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

24 HOUR MAIL ORDER SERVICE



The TS930S latest transceiver from Trio Price: **£1195.00 inc. VAT.**



TRIO TS430's
£779.00



TW4000A
£488.00



TRIO R600 RECEIVER
£272.00



TRIO R2000 RECEIVER
£436.00
VHF CONVERTER. £117.00
Covers 118-174MHz



TRIO TS830S
HF SSB TRANSCEIVER
£758.00

As the North West's only official Trio stockist we carry the full Trio range of equipment and accessories. Full service facilities. Send s.a.e. for up-to-date information.



We are proud to introduce the VHF/UHF communications receiver we have all been waiting for. A glance at the brief specification will tell you why the new AR2001 receiver is going to take the listener by storm.

- ★ Continuous coverage 25-550MHz (no gaps)
 - ★ Receive modes of AM (for VHF/UHF airband), FM narrow, (for amateur radio, CB, business radio) and FM wide (for broadcast and TV FM)
 - ★ Digital display of frequency, mode and memory channel.
 - ★ Memory channels which store frequency and mode.
 - ★ Full range of scan facilities.
- The performance of the AR2001 sets new standards. Gone are the complaints of "dead" receivers. The AR2001 has typical sensitivity of 0.2 microvolts for 12dB SINAD on FM (N) across the entire 25-550MHz range.
- Finally, the AR2001 is small, light weight, and powered from any 12V dc source, so it can be used at home, in the car, boat or aircraft, and whilst out portable.

Now comes complete with 12V PSU. **£345.00**



J.R.C. NRD515D

General coverage receiver 100 KHz to 30 MHz fully synthesised. Digital readout PLL synthesiser with rotary type encoder pass band tuning - modular construction. **£965.00**

N5D515 TRANSMITTER & AC PSU **£1,371.00**
NEW 96 CHANNEL MEMORY UNIT
J.R.C. JST 100HF TRANSCEIVER + Ac PSU **£998.00**

DATONG PRODUCTS

PCI General Coverage Converter	£137.42
Low Frequency Converter	£29.90
FL1 Frequency Audio Filter	£79.35
FL2 Multi-Mode Audio Filter	£89.70
Automatic FR Speech Clipper	£82.80
RF Speech Clipper P.C. Board only	£29.90
D70 Morse Tutor	£56.35
AD370 Active Antenna (outdoor)	£64.40
AD270 Active Antenna (indoor)	£47.15
2M Converter	£39.67
Keyboard Morse Sender	£137.42

ANTENNA ROTATORS

Diawa DR7500X	£142.98
DR7500R	£153.67
DR7600X	£189.37
DR7600R	£213.41

KENPRO

KR400C	£118.45
KR600RC	£167.90
KR500 Elevation Rotator	£115.00

Station Accessories

Weiz SP200PWR SWR Meter	£82.00
SP300	£115.00
SP400	£82.00
SP10X	£28.75
SP15M	£41.00
SP45M	£59.75
Wetz AC38 Antenna Tuner	£73.95
Global SWL AT1000 Tuner	£39.95
SWR25	£12.75
HK 708 Morse Keys	£13.50
Diawa 2 way Ant Switch	£13.95
SWL 2 way Ant Switch	£4.75
V22 way Ant Switch	£6.00
V33 way Ant Switch	£10.50
V44 way Ant Switch	£11.50
DL50 500hm 50 watt D. Load	£6.50
DL300 500hm 300 watt D. Load	£27.60
DL600 500hm 600 watt D. Load	£38.50
KX3 SWL Antenna Tuner	£42.50
TV3300 low pass filter	£27.60
HP41 high pass filter	£4.95

BELCOM

L5-202E 2m hand held DM-SSB transceiver. **£225.00** plus accessories.

Belcom LS20E 2M FM hand held transceiver **£139.00**

G-Whip Mobile Antennas.

Microwave Modules, FDK, and other equipment also available, including I.C.S. - Diawa.

ANTENNAS

Hy-Gain	
12AVO 3Band Vertical	£52.90
14AVQ/WB 4Band Vertical	£66.70
18AVT/WB 5Band Vertical	£113.85
TH2MK3 2El. Tribander Beam	£169.05
TH3MK3 3El. Tribander Beam	£274.85
TH3JNR 3El. Tribander Beam	£202.40
TH6DXX Tribander Beam	£396.75
205BA 5Element 20m Beam	£396.00
Explorer 14. Tribander	£325.00

Mini Products

HQ1 Minibeam 10-15-20m	£169.00
------------------------	---------

T.E.T.

HB23SP 2EL Tribander	£172.50
HB23M Triband Minibeam	£169.50
HB33M Triband Minibeam	£230.00
HB33SP 3EL Tribander	£231.50
HB34D 4EL Tribander	£222.90
HB35C 5EL Tribander	£283.95
HB35T 5EL Tribander	£278.50
MV3BH 3Band Vertical	£45.95
MV4BH 4Band Vertical	£59.95
MV5BH 5Band Vertical	£99.00
TE214 14Element 2m Beam	£74.40
MV3BH with Radial Kit	£69.00

G4MH

10-15-20m Minibeam	£88.00
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TONNA

4Element 2m Yagi	£14.95
9Element 2m Yagi	£17.71
17Element 2m Yagi	£37.66
19Element 432MHz Yagi	£20.70
21Element 432MHz Yagi	£29.67

Weiz Diamond Antennas

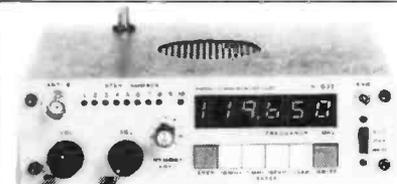
DP CP5 Vertical	£133.00
KB105 Vertical	£99.00
DP CP4 Vertical	£99.00

Hokasin

1/4 wave 2m Whip mobile	£2.00
5/8 wave 2m Whip mobile	£10.56
7/8 wave 2m Whip mobile	£16.00
5/8 wave Base Station antenna	£16.50
GPV-52m Base Station Co-Linear	£38.50
GPV-770cm Base Station Co-Linear	£31.60
GPV 720 144/432MHz dual base station	£33.90
Revcone. Discone.	£25.00

JAYBEAM

LW5 5El 2m Yagi	£14.37
LW8 8El 2m Yagi	£17.82
LW10 10El 2m Yagi	£24.15
LW16 16El 2m Yagi	£35.08
PBM10 10El Parabeam	£44.85
PBM14 14El Parabeam	£55.78
C5 2m 2m Co-Linear	£54.63
D5 2m Double 5Element Slot Yagi	£25.30
D8 2m Double 8Element Slot Yagi	£34.50
Q4 2m 4Element 2m Quad	£29.33
Q6 2m 6Element 2m Quad	£39.10
Q8 2m 8Element 2m Quad	£44.85
C8 70cm 432MHz Co-Linear	£62.00
D8 70cm Double 8Slot Yagi	£25.88
PBM 18 70cm 18El Parabeam	£32.20
PBM 24 70cm 24El Parabeam	£42.55
LW24 24El folded dipole	£27.00
MBM28 28El multibeam	£21.28
MBM48 48El multibeam	£35.65
MBM88 88El multibeam	£48.88
8XY 70C Crossed 8Yagi	£42.55
12XY 70 12El Crossed Yagi	£52.90
5XY 2m Crossed 8El Yagi	£28.18
8XY 2m Crossed 8El Yagi	£35.65
10XY 2m Crossed 10El Yagi	£46.00



THE R532
AIRCRAFT BAND RECEIVER
£175.00 inc. VAT

SPECIFICATION.

Frequency range: 110 to 136MHz, i.e. all NAV/COM channels.
Number of channels: 1040 (25kHz steps).
Sensitivity: Better than 0.75 microvolts 10dB / SN.
Memory channels: 100 (10 banks of 10). Memories can be scanned automatically or selected manually.
Power required: 12V dc negative earth 300mA typical (Display can be switched off to reduce consumption when operating portable). Size: 160 x 45 x 130mm.
Weight: approx. 1Kg. (including memory backup batteries)

SHORT WAVE MAGAZINE

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(GB3SWM)

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Advertising: Charles Forsyth

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AUTHOR'S MSS

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

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LOWE SHOPS

Whenever you enter a LOWE ELECTRONICS' shop, be it Glasgow, Darlington, Cambridge, London or here at Matlock, then you can be certain that along with a courteous welcome you will receive straightforward advice. Advice given not with the intention of "making" a sale but the sort which is given freely by one radio amateur to another. Of course, if you decide to purchase then you have the knowledge that LOWE ELECTRONICS are the company that set the standard for amateur radio after-sales service. The shops are open Tuesday to Saturday and close for lunch 12.30 till 1.30 pm.

In Glasgow the LOWE ELECTRONICS' shop (telephone 041-945 2626) is managed by Sim GMSAN. Its address is 4/5 Queen Margaret's Road, off Queen Margaret's Drive. That's the right turn off Great Western Road at the Botanical Gardens' traffic lights. Street parking is available outside the shop and afterwards the Botanical Gardens are well worth a visit.

In the North East the LOWE ELECTRONICS' shop is found in the delightful market town of Darlington (telephone 0325 486121) and is managed by Don G3GEA. The shop's address is 56 North Road, Darlington. That is on the A167 Durham road out of town. A huge free car park across the road, a large supermarket and bistro restaurant combine to make a visit to Darlington a pleasure for the whole family.

Cambridge, not only a University town but now the location of a LOWE ELECTRONICS' shop managed by Tony G4NBS. The address is 162 High Street, Chesterton, Cambridge (telephone 0223 311230). From the A45 just to the north of Cambridge turn off into the town on the A1039, past the science park and turn left at the first roundabout. After passing a children's playground on your left turn left again into High Street. Easy and free street parking is available outside the shop.

The Capital City also has a LOWE ELECTRONICS' shop managed by Andy, G4DHQ. Easy to find, the address is 278 Pentonville Road, London N1 9NR (telephone 01-837 6702) and the shop is located on the lower sales floor of Hepworths. That's only a 3 minutes walk from Kings Cross railway station. So, when you're in the Capital City, visit LOWE ELECTRONICS.

Finally, here in Matlock David G4KFN is in charge. Located in an area of scenic beauty a visit to the shop can combine amateur radio with a outing for the whole family. May I suggest a meal in one of the town's inexpensive restaurants or a picnic on the hill tops followed by a spell of portable operation.

if I am absolutely honest,

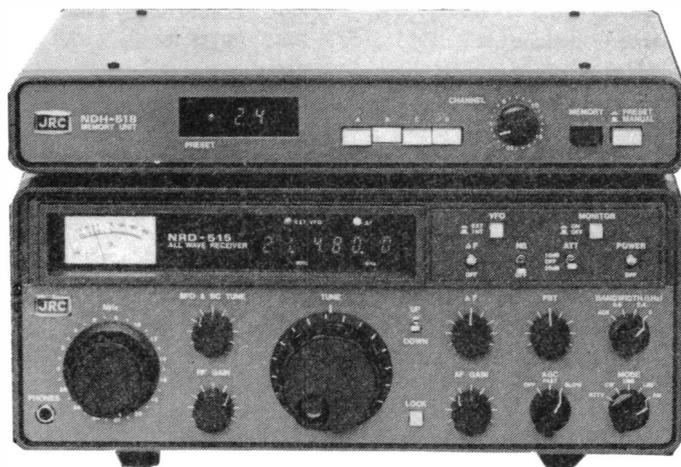
I am not certain whether I own a NRD515 because of its unbelievable performance as a general coverage receiver or just for the sheer pleasure of having and constantly admiring probably the finest piece of equipment available today.

Perhaps it comes down to the same thing, certainly the other NRD owners I have spoken to have all expressed the same feelings, that the NRD515 is a receiver in a class of its own.

As a person not owning the receiver, you may ask what sets this particular one above all the others. This is difficult to define—the feel of the equipment when wandering over the crowded band, its signal handling capability and selectivity can only really be appreciated by use. Technically, the equipment is above reproach. JRC's manufacture and production control methods as applied to other items in the range are equally applied to their amateur products. The other items referred to, only a small part of the vast range, are marine radio equipment, Marisat mobile terminal, Omega navigators, Doppler sonar, echo sounder/fish finders, communication satellite earth stations and a complete range of avionic beacons, radar and associated products. Indeed, a wider range application of electronic and radio technology for land, sea and air.

You may be forgiven for associating such advanced technology with complexity of operation, a piece of equipment that needs an operator with an electronics degree. However, this assumption is incorrect. The NRD515 is easy to use with the minimum of controls to ensure the operator really enjoys his listening time. Digital readouts, MHz, mode and filter bandwidth switches together with a VFO knob that will tune the band continuously without using any other control, from 100kHz to 30MHz or vice versa. To assist with difficult band conditions the NRD515 has pass band tuning and the medium wave broadcast section to 600kHz to 1.6MHz has a preselector control to cope with crowded conditions.

To give real "armchair copy" JRC have introduced the NCM515 remote control keypad. As its name suggests the NCM515 enables frequencies to be quickly keyed into the receiver. Four memories are provided, two rates of frequency stepping in increments of either 100Hz or 10MHz and finally the ability to add to or subtract from the operating frequency by any frequency step. Add the optional 600Hz CW filter and the 96 channel memory unit and, as the other NRD515 owners would say, "a joy to own".



the NRD 515

NRD515	monitoring receiver.....	£965.00 inc vat.
NDH515	96 channel memory unit.....	£264.00 inc vat.
NCM515	remote frequency controller.....	£125.00 inc vat.
NVA515	speaker.....	£34.50 inc vat.
CFL260	500Hz CW filter.....	£39.10 inc vat.
CFL230	300Hz CW filter.....	£64.00 inc vat.

LOWE ELECTRONICS

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



TR9130 TWO METRE ALL MODE TRANSCEIVER

This rig is proof, if one needed it, that TRIO do not bring out new models just for the sake of it. The TR9000 is remembered as a classic rig and today people are still asking for second hand ones, even they are a rarity on our S/H shelf. The TR9130 incorporates the improvements that all amateurs asked for, green display, reverse repeater, tune whilst transmitting, higher power, more memories and of course memory scan. TRIO's answer, the TR9130.

TR9130..... £458.72 inc vat.



TS780 DUAL BAND BASE STATION TRANSCEIVER

The TS780 is the perfect base station VHF/UHF transceiver for the enthusiastic operator. The rig has all the necessary control functions essential for operating on both today's busy two metre band and the wide spaces of seventy centimetres. Full repeater facilities plus reverse repeater are included and the transceiver has the usual memory channels (10), two VFO's, up/down frequency shift microphone, IF shift, two priority channels, memory and band scan, etc. A superb rig, I have one myself, ring for a full enthuise!

TS780..... £850.00 inc vat.



TR7930 TWO METRE FM MOBILE TRANSCEIVER

Those who have used or owned a Trio TR7900 will know what I mean when I say that Trio, with the introduction of the TR7930 have improved on the unimprovable. The Trio TR7930 improves on the TR7900 by giving a green floodlight liquid crystal display, extra memory channels, both timed and carrier scan hold, selectable priority frequency and correct mode selection (simplex or repeater). The most significant change is the liquid crystal display, but closely following this must be the ability to omit specific memory channels when scanning and the programmable scan between user designated frequencies.

TR7930..... £323.30 inc vat



R2000 GENERAL COVERAGE RECEIVER

The amateur bands are only a very small part of the radio spectrum, many other transmissions are available for the short wave listener. Broadcast stations provide an alternative source of current information both political and regarding the life style of the country. Fitted with the internal VHF converter the R2000 covers continuously frequencies from 118 to 174 MHz giving access to amateur two metre transmissions (am, fm, ssb and cw) plus a lot more. Having 10 memories, memory scan and programmable scan the R2000 provides in one rig the perfect receiver.

R2000..... £436.75 inc vat.



TS930S HF TRANSCEIVER WITH GENERAL COVERAGE RECEIVE FACILITIES

Much has been said about the TS930S transceiver and it now has a place high in the affection of those amateurs fortunate enough to own one, indeed it has become the "flagship" of the TRIO range. Providing full amateur bands plus a general coverage receiver (150kHz to 30MHz), the TS930S has every conceivable operating feature for today's crowded frequencies.

TS930S..... £1195.00 inc vat.



TR2500/TR3500 HANDHELD TRANSCEIVERS

Two first class hand held transceivers, one for two metres and the other for seventy centimetres. Ten memory channels, band and memory scan, repeater shift, reverse repeater and a low power position make the rigs extremely useful for the radio amateur who wishes to keep in touch with his local scene. A comprehensive range of accessories, base station charger, speaker microphone, mobile mount, etc. can be added to enhance operation, accessories used with one rig being compatible with the other.

TR2500..... £246.36 inc vat.

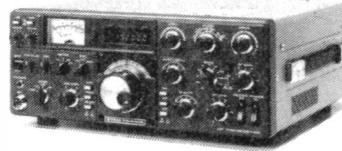
TR3500..... £265.85 inc vat.



TS530SP HF AMATEUR BAND TRANSCEIVER

A logic progression from the reliable TS520 series the TS530SP was the most popular HF rig in the range. I use the term "was" because TRIO decided to cease production and supplies were no more, however the demand from radio amateurs worldwide for the transceiver have continued and TRIO have reintroduced the rig. A standard HF valve transceiver without the frills but providing today's amateur with all necessary facilities for reliable world wide communication, the TRIO TS530SP. Now fitted with notch filter.

TS530SP..... £669.61 inc vat.



TW4000A DUAL BAND FM TRANSCEIVER

I have been waiting for this rig for the last three years, now it is here and I am using one, words fail me. Send for details.

TW4000A..... £488.70 inc vat.



just a part of the range

Securicor carriage on the above items £6.00

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

perfection?

Microphones	
HM3	4 Pin hand microphone (IC240)
HM5	4 Pin hand microphone noise cancelling
HM7	8 Pin hand microphone (IC-24G, 730 720A)
HM9	Speaker microphone for hand helds
HM10	8 Pin microphone with up/down scanning
HM11E	8 Pin microphone with up/down scanning - tone call
HM12	Up/down scanning mic for new sets (27147/1751/745)
SM2	4 Pin base microphone
SM5	8 Pin base microphone
SM6	Base microphone for new sets (27147/1751/745)
Ext Speaker/Headphones/Headsets	
SP3	Matching speaker for ICOM sets
SP4	Mobile speaker with magnetic mount
HP1	Good quality headphones
HS10	Headset and boom mic for ICOM hand helds
HS10SB	PTT switch box for HS10
HS10SA	VOX unit for HS10
ICOM Global digital clock	
	Attractive gold colour, gives time in cities all over the world. Pulsating red LEDs, LCD readout with alarm. 195mm
	59.00
TONO CW/RTTY/ASCII Terminals	
9000E	Communications computer, RTTY, CW, ASCII, TX/RX
550	CW/RTTY decoder, inc CW practice, and CW transmit
5000E	Communications terminal & k board, inc AMTOR, VDU
9100E	As 9000E with amtor
CR12000	High quality video monitor with green display
TONO Linears	
MR250W	144-146MHz, 10-15W drive, 180-200W out, RX pre-amp
MR150W	144-146MHz, 10-15W drive, 120-140W out, RX pre-amp
MR100W	144-146MHz, 10-15W drive, 80-90W out, RX pre-amp
2M50W	144-146MHz, 1-3W drive, 30-45W out, no pre-amp

NEW "Q" Series	
2M40G	144-146MHz, 1-3W drive, 20-35W out, RX pre-amp
2M90G	144-146MHz, 10-15W drive, 70-90W out, RX pre-amp
2M130G	144-146MHz, 10-15W drive, 110-130W out, RX pre-amp
4M60G	430MHz, 3-15W drive, 40-60W out, RX pre-amp
TONO Pre-amps	
RX144	2 metre mast head pre-amp & control box
RX430	70 cm mast head pre-amp & control box
TELEREADER Equipment	
CWR65E	CW/RTTY/ASCII terminal & k board, with VDU, TX/RX
CWR67SE	RX only version of 65E, with inbuilt printer/VDU
CWR670E	CW/RTTY/ASCII RX only, use with TV or VDU
CWR610	CW/RTTY decoder, slow morse practice
CWR610E	As 610 with ads board read from front panel (45-600)
CN40PS	13 pin plug for 610/610E
	4 character dot matrix printer, 11.5cm paper roll
ZENITH Monitors	
123E	12 inch with green display, good quality
122E	12 inch with amber display, good quality
TAL, ASP Series System 8 antennas	
ASP2016	138-512MHz 1/4 wave whip with threaded adaptor
ASP3976	66-138MHz 1/4 wave whip with threaded adaptor
ASP3936	130-174MHz 1/2 wave whip with barrel/spring, 3dB
Mounts for above	
K57	Fits 1/2 wave, 3/8 inch hole, snap-in type
K440	Fits 1/4 wave, 3/8 inch hole, snap-in type
K145	Fits 1/2 wave, 3/4 inch hole, snap-in with claw mount
K65	Fits 1/4 wave, 3/4 inch hole, deep claw with 17ft cable
K47	Fits 1/2 wave, 3/4 inch hole, wing mount
KR47	Fits 1/2 wave, 3/4 inch hole, narrow wing mount

K220	Fits 1/2 wave, magnetic mount with 17ft cable
K220A	Fits 1/4 wave, magnetic mount with 17ft cable
M161	Fits 1/2 wave, boot lip mount, needs K57
M161	Fits 1/4 wave, boot lip mount, needs K440
KR193	Fits 1/2 wave, swivel ball mount
K67	Ground plane kit for all whips
3000 Series System 8 antennas	
TAP3006	60-110MHz, 1/4 wave whip with threaded hinge
TAP3016	110-512MHz, 1/4 wave whip with threaded hinge
TAP3026	144-174MHz, VHF 1/2 wave, 3dB gain, threaded hinge
TAP3676	144-174MHz, VHF 1/2 wave, 3dB gain, with spring
TAP3456	420-440MHz, UHF 3dB gain, with threaded adaptor
TAP3466	450-470MHz, UHF 3dB gain, with threaded adaptor
TAP3696	420-440MHz, UHF 5dB gain, with shock spring
TAP3666	450-470MHz, UHF 5dB gain, with shock spring
Mounts for above	
K68	Snap in adaptor for 3/8 inch hole
K145	Snap in adaptor with claw fits 3/4 inch hole
K72	Wing mount with 17ft of cable, fits 3/4 inch hole
K66	Claw mount with 17ft of cable, fits 3/4 inch hole
K65	1/2 inch deep claw mount with 17ft cable, 3/4" hole
K220	Magnetic mount with 17ft of cable
ASPR332E	Gutter clip with 10ft of cable
M161	Boot lip mount needs K68
KR223	Duraflex noiseless spring
K67	Ground plane kit
Base station antennas	
ASP655	130-174MHz economy base, 1/2 wave with g-plane
TAP4009	156-174MHz Colinear, 3dB gain
ASPDX32	180-168MHz Colinear, 4.5dB gain
ASPE62UK	164-172MHz Colinear, 4.5dB gain
ASPD700	450-460MHz Colinear, 7dB gain
ASP2006	156-174MHz Unity gain

Low profile/Heavy-duty antennas	
ASP2001	66-88MHz dome shape, -12dB
ASP2000	105-108MHz TX - 138-141MHz RX dome shape, -4.5dB
ASP2002	162-174MHz dome shape, -3.5dB
ASP2021	162-173MHz lin shape, -1dB
ASP4005	450-470MHz dome shape, -0.5dB
Marine antennas 156-162MHz	
ASM37E	1/2 wave unity gain, deck mount, with 20ft cable
ASM38E	Colinear 3dB gain, deck mount, with 20ft cable
ASM77E	1/2 wave unity gain, mast mount, with 3ft cable
ASM88E	As above with 60ft of cable
ASM98E	Dipole, with deck/bulkhead mount & 20ft of cable
TAM1001	1/2 wave unity gain, lightweight whip style
TAM1003	Emergency antenna, (CH16) c/w special bracket
Mounts/Accessories for above:	
ASM42	Heavy duty ratchet mount all angles
ASM91	Vertical deck mount, fold over
K509	Stand off bracket (13cm) for 1001, 1005, 1006, 88E
TAM106	Antenna extension rod (1.5m)
ASM93	Antenna support bracket
CS100	Good quality extension speaker
Antenna matching units	
AMU100	1.5-99MHz 200 watts pep
AMU400	1.5-600MHz 400 watts pep

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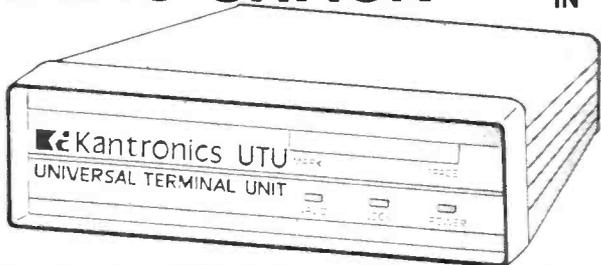
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FOR THE RADIO AMATEUR AND AMATEUR RADIO



EDITORIAL

Interference

We notice with some alarm that reports indicating a rise in interference, due to home computers being inadequately engineered, are increasing. On the same day, we saw a professional recruitment notice saying that RF analogue engineers were a disappearing breed . . . but when digital elements were fast enough, the problem would go away. Maybe the recruiting difficulty would go away but the interference problem would become far worse. Already the writer, no doubt in common with many others, has spent time on suppression of heating systems, fridges, freezers, various minor gadgets — to say nothing of a professional calculator by a very well-known company which blacked out all reception in the immediate vicinity when operated from the mains.

What is the answer? There can be no doubt that the need for legislation is there. Accompanying the legislation would be a need for a British Standard covering the testing requirements; and one can then foresee an explosion in the requirements for test facilities and equipment. But — legislation *must* cover everything using electricity in the home and the office, and the BS *must* strike a reasonable balance between severity and cost.

