what is short wave radio?

Not so many years ago, an evening's entertainment for the family was to sit around the fireside, the young ones in their dressing gowns, and listen together to radio broadcasts from the BBC. With the advent of television things changed; no more was radio the single source of news and entertainment and consequently, the listening habits of a nation changed. The short wave listeners of these times still had their "shacks" full of equipment, usually located at the bottom of the garden. These were the people who were always well informed, one step ahead of the newspapers and, more often than not, the domestic service of the BBC.

Times have changed; man has landed on the moon and come back. Television although now in colour, has lost its initial aura and the short wave receiver has, with the advent of the microprocessor, become acceptable alongside the HI-FI equipment. The result is that now more people are rediscovering radio. The short wave receiver is their ticket to far away places and, again due to the application of advanced technology, the set that now enables you to listen to the world can also be easily used to listen to Radios One, Two, Three and Four, etc. What do I mean by the term "Listen to the world"? The majority of countries world wide have radio stations, not only to broadcast to their own population but to inform others world wide of their life styles, customs and political beliefs. Many interesting programs can be heard and those beamed to us are, of course, broadcast in English.

Do not think for a minute that this is all the short waves have to offer; one can hear radio amateurs conversing – distances to them seeming insignificant. Ship’s radio officers discussing matters with the owner’s back in the home port, aircraft in mid Atlantic seeking out long distance weather information, in short, the world going about its business. There’s no need to worry about aerials either, your house does not have to look a miniature version of Jodrell Bank. The Trio general coverage receivers have as an included accessory a simple length of wire which will enable you to listen immediately. In most cases, a length of wire down the garden will give good results, keep it away from trees and other buildings and the world will knock on your door.

I can hear you now saying, this is all very well but isn’t a Short Wave receiver a very expensive item to buy? The answer is no, a good piece of equipment can be bought for as little as £215 and don’t forget, you will have many years of pleasure from the receiver and unlike a conventional radio the equipment, if you buy wisely, will have a realistic second hand value. Of course you can pay more than £215, the two Trio receivers are priced at £391 for the superb R2000 and £244 for the simpler R600 model. For the enthusiast who wants a top notch Short Wave receiver then we have at the top of our range the NRD515 which will lift you into the professional sphere. You don’t have to buy a new receiver though, we also have second-hand pieces of equipment. These items are all checked by our skilled workshop staff and each is sold with a full 3 months warranty. For a good second hand short wave receiver prices start at around £150.

For more information regarding new or used equipment then don’t hesitate to ring us, either here at Matlock or our London (01-837 6702) or Glasgow (041-945 26261) shops.

 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 200kHz-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 200kHz-30MHz with accurate digital readout; high performance FM USB/LSB/AM with switched filters; drift canceling frequency synthesis; built-in mains supply and built-in speaker; high quality construction and advanced design — and so much more.

SRX 300 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 ENHAACE YOUR LISTENING.

**AF606K** £56.50 inc. VAT, carr. £5.00

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

THE VIBROPLEX IAMIBC — PRESENTATION £92.50 — DELUXE £62.18 — STANDARD £49.20, THE BRASS RACER EKI £99.00

FOR THE ENTHUSIAST THESE PRODUCTS REQUIRE NO MORE DISCUSSION
FOR THE NOVICE "VIBROPLEX" IS NOT A MATRITAL 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 540 grams 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 in which frequency data is stored. Stays 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 5 kHz 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. The "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.

TONÉ 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).

HIGH POWER SELECTION
HIGH power output switch allows operation at 1.5 W or, for extended battery life, 300 mW.

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 normal 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 changefrequency to be quick and easy.

ACCESSORIES INCLUDED
- Flexible rubberised antenna with BNC connector.
- 400 mAh 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.
IN STOCK NOW!

FDK 2M ALL MODES—NOW EVEN GREATER VALUE

- Full coverage 144-148MHz in 3kHz 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

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!

FDK ATC720
AIRCRAFT MONITOR

- 118-136MHz AM portable aircraft monitor
- 26kHz steps controlled by thumbwheel switch
- Sensitivity better than 1 microvolt
- Internal long lasting rechargeable nickel-cadmium 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.

ADONIS MOBILE SPEAKER

- 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

£15.95

AIRBAND BASE/MOBILE MONITOR

- 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

£89.95

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

Name
Address

Please rush me the above. Cheque enclosed for £........./Please charge to credit card No.................
TONE SQUELCH UNIT
MODEL PTS-1
Model PTS-1 is ideal for Raynet groups, club nets, or groups of friends who wish to monitor for each other's own signals over long periods.

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 prearranged tone of precisely the correct frequency. Thus two transceivers, each fitted with Model PTS-1, will respond only to each other's signals over long distances.

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.

PTS-1 £38.99 with VAT £45.99

MORSE KEYBOARD
MODEL MK
As well as looking terrific, Model MK brings some very useful features to enhance your CW operating. Its four 64-character features to improve your typing speed. It includes all normal characters (including accents) and the "eng" key lets you make up specials. The four colour key-board features individual click action switches beneath a tough wipe-clean surface and a buffer memory automatically converts indifferent typing to perfect Morse.

All this, and it runs for up to a year from four internal pen cells (not supplied).

MODEL MK £119.50 with VAT £137.42

GENERAL COVERAGE RECEIVER CONVERTER MODEL PC1
Once upon a time the norm was 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 30 MHz).

Two metre SSB rigs are not cheap and it makes good sense to get the most out of them. They 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 30 MHz). The result, your two-metre SSB rig receives below 30 MHz as well as receives on two metres. And compared to many medium cost general coverage sets, that is saying something.

Try this test. Listen on twenty metres after the band goes dead in the evening. With a few minutes operating of twenty metres, many experienced operators can hear well into the 10 or 20 MHz range using this equipment.

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.

The result, an unusual freedom from spurious signals and overload effects together with a spurious-free dynamic range of 100 dB.

As the Rad. Com. reviewer wrote "With a 3 db noise figure and 90 db dynamic range the Datong products have long been used by military and amateur market by Datong only a few years ago have had been used by military and amateur market by Datong only a few years ago..."
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; pay no more than the cash price. Where this service is not available we have taken the worry out of 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, equipped with over a hundred facilities. We are in daily contact with the credit of most of our merchandise we are in daily contact with the store will convince you to give us a chance to serve. Another amateur (aspiring or veteran) or a visit to your nearest SMC store will convince you to give us a chance to serve. Another amateur (aspiring or veteran) or a visit to your nearest SMC stock carrying agents with demonstration facilities.

Web 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, Telescope, Dengeiner, Comet, Fitlay, and Hokushin of Japan, plus HyGain, CDE, Gem Quad, Channel Master, Mirage, ETO, Denton, MFJ, Van Gordon 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, G4MH, Mosley, G-Whip, Bantex, Ascot, Strumec, Microwave Modules, JIR, Bearcat, Delica, Ashidavox, Hi Mound, ICS, 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.
FT77 £475 inc. VAT @ 15%

- 80-10 metres including WARC allocations.
- Multimode LSB-USB-CW (W)-CW (N)* and FM*.
- 100W PEP output. (10W "S" version).
- No tune design — built-in SWR meter.
- Only 3¼ x 9½" — Less than a foot deep!
- Dual selectable pulse width noise blanker.

FT77 Transceiver 100W output £475.00
FT77S Transceiver 10W output £399.00
MARK7 Crystal Marker board £7.65
FMU77 FM Unit £23.75
XF8.9C(N) 600Hz or 300Hz (N) £24.90
FV707DM Digital Memory VFO £203.15
FC707 Antenna Tuner £85.10
FP707 Main P.S.U. £112.50
FTV707 Transverter, frame only £90.00

Modules: 432...185 144...100 70...30 50...15 30...10

FT707 £509 inc. VAT @ 15%

- 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 PEP 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 DC.
- Incredible range of matching accessories.
- N.B. — 6 models: Digital/Analogue-AM/FM options. — N.B.

FT102 £785 inc. VAT @ 15%

- 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.
- Tuner button (10 sec. of full power).
- Switchable AGC and RF attenuator.
- 390 or 600Hz 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 LEDS.
- Incredible range of matching accessories.
- Universal power supply 110-234V AC and 12V DC.

FT101Z £559 inc. VAT @ 15%

- 1.8-3.5-7.0-14.1-18.1-24.5-28MHz.
- 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 IF 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 8146B 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.

FT902DM £885 inc. VAT @ 15%

- 1.8-3.5-7.0-14.1-18.1-24.5-28MHz.
- 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 IF 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 8146B 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.

NEW

FT77 £475 inc. VAT @ 15%

- 80-10 metres (including 10, 18 and 24MHz bands).
- USB-LSB-CW-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 output module.
- Local oscillator with ultra-low noise floor.
- Variable IF bandwidth — 16 crystal poles.
- Bandwidths 8kHz, 2kHz-300Hz, (600-350Hz*).
- 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. *Opton

FT101Z £559 inc. VAT @ 15%

- 1.8-3.5-7.0-14.1-18.1-24.5-28MHz.
- 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.
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IF notch (455kHz) and independent audio peak.
- Noise blanker adjustable for pulse width.
- External Rx and separate Rx antenna provisions.
- Three 8146B 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.

FT902DM £885 inc. VAT @ 15%
**FL7010**
- 58 (H) x 150 (W) x 195 (D) (1.3kg)
- LED’s: ‘On Air’, ‘Busy’, m/c meter; S, PO
- Bandwidth 2.4kHz and 14kHz @-6dB
- Up/down tuning from microphone
- Any Tx/Rx split with dual VFO’s
- 10 memory channels ‘5 year’ backup
- 100Hz backlit LCD Frequency display
- Multimode USB, LSB, FM, CW
- Pushbutton band change Auto steps/splits.

**FT7208R**
- 144-146MHz (144-148 possible)
- 12.5/25kHz synthesizer steps.
- ±500kHz repeater split.
- 2.5 or 0.3W RF output.
- Rx: 20mA squelch 150mA max. AF.
- Tx: 800mA at 2.5W RF.

**FT720RV**
- 144-146MHz (144-148 possible).
- 12.5/25kHz synthesizer steps.
- ±500kHz repeater split.
- 2.5 or 0.3W RF output.
- Tx: 800mA at 2.5W RF.

**FT730R**
- 144-146MHz (144-148 possible)
- 2.5W PEP, 2.5W RMS/300mW out.
- FM: 25kHz and 12.5kHz steps
- SSB: 1kHz and 100kHz steps
- ±600kHz repeater split 1750Hz burst
- Integral telescopic antenna
- +430-440MHz (440-450 alternative)
- 1W PEP, 1/2W/250mW FM/CW out
- FM: 100kHz and 25kHz steps
- SSB: 1kHz and 100kHz steps
- 1.6kHz shift with input monitor,
- 1750Hz burst
- Rx: 100mA/200mA, Tx: 750mA max
- BNC Mounting 3/4 Flexi antenna

**FT780R**
- 144-146MHz (143.5-148 possible).
- ±600kHz standard repeater split.
- Excellent dynamic range and sensitivity.
- FM: 25, 12.5kHz steps.
- SSB: 1, 000, 0.1kHz steps.
- +430-440MHz (440-445 possible).
- GaAsFet RF for incredible sensitivity.
- FM: 100kHz, 25kHz, 1kHz steps.
- SSB: 1kHz and 100kHz steps.
- FT780R 1.6 fitter 1.6kHz Shift £409 inc.

**FT230R**
- 144-146 MHz (extensions possible).
- 25W RF output, 3W on low.
- ±600Hz repeater split, 1750Hz burst.
- Tx: 5A, Rx: 300mA (standby)
- ±430-443MHz (440-445MHz possible).
- 10W RF output, 1W on low.
- ±25 and 100kHz steps provided.
- +1.6kHz repeater split, 1750Hz burst.
- Tx 3A, Rx: 300mA (standby).

**FT290R**
- 144-146MHz (144-148 possible)
- 2.5W PEP, 2.5W RMS/300mW out.
- FM: 25kHz and 12.5kHz steps
- SSB: 1kHz and 100kHz steps
- ±600kHz repeater split 1750Hz burst
- Integral telescopic antenna
- +430-440MHz (440-450 alternative)
- 1W PEP, 1/2W/250mW FM/CW out
- FM: 100kHz and 25kHz steps
- SSB: 1kHz and 100kHz steps
- 1.6kHz shift with input monitor,
- 1750Hz burst
- Rx: 100mA/200mA, Tx: 750mA max
- BNC Mounting 3/4 Flexi antenna

**FT730R**
- 144-146MHz (144-148 possible)
- 2.5W PEP, 2.5W RMS/300mW out.
- FM: 25kHz and 12.5kHz steps
- SSB: 1kHz and 100kHz steps
- ±600kHz repeater split 1750Hz burst
- Integral telescopic antenna
- +430-440MHz (440-450 alternative)
- 1W PEP, 1/2W/250mW FM/CW out
- FM: 100kHz and 25kHz steps
- SSB: 1kHz and 100kHz steps
- 1.6kHz shift with input monitor,
- 1750Hz burst
- Rx: 100mA/200mA, Tx: 750mA max
- BNC Mounting 3/4 Flexi antenna

**FT80R**
- 144-146MHz (144-148 possible).
- 12.5/25kHz synthesizer steps.
- ±500kHz repeater split.
- 2.5 or 0.3W RF output.
- Rx: 20mA squelch 150mA max. AF.
- Tx: 800mA at 2.5W RF.
- £229 inc
- VAT @ 15% & CARRIAGE

**FT720R**
- 144-146MHz (144-148 possible).
- 12.5/25kHz synthesizer steps.
- ±500kHz repeater split.
- 2.5 or 0.3W RF output.
- Rx: 20mA squelch 150mA max. AF.
- Tx: 800mA at 2.5W RF.
- 0.25V for 12dB SINAD.

**S72 Switching box**
- Large “full sound” internal speaker.
- Concentric volume and squelch.

**FT480R**
- 144-146MHz (143.5-148 possible).
- ±600kHz standard repeater split.
- Excellent dynamic range and sensitivity.
- FM: 25, 12.5kHz steps.
- SSB: 1, 000, 0.1kHz steps.
- +430-440MHz (440-445 possible).
- GaAsFet RF for incredible sensitivity.
- FM: 100kHz, 25kHz, 1kHz steps.
- SSB: 1kHz and 100kHz steps.
- FT780R 1.6 fitter 1.6kHz Shift £409 inc.

**FT720RV**
- 144-146MHz (144-148 possible).
- 12.5/25kHz synthesizer steps.
- ±500kHz repeater split.
- 2.5 or 0.3W RF output.
- Rx: 20mA squelch 150mA max. AF.
- Tx: 800mA at 2.5W RF.
- 0.25V for 12dB SINAD.

**FT780R**
- 144-146MHz (143.5-148 possible).
- ±600kHz standard repeater split.
- Excellent dynamic range and sensitivity.
- FM: 25, 12.5kHz steps.
- SSB: 1, 000, 0.1kHz steps.
- +430-440MHz (440-445 possible).
- GaAsFet RF for incredible sensitivity.
- FM: 100kHz, 25kHz, 1kHz steps.
- SSB: 1kHz and 100kHz steps.
- FT780R 1.6 fitter 1.6kHz Shift £409 inc.

**FT208R**
- 144-146MHz (144-148 possible).
- 12.5/25kHz synthesizer steps.
- ±500kHz repeater split.
- 2.5 or 0.3W RF output.
- Rx: 20mA squelch 150mA max. AF.
- Tx: 800mA at 2.5W RF.
- 0.25V for 12dB SINAD.

**FT720 RV**
- 144-146MHz (144-148 possible).
- 12.5/25kHz synthesizer steps.
- ±500kHz repeater split.
- 2.5 or 0.3W RF output.
- Rx: 20mA squelch 150mA max. AF.
- Tx: 5A. Rx 300mA (standby).

**FT480R**
- 144-146MHz (143.5-148 possible).
- ±600kHz standard repeater split.
- Excellent dynamic range and sensitivity.
- FM: 25, 12.5kHz steps.
- SSB: 1, 000, 0.1kHz steps.
- +430-440MHz (440-445 possible).
- GaAsFet RF for incredible sensitivity.
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- SSB: 1kHz and 100kHz steps.
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**FT720R U**
- 144-146MHz (144-148 possible).
- 12.5/25kHz synthesizer steps.
- ±500kHz repeater split.
- 2.5 or 0.3W RF output.
- Rx: 20mA squelch 150mA max. AF.
- Tx: 500mA at 1W RF.
- 0.4/V for 12dB SINAD.
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- 160 10 Metres (Inc WARC) Plus standard service Rx.
- SSB, CW, FSK, 100 Watts output.
- Two 10 kHz step digital variable frequency oscillators.
- Split frequency or cross mode single frequency operation.
- 3 PLL’s (inc BFO) locked to 10 MHz reference.
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- Adjustable noise blanker, switchable AGC, calibrator.
- Adjustable RF output, RF speech processor, VoX.
- Comprehensive metering including compression level.
- Small 300W, 32710, 130HH, mm. 10kg.
- FT850B Clavis PSU, NFG97 A.T.U.
- NVA88 Ext. speaker, CFL260 600Hz filter.
- CHG43 Desk Mic. CFL230 300Hz filter.
- CHG44 Hand mic. KY3A Morse key.
- **NEW**

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- Rx 150 kHz-30MHz.
- Tx 160-10m. 9 bands x 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.
- AFSK shift 170, 425, 850 Hz selectable.
- Multi channel memory + programmable scan limits.
- Optional computer interface available.
- Notch filter in IF (AGC immune to heterodynes).
- Full break in keying. 500/600/700 Hz beat.
- Unique analogue scale of digital type.
- Comprehensive twin meter metering.
- Memory retains mode information.
- **NEW**

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- Rx: 150kHz-30MHz. Continuous general coverage.
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- All Modes: AM, CW, FM*, FSK, LSB, USB.
- 10 VFO’s!!! Any Tx-Rx split within coverage.
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- Dedicated digital display for RIT offset.
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- 300* or 600Hz*, 2,400-+ 3001-1z, 6kHz 1, 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.
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- Tx: 160-10m. 9 bands x 3 x 500kHz 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.
- AFSK shift 170, 425, 850 Hz selectable.
- Multi channel memory + programmable scan limits.
- Optional computer interface available.
- Notch filter in IF (AGC immune to heterodynes).
- Full break in keying. 500/600/700 Hz beat.
- Unique analogue scale of digital type.
- Comprehensive twin meter metering.
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- Noise blanker, impulse interference tuned

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- Comprehensive metering including compression level.
- Small 300W, 32710, 130HH, mm. 10kg.
- NVA88 Ext. speaker, CFL260 600Hz filter.
- CHG43 Desk Mic. CFL230 300Hz filter.
- CHG44 Hand mic. KY3A Morse key.

