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 VHF CONVERTER. £122.26
 Covers 118-174MHz



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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 radiol 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 (NI) 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. £365.00



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
 NSD515 TRANSMITTER & AC PSU £1,371.00
 NEW 96 CHANNEL MEMORY UNIT.
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Hokasin

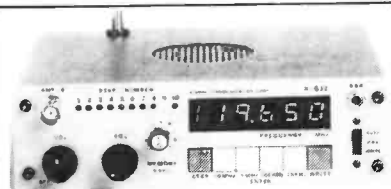
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ANT PRODUCTS

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THE R532
AIRCRAFT BAND RECEIVER
£186.50 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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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, Cardiff, 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 shops and after-sales service. The shops are open Tuesday to Friday from 9.00 to 5.30 p.m., Saturday from 9.00 to 5.00 p.m. and close for lunch each day from 12.30 till 1.30 p.m.

In Glasgow the LOWE ELECTRONICS' shop (the telephone number is 041-945 2626) is managed by Sim GM3SAN. 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 (the telephone number is 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 the location of a LOWE ELECTRONICS' shop managed by Tony G4NBS. The address is 162 High Street, Chesterton, Cambridge (the telephone number is 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, signposted Chesterton. After passing a children's playground on your left turn left again (between the shops) into Green End Road. Very quickly, and without you noticing it, Green End Road becomes High Street. Easy and free street parking is available outside the shop.

For South Wales, the LOWE ELECTRONICS' shop is located in Cardiff. Managed by Richard GW4NAD, who hails from Penarth, the shop (the telephone number is 0222 464154) is located within the premises (on the first floor) of South Wales Carpets, Clifton Street, Cardiff. Clifton Street is easily found, being a left turn off Newport Road just before the Infirmary. Once in Clifton Street, South Wales Carpets is the modern red brick building at the end of the street on the right hand side. Enter the shop, follow the arrows past the carpets, up the stairs and the "Emporium" awaits you. Free street parking is available outside the shop.

LOWE ELECTRONICS' London shop is located at 223/225 Field End Road, Eastcote, Middlesex (the telephone number is 01-429 3256). The shop, managed by Andy G4DHQ is easily found, being part of Eastcote tube station buildings and as such being on the Metropolitan and Piccadilly lines (approximately 30 minutes from Baker Street main junction). For the motorist, we are only about 10 minutes' driving time from the M40, A40, North Circular Road (at Hangar Lane) and the new M25 junction at Denham. Immediately behind the shop is a large car park where you can currently park for the day for 20p. There is also free street parking outside the shop.

Although not a shop there is on the South Coast a source of good advice and equipment — John G3JYG. His address is 16 Harvard Road, Ringmer, Lewes, Sussex. (telephone 0273 812071). An evening or weekend telephone call will put you in touch with John.

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 an 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.

For many years.....

I have found much pleasure in slowly tuning a receiver across the short wave bands. I remember discovering that the new wireless, just purchased by my Grandfather, had on it a short wave section. So, after the family had listened to "The Archers" and set about the evening's activities, I was left with the set to myself, able to tune around and listen to the world. I am certain that the thing that fascinated me then is still the same today; the fact that transmissions from such exotic places so far away could be heard in my own surroundings. Perhaps I am a romantic at heart but to imagine the sights and sounds of the countries originating the transmissions was special. I find it difficult to describe the feeling. I have since spoken to many people who have shared the same experience, they too find it difficult to explain.

Since those days.....

things have changed and many receivers have come and gone. When compared with the large pieces of surplus equipment once used by the short wave listener in his shed at the bottom of the garden, today's equipment looks "very HI-FI". Most of the receivers carry the description "general coverage" meaning that it will tune without gaps frequencies from around 100 kHz to 30 MHz. Such wide coverage means that not only can you listen to amateurs and short wave broadcast stations worldwide, you can also hear Radios 1, 2, 3 and 4 and Laser on 588 kHz. To the short wave listener this is a great advantage over rigs which only have selected bands. It is usually the band you particularly want that the manufacturer had decided you could do without. The receivers which I now describe are all "general coverage", and I might add are each capable of giving you the satisfaction which I describe above.

the R600.....



TRIO R-600

At the start of the range is the TRIO R600 which costs £285.26 including VAT. This is the receiver for the beginner, the person of limited means or the cynic who does not really believe my enthuse. The R600 is a basic receiver covering from 150 kHz to 30 MHz and having switched upper and lower sidebands, wide and narrow am and cw. It has a 20 dB attenuator and a noise blanker fitted as standard. Operation is simple, select the mode of operation, turn the MHz dial to the correct band and, by using the VFO knob, tune to the desired frequency. The clear digital readout makes station selection simple. The TRIO R600 is an ideal receiver for shack, bedroom or lounge.

There were shepherds abiding in the field, keeping watch over their flocks by night. And lo, the angel of the Lord came upon them, and the glory of the Lord shone about them, and they were sore afraid.

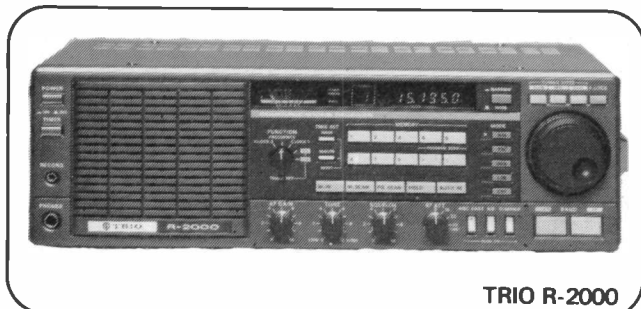
And the angel said unto them, "fear not, for behold I bring you good tidings of great joy, which shall be to all people. For unto you is born this day, in the city of David, a Saviour which is Christ the Lord".

*And suddenly there was with the angel a multitude of the heavenly host, praising God, and saying:
"Glory to God, glory to God in the highest, and peace on earth, goodwill towards men".*

LUKE 2 V 8 to 14

the R2000

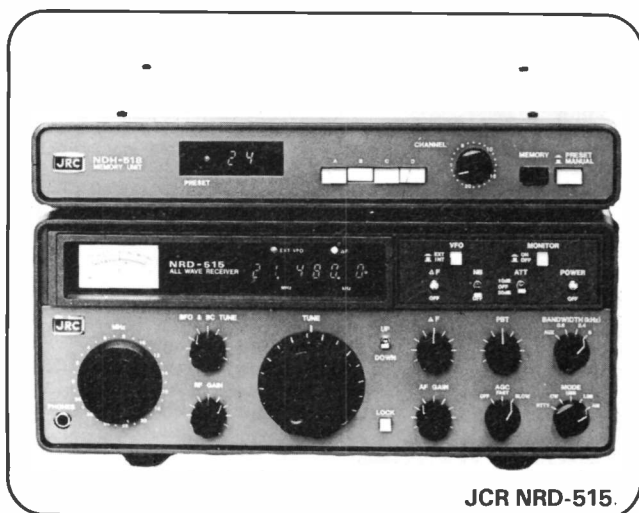
Moving upward from the R600 we find the TRIO R2000. The receiver covers frequencies from 100kHz to 30MHz and has, in addition to the facilities found on the R600, a ten channel memory to hold for quick access your favourite stations. Memory operation is versatile, each memory retaining not only the frequency but the mode of operation. Each memory can be also used as a separate VFO. In addition to AM, USB, LSB and CW the R2000 is fitted with FM which, when used



TRIO R-2000

with the VC10 internal vhf converter, enables the amateur 2 metre band to be fully listened to. Another advantage over the R600 is that the R2000 tunes continuously up the band and not in 1 MHz sections. Three rates of tuning are provided enabling the band to be either searched diligently or quickly "scanned". With the optional VC10 fitted the R2000 adds to its frequency range the VHF section from 118 to 174 MHz and, of course, operates on AM, FM, USB, LSB and CW. Fast or slow AGC can also be easily selected using a front panel switch. Altogether a fine receiver and ideal for today's listener. **The TRIO R2000 costs £456.63 including VAT.** The optional VC10 costs £117.00 including VAT and is easily fitted inside the receiver.

from JRC, the NRD515

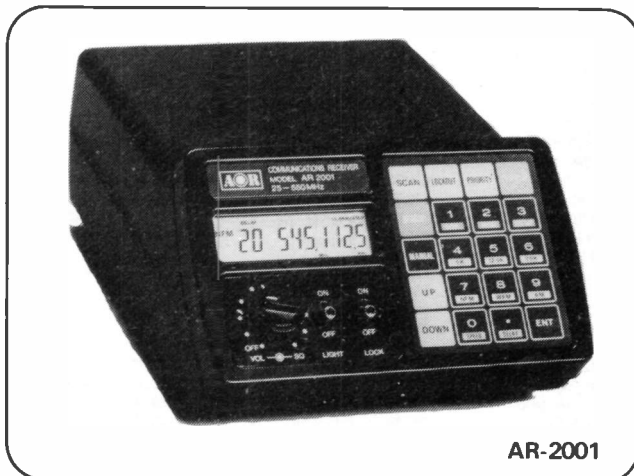


JCR NRD-515

There are amongst us a discerning few for whom only the best is good enough. For them there is only one receiver: this is the NRD515 manufactured by the JAPAN RADIO COMPANY. The receiver is built to professional standards and is designed to give its owner the ultimate in listening pleasure. Covering 100kHz to 30MHz the NRD515 has pass band tuning, slow and fast AGC and a preselector covering the broadcast bands from 600 kHz to 1.6 MHz. Optional accessories include a 96 channel memory unit (NDH518 £264.00 inc VAT), a remote frequency controller giving keyboard frequency entry, plus an additional four memories (NCM515 £169.75 inc VAT) and a matching speaker (NVA515 £45.41 inc VAT). **The NRD515 short wave monitor receiver costs £965.00 inc VAT.**

and the AR2001

It is rare to use a piece of equipment so refreshingly new as to be devastating. Although it has been my pleasure to use numerous receivers over the past years nothing has so captured my attention as has the AR2001 from the company AOR. Authority On Radio, AOR, sums them up exactly. In the past there have been several receivers covering parts of the HF/VHF/UHF spectrum but never before a receiver



AR-2001

tuning continuously from 25 MHz to 550 MHz. Never before a receiver having AM, narrow band FM and wide band FM. Never one that could be afforded by all enthusiastic listeners. The AR2001 is the new concept in receiver design combining user friendly controls to aid listening with a carefully designed receiver that actually works. The receiver with its continuous coverage between 25 and 550 MHz enables its owner to listen to a multitude of transmission sources. The provision of three modes, AM, narrow band FM and wide band FM are essential when one considers the variety of information that can be received. AM for the VHF/UHF airband channels, narrow band FM for amateur radio, CB and business radio and finally wide band FM for broadcast and TV sound. Digital frequency readout is combined with visual reminders of receiver state and for night time listening the panel is illuminated. Scanning, memories, memory scan, programmable band scan are all part of the receiver and to aid operating the memory not only remembers the frequency but the mode of operation. **The AR2001 receiver costs £365.00 inc. VAT.**

A PEACEFUL CHRISTMAS TO OUR FRIENDS

LOWE ELECTRONICS, Chesterfield Road, Matlock, Derbyshire DE4 5LE

WATERS & STANTON ELECTRONICS

18/20 MAIN ROAD, HOCKLEY, ESSEX. Tel: (0702) 206835
12 NORTH STREET, HORNCHURCH, ESSEX. Tel: (040-24) 44765

TRIO

TS930S HF Tcvr.....	£1195.00
AT930 ATU.....	£150.00
SP30 Speaker.....	£62.96
TS430S HF tcvr.....	£699.00
PS430 AC psu.....	£119.00
SP430 Speaker.....	£31.00
AT250 ATU.....	£277.00
MB430 Mobile Unit.....	£12.00
FM430 mod.....	£36.50
TS830S HF tcvr.....	£758.00
VFO230 VFO.....	£258.00
AT230 ATU.....	£143.00
SP230 Speaker.....	£43.00
TS530SP HF tcvr.....	£689.00
VFO240 VFO.....	£95.00
TS130S HF tcvr.....	£578.00
TL120 200w lin.....	£177.00
MB100A mobile mount.....	£19.50
SP120 speaker.....	£27.99
SP140 speaker.....	£14.48
AT130 ATU.....	£98.95
PS20PSU.....	£57.75
TL922 2kw.....	£950.00
TS780 2m/70cm.....	£850.00
TR9130 2m tcvr.....	£458.00
BO9A base.....	£49.00
TR7930 2m tcvr.....	£323.00
TW4000A 2m/70cm.....	£488.00
TR2500 2m h/hold.....	£246.00
VB2530 30w amp.....	£73.90
ST2 charger.....	£54.90
SC4 Case.....	£14.50
MS1.....	£33.90
SMC25 Speaker/Mic.....	£17.00
PB25 nicad.....	£26.50
LH2 case.....	£25.40
BT1 AA case.....	£5.98
DC25 12v.....	£17.00
TR3500 70cm h/hold.....	£285.00
TM401A 70 cm.....	£310.00
TM201A 2m.....	£279.00
SP50 speaker.....	£14.95
R600 Rx.....	£272.00
R2000 Rx.....	£438.00
VC10 VHF conv.....	£117.00
YK88C 500Hz.....	£33.70
YK88CN 270Hz.....	£39.48
YK88SN 1.8kHz.....	£34.48
MC50 mic.....	£32.98
MC60S6 mic.....	£53.59
MC80 mic.....	£39.00
MC42S mic.....	£18.00
MC55 Mobile Mic.....	£39.00
LF30A LPF.....	£22.49
HC10 Clock.....	£71.90
DM81 GDO.....	£75.40

NEW TRIO MODELS
COMING SHORTLY

YAesu

FT1 HF Tx/Rx.....	£1587.00
FT980 HF Tx/Rx.....	£1329.00
SP980 Speaker.....	£81.50
FT102 HF Tx/Rx.....	£719.00
FC102 ATU.....	£185.00
SP102 Speaker.....	£55.00
FM/AM.....	£49.00
FT77HF Tx/Rx.....	£479.00
MRKT77 marker.....	£10.85
FP700 PSU.....	£145.00
FC700 ATU.....	£103.00
MMB16 Mount.....	£14.40
FT757GX HF Tx/Rx.....	£718.00
FC757AT ATU.....	£245.00
FP757GX PSU.....	£145.00
FP757HD PSU.....	£178.00
FL2100Z amp.....	£589.00
FT290R 2m Tx/Rx.....	£279.00
FT790R 70cm Tx/Rx.....	£259.00

MICROWAVE

MML144/30LS.....	£75.00
MML144/50S.....	£92.00
MML144/100S.....	£149.95
MML144/100HS.....	£149.95
MML144/100LS.....	£189.95
MML144/200S.....	£245.00
MML432/30L.....	£139.95
MML432/50.....	£129.95
MML432/100.....	£245.00
MML435/600.....	£29.90
MM2001.....	£189.00
MM4001KB.....	£299.00
MMT144/28.....	£109.00
MMT432/28S.....	£159.95
MMT432/144R.....	£184.00
MMT1296/144.....	£215.00
MMC144/28.....	£29.90
MMD050/500.....	£75.00
MMF144.....	£11.90

NC11 charger.....	£10.55
NC nicads.....	£22.00
CSC1A case.....	£4.45
YHA/5 Ant.....	£5.85
MMB11 Mount.....	£28.19
FL2010 amp.....	£86.55
FT208 2m h/hold.....	£209.00
FT708 70cm h/hold.....	£189.00
NC9C charger.....	£9.20
FNB2 pack.....	£23.00
PA3 12v.....	£16.00
MMB10.....	£8.45
FT203R 2m h/hold.....	£175.00
MH12A2B mic.....	£17.60
MMB21 bracket.....	£8.00
FT230R 2m 25w.....	£269.00
FT730R 70cms 10w.....	£239.00
FT726R 2m.....	£775.00
430/726.....	£259.00
144/726.....	£185.00
50/726.....	£195.00
SAT726.....	£99.90
FRG7700Rx.....	£385.00
FRG7700M Rx.....	£455.00
MEMO.....	£75.00
FRT7700.....	£48.25
FRA Ant.....	£43.95
FF5 LPF.....	£11.25
FRV7700E.....	£94.25
YM24A mic.....	£22.50
MH-1B8.....	£15.70
YD148A mic.....	£25.25

ICOM

IC751 HF Tx/Rx.....	£1239.00
ICPS35 PSU.....	£185.00
IC745 HF Tx/Rx.....	£898.00
IC730HF Tx/Rx.....	£859.00
PS15PSU.....	£135.00
ICR70 Rx.....	£599.00
ICR71 Rx.....	£699.00
FL45 filter.....	£45.00
FL63 filter.....	£45.00
IC2KL 1kw.....	£1450.00
IC271E 2m base.....	£899.00
IC271H 2m 100w.....	£887.00
ICPS25 PSU.....	£89.00
IC290D 2m 25w.....	£499.00
IC471E 70cm base.....	£735.00
IC490E 70cm.....	£549.00
ICO2 2m h/hold.....	£259.00
ICO4 70cm h/hold.....	£289.00
HM9 sprk/mic.....	£16.50
LC3 case.....	£5.50
LC11 case.....	£5.50
BP3 nicad.....	£27.50
BP4AA.....	£8.76
BP5.....	£52.80
DC1 12v.....	£13.75

MUTEK

SLNA144S.....	£39.90
SLNA144U.....	£22.40
SLNA144UB.....	£13.70
SLNA144ESB.....	£27.00

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20505 50mHz.....	£33.15
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20118 144mHz.....	£32.40
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20117 144mHz.....	£37.60
20419 430mHz.....	£20.70
20438 430mHz.....	£34.00
20421 430mHz.....	£29.60
20422 435mHz.....	£29.60
20199 Oscar.....	£34.20
20623 1296 mHz.....	£25.90

ROTATORS

AR200XL VHF.....	£39.95
CDEAR40 HF/VHF.....	£105.00
9502B VHF.....	£59.50
9523 bearing.....	£19.75
KR400RC HF.....	£121.50
KC038 clamps.....	£12.85
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M725X 2m 25w.....	£239.00
M750XX 2m 20w.....	£348.00
EXP430 70cm tvtr.....	£269.00
Palmcomm II 2m h/hold.....	£135.00
ATC720 AM Rx.....	£179.00
RX40 FM Rx.....	£142.00

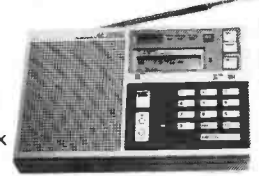
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SP200 1kw.....	£82.00
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- ★ Size 7" x 4 3/4" x 1 1/4"
- ★ Synthesised 150kHz-30MHz + FM
- ★ AM-SSB ★ 10 Memories
- ★ Ext. Ant. Socket ★ Digital Clock
- ★ Batt./Mains £179!



This is not a toy, it is a full specification communications receiver. Ideal for the travelling man. Now you can keep in touch with the DX whilst at work!

WELZ DIAMOND

GH22
6·5dB
144-146 MHz

No other aerial matches its performance and price!

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AR2001 £345



This popular receiver covers 25 to 550MHz with no gaps. Comprehensive scanning, channel spacing, and broad and narrow filters make this a number one choice. Send for leaflet.

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The most famous of all the Welz products. Covers 1.8 to 160MHz and measures vswr and in line power. Scaled 2.5; 20; and 200 Watts this is the ideal shack meter. £41.00

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 - ★ RF gain control.
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SPECIAL G5RV ANTENNAS 5 BAND DIPOLES

80-10m. Overall length 102ft. with 32ft. of 300 ohm feeder. Ready built with insulators and SO239 connector provided. Simply connect to 50 ohm cable. £16.95 p&P £1.50

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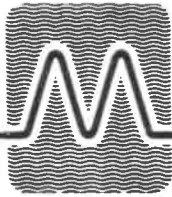
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This unique product is a self-contained speaking morse tutor and, as well as a random morse generator, the MMS 1 incorporates a microprocessor speech synthesis system which provides talk back of the random morse. This product is a truly cost effective means of obtaining a full class 'A' amateur licence, without having to rely on a third party for instruction.

FEATURES—

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- ★ Segmented alphabet choice for novices.
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144 MHz HIGH PERFORMANCE RECEIVE CONVERTER




Input frequency range : 144-146 MHz
Output frequency range : 28-30 MHz
Typical gain : 20 dB minimum
Noise figure : 2 dB
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FEATURES

- ★ Excellent strong signal handling characteristics
- ★ GaAsFET RF amplifier
- ★ High level double balanced mixer
- ★ Harmonic-free, regulated oscillator

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MML432/30-L
70CM 30 WATT LINEAR AMP WITH RECEIVE PREAMPLIFIER




FEATURES—

- ★ RF Vox
- ★ 1 or 3 watts input (switchable)
- ★ Suitable for SSB & FM
- ★ 30 watts output

Suitable for use with rigs such as— FT790R, FT708R, IC4E, C78, TR3500 etc. Available from stock.

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- ★ Suitable for SSB & FM
- ★ 30 watts output

Suitable for use with rigs such as— FT290R, FT208R, IC2E, C58, TR2500 etc. Available from stock.

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144 MHz 200 WATT LINEAR AMPLIFIER



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- ★ 200 watts Output Power
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- ★ GaAsFET Receive Preamp—Front Panel Selectable
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- ★ Equipped with RFVox & Manual Override
- ★ LED Status Lights for Power, Transmit, Preamp on and input level

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MTV435
435MHz 20WATT ATV TRANSMITTER



This high performance ATV transmitter consists of a dual channel exciter, video modulator and a two stage 20 watt linear amplifier. It is suitable for monochrome and colour transmissions, has two switch selectable video inputs, and includes a test wave form generator. Full transmit/receive switching is incorporated and aerial changeover is achieved by a PIN diode switch, which allows connection of the 435MHz aerial to a suitable receive converter, such as the MMC435/600 which is available at £29.90 inc. VAT, p&p £1.25. Available from stock.

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MMA 144V
2M RF SWITCHED PREAMPLIFIER



This RF switched low-noise receive pre-amplifier utilises the proven 3SK88 MOSFET in a noise matched design. Providing a power gain of 15dB and having a noise figure of 1.3dB, this unit will accept a through power of 100 watts. Available from stock.

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2M CONVERTER



This low-noise converter when used in conjunction with a 28-30MHz receiver will provide reception of the 2 metre amateur band. All that is required is a 12volt supply and a suitable antenna. Available from stock.

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MM2001
RTTY TO TV CONVERTER



This converter contains a terminal unit and a microprocessor controlled TV interface and requires only an audio input from a receiver to enable a live display of "off-air" RTTY and ASCII on a domestic UHF TV set, or video monitor.

- ★ RTTY—45.5, 50, 75, 100 baud
- ★ ASCII—100, 300, 600, 1200 baud
- ★ Switchable input filter
- ★ Parallel printer output
- ★ UHF and Video outputs
- ★ 16-line, 64 character display
- ★ 12v DC operation

£189 inc VAT (p + p £3)

MM4001 KB
RTTY TRANSCEIVER

This package, when connected to a transceiver and a domestic UHF TV set provides a data communication capability at a cost of half of any similar system, for both RTTY and ASCII.

FEATURES—

- ★ RTTY—45.5, 50, 75, 100 baud
- ★ ASCII—110, 300, 600, 1200 baud
- ★ Four message stores
- ★ Stored test functions (RY, QBF, etc)
- ★ Auto CQ call
- ★ Full size Qwerty keyboard
- ★ Parallel printer output
- ★ UHF and Video outputs
- ★ 16 line, 64 character display
- ★ 12v DC operation

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RADIOSTATE has 12 & 24 hour notation and the red and green sectors are to remind radio operators to listen out during the silence periods for emergency telegraphy or telephony transmissions. Also available without the 24 hour notation.

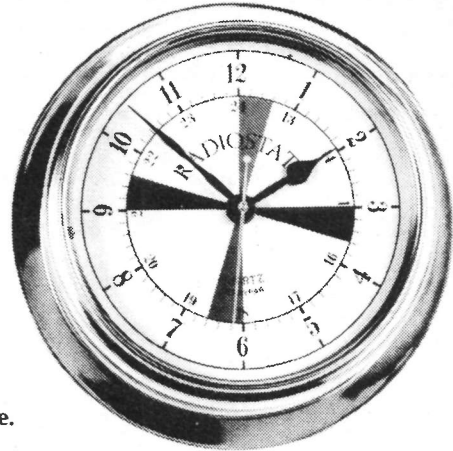
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The instrument cases are of high quality heavy gauge spun brass, which is polished and lacquered. Quartz movements are standard fittings.

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SEMFACT 9. It was very pleasant to hear so many complimentary comments at the Leicester show.

S.E.M. TRANZMATCH. The most versatile AERIAL MATCHING (Tuning) UNIT available. Matches 15 - 5,000ohms BALANCED or UNBALANCED feeders up to 1kw. Air coupled balun (no toroids) means no connection to equipment which can cure TVI both ways. An SO239 and screw terminals for CO-AX, END FED or TWIN FEED. They say "It will match anything". 8 1/4" x 4" x 7 1/4". 3 - 5-30MHz £80. 1 - 8-30MHz £90. The highly acclaimed EZITUNE built in (see below) £29.50 extra. All EX-STOCK.

NEW SEM WAVEMETER. Have you read your licence? Have you got a wavemeter? Covers 1.5-30MHz in 3 switched bands with a very nice meter readout. Only £29.50. Selling so quickly. But at last Ex-stock.

S.E.M. EZITUNE NEW CIRCUIT

Gives MORE noise a bomb proof operation. Because no similar unit is made, its usefulness is not appreciated until you have used one. Eliminates need for S.W.R. bridge.

Clean up the bands by tuning up without transmitting. Increase your PA life by many times.

Connects in aerial lead, produces S9 + (1 - 170MHz) noise in receiver. Adjust A.T.U. or aerial for minimum noise. You have now put an exact 500ohms into your transceiver. Fully protected, you can transmit through it, save your P.A. and stop QRM SO239s. 3" x 1 1/2" x 2". £34.50 Ex stock. P.c.b. to fit in any A.T.U. £29.50 Ex stock.

S.E.M. IMABIC KEYS. No better fully auto keyer anywhere. Uses Curtis chip. R.F. proof. Sidetone etc. £38. A first class twin paddle key £15. Ex stock.

BRAID BREAKER/HI PASS FILTER. Put in T.V. ant. lead to cure TVI. £6.50 Ex Stock.

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**NEW RANGE****SENTINEL 2M LINEAR POWER/PRE-AMPLIFIERS**

Now feature either POWER AMP alone or PRE-AMP alone or both POWER AND PRE-AMP or STRAIGHT THROU when OFF. Plus a gain control on the PRE-AMP from 0 to 20dB. N.F. around 1dB with a neutralised strip line DUAL GATE MOSFET. (BF981).

Ultra LINEAR for all modes and R.F. or P.T.T. switched. 13.8V nominal supply. SO239 sockets.

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3. 10/50. 10W in 50W out. £86.00.
4. 10/100. 10W in 100W out. £135.00.
5. 1/100 1W in 100W out. £148.00.

All Ex-stock

POWER SUPPLIES for our linears 6 amp £34.00. 12 amp £49.00.

SENTINEL AUTO 2 METRE or 4 METRE PRE-AMPLIFIER RF switched, same spec. as in our linears, see above. 400W P.E.P. power rating. Use on any mode. 12V 25mA. £29.50 * Ex stock.

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SENTINEL 2 METRE PRE-AMPLIFIER. No R.F. switch. £15.00* Ex stock.

S.E.M. AUDIO MULTIFILTER (A very good filter at a very good price). The most versatile filter available. Gives "passband" tuning, "variable selectivity" and one or two notches. Switched Hi-pass, Lo-pass, peak or notch. Selectivity from 2.5KHz to 20Hz. Tunable from 2.5KHz to 250Hz. PLUS another notch available in any of the four switch positions which covers 10KHz to 100Hz. 12V supply. Sizes: 6" x 2 1/2" front panel, 3 1/2" deep, all for only £57.00 Ex stock.