Even as we write, we see that the electricity authorities are considering equipment to 'read the meter through the mains'. When a viewer goes purple over the loss of a TV picture, whatever will he do when he gets an inaccurate bill due to some innocent neighbour using a calculator or a home-computer? On a more serious note, consider the situation of the poor unfortunate with a pacemaker unable to cope with the QRM — he, poor chap, just dies.

The matter is becoming deadly serious in our crowded urban and suburban areas.

John Adams
G3KFE.

WORLD-WIDE COMMUNICATION

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

WE are well into summer conditions now. NFD weekend was forecast to be a complete horror, but in the event the cowpats were the worst hazard. Old Sol, of course, did his thing, as anyone who hears the RSGB news-bulletin solar data will have realised.

On the other hand, if conditions were always the same it would be like working through a repeater — no challenge.

New Bands

A start here because we have a larger than usual crop of letters, of more than usual meatiness, for this section. Thanks for the response to my pleas and moans!

G3JFF (Clanfield) writes of his findings on 10 MHz. Mike finds the band opening to Oceania around 0630z, with 589 exchanges to ZL3GQ, VK3BXN, ZL1BSG, VK2TT and VK7RY; the path also opened up in the evenings, and VK2KM and VK2PA have been the star turns. Also around the 1900-2100z period, G3JFF noted good signals from K2AGJ, N3EA, W1FVX, and NU4H. Europeans worked included EA3JJ, OE3AKA, F6FKV, PA3BHD, LA1IE, OK1DOR, GJ3EML, PA0WFW, DL8WL, OY1R, OZ1HET, YU3CKJ, F6AIW/MM in the Western Mediterranean, EA4BWR, HB9ALL and LA4OE. A bit more DX'y were EA8AGF, 7X2KX, ZF1LA, DL2GG/YV5 and ZC4CZ. On a different tack, G3JFF mentions that the first Sunday of each month has been designated as an Activity Day on 18 and 24 MHz and Mike appeals for more activity on the band, both on the Activity day and indeed at any time. We agree wholeheartedly. G3JFF reckons his 'funny of the month' was K6LPL/KH5, calling CQ at well over S9 and, naturally enough, not answering any calls!

G3JFS (Taunton) last wrote in to this column some thirty years ago (although very much more recently he has written some excellent articles for us, with more in the pipeline). Meantime he has been getting around, and indeed has just received his WAZ, earned as VK6AI and awarded back in autumn 1971. Wonderful things, these modern postal arrangements! Peter usually operates in the 1800-2000z, and for the first half of the month found conditions good and a high level of activity, but on return from a brief break on May 18 there was a noticeable change into true summer conditions. He made a few sorties on the band in the early morning, and these have been worth while, with ZF1LA, N4FNG, KC7MY, all

worked, several VK/ZL stations heard, and a gotaway KH6CC. Very few Gs on the band, but on May 26, for a change Peter heard and worked GI3PDN, GD3FXN, GW3SPA, EI6EU, and GM3SWK during the morning-lunchtime period, plus FG7BG; and VK, W, K stations were heard too. G3JFS likes the idea of RTTY on this band, and uses a BBC micro to his KW-2000A, backed off to 50 watts.

G4VOZ (Lutterworth) has been on the band since the first week in April and to date has managed 15 countries on 10 MHz. John notices that any North American activity on this band seems to surface after 2300z, but often is right underneath the prime-user QRM which either they can't hear or don't consider they compete with. Even now, there is the odd SSB station which pops up bleating about his 'freedom and rights' — one such was an F6, whose CQ was returned by a DK who pointed out the position and in so doing provoked a six-minute slanging-match. Finally, G4VOZ pleads for more activity, in particular on 18 and 24 MHz.

G3SFZ (Ealing) is a regular on the new bands, and has 50 countries 'up' on 10 MHz. On 18 MHz, John worked LA9XG, GJ3YHU, PA3ANW, G3JLB, DL1SQ, CU1LN, VK3AGW, OZ1EUO, OE1JNB, OY1R, HB9LO, TR8JLD, VU2LO, C6ABA and I0LXJ, but reports the band as being very quiet of late. On 24 MHz, FY7CP, VU2LO, GW3AHN, 4Z4WF and a couple of Gs sum it up. G3SFZ adds his plea for more activity and in addition would like to see an allocation of a few kHz to SSB at the Top Band power level, just to see what that would do.

The other side of the coin comes from G3YVF, who reports that a week of activity on 10 MHz yielded just three QSOs, with HB9AFZ, LA4OE and F6ANZ, with gotaway F2PEX; and these four were the only stations even heard! Geoff uses a very long wire for the band — we wonder whether the resulting directivity is possibly not helping his results? One would have thought that Rochester would be a pretty good site from the point of view of a man bent on radiating RF.

Certainly that seems to be the case for G2HKU (Minster) who tried 10 MHz and sucked out 4X4WF, VK2PA and VK3MR.

Eighty

What a band! Most of it a sink into which a remarkable amount of inanity is

poured, but at the ends some good DX worked — and of course the QRP chaps have their own favourite spots for their activities. G3BDQ (Hastings) says he only operated HF this time when the TV was too boring — thus he found GU4WTN/A, a 'special' on Herm.

The QRP of G4SXE (Rolleston) is back in action now he has replacement valves for his JR-500S receiver; Brian also replaced the front-end valve, a 6AJ6, at the same time. It all proved to be a bit of a mixed blessing, as he found himself going back to lots of stations who just couldn't hear him. Moral for QRP stations: look out for the 599 signals and practice on them! Two watts on 80m. gave a best contact as SP5AGU, Zen, a G-QRP Club member, plus GM3AWF, GM4VYU, SM1IAI, DF5KR; so the log now shows 19 countries worked on Eighty QRP.

Two letters from G3ZPF (Kingswinford) who seems to have spent most of his time putting up larchlap fence panels, cooking, washing, ironing, and other domestic chores... he needs a housekeeper, a gardener, and maybe an aerial-farmer too, by the sound of it! Perhaps the highlight of the month was SV1IW/A who was giving out 599s to all and sundry and who David believes just might have been at Mount Athos. There are still a few 'easy' countries to be garnered in to the G3ZPF log, such as ZC4, before the 100 countries comes up.

Early afternoons are the times for G2NJ (Peterborough), when Nick found the band often noisy and with QSB as well. A couple of YL QSOs were interesting; GW4TNH/A, Marion, was about to return home with a crossbow from her friend's QTH, the said warlike instrument being the method of getting the dipole back up in the air. The other YL was G4RKK, Iris — and both had very nice CW fists. On the QRP front, there was a longish one late at night with DJ9NI, using the G2NJ HW-8. It seems that DJ9NI is learning English at evening-classes and is interested in practising by corresponding with a British amateur or student. Finally, G3OSJ, whose four watts was putting in a 599 signal, filled Nick with envy as he described the arrangement with a local farmer which gave him some 450 feet of wire, up at forty feet.

Top Band

G4AKY is slowly settling in to his new QTH, and is still threatening to get his aeriels back up in the air; indeed, we

believe he already has a temporary one aloft but isn't achieving much joy yet.

For G2HKU the band offered SSB with GI4MKC and PA0PN, while on the CW front, the old Morse key clattered its message to GM3BSQ/P, HB9AN/P, GM8TT/P, GW6AQ/P, HB9G/P, UP2NK, I2VUC, and SM6EHY. Ted notes his noise level on Top Band has gone down a little — late one night on the way home a spectacular display of arcing was noted among the overhead line wires, so a phone call next day to the local Electricity Board yielded action within the hour, and all was well again.

G4OBK (Chorley) wrote twice; he also has been suffering from a surfeit of chores, but he did manage to put on GB0PAC for the Preston Automobile Club of which Phil is vice-president, and he also did a bit on Ten and Top Band. Top Band yielded VE1ASJ, KA1PE, WA3EUL and W2FZY, while trying for *South America!* However, K1ZM was heard, talking first to PY1BVY and then CX8DT, neither of whom was audible to Phil. However, the next night conditions were better and PY1BVY was raised. this was encouragement to try for a third night on the trot, but although the PY was audible he was very weak and no contact resulted, although KH8AC/1 was raised. All these contacts were at the unearthly hour of 0200-0330z.

G4AAW (Maidstone) lays claim to the smallest shack in the country — he has his gear in what was once a coal cellar under the stairs. Maximum height is five feet, falling to zero, and width is just enough to get the Vespa and KW-201 in side-by-side, plus a small stool in front of the gear. Looking at the log copy, and skipping the small fry we note a QSO with PY1RO, who was wiped out under WB1FSW, then VE1ZZ, 4X4NJ, UL7MAN, 3A2GL, K1MEM, RA4FFP, SP8KAF, 4X4NJ again, VE1ASJ, 4Z4DX, 4U9ITU (QSL via W1RR), VE1AXT (back to a CQ), N3DAY, C31SD, TF6A, UA9CEI, UA9AME, RA9AKM, G4AKY, TF3XUU/P buried under DHJKH8AC/1 and GD4BEG.

Odds & Ends

G6FU (Mevagissey) harks back to the 'BA3' business, and sent in a photostat copy of the QSL he has — dated January 16, 1933, and indicating the call belonged to the Physics Department, Royal Naval College, Greenwich, with G5GW as the licensed operator, G6FU also enclosed a picture of his station in that era, with QRP an enforced condition, due to no mains electricity in the shack. However a great big retired BBC 'bottle' hung above the rig, just to feed ambition. . . . Now in his 81st year, G6FU is as active as ever, though with a 'black box', using for an aerial some 66 feet of Woolworth bell wire lying on the tiles of the house, with a 'counterpoise' of around 26 feet of wire on the floor indoors. A set of graphs shows that the



Roger Frisby, G4OAA, hon. sec. of Cheshunt and District Amateur Radio Society, holding 9L1FTN prior to its despatch to Sierra Leone at the beginning of April. The beacon became operational on April 13th, and was the Society's highly impressive contribution to 'World Communication Year 1983'. Involved in the project is Sierra Leone A.R.S., and one of the beacon's main functions is to provide information for propagation studies over the next few years. Reports, therefore, will be welcome from both home and overseas and should be sent direct to G4OAA, or G4ECT via bureau; all reports will be acknowledged with a special QSL card. 9L1FTN is situated on Mount Aureol at a height of 400m. a.s.l., with 10 watts to a vertical half-wave aerial; frequency is 28.27250 MHz (keying to 28.27350 MHz) and keys FIA "de 9L1FTN" at 12 w.p.m. with 20-second interval.

photo: G4OAA

aerial gets out well, and that G6FU has lost none of his skill.

The reason for the recent absence of GM4CXP (Borders) from this piece is now explained; Derrick's aerial suffered from a serious attack of gravity in the January gales. The result was a fit of VHF operating — painful illness, that — and only just now has the aerial been put back up, after agonising for a while whether to go to the inverted-vee configuration in the hopes of better DX.

G3FWE of the Marconi (Portsmouth) Club writes to say that their Mary Rose award, in connection with the raising of the historic Tudor warship in 1982, has now gone out to some 293 stations, including 7Q7. The club has also been involved with the D-Day commemoration stations in Normandy and at home, with GB1MAR, F01MT and F01MY, not to mention their GB2MAR signal. G3FWE, in writing about the Mary Rose award, says that there are quite a lot of applicants who have got the rules wrong so a note on them might be in order. U.K. stations need 25 stations in Hampshire and the Isle of Wight, as do the EUs. DX gets away with a mere ten stations in the same area. The Marconi club calls GB2MAR, G4MJR and G6JMR have a special role; work one of them and this counts as five points; if

you work the other club calls as well, then they are worth only one (*i.e.* a maximum of 7 for the three club calls). Send your certified check list plus £2 or its equivalent (UK/Europe), or £3 or its equivalent from your DX location, to G3FWE, 50 Park Avenue, Widley, Hants. Vern's phone number is Cosham 373099.

W1WY's invaluable Contest Calendar next, and here we must note the AGCW-DL QRP contest between 1500z and 1500z, July 21-22. Multi-op stations operate the full time, others take a nine-hour break. Class-A is below 3½ watts, Class-B below ten watts, Class-C is below ten watts multi-operator, and Class-E is QRO. Exchange RST + serial number plus power input, *e.g.* 599001/2 or 599003/QRO. Score one point for contacts within one's own country, two for own continent, three for other continents. Indicate if crystal-controlled in the exchange, and if you are, claim double for each QSO. The multiplier is one for each DXCC country worked, and one for each DX station worked. Call areas in JA, PY, W, VE, and ZS count as countries. Logs to Siegfried Hari, DK9FN, Spessartstrasse 80, D-6453 Seligenstadt, West Germany, and include an IRC for the results. Logs to be posted within six weeks of the contest.

As mentioned last month, this same weekend shows the CW leg of the SEANET DX contest; this one is 0001z Saturday to 2359z on the Sunday. To recap, exchange RST plus a serial number starting at 001. Contacts score as below, for non SEANET country stations: stations in DU, HS, YB, 9M2, 9M6, 9M8 and V85 are worth 20 points on 160m., 10 points on 80 and 40m., and four points on 14/21/28 Mhz. With stations in other parts of the SEANET area, claim half of these points. Multiplier is three for each SEANET country worked. Logs to 9M2FK, PO Box 13, Penang, Malaysia, to be received no later than October 31. This date and these rules apply to the Phone contest on August 18-19. SEANET countries include; A4, A5, A6, A9, AP, BV, CR9, C21, DU, EP, HL, HS, H44, JA, JD1, JY, KA, KC6, KG6/KH2, KH6, KX6, P29, S79, VK, VQ9, V85, VS6, VS9K, VU2, XU, XV5, XW8, YB, YJ8, ZK, ZL, 3B6, 3B7, 3B8, 3D2, 4S7, 4X, 5W1, 5Z4, 8Q7, 9K2, 9M2, 9M6, 9M8, 9N1, and 9V1. Results will be announced at the next SEANET Convention.

A letter from their Hon. Sec. says that the Yeovil Club are having a QRP Convention later this year — October 14 in fact, at Preston School, Monks Dale, Yeovil, from 0900 till 1700. Coffee will be available before the first lecture and tea after the last one; lunch obtainable at the "Preston Plucknett" pub nearby. Talk-in on S22. Details from the Hon. Sec. G3GC, at Dorset Reach, 60 Chilton Grove, Yeovil, Somerset (0935-75533).

DX Doings

Mainly culled from the *DX Bulletin* from Jim Cain, K1TN, and the *ex-Geoff Watts DX News Sheet*, now with G3XTT and G3ZAY driving the bus. From the latter we see that Mt. Athos appeared in the person of DJ5CQ/SV/A for a 24-hour operation, which in fact lasted almost 36 hours. Of those who caught up with this one, nearly all connected.

UBA, the Belgian society has written to several DX journals deploring the habit of some QSL managers not responding to SWL reports despite the enclosure of money or IRCs. W7PHO is particularly mentioned as an offender.

VR6TC and VR6KY are both carrying the Pitcairn Island torch, but we hear that the proposed VR6BR operation has come to nothing, as Betty was flying back to U.S.A. from Easter Island with a back problem.

Old friends and sparring partners of Snow, VK3MR, will be pleased to hear that Snow is now out of hospital and making progress to the point where he has been heard on the air occasionally — keep up the good work, Snowy.

The BY operations seem to be continuing and we hear that the QSLs for VE7BCs contacts are surfacing.

There seems to be a problem over

5X5FS. Some bulletins are indicating that he has not sent out any QSLs, in spite of receiving IRCs and dollar bills; we would be interested to know if anyone has a card from this station. We also note a question-mark hanging over the licence itself, as to its validity.

That G8GRN/5X operation was very definitely a piratical affair, and has now stopped; thanks to OH2BH and OH2BAH for establishing the true facts of the situation, even if they didn't get a callsign themselves.

Forty

Not a lot in the way of reports, but it offers a lot of interest to those who know how to take advantage of it — the problem is one of receiving rather than transmitting.

A favourite length of an end-fed aerial on most bands is 150 feet; this is the length chosen by G3JFS for his operations so far, and it was used by many stations on NFD as a convenient compromise length in terms of feeding.

G4NOZ (Colchester) mentions an early morning QSO with DL7ZG on CW, and another late at night with SM5AOG providing a pleasant rounding-off to the day's activity. On SSB, FD1HKK, Philip, from Metz, was giving out greetings to many U.K. stations.

Turning to G3BDQ (Hastings) we find that John spent a little time on the HF bands in between writing and operating VHF. 7 MHz was reckoned to have been at times better than the higher frequencies, with CW to UL7ECH, UL7GDG, UH8EWW, UJ8JMM, UA9COB, UV9UWW in Zone 18, 3V8AA, 4K1ANO, a grey-line contact with 4S7TPR, ZP5CA for a band new one, YB5ASO twice, and VK5RZ, not to mention a couple of useful EUs in 3A2ARM and DA1WA/HB0. That YB, incidentally, disguises the YB5AES who was on Top Band 18 months ago, but has now moved QTH and changed call.

Twenty

For most people this is where it all happens, G3ZPF notices that, while he is at the moment mainly on Eighty, the recent listings in the Honour Roll give him his next 'mountain' to climb — there isn't a G in the list; which is not to say that there aren't any Gs up there, but rather that they haven't claimed recently, G5VT springs to mind instantly, plus probably G3FKM and G3AAE. Anyway, Honour Roll on CW is the next one for G3ZPF; and as it must be a one-band effort, he is now planning beams and things for Twenty. Perhaps, if all readers pray for him in unison. . . .

G3NOF (Yeovil) enters the lists now. Don is nowadays an all-SSB man, and he found the band good for the first three weeks of the period, and sickly for the rest of the time. In the mornings, VK-ZL-Pacific stations were to be heard on the

long path, and between 1700-1900z short path to SE Asia, VK and ZL was often noted to be open. Gotaways included BY4AA, JT1AO, S79DF, T2GSH, T32AB, 1Z9A, and 5U7LD, but SSB contacts were completed with F6GNS/TU, FO8DH, FW8AF, J37AH, NH6AT, UA4PBH/U4H, UA0QBB in Zone 19, V85GA, VK9NL, VP5AB, Y11BGD, YJ8RG, ZK2RS, ZLs, 6W1AR, 9M2CO, 9Q5MA, and OD5CQ/SV/A who was alleged to be on Mount Athos — although there seem to be doubts about this one and some investigating was being done by the SVs.

Between visitors and the garden, G6QQ wasn't able to spend as much time in the shack as he would have liked; his operating hours being nowadays in the nine-to-five idiom. Even then it was mostly 21 MHz, but Twenty gave UZ9CWG, UA9OS and UA9YDX.

"CDXN" deadlines for the next three months:

August issue—July 5th
September issue—August 9th
October issue—September 6th

Please be sure to note these dates

QRP rigs aren't all that clever in the week-end contest QRM says G4SXE; but the odd session in midweek spare time managed HA8KVK, LZ2LP, SM2BXI, UC2ICJ, UQ2GEI, and UR2RAV, all with a two-watt rig which is VXO'd between 14.050 and 14.056 MHz only.

Twenty for G2HKU included on SSB ZL3FV and YU3AG/MM off Oran, while the CW accounted for K3ZO/HK3, KO2A/4X4, VK2EO, VK3MR, FM7CW, VK6RU, VE5AFY, KA4IFF (a YL), UL7FBY, UI8TAA, ZY4OD, HZ4MX, CX7BY and 9L1LM.

On now to G3BDQ, and here we find SSB to VK7GK and LG5LG (Morokulien) with CW contacts to JA1KFN, PY1HQ, and an old friend VE3BWY who was for a short period the conductor of this piece in the early post-war years.

Work commitments have kept G4LDS (Chelmsford) off the air, but the advent of some warmer weather has turned thoughts back to hobbies and aerial-farming in particular. On Twenty, the matter of escaping the EU QRM didn't stop G4LDS tackling 9V1VP, JT84UCS, N1, 2, 3, 9M2PM, VU2RPS, 4U1VIC, V85GA, VU2BIT, JA9YBA, 9M2WF, VK6RJ, VK7CV, OH0AM, VK3DWJ, VK6ON, A4XJV and EA6SO.

GM4CUX, when not working his string of VKs on this band, or dredging 21 MHz, is an interested observer of the enlightened Scottish educational scene. Enlightened? Yes, this year's 'O' Level Metalwork called for examinees to make the lever arm and stand for a Morse key! Thus is Amateur Radio spread to the young — and doubtless the price of keys will fall before long!

Ten Metres

All things considered, this one is holding up well; the advent of the converted CB rigs has undoubtedly done wonders for activity, which has always been needed when the sunspots turn it into a useful local-natter band with little QRM.

G4VBP/A is a fugitive from the columns of "SWL" and has an ICB1050 converted at his work QTH. Best day, Brian reckons, was May 14, when his four watts got out in simplex mode to Spain, Hungary, Germany, Yugoslavia and the U.S.A. — Connecticut — with no pile-ups on any of these, *and* in between work duties and the eternal telephone. On a totally different tack, Brian wants to know where he can get a modern version of the "Ham's Interpreter" with the Cyrillic (Russian) characters. Anyone out there who knows the answer — we'd be glad to know, too.

As G4LDS so rightly asks, "if the beacons are at good strength, where are the hams?" However, he did work N8DCL/8P6, ZS6AW, W6QL/CE0Z, for all-time country number 230, A4XJQ, UA6s, ZS1LQ, LU5EEK, PY5IW, and KC2GE/PJ3 whose QSL manager is N7RO.

For G4NOZ, the pick of the crop was PY2DSA, Arnold, on CW, and swapping 449 reports with various G stations.

"Very patchy" is how G3NOF reports the band conditions, with it dead for long periods, and open to short-skip during the day, plus a few openings to the Middle East. A few openings to S. America were noted between 1600 and 1900z, and one opening to the East Coast of W, around 1625 on May 14. Don made no contacts, and missed out on A71AD and KP4AXC.

That same opening was caught by G6QQ (Hoveton) who worked K4TNB, while CW was the stuff for PY1ZFO and LU8DQ.

Just one QSO was reported by G2HKU, with PY7GI on CW, with permission he says from the local CB-ers! On a different tack, Ted, like so many of us, was

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saddened to hear of the passing of G2JF, Jim Foster, who for the last few years had been in ZS after being an outstanding signal in U.K., particularly on Top Band, back in the Fifties.

Fifteen

Like 28 MHz, 21 MHz has been distinctly 'iffy' over the period under review.

G3NOF found things fairly good for the first three weeks and then poor. No VK/ZL stations were heard on the normal long-path opening times in the mornings, but the short path opened a few times to VK and the Pacific from 0900-1100z. Even under poor conditions, openings to VU, 9M2, 9V1 and YB were noted between 1400-1600z; Africans were noted between 1100 and 1400z and again 1600-1800z. Very few signals from North America were heard, and those that did surface were subject to heavy fading. South Americans seemed best between 1700-2100z. Don worked SSB to A71AD, A92DQ, A92DY, A92EB, A92NH, A92P, AP2MQ, C53AL, CE4EBJ, DF4RD/SV5, EA8MR, EL2AM, FB8WJ, FM7WD, FY7CM, GJ3LFJ, GU5DPR, H5AE, HH2WL, HK0HEU, HL2AMO, IY4FGM (a Marconi Commemorative), J28DX, J6LKG, JAs JY6ZZ, JY9TS, KA5BPE/C6, OD5YY, OX3BM, S79SM, SV5RW, T77C, TR8JLD, TU1BS, TU2IO, TU73, TZ6CY, UM8MK, V2AN, VK4KMO, VO2CP, VP2MDG, VS6CT, VU2CVP, VU2GI, W9JER/9Q5, XU1SS, YS1LSR, ZC4Z, ZD7CW, ZF2GE, ZS6XB, ZY5EG, 3D6AN, 5B4GZ, 5H3BM, 5H3RF, 5H3SG, 5H3QM, 5N8HEM, 5N9WJN/2, 5W1EJ, 5Z4JD, 7P8AD, 8J11TU, 9M2DC, 9M2SB, 9V1VG and 9Y4AT.

The main activity has been 21 MHz SSB, says GM4CUX, despite a few

wavings at the Morse key; the yield included ZB2HG/M half-way up The Rock, JR8KOG, C6ADJ, DU1KT, VE6BKY, JH1AJT/VP2V, 9K2BE, TA1UA and D44BC, the last two being new ones. The evening of May 18 was the best, when YV5ITK, VE7BEH, VE7EX1, WA6RGO, GM3POK/W6 and KC5EA were all hooked — the YV and KC5EA both sent their cards direct and unsolicited, to fill in a couple of gaps in the collection.

We turn next to G4LDS who notes the JAs coming through; he worked HZ1AB, TR8IG, 9V1VP, VP9JY, JA4WFG, JE3FOY, JA3OAW, JAOKUP, W2, W9, HI8CSE/W5, and TU1BS.

G4NOZ notes SV5HRW on Rhodes as a 599 signal, and from U.S.A. W9RYO, KA1KAU, Maria, in New London, and K4SSW all putting in good signals; not to mention UA6LHB and 9H4R, who by the way is a member of RNARS.

G2HKU used his QRP CW to tangle with DJ5GI/EA6, and then fired up the big rig for CW with IS0TDY, DJ5CQ/SV/A (Mount Athos), OH2AQ/OH0, ZF2HF, VK1XX, HK1QQ, K/ZO/HK3, VP2EC and RA9UN.

G3BDQ offers SSB with 5Z4JD, OD5HB/P, PY3DF, PY2CZL/2, YV2BTY (who may be on Top Band before long), 9U5JB, VP2MDG for a new one on the band and through a big pile-up, A92DY, and CE3AEG who is the first CE from the present QTH in which G3BDQ has resided for 15 years!