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- Rx 150 kHz-30MHz.
- Tx 160-10m. 9 bands x 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.
- AFSK shift 170, 425, 850 Hz selectable.
- Multi channel memory + programmable scan limits.
- Optional computer interface available.
- Notch filter in IF (AGC immune to heterodynes).
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KEEP AHEAD WITH THE FT-102!

Once again YAESU lead the field with the exciting 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 position 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 transmit 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.

A. 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.

B. FC-102 1.2 KW ANTENNA COUPLER

1.2KW band-switched L-C pi-network antenna coupler.

C. FT-102ZD SYNTHESIZED, SCANNING EXTERNAL VFO

In-line wattmeter with three ranges (20, 200 and 1200 watts full scale), and “peak hold” system.

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YAESU's FT-101ZD WITH FM. Undoubtedly the best selling HF transceiver ever — thanks to its superbly comprehensive specification and sensible prices. Incorporates notch filter, audio-peak filter, variable IF bandwidth plus many other features.

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- Large LCD readout.

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NC8 Charger DC PSU

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<table>
<thead>
<tr>
<th>Antenna Type</th>
<th>Gain (dBd)</th>
<th>Price (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4el 2m yagi VHF</td>
<td>4144A</td>
<td>8 dBd</td>
</tr>
<tr>
<td>10el 2m yagi VHF</td>
<td>10144</td>
<td>11.4 dBd</td>
</tr>
<tr>
<td>15el 2m yagi VHF</td>
<td>15144</td>
<td>14 dBd</td>
</tr>
<tr>
<td>17el 70cm yagi UHF</td>
<td>17432</td>
<td>14.5 dBd</td>
</tr>
<tr>
<td>4.5el HF Beam DUO2</td>
<td>(14/21 MHz) 9/8 dBd</td>
<td>£356.71</td>
</tr>
</tbody>
</table>

All matching cables, clamps and booms available for stacking 10 and 15 element yagis.

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As you know, the Home Office have given permission for the 50MHz band to be used by holders of special licences—the issue of which is to be controlled. This must be one of the most exciting things that has happened to the Radio Amateur since the invention of sliced bread (or should I say the microprocessor?). As you know, there are many countries in the world who already have 50MHz—so there is already some exciting equipment available. One of these is the ICOM IC-505 which is a multi-mode portable offering a choice of outputs of 3W (portable) or 10W (fixed). We have imported a few of these excellent little transceivers and they are available at £299. Inc. VAT so why not think about trying out this excellent band? Call us or send for technical details.

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Can YOU read the many RTTY and CW stations to be heard on the air? Short wave listeners and amateurs are able to take more interest in other modes of transmission than speech with the new ranges of decoders and senders available. As well as amateur transmissions there is loads of interesting news and other broadcasts which can be read using these space-age devices. As UK importers of the world renowned TONO and TASCO products we can offer you a wide range of devices from a simple morse and RTTY reader which can be plugged into your TV to complete send and receive systems with memories and built-in displays or outputs for a high definition VDU. MR-250 £325, 9000E £699, CWR-670 £289, CWR-685E £789, CWR-610 £189. Please call us for further details or visit us or your dealer for a demonstration.

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Another New Band

The applicants for 50 MHz licences have been sorted through and a list agreed between the RSGB, Home Office and the B.B.C. Details appear in VHF Bands in this issue. As a band which can, at a sunspot peak, open world-wide around the middle of the day, it should prove to be a very worthwhile allocation if the brief experience of the early post-war years is anything to go by. Six-metres again, at last!

TVI is also here again! The maggot in the biscuit this time is the video recorder and its wide-band amplifier. Cases are known where TV sets which are normally clear become TVI-prone when a recorder is plugged in — but not switched on. Should you be looking at a case of TVI and there is a video recorder coupled up we suggest you try, as a first test, connecting the TV aerial directly to the video recorder and moving it away from the TV set; if this clears the TVI, then the recorder is at fault and needs to be dealt with. The only consolation is that it must be clear even to the most non-technical viewer that the fault lies in his recorder and not your transmitter, so he can be recommended to return it to the suppliers for them to sort out. Whether or not ‘they’ are able to do so is a moot point of course, so if any budding technical author feels that he can write the definitive article on TVI-proofing video recorders we would be pleased to see it and, if acceptable, publish it for the benefit of everyone.

This issue marks the beginning of Volume 41 of Short Wave Magazine. As most readers must be aware, this journal has been devoted exclusively to Amateur Radio since 1937, and we shall of course be continuing our unambiguous policy into this new volume with, we hope, lots of good things for your pleasure and interest — including more contributions from, amongst others, G3RJV, G3ROO, G3XAP, and a first article in our pages from W3NQN. And much, much more!

Next month we will announce the winner of the Volume 40 (1982-83) Article Competition.
A NOTHER month of warm weather for the time of year has been accompanied by high winds to keep the aerial parties going, with conditions, on HF at least, that have varied from awful to abysmal; but it’s an ill wind that blows nobody good and the LF addicts have had a feast — although not many of the latter seem to want to tell all!

The Bands

We have already indicated the essentials of the position as we saw it. The sunspot number is declining steadily, but not so fast as a couple of months ago, and it would appear conditions have been more affected by other negative factors. And of course, there is always the matter of confusing activity and conditions; for example, Ten indicating ‘dead’ but a tune round the beacons indicating propagation to be world-wide!

Top Band

One very noticeable absentee from the scene here, at least to the time of writing, has been W1BB; nobody seems to have reported him active, and we have not had a report from him in ages. Anyone with any news, please let your scribe know, as lots of people are enquiring.

We finally caught up with G4AKY (Harlow); Dave hasn’t (by his lights anyway!) burned much midnight oil, as in general he has turned-in at the witching hour or just after, apart from one fairly heavy session in the contest. If we leave out of account the small fry; we find lots of W4, some W1 and W2, VE1BV, VE1ZZ, XL1ASJ, EA6JD, EA8QO, UA9UCO, UA9XAB, UA9CO, E29MAZ, UL7NCI, U7BAK, Z6EO, VK6HD, VS6DO, RI8DAA, UI8DC, UD6DKW, NP4A, KV4FZ, HH2P, V2AAW, and EA9KQ. Other DX heard included 4X4NJ, HI8DAF, 5Z4CS, JA6LC1, YB5AES, N5AR and W8RL, while these were known to be on but not heard: VU2WTR, XT2AW, 6Y51C, and LU2ZU. All CW of course.

Our next reporter is G32GC/MM, who is now aboard Guran, a 887-ton passenger-cargo ship running between Avonmouth and the Barbados-Windward Is. area of the Caribbean. Twelve passengers and general cargo outwards, and bananas by the box-full on the return trip. One week in four is spent in port in the Caribbean so Richard has taken out reciprocal licences in Barbados, St. Lucia, St. Vincent, and Grenada; Dominica has so far not been cracked due to red tape, but is progressing.

Top Band was operated once from 8P6: about midnight GMT on January 2, WA2BOT/8P6, W3ESU, N4DSA, and N1ACH were worked. WA2BOT/8P6 was intending to stay up all night and hunt DX, but no EUs were heard. 6Y5IC was heard calling “CQ EU” with no takers, while VP2MI1X and J6LB were enthusiastic for Top Band activities and hoping to be on the band before the season’s end.

Top Band for G2HKU meant SSB as usual with PA0PN, and CW to L1AEKO (the Ekofisk oil rig station), RA9AKM, RF66FW, 4ZUW, UB5UGF, 4X4NJ, and UQ2GMB. L5SAA, who ‘drives’ the L1AEKO rig, told Ted he was due to return to Stavanger soon, and it is not known whether another amateur will replace him.

We have two very interesting letters from G3BDQ (Hastings). The first one, in the middle of the month, indicates the pleasure of an LF DX-er at getting back into the swing after years in houses where the aerial possibilities were distinctly limited — we know the feeling! Since his last letter John has stuck to Top Band to a large extent, and CW has accounted for all USSR except UA0, VK6HD, 4X4NJ, 4Z4MK, HZ1AB, UA9CBO, U9CUD, U9CAPB, U9ADE, VE1BVL, YB5AES, and JA1KFN at 2214 on January 5. It is interesting to find JA reported twice in one month, as JA is always reckoned to be a near-impossible path. G3BDQ is looking for skeds with VS6, ZL and, especially, South American stations for next winter — volunteers please! Turning to the second letter, we note a sked with VP8SB which was blocked by a large tribe calling “CQ DX”, but it is believed G3FRS hooked them about an hour later working split-frequency. As a ‘stop press’ John rounded off with a QSO with 5Z4CS, who QSLs via J13LV.

Next reports is from D. Whitaker (Harrogate) and has much to say about brother Mike’s activity as GM31GW in the contest over the final weekend in January. Mike seems to have worked twenty-five U.S States and four VE provinces, plus other DX, to end with a multiplier of 66 from 39 countries. The best seem to have been 4X4NJ, ZB2EO, EA8QO, TF3KG, UD6DKW, NP4A, V2AAW, L1M8MAZ, UH8DC, UH8HCA, and KV4FZ; among the Ws the best were probably K0HA in Nebraska, and W0BXR in Iowa.

Thoughts

The events of the past few years, it seems to this old scribe, have made a right mess of any existing band-planning as far as Top Band is concerned, through no fault of the users; national administrations have allocated Top Band bits in umpteen countries, and while this is great from the activity point of view, DX-wise there has by no means been any degree of unanimity as to which bits of the band they will allocate. Thus we hear OT’s on the band complaining bitterly about EUs on the SSB in the “CW part of the band”. No good complaining bitterly if that happens to be their (relatively tiny) bit of the band, is it? Perhaps some kind soul would care to sit down and list out the various national band allocations on Top Band, which we could publish for the benefit of all concerned?

The saga of Heard Is. continues. VK0HI duly arrived, ahead of time and started the pile-up, but VK0NS, who set off first, has been forced to turn back three times so far, and was last heard of at Kerguelen; they should be there at the time of writing, but so far we’ve not personally heard them (sorry about the pun!) VK0HI was due to be on for the month, but the Jim Smith expedition which was to have been there for a fortnight has not as yet indicated its intentions now it has been so badly delayed.

As far as China goes, it is believed a third BY station will be on before long; and it is understood that BY1PK is off the air through February, leaving BY8AA to hold the fort. BY8AA still has the rough note and chirp, and it is understood they listen a couple of kHz up in frequency. However, they are very fuzzy about the way there are called, and tail-ending or other short call techniques won’t do more than get the cold-shoulder. One must remember that courtesy to the Chinese is all-important, in both directions; and in addition that the BY operators are monitored by their authorities who would themselves have the same viewpoint — which means that slow or not, one must play along with their way of doing it.

On the contests front, we note that we missed the RSGB 7 MHz shindig last month — sorry! The Phone leg of the ARRL International DX contest falls on March 5-6. Rules are essentially the same as last year, and exclude 10 MHz from consideration; otherwise all bands 1.8-28 MHz.

The G-QRP Club CW Activity is over the weekend March 19-20 for CW, with May 7-8 for SSB. Details from G4BU6E,
QTHR. This is not a contest, but it is intended that the spread of bands and times shall have the effect of getting as many QRP operators into QSO with each other as may be, and we commend it to you.

CQ's WW WPX Contest is over the weekend March 26-27, with the CW leg over May 28-29. The usual 48 hours, midnight to midnight, and single-operator stations can only use 30 of the 48 hours, the 18 hours of non-operating time being split into up to five periods during the contest and clearly marked. Otherwise the rules are pretty well as in previous years. Logs to and clearly marked. Otherwise the rules are pretty well as in previous years. Logs to and clearly marked. Otherwise the rules are pretty well as in previous years. Logs to and clearly marked. Otherwise the rules are pretty well as in previous years. Logs to and clearly marked. Otherwise the rules are pretty well as in previous years. Logs to and clearly marked. Otherwise the rules are pretty well as in previous years. Logs to and clearly marked. Otherwise the rules are pretty well as in previous years. Logs to and clearly marked. Otherwise the rules are pretty well as in previous years. Logs to and clearly marked. Otherwise the rules are pretty well as in previous years. Logs to and clearly marked. Otherwise the rules are pretty well as in previous years. Logs to and clearly marked. Otherwise the rules are pretty well as in previous years. Logs to and clearly marked. Otherwise the rules are pretty well as in previous years. Logs to and clearly marked. Otherwise the rules are pretty well as in previous years. Logs to and clearly marked. Otherwise the rules are pretty well as in previous years. Logs to and clearly marked. Otherwise the rules are pretty well as in previous years. Logs to and clearly marked. Otherwise the rules are pretty well as in previous years. Logs to and clearly marked. Otherwise the rules are pretty well as in previous years. Logs to and clearly marked. Otherwise the rules are pretty well as in previous years. Logs to and clearly marked. Otherwise the rules are pretty well as in previous years. Logs to and clearly marked. Otherwise the rules are pretty well as in previous years. Logs to and clearly marked. Otherwise the rules are pretty well as in previous years. Logs to and clearly marked.

March 19-20 is also the weekend for the very popular Bermuda Contest, where the prize of a guest trip to Bermuda to collect one's prize must be a big factor in the size of the entry. Entries to be received by May 31 by the Radio Society of Bermuda, P.O. Box 275, Hamilton 5, Bermuda. Incidentally, if you are in the U.K. you give your country each time, and you can work U.S.A., Canada and Bermuda. The multiplier is the number of VP9s worked (not the parishes) this year.

We have a nice letter from PY1CC (Rio de Janeiro) who reports on the RIO QSO Party; it was such a success that future events will be called "Rio DX Party", and we hear the next event will be in the second full weekend in October to clear major world-wide contests. Details from PY1CC, PPC, C. Postal 2673, ZC 00 20000, Rio de Janeiro, RJ, Brazil. Carl says that they have a problem with getting foreign magazines in Brazil, and so they can miss the bus with announcements — hence the early report this time. He also says they are going to the trouble of circulating Brazilian amateurs by direct mail, as far as possible. Such enthusiasm deserves a resonating success.

On the awards front, we have been notified of one by the Gloucester club which is intended to celebrate the 500th anniversary of the granting of the Royal Charter to the City of Gloucester. They will have GB2ROG on the go in September, and the club station G4AYM throughout the year, for those chasing the award. Details from A. J. Martin, 12 Redwood Close, Pocknhead, Gloucestershire GL1 5TZ.

Ten Metres
How nice to hear again from G2ADZ (Chessington) who has managed to get the odd spare moment to be in the shack; Bill is very definitely one of the 'non-list' types; he says you have to be "sick in the mind" to call that working a station, and anyway one can let the country slide as it'll turn up again for sure operating properly through some other station's activity. Bill noted that his CW went out to 9N10AT, VU2AL1, A92CE, VK2DQR, VU2JXO, 5B4RY, W6KG/A7, VK3CW, and KC7UU/5N6; getaways included YB30N, DU1TV, H2CM, and FR7CA. In the earlier letter we note a couple of oddities in ZD9KR for whom the beam was pointing west, and L8D/X who refused QTH but said QSL via GACW. All QRQ and in a big pile-up.

G3ZGC/MM has used his call either as quoted, or with the suffixes of his reciprocal calls as appropriate, but on 28 MHz Richard says he has only been on for his regular skeds. From Barbados, G3ZGC/8P6 worked G4NXG/M which must have chuffed the latter — this on the RNARS net.

Turning to G4MXW (Portadown) David found the band very erratic, and almost certainly dead by tea-time, so activity was confined to weekends; QSOs were completed with W5WDF, N7XS, W7QK, VE7DXI, WOAW, W0PA, and VE7DXJ again, in N. America; South America was represented by YV3BRF, LU1E, PY4LH, H18GB; 9Y4TAM, KP4EFO, YS1ECB, VP5WJR, C6ADV, and V2ARO represented Central America. However, most of the time, the beam was pointing towards the south for EA9KN, ST5AA, CN8CO and CS3CL. Among the also-rans we noted QSOs with A4XJO, IT9LYF, VO1QU, YUS5L/X and UR2QU.

The first letter from G4LDS (Chelmsford) missed the last deadline, Chris having been somewhat pre-occupied as his mother was taken into hospital on New Year's Eve; we are glad to hear by way of his second letter that she is now back home and on the mend. In the better of the January weather some gardening has been done, and of course the corollary to that has to be some aerial-farming. However, all the aerial-farming in the world won't help a truly dead band, so there hasn't been much time spent on 28 MHz with beam pointing south before retreating to 21 MHz. However, Chris does mention his QSOs with UA3APP, K1JR, HK0COP, N9CDE, W8UDN, KB3YK, K1VV, KB9N (who is QSL manager for V6ST), ZS1FH, ZS2GR and UB5FL, not forgetting a W9 who must remain anonymous as we can't read the writing!

Fifteen
Our first stop on this band is with GW4OFQ (Broad Oak, Carmarthen) who offers on SSB, G4AVV/ST3, AP2AC, J2AZ around noon, HH2RJ, VK6PY, FY7YE, VK2X and G4LDS (Chelmsford) missed the last deadline, Chris having been somewhat pre-occupied as his mother was taken into hospital on New Year's Eve; we are glad to hear by way of his second letter that she is now back home and on the mend. In the better of the January weather some gardening has been done, and of course the corollary to that has to be some aerial-farming. However, all the aerial-farming in the world won't help a truly dead band, so there hasn't been much time spent on 28 MHz with beam pointing south before retreating to 21 MHz. However, Chris does mention his QSOs with UA3APP, K1JR, HK0COP, N9CDE, W8UDN, KB3YK, K1VV, KB9N (who is QSL manager for V6ST), ZS1FH, ZS2GR and UB5FL, not forgetting a W9 who must remain anonymous as we can't read the writing!

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who was about to land on an aircraft-carrier off Puerto Rico.

