35p

The SHORT WAVE Magazine

VOL. XXXV MARCH, 1977 NUMBER 1

THE 2 METRE SIDEBAND PACKAGE

TR7010

If your station is equipped for FM only, and you wonder where other 2 metre operators have gone when conditions are good—just borrow a receiver and listen to the SSB around 144·3. Direct DX contacts with continental stations are commonplace because of the sheer distance covering ability of SSB. With the freedom from channel restrictions and the ability to have multi-station QSO's with ease, SSB capability can add a new dimension to your amateur radio 2 metre operations.

SSB and CW operation. Following the well deserved success of the TS700, Trio used its basic design and put together the ideal mobile/fixed station SSB/CW package—the TR7010.

Combining high receiver sensitivity and clean transmitted signal, the TR7010 gives continuous frequency coverage from 144·1—144·335 MHz to cater for CW, SSB, and beacon activity. 48 synthesised 5 kHz channels with VXO and RIT ensure crystal controlled stability with the freedom to move around the band.

Design expertise. Both transmitter and receiver in the TR7010 are of the single conversion type using an IF of 10·7 MHz. This gives a clean transmitter signal and a receiver that is free from unwanted image problems. Double balanced mixing is used throughout the transmitter and the carefully tailored audio system in conjunction with a first class crystal filter produces that good signal quality for which TRIO equipment is renowned. The PA stage uses a 30 Watt device which is run at only 20 Watts input to give optimum linearity and protection against misuse.

The construction of the TR7010 follows the rugged reliable package style of the TR7200G—and fits the same mobile mount so that one can fit either rig in the same mounting slide.

Fixed (using the matching PS5 supply), or mobile, the TR7010 is the DX SSB/CW rig for everyone.

SPECIAL OFFER

Trio have agreed to maintain a special low price for the TR7010. Stocks are limited. Contact us for the current price on this model.

Sole Importers
LOWE ELECTRONICS
Cavendish Road
Matlock Derbyshire
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YAESU

YAESU MUSEN

2 YEAR GUARANTEE
'24 HOUR' SECURICOR SERVICES
FT221R WE THINK IT THE BEST
NOW IT COSTS LESS £339 (+VAT 12½%)

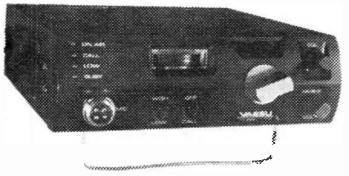
Thanks to our bulk buying policy, we have beaten inflation and the falling pound saving you £22·50 on last year's price ! As an added bonus all new SMC FT221Rs cover 4 MHz and are equipped with 600 kHz and 1·6 MHz shifts.

YAESU's state of the art, fully modular, plug in board, multimode, 2m. transceiver renders over the board "rats nest" wiring obsolete. A 134 MHz VCO, automatic varicap tuning of transmitter and receiver, gives you an exceedingly clean signal, sensitive receiver combined with good strong signal handling.

FR101S — FR101D — FR101SD — FR101DD Ex Stock

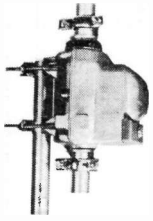
The FR101D (de luxe) wide coverage (23 (from 1·5 MHz) 500 kHz bands + 4 and 2 metres) receiver. Analysis of the signal path shows : 0–20dB switchable attenuator, two section permeability tuned input filter, Mosfet R.F. stage and mixer (crystal controlled), 3 section top coupled bandpass filter, no gain at first, I.F., IC balanced mixer, 20 kHz wide crystal filter, shunt diode noise blanker, single FET buffer stage. AM, CW or SSB (RTTY) filter, appropriate detector and audio stage. Add to this, two excellent VHF converters, squelch, FM detector, 1 kHz readout, excellent stability, Tx monitor control, crystal control facility, switchable AGC, transceive capability (FT or FL 101) and that digital readout options are available of this (de luxe), or the standard (less the plug in optionals), converters, broadcast band crystals, filters, etc.) version truly an "apparatus communication sine fills" extraordinary.

FR101DD



THE FT223 NEW LOW COST HIGH QUALITY 2m TRANSCEIVER

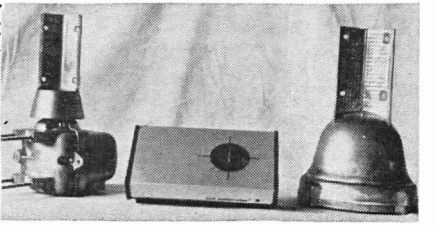
23 channels, 12v. DC, 1 or 10W output. Automatic tone burst, supplied complete with hand microphone, and mounting bracket, etc. Provision for sub audible tone squelch. **Ex Stock.**



ROTATORS

Ex-Stock in Totton for fast delivery
VAT–Rotators 12½%. Cable and delv. 8%
Carriage (BRS or post) FREE. Securicor delivery £1 extra (mainland)
All rotators supplied complete with appropriate control box and instrs.