Finally G6QQ; David spent much of his operating hours on 21 MHz, and so landed his SSB signals on to HL1AJZ, JH5FJB, 4Z4ZY, YC5NOF, UL8LWZ, RL8PYL, UF7FWY, UF6CR, UG6AO, UA9MA, UA9MC, UZ9MWF, UZ9AZA, UZ9QWM, UZ9FWW, UM8MK, UI9AWH, UA9YCO, UZ9CWZ, 4X4KR, JY5CI, KA1RL, UZ9AWH, 4X4KR, JH5MQH, JF6AVF, 4X4MS, UW9FU, JA5FBK, VP2MDG, YC0DPO and A22ME.

Finale

Here we reach the end of the line for another month; the deadline for next time is as shown in the 'box', and is the date for your letters to arrive, addressed as ever to your scribe, "CDXN", SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ.

Don't forget that sharp garden tools get the job done quicker!

A Beginner's Guide to RTTY

KEN MICHAELSON, G3RDG

FIRST of all, what is it? No doubt many of you, licensed amateurs and short-wave listeners alike, have sometimes tuned-in to something which sounds like "Jingle Bells" in various parts of the spectrum and wondered what is was, Well, this is RTTY.

The letters 'RTTY' are a contraction of Radio Tele-Typewriter, and RTTY is a means of transmitting printed text to a distant point by radio. The 'Tele-Typewriter', more usually called the 'Teleprinter', provides a means of coding the text entered on a typewriter keyboard and of decoding the received signals and printing them on paper for visual inspection.

elements per second. On the HF bands a speed of 45.45 bauds is almost universal, but on the VHF bands both 45.45 and 50 bauds are in use. It is possible that with the availability of more modern teleprinters using synchronised motors and running at a speed of 50 bauds, that this speed may become more greatly used.

It is possible, of course, to transmit RTTY merely by keying the carrier on and off for mark and space according to the code shown in Fig. 1, but this throws away almost all the advantages of RTTY. In practice one of two frequency shift keying (FSK) methods are used. 'Mark' is represented by transmitting one frequency and 'space' by transmitting another. A shift of 170 Hz is standard in

LETTERS	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z								
CHANNEL 1	●	●		●	●	●				●	●					●	●		●	●	●	●	●	●	●				△ 5					
CHANNEL 2	●		●				●		●	●	●					●	●	●			●	●	●					●	●	●	△ 4			
FEED HOLES	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	△ F TRACK			
CHANNEL 3			●		●		●	●		●	●		●	●	●	●	●		●		●	●	●	●	●	●		●	●	△ 3				
CHANNEL 4		●	●	●		●	●			●	●		●	●	●			●			●	●	●				●	●	●	△ 2				
CHANNEL 5		●					●	●				●	●		●	●	●			●		●	●	●	●	●	●		●	△ 1				
FIGURES	-	?	:	WHO ARE YOU?	3	OPTIONALS	8	BELL	()	.	,	9	0	1	4	'	5	7	=	2	/	6	+	CARRIAGE RETURN	LINE FEED	LETTERS	FIGURES	SPACE	ALL SPACE	BS 3880			
COMBINATION No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32		

Fig. 1 THE INTERNATIONAL 5-UNIT TELEPRINTER CODE

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In order to achieve this, it is necessary to use a code, and the one which is in universal use for commercial Telex all over the world is the one used by radio amateurs. This is the CCITT No. 2 International 5-unit Telegraph Code, sometimes called the 'Baudot' or 'Murray' code. The code contains only two states, called 'mark' and 'space' — similar in concept to the 'carrier on' and 'carrier off' states of a Morse transmission, and an illustration of it is given in Fig. 1. You will note that there are only 32 variations of the five units, and therefore we have to have two sets of characters in order to accommodate it all. This is accomplished by having a 'shift' key which changes 'case' from letters to figures as desired, transmitting a 'case change' signal to the other end so that the distant teleprinter also changes 'case'.

Although the two teleprinter machines (send and receive) are supposed to be in synchronisation, at a speed of either 45.45 or 50 bauds, (more of that later), it is necessary that a 'start' and 'stop' element be added to the 5-unit code making up the letter or figure being sent. The 'start' element is always a 'space' and the 'stop' element consists of one or more mark 'bits'. The speed, as mentioned above, is spoken of as so many 'bauds'. In the amateur context using the International Telegraph Code No. 2, two speeds are used. They are 45.45 and 50 bauds. A baud is a term used for 'signalling speed' and for RTTY it is the number of signalling

the amateur bands although 425 Hz is commonly used in commercial transmissions. The most usual mode is standard FSK and is generated by lowering the transmitted frequency by 170 Hz for the space element. For example, suppose the mark frequency were 14090.170 kHz, then the space frequency would be 14090.000 kHz. Audio frequency-shift keying or AFSK, on the other hand, is produced by modulating a transmitter with audio tones. The standard frequencies are 1445 Hz for mark and 1275 Hz for space. Either amplitude or frequency modulation can be used but FM is more popular.

RTTY is in regular use on all bands from 160 metres to 70cm., (where, incidentally, there is the first RTTY repeater). FSK is the

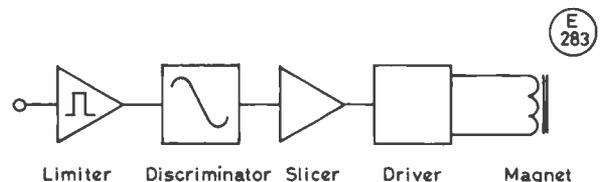


Fig. 2 BLOCK SCHEMATIC

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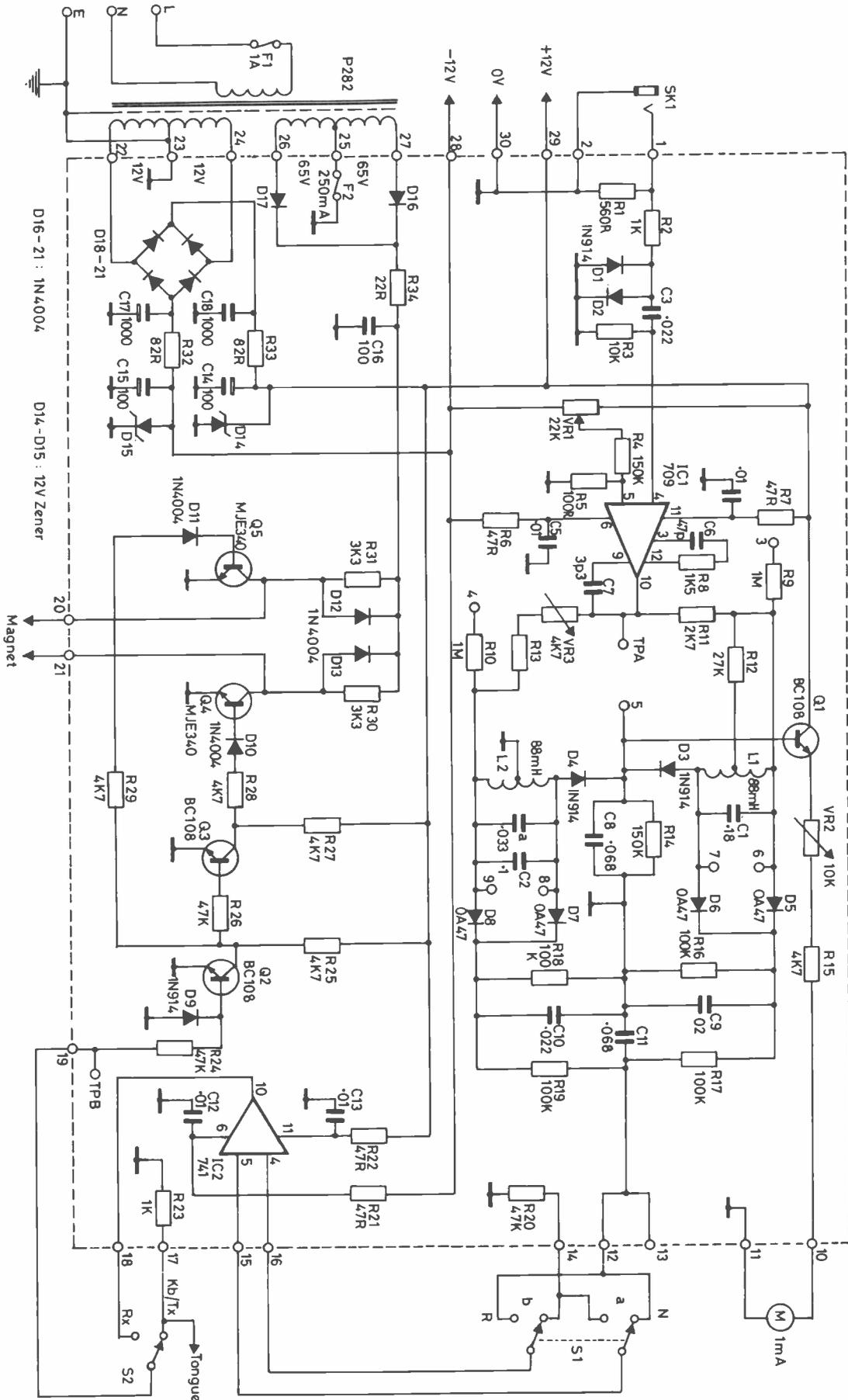


Fig. 3 TU CIRCUIT DIAGRAM

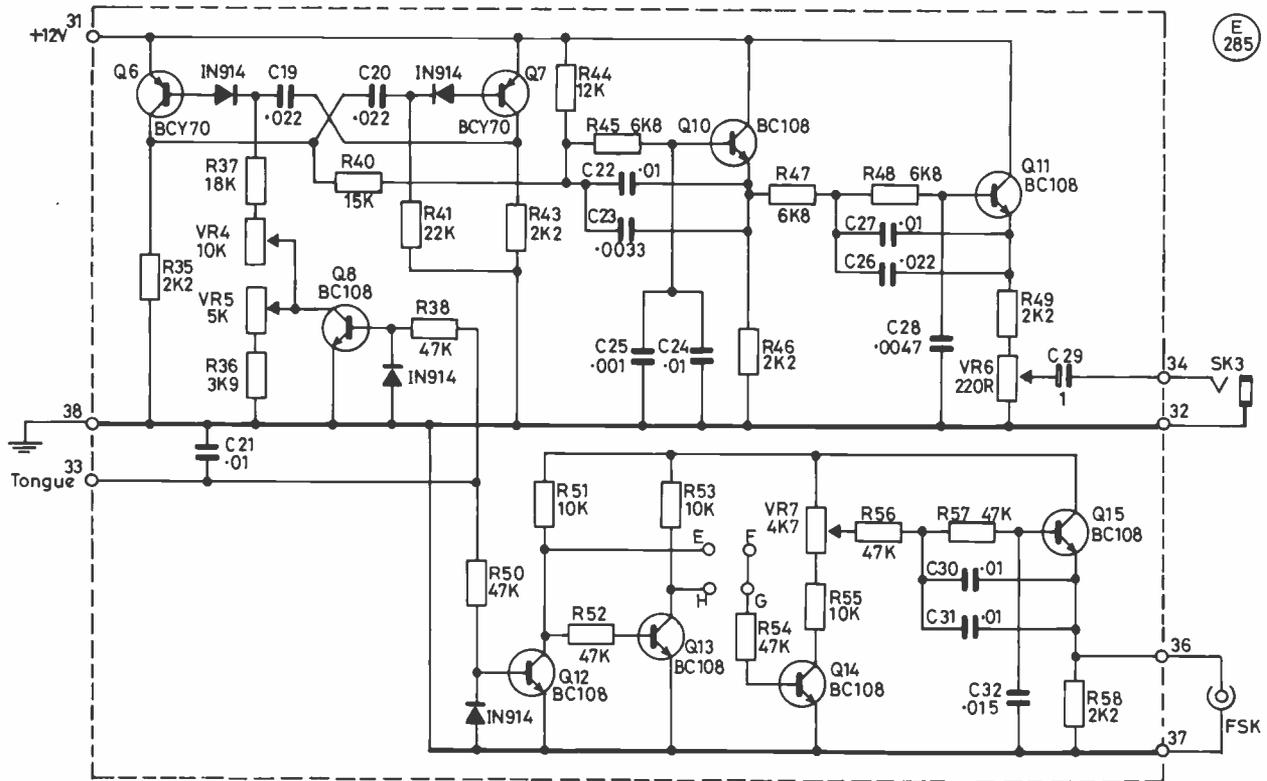


Fig. 4 FSK/AFSK BOARD CIRCUITS

only mode used on the HF bands, but both FSK and AFSK are used at VHF. RTTY is to be found in the top 20 kHz of the CW sub-bands on HF, the two most used frequencies being 3590 and 14090 kHz. On VHF 144.6 MHz for FSK and 145.3 MHz for AFSK are the two most active frequencies.

The first thing to do if you are interested in ways of using your amateur radio equipment other than just for talking, is to join the British Amateur Radio Teleprinter Group, known to all members as 'BARTG'. BARTG exists to help amateurs, and any problem that you run into will certainly have been encountered by someone else, and of more interest to you, has probably been solved. In addition to this, PCB's for the 'ST-5' mentioned below, can be obtained at members' prices, together with some specialist components required for it. The yearly membership fee is £5.00 at the time of going to press, so write to the Membership Secretary, John Beedie, G6MOK, 161 Tudor Road, Hayes, Middlesex, UB3 2QG, for particulars.

In order to receive RTTY signals it is necessary to pass them through a MODEM or Terminal Unit. By far the most popular one used by amateurs is the ST-5 and a block schematic of it is shown in Fig. 2. The circuit itself is shown in Fig. 3. If you are going to transmit as well as receive, then you will require an Audio Oscillator to provide the tones. This is easily arranged, as BARTG provide the pair of PCB's (ST-5 and Audio Oscillator) for £7.25 to members. The signal from the Audio Oscillator is switched between 1445 and 1275 Hz by the teleprinter, and is fed into the microphone input of an HF SSB transmitter set at USB (upper sideband); this generates an FSK signal which is transmitted as RTTY. Similarly, feeding into an FM VHF rig you can generate an AFSK signal. This is probably the simplest way of getting started on RTTY, and does *not* involve any modifications to the transmitter. The circuit of the Audio Oscillator is shown in Fig. 4. High power and complicated antennas are not needed as the mode's narrow bandwidth gives it almost as long a range as Morse code. I would point out here that it is also *not* necessary to modify your receiver in order to copy RTTY, as the audio signal is taken from the loudspeaker or headphone socket and passed through the ST-5 or some other terminal unit, the output of which will

drive the magnets of the teleprinter. The ST-5 or some similar TU can be built for about £35.00 even if you had to buy all the parts new.

The teleprinter or video display unit, (because it is also possible to use one of the popular microcomputers to encode and decode the marks and spaces), is the heart of any RTTY station, since it generates the code from the keyboard and decodes the received signal into text. Amateurs today are using all sorts of machines from pre-war electro-mechanical teleprinters to the latest solid-state video units with built-in TU and switchable speeds and codes. But do not be discouraged if you are unable to afford these latest 'state of the art' pieces of gear. It is perfectly possible to get excellent reception and transmission using one of the older teleprinters. The stalwart of the British teleprinters used to be the Creed Model 7 range: 7B, 7E and 7E/RP (RP meaning 'with reperforator'). It is still possible to obtain one of these very good machines at a reasonable price, say about £20/£25, and they work extremely well. I had a 7E/RP with a 6S6 tape reader for many years, and when I disposed of it there appeared to be no sign of wear in the machine in spite of the fact that it was more or less in constant use every evening, and at weekends! However, since that time, the Post Office Model 15, or to give it the correct Creed model number, the Creed 444, has become available. This is a very nice machine. The only thing about it is that it runs at 50 bauds, and in order to receive amateurs, particularly on the HF bands it is necessary to change a gear to make it run at 45.45 bauds; however, reverting to my mention of BARTG, this problem can be overcome through the Group, as Stuart Dodson, G3PPD, Chairman of BARTG, can supply the gear at £9.25 including packing and postage (price correct at time of going to press). For those operators who are unable to accommodate a teleprinter because of space or the noise, the video display unit offers an attractive alternative since the text is displayed silently on a television screen.

Recapping, to start off the equipment required to operate RTTY can be very simple. The cheapest approach is to buy a teleprinter for a few pounds, obtainable at one of the rallies, in particular the BARTG annual rally at Sandown Park. Then to

connect this to a home made Tone Generator or Audio Oscillator (for transmission) and a Terminal Unit for reception). BARTG publishes a very interesting book entitled "RTTY The Easy Way", which contains the full circuits and constructional details of the units mentioned above, together with full information on how to connect them together and set them up. As an alternative to this the home microcomputer can be used, together with a

television receiver for the video. Several trade suppliers provide suitable RTTY programs for the more popular machines.

I can only tell you that once you get bitten by the RTTY bug you will never leave it alone. So good luck and happy printing!

Acknowledgement is made to the British Amateur Radio Teleprinter Group for the drawings of the circuitry used in this article.

• • • SWL • • •

SHORT WAVE LISTENER FEATURE

By Justin Cooper

WHY should an SWL spend time and energy on a better aerial — and what, exactly, is a better aerial anyway?

Perhaps firstly, paradoxically, we should, look at the constraints on a decent aerial system. In essence it is the wrath of the neighbours and more directly the spouse-and-family. While the first one is a serious constraint on any effort in the line of planning-permission for a mast or tower, and the second a serious constraint in any hobby in which husband or wife has no interest, better aerials *can* be thought up if you are prepared to work at it.

For a start off, *the* time to have a first-class aerial is on a contest weekend when lots of rare countries and prefixes seem to crawl out of the woodwork. For a second thing, better aerials can be put up at will, regardless, if they are *temporary* — and if after use they disappear again, the locals will be far more willing to listen. Thirdly, don't fail to extract the maximum possible signal collected by your aerial — which implies the presence of an aerial matching unit and, where aerials having a ground connection are involved, lots of attention to the earth by way of buried radials, resonant counterpoises for each band that can be flung out of the shack window as needed, and the use of any chain-link fence or other metallic stuff in the garden. One amateur we know even includes the metal frame of his greenhouse! Obviously the improvements to the earth and the ATU can be permanent and no one can stop you. One should note that there is no one ATU circuit that will cope with *anything*. So if your present design doesn't cope on one band or other, try another circuit.

To return to the aerial proper. First of all you need a mast; if it is to go up or down quickly, you need to have prepared the ground — defining exactly the place for the heel of the mast, and putting in the 'dead men' and so forth at each guy point — three, at 120 degrees apart. Now, you can sit down with a calculator having trig functions and work out the length of the various guys; so long, of course as you have measured the length of the mast on the ground, allowing for the overlaps of the parts, and the securing devices at the end of each guy. Head off to the local sailing club, and see how they make boat masts stay up, then find out where they obtain the stays, shackles, and so forth. Next the raising; think out in detail exactly what to do, and what will cope with every emergency you can think of, before you ask for the help of the chaps you want for the erecting crew. And, on the day, be sure there is only one boss on the site. The committee system does not work on aerial parties.

Now, imagine you have a mast and at its top a pulley and halyard. If you have a little mast on your chimney with a TV aerial atop, you can have another pulley and halyard fitted up there.

Hang a string between them, and make up a wire three-element beam which you can suspend from it for the chosen band — the aerial hanging vertically down with its bottom end near the ground, and effect rotation by bits of string tied to the garden fence.

At the end of the weekend, drop the aerials. Then, with some help standing by, drop the mast. Retain two guys, use a ladder as an additional support, and sway it carefully down on to the ladder; if the ladder is a double-extension one you can now lower the extension, and you are all but home and dry! Next weekend it'll go up twice as easy. . . .!

Finally, the technical question as to what the advantage of the improvement in the aerial system does for you. Imagine a cabbage from the garden; the best leaves are inside. Our incoming signals are like that too — the relatively local ones that all can hear are the outer leaves of the cabbage, and the better DX, of which we only had glimpses before, is revealed as we strip the outer leaves off and cast them into the log. Wherever you may be, some parts of the world will be hard to hear; if you happen on a super opening you'll log them, but then not hear them for years. With an improved system, you will hear that 'hard' area on openings of lower degree (and therefore more often) and so there will be a better chance of your catching that elusive prefix. Of course, it's no good VR6TC, say, putting an S9 signal down your aerial if your receiver is off and you are digging the garden! But, given a good aerial system and the knowledge that a country is on at time X, there is every chance that you can put down the shovel for a few minutes, enter the shack and log VR6TC before returning to the spade refreshed!

The Mail

A. P. Lincoln (*Aldershot*) is still in regular contact with long standing SWL contributor Norman Jennings, an added mutual interest being that they both have Sharp home computers for which they are developing programs. On a different tack Peter has a great interest in SS/TV, and wonders why it is so rarely mentioned in *SWL*. Easy — no one says owt about it in the letters! Yet a third point in Peter's letter is on the subject of QSLs; often the report sent direct will net a QSL card through the Bureau system — so it pays to keep a few envelopes in the right places!

Several kind folk wrote in to answer the query from R. J. Swann last time around, and they all said he should write to Eddystone Radio Limited, Eddystone Works, Alvechurch Road, Birmingham B31 3PP (telephone 021-475 2231).

B. F. Hughes (Harvington) was away to the West Country as soon as he had posted his letter — “at least it makes a change from the four walls of the shack!”

One to write in answer to reader Swann's enquiry was *S. J. Peck (Ipswich)* who admits to answering calls to G4WSR. So far he has had some eleven QSOs on his son-in-law's station, on CW, but will soon have his own station set up at home; son-in-law being G3VZX. Incidentally it was interesting to note that G4WSR learned his Morse compulsorily, some forty years ago in the Royal Navy, and has been an active SWL for four years with an Eddystone 940 receiver. We'll bet that CW came back in minutes — once learned, never forgotten.

G. Carmichael (Lincoln) seems to have had a successful month on Ten, on which band he found TR8 and an XQ5; on other bands D44BC, HK0HEU, JT0EC, and some Africans were booked in. Gordon notes V85 as the new prefix for Brunei.

S. Clark (Birmingham) wants to know how an entry list should be made out. So long as we can run through it for checking purposes quickly, and it has enough detail on it, then frankly we don't mind. What is important is the presence of a good checking system at the *sender's* end — as well as here; there is nothing more time-consuming (and irritating!) than corrections sent with each entry and requiring to be cross-checked here in consequence!

J. Goodrick (Newport, I.o.W) seems to have partaken of the wormwood and the gall this month: firstly a very pointed attack on the people who answer a CQ DX call from a European station by the hundred — this sort of liddery is not in the slightest helped by the lack of operating practice sections in the RAE, of course. John then chuckles over the UA0 working a GW saying that the English contact was worth five points towards the RAEM Award — that must have pleased the GW no end, to be told he is in England! Finally the sting in the tail. What the blankety-blank use are these beacons on Ten — after all, if there's propagation to place 'X' as shown by a beacon, that's no good without a station in that area to work. . . . Fair enough, but the next statement should have been added: that this is the time for the transmitting types to wind up full power, turn the beam, and put out a CQ call. There are almost certainly others listening to that beacon, and one of them could surely be provoked into firing-up and returning the call.

There is an enormous amount that is unknown about propagation at HF, and we amateurs, recording our beacon reception from random sites all over the world, are the *only* ones who can clear up these gaps in our knowledge. A series report on a given beacon, over a period of weeks or months is an enormous addition to the data, and even the odd hearing reported adds to the collection — and we would all like to know just what *causes* these hearings so we could predict and use them.

It's been a traumatic few weeks for *E. B. Ward* in *Ruddington*. Loss of a very good friend and father-in-law was at least partly counterbalanced by the gaining of G4XSW. The rig is a TS-120V, but the erection of aeriels is a matter of concern, his daughter having now ditched the 'climbing' boy-friend; and there is the matter of a half-decent key to be obtained, too — none of the cheaper ones has a very happy feel to it. Barry has built a G2VF frame aerial and is very pleased with the results on it obtained so far; but he says his barge-board dipoles will have to go when the house is painted — we don't see why he shouldn't just paint the aeriels! Anyway, congratulations on the call after the long pull.

Conditions, says *H. M. Graham (Chesham)*, have been rather 'off' and in any case Maurice had an early holiday by way of a Greek island cruise. Ten was occasionally noted to be open in a north-south direction, taking in some African and South American talent, and of course there were as always the VHF-style openings to nearer Europe.

N. Fox (Wakefield) has had his SWL-ing somewhat disrupted by the arrival of a new baby in the house; but an aerial-maintenance exercise and the addition of a new aerial some 60 metres long will no doubt prove their value before long.

Now to *P. A. Cardwell (Sheffield)*; our note last time about the March issue carrying the last reprint of the HPX Rules was a bit

ANNUAL HPX LADDER

Starting date, January 1, 1984

SWL	PREFIXES		
A. J. Chapman (Newark)	473	P. A. Cardwell (Sheffield)	333
A. Woods (Norwich)	395	N. Fox (Wakefield)	315
J. Routledge (Hartlepool)	378	M. R. Warburton (Leicester)	289
C. Burrells (Stevenage)	352		

Minimum of 200 Prefixes to have been heard since January 1, 1984 in accordance with HPX Rules — see March issue p. 25. At score 500, transfer to the All-Time Table is automatic.

annoying as he hadn't been able to get a copy. However, we have plenty of spare ones at the office at Welwyn in exchange for the usual small bag of gold. Anyway, reader Cardwell sent us a list of nearly 800 stations heard, from which we extract some 333 prefixes — the only deletion was the 'BY40WAZ' who must have been a sick joker. This loss was cancelled by giving him back AM2FS after protest from other readers at J. C.'s forgetfulness. On the question of a country/prefix list, we stopped publishing one when the Geoff Watts' regular offering appeared — see his advertisement in any issue of *Short Wave Magazine*.

