil can also be used to load into a vertical aerial of, say, 6m. in conjunction with a good ‘ground’ system, using the coil as shown in Fig. 3b. The inner conductor of the 50-ohm coaxial cable can be placed initially at the second or third turn from ground, experimentally. With the transmitter already adjusted with the aid of a dummy load for optimum 50-ohm working the crocodile clip is adjusted a turn at a time until the SWR monitor reads low reflected and maximum forward power. This can clearly be time consuming when several bands are to be catered for, but later the croc. clip can be exchanged for a switch. A waterproof plastic case is needed for the vertical arrangement.

All that remains is to get the rig fired up on the CW patch of ‘Ten’, plug in the key and deal with any intruders with a juicy CQ call! It’s a band worth looking after!

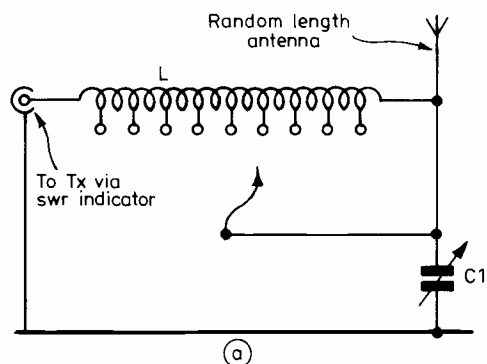
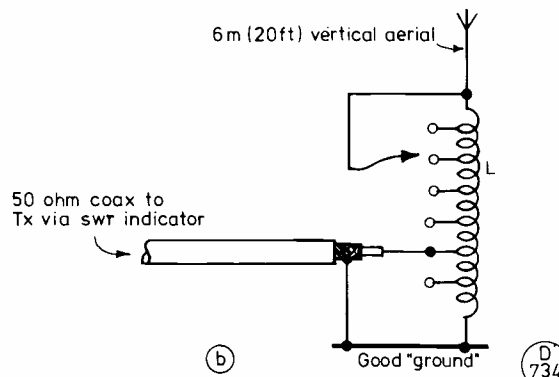


Fig. 3



D 734

“A Word in Edgeways”

Letters to the Editor

The views expressed here are not necessarily those of the Editor, nor should they be taken to represent any particular SHORT WAVE MAGAZINE policy.

Dear Sir – With reference to G3OHK's excellent suggestion in the September issue that G8's (and G6's) should have 28 MHz, I myself made this point in correspondence with Geoff Arnold, G3GSR, a few months ago.

His feelings that this band should be used under a novice licence, as in some other countries, permitting low-power CW operation are, I think, very sensible. This would keep the band busy and give us budding G4's some practice under actual operating conditions.

J. Acton, G8UXT

Dear Sir – It was with dismay and indignation that I read a proposal in “CDXN” (Sept.) to use Phone for shifting CB intruders from the CW section of the Ten Metre band. This way of thinking has already led to the formation of amateur vigilante groups in Yorkshire, which engage in CB-hunting using QRO SSB in the CW section. For all I know, this practice may be widespread.

Before we allow matters to descend to the level of chaos and confusion, let us consider the effect of using Phone in the CW end of the band. It contravenes existing and well understood principles of band planning, is inefficient, and causes irritation to CW operators.

If, as seems usually to be the case, QRO is used in order to deliver a strong ground-wave signal at several miles range, then the inverse square law will ensure that some neighbouring amateurs are going to get fed up before the CB intruders. Moreover, when the band is open, a lot more RF is going to come to ground where it is not wanted and may even lead to the Phone-using vigilante being mistaken for a CB-er himself.

The existing, unlicensed CB fraternity are well organised, not only to further their own aims but also to outwit the law; and this they do at present with impunity. I take the view that when the UK licensing procedures release genuine activity on to the top end of 27 MHz, there will be an increase of unlicensed ‘breaker’ activity in the nearest part of the spectrum – Ten Metres!

Amateurs must for their own protection make full use of Ten. As stated in “CDXN”, CW test calls can be made to render affected channels uncomfortable for the intruders. Even so, if brain rather than brawn is to succeed, we need to adopt an organised approach which nonetheless stops short of the Phone vigilante concept. CW “Test” calls can be made distinctive for this purpose, perhaps by including strings of alternating dots and dashes (easy for the el-bug users!), or by the use of “QRM?” (literally, “is there interference on this channel?”). This would lead to an exchange of information about strength, direction and possible location of the intruder.

Particularly in those instances when ground-wave propagation is concerned, this procedure, supplemented by the use of the landline, can be used to involve other interested amateurs located close enough to the offender to be able to deliver a strong, localised signal without use of excessive power. There is a role for Phone, in the setting up of control nets to direct operations when the intruder problem is severe or complex.

The majority of CB intruders are well aware of what they are doing and take little heed of polite requests to move. Far better that they should come to understand that use of unauthorised bands invites a sharp and effective response.

G3RJV does well to draw our attention to the weapons in the CB-ers armoury (Sept. issue). He and I as, respectively,

Secretary and Chairman of the G-QRP Club, are concerned with the use of minimal power to achieve the desired effect in communications. Many of the CB fraternity stand diametrically opposed to such views and must not be allowed to turn the lower end of 28 MHz into a battleground of the giants!

G. J. Bennet, G3DNF

Dear Sir – Recently, after a lapse of some years, I have returned to short wave radio as an SWL hoping to get my ticket shortly.

However, on tuning across the amateur bands I am often appalled at what I now hear. The standard of operating appears to be so low and seems to be exactly what is implied by the term ‘amateur’, and one can easily see how the late Tony Hancock obtained the material for his “Radio Ham” sketch.

For myself, my interests lie mainly in CW and RTTY, which at least require some real skills.

I happen to be the holder of a Flight Radio Telephony Operator's licence, and can well remember taking the exam. One had to pass, in addition to the technical exam, an operating test using simulated RT circuits, as well as being virtually perfect on procedures, in order to gain a licence. The use of standard phonetic alphabet was, and still is, mandatory.

When I hear the drivel coming over the HF and VHF bands I can understand why many of the public confuse CB-ers and radio amateurs. I am a mere amateur pilot, but when I use VHF (Aeronautical Bands), I try to be as professional as possible; in return I am treated by the professional operators as someone who can be relied upon to understand and pass messages of all types, including urgency and distress. Can the same be said of many amateurs? From the sounds on the amateur bands, personally I doubt it!

The very least an Amateur licence holder can do in return for the privilege of being allowed on the air in what is an increasingly crowded radio frequency spectrum, is to set an example to others in his standard of operating. That means at least using the standard phonetic alphabet (latest version!), standard procedures and sticking to the rules: because that is what places, or should place, radio amateurs in a class above CB-ers.

Not that I knock CB-ers. They have a place, just as glider pilots have their three special frequencies in the Aeronautical Bands; just listen and you will understand why they are restricted to those three frequencies (130.1, 130.4 and 129.9 MHz)!

The world of amateur radio is an extremely interesting one, offering all sorts of avenues for experiment and adventure. It seems a pity to this humble newcomer to reduce it to the status of a poor public telephone, albeit a party line at that. Surely this is what CB is for.

D. F. Barley, West Croydon

Dear Sir – Short wave listeners who are keen on collecting QSL cards can be assured of getting prize examples by sending reports to special and exhibition stations using the GB callsigns. But please, please, do remember to send a *large* stamped addressed envelope; otherwise the cards have to be spoiled by folding in two. And if you don't send an S.A.E. at all, how can you possibly expect a reply?

*Douglas Byrne, G3KPO/GB3WM,
Hon. Curator,
National Wireless Museum*

*Address your letters for this column to “A Word in Edgeways”,
SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts.
AL6 9EQ.*

VHF BANDS

NORMAN FITCH, G3FPK

A New Tropo Record

CONGRATULATIONS to Richard Baker GD8EXI (XO77h) and Salvador Patrino, EA8XS (SO73d) for achieving a very convincing, new 2m. tropospheric distance record of 3,025 kms. on Sept. 4 1981 at 2240 GMT. This historic QSO was a prime example of marine ducting with S9 signal strength reports exchanged. A QSY to 70 cm. did not produce a completed contact although they tried for two hours at 15 minute intervals during which EA8XS heard GD8EXI at RS52, using 2m. as a "talk-back" band!

Obviously this is a "first" GD to EA8 contact on 2m. Earlier, Salvador worked portable stations EI3VFF and EI3VGG in VL square. Richard is very grateful to Lyn Leach, GW8JLY, for telling him that the EIs had worked EA8XS and which set him searching for Salvador. He tuned the band and heard a Spanish speaking station quite weakly, called in, and was delighted it was EA8XS who answered at S9. There is no doubt that a 2m. and 70cm. beacon in the Canary Islands beaming to the U.K. would be a very useful research tool. Richard Rimmer, GD3YEO, heard GD8EXI's contact with EA8XS and called afterwards but is uncertain if a completed QSO took place as Salvador may not have copied his call correctly. If a QSO is later confirmed, the QRB would be a little more.

The Space Scene

Latest news on the *UOSAT* launch is that it was put back from the Sept. 12 or 15 date to the 16th, or more like the 20th. By the time this issue is read, hopefully this unique, amateur radio space project will be orbiting the Earth in the desired orbit. As for *Oscar 8*, the only amateur transponder still working, its managers, the *ARRL*, are now switching it off completely on Wednesdays, these days being devoted to battery charging. This has become necessary due to the increased use of 0-8 following the failure of 0-7.

Awards News

Nick Button, G4IRX, from Biggles-

wade, Beds., become the 341st VHF Century Club on 2m. He was first licensed in Feb. 1979, at the age of 16, with his late father's call, G8AEL. After three days of FM operation an *Icom* IC-202S was acquired with an 8-ele. *Yagi* aerial, the latter changed for a 9-ele. *Tonna Yagi* in April, 1980. Nick passed the Morse test and became G4IRX in Sept. 1979. The present power is 100 watts, best DX being LZ2XU via E's, although CT1AIF was worked with only 3w. in July 1980. Some "dabbling" on 160m. is mentioned. For the next three years, Nick will be in Nottingham at the Trent Polytechnic so hopes to operate the G4HQT call on 2m.

Roger Thorn, G3CHN, holder of QTH Squares Century Club Certificate No. 4, was issued with his "175" sticker for 2m. on Sept. 3, the new 25 squares comprising 9 tropo., 12 E's and 4 Ar QSOs. These included the notable "first" with EA8XS; LZ2KBI (LD) Via Ar and the recent ON1AMR/MM in Wk.

From time to time, readers inquire about *Magazine* awards and table entries. There are two VHF/UHF awards, the VHF Century Club and the QTH Squares Century Club. An *s.a.e.* will bring full details. Anyone may put an entry into the monthly tables. No QSLs are required, just a claim of what has been worked. The Four Band Annual Table is intended for fixed stations only from one QTH. For the Squares Table, provided you do not move your permanent QTH more than 50 kms, you may carry on adding new squares, but if you move more than that, you will have to start again in line with the rules for the QTHCC award.

Contest Notes

Results: From *GB2RS*, the results of the 70 MHz. Open Contest on June 7 which revealed G3WHK as winner of the Fixed Station section, G4IBA coming second and G3UKV third. The All Other Stations part was won by GW3XBY/P, runners-up being GW4ALE/P with GW4ASR/P in third place.

Coming Events: All times are GMT. On Sept. 26, 1900-2300, the AGCW-DL 144 MHz Contest for brass pounders with scoring system and exchanges as *per* page 38 of the March issue. The week end Oct. 3/4 sees two, coincident contests from 1600-1600, both for 432 MHz and all other SHF banks. The RSGB one requires the usual RS(T), serial number, QTH locator and QTH to be exchanged, with scoring at one point *per* kilometre and no band multipliers. The IARU Region 1 event does *not* need the exchanges of QTH. Scoring is based on 1pt. per km. but with multipliers of 5, 10 and 20 for 1,296, 2,304 MGz and higher bands, respectively. The RSGB affair is for members only and has

Single-op. and Multi-op. sections, while the IARU one is open to all amateurs with two sections; Single-op. by licensee only and All Others.

October sees three legs of the 432 and 1,296 MHz *Cumulatives* on the 9th, 17th and 25th, the former being on 1900-2100 on the 9th and 17th and 2000-2200 on the 25th, the latter scheduled for 2100-2300 on the first two sessions and 2200-2400 on the last. The *UK Horizontal FM Group* is running and FM contest on Oct. 18, 0900-1700 on 144.500 MHz and above, observing the band plan. Details from the group's secretary at Dogmersfield Park, Dogmersfield, Hants. The 70 MHz Fixed Contest is on Oct. 25, 0900-1300 and is a single section event.

Operating Notes

The Home Office is busy dealing with the issuance of several thousand, new amateur licences following the *May Radio Amateurs' Examination* successes. Already the G6E-series are under way. Time to remind newcomers of the VHF and UHF Band Plans as agreed for IARU Region 1 at the Brighton Conference at the end of last April. Dealing with the 2m. band, which is by far the most heavily populated, the 144.000-144.150 MHz segment is exclusive CW and the 144.150-144.500 is for SSB and CW only. The calling frequencies for CW and SSB are 144.050 and 144.300 MHz respectively. The random meteor scatter calling QRG for CW is 144.100 and for SSB, 144.400 MHz.

The 144.500-144.845 MHz section is designated as an all-mode area with various sport frequencies for RTTY, FAX, etc. 144.845-144.999 MHz should be avoided as it is the international beacon band and operation therein would cause interference to those listening for specific beacons for research purposes. 145.000-145.800 is the channelized FM segment including repeater inputs and outputs, while 145.800-146.000 MHz is the space section reserved for satellite users. Observance of this basic plan should enable the various mode users to get the maximum benefit from the band.

Once again it seems worth mentioning that those calling "CQ" should say where they are and where they are beaming for the benefit of listeners. Not everyone has a **Call Book** and in any case, thousands of later callsigns are not listed. Similarly, if, say, a London station is calling, "CQ long distance towards EI and GI", he probably won't appreciate a reply from someone ten miles away!

Finally, a plea yet again for honest reporting of signal *quality*. Unfortunately, the proportion of bad signals is on the increase and if the

originators are not told, in a polite way, they will go on annoying others, often unwittingly. Many cases of distorted and wide signals are due to incorrect setting up of the equipment: e.g. far too much microphone gain on SSB, too much drive to an amplifier, incorrect loading of the PA stage. In many cases, half an hour of experimentation with another amateur who know what to listen for can result in a transformation of a real stinker of a signal into quite an acceptable one.

Beacon News

Many readers are missing the 2m. beacon GB3CTC. The good news is that the RSGB is exploring a couple of proposals to restore a service from the southwest in the not-too-distant future. The much-missed Lannion beacon, FX3THF (YI13d) has been heard testing on 144.905 MHz, once or twice recently but no firm news as to if and when a regular service will be resumed. Geoff Brown, GJ4ICD, reports that the "Paris beacon," FX1UHF (BI21b) on 432.830 MHz is back on the air again.

Vernon Boldy, G8SVG (W. Yorks.) mentions locals operating in the beacon part of the 2m. band. One was heard to comment that there were many beacons in that part of the band, "... but they won't bother us, will they?"

Another First

In the big *Sporadic E* event on July 10, Peter Hallam, GI4GVS (Co. Antrim) worked CN8BA (WT24h) over a distance of 2,337 kms. for a GI/CN8 "first" on 2m. So far, 1981 has produced some super DX, with many new distance records and "firsts" by various propagation modes. Darrell Mawhinney, GI4KSO (Co. Antrim) had a successful *Perseids* MS QSO with CT1WW on Aug. 11 and reckons this to be a GI/CT1 "first", unless any other GIs managed Portugal in the July 10 E's?

Four Metres

Syd Harden, G2AXI (Hants.) has been trying to work Gibraltar "... for donkey's years ..." on 4m. His patience was finally rewarded on Aug. 16, when he contacted Jimmy Bruzon, ZB2BL, in the contest. Other notable contacts in the month included GM3WOJ/P (XS79f) via MS on Aug. 11 and GW3YET (Gwynedd) the following day. Dave Thorpe, G4FKI (Essex) is another reader who has had a QSO with ZB2BL, for square no. 21. He has contacted G5KW/A (Scilly Is.) which counts as a separate county, of course.

Peter Turner, G4IIL, regularly copied ZB2VHF up to mid-August from his Brighton QTH. Using *TW* crystal controlled gear on 70.26 MHz. He has

raised G3PFM in Dorset. From his Welsh QTH in Tregaron, two new locals worked were GW3YET and GW4HXO (not 'HFO as mentioned last month - *Ed.*). Others worked for the first time were G3BW, G4BWW (Merseyside), G6WR and GI3TLT (Co. Down). During the contest on Aug. 16, Peter contacted GM4HNS/P (Moffat); GM3XBY/P (Port Ellen); GM4BVE/P (Mull of Galloway); G3FDW/P (Stanhope) and GI4GIY/P. On the 30th, GM3UKV/P (Isle of Barra) was worked and on the 14th, GM3WOJ/P was copied via MS working G3IKR.

Nick Peckett, G4KUX (ex-G8PFC) lives at the bottom of one of the steepest Pennine valleys so does all his serious VHF/UHF operating from a nearby site as G4KUX/P (YO20c) some 1,700 ft. *a.s.l.* On 4m. he transverts from 2m. with a *Microwave Modules* 10w. rig using a 3-ele. home made aerial, and is willing to make skeds, if asked. The contest provided Arthur Breese, GD2HDZ, with his first GD QSO of 1981, plus six other new ones including GI4DBB/P (Co. Derry); G3CO in Essex and G3ORA/P in Somerset.

John Baker, GW3MHW, sent his usual, detailed band report from Dyfed. He writes that GW4HXO (Haverfordwest) now has 5w. of SSB on the air with a 50w. solid state PA planned. Anyone wanting a sked. with Clive Smith, GM4FZH, (YS33d) is invited to telephone him, or his wife, Helen, GM4KNQ, on 084 783 510. John has stopped his tests with SM6PU in which he used automatic keying, as, "... a certain amount of opposition exists ..." He wonders if these transmissions have been a nuisance to other operators. GW3MHW's signals were often received by SM6PU when he was mobile, whereas the beacons were not so reliable. John participated in the contest and added three counties but no new countries. He also worked GM3WOJ/P in XS by MS but not when Chris was in YS.

About 6m. John is looking forward to transatlantic signals from the end of October. Nearer home, he reports ZB2VHF as being pretty consistent in August and well over S9 on the 23rd at 1100. Both John and G3VZJ have received 10/6m. crossband certificates for contacting all U.S.A. call areas, from W6LS.