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Prices include VAT and delivery. C.W.O. or phone your credit card number for same day service.

* Means Belling Lee sockets, add £1.90 for SO239s or BNC sockets. Ring or write for more information. Place orders or request information on our Ansaphone at cheap rate times.

Goods normally by return.

WOOD & DOUGLAS



VHF/UHF COMMUNICATION PRODUCTS

Despite the threat of BIG BROTHER hanging over us, 1984 has been a happy and busy year for the W & D team. We would like to take this opportunity to thank all our customers for making it so, and to wish everyone a Happy Christmas and a prosperous New Year.

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ROSE ★ ALAN

Package Prices			KIT
1. 500mW TV Transmit	(70FM05T4 + TVM1 + BPF433)		35.00
2. 500mW TV Transceiver	(As 1 above plus TVUP2 + PS1433)		60.00
3. 10W TV Transmit	(As 1 above plus 70FM10 + (BDX35)		65.00
4. 10W TV Transceiver	(As 2 above plus 70FM10 + BDX35)		90.00
5. 70cms 500mW FM Transceiver	(70T4 + 70R5 + SSR1 + BPF)		75.00
6. 70cms 10mW FM Transceiver	(As 5 above plus 70FM10)		105.00
7. 2M Linear/Pre-amp 10W	(144PA4/S + 144LIN10B)		40.00
8. 2M Linear/Pre-amp 25W	(144PA4/S + 144LIN25B)		42.00
9. 70cms Synthesised 10W Transceiver (R5 + SY + AX + MOD + SSR + 70FM10)			150.00
10. 2M Synthesised 10W Transceiver (R5 + SY + SY2T + SSR + 144FM10A)			120.00
11. 2M Crystal Controlled 10W Transceiver (R5 + T3 + BPF + 144FM10 + SSR)			85.00
12. 70cms Linear/Pre-amp	(70LIN10 + 70PA2/S)		45.00
70cms EQUIPMENT	CODE	ASSEM-	KIT
Transceiver Kits and Accessories		BLEED	
FM Transmitter (0.5W)	70FM05T4	48.00	28.75
FM Receiver (with PIN RF c/o)	70FM05R5	65.40	45.80
Transmitter 6 Channel Adaptor	70MCO6T	21.30	14.25
Receiver 6 Channel Adaptor	70MCO6R	25.20	17.90
Synthesiser (2 PCBs)	70SY25B	88.00	62.25
Synthesiser Transmit Amp	A-X3U-06F	34.15	22.10
Synthesiser Modulator	MOD 1	8.95	5.50
Bandpass Filter	BPF 433	6.50	3.30
PIN RF Switch	PS1 433	7.55	5.35
Converter (2M or 10M i.f.)	70RX2/2	27.10	20.10
TV Products			
Receiver Converter (Ch 36 Output)	TVUP2	27.50	22.80
Pattern Generator (Mains PSU)	TVPG1	42.25	36.50
TV Modulator (For Transmission)	TVM1	9.85	5.75
Ch 36 Modulator (For TV Injection)	TVMOD1	9.80	5.50
Power Amplifiers (FM/CW Use)			
50mW to 500mW	70FM1	18.45	12.80
500mW to 3W	70FM3	23.45	17.80
500mW to 10W	70FM10	41.45	33.45
3W to 10W	70FM3/10	23.95	18.30
10W to 40W	70FM40	65.10	52.35
Combined Power Amp/Pre-Amp (Auto Changeover)	70PA/FM 10	56.60	40.15
Linears			
500mW to 3W (Straight amp, no changeover)	70LIN3/LT	27.90	19.90
3W to 10W (Auto Changeover)	70LIN3/10E	41.05	30.15
1W to 7W (Auto Changeover)	70LIN10	44.25	32.50
Pre-Amplifiers			
Bipolar Miniature (13dB)	70PA2	8.10	6.50
MOSFET Miniature (14dB)	70PA3	9.65	7.50
RF Switched (30W)	70PA2/S	24.25	15.25
GaAs FET (16dB)	70PAS	20.10	12.80
GM EQUIPMENT			
Converter (2M i.f.)	6RX2	28.40	20.80
2M EQUIPMENT			
Transceiver Kits and Accessories			
FM Transmitter (1.5W)	144FM2T3	39.35	26.30
FM Receiver (with PIN RF Changeover)	144FM2R5	65.50	47.20
Synthesiser (2 PCBs)	144SY25B	78.75	60.05
Synthesiser Multi/Amp (1.5W O/P)	SY2T	27.90	20.65
Bandpass Filter	BPF144	6.50	3.30
PIN RF Switch	PSI 144	7.55	5.35
Power Amplifiers (FM/CW Use)			
1.5W to 10W (No Changeover)	144FM10A	24.15	18.50
1.5W to 10W (Auto-Changeover)	144FM10B	36.11	26.25
Linears			
1.5W to 10W (SSB/FM) (Auto-Changeover)	144LIN10B	38.40	28.50
2.5W to 25W (SSB/FM) (Auto-Changeover)	144LIN25B	40.25	29.95
1.0W to 25W (SSB/FM) (Auto-Changeover)	144LIN25C	44.25	32.95
Pre-Amplifiers			
Low Noise, Miniature	144PA3	8.60	7.40
Low Noise, Improved Performance	144PA4	12.86	8.40
Low Noise, RF Switched, Full Changeover	144PA4/S	24.30	15.30
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Piptone	PT3	7.50	4.45
Keytone	PTK3	8.75	6.05
Relayed Keytone	PTK4R	12.70	8.20
Regulator (12V, low differential)	REG1	6.95	4.40
Solid State Supply Switch	SSR1	5.85	3.70
Microphone Pre-Amplifier	MPA2	6.10	3.50
Reflectometer	SWR1	6.35	5.35
CW Filter	CWF1	8.55	5.80
TVI Filter (Boxed)	HPF1	5.95	—
FM TV MODULES			
50mW 420MHz Source (Video Input)	UFM01	26.95	19.80
50MHz i.f. Processor	VIDIF	54.25	38.95
Varactor Multiplier (Boxed)	WVDV400Y	—	—
	1200	63.95	—
	1250DC50	69.95	—

Further details on our product range will gladly be forwarded on receipt of an A5 size SAE. Technical help is available by phone (NEW NUMBER) during normal office hours. Kits are usually available by return of post but please allow 28 days for unforeseen delays. Please add 75 pence to your total order for postage and handling. Credit card orders are gladly accepted, please give us a call.

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The following list shows most of our products. Please phone or write for a free catalogue and free data on product(s) which interest you. It takes only a phone call with your Access or Barclaycard number to speed any product on its way to you. Normally we despatch the same day. Or if you prefer you can obtain our "amateur" products from your local dealer.

All prices include delivery (UK only) and VAT at 15%. Independent reviews shown in brackets.

AUDIO FILTERS

SRB2 Automatic Woodpecker Blanker as seen on a well-known TV science programme. (SWM Sept. 83, Ham Radio Feb. 84, World Radio TV Handbook 84). **£86.25**

ANF Advanced stand-alone automatic whistle removal filter for SSB, plus CW filter. (SWM July 83, Ham Radio Oct. 83, R&EW July 83). **£67.85**

FL2 SSB/CW/RTTY Variable audio filter. (Rad Com, Aug. 80) **£89.70**

FL3 SSB/CW/RTTY audio filter (as in FL2) plus automatic whistle remover. **£129.37**

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D75 Manually controlled RF speech processor **£56.35**
D75/K Uncased version of D75 **£40.70**

MORSE EQUIPMENT

D70 The "go-anywhere" Morse Tutor. The PP3 battery supplied should last you until the exam! **£56.35**

MK Deluxe Self contained keyboard morse sender with memories. (SWM April 82, Amateur Radio April 83) **£137.42**

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This system turns any NBFM rig into a radio direction finder which really works. It is currently in use from HF to UHF by Government Departments, professionals of all kinds, and amateur "Wally Hunters". (Rad. Com. Jan. 84, Citizens Band Jan. 83).

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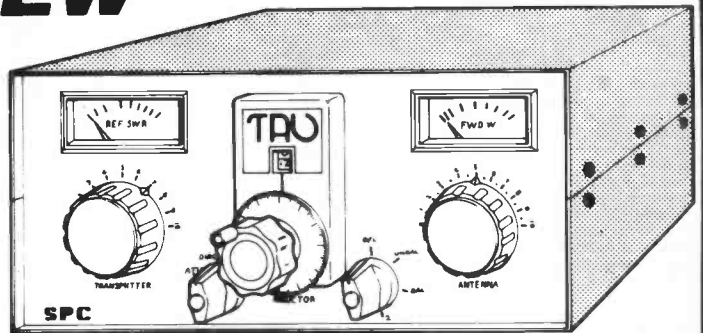
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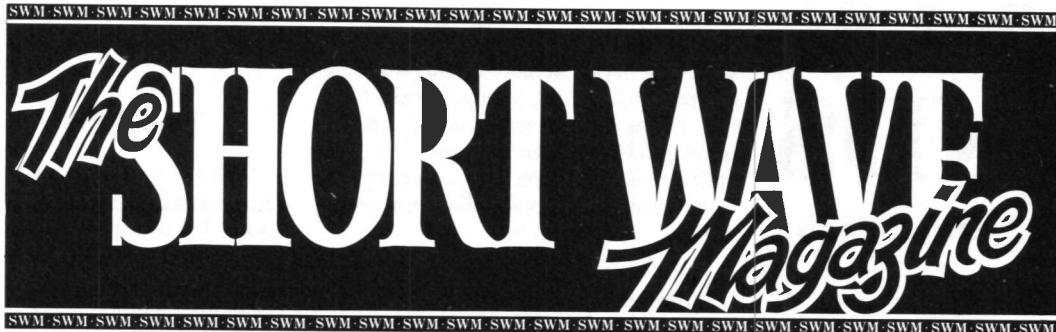
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FOR THE RADIO AMATEUR AND AMATEUR RADIO



EDITORIAL

“S.W.M.” Cover Price

With effect from the January 1985 issue, cover price of *Short Wave Magazine* is to be 85p. The annual subscription rate will be £12.00, and single copies posted first-class will cost £1.10. We apologise for this larger than usual, but unavoidable, increase.

Firstly, some basic production costs have risen very sharply over the last year — in particular, of course, the front cover, but also paper costs. We could use a lower grade of paper, but this would inevitably spoil the appearance and ‘feel’ of the *Magazine*, something which has been a special feature of it for so many years.

Secondly, *S.W.M.* is quite simply under-priced by today’s norms: take a look at the cover price of any magazine on any subject. If we are to continue to produce what we consider to be a high-quality journal in a market which has changed (for better and worse) almost out of recognition in the last few years, then we must charge a more realistic price, and we feel sure that readers will understand this necessity.

Christmas

Once again Christmas is nearly upon us, and so all of us involved with *Short Wave Magazine* would like to take this opportunity to wish our readers, advertisers and trade friends a Happy Christmas and a Successful and Peaceful New Year.

Here at *S.W.M.* we are looking forward to 1985, which has many interesting and exciting prospects in store for amateur radio. Actually we already have half an eye on 1987, which is when *The Mag* celebrates its *fiftieth* birthday!

John Adams
G3KFE.

WORLD-WIDE COMMUNICATION

VHF BANDS

NORMAN FITCH, G3FPK

Six Metres

THE *Department of Trade and Industry* has now issued the long-awaited sixty new 50 MHz permits. A telephone call from Ken Ellis, G5KW, on Saturday morning, Nov. 10, brought the news that some of the lucky sixty had just received their permits. He had heard G4NVS (Cambs.) and G31MW (Shrops.) prior to close down at 0830.

About 130 amateurs applied. After some slight pruning of the list, the applicants' calls were sent to the *D.T.I.* which then selected the sixty. So, although the applications went via the *R.S.G.B.*, the society did not choose the calls. There are now 100 Class A licensees with 6m. permits. With the officially announced close down of all remaining Band 1 and 3, 405-line TV transmitters on Jan. 6 next, there is optimism that the band could be generally released in 1985. However, there would be operating restrictions to protect continuing TV services in neighbouring countries. The *D.T.I.* will have to convince their opposite numbers in Belgium, for example, on this matter. As the wheels of diplomacy tend to turn rather slowly, considerable patience is necessary and it is pointless for 6m. enthusiasts to infer that the *R.S.G.B.* and the *D.T.I.* are dragging their heels on this issue.

Awards News

Peter Thompson, G8DDY, from Shanklin in the Isle of Wight is the 43rd member of the 144 MHz QTH Squares Century Club and his certificate was sent on Oct. 11 for exactly 100 squares confirmed. His list shows 93 tropo., five *Es* and two *Auroral* contacts, all SSB of course, with stations in 20 countries. Peter's station is currently a *Yaesu FT-221R* fitted with the *muTek* board, a 4CX250B amplifier and two 9-ele. *Tonna Yagis* at 50ft. *a.g.l.* The site is 250ft. *a.s.l.* He has four 19-ele. *Yagis* for 70cm. and hopes to be more active on that band now.

Beacon Notes

From the *R.S.G.B.* news that GB3AND on 23cm. and 13cm. were closed down, the former to be rebuilt, the latter for modifications. The 13cm. Tx frequency

will be changed to comply with the current band plan and it is hoped these beacons will be operational again by Christmas.

The latest news about SK4MPI (HU46d) on 144.960 MHz is that the PA stage has been repaired and that the equipment is waiting to be returned to the site. It has been a very reliable beacon, running 100-150w continuously since 1967 until the recent failure. There is a proposal to increase the power to 500w sometime.

Contests

From recent *GB2RS* news broadcasts, some contest results. In the 432 MHz Low Power event on Aug. 4, the winner of the Fixed section was G4SHC with 10,944 pts. from 54 contacts. Second was G3XDY with 8,120 (48). The All-other section winner was GW4BVY/P — 41,538 (131) — and runner-up was G4YTT/P — 37,975 (129). In the Listener part, BRS 32525 won with 1,638 pts.

In the Fixed section of the 144 MHz Low Power contest the following day, the winner was again G4SHC — 88,956 (192) — with G1BRS — 72,789 (198) — second. The All-other part winner was GW8JP/P — 302,216 (442) — with GM3KJF/P runner-up with 214,895 (336). The Listener section winner was BRS 52543 with 29,106 pts.

In the 144 MHz Contest over Sept. 1/2, GJ4ICD won the Single-op. section with 16,429 (1,023). G4AFF/A — 8,569 (586) — was second and GM4YXI — 7,319 (665) — came third. The All-other part was won by G4LIP/P — 14,862 (1,173) — with GW4NXO/P second — 13,178 (923) — and GW8JP/P third with 12,557 (984). Listener section winner was BRS 31976 with 1,831 pts., with BRS 52543 next — 1,146 — and BRS 25429 third with 1,272 pts.

The 144 MHz Fixed Contest is on Dec. 2 from 0900-1700 being a Single-op. and Multi-op. event with radial ring scoring. The 70 MHz Contest is on Dec. 16 from 0900-1400 and is a single section affair with radial ring scoring. In both contests, there are the normal exchanges of RS(T), serial number and QTH Locator, but in the 70 MHz event, participants have to send their location; e.g. 10 kms. SE of Guildford.

The fifth and final leg of the 432 MHz *Cumulatives* is on Dec. 12, 2030 to 2300 and the final two sessions of the 1,296 MHz *Cumulatives* are on Dec. 4 and 20, 2030-2300. The last leg of the *B.A.R.T.G.*'s 144 and 432 MHz RTTY *Cumulative* Contest is on Dec. 3, 2000-2200.

Repeater Notes

The *Leicester Repeater Group's* data relay, GB3GD, in the 70cm. band, came on stream on Oct. 17 on RB12. In Kent, the owners of the site where the UHF repeater GB3KB was to have been located at Biggin Hill have withdrawn their

permission for its installation. The Group is now seeking alternative proposals for possible sites to serve the area. Interested folk should contact either G8TOK or G4STA who are both *QTHR*.

The Satellite Scene

UOSAT-1, or U-O-9, celebrated its third birthday on Oct. 6. To quote from *UOSAT* Bulletin No. 97, "*UOSAT-1* has not exhibited any measurable degradation since the failure of the secondary computer memory devices in the summer of 1982, and the rate of decay of the orbit has been much less pronounced than was anticipated giving rise to an extended orbital lifetime of, perhaps, another two years?" Another telephone answering line has been installed at the *University of Surrey* and ringing Guildford (0483) 61707 will bring information on this satellite. The familiar number, 61202, now deals with *UOSAT-2* or U-O-9.

In the U.S.A. the *F.C.C.* granted Special Temporary Authorization to 21 U.S. amateurs for six months from Oct. 18 to operate *Teleports*. These are capable of automatically relaying digital, or packet radio, communications between terrestrial packet radio networks using amateur satellites. On Oct. 28, an automatic packet radio bulletin board system (PRBBS) operated by W3IWI was placed in experimental operation on *Oscar-10*. For further information, readers should contact the *American Radio Relay League*. The address is 225 Main Street, Newington, CT 06111, U.S.A.

The current operating schedule for *O-10* is now as follows:- *Mean Anomaly* 000-099, mode B; 100-117 (Except Sunday), Mode L; 100-117 (Sunday only), Mode B; 118-218, Mode B; 219-234, off; 235-255, Mode B. A reminder that the spacecraft's 699.535 minutes orbit is divided into 256 equal periods and that, say, a *Mean Anomaly* (MA) figure of 100 represents 100 such periods referred to the *Perigee*, which is where orbits start.

The "Get-Away Special" package carried on *Space Shuttle* mission 41G did not function. The package has been examined and powered up and did work properly. It seems that a controller was programmed to switch three relays on and off during the mission and it was this that did not work or, as *NASA* put it, "... there was an in-flight power-up anomaly..." This was noted in the flight log of Kathryn Sullivan.

The October and November issues of *Wireless World* featured a new *O-10* PSK telemetry decoder by Jim Miller, G3RUH. Data outputs are RS232 style serial and 8-bit parallel and pin-compatible with the *B.B.C.* microcomputer. Double-sided PCBs for this are now available from *AMSAT-UK*. An *s.a.e.* will bring full details; the address is *AMSAT-UK*,

London E12 5EQ. By the way, donations for 1985 are now due; see *Oscar News* No. 49.

Four Metres

Tim Raven, G4ARI, just missed last month's deadline so his additions for the tables were mostly worked in the contest on Sept. 16 which brought GW4BVY/P (Dyfed), GW3NYY (W. Glam.) and GW4VIX/P (Gwent) for new 1984 counties. Kev Archer, G4CMZ, (Derby) continues to plug away with his QRP activity with G4MGR (Merseyside) and G3NPI (Bucks.) added.

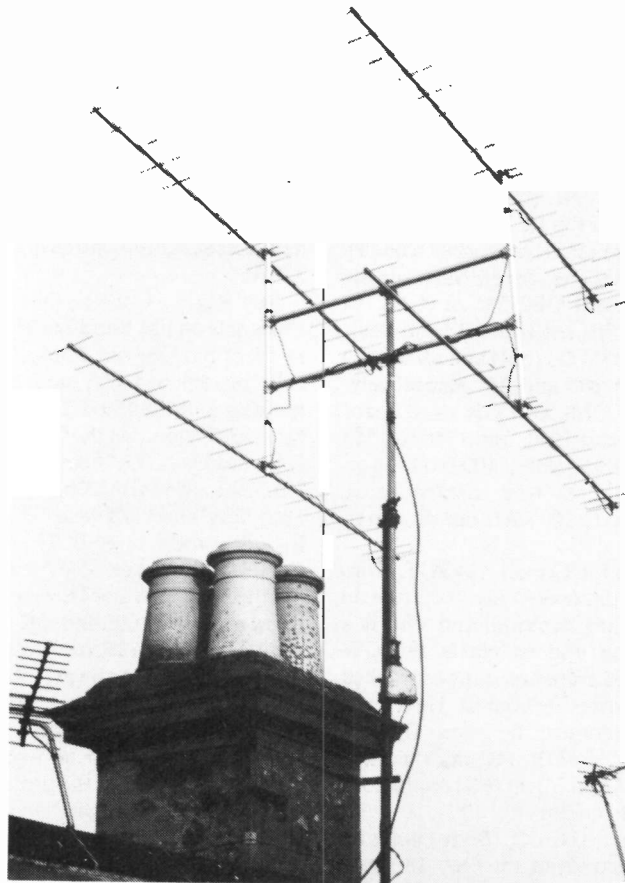
Congratulations to John Lemay, (ex-G8KAX) who now has the call G4ZTR. He took part in the contest on Oct. 28 and his first effort provided 17 counties for the table, using borrowed gear. Of his 32 QSOs, G4MGR was the best DX from Chelmsford. Dave Lewis, GW4HBK, (Gwent) describes activity as "... very good." New stations worked were G4LDZ in Norwich and G4VOZ in Leicester who was using a dipole. Others heard were G4SEU, G4WND and G5DQA but Dave complains about the increase in local QRM, up to S9-plus for hours on end, making the band unusable.

Two Metres

In mid-October there were a few days of excellent tropo. propagation which, without exaggeration, made the band sound like 20m. in a contest weekend. This was followed by three days on which some interesting *Auroral* periods occurred. David Whitaker, (N. Yorks.) heard F6ELI (ZE19j) on Oct. 15 for his best DX. He has on file the QTH Locators for 1,400 stations other than U.K. and West Germany and has offered to supply details for an *s.a.e.* to 57 Green Lane, Harrogate, W. Yorks.

Spells of high winds have meant that Mick Allmark's, G1EZF, (Leeds) antennas have been wound down much of the time. But he did operate on Oct. 15 and worked French stations in AG, AH, BG, YI, ZE and ZG squares. Bill Hodgson, G3BW, (Cumbria) reports a 109 m.p.h. wind gust locally which removed assorted roof tiles and chimney pots, but happily left his tower and antenna intact. Even so, he reports the 12ft. pole projecting from the top of the tower, "... waving about like a fishing rod ..." in hurricane force winds. Bill caught the good *Ar* on the 18th, working OH1AWW (LU42a), OY5NS (WW77f), various SMs and LAs and RQ2GAG (MQ01g) for a new square.

John Hunter, G3IMV, (Bucks.) was on for the *Ar* on the 18th and did quite well. The next day, he reports another event from 1630, when he worked LA1ZD, till 1815. On the 20th, GM3JFG was noted at 1640. On the 18th, GM4ILS was beaming at 60°; more on odd QTEs later. Dave Sellars, G3PBV, (Devon) wrote that the



Peter Thompson, G8DDY, from Shanklin, Isle of Wight, has recently joined the 144 MHz QTH Squares Century Club. He is also active on 432 MHz and the photograph shows his array of four 19-element Yagis by Tonna.

Ar on the 18th and 19th only produced the usual northern Gs, GI and GM stations. Prior to that, on the 13th, the big tropo. opening started with a QSO at 1820 with OZ7NI (FP) and towards midnight, it moved around to East Germany when Y350 (GM) and Y2IVC/P (HN) were worked in their contest. On the 14th, OE3XUA (HH) was contacted. Dave listened towards Moonset on the 21st and copied K5GW, and K1WHS who worked 176 stations *via* the Moon that weekend.

Dick Whittering, G3URA, (Herts.) is still running just 200 milliwatts of CW and worked his best DX so far, PA0FHG/P (CL01a) during the CW contest on Nov. 4. In a brief note, John Quarmby, G3XDY, (Suffolk) mentions Y2IVC/P, and Y2IBD/P and Y22IC/P, both in GN as new ones. G4ARI lists another 21 CW QSOs up to Oct. 2 but has probably added some more new stations in the contest. Paul Whatton, G4DCV, (Kent) found EI4FO (WM) for a new square on tropo. on the 15th on SSB. CW accounted for OK1JKT/P (GK) on the 16th. He worked UR2RIW (LS) and RQ2GAG (MQ) *via Ar* on the 17th, although nobody else reported an *Ar* prior to the 18th. On the

31st, he made contact with OK1JKT/P again on tropo.

From Dorset, Peter Atkins, G4DOL, worked Y24BO/P (GM) at 2300 on the 13th, the following day bringing Y23MF/P (FL), OK1KPU/P (GK) and Ds in FI, FJ and FK. On the 15th, when the opening was north/south, he contacted G6VEG (ZP), GM4IPD (YR) and GM4UFD (ZR) which last Peter describes as, "... an extraordinary contact ..." for him. He tried an MS SSB sked on the 21st, in the *Orionids*, with Y27BL which only produced 9 pings. He caught the tail end of the Oct. 19 *Ar* at 1800 and heard GMs on CW, but it fizzled out at 1810 in Weymouth.

Tim Charles, G4EZA, (Essex) had a go in the CW contest on the 4th, finding conditions slightly up for the first two hours with ducting to the south-east, after which it got flatter and flatter. He made 71 contacts and was busy scoring them when he wrote. Tim does not have a home computer, so was having to hand calculate the QRB for each QSO. Les Bober, G4NOZ, (Essex) stuck to CW adding another 13 stations to his Ladder score. Roger Greengrass, G4NRG, (Essex) lists

four Ys contacted between 2140 and 2205 on Oct. 13 in their contest as the most interesting QSOs of the month.

From Somerset Ken Osborne, G4IGO, also worked four Ys on the 13th and heard a couple more, plus SM7JUQ (GP). The next day he worked OK1VOW/P, OL3VFH/P, OK1AQF/P and OK1KPU/P, all in GK, LX1KL (CJ), OE3XUA, OE5VHL (GI) and OE5XLL, plus many Ds in the E, F and G rows of squares. On the 15th Ken worked some Fs in central France and some GMs while the next day he heard OE2CAL/2 (GH). In the *Ar* on the 18th, between 1753 and 1840, he worked GM3WOJ (XR) and SM5CNQ (HS) at QTEs 10° and 25° respectively. The next day GMs and GIs were heard between 1620 and 1640, and 1746 to 1753 at 20° to 30°. From about 1000 to 1138 on the 14th, there was *Sporadic E* propagation up to 100 MHz but no sign of Es on 2m.

Welcome to Ian Cornes, G4OUT, from Stafford who discovered the *Magazine* on a railway station bookstall and who is a keen CW man and so enters the CW Ladder with 55 different stations worked prior to the November contest. He did not say what equipment he uses, though. Martyn Jones, G4TIF, (Warks.) worked Y25GI/P (FL) and Y37Q (FK) on the 13th for a new 1984 country.

Mark Turner, G4PCS, (Beds.) notes an unusual feature about the Oct. 18 *Ar* in that it was necessary to beam at 325° for some GM QSOs. He missed the beginning, his first contact being LA8OJ (CS) at 1914, followed by SM4GVF (HT) and LA8SJ (FT) all at QTE 0°. At 1938, GM4ILS was

worked at 350°, the GM beam at 325° from YR24e. Next Mark worked GM4ZMK (XP) at 325° and GM3ZXE (YQ) at the same azimuth. The next QSO at 2005 with GM3WOJ (XR) was at 340° but from 2023, the QTEs were back to 10° to 30° with the GM and GI folk beaming at 40° to 50°. This report suggests it worth while to beam to the northwest during an *Aurora* to see how often this phenomenon occurs. In this instance, it seems there was a reflecting region centred about 58°N and 13°W.

Ray Baker, G4SFY, (Norfolk) reports Es signals on FM Band 2 at 1140 on Oct. 4, at times blotting out *Radio Norfolk*. CQ calls on 2m. on CW and SSB brought nothing and the Band 2 signals had gone by 1153. Tropo., on the 9th brought lots of PAs and Ds in the D row of squares, plus PA2GFL/MM (BM20b) on CW. On the 13th, Ray's best DX were Y37Q and Y35O in their contest, on SSB. The 15th brought F1GHP (ZG65c) on SSB for a new square. On the 30th, PAs and Ds were heard giving good reports to OE and OK stations who were inaudible in North Walsham.