AR30 (*Illus. right near and centre*) ...	£39·50
AR40 (*Illus. right centre and far*) ...	£46·00
AR33 (De-luxe control AR40) ...	£57·50
Big Torque sim CD44 Head ...	£79·50
CD44 (C.B. *illus. left*) med. duty ...	£95·00
Ham II (C.B. *illus. left*) hy.duty ...	£129·00
2010/220 Stolle through Rotator	£41·25
2030/220 Stolle de-luxe type ...	£45·50
5 core—AR30/40/44 2030 *per yd.*	20p
8 core—CD44, Ham II *per yd.*	32p
AK121	£3·60



CUSHCRAFT VHF OMNI (Carriage 95p) VAT 12½%

ARX2 Ringo Ranger 145 MHz	£21·50	ARX450 Ringo Ranger 432 MHz	£21·50
AR2 3 dB Ringo Vert. ...	£12·75	ABW144 2m. Big Wheel	£14·50
AR25 QRO AR2 ...	£15·00	ABW125 ABW harness	£7·30
CX100029 MHz Ringo ...	£25·75	ASQ1 2m. Squalo ...	£11 75

SMC TRAPPED DIPOLES (Post 45p) VAT 12½%

S 500W P.I.P. 14 SWG ...	£19·60	P500W. P.I.P. Cu/Terylene	
HP 1K P.I.P. 14 SWG ...	£21·75	braid c/w 75' feeder, etc.	£21·75

MOSLEY TRI-BAND BEAMS (Carriage £2.50) VAT 12½%

TA33 3 ele. 200W R.M.S.	£64·00	TA32 2 ele. 300W A.M.	£44·00
MUSTANG 3 ele. ...	£82·50	MUSTANG 2 ele.1kW A.M.	£66·00

GEM QUAD FIBREGLASS (Carriage £2.0)VAT 12½%

GQ3E 2 element ...	£119·00	GQ4E 4 element ...	£238·00
GQ3E 3 element ...	£178·00	CK1Q 1 ele. Conv. kit ...	£60·00

G WHIP HF MOBILE (Carriage 90p) VAT 12½%

Tribander 10-20m. (+LF)	£16·10	LF 40,80 or 160	£4·87
Multimobile 10/20 + MM	£19·00	MM40, 80 or 160 ...	£4·87
Flexiwhip 10m. (+ FF) ...	£13·35	FF15, 20, 40, 80 or 160 ...	£5·04
Basemount ¼" hole mount	£2·20	Telescopic whip for coils	£1·85

AERIAL WIRE (Carriage extra) VAT 8%

14 SWG hard drawn Cu. *yd.*	10p	7/·036 cad cu standard ... *yd.*	13p
Cu terylene braid ... *yd.*	13p	7/·044 cad cu standard ... *yd.*	17p

CABLES RF FEEDERS (Carriage extra) VAT 8%

RG8/U 50 ohm heavy ... *yd.*	35p	75 ohm flat twin... ... *yd.*	8p
UR43 50 ohm solid cent. *yd.*	15p	300 ohm ribbon ... *yd.*	9p

ROPES (Carriage extra) VAT 8 %

3mm. HT steel ... ... *yd.*	13p	X150 Rustproof 150m. ...	£10·85
3mm. HT steel ... *yd.*	20p	7 x 18g. Galvanised 100'	£2·20

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GM8DOX	B. of Allan	(078683)	3223	Ian McKechnie
GW3TMP	Pontybodkin	(035287)	846	Howarth Jones
GI3WWY	Tandragee	(0763)	840656	Mervyn Anderson

Access
Buy it with Access

YAESU MUSEN

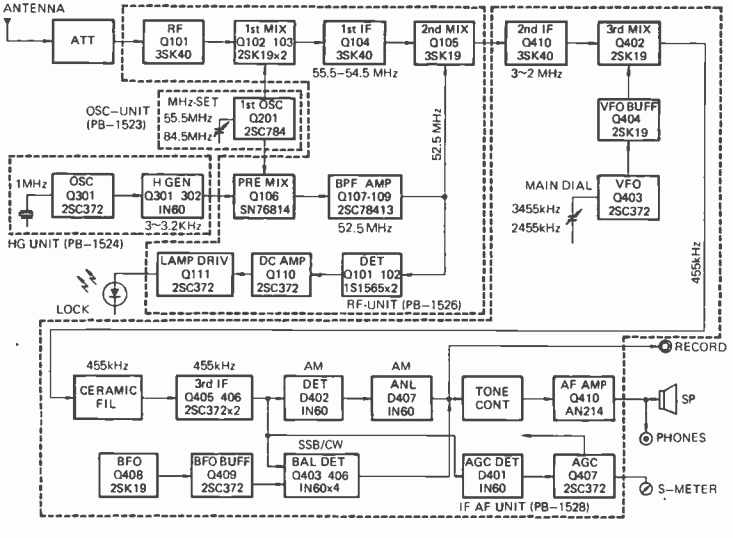
FRG7 Synthesised General Coverage Communications Receiver.

