

The SHORT WAVE Magazine

VOL. XL

JANUARY 1983

NUMBER 11

the new **R2000** general coverage receiver from Trio.

Now from Trio, the R2000 general coverage receiver. By taking all the superb features of the R1000 and combining them with the latest in micro-processor control Trio have, in one step, completely revised the standard by which short wave receivers are judged. Among the many features provided for the discerning listener are programmable scan, memory scan, memory retention of the mode set for a particular frequency and last, but not least, Trio have included an FM mode — why FM after all this time and our repeated comment that for a short wave broadcast receiver FM is not really necessary. Take a look at the rear panel of the R2000: a socket marked VHF converter. Wouldn't it be superb if Trio produced a VHF converter covering from 118 to 174 MHz — then you would require FM, you would also require AM. Study the features and I am sure you will agree the Trio R2000 is the receiver for you.

Continuous Coverage from 150 KHz to 30 MHz.

Use of an innovative up conversion digitally controlled PLL circuit provides maximum ease of operation and superb receiver performance. Front panel up/down band switches allow easy selection within the full coverage of the receiver. The VFO is continually tunable throughout the full 150 KHz — 30 MHz range.

All modes SSB, CW, AM and FM.

To give full listening potential USB, LSB, CW, AM, and FM are provided for easy selection by push buttons having adjacent led indicators.

Adjustable Tuning Rate.

Tuning speed switches enable the tuning rate to be in either 50 Hz, 500 Hz or 5 KHz. A frequency lock switch is included to guard against accidental shift.

Ten Memories Store Frequency, Band and Mode Data.

Each of the ten memories can be tuned by the VFO, thus operating as ten built in digital VFO's. The original memory frequency can be recalled by simply pressing the appropriate memory channel key. All information on frequency, band, and mode is stored in the selection memory. The "auto M" switch allows two types of memory storage: when the "auto M" switch is off, data is memorized by pressing the "M in" switch; when the "auto M" switch is on the frequency being used at that time is automatically memorized.

Memory Scan.

Scans all memory channels or may be user programmed to scan specific channels. Frequency, band and mode are

automatically selected in accordance with the memory channel being scanned.

Programmable Band Scan.

Scans automatically within the programmed bandwidth. Memory channels 9 and 0 establish the scan limit frequencies. The hold switch interrupts the scanning process. However, the frequency may be adjusted using the tuning knob whilst in the scan hold position.

Lithium Battery Memory Back Up.

Memory and VFO information is maintained by an internal lithium battery (estimated life, five years), a most important feature when moving the receiver from location to location.

Clock Display with Integral Timer.

Two 24-hour quartz clocks are built in to allow for programming two different time zones. An integral timer is provided for on and off switching of the receiver.

Three Built In Filters with Narrow/Wide Selector.

In the AM mode 6 KHz wide or 2.7 KHz narrow may be selected. In the SSB mode 2.7 KHz is automatically selected in the CW mode 2.7 KHz is again chosen and if the optional YG455C filter is installed then 500 Hz in the narrow position. In the FM mode 15 KHz bandwidth is automatically selected. Other important features are: squelch on all modes, noise blanker, a large 4 inch front mounted speaker, tone control, RF attenuator, AGC switch, high and low impedance antenna terminals, optional 13.8V DC operation, record jack and, of course, provision for a VHF converter.

All in all, a truly remarkable receiver.

R2000 £391 inc. VAT. Carr- £5.00

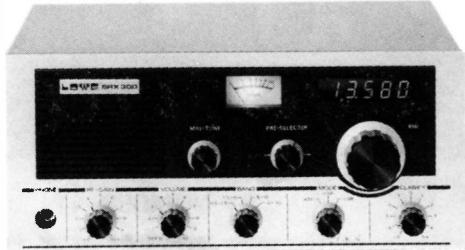


“memorable”

LOWE ELECTRONICS

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

ok, it was always a good receiver,
but now with FM
the **SRX 30D**, today's rig, yesterday's price.



- Extended coverage 200 kHz-30MHz.
- 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 SL 1600 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 ever better sound.
- All new IF filters with optimum bandwidth for mode in use. Automatic filter selection from mode switch.

We predict that the SRX 30D will be a landmark in low cost, high performance SWL receivers. Just consider how much you should pay for a receiver covering 200 kHz-30MHz with accurate digital readout; high performance FM 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.

SRX 30D NOW WITH FM STILL £215.00, carr. £5.00

From Daiwa yet another aid to operating. In addition to the notch, SSB and CW filters, the AF606K is equipped with a PLL tone decoder; when the tone frequency of the CW signal and the free running frequency of the PLL tone decoder are the same a locked signal is generated. This locked signal keys an audio oscillator which then reproduces the received CW signal. However, there is a tremendous difference between the produced signal and the received one — no noise and, of course, no fading. **ANOTHER PIECE OF EQUIPMENT TO ENHANCE YOUR LISTENING.**

AF 606K £56.50 inc. VAT, carr. £5.00



we now stock the **vibroplex** range of morse keys

THE VIBROPLEX IAMBIC — PRESENTATION £92.50 — DELUXE £62.18 — STANDARD £49.20, THE BRASS RACER EK1 £99.00
THE BRASS RACER IAMBIC £66.50, THE PRESENTATION £99.50, THE ORIGINAL — DELUXE £66.50 —
STANDARD £53.20, THE VIBRO-KEYER-DELUXE £62.18 — STANDARD £49.20 ALL INC. VAT CAR. £5.00

FOR THE ENTHUSIAST THESE PRODUCTS REQUIRE NO MORE DISCUSSION
FOR THE NOVICE "VIBROPLEX" IS NOT A MARITAL AID



Now from Daiwa, a new 2 metre monitor receiver. Using PLL synthesized circuitry, the SR1000E covers the entire amateur band in 5 KHz steps. It provides for today's amateur a small convenient means of monitoring activity on the busy 2 metre band. Compact and supplied with earphone, mounting bracket, the SR1000 provides for you mobile or fixed your contact with the 2 metre band.

SR 1000 E £72.50 inc. VAT, carr. £2.25

LOWE IN LONDON, Open monday to saturday, six days a week
lower sales floor, Hepworths, Pentonville Rd, London. telephone 01.837.6702
LOWE IN GLASGOW, Open tuesday to saturday
4,5 Queen Margarets Rd, Glasgow. telephone 041.945.2626





TR3500

COMPACT SIZE AND LIGHT WEIGHT

Measures only 66W x 168H x 40D mm with a weight of 540grams including Ni-Cd battery pack.

LCD DIGITAL FREQUENCY READOUT

Easy to read in direct sunlight, or in the dark. Virtually no current drain (much less than LED's). Displays transmit and receive frequencies and memory channels. Display includes four "Arrow" indicators: "F. LOCK" (Frequency Lock), "REV" (Repeater Reverse), "PROG. S" (Programmed Scan), "MS" (Memory Scan).

TEN CHANNEL MEMORY

Nine memories may be operated in simplex mode, or with transmit frequency offset permitting access to repeaters.

LITHIUM BATTERY MEMORY BACK-UP

No loss of memory in case of complete discharge (or removal of the Ni-Cd batteries. Current (approximately 1 microampere) to maintain memory supplied by built-in separate lithium battery, with estimated life of more than 5 years.

MEMORY SCAN

Scans only those channels (maximum 10) in which frequency data is stored. Stops on "Busy" channel, resumes scan automatically approximately 2 seconds after signal goes off, or when "MS" key is pressed. The "STOP" key or the PTT switch may be used to cancel the scan function. LCD displays memory channel number and "MS" arrow while memory scan in use.

PROGRAMMABLE BAND SCAN

Scan bandwidth (lower and upper frequency limits) and scan steps of 5kHz and larger (5, 10, 15, 20, 25 kHz, etc.) may be programmed. Scan automatically locks up on busy channel and resumes approximately 2 seconds after signal goes off or when "PROG. S" key is pressed. "STOP" key or PTT switch cancels scan function.

UP/DOWN MANUAL SCAN

UP/DOWN manual scan in 5 kHz steps.

FREQUENCY COVERAGE

Covers 430.00 — 439.995 MHz in 5 kHz steps.

TONE BURST SWITCH

The TONE BURST switch activates the 1,750 Hz repeater access tone oscillator.

TX OFFSET SWITCH

Selects simplex or repeater operation (operator pre-programmes repeater OFFSET MAX ±9.995 MHz).

HI/LOW POWER SELECTION

HI/LOW power output switch allows operation at 1.5W or, for extended battery life, 300mW.

REVERSE OPERATION

"REV" switch shifts the receiver to the transmit frequency, and the transmitter to the receive frequency. Useful for checking signals on the input of a repeater, to determine if you are within simplex range.

AUTO/MANUAL SQUELCH

Selector switch on threshold control allows selection of automatic or manual squelch operation.

BATTERY INDICATOR

LED battery condition indicator flashes when battery charge level approaches nominal discharged battery potential.

TWO "LOCK" SWITCHES

"F. LOCK" switch prevents accidental loss of chosen frequency when in "LOCK" position. "TX. STOP" switch prevents accidental transmission if PTT switch is accidentally pressed in handling.

BNC ANTENNA TERMINAL

Allows antenna changeover to be quick and easy.

ACCESSORIES INCLUDED

- Flexible rubberised antenna with BNC connector.
- 400mAh Ni-Cd battery pack.
- AC charger.
- Plug for external microphone and speaker.
- Hand strap.

“compatible”

the two metre & seventy centimetre handhelds from Trio.

TR2500 £220.80 inc. VAT, carr. £5.00

TR3500 £238.51 inc. VAT, carr. £5.00

PRICES AND SPECIFICATION SUBJECT TO CHANGE WITHOUT NOTICE.

LOWE ELECTRONICS

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



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PRICES DOWN!

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M700AX

NEW

- Full coverage of 144 to 148 MHz in 5kHz steps
- Concentric frequency control selectors—"aircraft style"
- Full 25 watts power output continuously variable down to 1 watt
- Receiver sensitivity better than 0.3µV for 20dB
- Single channel memory frequency instantly programmable
- 1750Hz tone-burst, 600kHz repeater shift, reverse repeater
- Large LED display and illuminated meter
- Complete with mic, mounting brackets, DC leads etc.

£169!

Carriage free

FULL FACTORY WARRANTY

FDK 2M ALL MODES—NOW EVEN GREATER VALUE



M750X

NEW

- Full coverage 144-148MHz in 5kHz and 100Hz steps
- High quality USB, LSB, CW, FM for base or mobile
- Power output 10 watts switchable 1 watt on all modes
- Receiver sensitivity better than 0.3µV/20dB and 0.15µV/10dB
- Dual programmable VFO's, 600kHz shift, automatic tone burst
- Automatic scanning and up/down frequency microphone control
- Complete with mic, mounting brackets and DC leads, etc

£269!

Carriage free

FULL FACTORY WARRANTY

NEW

MIZUHO SB2X 2M SSB PORTABLE



- 144.25-144.35MHz VXO frequency control
- 2m SSB/CW internal battery powered portable. 0.2w output
- Receiver sensitivity better than 15dB for 0.5µV
- Built-in microphone with optional external mic socket
- Noise blanker circuit and built in CW key
- BNC aerial socket/headphone socket/external psu socket.
- Base station performance from a pocket portable

£89!

NEW

FDK ATC720 AIRCRAFT MONITOR



- 118-136MHz AM portable aircraft monitor
- 25kHz steps controlled by thumbwheel switch
- Sensitivity better than 1 microvolt
- Internal long lasting rechargeable ni-cad battery pack
- Plug in helical whip and external earpiece socket
- Auto tracking front-end tuning for good image rejection
- Supplied complete with AC charger and aerial

£129

plus free list
of UK airband
frequencies.

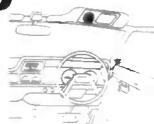
NEW

ADONIS MOBILE SPEAKER

£15.95



Carriage £1.00



- Ideal remote speaker for mobile operation
- 8 ohm impedance. Ultra slim construction
- Includes "magic" memo pad
- Fits onto sun visor with special velcro straps
- Makes mobile copy much easier and more enjoyable

NEW

AIRBAND BASE/MOBILE MONITOR CD-6000



£89.95

Carriage £1.50

- 110MHz-139.995MHz in 5kHz steps
- Covers all AM channels including beacons
- Clear LED digital readout display
- Sensitivity better than 0.5µV for 10dB
- 12v DC power requirement. 400mA
- Automatic scanning facility. Built in speaker
- Complete with mobile mounting bracket and DC cable

WATERS & STANTON ELECTRONICS

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

GH22
BASE ANT
144 MHz
2 x 5/8th wave
6.5dB gain

£24.95

Power 100 watts
Height 2.7m
Wind 25m/sec
Weight 0.9Kg
Mast clamp 25.50mm
SO239 connector

Carriage charge on all aeriels—£3.75

Carriage on accessories ordered separately—£1.50

B285
BASE ANT
144 MHz
1 x 5/8th wave
3.4dB gain

£14.50

Power 100 watts
Height 1.3m
Wind 35m/sec
Weight 0.75Kg
Mast clamp 25.50mm
SO239 connector

M285
MOBILE ANT
144 MHz
5/8th wave
3.4dB gain

£7.95

Power 100 watts
Height 1.3m
Tapered whip
Fold over base
PL259 connector

WELZ®

"DIAMOND" RANGE OF ANTENNAS

M287
MOBILE ANT
144 MHz
7/8th wave
4.5dB gain

£13.95

Power 100 watts
Height 1.8m
Tapered whip
Fold over base
PL259 connector

DP-LOR



DP-LOR
Elevated ground plane for all VHF models 0.35m high.

£17.95

"HF" MOBILE RANGE



DP-100S

EL40
EL80 **LBR** **BDS**

GLS

MB

Model No	Description	Price
DP100S	5 band HF mobile with telescopic base	£79.95
LBR	Heavy duty base spring to DP100S	£10.50
BDS	Bumper mounting strap for DP100S	£9.50
EL40	40m base loaded whip 2.45m PL259 con	£28.95
EL80	80m base loaded whip 2.48m PL259 con	£29.95
GLS	Gutter mount (SO239) with 5m cable	£8.50
MB	Deluxe magnetic base (SO239) with 5m cable	£11.50
TRB	Heavy duty trunk lip mount (SO239)	£13.95
KB105	80-10m vert 1kW 7m high	£79.00
KB101	40-10m vert 1kW 5m high	£54.00
CP5	80-10m compact vertical with radials 200 watts	£99.95



Carriage on all Welz power meters is free

JOIN THE HUNDREDS OF WELZ USERS AND EXPERIENCE "PERFORMANCE" **KB105**

WELZ DELUXE POWER METERS

SP600	1.8-500 MHz 2kW (HF) 200 watts VHF/UHF 3 power levels 0-20, 200 or 2000 watts 3 ant inputs	£95.00
SP300	1.8-500 MHz 1kW (HF) 200 watts VHF/UHF 3 power levels 0-20, 200 or 2000 watts 3 ant inputs	£85.00
SP200	1.8-160 MHz 0-20, 200, 1000 watts 2 ant inputs	£61.95
SP400	130-500 MHz 0-5, 20, 150 watts N connectors	£61.95

WELZ SP10X

1.8-150 MHz
20/200 watts
VSWR and power
50 ohm/SO239
Sens = 3 Watts
Pocket size
Ideal for mobile

£21.95

WELZ CH20 COAX SWITCH

Performance coaxial switch
1 input and 2 outputs
DC-900MHz 0.1dB
Isolation 50-70dB
VSWR 1:1 Power 1kW
Coaxial cavity
Gold plated contacts

£15.95



WELZ SP15M POWER METER

1.8-150 MHz Flat
2.5/20/20 Watts
VSWR and power measurements
50 ohm/SO239/0.2dB
VSWR sensitivity - 1.5 Watts
Large, easy to read meter
Accuracy better than 10%

£29

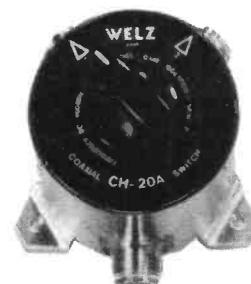
WELZ AC38 HF ATU

Ideal hf atu
8 bands 3.5-29.7 MHz
Power rating 200W CW 400W PEP
Input 50 ohm SO239
Output 20-300 ohm unbalanced
Insertion loss 0.5dB
Matches all modern transceivers

£59



SP10X



CH20A

QRV? FER ICOM

IC-R70, The very latest from Icom!



Now that we have tried the R70, we believe that it is going to be a real winner.

The R-70 covers all modes (when the FM option is included), and uses 2 CPU-driven VFO's for split frequency working, and has 3 IF frequencies: 70MHz, 9MHz and 455KHz, and a dynamic range of 100dB.

Other R-70 features include: input switchability through a pre-amplifier, direct or via an attenuator, selectable tuning steps of 1KHz, 100Hz or 10Hz, adjustable IF bandwidth in 3 steps (455KHz). Noise limiter, switchable AGC, tunable notch filter, squelch on all modes, RIT, tone control. Tuning LED for FM (discriminator centre indicator). Recorder output, dimmer control.

The R-70 also has separate antenna sockets for LW-MW with automatic switching, and a large, front mounted loudspeaker with 5.8W output. The frequency stability for the 1st. hour is ± 50 Hz, sensitivity-SSB/CW/RTTY better than $0.32 \mu\text{V}$ for 12dB (S+N) \div N, Am- $0.5 \mu\text{V}$, FM better than 0.32 for 12dB Sinad. DC is optional on the R-70. It has a built-in mains supply.

The IC-R70 measures 286mm x 110mm x 276mm and weighs 7.4Kg., making it a very attractive package indeed. Are you ready for this truly excellent receiver? You must hear it, we know you will be impressed!

IC-25E The Tiny Tiger And NOW the 70cm version IC-45E.



Amazingly small, yet very sensitive.

Two VFO's, five memories, priority channel, full duplex and reverse, LED S-meter, 25KHz or 5KHz step tuning. Same multi-scanning functions as the 290 from mic or front panel. All in all the best 2M and 70 cm. FM mobiles ICOM have ever made.

Remember we also stock Yaesu, Jaybeam, Datong, Welz G-Whip, Western, TAL, Bearcat, RSGB Publications.

Agents (phone first - all evenings and weekends only, except Scotland).

Scotland - Jack GM8 GEC (031 665 2420)

Midlands - Tony G8AVH (021 329-2305)

North West - Gordon G3LEQ Knutsford (0565)4040

Ansafone available

Securicor
or post
despatch
free

Introducing the NEW IC-740.



This latest transceiver contains all the most asked-for features, in the most advanced solidstate HF base station on the amateur market...performing to the delight of the most discerning operator.

Study the front panel controls of the ICOM IC-740. You will see that it has all of the functions to give maximum versatility to tailor the receiver and transmitter performance to each individual operator's requirements.

Features of the IC-740 receiver include a very effective variable width and continuously adjustable noise blanker, continuously adjustable speed AGC, adjustable IF shift and variable passband tuning built in. In addition, an adjustable notch filter for maximum receiver performance, along with switchable receiver preamp, and a selection of SSB and CW filters. Squelch on SSB Receive and all mode capability, including optional FM mode. Split frequency operation with two built-in VFO's for the serious DX'er.

The IC-740 allows maximum transmit flexibility with front panel adjustment of VOX gain and VOX delay along with ICOM's unique synthesized three speed tuning system and rock solid stability with electronic frequency lock. Maximum versatility with 2 VFO's built in as standard, plus 9 memories of frequency selection, one per band, including the new WARC bands.

With 10 independent receiver and 6 transmitter front panel adjustments, the IC-740 operator has full control of his station's operating requirements.

See and operate the versatile and full featured IC-740 at your authorized ICOM dealer.

Options include:

- FM Module
- Marker Module
- Electronic Keyer
- 2 - 9MHz IF Filters for CW
- 3 - 455MHz Filters for CW
- Internal AC Power Supply

Accessories.

- SM5 Desk Microphone
- UP/DWN Microphone
- Linear Amplifier
- Autobandswitching Mobile Antenna
- Headphones
- External Speaker
- Memory Backup Supply
- Automatic Antenna Tuner

Ask about the new range of CUE DEE antennas, the winners in recent tests!

Thanet ICOM **Thanet ICOM** **Thanet ICOM** **Thanet ICOM** **Thanet ICOM** **Thanet ICOM**

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**The World's most popular portables
IC-2E IC4E and now the marine
version IC-M12**



Nearly everybody has an IC-2E, the most popular amateur transceiver in the world, now there is the 70cm version which is every bit as good and takes the same accessories.

Fully synthesized – Covering 144-145.995 in 400 5KHz steps. (430-439.99 4E). **Power output** – 1.5W. **BNC antenna** output socket. **Send/Battery indicator**. **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 (1.6MHz and listen input on 4E). **Hi-Low switch** – 1.5W or 150mW. **External microphone jack**. **External speaker jack**.

The IC-4E is revolutionising 70cm!

**Multimode Mobiles
IC-290E IC-490E**



290E-144-146 MHz/490E-430-440 MHz. 10 W RF output on SSB, CW and FM. Standard and non-standard repeater shifts. 5 memories and priority channel.

Memory scan and band scan, controlled at front panel or microphone. Two VFO's. LED S-meter. 25KHz and 1KHz on FM – 1KHz and 100KHz tuning steps on SSB. Instant listen for repeaters.

**IC-720A Possibly the best
choice in HF.**

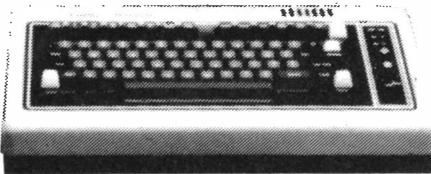


One way of keeping up with rapidly advancing technology is to look at what the IC-720A offers in it's BASIC form. How many of it's competitors have two VFO's as standard, or a memory which can be recalled, even when on a different band to the one in use, and result in instant retuning AND BANDCHANGING of the transceiver? How many include really excellent general coverage receiver covering all the way from 100KHz to 30MHz? How many need 'no tuning or loading whatsoever?' and take care of your PA, should you have a rotten antenna. How many have an automatic RIT which cancels itself when the main tuning dial is moved? How many will run full power out for long periods without overheating? How many have band data output to automatically change bands on a solid state linear AND an automatic antenna tuner unit?

The IC-720A may be just a little more expensive than some, but it's better than most! Make your choice an IC-720A.

IC-PS15 Mains PSU

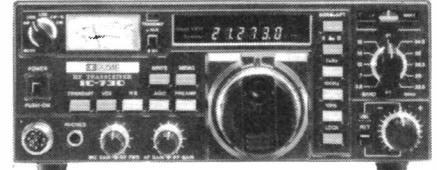
**Tono RTTY and CW computers
9000E**



The TONO range of communication computers take a lot of beating when it comes to trying to read RTTY and CW in the noise. Others don't always quite make it!

Check the many facilities offered before you buy – especially look at the 9000E which also throws in a Word Processor. Call us for further information and a brochure. Receive only version Tono 550

**IC-730 The best for mobile or
economy base station**



ICOM's answer to your HF mobile problems – the IC-730. 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 39MHz 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 a memory is provided for one channel per hand. Further convenience circuits are provided such as Noise Blanker, Vox, CW Monitor APC and SWR Detector to name a few. A built in Speech Processor boosts talk power on transmit and a switchable RF Pre-Amp is a boon on today's crowded bands.

**Great base stations
IC-251 IC-451**



ICOM produce a perfect trio in the UHF base station range, ranging from 6 Meters through 2 Meters to 70 cms. Unfortunately you are not able to benefit from the 6m product in this country, but you CAN own the IC-251E for your 2 Meter station and the 451E for 70 cms. Mains or 12 volt supply. SSB, CW and FM.

Thanet ICOM **Thanet ICOM** **Thanet ICOM** **Thanet ICOM** **Thanet ICOM** **Thanet Electronics**
 143 Reculver Road, Herne Bay,
 Kent. Tel: (02273) 63859.
 Buy it with a Visa
 Same day despatch if possible.

SMC SERVICE:— FREE FINANCE— FREE CREDIT COVER— GUARANTEE

Earning the title "The Communicators" in the amateur, commercial and marine fields was not gained easily, and we guard our reputation as jealously today, as we did a quarter of a century ago. Maintaining our reputation requires service with a capital 'S'. We offer free Securicor delivery on major equipment, take Access and Barclaycard over the phone, and have superb demonstration facilities.

On many regular priced items for an invoice over £120 we provide *free finance*, 20% down (balance over 6 months) or 50% down and the balance over a year; *you pay no more than the cash price*. Where this service is not available we have taken the worry out of finance:— enter a personal loan agreement — remember the deposit can be as low or lower than your monthly instalments — for 12 months to 3 years (at a typical APR rate of 31.8%) and in the event of sickness, accident, compulsory redundancy or death *your credit is covered by SMC*. If you have Access, Barclay or Bankers card, or a UK call sign and you bring your licence with you, or it appears in the call book, it's *INSTANT*.

Should you need a radio repaired, remember we have our own expert 10 man service department, equipment with over a hundred thousand pounds of spares and test equipment, and as the importer of most of our merchandise we are in daily contact with the manufacturer.

We are proud to be the largest representative in Europe of Yaesu Musen of Japan who produce the most diverse line of amateur radio equipment in the world. With them, communications is their only business not a sideline, thus they provide you with premium products at the forefront of technology.

We are also proud to be chosen as UK representatives by such fine manufacturers as The Japan Radio Company, KDK, Nag, Hansen, Kenpro, TTE, Leson, Telewand, Engineer, Commet, Fitlay, and Hokushin of Japan, plus HyGain, CDE, Gem Quad, Channel Master, Mirage, ETO, Dentron, MFJ, and KLM from the Americas.

The items illustrated here form only a tiny fraction of our range: 200 stock lines of Yaesu Musen equipment, 600 different antennas, masts, rotators, coaxes, etc., etc., plus 300 general items of communications equipment, selected as offering the best value in the world from: Jaybeam, Mini Beam, G4MH, Mosley, G-Whip, Bantex, Ascot, Strumech, Microwave Modules, JIR, Bearcat, Delica, Ashidavox, Hi Mound, ICS, Van Gordon, Datong, RSGB publications amongst others.

We trust the outline of our services, recommendations from another amateur (aspiring or veteran) or a visit to your nearest SMC store will convince you to give us a chance to serve.

SMC, your single stop source.

COMMUNICATION RECEIVER NRD515 £825 inc. VAT @ 15% SECURICOR

- ★ 30MHz to 100kHz or lower, 100Hz steps.
- ★ PLL digital VFO, outstanding (50Hz AWU) stability.
- ★ Backlash free, 10kHz rev, 500Hz analogue calib.
- ★ Fast tune up/down switch, dial lockout.
- ★ SSB (USB/LSB), CW, AM, RTTY.
- ★ 6 and 2.4kHz, 600° and 300° Hz @ 6dB.
- ★ Passband tuning ±2kHz or SSB and CW.
- ★ Variable BFO on CW for preferred tone.
- ★ Modular plug in design with mother board.
- ★ High reliability — low power schottky & CMOS.
- ★ Designed for maximum ease of operation.
- ★ Noise blanker. 0–10–20dB attenuator.
- ★ Small (140 x 340 x 300mm), light 7½ kg, rugged.



PROFESSIONAL MONITOR

- ★ Up conversion, 70.455MHz and 455kHz.
- ★ No R.F. amplifier, balance U310 mixer.
- ★ Crystal filter before first IF amplifier.
- ★ Transceiver provisions; mute, trip, etc.
- ★ Frequency data input/output port.
- NHD518 96 (4 x 24) channel memory unit.
- NCM515 Remote frequency keypad, LCD readout. Up/down step tuning, 4 chan. memory.
- CQE515 Junction unit (NCM515 to NHD518).
- NVA515 External 3W speaker.
- CFL260 600Hz mechanical filter.
- CFL230 300Hz crystal filter.

12 MEMORY RECEIVER:— FRG7700M; £399 inc. VAT @ 15% & SECURICOR

- ★ 30MHz down to 150kHz (and below).
- ★ 12 Channel memory option with fine tune.
- ★ SSB (LSB/USB), CW, AM, FM.
- ★ 2.7kHz, 6kHz, 12kHz, 15kHz, @ – 6dB.
- ★ 3 Selectivities on AM, squelch on FM.
- ★ Up conversion, 48MHz first IF.
- ★ 1kHz digital, plus analogue, display.
- ★ Inbuilt quartz clock/timer.
- ★ No preselector, auto selected LPF's.
- ★ Advanced noise blanker fitted.
- ★ Antenna 500Ω to 1.5MHz, 50Ω to 30MHz.
- ★ 20dB pad plus continuous attenuator.
- ★ Switchable A.G.C. Variable tone.



'7700 THE ONE WITH FM! Non memory version £335

- ★ 110 and 240V ac, 12Vdc option.
- ★ Signal meter calibrated in "S" and SIMPO
- ★ Acc; Tuners, Converters, LPF, Memory
- ★ FRT7700; 150kHz-30MHz, Switch, etc.
- ★ FRV7700A; 118-130, 130-140, 140-150MHz.
- ★ FRV7700B; 118-130, 140-150, 50-59MHz.
- ★ FRV7700C; 140-150, 150-160, 160-170MHz.
- ★ FRV7700D; 118-130, 140-150, 70-80MHz.
- ★ FRV7700E 118-130, 140-150, 150-160MHz.
- ★ FRV7700F 118-130, 150-160, 170-180MHz.
- ★ FF5; 500kHz (for improved VLF reception).
- ★ MEMGR7700; 12 Channels (internal fitting).
- ★ FRA7700; Active Antenna.