From Cheltenham, Tim Kirby, G4VXE, worked his best *Ar* DX on the 18th thanks to SM5MIX (HT). The following day *via Ar* he worked GI and GM. He is now, "... the proud owner of a Yaesu FT-225RD with *muTek* board, finding the difference in the receiver quite amazing." Tim is now on CW MS at 800 *l.p.m.* and looking for skeds. Accompanied by G4UAZ and G8TFI, he took part in the 144 MHz contest on Nov. 4 from a local hill and worked several Germans in the D and E lines, best DX being DL5FS/P (EL).

Sue Frost, G4WGY, (London) used the CW contests on Nov. 3/4 to get up to 123 different stations worked on the key this year, but was having problems from a strong local station. Dave Cater, G4WHZ, (Essex) was in Greece on business during part of October thus missing the good DX. However, he has worked 276 different CW practitioners up to the 30th. June Charles, G4YIR (Essex) added W. Glamorgan and G4FDX/LX for new table points along with 14 more for the CW Ladder.

G4ZTR may enter the 1985 CW Ladder. John says his TVI situation is slowly improving. One neighbour has a masthead preamp. which the *Post Office* found received everything from 14 to 1,296 MHz while another complainant only had a 14 *microvolt* signal instead of the more usual 1 millivolt. Keith Hewitt, G6DER, (S. Yorks.) found it rather frustrating in the Oct. 13-16 lift hearing those in the south working all the DX. However, he did get G4FDX/LX/P (CJ) on the 13th, PA2GFL/MM (BN), F1EAN (AG), F1CYB (BH) and F1BRV (BG) on the 14th and F6ELI (ZE) on the 15th.

Mick Cuckoo, G6ECM, (Kent) was well placed for the October tropo. Between 1730 and 2345 on the 13th he worked

Station	ANNUAL CW LADDER				Points
	4m.	2m.	70cm	µWave	
G4SFY	—	458	—	—	458
GW4TTU	—	318	72	19	409
G4ARI	72	214	—	—	286
G4WHZ	—	276	6	—	282
G4TVH	—	213	—	—	213
G4NOZ	—	201	—	—	201
G4TON	—	130	2	—	132
G4WGY	—	123	—	—	123
G4UNL	—	119	—	—	119
G4EZA	—	117	—	—	117
G4VXE	—	83	16	—	99
G2DHV	22	61	1	—	84
G4LZD	—	70	—	—	70
G4OUT	—	55	—	—	55
G4SGO	—	43	1	—	44
G4YIR	—	44	—	—	44
G3URA	—	30	—	—	30
GW4HBK	27	—	—	—	27
GU4HUY	—	27	—	—	27
G4PSS	—	23	—	—	23
GM4CXP	—	21	—	—	21

No. of different stations worked since Jan. 1.

OZ7NI (FP), SM7NJH (GQ), Y2IBD/P, Y21VC/P, Y22IC/P, Y24BO/P, Y24IH (FL), Y25CD (GM), Y25GI/P (FL), Y31SM/A (GL), Y35O and Y37Q. The next day conditions were even better and OK1KHI, OK1VOR and Y23MF were worked before QRT at 1000 for work. Laurie Segal's G6XLL, usual neat computer print-out always includes a summary of the best 25 QSOs of the month from North London. QSOs over 500 kms. were F1CYB, F1CVL (CI), F1EQE (ZF) and DL8DAU/P (EK) on the 14th, and F6GCJ (AG), F6BZA (AG), F1HFK (ZG) and HB6SAX/P in DH66f, the best DX of 718 kms., on the 15th. Also on the 15th, EI6EW (WN) was another new square. On the 30th Laurie caught G4FDX/LX for a new square and country.

Haydn Barker, G6XVV, (S. Yorks.) wrote from hospital to update his scores and had added ten more 1984 counties. A noteworthy QSO was with GM4UFP (ZR) in the *Ar* on Sept. 23, Haydn's first such contact using just 2½w — and he got S9. John Clark, G6YIN, (Leeds) runs a *Yaesu* FT-290 and 30w amplifier to a 16-ele. *Yagi* at 35ft. During the mid-month tropo. new squares were AF, ZE, ZG and ZI.

Peter Hizzey, G6YLO, (Kent) is another new contributor and his gear is an *Icom* IC-201 with *Gasfet* RF amplifier, a PA using two 4CX250Bs to a *Short Wave Magazine* design of some ten years ago, and a 7-ele. *MET Yagi*. On Oct. 30, he worked some nice DX between 1300 and 1400:—DL2LZ (EJ), DG9SH and DG2IH in EI, DL8NBN, DD1MX, and DK0AC in FI, OE5XFM and DL3MBG in GI. Jim Rabbitts, G8LFB, (London) is another *Es*-watcher and reports it reached 95 MHz on Oct. 22 at 1250. On the tropo. scene on the 13th, he worked nine Ys in FL, FK, GL, GM, GN and HN, and DL0VW (FM), but he missed all the *Auroras*.

From Cornwall, Philip Hocking, G8ZDS, worked four new squares on the 13th, DM, DN, EN and ZP, quite a long haul from the county. From Jersey, Geoff

2m. BRITISH ISLES QSOs BY EA8XS

Date	Station	QTHL	GMT	Mode
06.08.80	G3CHN	YK	2224	Tr
10.07.81	G8IDP	AM	1942	Es
"	G3POI	AL	1944	"
"	G8VLL	AM	1945	"
"	G8NQP	ZL	1947	"
"	G8PCB	ZL	1947	"
"	G4DEW	ZM	1948	"
"	G8NWM	ZM	1950	"
04.09.81	E13VF/P	WL	2114	Tr
"	GD8EXI	XO	2240	"
"	G5KW	WJ	2345	"
08.06.82	G4JZF	YM	2016	Es
04.07.84	G8ZDS	XK	1747	Tr
"	G6LEU	XK	1840	"
05.07.84	G6HRH	XK	2120	"
"	G8VHI	YL	2147	"
"	GW3NYY	XL	2213	"
"	GW8TVX	XL	2239	"
"	GW3KJW	XM	2304	"
"	GW4FJK	XL	2340	"
"	GW3KJW	XM	2350	"
"	GW8ELR	XL	2355	"
06.07.84	G6LEU	XK	2300	"
"	G8SDS/P	"	"	"
"	G4SDS/P	"	"	"
"	G4BAR/P	YK	"	"
"	G8MXX/P	"	"	"
"	G4SSS/P	YL	"	"
28.07.84	GW3KJW	XM	1716	"
"	GW4FJK	XL	1722	"
"	G8ZDS	XK	1805	"
29.07.84	G8ZDS	XK	0908	"
"	G6ION	XK	0930	"
"	G6JFX	XK	0935	"
"	G6UJB	XK	0945	"
"	G8NXD	XK	0950	"
"	G3ZY	XK	0955	"
"	GW6TEO	XL	0957	"
"	G6GNJ	XK	1015	"
"	G8VST	XK	1016	"
"	G4XTR	XK	1852	"
"	G4WIQ	XK	1858	"
"	G6LEU	XK	1905	"
"	G4HFO	XK	1908	"

Brown, GJ4ICD, enjoyed exceptional tropo. from the 13th. Just listening on 2m. he logged 18 countries including OZ, SM, SP, Y, OE, OK, HB9 and EA. Alex Scott, GM8BDX, (Borders) was pleased to hear stations spreading out over the higher part of the SSB section during Oct. 15. His favourite spot was 144.425 MHz for QSOs to the south. He should be QRV on RTTY now looking for contacts every evening on 144.600 and 145.300 MHz.

Jonathan Eastment, GW4LXO, (Cardiff) listened in on the *E-M-E* contest on Oct. 20/21. His antennas are four 9-ele. *Yagis* from *Tonna* with a 3SK97 preamp. He has AZ-EL control with digital readout and uses a *Sinclair ZX-81* computer to provide tracking data. Jonathan logged SM2GGF, K1WHS, VE7BQH, DL8DAT, SM7BAE, WA1JXN/7, F6BSJ, W7IUV, WA7BJU, WA6MGZ, YU3WV, KB8RQ, K6MYC, K5GW, W5UN and GW4CQT. Reg Woolley, GW8VHI, (W. Glam.) lists EA1OD (XD) on Oct. 15 at 0909 and later in the day, Fs in AG, BG and ZG. At 2106, EA1ACD (VD) was calling for Fs but as there were no replies, worked Reg. On the 16th, EA repeaters were heard on R7 but CQ calls to Spain on SSB produced nil. He has three skeds per week with 9HICD on SSB MS and hopes to complete with Henry soon.

Seventy Centimetres

David Whitaker found conditions poor for the Oct. 6/7 contest, but F6CTT/P was heard. There was more activity in the first leg of the *Cumulatives*, he found, and from N. Yorks. he regularly copies stations in ZL square. In the Oct. 15 lift, he heard 20 squares down to AF in France. G1EZF notes 7 Fs in AF, ZG, etc., that day. Although he did not manage any Europeans, G3BW enjoyed the lift working the "... length and breadth of the country." G3IMV reached his 100th square on the 15th, thanks to GM3JFG (XR). Angus McKenzie, G3OSS, (London) also worked GM3JFG, then GM4DMA/A from Fraserburgh (YR40g).

G3PBV worked OK1CA/P on the 13th at S9 prior to reading the *G2RS* news from Devon. At 1830, Dave worked G4FDX/LX/P for his 20th country, followed by DL7QY and DL9PW in FJ, and OE3XUA (HH) at 1,456 kms. G3XDY's new ones were in XI, ZI and XR, John now having 109 worked. G4DCV got F1FTB/P (ZI) in the contest and a further 7 new squares on the 15th, 16th and 30th to reach his half-century. Mark Marment, G4MAW, (Devon) lists

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	—	—	92	37	49	10	19	4	211
G6DER	—	—	75	25	61	14	25	8	208
G4TIF	31	3	69	19	53	13	—	—	188
G1EZF	—	—	83	26	52	11	14	1	187
G8PNN	—	—	62	14	50	10	38	13	187
G3BW	46	6	61	23	35	9	19	5	180
G4ROA	—	—	59	12	50	10	32	5	168
G6XLL	—	—	75	18	52	8	—	—	153
GD2HDZ	43	5	58	8	33	5	6	3	152
G4ZTR	17	1	54	16	38	10	17	5	140
G8ULU	—	—	58	18	32	13	8	7	136
G4MUT	37	4	43	16	28	7	—	—	135
G4ARI	42	4	71	18	—	—	—	—	135
G8FMK	—	—	36	5	48	8	30	5	132
G4VXE	—	—	66	14	43	8	—	—	131
G6MGL	—	—	58	18	42	12	—	—	130
G8TFI	—	—	—	—	63	18	32	12	125
GW8UCQ	—	—	59	16	38	8	—	—	121
G4XKR	—	—	61	9	38	7	—	—	115
G6XVV	—	—	61	13	31	8	—	—	113
GW3CBY	6	3	56	16	21	5	8	4	110
G6ZPN	—	—	72	14	20	4	—	—	110
G6ECM	—	—	78	28	—	—	—	—	106
G6YIN	—	—	71	17	13	3	—	—	104
G4HGT	14	2	50	6	24	7	—	—	103
G4NRG	22	4	23	20	20	9	1	1	98
G3FPK	—	—	75	23	—	—	—	—	98
G4SFY	—	—	71	23	—	—	—	—	94
G6HFF	—	—	57	8	20	5	—	—	90
G6AJE	—	—	64	16	—	—	—	—	80
G8RWG	—	—	59	20	—	—	—	—	79
G4LZD	—	—	60	15	—	—	—	—	75
GM8YPI	—	—	32	14	20	8	—	—	74
G8XTJ	—	—	59	14	—	—	—	—	73
G8HHI	—	—	5	9	33	3	18	4	72
G6NVQ	—	—	60	7	—	—	—	—	67
G8VVF	—	—	50	14	—	—	—	—	64
G4YIR	—	—	49	11	—	—	—	—	60
GW4HBK	29	4	6	3	7	2	—	—	51
G2DHV	7	1	33	4	3	1	—	—	49
G6XSU	—	—	—	—	40	8	—	—	48
GU4HUY	—	—	42	6	—	—	—	—	48
G4CMZ	36	4	1	1	—	—	—	—	42
G4EZA	—	—	31	9	—	—	—	—	40
GM4CXP	—	—	20	7	6	2	—	—	35
G3PBV	—	—	—	—	—	—	30	5	35
G6CSY	—	—	8	5	7	1	4	2	27
GW3MHW	16	2	—	—	—	—	—	—	18

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

G4FDX/LX/P (CJ), DL7QY, DL9PW and DB2RR all in FJ, and OE3XUA in the mid-Oct. lift but says the north/south path on the 15th was not good with signals going over the top of YK43.

G4TIF got the LX station on the 13th plus assorted G, GM and GU new counties on the 15th, with FD1HPK (AH). G4ZTR's best *Cumulatives* QSO on the 9th was G4VIX/P (Lancs.) and John lists the LX and Fs in AG, CH, ZH and ZJ on the 14/15th. G6DER found conditions disappointing from S. Yorks. in the lift, but did manage QSOs with F1AGO (AG) and F1AJD (AF) on the 15th. G6XLL's best DX was on the 12th to F6APE (ZH57b) at 469 kms. G6XVV added 13 more 1984 counties, plus F and GW for new countries in the month. Haydn has a second 48-ele. *Multibeam* ready to go on the tower.

G6YLO reports the lift on Oct. 30. At about 2000 he worked DJ0UI (DK), DB6KV/P (DK) and DG7NBE/P (EK60b) using a 17-ele. *Cue-Dee Yagi* indoors and just 10w. Pete's station consists of an *Icom IC-490E* with *Gasfet* RF stage and a 2 x 4CX250B amplifier is planned as a winter construction project.

Ray Cox, G8FMK, (Oxon.) made 54 QSOs in the Oct. 9 leg of the *Cumulatives*, and 22 during the Oct. 25 session. On the 15th, GW6DDB (XN) was an all-time new square and county.

Gordon Emmerson, G8PNN, (Northumberland) found four new squares in France on the 15th, including F6ECI in AF, to bring his tally to 83. G8ZDS now has four 18-ele. *Parabeams* on the band so Cornwall ought to be easier to work. Philip worked G1HGJ (ZP) in the lift. From Jersey, conditions over Oct. 13-16 were amazing and GJ4ICD worked into at least 24 squares from FO down to ZD. Geoff says that different areas kept coming in but now new squares were worked. He is claiming his QSO with GD2HDZ as a "first" GJ/GD on the band. Any challengers? It was Geoff's 22nd country.

GW4LXO has a fine 70cm. station with four 23-ele. DL6WU *Yagis*, MGF1400 preamp. and a K2R1W amplifier. Jonathan lists some choice DX during the lift including G4FDX/LX/P, OE2CAL, DL7QY and PA3BWY/MM in WK on his weather ship, bound for QQ square and also worked by GW8VHI on Oct. 21.

70cm. BRITISH ISLES QSOs BY EA8XS

Date	Station	QTHL	GMT	Mode
04.07.84	G8ZDS	XK	1850	Tr
05.07.84	E19Q	WM	2110	..
..	GW8ELR	XL	2110	..
..	GW8VHI	YL	2226	..
29.07.84	G8ZDS	XK	0912	..

Henry uses 10w to an 8-over-8 antenna on the ship. On the 15th, Reg lists 11 Fs in the A and Z squares, down as far as F1FVP (ZF80j).

Microwaves

G1EZF borrowed a transverter but only ran 150 milliwatts with low antenna in the lift. However, on the 15th, Mick worked G3OBD (Dorset) and other southern stations on 23cm. In the *Cumulatives* on the 17th, he had six QSOs in four new counties. G3BW now has about 20w of RF again with two *Tonna Yagis*, but 23cm. is a challenge from Cumbria. Bill Capstick, G3JYP, (Cumbria) worked GJ4ICD on 23cm. using a 2m. dish in the lift. G3OSS contacted G8PNN on 23cm. on the 15th at S9 each way, then did the same on 13cm. Angus later worked four Fs and heard GM4DMA/M call. Laurence was S9 using one watt with the antenna on his lap. G3OSS also worked G6LXX (Lancs.) on 23cm. and G8GDZ (Birmingham) on 13cm. that evening.

G3PBV found conditions, “. . . very up-and-down. . .” in the lift and failed to work OK1CA/P on 23cm. Dave did get G3SHK in Wilts. for county no. 45, and later F1FVP (ZF) who runs 40w to four 23-ele. *Yagis*. G3XDY worked F1FLN/P (AJ) and GJ4ICD on 23cm. and G4MAW worked Fs in four new squares, AJ, AG, YH and ZF. However, as with 70cm., Mark reckons north/south conditions were not favouring Devon. G6DER lists GU8FBO on the 15th for a new square, county and country on 23cm.

G6YLO has an *MM* 23cm. transverter with 1.5w to a 23-ele. *Tonna Yagi* and got to F6GCJ (AG) on this band, 70cm. and 2m. in the space of ten minutes. Pete has a six times 3CX100A5 amplifier on the stocks. Although beacon DB0VI (EJ) on 1,296.820 MHz was S7 on Oct. 30, Pete found no activity. G8FMK reports the first leg of the 23cm. *Cumulatives* as very disappointing with only seven QSOs in the log. On the 13th, Ray worked G6CBN (Co. Durham) at 2023 for an all-time new county and square.

G8PNN added five new squares on the 15th, 11 more counties and three countries for the Annual Table. Gordon's best DX were F6ECI (AF) and F1FHI (ZH). On 13cm. he worked G8TFI (YL) and G4LRT (ZM) and is up to 15 sq. and 6 countries. G4NRG is now QRV on 23cm. from Essex with 2w from an *MM* transverter and a single 23-ele. *Tonna* antenna. Don Hughes, G8WPL, (nr. Stockport) has 10w on 23cm. and is looking for contacts.

According to G3OSS, Iain McHardy, GM3JFG is planning to get on 23cm. and would be the first fixed station in Highland Region. In a letter to GJ4ICD, Laurence Howell, GM4DMA, wrote that he is building for 13cm. jointly with GM4SDG. GJ4ICD also did very well on 23cm. in the Oct. 13-15 period, boosting his total squares from 22 to 41. The furthest east

Station	QTH LOCATOR SQUARES TABLE			Total
	23cm.	70cm.	2m.	
G3IMV	—	100	366	466
G3POI	—	—	429	429
GJ4ICD	41	116	237	394
G4NQC	61	90	211	362
G3JXN	68	109	170	347
G3PBV	41	106	189	336
EA3LL	3	32	300	335
G4IJE	—	—	325	325
G3XDY	58	109	155	322
G3UVR	25	86	202	313
G3COJ	41	95	170	306
G8KBQ	22	96	188	306
GJ8KNV	18	79	201	298
G3BW	9	38	250	297
G4MCU	18	81	198	297
GW4LXO	24	63	207	294
GW4TTU	15	65	207	287
G8TFI	51	109	126	286
G4ERG	—	16	261	277
G8VR	2	24	246	272
GW3NYN	—	48	219	267
G4DCV	—	50	212	262
G8PNN	50	83	126	259
GJ8SBT	26	47	182	255
G4TIF	—	89	165	254
G8ULU	35	90	125	250
G4DHF	—	—	245	245
G4DEZ	—	—	242	242
G6DER	27	72	142	241
G4KUX	—	36	200	236
G8ATX	23	82	129	234
G8HHI	22	77	135	234
G8FUO	39	105	88	232
G4OAE	—	42	184	226
GW4EAI	—	—	218	218
G4BWG	—	64	152	216
G4FRE	41	106	68	215
G4RGK	5	52	154	211
G3FPK	—	—	204	204
GM4IPK	—	—	201	201
G4MAW	43	105	52	200
GM4CXP	—	27	172	199
G4STO	29	48	113	190
G4HMF	2	35	152	189
G8FMK	36	70	80	186
G4NBS	14	77	94	185
G6ECM	—	—	185	185
G4HFO	—	69	115	184
GW8UCQ	1	68	115	184
G4MUT	—	72	109	181
G3BDQ	—	—	177	177
G8WPL	9	63	103	175
G8LFB	—	—	175	175
G4ZTR	35	57	82	174
G8TGM	—	—	174	174
G6CMV	1	29	142	172
G6MGL	—	44	127	171
G1EZF	9	44	117	170
G6HKS	—	—	169	169
G8SRL	—	53	106	159
G4FRX	—	66	92	158
GD2HDZ	13	50	91	154
G4TJX	—	59	94	153
G4NRG	1	36	115	152
G4MJC	—	12	140	152
GW3CBY	10	35	105	150
G4ROA	25	60	65	150
G4MEJ	—	—	150	150
G6DDK	3	15	131	149
G6DZH	—	52	97	149
G6JNS	1	32	116	149
G4IGO	—	—	145	145
G4SFY	—	—	143	143
GM8YPI	—	37	105	142
G8ZDS	—	31	104	135
G4DOL	—	—	131	131
GW8VHI	—	41	82	123
G4MWD	—	1	120	121
G4GHA	—	6	112	118
G4YUZ	—	—	117	117
G4CQM	—	49	67	116
G6XLL	—	27	86	113
G4RSN	2	23	84	109
G8VVF	—	—	107	107
G8RWG	—	—	103	103
G6HCV	—	—	102	102
G6NWF	—	—	86	86
G8XTJ	—	—	82	82
G6AJE	—	—	82	82
G6YIN	—	11	71	82
GM8BDX	13	28	40	81
G4UYL	—	—	81	81
G6YLO	10	13	55	78
G4LZD	—	—	71	71
G6CSY	15	25	30	70
G6XVV	—	20	50	70
G6XSU	—	42	—	42
G2DHW	—	2	22	24

Starting date January 1, 1975. No satellite or repeater QSOs.

worked was DL7QY (FJ) and the best to the north was GM4DMA/P (YR). Geoff claims this as a first GJ/GM on 23cm.

GW4LXO's gear on 23cm. runs 120w output from a pair of 7289 valves, the antenna being a single 23-ele. *Yagi*. Jonathan worked DK8VR (DJ), DJ6GQ (EI), F6ECI, F1FVP and F1BUU (ZE) for

five more squares, plus F1FHI and F1DPX in ZH. GJ4ICD was a new country as was West Germany. On 13cm. he runs 5w output from an 8907 valve in a G3VVB cavity. The Rx preamp. is an MGF1402 and the antenna a 1.2m. dish with log periodic feed.

Final Miscellany

Tim Kirby, G4VXE, commented on the idea from Ian White, G3SEK, of adopting MS procedure for tropo. skeds. The suggestion appeared in one of the *RSGB's VHF/UHF Newsletters*. Your scribe has not seen the article but it is a practice which has been adopted before, of course. Presumably transmit periods and duration would be decided beforehand. Tim would be pleased to try this out on either 2m. or 70cm. and his evening telephone no. is 0242 36723.

Concerning the arranging of MS skeds, Haydn Barker, G6XVV, asks whether it is better to use the 20m. VHF net or write to stations. The advantage of the 20m. net is that, provided you can find the station, you can arrange things much quicker. Also you can find out just what equipment the other fellow is using. The letter method involves a lot of time, particularly with Eastern Bloc countries. In these cases, you need to make several proposals, particularly if you want to arrange a sked during a major shower, so that the fellow can advise when he is free. A further way is to use the telephone. It is very useful to exchange telephone numbers so that, if either partner cannot make a sked arranged weeks earlier, he can tell the chap.

Included this month is a list of all the British Isles stations worked by EA8XS since the first QSO with G3CHN on June 6, 1980. This information was obtained by Ken Osborne, G4IGO.

In 1985, the Squares Table will carry on and a new Four Band Annual Table will start from January 1. The Annual CW Ladder, suggested by Tim Raven, G4ARI, has proved very popular so a new one will begin on January 1. The 23cm. All-time Table will be dropped and participants should submit their final totals as soon as possible after Dec. 31, 1984. At the same time, those who operate on 13cm. can send in their figures for administrative counties and countries worked, the idea being to stimulate activity on that band by a little friendly competition.

Deadlines

The deadline for the January issue is Dec. 5 and for the following month, when the final placings in the 1984 annual tables will be published, it is Jan. 2. *That is very early*, so please make sure you allow for post-Christmas postal times. As usual, all your information to:—“VHF Bands,” SHORT WAVE MAGAZINE, 34, High Street, WELWYN, Herts. AL6 9EQ. 73 es *Happy Christmas de G3FPK*.

The Sloper Antenna System, Part 2

A CHEAP AND EFFECTIVE DIRECTIVE ARRAY

CHRISTOPHER PAGE, G4BUE

THE relay box was constructed from an old aluminium box, and the relays used were manufactured by *Potter and Brumfield* in the U.S.A. and used 24 volts DC; they are readily available at government surplus stores and are cheap. Their bases are the same as the B8 valve sockets, which enable them to be mounted easily inside the aluminium box. TV UHF sockets were fixed to the sides of the relay box, four for the slopers and one to take the coaxial cable to the shack. A hole is made to take the 24 volt control cable for the relays, and after being tested, the complete box is made water-tight, by sealing the joints with grease and tape. The photograph (A) shows the relay box fitted to the tower and Fig. 5 shows the wiring diagram for it; 12 volt relays can be used just as well.

Relay boxes of the type described make a very effective antenna changover system for antennas other than the sloper system. For instance, where several different antennas are used, each can be fed to the relay box, and only one length of coaxial cable need come into the shack. A later system I used was of a relay box consisting of five relays, which enabled any one of six antennas to be selected. With this particular relay box, four of the positions were used for the four slopers, and the other two for a 160-metre antenna and as a spare antenna. The photograph (B) shows this relay box with the relays in position and (C) after the box has been closed and made watertight ready for fixing to the mast. This relay box was also constructed from aluminium, and was purchased very cheaply from a government surplus store with the TV UHF sockets already fitted to it.

The control box consists of a single-pole four-way switch, together with some form of indication to indicate which sloper has been selected. This can vary from a pointed knob to LEDs wired in parallel with the 24 volt supply to each of the relays, and a double-pole switch being used instead of the single one. Fig. 6 shows the wiring diagram of the control box.

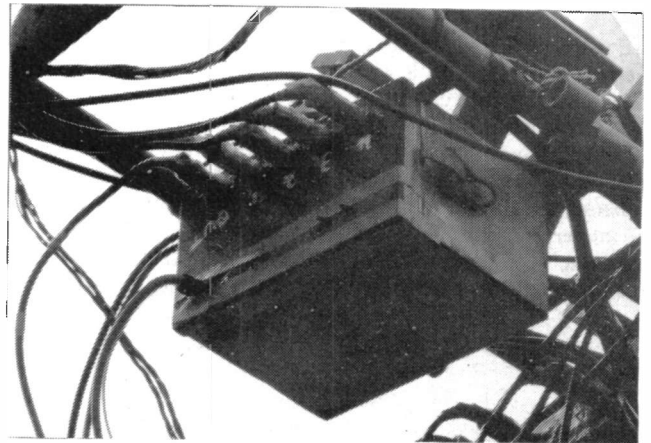


Photo A: The relay box fitted to the tower. The five TV UHF sockets taking the coaxial cable from the transmitter and the four slopers are at the top, and the four-way control cable for the relays enters the box in the bottom left corner.

The photographs (D) show the control box used with the relay box of five relays with LEDs to indicate which antenna has been selected and (E) the interior of the control box.