Two Metres

Mike Allmark (Leeds) reckons the *Perseids* meteor shower was not so good this year, an opinion shared by some other readers. The visual *ZHR* was 75 compared to 120 in 1980, so no doubt radio reflexions would have been similarly down. Nevertheless, he heard 19 countries, with many Is and YUs. Best CW DX heard was UA3LBO (QO)

QTH LOCATOR SQUARES TABLE

Station	23cm.	70cm.	2m.	Total
GJ4ICD	1	96	207	304
G3VYF	-	91	262	353
G3JXN	42	86	120	248
G8HVV	22	83	141	246
G3XDY	30	83	123	236
G3COJ	24	74	123	221
GJ8KNV	8	73	164	245
G3PBV	13	62	123	198
G8LEF	22	62	101	185
G4CMV	14	59	157	230
G8TFI	-	59	113	172
G3NAQ	-	58	128	186
G2AXI	5	58	106	169
G8GXE	13	57	89	159
G8ATK	6	56	113	175
G8FMK	15	56	69	140
G8HHI	6	52	120	178
G4HFO	-	50	78	128
G4ERX	5	45	92	142
GD2HDZ	12	44	90	146
G8KAX	9	43	78	130
G4BWG	-	38	136	174
G80PR	1	38	111	150
G8JJR	-	38	108	146
G8VLQ	-	38	106	144
G8IFT	15	34	81	130
G8LGL	-	31	128	159
G3BW	5	30	187	222
G4MCU	-	29	118	147
G3FIJ	-	29	79	108
G8KGF	-	28	99	127
GJ3RAX	1	27	74	102
G8MFJ	-	26	128	154
I4EAT	-	25	238	263
GM4CXP	-	25	142	167
G18EWM	-	25	67	92
G8WRD	-	25	44	69
G4AWU	-	22	130	152
G8LXY	-	18	32	50
G4ERG	-	16	208	224
EA3LL	-	15	211	226
GW3CBY	3	14	65	82
G4IGO	-	13	203	216
9H1CD	-	13	178	191
GM4COK	-	12	172	184
G4MJC	-	12	76	88
9H1BT	-	11	163	174
G8WUU	-	11	37	48
G8KPL	-	7	91	98
G8JAG	-	7	81	88
G4GSA	-	6	51	57
G4FBK	-	5	105	110
G8SKG	-	5	53	58
G4GXL	-	4	52	56
G8VR	-	3	132	135
G4JZF	-	3	115	118
G8TIN	-	3	56	59
G4LDY	-	2	39	41
G6UW	-	1	89	90
G3POI	-	-	343	343
G3IMV	-	-	290	290
SP2DX	-	-	280	280
DK3UZ	-	-	275	275
G4IJE	-	-	215	215
G3CHN	-	-	212	212
G3SEK	-	-	182	182
G3FPK	-	-	179	179
G3KEQ	-	-	173	173
G4DEZ	-	-	171	171
GW4EAI	-	-	146	146
G8IXG	-	-	139	139
G8CXQ	-	-	117	117
G8TGM	-	-	109	109
G4GHA	-	-	95	95
G4IRX	-	-	85	85
G8RWG	-	-	71	71
G8VJV	-	-	66	66
G8JGK	-	-	62	62
G8SVG	-	-	58	58
G8XQS	-	-	47	47
G8MBI	-	-	40	40

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

and the best bursts on SSB came from OE3OBC (II) who runs 3kW and four 16-ele. *Yagis*! Mike reckons the shower peaked at about 1000 on Aug. 12, but reflexions from the SM/OH direction were not all that good. He heard some

deliberately bad operating on the old random SSB QRG of 144.2 MHz. G8VHB was suffering from a certain G8V-- station who seems to think that 144.2 is his personal frequency. Mike thinks that the idea to hold an MS contest is not good as it attracts people who have no idea about operating procedures and who mess things up for others. August tropo. and E's were not very good in Leeds, it seems.

G2AXI was one of the lucky ones to work ON1AMR/MM in WK square, of which more details later. On Aug. 28, a 20 years search for Tyne and Wear was ended when G6AVL in Newcastle was contacted. Bill Hodgson, G3BW (Cumbria), managed three new countries in the *Perseids* for 1981 - ON5FF/CT (VA); OE9XXI (EG) and YU2EZA (IG), to make it 28 so far. Other successes included SP6GZZ (IL); DF1YQ (GM); PA2HKR/LA (DR); OH3AWH (LV); Y22UL (HO); and OK1MAC (HJ) after the shower. In a small *Aurora* on Aug. 23, Bill got LA9BM and LA9FY, both in EU square; OZ4VV (EQ); SM5FRH (HT) and EI6AS.

Brian Bower, G3COJ (Bucks.) worked CN8BA near Casablanca, in the Aug. 11 E's event covered in last month's *Stop Press* item, but did not hear ZB2BL. Dave Sellars, G3PBV (Devon) echoes Mike Allmark's comments about the *Perseids* adding: "Ineffective CQ-ing by inexperienced stations using unmodified 'black boxes' and small crossed *Yagis* is hardly sufficient to bring replies and only clutters up the band, especially when they keep 'QRZ-ing?' in the listening periods". Dave's only MS contacts were YU2EZA in 3 mins. on random, and a sked with DC7OH (GM). Tropo. was good after the shower as well as during it with GD6UQ/P a phenomenal signal. The 12th. brought his first ever GI-GI6CJG/P - in a very difficult direction, but the best DX occurred on his birthday, the 19th, when C31HY was worked for country no. 26. It seemed to be a very narrow duct as the C3 only worked about four or five Gs. The 26th brought some good tropo. to GI, GD and GW but the Ar on the 23rd was poor with only GM4ILS heard.

Clive Penna, G3POI (Kent) is now up to 343 squares on the band and his *Perseids* contacts included ON5FF/CT in all three squares - WA, VA and WZ; PA2HKR/LA; OH4UC (NV); SP6APV/8 (MK); YU1NRV/6 (JB); GM3WOJ/P (XS); and UA2FAY (KO) for country no. 52. Mike Lee, G3VYF (Essex) also worked the CT squares, and UA3LBO (QO) in 65 mins. Valera now runs 1.2kW and has an 80-ele. aerial array. UA1MC (Leningrad) is also a very strong signal now, but does not seem to get on the 20m VHF net.

ANNUAL VHF/UHF TABLE

January to December 1981

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		23 CENTIMETRES		TOTAL Points
	Counties	Countries	Counties	Countries	Counties	Countries	Counties	Countries	
G2AXI	58	9	64	19	44	9	7	1	203
GD2HDZ	47	6	63	15	42	9	4	3	182
G3BW	41	6	65	28	32	6	6	4	178
G8FMK	-	-	64	17	54	10	27	2	174
G8VLQ	-	-	69	26	45	14	-	-	154
G3PBV	2	2	60	23	41	9	8	1	142
G8GXE	-	-	52	11	44	9	17	5	138
G8HHI	-	-	49	16	44	12	14	2	137
G8RZP	-	-	66	20	40	10	-	-	136
G8RZO	-	-	66	20	33	9	-	-	128
G3FIJ	33	5	46	10	27	4	-	-	125
GW3CBY	22	6	50	14	17	6	3	2	115
G6ADC	-	-	60	11	39	5	-	-	115
G8VR	32	3	44	26	6	1	-	-	112
G4JZF	-	-	74	20	6	1	-	-	101
G8WUU	-	-	60	14	23	3	-	-	100
G4HAO	-	-	79	20	-	-	-	-	99
G8KAX	-	-	43	10	27	5	10	3	98
G4DEZ	-	-	67	30	-	-	-	-	97
G3FPK	-	-	74	22	-	-	-	-	96
G3CO	14	3	39	8	22	5	-	-	91
G4FKI	37	5	20	5	16	4	-	-	87
G8VJV	-	-	67	18	-	-	-	-	85
G4ARI	18	2	54	10	-	-	-	-	84
G8WRD	-	-	41	12	21	8	-	-	82
G4GXL	-	-	55	15	7	2	-	-	79
GW8TVX	-	-	52	15	-	-	5	2	74
G8RWG	-	-	57	15	-	-	-	-	72
G8TGM	-	-	48	18	-	-	-	-	66
G8TIN	-	-	40	7	12	3	-	-	62
G8XTJ	-	-	48	9	-	-	-	-	57
G8LXY	-	-	26	5	19	6	-	-	56
G6ABB	-	-	44	12	-	-	-	-	56
G8TRW	-	-	44	11	-	-	-	-	55
G4LDY	-	-	42	9	2	1	-	-	54
G8RZA	-	-	44	9	-	-	-	-	53
GM4CXP	3	1	35	13	-	-	-	-	52
G8SKG	-	-	39	10	2	1	-	-	52
GW3MHW	44	8	-	-	-	-	-	-	52
G4MJC	-	-	29	11	5	4	-	-	49
G8MBI	-	-	28	9	-	-	-	-	37
GM4COK	-	-	21	12	-	-	-	-	33
GM4ELV	-	-	10	3	-	-	-	-	13

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

Bob Lane, G4AWU, has not been on very much due to domestic QRM. However, he did make his first SSB MS QSO in the *Perseids* with YU. Seems he will be joining the MS scene as he has completed a memory keyer and a "Rugby" clock. Steve Fletcher, G4GXL, went to XJ square on Aug. 23 for a few days but, despite having 160w. and a 13-ele. *Yagi* at 25ft., only a few Gs were worked. He reckons anyone going to the Lizard should ensure good, prior publicity!

Rob Mackean, G4HAO (Liverpool) confesses that he is now hooked on MS. In the *Perseids*, he and John Wilkinson, G4HGT, used Rob's rig and QTH, with John's keyer for completed QSOs with SM3FGL (IV); OE5XPL (HI); HG4XT (JH); YU2KDE (JF); I3LGP (GF); YU3ES (GF); SM5CNQ (HS) and OK3CGX (II). So bitten is Rob with the MS bug that he has now built his own memory keyer and is saving up for a set of paddles. (Why not use a hacksaw blade? Much cheaper!)

Ken Osborne, G4IGO (Bristol) thinks his call is being pirated on the east coast as DL0SP/P reckons he worked a G4IGO. Sounds unlikely though, to

your scribe. Ken worked the CT expedition in WA and VA on Aug. 6 and 9, and YU2GZA (IG) on the 9th. The next day SP2DFW (JM), then on the 12th, OK2KZR/P (IJ); ON5FF/CT (WZ); YU1EQ (?); IV3HWT (GF); YU1EV (KE); HG1YA (IH); F1JG (CD) and SP8AOV (LL).

Graham Taylor, G4JZF (Staffs.) now has a 100w. MM amplifier. On Aug. 11, he raised EB7IY (WW) via E's, and on Aug. 30/31, LA9LS (DS) via tropo. provided country no. 20. This period also saw QSOs with OZs in EQ, ER, and FQ. G4KUX/P uses an Icom IC-26OE, Lunar 150w. amplifier, 8-ele. aerial combination. During the MS Contest, Nick and G8EEM operated from ZP61b and worked 31 stations worth over 75,000 points, but were using a bigger amplifier and 16-ele. *Yagi* at 40ft. Reflexions were poor from 1700-1900 but very good thereafter. Best DX was HG6KVB (KH) at 1,734 kms. Best burst was from EA3LL (AB) and the quickest QSO was with IW3QBC (GG) in 10 secs. All QSOs were on SSB. On tropo., conditions had been building up nicely to the north from Aug. 28 when GM3JJI (WS) was worked. On the 31st, both the

2m. and 70cm. OY beacons were S7. Four OYs were worked in WW76g. They were in the same car on a mountain side 650m. *a.s.l.* running 10w. to a 16-ele. aerial. Also worked were LA6HL and LA3EQ, both in CS. On Sept. 1, LA9FB (CU); LA6HL; GM4LBE (ZU65f) in Shetlands; LA5OH (CU) and GM8OGP, (ZU26c) Unst, were contacted.

G4KUX reports that TF3YH has plans for QRO operation from Iceland following LA6HL's trip recently. Also, LA3EQ is building a 2 times 4CX250B amplifier. Jon Stow, G4MCU (Essex), managed to complete a *Perseids* MS sked. with HG4XT on SSB in five minutes on Aug. 12. Ken Ellis, G5KW, has sent some nice colour prints of the yacht "Rebel", belonging to Robert Michielsen, ON1AMR. The -/MM trip in WK square on Aug. 4 produced 29 QSOs between 1000 and 2050. Ken was the second operator and the log shows 21 G QSOs; 5 Fs; 2 GWs and one EI. Grateful thanks to Roger Thorn, G3CHN, who acted as "anchor man" from his cliff-top vantage point on Bolberry Down throughout.

John Lemay, G8KAX, took part in the QRP contest on Aug. 2 from Kinder Scout in ZN square. At 1,930ft. *a.s.l.* and with a 13-ele. beam at 25ft. results with one watt were quite poor. John wonders just how some of the other one watt stations manage so many more QSOs and would like to see more details published on aerials and their heights, etc. John and Jackie Brakespear, G8RZP/G8RZO, took part in the two-part, Harlow Club contest and made 231 contacts with a multiplier of 49.

Neil Clarke, G8VFF (W. Yorks.) found the band open to PA on the 28th of August, and to OZ and SM on the 30th in the evening. Stations in three new squares, ER, FP and FR were raised. Bob Lane, G8VLQ (S. Yorks) has fitted a BF981 preamplifier ahead of his Trio TS-770E, which was a bit hard of hearing on 2m. He has been busy on MS after working some nice *E's* and *tropo*. DX in July. On Aug. 8, he completed with IV3HWT in 46 mins. at 0400. On the 11th, the sked with YU7PXB (KF) took just 6 mins. with all details in the first 30 secs., the QRB being 1,730 kms. On the 12th, HG1KYY (IH) was worked on random MS and EA3AIR (BB); SM5DRV (HR) and IW3QBC (GG) on skeds. The best DX was OH2BWL (MU56e) at 1500, who was only running 150w. PEP to a 6-ele. *Yagi*. The 30th provided LA, OZ and SM QSOs and the 31st, contacts with the OY quartet, 3OZ, 5A, 9JD and 9R, and GM4LBE in Lerwick.

Darrell Mawhinney, GI4KSO, made 17 CW QSOs in the *Perseids* including CT1WW (WB); SM0IME (JT); Y22UL and Y41VL (HO); PA3BFM/LA (DR);

LA1K (KX) and F80P (CG). SSB successes were F1JG (CD); OZ4VV (EQ) and DK2LM (EJ). GJ4ICD had 17 MS contacts in 17 squares for 43,332 pts. in the *Perseids* contest, best DX being YU1EU (KE13h). Geoff says that although he is a Class "A" licence holder, *all* his MS QSOs are on SSB. On Aug. 16, from 0800, Geoff worked 10 YUs in the 6 call area *via E's*. On Aug. 13 and 14, there was good *tropo*. propagation into Y, OZ and SM. He would like to confirm that U.K. postage stamps are *invalid* in the Channel Islands, so those requiring direct QSLs should send an IRC and envelope.

Derrick Dance, GM4CPX (Borders), has been overhauling his 14-ele. *Parabeam* so has not been very active lately. He seems to have many other activities including cycling and camping. Walt Davidson, GW3NYY (Swansea), is another who has succumbed to the MS habit with satisfying results. During the *Perseids* he was stuck on SSB only and completed 24 QSOs, all in different squares. Later he built the GW4CQT keyer and made a further 10 MS QSOs on CW. Walt's gear consists of a *Yaesu* FT-221R with *MuTek* board, a 4CX350 amplifier and single 9-ele. *Yagi*, the latter to be replaced later by a pair of 16-ele. beams. He is very keen to make skeds from XL square, SSB or CW (preferred speed 700 *l.p.m.* but up to 1,000 possible). QTH is: PO Box 21, Swansea, Wales, SA1 1ED.

Seventy Centimetres

Claus Neie, DL7QY (FJ61e), was QRV on July 30/31 for the *tropo* and worked 23 Gs in AL, AM, YO, ZL, ZM, ZN and ZP squares from 2000. During the *Ar* on Aug. 23, G3BW worked EI6AS on 2m. but a test on 70cm. was quite negative. G3PBV suffered severe *Syledis* QRM from Aug. 11-25, from both Start Point and Portland. The first PAs of 1981 were worked on the 13th, while the 17th produced F1BOF/P (BF). On the 19th, Dave worked F5VR/P (XH) at S9.

G4KUX/P (YO20c) has 50w. to an 18-ele. *Parabeam*. Aug. 31 saw QSOs with LA6HL and LA3EQ, both in CS square. Adrian Chamberlain, G6ADC (Coventry) is now getting used to his *Yaesu* FT-780R which is used for working through *Oscar* 8. On the terrestrial side, GJ4JWA has been worked for a new county, country and square on the band. G8RZO and 'RZP have been hearing LAs from Sheppey, but they always seem to be working to PA and ON. Several were S9 at the end of August but Jackie figures they have rather deaf receivers!

G8VLQ found SM6HYG (FS58f) and OZ1FEF (EQ25c) during the evening of Aug. 7; E14CL (WN60g) in the early

hours of the 13th; GM4BBU/P on the 18th and G8KBQ in Somerset on the 21st. The evening of the 30th brought OZ9PZ (EQ75b) and SM6HYG again. GD2HDZ's list shows six more 1981 G counties worked on the 25/26th period, including G3AUS in Devon.

Geoff Brown, GJ4ICD, asks it be made quite clear that his 70cm. amplifier is *not* a *K2RIW* design. Although based on that circuit, he has extensively modified it, so has agreed with Dick Knadle that it will not be marketed under his callsign. Geoff has heard CT1WW on the band but no QSO yet, but he did work F6EVT/P (AC07c) for square no. 96 on Aug. 14. He reports that, in the *tropo*. opening to central Europe on Aug. 13, Phil Johnson, GJ8KNV, made several fast-scan TV QSOs with OK stations at, "fantastic quality and strength".

Twenty-three Centimetres

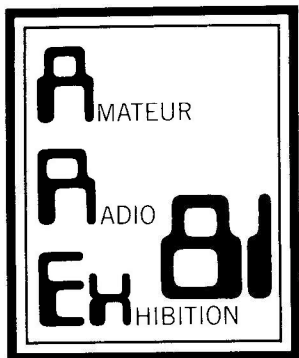
Claus Neie, DL7QY, was very disappointed not to have made any 23cm. QSOs with the U.K. on the 30/31 July period. GB3BPO beacon was 5 dB. above the noise at 2200 and rose to 40 dB. *a.n.* after midnight. He called "CQ" on CW from time-to-time, but to no avail. At 0049, he worked SM6HYG (FS) then they QSY-ed to 70cm. exchanging S9-plus 20 dB. reports. Finally they went on 13cm. CW with 529 reports and established a new European DX records of 1,018km. for the band. By 1100 on the 31st, GB3BPO had faded away.

G3BW has been QRV but with little luck due to one watt and insufficient aerial gain. G3PBV has installed a length of *Andrews* LDF4-50 feeder which has made a noticeable difference on reception. So far, Dave has worked G4CCH (Humberside) and his fourth nearest "local" G4GLN in London! PA0CRA was a good signal on Aug. 13 but even his *GASFET* pre-amp. was not enough to pull in Dave's 3w. G4KUX/P puts Co. Durham on the 23cm. Map with a home-built transverter giving 2½w. output to a 45-ele. *Quad Loop Yagi*.

For GD2HDZ, Aug. 25 and 26 brought G4CCH, and G6FK (W. Midlands). G2AXI has an amplifier, "... coming along nicely", but has not been active on 23cm. in August.

Deadlines

Not quite such an exciting month as July but no doubt more *Auroral* events are on the way. All your reports and claims by Oct. 7 and then Nov. 4 to: "VHF Bands", SHORT WAVE MAGAZINE, 34 High Street, WELWYN, Herts., AL6 9EQ. 73 *de G3FPK*.



WHAT?

The NEW Leicester Amateur Radio Exhibition. That's what.

WHERE?

The Granby Halls, "as usual," but with improved facilities including new catering arrangements, easier car parking and quicker admission. That's where.

WHEN?

Friday, Saturday, Sunday, 23, 24, 25 October 1981, 10am-6pm Fri/Sat, 10am-5pm Sun. That's when.

WHO?

At this independent show you will find some of the best-known retailers in the country. You will also find many specialist traders not previously invited to participate at Leicester. This way you'll have a real chance of finding the rig you want – at a keen price too – and also some of those awkward bits and pieces you're always looking for and can never track down. That's who you'll see there.

ADMISSION: £1

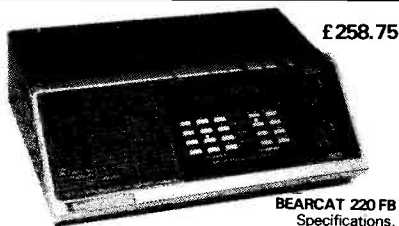
Refundable by certain exhibitors against purchases over £30.

BRING-AND-BUY/TALK-IN on 2m and 70cm.
Both organised by the Leicester Radio Society.

STEPHENS-JAMES LTD.

47 WARRINGTON ROAD, LEIGH, LANCS. WN7 3EA
Telephone (0942) 676790

SEE US ON STAND 13, AT THE A.R.R.A. 10th AMATEUR RADIO EXHIBITION, CASTLE DONNINGTON, 29-30-31 OCT.