SOUTH MIDLANDS COMMUNICATIONS LTD

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



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Stourbridge Brian G3ZUL { (031665) 2420 eve.
(03843) 5917

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Bangor John GI3KDR (0247) 55162
Tandragee Mervyn GI3WWY (0762) 840656

Neath John GW4FOI { (0639) 52374 day
Jersey Geoff GJ4ICD { (0639) 2942 eve.
(0534) 26788

- ★ 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.
- ★ Inbuilt keyboard with up/down scanning.
- ★ Dedicated digital display for RIT offset.
- ★ Receiver dynamic range up to 100dB!!!
- ★ 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 blanker.
- ★ 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.

FT ONE £1,349 inc. VAT @ 15% & SECURICOR



*Option

FREE FINANCE

FT980 £1,115 inc. VAT @ 15% & SECURICOR



★ NEW ★

- ★ Rx 150 kHz-30MHz.
- ★ Tx 160-10 m. 9 bands & 3 x 500 kHz Aux bands.
- ★ All modes AM, CW, LSB, USB, AFSK & FM (inc.)
- ★ IF shift & variable bandwidth 2.6 kHz-300 Hz.
- ★ Inbuilt keyboard operation & scanning.
- ★ Switchable attenuator 10, 20, 30 dB.
- ★ Audio peak + notch filter - 40 dB.
- ★ RF processor and Auto mic gain control.
- ★ 3rd order IMD - 40dB at 100W PEP.
- ★ AFSK shift 170, 425, 850 Hz selectable.
- ★ Multi channel memory + programmable scan limits.
- ★ Optional computer interface available.
- ★ Notch filter in IF (AGC immune to hetrodynes).
- ★ Full break in keying. 500/600/700 Hz beat.
- ★ Unique analogue scale of digital type.
- ★ Comprehensive twin meter metering.
- ★ Memory retains mode information.

- ★ 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.
- ★ VOX built-in and adjustable.
- ★ Instant write in memory channel.
- ★ Tune up button (10 sec. of full power).
- ★ Switchable AGC and RF attenuator.
- ★ 350 or 600 Hz CW, 6kHz, AM filters *included!*
- ★ Clarifier (RIT) switchable on Tx, Rx or both.
- ★ Plug in modular, computer style constructor.
- ★ Fully adjustable RF Speech processor.
- ★ Ergonomically designed with necessary LEDES.
- ★ Incredible range of matching accessories.
- ★ Universal power supply 110-234V AC and 12V DC.

FT902DM £885 inc. VAT @ 15% & SECURICOR



D & DE MODELS AVAILABLE

"PLASTIC" BY PHONE

FT 102 £785 inc. VAT @ 15% & SECURICOR

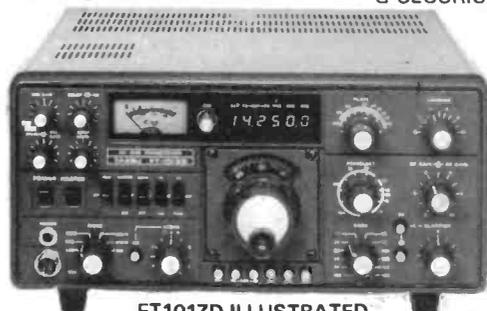


"INSTANT" H.P.

- ★ 1.8-3.5-7-10-14-18-21-24.5-28MHz
- ★ All modes: - LSB, USB, CW, AM±, FM±, (±Option board)
- ★ Front end: extra high level, operates on 24V DC.
- ★ RF stage bypassable, boosts dynamic range over 100 dB!
- ★ Variable bandwidth 2.7kHz→500Hz *and* IF Shift
- ★ Fixed bandwidth filters, parallel or cascade configurations
- ★ IF notch (455kHz) *and* independent audio peak
- ★ Noise blanker adjustable for pulse width
- ★ External Rx and separate Rx antenna provisions
- ★ Three 6146B in special configuration - 40 dB IMD!
- ★ Extra product detector for checking Tx IF signal
- ★ Dual meter, peak hold ALC system
- ★ Mic amp with tunable audio network
- ★ SP102: - Speaker, Hi and Lo AF filters, 12 responses!
- ★ FV102: - VFO, 10Hz steps and readout, scanning, QSY.
- ★ FC102: - ATU, 1.2KW, 20/200/1200 W FSD PEP, wire.
- ★ FAS-1-4R: - 4 way remote waterproof antenna selector.

- ★ 160-10 metres including new allocations.
- ★ Variable IF bandwidth 2.4kHz down to 300Hz.
- ★ Selectable CW fixed bandwidth CW-W and CW-N*.
- ★ Semi-break in with sidetone for excellent CW.
- ★ Digital* plus analogue frequency displays.
- ★ 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, AGC; slow-fast-off.
- ★ 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
- ★ N.B. - 6 models: Digital/Analyse - AM/FM options - N.B.

FT 101Z £559 inc. VAT @ 15% & SECURICOR



FT101ZD ILLUSTRATED

*Option

FREE SECURICOR

- ★ 150(W) x 50(H) x 176(D)mm.
- ★ Up/down, memory/band scanning.
- ★ Easy "write-in" memory channels.
- ★ Memory back-up "5 year" lithium cell.
- ★ Ten memories with priority functions.
- ★ Supplied with scanning microphone.
- ★ Illuminated "any angle" LCD display.
- ★ Display to 100's of Hz and functions.
- ★ Two completely independent VFO's.
- ★ Operation between memory and VFO.
- ★ Full reverse repeater function.
- ★ Manual and automatic tone burst.
- ★ Large "full sound" internal speaker.
- ★ Concentric volume and squelch.



2 or 70!

FT230R £239 inc. VAT @ 15% & SECURICOR

- ★ 144-146 MHz (extensions possible).
- ★ 25W RF output, 3W on low.
- ★ 25 and 12½ kHz steps provided.
- ★ ±600kHz repeater split, 1750Hz burst.
- ★ Tx; 5A. Rx 300mA (standby).
- ★ 430-434MHz (440-445MHz possible).
- ★ 10W RF output, 1W on low.
- ★ 25 and 100kHz steps provided.
- ★ ±1.6MHz repeater split, 1750Hz burst.
- ★ Tx 3A, Rx 300mA (standby).

FT730R £285 inc. VAT @ 15% & SECURICOR

- ★ Multimode USB, LSB, FM, CW
- ★ 100Hz backlit LCD Frequency display
- ★ 10 memory channels '5 year' backup
- ★ Any Tx/Rx split with dual VFOs
- ★ Up/down tuning from microphone
- ★ AF output 1W @ 10% THD
- ★ Bandwidth 2.4kHz and 14kHz @ -6dB
- ★ LED's; 'On Air', 'Busy', m/c meter; S, PO.
- ★ 58 (H) x 150 (W) x 195 (D) (1.3kg)

SMC2.0C	Nicad 2.0A/hr "C"	£2.35
SMC8C	Slow Charger (220mA) ..	£8.80
MMB 11	Mobile Mount	£22.25
CSC1A	Soft carrying case	£3.45
FL2010	Linear Amplifier 2m 10W ..	£59.00
FL7010	Linear Amplifier 70cms ..	£91.00



6 or 2 or 70!

FT290R

£265

VAT @ 15%
& CARRIAGE

- ★ 144-146MHz (144-148) possible
- ★ 2.5W PEP, 2.5W RMS/300mW out
- ★ FM: 25kHz and 12.5kHz steps
- ★ SSB: 1kHz and 100Hz steps
- ★ ±600 kHz repeater split 1750kHz burst
- ★ Integral telescopic antenna
- ★ Rx, 70mA, Tx; 800mA (FM maximum)

FT790R

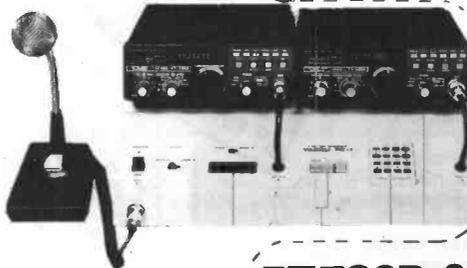
£325

VAT @ 15%
& CARRIAGE

- ★ 430-330MHz (440-450 alternative)
- ★ 1W PEP, 1W/250mW FM/CW out
- ★ FM: 100kHz and 25kHz steps
- ★ SSB: 1kHz and 100Hz steps
- ★ 1.6MHz shift with input monitor, 1750Hz burst
- ★ Rx; 100mA/200mA. Tx; 750mA max
- ★ BNC Mounting ½λ flexi antenna

- ★ USB-LSB-CW-FM (A 3, A1, F3).
- ★ 30W PIP A 3, 10/1W out A1 F3.
- ★ Any Tx Rx split with dual VFO's.
- ★ Four easy write-in memory channels.
- ★ Memory scanning with slot display.
- ★ Up/down tuning/scanning from mic.
- ★ Priority channel on any memory slot.
- ★ Digital RIT. Advanced noise blanker.
- ★ Satellite mode allows tuning on Tx.
- ★ Semi break in with side tone.
- ★ Very bright blue 100Hz digital display.
- ★ Display shows Tx & Rx freq (inc RIT).
- ★ String LED display for "S" and PO.
- ★ LED's; "On Air" Clar, Hi/Low, FM mod.
- ★ Size (Case): 8.3" D, 2.3" H, 6.9" W.

Ills. c/w SCI station
consol and YD148 mic.



6 or 2 or 70!

FT480R £369 inc. VAT @ 15% & SECURICOR

- ★ 144-146MHz (143.5-148.5 possible).
- ★ ±600kHz standard repeater split.
- ★ Excellent dynamic range and sensitivity.
- ★ FM; 25, 12½, 1kHz steps.
- ★ SSB; 1,000, 100, 10Hz steps.
- ★ 430-434MHz (440-445 possible).
- ★ GaAs Fet RF for incredible sensitivity.
- ★ FM; 100kHz, 25kHz, 1kHz, steps.
- ★ SSB; 1,000, 100, 10Hz steps.
- ★ FT 780R 1.6 fitted 1.6MHz Shift £409 inc.

- ★ Keyboard entry of frequencies/splits
- ★ LCD digital display with backlight
- ★ Any split + or - programmable
- ★ Ten memory channels '5 year' back up
- ★ Up/down manual tuning. Memory scan
- ★ Manual or auto scan for busy/clear
- ★ Priority channel with search back
- ★ Scan between any two frequencies
- ★ Auto scan restart. 1.750Hz tone burst
- ★ Built in condenser microphone
- ★ 500mW to int/ext speaker
- ★ External speaker/mic. available
- ★ 168(H) x 61(W) x 39(D)mm
- ★ C/w Quick change NiCad pack, helical



2 or 70!

FT208R

£199

VAT @ 15%
& CARRIAGE

- ★ 144-146MHz (144-148 possible).
- ★ 12.5/25kHz synthesizer steps.
- ★ ±600kHz repeater split.
- ★ 2.5 or 0.3W RF output.
- ★ Rx: 20mA squelch 150mA max. AF.
- ★ Tx: 800mA at 2.5W RF.
- ★ 0.25µV for 12dB SINAD.

FT708R

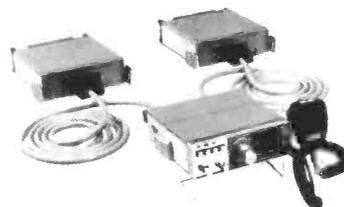
£229

VAT @ 15%
& CARRIAGE

- ★ 430-440MHz (440-450 option).
- ★ 25kHz synthesizer steps.
- ★ ±7.6MHz EU split standard.
- ★ 1W or 100mW RF output.
- ★ Rx: 20mA squelch, 150mA (max AF).
- ★ Tx: 500mA at 1W RF.
- ★ 0.4µV for 12dB SINAD.

- ★ Four easy write-in memory channels
- ★ Rx priority channel (auto check)
- ★ Scanning band/memory empty/busy
- ★ Up/down tuning/scanning from mic.
- ★ Optically coupled tuning control
- ★ Manual and automatic tone burst
- ★ String LED's for 'S' and PO, 7 status LEDs
- ★ 1½ W of audio to internal/external speaker
- ★ FT720 Control Head
- ★ 3.3 (4.3)" D x 6" W x 2 (2.2)" H
- ★ S72 Switching box
- ★ Pushbutton band change Auto steps/spits
- ★ **E72S** Extension cable, 2m long
- ★ **E72L** Extension cable, 4m long
- ★ **MMB3** Mobile Mounting bracket for deck

Ills. c/w S72 and
two E72S cables.



2 and/or 70!

FT720RV £199 inc. VAT @ 15% & CARRIAGE

- ★ 144-146MHz (144-148MHz possible).
- ★ 12½kHz synthesizer, 600kHz shift.
- ★ 0.3µV for 20dB quieting.
- ★ Rx 0.5. Tx RV 3.5A, RVH 6.5A.
- ★ 5.8 (6.5)" D x 6" W x 2(2.2)" D.

- ★ 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.

FT720RU £229 inc. VAT @ 15% & CARRIAGE

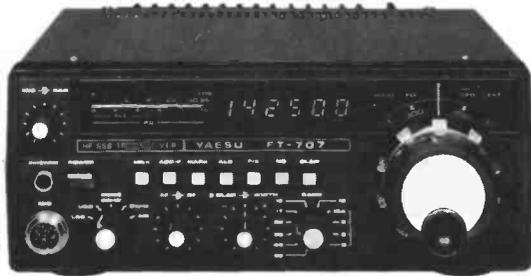
- ★ 2M. 12 VDC compact 2 7/16" x 6 3/4" x 7 3/16"
- ★ 25W (+ adjustable low power), 12 1/2 kHz steps.
- ★ 10 "year long" memories for "crystal control".
- ★ Display reads to 100's of Hz or channel number.
- ★ Sensitivity < 0.2µV for 12dB SINAD (0.14µV typical).
- ★ Single knob frequency selection. 20 steps rev.
- ★ Rapid QSY button, end to end in a single turn.
- ★ Digital RIT 1kHz steps, adjusted from main tuning.
- ★ 2, 5 slot memories, simplex, cross or 600kHz split.
- ★ Memories entered by pushing main tuning knob.
- ★ + 600kHz split. Instant repeater input monitor.
- ★ Band scan between front panel selectable, limits.
- ★ Scan stop requires squelch open and centre zero.
- ★ Scanning and up/down tuning on the microphones.
- ★ Reprogrammable; steps, tone, splits, and coverage.
- ★ C/W mic. "Easy out" mobile mount and handbook.

2030 £199 inc. VAT @ 15% & SECURICOR

★ NEW ★

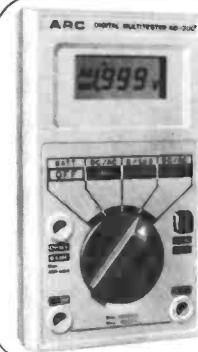


FT707 £509 inc. VAT @ 15% & SECURICOR



SMC FM VERSION AVAILABLE

- ★ 80-10 metres (including 10, 18 and 24MHz bands).
- ★ USB-LSB-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*
- ★ AGC; slow-fast switchable VOX built-in.
- ★ Semi-break in with side tone for excellent CW.
- ★ Digital (100Hz) plus analogue frequency display.
- ★ LED Level meter reads: S, PO and ALC.
- ★ Indicators for: calibrator, fix, int/ext VFO.
- ★ Receiver offset tuning (RIT-clarifier) control.
- ★ Advanced noise blanker with local loop AGC. *Option



£29.95

DIGITAL MULTIMETER KD200

3 1/2 Digit with full autoranging and full auto-polarity operation. Large LCD display. Overload protection. DCV; 200mV-1KV. AC V 2V-600V. Ohms; 200 to DCmA; 200mA.

KD200 Remarkable price inc p & p £29.95.

FT107 STATION

£350 OFF



£825 buys a FT107 c/w a FP107 internal power supply. Do that and we will give you: The DMS unit, The Antenna Tuner, The transvertor frame and an external speaker (together listed at £354.55) FREE!!!!



NEW

AMTOR TERMINAL UNIT £275

AMT1. AMTOR RTTY ASCII and CW Transmit. Remarkable error correcting facilities. Ideal with FT ONE or FT980.



£50 OFF

2m, 250W (+) PEP. £449

NAG 144XL LINEAR. 4CX350F tube, 10W nom. drive, switchable pre-amp. RF and hard switching. Thermal delay.

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



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TR7730 the new compact 2m Transceiver £268.87



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. £144.44

JAYBEAM

5Y/2M 5 element yagi	£14.38
8Y/2M element yagi	£17.83
10Y/2M 10 element	£24.15
PBM/14/2m. 14 element Parabeam	£55.78
5XV/2m. 5 element crossed yagi	£26.18
8XV/2m. 8 element crossed yagi	£35.65
10XV/2m. 10 element crossed yagi	£46.00
Q4/2m. 4 element Quad	£29.33
Q6/2m. 4 element Quad	£39.10
D5/2m. 5 over 5 slot fed yagi	£25.30
D8/2m. 8 over 8 slot fed yagi	£34.50
UGP/2m. ground plane	£12.65
MBM48/70cms. Multibeam	£35.65
MBM88/70cms. Multibeam	£48.88
C5/m. Colinear	£54.63
C8/70cm. Colinear	£62.10
D15/1296 23cm. Antenna	£00.00
8 element 2m quad	£44.85



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. £985.00

NEW 24 CHANNEL MEMORY UNIT.

NSD515 TRANSMITTER + NBD515 power supply

100Watts output. USB/LSB-CW-RTTY. Mic impedance 600 ohm - Antenna impedance 50 ohm. From the same Company, Japan Radio Company, comes the new JST-100 Digitally-synthesised HF Transceiver. All amateur Bands 160 through to 10M. 100 watts output AM-USB/LSB-CW-RTTY. Three phase locked loop circuits including BFO circuit are phase locked with stable 10MHz standard crystal oscillator, ensuring superior frequency stability and accuracy.

J.R.C. JST100

New digitally-synthesised, microcomputer-based transceiver. 11 channel memory - two digital VFO's. 100 watt PEP. CW - SSB - AM - RTTY - passband tuning - notch filter.



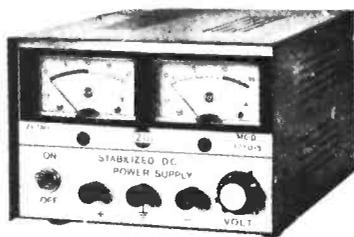
The TS930S latest transceiver from Trio Price: £1154.00 inc. VAT.

TRIO TS830S HF Transceiver	£678.00
AT230 All band Antenna Tuner/SWR	£129.00
SP230 Speaker	£39.00
DFC230 Digital remote control	£170.86
TS130S Solid State HF Transceiver	£531.00
TS130V Solid State HF Transceiver	£433.32
PS20 Power supply	£54.97
PS30 Power supply	£96.37
AT130 Antenna Tuner	£88.55
TL922 2 KW Linear Amplifier	£694.99
TR2300 Portable 2m Transceiver	£144.44
TR2500 Hand Held 2m Transceiver	£220.80
TR7730 compact 2m Transceiver	£268.87
TRIO TR9130 2m Transceiver	£411.24
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TS930S HF Transceiver	£1154.00
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Full range of TRIO Accessories stocked.

DATONG PRODUCTS

PCI General Coverage Converter	£137.42
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FL2 Multi-Mode Audio Filter	£89.70
Automatic RF Speech Clipper	£82.80
RF Speech Clipper	£29.90
D70 Morse Tutor	£56.35
AD370 Active Antenna (outdoor)	£64.40
AD270 Active Antenna (indoor)	£47.15
2M Converter	£39.67
Keyboard Morse Sender	£137.42



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

RECEIVERS AND TRANSCEIVERS

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R512 Aircraft Band Scanning Receiver	£135.00
Regency Digital Flight Scan Synthesised Aircraft Band Receiver	£215.00
Yaesu FRG7 Receiver	£199.00
AR22 2m Hand Held Receiver	£83.00
R528 Hand Held Aircraft Receiver	£68.50
FXI Station Wavemeter	£34.00
2-way Antenna Switch 3-30MHz	£5.00
3-way Antenna Switch 3-30MHz	£10.00
FDK 700EX Transceiver	£199.00
FDK 750E Transceiver	£299.00
DL50 50 watt 5ohm Dummy Load	£6.50
DL500 Dummy Load/Wattmeter 1 Kw. 3-400MHz 50 ohms	£38.00
WH.2. VHF Wavemeter	£00.00

ANTENNAS

HYGAIN 12AVQ Vertical	£50.60
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18AVT Vertical	£108.25
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TH6DXX Tribander	£281.75
TET HB33SP 3 element Tribander	£189.23
HB34D 4 element Tribander	£202.69
MV3BH Vertical	£40.25
MV4BH Vertical	£49.50
MV5BH Vertical	£71.25
SQ22 2 element Quad 2M	£55.67
TE214 14 element Yagi 2M	£67.00

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TV 3300 Low Pass Filter	£18.40
AK75, Doublet Antenna 132' top with 470 ohm Feeder	£29.90



TS830S HF SSB TRANSCEIVER £678.00

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
- * RIT/XIT
- * SSB monitor circuit
- * Expanded frequency coverage

AMATEUR ELECTRONICS UK



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**KEEP AHEAD
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Once again YAESU lead the field with the exciting new FT-102 HF transceiver— no other manufacturer offers so many innovative features.

Better Dynamic Range

The extra high-level receiver front end uses 24 VDC for both RF amplifier and mixer circuits, allowing an extremely wide dynamic range for solid copy of the weak signals even in the weekend crowds. For ultra clear quality on strong signals or noisy bands the high voltage JFET RF amplifier can be simply bypassed via a front panel switch, boosting dynamic range beyond 100dB. A PLL system using six narrow band VCOs provides exceptionally clean local signals on all bands for both transmit and receive.

Total IF Flexibility

An extremely versatile IF Shift/Width system, using friction-linked concentric controls and a totally unique circuit design, gives the operator an infinite choice of bandwidths between 2.7kHz and 500Hz, which can then be tuned across the signal to the portion that provides the best copy sans QRM, even in a crowded band. A wide variety of crystal filters for fixed IF bandwidths are also available as options for both parallel and cascaded configurations. But that's not all; the 455kHz third IF also allows an extremely effective IF notch tunable across the selected passband to remove interfering carriers, while an independent audio peak filter can also be activated for single-signal CW reception.

New Noise Blanker

The new noise blanker design in the FT-102 enables front panel control of the blanking pulse

width, substantially increasing the number of types of noise interference that can be blanked, and vastly improving the utility of the noise blanker for all types of operation.

Commercial Quality Transmitter

The FT-102 represents significant strides in the advancement of amateur transmitter signal quality, introducing to amateur radio design concepts that have previously been restricted to top-of-the-line commercial transmitters; far above and beyond government standards in both freedom from distortion and purity of emissions.

Transmitter Audio Tailoring

The microphone amplifier circuit incorporates a tunable audio network which can be adjusted by the operator to tailor the transmitter response to his individual voice characteristics before the signal is applied to the superb internal RF speech processor.

IF Transmit Monitor

An extra product detector allows audio monitoring of the transmitter IF signal, which, along with the dual meters on the front panel, enables precise setting of the speech processor and transmit audio so that the operator knows exactly what signal is being put on the air in all modes. A new "peak hold" system is incorporated into the ALC metering circuit to further take the guesswork out of transmitter adjustment.

New Purity Standard

Three 6146B final tubes in a specifically configured circuit provide a freedom from IMD products and an overall purity of emission unattainable in two-tube and transistor designs, while a new DC fan motor gives whisper-quiet cooling as a standard feature. For the amateur who wants a truly professional quality signal, the answer is the Yaesu FT-102.

New VFO Design

Using a new IC module developed especially for Yaesu, the VFO in the FT-102 exhibits exceptional stability under all operating conditions.

ANCILLARY EQUIPMENT

SP-102 EXTERNAL SPEAKER/AUDIO FILTER

The SP-102 features a large high-fidelity speaker with selectable low- and high-cut audio filters allowing twelve possible response curves. Headphones may also be connected to the SP-102 to take advantage of the filtering feature, which allows audio tailoring for each bandwidth and mode of operation to obtain optimum readability under a variety of conditions.

FC-102 1.2 KW ANTENNA COUPLER

FV-102DM SYNTHESIZED, SCANNING EXTERNAL VFO

FT-101ZD Mk III



YAESU's FT-101ZD WITH FM is still rolling off the line as fast as YAESU can produce - thanks to its very comprehensive specification and competitive price. Incorporates notch filter, audio peak filter, variable IF bandwidth plus many other features.

FT-ONE SUPER HF TRANSCEIVER



The ultimate in HF transceivers - the superb FT-ONE provides continuous RX coverage of 150KHz-30MHz plus all nine amateur bands (160 thru 10m). All-mode operation LSB, USB, CW, FSK, AM, *FM · 10 VFO system · FULL break-in on CW · audio peak filter · notch filter · variable bandwidth and IF shift · keyboard scanning and entry · RX dynamic range over 95dB! and NO band switch!!!

*OPTIONAL

AMATEUR ELECTRONICS UK

FT-230R 25watt 2m FM mobile



- Two independent VFO's
- 10 memories ● Priority function
- Memory and band scan
 - 12.5/25 KHz steps
 - Large LCD readout.

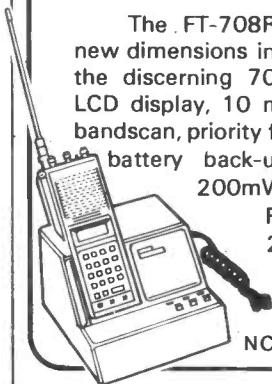
FT-290R/FT-790R 2m & 70cm portables



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

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

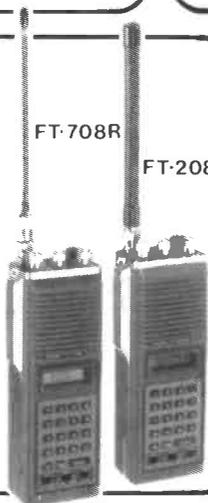
The FT-708R and FT-208R provide new dimensions in operating flexibility for the discerning 70cm and 2m operator. LCD display, 10 memories, memory and bandscan, priority function, internal lithium battery back-up. RF output FT-708R, 200mW low, 1 watt high, FT-208R, 300mW low, 2.5 watts high.



NC8 Charger DC PSU

FT-708R

FT-208R



FT-480R High technology all-mode 2metre mobile



The most advanced 2 metre mobile available today - USB, LSB, FM, CW full scanning with priority channel, 4 memory channel, dual synthesized VFO system.

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.



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

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.

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THE PICTURE SAYS IT ALL!



The latest FAT CAT from YAESU—
The **ALL NEW** FT-980 CAT HF transceiver
with continuous RX coverage of 150KHz–30MHz and computer interface option.

TET ANTENNA SYSTEMS

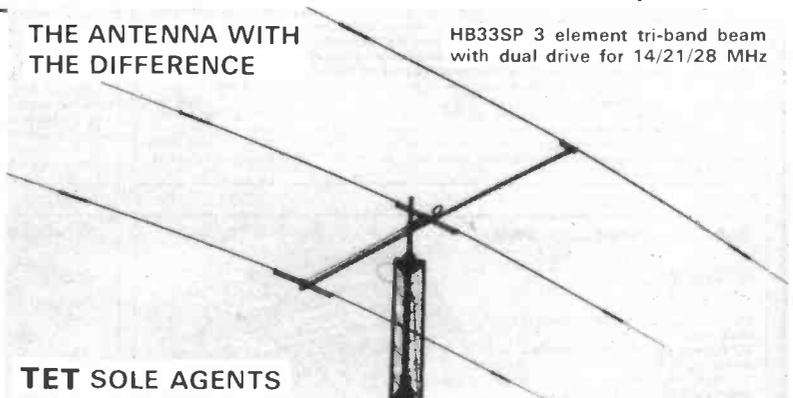
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- Better matching into solid state transceivers without an A.T.U.
- High power handling capacity.
- All this plus superb mechanical construction.

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HB33SP 3 element tri-band beam with dual drive for 14/21/28 MHz



TET SOLE AGENTS

Don't forget the fabulous VHF/UHF range by TET, details of which we shall feature shortly - but if you would like the full story now, an S.A.E. will do the trick.

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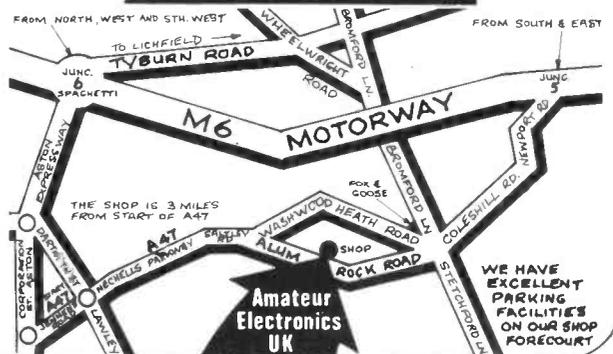
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WHERE TO FIND US



DATONG

NEW



MODEL PTS-1

TONE SQUELCH UNIT MODEL PTS-1

Designed to wire-in to the microphone and loudspeaker lines of existing FM or AM transceivers, Model PTS-1 provides a second independent squelch system. The squelch operates only when the incoming signal carries a pre-arranged tone of precisely the correct frequency. Thus two transceivers, each fitted with Model PTS-1, will respond only to each others transmission protecting the user from undesired interruptions. The system is ideal for Raynet groups, club nets, or groups of friends who wish to monitor for each others signals over long periods. Sixty-four tones in the range from 1747 to 2330 Hz are selectable by a DIL switch and a built-in notch filter removes the tone from received signals. Model PTS-1 is built to high standards using 9ICs on a glass fibre PCB. A full data sheet is now available. Unit price: £39.99 + VAT (£45.99 inclusive) (Note - a unit is required for each radio in the group).