J. Chapman (Newark) adds another 60 to his score, with some notable aid from the WPX contest, which turned up such as CK3UOT from Toronto and R1Z for the shortest call yet heard. Three characters is about the bottom limit for a call — one thinks also of JY1 and M1C.

E. M. Gauci (Sliema, Malta) has worked very hard to get over the 1000 mark so quickly, but now has the hard bit to come! On a different tack, Eddie wants to know about the business of awards and QSL cards. For the major awards, such as DXCC, WAZ, and so on, the QSLs are a must. For some of the minor ones, it is sufficient to send a certified log copy, as checked by a couple of the officers of the local club. On a 'heard' basis the rules won't change much: the worthwhile awards need the cards. What one has to do, therefore, is to get the cards in; and this is a matter of dollar bills or IRCs, return envelopes and, most important, keeping a supply of envelopes at the chosen QSL Bureau for the ones which, despite everything, turn up in the Bureau file. In general terms, over a period of years, one can expect to find about two-thirds of the outgoing cards to net replies, for a transmitter. For an SWL to reach that figure is not so easy, involving a good report first, covering letter with some personal data, and all the rest of it.

Worked All Britain

P. Oliver (Paisley) has tripped over the WAB net and wonders what it's all about. Originally it was the idea of the Cannock Chase club, and in particular G3ABG. You could buy the WAB book and fill in the various squares as you worked them (the book was quite a handy thing to have in the car too, as a gazetteer!) and then when you had a sufficiency of the squares nailed down you applied for the award in exchange for a small sum, with the proceeds after expenses being split between RSGB and RAIBC. It grew explosively and overtaxed the local lads somewhat, so that eventually others took over the running of it. Basically the squares are the ones of the *AA Book*; thus Hugh Town in the Isles of Scilly is in SV00, while the *Short Wave Magazine* office is in TL21 square. Where a square is divided by a county boundary, then it can be worked from each county; for example most of TL52 is in Essex but there is a small enclave in Hertfordshire, so in this case you want to know both the square *and* the county in which the station is. A trap here is that sometimes the postal address county and the actual county differ — this happens in TL52 where the chap can live in Essex but have his postal address end with Herts. Doubtless H. M. Graham has more details and might pass on the necessary next time around.

HPX LADDER (All Time Post War))

SWL	PREFIXES		
	<i>PHONE ONLY</i>		
B. Hughes (Harvington)	2827	G. Shipton (Rye)	751
Mrs. R. Smith (Nuneaton)	2388	J. Heath (St. Ives, Hunts)	741
E. W. Robinson (Bury St. Edmunds)	2287	B. Patchett (Sheffield)	703
H. M. Graham (Chesham)	1702	R. Wooden (Staines)	667
Mrs. T Parry (Blackpool)	1560	T. Morris (Headingley)	626
M. Rodgers (Harwood)	1425	A. J. Hall (Alvaston)	624
M. G. Toms (Rayleigh)	1418	A. Pilkington (Chesterfield)	534
N. E. Jennings (Rye)	1354	S. J. Bedford (Wakefield)	522
N. Askew (Coventry)	1235		
R. Fox (Northampton)	1230	<i>CW ONLY</i>	
D. P. Shapiro (Manchester)	1200	E. B. Ward (Ruddington)	1848
N. Henbrey (Northiam)	1174	J. Goodrick (I.o.W)	1635
E. M. Gauci (Sliema, Malta)	1159	A. F. Roberts (Kidderminster)	1315
R. Everitt (Bluntisham)	1143	R. Fox (Northampton)	433
S. Baker (Cwmbran)	924		
P. Lincoln (Aldershot)	879	<i>RTTY ONLY</i>	
P. Oliver (Paisley)	867	N. E. Jennings (Rye)	583
I. F. Thorpe (Bracknell)	813	P. Lincoln (Aldershot)	448
G. A. Carmichael (Lincoln)	761	N. Henbrey (Northiam)	267
		J. Routledge (Hartlepool)	254

Minimum score for an entry: 500 for Phone, 200 for CW or RTTY. Listings to be in accordance with HPX Rules. see p. 25, March issue.

Now to *G. Shipton (Rye)* who continues his steady rise up the Ladder — his Datong AD270 active aerial does seem to find them.

J. Routledge (Hartlepool) has added to his RTTY entry a starter for the 1984 HPX Ladder; he only listens at the weekends, he says, or he would have greater totals — work is the curse of the listening classes!

The *Bakers of Cwmbran* — that is father Paul, GW6VZW, and seven-year-old Stephen who does the actual listening — have made a goodly rise in the scoring, and in addition they have been pleased to receive QSL cards from Y11BGD and XU1SS, both of whom have been castigated as non-repliers by various people.

The Eddystone 730/4 of *R. Wooden (Staines)* has been endowed with a new 5Z4 which cured the immediate problem, but then after a few days it started to develop a serious case of the wobbles, making it all but impossible to hold an SSB Phone signal. There are two likely causes for this; one is that the new rectifier is over-working a tired local oscillator valve, or that there is dirt in the vanes of the tuning gang where the sliding contact to the rotating vanes is made. The latter probably only requires a squirt of switch-cleaner, while the former may only be the valve but could possibly be a fault on the circuit of the local oscillator or the mixer, though much less likely. It is even possible that the BFO is at fault — again the same answers as the LO. However this case is, in view of the improvement on lower frequencies, very unlikely.

N. Jennings (Rye) was upset about our forgetting that AM was a prefix in use by the Spaniards for the World Cup Football. Football, it must be admitted, is a matter that your J. C. is not well up in — he has not yet fathomed out the function of the ball at a ceremony in which those on the grass kiss each other while those on the terraces throw toilet-rolls and hit each other with bottles! Turning to Norman's second letter, and scores, we note various points of interest; firstly that he has been talking to Geoff Watts over the phone and hears that Geoff has a new edition of his Russian oblast list in preparation. Norman has also noted those funny looking long calls at the end of the G4 and G6 listings in the new RSGB *Call Book*. It took us all some time to work out, but if you recall that the G5+3 reciprocal calls are eventually going to be turned into G4/. . . calls, all becomes clear! For example, Norman's G6CTICJU — this should have appeared as G6/CTICJU. Thanks for bringing the point up, Norman.

D. A. Whitaker (Harrogate) sends us the results of the White

Rose Club SWL contest. In the Phone section he was himself second, to R. Smit of the Netherlands, with R. A. Treacher fourth and N. Henbrey fifth, In the CW listings, we see J. Goodrick lying second to D. C. Piccimillo, both of U.K., while that famous old-timer SWL, E. Trebilcock in VH3, was fifth.

Just a list from *N. Askew (Coventry)* — obviously one of the strong silent types!

B. Patchett (Sheffield) is going on holiday in the Isle of Wight soon, and will take his two-metre FM gear, to see if there is a bit more activity than he has heard from home!

I. R. Graham (Ulverston, Cumbria) is in the process of restoring an old HRO, with some help and advice from local G4SPW, in between bouts of study for RAE and SWL on the HA-800 at present gracing the shack.

Turning now to *E. W. Robinson (Bury St. Edmunds)* we see a further 37 to be added to the total, mainly due to the recent re-arrangement of the Russian call signs. An article on these changes will be appearing in *S.W.M.* shortly.

M. R. Warburton (Leicester) is still making more use of the receiver than Junior — which is not unexpected, as far as old J. C. goes! — and so has quite a collection of prefixes with which to demonstrate that the old skills of twenty years ago have not been lost.

Now we come to the letter from *C. Burrells (Stevenage)* who adds himself to those who want a monthly piece; meantime he has a 'nil' report to hold his place, while the gardening is cleared and the second wind regained.

Mrs. R. Smith (Nuneaton) writes to add a few more, but adds that she has been having some problems on 21 MHz, which she suspects may be aerial based — and if such be the case she will be getting things put right in July when the invaluable aerial-erecting son is next home.

Finally, *N. Henbrey (Northiam)* who has been active in SWL for many years now; Norman is at the moment sustaining his interest with RTTY, but when the TV used as a monitor went on the blink he did make a foray on the Phone bands; the result, of course, being an increase in both scores.

Finish Lines

That's the lot for another SWL — and a more interesting pile of letters we haven't had for a long time. Keep up the good work! Deadline for your letters for next time is July 19th latest, addressed to your scribe, "SWL" SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ.



The Digimax Model D1200, shown above, is a compact, high-stability 50 Hz to 1.2 GHz frequency counter with several advanced features. The 0.1 p.p.m. 10 MHz oven is of special low current consumption design, and a built-in audio multiplier allows resolutions of 0.001 Hz to be achieved; operation is mains/battery. For full details contact Aspen Electronics Ltd., 2 Kildare Close, Eastcote, Ruislip, Middlesex HA4 9UR. (Tel: 01-868 1188, Telex: 8812727).

Basics for the SWL and R.A.E. Candidate, Part 16

SUGAR-COATED THEORY

WE come now to transmitters, and there are indeed many things to talk about. Firstly, although the modern transmitter (transceiver) has much to commend it, there is no doubt that one can get on the air without all the 'bells and whistles' and have a hell of a lot of fun! In fact most of those same bells and whistles are in the nature of taking a sledge-hammer to crack a nut. We hope the next few parts of this saga will encourage those who haven't much cash to go on the scrounge, spend a few coppers on small bits, and go get on the air.

The requirements are simple. We need to have enough RF power available, on the right frequency, and of good stability, either CW or SSB; and, of course the SSB or the CW must be of reasonable quality.

Let us therefore, decide just what we want our home-brew rig to do, taking first the CW case. We require a VFO, one or more buffer amplifiers to isolate the VFO from the output end of things, a multiplier to add further isolation, and a suitable PA stage. The power output need be no more than is necessary to lay down a reasonable signal in Australia at a time when the band is open to that country. Some twenty-five to fifty watts of RF is plenty.

The VFO

There are just about as many VFO circuits (see Fig. 1) as fleas on a pi-dog's back; and all of them can be made to give an adequately stable signal provided the construction is done with care. The difference between Hartley, Clapp, Vackar or whatever is there, but is minimal compared with the difference between the well-built and the badly-built VFO using a given circuit. So — perhaps it is as well to consider the construction first.

Here we may as well start with the tuning dial and drive. This needs to be the best that can be organised — an Eddystone 898 drive, if one can be obtained, is fine, but a Japanese slow-motion drive will serve if it is given a chance. Behind the drive there will be a tuning capacitor, and this needs to be the best that can be found. Check that it is of brass construction if possible — aluminium is

not a good material for a VFO capacitor, as it seems to have a larger coefficient of expansion and so will tend to drift more with changes of temperature; and drift we want just like a hole in the head.

It goes without saying that a VFO in 1984 will be solid-state, if only to keep the temperature problems to a minimum; and it is suggested that all the electrical components be mounted on a scrap of PCB or even Veroboard, and the board itself mounted with the aid of a soldering-iron to the body of the capacitor. The whole assembly of the VFO should be contained in a small die-cast box, with decoupled leads coming out of the back for the stabilised DC rail, the capacitor shaft poking out of the front, and the RF output to the buffer led out of a tiny hole in the side.

Lash this lot together, feed it DC from a battery, get it going, listen to the signal from it on a receiver, and see that it is 'in the band'. It is a good idea to check that the signal you think is 'in the band' also appears at twice the frequency and half the frequency — that way, you won't be fooled by your superhet's image responses: very mortifying to find you've tuned it all up nicely on the wrong frequency. Now tap it on the bench and see if it wobbles. If it does, find out why — almost certainly the problem is mechanical. Now sit an unconnected key on the bench and bash Morse out on it, and see if the VFO wobbles — you may find at some sending speed you can set up a mechanical resonance effect which will make an apparently good VFO into a wobbler. Let the receiver have a 24-hour warm-up, and then check the stability of the VFO from cold, over a period of an hour. It should settle down in ten minutes and then 'stay put' to within, say, 100 Hz per hour.

Get it right at this stage, and then, when you are satisfied (and not before), put it to one side while you build the next bit.

Buffer-Multipliers

This, *mes amis*, is where many a good idea goes down the pan. A buffer should do just as its name implies — provide isolation. You may already have one or more buffers built into your VFO

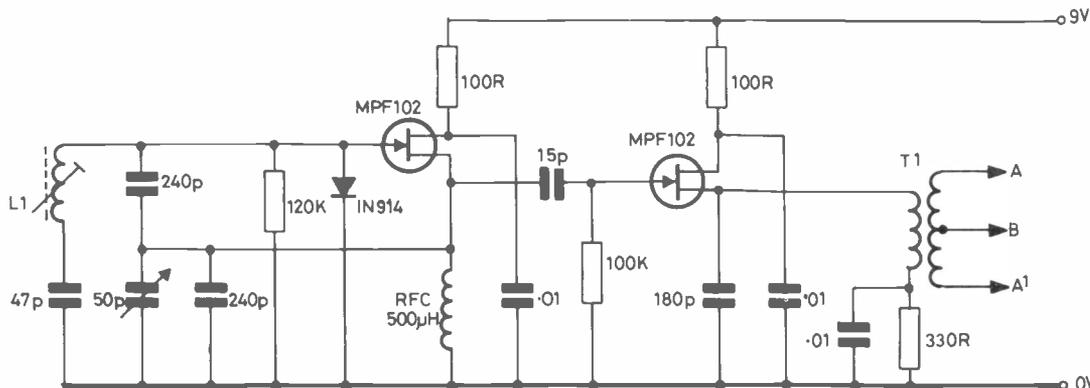


Fig. 1 A VFO CIRCUIT

Fig. 1. If L1 is a variable 5-12 µH coil, this VFO would 'perk' around 10.1 MHz, for that band — or 10.5 MHz, to be doubled to 21 MHz. T1 could be push-pull, to feed a doubler stage, or single-ended, when 'A' would be the centre of a coaxial socket and 'B' go to ground. For doubler stage, see Fig. 2. T1 primary is 17 turns, secondary 10 turns centre-tapped, on Amidon T50-6 core.

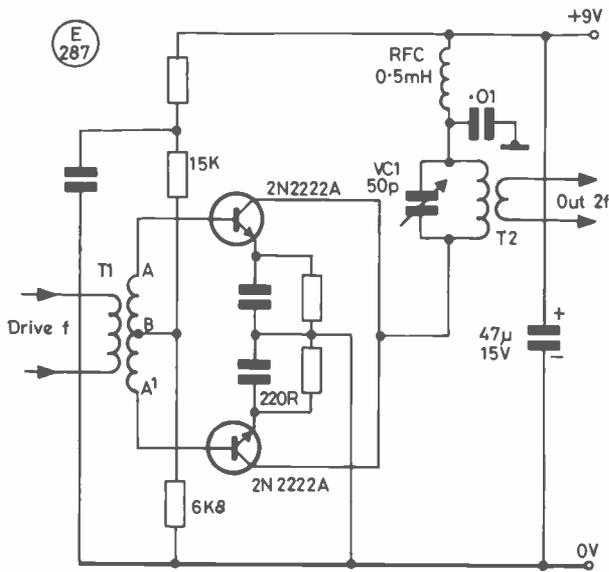


Fig. 2a PUSH-PUSH DOUBLER

Fig. 2a. T1 could be as given for Fig. 1; T2 would then have a 17-turn primary and 4-5 turn secondary on an Amidon T50-6 core to drive another 2N2222A, as a driver stage if 21 MHz output were desired.

circuit, just put aside. The one outside the box must increase the isolation — and this means none of the RF at its output should be able to ‘see’ the lead from the VFO output to the buffer input. You may have to do some clever routing tricks, and screened cable (preferably thin coax) goes without saying. Mount the VFO and the buffer into the case you are going to use for the transmitter. Now power up the VFO again and see it continues to behave as before — if it doesn't you may have put mechanical stress on the case or the VFO box, or on the VFO drive shaft. Rectify as necessary. Now add power to the buffer amplifier, and check the VFO doesn't change frequency as you tune the buffer coils through resonance. If it does, your buffer isn't buffering properly. Put it right; fiddle with it until it is.

Once this is achieved, you can go on to the multiplier; and this is as good a time as any to consider frequency multiplication techniques. Back in the ‘Good Old Days’ the recipe was ‘take on Class-C stage, increase the grid bias by a factor of two, increase the drive likewise, and extract the multiplied output at the anode

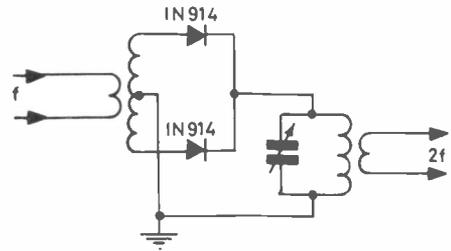


Fig. 2b A DIODE MULTIPLIER

by way of a tuned circuit.” The method worked well enough, but the solid-state devices of today don't like such treatment. We can achieve harmonic generation in solid-state in other ways though, and — which is probably an advantage — at lower relative power level. We can use the ‘push-push’ doubler if we want to use discrete transistors, or we can work various fiddles of doubtful morality with digital ICs; or we can go all simple and just use a fast diode, or, better, a pair of them.

The push-push doubler arrangement is shown in Fig. 2a, and it will be seen that in essence one feeds the input in push-pull and the output in parallel using a couple of general-purpose silicon transistors such as 2N2222A or similar. The method works very well with valve or transistor and does not deserve the neglect which has been its lot for 30 years or more. Fig. 2b shows the simplest way of multiplying with a diode; not so efficient but simpler, so your scribe suggests we redress the balance in favour of the push-push arrangement, and reduce the power required to effect multiplication.

Of course, if you want a multi-band rig, you can have a series of such multipliers, and switch them in as you increase the band frequency. However, in multiplying the frequency you also multiply by the same factor the drift in your VFO — if it drifts 100 Hz per hour at 7 MHz, the transmitter on 28 MHz will have 400 Hz of drift; which means you need to work much harder on the VFO mechanics. But — it can be done. On the whole, though, the writer doesn't recommend more than two bands in a homebrew rig.

The object of the exercise so far, then, has been to get on the final frequency and with isolation from the VFO, and good frequency stability. From the point of view of possible spurious outputs, it is good to keep the power level to this point nice and low.

More Modern Approach

Though as old as the superhet receiver! One snag of the arrangement outlined above is that, as we have said, the drift is

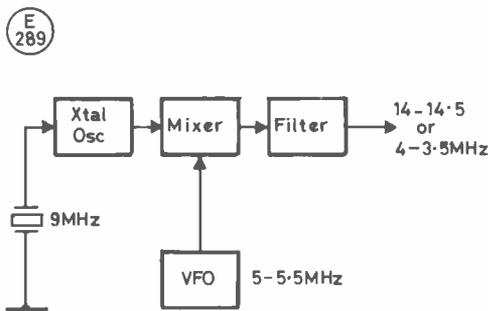


Fig. 3a A MIXER VFO BLOCK DIAGRAM

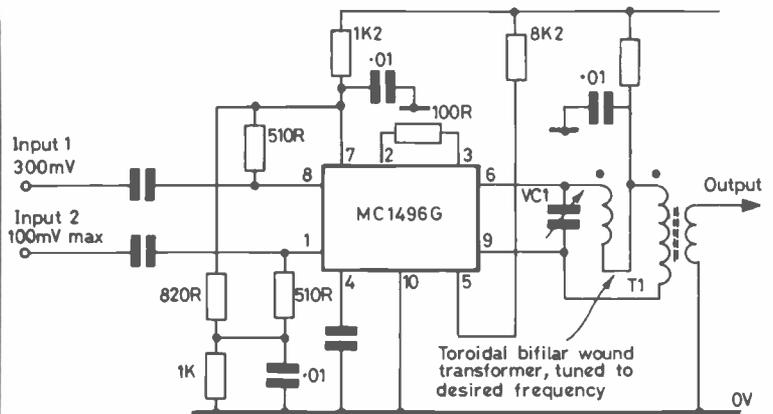


Fig. 3b MC1496G IC MIXER

In Fig. 3b we see a typical IC double-balanced mixer. For best results input 2 should be considerably less than the 100mV specified — 20dB lower in a receiver design. Using the 9 MHz and 5.0-5.5 MHz of Fig. 3a ‘spurs’ will be noted at 13, 15 and 16 MHz which may need trapping out when the filter is tuned to 14 MHz.

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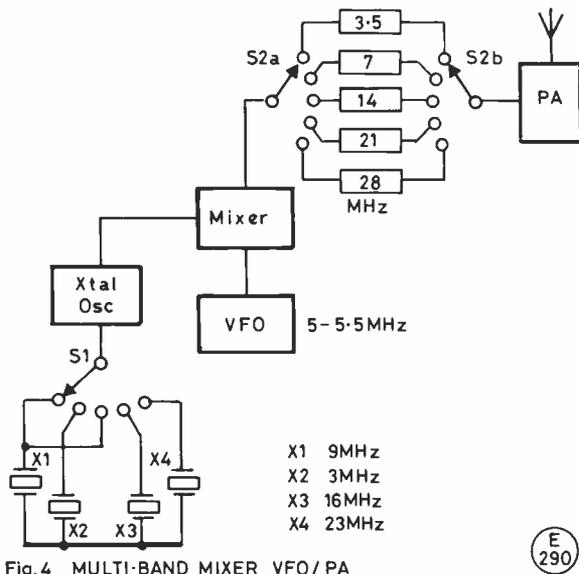


Fig. 4 MULTI-BAND MIXER VFO/PA

Fig. 4. This shows the way a mixer-VFO can cover several bands. In practice, the selection of crystal-oscillator frequencies is a matter of choosing a combination that, whilst 'hitting' the bands, will cause least trouble with unwanted outputs near the wanted frequency. Hence the odd frequencies on some commercial rigs! Circuit details for the PA and filter will appear in a later part.

multiplied up as well as the output frequency; the second snag is that when you go to receive you have to switch the VFO off or it will swamp the incoming signal — unless your screening is not far short of pure metalworking genius! One solution proposed is to kick the VFO up the band 100 kHz or so when you go to receive and just let it run. An implementation of this scheme is shown in the ARRL's *Solid State Design for the Radio Amateur* — but we still don't really go much on the idea.

The old-fashioned idea of our youth, therefore, was to turn off the VFO and live with the drift that resulted — after all, we did the same thing to the receiver, effectively, when we transmitted, so the receiver also had a drift problem. It worked all right on CW and AM, but the wide acceptance of SSB changed the picture a bit, and drift of that sort was out.

The proper solution was always to take two oscillators — one crystal and the other a VFO — such that the sum or difference frequency came out on the band, and feed these into a mixer. The output of the mixer was on the final frequency, so to disable the mixer would remove the signal-frequency component which thus would no longer annoy the receiver — and, more important in the SSB context, there would be no multiplication of the drift by a string of multipliers to get to the final frequency. You could in fact select the chosen band by swapping the 'rock' in the crystal oscillator. See Fig. 3a, for a block diagram, and recall that by now you have pretty well all the elements you require to turn the block diagram into a circuit.

Final Amplifier

Once you are at the final frequency you need to increase the power to whatever level you have decided upon. In addition, you want to improve the rejection of any unwanted frequencies you may have accidentally generated (harmonics, mixer unwanted products, *spuri*, etc.) and you want to be able to turn the output on and off in accordance with the Morse code. So — perhaps we'd better note the requirements in a little more detail.

For us to send Morse we want to mute the receiver whenever the carrier is on. For full break-in, we want the receiver alive at all times when the transmitter key is up; but we may settle for a key-

controlled system with a log, so we can only listen between words or even when we deliberately pause in our sending — like VOX on SSB in fact. Indeed, we could go even further along this route and have a mechanical or foot-operated switch to control change-over, and thus go to transmit for a complete 'over' at a time. Full break-in is widely claimed to be the bees knees — but in QRM conditions it can give you some surprises and confuse you, especially if you are a bit tired. The semi-break-in facility — "this dubious facility" in the words of the RSGB *Radio Communication Handbook* — has a lot going for it if you can adjust the delay in changeover to suit yourself; and a manual change-over system is easy to implement and gives you the chance to really concentrate on the quality of your outgoing signal. But of course, all the systems have their diehard adherents.

When the key goes down, then, we want to mute the receiver, preferably just enough to enable us to continue to hear our outgoing signal at an acceptable level, and obtain RF output to the aerial; when the key is released the reverse should happen. The pulses of RF should, when listened to on a distant receiver, neither click, nor thump, nor chirp.

Thus, if we looked at the output of a transmitter sending a string of dots that sounded good, we would find that (a) the leading and trailing edges of each pulse would be rounded a little at top and bottom, rather than truly square, (b) the flat top of the pulse would remain parallel to the base line within reason, rather than rising to a peak near the start and trailing away as the pulse goes on; and (c) we would discover that the frequency doesn't change to the ear, and is only discernible on the 'scope trace. If our oscilloscope has a sufficiently fast 'Y' amplifier, we could look for the presence of a fuzz on the pulse, like grass, and we would know that the 'grass' signified parasitic oscillation at some widely different frequency to the one desired. Apart from reducing the total output left on the wanted frequency, the parasitic's oscillation can destroy the stage, and will usually be the cause of incurable (by standard methods) key-clicks, or lousy speech quality when we try to use the stage on SSB; and it may only be intermittent on SSB as it is the sharp transient spike, as of a key coming down, which sets it off. Ergo, the way to start testing a SSB output stage is to *key* it!

Finally, in this little list of problems to be watched for, all our first tests will, clearly, be run on the bench and into a suitable non-radiating load. Once you think you have got it all hunky-dory, it's as well to try it all out on the band. Wait, if you can, until the band is dead, and as well as checking yourself, get a local to run over the signal too — he should be far enough away that you don't block his receiver, though.

We have already remarked that we would prefer to get to the final frequency at a low level; but that implies we need more amplification to get to the final power level, which equates to more chance of instability — or more care in the making. There is a trade-off here, but in general we still prefer to reach the final frequency at low level.