After erecting the four slopers, and testing the control and relay boxes, I carried out SWR checks on the slopers. Each one had an SWR of between 2.5:1 and 3:1. This is perhaps understandable as no allowance was made when cutting the lengths of the dipoles for extra capacitance caused by the insulators, etc., and no trimming

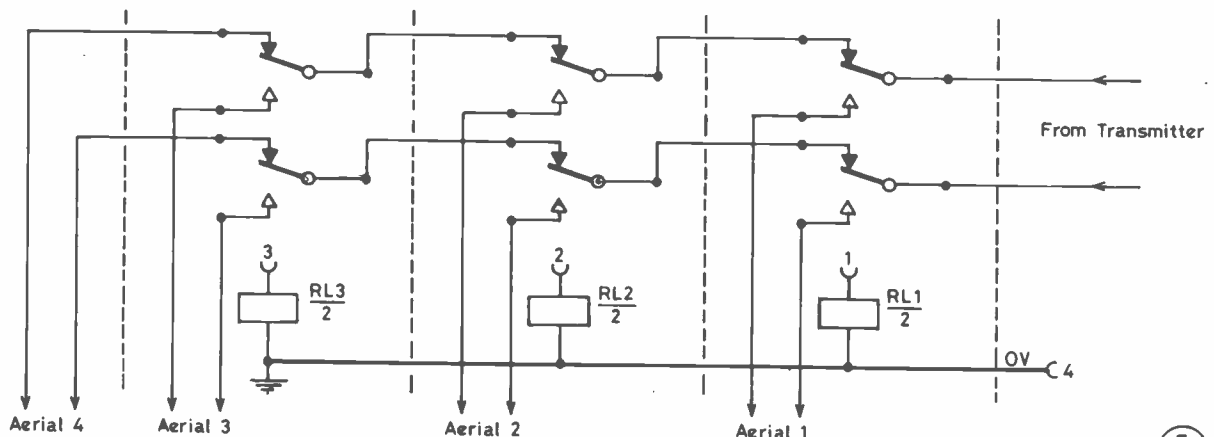


Fig. 5 Schematic Diagram of the Relay Box.

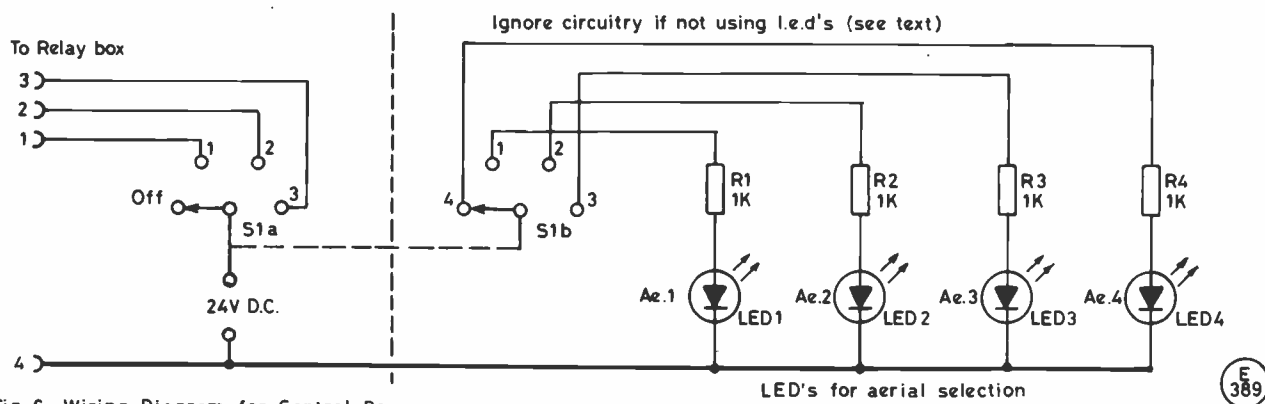


Fig. 6 Wiring Diagram for Control Box

had been done to bring them to resonance. K2WSP had mentioned the high SWR with his system, so for the time being I made no attempt to change it.

The advantage that good antennas have over linear amplifiers for increasing your signal strength is that they also work in reverse, *i.e.* they enhance received signals. By tuning the receiver into a signal, and selecting each sloper in turn whilst watching the 'S' meter, an indication of the front-to-back ratio can be obtained. 7 MHz has an abundance of strong broadcast stations, and for once they can be used to advantage by the radio amateur

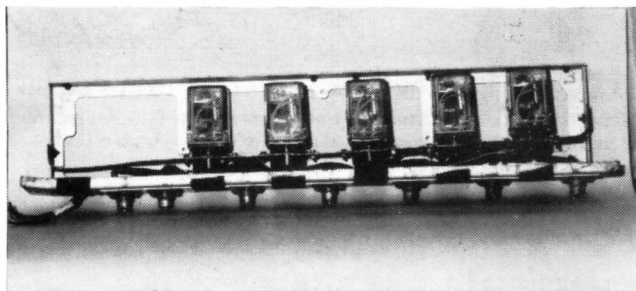


Photo B: Interior view of a later relay box using five relays which enabled six antennas to be switched (four slopers, a 160 metre antenna and a spare).

for testing a sloper system. As each sloper was selected the rise and fall of the 'S' meter had to be seen to be believed; if one accepts that each 'S' point is the equivalent of 6dB, the system was giving a minimum of 20dB front-to-back ratio, and perhaps more. During the next few weeks, a good amount of DX was worked with a surprising amount of ease. It was noticeable from the signal reports that I was giving and receiving, as compared with other western European stations, that the system was working very well. Tests were conducted with DX stations by transmitting on each of the four slopers in turn, and comparing the four signal reports. The results were consistent with the tests I had done earlier on the broadcast stations.

I was so impressed with the system that I became very frustrated at not having a higher support, so I could try a similar system for 3.5 MHz, like K2WSP. Although I was still very satisfied with the gain of the Extended Double Zepp, it did not have the front-to-back ratio which the sloper system had, and east European signals continued to be an annoying source of QRM. The recommended height for the 7 MHz system is 60 feet, and although I was using it at 50 feet, the centres of the slopers were still approximately 25 feet above the ground. A similar system for 3.5 MHz would therefore

have required a 100-foot mast, which was out of the question. For the time being I discounted using it on 3.5 MHz.

Although the system was working well, the high SWR worried me a little. I decided to adjust the lengths of the dipoles in an attempt to bring the SWR down. K2WSP had also tried this, and found he had to take about six feet off on 3.5 MHz to bring the SWR to 1:1. The result of this was quite unexpected in that he lost all of the front-to-back ratio! He replaced the wire and the front-to-back ratio returned, as did the SWR of course. Exactly the same thing happened with me, and so I changed the lengths of the dipoles back to their original length. The reason as to why this happens is unclear, but it is therefore very important that the lengths of the dipoles are cut to exactly half a wavelength. During the time that I used the sloper system, no harm was experienced to my equipment despite the high SWR. A bonus of the system was that it was very broad banded, which is an important factor on 3.5 MHz and the HF bands.

The reasons which led me to erect another system for 3.5 MHz were arrived at quite by accident. One evening during a bad storm I wound my tower down to approximately 30 feet. This caused the centres of the slopers to fall to just a few feet above the ground, and the half furthest from the tower was almost completely lying on the ground. Whilst the tower and the slopers were in this position I had QSOs with several stations in ZL and VK. I found that I was able to work them and obtain good reports, almost as easily as I had done with the tower and slopers at their previous height. I found it very hard to believe that an antenna with its feed point only a few feet above the ground and almost half of it lying on the ground, was able to work DX. Presumably it was working more like a vertical dipole whilst it was in this position, but more important the system retained its directiveness and front-to-back ratio, although slightly reduced.

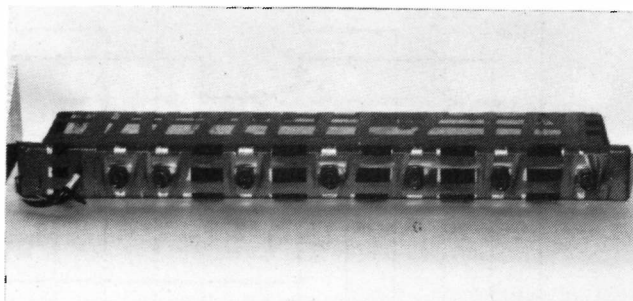


Photo C: The same relay box having been made water-tight with grease and tape and ready for installation on the tower. The six-way control cable for the relays enters the relay box on the far left.



Photo D: The Control Box used for the relay box containing five relays and switching six antennas. Leds have been used to indicate which antenna has been selected.

As a result of this I realised that it should be possible to erect a system for 3.5 MHz when the tower was at its normal operating height, doubling-up on the measurements for the dipoles and feeder. Another relay box was built and fixed to the tower in parallel with the existing one, so that the one control box selected both sets of slopers at the same time. Another coaxial cable came into the shack where another switch selected either the 3.5 MHz or the 7 MHz system. The dipoles were exactly the same as the 7 MHz ones, but twice the size, and when I hung them on the tower I found I was not able to pull them right out due to my boundary

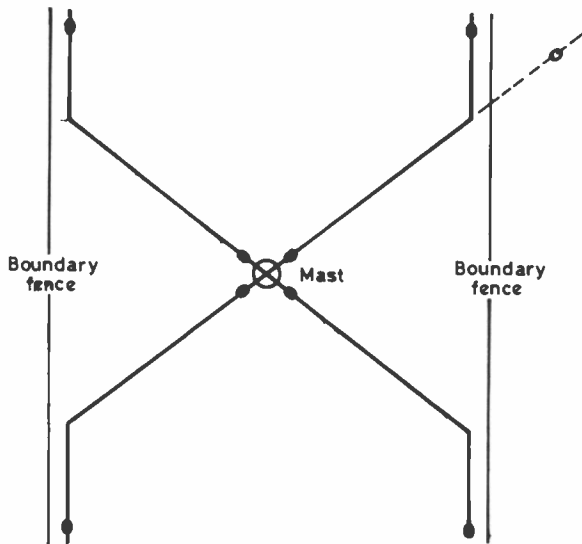


Fig.7 The 3.5MHz Sloper System looking from above showing how the ends of the dipoles had to be bent to keep them within the garden boundary. The dotted line indicates the ideal position for the N.E. Sloper

(E 390)

fences. I had to bend the ends to keep them within my garden; see Fig. 7.

The 3.5 MHz system worked as well as the 7 MHz system with similar gain and front-to-back ratio; this was despite their relative lower height and the ends being slightly bent. The success of the 3.5 MHz system prompted me to erect a fixed 70-foot mast, alongside the tower, just to support the two sloper systems. Although I had no evidence to suggest it, the fact that I had a two element tri-band quad immediately above the tops of the slopers made me wonder if there was any interaction between them which might impair their performance. By using a separate mast for the slopers, in addition to gaining some height, the possibility of interaction was eliminated.

Within a few days of erecting both sloper systems on the 70-foot mast, in addition to VK and ZL stations, I was working Japanese

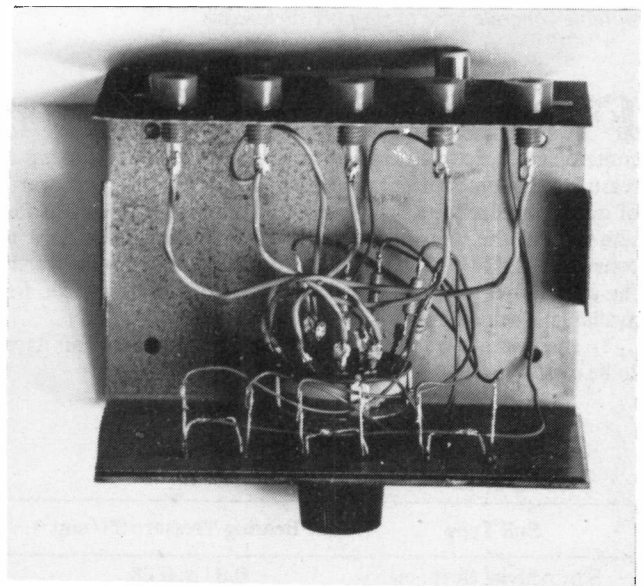


Photo E: Interior view of the Control Box showing the wiring.

stations on 3.5 MHz, early in the morning on the long path and on the short during the evenings through the European QRM. During the winter of 1976/1977 a large quantity of good DX was worked on 3.5 MHz and 7 MHz, resulting in my having to wait until 28 MHz opened during the summer of 1977 to complete my Five-Band DXCC.

All good things have to come to an end, and the following summer the whole system was dismantled as I moved QTH.

In the final part of this article I shall describe how the sloper system can be fitted into small gardens, a system for gaining height above an HF beam or quad for the slopers to hang on whilst allowing the beam to rotate, and a comparison between the sloper system and the inverted-vee antenna. I shall also describe how it is possible to install the system over a house, and outline the "half-sloper system" using quarter-wave dipoles.

Concrete Base Design for Self-Supporting Masts, Part 1

D. J. REYNOLDS, G3ZPF

The previous three articles in what might be termed 'the designer series' (S.W.M., June, August, October, 1984) covered the derivation of local windspeed and the design of masts to resist it with given headloads. This section deals with the sizing of a suitable concrete base to support such masts.

Soil Properties

FOR the purposes of this article it is assumed that the average radio amateur would not be willing/able to contemplate the construction of a reinforced base. This seems a reasonable assumption to make, as the author has only ever heard of mass concrete bases being used, and does make the maths far simpler. For the size of base likely to be required the savings in concrete possible by using reinforcement are unlikely to be worth the effort even assuming small quantities of reinforcement are available at sensible prices.

To ensure that the foundation is stable, two requirements have to be met:—

Soil Type	Safe Bearing Pressure (N/mm ²)
Silt; Aluvial earth; etc.	0.00 to 0.08
CLAY	
Sandy & Firm	0.08 to 0.16
Sandy & Stiff	0.16 to 0.30
Firm	0.08 to 0.16
Stiff	0.16 to 0.32
Shaley & Hard	0.32 to 0.65
Very Stiff	0.32 to 0.65
Sound Yellow	0.32 to 0.53
Blue	0.43 to 0.65
SAND	
Uniform particles:	
Loose	0.10 to 0.21
Compact	0.21 to 0.43
Well graded:	
Loose	0.21 to 0.43
Compact	0.43 to 0.65
SANDY GRAVEL	
Loose	0.21 to 0.43
Compact	0.43 to 0.65
CLEAN GRAVEL	
Loose	0.32
Compact	0.43 to 0.75
CHALK	
Soft	0.16
Hard	0.32 to 0.65

Fig. 1. A table of safe bearing pressures for soils of various classifications.

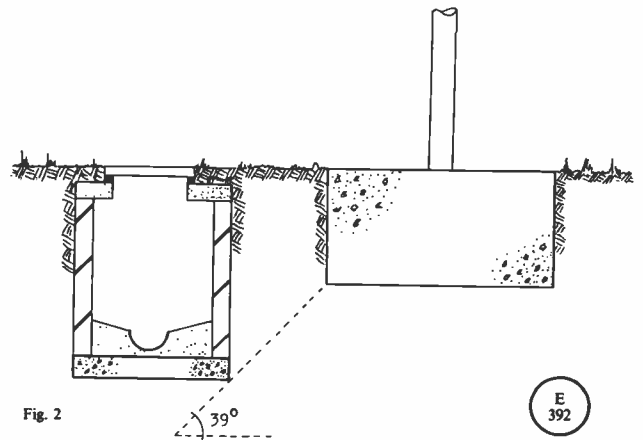


Fig. 2

Some manholes may be deeper than the base for the mast, in which case it will be necessary to take care that the walls of the manhole are not surcharged by the spread of pressure under the base.

- (i) That the base can resist the overturning moments applied to it without exceeding the 'safe ground bearing pressure' (S.G.B.P.).
- (ii) The base is founded at a depth sufficient to be immune to seasonal variations in soil condition brought about by the annual freeze/thaw cycle.

The S.G.B.P. is dependent upon the type of ground in the area, and can be evaluated from Fig. 1, which should cover most

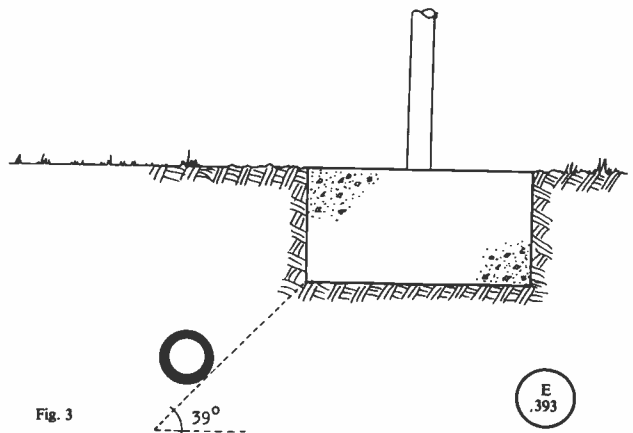


Fig. 3

It pays to check the position and depth of drain runs to avoid the possibility of them being fractured either while digging the hole, or by surcharge pressures from the finished base.

eventualities. In professional circles the civil engineer has several instruments at his disposal to determine the S.G.B.P. to reasonable accuracies, but the author appreciates the fact that readers will have to judge it by eye, with reference to Fig. 1. Note that the soil types referred to in Fig. 1 are those present at the bottom of the foundation, and not at the surface of the ground, which will invariably be different. If the reader is unsure of a suitable value, then 0.1 N/mm² (which is 1 ton/ft²) is a good assumption to make generally and will be on the safe side in all but the poorest soils.

Many modern housing sites have been built on 'fill' material, and as this can be unstable over periods of time it will be necessary either to assume a low value for the S.G.B.P. or to dig through it to the firm ground beneath. The latter may be impractical in some instances, as the depth of 'fill' can be quite large, so a visit to the local authority may be necessary to find out about local ground conditions. If a QTH is not a mining area, and houses are built on raft type foundations instead of footings, this could well indicate poor ground conditions and the possibility of settlement.

A foundation formed at too shallow a depth can give problems, as ground near the surface is influenced by weather conditions and liable to movement or changing properties when saturated with rain. To minimise such effects it is necessary for the bottom of the foundation to be at a depth of at least 900mm below the surface.

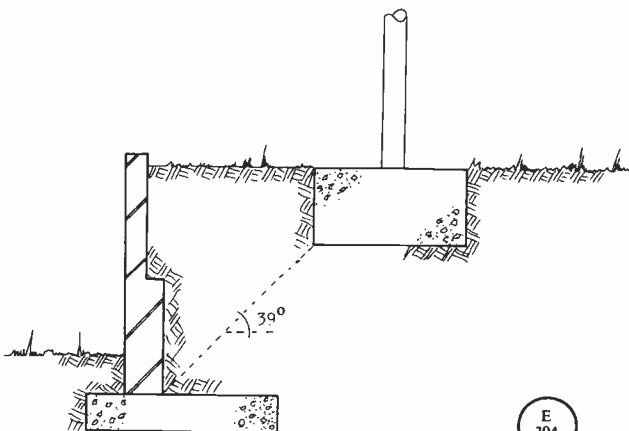


Fig. 4

On terraced ground it will be necessary to avoid overloading any retaining walls by keeping the spread of pressure from the base away from the wall.

Buried Hazards

It seems prudent to point out at this juncture that several services exist at the type of depth required by foundation bases, such as drainage runs, water mains, gas mains, electricity cables and the like. Before embarking on any major earthworks it is a good idea to obtain site information as to the location of all services. That may sound painfully obvious, but as dozens of professional builders seem to forget that each year it needs pointing out, and whilst a burst water main is merely embarrassing, a burst gas main or fractured electricity cable could be lethal. Be aware too, that service plans may be inaccurate with regard to exact positioning, and that there may be the odd service run that everyone has forgotten about. Of course, in the average housing estate situation with the mast in the back garden, then the only problem likely to be encountered are drain runs, but it pays to check, and the author is attempting to cover every eventuality.

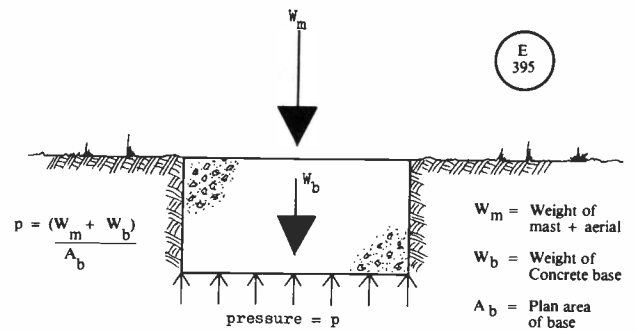


Fig. 5

Until the wind blows, the pressure distribution underneath the base is uniform. The magnitude of the pressure is dependent on the weight of the mast, and the size of the base.

Even if drain runs are not directly under a base, it is possible for the ground around the drain run to be surcharged by the spread of ground pressure under a mast base. Figs. 2 and 3 show the closest advisable approach to manholes or drain runs, with Fig. 4 showing a problem that may occur on terraced ground. If all this sounds rather off-putting remember that although a small installation is unlikely to cause many problems, it is good practice, and for readers fortunate enough to be contemplating a monster off-the-shelf tower system it is essential, to make a thorough check. A fractured drain run could result in a hefty bill from the local authority, and don't forget that the workmen would need to remove your prized base to be able to repair the drain. Monster arrays will need the nod from the L.A. planning committee anyway, so while up at their offices it doesn't take a minute to get the records out.

Forces on a Base and the Ground Beneath It

Since the majority of readers will be familiar with the fact that pressure is equal to force divided by area, Fig. 5 should be readily understandable, and represents the situation for a self-supporting mast base in "still-air" conditions.

As soon as any wind blows then other forces come into play and the situation is then as per Fig. 6. The effect of the bending moment from the wind forces is to increase the pressure under the downwind edge of the base, and decrease it along the upwind edge. Obviously if the bending moment is large enough relative to

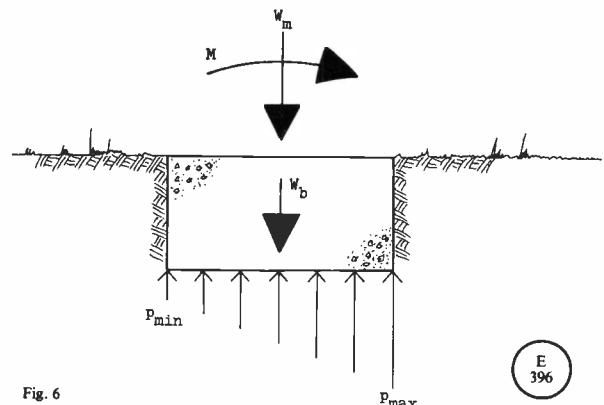


Fig. 6

When wind moments are applied to a base the pressure beneath it is no longer uniform but varies linearly as shown above.

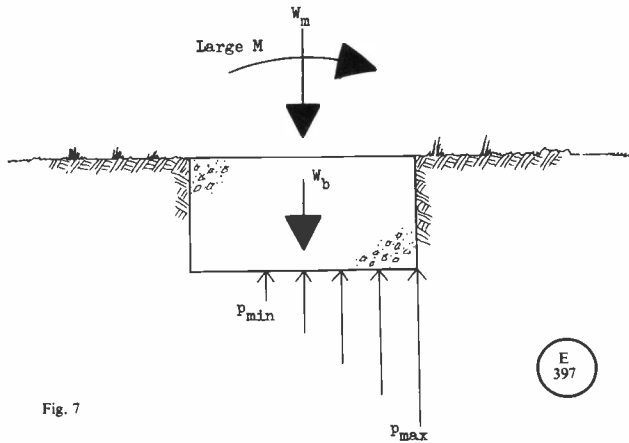


Fig. 7

Where the moment of the wind is large enough compared to the total of the self weights, the pressure may be shifted so much that only part of the base is bearing on the soil.

the weight of the mast and its base, then the pressure along the upwind edge could be zero (or "lower") and the pressure under the downwind edge could well exceed the S.G.B.P. of the soil. If the pressure along the upwind edge of the base tries to go below zero, then the underside of the base will lift, and the pressure distribution will be as shown in Fig. 7.

Since it is being assumed that mass concrete is being used, with no reinforcement, then the length and breadth of the base must not be greater than twice its depth. Above this ratio the concrete is able to bend as a cantilever, and once tensile bending stresses develop in the bottom face of the base the concrete will crack, as concrete has virtually zero strength in tension in spite of being immensely strong in compression. Figs. 8a and 8b illustrate the

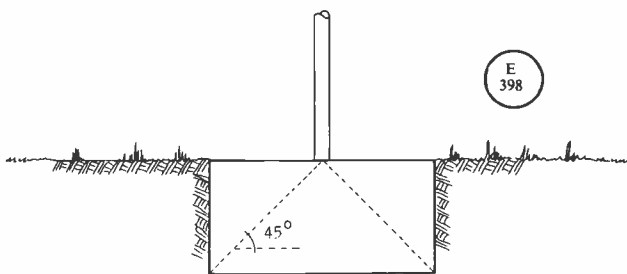


Fig. 8a

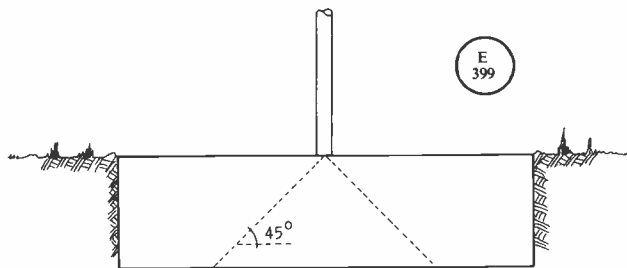


Fig. 8b

Fig. 8a. Unless the base is to be reinforced then the depth must be at least half of the length of the sides. Fig. 8b. If the depth of an unreinforced base is less than half of the length of the sides then only the area within a 45° cone under the mast can be considered to be effective as concrete outside that area will fail under tensile stresses.

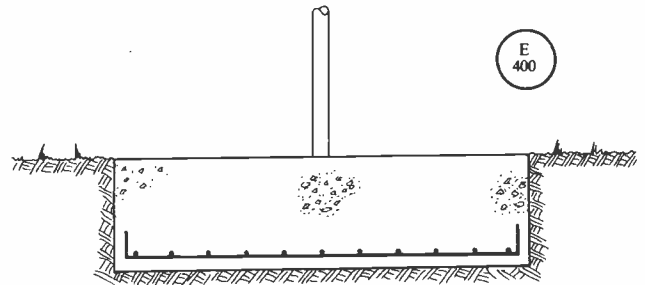


Fig. 9

Where very large axial loads exist it would save on concrete to reinforce the bottom face of the base. This enables large areas to be used with minimal depths, as the steel reinforcement takes the tensile stresses in the bottom of the base enabling the full width of the base to be effective.

point. Once the concrete has failed in a 'long' base then the working length will only be twice the depth anyway.

In building construction it is often necessary to have large base areas, but with limited depth. The way this is achieved is to use a layer of steel reinforcement on the lower (tension) face of the concrete base. The reinforcement would be positioned securely at the bottom of the hole, about 50mm above the formation, and then the concrete would be poured. The 50mm of concrete below the steel reinforcement protects the reinforcement against corrosion by ground water. Fig. 9 illustrates how the bars would be arranged, with the precise diameter and number being dependent upon the magnitude of the bending moments in the base. The steel bars take out the tensile forces on the bottom face, leaving the concrete to deal with the compressive forces along the top face.

Making the Base

Reinforced concrete might be beyond the scope of the DIY brigade as it involves the use of yet another B.S.I. code, namely CP110, but even a mass concrete base contains a very large amount of concrete and it is often not practical to mix it up from bags on site. One of the reasons for this is the time element, since concrete undergoes an 'initial set' shortly after being placed and so it is important to be able to have all of the concrete available at once. Another factor is the consistency of the mix, which will vary widely as the effort of mixing and placing the concrete takes its toll. A poor mix can be attacked by the weather and crack vertically, allowing rainwater to percolate into the body of the base and continue the deterioration from within.