MODEL AD270/370

COMPACT RECEIVING ANTENNAS MODELS AD270/370

Datong Active Antennas solve the age-old problem of finding space for a 'good' receiving aerial. Model AD370 mounted on a roof top or Model AD270 in a loft will give similar sensitivity to much larger conventional aerials yet are only 2 1/2 and 3 metres long respectively. Moreover they do not suffer from interference picked up by the feeder cable; such pick-up can be a problem with conventional dipoles because it is hard to maintain good balance over a band of frequencies. Although active antennas were introduced to the amateur market by Datong only a few years ago they have long been used by military and commercial receiving stations. The performance specifications achieved by the Datong AD270/370 are very close to those of "professional" active antennas selling for ten times the price - a point which is not lost on our many professional customers. The advanced design ensures two things: that you don't miss signals through inadequate sensitivity and that the antenna does not invent signals which are not there. Datong Active Antennas represent an advanced solution to a common problem and so far as we know have no serious competition in terms of performance at the price. (Reviewed in Rad. Com., June 1982).

GENERAL COVERAGE RECEIVER CONVERTER MODEL PC1

Once upon a time it was the norm to use a ten metre receiver to receive the two metre band. Now, large numbers of special purpose two metre SSB rigs are in use and conversion the other way becomes a very attractive possibility. With the addition of Model PC1 each of these two metre SSB rigs becomes a really good general coverage receiver (from 50 kHz to 30MHz!). Two metre SSB rigs are not cheap and it makes good sense to get the most out of them. They also tend to have very good performance in terms of sensitivity, selectivity, and big signal handling. Each of these features is just as vital for short wave reception and Model PC1 is designed not to degrade them at all. The result, your two metre SSB rig receives below 30 MHz as well as it receives on two metres. And compared to many medium cost general coverage sets, that is saying a lot! Try this test. Listen on twenty metres after the band goes dead in the evening. With many general coverage receivers the band never dies. It remains populated with phantoms generated by the receiver from the many very strong signals on forty metres. This is the kind of effect that the higher quality receivers minimise, and that goes for PC1 plus a good two metre rig. Reviews: Rad. Com., April 1982.



MODEL PC1

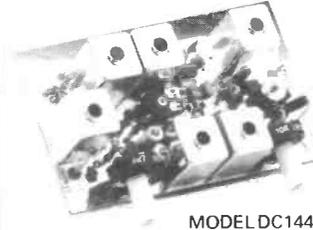
BROADBAND PREAMPLIFIER

MODEL RFA

Model RFA is designed to improve slightly 'dead' receivers within the range 5 to 200 MHz. It includes r.f. activated in/out switching so that it can be used to improve the sensitivity of low power transceivers (less than 20 watts PEP) simply by connecting it in series with the aerial. Most receivers have nearly adequate sensitivity. Adding Model RFA will give a useful improvement in signal-to-noise ratios without causing too easy overload on strong signals. The gain is fixed at 9 db for this reason. Conventionally most preamplifiers have been designed for single narrow frequency bands. By using modern broadband techniques wide coverage is achieved without compromising the noise performance. Model RFA is ideal for improving VHF scanners, HF receivers, mobile radio systems as well as for use on fixed amateur bands such as the 14, 21, 28, 56, 70 and 144 MHz bands.



MODEL RFA



MODEL DC144/28

HIGH PERFORMANCE 2 METRE CONVERTER

MODEL DC 144/28

Again strong signal performance is the key to the design of Model DC144/28. Where conventional converters use a dual gate mosfet as a mixer, the Datong uses a balanced pair of Schottky diodes fed with nearly 10 mW of local oscillator at 116 MHz. Where other converters use open wound coils, the Datong coils are in screening cans on a plated through board. The result: an unusual freedom from spurious signals and overload effects together with a spurious-free dynamic range of 90 db. As the Rad. Com. reviewer wrote "With a 3 db noise figure and 90 db dynamic range the Datong DC144/28 is one of the best 144 MHz converters currently available", Rad. Com., April 1982. Model DC144/28 is available either as a tested PCB module, as illustrated, or fully cased in a diecast aluminium box.



ALL DATONG PRODUCTS ARE DESIGNED AND BUILT IN THE U.K.

PRICES

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

FL3	112.50	(129.37)	AD370	56.00	(64.40)	Codecall	
FL2/A	34.00	(39.67)	AD270+MPU	45.00	(51.75)	(Linked)	28.00 (32.20)
FL1	69.00	(79.35)	AD370+MPU	60.00	(69.00)	Codecall	
FL2	78.00	(89.70)	MPU	6.00	(6.90)	(Switched)	29.50 (33.92)
PC1	119.50	(137.42)	DC144/28	34.50	(39.67)	Basic DF System	149.00 (171.35)
ASP	72.00	(82.80)	DC144/28			Basic Mobile	
VLF	26.00	(29.90)	Module	28.00	(32.20)	DF System	159.00 (182.85)
D70	49.00	(56.35)	Keyboard Morse			Complete Mobile DF	
D75	49.00	(56.35)	Sender	119.50	(137.42)	System	214.00 (246.10)
RFC/M	26.00	(29.90)	RFA	29.50	(33.92)	PTS1	39.99 (45.99)
AD270	41.00	(47.15)					

See previous advertisement or price list for further details.

Data sheets on any products available free on request - write to Dept S.W.

DATONG ELECTRONICS LIMITED

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

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Editor: PAUL ESSERY, G3KFE/G3SWM
Advertising: Charles Forsyth

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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.

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YAESU

FT1	Superb H.F. Transceiver	1349.00	(—)
FT980R	H.F. Transceiver	1115.00	(—)
FT902DM	160-10M Band Transceiver	885.00	(—)
FC902	All Band A.T.U.	135.00	(1.50)
SP901	External Speaker	31.00	(1.50)
FT102	160-10M Band Transceiver	785.00	(—)
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FRA7700	Active Antenna Unit	36.40	(1.00)
FT208R	2M F.M. Synthesised Handheld	199.00	(—)
FT708R	70cm F.M. Synthesised Handheld	229.00	(—)
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NC8	Base Fast/Trickle Charger	44.10	(1.50)
NC9C	Compact Trickle Charger	8.00	(0.75)
FBA2	Batt. Sleeve for use with NC7/8	3.05	(0.50)
FN2	Spare Battery Pack	17.25	(0.75)
PA3	12V DC Adaptor	13.40	(0.75)
FT480R	2M Synthesised Multimode	369.00	(—)
FT780R	70cm Synthesised Multimode (1.6MHz Shift)	409.00	(—)
FT290R	2m Portable Multimode	265.00	(—)
FT790R	70cm Portable Multimode	325.00	(—)
MMB11	Mobile Mounting Bracket	22.25	(1.00)
CSC1	Soft Carrying Case	3.45	(0.75)
NC11C	240V AC Trickle Charger	8.00	(0.75)
FL2010	Matching 10W Linear	59.00	(1.20)
Nicads	2.2 AMP HR Nicads Each	2.50	(—)
FF501DX	H.F. Low Pass Filter 1KW	23.00	(1.00)
FSP1	Mobile External Speaker 8 ohm 6W	9.95	(0.75)
YH55	Headphones 8 ohm	9.90	(0.75)
YH77	Lightweight Headphones 8ohm	9.90	(0.75)
QTR24D	World Clock (Quartz)	28.00	(1.00)
YM24A	Speaker/Mic 207/206/706	16.85	(0.75)
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YM38	As 34 but up/down Scan Buttons	24.90	(1.50)

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Multi 750E	2M Multimode Mobile	259.00	(—)
Expander	70cm Transverter for M750E	199.00	(—)

DRAE

4 AMP	Power Supplies	30.75	(1.50)
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VHF Wavemeter	130-450MHz	27.50	(—)

ICOM		£	C&P
IC740	H.F. Mobile Transceiver 8 Band	729.00	(—)
IC720A	H.F. Transceiver & Gen. Cov. Rec.	935.00	(—)
PS15	Power Supply for 720A	99.00	(3.00)
IC251E	2M Multimode Base Station	539.00	(—)
IC25E	2M Compact 25W Mobile	255.00	(—)
IC290E	2M Multimode Mobile	385.00	(—)
IC2E	2M F.M. Synthesised Handheld	169.00	(—)
ICL1/2/3	Soft Cases	4.25	(0.50)
IC HM9	Speaker/Microphone	12.00	(1.00)
IC BC30	230V AC Base Charger and Hod	45.00	(1.50)
IC BC25	230V AC Trickle Charger	5.00	(0.75)
IC CP1	Car Charging Lead	3.71	(0.50)
IC BP2	6V Nicad Pack for IC2E	29.50	(1.00)
IC BP3	9V Nicad Pack for IC2E	20.00	(1.00)
IC BP4	Empty Case for 6 x AA Nicads	6.95	(0.75)
IC BP5	11.5V Nicad Pack for IC2E	39.50	(1.00)
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IC ML1	10W Booster	59.00	(1.00)

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Ferrite Rings 1 1/2" dia. per pair	0.80	(0.20)
Toroid Filter TV Down Lead	2.50	(0.50)
Trio Low Pass Filter LF30A 1kW	20.00	(1.00)
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7.1 MHz Traps Pair	7.95	(0.75)
T Piece Polyprop Dipole Centre	1.20	(0.30)
Polyprop Strain Insulators	0.40	(0.10)
Small Egg Insulators	0.40	(0.10)
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4mm Polyester Guy Rope (strength 400kg) per metre	0.18	(0.04)
75 ohm Twin Feeder — Light Duty — Per Metre	0.16	(0.04)
300 ohm Twin Feeder — Per Metre	0.14	(0.04)
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UR76 50 ohm Coax — Per Metre	0.25	(0.05)

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£678.00



Amateur band transceiver

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AT120	All Band ATU/Power Meter	129.00	(2.00)
SP230	External Speaker Unit	39.00	(1.50)
TS430S	160-10M Transceiver	P.A. (—)	(—)
TS130S	8 Band 200W PEP Transceiver	531.00	(—)
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VFO120	External V.F.O.	93.00	(1.50)
TL120	200W PEP Linear for TS120V	159.00	(1.50)
MB100	Mobile Mount for TS 130/120	17.70	(1.50)
SP120	Base Station External Speaker	25.00	(1.50)
AT130	100W Antenna Tuner	88.50	(1.50)
PS20	AC Power Supply — TS130V	54.90	(2.50)
PS30	AC Power Supply — TS130S	96.00	(5.00)
MC50	Dual Impedance Desk Microphone	29.44	(1.50)
MC35S	Fist Microphone 50K ohm IMP	14.00	(0.75)
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TR9130	2M Synthesised Multimode	411.00	(—)
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TR7800	2M Synthesised F.M. Mobile 25W	257.00	(—)
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MK704	Squeeze Paddle	10.50	(0.75)
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EK150	Electronic Keyer	78.00	(—)

MORSE EQUIPMENT

MK704	Squeeze Paddle	10.50	(0.75)
HK708	Up/Down Key	10.50	(0.75)
EK121	Practise Oscillator	8.75	(0.50)
EK121	Elbug	33.00	(0.75)
EKM12A	Matching Side Tone Monitor	10.95	(0.75)
EK150	Electronic Keyer	78.00	(—)

TELEREADERS (CW & RTTY)

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MMT70/28	4M Transverter for HF Rig	119.95	(—)
MMT70/144	4M Transverter for 2M Rig	119.95	(—)
MMT1296/144	23cm Transverter for 2M Rig	184.00	(—)
MML144/30	2M 30W Linear Amp	69.95	(—)
MML144/100S	2M 100W Linear Amp (10W I/P)	139.00	(—)
MML144/100LS	2M 100W Linear Amp (3W I/P)	159.00	(—)
MML432/30	70cm 30W Ln. Amp (3W I/P)	95.00	(—)
MML432/50	70cm 50W Linear Amp	109.95	(—)
MML432/100	70cm 100W Linear Amp	228.64	(—)
MM2001	RTTY to VU Converter	169.00	(—)
MM4000	RTTY Transceiver	269.00	(—)
MMC50/28	5M Converter to HF Rig	29.90	(—)
MMC70/28	4M Converter to HF Rig	29.90	(—)
MMC1			

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

The Bands

WINTER'S come! Gone the autumn peak; by December the fallaway has, as usual, occurred. Why? Old hands have a good idea, but for the newcomers, it is simply a terrestrial seasonal thing, related to how many hours of the day in this or that part of the world the ionosphere is getting its daily dose of suntan, and hence, ionisation. At the equinoxes, when all the world is equally day and night (12 hours of each, no matter where), then all the world gets a fair crack of the whip. As for the difference between the spring and autumn equinox, take a look at the population distribution of the world and apply it to what you know. . . .

Towards the end of the period in question, there was some degree of lift in conditions at HF, and thus of deterioration at LF — but let's look at all the reports.

Twenty

Where much of the trade seems to stay, and where a new country will be found if all else fails. Our first reporter must be G3FPK (Purley) — our tame fugitive from the VHF bands. His main activity has been on SSB in the European VHF Net, and hearing a few late-evening watery Ws and S9 South Americans. On the preferred mode of CW, Norman notes contacts with JW6MY, KH6AK, NOZO/DU2, and 5T5TO.

GW4OFQ (Carmarthen) is in trouble with interference and has had to QRT for a month, but he did manage a few QSOs before the bar was put up; in the mornings CW to JA1BLX and KL7, SSB to ZL1HE and JA3HQG, while in the evenings it was all SSB, with such as D68AM, ZD9BV, KL7GKY, TU2JL, and ZL1ABO. Let's hope that next month we hear that Roger is free from problems again.

A new contributor now, in the shape of GW3NYY (Swansea) who is possibly best known in the Top Band field and at VHF. That doesn't stop Walt from having his bit of fun on other bands; Twenty SSB netted FM0GA and G4CTQ/ZB2 (who was previously 5N0SID), while a turn to CW raised UK9OAA/U8L which was a DX-pedition to Oblast 185, the QSL route being via UA9OBJ, VP2MM at 2200 one evening, and J28DP.

He's not done a lot on the bands this time, says G3PKS (Wells), largely because he has been playing with some rather natty aerial ideas — still based around his low horizontal loops but changing things by altering the feed methods, so as to alter the angle of radiation of the main lobe and be

able to 'adjust' the range from the shack on the LF bands. A write-up for us is promised, once Jack has things nailed down to his satisfaction.

A nice thought, too, from Tom, G2BON (Aldridge), who sent a listing for a 'QSL Corner' and promises some more in future months. All good deeds get their reward, and Tom worked YI1BGD, 5T5AP, AL7DN, CEOEVG/Z on Juan Fernandez, ZL3AAA, WL7ATN, ZL1DL, ZL3AAT, JY5YK/OD5, and ZL1BEB. The YI contact was the first one we've had noted in *CDXN* for a long time.

Top Band

G4AKY (Harlow) Xeroxed his logs for the month, as he was rather busy, and then he marked off the juicy bits and the comic turns. DL0HSC/5B4 was worked a couple of times, UA9S JL, UA9FKW, UA0BAJ who slowly disappeared into the noise, UA9CPB, UH8DC, DJ6QT/CT3, FC9VN, ZB2EO, VE1BVL, UD6DLL, UF6FHC, UL7CAD, UA9FDU, UA9CTE, VO1HP, VE1BVL again, VE1ZZ, W2FJ, W100, H18DAF (believed, call not completely copied), K1MM, W1CUL, UK9FCM, VE1BVL, W2BHM, N4IN, N4SU, 5N8ARY, UK2PCR/U6V, UM8MAZ, R18DAA, UK2BAS/U6G, EA8QO, UA9S JL, UA9AJC, UA9FKW, DJ6QT, EW6V, 4X4NJ, SP1DAM, RG6G, EA8AK, and of course the small fry from Europe. The comic relief was given during the QSO with R18DAA, who first copied Dave as GI4AKY, then as GI4TKY. He still hadn't got it right when along came UT5BN; after a little by-play, the latter, who obviously saw the funny side, came to rescue G4AKY, and continued with a QSO himself. At the end of this, says G4AKY, UT5BN had made the R18 station aware that he had worked G4AKY and no other, but for all his efforts he couldn't get his own UT5BN call over to the R18! It must have been a bit wearing to all three operators.

SSB on Top Band for G2HKU (Sheppey) gave PA0PN, HB9AMO, DK2QL, DKODX, EA8AK, PA0SE, and PA3ACQ; then a flip of the switch to CW accounted for UL7CAD, DL0HSC/5B4, LA2IG, OE8LKK, UQ2GKM, UA3PFN, GI3ALT, ZB2EO, GW3JI, GM3LWS, OZ5RM, YU3EF, OH2TI, OH3TQ, F9KP, DL8CM, OZ1W, GM3WTA, GM3ZSP, DL1YD, EA9EU, 5N8ARY, F3AT, GU3TXF, RG6G, LA40, 4X4NJ, OH0W, DJ2TI, LX2BQ, and EA2OP.

Our next offering comes from G3OUC (Newbury) who has been up on Wallbury

Hill, operating portable with a box-kite aerial support system; this activity on a Sunday morning seems well able to stir up activity to the tune of at least 100 miles radius with the old AM mobile gear in daylight. The new home-brew SSB tackle is almost ready and then watch things hum! At home, the local QRM is slight as G4MLG is suffering from a surfeit of work and some problems with his home-brew transceiver. The biggest bind locally is the rash of 'cordless telephones' which are set up to transmit at around 1.950 MHz when speaking in one direction, the return path being believed to be on VHF. The answer to this one is very definitely a formal complaint laid to British Telecom — and if in any doubt as to whether they will react send a copy of the letter to the responsible Minister.

Long before your scribe took over this piece after the death of G6QB, while he was still an SWL and wet behind the ears, he used to read what in those days was called "DX Commentary" in *S.W.M.*, and marvel at the exploits of such as G3GUM, G3BDQ, G2DC, and an SWL who later turned into G3NOF, and wonder what sort of magic these chaps wielded. How nice then to hear again the call letters G3BDQ, and still from the Hastings area. When G6QB died, John went VHF for many years but in the last couple he has gently sidled back to the old haunts, first with home-brew gear and latterly with a TS-530S; Top Band aeriels were first re-erected some six weeks before his letter — say mid-October — a $\frac{3}{8}$ -wavelength top, fed against an earth plane made of three quarter-wave radials and some 600 feet of buried wire. An hour or so playing in the WW SAB contest one evening resulted in Phone QSOs with UA3, YU, UP2, UB5, HBO, OK, UK2, EA9, UT5, RG6, UC2, OHO, and F. This naturally led to the deduction that to plug in a key would extend the horizon a little. VK6HD was raised, and VK4MK, both around 1850 kHz simplex. Other stuff worked on the band on CW included UL7CAD, UL7TBM, LX1YZ, FC9VN, ZB2EO, OE9JKH, OE7, UA9S JL, OY7ML, UK2BAS/U6G (Armenia), UK9AAN, 5N8ARY, lots of EUs, not to mention SPs, 4X4NJ, RG6, EA9EU, EA8AK, 4U1ITU, 4N1UB, 4S9s, and VE1BVL; and John does not burn the midnight oil, albeit he will on occasion be up in the mornings for the DX. G3BDQ still retains the knack, pretty obviously!

GW3NYY was able to use the superb aerial-farm at GW4IOI during November — the relevant bit is a 270 foot wire at 200

feet, with a remote controlled tuner at the 200-foot level and coaxial feed downwards. Walt tried this in the 2nd RSGB Top Band contest, November 13/14; it was noticeable for a complete absence of Russian signals but some 164 contacts were made in 45 counties and 14 countries, including LX1YZ, FC9VN, ZB2EO, and LA4O as highlights of the evening. One week later comes the Austrian contest, for which Walt has a soft spot; this made a poor start but livened up around 2130, so GW3NYY finished up with 154 QSOs in 73 different prefixes and three continents, the best being 5N8ARY, EA9EU, EA8AK, UA9MR, and EA3AQS. Plenty of Russians on for this one, but no QSOs because they were all calling WSEM in some internal Russian shindig!

Ten

Our first reporter on this band is G4HZW (Knutsford) who still uses a TS-820 and two-element Quad aerial. Tony found the band good on occasion, but not as good as 1981; openings were shorter and conditions were disturbed a little more often. Mainly SSB, but with some CW, G4HZW connected with: 4D9RG, 5H3BH, A71AD, DU1PJS, HL2GS, HL1AHW, JAs, JT1KAI, KHOAC, PY3CB (at 0800 on long path!) UA9s, UA0UCW, VK2 to VK6, all W call areas, Y11BGD, Z21GL, ZL3ACT, ZL2AZU, ZS6UY; plus, during an *Ar* opening, PA, GM and southern G stations.

"CDXN" deadlines for the next three months:

February issue — January 6th
 March issue — February 3rd
 April issue — March 3rd

Please be sure to note these dates.

We have to hand the 10-UK Newsletter, which provides a forum for addicts of the band. Perhaps this is as good a time as any for us to point out that it is but courtesy for any stations on the band to keep clear of the area — say 29.3 to 29.6 MHz — where one may expect to find satellite downlinks, whether they be from *Oscar*, or the Russian *RS* series. For the rest, we go along very much with the 10-UK admonition that if we don't use the band more, we stand to lose it, whether by Governmental action or by default to the CB-ers. To be fair, CB-ers either aren't aware of amateur radio to any extent, or, worse, are in fact trying to operate in a legal way against great odds in their own bands. Thus, while a bit of CW to 'zapp' an offender out of the band — especially if he is in the CW bit — is fair enough, there is much to be said for the idea of a little bit of work on converting them to our way of thinking.

G3FPK, on this subject, comments that although his local 'taxi-service' is still a pain in the neck, its gear is not well able to cope with a few watts of CW — and it isn't very popular with the local CB lads either! Norman didn't find much paydirt here, PYOZZ on Fernando do Noronha being one and W4GSM/HC8 being the other; the latter reckoning to appear with special prefix during the contest for which he was preparing.

G2BON sticks to his SSB and his G5RV aerial, and this seems to have made the grade to 7X2CR, PJ2WG, J3AH, PJ9EE, 4D9RG in the Philippines, DJ6QT/CT3, OH3DB, VK1MM, VU9YOU, TG9NX, 6W8AH, mainly around lunchtime or when the tea was brewing.

G3OUC takes his ten watts of SSB out portable on occasion, and he managed two-way contacts with G3ZGC/MM, KB2QN, KC3W, K2TV, K9KQ, W2RP, WA4BBI, N4EBZ, JY9RV, JG11I, E8ADY(?), UO5OEP, VE3KDT, UA9LCV, RA9CEM, 4X4IA, Z21DF, ZS6AVQ, VE1BYY, W1CUX, SV1JG, and SV0AN; these last four were worked by going to the top floor of a local multi-storey car park in Reading. On a different tack, Pat wants to know if anyone has data on conversion of CB rigs to our ten-metre band.

GW3NYY, like your scribe and others, noted the advertisement in American magazines for a 'Woodpecker Filter' — and reflects that it's an ill wind that blows nobody any good! During the CQ WW CW contest, Walt tangled on SSB with 9Y4W, VP2VDH, ZS3HL, PZ1CC, ZS3HL, DJ6QT/CT3, N1GL/6Y5, ZF2FL, VP5B, VP2EC, WA6ZVO/PJ4, and V3DX, this being a new prefix for Belize.

Oddments

Quite a bit here; 5N4BPC is a long-time reader of the *Magazine* — we recall him indeed as an SWL — and he is now getting interested in the idea of taking up RTTY with the help of a ZX81 or similar home computer. *Ergo*, Brian says, why don't you (meaning G3KFE) get some articles into print for this: computer usage for RTTY and SS/TV. A Great Idea! We would be pleased to receive any offerings of this sort, from 5N4BPC or elsewhere, and we would note that the SARUG group of Sinclair users in amateur radio is *not* now defunct, but still operational — maybe they could offer something?

G8UYD reminds us of the Sherwood Forest Award, which was set up some long time ago by the Mansfield club. For all the details on this rather nice wallpaper, get in touch with Graham Ridgway, G8UYD, 83 Moor Street, Mansfield, Notts.

Remember the GB2BT station to celebrate the first year of British Telecom? It was part of a set-up which seems to have been very effectively showing members of the Reading BT staff and others just what a wide range of activities there are in

Amateur Radio, with some help from various traders with demonstration set-ups. We congratulate them on a good job well done. Some may have laughed at the idea of a first birthday for BT celebration, but the point was its imaginative use as an excuse to show the Amateur Radio flag, which is another matter altogether.

We have a little note and QSL card from regular reader F6EYK — hi there, Bernard! — who has managed to get sight of the BY1PK QSL cards, and sent us copies. Rather nice, particularly that the card to JH1WIX has the 'remarks' bit written in Japanese. Someone in BY1PK is taking trouble to remind us all that the QSL and what goes on it is the ultimate courtesy of the QSO.

Another different tack now. The question of 'Suitland' is taken up by G4GAR after our remarks a while back. John finds 43N 155W very close to the 5000 metre depth contour according to an atlas published in 1967. The only Suitland in the *Gazetteer* is in the state of Maryland and is a suburb of Washington DC. No other 'Suitlands' have been picked up in other gazetteers. The US Navy Hydrographical Office was situated in Suitland in 1952 and may well be still there. Thus John suspects that Suitland will rank for DXCC with the Lost Continent of Atlantis. Over to the DXCC desk at ARRL!

Next we have the invaluable W1WY Contest Calendar to look at. Firstly we have results for the 1982 CQ WW CW contest, and here we must congratulate GW3NYY on doing eighth in the single-op category, in which NP4A was the leader. Turning to the multi-op category, the Top Ten includes G3RPB top, GM3IGW fourth; turning to the Phone leg, the top G was GW4IOI at sixth, with G3XTT seventh and G3LNG eighth. Scoring was remarkably consistent for both modes — if you had a score around the 100K mark you were going to be somewhere 'in the ball-park.' Congratulations to all mentioned.

The 1983 Top Band CQ WW has its CW leg over January 28-30 and the SSB leg February 25-27, starting time 2200 GMT on the Friday and finishing 1600 GMT on the Sunday. The Rules have been changed this year, and so we suggest you contact CQ magazine first.

Xtal Ball

Snag — no Wicked Witch to drive it! However we have a couple of Good Fairies in the shape of *DX News Sheet* and *The DX Bulletin*.

Both the Good Fairies report BY8AA, this one is sometimes on in the mornings working Europe and is notable for quite a chirp, caused by, it is understood, poor power-line regulation; CW of course. The VE7BC activity from BY1PK made about 700 QSOs, and we understand the cards are coming to hand in about three weeks from the QSO date and are numbered — which should be a help in keeping the

bootleggers off this rare country.

As for TT8LM, we have word both that it is coming shortly and that it has been postponed indefinitely!

The Heard Island DX-pedition — Jim Smith's effort — is still needing some donations and at the time of writing needed another operator, so if you have 3K dollars to spare, telephone G3GIQ and you might still be able to join the party.

Commencing in January, both K4YT and K4DDA are setting off independently for longish DX-peditions; the former hopes to include YI, AP, VU, 4S7, HS, 9M2, XW, 9V, YB0, DU and BY, while K4DDA says his itinerary will include JY, A4, A7, A6, A9, 9K, HZ, ST, 4W, SU and YK. We keep fingers crossed.

The ZA operations of DL7FT came to nothing, but it is understood that he hopes to go again next year, with DJ0UJ, who is an Albanian national, which should make the getting of a licence a little easier.

About the time this is being written Lloyd and Iris Colvin will be on from Abu Ail for a short spell, the call being G5ACI/AA. DXNS quotes the Yasme Foundation as saying this is the most difficult operation these two have ever mounted.

The October 2 date saw the S.M.O.M. operation completed, and cards are in the printing. It is understood that there will be no more operations from this country at any time in 1983.

Fifteen

Time closes in on us apace this month, so we must press on.

G3FPK's make-shift of an aerial only tunes up on the band in a driving rain-storm, which doesn't help much; but VD3GCO in Canada was raised on CW.

G2BON doesn't seem to have put in much time on the band, as his SSB only managed JR6YAH and JR4MQB.