£258.75

BEARCAT 220 FB

Specifications.
Frequency range:
Low Band Mobile..... 86 - 88MHz
Aircraft..... 118 - 136MHz
Amateur Band..... 144 - 148MHz
Public Service & Marine..... 148 - 174MHz
UHF Amateur..... 420 - 450 MHz
UHF Band..... 450 - 470MHz
UHF Band..... 470 - 512MHz



TR9000

The TR9000 is a compact lightweight 2 mtr. FM USB/LSB/CW Transceiver with an outstanding array of functions. FM1 for 25 KHz steps (for mobile use) FM2 for precise 100 Hz steps (for base station use). Microcomputer control giving many advanced features. Built in 5-channel memory. New type microphone with UP/DOWN switching. Built in high performance. N. Blanker. Side tone for CW.



J.R.C. NRD515D

General coverage receiver 100 KHz to 30 MHz fully synthesised. Digital readout PLL synthesiser with rotary type encoder pass band tuning - modular construction. £949.00

Matching Transmitter Solid State 100 Watts available shortly.

ACCESS & BARCLAYCARD facilities. Instant HP service. Licensed Credit Broker - quotations upon request.

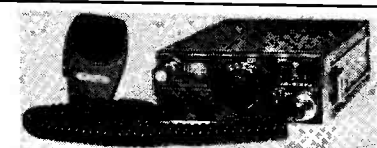
Try our new "Overnite" service for £6.00. Guaranteed 24 hour service if order placed before 11 a.m. (except North GM).

Part exchange always welcome. Spot cash paid for good clean equipment. If you have equipment surplus to your requirement we would be pleased to sell this on commission for you.

Shop Hours: 9.30 to 5.30 Monday to Friday, 4.30 p.m. Saturday.

No parking problems. Turn at the Greyhound Motel on the A580 (East Lancs.) Road. S.A.E. with all enquiries. 25p will bring you latest information and prices. Postage carriage extra.

ALL OUR PRICES INCLUDE VAT
SEND S.A.E. FOR OUR UP-TO-DATE SECONDHAND LIST.



TR2300

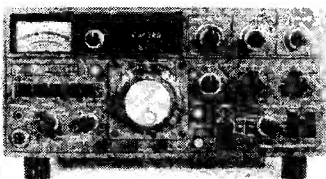
TR2300 2m Synthesised Portable Transceiver. We have lost count of the number of this model we have sold over the last 12 months. Hikers, campers, climbers, you can hear them all over the country and reliability which is the essence of TRIO equipment. £166.75

JAYBEAM		
5Y/2m 5 element yagi.....	£11.27	
8Y/2m element yagi.....	£14.49	
10Y/2m 10 element.....	£31.05	
PBM/14/2m. 14 element Parabeam.....	£44.80	
5XY/2m. 5 element crossed yagi.....	£22.77	
8XY/2m. 8 element crossed yagi.....	£28.40	
10XY/2m. 10 element crossed yagi.....	£37.72	
Q4/2m. 4 element Quad.....	£23.69	
Q6/2m. 4 element Quad.....	£31.39	
D5/2m. 5 over 5 slot fed yagi.....	£20.12	
D8/2m. 8 over 8 slot fed yagi.....	£27.40	
UGP/2m. ground plane.....	£10.12	
MBM48/70cms. Multibeam.....	£28.75	
MBM88/70cms. Multibeam.....	£39.33	
TAS 1/2m. Whip mobile.....	£15.29	
C5m. Colinear.....	£44.27	
C8/70cm. Colinear.....	£50.00	
D15/1296 23cm. Antenna.....	£34.04	
Carriage on Antennas	£4.50.	

TRIO		
TS830S HF Transceiver.....	£726.57	
AT230 ATU-SWR Power Meter.....	£121.21	
TS530S HF Transceiver.....	£561.20	
SP230 Speaker.....	£37.72	
TS130S HF Transceiver.....	£547.40	
TS130V HF Transceiver.....	£450.80	
PS20 Power supply.....	£48.30	
AT130 100 watt antenna tuner.....	£81.19	
R820 Amateur Band Receiver.....	£690.00	
TL999 2KW Linear amplifier.....	£595.70	
TR9000 2m Multimode Transceiver.....	£371.91	
BO9 Base plynth.....	£36.11	
TR7800 2m FM Transceiver 10watt.....	£276.00	
TR7850 2m FM Transceiver 40watt.....	£324.07	
TR2300 2m FM Portable.....	£166.75	
VB2300 10 watt Amplifier.....	£55.43	
TR2400 2m FM Hand held portable.....	£198.95	
ST1 Base charger.....	£43.70	
TR8400 70cm FM mobile Transceiver.....	£329.13	
TR9500 70cm multimode Transceiver.....	£482.54	
R1000 General coverage receiver.....	£305.95	
Full range of accessories available.		

DRAKE

TR7 Digital Transceiver.....	£1,035.00
PS7 Power Supply.....	£207.00
RV7 Remote VFO.....	£138.00
MS7 Speaker.....	£29.90
R7 Digital Receiver.....	£969.00
Filters for TR7.....	£39.10
FA7 Fan for TR7.....	£20.70
MN7 ATU/RF Meter 250 Watts.....	£124.20
MN2700 ATU 2 KW.....	£207.00
DL 300 Dummy Load 300 Watts.....	£20.70
DL 1000 Dummy Load 1 KW.....	£37.95
TV 3300 Low Pass Filter.....	£18.40
AK75 Doublet Antenna 132' top with 470 ohm Feeder.....	£23.00



R820 RECEIVER

THE ULTIMATE IN RECEIVERS

Frequency coverage 160-10m plus SW Broadcast Bands. All modes CW-USB-LSB-RTTY. Digital Readout. Noise Blanker. Fully variable. I.F. Bandwidth, plus Bandpass tuning, plus rejection notch filter. £690.00

TRIO TS530S NEW £561.00 ALL BAND HF TRANSCEIVER



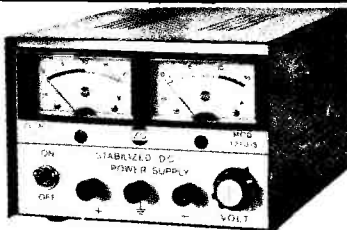
TR800

Continuing TRIO's policy of presenting the Radio Amateur with the finest equipment available, we were pleased to announce the NEW TR800 2m FM Mobile Transceiver. 15 memory channels - Priority channels with simplex ±600 KHz or non-standard operation - "Priority alert" beeps when signal on M14 priority channel. Frequency coverage 144.00, 145.955 in switchable 5 KHz or 25 KHz steps. Front keyboard for selecting frequencies, programming memories and controlling scan function. ALL THIS and MORE for £276.00.

TS830S HF SSB TRANSCEIVER £726.00

The new TS830S, the latest from TRIO. A high performance, very affordable HF SSB/CW transceiver with every conceivable operating feature built in for 160 through 10metres (including the new three bands). The TS830S combines a high dynamic range with variable bandwidth tuning (VBT), IF shift and an IF notch filter, as well as very sharp filters in the 455 KHz second IF. Together with the optional VFO230 (remote digital display VFO) which provides split frequency operation and 5 memories for frequency hold, the amateur has available today's advanced technology linked to the proven reliability and exceptional linearity of a valve PA.

- * VBT variable bandwidth tuning
- * IF notch filter
- * IF shift
- * Various filter options
- * Built in digital display
- * 6146B final with RF negative feed-back
- * Optional Digital VFO for increased flexibility
- * Innovative PLL system of frequency generation
- * RF speech processor
- * Adjustable noise blanker level
- * Adjustable audio tone
- * RF attenuator
- * RTT/XIT
- * SSB monitor circuit
- * Expanded frequency coverage



MOD. 1210 S

SOLID STATE STABILISED POWER SUPPLIES

Maximum ratings quoted. Prices include postage.	
Model 125 10-15V 5amp.....	£29.50
Model 156S 4-15V 5amp Twin Meter.....	£40.00
Model 1210S 4-20V 10amp Twin Meter.....	£75.00

NOW AVAILABLE FROM STOCK THE WHOLE RANGE OF "DATONG" PRODUCTS AT CURRENT PRICES.

RECEIVERS AND TRANSCEIVERS

(Inc. VAT and Postage)	
SR9 Tunable 144-146MHz Receiver.....	£46.00
R512 Aircraft Band Scanning Receiver.....	£135.00
Regency Digital Flight Scan Synthesised Aircraft Band Receiver.....	£215.00
Yaesu FRG7 Receiver.....	£199.00
Sky ACE Hand Held Aircraft Band Receiver.....	£49.50
AR22 2m Hand Hold Receiver.....	£83.00
SX200N Scanning Receiver.....	£264.75
FDK 700EX Transceiver.....	£199.00
FDK 750E Transceiver.....	£299.00
Standard G78 UHF Transceiver.....	£209.00
Beacat 220FB Scanner.....	£258.75



TRIO R1000

R1000 Receiver £305.90
The latest general coverage from Trio. Frequency coverage 200 KHz to 30 MHz in 30 bands. Using an advanced PLL system. Full digital readout. Three filters 12 KHz for AM - 6 KHz narrow AM and 2.7 KHz SSB. Also incorporates a noise blanker. Operation is from 100-240 V AC or 12 V DC.

Bredhurst electronics

HIGH ST., HANDCROSS, W. SUSSEX O444 400786

NEW FROM TRIO 2M. F.M. MOBILE



A VERY COMPACT 25W. 2M F.M. MOBILE WITH 5 MEMORIES AND SCANNING

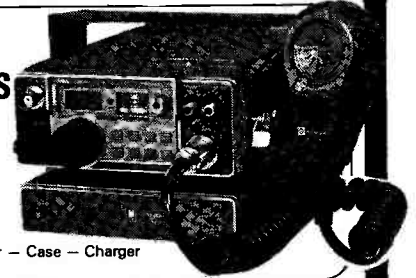
TR 7730 phone for price.

NEW STANDARD TWINS

C78 70cm FM Portable
£219 inc. VAT.

C58 2M. Multimode
£239 inc. VAT.

Accessories - Mobile Tray - Linear - Case - Charger



YAESU



FT 208R
2M
£190
inc. VAT

FT 708R
70CM
£199
inc. VAT

AIR BAND RECEIVERS



R517

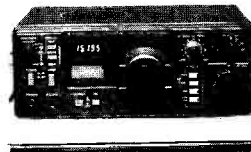
£49.50
inc. VAT.

Tunes
118-144 MHz
plus optional
3 Xtals for spot
on channel
reception

H.F. RECEIVERS V.H.F.

R1000

SX 200N

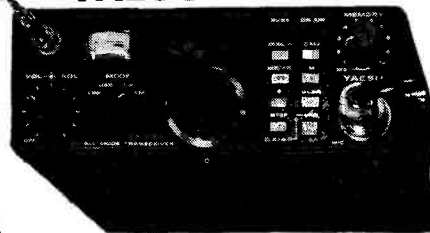


£305
inc. VAT & carriage



£264
inc. VAT & carriage

YAESU 2M MULTIMODE



FT 290R
£229
inc. VAT
& carriage

TRANSCEIVERS

H.F.	
Trio TS 130V	£460
Swan 100 MX	£418
Yaesu FT 707S	£464
Trio TS 130S	£547
Trio TS 530S	£561
Yaesu FT 101Z Mk.III	£529
Yaesu FT 707	£529
Yaesu FT 101ZD Mk.III	£599
Swan Astro 150	£613
Trio TS 830S	£726
Yaesu FT 107M	£690
Swan 102 BX	£798

F.M. MOBILES	
F.D.K. Multi 700EX	£189
Icom IC 255E	£255
Trio TR 7800	£276
Trio TR 8400 (70cm)	£329
Trio TR 7730	Ep.o.a.

HANDHELD F.M.	
Icom IC 2E	£169
Yaesu FT 208R	£190
Trio TR 2300	£166
Trio TR 2400	£198
Yaesu FT 708R (70cm)	£199
Standard C78 (70cm)	£219

MULTIMODES	
Standard C58 (portable)	£247
Yaesu FT 290R (portable)	£229
F.D.K. Multi 750E	£289
Icom IC 290E	£366
Trio TR 9000	£371
Yaesu FT 480R	£369
Icom IC 251E	£469
Trio TR 9500	£482

RECEIVERS

H.F.	
Yaesu FRG 7	£189
Lowie SRX 300	£196
Trio R1000	£306
Yaesu FRG 7700	£309
Yaesu FRG 7700M with memories	£389
J.R.C. NRD 515 (The Best!)	£948

2M F.M./MARINE	
Search 9	£45
A.O.R. AR22 AM/MAR	£83/£89
F.D.K. TM568	£89
SX 200N Scanner	£264

AIRBAND	
R 517 Handheld	£49.50
SX 200N Scanner	£264

ACCESSORIES

BATTERIES	
'AA' Nicads 450MA-HR	£1.00 (-)
'C' Nicads 2.2AMP-HR	£2.50 (-)

DRAE POWER SUPPLIES	
13.8 Fully protected - that includes over-voltage	
4 Amp continuous	£27.95 (£1.50)
6 Amp continuous	£44.95 (£2.00)
12 Amp continuous	£69.00 (£2.50)
24 Amp continuous	£99.00 (£5.00)

MORSE EQUIPMENT	
HK 707 Up/Down Key	£10.50 (£0.50)
MK 704 Squeeze paddle	£10.50 (£0.50)
HK 704 Up/Down Key	£14.50 (£0.75)
EKM 1A Practice oscillator	£8.75 (£0.50)
EK 121 Elbug	£29.95 (£0.75)

ACCESSORIES

EKM 12 Matching side tone monitor	£10.95 (£0.50)
EK 150 Electronic keyer	£74.00 (-)

DATONG	
PC1 Gen. Cov. Converter	£120.75 (-)
VLF Very Low Frequency Converter	£25.30 (-)
FL1 Frequency Agile audio filter	£67.85 (-)
FL2 Multi Mode Audio filter	£89.70 (-)
ASP/B Automatic r.f. speech clipper (TRIO)	£79.36 (-)
ASP/A Automatic r.f. speech clipper (YAESU)	£79.36 (-)
D75 Manual r.f. speech clipper	£56.35 (-)
RFC/M R.F. speech clipper Module	£26.45 (-)
D70 Morse Tutor	£49.45 (-)
AD270 Active antenna - indoor	£37.95 (-)
AD370 Active antenna - outdoor	£51.75 (-)

TVI FILTERS	
YAESU FF501 DX. Low pass filter	£22.25 (£0.75)
TRIO LF30A. Low pass filter	£19.32 (£0.75)
TVI 30. Low pass filter	£5.95 (£0.60)
HP 4A High pass filter (TV Lead)	5.95 (£0.50)
Ferrite rings - 1 1/2" dia. (per pair)	£0.80 (£0.20)

TEST EQUIPMENT	
Drae Wavemeter 130-450MHz	£24.95 (-)
FX1 Wavemeter 700K - 250 MHz	£28.00 (£0.75)
Trio DM 81 Dip Meter (250MHz)	£51.00 (£0.75)
MMD50/500 Frequency counter	£69.00 (£0.75)

COMPRESSION MICROPHONES	
Adonis AM 502 1 O/P 2 comp. levels	£39.00 (£0.75)
Adonis AM 601 2 comp. levels adj. single O/P	£49.00 (£0.75)
Adonis AM 802 3 comp. levels 3 O/P's	£59.00 (£0.75)

WELZ SWR METERS	
SP 200 H.F./2M	£59.95 (£0.75)
SP 300 H.F./2M/70cm	£75.00 (£0.75)

MAIL ORDER - RETAIL CALLERS 9-5.30 PM.
HIGH ST., HANDCROSS, W. SUSSEX. 0444 400786

TO ORDER ANY OF THE ABOVE ITEMS SIMPLY WRITE ENCLOSING A CHEQUE OR PHONE YOUR CREDIT CARD NUMBER

all prices correct at time of going to press

P.M.

ELECTRONIC SERVICES

PRICES SHOWN EXCLUDE VAT

UK CUSTOMERS PLEASE ADD 15%

2 ALEXANDER DRIVE, HESWALL
WIRRAL, MERSEYSIDE, L61 6XT

Tel: 051-342 4443. Cables: CRYSTAL, BIRKENHEAD.

CRYSTALS MANUFACTURED TO ORDER

Prices shown are for one off, to our amateur specs., closer tolerances are available. Please send us details of your requirements.

A Low frequency fundamentals in HC13/U or HC6/U
Adj. tol. ± 50 ppm. Temp. tol. ± 100 ppm 0 to 70°C.
6.0 to 19.999kHz £28.12 100 to 159.99kHz £9.25
20 to 39.999kHz £17.74 160 to 499.99kHz £6.19
40 to 79.999kHz £12.40 500 to 799.99kHz £7.30
80 to 99.999kHz £10.60

B High frequency fundamentals/overtones
Adj. tol. ± 20 ppm. Temp. tol. ± 30 ppm 10 to 60°C.
800 to 999.9kHz (fund) HC6/U £9.75
* 1.0 to 1.499MHz (fund) HC6/U £10.35
* 1.5 to 2.599MHz (fund) HC6/U £4.93
* 2.6 to 20.99MHz (fund) HC6/U £4.48
* 3.4 to 3.999MHz (fund) HC18 & 25/U £6.21
* 4.0 to 5.999MHz (fund) HC18 & 25/U £4.93
* 6.0 to 20.99MHz (fund) All holders £4.48
* 21 to 24.99MHz (fund) " £6.73
* 25 to 30 MHz (fund) " £8.28
* 21 to 62.99MHz (30/T) " £4.48
* 60 to 105MHz (50/T) " £5.16
* 105 to 125MHz (50/T) HC18 & 25/U £7.76
125 to 180MHz (O/T) " £7.50
180 to 25MHz (O/T) " £12.49

* Delivery Normally 5/6 weeks (express available), all other frequencies 7/8 weeks.

Holders: Low frequencies HC13/U or HC6/U dependent on frequency.

Mid and High frequencies are available in HC6/U, HC18/U or HC25/U unless otherwise shown.

HC17/U (replacement for FT243) and HC33/U (wire end HC6/U) available as per HC6/U above at 30p extra on HC6/U price

Unless otherwise specified, fundamentals will be supplied to 30pf circuit conditions and overtones to series resonance.

CRYSTALS FOR PROFESSIONAL USE

We can supply crystals to most commercial and MIL specifications, with an express service for that urgent order. Also for commercial use, eg TV or computer crystals, etc, we can supply at very competitive prices. Please send S.A.E. for details or telephone between 4.30-7pm and ask for Mr. Norcliffe.

EXPRESS SERVICE

Many types of made to order crystals are available on our "EXPRESS SERVICE" — with delivery of three days on our class "A" service. Telephone for details.

TERMS: CASH WITH ORDER — MAIL ORDER ONLY — S.A.E. WITH ALL ENQUIRES — PRICES INCLUDE P. & P. (BRITISH ISLES) EXCEPT WHERE STATED — OVERSEAS CHARGED AT COST.

TWO METRE CRYSTALS

CRYSTAL FREQUENCY RANGE USE (TX or and HOLDER)	4MHz-TX-HC6/U	6MHz-TX-HC25/U	8MHz-TX-HC6/U	10MHz-RX-HC6/U	11MHz-RX-HC6/U	12MHz-TX-HC25/U	14MHz-RX-HC25/U	18MHz-TX-HC25/U	44MHz-RX-HC6/U	44MHz-RX-HC25/U	52MHz-RX-HC25/U
OUTPUT FREQUENCY	b	e	b	e	e	b	e	e	e	e	e
144.4 (433.2)	b	e	b	e	e	b	e	e	e	e	e
144.480	c	e	e	e	e	c	e	e	e	e	e
144.800	e	e	e	e	e	e	e	e	e	e	e
144.850	e	e	e	e	e	e	e	e	e	e	e
145.000/ROT	a	a	a	a	c	c	b	b	a	a	c
145.025/R1T	a	a	a	a	c	c	b	b	a	a	c
145.065/R2T	a	a	a	a	e	e	b	b	e	e	e
145.975/R3T	a	a	a	a	e	e	b	b	e	e	e
145.100/R4T	a	a	a	a	e	e	b	b	e	e	e
145.125/R5T	a	a	a	a	e	e	b	b	e	e	e
145.150/R6T	a	a	a	a	e	e	b	b	e	e	e
145.175/R7T	a	a	a	a	e	e	b	b	e	e	e
145.200/R8T	a	a	a	a	e	e	b	b	e	e	e
145.300/S12	a	a	a	a	e	e	b	b	e	e	e
145.350/S14	e	e	e	e	e	e	e	e	e	e	e
145.400/S16	e	e	e	e	e	e	e	e	e	e	e
145.425/S17	e	e	e	e	e	e	e	e	e	e	e
145.450/S18	a	a	a	a	e	e	b	b	e	e	e
145.475/S19	a	a	a	a	e	e	b	b	e	e	e
145.500/S20	a	a	a	a	c	c	b	b	e	e	e
145.525/S21	a	a	a	a	c	c	b	b	e	e	e
145.550/S22	a	a	a	a	c	c	b	b	e	e	e
145.575/S23	a	a	a	a	c	c	b	b	e	e	e
145.600/ROR	a	a	a	a	c	c	b	b	e	e	e
145.625/R1R	e	e	e	e	e	e	e	e	e	e	e
145.650/R2R	e	e	e	e	e	e	e	e	e	e	e
145.675/R3R	e	e	e	e	e	e	e	e	e	e	e
145.700/R4R	e	e	e	e	e	e	e	e	e	e	e
145.725/R5R	e	e	e	e	e	e	e	e	e	e	e
145.750/R6R	e	e	e	e	e	e	e	e	e	e	e
145.775/R7R	e	e	e	e	e	e	e	e	e	e	e
145.800/R8R	a	a	a	a	c	c	b	b	e	e	e
145.950/S38	a	a	a	a	c	c	b	b	e	e	e

PRICES: (a) £1.95, (b) £2.32, (c) £2.50, and (e) £4.48.