It is possible to obtain ready mixed concrete and have it delivered in one of the mixer-trucks which are a familiar sight on the roads. There are a large number of companies, and directories will give the address of those in the locality. It is generally ordered in cubic metres, rather than cwt, with each truck capable of about 5m³. The price in m³ might seem rather high, but sit down and work out how many bags of sand/gravel/cement are needed to make up a cubic metre and it is not that unreasonable, especially as it is already mixed for you.

If contemplating a truck mix delivery, be sure to sort out beforehand just how you are going to get the concrete from the truck to the hole. There is either a chute or short conveyor fixed to each truck, which is fine if there is access up to the hole, but if it is going to be necessary to "barrow" the concrete to the hole, get some friends round with theirs. As far as can be remembered, a time of 15 minutes or so is allowed for unloading, but check this on ordering. Knowing the size of the barrows it should be easy to guess the time needed to move a certain quantity around the house.

to be concluded

Icom ICB-1050B Scanner

STEPHEN IBBS, G4LBW

ONCE readers have converted the Icom ICB-1050B to operate on 10 metres (*SWM*, Nov. '84), it will be found that at this point of the sunspot cycle, 'openings' do not occur as often as we would like, and do not last very long. It seems that the Virgin Islands repeater on 29.66 MHz becomes audible before anything else, and if the rig is set to the calling channel, 29.60, any brief openings will be missed. What is obviously needed is a scanner . . . but space is at a premium, both on the front panel for controls, and inside the case for extra PCBs, particularly if a noise-squelch board has been added as well as the conversion

board! Consequently some limits on the scanner design have to be accepted.

The design offered here will scan over 10 channels, stopping on any busy channel. It can also be locked manually, and can be bypassed to return control to the channel-selector switch. Once locked, operation can commence on the scanner channel, but the display will not follow the scanner; rather it will continue to show the channel selected by the normal 40-way rotary switch. To incorporate a scanning display would have involved far too many ICs for the space available. In other words the scanner is intended primarily as a *monitor-receiver* only, and not for transmitting. Indeed if the repeater switch is in, transmitting on the scanner channel will produce some very odd results. The circuit is intended to operate only from 29.60 – 29.69 MHz, covering all the repeater channels, and though operation is possible elsewhere in the band, some odd things will happen, as will be explained later. It uses only two ICs, costs about £2.50 including the switch, and certainly makes monitoring a lot easier. Ideas are also given as to how adventurous readers can develop the system further.

How it Works

The block diagram of Fig. 1 helps to illustrate the principle of operation. The 4510 is a BCD up/down presettable counter, Fig. 2, and its preset inputs are connected to the four least-significant bits of the binary code coming from the conversion board design of *SWM*, Nov. '84. If the preset-enable pin 1 is brought high, then the code from the conversion board will be fed straight through the 4510 to the synthesizer IC, the MC145106. However with the switch in 'Scan' position, the preset inputs are disconnected from the outputs, and the counter circuitry takes over, counting up from 0 – 9, producing the appropriate binary code on the 4 output pins. Naturally there must be some way of stopping the count if a 'busy' channel is found, and the count-enable pin 5 will do this if brought high, either by the Scan/Lock switch, or by the 'Scan' output pin 13 of the IF processor IC, the MC3357. The output pins will then hold their present state until either counting recommences or pin 1 is brought high, switching control back to the channel-selector switch, *via* the conversion board.

Looking at the circuit in more detail, Fig. 3, one gate of a 4093 quad NAND Schmitt trigger IC is used as the scan oscillator, and the scan rate can be increased or decreased by reducing/increasing the value of R1. The oscillator output feeds the clock-pulse pin 15 of the 4510. Another gate is used to control pin 5. The truth table of a NAND gate is given below, and this shows that if either (or both) of the inputs is low then the output will be high.

A	B	OUT
0	0	1
0	1	1
1	0	1
1	1	0

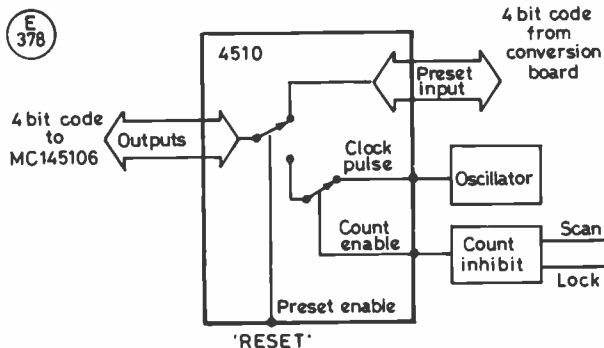


Fig.1 ICOM 1050B Scanner Block Diagram

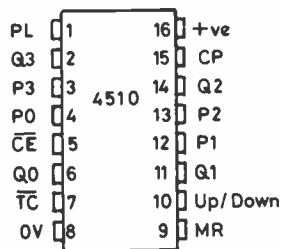


Fig.2 BCD Up/Down Presettable Counter

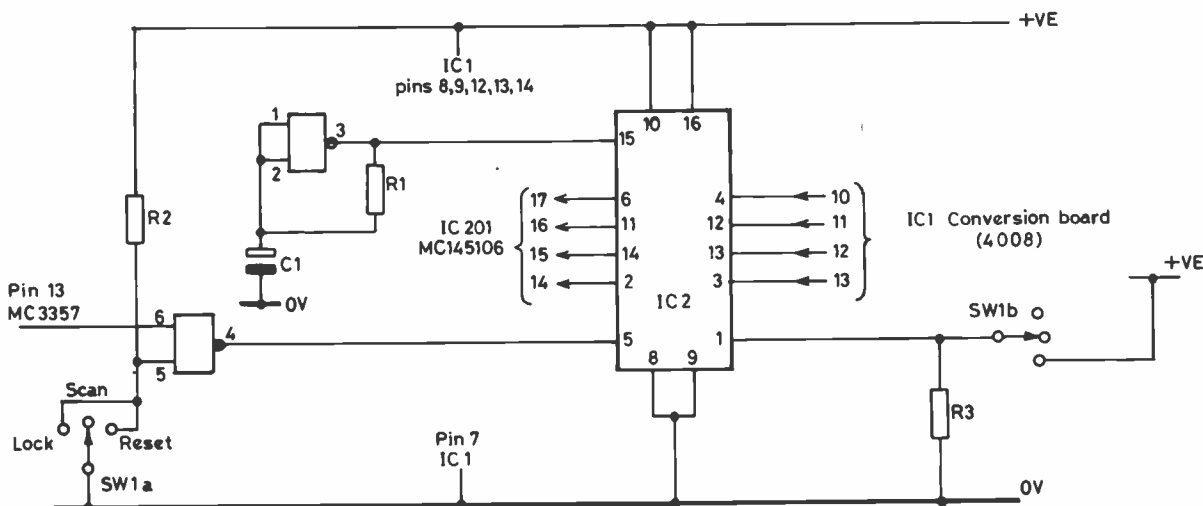


Fig. 3 ICOM 1050B Scanner Circuit

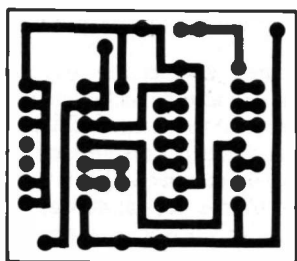


Fig. 4 PCB Track Layout

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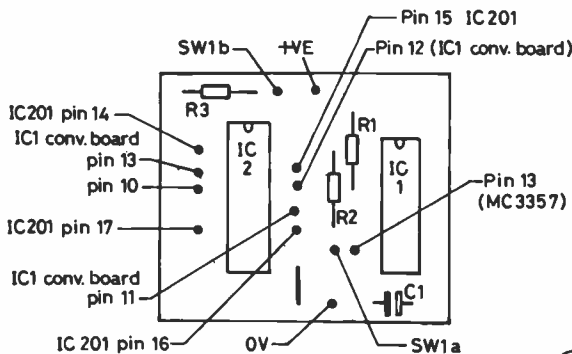


Fig. 5 Component Overlay

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Table of Values

R1 = 470K
 R2, R3 = 100K
 C1 = 2μ2, tantalum.
 Also DPDT centre-off miniature toggle switch, or 2-pole, 3-position slide-switch (RS 337-481), see text.

IC1 = 4093
 IC2 = 4510
 PCB

Thus in the 'lock' position pin 4 (IC1) and pin 5 (IC2) will be high, inhibiting the count. However in the 'Scan' position R2 holds pin 5 (IC1) high, and the output from the MC3357 is normally high, so the gate's output and the CE pin will be low, allowing the scanner to run. If a signal is heard, pin 13 of the MC3357 goes low, forcing the CE pin high, stopping the scan. Pin 1 of the 4510 is normally held low by R3 but if pulled high by the switch, then the scan circuitry is bypassed and the code from the conversion board is fed through.

Input	Output	Call	Location
29.51	29.61	DB0RU	Duisburg, W. Germany (1750Hz)
29.52	29.62	KE4IO	Atlanta, Georgia
		K3SP	Freeland, Maryland
		WB7CAG	Glendale, Arizona
		WD0ALH	Newton, Kansas
		W1BHD	Malden, Massachusetts
		WD8CIY	Brady, Texas
		W0JZY	Hillsboro, Missouri
		WA2TMZ	Toms River, New Jersey
		W4ZJM	Memphis, Tennessee
29.53	29.63	N6AHW	Monterey, California
29.54	29.64	WB3FKQ	NE Pennsylvania
		W3DID	Baltimore, Maryland
		WD8DPA	Ann Arbor, Michigan
		KE4QC	Mobile, Alabama
		WA6ZOI	Mount Wilson, California
		K0LKH	Boone, Iowa
		K0GBZ	Quinter, Kansas
		WA0YUA	Bridgeton, Missouri
		WB7DRU	Sioux Falls, S. Dakota
		WB5ITT	Port Neches, Texas
		K5TYV	San Antonio, Texas
		W7ZFX	Sedro Woolley, Washington
29.55	29.65	K3SLG	Pine Grove, Pennsylvania
29.56	29.66	KB2DQ	Buffalo, New York
		WP2IBJ(?)	St. Thomas, US Virgin Is
		WR2ABA	Huntington, New York
		AE0N	Bloomington, Minnesota
		W0IA	Boulder, Colorado
		N9PL	Palomar Mt., California
		N3AUY	Silver Spring, Maryland
		W0TQ	Concordia, Kansas
		K8YPW	Hastings, Michigan
		WR5ARS	Houston, Texas
29.57	29.67	DB0QK	Mainz, W. Germany (1750Hz)
29.58	29.68	W4MM	Albany, Georgia
		WB6IGH	Palos Verdes, California
		WB9STA	Pendleton, Indiana
		KD4DN	Sterling, Maryland
		W2SEX	Buffalo, New York
		K2YBW	Setauket, New York
29.51	29.69	W3EDU	York, Pennsylvania (YL Ident)*
29.60	145.15	N4AHN	Bessemer, Alabama
29.60	224.74	WA2NCB	Cambria Heights, New York
29.60	144.94	K2TKE	Setauket, New York
29.54	145.45	K2KLN	Manhattan, New York (Metroplex)
29.54	443.95	K2KLN	Manhattan, New York

*Note the unusual frequency shift of this repeater, which announces itself with a female voice.

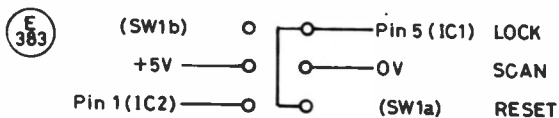


Fig. 6

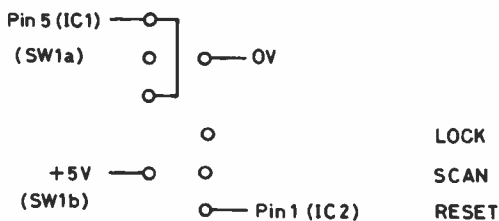


Fig. 7

E 384

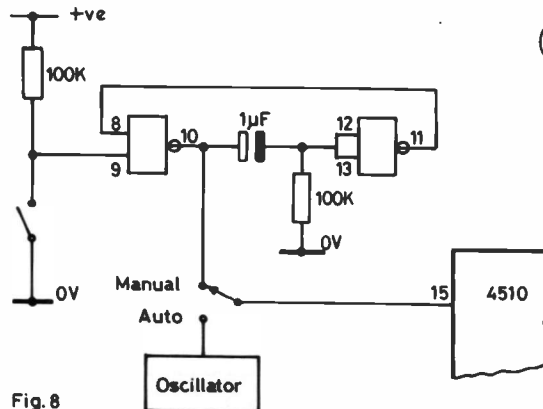


Fig. 8

E 385

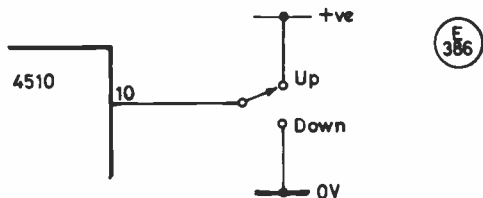


Fig. 9

Construction

A small PCB had been designed and is given in Fig. 4, with the overlay in Fig. 5. Mount the components, making sure the polarity of the tantalum capacitor and the orientation of the ICs are correct; don't forget the small wire link. Insert veropins for the various interconnections, and leave some blank PCB material untrimmed on one edge so that a small aluminium bracket can be bolted on. The board will eventually be mounted behind the channel switch. Connect +5ve and 0ve from the conversion board and check that the oscillator output (pin 3, IC1) is switching high and low. Connect the wires from pins 10, 11, 12, and 13 of the first 4008 (IC1) on the conversion board to pins 4, 12, 13, and 3 respectively of the 4510, and then connect pins 6, 11, 14, and 2 (4510) to pins 17, 16, 15, and 14 of the synthesizer IC, (MC145106). Connect a lead from IC3 pin 6 to pin 13 of the MC3357 on the main rig PCB. In the prototype this was soldered direct to the actual IC pin.

Important . . . the new switch must be a double-pole double-throw switch with a *centre-off* position. Whilst the obvious answer is a miniature toggle, it will be found that the RS 337-481 miniature slide switch will fit perfectly the aperture that is already partially prepared in the front panel (behind the word 'Icom'). A hole needs to be drilled and filed in the front fascia panel, and this is quite fiddly, so take time and care. Wire the switch according to Fig. 6 or 7, depending on what type is used. Mount the new switch, and then place the PCB behind the channel-selector switch. Mark the position of the small aluminium bracket, and drill two holes in the side panel with 6BA clearance. After a final check mount the PCB, ensuring that it won't foul the top plate.

No adjustment is necessary, and in the central 'Scan' switch position the rig will scan up to 29.69, (assuming that the selector switch is set to 29.60). In the 'Reset' position the channel switch will act as normal, and in the 'Lock' position the rig will stop on the frequency being scanned at the moment. Always let the scanner run for a couple of seconds before stopping, because, depending on what the selector switch is on, it needs a couple of seconds to settle into the 0-9 cycle.

Further Developments

It was mentioned at the beginning of the article that if the channel switch is on a different frequency to 29.60, some strange but logical scans will take place as shown below.

Channel Selected	Scans from
60-70	60-69
44-59	44-53
31-43	28-37

This is because only the 4 least significant binary bits are being interrupted and added to. If readers would like a 16-channel scanner, this can be done very simply by replacing the 4510 with a 4516. This IC is pin-for-pin compatible, and if inserted the scan will be as follows:—

Channel Selected	Scans from
60-70	60-75
44-59	44-59
31-43	28-43

However the author chose not to do this because (a) the inconvenience of it going below 29.31 MHz, (b) the illegality of transmitting above 29.70, something which would be very easy to

do by mistake because the display would not register it, and (c) most people will only want to scan 29.60-29.69 MHz to monitor the various repeater outputs, so the 4510 is preferable.

Readers may wonder why a 4093 was used instead of the cheaper 4011. This was because only one Schmitt trigger 4093 gate is needed to produce a clean square-wave oscillator, consequently leaving two gates free. These are at the moment connected to the +ve line following good CMOS practice, and these tracks will have to be interrupted if the following changes are made.

Those who are adventurous can extend the scanner's functions by using these gates to provide, for example, single-channel scanning *via* a pushbutton. The scan can also be made to go up or down. A normal pushbutton is very 'noisy', and may produce several pulses at once, causing the scanner to jump a few channels, but by building a monostable circuit as shown in Fig. 8, using the two spare gates, and adding a switch and pushbutton, a clean single pulse will be sent to the clock pin, thereby advancing the scanner one channel at a time with each pushbutton press. The track between the oscillator and pin 15 will have to be interrupted to insert the changeover switch.

Pin 10 decides whether the 4510 counts up or down, depending on whether it is high or low respectively. On the PCB it is connected to the +ve line, but if this track was interrupted with a changeover switch inserted as in Fig. 9 the scanner will work in either direction. Before readers contemplate these additions

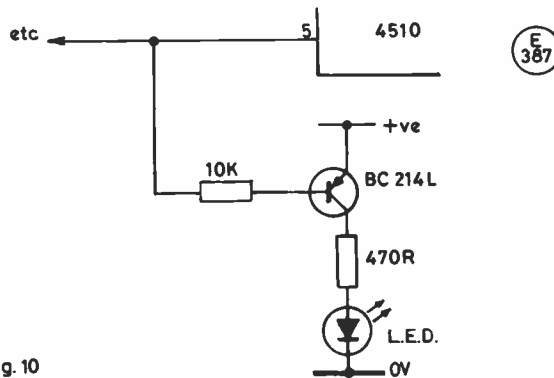


Fig. 10

however, it is worthwhile trying to figure out where the extra switches will go!

It will be remembered that pin 5 (4510) only goes low when scanning, so if desired readers can easily include a scan LED using a couple of resistors and a *pnp* transistor, Fig. 10. This will light when scanning, but go out when:

- (a) a busy channel is found,
- (b) the scanner is locked,
- (c) control goes back to the channel rotary selector switch.

Conclusion

This article has been written to attempt to make monitoring the repeater outputs easier. The design is necessarily limited, and it would have been nice to include, for example, 'hold' on a busy channel for five seconds before moving on, etc., but space restrictions prevented this. No doubt further developments are possible, and the author (QTHR) would be very interested to hear about them from readers.

Finally, with thanks to G4TZB and G4MKT for providing the original information, and G3VNQ and G3SUI for permission to reprint it from the Bury Radio Society "Feedback" magazine, included is a list of the known 10-metre repeaters.

(See page 483)

The "Tonne" 400-Watt Valve Linear Amplifier, Part 1

BRINGS THE WARMTH BACK INTO AMATEUR RADIO!

IAN KEYSER, G3ROO

THE reason for building this linear amplifier was actually *not* to try and heat the shack or to blast my way to VK land, but more as an exercise to remind myself what it was like to construct equipment using valves and to recall all that theory that I had almost forgotten! This it did, and more besides; can you really remember the weight of those old power supplies?

In their defence, valves take a lot of beating as far as high power is concerned. A transistor amplifier which can supply the maximum legal output is a formidable beast and I am sure that its linearity is inferior to this valve amplifier; also the power supply is formidable, say 24V at 40 amps, and that reasonably stabilised! Then come problems with power combiners for the individual amplifiers . . . perhaps the valve still has a place in radio, especially in amateur equipment.

The idea of constructing a power amplifier was thrust upon me at this year's VHF Convention when two QVO8/100 valves plus bases and a considerable number of components still attached were offered to me for little more than the cost of a litre of scotch at shoreside prices! Then the hunt was on for the other components, trannies, smoothing chokes, and capacitors. In fact the only other useful thing found at the convention was a suitable switch for the pi-network. The rest of the components were scrounged from friends' junk boxes, the trannie from G3IOT, the 500pF wide-spaced capacitor from G4DCV (tried to pinch one of his aerials, but he wouldn't look away!).

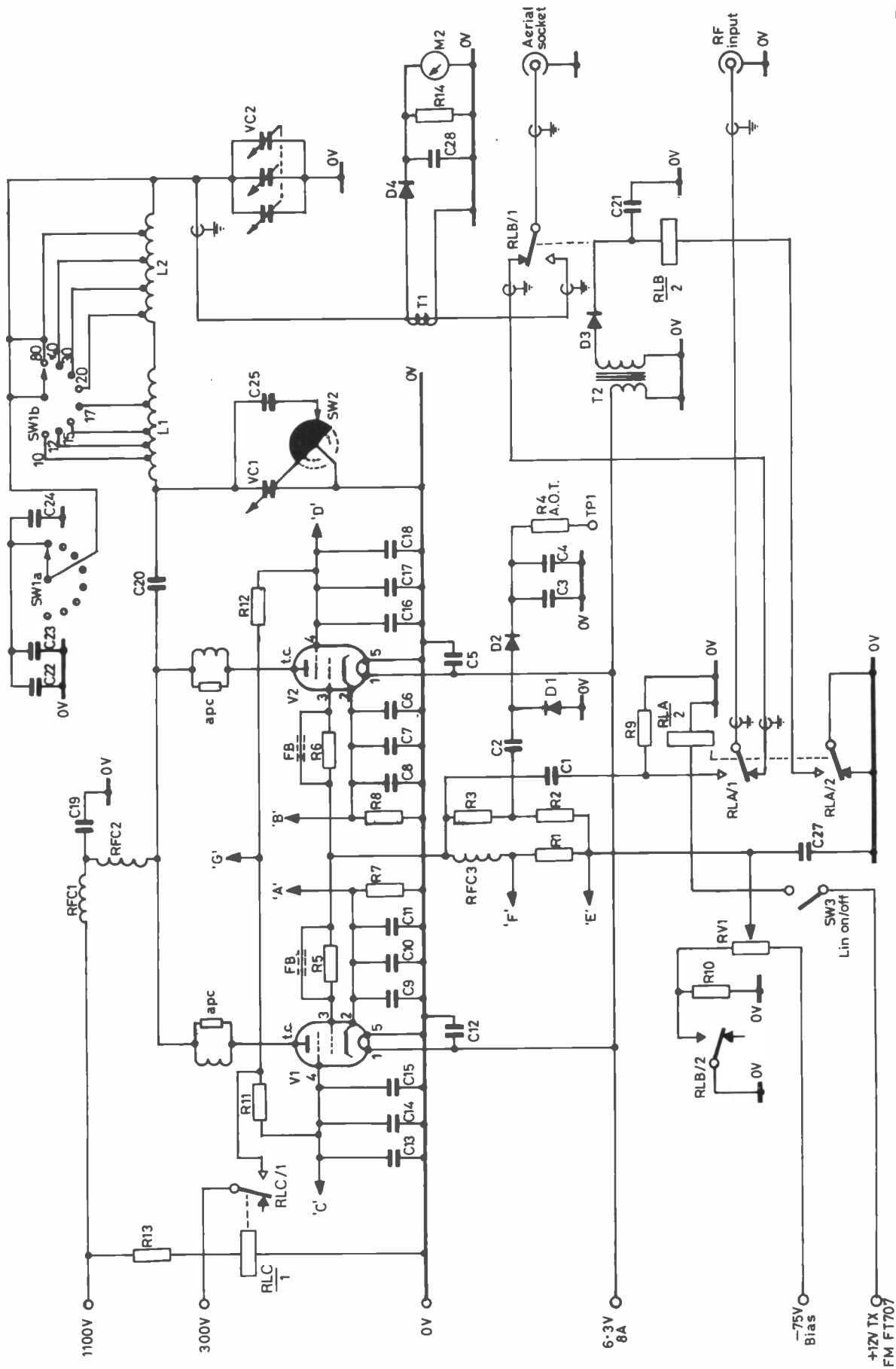
Table of Values

Fig. 1

R1 = 100R, 5W	RFC2 = <i>see text</i>
R2 = 330R, 5W	RFC3 = 1.5mH RF choke
R3 = 4K7, 5W	T1 = 6t 20 swg wire on small ferrite ring
R4 = 1K, ¼ W	T2 = small 9V secondary transformer as step-up across heater supply
R5, R6 = 150R, 5W	V1, V2 = QVO8/100
R7, R8 = 0.5R, 2W	RLA = 12V relay, 2-pole 2-way (continental)
R9 = 40R to 80R, 100W	RLB = heavy duty relay, 10K coil, 2-pole 2-way
R10 = 100K, ½ W	RLC = 5K5 coil relay, 2-pole 2-way (continental)
R11, R12 = 100R, 1W	SW1 = large cer. switch, 2-p 2-w
R13 = 220K, 5W	SW2 = homemade switch on rear of VC1, <i>see photo</i>
R14 = adjust for suitable deflection of M2	SW3 = 1-pole 1-way switch
C1, C2, C4 to C14, C17, C18 = 0.1 µF d/c, 1kV	D1, D2, D4 = small ger. diodes
C3 = 10 µF, 12V elec.	D3 = 1N4004
C15, C16, C27 = 1 µF 350V	M2 = <i>see text</i>
C19, C20, C28 = 0.01 µF d/c, 5kV	RV1 = 22K
C21 = 2 µF, 150V elec.	
C22 to C25 = 470pF d/c, 5kV	
RFC1 = 30t 20 swg enam on ferrite rod	

Coil data: L1 = 2" O.D., 3/16" dia. copper gas pipe, 4¼ turns spaced over 1¼", tapped: 10 and 12m., 1½t; 15m., 2½t; 17m., 3½t; 20m., 4¼t. L2 = 2¾" O.D., 16 swg silver-plated copper wire, 17 turns spaced over 3", tapped: 30m., 1t; 40m., 3t; 80m., 9t; 160m., 17t.



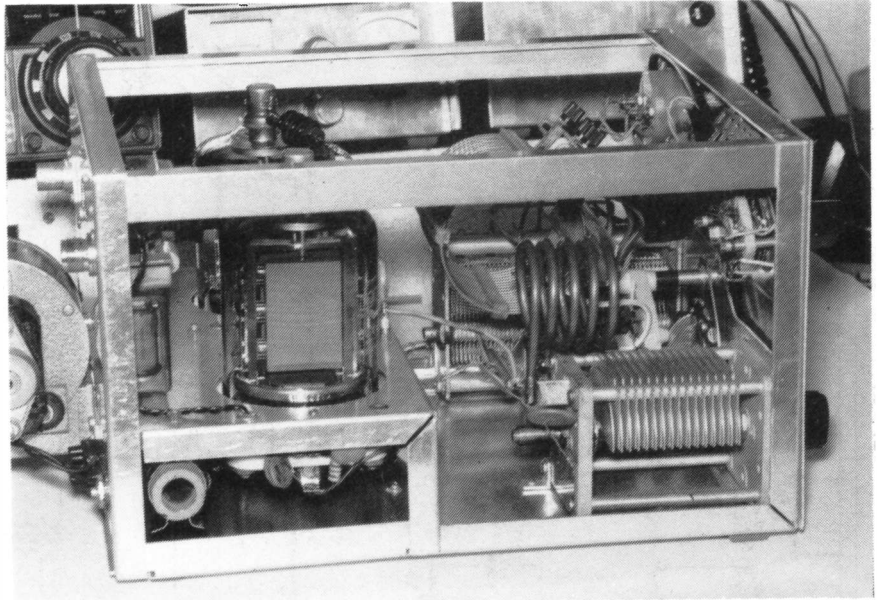


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Fig. 1 400 Watt p.e.p. Linear Amplifier Circuit Diagram

+17V TX
FM FT707

Side view of the amplifier; note R9, lower left, mounted in Terry clips. L1 is 3/16" dia. copper pipe!



The Design

Having got home from the Convention and opened the bag of goodies it was discovered that the majority of the under-chassis components were still attached to the valve bases. The design was almost certainly a passive grid circuit which would suit the output from the FT-707 to a charm, as the output across a 50-ohm resistor would develop more than enough peak-to-peak voltage to drive the valves. The next problem was to search for data on the valves to find what they could stand; Paul, G4DCV, came to the rescue again with the full data sheet which revealed that with an anode supply of 800V an output of 400W could be realised up to 30 MHz.