The FRG7 is a solid state mains and 12v. receiver offering continuous coverage 0·5–30 MHz with specifications unparalled in its price range.

Its advanced circuitry provides superb performance either as a standby receiver or for SWL's (BC and Amateur Bands alike)

The use of a Wadley loop (using the same VHF oscillator to mix up, then after pre-mixing with a stable crystal source down again (this cancelling all drift from the variable oscillator)) it provides equivalent performance to 30 crystal controlled converters feeding a low IF, but without the image problems of such an arrangement.

The signal path starts with the choice of 3 antenna connectors : for 1·6–30 MHz, a 50/75 ohm feed (to a SO239 (UHF) coax. socket and a binding post) and for 0·5-1·6 MHz (medium wave) a separate high impedance binding post. A 3 position 0–40dB switchable attenuator aids reception of very strong signals and reduces adjacent channel interference. The low noise MOSFET RF amplifier provides a SSB sensitivity of 0·25μV (for 10dB N+D S/N at 10·5 MHz) and is sharply tuned by a well calibrated "pre-selector" capacitor with 4 band switched coils. Its output is low pass filtered (fc = 35 MHz) removing VHF image problems from the following mixer. This comprises a pair of JFETS, driven by the "MHz set" 55·5–84·5 MHz, oscillator, which upconverts the signal to the band pass first IF to 55 MHz ± 500 kHz where it is MOSFET amplified. The secondIF of 2-3 MHz is produced by a FET mixer by hetrodyning with the synthesiser derived 52·5 MHz signal. A 1 MHz crystal oscillator and diode harmonic generator produces a 3–32 MHz comb spectrum. This, with the first hetrodyne oscillator (MHz set) is fed to a dual balanced i.c. pre-mixer. The output is expurged by a multiple stage selective amplifier producing the 52·5 MHz second oscillator. A small fraction of this is rectified, DC amplified and lights the "lock" LED (saving power) when the MHz oscillator is malset. The 2–3 MHz signal is MOSFET amplified and fed to the third mixer (a JFET whose input and output are tuned by capacitors ganged to the main tuning control) where it is hetrodyned to the fined IF by the main VFO which covers a 1 MHz range (2·455–3·455), is clearly calibrated, to 5 kHz (or better), well buffered, and highly stable. The third (455 kHz) IF starts with the ceramic selectivity element and is followed by two stages of bipolar (the first in the signal path) amplification before the choice of detectors, twin diodes for AM, or a 4 diode product detector, with well buffered switched frequency (for selectable sidebands) B.F.O. A diode rectifies, a fraction of the output from the final IFT, this is boosted to drive the illuminated "S" meter and automatically gain control the MOSFET amplifier in the RF, second and third IF stages, reducing facing and distortion. Immediately following the demodulator is an automatic noise limiter, highly effective in suppressing pulse type interference on AM signals, and a three position "tone" switch a (high, low or band pass) audio filter, reducing the bandwidth to that required. A transformerless AF amplifier ; delivers a generous 2W to the internal 5" x 3", or external speaker, drives a phone jack, and a "volume" independent output for tape recorder. The receiver is, mains (234VAC), external (12v. DC) or internal dry cell powered, the most economic source being automatically chosen. This is reduced to a stable regulated 10v. (or 9v. for oscillator and the harmonic generator). A dial lamp switch is provided to conserve power when battery operation is employed.



OUR AGENTS

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508-514 Alum Rock Road
Alum Rock,
Birmingham B8 3HX

South Midlands Communications Ltd.
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Southampton, Hampshire SO4 4DN

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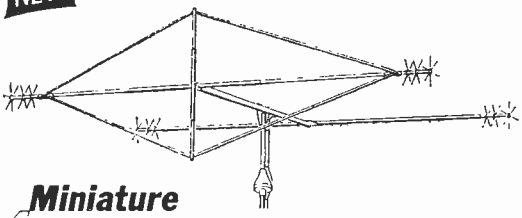
STANTON ELECTRONICS

Telex : 897406

NEW

Hi-pot Multiple Hat Loaded!