Tuning

Modern commercially-built amateur rigs often feature no-tune outputs. This is, in the writer's opinion, bad engineering practice for the following reasons: firstly, the tuned circuits deleted would have helped in reducing the level of spurious outputs and, secondly they would have helped with the important matter of keeping TVI down. Since it's easier to get a tuned stage going anyway, there's no need for us to fall into the same silly trap, is there?

Fig. 4 gives us a block diagram of the sort of transmitter for CW which we have envisaged, whether we go the VFO-multiplier-PA stage, or mix to the final stage.

Next time, we'll modify these ideas to take us to SSB, and discuss the special problems of building an SSB transmitter; and it should be noted that this part and the next need to be read in conjunction, if you are interested in the mixer-VFO approach.

to be continued

Maidenhead Revisited

N.A.S. FITCH, G3FPK

THE author's article on Maidenhead Squares in the January, 1984 issue of *Short Wave Magazine* has resulted in some queries about its compatibility with the familiar European QTH Locator Squares system, hence this follow-up article. To re-cap, the Maidenhead, or World, Locator system is a unique one in which any relatively small geographical area on the Earth's surface can be defined using just six characters. It is sufficiently accurate for amateur radio purposes and much more convenient than exchanging conventional longitude and latitude details.

One of the decisions taken at Cefalu in Sicily during the IARU Region 1 Conference in April was to adopt the Maidenhead Squares system from January 1, 1985, so presumably contest operators will exchange IO91WH instead of ZL60j type information.

It seems that some readers did not appreciate that the so-called "Squares" in the Maidenhead system are perfectly compatible with the Primary Squares of the QTH Locator system. Both are two degrees east/west and one degree north/south so the first two letters of the QTHL code can be readily translated into the first four characters of the Maidenhead code. Our QTH Century Club award and the Square Table in "VHF Bands" are based upon these 2° × 1° squares, so both will continue unaffected by the change.

Tabular Presentation

To assist readers in translating from QTHL to Maidenhead codes tables have been prepared and these show the relationship between the familiar first two letters of QTHL and the first four Maidenhead characters. Their use is best illustrated by a couple of examples.

QTHL 1st letter	20°W				0°				20°E				40°E		
	OP	QR	ST	UV	VW	XY	Z	A	B	C	D	E	F	G	H
1st character	HH	II	JJ	KK	LL	MM	NN	OO	PP	QQ	RR	SS	TT	UU	VV
3rd character	89	01	23	45	67	89	01	23	45	67	89	01	23	45	67

Table 1. Longitude codes.

1) To find the Maidenhead Square equivalent to "YM" which covers England and Wales.

From Table 1, look along the top row for letter "Y". In the second row is found the letter "I" and in the third, figure "8" which give the first and third characters, corresponding to the longitude information. Similarly from Table 2, against the letter "M" are found the letter "O" and figure "2" for the second and fourth characters corresponding to the latitude information. This gives the Maidenhead "Square" — the 2° × 1° part — of I082.

2) To find the Maidenhead Square equivalent to "CG" in France.

From Table 1, under "C" are found "J" and "2" giving the first and third characters, while from Table 2, under "G" are found "N" and "6" for the second and fourth characters. So the Maidenhead equivalent of "CG" is JN26.

Reverse Use

Obviously, the tables can be used in reverse to work out the European QTHL from the Maidenhead Square, this being of use later on in record checking once the new system becomes established. In this case, there is no confusion since the Maidenhead locator is unique.

Computer Programs

These days, it seems the fashion to write computer programs for everything, so not unexpectedly, such programs have appeared to translate QTHL to Maidenhead. In *Dubus Informationen* issue 1/84, Claus Neie, DL7QY, published three relevant programs in "common BASIC" the first of which does the conversion which the above tables achieve. His other programs calculate the distances between any two Maidenhead locators, and the locator from longitude and latitude information. These three programs were tried out by Bryan Petifer, G8DTQ, on his *BBC Model B* computer and, with a few minor modifications to suit BBC syntax, worked.

70°N	O	P 9	50°N	J	N 9
	C	P 8		I	N 8
	B	P 7		H	N 7
	A	P 6		G	N 6
	Z	P 5		F	N 5
	Y	P 4		E	N 4
	X	P 3		O	N 3
	W	P 2		C	N 2
	V	P 1		B	N 1
	U	P 0		A	N 0
60°N	T	O 9	40°N	Z	M 9
	S	O 8		Y	M 8
	R	O 7		X	M 7
	Q	O 6		W	M 6
	P	O 5		V	M 5
	O	O 4		U	M 4
	N	O 3		T	M 3
	M	O 2		S	M 2
	L	O 1		R	M 1
	K	O 0		Q	M 0
50°N			30°N	P	L 9
				O	L 8

Table 2. Latitude codes. First column is the second letter of the QTH Locator. Second column is the second character of the Maidenhead locator and the third column gives the fourth character. See text for full explanation.

Ambiguities

Because the QTHL system repeats, the tables can give different answers for certain squares. For example, consider "SO". Following the procedure outlined in the two previous examples, "SO" could be IL28, IO24, KL88 and KO84. To resolve this ambiguity, latitude and longitude figures have been added to the tables. For instance, EA8XS in the Canary Islands is in SO square off the African coast, approximately 15°W and 28½°N, so would be in IL28 and not KO84 in Russia.

Ian Masters, G4CFF, sent two BASIC programs in the standard ASCII code, one to work out the Maidenhead Locator from latitude and longitude, the other to accomplish the opposite. George Sassoon, G3JZK, wrote a very "user-friendly", detailed and all-embracing program which included printing the azimuth between locators. Although written for his *Sharp PC-3201* computer, he suggests it is easily adaptable for any computer using BASIC language. The author has also compiled several programs for the *Sinclair ZX-81*, 16K version, which are quite user-friendly, with error checking in case impossible information is keyed in. However, all these exercises take up a lot of space and almost invariably contain a few printing errors which later have to be corrected, therefore it is not proposed to publish them here.

A Flexible PLL/Tone-Decoder Project, Part 2

WITH EXTENSION AS A SIMPLE CW FILTER

G. W. GOODRICH, G4NLA

THE input from the receiver is taken *via* the by-pass relay either directly to the output of the system, or to the input rail of the mother-board. If a CW station present has the same frequency as the reference oscillator then the lock detect rail (2) will switch in sympathy with the received Morse. The lock detect rail is used to control a simple transistor switch (side-tone switch in the diagram). This action causes the free running audio oscillator to be switched at the output of this module. The output of the switch is fed back to the input of the spare op-amp. on the mother-board. The output of the op-amp. is taken to one input of the mixer module, the other input to the mixer being pulled from the post-filter signal rail. The 'Pan' control allows the operator to listen to either the incoming CW signal, or to the switched side-tone. The 'Pan' control can also be used in such a way that both the incoming CW signal and the switched side-tone can be heard together, thus making the tuning of the reference oscillator easier.

The output of the mixer is now fed to the input of a 1-watt audio power amplifier and thence on to the control relay.

Each of the modules referred to above will be described individually, both in terms of the construction and circuit details. As each module is completed it should be tested with the mother-board as described. This will provide a simple construction/testing procedure and should ensure that the project is completed with the minimum of late nights!

Mixer Board

The circuit diagram and Veroboard layout for the mixer board are shown in Fig. 7. The power supply and bias for the 741 operational amplifier used on this board are all taken from the mother board.

The power supply and bias lines having been described, lets look at the operation of the mixer itself. The op-amp. (IC6) is used as a simple mixer. It has two inputs: one from the switched side-tone (that appears at the spare op-amps. output on the mother-board) and the other from the output of the 800 Hz active filter on the mother-board.

The relative levels of these signals appearing at the output of the mixer (rail 8) is controlled by RV2a and RV2b, RV2 being a dual gang linear law pot; this circuit is both simple and effective.

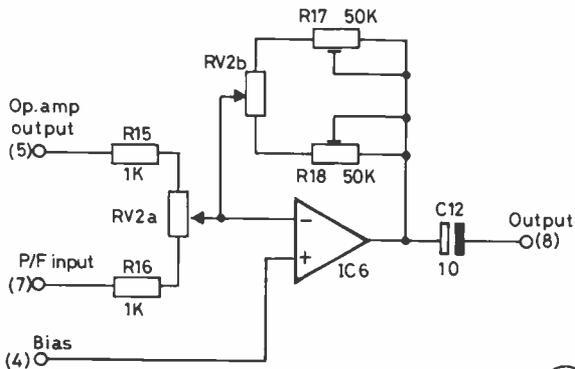


Fig. 7a CW FILTER MIXER CIRCUIT

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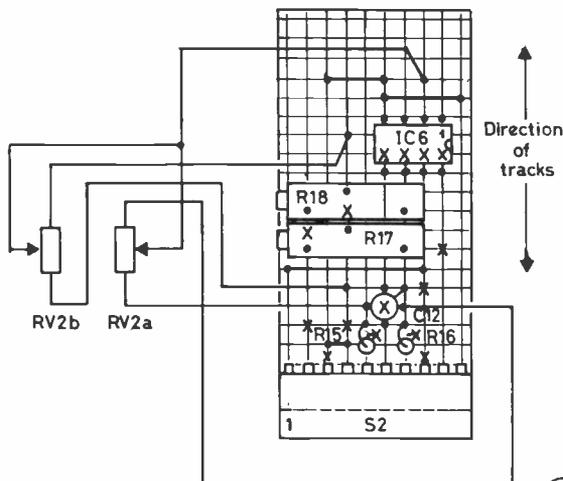


Fig. 7b MIXER BOARD LAYOUT

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Tables of Values

Fig. 7

- R15, R16 = 1K
- R17, R18 = 50K multi-turn preset
- RV2 = 100K dual-gang linear
- C12 = 10 μ F elec., 16V
- IC6 = 741
- 1 x 10-way inter-PCB socket
- 1 x 10 x 20-way Veroboard

Fig. 8

- R19 = 10K
- R20 = 120R
- R21 = 56R
- R22 = 1R
- VR3 = 10K log
- C13 = 100 μ F, 16V
- C14 = 0.47 μ F
- C15, C19 = 100 μ F, 25V
- C16 = 220 pF
- C17 = 220nF
- C18 = 470 μ F, 16V
- C20 = 100nF
- IC7 = TBA820M

Fig. 9

- R23, R24, R25 = 2K2
- R26 = 25K multi-turn preset
- R27 = 180K
- C21, C22, C23 = 22nF Mylar film
- C24 = 220nF Mylar film
- IC8 = 741
- 10 x 20-hole Veroboard
- 10-way interconnecting PCB socket

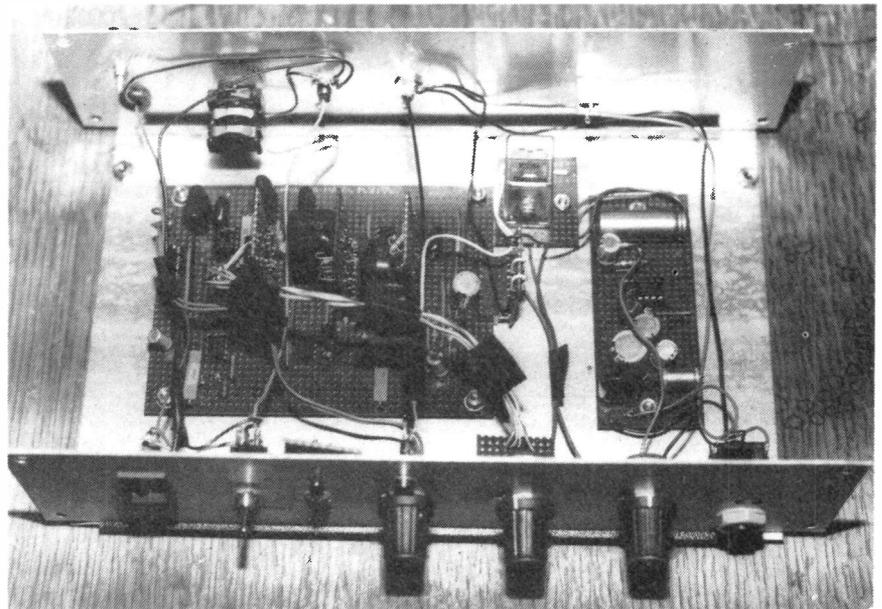
Fig. 10

- R28 = 3K3
- R29 = 100K
- R30, R31 = 1K2
- R32 = 100R
- C25, C26 = 220nF Mylar film
- Q2 = BC109
- 10 x 20-way Veroboard
- 10-way interconnecting PCB socket

Fig. 11

- R33 = 220K
- R34 = 330K
- C27 = 100nF Mylar film
- IC5 = 741

An internal view of the completed project.



Testing: Having built the board it should be plugged into the mother board. With an audio signal present at the input to the mother-board, RV2 should be rotated until a signal can be heard using ordinary headphones, on rail 8. The level and quality of the signal should be adjusted using both R3 on the main mother board, and R17 on the mixer board; both these resistors should be adjusted until an acceptable signal is achieved. Swinging RV2 to the opposite extreme of its rotation should render the audio signal inaudible; if this does not happen re-check your wiring on the mixer board.

Audio Power Amplifier

The audio power amplifier is based around a TBA820M 1-watt audio IC, and this is the only unit that does not plug directly into the main mother-board. The circuit diagram and Veroboard layout are shown in Fig. 8. The circuit is standard so no explanation of its operation is given here.

Testing: Having connected the audio board to the main mother-board via VR3, a signal present at the input to the mother-board should be heard clearly in either headphones or an 8-ohm speaker connected to the output of the power amplifier.

AF Side-Tone Generator

The AF side-tone is generated by a simple phase shift oscillator, the frequency of operation being around 800 Hz. The circuit diagram and Veroboard layout are both shown in Fig. 9.

Testing: The easiest way to test this module is to install it on the mother-board, temporarily connecting the output of the oscillator to the input of the mixer (rail 5). At turning on the

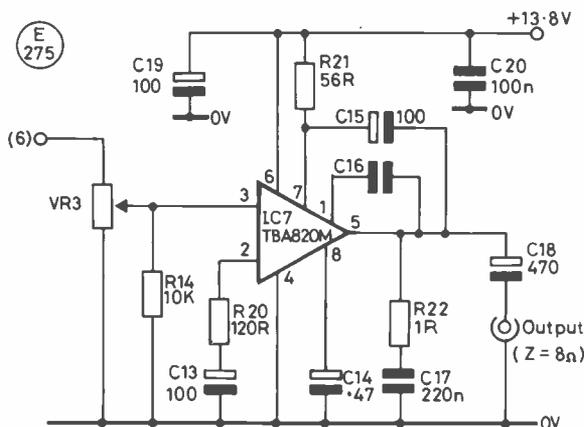


Fig. 8a AUDIO POWER AMPLIFIER CIRCUIT

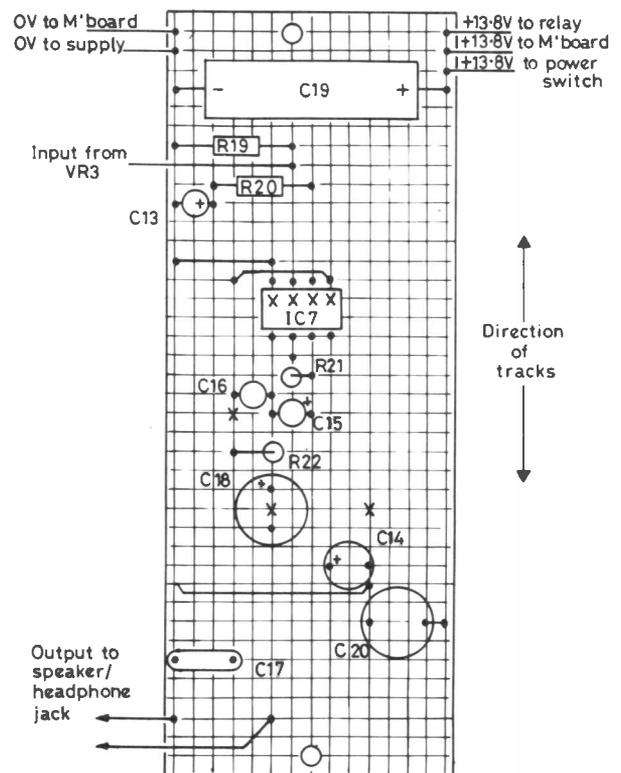


Fig.8b AUDIO POWER AMPLIFIER LAYOUT

Rear view of completed case.

photos: H. Jaremco

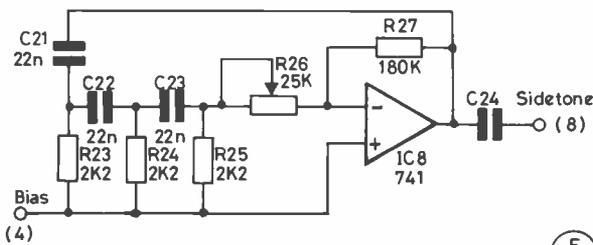
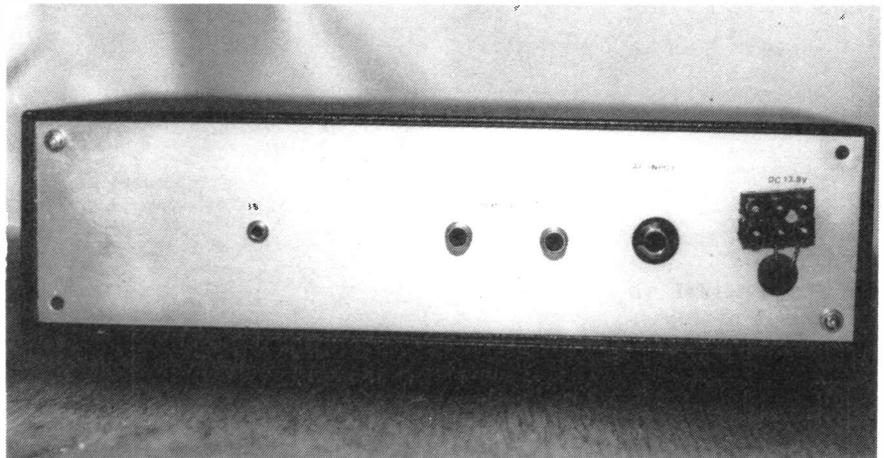


Fig.9a AF SIDE TONE OSCILLATOR CIRCUIT

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Testing: Having assembled the module, it may be tested in the following way. Place the module on the mother-board and temporarily connect rail 3 to rail 5. Switch the mother-board on and listen to an incoming carrier. Now sweep VR1, the reference oscillator control, until the LED lights, indicating that the NE567 has locked onto the tone. Now adjust RV2 so that the generated side-tone can be heard. If all is well, check that the side-tone disappears when the reference oscillator control is adjusted. If the last test works then now is the time to check that the system so far is fully functional.

Find a CW station, and lock onto it using VR1. You should now find that the side-tone is reproducing the received CW.

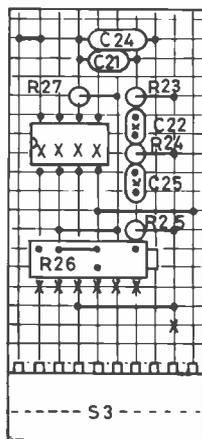


Fig. 9b AF SIDETONE OSC. LAYOUT

Direction of tracks

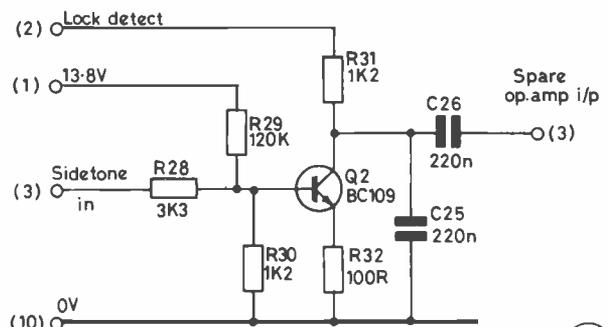


Fig.10a TONE SWITCHING MODULE CIRCUIT

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mother-board, and hence all other circuits currently using the mother-board, the side-tone should be heard; setting VR2 on the mixer board should vary the level of the tone heard. R26 on the side-tone generator module should now be adjusted to obtain a preferred tone. Having accomplished this the temporary connection between rail 8 and rail 5 should be removed.

Side-Tone Switching Module

The tone switching module functions around a single BC109 transistor. The transistor is biased by the potential divider network R29 and R30; however the transistor stays in an off state until rail 2, the lock detect line, goes to 12V. When this happens the transistor acts as a simple low-gain amplifier. The side-tone enters the amplifier via R28. When the transistor is turned on, the side-tone appears at the output side of C26.

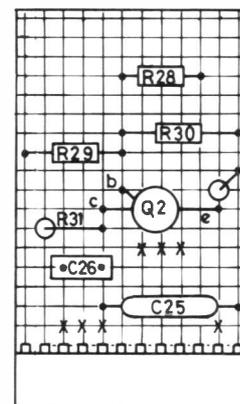


Fig.10b TONE SWITCHING MODULE LAYOUT

Direction of tracks

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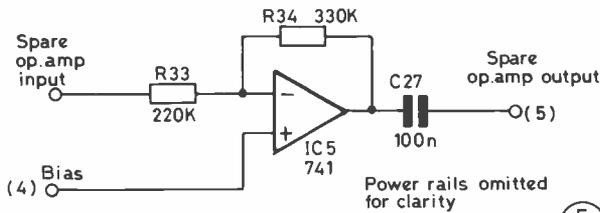


Fig. 11 BUFFER AMPLIFIER CIRCUIT.

Having satisfied yourself that all is well, remove the temporary connection between rail 3 and rail 5.

Side-Tone Buffer Amplifier

The side-tone buffer amplifier uses the spare op-amp. available on the mother-board. It simply isolates the switching amplifier from the mixer. The circuit diagram is shown in Fig. 11, and the layout of the circuit on the mother board in Fig. 4.

Prior to assembling this circuit, disconnect the mother-board from everything else, by removing the end connector and the applications boards.

Testing: Once you have completed this part of the construction you can consider the system as being complete. The system should now be tested in its entirety by plugging the applications boards back onto the mother-board, along with the edge connector.

Round-Off

The only thing that remains to be done is to mount the system in a box, and wire in the power supply switching, remote control and audio input and output jacks. I do not propose to outline this in great detail as it depends on what type of box you decide to use. The box used to house the prototype is obviously commercial, the legends being done with transfers.

The prototype unit is controlled by a transceiver in my shack, and the circuit details are shown in Fig. 6. The relay is a DPDT type that is switched either by the remote line to the rig or the switch completing the relay circuit to 0V. The status LEDs and their limiting resistors are mounted on a small piece of Veroboard, bolted onto the front panel.

The unit draws, on average, about 200mA and is best run from a 13.8V regulated PSU.

This is a worthwhile project, costing only about £20.00 to construct, and could be made a lot cheaper if junk box components were used. Inevitably, the major expense lies in the case; I am no sheet metal worker and having spent some time developing this system I decided to put it in a decent case for a change.

This little unit also opens up opportunities to develop other systems that require a very narrow bandwidth, and an RTTY reception terminal is currently being designed to interface with this system.

As a CW filter, I believe that it may be of interest to keen QRP homebrew types who use various kinds of direct-conversion receivers, since it does make up a great deal of ground where no narrow IF filter is available.

CONTEMPORARY BRIEFS . . .

MENTION was made in the April *VHF Bands* feature of non-metallic stub mast material. Messrs. **Metalfayre**, who manufacture 4m., 2m. and 70cm. Yagi antennas based on the N.B.S. designs, have sent a sample of such a product. Theirs is a tubular section made from reinforced polyester and the short, 40cm. long sample was extremely rigid but only weighs 200 grammes.

The standard diameter is 1½ inches (38mm.) and 1.5 and 3 metre lengths are offered, the latter consisting of a kit of two 1.5m. lengths, a 250mm. coupling sleeve and a pack of epoxy resin. The specific gravity is quoted as 1.6-1.8 so the tube wall thickness would be about 0.1 inch (2.5mm.). (End caps were glued on the sample so this could not actually be measured). Thus the tubing weighs 0.5 kilogrammes per metre length. The finish is smooth and the colour a very light grey.

The 1.5m. length retails for £17.25 including VAT and a fixing clamp is supplied. The 3m. kit sells for £34.50 and both are available from **MET** stockists. Postal costs are extra at £1.95 and £2.25 respectively. A leaflet is available on this product from **Metalfayre** at 12 Kingsdown Road, St. Margarets-at-Cliffe, Dover, Kent, CT15 6AZ and their telephone number is 0304 853021.

THIRTEEN toroidal transformers, from the 'Budget Range' manufactured by **Cotswold Electronics**, are a new entry in the latest catalogue available from **Verospeed** of Eastleigh, Hants. These low noise transformers include power ratings of 30, 60, 100 and 160VA, with regulation figures quoted as 16% or better. The toroids have two separate primary windings for parallel 120V operation, or series connection for 240V operation; twin separate secondary windings terminating in flying leads provide a range of output voltages including 2 × 6, 9, 12, 15, 18V r.m.s., depending on the VA size selected. The transformers are constructed to professional standards enabling these toroids to be operated for short periods at 120°C without deterioration, and each transformer is proof tested at 2.5kV peak. The nominal frequency is 50 to 60 Hz with an operating range of 47 to 400 Hz, and the secondary voltage tolerance is within 3% at nominal input and full load. Further information from: Ian Hames, **Verospeed**, Stansted Road, Boyatt Wood, Eastleigh, Hants. SO5 4ZY (tel: 0703-641111).

ASIXTEEN-page catalogue of cases and components, and price list, is available on request from **Semiconductor Supplies International Ltd.**, 128/130 Carshalton Road, Sutton, Surrey SM1 4RS (tel: 01-643 1126). Items listed include small cases, racks, connectors, breadboards, eurocards, PCB etch-resistant transfers, a copper etching kit, wiring systems and hand tools.