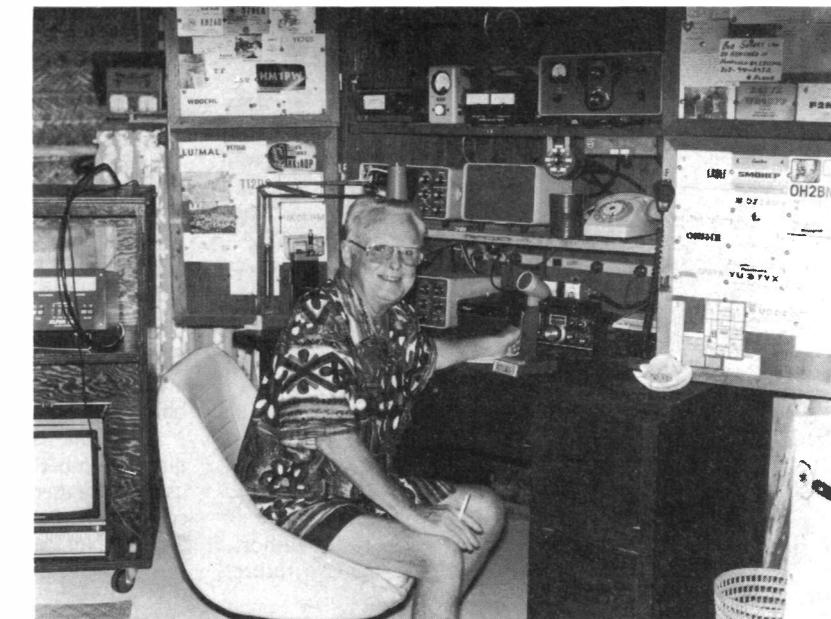
A short list from GW3NYY too; he made it on SSB to VP2MR, HZ1AB and DJ6QT/CT3, all around 1700z.

Another one with a short list is G2HKU, who found his CW good enough to raise JA5RH and JA2WAC.

80 and 40

Not given a lot of notice by many of our reporters this time. GW4OFQ offers JA6BJI, JA6IEF at teatime, 4X6CA and A71AD around 2000, then at 2200 4X6DK, and hour later ZB2EO, and VP2CP at midnight. The best time seems to have been between midnight and dawn, when he found and raised AP2ZR, C6ABG, C31VC, EA9IB, VP2MCK, 6Y5IC, 4X4UH, PT7BH, 6Y5MJ, 3A2EE, and plenty of US stations.

G3ZPF (Dudley) has not been smitten with the band for DX this season, as only UA9 and UAO have been heard. ZC4 and SV both slipped through his fingers while he was realising he needed them both, and as for the 5B4 QSO that came to a sticky end: "Murphy put down his pint, walked



This unseasonal picture shows Bob Savery, F08HG, in his shack on Tetiaroa. Tetiaroa, which belongs to Marlon Brando, is a cluster of twelve islands and coral atolls in French Polynesia, and Bob is the resident radio engineer there. Part of his regular routine is to pass daily weather reports to the French administration in Papeete. F08HG is very active on the amateur bands and has a regular sked with G5BSW in Harrogate.

photo: Rose Tilly

over and turned off the conditions!"

G4BUE ended up putting in a QRO entry for the CQ WW CW contest, after his plans for an all-band QRP entry were disrupted by a work commitment at the last moment. The first night was punk — with half the aerial not connected but no change to the VSWR(!) After that was set to rights, the second night went much better and lots of DX was raised, although it was annoying to hear the Eastern Bloc working loads of JAs Chris couldn't hear! On a different tack, some time back Chris wrote a little note in the QRP Club magazine about 'sloper' aerials, with which he is much enamoured — so much so that he has been doing some more work on them as a compact HF-band beam aerial arrangement, and he wonders if we would like an article. We would — and so would *all* of us with no room for ordinary beams.

The LF Bands are the next stop for G3FPK, who has just rumbled that he has two cypress trees at 132 feet apart, albeit their magnetic QTF is 298/118 degrees. Making a due allowance for variation, and hoping that deviation is in one's favour this could turn a not very hopeful looking alignment into something quite interesting. Suck-it-and-see seems to be the motto here!

G2NJ (Peterborough) mentions hearing the SP prefix on Eighty; in addition around 1450 he heard SM7DLZ working JAs, although they were not audible at G2NJ — this is a repeat performance of the happening last year in November, and it is a bit frustrating to know the skip just

doesn't get quite enough!

G2BON looked on Eighty SSB to find EA8PP, D44BC, 5T5TO, and 6W8DY, while on Forty the tally included 6W8DY again, CX8AC, VE2FU, PY2ESK, and EA9KF.

QSL Corner

All this thanks to G2BON.

6W8AH to CSS, PO Box 2031, Dakar; JY5KK/OD5 to OE3YLK; YB0ACL to WA4RRB; 4D9RG to DU9RG; AL and DN to KL7GNP; 5T5AP to CT4UW; VU9YOU to K4YT; CEOEVG/Z to PO Box 3016, Vlaparaiso, Chile; ZF2FL to N6RJ; HH2WW to N4WW; 9NIMM to N7EB; FM8CD to F5VU; FMOHOR to K6YRA; TU2LE to F6ESH; 6W8EX to PO Box 35, Ziguinchor, Senegal; EL8N to SM4CY; Y11BGD to Box 5864, Baghdad, Iraq; TU2JT to F6CXV, TR8CR to F6AQO; D44BC as for old call D4CBC; J6LB to P.O. Box 732, Castries, St. Lucia; S79MC to AK3F; VP8LP to G3VPW; P29CH to Box 496, Port Moresby; C53CG to K4YT; VK9NYG/AX9NYG to VK6NE; JT1BG to P.O. Box 158, Ulan Bator, Outer Mongolia; VK9NS, to P.O. Box 90, Norfolk Island; 5T5TO to F6BUM; A71AD — was A7XD; 7Q7LW to P.O. Box 24, Makataka, Malawi.

Finis

Where we say farewell for another month, the deadline for next time being in the 'box'; and that is the date for it to arrive, addressed as always to your conductor, "CDXN", SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ. Mind how you go!

A MICROPROCESSOR CONTROLLED MORSE DECODER, PART II

Peter Lumb, G3IRM

The Memory Board

THE memory used in the decoder is much larger than needed but has been used for the following reasons:

1. It costs only a little more than a number of smaller ones.
2. Additional memory space is available if needed.
3. It is interchangeable with other circuits built by the author.
4. By adopting one type of memory as a standard future constructional projects are simplified.
5. It is easier to wire up one IC than interconnecting several smaller ones.

The circuit used is well known and has appeared in print more than one occasion with slight modifications. Inputs on CMOS devices should never be allowed to float so resistors are connected to each input, any value between 10K and 100K can be used; due to the number involved it is advisable to use the smallest wattage available. It might also be mentioned that thin connecting wire should also be used and 28 swg tinned copper wire covered with 0.8mm. p.t.f.e. sleeving is recommended. The use of IC holders is also strongly recommended as there is nothing more annoying than wondering if an IC is faulty and not being able to replace it without considerable unsoldering.

When power is connected the four gates in the CD4071 are opened allowing signals to pass into the memory which is a 6116. (The standard 6116 was used originally in this design but was later changed to the special low power version intended for battery back-up systems). At the same time the nicad battery is trickle charged. When power is again switched on the battery is disconnected but maintains information in the memory when no power is available. In this way an R/W memory can be used as a ROM but data can also be altered as the program is being run.

Construction is quite straightforward, but it must be remembered that the connections to the sockets must agree with those in the programmer. The Minicon sockets are glued to the edge of a piece of Veroboard and connections made to the copper strips to form a plug-in board. Although CMOS devices have static protected inputs it will do no harm to repeat the warning given by the manufacturers not to handle them more than necessary, and to avoid touching the pins as much as possible.

Testing the Programmer and Memory Board

The writer is a firm believer in checking as much as possible as construction proceeds and it is now possible to program the memory and verify the program entered. The program will, of course, only be a short simple one as there is no need to fill the memory as it can be assumed, at least for the time being, that if part of the memory can be programmed the whole of it can.

There are four systems of numbering which are common in computer use, namely binary, octal, decimal and hexadecimal and it will be assumed that anyone who may wish to construct digital equipment will at least know what is meant by binary and decimal. Of the two other scales, the octal one is the most useful so far as the 8085A microprocessor is concerned as the instruction codes are closely related to one another when written in octal. In octal there are no such numbers as 8 and 9. This simple program used to check the memory is not long enough to show the relationship between the scales, so the first 20 decimal numbers

Table 1

Decimal	Octal	Binary	Decimal	Octal	Binary
1	001	00001	11	013	01011
2	002	00010	12	014	01100
3	003	00011	13	015	01101
4	004	00100	14	016	01110
5	005	00101	15	017	01111
6	006	00110	16	020	10000
7	007	00111	17	021	10001
8	010	01000	18	022	10010
9	011	01001	19	023	10011
10	012	01010	20	024	10100

are listed in Table 1 together with their equivalents in octal and binary.

It is quite easy to convert binary into octal by dividing the binary number into groups of three from the right. As the data used in the memory is built up of eight-bit words, the following conversion of an eight-bit binary number into octal can be used as an example:

Binary 011101010
Octal 1 6 2

Treat each three-bit block as a binary number (maximum of seven) and translate each block into decimal; this gives 162 as the octal for the binary number quoted. The reverse operation is used to convert octal into binary. In addition to the octal coding used by the 8085A a list of mnemonics is also used by the makers to assist in programming. Each mnemonic has a corresponding machine code (binary) and either or both can be found in programs. The advantage of using mnemonics is that the meaning of the instruction is more obvious than in either binary or octal

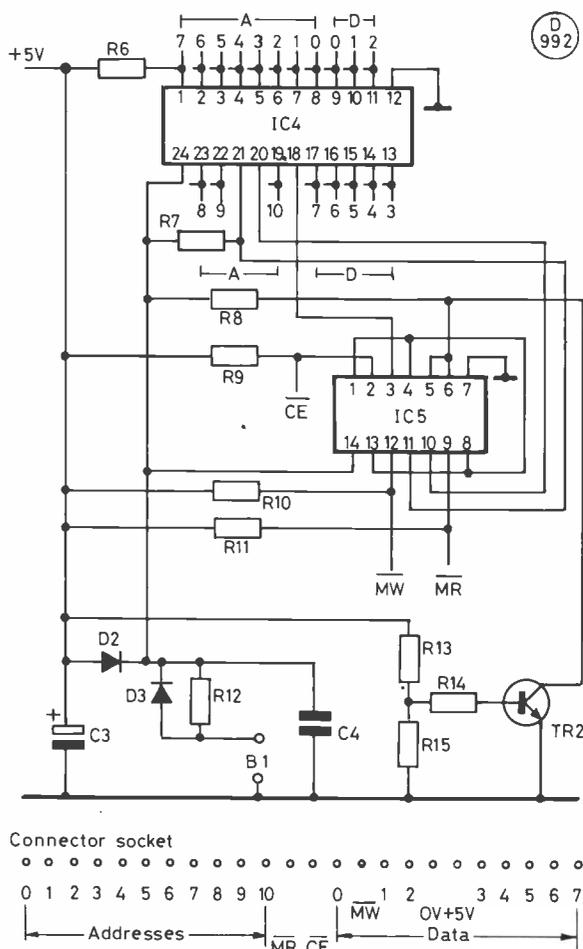


Fig. 2 MEMORY BOARD CIRCUIT

Tables of Values

Fig. 2

- R6 = 10K to 100K
 - R7, R8, R9,
 - R10, R11, = 47K
 - R12 = 2K2
 - R13 = 270R
 - R14 = 1K
 - R15 = 56R
 - C3 = 4.7µF tant.
 - C4 = 0.01µF disc
 - TR2 = BC107 or similar
 - IC4 = 6116LP
 - IC5 = CD4071
 - D2, D3 = 0A47
 - B1 = 3.6v. 100mAh nicad
- Note: R6 is duplicated on each address and data line marked 'A' and 'D' in the diagram.*

Fig. 3

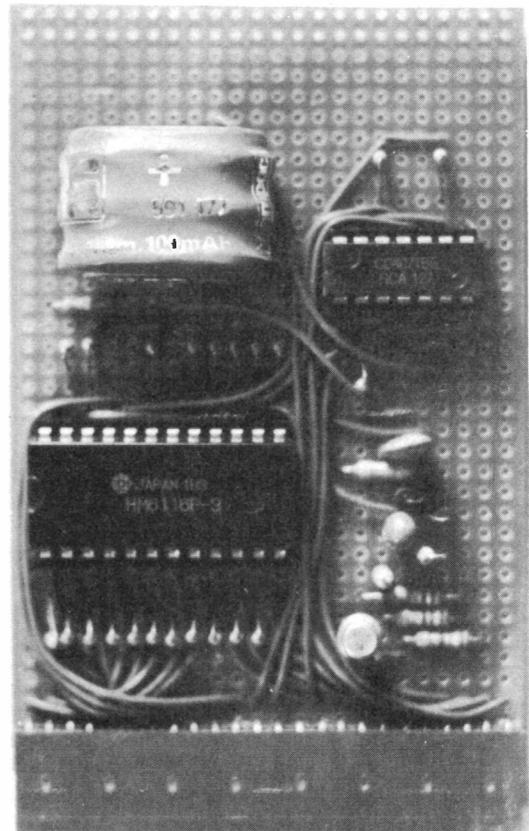
- R16 to R22 = 470R
- IC6 = CD4511
- IC7 = DL704

code. They do, however, have to be translated into either of these codes for use by the microprocessor.

Programming the Memory

To program the memory first charge the nicad battery by means of a charger if this is available. If not the battery can be charged but at a much slower rate by soldering it in place, plugging the memory board into the rear row of connectors on the programmer, and applying 5v. to the power lines. Assuming everything is wired correctly the programmer can be left connected for some time to charge the battery. To commence programming, close the reset switch to Ov. and then release it. This operation sets all the address lines to 0 which can be checked at the appropriate pins of the 6116 with a voltmeter. Enter the data at instruction 000 by means of the switches and press the programming switch once, following this by pressing the addressing switch once. Data has been entered at address 000 and the programmer has moved to address 001 for the second data code to be entered. If a counter is available which will count single pulses it can be connected to either pin 12 or pin 13 on IC2 to keep track of the address being programmed.

The programmer described so far is about the simplest that will do the job though the addition of a counter is well worthwhile and is virtually essential when entering the main program — so much so that the construction of a special counter can be considered as an optional extra; a suitable circuit is shown in Fig. 3. Three of these units can be assembled side-by-side on a piece of board and



The memory board

provided with two wires to connect the power supply. There are three inputs to each section labelled A, B, and C; these are connected to a Minicon socket by flying leads as follows:

Input	R.H. display (most significant)	Centre display	L.H. display (least significant)
A	A6	A3	A0
B	A7	A4	A1
C	A8	A5	A2

The board to be programmed is plugged into the rear row of pins on the programmer so that the Minicon from the display can be inserted in the front row of address pins, such that the address pins on the display correspond with those on the programmer. During verifying these connectors are reversed. As the addressing switch is pressed the counter will count up in octal to a maximum of 777. If there is any doubt about the accuracy of the programming there is no need to check it immediately, just continue to the end, verify it, and keep a note of the addresses which have been programmed incorrectly. A similar display to that described above can be used in place of the diode readout, but as the switches used in programming are in binary it is convenient to have the readout in the same number system.

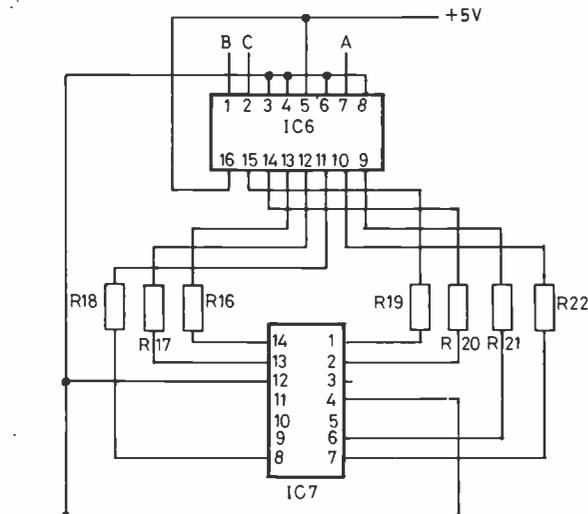


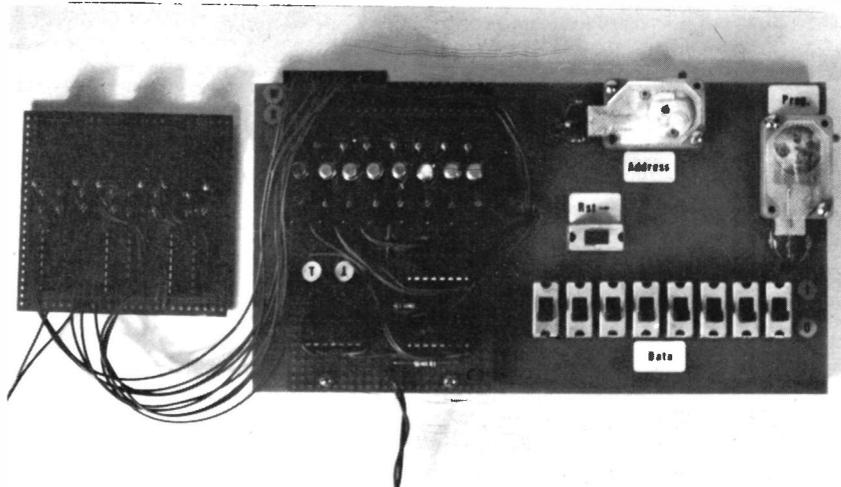
Fig. 3 COUNTER CIRCUIT

(D 993)

Table 2

Octal address	Decimal address	Data octal	Data binary	Mnemonic
000	0	076	00111110	MVIA
001	1	230	10011000	
002	2	323	11010011	OUT
003	3	203	10000011	
004	4	333	11011011	IN
005	5	200	10000000	
006	6	323	11010011	OUT
007	7	201	10000001	
010	8	166	01110110	HLT

Programmer with address display



It is fairly easy to be careful with a short program, but when the main program is entered extra care is needed to ensure everything is correct and the counter will be found almost indispensable. The short program given in Table 2 can be used. When the program has been entered, disconnect the power and transfer the board to the front connectors; reconnect the power and close and release the reset switch. The address counter will indicate 000 and the light emitting diodes will show the first data entered at this address. Press the address switch once and data at address 001 will appear, and so on. After address 010 has been reached there is no harm in continuing but what will be seen will be the miscellaneous information present in the memory. The last instruction in Table 2 is interesting as it instructs the microprocessor to halt. When this

program is run almost anything could happen if the HLT was not included as the processor would continue into the miscellaneous information in the memory and do its best to interpret it; including the HLT instruction effectively isolates the rest of the memory and stops operation at address 010.

Provided the battery is charged the programmer can be switched off. Next time it is switched on the program entered will still be there ready for use. The memory board can, of course, be removed and replaced at a later date or transferred to the microprocessor for checking and subsequently, when fully programmed, for use in the Morse decoder.

to be continued

AN EXTRA HAND

A CHEAP AND VERSATILE PCB JIG

J. GERARD

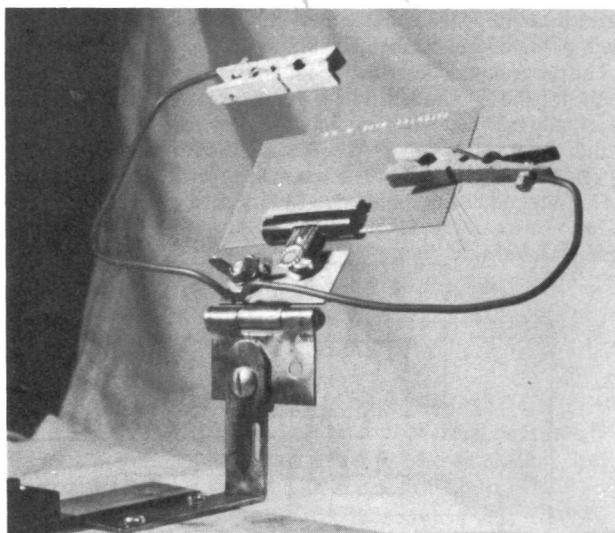
As a constructor, I am well aware of the difficulty of holding PCB's whilst under construction. Described here is the solution I have found to this problem, which also enables the components necessary in board construction to be held. All the materials used can be bought at DIY shops or ironmongers.

The photograph shows the idea. The hinge is a common door hinge; it needs to be fairly stiff, and it can be made stiffer by squeezing the clasps in a vice or by giving the clasps a moderate tap with a hammer. The angle bracket can be any type as long as it has holes that can be used to mount the hinge, and also to mount it to whatever you find suitable — it could for instance be mounted to a piece of scrap wood 2" x 6" for portability.

All mountings (hinge-to-angle bracket, clip-to-hinge and component holders) are made with 6mm. roofing bolts, washers and wingnuts. This is to allow the circuit board to be worked on in as many attitudes as possible in either the component side or by flipping the hinge over to solder the foil side.

The component arms are made from 2.5mm. twin and earth house wiring cable; the wire is easily bent to hold most small components in position for soldering, and these are mounted on the hinge and flip over with it, an eyelet being bent in the centre of the wire to facilitate its mounting.

Spring-type clothes pegs are bolted to eyelets bent in the ends of the arms to hold components or accessories, such as a small magnifying glass. The grey outer insulation of the 2.5mm. cable is



stripped and used in the jaws of the 'bulldog' clip to alleviate scratching the boards, providing a very good grip and allowing them to be tested in the holder. This can be slid into the jaws, or a drop of epoxy may be used to hold it in place.

This device came about because commercial PCB jigs are both expensive and limited in their use. The jig featured here is a cheap and versatile aid to the electronics constructor, which has proved itself invaluable.

• • • SWL • • •

SHORT WAVE LISTENER FEATURE

By Justin Cooper

OUR first task must be to congratulate all those who have come up with RAE passes and/or Morse test successes — one of the sorts of news that makes this column worth while!

This leads on to the thought that the most important part of any shack is the 'nut between the ears'. And if he has, say, some 7-800 prefixes booked in, then it is a fair bet that our SWL has a good idea as to what he or she is up to. Many such have stations of the most simple — for example it was, we recall, John Fitzgerald who put in HPX lists to the tune of around nine hundred before he gave up his "two transistor portables helping each other" in favour of a simple communications receiver; and we don't remember any rise in the rate of acquiring prefixes between getting the communications receiver and getting the licence, either.

One area where individuals vary quite largely is in their definition of "heard". Some chaps will only claim a station for a new prefix after they have listened to him for several QSOs and assured themselves beyond all doubt that they have got him taped. Others won't claim a station until they have made 100% copy of *both* ends of at least one QSO; and most people do try to be quite sure they have identified their station and not the other end of the QSO... but there are some who are a bit less fussy. All we can say is that to make a fast rise up the table one needs the hours at the receiver — and so we generally know when somebody is putting in a shaky claim, and then we monitor it to be sure. 'Nuff said!

The Mail

J. Dunnett (Prestatyn) has passed his RAE and now the Morse, and is waiting for the Class 'A' ticket to arrive; meantime Jim is getting the station and aeriels 'ship-shape and Bristol fashion' — an FT-101 which receives its inspiration from a 66-foot top fed with open-wire feeder from the centre, used for 7-28 MHz. Jim is not able to do much on 80 and 160m., though, as he doesn't like strapping the aerial terminals together and feeding the lot Marconi-fashion through an ATU for fear of TVI. All we can say is we've never had the chance to do anything better; and the only TVI we ever had was on Eighty and needed braid-breakers to cut up the 'outer circuit' of the TV feeders. This talk about end-feds and TVI is just another nugget of truth buried well out of sight by a soil largely comprised of hot air!

Learning CW is the current interest for *T. Kirby (Cheltenham)* who notes that there is a very definite relationship between one's state of mind and ability to copy the stuff — if the mind is relaxed the receiving speed is noticeably improved. Agreed, and we should go further — if one is really 'tight' then the ability to read copy falls away very badly indeed. The only answer is to try and be in a relaxed frame of mind always; and if the thought of taking the test is terrifying, then ask the doctor for something to take just before you take the exam. Tim has noted that sometimes he is reading the stuff while talking to a pal, but if he picks up paper and pencil then it all just goes. Oh, well — practice and more practice!

QRT for the summer has been the scheme of things for *N. Askew (Coventry)*, and a further snag is that there often doesn't seem to be time for listening in the evenings.

B. F. Hughes (Worcester) is now on from the new site, and finds it a better site for SWL all round, even though it is such a short distance from the old place. The height, Bernard opines, it the thing.

That distinctive fist of *E. W. Robinson (Bury St. Edmunds)* now makes its appearance at the top of the pile, with quite an assortment of interesting prefixes heard to take him up to 2134.

J. R. Cox (Treherbert) wrote to us a while back on the subject of getting a start in SWL — our advice seems to be working as he

now notes a string of VKs heard, including VK9NF on Norfolk Is., not to mention lots of Americans and other North Americans and HZ1AB.

Turning to *M. Law (Chesterfield)* we have it that Mike is now retiring from the HPX Ladder as his new call has arrived — he is now G8OKU.

The interest for *C. M. Lindars (Wallington)* of late has been in comparing receivers — in his case the FRG-7 and an SSR-1, and the problem now is to decide which one to keep and which to dispose of — difficult! Most people seem to get over this by keeping both, and calling one the 'standby'.

The WAB activity has been entertaining *J. Goodrick (Newport, I.o.W.)* somewhat of late, and John is well on the way for the basic award; but now, he says, for the moment he has other fish to fry. John's report is one of the few to cover all bands; on 24 MHz he heard OY7ML, CT3, DL and G, while on 18 MHz it was F9, DJ2, and Gs. 10 MHz has been very erratic but the activity is well up since the W and VE lads and lasses are to be heard. Plus of course the usual things on 14/21/28 Mhz, with all continents heard within 21 minutes on September 24, between 1720 and 1741z, on Ten.

J. Heath (St. Ives, Hunts.) reckons his U5YY should be deleted from his score as a misreading of YU5YY — OK, but we aren't all *that* sure! Seriously, it is easy enough in all conscience to miscopy a signal — but if the miscopy is such as to result in the call of a rare 'un, then one's own instincts must be the final arbiter — we don't know how it sounded in *your* ears! This can be important; for example, if the writer was on SSB and using the inbuilt speaker, any doubts would result in an immediate transfer to an outboard speaker of good sound quality before we would make a firm decision.

H. M. Graham (Chesham) has been on Top Band and heard 5N8ARY being called but couldn't find the 5N8; one wonders if Maurice in fact tried to listen down at the LF end of the band, as most DX operating is split-frequency on Top Band and the last place to look for the DX is where people are calling him. That being said, 5N8ARY didn't by all accounts work all that many stations, even though most of the Top Band 'regulars' seem to have known he was around.

On now to *B. A. Payne (Leeds)* who has an interesting list of prefixes among which we note JY1 — nice to know His Majesty is finding time to get back on the air once more.

Over the 1000 mark goes *H. Bale (Canton, Cardiff)* to join the others up there. During the early years of this piece, when one got over the 1000 mark one used to retire — but now one supposes the 'possible' is so high that a 2000 score is by no means a marvellous feat, although still a rare old bit of good-old-application, as indeed is the 1000 scored.

ANNUAL HPX LADDER Starting date, January 1, 1982

SWL	PREFIXES	
R. Wooden (Staines)	496	A. Pilkington (Chesterfield) 368
B. Patchett (Sheffield S9)	493	P. D. Hunt (Woolwich) 310
T. Kirby (Cheltenham)	462	I. Blair (Swansea) 263
Mrs. C. Law (Chesterfield)	390	H. Smith (Sale) 204

200 Prefixes to have been heard since January 1, 1982, for an entry to be made, in accordance with HPX Rules, (p. 367, September issue). At score 500, transfer to the All-Time listings is automatic.

Talking of high scores, *E. B. Ward (Ruddington)* wonders what was the highest score on CW in the Ladder. As we said before, Noel Phelps it was — no-one prior to him ever carried it on that far, before losing interest or getting a ticket, which in fact is what Noel himself did. All this is a preamble to noting that Barry has now busted that record well and truly, coming in at 1454 with some 96 new ones for this last period. However, as Barry remarks, it's all a matter of *time* — and he has, unfortunately, too much of that to spare, being rather homebound by disability.

Like most others, *R. Wooden (Staines)* found conditions rather patchy on the HF bands, but still had his mite of fun from them; best catches in the contest were ZF2FL on Cayman Is. on Twenty and FM7CD in Martinique on 21 Mhz.

B. Patchett (Sheffield) is well dug in to the RAE studies and then intends to apply himself to CW — he is 'only' copying 15 w.p.m. and intends to get to 20 w.p.m. before he sends in his test application! On a different tack, Bron wonders when the HPX idea first started in *SWL*. Back in the very early sixties is the answer, very shortly after we first began doing this piece. Don't know about reprinting an early issue though — we'll have to ask G3KFE!

R. Fox (Northampton) enters the lists on both CW and SSB, with an FRG-7700 plus FRT-7700 ATU and a long-wire aerial, plus a converted CB Quad aerial used on 28 MHz. To receive CW, Roy has a commercial Morse reader and a program for his Apple-2 home computer. As to the latter, we would be very interested to know just what he has done to achieve this, as apart from the program itself, he has doubtless done some work on the Apple to reduce its output of RFI in order to be able to run it direct off the receiver. What about an article, Roy? On the subject of listening hours, Roy listens at all sorts of times, as and when work and the RAE studies permit, but the most interesting period on 14 and 21 MHz have been the twilight hours.

After his lay-off, it was nice to run across *S. Foster (Metheringham)* again at Leicester, and to have another entry in the Ladder: this was provoked by his noting just how close to passing him Ruth Smith is!