AVAILABILITY: (a), (b), (c) stock items, normally available by return (we have over 5000 items in stock). (e) 4/6 weeks normally but it is quite possible we could be able to supply from stock.

N.B. Frequencies as listed above but in alternative holders and/or non stock loadings are available as per code (e).

ORDERING. When ordering please quote (1) Channel, (2) Crystal frequency, (3) Holder, (4) Circuit conditions (load in pf). If you cannot give these, please give make and model of equipment and channel or output frequency required and we will advise if we have details.

**SEE YOU AT THE
ARRA EXHIBITION
at Castle Donnington 29th, 30th,
31st October**

70 cm CRYSTALS

Due to the much higher multiplication involved (3 times that on 2m) all our stock 70cm crystals are to much higher tolerances than our standard range.

We are stocking the following channels: RB0 (434.60/433.00), RB2 (434.65/433.05), RB4 (434.70/433.10), RB6 (434.75/433.15), SU8 (433.20), RB10 (434.85/433.25), RB11 (434.875/433.275), RB13 (434.925/433.325), RB14 (434.95/433.35), SU18 (433.45), SU20 (433.50) — TX & RX for use with: — PYE UHF Westminster (W15U), UHF Cambridge (U10B), Pocketfone (PF1) AND UHF PF70 Range, and STORNO CQL/COM 662 all at £2.32. For the U450L Base Stn we have the TX crystals for the above channels. The RX crystals for the U450L Base Stn together with TX and RX crystals for any other 70cm channel (eg RB/SU12 (434.90/433.30) RTTY, SU16 (433.40), SU22 (433.55) etc.) for most UHF equipments are available at £4.48 for crystals up to 63MHz, and £5.16 for 63 to 105MHz to amateur spec or £5.26 for up to 63MHz and £6.05 for 63 to 105MHz to the same closer spec as our stock items. Delivery approx. 5/6 weeks.

4m CRYSTALS FOR 70.26MHz — HC6/U

TX8.7825MHz and RX6.7466MHz or 29.7800MHz £2.32

10.245MHz "ALTERNATIVE" I.F. CRYSTALS — £2.32

For use in Pye and other equipment with 10.7MHz and 455kHz I.F.s to get rid of the "birdy" just above 145.0MHz. In HC6/U, HC18/U and HC25/U.

CRYSTAL SOCKETS — HC6/U, HC13/U and HC25/U (Low loss) 16p each. 10p P. & P. per order (P. & P. free if ordered with crystals).

CONVERTER/TRANSVERTER CRYSTALS — HC18/U

All at £3.30, 38.6666MHz (144/28), 42MHz (70/28), 58MHz (144/28), 70MHz (144/4), 71MHz (144/2), 96MHz (1,296/432/144), 101MHz (432/28), 101.50MHz (434/28), 105.6666MHz (1,296/28) and 116MHz (144/28).

TEST EQUIPMENT FREQUENCY STANDARD CRYSTALS

200kHz and 455MHz in HC6/U £3.50
100kHz in HC13/U and 1MHz in HC6/U £2.95
5MHz in HC6/U and 10MHz and 10.7MHz in HC6/U and HC25/U £2.80.

CRYSTALS FOR MICROPROCESSORS

Please let us know your requirements e.g. 4MHz HC18/U. 1 off, £2.00; 100 off, £1.10; 1000 off, 99p; 25,000 off, 50p.

ANZAC MD-108 DOUBLE BALANCED MIXER

5 500MHz supplied with full details for only £6.95.

ALL VALVES & TRANSISTORS

Call or phone for a most courteous quotation
01-749 3934

We are one of the largest stockists of valves etc. in the U.K.

COLOMOR ELECTRONICS LTD. 170 GOLDHAWK ROAD LONDON W12

CO-AXIAL CABLES

UR43 50 ohms. The most popular standard Coax. 5mm dia. 20p per Metre (post 2½p).
UR76 50 ohms. About the same spec. as UR43 and the same size but a stranded inner conductor. 22p per Metre (2½p).
UR95 50 ohms. Miniature. Polythene & Nylon 2.3 dia. 25p Metre (1p).
UR67. The thick low loss 50 ohm ½" dia. Coax. 60p per Metre (4½p).
UR70 75 ohm standard Coax. Stranded 6mm dia. Stranded inner conductor 20p Metre (2½p).
300 Ohms. Twin ribbon feeder PVC Polarity coded. A very popular line @ 11p. per Metre (1½p).
Send for Full lists. W. H. WESTLAKE, Clawton, Holsworthy, Devon.

G2BAR HAM BAND AERIALS

UHF 6element YAGI 432MHz	VAT inc.	£8.05	£1.15P.P.
11 element YAGI 432MHz	"	£11.50	"
VHF 5 element 2 metre YAGI	"	£8.50	"
VHF 8 element 2 metre YAGI	"	£11.05	"

For further information of Dipoles and HF GAMMA MATCH BEAMS — Please send 30p stamps.

UPPINGTON TELE-RADIO (BRISTOL) LTD.

12-14 Pennywell Road, Bristol BS5 0TJ. Telephone 0272 557732

MORSE CODE RECEIVING AND SENDING

Receiving: C-90 Cassettes. CASSETTE A for Amateur Radio examination preparation. Speed slowly increasing from 1-12w.p.m. CASSETTE B for professional examination preparation; computer produced morse from 12-25w.p.m. incl. international procedure signs and symbols and their incorporation into messages.

Sending: Morse Key and Buzzer Unit for sending practice and own tape preparation. Phone output. Prices: each cassette, incl. booklets, £4.75. Morse key and buzzer unit, £4.75.

Prices incl. postage, etc. Non-Europe Airmail £1.50 extra

MH ELECTRONICS (Dept. 3, 12 Longshore Way, Milton, Portsmouth PO4 8LS

MAIL ORDER

FROM



by two way
FREEPOST

MORSE KEYS		
HK 707	Straight Up/Down keyer	£11.44
BK 100	Semi-automatic mechanical bug	£17.88
MK 702	Up/Down keyer on marble base	£22.43
MK 702	Manipulator	£22.43
MK 704	Squeeze paddle	£14.38
MK 705	Squeeze paddle on marble base	£22.43
EKM 1A	Morse code practice oscillator	£8.63
MK 1024	Automatic memory keyer	£135.13
EK 150	Semi/Automatic keyer	£74.75

LINEAR AMPLIFIERS		
2M10-80P	144MHz 10W input/80W output with 9dB preamp	£138.00
2M25-150P	144MHz 25W input/150W output with 9dB preamp	£184.00
2M10-150P	144MHz 10W input/150W output with 9dB preamp	£209.88
2M3-150P	144MHz 3W input/150W output with 9dB preamp	£209.88

G. WHIP Mobile Antennas		
Tribander 10-20 Slide		£25.88
L.F. Coil 40/80/160 MTS		£6.56
L.F. Whip Telescopic		£4.26
Multimobile 10-20 Auto		£30.48
M/Mobile Coil 40/80/160		£6.56
M/Mobile Whip Telescopic		£4.26
Flexiwhip 10M Mast		£18.11
F/Whip Coils 40/80/160		£6.56
Base Standard		£6.00
Base Heavy Duty		£6.50
Extenarod		£12.00

SHURE MICS		
201	Hand ceramic omnidirectional high impedance	£14.49
202	Hand ceramic noise reducing high impedance	£15.18
401A	Hand controlled magnetic high impedance	£16.56
401B	Hand controlled mag. low impedance (200 ohms)	£16.56
444	Desk adjustable height controlled magnetic	£32.43
526T	Desk controlled response transistor preamp	£39.33

DUMMY LOADS		
DL20	30W DC-150MHz with PL259 connector	£6.33
T-80	80W DC-500 MHz with SO239 connector	£22.94
T-150	150W DC-500MHz with SO239 connector	£32.78

STILL HELPING WHERE IT HURTS				
Here's a list below to make buying easier for you — Work it out yourself — You'll see — It really is easy!				
Product	List Price	Deposit	12 Payments	
Yaesu FT 902DM	£799	£312	£40.55	
Yaesu FRG 7700	£309	£119	£15.89	
Yaesu FRG 7700M	£389	£160	£19.01	
Yaesu FRG 7000	£299	£115	£15.30	
Yaesu FT 101ZD FM	£599	£250	£29.05	
Yaesu FT 101ZD AM	£585	£225	£30.02	
Yaesu FT 101Z FM	£529	£190	£28.27	
Yaesu FT 101Z AM	£515	£195	£26.61	
Yaesu FL 2100Z	£385	£155	£19.20	
Yaesu FT 225RD	£565	£220	£28.76	
Yaesu FT 707	£529	£200	£27.49	
Yaesu FT 480R	£359	£175	£15.30	
Yaesu FT 290	£229	£100	£10.82	
Standard 8800	£252	£99	£12.71	
Standard C78	£219	£99	£10.04	
Standard C58	£247	£107	£11.69	

Many Other Items Available on Similar Terms
Call for Details

MICROWAVE MODULES		
MMT 432/28S		£149.00
MMR 432/144R		£184.00
MMT28/144		£199.00
MMT 144/28		£99.00
MMC 28/136		£27.90
MMC 28/156		£27.90
MMC 28/144		£27.90
MMC 144/any IF		27.90
MMC 144/28LO		£29.90
MMC 70/any IF		£27.90
MMC 432/28S		£34.90
MMC 432/144S		£34.90
MMC 1296/any IF		£32.20
MMC 050/500		£69.00
MMA 28 preamp		£14.95
MMA 144V preamp		£34.90
MMV 1296/28		£32.20
MML 144/100linamp		£142.60
MML 432/100linamp		£228.85
MML 144/25linamp		£59.00
MML 432/50linamp		£119.00
MM 2000		£169.00

UNADILLA/REYCO		
Antenna Traps — Precision moulded coil forms stainless - hardware - Aluminium tube irridit finish - Coated aluminium wire. Fully waterproofed.		
Available 7/14/21MHz		£11.99

W2AU BALUN		
3.5/30 MHz 2.5 Kw with Lightning Arrester — Suitable Vees, Yagis, Doublets, Quads, etc.		
		£11.99

STANDARD		
C8800 2m Tcwr		£252.00
C7800 70cms Tcwr		£275.00

DENTRON		
GLA 1000 Linear Amp 10/80 1Kw		£295.00
MLA 2500 Linear Amp 10/160 2Kw		£699.00
MT 3000 3Kw Tuner/SWR/Dummy Load		£275.00

FDK Multi 700EX		£199.00
FDK Multi 750E		£299.00

Send 30p for our bumper bundle literature

No Quibble Guarantee
Same Day Despatch
All Items Advertised

Choose your AMTECH here		
Amtech 100 Mobile Match		£16.95
Amtech 200 Random Wire ATU 10-160m 200w pep		£29.95
Amtech 300 Random and Coax Fed ATU 300w pep		£43.95
Amtech CW 250 — The most outstanding CW filter available		£24.90
Amtech Channelguard — A plug in device to eliminate those unwanted stations	Decoder	£15.25
	Sender	£7.25
Amtech FM7: FM Demodulator for FRG 7		£11.90

SWAN CUBIC		
Astro 103	Ep.o.a.	
PSU	Ep.o.a.	
1500Z linear	Ep.o.a.	
ST1A ATU	Ep.o.a.	
ST2A ATU	Ep.o.a.	
ST3 ATU	Ep.o.a.	

ICOM IC 730. All bands 10-80m including 30m, 17m and 12m. 100w RF out and 40w AM. Twin VFO, digital readout, 3 speed tuning down to 10Hz, Dial lock, RIT, N.B. and Switchable Preamp. £544.00 inc. VAT. Securicor delivery £5.00.		
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	--

SWR/RF POWER METERS		
SWR 25 3.5/170 MHz		£12.94
LEADER LPM 885-HF 1Kw		£58.00
HANSON 3.5/150MHz 200w		£28.75
REECE UHF 74 144/432		£16.28
HANSON FS 500H 1.8/60MHz 2Kw		£67.85
OSKAR SWR 200 3.30 MHz 2Kw		£40.00

ROTATORS		
Skyking SU 4000		£92.00
Skyking 250		£39.50
Emoto 502CXX		£139.75
KR 400RC		£90.85
AR 40		£59.00
KR 9502A		£50.00
Rotor Bearing		£12.00

*All items VAT and carriage paid.

AMCOMM SERVICES

194 NORTHOLT ROAD, SOUTH HARROW, MIDDX.
Telephone: 01-864 1166, 01-422 9585
Opposite South Harrow Tube Station on Piccadilly Line

Showroom Opening Hours
Tuesday to Saturday 9 – 5.30
Sunday by Appointment

All items over £100
available on easy terms
at List Price

NO POSTAGE REQUIRED **AMCOMM SERVICES (S1), FREEPOST, HARROW HA2 0BR.**

Please send me

at enclosed cheque/P.O. for

..... or charge my VISA/ACCESS

Nr.

Name

Address

..... Post Code

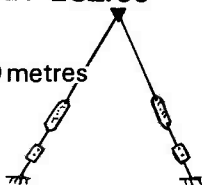
M & B RADIO

INVERTED VEE DIPOLES

ONLY £32.00

MULTIBAND 10-11-15-20-40-80 metres

- 2 Kw handling power.
- Heavy duty stranded non-corrosive & plastic coated.
- Total length 26 metres



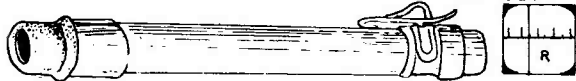
RADIATION DETECTOR

ONLY £2.70

- Metal cased.
- Contains 3 lenses.
- Quartz fibre type.
- Only the size of a pen.

Complete with information

DETECT RADIATIONS BEFORE IT IS TOO LATE



Bosch 2.5 Kw 40µF capacitor £8.00.

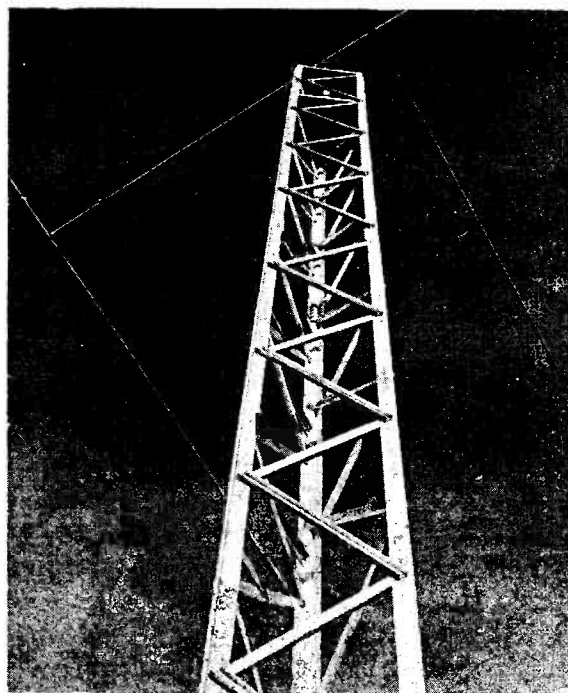
- Mini transformer 12 volt 250mA £1.00 p&p inc.
- Transformers 12-0-12, 24-0-24 500mA £3.25 VAT p&p inc.
- Auto wound 240 - 110 volt, 6.3A £9.00.
- Transformer 15-0-15 volt, 5A £6.50.

VAT & p&p extra unless stated.

M & B RADIO 86 BISHOPSGATE STREET
Tel: (0532) 35649 Leeds LS1 4BB

Western

ALUMAST



The ALUMAST is a 15" (375mm) wide triangular cross section lattice sectional aluminium mast based on a 10ft (3.05m) section length. It is supplied "knocked-down" in a tubular carton for ease of transport, but can easily be assembled needing no special tools or skills. The system includes top plate with bearing sleeve, rotor plate and a choice of a fixed base frame (FB-1) or one with hinge joints (HB-1) to enable the mast to be pivoted at ground level. Guy brackets are available for use at heights above 30ft.

- ★ Made from high strength corrosion resistant alloy using WESTERN EXCLUSIVE 'W' section leg extrusions.
- ★ Easy assembly using bolts and "Nyloc" locking nuts for security.
- ★ Free-standing to 30ft (9.15m) with a typical tri-bander plus VHF/UHF antennas.
- ★ Heights to 250ft (61m) with appropriate guy configurations (ask us for quotes).
- ★ Lightweight — only 25lb (11kg) per 10ft (3.05m) section.
- ★ 30ft (9.15m) mast is delivered in a tube only 10ft 6in (3.2m) long. 6in (0.126m) dia.

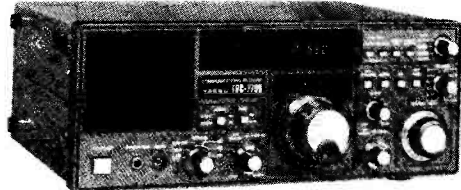
A COMPLETE 30ft (9.15m) MAST for 375/PSS/3; HB-1; RMP-1; TP-1

£ 240.35

FULL PRICE LIST

375/PSS/3	30ft mast (3 sections)	£184.00
375/PSS/1	Additional 10ft section	£62.68
HB-1	Hinged base unit	£31.05
FB-1	Fixed base unit	£21.85
RMP-1	Rotor mounting plate	£12.08
TP-1	Top plate with sleeve	£13.23
GB-1	Guy brackets (set of 3)	£11.50

All prices include carriage and VAT at 15%
For Scotland — add £10 extra carriage



THE LATEST SOMMERKAMP — FRG 7700 COMMUNICATION RECEIVER. 150kHz - 30MHz multimode, digital frequency readout, 12 programmable memories, variable bandwidth, built-in clock/timer. Price £375.00.
FT207 SYNTHESIZED 2 METRE TRANSCEIVER. 144 - 148MHz in 12½kHz steps, 4 memories. Inc. case and nicad charger special at £169.00 inc. VAT.
BEARCAT 220FB RECEIVER £239.00.
SPECIALS: 2 METRE TS280 50 Watt MOBILE TRANSCEIVER. Fully Synt. at only £169.00 inc. VAT. Special. TS280 10 Watt version £139.00 inc. VAT. Special.



FT480R MULTIMODE MOBILE BASE £349.00 inc. VAT.
NEW NEW — BRAND NEW FROM SOMMERKAMP the all-mode 2m portable FT-290. So many features ● 10 memories ● Memory scan ● 2 VFOs ● Band scan ● Clarifier ● FM/LSB/USB/CW ● LCD readout ● Real S-meter ● Priority channel ● 2.5W out.
Our price £229.00 inc. VAT.