GI4MXW says he only spent a few hours on this band, but the pick of the crop included K5NA/KP2, N9EJ/P/C6A, WB6FJR, K6YRA, EA8BS, EA8TL, E9AKS, IT9ZGY, ZB2GW, HV3SJ, UC20AV, UQ2QFN, and a short-skip QSO with G3JDC.

G4LDS mentions, in his earlier letter, KD6GH in Los Angeles, PT7CG, G4KXL/DU1, JR4ABF, JH3KKE, A71BJ for country number 210, WB6SJP, VE3JBR, and N9EJ/C6A; while the second letter adds VE7DGI, UA3AAH, W8JZ, ZL3WM, and 8P6OL, skipper of the replica pirate ship Jolly Roger from Barbados.

**Now Twenty**

Where much of the traffic occurs, but as far as the writer goes it was found to be pretty dead in the evening hours.

G2HKU kept his usual ZL skeds with ZL3RS and ZL3FV on SSB, while CW worked out to UA9CBR an VK3XB; the QRP rig managed to raise UA9CBR with some five watts of CW.

G3BDQ tried out his SSB skills on A4XCB, 4S8OM (QSL via DFSUQ), YV5EUX, VK6NO, VP8SB at Faraday, LUSLBD, M1V and many run-of-the-mill signals. CW took in JH7KWC, VK0HI (Heard Is.), LU3ZI, and then a string of EU's in a QRP contest. The latter prompted John to go down first to five and then to one watt, at which level he seemed to be swapping 57 to 59 reports.

For GI4MXW the activity was all but non-existent as he found the band very noisy and full of QRM. The only stations raised were 4Z2HS and FC9UC, though rather noisy and full of QRM. The only stations to be swapping S7 to S9 reports.

Turning to GW4OFQ, Roger stuck to the 0800-0900 zulu as the two hours where DX was least noticeable (EL2 and 6W8!), things picking up then and carrying on lively right through to 0800 when ZL and lots of Central and South Americans were on offer.

**Thirty**

After all the trouble of getting this band, we don't seem to have much in the way of reports on it. This month there is just the one, namely G2HKU, who worked CW to VK3AUV, but found himself being QRM'ed by SSB from VK3A.W.

**EIGHTY**

G3ZGC says that the eighty-metre activity in the Caribbean is massive, with the local weather net on 3.815 MHz, at 1030 and 2230z, as the main gathering-point. From Barbados, PJ8Q on St.

Martin was worked, as was W1CWU, VE1BPN, and W4PDL; and from J6L, K19C, H12BH, G4GZQ who was a shaky 229 on sked, DJ1HJ, N5RZ, KQ4PR, WE4H, K6SSS, N3KV, H12WK, K1CC, AF5K, VO1CA, G3FDQ, OE2VEL, W4YJ, YV3BRF, H8KXW, G4UIF and V01FB.

GW4OFQ offers SSB contacts with KP4DEX/V2A, VP5RAC, J6LCV, JW5VAA, at 0100, then at 0600 came 6W8AR and 7X5AB. 1800 brought 5N8AR, Y100 yielded 6W8DY, OE2TWM/YK, and VK3Q1, while a whirl round at 2300 came up with OX3JF.

**Forty**

G2HKU used his CW to raise EA9KZ as his only offering in a month when he has been rather occupied with non-radio matters.

GI4MXW tangled with Y05KLN, U6DCN, CQ7LN, OK1DN, VE3ICR and VK3MR, the last-mentioned put down his usual good signal thanks to his rhombic farm.

Forty for G3LDS meant GB2BBC, ON7ES, and UBSAAF worked, plus ZL4BY heard on Christmas Day, and on the second letter contains a plaintive note that he's 'well on the way to DXCC in gotaways'!

Evenings and breakfast-time are, in the view of G3BDQ, 'sensible times' at which CW came up with VU9ARZ, VK3VJ and a string of JAs, while SSB accounted for ZL2SQ, TG5LXG, VK3AE, and VK3AMZ. Sundry Vks get a mention in the later letter.

We turn now to D. A. Whitaker, who works his way round the clock on SSB as follows: 0000z JX1CY, JW5VAA: 0100z CX3BA: 0700z 5T5AP; 0800z 8P6OR, JA5, ZP5WC, TG9YT, XE1CX, VP8AQB, VP2MF; 1700z ZL1AXU, SV5FD; 1800z F6FIC/TZ, 6W8DY, ZS4PB, YC2CGW, FB8XAB, 1900z YB2CR, UH8HCS, 6W8AR, 9X5SL, UI8JQZ, UL7LAW, UH8EAA, TU2JL, TU2ID, OE8HNK/YK; 2100z 4S7OM; 2200z FM7WS; and 2300z OE8HNK/YK, ZDB8W and SV5OX.

Turning to GW4OFQ, Roger stuck to the 0800-0900 time slot, and raised JA4CQS, JA3EMU, JA4IKD, JF1IST, JA2BAY, JR7FTV, VK2AYA, and ZL1ABO.

Our last reporter is G3ZGC/MM who says that he didn't use the band much, but he did make a QSO while /MM with G4GZQ, the ship at the time being between-islands.

**Conclusion**

There you have the picture for another month. We can always do with some more reporters, and all April issue offerings should be addressed to your scribe, "CDXN", SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ, and be posted to arrive by first post on March 3. Meantime, mind how you go and may the DX fall right into your hands!
EQUIPMENT REVIEW

THE MICROWAVE
MODULES 144 MHz
LINEAR AMPLIFIER
TYPE MML 144/30LS

There are several single and multimode two-metre transceivers on the market with output powers of one to three watts, some of which have good receivers enabling the user to hear much further than he can work. Thus, a range of linear amplifiers to boost the output powers of these QRP transceivers must be attractive, especially when they incorporate a low noise receiver preamplifier.

Microwave Modules Limited is one of the best known companies manufacturing amateur radio equipment in the U.K. The company, which was formed in 1969, now sells its products throughout the world, and these items are listed in the glossy, 24-page, 1983 Catalogue. One of its best selling items is the MML 144/30LS linear amplifier for 144 MHz, reviewed here.

Specification

The power output is 30 watts for one or three watts input. The bandwidth between -1dB points is 144-146 MHz. At maximum power output, the current consumption at 13.8 volts is 4A and the quiescent current, 0.8A. The receiver preamplifier has a gain of 12dB with a noise figure better than 1.5dB. The -1dB bandwidth is 144-146 MHZ and the current consumed is 200mA.

The Circuit

The receiver preamplifier uses a 3SK88 Mosfet device in a noise-matched circuit. The output goes through a 4dB attenuator, shunted by two 1N4148 diodes to protect the input to the transceiver “front end”.

The power amplifier is a single stage RF2123A device, rated at 65 watts dissipation. A PIN-diode switched input attenuator selects one or three watts drive level from the front panel. The input and output networks have been carefully matched to 50 ohms using PCB tracks, stripline fashion, for the inductors. The output side incorporates a low-pass filter network and the PA transistor is thermally tracked against temperature rise during operation.

Two double-pole changeover relays are incorporated which control all four functions of the unit. These are:
1. Both preamplifier and PA off, when the antenna is switched straight through.
2. Receiver preamplifier operational only.
3. PA stage operational only.
4. Both preamplifier and PA stage operational. When the PA is at stand by, any transmitter RF at the input is coupled through a small capacitor, rectified and fed to the RF switching circuit. This is a four-stage affair, using ZTX302 transistors, two of which act as relay drivers. The relays switch the RF2123A stage between transceiver output and the antenna. For SSB and CW operation, a slight delay can be provided by switching in a 33µF capacitor to hold the base voltage on the first relay drive transistor. Alternatively, the PA can be hard switched via a separate PTT line brought out to a phone socket on the rear panel.

Construction

The “works” are built on a double-sided, fibreglass PCB, housed in an extruded aluminium heatsink enclosure, 200mm. long, 115mm. wide and 55mm. high. The rear panel accommodates two SO-239 sockets for the connections to the transceiver and antenna, a fuse and a phono socket for the PTT lead. Red and black DC power leads come out of this panel and are 75cm. long. The front panel incorporates three miniature toggle switches which are: “Power”, a three-position, centre-off, selecting either one or three watts drive; “Power Amp”, also centre-off which selects either FM — instant switching — or SSB — delayed changeover; and “Preamp”, which simply switches the Rx preamplifier on or off. Each of these switches has an LED underneath as a status indicator. A green LED lights when RF power is being fed through the PA. The “works” are protected by a cover plate which carries a label, “Beryllium Oxide — Hazard”, warning the user not to dismantle or tamper with the component parts.

Results

The Rx preamplifier gain was about 15dB, measured by the previously calibrated S-meter in the station receiver and was slightly more than the specified figure. On very weak signals, such as distant beacons in flat band conditions, this stage made all the difference between marginal and “solid” reception.

The amplifier was used after the normal station transverter but with the output of the latter reduced to the one or three watts level by a “power control” in the 28 MHz driver stage. With this method, it was a simple matter to switch off the MML 144/30LS and run the normal station at 30 watts, and then switch it in and reduce the transverter output. This was done during numerous routine contacts and nobody realised any changes had been made. Dummy load tests confirmed that the signal quality was unaffected by the MML 144/30LS, in other words, it was linearly amplifying what was fed into it.

Two tone tests were carried out to compare the performance of the normal, valve PA and the solid-state one at 30 watts. For both experiments, the third order intermodulation distortion products were in excess of 30dB down. No figure for this parameter was quoted in the specification but, for a solid-state PA at this power level, with no RF feedback, that is a reasonably good figure. No doubt the use of a 65 watts dissipation device is the main reason for this respectable performance.

The SSB/FM switch does not alter the class of operation from AB to C, as might be expected. All it does is to switch off the MML 144/30LS via a separate PTT line brought out to a phone socket on the rear panel.

Conclusions

The MML 144/30LS can be well recommended to anyone using a low power transceiver of the IC-202, FT-290 type, for example. At £69.95 including VAT, it is reasonably priced, especially when one considers the Rx preamplifier is provided. For the loan of this unit, we are indebted to the manufacturer, Messrs. Microwave Modules Limited, of Brookfield Drive, Aintree, Liverpool, L9 7AN.

N.A.S.F.

April issue due to appear on Friday, March 25th
THE EXTENDED GROUND PLANE AERIAL
WITH PRACTICAL DETAILS OF AN EASILY ADJUSTED RADIATOR FOR 10 METRES

P. C. COLE, G3JFS

The ground plane aerial is an effective omni-directional radiator that can be put almost anywhere. It is quite simple and inexpensive to construct and although it may not stand up to close comparison with a high gain beam under poor propagation conditions it will often work better than most other simple aerials, especially when the mean height is less than a half-wavelength above ground.

The Basic Ground Plane

In its simplest form the ground plane is made up of a quarter-wave vertical radiator mounted above four equally spaced horizontal radials, as shown in Fig. 1. The feedpoint impedance of a true ground plane is of the order of about 20 ohms, but in practice this can vary widely and values of 25-40 ohms are likely in a typical amateur radio installation on a less-than-ideal site. Thus in most cases a standard low impedance coaxial feeder can be connected directly to the feedpoint and the mismatch will not be serious enough to affect the radiation efficiency adversely. This is particularly true if the feeder is a short (say less than 50ft) run of good quality cable, when time spent in tuning and adjusting to reduce the VSWR would be wasted as far as the strength of the radiated signal is concerned.

However, radiation efficiency is not necessarily the only consideration and there may be times — for example to allow a rapid change between aerial systems without having to retune, or even just for personal satisfaction — when one wants the most accurate match possible. Also, another factor which may have to be considered is that many modern solid-state transmitters will not operate properly with a mismatched load and they have protection circuits which reduce the output power at quite low levels of VSWR.

Table 1. Comparison of the performance of a ground plane aerial mounted close to ground with that of a dipole at 25ft, when used with a typical 100-watt output transmitter. This table is intended to be a very simple guide to the behaviour of a ground plane aerial, based on tests and observations over many years on the HF DX bands. It should be appreciated that the subject is very complex and cannot properly be covered in so simple a manner but it is hoped that this form of evaluation will be more useful than listing stations worked.

<table>
<thead>
<tr>
<th>Use</th>
<th>Ground Plane</th>
<th>Dipole</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground Wave — across town nets.</td>
<td>Very good, especially if all stations used verticals.</td>
<td>Good, but directivity can cause some problems.</td>
</tr>
<tr>
<td>Short skip — Western Europe.</td>
<td>Generally poor due to lack of high angle radiation.</td>
<td>Very good. The high angle of radiation from a low dipole is ideal for short skip.</td>
</tr>
<tr>
<td>Medium distance — Eastern Europe, Asia, etc.</td>
<td>Similar signals to dipole but usually more prone to fading.</td>
<td>Good but signal strengths start to fall off.</td>
</tr>
<tr>
<td>Longer distance — Far East, Australasia, etc.</td>
<td>Typical signal levels of S5 when the band is open. Very good contacts can often be made as the band opens or closes though signals may be weak.</td>
<td>Generally similar signal level to ground plane. No discrimination against short skip signals on reception.</td>
</tr>
</tbody>
</table>

The horizontal radials act as an artificial earth or ground plane allowing the aerial to be mounted at any convenient height. Fed with a short run of good quality coaxial cable, this arrangement will normally radiate efficiently without resorting to lengthy tuning and matching procedures. Element lengths are not extremely critical and can be cut to: length = (234/f MHz)ft.

Diagrams (a) to (d) illustrate the change in feedpoint impedance of a vertical radiator as its electrical length is increased from a quarter to one half wavelength. By proper choice of element length the resistive part of the feedpoint impedance can be matched to a standard 50-80ohm coaxial feeder and the unwanted inductive reactance can then be tuned out with a suitable capacitor to leave a purely resistive feedpoint, a shown in (e) and (f). See the text for comments on practical radiator lengths.

Fig. 1 THE BASIC GROUND PLANE AERIAL

Fig. 2 THE PRINCIPLE OF THE EXTENDED GROUND PLANE AERIAL

NB. The inductive reactances $X_L$ shown in (b) and (c) are not the same, as like the resistive components they also increase with radiator length up to $\lambda/2$. 

Table 1. Comparison of the performance of a ground plane aerial mounted close to ground with that of a dipole at 25ft, when used with a typical 100-watt output transmitter. This table is intended to be a very simple guide to the behaviour of a ground plane aerial, based on tests and observations over many years on the HF DX bands. It should be appreciated that the subject is very complex and cannot properly be covered in so simple a manner but it is hoped that this form of evaluation will be more useful than listing stations worked.

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Matching

The most widely used matching arrangements involve such things as Q-sections, stubs and network transformers and whilst all of these devices are electrically sound their use is viewed with some apprehension by many radio amateurs.

The extended ground plane, in which feedpoint impedance is controlled by radiator length adjustment, is another way to achieve accurate matching. Using a method based on simple theory, it is easy to set up and only slightly more difficult to install than a more conventional ground plane.

The Extended Ground Plane

The feedpoint impedance at the base of a resonant quarter-wave length vertical radiator is a pure resistance of perhaps 35 ohms. If the radiator length is made longer than a quarter-wave length the feedpoint impedance will increase but it then becomes a complex quantity looking like an increased value of resistance in series with an inductive reactance, as shown in Fig. 2. By choosing a suitable length for the radiator the resistive component of the feedpoint impedance can be made to match the characteristic impedance of the chosen feeder line, whilst the inductive reactance can be cancelled or tuned out by an equal amount of capacitive reactance in series with the aerial. In this condition the radiator will be resonant, it will be accurately matched to the feeder, and it will radiate RF power efficiently.

Most amateur radio aerial handbooks quote the theoretical radiator lengths of 0.28\(\lambda\) for matching to a 50-ohm coaxial cable and 0.32\(\lambda\) for matching to an 80-ohm one. Contrary to statements that have been made in some handbooks these lengths are not fixed free-space values and in a practical aerial it is usually found that the radiator must be made somewhat longer than these figures suggest. Because of the many variables involved it is not easy to predict accurately the proper length for the vertical element, but past experience has shown that 0.4\(\lambda\) is a good starting point for the design of an 80-ohm system when using tubular elements. Once the aerial is built it is a simple matter to adjust the vertical element to the correct length with a little trial and error aided by some SWR measurements. However, as it is usually easier to cut bits off than it is to put them back on, initially it is wise to make the vertical too long; using radiator length = 0.4\(\lambda\) errs in this direction.

An Extended Ground Plane for 10 Metres

Fig. 3(a) gives the essential details of a 10-metre ground plane designed for use with a nominal 80-ohm coaxial feeder. (This impedance was standardised upon a long time ago at G3JFS simply because of the availability of a high power dummy load resistor which happened to be 80 ohms!) Fig. 3(b) shows one possible method of construction, but as the physical arrangement of the aerial is open to many different interpretations there is considerable scope for improvisation and exercise of one's ingenuity to make the best use of the available site and materials.

Some points to consider when building the aerial are:

1. Use metal tubing or the heaviest gauge of wire that is available for radiator and radials.
2. HF band ground plane radials are always something of a nuisance and difficult to install but every effort should be made to mount them above head height where they cannot be touched easily. The end of each radial is a point of high RF potential which is hot enough to give a very nasty burn with only the output of a low power transmitter applied to the aerial.
3. All joints and connections should be made mechanically...
and electrically sound and then waterproofed to resist corrosion. (4) Make sure that water cannot get into the capacitor box. A rubber grommet of appropriate size, smeared with silicon grease, can be used as a watertight seal for the capacitor spindle.

(5) Use good quality coaxial cable. The cable ends should be well protected with tape and waterproof sealant to prevent the ingress of moisture which will quickly ruin a good cable.

### Tuning and Adjustment

The tuning and adjustment of the aerial can be done very easily by using the station transmitter and a VSWR bridge to carry out the following simple procedure:

(1) Tune the transmitter into an 80-ohm dummy load at the desired operating frequency, using the lowest power level that will give a useful forward power reading.

(2) Connect the aerial in place of the dummy load and adjust the series capacitor 'C' for a minimum VSWR. If necessary alter the length of the vertical section and repeat the tuning procedure to get the lowest possible VSWR, or the best compromise over a band of frequencies of particular interest.

(3) If a telescopic aerial section is not provided, carry out the tuning procedure at intervals over the band. Then by plotting VSWR against frequency on a piece of graph paper it will be easy to decide if the radiator needs to be shortened or lengthened to resonate at the desired frequency.