We turn now to *H. Smith (Sale)* who has been presented with a 9R-59DS receiver, a Joystick aerial/ATU, and a Hamgear



"SWL" reader Bernard Hughes in his shack at his Kidderminster home.

preselector by a neighbour who was emigrating. Herbert, having also obtained a large number of back-issues of *Short Wave Magazine*, is now settling down to getting a grip of it all, and finding it quite a good way of keeping a semi-invalid amused. He sounds like a very likely candidate for membership of the RAIBC and the South Manchester clubs, followed in short order by a 'ticket' in his own right. We shall be watching with interest!

B. Patchett (Sheffield) was denied his RAE course locally thanks to a bit of an over-subscribed class — but all's well that ends well, and Brian is now safely enrolled in a course at Rotherham College of Technology. As for the Morse, that is at 12 w.p.m. already, and it is hoped to get it well up by the time the RAE pass slip arrives, so that a start can be made with an 'A' licence.

R. Everitt (Bluntisham, Hunts.) notes the name of John Heath at the top of the Annual Ladder and wonders if some contact might not be beneficial. If John thinks so, Richard's address is 15 St. Mary's Road, Bluntisham. We hope they get together; we recall the fun the three Wizards of Bury St. Edmunds had.

N. E. Jennings (Rye) is distinctly chuffed, and so he might be — with all the snags he has managed to crack the 1000 on SSB. However, alas, he folded his last entry together so well that we didn't notice and take in his RTTY starter — but we make up for it this time. Sorry, Norman.

The Ladies

Here at the top of the clip is *Mrs. T. Parry (Blackpool)* who has cracked the 1000 barrier. The OM continues his aerial-farming and at the moment is wondering how he can measure the impedance of his aerial feed-points, without the use of an SWR meter and a transmitter. Well, there are several possibilities, of which the most obvious are the use of a grid-dipper and a simple bridge of the Antennascope type suggested by W6SAI in his books. Another way is to use an antenna noise bridge, with the receiver as the detector; setting the receiver at the design frequency and turning the potentiometer of the noise bridge for a null in received noise. The recent RSGB book "HF Antennas for all Locations", by Moxon, (S.W.M.'s Publications Dept. has it in stock — and despatches by return) also has some useful ideas on this subject.

HPX LADDER (All Time Post War)

SWL	PREFIXES		
PHONE ONLY			
B. Hughes (Worcester)	2567	R. Everitt (Bluntisham)	795
S. Foster (Lincoln)	2293	K. Cooke (Cardiff)	762
Mrs. R. Smith (Nuneaton)	2287	J. Dunnett (Prestatyn)	732
E. W. Robinson		B. L. Henderson (Salisbury)	708
(Bury St. Edmunds)	2124	P. Lincoln (Aldershot)	702
J. Worthing (Shrewsbury)	1668	R. Fox (Northampton)	671
H. M. Graham (Chesham)	1524	A. J. Hall (Alvaston)	588
G. W. Raven (London SE13)	1441	J. Heath (St. Ives, Hunts.)	560
M. Rodgers (Harwood)	1373	CW ONLY	
M. Toms (Barkingside)	1360	E. B. Ward (Ruddington)	1454
N. Askew (Coventry)	1279	J. Goodrick (I.o.W.)	1223
M. Law (Chesterfield)	1268	J. M. Dunnett (Prestatyn)	1125
D. C. Casson (Reading)	1089	H. Scott (Wetherby)	1074
N. E. Jennings (Rye)	1049	A. F. Roberts	
Mrs. T. Parry (Blackpool)	1037	(Kidderminster)	1072
B. A. Payne (Leeds 18)	1025	P. L. Shakespeare (Foulness)	624
D. J. S. Williams		D. J. S. Williams (Romsey)	266
(Wednesbury)	1024	R. Fox (Northampton)	233
H. Bale (Cardiff)	1015	RTTY ONLY	
P. Pyne (Bradford)	870	P. Lincoln (Aldershot)	306
Mrs. J. Charles (Colchester)	844	N. E. Jennings (Rye)	292
		J. M. Dunnett (Prestatyn)	287

Minimum Score for an entry: 200 for CW or RTTY, 500 for Phone. Listings to include only recent claims and be in accordance with HPX Rules. (p. 367, September issue).

Mrs. C. Law (*Chesterfield*) notes that the OM has now got a call and adds that she hopes to be taking and passing the RAE next year herself; meanwhile she is content to enter a bumper bundle into the Ladder.

The two lists from Mrs. R. Smith (*Nuneaton*) take her up to 2287 in the Ladder, despite not having a lot of time for the hobby; although she does say the contest at October-end helped quite considerably.

Now to Mrs. J. Charles (*Colchester*) who seems to have spent lots of time collecting 'specials' of one sort and another, all of which have helped her score quite a bit.

Last Letters

H. Scott (*Wetherby*) comes into the CW listings at 1074; and he also adds a list of all the places given as QTH by various USA stations copied on the key — this last makes quite fascinating reading!

A photograph of his gear was sent in by A. P. Lincoln (*Aldershot*). Peter has quite a set-up there, and it certainly seems to work well. He has especially nice words for the Datong FL2A board which has turned his FL2 into the latest FL3 and is a really fine bit of work. Peter has a Sharp MZ80K home computer with a floppy disk unit and he certainly seems to be making it work

around the station — producing for example his letter, his HPX entry list, and his conversion of the sunset and sunrise times listing which we ran recently by G3ZPF (*Short Wave Magazine*, October 1982) — which Peter modified successfully to run on his own box. Next, a few lists-without-letters. These include P. Pyne (*Bradford 6*); D. J. S. Williams, A. F. Roberts (*Kidderminster*); G. W. Raven (*London SE13*); A. Hall (*Alvaston, Derby*); and R. W. Roberts (*Caernarfon*).

White Rose SWL Contest

Since November's column, the address to which entries for the contest should be sent has changed, and is now: White Rose Amateur Radio Society, SWL Contest, P.O. Box 73, Leeds LS1 5AR, West Yorks.

Finale

Which just about wraps it up for another time. Deadline for the March column is **January 20th** to arrive. Include your closing scores for 1982 if you are on the Annual Ladder, and we will take the first scores for the 1983 HPX table as well. The address, of course, is J.C., "SWL", SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ. Meantime, Happy New Year!

WHO'S AFRAID OF THE R.A.E?

PETER BUBB, G3UWJ

CAN I pass this exam? During sixteen years of preparing students, of all ages, for the RAE, this is usually the first and most frequently asked question. If you are asking this of yourself, the answer is Yes — you too can pass.

The Radio Amateurs Examination is not a means of preventing people from becoming licensed, it is the way to their licence.

Perhaps you feel that your arithmetic is weak after many years of neglect and that your knowledge of electricity is nil; if so take heart! You are in the company of thousands who share the same problem. Many of them have passed the RAE, many more will go on to pass.

Who are these people who succeed, and why? Leaving aside those who are professionally involved in electronics, the majority of candidates are ordinary men and women. They are people of all age groups and from a wide spectrum of society who are simply "bitten" by the communications bug. Radio waves seem to engender a sense of wonderment. Produced from the confines of one's own home they can travel around the world bringing the intimacy of conversation and fellowship to two people whose paths would otherwise never cross. It is the sustained enthusiasm for this magical concept of radio communication that produces successful candidates.

One thing I have learned over these years is that it is a steady continuous effort that results in that coveted pass. This means that you have to pace yourself, and be patient too. You should select the time that can be devoted to study and then work steadily and systematically through the syllabus towards the day of the exam. In this respect it is probably easier for the student who has an organised evening class available to him since this tends to impose the discipline of regular attendance each week. For those who are unable or unwilling to attend evening classes, it is even more important to establish a pattern of study, and then stick to it! It is not easy when you are on your own, and there are usually

plenty of distractions at home to divert you away from your allotted study period. It can be done nevertheless, though it may test your enthusiasm for the attraction of the hobby. I know of one successful candidate who just could not find the necessary couple of hours for study in an already full business day. He felt that he should not be anti-social and ignore family and friends in the evening and so he got up two hours earlier each morning during the period of his preparation. Fresh from a night's sleep and during the quiet of those early hours he found this work period very effective.

This man succeeded and many more like him have done so too. Most people who have prepared conscientiously will pass at the first attempt, some will not and this is perhaps the biggest hurdle of all to overcome. If you fail you have to gather up your shattered pride and disappointment, put the experience behind you, start again preparing for the next one. It is the only way. There is no disgrace whatever in having to retake an examination and only you will know whether you put all the effort you could have into your study.

The examination system is not without criticism. On the one hand there are those who say there should not be one at all, the opposite point of view is that the RAE is too simple. There is also criticism of the syllabus and its relevance to current amateur practice. Then there is disagreement about the form that the questions, and their answers, take; ambiguity, for example. There is much that can be said from all points of view but this discussion belongs to another forum. Readers of this and other magazines will be aware that it is a continuing topic. The point is that the exam is there and we have to pass it in order to apply for an amateur licence.

The older candidate may feel uneasy about sitting examinations, simply because his age means that memory has had longer to go rusty and he is so much further away from his period of formal education. Again maths is usually the biggest worry here. It is as well to remember that this is a hobby exam, it is not a test of professional competence. It is to measure your general knowledge of radio communication. If we accept that this is the method chosen to test our knowledge of this subject then it helps to understand the examiner's problem. He has to pitch the severity of the test at the right level, and that is not a level which will allow everyone an easy pass. If, for example, we wanted to

know how far a group of people could run non stop, it would be no test to set a distance of 20 metres since all could complete it. However if a distance of 20 miles were set we could observe the distances achieved by individuals within that range. In the RAE test paper the examiners prepare questions which will allow the average student to achieve something like half marks. There will be those who fall behind this standard and fail; there will be those who do much better and achieve a 'credit' or 'distinction'.

The disabled candidate is in a somewhat more difficult position and obviously much depends on the nature of the disability. The examination can, however, be taken at home (or in hospital) by prior arrangement with the City & Guilds. If you are disabled, a very helpful organisation is the Radio Amateur Invalid and Blind Club.

The Radio Amateurs Examination is set and marked by the City and Guilds of London Institute. This honourable body examines a whole range of different subjects, of which the two components that we are interested in have the C. & G. reference numbers 765-1-01 and 765-1-02. They are held twice a year in May and in December.

In recent years the RAE has been set in the multiple choice mode; 95 questions in total, each have four alternative answers coupled with them. They are labelled *a*, *b*, *c* and *d*, and only one is correct. The chosen answer is indicated by marking a separate answer book (disabled candidates may be examined orally but the questions will be the same). This form of examination certainly removes the disadvantages that the previous method had which penalised the person who had difficulty in expressing his thoughts in writing. The answers being written out, you simply have to choose the correct one. This can lead to difficulties if the question is not clearly understood, so there is a responsibility on the examiners' side to write the question lucidly and unambiguously. The answers, too, should be clearly stated and there ought to be no doubt about the correct one if the subject matter is understood. I think, in common with many others, that there is still some room for improvement here. There is an equal responsibility on the part of the candidate to make sure he reads the question carefully and preferably two or three times.

Here are three examples of multiple choice question. It should be noted that they are *not* actual City & Guilds samples (which are copyright), they are taken from my selection of questions and answers. These have been compiled over the years by interviewing students immediately after their examination. They are fairly typical.

- 1) Which one of the following formulae gives the value of inductance in a parallel resonant circuit?

(a) $\frac{1}{4\pi^2 f^2 L}$

(b) $\frac{1}{2\pi \sqrt{LC}}$

(c) $\frac{1}{4\pi^2 f^2 C}$

(d) $2\pi fL$

This is one way of presenting the mathematical question without asking for calculations. Here we have to recognise the less familiar transposition of the formula for resonance. Notice that there is a similarity in all of the answers particularly (a) and (c) which might easily be confused after only a hasty glance.

- 2) Of the following information, which must be included in the main station log?

(a) Name of the licensee.

(b) Precise frequency.

(c) Signal strength report.

(d) Details of any CQ calls.

This is a straight forward licence condition question, about which there should be little doubt. Notice here that any one or all of the details could, and in many cases are, included in the log.

Only one is obligatory. In these answers there may be confusion between (b) and (d).

- 3) The principle mode of long-distance propagation in the VHF and UHF bands is by:

(a) Ground-wave.

(b) Sporadic-E.

(c) Tropospheric refraction.

(d) Ionospheric reflection.

This is an example of the less definite type of question and answer. Unlike the previous one it is open to some interpretation. For instance what is meant by long distance, 40 miles? 400 miles? On this might depend what you consider to be the 'principle' mode. Basically the question is asking about refraction and reflection, (c) and (d), and the difference between propagation in the HF and VHF bands.

Much had been written in the amateur radio press about taking the RAE, what to do, what not to do, and a good series of instructional articles has appeared in *Short Wave Magazine*. Again, the most important thing is to have a proper planned programme of study. Another problem, when studying alone, however is obtaining guidance and monitoring progress. If at all possible have someone who is familiar with the syllabus test you with questions from time to time. It is also helpful to have someone to turn to when those inevitable explanations occur that will just not sink in. Usually when looked at from another viewpoint such obstinate facts can be driven home. For the same reason it also helps to have more than one source of reference so that you are able to seek out different explanations of difficult points. However, beware of having too many sources and too complex explanations. Some material, frankly, just frightens people off. In order to cover such a broad syllabus as the RAE inevitably means we can go only into the shallows of the subject. If it happens to stimulate your interest in electronics — fine, there is a lifetime to study this intriguing subject, but *after* you have passed the RAE.

You too then can pass the exam. After all we licensed amateurs are only human, no different from our fellows; there are good, bad and indifferent among our number. Make a resolution now that you will take the RAE and join us. Draw up a plan of action, decide how much study you can do each day, select the date you are going to aim for, make this your objective and stick to it.

It is an interesting but neglected fact that faith and determination are the main forces in contributing to the goals we achieve in this life. Why not start — NOW.

Publications:

"How to become a Radio Amateur", obtainable free from the Home Office.

"Radio Amateurs Examination Manual", 10th. ed. (RSGB).

"Amateur Radio" (Lutterworth Press).

The last two titles are obtainable from *S.W.M.'s Publications Dept.*

Addresses: Home Office, Radio Regulatory Department, Radio Regulatory Division, Licensing Branch (Amateur), Waterloo Bridge House, Waterloo Road, London SE1 8UA.

City and Guilds of London Institute, 76 Portland Place, London WIN 4AA.

Radio Society of Great Britain, Alma House, Cranborne Road, Potters Bar, Herts.

The Radio Amateur Invalid and Blind Club, 9 Rannoch Court, Adelaide Road, Surbiton, Surrey KT6 4TE.

Answers to questions: 1) c; 2) d; 3) c.

EQUIPMENT REVIEW

THE SABTRONICS MODEL 8610B FREQUENCY COUNTER

It has always been a licence requirement that you have some means of determining your transmitter frequency with reasonable accuracy. Until the advent of digital frequency meters, this was usually met by using an analogue device, such as the popular BC-221 of W.W.II fame. Nowadays an increasing number of HF and VHF transmitters and transceivers incorporate digital readout of frequency. Even so, an independent means of measuring frequency is very useful, not only to comply with licence requirements, but also to use during development and servicing work, for setting up very accurate frequencies for meteor scatter and E-M-E schedules, etc.

My first dabble in DFMs was the 20 MHz design by G3TVU and G8BDO, which appeared in 1971. Although mine worked up to 32 MHz with a selected 7490 IC, it was very basic and is rather old hat now, so I decided it was about time I acquired a modern counter capable of operating at least to 500 MHz without an external prescaler.

The Choice

The advertisements in British and U.S.A. magazines revealed several companies offering suitable products. After carefully reading through the specifications and considering value for money, I decided upon a Sabtronics product. The reasons were:—

- 1) Eight and nine digit models are available.
- 2) They count up to 600 MHz.
- 3) They come either ready-built or in kit form.
- 4) They run off re-chargeable batteries or a mains adaptor.
- 5) The crystal oscillators are user-adjustable.
- 6) They are available from a U.K. source.
- 7) They look smart and have a tough case.

Getting it

An inquiry to the sole U.K. and Eire importers, Messrs. Black Star Limited of St. Ives, Cambridgeshire, produced a prompt reply to technical queries, a price list and confirmation that the model I wanted, the 8610B in kit form, was available from stock. I ordered this nine digit, 600 MHz counter, four NiCad batteries and a mains adaptor. These were sent parcel post and arrived safely in a couple of days.

The Manuals and Components

Two manuals are supplied, one covering assembly, the other operating the counter. The Assembly Manual is a 16-page affair, 8½ by 6½ inches and contains a complete list of components, the customary hints on proper soldering and the step-by-step assembly instructions. The information is all there but the diagrams are a bit "amateurish" and the dot matrix type of printing does not make for easy reading. Pages 11 and 12 were transposed, so you have to do pages 10, 12, 11 and 13. This, and a few other amendments, were incorporated in an addendum stapled to the manual. There is a separate, 17 by 11 inch sheet one side of which is devoted to the circuit diagram of the main counter, the reverse to that of the prescaler and physical layouts of the PCBs, plus an "exploded" assembly sketch.

The components were packed in several sealed polythene bags. They came from several countries including Japan and Mexico, and are of satisfactory quality. The PCB material is single-sided fibreglass and the case is moulded in a very tough plastic material, light grey, with a "crackle" effect finish. Part numbers feature in the lists in the manual but not on the components. However, anyone capable of building kits would have no trouble identifying everything. There were no shortages and an extra 2N5771 transistor was included. It took 75 minutes to check through the 150-odd components, from the main PCB, to lengths of hook up wire. No solder was provided.

The Circuit

The early frequency counters used TTL devices and "Nixie" tubes for the displays. Each digit required a 7490 decade counter and 7441 BCD/decimal decoder, at least and the total current



Fig. 1. The completed counter showing the clean, functional layout of the controls. The tiny hole just discernible beneath the letter E in 'Model' was drilled to gain access to the trimmer for adjusting the crystal oscillator frequency to exactly 10 MHz.

photo: T. Traill

consumption tended to be too great for battery operation. This approach is now quite archaic and modern counters use the 7216 LSI IC which comes in a 28-pin DIL package. It will directly drive eight multiplex common cathode displays from a 5V. supply. It will count to 10 MHz minimum and is the device used in the Sabtronics instruments.

An external 10 MHz crystal is connected across pins 25 and 26 of the 7216 and the internal oscillator frequency can be set exactly to MSF or WWV by a 5-35 pF trimmer. The 10 MHz signal is internally counted to give 0.1, 1.0 or 10 seconds periods and these switch selected gate times are verified by a small LED flashing at the appropriate rate. The incoming signal is applied to the count input, counted and stored internally. The 7216 contains digit and segment drives which are connected directly to eight of the nine seven-segment and decimal point display LEDs.

A 74S196 presetable decade ripple counter is used ahead of the 7216 in a divide-by-two/divide-by-five circuit enabling 100 MHz signals to be counted. The nominal input on the 10 Hz to 100 MHz ranges is 1M/100 pF. The signal is amplified by a 2N5486 FET and 2N5771, the output then being fed to a three stage ECL amplifier, each stage of which has a gain of about five. Positive feedback from the last stage is used to introduce about 5mV hysteresis in the input triggering levels to help in noise reduction. The ECL levels are translated to TTL levels by two more 2N5771 amplifier stages.

In the 8610B, the prescaler enables frequencies of at least 600 MHz to be counted. It is on a separate, small board and uses an SAB1009 preamplifier IC driving an SP8680, 650 MHz decade TTL counter. In the 600 MHz range position, the output from the prescaler board is routed to the 74S196 IC, bypassing the ECL amplifier chain. The nominal input impedance is 50 ohms. A count exceeding eight digits stored is detected and results in a "1" in the ninth LED. The sensitivity of the counter is controlled by varying the gain of the ECL amplifiers using a single 100K "pot", the slider of which is connected to the 5V supply line. One end of the track goes to the bias line of the 10 Hz to 100 MHz ECL IC on the main PCB, the other end going to the preamplifier IC on the prescaler board. Thus maximum sensitivity on the 600 MHz range is minimum sensitivity on the 10 and 100 MHz ranges, and *vice versa*.

Circuit Board Assembly

For rapid assembly from a kit of parts, I select the components required for, say, twenty steps and put them in the edge of a length of corrugated cardboard bent into a circle. this way you double

Sabtronics 8160B Nine Digit Frequency Counter SPECIFICATIONS

<i>Frequency range:</i>	10 Hz to 600 MHz in three ranges
<i>Input impedance:</i>	Input "A" 1M/100 pF. Input "B" 50 ohms
<i>Sensitivity:</i>	15 mV RMS, 10 Hz-100 MHz 20 mV RMS, 100-600 MHz
<i>Input protection:</i>	400 V peak-to-peak at 10 Hz declining to 3V P-P at 600 MHz.
<i>Gate times:</i>	0.1, 1.0 and 10 seconds, switch selectable
<i>Display:</i>	9-digit. 0.4 inch LEDs with automatic decimal point. Leading zero suppression
<i>Maximum resolution:</i>	10 MHz range 0.1 Hz with 10s. gate time 100 MHz range 1 Hz with 10s. gate time 600 MHz range 10 Hz with 10s. gate time
<i>Time base:</i>	Frequency 10 MHz Temp. stability ± 1 p.p.m. 0°-40°C Setability ± 2 p.p.m. Ageing rate <5 p.p.m. per year
<i>Measurement accuracy:</i>	1 Hz plus 1 digit plus time base error
<i>Power requirement:</i>	4.8 to 6.5V DC @ 300 mA.
<i>Dimensions:</i>	8" wide \times 3" high \times 6½" deep
<i>Weight:</i>	1.3 lbs. less batteries

check that you have the right components. The first steps in the manual deal with the fitting and soldering of the nine LED displays. Thereafter, small groups of components are fitted and soldered until the board is completed. This main PCB was designed for MPS H-81 transistors but 2N5771s were supplied and which have a different outline. This requires the base and emitter leads to be transposed and this is adequately covered in the manual with diagrams. Sockets are provided for the three ICs on the main board. Everything fitted properly and there were no ambiguities apart from the 20 inch length of coaxial cable supplied from which you have to prepare one 2" and two each lengths of 4½" and 5½".

Care is needed when soldering the prescaler board as it is easy to damage the tracks if too much heat is applied. This is mentioned in the manual. Slightly puzzling was the illustration of three ICs, but it transpired that "Z2" was just a 56 ohms resistor in this model. (A divide-by-ten, 1 GHz IC is used in the 1 GHz model 8000 counter). The general layout of the instrument in various stages of assembly can be seen from the photographs.

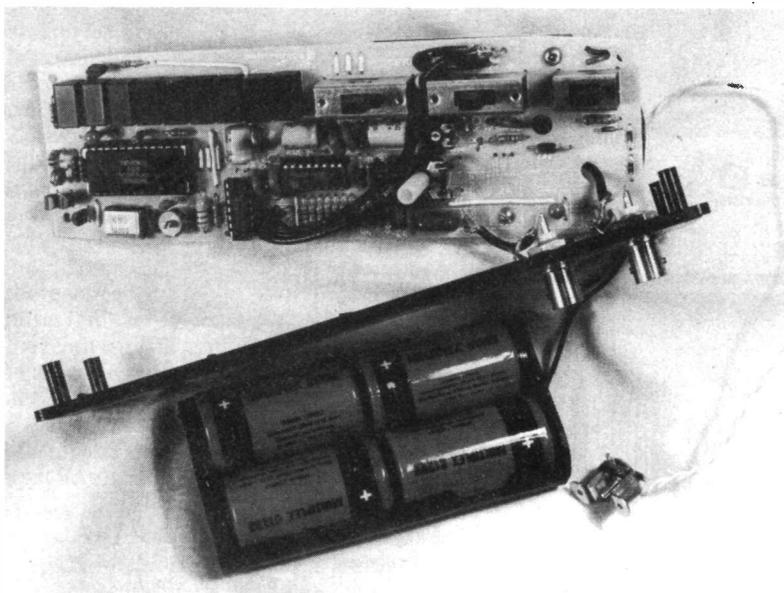
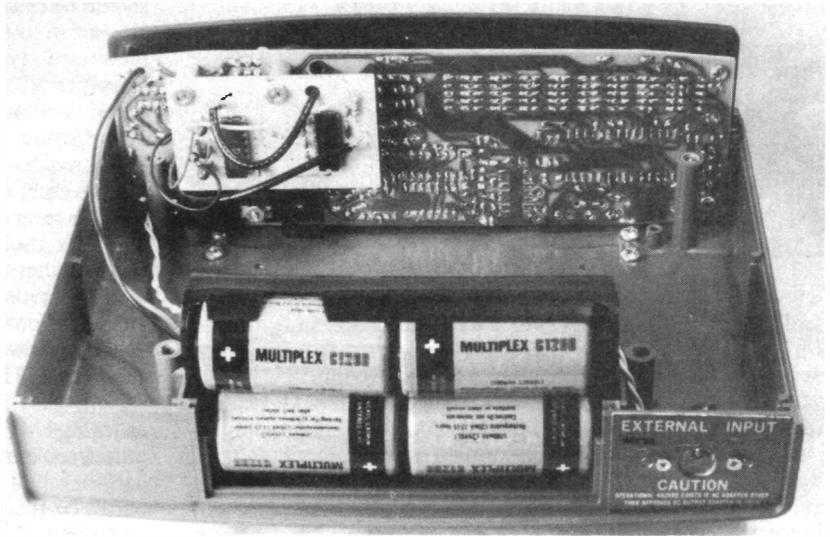


Fig. 2. Completed circuit board, front panel and battery pack prior to assembly into the case. The 7216 IC is below the nine display LEDs with the 10 MHz crystal below it.

photo: T. Traill

Fig. 3. Rear view of the counter installed in the bottom half of the case. The 600 MHz prescaler board is bolted to the left hand end of the main PCB. There is plenty of space inside the case for a small mains PSU if required. The battery holder comes with the kit but not the batteries. *photo: T. Traill*



Mechanical Assembly

The case came in two identical halves although the manual refers to a bottom half with four holes in it and a top half without holes. Holes had to be drilled carefully through the sleeves in the bottom half to enable the 1 ¼ inch self-tapping screws to be fitted and which join the two halves together. Also, you have to drill eight more holes to fix the feet and another three for the external power socket. The manual states that there is a hole in the front panel for access to the trimmer capacitor in the 10 MHz oscillator circuit. However, there was not, so one was drilled.

Testing and Calibration

To my great satisfaction, the counter in embryo form worked first time. This is unusual as, however careful I am, I often manage to omit a vital jumper wire. There are only two adjustments to make: the bias to the ECL amplifier has to be set to 3V as measured at a test point on pin 10 of the 10116 IC, and the crystal oscillator has to be set to exactly 10 MHz. The former must be done before the main PCB is attached to the front panel, but the latter can be done through the hole in the front panel.

There was some confusion concerning the ECL bias. The manual states one procedure but which was countermanded in the addendum. Black Star Limited included their own comments which took us back to "square one." Would-be constructors are advised to follow Sabtronics's addendum which ensures that the bias is set up correctly. Finally a check was made on the battery current consumption and with all nine LEDs on, it was about 250 mA.

Operation

The Operator's Manual is a 16-page companion booklet to the Assembly Manual. It includes sections on operating controls and features, specifications, theory of operation, operating suggestions, calibration and trouble shooting. The circuit diagrams are included, plus a sketch of the main PCB identifying various test points.

Reference to the specification shows that the counter is very sensitive, consequently some care and commonsense have to be exercised when using it. To avoid unwanted stray RF pick up when measuring low frequencies, input lines should be shielded and a low pass filter consisting of a series resistor and a bypass capacitor across the counter input, may be needed. Ringing of the logic level inputs can be a problem resulting in a false count and this can be alleviated by terminating both ends of the connecting cable with resistors equal to the cable impedance.

The counter has been used to measure everything from the frequency of the mains, to 70cm transmitter frequencies. Once the needs for proper measuring techniques were appreciated and adopted, unambiguous readings were obtained. For example, an initial attempt to measure a frequency around 432 MHz simply by running an unterminated lead between the Tx and counter's 600 MHz input gave meaningless readings. Once properly screened and terminated leads were used, as described in the Operator's Manual, everything worked perfectly.

Conclusions

I am very satisfied with my choice of the Sabtronics Model 8610B Frequency Counter which is proving a most useful addition to the shack equipment. The manufacturer is Sabtronics International, 5709 N. 50th. St., Tampa, Florida, 33610, U.S.A., who produces a range of test equipment at reasonable cost, some of it in kit form. The sole U.K. and Eire distributor is Black Star Ltd., 9A Crown St., St. Ives, Huntingdon, Cambs., PE17 4EB, who operates a 90 day limited warranty for kits, a technical consultation service in case of problems with the assembly or use of kits, and a repair and calibration service for which latter a fee will be quoted. The cost of the 8610B in kit form at the time of purchase was £84 including postage, plus VAT; various accessories are available at competitive prices.

Finally, I would like to thank Ken Miles, G8GGK, for help in testing the counter at 432 MHz. We both learned how *not* to use it!

N.A.S.F.