NEW — H.F. FT2772D Mk III
SOMMERKAMP H.F. RIGS. FT277D (= FT101 with extras) AM version £649.00, FM version £699.00. FT307 (= FT107 with extras) Price on application. FT767 (= FT707 with extras) £589.00.

Prices may change due to currency exchange fluctuations.
PART EXCHANGE your old gear and get a good deal.
ROTATORS, ANTENNAS, GENUINE SOMMERKAMP SWR BRIDGES AND 12VOLT POWER SUPPLIES.

All prices include VAT. Barclaycard and Access welcome.
H.P. terms available. Prices may change without notice. S.A.E. for details.

GEMINI COMMUNICATIONS

YOUR SOMMERKAMP IMPORTER.

1, Railway Road, Blackburn, Lancs. Telephone: 51842.
(Telephone Evenings: Bolton 592929 G4GHE).

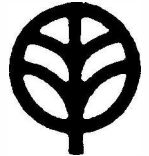
Western Electronics (UK) Ltd

FAIRFIELD ESTATE, LOUTH, Lincs LN11 0JH
Tel: Louth (0507) 604955 Telex: 56121 WEST G

Western



CALL **Western** FOR YOUR YAESU AND TRIO REQUIREMENTS



A selection from the range . . .

HF EQUIPMENT			HF EQUIPMENT		
FT-101Z	Analogue dial	from	TS-130S	Solid state transceiver	£499
FT-101ZD	Digital	£559	TS-530S	HF base transceiver	£539
	(Basic, AM, FM versions available)		TS-830S	Deluxe HF transceiver	£699
FT-707	Solid State transceiver	£495	TS-820S	* SPECIAL OFFER *	£559
FP-707	PSU/speaker	£99			
FC-707	Antenna tuner	£69			
FL-2100Z	Linear amplifier	£349			
V/UHF EQUIPMENT			V/UHF EQUIPMENT		
FT-227RB	2m FM Mobile	£229	TR-2300	2m FM Portable	£159
FT-290R	2m all-mode Portable	£239	TR-2400	2m FM Hand Held	£195
FT-480R	2m all-mode Mobile	£359	VB-2300	10W Amp. for TR-2300	£45
FT-720RV	2m FM Mobile	£239	TR-8400	70cm FM Mobile	£289
FT-720RU	70cm FM Mobile	£259	TR-7625	* SPECIAL OFFER *	£239
	(* Both FT-720 offers incl. FREE Extension Cable *)				
RECEIVERS			RECEIVERS		
FRG-7	General Coverage Receiver	£189	R-1000	General coverage, digital	£289
FRG-7700	General Coverage, Digital	£299			

FT-ONE

NOW! THE ONE THAT HAS IT ALL!

AVAILABLE SOON

NEW

FEATURES

- ★ Wide Dynamic Range Front End
- ★ Frequency Control by Keyboard, Up-Down Switches or Dial
- ★ IF Width, Shift and Audio Peak or Notch Filtering
- ★ 10 VFO System for Comprehensive Frequency Control
- ★ Full CW Break-in
- ★ General Coverage Receive
- ★ Built-in PSU

NEW

BRIEF SPECIFICATIONS

Frequency Coverage

Modes

Size

Weight

Power Requirements

RX: 150kHz-29.999MHz

TX: 1.8MHz-29.999MHz

(No TX outside Amateur Bands)

LSB, USB, CW, FSK, FM, AM

370(W) x 157(H) x 350(D) mm

17kg

100-234VAC; 13.5V DC

A FULL RANGE OF ANTENNA ROTORS from Western

THE "BUDGET" FAMILY <small>(24v motors)</small>	"EMOTO" — THE "PROFESSIONAL" FAMILY <small>(All EMOTOS take 32-62 mm mast — motor volts 50-0-50v isolated)</small>	
<p>WE-1145 — LIGHT DUTY <small>(similar to SU-2000 with circuit improvements)</small></p> <p>Direction indicator Control knob</p> <p>Rotation time 60 seconds</p> <p>Antenna weight (max) 50 kg</p> <p>Mast size 28-44 mm</p> <p>Wind load area (max) 0.25 sq. m.</p> <p>Cable required 5-way</p> <p>PRICE £34.95</p>	<p>EMOTO 103SAX — MEDIUM DUTY</p> <p>Direction indicator 360° circular dial</p> <p>Rotation torque 450 kg. cm.</p> <p>Braking torque (stationary) 1500 kg. cm.</p> <p>Rotation time 55 seconds</p> <p>Antenna weight (max) 150 kg</p> <p>Wind load area (max) 0.5 sq. m.</p> <p>Cable required 6-way</p> <p>PRICE £86.25</p>	<p>EMOTO 502SAX — HEAVY DUTY</p> <p>Direction indicator 360° circular dial</p> <p>Rotation torque 600 kg. cm.</p> <p>Braking torque 4000 kg. cm.</p> <p>Rotation time 66 seconds</p> <p>Antenna weight (max) 400 kg</p> <p>Wind load area (max) 1.5 sq. m.</p> <p>Cable required 6-way</p> <p>PRICE £125.35</p>
<p>FU-400 — MEDIUM DUTY</p> <p>Direction indicator Meter (NESW)</p> <p>Rotation torque 550 kg. cm.</p> <p>Braking torque (stationary) 1500 kg. cm.</p> <p>Rotation time 50 seconds</p> <p>Antenna weight (max) 200 kg</p> <p>Mast size 38-50 mm</p> <p>Wind load area (max) 0.5 sq. m. (basic)</p> <p>0.8 sq. m. (with stay bearing)</p> <p>Cable required 6-way</p> <p>Lower mast clamp included</p> <p>PRICE £64.95</p>	<p>EMOTO 1102MXX/1103MXX — EXTRA-HEAVY DUTY</p> <p>Direction indicator Meter (NESW)</p> <p>Rotation torque 800 kg. cm. (1102); 1000 kg. cm. (1103)</p> <p>Braking torque 10000 kg. cm.</p> <p>Rotation time 80 sec. (1102); 110 sec. (1100)</p> <p>Antenna weight (max) 400 kg</p> <p>Wind load area (max) 2.5 sq. m.</p> <p>Cable required 7-way</p> <p>PRICE 1102MXX £189.75 1103MXX £194.35</p>	<p>EMOTO ACCESSORIES</p> <p>1211 — Mast bracket for 103SAX £10.93</p> <p>1213 — Mast bracket for 502SAX £14.38</p> <p>1215 — Mast bracket for 1102/1103 £22.43</p> <p>MB-300 — Rotary guy bearing £13.80</p>

ALSO . . . Western MASTS, TOWERS, ANTENNAS . . .

SEE PREVIOUS ADS. FOR WESTOWER, ALUMAST, ULTIMAST
NO PRICE CHANGES ON THESE BRITISH-MADE PRODUCTS!

SEE YOU AT GRANBY HALLS AND DONINGTON PARK!

ACCESS — VISA CARDS ACCEPTED — HP ARRANGED (WRITTEN QUOTATIONS ON REQUEST)
ALL LISTED PRICES INCLUDE VAT AT 15% AND CARRIAGE

Western Electronics (UK) Ltd **FAIRFIELD ESTATE, LOUTH, LINGS LN11 0JH**
 Tel: Louth (0507) 604955 Telex: 56121 WEST G

OPENING HOURS: 09.00-12.00; 13.00-1700 Mon/Fri; Saturdays 0900-1700

<p>NORTHERN IRELAND Mike Matthews, G18VNO Newtownards (0247) 815859</p>	<p>SOUTHAMPTON Alan Paxton, G4BIZ Southampton (0703) 582182</p>	<p>LEICESTER May's Hi-Fi, Churchgate Leicester (0533) 58662</p>
----------------------------------------------------------------------------------------	--------------------------------------------------------------------------------	--------------------------------------------------------------------------------



Your one-stop shopping centre for complete equipment from 'Trio' and 'Philips', accessories from 'Jaybeam' and 'Microwave Modules', components, kits and the 'Video Genie' Microcomputer system.

Now available from Catronics – REAL Value-for-Money in Microcomputers

video genie system

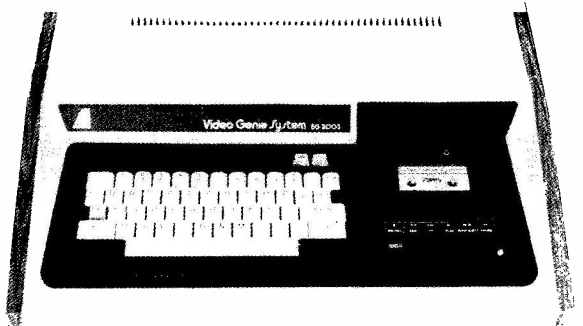
Advanced features are:

1. Built-in TV interface, the user's TV set may be used as the display terminal, thus saving money.
2. Main Control Unit contains the CPU plus.
 - i) 51 key typewriter keyboard, with 10 key rollover.
 - ii) High quality cassette recorder, enables recording and playback of programs, data and the use of pre-recorded tapes.
3. Built-in audio cassette interface for connecting another cassette recorder to serve as cheap and compact storage for large amounts of data on tapes.
4. 16k user RAM included, expandable to 48k.
5. Fully TRS 80 level II software compatible so a huge range of software is already available.
6. Full 12k Microsoft BASIC in ROM.
7. Full expansion capability to Discs and Printer, a small system with big possibilities.
8. Self-contained, all in one attractive case.
9. The system uses the powerful Z80 processor.

Our Special Discount Price only £365.00 inc. VAT.

Also available 9" Monitor – built to full professional specification (Not a converted television) Model CVM600: £130.00.

Full range of supporting programs and accessories available, including Amateur Radio packages.



New RTTY Terminal Unit
/Program for Computers

Fabulous new program now available to send and receive RTTY. Complete with Receive Terminal Unit and Transmit AFSK on PCB assy. Suitable for Video Genie and TRS80 computers: CT600 special introductory price £109.20.



Why not pay us a personal visit? CATRONICS are 300 yards from Wallington Railway Station (London Bridge or Victoria). Frequent buses from Croydon and Sutton. Three large car parks within 100 yards. Hire purchase facilities available on equipment. Credit Cards accepted. Mail orders are normally dealt with on day of receipt. All our prices INCLUDE VAT.



Catronics Ltd., Dept. 110, Communications House, 20 Wallington Square, Wallington, Surrey SM6 8RG
Tel: 01-669 6700. Shop/Showroom open Mon to Fri 9am to 5.30pm. Closed for lunch 12.45 to 1.45pm. Sat 9am to 12.45pm.



FOR QUALITY CRYSTALS – AT COMPETITIVE PRICES. POPULAR FREQUENCIES IN STOCK – MADE TO ORDER 10kHz to 225MHz. RB15 Pocketfone crystals now in stock.

2 METRE STOCK CRYSTALS. Price £1.83 for one crystal. £1.74/crystal when two or more purchased.

	HC6/U	HC6/U	HC25/U	HC25/U	HC25/U	HC6 &
	30pF TX	30pF TX	30pF TX	20pF and 30pF RX	25pF and 20pF TX	25/U SR RX
RO	4.0277	8.0555	12.0833	14.9888	18.1250	44.9666
R1	4.0284	8.0569	12.0854	14.9916	18.1281	44.9750
R2	4.0291	8.0583	12.0875	14.9944	18.1312	44.9833
R3	4.0298	8.0597	12.0895	14.9972	18.1343	44.9916
R4	4.0305	8.0611	12.0916	15.0000	18.1375	45.0000
R5	4.0312	8.0625	12.0937	15.0027	18.1406	44.0083
R6	4.0319	8.0638	12.0958	15.0055	18.1437	45.0166
R7	4.0326	8.0652	12.0979	15.0083	18.1468	45.0250
S8	–	–	12.1000	14.9444	18.1500	44.8333*
S9	–	–	12.1020	14.9472	18.1531	44.8416*
S10	–	–	12.1041	14.9500	18.1562	44.8500*
S11	–	–	12.1062	14.9527	18.1593	44.8583*
S12	–	–	12.1083	14.9555	18.1625	44.8666*
S13	–	–	12.1104	14.9583	18.1656	44.8750*
S14	–	–	12.1125	14.9611	18.1687	44.8833*
S15	–	–	12.1145	14.9638	18.1718	44.8916*
S16	–	–	12.1167	14.9667	18.1750	44.9000*
S17	–	–	12.1187	14.9694	18.1781	44.9083*
S18	–	–	12.1208	14.9722	18.1812	44.9166*
S19	–	–	12.1229	14.9750	18.1843	44.9250*
S20	4.0416	8.0833	12.1250	14.9777	18.1875	44.9333
S21	4.0423	8.0847	12.1270	14.9805	18.1906	44.9416
S22	4.0430	8.0861	12.1291	14.9833	18.1937	44.9500
S23	4.0437	8.0875	12.1312	14.9861	18.1968	44.9583

Also in stock: RO to R7 and S8 to S23 for following: Belcom FS1007, FDK TM56, Multi 11 Quartz 16 and Multi 7, Icom IC2F, 21, 22A and 215, Trio Kenwood 2200, 7200. Uniden 2030 and Yaesu FT2FB, FT2 Auto, FT224, FT223 and FT202

Also in stock 4 and 6MHz TX in HC6/U for 145.8MHz. Icom crystals TX for 145.6MHz (RRO). 44MHz RX crystals in HC6/U for 145.8 and 145 (RRO). All at above price.

4 METRE CRYSTALS for 70.26MHz in HC6/U at £2.25. TX 8.78250MHz. RX 6.7466 or 29.78MHz in stock.

70cm CRYSTALS in stock 8.0222 and 12.0333 in HC6 £1.85. Pye Pocketfone PF1, PF2, PF70 and Wood and Douglas £4.50 a pair or TX £2.25, RX £2.50, SU8(433.2) RB0, RB2, RB4, RB6, RB10, RB11, RB13, RB14 and RB15.

CONVERTER CRYSTALS IN HC18/U at £2.85. In stock 38.666, 42.000, 70.000, 96.000, 101.000, 101.500, 105.666 and 116.000MHz.

ONE BURST AND I.F. CRYSTALS in HC18/U at £2.25 in stock. 7.168MHz for 1750kHz and 10.245MHz for 10.7MHz IF's.

FREQUENCY STANDARDS in stock £2.75. HC6 200kHz, 455kHz, 1000kHz, 5.000MHz and 10.000MHz. HC13 100kHz, HC18 1000kHz, 7.000MHz, 10.700MHz, 48.000MHz and 100.000MHz.

We shall be as usual exhibiting at the GRANBY HALLS LEICESTER this year from 23 to 25 October. As a result we shall be closed from 17 to 24 October. Any inconvenience to customers is regretted.

MADE TO ORDER CRYSTALS SINGLE UNIT PRICING

	Price Group	Adjustment Tolerance ppm	Frequency Ranges	Price and Delivery	
				A	B
Fundamentals	1	200 (total)	10 to 19.999kHz	–	£23.00
	2	200 (total)	20 to 29.999kHz	–	£16.50
	3	200 (total)	30 to 99.999kHz	–	£10.50
	4	200 (total)	100 to 999.999kHz	–	£6.00
3rd OVT	5	50	1.00 to 1.499MHz	£9.00	£6.00
	6	10	1.50 to 1.999MHz	£4.75	£4.20
	7	10	2.00 to 2.599MHz	£4.75	£4.00
	8	10	2.60 to 3.999MHz	£4.55	£3.70
	9	10	4.00 to 20.999MHz	£4.55	£3.60
	10	10	21.00 to 24.000MHz	£6.00	£5.40
	11	10	21.00 to 59.999MHz	£4.55	£3.60
	12	10	60.00 to 99.999MHz	£5.00	£4.00
	13	10	100.00 to 124.999MHz	£6.15	£5.20
	14	20	125.00 to 149.999MHz	–	£6.00
15	20	150.00 to 225.000MHz	–	£7.50	

Unless otherwise requested fundamentals will be supplied with 30pF load capacity and overtones for series resonance operation.

HOLDERS – Please specify when ordering – 10 to 200kHz HC13/U, 170kHz to 170MHz HC6 or HC33/U, 4 to 225MHz, HC18 and HC25.

DELIVERY Column A 3 to 4 weeks. Column B 6 to 8 weeks.

DISCOUNTS. 5% mixed frequency discount for 50 or more crystals at B delivery. Price on application for 100 or more crystals to same frequency specification. Special rates for bulk purchase schemes including FREE supply of crystals used in UK repeaters.

EMERGENCY SERVICE SURCHARGES (to be added to A delivery prices). 4 working days £12. 6 working days £7. 8 working days £5. 13 working days £3 (maximum of 5 crystals on 4 day delivery).

CRYSTAL SOCKETS HC6/U and HC25/U 16p. MINIMUM ORDER CHARGE £1.50.

TERMS. Cash with order, cheques and postal orders payable to QSL Ltd. All prices include postage to UK and Irish addresses. Please note Southern Irish cheques and postal orders are no longer acceptable. Please send bank draft in pounds Sterling.

PRICES ARE EX VAT. PLEASE ADD 15%



MARKETING LTD. P.O. BOX 73 SUMMIT HOUSE, LONDON SE18 3LR
Telephone: 01-690 4889 24 hr. Ansafone: Erith (03224) 30830
Telex: 912881 CWUKTX-G (Attention QUARTSLAB). Cables: QUARTSLAB LONDON SE18.

AMATEUR RADIO RETAILERS ASSOCIATION

Secretary: Fred Hopewell, P.O. Box 36, Loughborough LE11 1DW
TENTH ANNIVERSARY

AMATEUR RADIO AND ELECTRONICS

★ EXHIBITION ★

DONINGTON PARK
CASTLE DONINGTON
29/30/31 OCTOBER



NOTE THE
NEW VENUE!

OPEN DAILY, 10 a.m. to 6 p.m.

DON'T MISS THIS EXCITING EVENT — BARGAINS GALORE,
REFRESHMENTS, BAR AND ALL THE USUAL AMENITIES

£500 IN VOUCHER PRIZES TO BE WON!

PLUS FABULOUS FREE DRAW PRIZES THROUGHOUT THE EXHIBITION!

ADMISSION: £1. Concessionary Tickets 80p for Parties of 15 or over

Advance Tickets may be obtained direct from: Stuart
Parker, Esq., Donington Park Racing Ltd., CASTLE
DONINGTON, Derbys. DE7 5RP. Please enclose postage: up
to 18 Tickets, 14p. 19-30 Tickets 20p. 31-50 Tickets, 26p.



BOOK THE DATES NOW
FOR THE SHOW OF THE YEAR!

ENTER THE NEW WORLD of KW + TEN-TEC

Introducing a New Concept in HF communications

A NEW SERIES WITH NEW FEATURES, NEW PERFORMANCE, AND ALL 9 HF BANDS.



KW + TEN — TEC OMNI-C*

- with comprehensive facilities • superb SSB with 8 pole filter • all 6 present HF bands (+ all 3 new bands 10.18 + 24.5 MHz) covering 10-160 meters
- 2 speed CW break — in facility • new "hang" AGC for smoother operation
- 200 watts max input power.

Come to KW for all your other amateur radio requirements KW service and guarantee — KW maintains the tradition of service the company is renowned for. Output transistors unconditionally guaranteed for 12 months. The KW — TEN — TEC units offered above are introduced as a prelude to fully UK assembled equipment.

KW + TEN — TEC DELTA*

- HF transceiver 10 — 160 meters. 9 bands including new bands.
- 200 watts max input power
- compact yet easily serviceable
- superb mobile transceiver, nominal 13v D.C. input.

KW + TEN — TEC ARGONAUT*

- the best in QRP is now better than ever
- total solid state full band coverage 10-80 meters
- 5 watts input • imported receiver sensitivity
- full CW break-in
- WWV receive at 10 and 15 MHz.