(4) If the aerial has to be shortened by cutting do it a small piece at a time because it is far easier to cut some off than it is to put it back on!

(5) However, if you do cut off too much all is not lost as Fig. 5 suggests three simple ways of increasing the electrical length of the radiator. Although the above description has been of a 10-metre aerial the dimensions can be scaled up for 15 or 20 metres, where the radiator.

### Results

Most aerial handbooks put great emphasis on the low angle radiation produced by a ground plane aerial, but this is rarely achieved in practice as it depends on the aerial being mounted over perfectly conducting ground. As even the best approximation to this — an aerial over salt water — is out of the reach of most of us we must accept that the DX performance of a practical ground plane is not going to be as good as theory suggests, though just how well it will work is not easy to determine except by using it under actual operating conditions. Much does depend on the site but in one series of tests carried out by the writer a ground plane mounted with its radials at 6ft. above ground on a reasonably open site gave very similar results to a dipole at 25ft., and it was 2 to 4 "S" points down on a TA-33 at 30ft. Other tests results are summarised in Table 1 which gives a simple comparison of the general behaviour of a ground plane with that of a dipole.

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### BOOK REVIEW

**TELEPRINTER HANDBOOK**

Second Edition

My first encounter with amateur RTTY was in the early 1960s during a visit to the shack of a local friend. The size and noise of the **Creed** 7B page printer did not entirely endear me to the mode. However, much progress has been made in the last two decades with the advent of quieter, more compact machines, VDUs, and so on, so it was with considerable interest that the chance to review the second edition of the **Teleprinter Handbook** was accepted.

The book contains fourteen chapters, three appendices and an index, beginning with a short chapter on basic telegraphy transmission theory based upon a British Telecom pamphlet. The next section, entitled "Teleprinters", is the real meat of the book, its 156 pages occupying nearly half the volume. It deals in great detail with the **Creed** 7B, 54, 75 and 444 machines, the Siemens T-100 and T-150, the **Teletype Corporation**'s Models 15 and 19, and the **Creed** Type 85 and 86 reperforators. There are brief details of the **Teletype Corporation**'s 28, 32, 33 and 43 models. This chapter is copiously illustrated with scores of diagrams and photographs, akin to workshop manuals for motor cars.

Chapter three comprises 32 pages devoted to “Other RTTY Machines”, and includes the **Creed** 65-series of automatic transmitters and **Creed** and **Teletype Corporation** reperforators. The following short section on “Power Supply Units” is quite basic and conventional. The fifth chapter, "Demodulators", is the second longest and features the **Mainline** ST-6 and **BARTG** ST-5 designs in great detail in its 44 pages. The next chapter is devoted to "Polarised Relays" and covers the **Carpenter** 3, 4, 5 and 6, and **Western Electrics** 251A and 255A devices, thoroughly illustrated with many drawings and photographs.

The next two chapters are quite short: seven deals with "Keying Methods", and eight with "Filters". Chapter nine’s 21 pages are devoted to "Test Equipment" and includes information on various Telegraph Distortion Measuring Sets and Telegraph Signal Generators. I had assumed that teleprinters with reams of paper copy were rapidly becoming museum pieces, so found it somewhat surprising that a mere nine pages, forming Chapter 10, were devoted to a "Video Display Unit". It seems that the old **Hilschreiber** system is enjoying a bit of a renewal in Europe lately, so the handbook includes a brief reference to it in the three pages making up Chapter 11. The final three sections are short ones entitled; "Control Systems", "The RTTY Station", and "Operating Procedures", while the three appendices consist of a "Glossary of Commercial Equipment", "Terminology", and six pages of "Data".

To sum up, then, for the "mechanical" RTTY enthusiast, this second edition of the **Teleprinter Handbook** must be classed as a "bible" so can be thoroughly recommended. The editors are Messrs. Hobbs (G8GOJ), Yeomanson (G3IR), and Gee (G2UJ), and it is published by the RSGB. It is a hardback production of 368 pages, 246 x 184 mm, and is available at £13.70, including postage and packing, from Short Wave Magazine Publications Department, at 34 High Street, WELWYN, Herts., AL6 9EQ.

N.A.S.F.
ONCE or twice in this column your scribe has remarked that each year he took an RAE class increased his own understanding of the subject somewhere. This thought always puts me in mind of others trying that hardest of all tasks; preparing for the examination alone with no one to elucidate the hard bits. For one thing, even if you had someone to help, for him the 'hard bits' would be different, and one tends to be impatient with those who find hard that which is easy to yourself.

We were, then, naturally very interested in the letter from Barry Ward (Ruddington) who faces just this sort of problem. With regard to the learning part itself, repetition is the word: read the text time and time again. The way we suggest is that you take a portion of the syllabus — say, a single chapter or less. Read it, and re-read it again at, as near as you can, daily intervals. There is a reason for choosing this interval of time, in that recall is better after 24 hours. Read with a pencil and paper; if a sketch of what is happening will help, then sketch it. After a few times, the idea will 'click', and then a couple more readings at 24-hour intervals will reinforce it; then go on to the next bit. Remember, especially if you haven't done any study since school-days, that you are in reality doing two subjects, of which one is the RAE, and the other is 'How to Learn'!

On a totally different tack, Barry is a CW buff of no mean ability, but, being R.A.F. trained, there is a strong instinct to write everything down. The lad is just trying to break this habit, and rightly so — after all, even with the abbreviated symbols used by CW operators, 90% of what is copied are mere connecting words and irrelevant to the matter in hand. Even when ragchewing, J.C. only writes down the salient points on the scratch-pad, and in a 'rubber-stamp' QSO this is what goes in the log. However, everything is copied and 'stowed' in the mind with anything demanding a response being noted on the scratch pad.

The Mail

The ladies come first, and they lead with Mrs. T. Parry (Blackpool) from whom we had an interesting letter. Tina seems to have been in among the oddities this time; 70XN who claimed a number of prefixes; probably changes of favoured direction, height, orientation of aerials and so forth, account for it. Many readers commented on the shortage of prefixes of late, and it does seem that a combination of below-normal propagation and a shortage of DX-peditions has lowered activity among the rare ones. However, there are still nuggets to be found. L2M was a contest call from the Argentine, and XO2JCG was associated with the Canadian Winter Games, name of Roch, and address PO Box 212, Chicoutimi, Province of Quebec. Finally J87BS, on the island of Mustique, just off St. Vincent in the Windward Is. group.

Next we turn to B. F. Hughes (Worcester) who seems to have gained a new lease of life from the move of QTH, at least in terms of prefixes; probably changes of favoured direction, height, orientation of aerials and so forth, account for it.

A Good Station

E. G. Hughes (Belfast) wants some ideas of how to make himself a first-class listening post. He is already doing the first part, by way of a home-study course, and we would strongly recommend a second activity of joining the local club. Thus one has inputs of theoretical knowledge and practical experience. Now to the station proper. On the face of it, one would imagine that ‘the very best receiver obtainable' would be mandatory, but your J.C. doubts it; a simpler receiver, with short-comings to 'learn on' and on which your tastes in listening can be allowed to emerge while your operating skill is sharpened by its weaknesses. Then, by all means, a sooper-doooper receiver with the ‘options’ chosen to fit it towards your own preferences. Of course, the ideal station would have a room to itself, and enough room to operate the equipment in comfort, with the log and the reference books easily to hand — you always seem to want them in a hurry! — and, naturally, enough room to write as well. Nearby, the filing system: when you have the station logged you want to slot it into your HPX list, or know whether to QSL him, and if a QSL has gone out whether it has come back. There will be arrangements for several aerials, and their ATUs, and all aerials can be attached to any receiver; outside, there will be the real estate, the towers and masts to hold up the chosen aerials. Last but not least a gardener!

So much for perfection: what about the practice? Do the best you can, but always bear in mind two things, namely that in the first place ingenuity can do a lot to make up for the shortcomings of the station, and in the second place that you can leave out the gimmicks so beloved of receiver makers, meaning that much of what is needed can be home-brewed or improvised.

Turning to QSLs: the report is the first thing, and all we need to say is that it must be detailed enough and informative enough to make the recipient feel it his duty to respond; in other words a useful report. Then you must decide whether the card goes through the Bureau system, and if so you must belong to a group

ANNUAL HPX LADDER
Starting date, January 1, 1982

SWL PREFIXES

<table>
<thead>
<tr>
<th>SWL</th>
<th>PREFIXES</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>SWL</td>
</tr>
<tr>
<td>263</td>
<td>Kirby (Cheltenham)</td>
</tr>
<tr>
<td>204</td>
<td>Mrs. C. Law (Chesterfield)</td>
</tr>
<tr>
<td>310</td>
<td>P. D. Hunt (Woolwich)</td>
</tr>
</tbody>
</table>

This is the last appearance of the 1982 Table. Next issue will include entries for the 1983 Table; 200 prefixes to have been heard since January 1, 1983 for an entry to be made, in accordance with HPX Rules shown on p. 26. At score 500, transfer to the All-Time listings is automatic.
organising one (RSGB or ISW in U.K.). For the rare ones, such as the upcoming Heard ls. DX-peditions, you will QSL direct to the address given by the station, and enclose an s.a.e. or IRC's, as the upcoming Heard Is. DX-peditions, you will QSL direct to an Annual affair as so many readers preferred to compete with people at their own stage of development before going into the ATPW at which time they should be able to hold their own with the best.

Turning to B. Patchett (Sheffield) we find him now moving out of the Annual and into the ATPW lists, and also well into RAE studies at Rotherham college. Brian is having serious thoughts about the possibility of taking the Morse ahead of the RAE sitting in may, on the grounds that he is already practising at 17 w.p.m., but he does say he wishes more of the RSGB Slow Morse was to be heard on the LF bands.

Lots of interesting things are said in the letter from M. Toms (Barkingside); Mike has been putting in lots of hours of work, but as he comments philosophically, why complain of that in time of recession? On a different tack, Mike thinks that the RSGB's U.K. Calbook is out-of-date before it comes out, due to the long

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**HPX RULES**

(1) The object is to hear and log as many prefixes as possible; a prefix can only count once for any list, whatever band it is heard on.

(2) The /M and /MM suffixes create a new series: thus G3SWM, G3SWM/M and G3SWM/MM all count as prefixes, and where it is known to be legal, /AM also.

(3) Where a suffix determines a location the suffix shall be the deciding factor, thus W1ZZZ/W4 counts as W4. Where the suffix has no number attached, e.g. VE1AED/P/SU, VE3UJ/P/ SU, they are arbitrarily counted as SU1 and SU2 respectfully, and the same holds good for similar callsigns.

(4) When the prefix is changed both the old and the new may be counted; thus VQ4 and 5Z4 both count.

(5) The object is to hear prefixes not countries, thus there is no discrimination between say MP4B and MP4K which count as one prefix.

(6) Only calls issued for Amateur Radio operation may be included. Undercover and pirate call signs will not be credited, nor any MARS stations be claimed.

(7) G2, G3, G4, etc., all count separately, as do GW2, GW3, GW4, etc., and in the same way K2, W2, WA2, all count separately even though they may be in the same street.

(8) Send your HPX list, in alphabetical and numerical order showing the total claimed score. With subsequent lists, it is sufficient to quote the last claimed score, the new list of prefixes, and the new total. Give your name and address on each sheet, and send to "SWL"., SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ, if possible to arrive before the SWL deadline for that particular month.

(9) Failure to report for two consecutive listings, i.e. four months, will result in deletion from the Table, although there is no objection to a "Nil" report to hold your place.

(10) Starting score 200. Phone Table is mixed AM/SSB, with a separate CW Table. No mixed Phone/CW Table, nor will AM-only or SSB-only entries be accepted.

(11) Lists will be based on those shown in the current "Radio Amateur Prefix-Country-Zone List", published by Geoff. Watts (see Advertiser's Index in any issue of SHORT WAVE MAGAZINE).

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**HPX LADDER**

(*All Time Post War*)

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<tr>
<th>SWL</th>
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<td>E. W. Robinson (Bury St. Edmunds)</td>
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<td>H. M. Graham (Chesham)</td>
<td>1549</td>
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<td>G. W. Raven (London SE13)</td>
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<td>859</td>
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<tr>
<td>R. Everitt (Bluntisham)</td>
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</table>

**CW ONLY**

| PHONE ONLY | |
| K. Cooke (Cardiff) | 762 |
| J. Dunnett (Prestatyn) | 732 |
| B. Hughes (Worcester) | 2614 |
| S. Foster (Lincoln) | 2304 |
| Mrs. R. Smith (Nuneaton) | 2297 |
| E. W. Robinson (Bury St. Edmunds) | 2139 |
| H. M. Graham (Chesham) | 1549 |
| G. W. Raven (London SE13) | 1441 |
| M. Toms (Barkingside) | 1400 |
| M. Rodgers (Harwood) | 1392 |
| N. Askew (Covenry) | 1279 |
| M. Law (Chesterfield) | 1268 |
| Mrs. T. Parry (Blackpool) | 1250 |
| D. C. Casson (Reading) | 1089 |
| N. E. Jennings (Rye) | 1089 |
| B. A. Payne (Leeds) | 1025 |
| B. A. Payne (Leeds) | 1025 |
| D. J. S. Williams (Wednesbury) | 1024 |
| H. Bale (Cardiff) | 1015 |
| A. Pyne (Bradford) | 916 |
| Mrs. J. Charles (Colchester) | 879 |
| R. Fox (Northampton) | 859 |
| R. Everitt (Bluntisham) | 831 |

**RTTY ONLY**

| PHONE ONLY | |
| K. Cooke (Cardiff) | 762 |
| J. Dunnett (Prestatyn) | 732 |
| B. Hughes (Worcester) | 2614 |
| S. Foster (Lincoln) | 2304 |
| Mrs. R. Smith (Nuneaton) | 2297 |
| E. W. Robinson (Bury St. Edmunds) | 2139 |
| H. M. Graham (Chesham) | 1549 |
| G. W. Raven (London SE13) | 1441 |
| M. Toms (Barkingside) | 1400 |
| M. Rodgers (Harwood) | 1392 |
| N. Askew (Covenry) | 1279 |
| M. Law (Chesterfield) | 1268 |
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| D. C. Casson (Reading) | 1089 |
| N. E. Jennings (Rye) | 1089 |
| B. A. Payne (Leeds) | 1025 |
| B. A. Payne (Leeds) | 1025 |
| D. J. S. Williams (Wednesbury) | 1024 |
| H. Bale (Cardiff) | 1015 |
| A. Pyne (Bradford) | 916 |
| Mrs. J. Charles (Colchester) | 879 |
| R. Fox (Northampton) | 859 |
| R. Everitt (Bluntisham) | 831 |

Minimum score for an entry: 200 for CW or RTTY, 500 for Phone. Listings to include only recent claims and to be in accordance with HPX Rules, see this page.
for a flood of new prefixes, which eased off a bit later but still kept quite well.

A. P. Lincoln (Aldershot), who has put aside the old Eddystone in favour of a new Icom IC-R70, which he finds a vast improvement. For one thing the stability is much better, so CW and RTTY copy are that much easier, while the improved front-end dynamic range means that weak signals on SSB can be found and copied on 7 MHz, where the Eddystone had so much front-end attenuation to stop overload that only the big ones could be copied. Also notable is the reduction in the number of spurious responses.

N. Jennings (Rye) and A. P. Lincoln continue to maintain contact; Norman found a nice line in 'weirdos' this time with "EPA1B?" who claimed to be on a caravan site in Southern Spain. Probably a CB'er with delusions of grandeur, and we hope the poor fellow left the site before the Long Arm of the Law descended! On a totally different tack, Norman found another ISWL member in Rye, and is doing a bit of work at bringing him on to the HPX ladder. Good!

A. Pilkington (Chesterfield) has had a couple of weeks on the sick-list, and some mock A-level exams to be studied for and taken; but another 150 prefixes go on the total, nevertheless!

For R. Wooden (Staines) the long Christmas break was a good thing, enabling him to settle down and listen at times when he would normally be at work or asleep. Naturally the totals have gone up to suit. Surprising how a change of listening habits can improve results!

J. Heath (St. Ives, Huntingdon) seems to have been working at the SWL since last time, and his most interesting one is definitely VKOAB in Antarctica, talking about his recent visit to McMurdo Sound.

Contest

We mustn't miss this one out — Barking Radio & Electronics Society have their 144 MHz contest on March 27, with an SWL category. Log stations taking part in the contest only for points claims. One point per station, or ten points if you hear G3XBF or G8XBF, the club calls. More details from our very own contributor Mike Toms, either by letter with s.a.e., at 1124 have been heard; a full set for Connecticut, Delaware, New Hampshire, New Jersey, Rhode Island, and Washington D.C. but gaps in all other States. This is an interesting exercise, and it would be worthwhile getting hold of some copies of CQ Magazine, as they run an award programme on just this basis, and many of the rare ones are activated by mobiles and nets, just as with WAB at home.

A change of receiver is the big news from A. P. Lincoln (Aldershot), who has put aside the old Eddystone in favour of a new Icom IC-R70, which he finds a vast improvement. For one thing the stability is much better, so CW and RTTY copy are that much easier, while the improved front-end dynamic range means that weak signals on SSB can be found and copied on 7 MHz, where the Eddystone had so much front-end attenuation to stop overload that only the big ones could be copied. Also notable is the reduction in the number of spurious responses.

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Our last mention is just a list from M. Rodgers (Harwood).

Thoughts

Purely J.C.'s meanderings, sad to say! On wonders how many others are actively listening to the satellites; **Oscar 9** is of course the UOSAT one, now under full command. and there are the Russian ones, both **ISKRA** and the **RS** series, not to mention **Oscar 9**, and they can all contribute to interest in and activity on Ten in slack times. We'd be interested to hear.

A final thought, this time on the subject of learning Morse. Many of you have bought Datong Morse tutors, and use them to get up speed. The tutor produces perfect Morse, and therein lies a bit of a trap for the unwary! When you go for the test, you will get a dose of good, but **hand-sent**, Morse, and the divergence between the two may be enough to 'throw' you. You need to do at least some practice on good hand-sent Morse so that the Morse you get at the test is still easy copy to you — and we suspect that a copy speed of around 15 w.p.m. on the Datong equates to easy copy at 12 w.p.m. of good hand-sent stuff.