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PLUG IN YOUR SOLDERING IRON AND BEGIN HERE, PART VIII

A GUIDE FOR THE INEXPERIENCED
IN THE METHODS, TECHNIQUES,
PITFALLS AND FOLKLORE OF
BUILDING EQUIPMENT, WITH
PRACTICAL PROJECTS TO BUILD
ALONG THE WAY

REV. G. C. DOBBS, G3RJV

TALKING the other day with an oldish G3 about the days when men were men, and women were ladies, radios were radios and lit up inside, and Newcastle Brown was one-and-tentpence a pint, our conversation turned to receivers of yesteryear. In common with many radio amateurs of that time we had both run ex-services general-coverage receivers with crystal controlled converters to give us better sensitivity and selectivity on the higher amateur bands. Oh, what we heard in 1959 with a ten-metre converter plugged into a BC-348! The last part of this series described a simple single-band superhet receiver for the 80-metre band. So thinking back to those days when converters were state-of-the-art, in this part we will consider a simple crystal controlled converter to add the 40 and 20-metre bands to the Superex receiver. Thus the converter could be added ahead of many receivers, and it may be that someone with an old receiver or a cheap general-coverage receiver that is adequate on 80 metres but poor on 20 metres, will want to build it to soup-up high frequency performance.

This is the final part in this series . . . phew! Readers who have followed the whole series should by now be familiar with the techniques of construction and capable of making up a printed circuit board to suit a given design. So the approach here is to offer the circuit, with just a little construction guidance, and leave the reader to get on with it. Component layouts suitable for making up a printed circuit board are given, although these may need modification to suit the physical size of individual components. As with all of these circuits it would be possible to build the boards using plain matrix drilled board, or to redesign it around the popular *Veroboard* with its copper strips. The circuit is reasonably non-critical and the constructor will probably be able to get away with murder — or at least light abuse — in the construction.

The principle of the receiver converter is simple. Recalling superhet theory, all one does is use a receiver as an IF (intermediate frequency) device and build what amounts to another receiver front-end to go ahead of it. This requires a mixer stage to change the required receiving frequency to the chosen IF and an oscillator to mix with the incoming frequency to produce the required IF output; an RF stage can also be added ahead of the mixer if this is required. Converters can be tunable, in which case the receiver remains on a fixed frequency and the local oscillator in the converter is tuned to give the required coverage. They may also be crystal controlled, the frequency of the converter local oscillator being a fixed crystal frequency and the receiver then acts as a tunable IF. The latter is the more common and is the method used here.

Simple Crystal Controlled Converter

Right — repeat after me. What are the rules when looking at the suitability of a circuit for home construction? The components

should be *cheap* and are they *easy to obtain*? This, however, can be one of the problems of a crystal controlled converter. It requires a crystal, or crystals, and these may be expensive — doubly so if they are odd frequencies which need to be etched to order. The problem is perhaps not quite that bad as several manufacturers do produce crystals which will convert from the higher amateur bands down to 80 metres, but these are still several pounds each; they also give conversion frequencies which tune the bands in reverse on 80 metres. Assuming the receiver will cover 3.5 to 4 MHz, the low end of the converted band begins at 4 MHz and reverse tunes towards 3.5 MHz. This is not as odd as it might appear because the harmonic relationship of the HF bands does give rise to problems in converting to enable forward tuning on 80 metres, as we will discover later. This approach, although excellent, will not be used here because not only does it require an expensive crystal for each band but the Superex does not tune up as far as 4 MHz. It could be made to do so, but then we go into other problems such as providing a slow enough tuning rate for a half-megahertz wide band. Our little cheap epicyclic drives would hardly be adequate — and who wants a receiver that includes 3.8 to 4 MHz, anyway?

In the exact month 20 years ago that I received the G3RJV licence for the first time (what a day, I rushed home at lunchtime for my first QSO — 300 yards on Top Band CW!), ZL2AMJ published a converter design called the "HF Gem". The original circuit has remained something of an evergreen and in fact is still in print in a prodigious UK handbook. The circuit was a three band, 40/20/15 metres, converter using an 80-metre receiver as tunable IF. It had three valve stages including an RF stage, and the converter also functioned as a preselector on the 80-metre band. The circuit was popular because it used just one crystal to convert to all three bands and the three converted bands were not reverse tuned. It did, however, suffer from the severe restriction that this method presents.

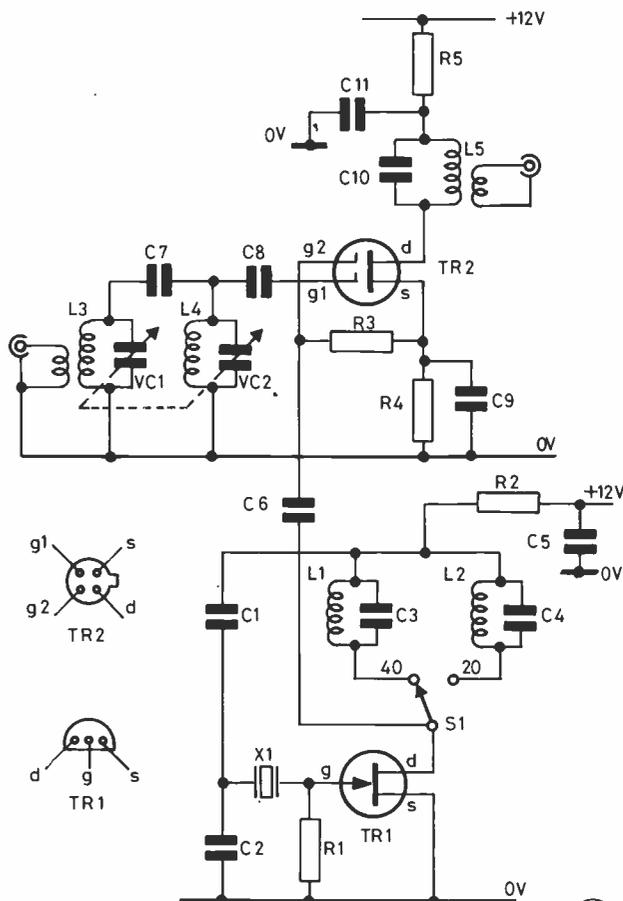


Fig.1 SIMPLE CONVERTER CIRCUIT

Tables of Values

Fig. 1

- R1 = 82K
- R2 = 820R
- R3 = 100K
- R4 = 470R
- R5 = 220R
- C1 = 390 pF
- C2 = 220 pF
- C3, C10 = 200 pF
- C4 = 100 pF
- C5, C11 = 0.1 μ F
- C6, C7 = 10 pF
- C8 = 500 pF
- C9 = 0.01 μ F
- VC1, VC2 = 250 pF, 2-gang
- X1 = 3.495 MHz crystal
- TR1 = 2N3819
- TR2 = 40673
- S1 = single-pole, changeover slide-switch

Fig. 5

- R1 = 1K
- C1, C2 = 0.01 μ F
- RFC1 = 1.5 mH RF choke
- TR1 = 2N3819

Think about it. To convert a 7 MHz signal to 3.5 MHz it has to be mixed with a 3.5 MHz signal so the local oscillator frequency is exactly the frequency that the receiver will tune to receive 7 MHz. The local oscillator will batter its way through the mixer and appear as a "birdie", a juicy spurious signal, when the receiver is on 3.5 MHz — and it's "a biggie", as they say. I would not know if the reader has ever tuned in a large "birdie" on a receiver: suddenly you are tuning across the band and the receiver goes quiet and that is the sign — a biggie is on the way. The front-end dies and then it arrives like a heavy metal pop guitarist tuning up his instrument at full volume. It should ruin at least 5 kHz of the band.

The "HF Gem" has this problem on all bands as the conversion chart shows:

Converted Band	Local Oscillator	Main Receiver Tuning
7-7.1 MHz	3.5 MHz	3.5-3.6 MHz
14-14.35 MHz	10.5 MHz (3.5 x 3)	3.5-3.85 MHz
21-21.45 MHz	17.5 MHz (3.5 x 5)	3.5-3.95 MHz

The local oscillator frequencies are conveniently harmonically related so that one crystal can be used for three bands, but the birdies have the same relationship so appear on every band. What is worse is that in a simple overtone oscillator the harmonic output of the crystal is not exactly the multiple of the frequency and is often higher, giving a greater intrusion into the useful band coverage. What would help here is to use a crystal slightly lower in frequency so that the band is tuned a little higher on the receiver and the spurious output may then be completely out of the band. All this preamble is to lead up to explaining my pleasure when I found that *J. Birkett* of Lincoln sold a surplus crystal for £1.00 with a frequency of 3.495 MHz. With that a simple "HF Gem" type converter is possible without problems detailed above.

Fig. 1 shows the circuit of a simple converter based upon the principles outlined above. The circuit is very simple, being only a mixer and crystal oscillator, and covers two bands 40 and 20 metres. TR1 is a simple FET crystal controlled oscillator using the 3.495 MHz crystal. L1/C3 tune the fundamental frequency for 40 metres and L2/C4 tune the third harmonic for 20 metres. TR2 is a standard dual-gate MOSFET mixer circuit, with L4/C10 tuning out the 80-metre band for the required IF. L3 and L4 provide a

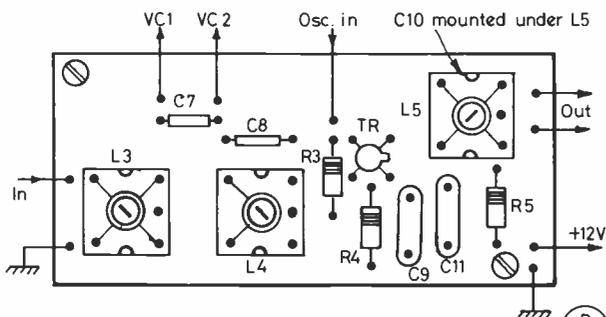


Fig.3 CONVERTER MIXER BOARD (Actual size)

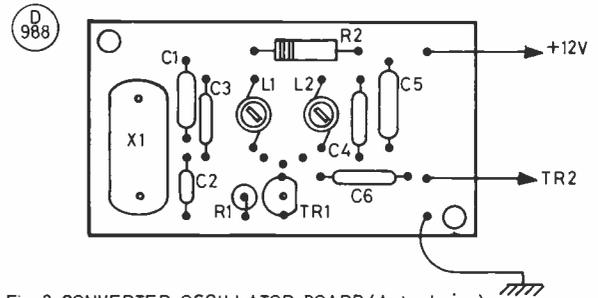


Fig.2 CONVERTER OSCILLATOR BOARD (Actual size)

two-stage input tuning filter variable over both bands with VC1/2. Simple isn't it? I hope no one *technical* reads this magazine!

The Oscillator Board

The natural choice for the first section to build is the oscillator board as this can be tested alone. Fig. 2 shows the component layout used in the prototype as a guide for printed circuit board design. The crystal is an HC6U type and is soldered directly into the circuit board. The coils L1 and L2 are wound on the 3/16" diameter formers mentioned in previous parts of this series. In this application the formers were removed from the base mounting and glued directly into holes drilled in the circuit board, to save space. The switch, S1, which selects the desired band was soldered in place underneath the PCB with short direct leads to the underside of the board. The mounting of this switch is shown later in the enclosure drawing.

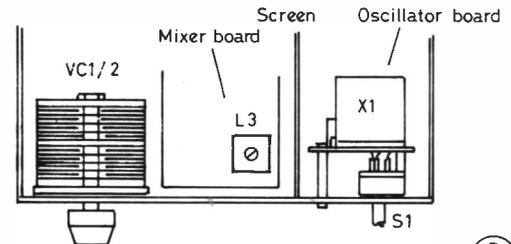


Fig. 4 ENCLOSURE LAYOUT (Top)

Once the board has been constructed and the wiring checked it can be tested as an oscillator. L1 and L2 are required to tune out the desired frequencies from the crystal, the fundamental and the third harmonic. It is helpful to be able to pretune these coils somewhere near the desired frequency before the final setting up is performed. This can be done with a GDO, a circuit for such an item appeared in *Part III* of this series, *Short Wave Magazine*, August 1982. The final tuning-up of the coils can be done with the RF Probe, which appeared in *Part IV* of the series, and a multimeter. A little care is required with L2 as this can be made to tune the fourth harmonic of the crystal by mistake. The final test is done with a frequency counter, if available, or the signals can be detected on a receiver. A word of warning about S1: this is a slide switch, although any suitable type can be used, and such switches are prone to poor contacts so check it with a meter before use — and check the action in use with the circuit.

Converter Mixer Board

The layout for the mixer board is shown in Fig. 3. The coils are all wound on the 3/16" diameter formers with the screened cans used. These coils can be roughly set up on frequency with the GDO prior to wiring them into the circuit board. Try to ensure that the cores of L3 and L4 are roughly in the same position as they have to track when tuned by VC1/2, which is a ganged control. They also have to cover both bands; in practice I found the cores needed to be just completely inside the former for the correct

coverage. The tuning control VC1/2 is a two gang 250pF airspaced variable capacitor sold by *J. Birkett*. This is a good 1/4" shaft variable at a reasonable price, although a polycon type taken from an old transistor radio would probably do the job.

Having completed the board it can be connected to the oscillator for a first testing. Those with signal generators can insert signals at 40 metres and 80 metres and see if they come out on the required 80-metre IF. Without a signal generator the converter will have to be set up using signals on the required band. L5 merely requires peaking, using the core, for maximum output and L3 and L4 need to be fiddled a little so that they will tune the bands at either end of the travel of VC1 and 2. A bench hookup will probably reveal one of the drawbacks of such a converter: IF breakthrough. Lashed up for a test without proper screening the converter may receive some of the louder signals on the 80-metre IF.

The converter requires a good screened lead, short if possible, between the output and the receiver and needs to be in a screened box. One of the techniques for housing equipment not so far discussed in this series is that of making boxes and enclosures out of printed circuit board. It is possible to make quite neat boxes from scraps of double-sided, or even single-sided, PCB cut to size and soldered into a box. The prototype converter was housed in such a manner; Fig. 4 shows the principle of the construction. A simple shallow box was made from pieces of double-sided PCB with a screen running between the oscillator board and the mixer board. The edges of the box are butt-jointed and soldered together. This can be done with large blobs of solder, or a neater way is to run a line of solder down the inside of each seam. Some exponents of this method like to lay a length of bare copper wire along the inside seam first then solder into this wire. S1 is shown in Fig. 4 mounted under the oscillator PCB: the board is mounted on

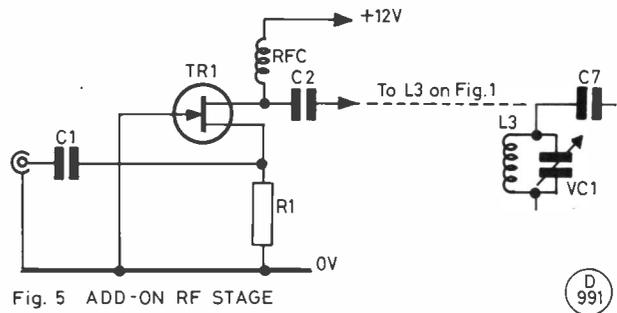


Fig. 5 ADD-ON RF STAGE

the front panel with standoffs and S1 is placed under the board with short wires going to the appropriate places on the underside of the PCB.

This little converter is not exactly state-of-the-art, but it does enable two useful bands to be received with the Superex or any other 80 metres receiver. The sensitivity is adequate but might be improved by an RF stage; Fig. 5 shows a very simple RF stage that can be added if desired. It is just a basic grounded-gate FET untuned circuit and added to the front end of the converter. Since the output impedance of this stage is high it is added to the top of L3 and not *via* the low impedance link winding. The stage is untuned and this could lead to problems. Like every circuit this is a compromise . . . and that includes a £1,000 receiver; electronic design is all about the best compromises. Experimenters might like to try it between L3 and L4 so that L3 tunes the RF stage and L4 tunes the mixer. Or they may like to try adding another tuned stage, but does one add yet another tuning control, or — not easy — look for a 3-gang 250pF capacitor? Just a few ideas to play with and if the reader has followed this series such ideas should be leading to modification and compromise.

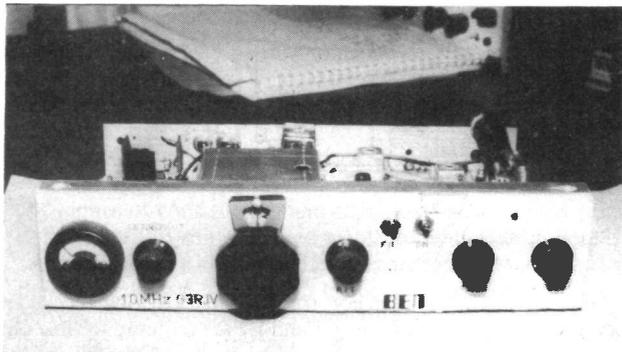
That is what construction is all about. This is the last part in this series and by now the reader should be a "thinking constructor". The best projects are rarely those built directly from a single design as given, but an amalgam of bits from here and there to make up the desired whole. Avoid slavishly following an author, try variation and plagiarise from everywhere possible.

Odds and Ends

Many readers have written to me during the publication of this series of articles, most have been kind and some have offered further tips. I have been told of the advantages of using a magnifying glass to inspect the joints made on printed circuit boards; useful, but I never do it — perhaps I ought to. Another idea is to give a cleaned blank PCB a quick dip into ferric-chloride before the etch resist is applied; this ensures it is grease and dirt free and gives a better matt finish for applying the etch resist pen. Naturally the board will have been rinsed clean of the chemical before the pen is used. I haven't tried this, but I may.

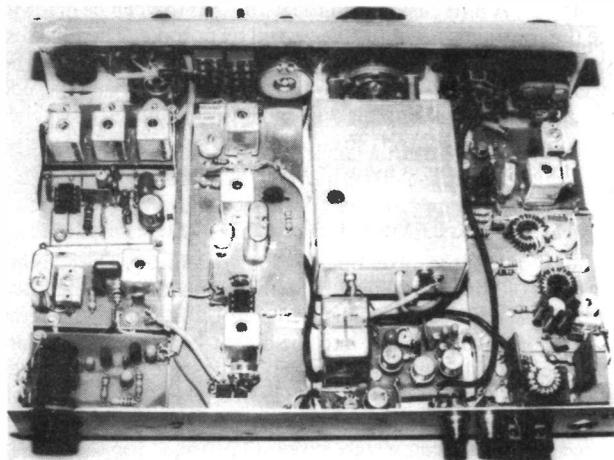
I have had a couple of useful ideas for working on cases, or "Aluminium G.B.H." as we call it at G3RJV! Very often holes have to be added to a case when parts of the circuitry are already in place. This can lead to problems with metal shavings from drills and dust from filing. One simple procedure is to stuff the vacant space inside the case with old rag to take up the surplus metal so that it can easily be removed. Those difficult tiny scraps of metal that stick in the corners and edges of cases, like glue, can be removed with a pencil wrapped with some masking tape, sticky side out, and used as a probe.

That brings us to the end of this short series, but not to the end of the pleasures that can be had from the building of ones own equipment. That pleasure is endless. I shall continue to fiddle around with little circuits at home and hope to share them with *Short Wave Magazine* readers. I hope that in the months to come I will be able to offer useful ideas, capable of execution by the average amateur in his workshop, garage or on the kitchen table. To this end I hope to contribute occasional articles to the *Magazine* under the umbrella title, "Kitchen Table Technology". So good constructing and keep reading *The Mag*.



Two views of "Ben", the G3RJV 10 MHz transceiver project which was described in *Short Wave Magazine*, January and February 1982. Above, the front panel layout. Below, a top view; the VFO is in the screened box, with receive sections to its left, transmit sections to its right, and changeover circuits to its rear.

photos by G3SEQ.



VHF BANDS

NORMAN FITCH, G3FPK

Awards News

HIGHLIGHT of the *Magazine* awards programme this month is the issue of the very first QTH Squares Century Club certificate for 432 MHz to Mike Lee, G3VYF, on December 6. His list of exactly 100 QSLs included cards from twenty countries. One GM square, YP, was worked via *Auroral* propagation, all the rest being via *tropo*. In his brief, covering letter, Mike wrote that he was "... now 100% QRT on all bands but will continue to operate for 'HADRABS' from time to time".

Sincere apologies are due to John King, G6ADH, from Horley in Surrey, whose election as member no. 21 of the 144 MHz QTHCC should have been announced last month. He is the first G6 to join the club and only the second Class "B" licensee. (It is, perhaps, worth mentioning that it is inevitably more difficult for Class B folk to work the DX since they cannot use CW, on which mode so much DX, especially from eastern Europe, is only to be worked). John's confirmed total is 100 squares.

Three more 144 MHz VHF Century Club certificates have been awarded. No. 351, dated Nov. 15, went to Neil Montanana, G8RWG, from Camberley, Surrey. He took the R.A.E. in May, 1975 but did not get his licence and some equipment till February, 1979. Neil started off with some home built 2m. FM gear and a 5-ele. *Yagi*. Successive equipment was a *Mizuho* SB-2M, *Trio* TR-7010 with 100w. *Microwave Modules* amplifier, and presently a much-modified *Yaesu* FT-221, with the 10w. from which, a large number of stations have been worked. Aerials have been a 9-ele. *Tonna Yagi*, a home made, 16-ele. G2BCX *Yagi* and now an 11-ele. *H.A.G.* at 40ft. *a.g.l.* G8RWG has quite a good location, but take-off eastwards is very poor. Current construction project is an 8874 triode amplifier and some changes to the FT-221's front end are contemplated.

Brian Joyner, G8ZYZ, from Dover in Kent, has certificate no. 352, dated November 23. His introduction to amateur radio, at the age of fifteen, was by participation in a "Jamboree of the Air". Brian's first Rx "... was an ex-government set which weighed a ton!" and, "... disappeared in a puff of

smoke . . ." later. He signed up for the December, 1979 R.A.E. then signed up on a correspondence course run by the Dover club. The licence arrived the following February and the present station comprises an *Icom* IC-290E, *Tono* 80w. amplifier, 11-ele. *Cushcraft* aerial and *muTek* masthead preamp. An *Icom* IC-2E is used for portable and mobile operation. Brian is an active member of the Dover club, particularly in contests, and he plans to join *Raynet*, pass the morse test and get going on 70cm.

Graham Ridgeway, G8UYD, from Mansfield, Notts., is member no. 353, his certificate also being issued on Nov. 23. His interest dates back to the early 1960s when he used to contribute to Justin Cooper's column from various U.K. locations. Like G8ZYZ, Graham also sat the Dec. 1979 R.A.E. and got his licence in Feb. 1980. Initial operation was on 2m. FM using an *Icom* IC-215. Following a move to Mansfield in Sept. 1981, an IC-202S was acquired with a 10w. amplifier and 4-ele. *Quad* aerial. The majority of operation has been on SSB and he rarely feels the need for more than 10w.

The Tables

Next month, the final placings in the 1982 tables will be published so please make sure to send in your final figures by January 5. Anyone in, or wanting to join, the 23cm. All-time table may like to update their scores.

Satellite News

Another Soviet amateur satellite was hand-launched from *Salyut 7* at 0756 UT on Nov. 18. Known as *ISKRA 3*, its initial orbit had a period of 91.466 minutes with a *perigee* of 347 km. and *apogee* of 364 km. at an inclination of 51.6338°. The track separation *per* revolution was 23.453°. By Nov. 11, the period was reported to have reduced to 90.615 mins., the track separation to 23.037° *per* orbit, and the *perigee* and *apogee* to 328 and 331 km. respectively. This satellite carries a telemetry beacon of 300mw. output on 29.583 MHz and a 15/10m. transponder. The uplink band is 21.23 to 21.27 MHz and the downlink 29.58 to 29.62 MHz. The telemetry is showing very high temperatures which the Russian controllers cannot explain. A fault in a PA stage is causing the batteries to discharge rather quickly. Consequently, the need for re-charging dictates that the satellite is only working once every three or four days at the time of editing.

From London, orbits crossing the equator in *ascending node* between 15° and 154° west are in range. Soviet stations hold a net after every orbit on 3,644 kHz. Telemetry copy would be appreciated. Your scribe got his 15m. signal transponded on orbit no. 65 on Nov. 22,

but no stations were heard on the 10m. downlink.

U-O-9 (UOSAT) is now working well. The "*Digitalker*" has been on reading out telemetry frames, and data and news bulletins have been transmitted at 1,200 *Baud* on both channels. The satellite has been completely de-spun and the gravity gradient boom should have been deployed well before this is read, and the HF beacons switched on. These are on 7.050, 14.002, 21.002 and 29.510 MHz. Each has its own crystal oscillator and can be operated independently, but a synthesiser network enables the 14, 21 and 29 MHz oscillators to be phase-related to the 7 MHz one for trans-ionospheric path analysis.

AMSAT-UK's *Computer Software Handbook* is now published and has proved so popular that a second printing has been ordered. The price to members is £3.00 (£3.50 to non-members) plus 40p for postage. A *Technical Manual* incorporating the second part of "*The Best of Oscar News*," is in preparation. For full details of AMSAT-UK membership and services, send an *s.a.e.* to AMSAT-UK, London E12 9EQ.

There is no further news concerning the *Phase 3B* project and information about this satellite's aerials is still awaited. The six Soviet satellites, *RS-3* to *RS-8*, continue to function normally and seem reliable and well used. Nos. 3 and 4 are not transponders, but nos. 5 to 8 have 145/29 MHz transponders. Looking to the more distant future, the *Cablesat General Corporation* in the U.S.A., has sought permission to launch two geostationary professional satellites in 1985. The President of the business is a licensed amateur and plans to incorporate microwave transponders, known as *ARNET*, with uplink in the 5.6 GHz band and downlink around 3.4 GHz. If "stationed" no further west than 75°, *e.g.* about the longitude Philadelphia, one would just about be above the horizon from London. It is suggested that 10W. to a 2m. dish will produce the required *e.r.p.* for access.

Beacon News

Two more microwave beacons are now operational. GB3CEM is on from Sutton Coldfield (ZM31a) on 10.36888 GHz with 3mw. to an omnidirectional aerial. It sends its call sign and QTH locator. GB3GBY is on 10.400 GHz from Grimsby (ZN40c). It runs 10mw. to a slotted waveguide, 16-ele. aerial beaming to the south and it, too, sends its call and locator.

On 23cm., the Kent beacon GB3NWK, located at Chelsfield (AL51b) came back into service on Dec. 5. The height of the aerial is now 35ft. *a.g.l.* and better feeder cable has resulted in the *e.r.p.* being increased to 100 watts. Reception reports to GB3BJG at 39 Baston Rd., Hayes, Bromley, BR2 7BO.

Repeater Notes

Trevor Day, G3ZYY, Membership Secretary of the *West Devon Repeater Group*, has written with news of the GB3WD relay which it is hoped to have operational early this year on Channel R4. The proposed site at North Hessary Tor, near Princetown on Dartmoor, is expected to give excellent coverage of north and south Devon and to fill in gaps in the coverage of existing repeaters GB3s BC, NC, TR, WR and WW. The hardware is now at an advanced stage so the Committee is looking to increase membership of the group. Interested readers should contact G3ZYY at 46 Beatrice Avenue, Saltash, Cornwall, PL12 4NG. Trevor's 'phone number is Saltash 5913.

The RSGB's Repeater Working Group has provisionally allocated Ch. RB13 for a proposed UHF repeater in the Breckland district of Norfolk. It has also accepted a proposal for a 2m. relay for Black Isle, near Inverness, and has allocated Ch. R5 provisionally. The Home Office has agreed to a site change for the Mid-Kent VHF relay, GB3KN, but the service area is not expected to be much different from what it was before. GB3OX on RB15 is now operating from Oxford and G8SIN would welcome reports.

Contests

The first event of the year is the 70 MHz CW contest on Jan. 16 from 1000 to 1500 and it is a single section affair. Entries and check logs to G3LCH at 49 Streathbourne Road, London, SW17 8QZ. The first leg of the 70 MHz *Cumulatives* is probably on Jan. 30 but, as happened last year, no times/dates/rules have been published yet. The 432 MHz Fixed Contest is scheduled for Feb. 6; more details next month.

Two Metres

Bill Hodgson, G3BW, says he does not have much recent news but had made a number of MS skeds for the *Geminids* and *Quadrantids* meteor showers which he hoped would bring him some new ones. Frank Howe, G3FIJ, (Essex) operated during the end-of-October tropo. lift and added OK1KPU/P (GK) for a new square and new 1982 country.

Dave Sellars, G3PBV, (Devon) was not available early enough to catch the *Aurora* on Nov. 23 and reckons the one the following day was poor in the south west. First reflexions were heard at 2140 and "came and went" over the next couple of hours. On CW, OZ1CLL, GM4IPK, GM3WTA, EI6AS, G4ITR and some other northern Gs were heard at no great strength. He concluded that, from past

experience, they were not strong enough for him to work them. Nothing was heard of the Nov. 29 *Ar* in Newton Abbot.

Clive Penna, G3POI, (Kent) with a massive 391 squares to his credit, looks to be set for 400 before much longer. Naturally, his 160-ele. colinear aerial array has enabled him to work many stations *via E-M-E* to help boost the tally, and the quest to get the last fraction of a dB. reduction in system *noise figure* has obviously paid off. Recent MS new ones include LA1K (FW), LA6QBA (GV) and OH1ZAA (KV). Clive has made a number of trips to Gibraltar recently and seems intent on getting Jimmy Bruzon, ZB2BL, going on *E-M-E* this year. He has details of the various *N.B.S. Yagis* and, as some aluminium stock is available locally, may be able to do a *D-I-Y* on a few. He has the components for a QRO amplifier.