(*A full range of accessories is available for
KW + TEN — TEC equipment)

other KW units available.
KW 107 Supermatch KW trap dipole
KW E-Z match KW traps
KW Balun KW antenna switch

KW COMMUNICATIONS LTD

Vanguard Works, Jenkins Dale, Chatham ME4 5RT
Tel: 0634-815173 Telex: 965834 KW COMM G

TRIO



LAR

AUTHORISED
ICOM
DEALER

SHORT WAVE 'GOOD BUYS'

Buy from the Short Wave Specialists every time ... you'll get good service from professionals who know your hobby well. For example:



R1000 Communications Receiver for use at home and in your boat or caravan
PRICE

£ 305.90

SX200N Scanning Receiver 26 MHz to 512 MHz
PRICE

£ 264.00



SRX 30D. The most popular Short Wave listeners receiver. 0.2 - 30 MHz now with digital readout!
PRICE

£ 195.00

Buy by post - or 'phone your Barclaycard, Access or LAR Creditcard number. Alternatively, call in for a chat. The shop is just 10 minutes from Leeds City Station and there's easy parking if you travel by car. *Instant HP for licensed Amateurs. *Extended Credit Terms Available. **A QUOTATION ON ALL CREDIT ITEMS IS AVAILABLE**
*Open Mon-Fri 9.15 - 6.00 pm, Saturday 9.15 - 5.30 pm

LAR

Leeds Amateur Radio
27 Cookridge St., Leeds, W. Yorkshire. LS2 3AG.
Tel: (0532) 452657 (Shop).
Mail Order/Service Department: 60 Green Road,
Meanwood, Leeds LS6 4JP. Tel: (0532) 782224

POST NOW!

Send 50p for Catalogue and Price List.

I enclose cheque for £ _____ Plus 50p for Brochure*
*delete if not applicable.

to purchase _____

Name _____

Address _____

SW2

Post to: Leeds Amateur Radio, 60 Green Road, Meanwood, Leeds LS6 4JP.

TO BARCLAYCARD/ACCESS/LAR

I authorise you to debit my Barclaycard/Access/
LAR Budget Account with the amount of £ _____

My No. is

--	--	--	--	--	--	--	--	--	--

Signature _____

TRIO DISTRIBUTOR, LAR are area distributors for CUSHCRAFT, Antenna Specialists, ICOM, Microwave Modules.

("SITUATIONS" AND "TRADE")

20p per word, minimum charge £2.40. No series discount. All charges payable with order. Insertions of radio interest only accepted. Add 50 per cent for Bold Face (Heavy Type). No responsibility accepted for transcription errors. Box numbers 40p extra. Send copy, with remittance, to the Classified Dept., Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts. AL6 9EQ.

TRADE

Courses — RADIO AMATEURS EXAMINATION, City and Guilds. Pass this important examination and obtain your licence, with an RRC Home Study Course. For details of this and other courses (GCE, professional examinations, etc), write or phone: **THE RAPID RESULTS COLLEGE, Dept. JV1, Tuition House, London SW19 4DS.** Tel: 01-947 7272 (9 a.m. to 5 p.m.), or use our 24-hr Recordacall Service, 01-946 1102, quoting Dept. JV1.

Listener and QSL cards, quality printing on coloured gloss cards at competitive prices. Send s.a.e. for samples. — S. M. Tatham, "Woodside", Orchard Way, Fontwell, Arundel, West Sussex.

VHF converters, 45-220 MHz (varicap), 28-30 MHz tunable IF, £8. **50-300 MHz** model, £9. Please send s.a.e. for data and lists. — H. Cocks, Cripps Corner, Robertsbridge, East Sussex. (Tel: 058083-317).

QSL's, 5000 for £38, c.w.o. Send s.a.e. for samples. — Printshop, 89 Derwent Street, Consett DH8 8LT.

For Sommerkamp in Stockport. We also stock Belcom, Daiwa, Trio (receivers), M.M., scanners, airband monitors, aerials and accessories. — **Fairbotham & Co. Ltd.**, 58-62 Lower Hillgate, Stockport, Cheshire. (Tel: 061-480 4872).

Aerial wire, 14 s.w.g. hard-drawn copper: 70 ft. coils £5.50; 140 ft. coils, £8.90. Including postage. — **TMP Electronics**, Britannia Stores, Leeswood, Mold, Clwyd CH7 4RU.

Towers, 35-ft. telescopic, beautifully built, strong, light, £210. 2m. omnidirectional 3/4-wave, 4.5dB gain, £21. — **AAC**, 132 Hermon Hill, London E18. (Tel: 01-530 6118).

1920's onward valves, wireless's. Lists 25p, s.a.e. please. — **Sole Electronics**, 37 Stanley Street, Ormskirk, Lancs. L39 2DH.

QSL cards. Sample pack and price list forwarded on receipt of 20p stamp. — **Derwent Press**, 69 Langstone Drive, Exmouth, Devon EX8 4HZ.

Good second-hand equipment always wanted. Come to **AMATEUR RADIO EXCHANGE** for the best deal. — 2 Northfield Road, Ealing, London W13 9SY. (Tel: 01-579 5311.)

TVI/AFI? Cure it with ferrite rings, 67p each including postage. — **TMP Electronics**, Britannia Stores, Leeswood, Mold, Clwyd CH7 4RU.

Automatic Morse decoder, low cost easy-build 9v. circuit, accepts audio input or practice key, gives continuous readout on 12-character alphanumeric display. Send £3.95, plus large s.a.e. for fully detailed 17-page construction manual. Parts and PCB available. — **N. MacRitchie (Micros)**, 100 Drakies Avenue, Inverness IV2 3SD. (Tel: 0463-221194).

Trap dipoles, custom built, anti-TVI models, Tx-ing, SWL-ing, 24-ft. to 108-ft. Send s.a.e. for lists. — **G2DYM, Uplowman, Tiverton, Devon.** (Tel: 03986-215).

Unforgettable Caribbean winter holidays aboard luxury skippered sloop "Moody Mistress" based English Harbour, Antigua. Operate /MM with latest Icom IC-720A and standby Atlas 215X rigs, while your YL/XYL gets the suntan she missed this summer! Charter agents: **Montague Marine Management**, 43a North Hill, Plymouth. (Tel: 0752-665187).

READERS' ADVERTISEMENTS

10p per word, minimum charge £1.50 payable with order. Add 25p per cent for Bold Face (Heavy Type). Please write clearly, using full punctuation and recognised abbreviations. No responsibility accepted for transcription errors. Box Numbers 40p extra. Send copy, with remittance, to the Classified Dept., Short Wave Magazine Ltd., High Street, Welwyn, Herts. AL6 9EQ.

READERS

Selling: Yaesu FT-707 transceiver, with YM-37 mic., leads, connectors and handbook, in original packing, immaculate condition (bought for mobile use but not fitted due to vehicle change), £395. G-whip mobile aerial complete (used five bands with Atlas 210X), with never-fitted new base and cable, good condition, £22.—Ring 01-428 1128 after 7 p.m.

Selling: DX-300 receiver, digital readout, with headphones and outdoor aerial, mint, boxed, £169.—Ring Mersi, 01-641 1758.

For Sale: Trio R-1000, perfect, £175. New Sanyo mini radio/cassette recorder, FM/MW/SW/LW, £60. Please write giving phone number if possible.—Donaldson, Seismograph Service Ltd., Kyle Valley Farms, King Edward Road, Thorne, S. Yorks.

Sale: Sommerkamp FT-767DX and FP-767, £560 or near offer. FC-902, £80.—Iley, 31 Severn Close, St. Helens, Lancs. (Tel: Marshalls Cross 813749).

Sale: Trio R-1000, mint condition, with manual and original packing, £225.—Ring Dorian, Rustington 73089 (Sussex).

For Sale: FT-101E HF Tx/Rx, £315. Two-metre PA 1 to 10 watts, £35.—Tugwell, G3KMV, QTHR. (Tel: 0438-54689).

Selling: Amateu bands receivers: Yaesu FR-400SDX, 2-160m., CB, with all filters and options, spare valves, speaker and manual, immaculate condition, £160. Eddystone 888A, professionally realigned, re-valved, with spares and manual, superb condition, £80. Datong FL-1 audio filter, as new, £35. Hamgear preselector, £5. Buyers collect.—Ring Robinson, Bury St. Edmunds (0284) 61951.

Wanted: HT transformer, 3kV or more, at least 1 amp; also high-voltage smoothing capacitors. Part or completed PSU acceptable.—McHenry, 28 Charlbury Road, Oxford. (Tel: 0865-56321).

Complete Station for sale: FT-200, FP-200, FV-200, ATU, SWR/Power meter, Joystick, artificial earth, £300.—Catterall, G4IWC, QTHR. (Tel: Great Missenden 4504).

For Sale: Redifon GA406 linear amplifier, 2-18 MHz, 750w., with handbook but no 4-400 valves (two), £60.—St.-Amour, G3ZTE, QTHR.

Selling: Yaesu FR-400SDX receiver, all options fitted including 2 and 4m. bands, covers 27 Mhz all modes, with matching SP-400 speaker, handbook and spare valves, particularly nice condition, £150. Yaesu FL-400DX transmitter with matching YD-44 mic., has 3 switch positions to provide for additional operating frequencies, with handbook and spare valves, particularly nice condition, £140. Leads and connectors available to operate above transmitter and receiver as a station pair. Yaesu QTR-24 world time clock in original packing, immaculate condition, £12. SBE-10SM scanning FM receiver, UHF channels RB4, RB6, RB10 and RB14 fitted, original packing, in very nice condition, £49.—Ring 01-428 1128 after 7 p.m.

Selling: No. 19 Mk. III transceiver with operating handbook, £30 or near offer.—Ring Saunders, Sheffield (0742) 344356.

Wanted: W.S. No. 19 Mk. III ex-Army transceiver, prefer very good condition and appearance with no modifications or parts removed. I will pay for transit by B.R.S. Please state model (British or Canadian), condition and price.—Barker, 42 Swinhoe Gardens, Wideopen, Newcastle-upon-Tyne NE13 6AF.

Selling: Eagle RX60N communications receiver, £30. Codar PR-40 preselector, £10. Labgear Topbander transmitter, £20.—Ring Howard, 01-452 7618.

Sale: Eddystone EC-10 Mk. II Rx, complete with mains and battery units, £99. Trio JR-310 Rx, £99. Both 'or near offer'.—Ring Holland, Malvern 61707 after 5.30 p.m.

For Sale: FRG-7 with filters and digital readout as per R. Dawson's article in "S.W.M." Jan.-Feb. '80, better than new, £130 plus postage.—Smyth, "De Porres", 67 East Princes Street, Helensburgh G84 7DG, Scotland.

R. T. & I. ELECTRONICS LTD.

Ashville Old Hall, Ashville Road, London E11 4DX. Tel. 01-539 4986
Nearest Station: Leytonstone (Central Line)

We are MAIN DISTRIBUTORS for AVO, MEGGER, TAYLOR and SULLIVAN INSTRUMENTS

FULLY OVERHAULED EQUIPMENT

EDDYSTONE EC10 Mk. 1. Receiver	£103.50
EDDYSTONE EC10 Mk. 2. Receiver	£128.50
HAMMARLUND Model SP600JX	£245.00
KW2000E Transceiver. As new	£327.75
KW204 Transmitter. As new	£253.00
EDDYSTONE 940 Receiver	£236.90
EDDYSTONE EA12B.S. Receiver	£236.90
DRAKE SPRA Receiver	£405.75
EDDYSTONE 840C Receiver	£109.25
HAMMARLUND HQ170 AMATEUR B.S. RECEIVER	£213.90
YAESU FRG-7. As New	£175.00

NEW EQUIPMENT

TRIO R-300 Receiver	£193.89
YAESU FRG-7 Receiver	£199.00
YAESU FRG-7000 Receiver	£299.00
YAESU FRG-7700 Receiver	£309.00
MEMORY UNIT FOR FRG-7700	£83.95

AVO & MEGGER EQUIPMENT (A Few Examples)

AVO Digital Multimeter Model DA211	£66.12
AVO Digital Multimeter Model DA212	£86.67
AVO Digital Multimeter Model DA116	£140.53
AVO Digital Multimeter Model DA117 Auto Range	£181.12
AVO Digital Multimeter Model DA118	£231.72
Taylor Analogue Multimeter Model 131	£20.12
Taylor Analogue Multimeter Model 132	£24.72

Cases for AVO, TAYLOR & MEGGER instruments in stock. Send for Details. We also repair all types of instruments. Trade and Educational enquiries invited.

SINCLAIR DM235 Digital Multimeter	£60.38
Carrying Case for DM 235	£8.86
Mains Adaptor for DM 235	£5.69
SINCLAIR PDM35 Pocket Digital Multimeter	£39.68
SINCLAIR PFM200 Pocket Digital Frequency Meter	£57.27
PARTRIDGE "JOYSTICK". New improved VFA, £29.00. JOYMATCH IIIIB, £22.55.	
LO-Z500, £28.62. JOYMATCH A.T.U. Kit, £10.50. A.T.U. Kit assembled, £12.75.	
Artificial earth and bandswitch, £10.50.	

SHURE MICROPHONES, 526, T £35.42; 444, £29.21; 401A, £14.95; 202, £13.80; 201, £13.11; 414A, £22.43; 414B, £22.43. Full details on request.

SCOPEX OSCILLOSCOPES IN STOCK.
TMK METERS: Model TP105, £18.05. Model 500TU-B, £33.23. Model TW20CB, £39.56. Model TP55N, £21.27. Model 700, £88.42. Also in stock Leather Cases for above. Model 700B, £72.16. Model 3020E (Digital) £115.00. Full details on request. In present conditions we regret that all prices are subject to alteration without notice. ALL PRICES INCLUDE VAT AND CARRIAGE. Terms: C.W.O., Approved Monthly Accounts, Hire Purchase and Part Exchange. Special facilities for export.
HOURS - 9.30 am - 5.30 pm MON.-FRI. CLOSED SATURDAYS

CALL BOOKS

INTERNATIONAL:	
RADIO AMATEUR CALL BOOKS (1981)	
Foreign ("DX") Listings	£9.80
U.S. Listings	£10.30
U.K. Callbook, 1981 Edn. (RSGB)	£4.25

MAPS

"SHORT WAVE MAGAZINE" DX ZONE MAP (GREAT CIRCLE) in colour. Latest 9th edition	£3.35
AMATEUR RADIO MAP OF WORLD Mercator Projection - Much DX Information - in colour. Latest 14th edition	£1.10
RADIO AMATEUR MAP OF THE U.S.A. AND NORTH AMERICA State Boundaries and Prefixes, size 24" x 30", paper. Latest 7th edition	95p
RADIO AMATEUR'S WORLD ATLAS In booklet form, Mercator projection, for desk use. Gives Zones and Prefixes. Latest 11th edition	£1.65

LOG BOOKS

Amateur Radio Logbook	£2.80
Receiving Station Log	£2.60
Mobile Logbook	£1.10

(The above prices include postage and packing)

Available from:

Publications Dept.

Short Wave Magazine

34 High Street, Welwyn, Herts. AL6 9EQ

Tel: Welwyn (043871) 5206/7

(Counter Service, 9.30-5.00 Mon. to Fri.)

(Giro A/c No. 547 6151)

EASIBINDERS

To hold together 12 copies of the new-size "Short Wave Magazine" are now available.

Strongly made with stiff covers, and bound in red Wintrel Achina, the binders have the title and date frame blocked in gold on the spine. Price £4.65 including post/packing.

Publications Dept.

Short Wave Magazine Ltd.,
34 High Street, Welwyn, Herts. AL6 9EQ.

PORTABLE MASTS EX-GOVERNMENT 32 ft. heavy duty aluminium.

COMPRISING

Qty
Eight 4ft x 2in interlocking sections
Eight galvanised guy ropes
Four 27in steel guy securing stakes
Base plate & various accessories
All packed in strong marine ply carrying & storage case — in new condition. £35 each plus £10 carriage & VAT = £51.75

WILLIAMSONS

Mumps Bridge, Oldham, Lancs OL1 3HG
Telephone 061 624 5441 - 3525

PERSONAL CALLERS WELCOME

RADIO AMATEUR PREFIX-COUNTRY-ZONE LIST

published by GEOFF WATTS
Editor of "DX News-Sheet" since 1962

The List you have always needed, the list that gives you everything, and all on one line! For each country: —

- | | |
|---------------------------------------|----------------------|
| a. its DXCC "status" | e. the continent |
| b. the normal prefix | f. the "CQ" Zone No. |
| c. the special prefixes | g. the ITU Zone No. |
| d. the ITU call sign block allocation | |

Full information on Antarctic stations, USSR Klub-stations, obsolete prefixes used during the past 10 years, and much more.

The List can be kept always up-to-date because ample space has been provided for adding every new prefix, each new ITU allocation, etc.

Everything arranged alphabetically and numerically in order of prefix. Ideal for Contest operators and SWL's.

Tell your Club-members about it. Order an extra copy for that overseas friend. 15 pages. Price 55p (UK), overseas (air mail) \$2.00 or 5 IRCs

GEOFF WATTS

62 BELMORE ROAD, NORWICH NR7 0PU, ENGLAND

MORSE MADE EASY BY THE RHYTHM METHOD!

FACT NOT FICTION •

No expensive equipment required only a turntable

If you start RIGHT you will be reading amateur and commercial Morse within a month. (Most students take about three weeks). That's why after 25 YEARS we still use three scientifically prepared special records with which you cannot fail to learn the MORSE RHYTHM automatically. It's as easy as learning a tune. 18 w.p.m. in 4 weeks guaranteed. Complete course comprising 2x 12" + 1 x 7" multi-speed records + books. £5.50 plus (U.K. p.p. + 75p. Overseas, sufficient for 750 grms.). Despatch by return from: — S. Bennett, G3HSC, (Box 14), 45 Green Lane, Purley, Surrey CR2 3PD. 01-660 2896.

G2DYM ANTI-INTERFERENCE ANTI-TVI TRAP DIPOLES TRANSMITTING & S.W.L. MODELS DATA SHEETS LARGE SAE. AERIAL GUIDE 50p.

Callers Welcome.

Tel: 03986-215

G2DYM, UPLOWMAN, TIVERTON, DEVON

Wanted: Circuit diagrams and information for HRO communications receiver, PSU and coil packs. (Bucks).—Box No. 5753, Short Wave Magazine, 34 High Street, Welwyn, Herts. AL6 9EQ.

Selling: Pye Cambridge international valve set, LW/MW and three SW bands, £95.—Ring Cheltenham (0242) 39249 evenings.

November issue: due to appear October 30th. Single copies at 75p post paid will be sent by first-class mail for orders received by Wednesday, October 28th, as available.—Circulation Dept., Short Wave Magazine, 34 High Street, Welwyn, Herts. AL6 9EQ.

Sale: Liner-2 two-metre SSB transceiver, with pre-amp. and mic. etc. Offers?—Ring Peel, G4KWE, Sheffield 731714.

For Sale: Sommerkamp twins FL-DX500 and FR-DX500, plus Europa-A transverter (complete 160-2m. SSB station), £335 or near offer.—Ring Sunderland, 0422-882315 after 6 p.m. (W. Yorks).

Selling: Ken KP-202 2m. FM handheld with toneburst, helical whip, new nicads and charger, 6 channels (all crystallised-up), 2-watt output, £75 or near offer.—Ring Saxon, Cambridge 316065.

For Sale: FT-200 transceiver with FP-200 power supply, fully crystallised on 10 metres, £185.—Ring Thomas, 061-430 3954 evenings.

Sale: Sony CRF-320 receiver, as new, £550 or near offer.—Ring Cullen, Newport 523360 (Isle of Wight).

Sale: Trio R-1000 Rx, £200. Trio TR-7800 and PS-20, £200. IC-202 with IC-3 power supply, £105. Buyers collect.—Smith, G3CSE, QTHR. (Tel: Welwyn Garden City 28831).

Selling: Yaesu FT-107M Transceiver with mic., leads, connectors and handbook, in original packing, immaculate condition, £495. Yaesu FP-107 AC/PSU with loudspeaker, in original packing, immaculate condition, £87.—Ring 01-428 1128 after 7 p.m.

Selling: FRG-7700 receiver, bought April, little used, £220 or near offer.—Ring Quick, Penzance (0736) 797361.

For Sale: Yaesu FRG-7 with analog and MGC-7 digital readout, including 2m. converter, as new condition, £150.—Ring Blackwood, Four Elms 246 after 6 p.m. weekends.

Sale: FRG-7, as new, with battery box, fine tuner, Toko filter, headphones, superb selectivity, £150.—Blackett, 16 Warneford Gardens, Exmouth, Devon.