Period

All for now; the deadline for next time is **March 17**, to arrive, addressed to your scribe, "SWL", SHORT WAVE MAGAZINE, 34 High Street, Herts. AL6 9EQ. **Cheerio!**
MINOR MODIFICATIONS TO THE LOWE SRX-30 RECEIVER
LOWERING THE COVERAGE TO 190 kHz ON EARLY MODELS

A. SKAIFE, Tech(CEI), MSERT

THE Lowe SRX-30 receiver has now been around for several years and is used by hams and SWL's alike. However, the manufacturers have been periodically bringing out modified versions in a bid to tempt us towards newer models. My modification is for those (like myself) who still have the original version and who wish to improve its facilities. It is also cheap, easy and may be readily attempted by the novice.

The lowest frequency at which the radio will operate is 500 kHz, but my modification will lower this range to 190 kHz. In order to make the radio tune to lower frequencies I adjusted the preselect circuits by simply adding a padder capacitor across VC1, the preselector. Also an on/off switch was incorporated in the new component section (Fig. 1) as the capacitor is not used on the higher bands. The circuit shows a 2000pF capacitor (CX) but I found two 1000pF capacitors in my junk box and twisted together in parallel found they worked OK. I mounted the on/off switch (SX) on the right-hand side, and Fig. 2 shows a simplified layout with only the major components shown. The capacitor is hard (or ugly) wired straight between the spare unsoldered connection on the pre-selector variable capacitor and the switch. From the other side of the switch a wire is soldered to the case of the variable capacitor at the top; this point is already tinned. To peak up reception of Radio 4 a slight adjustment to L11 may be found to be necessary if VC1 does not provide enough gain.

At the time of writing the radio is being used in Germany and Radio 4's signal is OK on the normal portable 'tranny'. However, it is much more convenient when in the shack to be able to tune in on the SRX-30 and avoid those second channel or image noises.

In order that the receiver can be returned to original condition for future sale I decided to construct a new case; the dimensions and design of a new case are shown in Fig. 3. (It is a direct replacement so the original can be retained for future use). The hinged top lid makes access simpler when adjustments need to be done. I used aluminium (because it was at hand) but other materials such as tinplate, mild steel or even plywood may also be utilised. With a home-made case fitted one may feel a little happier when extra holes are required for other modifications.

Icom ICB1050

There is an error in the article on converting this piece of equipment to 10 metres FM, on p. 656 of the February issue: line 17 of the right-hand column should read "... pin 11 and transfer to pin 13". We apologise to readers, and author G3XSE, for this mistake. However, it has also transpired since the article appeared that some examples of the ICB1050 have non-standard wire colour coding, and we suggest that anyone carrying out the modification should carefully follow the 'sense' of the description in the article, in conjunction with their own particular rig, without necessarily referring to wire colours — particularly if there appear to be discrepancies. There are, we understand, literally scores of converted ICB1050's now on the air, all modified successfully in accordance with G3XSE's article.
"THE WHITFIELD"
SSB/CW/QSK TRANSCEIVER
PART I

AN EASY-TO-BUILD, 5 WATTS OUTPUT, MODERN DESIGN COVERING 160 METRES, 80 METRES, AND 3–3.5 MHz

IAN KEYSER, G3ROO

This transceiver was born when Short Wave Magazine asked me to follow George Dobb's, G3RJV, series "Plug In Your Soldering Iron and Begin Here" with a design that was easy to copy but still had all the required facilities. I intend to cover almost every component in the rig on a 'blow-by-blow' basis.

General Description and Design Considerations

When considering the design of a new rig the first requirement is to decide the frequency coverage. Of course, with a 'simple' unit it is unwise to contemplate an all-band rig, but on the same basis it is rather a waste to build a 'single bander' when one considers that the amount of extra work to include a second band is minimal, especially if they are adjacent. With the sunspot maxima rapidly passing into history it was decided to construct the transceiver for 160 and 80 metres, plus a third range of 3 to 3.5 MHz for use with transverters. This meant that mental gymnastics were not necessary when trying to sort out calibration; also Ambit International market converters for the HF bands for this IF at very reasonable prices.

The next thing to sort out in the design are the modes which are to be available. Naturally it would be nice to include all modes, but this is to be a 'simple' set so it was decided that SSB and CW would be used. With regard to CW I have a little fad that it must be full break-in (once QSK has been experienced it is very difficult to be happy with semi-QSK), and although it is an added complexity it is well worth the effort.

A problem that bugs all designers is the dial arrangement and tuning method. Over the years I have tried to use variac tuning—with never very satisfactory results due to thermal problems. Various tricks are available that ease these, and with multi-turn pots which are now about there is no doubt it can be made satisfactory. However, as my mail bag is already plenty big enough, I decided to stick to convention. This decision was certainly influenced by the appearance of the Eddystone 898 dial on the second-hand market at very reasonable prices—sometimes as low as £5—and this very smooth piece of machinery makes an excellent building chassis for the VFO.

As far as possible integrated circuits would be used to ease construction, in the major part of which a 'breadboard' would be built first and then re-built onto a PCB; this would verify the inherent stability of the circuits. (This decision at the onset of construction has proved rather enlightening, especially at the receiver IF stage where the Plessey SL6700 is used. When I tacked the components together I thought "this is impossible, no way can it work"... power was applied and—I lo and behold—it was stable; yet when the PCB was built it was a very different story—it would not settle down. Then I discovered that I had forgotten to decouple the AGC detector: panic over!)

Peter Chadwick, G3RZP, had designed and built an 80-metre receiver using the SL6700 and the new high-level mixer from Plessey, the SL6440. After discussion with Peter, and with his kind permission, it was decided to pinch chunks of his design for use in "The Whitfield". The ceramic filter was satisfactory for SSB, but there would be an advantage in having an audio filter for CW; and if this could be switched into a notch mode, so much the better. The audio amplifier was to have enough output to drive a loudspeaker. Although the specification of Peter's design was sufficient for the LF bands, provision would be made for those who wish to include an RF stage to make the rig 'seem' more lively during the day.

SSB generation would be carried out on the receiver IF PCB. This is the obvious place for it due to the placement of the IF filter and the CIO. Plenty of gain would be made available in the strip so as to be able to lose signal when coupling into the filter and so

![Fig. 1 BLOCK DIAGRAM OF "THE WHITFIELD" TRANSCEIVER]
reduce any loss of gain in the receiver section. Plessey SL1600 devices would be used in the SSB generator, but Vogad (voice operated gain adjusting device) would not be employed on the grounds of cost. Actually, I rather doubt the value of Vogad in amateur use, but in commercial applications it is superb.

The transmitter signal mixer would use an SL641, thus keeping component count to a minimum, to be followed by a Mosfet tuned amplifier/filter to select the correct signal on the band in use; this tuning to be independent of the main tuning and to cover the whole range 1.7 to 4.0 MHz without switching. This decision was made with split frequency working in mind; it is very difficult to align wide band passband circuits for this LF region, and if split frequency working is required it is much simpler to tune the Tx to that frequency and only have to switch the VFO signals. Split frequency is not included in this unit, but will no doubt be the subject of a future article.

Transmitter output to be about 5 watts, followed by low pass filters which would be used on receive as well as transmit. The reason for this is that with only two tuned RF circuits on receive, second channel is still (just) audible in practice; an ATU is sufficient to eradicate it, but the low pass filters are there and so might as well be used.

That covers the basic outline of "The Whitfield" before starting construction; we now have to consider the size of the rig. As mentioned earlier, the Edgystone 898 dial is the heart of the tuning and this automatically sets the front panel minimum size to 6 x 9 inches. There are also a fairly large number of controls: main tuning, Tx tuning, RF attenuator, AF gain, mode switch, filter switch, filter tune, filter 'Q', meter, meter switch, phones socket, mic. socket, and Tx gain.

In view of the number of controls, and not wishing to use concentric pots, the front panel was set at 6 x 12 inches: this allows plenty of room between controls without making the unit too large. Certainly, by cutting down the dial and other modifications the set could be made very compact since the PCB's are small — it's just that as it stands there is plenty of space between them! Box, rather than chassis, construction was used for maximum screening and this enables a much more solid job, a necessity in any rig. The metalwork can be supplied by H. L Smith 287-289 Edgware Road, London, and all the sizes will be given in due course for those who like to 'do it themselves'.

The Block Diagram

Fig. 1 shows the block diagram. The aerial is fed into the low pass filters which are switched for the different bands, the 80m. LPF being used on the 3.0 to 3.5 MHz range. The aerial relay switches the output from the filter to the receiver input bandpass tuned circuit; the top coupling capacitor may be replaced by the optional RF amplifier. The output tuned circuit has a push-pull output winding (50 ohms) to drive the mixer, IC1; the required IF output from the mixer is selected by the ceramic LF filter (455 kHz) and the resultant signal is amplified in the SL6700. This integrated circuit also includes the AGC detector and SSB product detector. The required CIO signal for the product detector is supplied from Q5, Q6 and Q7, which use ceramic resonators as the frequency determining elements. The audio output from IC2 is low-level and IC3 is used to amplify this signal prior to audio filtering in IC4. (This filter is based on a very old design believed to originate from DJ6HP; a very useful little circuit which can be used in either peak or notch modes). IC5 completes the receiver chain as the audio output stage, giving about 1 watt of audio to the speaker.

The transmitter section starts with the microphone amplifier, IC6. This amplifies the AF signal and drives the signal input to the balanced modulator, IC7. The CIO signal is also fed into the balanced modulator producing (among others) a DSB signal on 455 kHz, and this DSB signal is fed into the IF filter where one of the sidebands is removed along with all the other mixer products from the balanced modulator. The sideband obtained depends upon which ceramic resonator is selected in the CIO. The low-level SSB signal from the ceramic filter is amplified in IC8 before being fed into the transmitter mixer, IC9. Here the 455 kHz SSB signal is mixed with the VFO signal to produce an RF signal on the required band. On CW the SSB signal is not present as the supply to the SSB generator is removed, and signal is supplied by the keyed CW oscillator circuit Q11 and Q12. The resulting output on the amateur band is filtered and amplified in the Mosfet, Q8; this stage is also used to vary the transmitter gain, by varying the gain of this device with a pot (mounted on the front panel) in the source. The signal on the required band is amplified by the wideband driver Q9 and Q10 which gives an output of about 100mW., sufficient to drive Q13, the Class-A linear power amplifier, to 5 watts output. This transmitter output signal is passed via the aerial relay, through the low pass filter, to the aerial.

Hall hospital. Details from the Hon. Sec. — see Panel for his details.

Now we turn to Acton, Brentford & Chiswick, which of course means Chiswick Town Hall, High Road, Chiswick; the date is March 15, and the subject "An introduction to CW" for the benefit of the newer members.

Addiscombe are in the main a contest club, but they do also have social meetings, at "The Woolpack" in Gloucester Road, Croydon, from 9 p.m. every Tuesday.

We head south-west next, to Axe Vale, where they now have their HQ at the "Cavalier Inn", West Street, Axminster, on the first Friday of each month. Incidentally, this club now has all but two members licensed, and these took the December RAE anyway! So the moral is — they are looking for some SWL members.

For the essential details on the Aylesbury Vale doings we must refer you to the Hon. Sec. — see Panel. This is because we haven't had any updating for some time.

Over to GI, and nice to hear again from the Bangor gang, who

CLUBS ROUNDUP

By "Club Secretary"

The Mail

A BIG pile for this month, with lots of updates to check, and quite a lot of changes. We hope we have picked up all of them; but sometimes the required detail is in a small paragraph and not underlined, so we can miss it. Please check your club's entry!

Abergavenny have the use of a room over Male Ward 2 at Penyfal Hospital, Abergavenny, every Thursday evening, while on Tuesdays their RAE class runs in the Seminar Room at Nevill Penyfal Hosptial, Abergavenny, every Thursday evening, while entry!
have a meeting on the first Friday of each month at 7.45 p.m. For March, the speaker will be G14BWM, who will be talking about repeaters, what they are and how to use them. During March, too, they have a dinner-dance fixed up, on the 18th. More from the Hon. Sec. — see Panel for his details.

The thriving new Bath club says they have a lot to offer licensed amateurs and SWLs in the way of events, projects and talks. March 9 is a night-on-the-air, and on 23rd they have a questions-and-answers session. Find them every other Wednesday at the “Englishcombe Inn”, Englishcombe Lane, Bath, at 7.45 p.m.

Over to Biggin Hill, and the Memorial Library on March 22; there they have a junk sale, which should bump up the attendance somewhat!

Every Wednesday at Horwich Leisure Centre, you can locate the members of the Bolton group; sometimes they have visiting speakers, sometimes their own members, and there are also activity nights, operation of HF and VHF stations, Morse practice and all sorts of other such goings-on.

Nice to hear again from the Bristol club, who now have their place at the YMCA, Park Road, Kingswood, Bristol, where they may be found every Tuesday evening.

Avoncroft Arts Centre is the address to find if you are looking for the Bromsgrove group; they have the main meeting on the second Friday of the month and a QRP meeting on the fourth Friday at the same place. March 11 is down as the club AGM, and in April they have the Constructors Contest.

Bury have a talk on RTTY on March 8—a late change to the programme at Mosses Community Centre, Cecil Street. It should be noted that the group foregather every Tuesday here.

A familiar spider-in-the-ink sort of fist appears again for Cambridge, announcing that G2FKS has once again been pressed into service as P.R.O. The club HQ is in the Visual Aids Room, Coleridge Community Centre, Radegund Road; March 4 and 18 are informals, and March 11 a talk on simple digital circuits by G8JKV. On March 25 they have the Annual General Meeting.

On Thursday, March 3, the Cheltenham club have their Constructors Contest. However, we understand they have a search on for a new HQ address so we feel you should check the details with the Hon. Sec. — see Panel for his details.

There are three ‘natter nites’ for Cheshunt, on March 2, 16 and 30; in addition, on March 9, they have a talk on “VSWR and all that” by G6BTO and on 23rd there is a junk sale.

Down at Chichester they have an informal on March 1, and on 17th there is a talk on wartime radar by G6HY; the venue is the Green Room, Fernleigh Centre, 40 North Street, Chichester.

Over to Colchester where we are advised that on March 10, G4AZR will be talking about car interference suppression, while on March 24 they have a talk on maps and map reading by G6HHR.

At Cornish the venue is the SWEB Clubroom, Pool, Camborne on the first Thursday in each month; they also have a Computer section who have the same venue on the third Monday of the month. For March the main meeting will be hearing from G6CSZ on “Audio Aspects of Hi-Fi”, and in April comes the AGM.

Dartford Heath D/F club have a meeting on March 2, at the “Malt Shovel”, Eynsford; as usual this is the Wednesday before a D/F Hunt, which in this case occurs on March 6. Details from the Hon. Sec. — see Panel.

Up north a little now, to Denby Dale which means the Denby Dale Pie Hall; March 9 is a talk on Oscar by G4JJ, and for the rest we refer you to the Hon. Sec. — see Panel.

March for Derby sees them foregathering at 119 Green Lane, Derby, every Wednesday; on 2nd there is a junk sale, and on 9th they have a talk on Royal Crown Derby china, followed on 16th by a natter evening. March 23 is down for the Annual General Meeting, and on 30th G3YUT will talk about his trip to Japan.

A new club comes up now; Droitwich, once so well-known as a Spa, and current home of the BBC transmitter, now has an amateur radio club, who are booked in on the first Monday of every month at the Scout HQ in Station Road. More details from the Hon. Sec. — see Panel.

On now to East London RSGB, where the HQ is at Wanstead House, which lies about 100 yards behind Wanstead Tube Station. The start is at 3 p.m. on the afternoon of March 20, and is set aside for a session on RSGB with the local RSGB representative present to answer the questions.

Turning to Echelford we find they are still meeting at The Hall, St. Martin’s Court, Kingston Crescent, Ashford, Middx. on the second Monday and the last Thursday of every month.

March 10 is informal and 24th remains to be settled for Edgware; but they will definitely be in session on both dates at 145 Orange Hill Road, Burnt Oak, Edgware.

The Farnborough super-newsletter now comes out annually, but it must still cost them a bomb to produce! The group can be found at the Railway Enthusiasts Club, Access Road, off Hawley Lane (near the M3 bridge), on March 9 for a natter evening, and on March 23 for a talk on satellite communication by G3OQB.

Up to GM now, and Glenrothes where they have a Sunday meeting on March 20, at Provosts Land, Leslie, Fife. We believe they also have weekly evening meetings, the details on these being doubtful obtainable from the Hon. Sec. — see Panel for the needful.

The G-QRP Club caters for the low-power buffs, both SWL and licensed, and we hazard a guess that many of the 1000-plus members are more than a little interested in the circuits and things to build in the newsletter! Get the details from the Hon. Sec. — see Panel.

Turning to Grafton, we suspect the majority of the licensed amateurs in North London passed the RAE thanks to the Grafton classes. Nowadays they foregather at the “Five Bells” in East End Road, Finchley on the second and fourth Friday.

The Greater Peterborough gang are at Southfields Junior School, Stranground, Peterborough, usually on the fourth}

In next month’s issue: repeater-shift for the Icom IC81050 after conversion to 10 metres FM. Make sure of your copy now!
Thursday. Details from the Hon. Sec. — see Panel for his details.

A change of the details is to be reported at Grimsby where they now foregather on alternate Thursdays (from January 13) in Cromwell Social Club premises. More details from the Hon. Sec. — see Panel.

The Guildford club are based at the Guildford Model Engineer’s Hq in Stoke Park; on March 25 they have a tag sale. We rather liked the tailpiece on school science from G6BZ in the newsletter: "Many things that we once thought to be science fiction now actually are "... out of the mouths of babes and sucklings"?"

Harrow now have some 147 paid-up members; you can meet them by going to Harrow Arts Centre any Friday evening, and they will be in either the Roxeth or the Belmont Rooms, the latter being the one for the AGM on March 18.

There are now some 196 members of the Hastings club, and here the venue is Ashdown Farm Community Centre. The ‘main’ meeting is on the third Wednesday of the month, but they have RAE and Morse classes on Tuesdays and a chat night every Friday — oh, and the computer section have the other Wednesdays, so you should have no difficulty in finding them in!

Turning the pages of the Ipswich newsletter, we have to turn to page 28 for the meeting details; they are at the “Rose and Crown”, Norwich Road, Ipswich, on March 9 for a Constructional Contest, and 30th is the Spring Sale.