A short note has been received from

Martin Blythe, G4HFO, from St. Austell in Cornwall, to up-date his Squares Table figures. His son, Julian, is G8ORP, and uses the same station and enters this table as well to create a little family rivalry. Because Julian can operate at times when Martin is not home, he has some squares which the latter has not.

Paul Turner's, G4IJE, (Essex) main interest these days is MS operating and he once confessed to your scribe of suffering withdrawal symptoms if too many days passed without an MS sked! However, he does come on when conditions are up and was in on the Nov. 24 *Ar* which yielded UQ2AO (MQ) for a new square. He started at 1417 and other QSOs, all CW, included Y22IC (GN), UP2BFR (LP), DL7YS (GM) and an HG7 in JH square. Paul was nearing the 300 squares total and no doubt the *Geminids* and *Quadrantids* will bring that landmark nearer.

ANNUAL VHF/UHF TABLE

January to December 1982

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		23 CENTIMETRES		TOTAL Points
	Counties	Countries	Counties	Countries	Counties	Countries	Counties	Countries	
G2AXI	56	7	73	24	50	19	12	2	229
G3BW	45	6	75	22	48	10	6	4	206
GD2HDZ	54	7	68	16	45	13	3	2	203
G3PBV	35	7	67	23	42	14	14	6	188
G8TFI	—	—	78	20	62	21	—	—	181
G4JZF	—	—	82	22	58	17	—	—	179
G8RZO	—	—	77	25	45	16	—	—	163
G8RZP	—	—	77	25	45	16	—	—	163
G6ADE	—	—	65	16	53	16	—	—	150
G3FIJ	42	4	54	18	25	3	—	—	146
G6ADC	—	—	67	14	46	14	1	1	143
G8HHI	—	—	61	19	33	13	14	2	142
G4MUT	15	4	53	19	38	12	—	—	141
G4ARI	40	5	72	23	—	—	—	—	140
G8ULU	—	—	61	22	37	16	—	—	136
GW3NYY	—	—	81	27	19	7	—	—	134
GW3CCF	—	—	62	12	35	7	14	3	133
G8VRJ	—	—	46	15	33	11	20	5	130
G8VR	24	3	62	36	—	—	—	—	125
G6DER	—	—	72	18	26	6	—	—	122
G6ADH	—	—	65	21	26	7	—	—	119
G4DEZ	—	—	77	41	—	—	—	—	118
G4NBS	—	—	44	9	43	7	11	1	115
G6ECM	—	—	80	25	—	—	—	—	105
G3FPK	—	—	76	25	—	—	—	—	101
G8KAX	—	—	42	12	24	9	10	3	100
GM8OEG	—	—	74	25	—	—	—	—	99
G8LFB	—	—	72	23	—	—	—	—	95
GM4CXP	8	3	51	21	6	3	—	—	92
GW3CBY	12	4	44	15	13	2	4	3	90
G6FSH	—	—	71	15	—	—	—	—	86
G8WUU	—	—	41	15	18	6	—	—	80
G8VVF	—	—	60	16	—	—	—	—	76
G4KLX	—	—	53	18	3	1	—	—	75
G4MEJ	—	—	51	23	—	—	—	—	74
G4NRG	1	1	37	15	12	6	—	—	72
G6CGY	—	—	51	14	4	2	—	—	71
G4FKI	21	2	23	10	9	1	—	—	66
G8RWG	—	—	54	12	—	—	—	—	66
G8XTJ	—	—	52	11	—	—	—	—	63
G6AJA	—	—	49	13	—	—	—	—	62
GW4HBK	35	7	14	5	—	—	—	—	61
GM4COK	—	—	28	20	5	6	—	—	59
GW8TVX	—	—	39	11	—	—	6	3	59
G8LXY	—	—	30	7	16	2	—	—	55
G8XHL	—	—	30	9	11	3	—	—	53
G4BVY	9	2	—	—	29	11	—	—	51
G6HDD	—	—	40	7	—	—	—	—	47
G8ZYL	—	—	35	8	—	—	—	—	43

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

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

QTH LOCATOR SQUARES TABLE

Station	23cm.	70cm.	2m.	Total
G4BYV	60	—	—	60
G3JXN	46	91	137	274
G3COJ	30	82	150	262
G3XDY	30	86	131	247
G8PNN	25	57	104	186
LA8AK	23	49	195	267
G3PBV	17	81	159	257
G8VRJ	16	38	101	155
G8FMK	16	57	71	144
G8ATK	15	81	129	225
G8KAX	14	52	80	146
G4NBS	13	58	91	162
GD2HDZ	13	46	91	150
GJ8KNV	12	76	191	279
G8HHI	12	70	132	214
G2AXI	9	72	120	201
G4BYV	9	72	—	81
G4GFX	7	40	103	150
G4BW	6	35	198	239
G4ERX	6	46	121	173
GW3C'BY	5	16	79	100
G8KBQ	4	75	161	240
GJ8SBT	3	—	161	164
G8ZSU	2	18	65	85
GJ4ICD	1	102	223	326
G3VYF	—	117	307	424
G3POI	—	—	391	391
G3IMV	—	34	322	356
DK3UZ	—	—	304	304
G4IJE	—	—	289	289
EA3LL	—	30	252	282
SP2DX	—	—	280	280
G4IGO	—	19	245	264
G4ERG	—	16	235	251
G4DEZ	—	—	233	233
G8VR	—	3	224	227
G3CHN	—	—	224	224
G8RZO	—	75	148	223
G8RZP	—	76	147	223
9H1BT	—	11	210	221
GM4COK	—	26	194	220
GW3NYY	—	42	169	211
G4JZF	—	68	140	208
G4MCU	—	44	158	202
G4PCI	—	28	165	193
G3FPK	—	—	193	193
G8CXQ	—	48	144	192
GW4EA1	—	—	187	187
G3NAQ	—	58	128	186
G3KEQ	—	—	186	186
GM4CXP	—	26	159	185
G4OAE	—	26	157	183
G4NFD	—	36	138	174
G4HMF	—	32	140	172
G4HFO	—	59	102	161
G4NQX	—	46	111	157
G6ADH	—	29	124	153
G8ULU	—	62	91	153
G8LFB	—	—	147	147
G8WPD	—	19	120	139
G6ECM	—	—	138	138
G6ADE	—	64	70	134
G6DDK	—	11	122	133
G8TGM	—	—	122	122
G3FIJ	—	29	92	121
G4MJC	—	12	108	120
G4MUT	—	50	69	119
G8ORP	—	37	76	113
G8XIR	—	—	112	112
GM4IPK	—	—	111	111
GM8OEG	—	—	109	109
G4MEJ	—	—	105	105
G8SRL	—	21	83	104
G4GHA	—	—	104	104
G8WUU	—	27	72	99
G4MWD	—	—	95	95
G6ADC	—	34	58	92
G6DER	—	18	74	92
G6HKT	—	28	62	90
G8RWG	—	—	83	83
G6HTJ	—	17	66	83
G8XQS	—	4	76	80
G4K LX	—	5	74	79
G8WPL	—	—	79	79
G4NWT	—	22	55	77
GM8BDX	—	24	53	77
G8V FV	—	—	76	76
G6ABB	—	—	75	75
G4NRG	—	11	57	68
G6CNX	—	—	63	63
G8XMP	—	—	62	62
G8LXY	—	20	34	54
G4PEM	—	—	50	50
G8ZYL	—	—	46	46
G4LDY	—	3	41	44

Starting date January 1, 1975. No satellite or repeater QSOs. *Band of the month*, 23cm.

Tony Collett, G4NBS, (Berks.) says he actually found and worked in an *Ar* on Oct. 31 when, at 1851, he contacted GM6PZ (XQ) for an all-time new square. However, nothing else was heard. He took part in the CW Contest on Nov. 6/7 and made 72 QSOs worth 317 points. Conditions seemed very poor with little coming in from the north, apart from G4KTP in Durham. Continentals included a DL, 3 Fs, a PA and 3 ONs. The *Verulam Club's* Contest on the 28th provided a few more counties for 1982.

Keith Hewitt, G6DER, (S. Yorks.) mentions the tropo. on Oct. 30 in which he worked HB9AEN/P (DG) and OK1KPU (GK) both new squares and countries. Other new squares were DK5GX/P (DI), DC2GY/P (EI), DL6NAQ/P (EK) and F6CVN (CI). The *Ar* on Nov. 24 brought DC3VW (DJ) for another new square, plus F1DQK, F1FHI and GM6KWF (XP) in Strathclyde Region.

Ken Willis, G8VR, (Kent) is another keen MS operator who uses this mode to good effect as will be obvious from his total of 36 countries so far this year. During writing this piece, he reported a successful *Geminids* CW QSO with OH4UC (NV). Martyn Jones, G8CXQ, (Warks.) missed most of the fine tropo. at the end of October, but did get home at 1900 on the 30th to work OK1KPU/P and Y21RN, both in new square GK.

Tony Prior, G8XHL, has just gone through the trauma of moving house and is now in Langham, about five miles north of Colchester in Essex. This has curtailed amateur radio activities but the home made 16-ele. G2BCX aerial is already up at 25ft. The transceiver is a *Trio* TR-9130 with which he is very pleased. Tony was on for the Dec. 5 contest and worked Co. Durham to bring the year's total to 30.

Arthur Breese, GD2HDZ, was on several bands during the October lift and added his 16th country for the year on the 30th, thanks to LX1GR, Ken Wood, GM3WCS, (Fife) in a QSO with your scribe on the 20m. VHF net, mentioned an *Ar* on Dec. 7 and another, better one the next day from 1630 to 2100. This yielded CW QSOs with RQ2GAG in MQ and OH1DP in LU, amongst the usual, nearer continentals. At G3FPK, the Dec. 8 affair was discovered at 1720 but only weakish GMs were heard, and it was still rumbling on at switch-off at 1930.

At G3FPK, the October tropo. lift provided a couple of new squares; OK1IBI/P (GK) on SSB and Y31QM/A (GL) on CW, on the 30th. On the *Ar* scene, a very weak event was noticed in the evening of the 21st Nov. Eddi Ramm, DK3UZ, telephoned at 1715 on the 23rd to report another event in EN square and a number of G, GI and GM signals were copied on SSB and CW but none were very strong. This was from about 1830 for half an hour.

Another event was heard from the start on the 24th at about 1340. On the 20m.

VHF net, DF5HC (FN22d) was calling so was advised of the event and checked to confirm it was all happening. The *Doppler* shift was about 700 Hz high frequency. The event was very intense and QTF's peaked rather broadly around 40° but *Ar* were audible between 0° and 90° for much of the time. Best DX heard was UQ2GAJ (LQ06b) at 1600 and OH1DP (LU42j) at 1615. SM7DLZ (IQ53h) at 1734 was the sole new square.

In a subsequent inquest on the VHF net, DF5HC mentioned working stations in AL, BJ, FU, KQ, HT, NR and ZO squares. Another fact is that in these more southerly *Auroras*, the more northerly stations, e.g. the GMs, do not hear the Russians copied and worked by stations in the south of Britain.

The fixed contest on Dec. 5 saw a great deal of activity. The majority of signals were acceptable, a few outstandingly clean and there were some real stinkers. Steve Marsh, G4BWG, (ZL60j) made 420 contacts. With six minutes left, the South Bucks. Contest Group, G4NXXO, had made 402 QSOs. G3RQZ (AL51g) ended up with 343 and G8RZO was giving a serial number of 354 with about thirteen minutes to go. Andrew Kett, G8VLL, (Norwich) made 371 contacts in the Multi-op. section, so it looks as if it will be a fairly even battle for the top places.

John King, G6ADH, (Surrey) arrived home from the Middle East early on the morning of Oct. 30 to find the band full of OK and Y stations, all S9-plus. He worked fifty of them before succumbing to jet lag, the pick of the bunch including: OK2VIL/P (JJ33g), OK2KZP/P (LJ32j), OK1KKH/P (HJ06c), OK1KPU/P (GK29a), Y24XN/P (GK43f), Y38ZA (HN07c) and Y23LI/M (FK24e). There were many East Germans in GL and GM squares and "out of the blue" came SM6JMZ (GQ24a), the only Scandinavian heard. All the new squares have been confirmed already but John still awaits cards from several GMs and Scandinavians to whom he has sent *s.a.e.'s* and IRCs.

Seventy Centimetres

G3PBV reports that the only addition to his table score was the county of Berkshire and little DX was heard in his part of Devon in November. G4NBS took part in the *Cumulatives* and was glad at the increased activity even though conditions have been very poor. In the Nov. 1 session, Tony made 47 QSOs worth 205 points and on the 9th, the same number of contacts but 225 pts. This session included a QSO with G8PNN in Northumberland. On the 17th, 46 stations were worked, including G8REQ/P (Lancs.) for 160 pts., while the last session on the 25th gave 48 contacts for just 130 pts.

Cliff Jeffery has done very well on the band this year with 58 counties and 18 countries in the G6ADE log, from 72 squares. On Oct. 30, he worked OE2CAL

(GH16c), F1DZB (ZJ78a), F1EZQ (CH15d), F1FHR (BI12c), OK2VIL/P, F0GOH/P (DI76f), Y24XN/P and DK0NA (FK58b) from his Maltby, S. Yorks. QTH. His station comprises a *Trio* TS-770E transceiver, *MM* 50 watts amplifier, *Datong* speech processor and 21-ele *Tonna* beam at 35ft., 450ft. a.s.l.

G6DER lists G8EUX (Northants.) on Oct. 27 for a new county, DL6NAQ/P (EK) on the 30th, G8MFP (Warks.) on Nov. 6, G6CGY (Cleveland) and G8FUO (Berks.) on the 30th, and G8VZT in Shropshire on Dec. 2. Keith wonders why French QSLs seem to get through the bureaux so quickly, citing receipt of cards from the Sept. 26 *Ar* in about five weeks. G8CXQ, who missed most of the late October tropo., mentions just DB6NT/A (FK) for a new square on the band.

John Pilags, G8HHI, (Hants.) has been travelling around a lot lately which has curtailed activity, but he did participate in the Nov. 1 session of the *Cumulatives* which brought QSOs with G3TDG (Kent), G8REQ/P (Lancs.), G4APA/P (Staffs.) and GD2HDZ. Since his recent move, G8XHL has not been on the band but has an 88-ele. *Multibeam* ready for launch soon. He was hoping for a transceiver as a Christmas present! GD2HDZ could not raise HB9AMH/P on 2m. on Oct. 30 but did manage to contact Arnold on this band, along with LX1DB.

Gigahertz Bands

John Tye, G4BYV, (Norfolk) specialises in 9, 13 and 23cm. operation and now has a commanding lead in our Squares table with 60 worked. He has 21 worked on 13cm. and three on 9cm. and would welcome skeds on any microwave bands. In the Oct. 30 tropo., John worked OK1AIY/P (HK) on 13cm. the QRB being 1,027 kms. His previous 464 kms. record on 9cm. was broken by PA2DOL (CL) who worked over 500 kms. He reports, too, that G3AUS (Devon) worked an OK in JJ square on Oct. 30 to create a new 23cm. DX record of 1,576 kms.

G4NBS has at long last got his 23cm. transverter back from the mender's and tested it out on Nov. 24. All seemed well, but when used in the last leg of the *Cumulatives* — nothing! A check the following morning revealed that the *Heliac* feeder had gotten tangled up in the rotator bearing and is now in two pieces. "Murphy" never gives up! G8HHI operated in the 23cm. *Cumulatives* and lists G4APA/P at 220 kms., G4FRE/A (Suffolk) at 161 kms., G4KIY (Cambs.) at 147 kms. and G3TDG. John was only using one watt for these QSOs.

Highlight of the Oct. 30 opening on 23cm. for GD2HDZ was working

HB9AMP/P with just one watt of SSB, for an RS53 report. This QSO was almost exactly seven years since Arthur's first contact with Arnold in October, 1975. Russ Clarke, GW3CCF, (Clwyd) is still only running 1½ watts on 23cm. but nevertheless did work some good DX on Oct. 30 into DJ, EI and EK squares. He has also worked into London on a number of occasions under normal conditions.

Operating Notes

Until relatively recently, it was usual for anyone getting an amateur radio licence to have spent some while as a short wave listener. This "apprenticeship" ensured that basic operating procedures and band plans were known so that when the licence arrived, the new operator would not make a complete ass of him or herself. However, this seems less likely to be the case today, a point mentioned in The RSGB's *Annual General Manager's Report* in the supplement to the November, 1982 *RadCom*.

Hardly a month passes when readers do not complain about people operating FM in a CW band, clobbering beacons or interfering with satellite communications. Much of this nuisance is simply through ignorance. As one colleague put it, "After they've let go the PTT button on the mike, that's probably the first time they have ever *listened* on an amateur band". A typical illustration of this syndrome occurred a few days ago, during the *Geminids* meteor shower when the 2m. Rx was tuned to the random MS CW frequency, 144.100 MHz. Two G6s were chatting away on SSB so your scribe chipped in to tell them the situation, asking them to QSY. They did, without delay, one remarking to the other that he thought he had heard some CW underneath the other's signal.

There seem to be three cases of inconsiderate operation. The first is by those genuinely unaware of any band plans and who see that their licence permits various modes over the entire bands. They have probably never been *s.w.l.'s* and probably are not members of the RSGB. or readers of this sort of column. Their main interest is likely to be chatting to local friends, little more than CB-ers, in fact, even though they have taken the trouble to get their amateur licence. A friendly chat about band plans and the various interests, such as MS, etc., in most cases puts them on the right road.

The second group comprises the more "bolshie" characters, less amenable to reasoned persuasion to respect band plans. Some of the excuses include: "Band plan? That's some RSGB rubbish and I'm not a member," or "My licence lets me

transmit all modes all over the band . . ." Another one is, "I can't hear any beacons, the channel's free as far as I'm concerned". The third group are the pirates who could not care less about upsetting licensed amateurs.

The band worst affected is undoubtedly 2m. so no excuses for outlining the internationally agreed, *Region 1 Band Plan*, again. 144.000 to 144.150 MHz is *exclusively* CW. The bottom 10 kHz is for *E-M-E*; 144.050 is the calling frequency and 144.100 the random — *i.e.* non-scheduled — MS frequency. From 144.150 to 144.499 is SSB and CW, though little CW operation occurs in this part. 144.300 is the calling frequency for SSB and 144.400 the calling frequency for random SSB, although 144.200 is still very much in use, too.

144.500 to 144.849 MHz is basically for all-mode "DX" operation, with 144.500 for SS/TV calling, 144.600 for FSK RTTY calling, 144.700 for FAX calling and 144.750 for ATV talkback. 144.850 to 144.99 is the beacon band. Although there may appear to be a lot of unused spectrum space, many amateurs monitor specific beacons to assess random meteor activity, auroral propagation, etc.

145.00 to 145.80 is for local FM traffic including eight repeater channels R0 (145.000/145.600 input/output) to R7 (145.175/145.775). 145.300 is the AFSK RTTY calling frequency and 145.500 the general calling frequency. The section 145.800 to 146.000 is for satellite communications. Use of this part for terrestrial QSOs can result in one's signals being picked up by a passing satellite transponder and/or interference to local stations trying to copy weak downlink signals.

So much for the 2m. band plan. If everyone adheres to it, there will be no conflict of interest and everyone will get maximum enjoyment. One final plea, if you must adjust your Tx on the air, the calling frequencies are *not* the ones to use; "w-a-a-l-lows" and whistles are best performed well away from the more active parts of the band.

Deadlines

The very important deadline is **Jan. 5** if you want to get in your final, 1982 Table scores. The March deadline is Feb. 2; very early. Everything to: "VHF Bands," *SHORT WAVE MAGAZINE*, 34 High Street, WELWYN, Herts., AL6 9EQ. Thanks to those readers who sent cards and Season's Greetings and may I wish you a very Happy New Year with lots of super DX. *73 de G3FPK*.

A POWER SUPPLY FOR THE YAESU FT-707

IAN KEYSER, G3ROO

HAVING completed the 160m. transceiver and external VFO for the FT-707 (*Short Wave Magazine*, June and September, 1982, respectively) there were two other units which could be constructed to complete the range of accessories. These are a suitable ATU, and a power supply. Work started first on the ATU — but this project was shelved when the accumulator that was powering the station failed!

Top priority then became the power supply, and magazines were scanned to try and find a suitable circuit which could be 'cribbed' to save time, but it soon became apparent that although there were many good ideas all the units described either were built from the junk box, or suitable components could not be located. Having made this discovery, commercial units were investigated but that revealed that they were greatly over-priced, and I was sure that a comparable unit could be constructed using new components for little over half the cost. Indeed, taking into account retailers' profits and 'good old VAT', the cost of the power supply described here should be in the region of £60 for all new components.

Description

The heart of the power supply is of course the transformer, and here I have used a unit from *ILP Transformers*. These units are toroidal, and so before proceeding a few points about them should be made. They do tend to be a little noisy in use, and when the mains supply is badly loaded, and so non-symmetrical, the situation can be considerably worse with acoustic hum clearly audible. This would appear to be a general situation, and not peculiar to the *ILP* units. Having said that, the points in favour of the toroid are considerable: much reduced magnetic field, small size, the ability to be overwound easily, and low price which makes them desirable for amateur use.

For two reasons I wished to keep the voltage across the smoothing capacitors to just below 25 volts — firstly to keep the dissipation in the series pass transistors to a minimum, and secondly to enable me to use 25 volt working capacitors. Calculation shows that 18 volt transformers would develop 26 volts under no load conditions, and so too high, and 15 volt

transformer would give 22 volts off-load. Thus the 15 volt unit was decided upon, but in practice an extra volt or so would prove to be an advantage. The final figures obtained with this transformer are: off-load output 13.6v; onset of ripple at 17A; 0.5v ripple at 20A; full load (20A) voltage 12.5v.

To obtain the extra volt an overwind could be added to the transformer. The transformer develops 0.5 volts per turn, so by adding three turns of stout enamelled copper wire (12 s.w.g.) capacitor voltage is brought to 25 volts — an almost ideal situation.

The rectifier used in my unit was made up from some very high power diodes from the junk box, but a suitable unit is marketed by *Radiospares*. Their 35 amp. bridge rectifier (part number 262-523) can handle surges up to 400 amps. The capacitors are also *Radiospares* items, 22,000 μF at 25VWKG (p/n 102-617), two of these being used to give a total of 44,000 μF . The next size capacitor is 33,000 μF at 40VWKG; these should just be able to fit into the case and would considerably assist in the regulation (p/n 102-137).

The regulator element is the old favourite, the 723. This has an output current of only 150 mA., so there has to be a current amplifier (TR1) to drive the bases of the three series pass amplifiers (TR2, TR3, TR4). These four transistors are mounted on a *Radiospares* heatsink (p/n 401-807) which has been cut in half to make two 3-inch heatsinks mounted on the rear of the case. For the main LT fuse I have tried to locate a source of suitable wire-up fuse holders, but without success. Instead I have used a

Table of Values Fig. 1

- | | |
|---|--|
| R1, R2, R3, R4 = 0.1R, made from old fire element | TR1 to TR4 = 2N3055 |
| R5 = 2K2, 1/4W | D1 = RS 262-523 |
| R6, R7 = 3K3, 1/4W | Heatsink = RS 401-807 |
| R8 = 3K9, 1/4W | Stick-on feet = RS 543-333 |
| RV1 = 4K7 preset | Mains input = RS 488-400 |
| C1, C2 = RS 102-617 or 103-137, see text | Mains plug = RS 488-393 |
| C3, C4, C5, C10 = 1000 pF s/m | SW1 = RS 388-305 |
| C6 = 4.7 μF elec. | Terminal posts = RS 444-775 (red), 444-781 (black) |
| C7 = 10,000 pF cer. | T1 = <i>ILP</i> 300W 240V primary, 15V secondary |
| C8 = 100 μF elec. | IC1 = 723 |
| C9 = 10,000 pF s/m | FS1, FS2 = see text |

Note: T1 available from *ILP Transformers*, Freeport T4, Graham Bell House, Roper Close, Canterbury CT2 7EP.

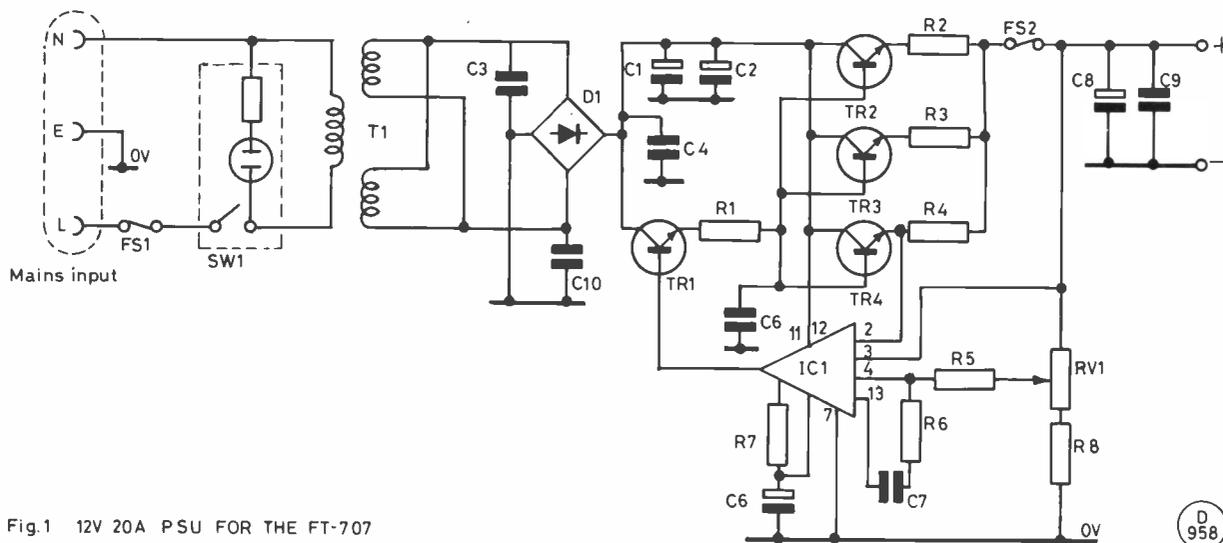


Fig.1 12V 20A PSU FOR THE FT-707

'Slidlock' unit from an old wartime PSU, but if one of these cannot be found I would suggest mounting a 20 amp. fuse on the rear of the positive terminal inside the case, along with the crowbar SCR. The SCR itself (which may prove a little hard to find) should be rated at 40 amps.

No PCB is given here as the regulator can easily be built on *Veroboard*; however one point must be observed, and that is if anything is mounted on the transformer top mounting washer, it must be insulated from the washer otherwise in effect there will be a shorted turn on the transformer which will cause overheating and bad regulation.

Finally, the metalwork: this can be obtained from *H. L. Smith*, 287-289 Edgware Road, London W.2.

Conclusion

Of course, no originality can be claimed for the circuit! It is very simple but, more important, it works. With a ready-made case and all the parts to hand it should be possible to complete, paint and use over a weekend, between all those domestic odd jobs which need doing.

The only thing I do miss about the old battery is the ability to go on the air during a power cut, but — thank goodness — we haven't had too many of those in the last couple of years.

A SEVEN-EIGHTH WAVE COAT-HANGER ANTENNA

H. R. Henly, C.Eng., MIERE, G3IHR

UNTIL the recent rail strike the 'joys' of 2-metre, and in particular mobile, operation had eluded the author. This was probably brought about largely by reading only the worst reports about the VHF bands and repeater operating practices and never sampling some of the less reprehensible activities. However, when faced with several weeks of commuting from the Sussex coast to the City of London by car, a colleague's suggestion that 2m. mobile operation would leaven even the worst traffic jam seemed worth a try.

For this venture a quarter wave-length vertical was used. This was a piece of 16 swg brass rod initially cut oversize (approximately 20 inches) and then trimmed to size using the set-up shown in Fig. 1. The quarter-wave was mounted in the centre of the car roof using a magnetic mount and the length was then reduced 0.5 inch at a time until the reflected power was as low as possible. This was found to be more reliable than a simple SWR reading but this was probably a characteristic of the author's SWR meter. It is necessary to make measurements at a few spot frequencies

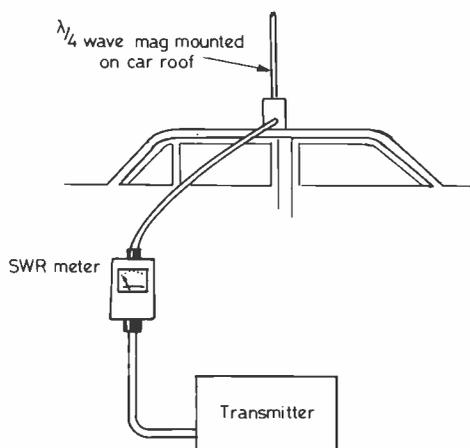


Fig. 1 TEST SET-UP FOR ADJUSTING ANTENNA

D 982

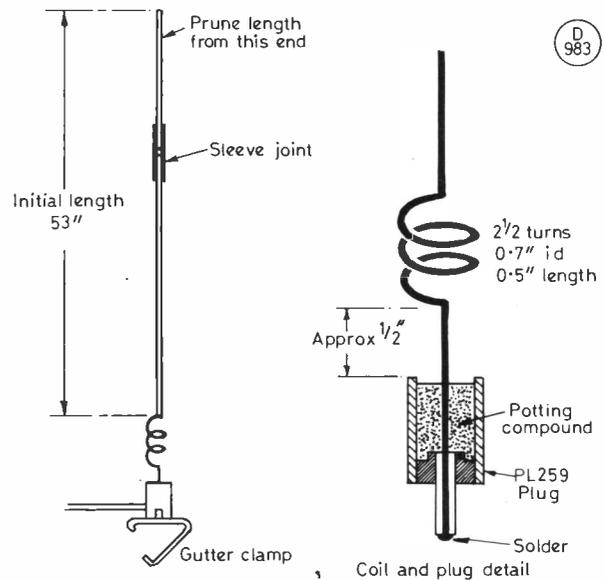


Fig. 2 7/8λ COAT HANGER

through the band in order to check that one is progressing in the right direction as the antenna length is shortened. Thus one starts by cutting to obtain resonance at 144 MHz and then proceeds slowly towards 145.5 MHz. Haste will invariably result in a collection of potential 420 MHz antennae! An SWR of better than 1.1:1 was obtained over the range 145.2 to 145.8 MHz with a little patience. This antenna provided some enjoyable mobile contacts, mainly on simplex — with some over 30 miles — using only 5 watts output from a Zycomm 58000 hand-held transceiver.