• • • "Practically Yours" • • •

with GLEN ROSS, G8MWR

THIS month we are going to take a look at comparator circuits and see how we can make use of them around the shack. The circuits are built around the widely used 741 type of integrated circuit. This is well known as a high gain amplifier but, because it is equipped with two inputs, it can be made use of in a wide variety of circuit applications including power supply regulators, oscillators, filters and comparators.

Why two inputs and what are the differences between them? They are identical in all respects except that an input to the non-inverting pin causes the output pin to move in the same direction (more positive input gives more positive output) while an input to the inverting pin will do just the opposite. If the two inputs are kept at the same level then the output will rest at half the supply voltage.

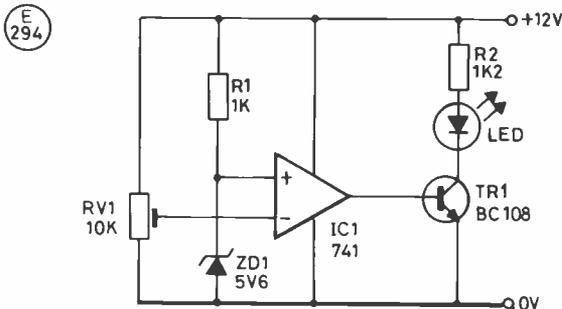


Fig. 1

In Fig. 1 the 741 is wired to check battery voltage and the LED will not come on until the battery voltage falls to some predetermined value. Let us see how the circuit works. The 741 takes its supply from the normal supply lines. One of the inputs is supplied with a fixed voltage *via* R1 and the zener diode whilst the

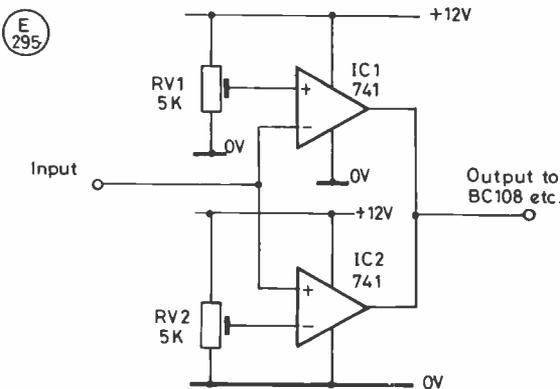


Fig. 2

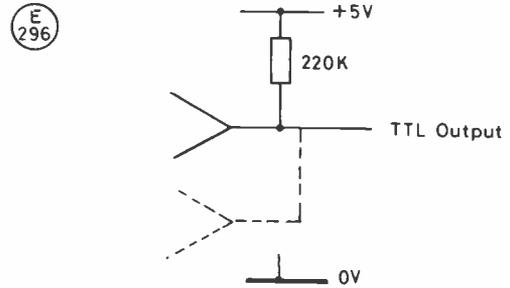


Fig.3 MODIFICATION FOR TTL LEVEL OUTPUT

other is supplied from the tap on RV1. These two inputs may be taken to either of the inputs of the 741, depending upon whether you want the light to come on when the battery voltage is normal or to come on as a warning when it falls below the preset level. The output of the 741 drives a BC107 which is used as a switch for the LED. In fact the 741 could drive the LED direct but use of the BC107 would enable the circuit to drive a relay or some other warning device if required.

Setting-Up

This is very simply done. Connect the unit to a power supply and adjust the voltage to the level at which you want the unit to switch. Adjust RV1 until the lamp switches on or off depending on the way you have wired the inputs of the 741. To reverse the action simply reverse the wiring to the two inputs and reset RV1. Now connect the unit to the normal power supply rails and the job is done.

There is nothing critical about the circuit and it can be easily constructed on Veroboard. This is a very simple circuit but its uses are only limited by your imagination. Anything that can be made to produce a suitable voltage can be connected to the top of RV1 (first disconnecting the supply rail from this point) and the output could be made to switch a relay, bell or some other system as required.

Further Expansion

By combining two of these circuits as in Fig. 2 we can make a unit that will only light the lamp when the input voltage is between the levels set by RV1 and RV2. This input may come from a variety of sources. If the unit is required to drive TTL levels then the output of the circuits should be as shown in Fig. 3.

No constructional details are given as these will depend on the requirements of the individual constructor.

We welcome ideas from readers as to what they would like to see described in this feature.

VHF BANDS

NORMAN FITCH, G3FPK

ONCE again, an extensive *Sporadic E* opening on 2m. occurred just after the copy deadline. Fortunately, several readers communicated their successes "on the wireless" and these will be chronicled later.

Satellite News

The main item of satellite news this month is that the *University of Surrey* has regained full control of *UOSAT-2* or *OSCAR-11*. Using predictions supplied by *AMSAT-UK*, a listening station of the *Stanford Research Institute* in Greenland managed to pick up the local oscillator signal of the 438 MHz Rx in the spacecraft, thus positively identifying it. This hot news was given by Ron Broadbent, G3AAJ, during the Annual General Meeting of *AMSAT-UK* on May 12.

This news was sent to *SRI* in California and eventually to *Surrey University* via G3AAJ. Full control was regained by the *UOS* Command Station by the morning of May 14 and this time, no assistance from any other "big guns" was needed. The *UOS* team have since narrowed the malfunction to one of five areas in the electronics and have now commanded the spacecraft to bypass the faulty modules.

It is suggested that the original shutdown was due to a temperature effect in the spacecraft which, due to its attitude, went down to *minus* 13°C. at times. It seems it switched itself off at *minus* 6°C. Now that full and reliable command has been re-established, the original test program has been resumed with the necessary safeguards to prevent any recurrence of the earlier fault.

The only reader to mention *O-11* was Adrian Chamberlain, G4ROA, (Coven-try) who wishes they would reset the date clock. He was finding that, due to the spacecraft's spin, it was difficult to copy more than four or five good frames of telemetry in a minute as the signal got very noisy for 15-20 seconds. He did not do much with *O-10* as it was in an unsocial hours period for those who need normal sleep.

Steve Reading, G4LZD, (Devon) has continued his mode "A" operation through the Soviet *RS* satellites and is now up to 26 countries worked in three

continents. He reports all the robots seem to be having problems, though.

A few comments have been received concerning the "Heresy Corner" item in the May feature. In favour of the *UOSAT* program in the amateur bands was John Osborne, G3HMO, Warden of the *South London Science Centre* in London S.E.5, who says that our licences were issued, "... primarily for experimentation." He suggests that to demonstrate amateur radio to children or others, better to use the "Digitalter" on 145.825 MHz than the GB3SL repeater. John thinks it is the role of radio amateurs, should they be so placed, to educate children in space matters. Several friends in the *Inner London Education Authority* are doing fine work in recruiting future radio amateurs, he wrote.

An opposing view came from Derek Turner, G4SWY, (Herts.) who made the point that, "... media publicity deliberately avoids reference to Amateur Radio." He says he rarely hears people on 2m. trying to work satellites. The main thrust of his letter was that, as an RTTY enthusiast, he would welcome more channels for that mode so is, "... especially jealous of the open spaces above 144.775 MHz. ..."

This subject was discussed after the *AMSAT-UK* A.G.M. on May 12, which was attended by about two dozen members. The few who spoke on the matter were in favour of *UOSAT*-type operations in the amateur bands, suggesting this was really what amateur radio was all about. Your scribe asked where was all the feedback from the *U.O.S.* through *AMSAT-UK* on the results of the various experiments? A member of the *U.O.S.* team said that the University had built *UOSAT-1*, which was providing information, and that it was up to radio amateurs to use it and do their own experiments and research.

AMSAT-UK is to carry out a feasibility study concerning designing and building its own satellite. There is little doubt that, among its 2,700 members, the expertise is there. However forming a really dedicated team to virtually eat-and-sleep on the project may not as be so easy. Ron Broadbent, G3AAJ, made the point at the A.G.M., that previous *Oscar* satellites had been designed and built by ordinary radio amateurs, albeit very keen and enthusiastic fellows. If the Committee does decide to proceed, the task will be a formidable one but, with twelve *Oscars* built, there is plenty of experience to learn from. Any readers able and willing to assist should contact *AMSAT-UK* at London, EI2 5EQ. Details of membership and all services can be obtained from this address on receipt of an *s.a.e.*

Awards News

Two more readers have joined the 2m. QTH Squares Century Club. Certificate

no. 37 goes to Alfred Pehmer, OE1APS, from Vienna in Austria. First licensed in July, 1979 with the OE equivalent of the U.K. Class B licence, his QTH is in the southeast of the city, 150m. *a.s.l.* Alfred's 2m. station consists of a *Yaesu* FT-225RD with G3SEK "front end," plus a home made S-3030 preamplifier. He uses a 4CX250R amplifier and the antenna array is a group of four, 16-ele. *Yagis* from the French company *Tonna*.

His 100 cards comprised 69 tropo, 13 *Es*, and nine each via *MS* and *Ar*, the certificate being dated May 5. He is also QRV on 70cm. the station being a *Trio* TS-780, MGF 1400 Rx preamplifier and a home made 4CX250B amplifier. The antenna array is four 21-ele. F9FT *Yagis* 25m. *a.g.l.* Alfred is interested in all modes of propagation and is looking for partners for 70cm. *MS* tests. He hopes to be QRV on *E-M-E* next year.

Certificate no. 38 was issued to Dr. Roland Milker, DL20M, from Eitelborn in West Germany, on May 14. He has 178 confirmed from DK49j/JO30UJ. He did not list the various propagation modes, hence no breakdown. His antenna array comprises four 16-ele. *Yagis* and Roland copies the Wrotham beacon, GB3VHF, regularly at RST 519 in flat band conditions. He is active on *E-M-E* and has confirmations from W5UN, W7IQV, WAIJXN and VE7BQH.

Jon Stow, G4MCU, (Essex), holder of 2m. QTHCC Certificate no. 20, was sent his 150 sticker on May 22. His 19 new confirmations were for 11 tropo, four *Ar* and two each *MS* and *Es* QSOs, from 14 countries.

Another 2m. VHF Century Club certificate has been issued. Steve Reading, G4LZD, from Townstal in Devon was issued with no. 365 on May 24, all contacts having been made using just 2½w. For details of the QTHCC and VHFCC awards, send an *s.a.e.*, or IRC if overseas, to the address at the end of this feature.

Beacon Notes

The 6m. beacon, GB3NHQ, was intalled and tested at the *RSGB's* Potters Bar headquarters on May 31. The QRG is 50.050 MHz and the antenna is a crossed dipole system at 20ft. The Tx was built by G3UUT as was the keyer. The callsign is transmitted by FSK followed by its Maidenhead locator. If all goes as expected, continuous operation should be sanctioned by the *D.T.I.* within a week or two of publication.

DX Notes

Last month's reference on p. 167 to F0GAL/P had a misprint; the square is YG, not TG, of course. A Swiss group from Neuchatel is responsible for this Aug. 3 to 16 DX-pedition for which skeds can be arranged with André Brequet, Gare 49, CH-2017 Boudry, Switzerland. F6CTW, F1EDJ and F1COW will be QRV

from ZJ from July 3 to 15 on 2m, 70cm, 23cm. and 13cm. using good gear, also on 3cm, perhaps with 10w. Principle operation in the *IARU* contest, July 7/8 with the call F1KBF.

Norwegian club station LA1K will be on from EY80e from 1800 on Aug. 7 till 1200 on the 14th for *Perseids* MS operation. Two hour CW skeds — max. speed 1,000 *l.p.m.* and one hour SSB/CW skeds proposed. Good equipment; QRGs 144.117, 144.147, 144.157 and 144.357 MHz with two stations on the sked QRGs and one on random ones by eight operators. Sked proposals to: Akademisk radioklubb, St.p.250, N-7034 Trondheim-NTH, Norway.

A Bulgarian group plan MS operation in the *Perseids* from NB, NC, OB and OC squares. In September or October, same group hopes to operate from Mount Athos, in LA/MA — DXCC country — but further details awaited concerning QRGs, calls and gear. Another *Perseids* expedition is planned by DL8NBN, DG5MCL and DH2NAF to Corsica, new prefix TK, from ED square. Dates are Aug. 2-17. CW QRG is 144.060 MHz and the SSB one is 144.433 MHz. No written inquiries for CW skeds, only SSB proposals. CW skeds to be arranged via the 20m. VHF net. Further information from DG5MCL, P.O. Box 242, D-8070 Ingolstadt 2, West Germany. IRC requested.

There is a Spanish contest on the first weekend each month till November with activity from ZA47d. EA3ECY/2 is on 2m., and EA3LL/2 on 70cm. and 23cm. No MS in contest periods but possible operation at other times. Thanks to *DUBUS INFORMATIONEN 2/84* for all the foregoing gen.

Russell Coward, G4XKR, (ex-G6HRI from Blackpool) reckons to be operating from either GD or in some of the rarer Scottish squares such as XQ, XR, YQ, YR, etc., from July 15 for a week. 2m. and 70cm. operation, plus 0-10 is promised and he will listen on the 20m. VHF net. 50w on each band with 8-ele *Yagi* on 2m. and 12-ele. on 70cm.

Martin Daft, G6ABU, wrote to pass on details of the Derbyshire Hills Contest Group's proposed DX-pedition to WL square in the Irish Republic from Aug. 4-15 the likely locator being WL03h. Personnel are G8ROU, G8XVJ, G8PNM, G6ABU, G4VVZ who has the call EI2VPX, and G6HKX, who has the call EI3VOL. The other calls were awaited. Operation is planned on 4m, 2m, 70cm, 23cm, 13cm, and 3cm. As would be expected from this successful group, very good gear will be taken. Some QRGs; — 2m. tropo 144.325; CW MS 144.144; SSB MS 144.444 MHz. 70cm. SSB only on 432.230 MHz, ditto on 1,296.230 and 2,320.230 MHz. 10 GHz operation will be by G8ROU using his portable wideband transceiver. Skeds can be arranged on the

lower bands or by prior telephone call to 062973 2620. They will be on the 20m. and 80m. VHF net QRGs throughout. Martin's, G6ABU, 'phone no. is Nottingham 289122. (Dialling code 0602).

Bryn Llewellyn, G4DEZ, (Essex) has advised of operation from the tiny island of Tanera More in the Summer Isles off the northwest coast of Scotland. This island is on the borders of XR and XS squares and the dates are Aug. 22-29. MS and *E-M-E* operation is planned with QRO on 2m. and 70cm. Antennas four 16-ele. and eight 17-ele. *Yagis* respectively. 100w on 23cm. with a five or six foot dish. Twelve operators will be going being members of the *Mud Hoppers Contest Group*. It is hoped to get a special GB0 callsign, otherwise their own calls will be used. Although there are only six inhabitants in Tanera More, three 11kVA generators are available, plus proper accommodation.

This special event operation was prompted by the *Anglican Diocese of Chelmsford* to celebrate its 70th anniversary, in collaboration with the *Youth Opportunities Scheme* which has a base there. Three to five ton trucks will be provided to take all the equipment including antennas and towers. More details next month, meantime anyone wanting to propose MS or *E-M-E* skeds should contact G4DEZ, who is *QTHR*.

Contest News

As if anyone needed reminding, the weekend July 7/8 is VHF NFD from 1400 to 1400; full rules in the April *RadCom*. The 432 MHz QRP event is on Aug. 4 from 1700-2300. Radial ring scoring but multiply the total by the total number of countries and countries worked. The county name or code letter, as per January *RadCom* p. IV, must be part of the contest exchange. The 144 MHz QRP affair is on Aug. 5, 0900-1700, again with the multiplier. Both are two section contests, Fixed and All other. 10w maximum Tx output on 70cm. and 25w *p.e.p.* output on 2m. is what QRP means.

Apologies for not publicising the Maltese *9H Falcon Contest* this year. Unfortunately the details arrived far too late. Your scribe sent the information to the *RSGB* in time for the *GB2RS* News Bulletin on May 27, but that was overlooked. The item was broadcast the next week, after the event had begun, but it was somewhat ambiguous.

Six Metres

No news yet about the next 60 to be granted permission to operate on the band. Bearing in mind the recent Government *Green Paper* on the future of the VHF spectrum in the U.K. and the accelerated closure of all the remaining Band I TV transmitters, there is justifiable optimism that a fair size 50 MHz allocation might become available much

QTH LOCATOR SQUARES TABLE

Station	23cm.	70cm.	2m.	Total
G3JXN	68	108	165	341
G4NQC	59	81	164	304
G3XDY	54	101	149	304
G8TFI	51	109	126	286
G8PNN	42	77	115	234
G3COJ	40	91	163	294
G8FUO	39	105	88	232
G4FRE	37	100	51	188
G3PBV	35	101	172	308
G8FMK	35	68	80	183
G8KAX	35	57	82	174
G8LUL	31	85	115	231
G4STO	29	48	113	190
LA8AK	25	62	200	287
G8ATK	23	82	129	234
G8KBO	22	96	188	306
G6DER	22	65	105	192
G4ROA	21	58	61	140
GJ8SBT	20	35	182	237
G8HHI	20	77	135	232
G3UVR	17	79	196	292
G6CSY	15	25	30	70
G4NBS	14	77	94	185
GD2HDZ	13	50	91	154
GJ8KNV	12	76	191	279
GW3CBY	9	32	95	136
G4BVV	9	100	—	109
G3BW	7	36	234	277
G4MCU	7	77	183	267
G4ERX	7	61	132	200
GW4TTU	3	19	139	161
GJ4ICD	2	115	231	348
G8VR	2	24	241	267
G4HMF	2	35	144	181
G6DDK	2	13	127	142
G4RSN	2	23	81	106
GIEZF	2	24	51	77
G6CMV	1	29	142	172
GW8UCQ	1	65	105	171
G4RGK	1	48	113	162
G6JNS	1	3	106	110
OZ1EKI	—	116	345	461
G3IMV	—	91	355	446
G3YVF	—	117	307	424
G3POI	—	—	422	422
DK3UZ	—	—	317	317
G4IJE	—	—	317	317
EA3LL	—	30	261	291
SP2DX	—	—	280	280
G4ERG	—	16	250	266
GW3NYV	—	48	209	257
G4DEZ	—	—	241	241
G4TIF	—	82	157	239
G4KUX	—	36	200	236
GM4COK	—	28	204	232
G8RZO	—	75	148	223
G4RZP	—	76	147	223
9H1BT	—	11	210	221
G4BWG	—	64	152	216
GW4EA1	—	—	210	210
G4OAE	—	31	174	205
G4AWU	—	50	150	200
G3FPK	—	—	199	199
G3KEQ	—	—	194	194
GM4CXP	—	27	165	192
G3NAQ	—	58	128	186
G4HFO	—	69	112	181
G6ECM	—	—	174	174
G6ADH	—	35	135	170
G4MUT	—	68	100	168
G8LFB	—	—	168	168
G8TGM	—	—	163	163
G8SRL	—	53	106	159
G8WPL	—	56	94	150
G4TJX	—	59	90	149
G6MGL	—	32	117	149
G6HKS	—	—	148	148
G4FRX	—	58	87	145
GM4IPK	—	—	139	139
G6DZH	—	48	88	136
G4MEJ	—	—	135	135
G4MJC	—	12	120	132
G4NRG	—	32	94	126
G4MWD	—	1	120	121
G4DOL	—	—	117	117
G4GHA	—	2	110	112
G4SFY	—	—	112	112
GM8YPI	—	13	96	109
G6DFT	—	—	108	108
G4COM	—	48	55	103
G8ZDS	—	16	86	102
G8VVF	—	—	97	97
G14OMK	—	—	96	96
GW8VHI	—	30	64	94
G8RWG	—	—	92	92
G8XTJ	—	—	74	74
G6AJE	—	—	74	74
G6NWF	—	—	67	67
G6XLL	—	19	48	67
G6PFR	—	13	50	63
G4IGO	—	—	59	59
G4UYL	—	—	54	54
G4LZD	—	—	51	51
G6XSU	—	38	—	38

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

sooner than was thought possible even a year ago.

Dave Sellars, G3PBV, (Devon) reports the Gibraltar beacon ZB2VHF being audible on the afternoon of May 20 and at lunch time on June 2. It was very strong during the later *Es* openings. Paul Turner, G4IJE, (Essex) now has a 5-ele. *Tonna Yagi* which is giving excellent results at just 25ft. Ian Parker, G6DFT, (Herts.) is listening on the band and also uses this antenna. Derrick Dance, GM4CXP, (Borders) has his 5-ele. *Yagi* on a separate mast from the 2m. and 70cm. beams 23ft. *a.g.l.*

Four Metres

Tim Raven, G4ARI, (Leics.) worked EI2CA (Wicklow) and G3YJX (Cornwall) on May 30 on CW. Dave Robinson, G4FRE, (Suffolk) worked 14 stations in the June 3 contest, all but one hour of which was ruined by strong *Es* broadcasters from east Europe. He figures east coast stations are at a considerable disadvantage compared to the Welsh portables. Using SSB, Martyn Jones, G4TIF, added another four counties in the month, three of them in the contest, GW4MGR/P (Clwyd) being a new 1984 country. GM4CXP has a 5-ele. *Yagi* at 26ft. but still has transverter problems. G3BW (Cumbria) is very active on the band.

Two Metres

After lengthy periods of mediocre conditions, the *Sporadic E* season got off to a fine start on June 7, but first, some *Auroral* notes. Mick Allmark, G1EZF, (W. Yorks.) mentioned a weak event on May 1 with a couple of GMs heard. Ken Osborne, G4IGO, (Somerset) spoke to one of the LA1K operators (FX) who said the QTE was 280° when G4DHF was worked in the Apr. 9 affair: see p. 169 last month. This suggests that the reflecting region was some 1,200 km. from G4DHF, so Ken reckons the *Aurora* may have extended higher in altitude than usual.

GM4CXP (YP37c) found an *Ar* from 1705 to 1812 on May 20, his QTE being 35° to 40°. It was a weak affair, though but Derrick worked LA9BM at 1740 in EU32g. Another weak event was recorded on May 22, 1722-1738, QTE being 40° with stations in YP, XR and XO worked and GB3LER (ZU65f) heard.

Now some MS news. G1EZF worked DD5TD (EI55j) on 144.200 MHz during the *Aquarids* shower on May 5. The next day, IW0BMV was heard in a long burst on 144.300 MHz but the QSO was incomplete. Bill Hodgson, G3BW, (Cumbria) has a four memory keyer going now and can manage up to 1,500 *l.p.m.* At the end of May, he completed CW contacts with CT4KQ (WA), F6DRO (AD) and Y27BL (GL). Activity is high in the early mornings, he finds.

Dave Dibley, G4RGK, (Bucks.)



Geoff Brown, GJ4ICD, in his shack in Jersey. His call will be a familiar one to 144 MHz and 432 MHz operators, particularly in contests. At the right of the table is the Yaesu FT-726R all-mode transceiver, behind which are two fans. At the rear is the big power supply for the 144 MHz amplifier which is sitting on top; note the big blower. At the extreme right on the bottom shelf is the Bird Type 43 Power Meter. On the left is the PSU for the 432 MHz amplifier, and the amplifier, which is based upon the K2RIW design.

photo: Ron Mayne

missed last month's deadline but reported on CW MS successes in the April *Lyrids* with YU7MAU (JF), OK3CGX (II), OK2PEW (IJ), YU3FM (HG) and OK2PBV (JJ). Kevin Piper, G8TGM, (W. Sussex) failed with YU3FM on May 2 and a sked with I4YNO on June 3 was not completed in spite of his receiving 29p. and 6b. in the first 24 mins. from 0400, *via* random meteors, on SSB. On June 8, Reg Woolley, GW8VHI, (W. Glam.) completed with IW4ARD (GE) in 22 mins. but nothing at all was heard from CT1LN (WX) during a sked at 0300 one morning.

Next the tropo scene starting with G1EZF who grabbed several new squares in the *IARU* Contest. On May 9, Mick worked EI9FE (VM39d) in Tipperary. George Haylock, G2DHV, (Kent) notes CW QSOs with G4PQX (YK38b) and G4NVA/P (ZN56g) to add to his table total. John Hunter, G3IMV, (Bucks.) found good tropo to the Alps on June 9 and worked a couple of HB9s, plus I2FAK (EF) at 0925. Dave Sellars, G3PBV, (Devon) managed a QSO with GM4RZW/P (YP) at 0842 on May 27, it being difficult to work GM from his location.

Peter Atkins, G4DOL, (Dorset) found conditions very quiet up to May 31. On the 6th he got HB9LC/P (DH); on the 13th GM8BDX and GM4GUF/P in YP; G14VIP/P (XO) and GM4RGC/P (YQ) in the contest on the 20th, and GM4RZW/P on the 27th. With 900ft. hills to the north, GM is a difficult direction from Weymouth. Tim Charles, G4EZA,

(Surrey) only operated on May 27 and got GW8VHI/P (XM). G4IGO had contest QSOs with Frenchmen in AJ, CH, CI, XI, YI, ZH, ZI and ZJ on May 5 plus two HB9s heard from YK07f.

Steve Reading, G4LZD, (Devon) is another 2m. operator who thinks the idea of calling frequency is ridiculous in today's crowded conditions. When people QSY off it, they often settle on another frequency already in use, so why not drop it from the band plan? What do the rest of you think? He has a perennial moan about over-driven, so-called "linears," a phenomenon not unheard in your scribe's QTH in the Surrey hills. On the positive side, Steve tried on-and-off for two hours to work GM3KJF on May 19. Quite suddenly, he came up to 40 dB over S9 and was worked using just 2½w. His previous, and best, QRP achievement was EQ square at 1,097 kms. on 2½w. He asks if anyone keeps any record of distance-per-watt QSOs?