I.R.T.S. is the National Society in E.I.-land, and they are the ones to turn to if you want to know anything about the amateur radio scene, or clubs, in that country. All the needful from the Hon. Sec. — see Panel.

In Jersey the club has its Hq at Le Hocq Tower, St. Clements, where they turn up on Friday evenings and also on Sunday mornings. Details from the Hon. Sec. — see Panel.

It’s a long time since we last heard of the Leyland Hundred group; nowadays they are to be found on the second Monday of each month at Astley Park Social Club, Hallgate, Astley Village, Chorley. The group intersperse natter sessions with talks and other more formal meetings; details from the Hon. Sec. — see Panel.

We now turn to the Lincoln situation, where we are in the doghouse with the Hon. Sec., G8VRJ — sorry! They have the Lincoln Mobile Rally and Hamfest booked for May 8 on the Lincolnshire Showground site. Ordinary club meetings are at the City Engineers Club, Central Depot, Waterside South, Lincoln, on March 9 for a talk on satellites by G4CUO, and a lecture/demonstration of fast-scan TV by G8CTG and G6HMS.

Up again to GM, and Lothians who are at the Drummond High School on March 10 and 24; on the latter date GM4COX will talk about Field Days.

March 3 is T.B.A., says the Maidenhead letter, and on March 15 they have the Annual General Meeting. Both are at the Red Cross Hall, The Crescent, Maidenhead.

The Maltby group are attacking with vigour the problem of supporting a weekly programme, based on the Methodist Church Hall, Blyth Road, Maltby. March 4 is down for microwaves and G3PHO, March 11 G6RIL and power supplies, March 18 for a film-show, and on 25th there is the Annual General Meeting.

Melton-Mowbray have been at the St. Johns Hq in Asfordby Hill for years; find them on March 18 talking about resonating aerials, with G3WKM and G3NVK.

A novel subject will come up for discussion at Melton on March 3, when G3CSG will be talking to them about “Japanese Morse”; they get together on the first Thursday of each month at Nannau Country Club, Llanfachreth, which is two miles north of Dolgelau.

March 15 sees the Midland gang hearing all about new Midlands repeaters, the venue being the club Hq at 294A Broad Street, Birmingham, which faces the Repertory Theatre.

Mid-Ulster club writes to mention that Parkanaur Mobile Rally; details from the Hon. Sec. — see Panel.

Next we have Newark where they gather on the first Thursday of every month at the Palace Theatre, Appleton Gate, Newark; details from the Hon. Sec. — see Panel.

No messing about with the Norfolk programme; they have all the needful on one bit of paper covering through to May. They have short meetings on March 2, 16 and 30; on March 9 there is the initial VHF NFD meeting, and on 23rd they have a surplus equipment auction. All this at Crome Centre, Telegraph Lane East, Norwich.

Northern Heights have their place at the Bradshaw Tavern, Bradshaw, Halifax. On March 9, G4MH will tell them all about Amateur Radio, and on 23rd they have a visit to Bradford Police Hq.

The North Wakefield newsletter writer has a distressing lack of faith in his typewriter; and it certainly failed to give us the venue for the weekly meetings each Thursday. Hence — his name and address are in the Panel.

We have often wondered about the ‘Forum’ that appears so often in the Nottingham programme; it now appears that there are dates on which the committee decisions are discussed by the membership at large. March 3 is the Forum, and there is a video film on 10th. March 17 is an activity night, with a junk sale on 24th; then on March 31 they will be judging the Constructors Trophy. The April 7 date is down for the AGM.

Pontefract have their Component Fair on March 13; for the rest it is Mondays at Carleton Community Centre, where they have rooms on the top floor. March 3 is down for G3HCW to talk about HF aerials.

Deadlines for “Clubs” for the next three months—

April issue—February 25th
May issue—March 25th
June issue—April 29th
July issue—May 27th

Next we come to R.A.I.B.C., and here we are in the doghouse again, because we got G3LYW’s address wrong last time. Sorry! This club caters for the blind, invalid and disabled among the amateur and SWL fraternity, and those who are qualified but need introduction and help in getting started. Details from the Hon. Sec. — see Panel.

March for Reading means an Alignment Evening on 1st, and a talk on 15th by G3SEK about RF radiation hazards. Both are at the clubroom, “The White Horse”, Emmer Green.

At Reigate the Hq is at the Constitutional and Conservative Club, Warwick Road, Redhill; March 5 is a talk on RTTY by G3RIM.

The Salisbury get together every Tuesday evening at Grosvenor House, Salisbury; they have a regular programme of outdoor events and special-activity stations during the summer, plus Morse and RAE classes in addition through the winter, or as required. Details from the Hon. Sec. — see Panel.

Nice to hear again after a long break from Shefford, who are still meeting at their Hq at the Church Hall, Ampthill Road, Shefford; March 3 is a matter, and on 10th they have a junk sale. March 17 sees founder-member G2DPQ giving a talk, and on 23rd G3DOT will talk about USA Hamfests. Finally March 31 is down for an evening on test gear.

Now to South Dorset, which means the Annual Constructors
Cup on March 1 followed by a junk sale, at the Army Bridging Camp, Wyke Regis, Weymouth.

The Southdown gang have their place at Chaseley Home for Disabled Ex-Servicemen, South Cliff, Eastbourne, on the first Monday in each month; March is down for junk sale. April's meeting will be put back a week to avoid the Bank Holiday.

S.E. Kent YMCA is another name for the Dover gang, and acknowledges their Hq. Wednesdays are club nights, with RAE classes on Mondays and Morse on Tuesdays. We had to chuckle at the "Lament" from a very old-timer in the newsletter this time.

Off now to Spalding, where they are to be found on March 11 at the Maples Room, White Hart Hotel, Spalding, for a talk on "Planning Aspects of Aerials" by the planning officer for South Holland District Council.

The Stourbridge meetings are at the "Cross Inn", Hagley Road, Oldswinford; March 7 is a natter session and on 21st they have the Annual General Meeting.

A review and discussion of members equipment takes place for Stratford-on-Avon on March 14, at the Control Tower, Bearley Radio Station; it's there also that they have the AGM and a film of radio interest on March 28.

Main meetings for Sunderland are on Mondays, with other meetings on Sundays and Thursday evenings; the Hq is the Brewery Yard, Westbourne Road, Sunderland.

March 7 at Surrey is a surplus equipment sale, and March 21 an informal, both being at TS Terra Nova, 34 The Waldrons, South Croydon.

Sutton & Cheam are at Sutton College of Liberal Arts on March 11, and Carshalton Sea Cadets Hq, Church Path, Beddington, near Carew Manor School on March 25; No details are given as to what's on.

Now to Sutton Coldfield, where they have a natter evening on March 14 at Sutton Coldfield Public Library, Sainsbury Centre and a talk on setting-up an amateur radio station by G2CCV on 28th.

Swansea meet on the first and third Thursday of each month at Lecture Room ‘N’ in the Applied Sciences Building, University of Swansea. They often have talks and demonstrations, but also have a club station in action.

Swale now forgather at Nina’s Restaurant, 43 High Street, Sittingbourne, on Monday evenings.

Thames Valley have their PR operation well organised with a standard form carrying all the necessary information. They gather at Thames Ditton Library meeting room, Watts Road, Giggis Hill on the first Tuesday of each month. March 1 is in fact their AGM.

Thanet have ‘mini-talks’ on March 4 and a talk by G3XDV on RSGB’s Repeater Working Group on March 18; both are at Birchington Village Hall. On April 3 they have a special event station signing GB2TM, for the Thanet Marathon Race.

On the first Wednesday of each month you can find the Thornbury crew at the "White Horse" on the A38 at Glosvendes, Thornbury; March is down for a talk on HF station equipment.

The Annual Dinner of the Torbay group is on March 12, at the United Services Amenity Centre, except that on March 15 the club Hq is closed while they enjoy the Annual Dinner.

Great Yarmouth club are based on the STC Sports & Social Club, Bevoir Road, South Denes, on a fortnightly basis. More details from the Hon. Soc. — see Panel.

A temporary change of Hon. Sec. occurs at Yeovil, where G3NOF is on the sick list; as for the weekly meetings, they are in process of changing their Hq, so we must refer you to G4JBH at the address in the Panel.

Finally, at York, they still meet weekly at the United Services Club, 61 Micklelegate, York, each Friday. On March 11 they have a talk on satellites by G6GUW.

Finale

The bottom of a Big Pile again. Deadlines for the next issue are in the 'box' in the piece, and are to arrive, addressed to "Club Secretary", SHORT WAVE MAGAZINE, 34 High Street, WELWYN, Herts. AL6 9EQ. 73, BCNU.

Components Fair in Yorkshire

Pontefract and District Amateur Radio Society is holding its 3rd Components Fair on Sunday, 13th March, at Carleton Grange Community Centre, Carleton, Pontefract; doors open at 11 a.m. (10.30 a.m. for the disabled). Traders will be displaying new and second-hand components and test equipment, station accessories and antennas; there will be no new 'black box' radio equipment. Also RSGB book stand, bring-and-buy, raffle, and talk-in on 2m. and 70cm. Ample nearby parking, with licensed bar and refreshments. Further information from G4AAQ, QTHR (tel: 0977 791071).

New Low-Loss 50-ohm Coaxial Cable

W. H. Westlake of Clawton, Holsworthy, Devon, is introducing this month a new type of coaxial cable, designated H100 and manufactured by Pope in Holland. H100 has about half the loss of UR67, and should be of particular use to amateurs using the higher frequency bands up to 1296 MHz; other features include higher power-handling capacity and lighter weight than UR67. Full specifications are available from the above firm, who offer the cable at 80p per metre (100m. runs at 20% discount), plus postage.

Ant Products

The telephone number of Messrs. Ant Products of Pontefract (whose "Silver 70" antenna we reviewed last month) is 0977 700949.
There are still three IC's to mount on the processor board and these form an interrupt controller. This part of the circuit would not be needed if everyone inserted correct spaces between words, but a check on the amateur bands will soon show that a very large number of operators leave spaces which are far too short. This is easily possible with many electronic keyers as only the lengths of the dots, dashes and letter spaces are usually controlled by the keyer; the sender has to guess the length of word spaces. With manual or bug keys some spaces must inevitably vary a little.

The circuit is shown in Fig. 8 together with connections to other parts of the circuit. The temporary MW connection must be removed; one end of this to pin 3 of IC9 is now joined to pin 1 of IC21. The other end which comes from the memory board is joined to pin 11 of IC19. This part of the circuit cannot be checked at this stage but it enables the interconnecting tag strips to other circuits to be mounted and wired, making it possible to tidy up all the connections on the processor board; the tag connections are shown in Fig. 9.

The interrupt controller has two functions. Port C (high) is connected to a spacing switch via diodes to be described later. The switch varies the length of the word space accepted by the processor. For good, or machine-sent, Morse it can be set to a 'normal' position. (Try copying the ARRL bulletins when the decoder is complete.) If when receiving other stations it is found that words join together it is due to the fact that the operator is not leaving correct spaces between words and the switch may be altered to compensate. The switch can be left in the 'shortest' position but this reduces the margin of error in the counting circuits and it is advisable to use the 'longest' position usable as much as possible. The switch can be altered at any time but this obviously has no effect if the spacing switch has not been changed. It was noted earlier that the reset switch on the processor also resets the speed controller but, in addition, it will be found to clear the whole display on the video monitor. The interrupt switch (called restart) resets the speed controller but leaves the display unchanged. This is useful if severe interference or other causes makes the automatic speed controller go out of range — a touch on the restart button will put it back again.

This part of the circuit has one further function which it carries out on its own. When the processor is switched on and the full program is run a number of initial operations take place, including clearing the video monitor display and returning its cursor to the top left hand corner of the screen; until these operations have been carried out the MW line to the memory is disabled. When the program has reached a point where it is ready to decode incoming signals, MW is enabled allowing alterations to be written into the memory. It should be noted that the memory takes note of the spacing switch and if the decoder is turned off and turned on again at a later date it will automatically go to the spacing set on the switch.

If an electronic keyer is available which has a negative-going TTL output a Morse decode program can now be carried out; should the keyer be positive-going it can be inverted by a single gate. The keyer is connected to either pin 12 or 13 on IC11 (key input). An alternative keyer can be made by taking a connection from pin 1 on IC2 on the programmer and using the programming switch as a key. If this is done it will be necessary to increase the value of C11 to 0.68 μF to take account of the slower sending which will result. A voltmeter should be connected from pin 13 on IC17 to OV, to read the output of the digital-to-analogue converter. The initial reset previously carried out by a switch is now done by part of the program. Connect PBO to PB7 on the 8255A to the corresponding indicator pins on the programmer as well as two power lines.

Preliminary Program
This preliminary program will decode Morse entered by the keyer and display this on the indicator diodes as octal numbers. When power is applied the program resets the speed controller to

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Table of Values

| IC19 | 74LS00 |
| IC20 | 74LS74 |
| IC21 | 74LS04 |
| SW5  | push-button changeover |

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Fig. 8 INTERRUPT CONTROLLER CIRCUIT
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The error symbol will produce 077, 177 or 377 depending whether 6, 7 or 8 dots are strung together — this will be explained later.

<table>
<thead>
<tr>
<th>Address</th>
<th>Data Mnemonic</th>
</tr>
</thead>
<tbody>
<tr>
<td>000 143</td>
<td>346 ANI</td>
</tr>
<tr>
<td>144 017</td>
<td></td>
</tr>
<tr>
<td>145 326</td>
<td>SUI</td>
</tr>
<tr>
<td>146 001</td>
<td></td>
</tr>
<tr>
<td>147 312</td>
<td>JZ</td>
</tr>
<tr>
<td>150 141</td>
<td></td>
</tr>
<tr>
<td>151 000</td>
<td></td>
</tr>
<tr>
<td>152 303</td>
<td>JMP</td>
</tr>
<tr>
<td>153 120</td>
<td></td>
</tr>
<tr>
<td>154 000</td>
<td></td>
</tr>
<tr>
<td>160 076</td>
<td>MVIA</td>
</tr>
<tr>
<td>161 005</td>
<td></td>
</tr>
<tr>
<td>162 270</td>
<td>CMPB</td>
</tr>
<tr>
<td>163 322</td>
<td>JNC</td>
</tr>
<tr>
<td>164 116</td>
<td></td>
</tr>
<tr>
<td>165 000</td>
<td></td>
</tr>
<tr>
<td>166 076</td>
<td>MVIA</td>
</tr>
<tr>
<td>167 020</td>
<td></td>
</tr>
<tr>
<td>168 016</td>
<td></td>
</tr>
<tr>
<td>169 012</td>
<td></td>
</tr>
<tr>
<td>170 270</td>
<td>CMPB</td>
</tr>
<tr>
<td>171 332</td>
<td>JC</td>
</tr>
<tr>
<td>172 235</td>
<td></td>
</tr>
<tr>
<td>173 000</td>
<td></td>
</tr>
<tr>
<td>174 024</td>
<td>INRD</td>
</tr>
<tr>
<td>175 076</td>
<td>MVIA</td>
</tr>
<tr>
<td>176 012</td>
<td></td>
</tr>
<tr>
<td>177 270</td>
<td>CMPB</td>
</tr>
</tbody>
</table>

its starting point and the meter will register about 1.54v., as described earlier. If a single dot or a series of dots is entered the meter will vary about its starting point depending on the length of the dot, the speed of sending or the value of CI1. Any or all of these must be altered to keep the meter roughly stable around its starting point; it will be noted that a dash has no effect on the meter. As each Morse character is entered the indicator diodes

<table>
<thead>
<tr>
<th>Morse holding codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 004</td>
</tr>
<tr>
<td>B 027</td>
</tr>
<tr>
<td>C 031</td>
</tr>
<tr>
<td>D 013</td>
</tr>
<tr>
<td>E 001</td>
</tr>
<tr>
<td>F 021</td>
</tr>
<tr>
<td>G 015</td>
</tr>
<tr>
<td>H 017</td>
</tr>
<tr>
<td>I 003</td>
</tr>
<tr>
<td>J 026</td>
</tr>
<tr>
<td>K 014</td>
</tr>
<tr>
<td>L 023</td>
</tr>
<tr>
<td>M 006</td>
</tr>
<tr>
<td>N 005</td>
</tr>
<tr>
<td>O 016</td>
</tr>
<tr>
<td>P 025</td>
</tr>
<tr>
<td>Q 034</td>
</tr>
<tr>
<td>R 011</td>
</tr>
<tr>
<td>S 007</td>
</tr>
<tr>
<td>T 002</td>
</tr>
<tr>
<td>U 010</td>
</tr>
<tr>
<td>V 020</td>
</tr>
<tr>
<td>W 012</td>
</tr>
<tr>
<td>X 030</td>
</tr>
<tr>
<td>Y 032</td>
</tr>
<tr>
<td>Z 033</td>
</tr>
</tbody>
</table>

March, 1983
octal numbers must be used and the memory must be divided into four sections. In octal these are:

**Addresses**

000 000 to 000 377  
001 000 to 001 377  
002 000 to 002 377  
003 000 to 003 377

When the programmer address indicator was described it was stated that it would count up to 777 and then return to zero. The effect of this is that it is necessary to go through the address indicator sequence twice to program the whole memory though this is not necessary in this design. The first time it counts to 777 corresponds to the two lines marked 'A' above and the second time it corresponds to 'B'. The effect is that:

**Addresses**

000 000 to 000 377  
001 000 to 001 377  
002 000 to 002 377  
003 000 to 003 377

From this it can be seen which numbers on the indicator correspond to the memory addresses. One thing easily forgotten as a result of this is that if an alteration is found necessary between 002 000 and 003 377 it is necessary to pulse all the way through the first cycle of the counter before 002 000 is reached (when it returns to 000). In this preliminary program only the addresses between 000 000 and 001 063 are used corresponding to counter numbers 000 to 463 (first sequence).