Selling: Europa-B 144 MHz transverter, with leads for FT-200, little used, £47 plus postage.—Ring Knight, G2FUU, Nazeing 2274.

Wanted: Trio TX-599 Tx to complement existing JR-599CS Rx. Minor repairs no objection, collect anywhere in U.K.—Ring Maddocks, G8ZON, 0705-29129.

Sale: R.A.E. course with experimental kit, only first test paper used (cost £100), bargain £50.—Box No. 5754, Short Wave Magazine, 34 High Street, Welwyn, Herts. AL6 9EQ.

For Sale: Eddystone EC-10 with handbook, immaculate condition, with ATU, £80.—Ring Watson, St. Ives (0480) 65403 Cams.

Wanted: Most urgently, for small research project: QSL's (amateur and commercial), envelopes, etc., used postally pre and post-war from Iceland, Greenland, Faroes, Jan Mayen, Spitzbergen, Bear Is., and Scandinavia.—Box No. 5752, Short Wave Magazine, 34 High Street, Welwyn, Herts. AL6 9EQ.

Selling: Levell TM3A AC microvoltmeter, with input lead and handbook, good condition, £35. Marconi F1031 460 MHz circulator, three 50-ohm N-type ports, good condition, £25.—Ring 01-428 1128 after 7 p.m.

Sale: Trio R-820 receiver, amateur and broadcast bands, digital readout, noise blanker, variable IF, etc. (Cost £690), only £410. Drake SPR-4 amateur and broadcast bands Rx, £160. Datong Up-Converter, £85. Or the lot, £600. Buyers collect. Cash only please.—Ring Ahmed, 01-272 3427, 5-9 p.m. and weekends.

Sale: Bearcat 220 with antenna, 3 months old, £150.—Ring Parker, Rhyl 55595.



NORTHERN COMMUNICATIONS

AZDEN · CUSHCRAFT · YAESU · FDK · STANDARD · JAYBEAM
LUNAR · ASP · SWAN-CUBIC · G-WHIP · MM · CDE SEM

AND NOW FOR SOMETHING REALLY NEW!

2 metre or marine

- 12v DC
- 15x19x5cms
- mobile bracket
- + int. speaker



A VHF monitor receiver with VFO plus 12 optional scanning channels for **£46.00** inc. VAT. Carriage free.

Crystals for scanner **£2.25** each.

'POWER HOUSE' SPECIAL OFFER SWAN 100Mx +

A unique opportunity to obtain this 100watt CW/SSB Output 80-10 metre transceiver. Superb and simple operation, built in VOX, calibrator NB.RIT, Solid State P.A. at a one off price.



Normal price 100Mx **£422.00**
Matching 20amp PSU **£135.00**

SPECIAL OFFER:-
A complete FH Mobile station with -
100Mx, top quality Shure microphone +
G Whip 3band mobile Antenna for **£389.00**
OR:- Swan 100Mx + 20 amp supply
£499.00

Also in stock the Swan Cubic Astro 150 & New 103



Box 2, 299-303 CLAREMOUNT ROAD, HALIFAX HX3 6AW, West Yorkshire
VISIT OUR SHOWROOM - Tues. - Sat. inc. 9.45 a.m. - 5.30 p.m.

Tel: (0422) 40792 and 24-hour answering service



ROTATOR BARGAINS

In addition to being noted as a leading supplier of Antennas, masts and fixings we are able to supply more than 20 different styles of antenna Rotators, by leading manufacturers.

From our extensive range we have selected just two, for special attention, this month

RO-250 The successor to the Stolle 2050, now available from Hirschmann. A 'through' style rotator, ideal for VHF beams or azi/elevation and polarisation applications.

25kg load with easy 3 core type cable control system. RO-250 complete with control box, inc VAT and delivery **£45.00.**

SI-100 Optional alignment bearing for increased load bearing by 10kg., inc VAT and delivery **£12.00**

NEW SU4000 by Skying. A medium/heavy duty 200kg load rotator, in Melamine coated, reinforced diecast alloy housing. Stationary braking torque 1500kg cm. 6 core control Designed to be Durable, Quiet and Weather Proof. Supplied complete with insulated, safe ABS plastic control unit with meter style display. A very nice unit! SU4000 complete with control box, inc vat and delivery **£85.00**

WIDEBAND ANTENNA

The new "NORCONE DISC 512" is a wideband, unity gain antenna, specially developed for coverage of 66MHz to 512MHz. An ideal partner for the BEARCAT SX200N and other scanning monitor receivers. It may also be used for transmission. Full coverage of 70, 144, 432 MHz Amateur bands, Aircraft, Marine and Public Services. **£25.95**

SPECIAL OFFER

SX200N SPECIAL OFFER. Latest model SX200N Scanning Receiver + Norcone 512 inc. Vat and delivery **£285.00**

ZL-12 COMPACT YAGI

13db gain, compact 2 metre Yagi. 10'6" boom, lightweight rugged design. Hundreds of this award-winning antenna already in use. Send for details. **£28.75** p.p. £1.75

ZL-8 SUPER COMPACT YAGI

9db gain, super compact 2 metre Yagi. 6'0" boom, lightweight rugged design. Ideal for limited spaces and portable operations. Send for details. **£17.95** p.p. £1.75

Lee Electronics Ltd



London's Leading Stockists of:
STANDARD YAESU ICOM FDK KDK MICROWAVE MODULES LUNAR SST SHURE HI-MOUND CDE STOLLE
TELECOMM ANTENNAE J-BEAM SWAN KATSUMI, ETC.

YAESU GENERAL COVERAGE COMMUNICATIONS RECEIVER FRG7700



- ★ 150KHz - 29.999MHz, FULL COVERAGE HIGH STABILITY DUAL PLL SYSTEM
- ★ AUTOMATIC BAND PASS FILTER SELECTION
- ★ 3 FILTERS FOR AM RECEPTION
- ★ FAST/SLOW AGC SWITCH
- ★ NARROW BAND FM RECEPTION CAPABILITY
- ★ TIMER FACILITIES

- ★ SINPO CODED SIGNAL STRENGTH METER
- ★ RECEIVER NOISE BLANKER
- ★ TWO ATTENUATOR FACILITY
- ★ HIGH QUALITY AUDIO (1.5 WATTS OUTPUT)
- ★ 24 VOLT AC OR (WITH ADAPTOR KIT) 13.8 VOLTS DC
- ★ RECEIVES SSB, AM, CW AND FM (NARROW BAND)

PRICE **£309.00** inc VAT

£389.00 inc VAT WITH 12 CHANNEL MEMORY

Free amplifier worth **£15.00** with every receiver purchased

400 EDGWARE ROAD
LONDON W2
01-723 5521 Tlx: 298765



INSTANT H.P.
& P/PEX. WELCOME

Send 25p for full details of our range.

YAESU

TRO

REVCO

JAY BEAM

TAL

**G8XKS
TONY**

 SPARES &
SERVICE

NORTH WEST COMMUNICATIONS (LIVERPOOL)

FAST BECOMING THE LARGEST SUPPLIERS OF EQUIPMENT IN THE NORTH

**G8TBK
GARY**

MAIL ORDER

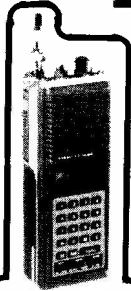
PACKER COMMUNICATIONS

SOTA

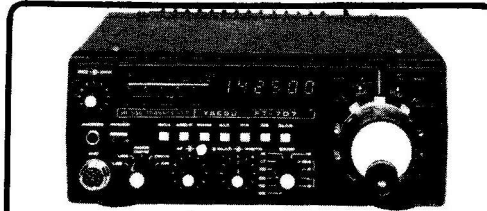
MIRAGE

KENPRO

HANSEN

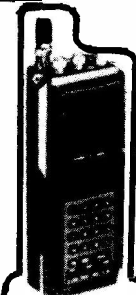

FT708R
£199 inc.

430-440MHz (440-450 option)
25KHz synthesizer steps
4 bit CPU chip frequency control
Keyboard entry of frequency/splits
LCD digital display with backlight
Ten channels of memory


FT707

FT707	£529.00inc.	FTV707	£82.00inc.
FT707S	£455.00inc.	70TV	£80.50inc.
FP707	£109.25inc.	144TV	£101.20inc.
FC707	£80.50inc.	430TV	£175.95inc.
FV707DM	£186.30inc.	WMT707	£10.00

All our sets now guaranteed a full 18 months, parts and labour (excluding P.A. bottles)


FT208R
£195 inc.

144-148MHz (144-148 possible)
12.5/25KHz synthesizer steps
4 bit CPU synthesiser control
keyboard entry of frequencies/splits
LCD digital display with backlight
Ten channels of memory

NOW WE'RE OFFERING MUCH MORE; MORE GEAR, MORE SAVINGS, MORE HELP! NOT ONLY ARE WE STOCKING YAESU, BUT OTHER BRANDS ARE NOW AVAILABLE, PHONE FOR ALL DETAILS, DON'T FORGET OUR MAIL ORDER SERVICE AND THERE ARE STILL NO POSTAGE AND PACKAGING CHARGES ON ANY OF OUR ITEMS. WE NOW HAVE OUR VERY OWN SERVICE WORKSHOP AND ARE SERVICING EVERYTHING WE SELL. WE OPEN EVERY DAY TILL SIX (EXCEPT WEDNESDAY) AND LATE NIGHT FRIDAY TILL 7 P.M.

117 OXFORD ROAD, WATERLOO, LIVERPOOL L22 7RE
051-920 7483

MIZUHO

CDE

MICROWAVE MODULES

RSGB PUBLICATIONS

S.E.M. P.O. BOX 6, CASTLETOWN, ISLE OF MAN

Tel: MAROWN (0624) 851277

S.E.M. ACTIVE MULTIFILTER

Will improve ANY receiver on ANY mode. Gives "passband tuning" & "variable selectivity". Switched Hi-pass, Lo-pass, peak or notch. Selectivity 2.5KHz - 20Hz tunable from 2.5KHz - 250Hz. PLUS another notch which can be used in any switch position and covers 100Hz - 10KHz. TRY ONE ON 14 DAYS APPROVAL. £57.00 Ex stock.

S.E.M. EZITUNE

"In my fifty years on the air, this is the most useful gadget I've ever seen" Connects in aerial lead, produces S9 + (1-170MHz) noise in receiver. Adjust A.T.U. for minimum noise. You have now put an exact 50 Ohms load into your transceiver. Fully protected, you can transmit through it, to save your P.A. & stop QRM. £25.00* Ex stock.

S.E.M. TRANZMATCH

The most VERSATILE transmatching system. Will match from 15 to 5000 Ohms BALANCED or UNBALANCED at up to 1kW. Link coupled balun means no connection to the equipment which can cure TVI both ways. SO239 and 4mm connections for co-ax or wire feed. 160-10 metres TRAN Z MATCH £65.00 80-10 metres £58.00. EZITUNE built-in (see above) extra. ALL EX-STOCK.

THE SENTINEL AUTO Mk II 2 or 4 METRE PRE-AMPLIFIER

These include NEW PROTECTION circuit to give MAXIMUM LEGAL through power rating. Completely new third generation DUAL GATE MOSFET pre-amp giving 10dB N.F. and 20dB gain with GAIN CONTROL and OFF switch (straight through when OFF) The High Q tuned circuits for high selectivity. Size: 1½" x 2¼" x 4" £25.00* Ex stock.

SENTINEL STANDARD Mk II 2 or 4 METRE PRE-AMPLIFIER

Same as the AUTO less R.F. switch 12V 5mA. £15.00* Ex stock.

PA3

ONE cubic inch miniature 2 metre pre-amplifier. Same circuit as above. External gain can be added. Full instructions. £7.95 Ex stock.

70cms versions £4.00 extra. Marine Band Ex stock. Other frequencies to order.

SENTINEL 2 METRE LINEAR POWER AMPLIFIER/PRE-AMPLIFIER

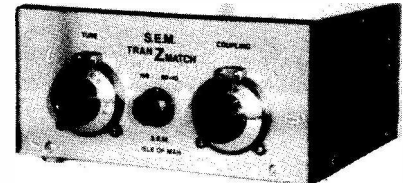
These units use the latest techniques and transistors for highest reliability and performance. Infinite SWR PROTECTED devices. ULTRA LINEAR, all modes. R.F. switched. Same POWER GAIN at lower drive powers. Supply 13.8V nominal. SO239s. Three models.

1. SENTINEL 35

Twelve times power gain. 3W IN 36W OUT. 4 amps. Max. drive 5W. 6" x 2¼" front panel. 4½" deep. £57.50 Ex stock.

2. SENTINEL 50

Five times power gain. 10W IN 50W OUT. Max. drive 16W. Same size as the Sentinel 35. £69.50 Ex stock.



3. SENTINEL 100

Ten times power gain. 10W IN 100W OUT. Max. drive 16W. Size: 6½" x 4" front panel. 3½" deep. 12 amps. Price: £126.50 Ex stock.

All available less pre-amp for £8.00 less.

SENTINEL H.F. WIDEBAND PRE-AMPLIFIER

2-40MHz. 15dB gain. Ideal for 15 and 10 metres and OSCAR or an ACTIVE AERIAL. 9-12V. Size: 2¼" x 1½" x 3". Two versions.

1. STANDARD

Performance as above. £10.00* Ex stock.

2. AUTO

Same performance as above with a change over relay r.f. operated by your transceiver for direct connection in your aerial co-ax. £16.93* Ex stock.

FREQUENCY CONVERTERS

SENTINEL DUAL GATE MOSFET 2 METRE OR 4 METRE CONVERTERS

N.F. 2dB. Gain 30dB. IFs 2 metres: 2.4MHz, 4.6MHz, 28-30MHz. 4 metres: 28-28.7MHz. 9-12V. 15mA. £24.73 Ex stock.

SENTINEL X 2 METRE CONVERTER

Same as above plus mains power supply. £28.80 Ex stock.

70cm to 28-30MHz £28.80.

SENTINEL L.F. CONVERTER

10KHz - 2MHz IN. 28-30MHz OUT. 9-12V 5mA. £20.80 Ex stock.

SENTINEL TOP BAND CONVERTER

1.8-2.3MHz IN. 14-14.5MHz OUT. 9-12V 5mA. £20.80 Ex stock.

S.E.M. IAMBIC KEYS

The ultimate auto keyer using the CURTIS custom LSICMOS chip. Tune and sidetone Switching. £30.00 Ex stock. Twin paddle touch key. £12.50 Ex stock.

S.E.M. EUROPA C 2 METRE TRANSCIVER

100W. Tx. 2dB NF Rx. £126.50 Ex stock.

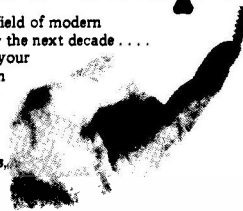
12 MONTHS COMPLETE GUARANTEE.

Prices include VAT and delivery. C.W.O. or phone your credit card number for same day service.

* means Belling Lee sockets, add £1.90 for SO239s or BNC sockets. Ring or write for more information. Place orders or request information on our Ansaphone at cheap rate times.

Conquer the chip!

The silicon 'Chip', the microprocessor, and the whole field of modern electronics will revolutionise every human activity over the next decade.... If you are looking for a new job or career, promotion, your own business or simply want to keep abreast of modern developments - you will need to master the subject. It can be done simply and efficiently, in a practical way. No previous knowledge is needed. Write to us now - without the slightest obligation.... We have been successfully training people in electronics, at home, for over 40 years!



MASTER ELECTRONICS LEARN THE PRACTICAL WAY BY SEEING AND DOING

- Building an oscilloscope. ● Recognition of components.
- Understanding circuit diagrams. ● Handling all types Solid State 'Chips'.
- Carry out over 40 experiments on basic circuits and on digital electronics.
- Testing and servicing of Radio, T.V., Hi-Fi and all types of modern computerised equipment.

MASTER MICROPROCESSORS

LEARN HOW TO REALLY UNDERSTAND MICROPROCESSORS, HOW THEY WORK AND THEIR APPLICATION TO COMPUTER TECHNOLOGY.

- Complete Home Study Library ● Programming
- Special Educational Microprocessor Equipment supplied
- Services of skilled tutor available throughout course

MASTER THE REST

- Radio Amateurs Licence ● Logic/Digital techniques
- Examination courses (City & Guilds etc.) in electronics
- Semi-conductor technology
- Training Kits (Signal Generators, Digital Meters etc.)

FREE

Please send your **FREE** brochure without obligation to :-

Name

Address

I am interested in :-

PRACTICAL ELECTRONICS

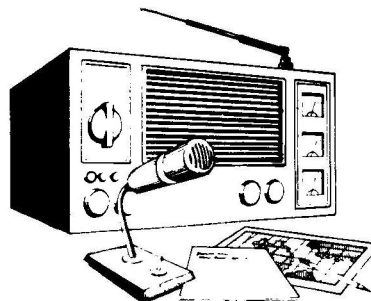
MICROPROCESSORS

OTHER SUBJECTS

(please state your interest)

BLOCK CAPS PLEASE

BRITISH NATIONAL RADIO & ELECTRONICS SCHOOL
 READING, BERKS. RG1 1BR
 SWT/10/815/817R



BECOME A RADIO AMATEUR

Learn how to become a radio amateur in contact with the whole world. We give skilled preparation for the G.P.O. licence. No previous knowledge required.

Free!

Brochure without obligation to :-
British National Radio & Electronic School
 READING, BERKS. RG1 1BR

Name

Address

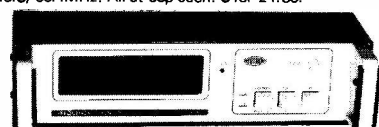
SWT/10/815/817R BLOCK CAPS PLEASE

J. BIRKETT *Radio Component Suppliers*

25 THE STRAIT · LINCOLN · LN2 1JF

TELEPHONE 20767

- TELEDYNE SUB-MINIATURE RELAY in a T05 Can type 732-D9 9 volt at 85p each.
- SPECIAL I. C. TYPE AWH 1494 24 LEAD FLAT PACK No details, at 60p each.
- BURNDIPT HAND HELD F. M. TRANSMITTER P. C. BOARD FOR 70cm Less Crystal with connections @ £5.50.
- EMCAP SUB-MINIATURE DISCS .01uf 100v.w. @ 5p.
- MINIATURE TANTALUM BEAD CAPACITORS .1uf 35v.w., .33uf 35v.w., 2.2uf 35v.w., 4.7uf 16v.w., 4.7uf 35v.w., 6.8uf 35v.w., 10uf 10v.w., 10uf 25v.w., All at 10p each. 15uf 25v.w., @ 15p, 22uf 25v.w., @ 25p, 33uf 10v.w., @ 25p, 47uf 10v.w., @ 30p, 100uf 20v.w., @ 40p.
- CRYSTAL FILTERS 10.7MHz B.W. + 7.5KHz @ £5 each.
- ITT PMT-2R CAPACITORS .1uf 400v.w., at 6 for 15p.
- ERG WIRE WOUND RESISTORS 2.5 watt 4.7 ohm. 3 for 18p.
- 14 PIN DIL 741 OP-AMPS at 4 for 50p.
- P. C. MOUNTING HEAT SINKS TO66 Type @ 15p, TO3 Type @ 20p.
- 2 POLE 3 WAY LEVER MINIATURE SWITCH at 60p each.
- SPECIAL MIKE INSERTS Sub-Miniature Electret @ £1.50. Knowles Magnetic 300 ohm @ 50p. Magnetic 1000 ohm @ 50p.
- CMOS CD 4022 OCTAL COUNTER-DIVIDER @ 40p.
- CAMBION R.F. CHOKE 15U.H. 260mA at 15p.
- RCA CA3081 MULTI TRANSISTOR I.C. @ 20p.
- PLESSEY OP-TO 1 STATOR OPX-003 @ 20p.
- P CHANNEL FET 2N 5461 at 3 for 60p.
- TOKO YXNS 30450 2M.H. COIL at 20p.
- MULLARD SUB-MINIATURE DISCS 1000pf 63v.w., @ 25p doz.
- SUB-MINIATURE COIL FORMERS with core 4mm Dia. 9mm Long @ 7p.
- FILM TRIMMERS 4pf, 10pf, 20pf, 60pf, All at 15p each.
- CERAMIC TRIMMERS 2.5, to 6pf, 3 to 10pf, 4 to 20pf, 7 to 35pf, 10 to 40pf, 10 to 60pf. All at 15p each.
- MULLARD CLEAR LED'S CQY 47A at 15p each.
- VARIABLE CAPACITORS 10+10+10pf @ 75p, with S.M. Drive. 250+250+20+20+20pf @ 75p. SUB-MIN. 25+25+25pf @ £1.
- SILVER MICA CAPACITORS 13, 15, 33, 47, 82, 213, 430, 460, 560, 620, 820, 1800pf. All at 10p each.
- CAMBION UHF R.F. CHOKE 0.1U.H. 690MHz 1100mA. Price 15p each.
- HC8U CRYSTALS 1396.50, 1403.35, 2002, 7050KHz, 19.06MHz, 20,006, 38.1481, 38.333, 38.88889, 39.6667, 39.7037, 39.7407, 39.7778, 39.8148, 39.8889, 39.9259, 39.9630, 40, 40.037, 40.111111, 40.3333, 44.3, 45.7, 45.9, 46.1, 46.3, 46.5, 46.7, 48.3, 50.1MHz. All at 50p each. 3 for £1.30.