Les Bober, G4NOZ, (Essex) reckons that CW activity has certainly increased since the new table started and May brought him another 16 stations. Rod Burman, G4RSN, (Surrey) hopes to move from ZL48g to ZL47d on July 17, after a few false starts. Ever since his big amplifier was completed over last Christmas, there has been little opportunity to use it. He worked a few Fs in the contest on May 6.

Welcome to Ray Baker, G4SFY, (Norfolk) who submitted a very neat wad of log-type sheets listing all his claims for the various tables. His station consists of a

Trio TR-9000 and MM 100w amplifier with a 9-ele. *Tonna Yagi* at 40ft. On May 16, GB3ANG was over S9 most of the evening and three GMs in YR were worked on SSB. In the May 19/20 contest, in flat conditions, he got GJ4ICD, GD4IOM and GI4VIP/P. Ray hopes to contribute regularly now.

Another new contributor is Keith Lawrence, G4SGO, (N. London) whose QTH in the Lea Valley he describes as "... an RF black hole!" Hence his phonetics for 'SGO — Sometimes Gets Out. He uses a *Yaesu FT-480R* with a home made 12-ele. *ZL-Special* antenna and enjoys CW ragchews, asking more new G4s to try the mode. Sorry though, Keith, portable operation does not count for our tables. G4TIF added F and ON on May 5, and EI6EV in Dublin on the 30th, to his 1984 countries tally on SSB. The 30th also brought G4NJW/P (XJ04b) on the Lizard Point in Cornwall.

Writing before all the *Es*, Tim Kirby, G4VXE, asked, "What had happened to good conditions?" He lists EI9Q(WM) on May 1, Fs in AJ, AK, BK and ZI and ON4ASL/P in BK on May 5, and GJ4ICD and GI4VIP/P on the 19th, from Gloucestershire. Mike Johnson, G6AJE, (Leicester) mentions a QSO with GM4CXM (XP) on May 11 completed by *quasi-MS* procedure and lucky aircraft scatter. Another GM contact on the 27th was GM4RZW/P, 2,400ft. *a.s.l.* on Green Lowther. Nine ONs and three PAs were worked on June 3, plus DL6FAW/P (EK21g). Glenn Bates, G6HFF, (Gtr. Mchstr.) added Northumberland, Tyrone, Dumfries, Bucks., Leics. and Hereford and Worcester in the month.

Since his last letter, Bob Hamer, G6NVQ, (Lancs.) has added 20 more counties and EI, GI and GJ to his table score. June Charles, G6WXX, (Essex) took part in the May 19/20 contest adding Dyfed, Clwyd, Gtr. Manchester, Notts., N. Yorks. and Co. Down to her 1984 score and was quite excited to work into GI for the first time. Neil Montanana, G8RWG, (Surrey) got his *Nag* amplifier going again over Easter but has not been on very much of late, thus missing any real DX.

Laurie Segal, G6XLL, (London) is another new contributor. His wife Diana is G1DMS and they use a *Yaesu FT-726R*, *Mirage* amplifier at 130w and a 17-ele. *Tonna Yagi* at 38ft. *a.g.l.* He sent in a computerised list of squares, counties and countries worked and has respectable scores for the year so far. He is a keen WAB operator. Gordon Emmerson, G8PNN, does not come on the band too often but did add 19 more counties in the month, all but one in the May 19/20 contest.

Arthur Breese, GD2HDZ, is a quite staggered to read of all the DX other readers work and reckons he must listen at all the wrong times. Nevertheless, he is spurred on by his annual friendly battle

ANNUAL VHF/UHF TABLE

January to December 1984

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		23 CENTIMETRES		TOTAL Points
	Counties	Countries	Counties	Countries	Counties	Countries	Counties	Countries	
GW4TTU	—	—	79	18	32	5	8	2	144
G1EZF	—	—	73	12	40	6	3	1	135
G4TIF	19	3	57	12	36	3	—	—	130
G4ROA	—	—	48	9	38	4	14	3	116
G4ARI	19	2	69	13	—	—	—	—	103
G3BW	16	2	43	13	17	6	7	3	97
GD2HDZ	25	3	35	6	24	4	1	1	97
G6XLL	—	—	57	9	26	2	—	—	94
G8PNN	—	—	30	6	32	10	8	7	93
G4VXE	—	—	57	8	25	3	—	—	93
G4MUT	27	2	31	7	19	3	—	—	89
GW8UCQ	—	—	46	9	26	6	—	—	87
G6MGL	—	—	42	7	27	7	—	—	83
G3FPK	—	—	65	15	—	—	—	—	80
G4XKR	—	—	41	7	23	4	—	—	75
GW3CBY	6	3	39	7	15	4	4	2	74
G4NRG	21	2	21	10	17	2	—	—	73
G6ECM	—	—	61	12	—	—	—	—	73
G8TFI	—	—	—	—	47	10	5	3	65
G6HFF	—	—	41	7	13	4	—	—	65
G6AJE	—	—	55	9	—	—	—	—	64
G6NVQ	—	—	51	6	—	—	—	—	57
G4LZD	—	—	45	11	—	—	—	—	56
G4SFY	—	—	38	11	—	—	—	—	49
G6WXX	—	—	40	7	—	—	—	—	47
G8RWG	—	—	39	6	—	—	—	—	45
G8XTJ	—	—	37	7	—	—	—	—	44
G6XSU	—	—	—	—	31	6	—	—	37
G8FMK	—	—	3	1	21	2	7	2	36
GU4HUY	—	—	26	5	—	—	—	—	31
GM4CXP	—	—	18	5	4	2	—	—	29
G4EZA	—	—	23	6	—	—	—	—	29
G2DHF	4	1	17	2	3	1	—	—	28
GW4HBK	11	3	5	2	2	1	—	—	24
G6CSY	—	—	6	1	4	1	—	—	12

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

with G3BW. Geoff Brown, GJ4ICD, had 508 QSOs in the contest, worth 6,135 points best DX being GM4RGC/P at 858 kms. He reports average conditions but some bad operators. On June 7, he contacted 13 countries on tropo, including OZ, LX and HB9.

Roger Sarre, GU4HUY, (Guernsey) reports slightly below average conditions in the May 19/20 contest, but did work G4NOK/P (ZN23h). He runs 25w through 220ft. of feeder to a 10-ele. *Yagi*. Kelvin Weaver, GW4TTU, (Gwent) was an operator of GW6GW/P (YL06d) in the contest and they made just under 700 QSOs.

Finally *Sporadic E*. The majority of opinion about the events on May 5 and 6 is that E-layer ionisation was enhanced by some very good meteor trail ionisation from the *Eta-Aquarids* shower. On the 5th, I4ERN (GE73d) was heard by readers from Devon to Yorkshire. He was worked by G3PBV and GW3NYY (W. Glam.).

June 8 was the definitive start of this summer's *Es* "season". Around 1220, a few I8s appeared and G3IMV got I8YZO (HY), I8PKQ and 'MIB in IY and I8TUS (IZ). The main Russian event commenced around 1730 but John worked SV2JL (LA) who was on SSB in the CW band — not very popular! His Russians were UA3LAW (PO), UC2AA, UC2AAB and RC2AA (NN), RP2PED (MP), UP2AN (MO), RC2WBR (NP), RB5AO (QL), UB5PM (MK) and RB5XBR (OJ11c). On

the 9th at 1753, John heard EA3ADW (BB).

Clive Penna, G3POI, (Kent) worked lots of Russians on CW but the most fascinating period was after the main *Es* had ended. Still beaming at 70°-80°, he was called by HG1YA (IH) who had been working into Scandinavia and beaming at 350°. Turning their beams towards each other, the signals vanished. Between 2030 and 2120, Clive worked 17 assorted YUs and HGs by this sideways scatter, FAI-type mode and all the signals were weak and watery. G4IJE heard SV2JL calling CQ on 144.300 at 1630, and at 1701, IT9DTU/9 (HY) was copied before the Russians came up.

John Neal, G4NQC, (London) worked UC2AAB, RP2PED, RP2WBR, UA3LAW, RB5AO and RC2AA and Jim Rabbits, G8LFB, (London) also got the UA3 for his first Russian QSO. Mark Turner, G4PCS, (Beds.) got I8YZO and 'PKQ at 1226, but missed completing with SV2JL at 1625. He got YU5CXY (KC79a) at 1655, then IT9DTU/9 at 1700 before all the Russians. RB5AO at 2,343 kms. was Mark's best ever DX as he was your scribe's at 2,335 kms. Last signal heard was UC2AA at 2040.

Commenting on the G3POI experience, Mark suggests the reflecting region was over FO/GO squares but *tilted*. This could explain how LA6QBA (FT) was able to make some 150 QSOs, when so close to it, in forward *Es* mode to the Balkans.

ANNUAL CW LADDER

Station	4m.	2m.	70cm	μ Wave	Points
GW4TTU	—	167	23	5	195
G4ARI	15	162	—	—	177
G4SFY	—	142	—	—	142
G4NOZ	—	103	—	—	103
G4VXE	—	51	9	—	60
G4EZA	—	44	—	—	44
G4LZD	—	40	—	—	40
G2DHV	8	25	—	—	33
G4SGO	—	21	1	—	22
G3FPK	—	20	—	—	20
GM4CXP	—	19	—	—	19
GU4HUY	—	13	—	—	13

No. of different stations worked since Jan. 1.

G4PCS heard EA6IF (CA71d) at 1748 on June 9, then EA3ADW (BB) in a four minute opening, signals fading deeply and rapidly. He suggests the *Es* "cloud" was directly over England as he was receiving strong Band I TV from SM/LA and EA. Then at 1700, Scandinavian stations in Band 2 were good followed quickly by some F and EA at 1720.

GJ4ICD reports *Es* on June 7 and 8, 1300-1800. He worked LZ2XU (MD44e), LZ2KBI (LD) and YU2WA (ID) on the 7th. Up to June 12, no reports of any 9Hs worked, bearing in mind one was needed to qualify for an entry in their contest. Not a bad month on 2m., by and large, and it will be interesting to analyse more reports on the June 8 *Es* next month when, hopefully, there will be more *Es* to report.

Seventy Centimetres

G1EZF worked only 11 stations in the May 5/6 contest for a few more table points. Mick was out portable in ZN05a on May 13/14 and worked SM6KJX (GR), OZ9IT (EQ) and some PAs. Only a couple more counties for G3BW, whose amplifier PSU "blew up". G3PBV reports very bad *Syledis* QRM making operating very difficult in Devon. G4ROA was on for the May 5/6 contest but did not find too much activity as heard from Coventry. Adrian thinks it down on 18 months ago for reasons yet to be ascertained. Do other readers find this?

G4SGO uses a *Yaesu* FT-790R, 30w *MM* amplifier and *Jaybeam* 12XY antenna and Keith remarks he never hears anyone calling "CQ" on CW, so how about a CW activity period one night *per* week? Any support for this? G6HFF in Bolton added nearby Cumbria to his score and G1DOX in Shropshire, remarking ruefully, "Slow progress!" G8PNN also only added two in May; GW8TFI/P (Gwent) on the 6th and GM3JFG

(Highlands) on the 23rd, the latter a new square along with LA8AE (FT) on the 12th. GD2HDZ also managed two more in the contest, G8XVJ/P (S. Yorks.) and G3UHF/P (Derbys.), then Oxford at the end of the month.

GM4CXP has his 46-ele. *Multibeam* back at 44ft. fed with *Pope* H-100 cable. Derrick lists GM8BDX (Borders), G8AGU (W. Yorks.), G6FLK (Durham) and G4WVI (Northumberland).

Twenty-three Centimetres

G1EZF/P (ZN05a) managed PA3DIJ during his May 13/14 operations. G4RGK is now on the band from Marlow, Bucks. using a home made transverter. GJ4ICD came on for the June 9 contest, his antenna being hand-held 5ft. *a.g.l.* G3PBV and GU2FRO were worked, but GW4LXO/P was lost in the noise. G3BW now has 25w on the band so hopes, "... to blaze a trail on 23cm. from this remote outpost". Bill was contemplating stacking two 23-ele. *Tonna Yagis* fed with LDE4-50 cable. He thanks G4CBW, G6FK, G2AUS and others for all the cooperation they have given.

G3PBV's 5ft. dish brought in 12 stations over May 5/6 in poor conditions. Best DX was G4LIP/P (AN) at 388 kms. and GB3BPO is heard most all of the time now. On May 14, PA3BPC was called on CW but did not respond. Dave says that GU2FRO (Sark) has an *MM* transverter and 23-ele. *Tonna* antenna and was worked on the 27th. GW4LXO (S. Glam.) had 100w to 23-ele. and is a reliable and regular contact. The Sunday evening activity periods continue and on June 3, five stations were worked. Some contacts are lost because people do not wait long enough for Dave's PA heaters to warm up.

Jon Stow, G4MCU, is now QRV from Billericay in Essex with an *MM* transverter and 23-ele. *Tonna Yagi*. G3LQR (AM) and G4NQC (ZL) have been worked. G4ROA found considerable activity in the May contest and lists QSOs with G4ERP/P (Gloucs.), G4ALE/P (Kent), G8ZQP (Leics.), G4LIP/P (Lincs.), G3UVR (Merseyside), G4NVA/P (S. Yorks.) and GW4HWA/P (Gwent). G8PNN worked G4CCH (Humberside) and G4LIP/P in this event and G8AGU on the 29th.

GW4TTU uses a *Yaesu* FT-290R, *MM* transverter and four 23-ele. *Tonna Yagis* and Kelvin monitors 1,296.20 MHz on Sundays for the activity group. He has worked S. Glam., Devon, Gloucs., Somerset and Gwent, but had not worked G4NQC, G6HV or G3PBV.

Thirteen Centimetres

GW4TTU, with G8TFI, GW8VHI and GW4LXO were out -/P in Dyfed (XM80f) using a *Yaesu* FT-225RD, *SSB Electronics* transverter and two 7289s in cavities in cascade, producing 45w to a 4ft. dish. Stations worked included G3JXN and G4NGQ (ZL), G3WDG and G4LRT (ZM) and G3LQR (AM). G8FUO was also worked. Kelvin is contemplating -/P operation in mid-summer with 2m., 70cm., 23cm., 13cm. and 3cm. perhaps to WJ, XJ, YJ, or XN and asks for readers' comments in choosing the most wanted region. He will also welcome sked proposals for 2m., 70cm. and 23cm. and his 'phone no. is Blackwood (0495) 224432.

Final Miscellany

The Lunar Letter Magazine has ceased publication and its U.K. distributor Doug Parker, G4DZU, has contacted all subscribers. By all accounts, Doug found it a frustrating experience. GJ4ICD would like to record his appreciation of all the voluntary work Doug put into this task.

GJ4ICD again asks those wanting QSLs from Jersey *not* to send *s.a.e.*'s with ordinary U.K. stamps. These are invalid in Jersey — and the Isle of Man — so only IRCs are acceptable. SM5MIX used to be worked regularly on 2m. but Ulf in HS66g told your scribe he has gone QRT due to too much TVI, BCI and video recorder interference — menacing looks from the neighbours, etc!

G4FRE thinks the new front cover to be "hideous" and says his newsagent now puts the *Magazine* among the computer ones. Dave also thinks that *UOSAT-type* satellites should not use amateur frequencies. The interference in the beacon band on 144.875 MHz from amateur and pirate stations in North London seems to have ceased. It was possible to copy HB9HB and EA1VHF on June 9, for example.

Deadlines

So much for May and the early June happenings. All your news, views and claims for August by July 4 and for the next month by Aug. 8. As usual, the address is:— "VHF Bands", SHORT WAVE MAGAZINE, 34 High Street, WELWYN, Herts. AL6 9EQ. 73 *de* G3FPK.

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

All At Sea with Your Morse?

A DIFFERENT APPROACH TO EFFECTIVE RECEIVING PRACTICE

MICHAEL OCKENDEN, G3MHF

THE number of Class-B licences has increased enormously but the hurdle of the Morse test remains insurmountable for many. Initial enthusiasm takes care of the learning of the characters, but all too soon a barrier of 6-8 wpm is reached. Practice will eventually make perfect but after a day at work it is all so boring! ("Keep slogging away at the morse", "Lock myself away for half an hour a day with the cassettes", "Really must force myself to get down to it"). Electronic generators of random five-letter groups and pre-recorded tapes both suffer from the fact that they are not quite the real thing. How much more interesting it would be to listen to Morse signals from afar, write down callsigns, check the country of origin and compare signal strengths from the five continents.

In recent years, the general coverage receiver has returned to the amateur radio shack, bringing with it the opportunity for anyone to improve his (or her) Morse receiving speed to well in excess of the required 12 wpm. But useful practice is hard to find in the amateur bands: masses of stations crammed into a few kilohertz, varieties of speeds and sending styles make for a most discouraging experience. In countries (unlike Britain) where out-of-band short wave listening is permitted, those seeking Morse receiving practice find that a far better place to listen is in the 4, 6, 8, 12, 16 and 22 MHz bands, where CW is still used to pass most of the traffic between merchant ships and hundreds of coast stations around the world. The constantly repeated tuning calls of the latter, for example, "CQ, CQ, CQ, DE FFL4 QSX 8MHZ K", monitored in conjunction with a guide to frequencies and some knowledge of the method of working of the Maritime Mobile Service provide a ready source of interesting 24-hour Morse practice to the short wave listener who is able to tune outside the amateur bands. Ship-to-shore communications in the HF marine bands are maintained with CW, SSB, RTTY, SITOR, DATA and FAX, with allocations being strictly laid down at international conferences. The 8 MHz band — the workhorse of marine communications — is divided as follows:—

8195.00 – 8291.10 Ships; SSB with cst. stns.* (31 channels)
 8291.10 – 8297.30 Ship & Cst. stns; simplex SSB (2 channels)
 8297.30 – 8300.00 Ships; RTTY & SITOR (5 channels)
 8300.00 – 8328.00 Ships; w/b telegraphy, FAX & special systems
 8328.00 – 8331.50 Ships; ocean data transmissions
 8331.50 – 8343.50 Ships; w/b telegraphy, FAX & special systems

8343.50 – 8357.25 Ships; RTTY & SITOR with cst. stns.** (27 chs)
 8357.25 – 8357.75 Ships; RTTY & SITOR (1 ch)
 8357.75 – 8359.75 Ships; CW working frequencies
 8359.75 – 8374.40 Ships; CW calling freqs (18 chs)
 8374.40 – 8376.00 Ships; digital selective calling
 8376.00 – 8435.40 Ships; CW working frequencies (116 chs)
 8435.40 – 8704.40 Cst. stns; CW, RTTY, SITOR, FAX & special systems
 8704.40 – 8718.25 Cst. stns; RTTY & SITOR with ships** (27 chs)
 8718.25 – 8718.90 Cst. stns; digital selective calling
 8718.90 – 8815.00 Cst. stns; duplex SSB with ships* (31 channels)

Ships with traffic for the U.K. and Ireland would contact the British Telecom station, Portishead Radio, which maintains a traffic handling centre with a staff of 250 radio officers at Highbridge in Somerset, remotely controlled transmitters at Rugby, Leafield and Ongar and remotely controlled receivers at Somerton. A ship's radio officer aboard the imaginary British ship *S.S. Orsteno* (callsign GBXM) listening to Portishead's CW transmitter GKB4 on 8559.50 MHz might hear the tuning signal "de GKB 2", indicating to ships that the search operator at Portishead is listening for calls on channel 2 in the 8 MHz calling band. Having set his transmitter to channel 2, the radio officer would call Portishead in the following way: "GKB GKB GKB de GBXM GBXM GBXM QTC QSS 384 K" (GKB from GBXM, I have a telegram for you. I will use the working frequency 8384 MHz. Go ahead.) It may take some time before the search operator picks out the call, for with coast stations being called by ships from all around the world, the QRM in the calling band can be quite dreadful — at times approaching that on 40 metres during NFD! When GBXM has been heard, the search operator will reply "GBXM de GKB lsn GKC up" (GBXM from GKB, Roger. Listen for GKC and go up to your working frequency). The ship's radio officer will then QSY to transmit on 8384 MHz and receive on 8516 MHz, the frequency of GKC. Now that the search operator has passed the ship to GKC, he is free to listen for calls from other ships, who will be told by the signal "QRY 2" (Your turn is number 2) to wait in the queue for GKC or, if traffic is very heavy, be passed to another Portishead channel, GKD on 8569.60 MHz.

The telecommunications administrations of most countries (including landlocked nations such as Switzerland and Hungary) maintain similar radio stations for communications with ships at sea. CW traffic in the six principal HF marine bands is passed in the same way: ships establish initial contact by means of a transmission in the calling band, using the common channels (ch 5 and 6) or one of the other 16 channels, which are allocated to ships on a geographical basis depending on the vessel's country of registration. The ship's receiver is first set to the transmission frequency of the coast station and adjusted for optimum reception of the automatic tuning call. It is these automatic tuning calls from coast stations which can be used to provide excellent practice in CW reception, for even though they are transmitted at speeds of between 15 and 20 wpm, they are repeated time and time again and can always be copied with a little patience. It is only when traffic is being exchanged and the automatic tape has been switched off that things start to get difficult. Furthermore, because they operate on fixed frequencies, coast stations can be used as beacons to give a useful indication of propagation.

There are literally hundreds of coast stations operating throughout the world and it would be possible any evening to log at least 50 automatic tuning calls on the 8 MHz Marine Band alone, with the following always coming in at good strength:—

8454.50 SVG 4 (Athens, Greece)
 8457.00 LSA 4 (Boca, Argentina)
 8461.00 CUB (Funchal, Madeira)
 8478.50 FUF (Fort de France, Martinique)

8483.50	DAN	(Norddeich, West Germany)
8514.00	WSL	(Amagansett, USA)
8522.50	FFL 4	(St Lys, France)
8562.00	PCH 40	(Scheveningen, Netherlands)
8597.00	VIP 3	(Perth, Australia)
8652.00	OST 42	(Ostende, Belgium)
8665.00	XSG 3	(Shanghai, China)
8694.00	4XO	(Haifa, Israel)

Corresponding allocations for coast stations in the other HF marine bands are as follows:— (* used by some countries only).

4219.40 – 4349.40
 6325.40 – 6493.90
 12652.30 – 13070.80
 16859.40 – 17196.90
 22310.50 – 22561.00
 25010.00 – 25070.00*
 25110.00 – 25600.00*
 26100.00 – 27500.00*

Identification of stations operating in the Maritime Mobile Service is not possible from a knowledge of amateur prefixes alone: for example, some British ships use callsigns in the series MAAA – MZZZ, and France has the allocation from HW to HY. An excellent guide to frequencies, giving details of all utility stations (not only those in the Maritime Mobile Service), together with a comprehensive list of frequency and callsign allocations, a decode of the special Q-Codes in use and much more besides is available in English from Joerg Klingenfuss, Panoramastrasse 81, Hagelloch, 7400 Tuebingen, West Germany.

U.K. readers are reminded that messages heard of a non-amateur nature must not be passed on to any other person — Ed.

CLUBS ROUNDUP

By "Club Secretary"

AT **Abergavenny & Nevill Hall** the gang have a get-together every Thursday evening in the room above Male Ward 2, Pen-y-Fal Hospital. More information from the Hon. Sec. — see Panel for his details.

Acton, Brentford & Chiswick are based on Chiswick Town Hall; they will be there on July 17 for a discussion on the Radio Interference Service. The venue is in Chiswick High Road, London W4, and the start time 7.30 p.m.

Now to **Axe Vale** where they go to the Cavalier Hotel in West Street, Axminster, on the first Friday in each month; July 6 is a visit to the IBA station at Stockland Hill. Again, more details from the Hon. Sec. — see Panel.

Apart from the regular club activities (details from the Hon. Sec.) the **Barking** club will be putting on GB2DTS at the Dagenham Town Show over the weekend July 14/15 in Central Park; they have HF, VHF, RTTY, ATV and computers on exhibition, plus a demonstration of direct satellite TV reception.

The second Tuesday of each month is the one ringed in the **Basingstoke** members' diaries; the venue is the "Swann Inn", Sherbourne St. John, near Basingstoke; and they have a club net every Monday evening on 145.475 MHz FM at 2000 clock.

The **Bishops Stortford** chaps have a visit from the aerial trapper, G3XAP, for their main meeting on July 16 (third Monday) at the British Legion Club in Windhill. The informal session is in the "Nag's Head" on the A120 heading out of town towards the motorway, and is on the first Thursday of each month in the saloon bar.

Up the road from Bishops Stortford is the town of **Braintree**, where the local club is based on Braintree Community Association Hq. in Victoria Street, next door to the bus station in the centre of the town. Doors open at 7.30 p.m. July 2 is down for

a talk on power supply units by G3PEN, and on July 16 there is a talk on nuclear power by the CEGB people. August 6 is down for an evening of operating on HF and VHF.

A new Hon. Sec. is noted by **B.A.R.T.G.**: this is the club to join if you are interested in RTTY or AMTOR. His details are in the Panel.

July 3 at **Bury** is down for a surplus equipment sale, and on July 10 they have a visit to the IBA transmitter site at Emley Moor. We are asked to note that their Hq. at Mosses Community Centre, Cecil Street, Bury is closed between July 6 and 22. Doubtless the Hon. Sec. — see Panel — will be able to advise what other activities are cooking.

Cheltenham continue happily at their Hq. in the Stanton Room, Charlton Kings Library, Cheltenham; on July 6 G3KKN will talk about communications in Africa, and over the VHF NFD weekend the gang will be out in conjunction with the Hereford group. On July 20 they have the natter session while August 3 sees a quiz.

At **Cheshunt** the natter evenings are on July 11 and 25; July 4 is an equipment evening, and on 18th there is a visit, details of which are to be had from G3OJI. The venue for the club meetings is Church Room, Church Lane, Wormley, every Wednesday evening.

Chichester practice is to meet on the first Tuesday and the third Thursday, at Fernleigh Centre, 40 North Street, Chichester, either in the Long Room or the Green Room.