**The Program So Far**

*Note — all numbers from now on are listed in octal. After a number of preliminary instructions to set the various sections of the decoder to their required values, the processor reads port A and, if it finds a space, it continues to idle in a loop until a mark is detected at 000 104; should a mark be received it will jump straight to 000 127. Whatever happens it will eventually jump to 000 127 and continue to input port A counting each Morse clock pulse passed and storing this in one of the general purposes registers (register B) by looping between 000 120 and 000 154. When a space is detected at 000 124 the processor jumps to 000 160. Register B is now checked to see if the count is less than 005; if it is, it is rejected and the program returns to 000 116. Register B is cleared and a space or the next mark commences. If B is greater than 005 it is checked at 000 166 to see if it is 020. If it is 020 or more a dash is received and the program goes to 000 235 to store this in register E. If the count is more than 005 and less than 020 a dot is received and this is stored in register D at 000 174. B is then checked to see if it is 012; if it is, no speed adjustment is needed and the program goes to 000 257. Depending on whether B is less than or more than 012, the program between 000 203 and 000 234 either increases or decreases the speed of the Morse clock by pulsing PC0 or PC1. In any event, it finally jumps to 000 257 where clock pulses begin to be counted during the space, each pulse increments register C by one; this continues in the loop 000 250 to 000 320 until a mark is detected at 000 254. The program then jumps to 001 050 for rotation. B and C registers are cleared and the processor returns to 000 127 to start again. However should the count in C at any time exceed 017, detected at address 000 277, a character space has been detected and the character must be printed out. The jump to 000 330 initiates this print out. Addresses not shown in the program can be skipped by pressing the address switch. Some of these will be programmed in the second part of the program and one or two alterations to the preliminary program will be needed. The spaces have been left to avoid extensive reprogramming later.*

For those interested, an example of how the data in D and E is entered and rotated can be illustrated by taking the letter P. Rotation means moving all bits either one to the left or one to the right.

<table>
<thead>
<tr>
<th>Register D</th>
<th>Register E</th>
</tr>
</thead>
<tbody>
<tr>
<td>(dots)</td>
<td>(dashes)</td>
</tr>
<tr>
<td>First dot received</td>
<td>000000001</td>
</tr>
<tr>
<td>Rotate left at 001 051 and 001 054</td>
<td>00000010</td>
</tr>
<tr>
<td>First dash received</td>
<td>00000010</td>
</tr>
<tr>
<td>Rotate left again</td>
<td>00000100</td>
</tr>
<tr>
<td>Second dash received</td>
<td>00000100</td>
</tr>
<tr>
<td>Rotate left again</td>
<td>00000100</td>
</tr>
<tr>
<td>Second dot received</td>
<td>00000100</td>
</tr>
</tbody>
</table>

When the end of the letter is detected by a space register E only is rotated left at 000 331.

**Rotate E left**  
00001001  
00001010

**Add D to E at 000 332**  
00001001  
00001010  
(= 025)
and this is the display which will be seen when the circuit is connected together and this part of the program run and the letter P is received.

Author's note:
There is an error in Fig. 1 (p. 539, December 1982 issue): R2 should connect to pin 7 of IC2. When the writer programmed the memory the precaution was taken of entering 000 at all unused addresses. Recently some further tests have been carried out using the decoder and it has been discovered that the data at two of the addresses has changed.

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**"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** — I would like to reply to the letter from Susanne Tilley in the January issue.

For some years the build-up of illegal radio operation has continued apace, beginning in the days of "Radio Caroline" if not earlier. A check on frequencies such as 6.66 MHz, 26 MHz, plus sundry VHF areas, will reveal the current situation. Not that the aforementioned bands have much to do with amateur radio.

What does concern me is that illegal, so called "pirate", operation using modern readily available off-the-shelf equipment is described by Susanne as being conducted by "very good radio operators, serious and basically responsible citizens". It would seem that she has personal contact with these people — hardly an asset towards obtaining an amateur radio licence, in my opinion. Furthermore I fail to see how breaking the law can be described as an act of serious and responsible citizens.

Nothing is achieved in this world without effort: the amateur radio licence can be obtained by anyone who has the determination to study for it, Susanne says "I could pass a novice exam and Morse test tomorrow", so she really should not have much difficulty in gaining a Class-A licence. Failing this, there is always CB.

I hope my comments will not deter her from pursuing the hobby, and that her desire to become an amateur will be realised — preferably with a Class-A licence!

**Pat Painting, G3OUC**

**Dear Sir** — May I, as an old-timer of fifty (that seems a bit hard! — Ed.) and an advocate of QRP, endorse Mark McIntyre's, G13YDH, comments regarding contests in the January issue.

As a poor sleeper I am often in the shack from 0200 to 0500, Monday to Saturday, listening, and calling "CQ QRP" with five watts input, using both commercial and home-built equipment, on any band that appears to be open — usually only to be rewarded with a "no QSO" entry in the log.

Why not restrict contests to *weekdays* to keep the bands occupied, leaving the weekends clear for those who wish to *communicate*, whether QRO or QRP and regardless of equipment?

One further point: as I understand my licence conditions, the call "Test" should be made from time to time by stations monitoring their signals for harmonic radiation, RFI and TVI. So should we answer a station calling "CQ Test"?

**Ken Terry, G3GSY**

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**Editorial Note**

*May I, as an old-timer of fifty (that seems a bit hard! — Ed.) and G3ZQS (Feb.) on the subject of contests? It is absurd to suggest, as G3JDK (Feb.) does, that any one person can be interested in amateur radio "in all its aspects", but G4LDS (Feb.) hits the target when he reminds us that radio is all about communication. In contests, it is difficult to see what communication takes place. As someone who is, professionally "a person whose business is words", I enjoy doing crossword puzzles. This occupation is entirely pointless. But it does not interfere with the enjoyment of others, or involve me in loutish behaviour.

Contests are similarly pointless, but interfere greatly with the pleasure of others. For most of us, Saturdays and Sundays are the only times when daytime operation is possible. How one groans, on switching on and hearing that first idiot "CQ Test!" Another Lost Weekend...*

**Dear Sir** — May one add a word to the views of G13YDH (Jan.) and G3ZQS (Feb.) on the subject of contests? It is absurd to suggest, as G3JDK (Feb.) does, that any one person can be interested in amateur radio "in all its aspects", but G4LDS (Feb.) hits the target when he reminds us that radio is all about communication. In contests, it is difficult to see what communication takes place. As someone who is, professionally "a person whose business is words", I enjoy doing crossword puzzles. This occupation is entirely pointless. But it does not interfere with the enjoyment of others, or involve me in loutish behaviour.

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**Surely, G3ZQS's suggestion is sane and sensible. The objection might be raised that it would be difficult to get international agreement to band limitations, but this is not really necessary. If UK amateurs would agree to use only, say the lowest 25 kHz of each 'phone and CW band, amateurs in other countries would soon learn that it was unproductive to beam their California-kilowatts anywhere else, thus leaving the rest of each band free for normal users. Fair shares for all, in fact. It was interesting to hear other readers' views on this. Maybe some sort of poll could be conducted.**

Secondly, as a Class 1 services operator from 1941-44, may I underline G4LDS's remarks by suggesting that, in these days of highly-efficient black boxes and highly inefficient operators, one or two of the "academic" sections of the RAE might profitably be replaced by a section on simple on-air procedure? We might then be spared the antics of those who send 173 CQs followed by one callsign and KN, and wonder why they never get a reply!

But, Sir, what we really need are more chaps with the attitude of G6HCV (Jan.). Don't worry, Byron, it's not that hard. There's no maybe. You are hooked, and we need you!

**James Lockeyer, G4JQG**

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**Address you letters for this column to "A Word in Edgeways"**, SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ.
THE fascination with all things radio, first recollection of which goes back nearly thirty years (rushing home having seen someone transmitting from a car to see if he could be heard on the ‘steam’ radio), was finally kicked awake by a friend some two years ago who came visiting bearing a strange box with wires attached which he called a ‘CB rig’.

We’ll jump swiftly over that phase, sufficient to say that it did not take long for us both to realise — although we live a hundred miles apart — that the limitation of what the Home Office was then calling Open Channel radio was prohibitive to enjoying a pastime.

Ian found ‘It’ before I did. The next time he came south he brought another strange box with wires attached, this one he called a “Scanning receiver”. It picked up signals from “radio amateurs” operating, very often from cars and through things called repeaters, in something called the “two-metre band” (not a amateurs” operating, very often from cars and through things called repeaters, in something called the “two-metre band” (not a dance orchestra, I was told). I can, and I think always will, remember hearing those first QSO’s standing beside Ian’s car — these people sounded sensible beings (I was to learn different later) and I realised I, too, had found “It” — amateur radio.

Then he said casually that he was going to night school to study the course, another chap who had been studying on his own and for no good reason. So, armed with the books collected so far I went to the first session. He started with electrical theory — all Greek to me but I followed the first couple of sessions. Then he started to accelerate and I started to flounder. Do you know, I spent nearly every night sitting up in bed pouring over that lot.

Then came the final straw; one of my customers who had a couple of other strangers there that night (who have never been gentlemen discussing Mr. Mullard, one who had worked for him and the other who had written a book about the company; my local friend Ernie on the ground wave working a VK on phone (unusual for him) but no VK heard my end, then a PA0 working two Vks — and I could hear them, just.

Meanwhile time ticked on and September arrived, time to enlist, no, I mean enroll at one of the colleges for evening classes to study for the Radio Amateurs’ Examination.

I chose the college on the basis that another SWL from the club had elected to go there, enrolled, and then found he could not commit himself due to transfer of his job back to Devon; typical — I’m going to a college further away from home than necessary and for no good reason. So, armed with the books collected so far off I went to the first session. He started with electrical theory — all Greek to me but I followed the first couple of sessions. Then he started to accelerate and I started to flounder. Do you know, I spent nearly every night sitting up in bed pouring over that lot.

The wife — sorry XYL — put up with it magnificently considering my eight-year-old was as keen as I. We went through the lot very briefly, then started in earnest. Now after a day’s work, rushing home for a meal and then rushing out to college you suddenly stop . . . and sit and listen to someone else doing the talking. I don’t think I actually snored, but I nearly fell off the chair on more than one Thursday evening.

Next to think about that exam. I had not done any of this studying or taken an exam for over twenty years. Now, of course there was this thing called multiple choice, so my reasoning went like this: The first component (paper to the uninitiated) was a cause of learning facts parrot-fashion and I’m not a bad impression of a parrot at times, so I should be able to cram for that. I would take the exam in December (you mad fool), hopefully pass the first paper, get it out of the way and get back into the routine of taking exams. Right then, apply for the December exam and pay your money, chum — and how many of you students wish to register for the December exam? Two — only two and the other guy a television engineer. Oh well, anything for a laugh.

I had a traumatic couple of weeks before the exam. Not only were there all the usual pressures that build up before Christmas but we had decided to move house as well. I spent as much time as possible with my nose in the books and keeping on doing the sample papers in the back of the Manual until I could get quite a few right, presumably because I remembered the answer from last time.

The fateful day arrived — cancelling my usual business trip in the evening I arrived at the college a good half-hour before time with copious amounts of pencils, pens and rubbers. Oh yes, and a couple of good luck charms the XYL (I’m learning) pressed into my hand before leaving home. The silly girl said they’d brought her luck when she’d taken exams — her with her ten ‘0’ levels, I ask you. We assembled early in the room with “Silence — examination in progress” on the door. There was my colleague from the course, another chap who had been studying on his own and me. Lecture on what to do and what not to do and you can leave the room when you have finished. So away we went — read it all through first — crumbs, I’m supposed to be able to pass this one. So now to start filling in the little boxes and I’d finished in about half the time. They said check through when you’ve done but don’t alter any answers you’re not sure of. I’m sure that answer is ‘b’ and not ‘c’ — so I’ll alter it. The stranger handed in his paper and left so I think I will too.

Outside, comparing notes before Paper Two I found the answers I’d altered was right first time; now of course, it was answered wrongly.

Back we go for Paper Two. This time we’re joined by two more candidates who had already passed Paper One at an earlier attempt. Here comes the papers, read it all through first; my heart sank deeper and deeper as I read on. I didn’t even understand some of the questions let alone answer them. At least four were on
key click filters which we’d been all through at the club a couple of weeks before, I should get those right. OK, do the ones you are certain of first (that won’t take long!), then the ones you need to work at, then the others and finally the guesswork. I’d finished and all the rest were hard at work — good sign or bad? Bad I fear. Check through once again and don’t alter any this time, dummy. All done and still nobody stirred — OK then, up you get and hand it in. I looked back as I left the room and they were all hard at it.

I drove home feeling drained, perhaps I hadn’t got into it yet, I’d forgotten what a strain exams are.

Now for the wait — the dye was cast and I’d passed or failed, failed or passed but I won’t know for nearly two months. They’ll get on with it, I thought, not many candidates on a December exam, the results will be early. Anyway Christmas was upon us and we’d moved temporarily to a house in a hole in the ground, no VHF signals there, even the police couldn’t use their stuff outside that house! The HF receiver was in store so we gave it all a rest.

I suppose I started looking for the post soon after the new year, the experts said the end of January but I’m an optimist you see. (As some of you will remember it did go on a bit!) January went and then February nearly went. I must have got on the college’s nerves ringing up to ask where the results were. I don’t know why I did because I had decided quite definitely that although I might have passed the first bit I’d failed the second.

When the envelope eventually arrived and I’d opened it, I didn’t understand what it meant. Paper One was marked ‘C’ and Paper Two ‘P’ — could this mean ‘credit’ and ‘pass’? Immediately I rang the college (and yes, they said it means Credit and Pass! Well, how about that then; who’s a genius? It don’t half boost your self esteem! The XYL (you see, I do learn) was almost as pleased as I — thinking I wouldn’t be studying in bed anymore, I suppose.

Now what about this application for the licence? Where’s the pass slip? Ring the college again; sorry, they’re delayed, they said. I wasn’t waiting any longer, it’s all a conspiracy I’d decided; delay the results, don’t issue the paperwork, just keep him off the air. So I’ll ring the college — please could you issue me with a note on your headed notepaper and signed by someone in authority to say ‘I’ve passed’? Oh! yes, said the voice. Can I collect it after work tonight? Oh! no, said the voice, we close the office before you could get here. I must have sounded desperate. What a kind lady, she suggested she took the paper home with her and then I could pick it up from there. Armed with all the other bumph and a stamped (First Class) addressed envelope off I went and collected the magic document from my new friend with grateful thanks. I stamped (First Class) addressed envelope off and went and collected it. Armed with all the other bumph and a stamp and pass slip and away in the car to the post office. Then to wait again. (They’ll get that tomorrow or even the next day, one day to process, one day to come back, I should have it within a week.) Time went by, now my birthday was looming. I know, it’ll arrive on my birthday. By this time all concerned were getting fed up and leading the the fed-ups was . . . guess who? The RSGB news service was referring to the delay but when I rang them they said sorting out the schedule was far more important as my licence would eventually come but the schedule had to be sorted out for good. Fair comment, I suppose but that was no help to me. So I thought . . . that’s it — the lot of them; I won’t have anything to do with this amateur radio lark until the licence arrives, if it arrives.

I tried hard to practice that, but would occasionally get drawn to a magazine or to the rig I’d been out and bought in the first flush of success.

About this time a builder friend was doing a few jobs on the new QTH (house, you ignorant lot). Being interested in what was going on, or not going on which ever way you look at it, the penny dropped when, working alone at the QTH (yes, house) he was asked to sign for an O.H.M.S. recorded delivery package. He ‘phoned work and suddenly all was pandemonium, I wasn’t waiting till knocking off time. A friend who had dropped in offered to go and collect the package . . . ‘go into the hall and you’ll see a box with wires attached, please will you bring that as well’”. She returned with the package and the box . . . yes, it was the much coveted, long awaited amateur transmitting licence.

Out into the yard I went . . . “CQ CQ CQ this is Golf Six Hotel Hotel India calling CQ” and there was a station answering . . . we had arrived.

Still I couldn’t spend long, for Joan (the friend who’d fetched the bump and rig) had managed to lock herself out of her car in the excitement and I had to go and prise out her back window to get the car open. Complicated business this amateur radio.

That evening I set it all up on the sitting room floor, then followed one of the most enjoyable hours ever spent; I couldn’t get away from the rig. I had a QSO with a friend from the club, then when we’d finished other stations kept calling me to congratulate me on the call-sign, it really was magic and all the frustrations melted away. It seems it wasn’t a conspiracy after all.

You know, the amateur fraternity is, by and large, unique: such a friendly lot who are so keen to welcome newcomers to the hobby. Long may it remain so.

Now I’m intending to start on CW, I’ll let you know how it goes.
Six Metres at Last

February 1, 1983 was an historic date in the British VHF calendar, which saw our once again getting an amateur band in the 50 MHz region. Following protracted negotiations between the RSGB and the Home Office, permits have been issued to 40 Class A licenses to operate between 50 and 52 MHz outside B.B.C. Band 1 television broadcasting hours. The power levels and emission modes are as those for the 4m. band. This was officially broadcast over GB2RS on Feb. 6. The 40 licenses are:- G2AOK, G3COJ, G3LTF, G3NOX, G3OHH, G3PWK, G3TCU, G3J5F, G3WZJ, G3ZIG, G4BAO, G4BPY, G4CUT, G4GLT, G4HUP, G4JE, G4JLH, G5KW and G6XM. The three in Ulster are:- G13RXV, G13ZSC and G14MJD, and from Jersey:— G13RAX, G13JYHU and G14ICD. The Ten from Scotland are:- GM3DOD, GM3OBC, GM3WCS, GM3WOJ, GM3ZBE, GM4DIJ, GM4ELV, GM4FDT, GM4FZH and GM4HJH, while Wales is represented by:- GW3LHD, GW4BCD, GW4HKB, GW4JXO and GW4IIL. Any Class A licensee may work the above crossband, but not Class B folk.

Broadcasting hours include trade test transmissions and engineering transmissions, as well as the normal public entertainment service. If in doubt, the local TV station manager will furnish a schedule since not all Band 1 stations come on and close down at the same time. All Band 1 TV transmissions have to vacate the band by the end of 1986. However, the remaining 50 MHz, simply QSY to apparently vacant frequencies. FM-ers, hearing nothing just below 145.00 MHz, certainly need weak signals.

More reports are awaited with interest. G4JUE has been “promoting” 6m. on the European VHF Net on 20m. and the interest is such that Paul is building a few converters to be sent to keen types for crossband operation 6/2m. It is planned for these converters to be circulated within groups and likely duplicated.