The Circuit

There is little that can be said about the circuit except to explain items with which the modern amateur, with little experience of valves, might not be conversant.

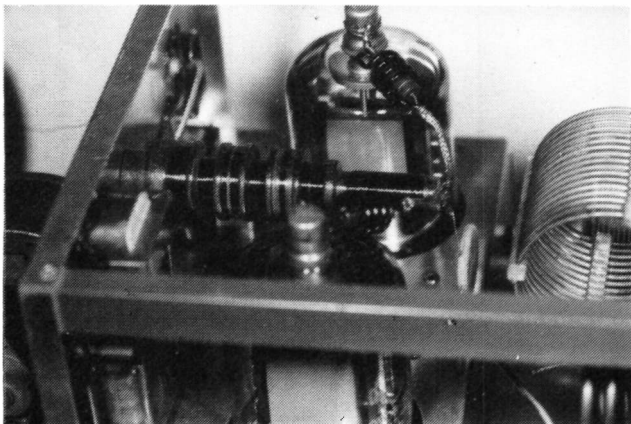
The first of these are the anti parasitic chokes. Parasitic oscillations are caused by resonances in parts of the circuit, the higher the frequency of these resonances the greater the chance of oscillation occurring. The APC inserts inductance to reduce the resonant frequency and then reduces the 'Q' of the circuit by

introducing resistance. R5 and R6 are shown shorted with a ferrite bead inserted onto the shorting wire; these are APCs. The ferrite bead consists of an old 1/4 inch coil slug, the type with the hexagonal hole in the centre. The APCs in the anode circuits consist of four turns of 18 s.w.g. wound on 100 ohm 1-watt resistors.

Two relays have been used for RF switching. Some designs I have seen have used one relay but I always feel that that brings the input and the output of the amplifier far too close together, so asking for trouble with feedback. A second advantage is that the input relay switches the load onto the exciter prior to the bias

Frequency (MHz)	VC1 (pF)	VC2 (pF)	L(μH)	VC1 with VC2 shorted
3.5	784	2935	3.3	618
7	392	1467	1.7	310
10.1	271	1071	1.2	215
14	196	773	0.83	155
18	152	570	0.65	120
21	130	489	0.55	103
25	109	410	0.47	87
28	98	366	0.41	77

Table 1



The PA radio frequency choke.

being removed. At first this may not seem too important, but consider the first dot or dash after reception: the start of this is almost certainly going to be clipped by the 'making' of RLA, causing a click. With this method the start of this first signal is due to the reduction of the bias, allowing the valves to turn on relatively slowly as C27 changes its charge level.

RLC has been included to protect the valves. If for any reason the screen supply is present and the anode supply is not the screens try to act as anodes; this has the immediate effect that the screens dissipate too much power and are burnt out. A simple relay wired across the HT supply to switch the screen supply removes this risk entirely.

to be continued

The QSL Card: Treasure or Trash?

N. S. CAWTHORNE, G3TXF

NO amateur radio transmitting or SWL station is complete without some QSL cards. QSL cards may be displayed in glory on shack walls, stored away in ignominious cartons, filed away with loving care in alphabetical order or just tipped unceremoniously into the waste paper basket. QSL cards are part of the amateur radio way of life!

Sending Out and Collecting Cards "via the Bureau"

The normal and most popular route for exchanging QSL cards is "via the bureau". This means that the cards are distributed around the world through the network of amateur radio QSL bureaux. This unique national and international sorting and distribution system relies on a large amount of voluntary help to keep QSL cards flowing around the world at an absolute minimum of cost to radio amateurs and SWLs. QSL-ing via the bureau is a cheap and easy method of exchanging QSL cards worldwide.

Fig. 1 shows in simplified form how the worldwide QSL bureaux network operates and how your QSL or SWL card

reaches its destination. In the U.K. the main QSL bureau is funded and managed by the RSGB. There are some smaller, independent QSL bureaux in the U.K., but these also tend to route some of their cards through the RSGB bureau. It is the RSGB's bureau that handles the millions of incoming and outgoing QSL cards each year.

In overseas countries too, it is usually the national amateur radio society that runs the QSL bureau system. At any one time, there are hundreds of thousands of QSL cards on the move around the world in transit between different QSL bureaux.

QSL-ing Direct

The alternative to QSL-ing via the bureau is to send QSL cards direct through the post to the other station. QSL-ing via the bureau is very cheap indeed but because of the amount of sorting, handling, distribution and redistribution that takes place as well as the use of the slower parcel post, QSL-ing through the bureau can take several months — or even years.

When a QSL card is wanted in a hurry or where the QSL card is for a particularly rare or interesting station, the QSL card can be

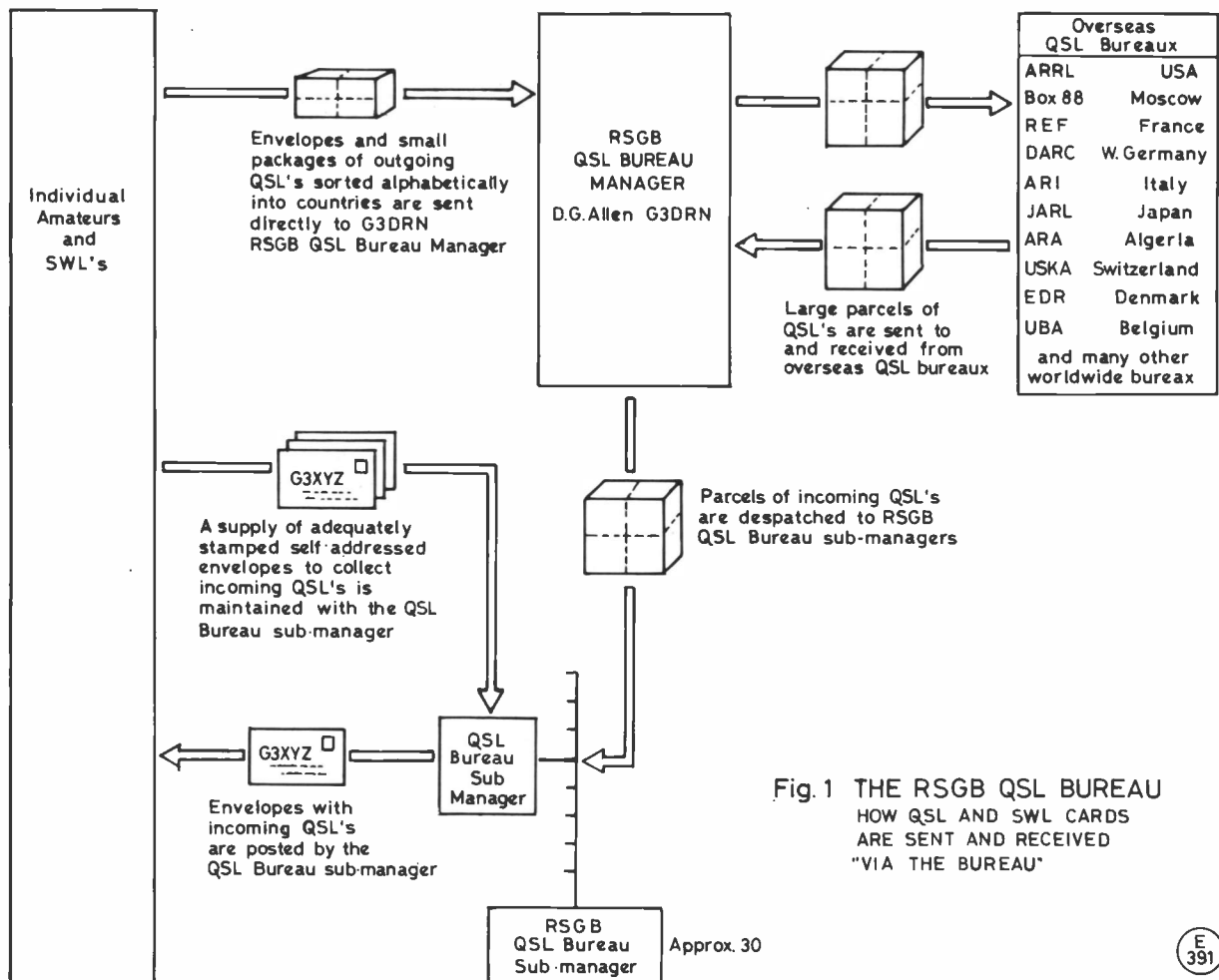


Fig. 1 THE RSGB QSL BUREAU HOW QSL AND SWL CARDS ARE SENT AND RECEIVED "VIA THE BUREAU"

quickly and easily understand the basic facts of the SWL report. To maximize the chances of receiving a reply, the SWL should try to tell the transmitting amateur something that he might not otherwise know. A useful SWL report might be reporting an unanswered CQ when conditions were poor, or reporting a QSO between two stations neither of whom are in the SWL's part of the world and at a time when the two stations in contact might not expect to be heard in the SWL's QTH.

However in practice, for both the SWL report and the transmitting amateur's QSL, it is more likely to be the recipient's own QSL philosophy that determines whether a reply is sent or not. Some transmitting amateurs just do not have any interest in QSL-ing and no longer receive or wish to receive incoming QSLs. Other than visiting the station personally there is not very much that can be done! Many amateurs adopt the more practical approach of at least trying to reply to every incoming card. The SWL who tries to make his report more interesting to the recipient will increase his chances of getting a QSL in return.

DX-peditions

After a major DX-pedition, the QSL manager will be handling enormous numbers of QSLs that arrive both direct and through the Bureau. SWL cards sent to DX-pedition QSL managers should clearly state the basic data (date, GMT, band, signal strength) as well as a list of the stations being worked at the time of the SWL report. Where a DX-pedition has worked a large number of QSOs, the QSL manager may well sort the incoming cards into different bands or into date order, depending on how the logging was done during the DX-pedition. Possibly with large DX-peditions, separate band logs will have been kept during the operation, so that the QSL manager will sort incoming cards accordingly before answering them. Where an SWL report for a DX-pedition is kept simple and clear, with the basic date highlighted, it is likely to be sorted and answered on the same basis as the incoming QSLs from transmitting amateurs.

Accuracy of Date when QSL-ing

Accuracy in the data put onto QSLs is most important, particularly when QSL-ing DX stations and DX-peditions which might have been working thousands of stations and where the QSO rate was such that a ten minute slip in the reported time could mean being a whole page of QSOs away in the DX station's logbook! Where there is an inaccuracy in the QSL data, the QSL manager might have to spend time hunting up and down long lists of callsigns to find yours!

Common errors on in-coming QSLs are: wrong time (particularly errors in converting local time to GMT), wrong date (again sometimes caused by using the 'local' date, rather than the GMT date), miscopied callsign, and wrong band. Over the years the author has received a number of QSLs for contest DX-pedition operations where virtually every detail on the QSL has been wrong — including the callsign!

Conscientious QSL managers will take time to try to locate the QSO in the log even if the information on the QSL is inaccurate, but in so doing he can waste a lot of time, which would otherwise be spent answering accurate QSLs. Where, after exhaustive searching, the station cannot be found anywhere in the log, the card may be returned to the sender marked "QSO not in log", but more likely the card will be chucked in the bin or put to one side into a "dodgy QSL box"!

Since inaccuracy in the basic QSO data on the QSL card wastes the QSL manager's time, every effort should be made to keep all data on QSLs both clear and accurate: it will speed up the return of your DX QSL.

QSL Cards as History

Older QSL cards, because they are written evidence of amateur radio history can make fascinating reading to the younger DX operator or newcomer. Visiting an old timer's shack which

proudly displays a pile of QSL cards from China is an exciting experience for the younger DX-er, who is still trying to work BY1PK! Similarly an OT's collections of ZA cards from mysterious Albania are mouthwatering to the newer DX-er who has yet to hear a true ZA station.

Today's QSLs can be tomorrow's historical records. Stations which are today commonplace on the air can become for different reasons very rare or totally inactive as circumstances change. A DX-er does not have to be very old to remember regular signals from CR6, CR7, 5A or VS9A all of which are currently virtually inactive, and which are therefore getting higher and higher on 'wanted' lists. QSL cards are history and can remind us of previous QSOs and earlier DX successes. Prefixes are constantly changing; the callsigns of the past will never return, only their QSL card reminds us of them! QSL cards can become priceless historic evidence of earlier amateur radio DX activities.

QSL Cards for Awards

To the award hunter and collector, the QSL card is his basic currency. Many operating awards require that the requisite QSLs be in the possession of the radio amateur before a claim is made. Most major operating awards are on a 'confirmed' basis. Details on many of the major operating awards can be found in the RSGB's *Amateur Radio Awards*.

Probably the best known operating award is the ARRL's DXCC. This DX Century Club Award is issued in its basic form for receipt of confirming QSLs from 100 different countries. The QSLs themselves have to be submitted to the ARRL in the U.S.A. for checking. Sending precious QSLs overseas is not only nerve racking, but also expensive in postage! The QSLs are returned after they have been checked, but this can take several months with surface mail in both directions.

Not all awards require that the QSLs be sent away. Many awards are issued on the basis of a declaration that the cards are in



Callsigns once regularly heard on the air. CR6 and CR7 were the Portuguese colonies of Angola and Mozambique in Africa. Since independence and their change of prefix to D2A and C9M, they have both effectively disappeared off the bands!

the possession of the award claimant. This declaration is signed by two other radio amateurs; this avoids having to send precious QSLs overseas.

QSL Cards: Things to Come

A small but ever increasing number of QSL cards being received by the author are filled out with the aid of a computer. The increase in home computing and its immediate applications within the amateur radio shack will lead to an even faster increase in the number of computer-generated QSLs. The most common computer-generated QSL is a normal QSL card format, but with a computer-generated QSO detail label stuck on the card.

Computer generation of QSLs, when done as part of a computer contest check log program, can allow the operator to scroll through pages of log, selecting those QSOs for which a QSL card is to be sent. At the push of a button, the QSL card or the QSO detail label is produced. Home computing applications for

contest check logging and QSL printing are other subjects on their own!

QSL Cards: The Final Courtesy of a QSO

QSL-ing can be fun, expensive and time consuming. Only a few amateurs would honestly claim to have sent QSLs for every QSO that they ever made. Indeed if too many amateurs did do this the QSL bureau system would collapse under the strain! A moderate QSL-ing policy followed by many amateurs is to send QSLs to the rarer stations worked and to those who particularly request a card during the QSO, but also to answer all incoming cards, be they from transmitting amateurs or SWLs.

QSL cards are a hobby within the hobby of amateur radio: designing them, filling them in, sending them out, collecting, filing and recording them. To some, QSL cards may just be waste paper, to others they may be priceless treasures! QSL cards have always been an important part of amateur radio. Long may they remain so . . . *es PSE QSL!*

• • • "Practically Yours" • • •

with GLEN ROSS, G8MWR

Looking at SWR

"PRACTICALLY Yours" does not have to mean building something, it can mean taking a practical look at some technical points. If our understanding is better then, hopefully, so will be the results obtained. This is all brought about by the large number of letters received after publication of my aerial construction article in October's issue. Many people brought up points relating to the statement that you could only measure SWR at the aerial or at points along the feeder that were multiples of an electrical half wave, after allowing for the velocity factor of the cable. This and other points raised, demonstrates a lack of knowledge of the subject. Let us restate some basic truths of the matter.

What is SWR?

It is purely a measurement of the ratio of the impedance you expect to see and what you actually get. On a 50-ohm system an actual load impedance of 150 ohms would give a 3 to 1 SWR, as would a load of 16.6 ohms. Your meter will not show you which impedance you have and, for most purposes, it does not matter. In a similar manner 100 or 25 ohms would give a reading of 2 to 1.

The SWR Meter

The meter measures the SWR by reading the "forward" and "reverse" power. From these two readings it is possible to calculate the SWR. Normally the meter is set to full scale on forward and the reflected power is indicated as SWR — but here lies the first problem. This method of measuring assumes that there is *no* loss on the feeder. Let us take an actual example to demonstrate this. Assume a line with no loss, a frequency of 432 MHz, 100 watts forward power and an SWR of 3 to 1. The meter reads the forward power correctly at 100 watts and, due to the mismatch, finds a reflected power of 25 watts. It "does the sums"

and shows you that the SWR is 3 to 1. In real life cables have losses, so let us assume that you have a fairly long run with a loss of 3dB. Now the picture becomes more complicated. You are still producing 100 watts which the meter "sees" but, because of the cable loss, only 50 watts reaches the aerial. Due to the 3 to 1 mismatch, 25% of this (12.5 watts) is reflected but, because of the 3dB cable loss, only 6.25 watts actually returns to the meter to be measured. The meter now indicates an SWR of only 1.5 to 1, yet we know that the mismatch is actually 3 to 1 because those are the figures we actually used to make the calculation!

Additional Losses

There seems to be great concern about the additional losses caused by high SWR on coaxial cable; in fact more power is usually lost due to leaving the SWR meter in line than is normally lost due to high SWR. Let us assume that you are using 20 metres of UR43 on 144 MHz, this has a "built in" loss of 2.7dB which you can do nothing about. The additional loss due to an SWR of 3 to 1, which is higher than most people would find in practice, amounts to only 1dB, or around 1/3 of an 'S' point. Using UR67 under the same conditions would give an additional loss of only 0.7dB. The figures for an SWR of 1.5 to 1 are 0.13dB for UR43 and 0.08dB for UR67, which hardly represent the sort of losses to worry about. On two metres it is hard to even justify the extra expense of using UR67 cable, the saving on a 20 metre run, compared to UR43, is only 1.2dB which represents 1/3 of an 'S' point. On the higher frequencies the losses become more significant.

Wasted Power

Another commonly held belief is that the power reflected is in some way absorbed by the PA and is lost as heat. This is based on the idea that as the output impedance of the rig is 50 ohms then the

returned power must be absorbed. The point here is that the rig is designed to operate into 50 ohms but the output impedance has to be far less than this. The output impedance is in fact in series (not parallel) with the output, and if it were 50 ohms then with both it and the load impedance being in series, you would actually lose half of your generated power in the rig itself — irrespective of the SWR. In fact the output impedance which the returned power 'sees' is only a fraction of an ohm and represents a huge SWR. On seeing this the reflected power is again reflected and returns to the aerial where most of it is radiated and the whole sequence repeats. Because of this it is even possible for the forward reading on the meter to be *higher* than the actual amount of power generated — if the re-reflected power is in phase with the original forward power.

The PA heating which one observes when operating into a high SWR is due to the PA now operating into a load that it was not adjusted for and hence is not operating at maximum efficiency, the reduced efficiency causing losses which are produced as heat. The PA does not see an SWR, it only sees the feedpoint impedance caused by the SWR and if the output circuits are returned to match this impedance it will again operate at normal efficiency.

The ATU

The ATU does not tune the aerial system, neither does it adjust or change the SWR on the line except in the case of 'open line' feeders where it brings the whole system to resonance, hence effectively 'losing' the feeders. The only thing it does on a coaxial system is to transform the feed impedance, at the point on the cable at which it is connected, to the impedance into which the PA expects to operate. The original SWR still exists on the line and therefore so do the original losses. You have simply inserted a matching transformer to keep the PA happy.

Changing the length of the coaxial cable (cutting for best match) also has no effect on the SWR. If you consider the SWR as a sine wave representing impedance drawn along a straight line

representing the feeder, it is obvious that at certain points you will find 50 ohms. You then cut to that point and claim a low SWR. But if you really had achieved a 1 to 1 SWR in this way you would have achieved a 'flat' line and you could then remove a further random length of cable and still have 50 ohms. In practice if you try this you will find the SWR *has* changed, so you obviously did not have a flat line! Also, if you have used this cutting technique to get 50 ohms at the meter, what happens on the length of line that connects the meter to the rig? Try borrowing a bridge and insert it between the cable and the rig so that you have two bridges in the line; if your SWR is not 1 to 1 you will get two different readings which you could not obtain if the line were flat.

Trim the Aerial

There is only one resonant length for an aerial, except for multiple half-waves. By trimming the length of the aerial all you are doing is forcing an impedance on to the line which gives you 50 ohms at the meter. Try moving the meter and take the reading again: if the line is flat the SWR will still be 1 to 1. It will not be, unless you are lucky or have used a multiple of half waves in the extra cable. Also a 1 to 1 ratio does not indicate a good aerial — a dummy load will give a perfect SWR but you will not get far on it. To give an example, a quarter-wave whip on a ground plane (say a car roof) when operating correctly will have an SWR of 1.6 to 1. If you have cut yours to give 1 to 1 then you have not got a good aerial system.

Conclusion

Some simplification of argument has been used so as to demonstrate the concepts of SWR in a manner which can be easily understood. The uses of Smith Charts and other aids are not known to the majority of amateurs. It must however be said that by using impedance bridges the SWR can be calculated no matter where the instrument is connected into the line. Such instruments are not normally available to the average amateur who has to make do with the reflected power meter with all its limitations.

CONTEMPORARY BRIEFS . . .

THE majority of 144 MHz transceivers have power outputs between 3 and 25 watts and, while many amateurs do quite well with them, there is no disputing they could do better with higher power. Reviewers of these transceivers often find the performance of the receiver sections to be disappointing, lacking in sensitivity. In these circumstances, while a hefty power amplifier will make your signal go farther, you will likely not copy the weaker stations calling you due to this deafness. Therefore, it is questionable whether it is worth buying an amplifier.

The solution is to use a high performance preamplifier ahead of the receiver and the long-established company **Microwave Modules Limited** have introduced their model **MML 144/200-S** which incorporates such a preamplifier. The PA stage comprises two 100 watt amplifiers fed to a Wilkinson combiner to produce 200W output. Nominal input levels of 3, 10 and 25W are selectable, the first two being fed through a driver stage while the 25W level goes directly to the two PA transistors which incorporate thermal tracking against temperature variation. Relative power output is indicated by a bar LED display and there is an option for RF-sensed switching or manual control *via* the PTT line from the transceiver.

The receive preamplifier uses a dual-gate *Gasfet* device in a noise matched circuit giving a claimed overall noise figure of

1.5dB. The specified overall gain is 12dB which is quite sufficient for general use. This preamplifier is independently switchable from the front panel and the PA can be by-passed. This gives four combinations of options, verified by status LEDs. The input socket is an SO-239, the output one an 'N' type, both situated



on the rear panel with the power lead and phono socket for the hard-switched PTT line. All plugs are supplied.

The overall size of the **MML 144/200-S** is 335 × 175 × 98mm. and it weighs 4 Kg. Power supply requirements are 13.8 volts DC at a nominal 30 amps. The U.K. price is £245 including VAT, and postage is another £4.50.

ALSO from **Microwave Modules Limited** comes provisional details of a new two-metre, multimode transverter, the **MMT 144/28-R**. This product caters for those with HF transceivers which cover 28-30 MHz and who wish to operate on 144-146 MHz. Transverting is a very cost effective way to get on to VHF as it provides all the modes and facilities — e.g. SSB/CW/AM/FM — likely available on most modern transceivers.



The transmitting section requires an input signal up to 300 milliwatts down to as low as 250 microwatts from the 10m. band, the correct level being set by a variable control on the rear panel. The signal is fed to a pair of *Mosfets* in a balanced mixer circuit and heterodyned to 2m. Several linear amplifier stages boost the signal to a respectable 25 watts. An ALC circuit with a dynamic range of 20dB is incorporated to prevent overdriving and its consequent non-linearity, and relative power output is indicated by a bar LED display. The transmitter can be either voice operated by RF Vox with an adjustable delay, or manually switched.

The receiving section uses an NEC *Gasfet* RF amplifier in a noise matched circuit fed through a bandpass filter to a double

balanced mixer. Overall gain is stated as 20dB, the noise figure 2dB and the third order intercept output +19dBm. Assuming the HF transceiver has FM mode, the transverter enables repeater mode to be used because it has two local oscillators, one at 116 MHz, the other at 115.4 MHz. Thus normal simplex or repeater or reverse repeater modes can be used. Much attention has been paid to achieving high level injection which is "... extremely pure and free from harmonics ..." which would result in low amplitude noise and good reciprocal mixing performance.

The unit is contained in an aluminium box of unspecified size and all necessary plugs are supplied. It requires a power source of 13.8v DC at 6 amps. The U.K. price of the **MMT 144/28-R** is £215 including VAT. The manufacturer of both these products is **Microwave Modules Limited**, of Brookfield Drive, Aintree, Liverpool, L9 7AN, and the telephone number is 051-523 4011.

FROM **A.F. Bulgin and Company P.L.C.** comes a four page brochure covering 60 new products. These include "fully touchproof" fuseholders, microswitches, power supplies including DC-to-DC converters and uninterruptible supplies, mains filters, signal flashers, appliance couplers, battery holders, fuses and fuseholders, keyswitches, LED indicators, waterproof connectors, screened cord sets and control knobs. For more information, contact Brian Diggle on 01-595 5588 or write to the company at Bypass Road, Barking, Essex, IG11 0AZ.

ELECTROVALUE LIMITED are well known component suppliers who deal with anyone. They issue their catalogue three times each year and the latest one, valid till January 31, has been received. It is a 44 page, A5 size publication listing a large range of stock items from threepenny grommets to computers costing nearly £3,000. There is no index but products are listed in alphabetical order of their main groupings, e.g. Fuse Holders, Group Boards, Hall-effect Devices, Hardware, etc. Prices seem comparable with other supply houses and there are discounts on most items on orders valued over £20 plus VAT. The catalogue is free and regular customers receive new editions. All items are priced on the page and postage is free. Write to the company at 28 St. Jude's Road, Englefield Green, Egham, Surrey, TW20 0HB, or telephone 0784 33603.

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

WHAT an awful month it has been! Weather, band conditions, everything. Of course, as far as conditions go, one supposes that most of us think of the sunspot cycle as a slow imperceptible change; but in fact after the long high plateau, during the last few months things have taken a dive over the cliff. However, we have a way to go yet to reach the bottom — somewhere about the end of 1987 at a guess. On the other hand the drop in sunspot count usually means an improvement in the LF band conditions — though we can't say that

this appears to have been the case. Perhaps we'd better shake the water out of the coax!

The Bands

Naturally enough, the fallaway in conditions on the higher bands has caused people to head downwards in frequency on the not unreasonable principle that if you can't have a QSO on Twenty 'cos the band is dead, you may as well migrate to Eighty or Forty and work *something* if only to keep the hand in! So — we'll start on Top Band.

160 Metres

A letter from G3ROO (Dover) indicates that after some effort he has now erected a Top Band dipole having the whole length at sixty feet, running N-S so that it fires east-west, and fed with coaxial cable. Later, it will be altered to feed with open-wire line through an ATU, thus making it an all-band aerial. The rig is an FT-707 modified for Top Band, and set to ten watts (an article on this is due to be published in *Short Wave Magazine* very soon). As for the coaxial cable, it is old

stuff that has been lying around in the garden for years, 75-ohm at that, and it is believed to be lossy even on this band! However, it certainly seems to be working, as does the G3ROO key — Ian is the QRP Club phone king! — like this: November 2, 1643-1836z, G3BPM, UR2AMO, OK2KZC, IK2BCP; next evening, 2200-0015z, HB9CYS, GW3OSV, IK3BNC, OK3CTQ, UV3DBJ, G3PHV; November 5, 2135z to midnight, RT5UY, OZ1W, SK7AX, LA2VC, G3AZ, SM3CWE, G4UZN, G3LJR, G4DLE, G2FNK, UT5AB, UG6GAN; and an after-tea session on November 6 gave UQ2GNL, DF5LJ, UC2WBZ, DL8WR, and GM3JJQ.