The **Cornish** crowd seem to have settled down at the Church Hall, Treleigh, on the old Redruth by-pass now; July 5 is a natter and questions answered session, and on August 2 G3VWK talks about early radio and TV. Oh — we mustn't forget the Cornish Rally at Camborne Technical College, Pool, on July 15.

Crawley will be operating in VHF NFD, and on July 11 they have an informal meeting at the QTH of G3UOV; the main meeting, at Trinity Church Hall, Ifield, Crawley, is on July 25 and is a talk by the Sussex Repeater Group.

The **Crystal Palace** group get together at All Saints Parish Room, at the junction of Beulah Hill and Church Road, Upper Norwood, opposite the IBA mast on the third Saturday in each month, starting at 8 p.m.

If you are interested in **Dartford Heath D/F Club** we must refer you to the Hon. Sec. — see Panel — for more details on their meetings and club hunts, which seem to have been left out of the current newsletter.

July in **Derby** sees meetings on most Wednesdays at 119 Green

Names and Addresses of Club Secretaries reporting in this issue:

- ABERGAVENTNY: D. F. Jones, GW3SSY, 80 Craesonen Parc, Abergavenny, Gwent NP7 6PE. (0873 78674)
- ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, Acton, London W3 8LB. (01-992 3778)
- AXE VALE: R. H. Newland, G3VW, 'Ham House', Lyme Road, Uplyme, Lyme Regis, Dorset.
- BARKING: R. Woodbury, G6YZV, Barking Radio Club, Westbury Recreation Centre, Westbury School, Ripple Road, Barking IG11 7PT.
- BASINGSTOKE: E. C. Thompson, G4SQZ, 21 Wigmore Road, Tadley, Basingstoke, Hants. RG26 6HH.
- BISHOPS STORTFORD: S. Mammatt, G6HKK, 31 Atherton End, Sawbridgworth, Herts. CM21 0BS. (0279 724669)
- BRAINTREE: Mrs. P. Penny, G6TAF, 13 Newnham Close, Braintree, Essex. (0376 26487)
- B.A.R.T.G.: J. Beedie, G6MOK, 161 Tudor Road, Hayes, Middx. UB32 0QG. (01-561 0010)
- BURY: B. Tyldesley, G4TBT, 4 Colne Road, Burnley, Lancs. (Burnley 24254)
- CHELTENHAM: Mrs. G. Harmsworth, G6COH, 42 Leckhampton Road, Cheltenham, Glos. (Cheltenham 25162)
- CHESHUNT: R. Frisby, G4OAA, 2 Westfield Road, Hoddesdon, Herts. EN11 8QX.
- CHICHESTER: T. M. Allen, G4ETU, 2 Hillside, West Stoke, Chichester, Sussex PO18 9BL. (West Ashling 463)
- CORNISH: S. Rodda, G4PEM, Cliff Hotel, Penrose Terrace, Penzance TR18 2HH. (Penzance 3948)
- CRAWLEY: D. L. Hill, G4IQM, 14 The Garrones, Worth, Crawley, W. Sussex RH10 4YT. (Crawley 882641)
- CRYSTAL PALACE: G. M. C. Stone, G3FZL, 11 Liphook Crescent, London SE23 3BN. (01-699 6940)
- DARTFORD HEATH D/F: A. Burchmore, G4BWV, 49 School Lane, Horton Kirby, Dartford, Kent DA4 9DQ.
- DERBY: Mrs. J. Shardlow, G4EYM, 19 Portreath Drive, Darley Abbey, Derby DE3 2BJ. (0332 556875)
- DUDLEY: Mrs. C. Wilding, G4SQP, 92 Ravenhill Drive, Codsall, Wolverhampton, W. Midlands WV8 1BW. (Codsall 5636)
- EDGWARE: J. Cobley, G4RMD, 4 Briars Close, Hatfield, Herts. (Hatfield 64342)
- EXETER: R. Tipper, G4XKR, 11 Chancel Court, Chancel Lane, Pinhoe, Exeter. (Exeter 68065)
- FARNBOROUGH: I. Ireland, G4BJQ, 118 Mychett Road, Mychett, Camberley, Surrey. (Farnborough 543036)
- FYLDE: H. Fenton, G8GG, 5 Cromer Road, St. Annes, Lytham St. Annes, Lancs. FY8 3HD.
- GLENROTHES: A. Givens, GM3YOR, 41 Veronica Crescent, Kirkcaldy, Fife KY1 2LH. (Kirkcaldy 200335)
- G-QRP CLUB: Rev. G. C. Dobbs, G3RJV, 17 Aspen Drive, Chelmsley Wood, Birmingham B37. (021-770 5918)
- GREATER PETERBOROUGH: F. Brisley, G4NRJ, 27 Lady Lodge Drive, Orton Longueville, Peterborough, Cambs.
- HALIFAX: D. L. Moss, Beechwood Lodge, Lightcliffe, Halifax HX3 8NU. (0422 202306)
- HARROW: D. Atkins, G8XBZ, 25 Maxwell Close, Rickmansworth, Herts.
- HASTINGS: D. Shirley, G4NVQ, 93 Alfred Road, Hastings, Sussex. (Hastings 420608)
- HAVERING: J. R. Gibbs, G4UQR, 40 Bridge Avenue, Upminster, Essex RM14 2LX. (Upminster 26904)
- HEREFORD: F. E. G. Cox, G3WRQ, 35 Thompson Place, Hereford. (Hereford 54064)
- INVERNESS: D. E. Jones, GM4SXD, Beacham, Farr, Inverness, IV1 2XF. (Farr 08083) 240)
- IPSWICH: J. Tootill, G4IFF, 76 Fircroft Road, Ipswich, Suffolk IP1 6PX. (0473 44047)
- I.R.T.S.: S. Nolan, EI7CD, 68 Ratoath Estate, Ratoath Road, Dublin 7.
- ISLE OF MAN: Mrs. A. Matthewman, GD4GWQ, 20 Terrace Avenue, Douglas, I.o.M. (0624 22295)
- JERSEY (Electronics Club): P. Johnson, GJ8KNV, 'Mon Repos', Fauvie Grauville, Jersey. (Jersey 53333)
- LINCOLN: Mrs. P. Rose, G4STO, Pinchbeck Farmhouse, Mill Lane, Sturton-by-Stow, Lincoln LN1 2AS.
- MEDWAY: A. Wallis, G4TQS, 13 Stoneacre Close, Parkwood, Rainham, Gillingham, Kent ME8 9PS. (0634 363960)
- MIDLAND: N. Gutteridge, G8BHE, 68 Max Road, Quinton, Birmingham B32 1LB. (021-422 9787)
- NENE VALLEY: L. Parker, G4PLJ, 128 Northampton Road, Wellingborough, Northants NN8 3PJ.
- R.A.I.B.C: Mrs. F. Woolley, G3LWY, 9 Rannoch Court, Adelaide Road, Surbiton KT6 4TE.
- R.A.M.U.G.: R. A. Webb, 39 Aldworth Road, Stratford, London E15 4DN.
- ROYAL NAVY: M. Puttick, G3LIK, 21 Sandyfield Crescent, Cowplain, Portsmouth, Hants. PO8 8SQ.
- SOUTH BRISTOL: L. Baker, G4RZY, 62 Court Farm Road, Whitechurch, Bristol, Avon BS14 0EG.
- SOUTHDOWN: T. Rawlance, G4MVN, 18 Royal Sussex Crescent, Eastbourne.
- SOUTH MANCHESTER: D. Holland, G3WFT, 32 Woodville Road, Sale, Greater Manchester. (061-973 1837)
- STEVENAGE: C. Barber, G4BGP, 13 The Sycamores, Baldock, Herts. (0642 893736)
- STOURBRIDGE: M. Davies, G8JTL, 25 Walker Avenue, Quarry Bank, Brierley Hill. (Lye 4019)
- SURREY: R. Howells, G4FFY, 7 Betchworth Close, Sutton, Surrey SM1 4NR. (01-642 9871)
- SUTTON & CHEAM: J. Korndorffer, G2DMR, 19 Park Road, Banstead, Surrey.
- THANET: I. B. Gane, G4NEF, 17 Penshurst Road, Ramsgate, Kent. (Thanet 54154)
- TODMORDEN: Ms. J. Gamble, G6MDB, 283 Halifax Road, Todmorden, Lancs. OL14 5SQ.
- VALE OF WHITE HORSE: I. White, G3SEK, 52 Abingdon Road, Drayton, Abingdon, Berks. (0235 31559)
- VERULAM: H. Clayton-Smith, G4JKS, 115 Marshalswick Lane, St. Albans, Herts. (St. Albans 59318)
- WACRAL: L. Colley, G3AGX, Micasa, 13 Ferry Road, Wawne, Nr. Hull, Yorks. HU7 5XU.
- WAKEFIELD: W. Parkin, G8PBE, 14 Cleveland Grove, Lupset Park, Wakefield WF2 8LD. (Wakefield 378727)
- WEST KENT: P. Reeve, G4GTN, 2 Court Road, Tunbridge Wells, Kent. (Tunbridge Wells 24689)
- WIRRAL: C. Cawthorne, G4KPY, 40 Westbourne Road, West Kirby, Wirral. (051-625 7311)
- WISBECH: K. J. Stockley, G4UQN, 14 St. Peters Road, Wisbech, Cambs. PE13 2NB. (Wisbech 61029)
- WORCESTER: A. C. Lindsay, G4NRD, 11 Durcott Road, Evesham, Worcs. WR11 6EQ. (Evesham 41508)
- YEOVIL: E. Godfrey, G3GC, Dorset Reach, 60 Chilton Grove, Yeovil, Somerset BA21 4AW. (0935 75533)
- YORK: K. R. Cass, G3WVO, 4 Heworth Village, York.

Lane, Derby. July 4 is a junk sale, and on 11th there is a limited-number visit to Radio Derby studios. July 18 is down for a talk on AMTOR and a practical demonstration by G3XOF, and on July 25 there is a night-on-the-air.

For details on the July meetings of the Dudley club we must refer you to the Hon. Sec. — see Panel. However, from the previous month's data we can deduce the form as "weekly on Mondays, at Allied Centre, Greenman Alley, off Tower Street, starting at 7.45 p.m."

Cancellation

Always sad to have to report one; but East Kent write to say they have been forced to cancel their Mobile Rally due to circumstances beyond their control. As for the club meetings, contact the Hon. Sec. — see Panel — for the details.

Apart from entering VHF NFD, Edgware has an outside visit planned for July 12 — details from the Hon. Sec. at the address in the Panel. On July 26 they have their informal at Hq., 145 Orange Hill Road, Burnt Oak, Edgware.

Exeter will be investigating the matter of "Static and Chips" with G3RSJ doing the detective work for them, on July 9 at the Community Centre, St. David's Hill, Exeter.

Turning to Farnborough, Hants., we seem to have been left off the list for an update, so all we can do is to say their Hq. is at the Railway Enthusiasts Club, Access Road, off Hawley Lane, and for the rest refer you to the Hon. Sec.

The members of the Fylde club are very pleased indeed with their combined membership arrangement with their Kite Club hosts at Blackpool Airport, which means they can use the Kite Club facilities on other evenings apart from the designated Fylde meetings on the first and third Tuesday of each month. On July 3 they will have a talk on the radio and radar equipment installed at Blackpool Airport, and on 17th there is the informal. On a recent trip to HMS Inskip, the members were offered the chance to climb the 650-foot towers; not one member failed to find an excuse for not going up the ladder!

Up at Glenrothes the group are well on the way with the work on their Hq. at Provosts Land, Leslie, Fife. This is the venue for the meeting on July 15, when VP8AQA will talk about Antarctica. There are, we know, other meetings, for details of which we must refer you to the Hon. Sec. — see Panel.

If you are into low-power operating, or home-brew equipment, then membership of the G-QRP Club is for you; all the details from the Hon. Sec.

Turning to the **Greater Peterborough** letter, we note they have July 19 as the date for the meeting at Southfields Junior School, Stanground, but at the time of their letter the subject was still to be finalised.

On we go again, to **Halifax** now, and the "Running Man", Pellon Lane, on the first and third Tuesdays of each month. However, a look at the membership card attached to their letter shows *no meetings in July*. Sounds like a good case for contacting the Hon. Sec. — see Panel.

Harrow newsletter sports a rather dishy new cover, which tells us they have meetings on Fridays at Harrow Arts Centre, High Road, Harrow Weald. Opening it we find a note about car parking which could be applied to every club using another organisation's car park: don't block someone else's way out by careless or thoughtless parking. As for the meetings, we see a talk on basic microwaves on July 6, informals on July 13 and 27, and on July 20 a talk on airborne radio.

At **Hastings**, the main meeting is on the third Wednesday of each month at West Hill Community Centre, Croft Road, Hastings; in addition the group have informals every Friday evening in the Club Room, Ashdown Farm Community Centre, Downey Close, which is off Harrow Lane. July 18 is a special one — G4ZU will be talking about aerials.

July 4 is a 'business' meeting for **Havering**; July 11 and 25 are informals, and on July 18 the topic was still open at the time of their letter. Fairkytes Arts Centre, Billet Lane, Hornchurch, will find all these events.

Hereford foregather on the first and third Friday of each month at County Control, Civil Defence Hq., Gaol Street, Hereford. July 1 is noted as the Droitwich Rally, then on 6th at Hq. G8IVO will talk about oscilloscopes. July 20 is the informal evening.

Right up north now, to **Inverness**; the club Hq. is at Planefield Road, Inverness, and the members are there every Thursday evening. More details from the Hon. Sec. — see Panel.

At **Ipswich** one finds the local group on the second and last Wednesday of each month at the "Rose and Crown", 77 Norwich Road, Ipswich; this is at the junction with Bramford Road, and the club room is detached from the public bars, so juniors and indeed any visitors are very welcome. July 4 is the date for the post-mortem on the rally and the VHF NFD planning, and on July 22 they have a visit to Suffolk Police Hq., Martlesham. August 25 is a D/F Hunt, to finish at the clubroom.

Over to EI now, and **I.R.T.S.** where at the time of writing they will be busy organising everything for another year after the AGM. For details on any of the activities in EI, contact the Hon. Sec. — see Panel for his details.

In the **Isle of Man** they have weekly meetings, but for the details we must refer you to the Hon. Sec. as our information is a little out of date — see Panel.

Jersey now, and on July 11 they have a D/F Hunt: start at the second lay-by in Victoria Avenue, St. Brelade, at 7.30 p.m. and end up with pub food at a 'local'. Normal meetings are at Communicare Centre — for details contact the Hon. Sec. — see Panel.

The latest hand-out to reach us from **Lincoln** shows them to be still based on the City Engineers Club, Central Depot, Waterside South, Lincoln, on second and fourth Wednesdays; on the intermediate Wednesdays they are doing RAE and Morse classes for those interested. July 11 sees G8VGF talking about "The End of the Vulcan", and on July 25 they will have an activity night and operate the club calls.

At **Medway** the Hon. Sec. has forgotten to tell us the venue for the meetings on July 6 when they have films, and July 20 when G8VR will tell them how to improve their VHF DX. We suspect it all happens at St. Luke's Church Hall, King William Road, Gillingham, but check with the Hon. Sec. first.

Robbery

Midland members are still trying to recover from the shock of having their Hq. at 294A Broad Street, Birmingham, broken into



Cork Radio Club hosted the recent Annual Banquet and A.G.M. of the Irish Radio Transmitters' Society. Pictured here are Cork R.C. members, left to right, Kevin O'Sullivan EI740, Aidan O'Meara EI3EG, John Coakley EI5FC, Helen O'Reilly EI646, Tom Foley EI6BA, and Finbarr Buckley EI1CS.

photo: EI9FE.

and a quantity of gear stolen. The evidence suggests this robbery may have been done with inside knowledge — which is a very sad thought. Life goes on though, and July 17 is the next formal club meeting date for a talk on Amateur TV.

At **Nene Valley** the group foregather in the "Dolben Arms" public house in Finedon, near Wellingborough. July 4 and 25 are both natter evenings; July 7 sees them out on VHF NFD and operating GB4CWR at the Wellingborough Charities Festival; July 11 is down for a tube sale by G4MEO — does he mean valves or CRT's? — and on July 18 there is a lecture from a crime prevention officer.

R.A.I.B.C. looks after the interests of the blind or invalid radio amateur or SWL — if you know of someone who is interested in the idea of amateur radio, and in one of these categories, then you should put them in touch with the Hon. Sec. see Panel. In addition, you could possibly join yourself, as a supporter or representative, or even send a donation.

The next meeting of **R.A.M.U.G.** (Radio Amateur Micro User Group) is on July 10 at The Design Block, Eastlea School, Hilda Road, Canning Town, London E16. The subject will be database and log keeping, with G6OVL and G4KCS.

Next we must look at the **Royal Navy**; this club is open to members of the RN or MN, or foreign navies, whether serving or retired. Quite apart from the newsletter and gatherings at such as the NEC exhibition, there is the Rally at *HMS Mercury*, a sub-group based on *HMS Belfast* in London — their activity week is running as this is being written — and various other things. And, of course, the newsletter, which is one of the best we have seen.

At **South Bristol** the Hq. is Whitchurch Folk House, East Dundry Road, Whitchurch, Bristol. July 4 sees a talk about RSGB by G4FRX, and on 11th they have a UHF activity night. July 18 is a computer bring-and-buy session plus an activity night, and on 25th they have an HF activity evening. August 1 is down for a lecture, the subject of which is not finalised at the time their letter was sent.

The **Southdown** chaps gather on the first Monday of each month at the Chaseley Home for Disabled Ex-Servicemen, Southcliffe, Eastbourne. However, there seems to be some sort of move afoot, and so it seems that before turning up a contact with the Hon. Sec. would be in order; his name and address, of course, are in the Secretaries Panel.

Every Monday is a natter and every Friday a main meeting for the **South Manchester** crowd; July 6 sees preparation for VHF

NFD, July 13 a talk entitled "Synthesis of the Elements, or a Hitch-Hiker's Guide to the Universe", by G4ROM. On July 20 they have a clinic at which they will attempt to make failed projects work; and on July 27 G8TYT of Manchester University Department of Computer Science will talk about microprocessor design. August 3 is a Top Band D/F Contest. All these are at Sale Moor Community Association, Norris Road, Sale.

At **Stevenage** the club Hq. is at *TS Andromeda*, Fairlands Valley Park, Shephall View, Stevenage, and they are to be found there on the first and third Tuesday of each month. More details from the Hon. Sec.—see Panel.

July in **Stourbridge** sees an informal session on 2nd, at Hq., with all the usual attractions, and on July 16 the main meeting will take a look at the club's various properties. Hq. is the Robin Woods Centre, School Street, off Enville Street.

Deadlines for "Clubs" for the next three months—

August issue—June 29th
 September issue—July 27th
 October issue—August 31st
 November issue—September 28th

Please be sure to note these dates!

Now to **Surrey**, which means *TS Terra Nova*, 34 The Waldrons, South Croydon, and the first and third Monday in each month, 7.45 for 8 p.m. The first meeting in July is down for G8TB to talk about aeriels.

Not so very far away is **Sutton & Cheam**; they have a booking at Sutton College of Liberal Arts on July 6, the subject undecided at the time of their letter; and on July 20, G3IEE will be talking about German war radio equipment at Downs Lawn Tennis Club, Holland Avenue, Cheam.

If you want to find the **Thanet** group, look for the Grosvenor Club, Grosvenor Place, Margate, on the second and fourth Tuesday of each month.

For the venue of the **Todmorden** club we must refer you to the Hon. Sec. — see Panel. However, we can say they have their meeting on July 2 and that it is a treasure hunt with a radio bias.

July 3 is AGM time for the **Vale of White Horse** at the Landsdown Club, Milton Trading Estate, near Didcot; the normal routine is for meetings to be on the first and third Tuesday of each month.

Change of Date

The **Verulam** main meeting for July has been shifted to July 10, when G5RV will be giving a talk on wire antennas. The informal is on July 24, and both are at the R.A.F.A. Hq. in New Kent Road, off Marlborough Road, St. Albans.

WACRAL is the radio amateur group of committed Christian radio amateurs and SWL's world-wide — details from the Hon. Sec.—see Panel.

Change of Hq.

This applies to **Wakefield**, and takes them to Ossett Community Centre, Prospect Road, Ossett, where they are to be found on alternate Tuesdays. July 10 sees a joint 144 MHz Foxhunt with the Pontefract crew, and on July 24 a pitch-and-putt competition at Holmfield Park.

We also have a change for **West Kent**. They are now gathering every Friday evening in the Adult Centre Annexe, Quarry Road, Tunbridge Wells; for July the formals will be on July 13 and 27. In addition they have a Radio and Electronics Fair to which all are welcome: Saturday, July 21, Victoria Hall, Southborough, 10.30 till 5 p.m.

Problem

We have a letter from **Wirral**, saying they gather on the first and third Wednesday at the Guide Hut, Westbourne Road, West Kirby, with July 4 a surplus sale and July 18 a talk on computers in amateur radio. The snag? We just don't know which of the two known Wirral clubs this refers to, or whether a third one has popped up. Will someone put us right please?

The **Wisbech** club still foregather at the "Five Bells", Parson Drove, every Thursday evening, and they are interested in hearing from any prospective new members. More on this from the Hon. Sec. — see Panel for his vital statistics.

Worcester in their letter only mention the Mobile Rally on July 1 — Droitwich High School, Ombersley Road, Droitwich. Club meetings alternate between the "Old Pheasant Inn", and the Oddfellows Club, both of which are in New Street, Worcester. For the details on the club, refer to the Hon. Sec.

A new departure for **Yeovil** this year will be a QRP Convention in October — more details in "CDXN". The club meets every Thursday evening at the Recreation Centre, Chilton Grove, Yeovil; on July 12 G3MYM takes a look at six metres, and on 19th at JFET RF amplifiers. July 26 is a natter session. On a different tack, the locals are pleased to see their new repeater GB3YS on RB2 in action.

One of the joys of running a special-event station, says the **York** scribe, it to see a visitor becoming hooked on amateur radio — very true! The gang are to be found every Friday evening, from 7.30, at the United Services Club, 61 Micklegate, York.

Special Event Stations

Carmarthen Amateur Radio Society will be operating **GB2EGL** from the site of the Royal National Eisteddfod of Wales (Eisteddfod Genedlaethol Frenhinol Cymru) at Lampeter, Dyfed, **August 4th to 11th**. Operation will be on HF and VHF and special QSL cards will be issued. Full details from Allan Jones, GW4VPX, on 055934-434.

Yeovil Amateur Radio Club will be operating **GB2FAA**, on behalf of R.N.A.R.S., during the Open Day/Air Display at *H.M.S. Heron*, Yeovilton, Somerset, on **August 4th**. Details from B. Clark, G3BEC, QTHR.

Rallies

August 19, Hamfest '84, organised jointly by RAIBC and Flight Refuelling A.R.S., at F-R Social Club & Sports Ground, Merley Park Road, Merley, Wimborne, Dorset, 11 a.m. to 5 p.m., trade stands, bring-and-buy, free entrance and car park, attractions for the whole family, talk-in on 2m. and 70cm. with GB2FRH. Further details from Miss E. K. Howard, 11B Chester Road, Poole, Dorset BH13 6DE; or ring Bob Burrows, 0202-762828 (day).

The End

All complete for this month: arrival deadlines for your letters are given in the 'box' in the body of the script, which should be addressed to your Club Secretary, **SHORT WAVE MAGAZINE**, 34 High Street, Welwyn, Herts. AL6 9EQ. Meantime, watch out for the suntan and don't forget to take a broly!

Timestep Electronics Ltd.

Timestep Electronics Ltd. has moved to new premises, and their address is now: Wickhambrook, Newmarket, Suffolk (tel: 0440-820040, telex 817015).

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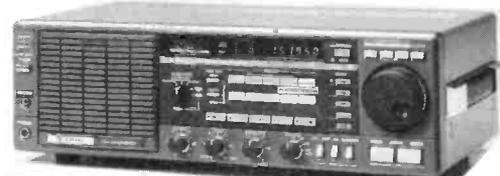
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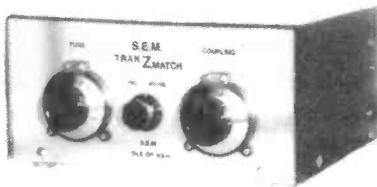
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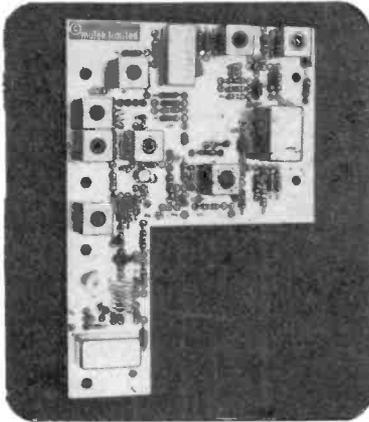
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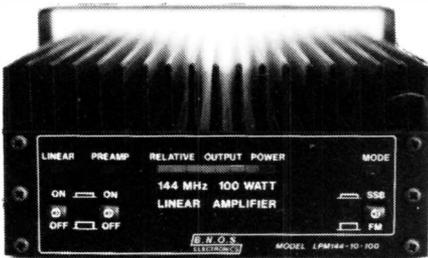
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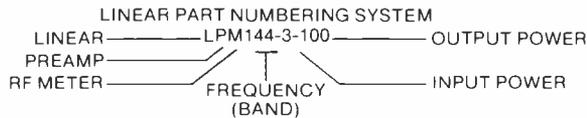
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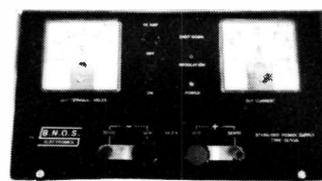


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