Awards News

Two more readers have joined the 2m. QTH Squares Century Club. Certificate No. 22 dated January 14, went to Erik Cechota, OE3CEW, (1152f) from Scheiblingstein in Austria, for exactly 100 squares confirmed out of 132 worked at Jan. 3. CW accounted for 16 QSOs, the remaining wave being on SSB. Five contacts were via Ar, two via E’s, by MS and the rest were tropo. Unfortunately, Erik did not forward any station or personal details.

QTHCC Certificate No. 23 was issued to Angelo D’Elia, 16DQE, (GD48d) from Recanati, Italy on Jan. 24. His total is 103 confirmed, made up of 37 CW, and 66 SSB contacts. 65 QSOs were via tropo., 32 by MS and six via E’s, these latter including ODSMR (RT) on June 12, 1981, and JY9CF (RR), ZC4AG (QU) and 4X4IX (RS) on Aug. 4 last year. John Hunter, G3IMV, who has QTHCC Certificate No. 3, has got his “300” sticker, the first reader to achieve this total. He now has 302 confirmed out of 324 worked.

Keith Hewitt, G6DER, from Barnsley, is the 354th member of the 2m. VHF Century Club, his certificate being issued on Jan. 19. Licensed in Aug. 1981, he operates from the living room with an Icom IC-290E and Microwave Modules MM144/100S amplifier. The aerial is a 14-ele. Cushcraft Yagi. A bigger amplifier is being contemplated so that some serious MS work can be done.

Beacon Notes

The recent tropo. lifts brought reports of distant beacon reception from several readers. G3COJ found FX6VHF on 144.145 MHz. This would be somewhere between the RSGB and the Home Office, following protracted negotiations which saw our once again getting an amateur band in the 50 MHz region. A reference orbit for Feb. 6 was no. 7391, EQX 12h.33m.16s. at 321.1°W and the period in minutes:— 95.16695 minus 5.48025 x 10^-5. The track separation is:— 23.791985 minus 1.378845 x 10^-5, where N is the orbit number.

Adioman Chamberlain, G4ROA, (Coventry) is now getting hard copy from UOSAT via his MM-2001 converter and Epson 80MX 3 printer. At 1,200 baud, it is too fast to read from the VDU. Russell Coward, G6HR1, (Blackpool) operates, on average, 4-6 QSOs per day via O3J and the RS transponders. Up to Jan. 23, he lists 64 QSOs with 14 countries this year with assorted European and North American stations. Russell uses a Yaesu FT-290R with amplifier to give 100w. e.r.p., the aerial being a 10-ele. Parasbeam with a fixed 15° elevation for transmission.
The Rx side comprises a Yaesu FT-901DE with MM 10m. preamp. with a Delta loop or crossed dipoles aerial system. For Mode I, he has an MM transverter and 48-ele. Multibeam, again at 15° elevation. He often uses the FT-290R "barefoot" illustrating the benefits of a good receiving system. (Too many satellite ops. have big mouths and small ears! Ed.)

Contests

Results:— Winners of the 1982, 432 MHz Cumulatives were the Five Bells Contest Group, G8ZHP, with 1,410 pts. Chris Easton, G8FTI, was runner-up with 1,357 pts. John Brakespear, G8RZP, came 3rd with 1,298 pts. out of 25 entries. The 1,296 MHz Cumulatives winners were the Hillbillies Contest Group, G4HWA/P, with 499 pts., with G4FRE/A, the Ipswich Microwave Activity Group, in second place with 409 pts. There were 11 entries. Coming Events:— Mar. 5/6 weekend sees the 144/432 MHz affair, 1400-1400 GMT. The first event is on Mar. 13, 1000-1200, while the 22nd yielded F6HLD/P (CG55a) and F6DZK (AI20d). Dave Sellars, G3PBV, (Devon) heard F1BUU on the 11th and worked F1FH1 on the 23rd along with G4CW8 in Stockport. In the later evening, beacons ON5SHF and GB3NWK were heard.

John Tye, G4BYV, (Norfolk) asks to be taken out of the Squares table so that younger readers can be included. He also worked F1BUU on the 11th, as did Adrian Chamberlain, G4ROA, in Coventry, who added HB9AHM/P (DH) and G3GIM (ZL) on the 22nd. Adrian uses one watt but should have a couple of D-15 aerials aloft by now. Ray Cox, G8FMK, (Oxon.) added quite a few U.K. counties for the 1983 Table, mostly eastwards including GW3CCF (Chwyd) for the first outside England QSO. At 2310 on the 23rd, he made his first QSO with France, thanks to F6DZK.

Gordon Emmerson, G8PNN, (Northumberland) is now up to 30 sq. on 23cm. On Jan. 23, he worked some Gs and DB6BU, HB9M1N/P (DH) and OZ2CAL (GH) at 1,313 kms., the best DX to date. Richard Hope, GW8TVX, (W. Glam.) uses 1.3w. to four 23-ele. Tonna Yagis on 23cm. and worked F1BUU and F1FH1 on the 23rd.

VHF Convention

March 26 from 1030 a.m. at Sandown Park Racecourse in the day for the 1983 RSGB VHF Convention, details of which were given on p. 638 last month. Concerning the Equipment Test Facility, this is down to Don Hamilton, G8DON, whom your scribe telephoned on Feb. 6 for details. There will be some Hewlett Packard test gear including noise figure measuring and transceiver testing gear, so take along your super preamps., converters, etc., and learn how rotten some of them are!

January Round-up

1983 got off to a flying start with some excellent tropo. and several Auroras, not forgetting the Quadrantids meteor shower. The period Jan. 21-24 brought a fine lift which started off with Spanish stations, ending up with Scandinavians as a big anti-cyclone in mid-Atlantic wandered majestically westwards and northwards. Consequently, the mail bag is swollen this time so let us begin with the microwave bands.

Gigahertz Bands

Brian Bower, G3COJ, (Bucks.) remarks on the number of French stations QRV on 23cm. now. He worked F1BUU (ZEO8e) on Jan. 11 and later met Jean when he was in England on business. F1BUU has a 30w. solid-state, masthead-mounted 23cm. amplifier and worked up to ZN and ZO in the lift. On the 21st, Brian contacted F1FH1 (Z1H63d) who runs 100w. on the band, while the 22nd yielded F6HLD/P (CG55a) and F6DZK (AI20d). Dave Sellars, G3PBV, (Devon) heard F1BUU on the 11th and worked F1FH1 on the 23rd along with G4CW8 in Stockport. In the later evening, beacons ON5SHF and GB3NWK were heard.

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Chris Bartram, G4DGU, was out—/P in Cornwall on Jan. 21 with half-a-watt and a single Tonna beam from near Boscastle. They included G3COJ, G4KDH, G4K4Y, G6AVK, G8FMK, G8ZXG and ON1JE (BL80). Writing from Saudi Arabia, Derek Brown, G8ECl, says he hopes to be home in Lincolnshire from Apr. 7 to 26, Aug. 10 to Sept. 5 and Dec. 14 to Jan. 3. One aim is to build a 2C39A amplifier for 23cm. to put AN square on the map again.

Seventy Centimetres

This should have been included in the Beacon Notes; the Emley Moor beacon, G3B3M, should have changed its callsign to G3M3LY on Feb. 5, according to G3COJ. John Hunter, G3JMV, (Bucks.)
is zooming up the squares table and now has 58 to his credit. He was impressed with the performance of his Trio TS-780 in the recent lift without benefit of a pre-amplifier, and is thinking about improving the aerial system.

G3PBV reports strong Syledis QRM from Jan. 4 but did work F1BUU (ZE) and F6BZA (AG) on the 11th. The 17th brought F1FVP (ZF). The period 22/23 produced a crop of DX stations, the best being HB9AEN/P, DK2GR (FJ), OE3LFA (JI). Dave called LA2SN (ES) for half an hour from 2100 on the 23rd, but could not get through "...400 kms. of G stations". As compensation, he did get LA8AK (DS) to give Jan-Martin his first YK QSO. On Jan. 11, G4BYV heard EA2CA (YD66c) working Gs.

Nick Peckett, G4KUX, (Co. Durham) worked some OEs in the Jan. 22/23 affair but, although he copied OK0EA (HK), no OK stations were worked. German and Swiss stations were very strong. There is no doubt that the midlands and northern stations had much the best of the Jan. 22/24 lift and Jon Stow, G4MCU, (Essex) says he did not hear any of the really good DX to the south and south-east. It certainly seems that the London area was rather a dead spot much of the time. Jon's best DX on the 22nd were DF7VX (EL) on SSB/CW and DK2GR (FJ) on SSB. LA2SN was a good signal but the wall of PAs prevented a QSO.

Tony Collett, G4NBS, (Berk.s) spent nearly all his operating time on this band and, although EA2CA (YD) was not completely worked, he did get a string of distant Fs on the 11th. Some GDX was also worked on the 11th and 12th. Between 1800 on the 22nd and 2400 on the 24th, Tony filled up three log pages contacting 20 Ds, 6 Fs, 3 HbS, 2 OEs, 2 Las, PAs, GU, GW, Y and assorted Gs. He was particularly pleased when DL7YC in Berlin answered a CW CQ call. This weekend produced 33 squares, including 12 new ones in six hours on the 22nd, but patience was needed for signals to come up to a workable level at times.

G4ROA in Coventry comments upon the very strong signals over the same weekend. Adrian has added another nine squares and remarks, "As usual, the band was very sedate with very little pile-ups". His best DX were HB9AEN/P, DGI1NZ (FG) and DK5AI (FL). Derek Newton-Goverd, G6HKT, is a new contributor for Priddy in Somerset. On Jan. 11, he worked F1BUU, F1FVP (ZF80j) and F6BZA (AG) on the 22/24 lift and Jon Stow, G4MCU, (Essex) says he did not hear any of the really good DX to the south and south-east. It certainly seems that the London area was rather a dead spot much of the time. Jon's best DX on the 22nd were DF7VX (EL) on SSB/CW and DK2GR (FJ) on SSB. LA2SN was a good signal but the wall of PAs prevented a QSO.

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had a ball on the band from Northumberland picking up 13 new squares on Jan. 23. Choice QSOs include O2ECAL, DF3CK (FH), HB9MIN/P, LA8AK and FIAGO (AG). Arthur Breese, GD2HDZ, got over to F, ON and PE on the 23rd and heard HB9AEN/P and the same day, Geoff Brown, GJ4ICD, found square no. 103, LA2SN in ES.

Now here's a thing! G4DCU had his 70cm E-M-E array vandalised over the weekend Jan. 29/30, by someone who knew what they wanted. The power combiner and cables were stolen. Chris suggests potential E-M-E types consider a 16ft. stressed dish instead of multiple Yagis. It can be parked on the ground when not in use. He has had good results via the Moon last November working 2Z5JJ, YUI1AW, JA66CDZ, ISM5F, N9AB, F9FT, K3NSS, UA3LBO, SM3AKW, JA4BLCL, OK1KIR and HB9SV, with VK5MC and VK6ZT heard. YU1AW was also worked on SSB at RS53 each way. All the above using eight Tonna Yagis.

Alex Scott, GM8BDX, (Borders) now has 300w. on the band to a 21-ele. Yagi at 35ft. and can now work G3NNG (Berks.) on a flat band. His best DX in the lift was OE3LFA, with DL7QY (FJ) and DL9MCC/P (GH) also worked. Walt Davidson, GW3NYY, (Swansea) confesses to playing with computers but offers RTTY QSOs for those needing XL square by that mode. On Jan. 23, he worked a number of Fs including FIETX (AF) and FIAGO (AG) for two new squares.

**Two Metres**

First the MS notes. Paul Turner, G4JIE, one of the keenest U.K. MS experts, has taken a successful QRP test with DJ5MJ (GI) on Jan. 30 when both stations were running 15w. Paul got 13 bursts and 5 pings from Peter, who received 6B, 5P from Paul, the test being completed in an hour. George Gullis, G4PCI, (Wilt.) has three skeds in the *Quadrants*, but none came off. He asks if the random SSB reference frequency of 144.40 MHz has replaced or augmented the earlier 144.200 MHz. The "200" QRG does not feature in the 2m. Band Plan published in the Jan. 1982 RadCom, only does not feature in the 2m. Band Plan published in the Jan. 1982 RadCom, only. "200" was to get away from tropo. QRM. The "200" QRG was found on 144.955 MHz. G4IGO notes QSOs with AE1ANC and EA1TA (VD) and F6FOB (AD) in this period, while G4IOV worked to AE, ZE and ZF squares and G8KAX worked down to AD and ZE, plus EA2L.P the same day. On the 12th, John worked down to AE, ZE and ZH.

Jim Rabbitts, G8LBF, (London) did much the same on the 11th, but also managed HB9RDB (DH) and HB9ASB (DG) on the 12th. G8TMG also worked to southern France and into EA on the 11/12th period.

The next tropo. opening occurred on Jan. 16/17. G3CHN worked EB1VV (XD) and EA1CR on the 17th and the latter told Roger he had worked into Norway the previous day. G3PBV found F8SV8HF in AF79h on the 17th. Dave did not mention the QRG which should be 144.955 MHz. G4GO notes QSOs with EA1NC and EA1TA (VD) and F6FOB (AD) in this period, while G4IOV worked to AE, ZE and ZH. Roger Breese, GD2HDZ, got over to F, ON and PE on the 23rd and found square no. 103, LA2SN in ES. This event fizzled out during the morning of the 24th.

David Whitaker, (N. Yorks.) sets the scene: he heard 16 countries and 70 squares. His best DX were OEs in GH, HI and II, and OKs in HJ, HK and II. After reading the GB2RS News Bulletin on the 23rd, G3CHN was called by OZ24LV, a novel experience, after which Roger worked LA, OZ and D folk in CS, EQ, EO and FO squares. In the evening, three SMs in FR provided the only new square. He reports that F6HRP worked to CU square from Normandy but that Alain was not too pleased when persistently called by G6s, in particular when he was calling for DX.

G3PBV worked OK1F1H (GI) on the 22nd and a couple of Ds in GI. Dave also heard 4U11TU very weakly when operator Geoff Grayer (G3NAQ) was working 9K8CK but did get LA7CRU (CS) at 1630 before the "wolf pack" descended. He wishes DX stations would be more selective and call for specific squares. Mark Turner, G4PC5, operated G3UNU in this lift and found DG and FH for new squares. He had QSOs with stations in D, H, HB, LA, L1, OE, OK, ON, OZ, PA and Y, and worked 4U11TU twice. He found beam headings quite broad. Clive Penna, G3POI, (Kent) says his best DX on the 23rd was OK3CK/P in J1. Tim Raven's, G4ARI, (Leics.) list shows QSOs with D, GI, GM, GW, GU, EA, HB, ON and PA stations as well as a lot of GDX, which was overlooked by most operators anxious to get some EDX.

G4GO wrote, "What an opening: all of Europe working all of Europe for most of the time". Ken then goes on to list some very choice DX. CW contacts took place with:— DF1CF (FH), DF3FRU (FJ), HB9AOF(DG), Y24XN(GK), DL8MAS

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**ALL-TIME TABLE**

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Based on administrative counties.
(Gi), DL4RBK (FJ), OK1ATQ (HK), OK1FAV (GK), OK2LG (II), OK1FM (GJ), OZIYEE (FQ), and LA4IJA (CS). On SSb, he offers:- HB9RCJ (DH), DL3MBG (GI), HB9QQ (EH), OE3CEW (II), SM7MRJ (GP), Y23BD (GM), Y22QG (FM) was a mixed mode list of the better QS05 breaks down to 14 squares in the period but could not hear any of the Scandinavians that other near neighbours were working on the 23rd. Just as this was being edited, there were Auras on Feb. 4, 5 and 6, rather noisily affairs, with lots of GMs, GIs, a few Els, Scandinavians and some UQ2s, etc. Ken Willis, G8VR, (Kent) reckons he heard OYSNS (WW) around midnight on the 4th. More next time.

Four Metres

Only a few reports, the first from G4ARI who added some counties in the first leg of the Cumulatives on Jan. 30. On Jan. 14, G4IJE (AL) had a very successful MS QSO with GM3WCS (YQ) getting 25B and 39P from Ken, who received 35B and 15P from Paul, the longest bursts being 7 secs. In the Feb. 4 Ar, Paul worked E12CA (WM) and the next day, E16AS (WN). All the 4m. beams were Ar with E14RF and GB3CTC quite loud.

G4NBS borrowed a transverter and stuck a dipole in the loft to take part in the contest on Jan. 16. Tony had 17 QSOs and is now making a transverter of his own. GD2HDZ tuned the band on Jan. 21 at the start of the tropo. lift to find it full of broadcast FM stations via E’s at 1800. Dave Crisp, G4OAE, reported strong E’s at 1200kms. and the one Y heard, but did contact a MS QSO with GM3WCS (YQ) getting 25B and 39P from Ken, who received 35B and 15P from Paul, the longest bursts being 7 secs. In the Feb. 4 Ar, Paul worked E12CA (WM) and the next day, E16AS (WN). All the 4m. beams were Ar with E14RF and GB3CTC quite loud.

G4K8Q worked 32 squares over the three days and singles out the best DX as OK2KZ/P (UJ), OK2LG (II), OK1DKX (H1), OK1OA, OK1HAG (H1), Y30BNE/P (HM) and LA6HL (CS). G8LFB’s list includes 7 Swiss stations on the 22nd, plus OE5FPL (GI) and OE3CEF (I). G8TGM reports DX hard to find from Bogner Regis. Kevin heard a station in Southampton working OE, OK, LA and Y stations which were audiable with him. Even so, he goes on to list assorted D, F and HB QSOs on the 22nd, plus Y23FG (FM), Y24XN, OE3CEW and then at 0145 on the 23rd, the best tropo. DX so far, G8CQX did not spend much time on 2m., but in the wee small hours of the 23rd, managed Y24XN (GK), OK1OA (HK), OE3LFA (II) and F6EQZ (CJ).

Final Miscellany

G4DFH is planning a DX-pedition to YS, XS and YT squares at the beginning of August. Doug Parker, G4DZU, is handling the Lunar Letter for E-M-E types and will send details for an s.a.e. His address: 14 Moorside Crescent, Drighlington, Bradford, BD11 1HS.

Deadlines

All your letters and claims for next month by March 2, please, and for May, by Apr. 6 to: “VHF Bands”, SHORT WAVE MAGAZINE, 34 High Street, WELWYN, Herts., AL6 9EQ. 75 de G3FPK.
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