G3BDQ (Hastings) had a visit from G4AKY one morning, and also went out and bought another rig; John doesn't think much of conditions, as he hasn't heard anything from ZL yet and there has been a lot of QRN about. Nonetheless, the pre-sunrise peak brought in KH8AC/1, AA1K, N1BUG, K1ZM, W1PL, W2FJ, K2QTC, KA2K, W2FZY (once at 0602z and once at 2224z), W3BGN, W3ESU, WA3EUL, W3RCQ, WB3CAC, W3NX, K4P1, K5UR, W5CH, W8LRL, not forgetting such DX as HZ1AB, TK5VN, UA9FBP, 4X4NJ, OH0PA, HB0/DL4JV, HB0NL and DL3DK/HB0, all on CW. SSB was tried in 'the contest', with the pick being EA6MDK, EA8QL, EA9CM, EA9EU, LZ2CJ, lots of Russians, three more HB0 and C31SC and C31OF — these latter, plus VP2MW on CW, being new countries. Finally, John mentions a daily Top Band net on 14185 kHz, at 1800z, with AA1K as the leading light.

SWL D. A. Whitaker (Harrogate) admits he only surfaces when the seasons change. David says he has found conditions at HF so poor he has become rather inactive there, and has paid some more attention to the lower bands. Indeed, he is within striking distance of the magic 100 countries on Top Band, having added D44BC and VP2VCW recently. On SSB of course, the list includes, working from midnight, OE2VEL/HB0, EA9EU, C31OF; from 0200z, 4X4NJ and VP2VCW; 0300Z, D44BC, VP9AD, ED6MDX; 0400z, 6Y3M, T77C; 0500z, C31SC, Y39XO; 0600z, GU4LJC, GJ3YHU, ZL2BT, N4CGC; in the evening from 1700z GU2FRO (Sark), UA9FKU 1800z, OH0BH; 2100z, EA8YG, UA9FKU and EA8QL; 2200z SV8CS, HB0/DL8EBX, DK5EZ/HB0, 7X2AB, HZ1AB and LX1JAN; finally, 2300z to midnight was the hour in which D44BC and UZ9FWR were heard.

Our next reporter is G2HKU (Sheppey) who used SSB to work HB9AMO, LX1JAE and PAOPN, while the CW signal found its way to LA1EKO, DJ0XJ, SK7AX, GM3HBT, DL1RK, EA5CF, GJ4/DK5SF,

PA0GE.

Finally, on Top Band, a report from G4OBK (Chorley), who says he has been finding it much harder to work the DX this year, with more competition; Phil says the best time is midweek, around 0200 onwards, when you seem to have the band to yourself, with no others in EU audible . . .! CW keyed with HB0NL, RF6FFW, VE1ZZ, C31OF, LZ2CJ, LZ1KDP, WB3GCG, SV0AA and 4X4NJ; picking up the microphone did the trick with HB9AMO, IK0BYO, OE2VEL/HB0, EA8QL, EA6FO and LZ2CJ.

Eighty

This has always been a band of split personality: on the one hand the QRP types and the DX'ers, and on the other the eternal rag-chewing and QRM in the middle of the band. G2NJ (Peterborough) found the QRP aspect to be of interest this month, and mentions firstly his QSO with YL G4GIG, of Birmingham; G2NJ heard Jane telling G4VFFV that it was her first QSO with her new home-brew 3-watt rig; G2NJ then called her and gave a 579 report on the little rig. A half-watt signal worked was the one from G3KRR, of Hockley, which was RST 569 to G2NJ. G2CNN/A told G2NJ how surprised he was to work W1CFZ at 0605z from the St. Albans location, as the aerial was only about twelve feet high. One wonders just how many /A locations have been used by G2CNN in say the past three years? On a different tack, ON6TW near Ypres told G2NJ that he was a collector of hand keys and had some 33 different types; this caused G8KI to comment that his operating key was some 55 years old. These all seem young ones to G3KFE — his present key was probably sold out of Post Office service in the twenties, and then used by G2DC around the world for umpteen years, before coming to this shack — it is, one would guess, at least eighty years old.

On a different tack again, we have a note that the TOPS CW Club nets are still running on 3508 kHz on Sundays and Wednesday evenings — time not quoted. The European net is also still active, on Sundays at 1930z, on 3534 kHz, the net control being G4GBG. The net control for the first two nets is GW6AQ (or GW8WJ). On December 1 they have their CW contest starting at 1800z for twenty-four hours — there are three sections, for single-op, multi-op, and QRP at 5 watts or lower (single-op). The first and last classes are required to take seven hour's break and so indicate in the logs. Logs to SM3VE, Bergesvagen 26, 823 00 Kilafors, Sweden, not later than January 31, 1985. Note that this contest is open to all CW operators.

G4KKI (Manchester) has been active on 80, 40, and a bit of 20m., but time is getting a little tight; on the one hand, Bill is teaching Morse and simple radio construction at evening classes and on the other he has been doing some home-brewing. As far as 3.5 MHz went, the usual three watts worked out to G4WQD, GM3MXN who was QRP, G3RB, G4INM, G5JL and, out of the country, LA5AA. The new rig a-building is a DSB/CW arrangement, based on the PW 'Dart' but modified for this band, and it has been proven on the band even though there is still a little more to be done, and a linear to be built to give it 3 watts DSB output. One amusing CW QSO was with G4WQP in Sale for which the Morse key was the multi-meter lead!

"CDXN deadlines for the next three months:

January issue—December 6th

February issue—January 3rd

March issue—January 31st

Please be sure to note these dates

Nice to hear from G3ZPF (Kingswinford) who has finished the washing-up he mentioned in his last letter and put up an inverted-V for this band. This has been injected with RF and gets over to U.S.A. "nae bother" and it even gave a couple of new countries in the form of 4Z4DX and TK5BF — even though the latter was at first copied as VK5BF! The CQ WW DX SSB contest brought out shoals of new ones, including WA8LZJ/HB0, and C31SC.

D. A. Whitaker seems to have preferred 160 and 40m. to this band, but he did find P44A, KP2AI, CO7AM, 8P6AX, YS1GMV, 4V3C, KP4BZ, VP9AD, HK5BCZ, YS9RUE, DJ0SB/C6A, YV3AZC, VK3FY, VU2GO, TL8CK, NP4AT, 9K2BE, and AP2ZA.

October 6-8 were very good nights according to G4NOZ (Colchester); it started when WA1EKV got DJ4AX back to his CQ, followed by three Gs; then all Europe joined in of course. W2ONZ took over from WA1EKV and was making a fair fist at it all until 7X5AB appeared, immediately reversing the direction of the pile-up. On the night of October 8, ZLs were to be heard, plus Italians working over to HP9. On a different tack G4NOZ has nice things to say about the CW on the band, particularly coming from YL operators G4YKK and G4ZGJ.

Just a couple of contacts are mentioned by G3BDQ, who incidentally seems to have covered all bands in his operation bar 28 MHz; UL7OB and RL7FER, both on CW.

Last man in on this band is G2HKU, who used CW to work AJ1G, W2BA, K9BG, and W7TEX/CT3.

Snippets

So nice to hear again from ON4QX, operational again after a stroke which paralysed his right hand — not good for a CW operator! — but which has now, thankfully, mended. Bob hopes to be on the air from LX, either using LX3QX, his old call, or maybe ON4QX/LX, over the December/January period, on CW of course.

Next we have early warning of the Spring BARTG contest, over the weekend 0200z March 23 to 0200z on Monday morning, March 25; 48 hours in total of which 30 can be used, the off periods being taken as desired but in lumps of at least three hours. Listening periods not to count as rest periods. As it is well ahead, there is time for us to recommend that, if you mean to play, you drop a line for the full set of rules to Peter Adams, G6LZB, 464 Whippendell Road, Watford, Herts. WD1 7PT. He is also the addressee for logs which must be received by May 31, 1985, in order to qualify.

We have a note from the Victoria Division of WIA to say they are putting on V13WI as part of the 150th anniversary celebrations of European settlement in Victoria. The station will be manned by members of the Victoria Division of the Wireless Institute of Australia, the station being on from November 1983 through to at least April 30, 1985. All modes, and a commemorative QSL will be available, not to mention an award, which one gets for a contact (or SWL logging) of one VK3 station during the period. The address for details being Victoria 150 Award, Wireless Institute of Australia, 412 Brunswick Street, Fitzroy 3065, Victoria, Australia.

As something a little different, WIA are running, as part of its own 75th anniversary celebrations, an International RTTY Art competition. Entries to contain not more than three overlinings, and be submitted with a hard copy printout and baudot tape; there are 3 categories: (a) best hand-generated signal submitted by its author from outside VK, (b) best by a VK, and (c) best non-original hand generated or computer generated RTTY picture. Entries close on August 31, 1985, and must be sent to: WIA 75 Art Competition, Wireless Institute of Australia, 412 Brunswick Street, Fitzroy 3065, Victoria, Australia.

CQ WW 160 Metre DX Contest has its CW leg over January 25-27, and the SSB leg is February 22-24. In both cases it runs from 2200 GMT Friday night to 1600 GMT on the Sunday. The rules are as per 1983, but we note and agree with the organiser's comment that the DX

Window is an essential to successful operation, and that therefore on-frequency operation be kept *out* of the DX Window at 1825-1830 kHz. The organisers are strongly considering disqualifying stations who repeatedly offend or who solicit on-frequency contacts in the Window — and that rule will also apply to the less well-known SSB Window between 1850-1860 kHz. Logs in standard form, 40 contacts to the page, plus summary sheets and declaration, addressed to 160 Contest Director, Don McClenon, N41N, 3075 Florida Avenue, Melbourne, FL 32901, U.S.A., or to CQ 160 Contest, *CQ Magazine*, 76 North Broadway, Hicksville, NY 11801, U.S.A., indicating CW or SSB on the envelope. The mailing deadline is February 28 for the CW, and March 31 for the SSB logs.

The January 73 *Magazine* Top Band contest is on January 19-20, for the full 48 hours midnight GMT to midnight. Single-ops to operate only 32 hours of the time, multi-ops the full 48 hours. Exchange RS and QTH, which for us means giving country. Five points per QSO, and a multiplier of one for each U.S. State, Canadian Province/Territory, and each DXCC country worked. W/VEs are expected not to operate within the DX Window between 1825-1830 kHz, but no mention of the SSB Window! Work a minimum of 100 QSO's to be eligible to enter; and include a summary sheet, multiplier check list, and a QSO dupe sheet. Mailing deadline is February 20, addressed to Harry Arsenault, K1PLR, 603 Powell Avenue, Erie, PA 16505, U.S.A.

Forty

A better turn-out of reports this month on 7 MHz, maybe because of the downturn in higher band conditions. G2HKU (Sheppey) used his CW to work W2BA, J28EF, VK6RZ and YV2AEF.

G4OBK was of course more interested in his home-brewing, but he did make the odd foray on the band, and managed UO5GQ and OX3AX on CW, plus SSB to V2ARS, DF1JC, who was signing /HB0.

During the CQ WW contest, a little operating around 2300z gave G3NOF (Yeovil) SSB contacts with EA6SX, EX6F (Armenia), RF0FWW, VP2MW, UH8EAA and XL1CV.

G4KKI next; Bill plied his three watts of CW to I2SPU, GU4XEA, IK2EXI, ON5AG/QRP.

Listening to Forty started at 0400 and went through to 2300z for D. A. Whitaker. This means logging VO2VCW, D44BC, V2ARS, CE3EEO, CE0AA, TI2CCC, KL7Y, KL7NT, VK7AZ, TG9VT, VO1CV, YB0WR, JH1TKM, VK6IR, CN2AQ, 9M2CO,

UD6DJ, TT8CW, UI8ZAC, CX4DI and YB4FW.

Forty for G3BDQ included CW contacts with CN8CX, JA1AEA, VK3MR, VK3NC, and yet another HB0; while on SSB, VK6DU and SV5YS (Rhodes) were raised.

The New Bands

As so often the case, not much in the way of reports. G2HKU tried 10 MHz and raised T77C on CW for his pains.

G4UZN (Leeds) also found T77C for San Marino, but also made it to KA2DIV/V2 in Antigua, VE3UD, VK2BKH, W1-2-3-4 plus W7BNK/0, not to mention gotaways JA, ZS, and TT8CW. As for 18 MHz, CW made it to DL, HB9, and I3BLF.

DX Notes

G4GOF (Hastings) comes back to the request by G4VBP back in July for a modern issue of the *Ham's Interpreter* with Russian Cyrillic characters. Jesse says he got his from the publishers, Transelectro OY, PO Box 8, SF-00601, Helsinki, Finland, and paid for it with a cheque on an English bank.

That CE0AA DX-pedition was a bit of a frost for the Europeans, insofar as it seems they were only interested in working Americans at times when European propagation was good. Nevertheless they did work some EUs, and even managed the odd contact with Europe on Ten, notably G3HTA. The final total was around 25K contacts, and the two operators certainly learned quickly!

As for the VK9MR Mellish Reef operation, that ended up with some 10000 contacts, 7000 of which were in the contest. The whole show was curtailed, it seems, because the captain of the boat became increasingly worried over the low tides — there are said to be no accurate charts of this region. No wonder he beat a retreat — there is nothing worse than a stranding if a boat then finds itself up against heavy weather.

Turning now to the continent of Asia, we note that the new Indian Prime Minister is VU2RG, while his Italian-born wife, Sonia, holds VU2SON.

If you have been looking for an A6, you should be aware that G3LCS has been active as A61AA, using a commercial log-periodic aerial jammed in a Northerly direction.

If you have a ZC4 card in the old shoe-box, hang on to it; the DXAC vote on it as a new country soon, according to *DXNS*, which quotes VE3QA (DXAC member, be it noted).

That BV0BG DX-pedition to Taiwan first lost Senator Goldwater from the team, and then, or so we understand,

has been postponed. Their original effort was supposed to be in the CQ WW CW contest.

The possibility of some Bangladesh operation was mooted in both *DXNS* and *TDXB*, the latest being that a group from Yaesu are there for a couple of months and hoping to sign S21JA and S21DX from late October. At the time of writing there hasn't been any sign of them.

28 MHz

Not a place for a mountain of activity at this stage of the sunspot cycle, although the band occupancy is greatly aided by the numbers of FM operators who use the band for nattering. However, the odd contact is possible if you are game to work at it. For G2HKU it was a couple of CW ones, with IN3UZM and PP7IE.

G3NOF (Yeovil) noted precious little activity on the band, although as usual the contest weekend did a bit of good to 'conditions' (!). Outside the contest, in the daytime it was CT1, EA, or occasionally PY-LU-ZS. During the contest it came good to South and Central America from 1400-1800z. SSB contacts were made with CE4TA, CE6EZ, CX4HS, CX5AO, D44BC, FH4AA (Mayotte), G4CJC/EA8, LU1BR, LU1E, LU1VK, LU2A, LU2DFR, LU3MDO, LU6EF, P44A (Bonaire), PJ2FR, PP2ZZD and YV5TK.

G6QQ (Hoveton) found it a thin month outside of the contests. Thus all David has to report is 9J2BO, JY9CL, HZ1AB, W1-3-4-5, a couple of J28s and various European countries.

The arch-specialist on Ten is G4HZW (Knutsford) with his two-element Quad and TS-820, and SSB. No Ws were heard at all, but the list is still quite impressive: 3B8FA, 3B8FP, 3D6AK, 5B4DN, 9J2BO, 9H3DN, CX4HS, CX5AO, HZ1HZ, J28EB, J28EF, LUs, HA, OE, YU, F, I, UP, EA, EA6, EA8, EA9, HB9, DF, CT, SP, SM, LA, OH, OZ, UZ6, SV1SR, T77V, TR8JLD, VQ9DX (Chagos), Z23JO, ZS6CDJ, ZS6JM, ZS6BPL; not to mention gotaways in FR0FLO, FH4AA and, worst of all, CE0AA, busy sticking to a list, though the list taker was a much weaker signal than CE0AA.

Fifteen

This band also hasn't been too happy. G3NOF heard nothing from the Pacific, no JAs, only a few VKs, and from Asia just a few VUs. North Americans were unreliable and heard at odd times until the band closed around 1800. Don made SSB contacts with: A22ME, A92DY, A92DZ, A92P, C53EK, C53FE, CN2AQ, CN8CW, EA8AHB, FG7CM, FM7CD, FR0FLO, G3WZS/VP9, HA1YI/MM, HP1JXL, HV3SJ,



Bob Bergé, ON4QX/ON6QX, sent us this picture of his station, with himself in his wartime RNVr uniform; just out of sight is his R.N.A.R.S. /MM award. See "CDXN" news item, this issue.

HZ1AB, J28DN, J28AQ, K4ZLE/V2A, K0RF (Colorado), KU8E/VP9, KJ1L/MM in the S. Atlantic, KP4BZ, N4NW/3D6, PJ2FR, PS7AAW/PY0F (Fernando do Noronha), PS8YL, PT7WZ, PZ1AP, S79CW, S83H, TG9VT, TI1C, TR8CR, TR8JLD, TT8CW, V2ARS, VP2MW, VP2MO, VP2VCW, VP8ASR, VP9AD, VK3VSL, YC2DNT, YC0DPO, WB3KBZ/VP9, ZD9CC, ZS6BRT, ZS6BUR, ZS6CEA, ZS6CEO, 3X4EX, 4K1GAG (South Shetland Is.), 4S7NE, 5N24RTF, 5R8AL, 6W1NQ and 9K2BE.

G3BDQ took the odd peep at the band, and on CW offers for inspection ZS1H, ZS6ANL, J28EG, Z21FN, 3B8FK and W0UBT; the SSB went out to UF7WYF, 5B4DN and ZC4ESB.

G6QQ made his SSB go over to WD4RAF, ZS5UF, EL8E, and CW to WD4FTY and EL8E outside the contest period; in the contest his SSB found its way to CE3BNP, KP4BZ, L8H(LU), P44A, PY1NEZ, ZY5EG, V2ARS, VP2VCW, VP9AD, VP9LB, YV5TK, YV5JEA, ZS6BPL, 9K2BE, plus 62 Ws in all call areas except W6, W7, and W0, and VE2 and 3.

Twenty

Again we start with G2HKU. Ted used SSB to work ZY5EG, VP2EC, and CT2FH, while his CW managed 3D6AK, JX5DW and OY7ML. A whirl with the 4-watts of QRP CW was enough to raise JX5DW.

Turning to G4OBK we find Phil working his SSB to S83H, TF3CW, KP4BZ, V2ARS, KL7RA, VP2MW, VP2VCW, VP9AD, C31SC, 4V2C and JX5DW; and CW did the trick on JY8YD, 9H3JAM, T77C and W6TEX/CT3.

Over to G3NOF; Don noted the usual long-path openings to VK/ZL/JA from 0730 to sometimes as late as 1030. The short path to Asia was open 1200-1600 with the same path to VK/ZL opening

1200-1600. A few Africans appeared around 1700, and the band faded out around 2000. Most of the G3NOF contacts were made in the afternoons and early evenings, and the total included A4XJZ, A92EB, AP2MQ, CT2FH, CY9SPI (St. Paul Is.), DJ0SB/C6A, G4CNY/VP9, IK8CWB/IC8, JY8KL, K0GU/8R1, KG4DX, LU1AJH/MM, TI2CC, TT8CW, TU2CJ, UF6QQ, VE7GI, VK2WU, VK2XG, VK3CAG, VK4LT, VK5MS, VO2CP, VP2EC, VP2MW, VP9CP, VU2AIG, W0GZD (N. Dak.), XL2CP (Labrador), YB6MF, ZL3MA, IZ9A, 4S7PVR, 9K2BE, 9M2CO, 9M2RT and 9Q5MA.

On Twenty, G4KKI used the famous 'OXO' design of GM3OXX published in the G-QRP Club newsletter, with which he worked WD4EXC, WB1CPD and EA3PO.

At G3BDQ, the band was turned over to find CW with VE3AR, UL7LBS, UL7WPI, UL7LAF and YC3CUR, while SSB was used for the QSOs with A61AA (=G3LCS), VK5BJA, W4AMJ, VK2EAZ, and W7KEQ in Seattle.

Twenty SSB meant for G6QQ working W2OKN, VE3KLE, VE1ZK, K8IA, K3TM, N2DAX, WA1RNE, W2RB and WA4BWY outside the contests, while CW was used for the contacts with K1RH, JY9WR, WA4WZO, KL7GU and WA8IGG. In the SSB leg of the contest, it was a question of AI5P/P/TF, XT2R, and six East Coast W stations only.

Finale

That's it for another time; the deadline for the next column is in the 'box' and is for the *arrival* of your letters, addressed to your conductor, "CDXN", SHORT WAVE MAGAZINE, 34 High Street, WELWYN, Herts. AL6 9EQ. Meantime have a pleasant Christmas break, and mind how you go. 73.

CLUBS ROUNDUP

By "Club Secretary"

THE pile of mail always seems to grow at this time of year, and this lot is no exception! So we will only stop for one comment this time, which is to say that if you are one of the keen types who write in for more than one club — then *please* write about each on different pieces of paper, so we can file one piece of paper in each slot and so avoid the risk of error or loss!

Letters

And we must make a start at **Abergavenny and Nevill Hall** where they have a base in the room over Male Ward 2 in Pen-y-Fal Hospital on Thursdays. In addition, December will see them having the Annual Dinner on December 20, at the "Llanwenarth Arms", Crickhowell — this will clearly replace the normal session on that evening — and on Saturday, December 22 they will be having a get-together between 7.30 and 10 p.m. in the clubroom.

Acton, Brentford and Chiswick will home on to Chiswick Town Hall, on December 18, for a general discussion at 7.30 p.m.

Up north now, to **Aycliffe and Shildon** where the Tuesdays are booked at Sunnydale Leisure Centre, Middridge Lane, Shildon. December 4 is a quiz and natter, December 11 a video evening, and on December 18 they have the Christmas rave-up, complete with singer, comic, big eats and an extension to 11.30 p.m. They are then QRT until January 8.

December 7 is the **Bangor** date; they have a talk, by GI3HXV and GI3UBA, the subject weather satellites at the usual venue, the Sands Hotel on the Bangor seafront.

A brief note tells us that **Bath** are still at the "Englishcombe Inn", on alternate Wednesdays, and that they are in the process of putting together a full calendar of events. More from the Hon. Sec. — see Panel for his details.

Tuesday, December 18 is the date for the **Biggin Hill** meeting at St. Mark's Church Hall, and this one is a junk sale.

We head east now, to **Braintree**, and this means St. Peter's Church Hall, St. Peter's Close, Braintree; there they foregather on the first and third Wednesday of each month.

December 11 is the AGM for **Bury** at the Mosses Centre, Cecil Street, Bury, and will be followed by cheese and wine. The club, in fact, can be found at this venue on every Tuesday evening.

Cambridgeshire Repeater Group has its informal meetings every Friday lunchtime, in the "Green Dragon" in Water Lane, Cambridge. In addition they look after the four repeaters, 'PI, 'PY and the two 'PTs. More details from the Hon. Sec. — see Panel.

Off we go now to **Cheltenham** where the recent joint meeting of the five local clubs to hear about the Fiennes Transworld Expedition from Lady Fiennes was an outstanding success. Meetings for December are at Stanton Room, Charlton Kings Library, Cheltenham; December 7 is the AGM and on December 21 they have a Christmas Party at "The Hobnails".

At **Cheshunt** they are at the Church Room, Church Lane, Wormley, every Wednesday evening. Thus December 5 is a talk on remote imaging, and on 19th there is the Christmas video show. December 12 is a natter and the 26th is deleted from the club calendar. Over and above this there is a Christmas Dinner on December 13 at the "Rose and Crown" in Hoddesdon.

The **Chichester** gang have their base at Fernleigh Centre, 40 North Street, Chichester, in the Green Room. On December 4 there is the normal meeting, and on 20th they have a Christmas Social.

The **Civil Service** group has a place at the Civil Service Recreation Centre in Monck Street, London, on the first and

third Monday of the month, at 12.30 lunch-time. More details from the Hon. Sec. — See Panel.

One is interested to note that the **Colchester** crowd had formally passed a resolution at their AGM for an RSGB rally at Alexandra Palace, as they feel Birmingham's is too far away for a return trip for people from the Home and Southern Counties. While it's a thought, your scribe is not too sure it would work. However, if you want to argue, why not go to a meeting, find G4NOZ, and talk to him . . . all welcome at their meetings at the Colchester Institute, Sheepen Road, on the first and third Thursday of each month.

At **Cornish** the locals have their Hq. at the Church Hall, Treleigh, on the old Redruth bypass road; December 6 is the Christmas Party and Film evening.

Now to **Crawley** where, we hear, they have a video repeater going — contact G6LVN for the details. As for the club itself, the members are to be found at Trinity United Reformed Church Hall, Ifield, on the fourth Wednesday as a rule. Obviously 'the rule' had to go for a burton this time, so they have substituted a skittles evening on December 12, at "The Haycutter" in Oxted, starting at 7.30 p.m.

Cray Valley has G3RWL to talk to them about *Oscar* on December 6, and on 20th there is the usual natter session; both are at Christchurch Centre, Eltham High Street, starting at 8 p.m.

Now **Crystal Palace** has its corporate being at the All Saints Parish Room, Upper Norwood, London SE19; this is at the junction of Beulah Hill and Church Road, opposite the IBA mast, on the third Saturday of each month.

The **Derby** group still has its Hq. at 119 Green Lane, Derby, where they have the whole Top Floor, and are in session on each Wednesday evening. December 5 is a junk sale, the Constructors Contest is on 12th, the Christmas Party on 19th; and on 26th, as everyone will be eating cold turkey at home, no meeting!

The **Droitwich** group has a lady chairman in the person of G4THU, at their meetings at the Scout Hq., Union Lane, Droitwich, where they are to be found on second and fourth Mondays. More details from the Hon. Sec. — see Panel.

We seem to have been left off the December list of **Dudley**; however, we can say they are to be found at the Allied Centre, Greenman Alley, off Tower Street in Dudley, on first and third Mondays.

At **Edgware** the club are based at 145 Orange Hill Road, Burnt Oak, Edgware, where they have a booking on second and fourth Thursdays; December 13 is the only meeting shown this month,



The Merseyside Special Event Group will be operating the call-sign block GB0-1-2-4-6-8-BCL (Beatle City Liverpool) during the whole month of December, to celebrate the opening of the Beatle City Museum in Liverpool. Members of the group are, left to right, G4UVB, G4SYW, G1DFQ, G4KIN, G4YPD, G6ICR, G4VKV (QSL manager), G4HSF, G6PZW; G4OJK is absent. QSL information is available by writing (enclosing s.a.e.) to G4VKV, c/o Beatle City, P.O. Box 12, Liverpool.

and is a junk sale, with the restart on January 10 with the AGM.

For details on the Exeter club activities at the Community Centre, St. Davids Hill, we have to refer you to the Hon. Sec. as he has forgotten to update us! Find his vital statistics in the Panel.

December 12 for Farnborough is, not surprisingly, a Christmas Social evening at the Railway Enthusiasts' Club, Access Road, off Hawley Lane.

Now we head for Fylde; December 4 is a talk on radio astronomy by Ken Porter, G3KEN; December 18 is the Christmas Party. Both are at the Kite Club, Blackpool Airport, and the club membership subscription is also a sub. to this club, so they can use it at other times too.

Scotland next, to Glenrothes, and on December 16 they have a fire safety film, at Provosts Land, Leslie, Fife; we understand they are at the same venue every Wednesday evening too.

Glossop gives G3PY as the famous speaker on December 20, at the "Nags Head", Glossop.

Another famous character is the Hon. Sec. of the G-QRP Club — G3RJV, whose details are in the Panel. This is the club for all those interested in home-brew and in QRP operating. Details from G3RJV at the address in the Panel.

New Club

This one covers the Northallerton area, and is called Hambleton, based on the Allertonshire School, Northallerton, in Room C11, fortnightly from October 1 (which was a Monday), which gives November dates as 12th and 26th. More details from the Hon. Sec. — see Panel.