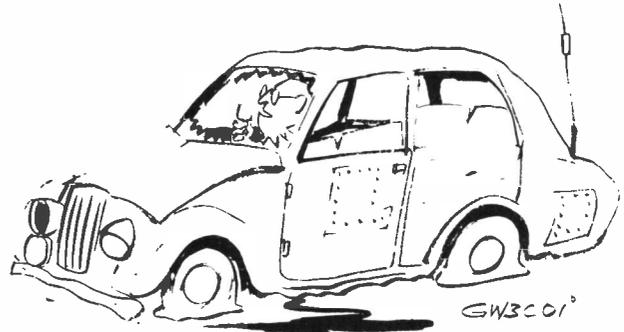
A very crude attempt to estimate the radiation pattern by walking round the car at a constant radius with a field-strength meter, indicated an omni-directional pattern with the vertical lobe concentrated roughly between 0 and 60 degrees to the horizontal plane.

The majority of people contacted seemed to favour either a 5/8 or 7/8-wavelength vertical, gutter or bumper mounted. The excellent article by Jessop (*Practical Wireless*, July 1978) confirmed that one should achieve lower angle radiation with this type of antenna. When the annual holiday in Wales came along it seemed an ideal opportunity to try one. It was decided to gutter-mount the antenna rather than use the mag-mount since this would enable the quarter-wave to be retained for comparison. The gutter-mount used is a standard CB type, comprising a PL259



A view of the gutter-mounted $\frac{7}{8}$ -wave and mag-mounted $\frac{1}{4}$ -wave aeri-als.

off-side rear gutter the radiation pattern did not appear to be seriously distorted by the presence of either a loaded roof-rack or the mag-mounted quarter-wave but this is only a subjective assessment. As an indication of the results obtained, it was used to work into the Dublin repeater from just outside Fishguard. It was also found possible to access the Carmarthen repeater from the M4 near Newport whilst this was not possible with the quarter-wave, but with the number of variables involved there may be other explanations of why this was so! In addition several very enjoyable simplex QSO's were made en-route between Sussex and West Wales. In Wales, operation was mainly of HF — but that's another story!



“... standing-by for a short QC...”

female connector mounted on a gutter clamp complete with some 4m. of coax cable. The antenna itself leaves much to be desired mechanically — it was constructed in approximately 1 hour (including commissioning) just before driving off into the sunset! The basic material was a stout wire coat-hanger, carefully straightened out. The lower end was coiled to form the loading inductor (see Fig. 2 for details) leaving a short tail of sufficient length to solder direct to the centre pin of a PL259 male connector. Before soldering to the connector this tail should be sleeved with a short length of PVC. When first conceived it was intended to fill the space between the inner and the shell of the connector with a potting compound to make a water-tight seal. However time did not permit 'temporary' measure the space was filled instead with *Blutak!* This has proved to be a very successful sealant, being water-tight and sufficiently elastic, and has survived a 1,000 miles of variable English/Welsh weather.

The antenna length was made up to a total of 53 inches by the addition of a length of brass rod and a short length of copper sleeve which was crimped to make a good electrical connection and, then wrapped with PVC tape to protect from the weather. The length was then pruned in the same way as for the quarter-wave described above but was found to be rather more critical — so be warned.

Results have been very encouraging. In general signal strengths appeared to be one or two S-points higher than with the quarter-wave and the radiation angle was decidedly lower. Mounted on the



LAR Modules Ltd., are now able to offer lightweight versions of their popular traps. Typically, a 7 MHz trap now weighs only 50gm — half the previous figure — while still retaining the electrical and weatherproof properties of its earlier counterpart. The traps, 3.5 or 7 MHz, complete with end insulators and a centre tee-piece, come boxed with instructions for £17.20 inc. VAT (p/p £2.00 extra). Orders should be sent to *LAR Modules Ltd.*, 60 Green Road, Leeds LS6 4JP. (Tel: 0532-782224.)

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CLUBS ROUNDUP

By "Club Secretary"

Before we get stuck into the business of reporting on the activities of clubs may we take this opportunity of reminding you that we can't manage without your regular up-dating. If *your* club appears in this piece, dear reader, please check on the details, and if you have a new Hon. Sec. or Hq address, or meeting date or whatever, then get him/her to send us an update. If your club doesn't appear here — and some clubs for various reasons don't want publicity — then at least send us the essential details annotated "not for publication" so that if we come across a wandering SWL looking for a club in your area we can at least set him on the right track. And, you'd be surprised how many enquiries we get of that sort!

The Mail

We start with **Acton, Brentford & Chiswick** as so often before, at the Chiswick Town Hall, in High Road, Chiswick; the date is January 18, and the matter in hand is the Annual General Meeting, starting at 7.30 p.m.

Addiscombe is nowadays primarily a contest club, but they foregather each week from 9 p.m. in "The Woolpack", Gloucester Road, Croydon; Tuesday evenings it is.

Turning to **Aylesbury Vale**, they, like so many other groups, have an AGM in January; in this case on January 25, at Stone Village Hall, commencing at 8 p.m. with a natter, coffee, and raffle as usual to finish off with. Details on the club from the Hon. Sec.—see Panel.

Yet another AGM — **Biggin Hill** on January 18, at Biggin Hill Memorial Library, starting at 8 p.m.

The **Braintree** gang foregather on January 18, the venue at Braintree Community Centre, Victoria Street, next to the bus station.

If you have an interest in RTTY, then you should be a member of **B.A.R.T.G.** There is a very fine newsletter, and supplies of materials likely to be required in the RTTY station are obtainable at favourable rates; all the details from the Hon. Sec.—see Panel.

Similarly, all the details on the **Caradon Hill Repeater Group** can be obtained from the Hon. Sec.—see Panel for his details. As this club is based in the Holsworthy district of Devon, it could provide a club in an area otherwise somewhat short of them.

There seems to be a change of Hq in the wind for **Cheltenham**; that being so, we feel the best thing for anyone wishing to join would be for them to get in touch with the Hon. Sec.—see Panel—for the latest details.

The **Chesham** chaps recently had an AGM, and so the new committee is doubtless busy putting the programme together. This being the case, for all the latest dates and details we must refer you to the Hon. Sec.

January 4 and 20 are the dates for the **Chichester** club meetings, at Fernleigh Centre, 40 North Street, Chichester, starting at 7.30 p.m.

The **Clifton** lads are to be found every Friday evening informally supping a pint at the New Cross Inn, Clifton Rise, London SE14.

An interesting talk is down for January 13 at **Colchester**, when G4JVM will be charting the shoals of obtaining planning permission for aerials. Turning to January 27, they have a talk about the new Sudbury repeater by G4IZA. The venue is Colchester Institute, Sheepen Road, starting at 7.30, and they make a point of expressing a welcome to visitors and new members.

The **Cornish** Hq is the SWEB Clubroom, Pool, Camborne, and it is here that on January 6, Stella, G6EGS, will be talking about "Polymers — where would we be without them?" This

club may be well away from other groups, but they certainly know how to fill their Hq at every meeting — they've been overflowing it every month for years! Moral — get there on time at 7.30 p.m.

The **Crawley** meeting on January 12 is an informal; as these are held at members' homes, we would suggest a contact with the Hon. Sec.—see Panel for his details — to find out where and when to go.

The **Crystal Palace** Hq these days is All Saints Church Parish Room, Upper Norwood, which is almost opposite the ITA mast, at the junction of Beulah Hill and Church Road, and as every time, it is the third Saturday evening of the month.

For all the details on the **Dartford Heath D/F** club, we must refer you to the Hon. Sec.—see panel for his address. Apart from D/F Hunts, they have a regular meeting at the "Malt Shovel" in Eynsford, every month.

Up to **Derby** and this means 119 Green Lane, Derby, each Wednesday. January 5 is a junk sale; and on 12th G2CVV will be talking about the history of this, the oldest club in the country. On 19th they go all modern again with a computer demonstration by ICL, and then on 26th, G6CHE, will be asking "Contests — what are they?"

Further northward yet, this time to **Derwentside**; they are to be found every Monday evening at the R.A.F. Association, Consett, where we hear they are collecting in new members almost every week. Sounds good!

If you are within the catchment area of the **Doncaster** group, based on Gertrude Bell Hall, Church Street, Armthorpe, Doncaster, then every Monday evening should see you heading there for the meeting. All the details from the Hon. Sec. — see Panel for his address.

The **Echelford** crowd have the second Monday and the last Thursday of each month booked at The Hall, St. Martin's Court, Kingston Crescent, Ashford, Middlesex.

On January 13, **Edgware** group have their AGM, and on 27th they have an informal evening on the club project, the venue is 145 Orange Hill Road, Burnt Oak, Edgware. We are interested to note that they have set up another of their straight key evenings on Eighty CW on the evening of March 31.

We don't have the January data for **Farnborough**, but we can say that they foregather on the second and fourth Wednesday evenings in each month at the Railway Enthusiast Club, Access Road, off Hawley Lane, near the M3 bridge, Farnborough.

Up to Scotland now, to **Glenrothes**, which means Provosts Land, Leslie, Fife on January 16, when GM4GVJ will talk about amateur radio in New Zealand.



Leo Delaney, KC5EV, Hon. Sec. of the Houston QRP Club, recently visited England, and pictured here in the G3RJV shack are, left, Ian Deverell G6BA1, Fred Garratt G3HOM (rear), KC5EV (centre), and Rev. George Dobbs, G3RJV, Hon. Sec. of the G-QRP Club. QRP-talk must have lasted well into the small hours that night!

photo by G4LQF

January 28 is the date set up for Annual General Meeting at **Grafton**; they have this in the small hall at the rear of the "Five Bells" public house, East End Road; this is a half-mile from Manor Cottage on the North Circular Road, London, and the general routine is to meet on the second and fourth Friday of each month.

Turning to **Greater Peterborough** we find they also have an AGM, on January 27; but for details of the venue and the club itself, we are asked to pass you on to the Hon. Sec. — his details are in the appropriate spot in the Panel.

We come now to what must be one of the biggest groups in the country, namely the **G-QRP Club**; everyone with an interest in home-construction of gear, or of QRP operating should be a member! Details from the Hon. Sec. — see Panel.

It is party night at **Guildford** on January 14; the place is, as always, the Model Engineering Club Hq in Stoke Park, Guildford.

Tuesday evenings see a pile of cars outside **Harlow** club Hq, Mark Hall Farm, in First Avenue, owned by members attending. They seem to have something set up in the way of a talk or activity most weeks — why not go and have a look?

The **Harrow** gatherings are at the Harrow Arts Centre, High Road, Harrow Weald, on January 7 in the Belmont Room, and on January 14 in the Roxeth Room, the latter being the Informal and Practical evening.

We turn now to **Hastings** where the new Hq at Ashdown Farm Community Centre, which is in Darley Close and "up in the trees" according to the newsletter. Does that mean you bring your own ladder, we wonder? The main meeting there is on the third Wednesday evening in each month, and in addition they have an informal every Friday evening at the same place.

Deadlines for "Clubs" for the next three months—

February issue—December 31st
 March issue—January 28th
 April issue—February 25th
 May issue—March 25th

Please make sure to note these dates!

Turning to **Havering**, we find them at Fairkytes Arts Centre, on January 5 for the AGM, on 12th for an informal, on 19th for a demonstration of the Microdot Terminal, and on 26th for another informal.

Off to **Hereford**, where cider apples grow and kings steam, not to mention the local club meetings. They are based on County Control, Civil Defence Hq, Gaol Street, on the first and third Friday of each month, and they have something set up for almost every meeting.

If there is anything doing in the amateur radio field in Eire, and you want to know about it, your first contact should be with **IRTS**; after all, they are the national society, as well as having local clubs. All the data from the Hon. Sec. — see Panel for his details.

Next stop is in **Jersey** where we are advised of the change of Hon. Sec. — but it gives us a suspicion that there is more than one amateur radio club in Jersey. To resolve the doubts, contact the Hon. Sec. — see Panel for his details.

KSC Amateur Radio Group is open to SWLs and licensed radio amateurs who are of the Catholic faith; details from the Hon. Sec.

The second and fourth Wednesdays are booked by **Lincoln** club at the City Engineers Club, Central Depot, Waterside South, Lincoln. On the intervening Wednesdays they have RAE and Morse classes at the same spot.

Scotland again now, and **Lothians**, who now have their base in Drummond High School, Edinburgh on the second and fourth Thursday of each month. On January 13 various members will be



A hark back to summer, the occasion being Havering & District A.R.C. VHF Field Day. Standing, left to right, are G4MYO, XYL of G8ZKZ, BRS48819, G8DQJ, G8FBV, BRSS1183, G3TPJ, G4GDG, G5AQQ, G6BEL, G6FQN, and YL of G6BEL; middle row, left to right, are G8KAX, G6JFQ, G8VVG and Paul; up front, left to right, are G6CNQ (VHF manager), G8URI and G8ZKZ.

photo by John Gibbs, BRS50947

giving mini-lectures, and on 27th, GM3YOR will be talking about the role of the RSGB.

Macclesfield Hon. Sec. G6HLQ says that they foregather on the second and fourth Tuesday of each month at St. Andrews Old School Hall, St. Andrews Road, Brough Street, West, Macclesfield, at 7.30 for 8 p.m. They alternate between informals and lectures, or whatever.

For details of the **Maidenhead** we must refer you to the Hon. Sec. — see panel. However, we can say that their Hq is at the Red Cross Hall, The Crescent, Maidenhead, and that to find it you turn westward off the A4 onto the A308, and look for the Crescent off the left-hand side; if you are just too late spotting the first entry to the Crescent, the next one is t'other end of it!

Maltby is a new club, meeting on Fridays at the Methodist Church Hall, Blyth Road, Maltby. Details from the Hon. Sec. — see Panel.

January 21 is the date for **Melton Mowbray**, and the topic "Front-end Measurements" given by G4AMK and G6KQP. As ever, the place is the St. John Ambulance Hq, Asfordby Hill, Melton Mowbray.

Midland get together at their own place at 194A Broad Street, Birmingham; on January 18 they have a talk on "Transforming a Transformer" to be given by G8KWE.

Mid-Warwick use the first and third Tuesday evenings at 61 Emscote Road, Warwick; they seem to alternate between open evenings and sessions at which they have a talk or demonstration laid on.

One of the groups with a forward programme for many months ahead is at **Norfolk**, based on Crome Community Centre, Telegraph Lane East, Norwich. January 5 and 19 are what they call 'short meetings' and on 12th they have a talk by G3PLF, the RSGB RR. January 26 is down for a lecture on Aurora by member G3IOR.

Northern Heights newsletter doesn't look far enough ahead to give January's dates at the Bradshaw Tavern, Bradshaw, Halifax, for which we have to refer you to the Hon. Sec. — see Panel for his details.

Carr Gate Working Men's Club, Thursdays, is the form for **North Wakefield**; on January 6 they have G4DXA on Interference, on 13th a visit to Wakefield power station, and on 20th they visit the Pontefract club junk sale.

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Every Thursday evening the **Nottingham** crowd head for Sherwood Community Association, Woodthorpe House, Mansfield Road, Sherwood, Nottingham; they have a forum on January 6 and a talk on 13th. They have an activity night-on-the-air on 20th, and another talk set down for 27th.

Weekly on Thursdays is also the **Pontefract** routine. January 6 is the AGM, and there are informals on 13th and 27th January, plus the junk sale on January 20.

If you know of a blind or invalid amateur or SWL — or someone who would be interested in our hobby in these categories — then you should point them in the direction of **R.A.I.B.C.** The Hon. Sec. has all the details and her details are in the Panel.

RATEC is a club for the experimentally-minded ham; meetings are on Monday evenings at the British Legion, Moor Lane, Woodford, Cheshire. Details from the Hon. Sec. — see Panel.

An amusing consequence of the Amateur TV demonstration recently given at **Reigate** was that when passing motorists spotted the camera at the roadside near Hq, they jumped to the conclusion they were in a speed-trap! On January 18, G3JKF will talk about the antenna vector processor at the Constitutional and Conservative Club, Warwick Road, Redhill, Surrey.

If you have a **Sharp Computer** and are a radio amateur as well, this club should be of some interest; it hopes to act as a focal point for anything to do with the beast that can be said at any reasonable stretch to be connected with amateur radio.

South Dorset are to be found on January 4, at the Civilian Canteen, Army Bridging Camp, Wyke Regis, Weymouth, where they will be entertained by an RSGB film show; if you have trouble getting there, a shout on S20 will usually produce guidance from a member also on the way.



At the November meeting of Spalding & District A.R.S. (G4DSP), club chairman Dennis Houtt, G4OO (right), presented Cliff Collins, G3THX, with the G2BQC Memorial Trophy. Cliff's winning entry in the club's construction contest was a 160-metre AM/DSB/CW transmitter.

Southdown meetings are at the Chaseley Home for Disabled Ex-Servicemen, Southcliff, Eastbourne, on the first Monday in each month, or the second should the first one be a Bank Holiday. We don't have any data on the January meeting, but they usually have something organised.

Off to Wales now, and **South Powys**; this name covers a club based on Concorde House, The Street, Brecon, where they foregather on the first and third Tuesday of each month, and they would like to see anyone who is in the vicinity on Club nights.

Now to **Stevenage** where they have January 4 and 18, at their new Hq at **TS Andromeda**, Shephall View, Stevenage, starting at 8 p.m. At the time of their newsletter they had not finalised the details of the programme for these two dates, but by now it will doubtless be all settled.

Off to **Stourbridge**, where the group have a base at the Cross Inn, Hagley Road, Oldswinford; January 3 is a natter-night, and on 17th they have the Annual Grand Constructors' Contest.

For **Stratford-on-Avon**, the venue is now the Control Tower, Bearley Radio Station, on second and fourth Mondays; January 10 is a construction evening, and on 24th they have a visit to BBC Pebble Mill.

You've heard of the song about the "pub with no beer?" Well in **Sunderland** the group meet in a Brewery with — no beer! This phenomenon is in Westbourne Road, Sunderland, where they attend on Thursday evenings and Sunday mornings. In addition, on January 23 — a Sunday — they have a get-together and bring-and-buy sale at the Alexandra Hotel, Grange Town, Sunderland, where "there is lots of space and the beer is good!"

The New Year Party for **Surrey** on January 10 will be at the Community Centre, The Court, Blanchmans Road, Warlingham. The informal on January 24 is, of course, back at 34 The Waldrons, South Croydon.

January 10 at **Sutton Coldfield** is down for the video tape "The Secret Listeners" at Sutton Coldfield Public Library, Sainsbury Centre.

For the details of the **Thames Valley** meeting in January, we must refer you to the Hon. Sec. — see Panel.

Heading now for **Thanet** we find they are based on Birchington Village Centre, where on January 7 they have a video tape talk; on January 21st they have a talk by *Racal Thanet*, and on 28th they go to Richborough power station.

On the first Wednesday of each month the **Thornbury** crowd meet at the "White Horse", Grovesend, Thornbury. The January meeting is devoted to the making of PCBs.

We now head for **Torbay**, where the Hq is at Bath Lane, rear of 94 Belgrave Road, Torquay; they are there on every Friday evening, plus a formal on the last Saturday of the month, which for January features a video talk on satellite communications.

In the **Vale of White Horse** the club meets at the "White Hart" in Harwell village; on the first Tuesday of January G3CCC will be talking about repeaters, and on the other Tuesday evenings they have an informal at the same venue.

The **Verulam** meetings for January aren't mentioned in the current newsletter, so we must refer you to the Hon. Sec. — see Panel for the needful.

WACRAL, the group of Christian radio amateurs, continues to grow, says the Hon. Sec., and they keep in touch world-wide through the medium of their net operations on various bands. Details from the Hon. Sec. — see Panel.

Alternate Tuesdays at Holmfield House, Denby Dale Road, Wakefield, sees members of the **Wakefield** group filling their club room. On January 11 they will have something organised, still to be settled at the time of their letter, but on 25th they will be on the air and nattering as is the usual routine for one meeting each month.

January 7 at **West Kent** is down for John Thwaites to talk of "Keyers and Kindred Subjects", while on 21st they will be hearing all about computing in amateur radio. Meetings at the Adult Education Centre, Monson Road, Tunbridge Wells, as above, and informals at the Drill Hall in Victoria Road on the alternate Tuesdays.

One week later than normal the **Worcester** lads will be in session at the Oddfellows Club, New Street, Worcester, on January 10 for a discussion night. The informal at the "Old Pheasant" in New Street, is on the 17th as normal.

A new Hq is notified by the **Great Yarmouth** club, who are now to be found at the STC Sports & Social Club, Beevor Road, South Denes, Yarmouth; dates and details from the Hon. Sec. — see Panel.

At **Yeovil** the Hq is still at Building 101 Houndstone Camp on Thursdays. January 6 is down for G3MYM to talk of aerial vertical radiation patterns, while on 13th G6HTI will give a potted history of radio astronomy. G3DSS takes over on 20th for his talk on frequency synthesis, and on 27th they have a natter night.

If you are in **York** the lads would like to meet you; find them at the United Services Club, 61 Micklegate, York any Friday evening.

QRT

That's all for this time, so it but remains for the writer to wish all you club members a very Happy and Prosperous New Year, individually and to your club. Deadline for next time is in the 'box', and is to *arrive* addressed to your conductor, SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL69EQ.

Extension Course for Radio Amateurs

Bedford College of Higher Education, Cauldwell Street, Bedford MK42 9AH, are offering a course suitable for those radio amateurs who have passed the R.A.E. and wish to extend their knowledge. Subject areas are: VHF/UHF propagation, aerials, SWR, modulation and digital integrated circuits. The course commences on Monday, 17th January 1983 and will run for eight weekly evening sessions; the lecturer is C. P. Meadows, G4KWH. For more details ring the College, Bedford 45151 ext. 240.

“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 — Having a weekend off recently, I sat down in the shack and switched on my transceiver. What did I find? Another contest.

I would like someone to explain to me what these contest operators are trying to prove. What chance has the man with 10 watts into a dipole got against the man — or woman — with 1 kW into a four-element Quad? I can't see the 10-watt man winning. In other words, contest day is big-boy day — which is fairly often. This letter is not sour grapes on my part: I am the proud owner of one of the best transceivers and linears on the market, working into a Quad.

Contest operators must have a nice easy life with nothing else to do but shout meaningless signal reports into a microphone; and they must all use fantastic equipment because all reports are 5-9. I am sure that there are thousands of other operators like myself who are sick to the teeth of contests. If they must rave on like this, could they not be restricted to particular portions of the bands? It must be very embarrassing for a serious operator who is giving a demonstration to a budding SWL to receive nothing all weekend but “5-9, 001”, “5-9, 002”, etc.

If the RSGB, or some other recognised body, was to run an opinion poll on this subject, the result could be very interesting. On three previous occasions I have written a letter similar to this to the RSGB: one was acknowledged — but that was the last I heard.

I am thinking very seriously of taking up CB.

Mark McIntyre, G13YDH

Dear Sir — My personal battle against CW started after passing the R.A.E. in December, 1981.

Having convinced myself that two-metres was really only a personal telephone system for local friendly chats, I prepared myself for the mental torture of ‘dits and dahs’ and wondered if the world was really ready for another G4 from central England.

After six weeks of total commitment to my Datong Morse Tutor, evening institute and nightly slow Morse practice sessions that strange sounding language of the airways is slowly starting to have meaning. Every increase in speed seems to create its own barrier but, with time and patience, I move on to the next hurdle and the ultimate goal, that Class-A licence.

And at the end of it all, you never know, I may even enjoy the art of the key.

Byron Fletcher, G6HCV

Dear Sir — Until I read G4MBD's letter (*S.W.M.*, September), I thought my collection of funny “not QSLs” were due to phonetic confusion with similar-sounding calls to my own. Now I'm not so sure — I've got a batch for the peripatetic Trevor too, some going back eight years. Anyone else?

Peter Jackson, G3ADV

Dear Sir — While postage costs have no doubt increased worldwide, there is also no doubt that we are getting a poor return for the QSL cards we send out, both direct and through the bureaux. When one considers that most DX stations are now asking for three IRC's it means that, by direct QSL-ing, each DX QSL is costing us £1 each.

If the small print is examined on an IRC you will see that it states

that the coupon is valid for return postage by surface mail from anywhere in the Postal Union. Now I don't mind how long a QSL card takes to get to me, but I deplore spending a pound per QSL and *not* getting a QSL back.

One other aspect of this QSL game should be evident: that is, nobody is *bound* to QSL to anyone — even if three IRC's are sent, and if you consider that IRC's can be sold quite a reasonable income can be gained by unscrupulous people. Even selling them at 20p each or equivalent in foreign currency, means a sum running into hundreds, or even thousands, of pounds.

This letter was prompted by a certain DX station heard recently who said, “if you want a QSL from me, send me one U.S. dollar bill”. Okay, so emigrate to the Channel Islands, charge all DX stations £1 per QSL, and you need never work again!

Tom Burton, G2BON

Dear Sir — I enjoy reading *Short Wave Magazine* and find the articles interesting. Recently, you asked for opinions on amateur radio today. I feel very strongly on this subject, and as I am confined to bed at the moment and feel very cut off, it is a good chance to put pen to paper.

In some respects amateur radio has made rapid progress, especially in recent years, and yet for a communication system in many ways it is out of touch with the reality of today, inclined to remain an exclusive club for the minority. As the amateur bands are being invaded by pirates, hands go up in horror. “How dare they use our frequencies!” is the cry. But does anyone stop to ask why?

Some of these ‘pirates’ are very good radio operators, serious and basically responsible citizens who cannot, or do not for various reasons, sit the R.A.E. — an examination out-moded in its present form, requiring careful re-organisation and restructuring. Many licence holders I know study parrot-fashion, pass the exam., purchase a commercial transceiver, go on the air and promptly forget most of what they studied (studied rather than learned). Few are going to pay today's prices for a transceiver and even attempt to repair it. Most seem to cram, remember, pass and forget: not really evidence that they are either suitable licence holders or potentially good operators. Thus you get pirates who see the ‘B’ licence for what it is, a meaningless paper qualification, time consuming in requirement but of no real practical value.

So what would I like to see changed in amateur radio? First, a new structure of licence; second, a *novice licence* which would require knowledge of schedules, regulations and a practical transmission test, restriction to one or two frequencies, restriction on type of equipment purchased and used; third, a ‘B’ licence similar to the present one, but use of more bands; fourth, an ‘A’ licence for more advanced and experimental radio use only; fifth, a separate Morse test available to any licence holder at a minimum of one year after obtaining a novice or ‘B’ licence. Also it should not be possible to buy amateur transmitters without either a novice, ‘B’ or ‘A’ licence.

In my own particular case, I could pass a novice exam and Morse test tomorrow, but have no interest in the ‘A’ licence as I have no intention of getting involved in technical radio and electronics (that in my opinion is for the expert with years of training). All I would like to be able to do is *communicate*; any breakdowns, TVI, etc., and I would call in a qualified radio engineer.

*Susanne Tilley,
Southampton*

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

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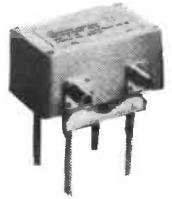


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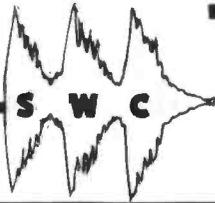
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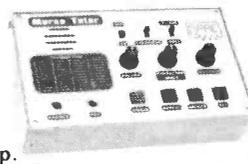
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R4	4.0305	8.0611	12.0916	15.0000	18.1375
R5	4.0312	8.0625	12.0937	15.0027	18.1406
R6	4.0319	8.0638	12.0958	15.0055	18.1437
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S11	4.0354	8.0708	12.1062	14.9527	18.1593
S12	—	—	12.1083	14.9555	18.1625
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S14	—	—	12.1125	14.9611	18.1687
S15	—	—	12.1145	14.9638	18.1718
S16	—	—	12.1167	14.9667	18.1750
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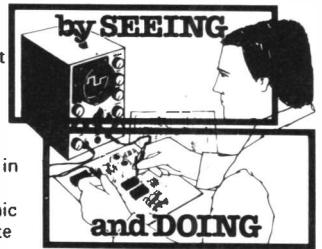
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