6000MHz DIGITAL FREQUENCY COUNTER. MODEL UK 522 8 Digit Readout. Complete with leaflet at £108.
 Please add 30p for post and packing. Orders over £3 post free.

REG WARD (G2BSW) & CO. LTD.

South West Stockists for

YAESU — SWAN CUBIC — KDK

YAESU PRICES

FT902DM	£ 799.00	FT290	£ 229.00
FT101ZD MkIII FM	£ 599.00	FT202	£ 109.00
FC902	£ 126.50	FT208R	£ 195.00
SP901	£ 28.75	NC1	£ 19.15
FT707	£ 529.00	FT480R	£ 359.00
FP707	£ 109.25	FP80	£ 59.00
FC707	£ 80.50	CPU2500R	£ 315.00
FL110	£ 142.60	FT225RD	£ 565.00
FT7B	£ 399.00	FP4	£ 41.40
FT107MWARC	£ 690.00	FP12	£ 78.20
FRG7	£ 199.00	YH55	£ 9.94
FRG7700	£ 309.00	YE7A	£ 5.75
FRG7700M	£ 389.00	YD846	£ 5.75

CONTACT US FOR SPECIAL PRICES ON THE FOLLOWING
 ★ FT200 with FP200 ★ FR101S

SWAN CUBIC

ASTRO 102 BX	£ 798.00	PSU6 (for 102)	£ 142.00
ASTRO 150 MX	£ 613.00	PSU5 (for 100/150)	£ 135.00
100 MX	£ 418.00		

10% discount on above Swan Cubic prices for cash/cheque sales

KDK FM 2025 £ 199.00

Ancillary equipment stocked include: Valves, Shure microphones, SEM range of products, aerials and aerial accessories, cables, rotators, plugs, sockets, etc.

Please check prices and availability before ordering. VAT included in all prices — carriage extra.

TERMS: CASH/CHEQUE WITH ORDER.
 ACCESS/BARCLAYCARD/TRUSTCARD ACCEPTED.
 H.P. ALSO AVAILABLE.

GEORGE STREET, AXMINSTER, DEVON EX13 5DP
 Telephone (0297) 33163

R.A.E. ** TUITION ** R.A.E.

Obtain the highly coveted Amateur Radio Licence. Personal tuition, specifically paced to achieve this result, is available in Georgian Bath. This is a five day course leading from basic principles, through the City & Guilds syllabus, to examination level. The classes, held on the outskirts of this beautiful City, are essentially small: so each student is able to receive the required amount of tuition. Instruction is given by G3UWJ specialist in personal tuition and co-author of 'Amateur Radio'. For more than a decade students of all ages and walks of life have benefited from these courses and are now licensed amateurs.

For further details please write, enclosing a S.A.E., to:

PETER BUBB — tuition
58 Greenacres, Bath, Avon, BA1 4NR.
or telephone 0225 27467

5day courses
 refresher courses

revision courses
 private individual tuition

introduction to electronics (non-exam course)

SAMSON ETM-3C C-MOS KEYS

1µA battery drain — Why switch off?

● Self-completing dots/dashes/spaces ● Can be used either as normal electronic keyer or as an iambic mode squeeze keyer ● 8-50 wpm ● Constant 3:1 dash-dot ratio ● 6 C-MOS ICs and 4 transistors ● Plug-in PCB ● Long battery life — typically 1µA drain when idling — Built-in battery holder for 4 x 1.5v. batteries (but will work over 3-10v. range) ● PCB has both a reed relay (250 v., 0.5 amp., 25 w. max.) and a switching transistor (300 v., 30 mA., max.) — either keying method can be used ● Has the well-known fully-adjustable Samson precision twin keying lever assembly ● Operate/Tune button ● Sidetone oscillator ● Grey case 4" x 2" x 6". ETM-3C, £66.86.

ETM-4C MEMORY KEYS: Has ETM-3C features plus 4 memories of 22 characters each (or two of 44). Erase/Rewrite memories as needed — Send CQ's etc. by pressing button. £124.95.

BUILT FOR DEPENDABLE MARINE AND COMMERCIAL SERVICE
JUNKER PRECISION HAND KEY: A superbly engineered straight key used for many years by professionals afloat and ashore. With this key you can't help but send good Morse. Free-standing — no screwing down. Front and back contacts — fully adjustable gaps/tension. Keyclick filter. Hinged grey cover. £39.87.

BAUER KEYING PADDLE: Single-paddle unit on 1 1/4" x 2" base for home-built El-bugs. Adjustable gaps/tensions. £13.85.

All prices post paid UK and include 15% VAT. Please send stamp with enquiries.

SPACEMARK LTD.

Thornfield House, Delamer Road, Altrincham, Cheshire. (Tel: 061-928 8458)

TMP ELECTRONIC SUPPLIES

Stockists of Yaesu, Jaybeam, Hy-Gain, Swan, Amidon Cores, KDK, FDK, Microwave Modules, RSGB Books, ASP, Leader, Cushcraft, Daiwa, Dentron, Hansen.

FRG-7700	£309.00	FRG-7	£199.00
R1000	£285.00	SRX-30 Digital	£195.00
FRG-7 Digital	£230.00	SR-9 2 Metre	£46.00
Copper Aerial Wire 140'	£8.90	Balun Kits 3.5-21MHz	£6.00
70'	£5.40	14-30MHz	£7.20

AIRBAND RECEIVERS

Digital Flight Scan	£215.00	SX200N 26-512MHz	£264.00
R512 8 Channel Scanner	£138.00	R517 Sky Ace Handheld	£49.00
Sharp FX213AU MW/Air Band	£14	Academy MW/FM/Air Band	£13.75
Converter 118-124MHz IF 18-24	£25.00	VHF Air Band Guide Book	£2.00

Usual stocks of coax, plugs, etc. SAE with all enquiries.

BRITANNIA STORES, LEESWOOD, Nr. MOLD, CLWYD CH7 4RU
 Tel: Pontybadkin 846 (035 287)

Open Mon., Wed., Thurs., Fri. 9.30-5p.m. Sat. 9.30-1p.m. Lunch 1-2p.m. Closed Tuesday.

G4DSG D.P. HOBBS (NORWICH) LTD. G3HEO
RADIO COMPONENT SPECIALISTS

YAESU FRG7 0.5-30MHz Gen. Cov. Rec. 1MHz Segments	£199.00
YAESU FRG7700 0.15-30MHz Gen. Cov. Rec. Clock, Timer, Digital Display	£309.00
LOWE SRX30 0.5-30MHz Gen. Cov. Rec. 1MHz Segments	£158.00
LOWE SRX30D Dig. version of above	£195.00
DAIWA SR9 2 Metre or Marine Monitor Receivers. VFO + 11 fixed positions	£46.00
SOUND — AIR FM Marine 8 Ch. Scanning Rec. with 3 preset Ch.	£85.10
TM56B Marine Scanner Rec. with 6Xtals	£78.99
FDK 700EX 2 Metre FM T/Ceiver Dig. Display, Scan, Tone-Burst, etc.	£189.00
FDK 750E 2 Metre FM/SSB CW T/Ceiver Dig. Display, Tone-Burst, etc.	£289.00
R517 Airband Rec. Tuneable + 3Fixed Xtal Positions	£49.75

Jaybeam Aerials, Test-Meters, Microphones, Microwave Modules, Converters, Transverters, Linears, Preamps, etc., for 2 Metres/70cms, Bantex Aerials, Vero Products, Capacitors, Resistors, RSGB and Bernard Books, Rechargeable Batteries, etc. Prices include VAT. All Mail Orders to Norwich. Barclay Card & Access.

13 St. Benedict's St., Norwich. Tel. 615786

Open 9 a.m. — 5.50 p.m. Mon. — Sat. Closed all day Thursday.

Also Visit D.P. Hobbs Ltd., 11 King St., Luton. Telephone 20907.

Closed all day Wednesday.

"S.W.M." DX ZONE MAP

9th Edition!

Great Circle Projection on durable, quality, paper for wall mounting, 33 3/4 in. wide by 24 1/2 in. deep. Giving essential DX information — bearing and distance of all parts of the world relative to the U.K., the Zone areas into which the world is divided for Amateur Radio purposes, with major prefixes listed separately. Distance scale in miles and kilometres. Time scale in GMT. Marking of Lat./Long. close enough for accurate plotting. Hundreds of place names, mainly the unusual ones, and most of the rare islands.

Zones and Prefixes corrected to August 1980

Price **£3.35 inc. p/p**
 Publications Dept.

Short Wave Magazine Ltd.,
 34 High Street, Welwyn, Herts. AL6 9EQ.
 Tel: Welwyn (043871) 5206/7

HAM RADIO

A BEGINNER'S GUIDE

by R. H. Warring

Written by a well-known author, this book deals with transmitting and receiving equipment; its installation and maintenance; the operation of amateur stations; call signs; amateur transmitting licences; Morse Code transmission described in detail.

Excellent reading for those wishing to gain a sound knowledge of Amateur Radio without the need to become too technically expert.

152 pages

£3.95 inc. post

Publications Dept.

Short Wave Magazine Ltd., 34 High Street,
Welwyn, Herts. AL6 9EQ. Tel: Welwyn (043871) 5206/7

1981

"CALLBOOKS"

Foreign ("DX") Listings **£9.80**

U.S. Listings **£10.30**

The above prices include postage and packing

Publications Dept.

Short Wave Magazine
34 High Street,
Welwyn, Herts. AL6 9EQ
Tel: Welwyn (043871) 5206/7

SOLID STATE BASICS

for the Radio Amateur

Published by the A.R.R.L., this book contains a complete beginner's course in solid-state theory, with simple projects to build, and backed by excellent diagrams and illustrations. There are sections to cover, amongst others, transmitters, receivers and linear IC's. Clearly written, this title is a 'must' for all those who want a thorough grounding in the subject. Complete with index.

159 pages

£3.35 inc. post

Order from:

Publications Dept.,
SHORT WAVE MAGAZINE LTD.,
34, High Street, Welwyn,
Herts., AL6 9EQ

Have you got all these ARRL titles on your shelf? . . .

Solid State Design for the Radio Amateur	£5.60
Electronics Data Book	£3.15
Antenna Book, 13th edition	£4.15
Understanding Amateur Radio	£4.05
A Course in Radio Fundamentals	£3.10
FM and Repeaters for the Radio Amateur	£3.20
The Radio Amateur's Handbook 1981 <i>soft cover</i>	£8.60
Antenna Anthology	£2.75
Hints and Kinks	£2.85
Single Sideband for the Radio Amateur	£2.95
Learning to Work with Integrated Circuits	£1.70
Radio Frequency Interference	£2.00
Solid State Basics for the Radio Amateur	£3.35

(all prices include post/packing)

Available from SHORT WAVE MAGAZINE

Publications Dept.,

34 HIGH STREET, WELWYN, HERTS. AL6 9EQ. Telephone: Welwyn 5206/7.

Butterworth Group publications now in stock

Practical Aerial Handbook, 2nd edition	£7.95
Two-Metre Antenna Handbook	£4.35
Questions and Answers on Amateur Radio	£2.25
Beginners Guide to Radio, 8th edition	£3.70
Beginners Guide to Electronics, 3rd edition	£3.70
Questions and Answers on Transistors, <i>new</i> 4th edition	£2.05
Projects in Radio and Electronics	£2.60
Guide to Broadcasting Stations, latest 18th edition	£3.40
Radio Valve and Semiconductor Data, 10th edition	£4.35
Foundations of Wireless and Electronics, 9th edition	£6.15
Radio and Electronic Laboratory Handbook, 9th edition	£21.25
Practical Electronics Handbook	£4.40
Electronics Pocket Book, <i>new</i> 4th edition	£6.20
Oscilloscopes — How to Use Them, How They Work, <i>new</i> <i>title</i>	£3.85

prices include postage and packing

Publications Dept.
SHORT WAVE MAGAZINE LTD.
34 HIGH STREET, WELWYN,
HERTS. AL6 9EQ

SIMPLE, LOW-COST

WIRE ANTENNAS

by **William Orr, W6SA1**

This excellent and thoroughly recommended handbook is *the* publication on the practical approach to building aerials. After starting with aerial fundamentals there are discussions and descriptions of ground-plane, end-fed, DX dipole, vertical and wire beam antennas, plus coverage on a universal HF antenna system and working DX with an "invisible aerial"; the SWR meter and coaxial cable also have chapters to themselves.

The whole book is presented in an authoritative, immensely clear, readable and enjoyable manner with the emphasis on the practical throughout — to the extent that even the chap who can hardly strip a piece of co-ax need not feel at all left out! Just as practical for the SWL, too!

192 pages

£4.45 inc. post

Order from

Publications Dept.
Short Wave Magazine Ltd.
34 High Street, Welwyn, Herts. AL6 9EQ

Technical Books and Manuals

(ENGLISH AND AMERICAN)

AERIAL INFORMATION

Antenna Handbook (Orr and Cowan)	£4.45
Practical Aerial Handbook, 2nd Edition (King)	£7.95
Beam Antenna Handbook	£3.95
Cubical Quad Antennae, 2nd Edition	£3.15
Simple Low Cost Wire Antennas, by Orr	£4.45
73 Vertical Beam and Triangle Antennas (E. M. Noll)	O/S
73 Dipole and Long-Wire Antennas (E. M. Noll)	£4.35
Antenna Book (ARRL) 13th Edition	£4.15
The ARRL Antenna Anthology	£2.75
Two-metre Antenna Handbook, F. C. Judd G2BCX	£4.85

BOOKS FOR THE BEGINNER

Amateur Radio (<i>Lutterworth Press</i>)	£9.60
Questions and Answers on Amateur Radio, by F. C. Judd G2BCX	£2.25
Transistors Q & A, new 4th Edition (<i>Newnes</i>)	£2.05
Elements of Electronics, <i>Book 1</i>	£2.50
Elements of Electronics, <i>Book 2</i>	£2.50
Elements of Electronics, <i>Book 3</i>	£2.50
Elements of Electronics, <i>Book 4</i>	£3.35
Elements of Electronics, <i>Book 5</i>	£3.35
Solid State Short Wave Receivers for Beginners (R. A. Penfold)	£1.50
Beginners Guide to Radio (8th Edition)	£3.70
Beginners Guide to Electronics	£3.70
Beginners Guide to Microprocessors and Computing	£2.05
Course in Radio Fundamentals, ARRL	£3.10
Guide to Amateur Radio (new 18th Edition) (RSGB)	£2.95
Ham Radio (A Beginners Guide) by R. H. Warring	£3.95
Morse Code for the Radio Amateur (RSGB)	£1.20
Understanding Amateur Radio (ARRL)	£4.05
Radio Amateur's Examination Manual, 8th Edition (<i>new syllabus</i>) RSGB	£2.70

GENERAL

An Introduction to BASIC Programming Techniques	£2.25
How to Build your own Solid State Oscilloscope (Rayer)	£1.75
Projects in Radio and Electronics (<i>Newnes</i>)	£2.60
How to Make Walkie Talkies (Rayer)	£1.75
How to Build Advanced Short Wave Receivers (Penfold)	£1.40
Better Short Wave Reception, 4th Edition	£3.00
FM & Repeaters for the Radio Amateur (ARRL)	£3.20
Easibinder (to hold 12 copies of "Short Wave Magazine" together) <i>new A4 size</i>	£4.65
Oscar — Amateur Radio Satellites	£4.30
World Radio & TV Handbook 1981 Edition	£10.55
World DX Guide	£5.40
Guide to Broadcasting Stations (new 18th Edition)	£3.40
Radio Stations Guide	£2.05
Long Distance Television Reception (TV-DX) for the Enthusiast (<i>revised edition</i>)	£2.25

Solid State Basics for the Radio Amateur (ARRL)	£3.35
Counter Driver and Numeral Display Projects, Rayer	£2.05
Electronic Test Equipment Construction (Rayer)	£2.05
Power Supply Projects (Penfold)	£2.05

HANDBOOKS AND MANUALS

Radio Communication Handbook, Vol I (5th Edition) (RSGB)	£9.65
Radio Communication Handbook, Vol II (5th Edition) (RSGB)	£8.50
TVI Manual (<i>2nd Edn.</i>) (RSGB)	£1.85
Radio and Electronic Laboratory Handbook by Scroggie-Johnstone, 1980 (9th Ed)	£21.25
RTTY Handbook (<i>73 Magazine</i>)	O/S
Slow Scan Television Handbook (<i>73 Magazine</i>)	o/s
Working with the Oscilloscope	£4.05
The Radio Amateur's Handbook 1981 (ARRL) soft cover	£8.60
The Radio Amateur's Handbook 1981 (ARRL) hard cover	£11.95
Shortwave Listener's Handbook	£4.80
Learning to Work with Integrated Circuits (ARRL)	£1.70
Weather Satellite Handbook	O/S
Single Sideband for the Radio Amateur (ARRL)	£2.95
Test Equipment for the Radio Amateur (RSGB)	£5.75
Amateur Radio Operating Manual (RSGB)	O/S
Practical Electronics Handbook (<i>Newnes</i>)	£4.40
Oscilloscopes — How to Use Them, How They Work (<i>Newnes new title</i>)	£3.85

USEFUL REFERENCE BOOKS

Solid State Design for the Radio Amateur (ARRL)	£5.60
Foundations of Wireless and Electronics, 9th Edition (<i>Scroggie</i>)	£6.15
Amateur Radio Techniques, 7th Edn (RSGB)	£6.00
U.K. Call Book 1981 (RSGB)	O/P
Hints and Kinks (ARRL)	£2.85
Radio Data Reference Book (RSGB)	£4.80
Electronics Data Book (ARRL)	£3.15
Radio Frequency Interference (ARRL)	£2.00
Amateur Radio Awards, RSGB	£3.40
Electronics Pocket Book, <i>new 4th Edition</i> (<i>Newnes</i>)	£6.20

VALVE AND TRANSISTOR MANUALS

Towers' International Transistor Selector 1980 Edition (Up-Date No. 2)	£10.40
Radio Valve and Semiconductor Data (10th Edition)	£4.35
International Transistor Equivalents Guide	£3.35

VHF PUBLICATIONS

VHF Handbook, Wm. 1 Orr	£3.50
VHF Manual (ARRL)	o/p
VHF/UHF Manual (RSGB) 3rd Edition	£8.60

O/P (Out of print)

THE ABOVE PRICES INCLUDE POSTAGE AND PACKING

O/S (Out of stock)

(Terms C.W.O.)

Many of these titles are American in origin

Prices are subject to alteration without notice.

Available from

SHORT WAVE MAGAZINE

Publications Dept.

34 High Street, Welwyn, Herts. AL6 9EQ - Welwyn (043871) 5206/7

(Counter Service. 9.30-5.00 Mon. to Fri.)

(GIRO A/C No. 5476151)