Harrow Arts Centre in High Road, Harrow Weald, almost opposite the bus garage, is the base of the Harrow group, every Friday evening; December 7 is informal and practical, and on 14th they have the *Spring Valley Computers* lecture-demonstration. December 21 is the Christmas Party and they miss the 28th date.

Hastings has its main meeting on the third Wednesday of each month at West Hill Community Centre; in addition they are to be found at the club room at Ashdown Farm Community Centre every Friday evening. We believe the December 19 date is the Christmas Social.

At Havering, the Fairkytes Arts Centre is the Hq., and here they have an informal on December 5, and a talk by John Nelson, G4FRX, on RSGB, on 12th. There is a Christmas Dinner — ticket-only — on 19th, and 26th is scrubbed as the Centre is closed.

While the meetings of the Hereford club are on first and third Fridays, at the County Control, Civil Defence Hq., Gaol Street, Hereford, they also have nets, notably on 80 and 2-metres on Christmas Day. To revert to the gatherings, December 7 is a light-hearted talk by G8HGF, and on 21st an even more light-hearted annual quiz.

The Ipswich club newsletter has to be the biggest in the country; to get it, join the club, by turning up at the "Rose and Crown", at the junction of Norwich Road and Bramford Road, Ipswich. As for the dates, these are the second and last Wednesday in each month, in a room apart from the main bars, to cater for any junior members. More details from the Hon. Sec. — see Panel.

The Isle of Man, of course, has its amateur radio club, and it takes the AGM on December 11, 1984 at the Keppel Hotel, Cregny-Baa, where they are to be found on any Monday evening.

At Maltby they have weekly gatherings every Friday evening, at Church Buildings, Church Lane, Maltby; December 7 is G3XXN on test gear usage, and on December 14 G3ZVG says "Make it Work!" December 21 is the Christmas Junk Sale and Buffet, and they are then closed until January 4.

The unfortunate Hon. Sec. at Medway had, it seems, his programme collapse around his ears through no fault of his own; however it is now back together again, and at No. 1 Hall, St. Lukes Church, King William Road, Gillingham. December 7 is a junk sale, and on 14th there is a natter session. The Christmas Social on 21st will make up for the absence of a session on 28th.

On we go now to Midland, which means 294A Broad Street in Birmingham, where they have their Hq.; the main meeting is on



The Leicester Amateur Radio Show held at the Granby Halls, Leicester, over October 26/27th, attracted many visitors as can be seen in this photograph by Peter Waters, G3OJV, of Waters and Stanton Electronics which was one of the several major stands.

the third Tuesday but we know they have other gatherings as well — contact the Hon. Sec. for more details.

Change of Venue

We have a letter from the Hon. Sec. at North Devon to say that they have changed their arrangements; meetings will now be at "Micro Chips", Castle Street, Barnstaple, on the first Wednesday of each month. This gives us December 5 and January 2. Details of what's on from the Hon. Sec. — see Panel for his details.

Deadlines for "Clubs" for the next three months—

January issue—November 30th

February issue—December 28th

March issue—January 25th

April issue—February 22nd

Please be sure to note these dates!

Now we go to North Wakefield; they have a natter night at Hq. on December 6, and the Annual Dinner at the Swallow Hotel on the following evening (7th); a quiz with the White Rose crowd (at White Rose) occupies December 12, and they have another informal on December 13 at their own Hq., which is Carr Gate Working Men's Club, Lawns Lane, Wakefield.

Next we come to the self-explanatory **Racal User Group**; for more details of their activities we suggest you contact the Hon. Sec. — see Panel.

It is quite surprising how the net activities of R.A.I.B.C. have expanded over the past few years; it must be a good way for our blind and invalid amateurs to keep in touch, as well as through their newsletter. Details on all the club activities, and how to support or represent them, from the Hon. Sec. — see Panel.

On December 18, the Reigate crowd has the Members' Constructional Contest, in the upstairs meeting room at the Constitutional and Conservative Centre, Warwick Road, Redhill.

Now we turn to the Royal Navy, membership of which is open to those who are, or were, in the RN, or MN, or in foreign navies. Details from the Hon. Sec. — see Panel.

A new contributor to this piece is Rugby, where they have their base at the Cricket Pavilion, BTI Radio Station, 'B' Building Entrance, A5 Trunk Road, Hillmorton, Rugby, and they are

Names and Addresses of Club Secretaries reporting in this issue:

- ABERGAVENNY: D. F. Jones, 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)
- AYCLIFFE & SHILDON: E. W. Bate, G3LUC, 5 Elm Road, Shildon, Co. Durham DL4 1BH. (0388 774666)
- BANGOR: S. Mackay, G14OCK, 11 Dellmount Park, Bangor, BT20 4UA. (Bangor 54049)
- BATH: C. Ashley, G4UMN, 57 Stonebridge Drive, Frome, Somerset. (Frome 63639)
- BIGGIN HILL: I. Mitchell, G4NSD, Greenway Cottage, Tatsfield, Westerham TN16 2BT. (Tatsfield 376)
- BRAINTREE: M. Jones, G6DFZ, 26 Anson Way, Braintree, Essex. (Braintree 44168)
- BURY: B. Tyldesley, G4TBT, 4 Colne Road, Burnley, Lancs. (Burnley 24254)
- CAMBRIDGE (Rep. Group): C. Lorek, G4HCL, 11 Beville Close, Doddington, March, Cambs. PE15 0TT. (0354 740672)
- 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.
- CIVIL SERVICE: G. H. Costin, G4GFU, MOD(PE), SIP13, Room 328, Fleetbank House, 2-6 Salisbury Square, London EC4Y 8AT.
- COLCHESTER: F. R. Howe, G3FIJ, 29 Kingswood Close, Colchester. (0206 70189)
- CORNISH: N. Pascoe, G4USB, Bosuathick Farm, Constantine, Falmouth, Cornwall. (Falmouth 40367)
- CRAWLEY: D. L. Hill, G4IQM, 14 The Garrones, Worth, Crawley, W. Sussex RH10 4YT. (Crawley 882641)
- CRAY VALLEY: P. J. Clark, G4FUG, 42 Shooters Hill Road, London SE3. (01-858 3703)
- CRYSTAL PALACE: G. M. C. Stone, G3FZL, 11 Liphook Crescent, London SE23 3BN. (01-699 6940)
- DERBY: Mrs. J. Shardlow, G4EYM, 19 Portreath Drive, Darley Abbey, Derby DE3 2BJ. (0332 556875)
- DROITWICH: E. G. Taylor, G4HFP, 6 Marlborough Drive, Stourport-on-Severn, Worcs. DY13 0JH. (S-on-S 3818)
- DUDLEY: Mrs. C. Wilding, G4SQP, 92 Ravenhill Drive, Codsall, Wolverhampton, W. Midlands WV8 1BW. (Codsall 5636)
- EDGWARE: J. Cobby, G4RMD, 4 Briars Close, Hatfield, Herts. (Hatfield 64342)
- EXETER: R. Tipper, G4KXR, 11 Chancel Court, Chancel Lane, Pinhoe, Exeter. (Exeter 68065)
- FARNBOROUGH: P. Taylor, G4MBZ, 12 Dunbar Road, Paddock Hill, Frimley, Camberley, Surrey.
- FYLDE: H. Fenlow, 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)
- GLOSSOP: E. Calvert, G4EIC, 6 Barber Street, Padfield, Hadfield, via Hyde, Cheshire SK14 7EG.
- G-QRP CLUB: Rev. G. C. Dobbs, G3RJV, St. Aidans Vicarage, 498 Manchester Road, Rochdale, Lancs. OL11 3HE. (0706 31812)
- HAMBLETON: Dr. A. Wilson, G3MAE, 8 The Paddock, Appleton Wiske, Northallerton, N. Yorks. DL6 2BE.
- HARROW: D. Atkins, G8XBZ, 25 Maxwell Close, Rickmansworth, Herts. (0923 779942)
- 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)
- IPSWICH: J. Tootill, G4IFF, 76 Fircroft Road, Ipswich, Suffolk IP1 6PX. (0473 44047)
- ISLE OF MAN: Mrs. A. Matthewman, GD4GWQ, 20 Terence Avenue, Douglas, I.O.M. (0624 22295)
- MALTBY: I. Abel, G3ZHI, 52 Hollytree Avenue, Maltby, Rotherham, Yorks.
- 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)
- NORTH DEVON: H. G. Hughes, G4CG, Crinnis, High Wall, Sticklepath, Barnstaple, Devon EX31 2DP.
- NORTH WAKEFIELD: S. Thompson, G4RCH, 3 Harlington Court, Morley LS27 0RT. (0532 536603)
- RACAL USER GROUP: P. Barber, G8BBZ, 8A Alwyne Place, London N1 2NL.
- R.A.I.B.C.: Mrs. F. Woolley, G3LWY, 9 Rannoch Court, Adelaide Road, Surbiton KT6 4TE.
- REIGATE: T. I. P. Trew, G8JXV, Hoath Meadow, Church Hill, Merstham, Redhill, Surrey.
- ROYAL NAVY: M. Puttick, G3LIK, 21 Sandyfield Crescent, Cowplian, Portsmouth, Hants. (Waterloo 55880)
- RUGBY: K. Marriott, G8TWH, 41 Foxons Barn Road, Brownover, Rugby, Warks. CV21 1LA. (0788 77986)
- SOUTH BRISTOL: L. Baker, G4RZY, 62 Court Farm Road, Whitchurch, Bristol, Avon BS14 0EG.
- SOUTH CHESHIRE: H. Pallen, 20 Burlea Drive, Shavington, Crewe CW2 5BZ. (0270 67003)
- SOUTHDOWN: T. Rawlance, G4MVN, 18 Royal Sussex Crescent, Eastbourne.
- SOUTHGATE: R. Snary, G4OBE, 12 Borden Avenue, Enfield, Middx. EN1 2BZ.
- SOUTH MANCHESTER: D. Holland, G3WFT, 32 Woodville Road, Sale, Greater Manchester. (061 973 1837)
- SURREY: R. Howells, G4FFY, 7 Betchworth Close, Sutton, Surrey SM1 4NR. (01-642 9871)
- SUTTON & CHEAM: A. Keech, G4BOX, 26 St. Albans Road, Cheam, Surrey.
- SWALE: B. Hancock, G4NPN, Leahurst, Augustine Road, Minster, Sheerness, Kent ME12 2NB. (Minster 873147)
- SWINDON: D. Ireson, G4ZAZ, 20 The Broadway, Swindon SN2 3BT.
- THREE COUNTIES: R. S. Hodgson, G3TBT, Brackendene, Hollywater Road, Passfield, Bordon, Hants. GU35 0AE.
- TIVERTON (SOUTH-WEST): G. Draper, G4ZNV, 19 Sunnymead, Coplestone, Crediton, Devon EX17 5NQ.
- TODMORDEN: Mrs. J. Gamble, G6MDB, 283 Halifax Road, Todmorden, Lancs. OL14 5SQ.
- TORBAY: B. Wall, G1EUA, 48 Pennyacre Road, Teignmouth, TQ14 8LB. (Teignmouth 78554)
- VERULAM: H. Clayton-Smith, G4JKS, 115 Marshalswick Lane, St. Albans, Herts. (St. Albans 59318)
- WELLAND VALLEY: A. Faint, G4TZY, 33 Fairway, Market Harborough, Leics. LE16 9QL. (0858 62827)
- WEST KENT: Mrs. J. Green, G4UPI, 13 Culverden Down, Tunbridge Wells, Kent TN4 9SB.
- WESTMORLAND: G. Chapman, G1HE, 61 Rusland Park, Kendal, Cumbria, LA9 6AJ. (0539 28491)
- WIRRAL: G. Cawthorne, G4KPY, 40 Westbourne Road, West Kirby, Wirral L48 4DH.
- WOLVERHAMPTON: K. Jenkinson, 10 Avondale Road, Wolverhampton WV6 0AL. (0902 24870)
- WORCESTER: D. Batchelor, G4RBD, 14 Oakleigh Heath, Hallow, Worcester. (Worcester 641733)
- YEOVIL: E. H. Godfrey, G3GC, Dorset Reach, 60 Chilton Grove, Yeovil, Somerset BA21 4AW. (0935 75533)
- YORK: K. R. Cass, G3WVO, 4 Heworth Village, York.

there every Wednesday evening; they try to have two meetings with a programme, and the other two as informals each month. We note also a change next spring to Tuesday evenings.

South Bristol's venue is the Whitchurch Folk House, East Dundry Road, Whitchurch, Bristol; December 5 is a talk on test equipment by G4KUQ/G4SDR, and on 12th they have a HF CW activity night. December 19 is the Christmas Families Evening and on 26th they are QRT.

We have been asked to mention the South Cheshire group who now have their meetings on the second and fourth Monday evenings of every month at the Victoria Club, Gatefield Street, Crew. For more details on the club, contact the Hon. Sec. — see Panel for his statistics.

There is no December meeting of Southdown in the normal sense; instead, we understand, they are having an informal social evening, with a disco and buffet, at the "Red Lion" at Stones

Cross, on Friday, December 7, with the tickets obtainable from committee members.

The Southgate group have a booking at the St. Thomas' Church Hall, Prince George Avenue, Oakwood, London N14, for the second Thursday of each month. For details of the programme, contact the Hon. Sec. — see Panel.

On to South Manchester now, and that means Sale Moor Community Centre, Norris Road, Sale. December 1 is the Club Dinner, and on 7th G8UQC talks about the Smith Chart. December 14 sees a talk about three years of SSB NFD, by G3SVW, and on December 21 they have the club Christmas Party. December 28, the club is closed. In addition to these there are informals at the same place each Monday evening.

Surrey means *TS Terra Nova*, 34 The Waldrons, South Croydon, where they have the use of the first floor mess deck on first and third Mondays. December 3 is a talk by G4MVS on SSB.

Sutton and Cheam are nowadays at Downs Tennis Club,

Holland Avenue, Cheam; December 3 is a natter session in the bar, and on 21st they have a Christmas get-together in the clubroom.

We turn now to **Swale**; they foregather at the Ivy Leaf Club, Dover Street, Sittingbourne, each Monday evening. Details on what goes on from the Hon. Sec. — see Panel.

It is quite a while now since we heard from the **Swindon** group, and it is nice to hear they are still about. They are at Oakfield School, Marlowe Avenue, Swindon — the same venue as the Swindon Rally — every Thursday evening.

The **Three Counties** is the title of the club based on the Bordon area; on Saturday, December 7 they have a Christmas Party, and on December 11 there is a Quiz Night. Meetings are at the Railway Hotel, Liphook, Hampshire, normally on two Wednesdays of each month.

Another new one is **Tiverton (South West)**. They meet every Monday evening at the “Queens Head” in Tiverton. Originally it was a CB club, but now many of the members have amateur licences, and the club owns an HF rig, which is operated, by permission of the landlord, from the skittle alley, using the call G4TSW. Enquiries about the club to the Hon. Sec. — see Panel for his details.

December 3 at **Todmorden** is a Social Evening; the Hq. is at the Queens Hotel in Todmorden.

At **Torbay** the monthly Sunday ‘do’ is the Christmas Party on 22nd December, and of course they still have the regular Friday evening informals, and nets on 3.755 MHz at 10.30 on Monday, Wednesday and Friday evenings. The Hq. is at Bath Lane, rear of 94 Belgrave Road, Torquay.

A change of date is noted by **Verulam**; they are to foregather at the R.A.F.A., New Kent Road, St. Albans, for their AGM on Tuesday, December 18, followed by a film show and some seasonable refreshments.

For **Welland Valley**, apart from knowing that they have Hq. at Welland Park College, Market Harborough, we must refer you to the Hon. Sec. for all the doings — see Panel.

The **West Kent** gang has its base these days in the Adult Education Centre Annexe, Quarry Road, Tunbridge Wells; December 7 and 21 are informals, December 14 is the Annual Dinner, and on December 28 they have a cheese and wine party at the club premises.

Westmorland now, which means the “Strickland Arms”, Sizergh, near Kendal, on December 11; the talk will be by G3IZD and about the 10 MHz band.

A new Hon. Sec. is noted by the **Wirral** lads — see Panel — and we are also told that they meet these days in Heswall Church Parish Hall, next to the bus station on the first and third Wednesday of each month. On December 5, G3CSG will unravel the details of Japanese Morse for the group!

A long time since we used to hear regularly from **Wolverhampton**, and they seem to have changed Hq. too. The gang is now based on Wolverhampton Electricity Sports and Social Club, St. Marks Road, Chapel Ash, Wolverhampton. December 4 is a talk on data communications by G4CJP; December 11 is a natter evening, and on 18th they hope to have a social evening, before knocking off — the Christmas Day and January 1 dates are both to be missed. On a different note, it seems the Hq. went ‘dry’ recently due to some hang-up over the licence, and the Hon. Sec. wishes all who fled to know that it is now safe to return!

December 3 at **Worcester** is taken at the Oddfellows Club in New Street, and is a talk on the Spectrum computer by G6CQK; December 17 is skittles and socialising at the “Old Pheasant” which is also in New Street, Worcester.

Yeovil are to be found every Thursday evening at the Recreation Centre, Chilton Grove. December 6 is down for G3GC to talk about DeeBees (decibels or dog biscuits!) and on 13th G3MYM talks about radio noise. The same speaker then looks at sky wave absorption on 20th, which leaves them December 27th for a natter evening.

Finally **York**, who have their Christmas Party on December 14 at their Hq. at the United Services Club, 61 Micklegate, York;

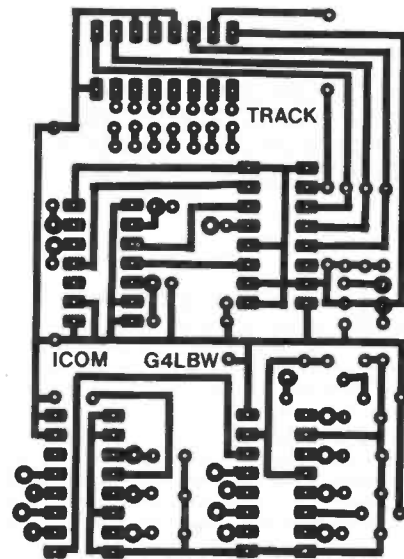
meetings are normally held on Fridays, but this time it’s not quite clear whether they will be in session right through the break, or are closing down until the AGM on January 11, so we suggest a check with the Hon. Sec. — see Panel.

QRT

That’s the lot for this time — the typewriter can now be allowed, creaking and steaming, to cool down for another month! Deadlines are all in the ‘box’, and are for the arrival of your letters, addressed to your “Club Secretary”, SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ. Meantime — Christmas and New Year Greetings to all our readers, and 88s to the girls. *Cheers!*

Corrections

Regarding “Icom ICB-1050 Conversion Update” in last month’s issue, ICI (Fig. 1) on p. 408 shows two pin 9’s: the top one should be pin 14. There are errors in the PCB track layout (Fig. 4) on p. 410 and a corrected layout is given below. In Fig. 5, the unlabelled resistor is R14; the unlabelled transistor is TR1, its ‘west’ pin is ‘e’ then, anti-clockwise, ‘b’ and ‘c’. Pins on IC6, from the top, are ‘in’, ‘c’ and ‘out’. We apologise to readers for any inconvenience.



Unfortunately, the author has discovered having made the following errors in “Every Beam has its Moment”, in the October issue.

- (i) The *British Standards Institute* was referred to as the British Standards Institution.
- (ii) In Fig. 6 the formula should have been $Z = \frac{\pi}{32} \cdot \frac{(D^4 - d^4)}{D}$
- (iii) At the top-right of p. 382 the formula for the radius of gyration has a square-root missing, and should have been

$$\sqrt{\left(\frac{Z \cdot \frac{D}{2}}{A}\right)}$$

with the corresponding formula for the area of the section having departed from its correct value as $A = \frac{\pi}{4} \cdot (D^2 - d^2)$

Apologies for any inconvenience this may have caused, and rest assured that G3ZPF feels suitably embarrassed!

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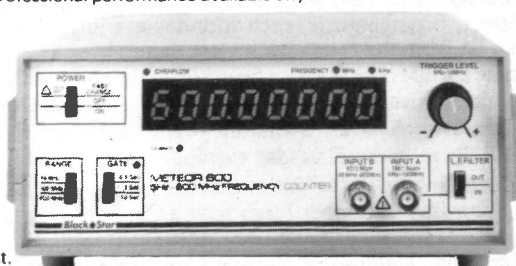
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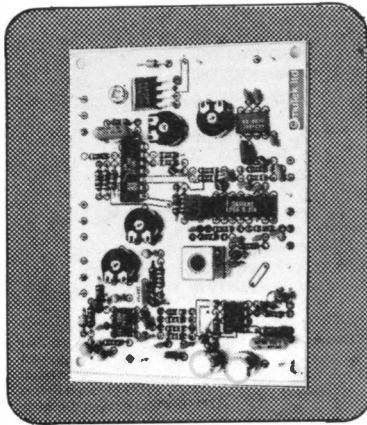
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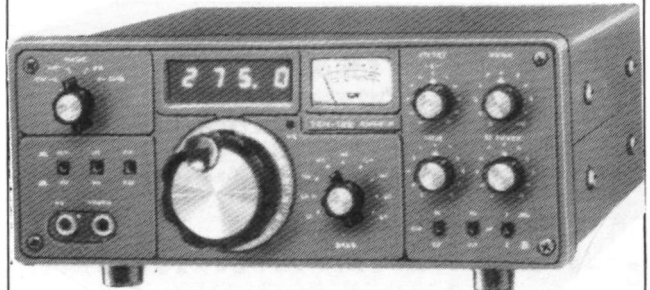
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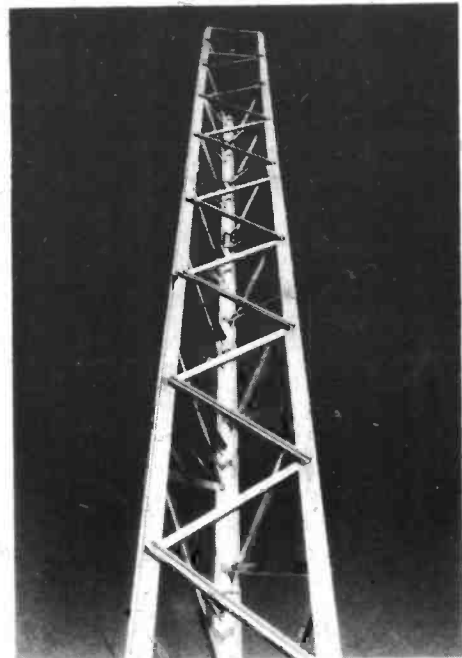
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TO: G3TXF

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PSE QSL TNX 73

RSCB **Brian G. Levett - G3TXH**
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RADIO	DATE	GMT	MHZ	RSY	TWOWAY	QSL
G3TXF	AUG 21 1968	2155	3.8	5-8	SSB	TKS

GEORG SCHNEIDER

Once reasonably common on the HF bands: Aden and Libya. Due to changing political circumstances both countries are now very rare. QSLs are reminders of amateur radio history.

sent to the DX station direct through the post. Addresses for overseas stations can be found in the *Radio Amateur Callbook* which is published annually in the U.S.A. and which contains the addresses of radio amateurs all over the world. If the DX station uses a 'QSL manager', the QSL card would be posted to the QSL manager's address rather than to the DX station.

QSL Managers

The use of QSL managers is becoming more and more popular with DX stations. The QSL manager helps the DX station in many ways. He relieves the DX station of the time consuming chore of answering and sending out QSL cards, allowing the DX station more time to operate and contact a greater number of stations on the air. The use of a QSL manager can also solve postal difficulties where a DX station is located somewhere where the postal service is very erratic or infrequent, which could otherwise lead to excessive delays in replying to incoming direct QSLs. An excellent example of this is VR6TC on Pitcairn Island. Boats call into Pitcairn only a few times each year with mail, and any requests for QSLs would necessarily take a very long time to be answered, if this extremely isolated DX station did not use a QSL manager. In the case of VR6TC, the QSL manager is in the U.S.A. A QSL manager thus plays an important role in such circumstances both in assisting the DX station with the chores of QSL-ing as well as helping DX-ers by speeding up the delivery of sought after DX QSL cards.

The QSL manager arranges to receive copies of the DX station's log, either in the post or possibly over the air, so that he can check and reply to incoming cards.

Where the DX station is a DX-pedition, visiting some rare location for a short while, the QSL manager may well be one of the DX-pedition operators, so that upon their return after the DX-pedition the QSL cards are dealt with by the DX-pedition member from home. Where the DX station is using a 'portable' DX call such as DL1RK/CT3, the QSL manager would usually be the 'home call', namely DL1RK.

Direct QSL-ing with IRCs

Direct QSL-ing means that the QSL is posted direct to the DX station or to his QSL manager. The station receiving the QSL card will also need to be sent a self-addressed envelope and the means of paying for the return postage; it would be unreasonable to send a QSL to a DX station through the post and expect a reply by the same method if return postage was not included. Remember that some DX-ers and QSL managers may receive dozens or even hundreds of direct QSL cards through the post every day. If return postage is not enclosed then the chances of receiving a direct reply greatly diminish. At best the station will possibly reply *via* the bureau, where there is one. Where there is no bureau operating, a QSL sent direct without any form of return postage is unlikely to get any reply. Enclosing an s.a.e. and return postage is the minimum of courtesy if a direct reply is expected.

Return postage is normally in the form of International Reply Coupons. IRCs are purchased at a post office in the originating country and are exchangeable in most countries of the world for postage stamps. The exchange value of an IRC is normally the minimum surface mail postage rate back to the country of origin of the IRC. Where return of the QSL card is to be by airmail, several IRCs will be needed so that their exchange value is sufficient to cover the extra postage required for airmail. Typically to pay for return airmail from the U.S.A. to Europe two IRCs are required, whereas for return from Japan, Australia or New Zealand the number of IRCs required would be three. There are still several DX countries where the IRCs are either not accepted or their trade-in value is excessively low.

Direct QSL-ing the Cheaper Way: Using Mint DX Stamps

The cheapest method of paying for the return postage for DX QSL cards from QSL managers is to enclose mint postage stamps valid in the QSL manager's country which he can use on your own self-addressed envelope. With new IRCs costing twice as much as their cash-in value, the use of mint overseas stamps instead of IRCs makes direct QSL-ing *via* QSL managers a lot cheaper. It also makes less work for the QSL manager; he can just throw the already stamped return envelope into the letter box for a speedier return.

Quantities of mint stamps suitable for use by DX-ers on return-direct QSLs can be obtained from an amateur radio DX stamp service, of which there are several in the U.S.A. In the U.K. one such source of supply is the G3TXF DX Stamp Service, which holds small stocks of mint stamps for the main QSL manager countries.

Helping the QSL Bureau

Sorting and packing thousands of QSL cards each week is a very tedious and time consuming task that is carried out by numbers of QSL Bureau managers the world over. There are several things that the QSL bureau user can do to help the QSL bureau manager deal with his cards as quickly and as easily as possible. Probably the most important is to send the cards to the bureau in order, and not just in a random pile; it is much easier for the QSL manager to go through a pile of accurately sorted cards, than it is to handle a pile of totally jumbled QSLs.

The RSGB QSL Bureau uses sub-managers for the distribution of QSLs within the U.K. It is important to keep a good stock of sensibly sized stamped self-addressed envelopes with your sub-manager.

The callsign of the station to whom the card is being sent must be written clearly on both sides of the cards.

Short Wave Listener Cards

All that has been said about QSL cards applies equally to SWL cards. In order to try to increase the chances of receiving a reply to his card the SWL should take care to present the information fully on his card in an uncluttered manner, so that the recipient can