Miniature Band HYBRID QUAD Antenna

HQ–1 A further stock of the fast selling HQ–1 aerials from USA has arrived. This amazingly compact beam covers 10–15–20 metres and has a turning radius of 6ft. 2in. It will take the full UK legal limit and is the ideal way of putting out a big signal from a small garden.

Price : £84·37 (£2·00)

NEW MODEL

The FDK PS–110 power supply is the ideal unit for powering 12 volt mobile transceivers. Its generous ratings provides up to 4 amp. capacity and the front selector switch permits selection of 9v., 10·5v., 12v. 13·5v., and 15v. outputs. An over current indicator is incorporated and 3 sets of output terminals are provided (2 at the rear and one at the front) to add to its versatility as a general bench supply. A matching DC power cord for FDK transceivers is also supplied. **Price** (inc. VAT) **£63·50**

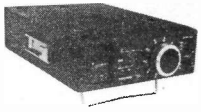
FDK

FOR 2M FM
THE SUPERB MULTI-11

Fitted 7 Channels + Autoscan + Toneburst **£199·68** inc. VAT
Special Offer : S21, 22 and 23 **£10** inc. VAT if ordered at the same time as Multi-11

MULTI–11 This transceiver is now undoubtedly the best on the market. No other model has greater receiver sensitivity or cleaner transmitter output. And there's plenty of power output too ; whilst other models struggle to give 10 watts out the Multi-11 loafs along at 13–13 watts output, effortlessly. But FDK doesn't stop here, they have gone on to add those extras which makes owning an FDK mobile a pleasure. Things like auto-scan, IRT control, tx monitor switch and of course that superb audio quality that brings you excellent reports. Send for full details today and see why others have changed to FDK.

NEW MODELS



Matches Multi-11 transceiver. 144–146 Rx/Tx. Plus 600 kHz repeater shift. **Price** (inc. VAT) **£89·0**

FDK

FREE CREDIT

For a limited period you may purchase an FDK transceiver and spread your payments over 6 months without paying a penny extra. This offer applies only to UK licensed amateurs. **Example :** Multi-11 deposit **£49·68** and 6 payments Multi-U11 deposit **£62·50** and 6 payments. Phone or write for full details and beat inflation. For longer periods up to 30 months we can offer very competitive rates !

YAESU MUSEN EQUIPMENT

FT101E transceiver, 160–10m. 230/12v.	£482·62	(n.c.)
SP101B matching speaker console	£17·43	(£1·25)
FV101B matching remote vfo	£16·31	(£1·25)
FT200B transceiver 80-10m, 260w.	£264·37	(n.c.)
FP200B matching AC p.s.u. ...	£60·75	(n.c.)
FL101 transmitter 260w. 160–10m.	£365·62	(n.c.)
FR101S receiver standard 160–10m.	£336·37	(n.c.)
FR101D receiver de-luxe 160–2m. plus short wave broadcast	£438·75	(n.c.)
FR101DD as above with digital counter	£540·00	(n.c.)
FL2100B linear 1200w. input ...	£279·00	(n.c.)
YP150 dummy load/wattmeter	£47·52	(£1·00)
Yo100 monitor 'scope... ...	£127·44	(£1·50)
YC355D 200 MHz counter ...	£150·12	(n.c.)
FT221 2m. ssb/cw/fm/am transceiver	£403·87	(n.c.)
YD844 table microphone ...	£20·25	(75p)
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FRG7. General coverage receivers	£167·09	(£2·00)

TRIO

HC2 ham clock	£13·50	(48p)
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Shure 201 hand microphone ...	£9·95	(50p)
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Set of 10 HP7 ni-cads ...	£9·72	(75p)
Set of 9 HP11 ni-cads	£16·20	(£1·00)
Balun insulator 50 ohm (beams or dipole)	£8·43	(50p)

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Liner 430 as new	£247·00
Icom IC30A 70 cms. FM ...	£150·00
Trio QR666	£129·00
Codar PR30 Preselector ...	£15·00
Codar Q-10 Q-multiplier ...	£15·00
Lafayette HA63 Rx ·5–30 MHz	£20·00
Trio 520 Transceiver	£350·00

2M FM HANDHELD TRANSCEIVERS

KP202 fitted 6 channels plus t/b	£129·00
KCP2 charger	£12·65
Flexible antenna	£6·45
10 Ni-cads	£9·00
Leatherette case	£5·34

ROTATORS

AR30 antenna rotator ...	£42·18	(£1·50)
AR40 antenna rotator ...	£48·93	(£1·50)
CD44 antenna rotator ...	£100·00	(£1·75)
Ham 11 antenna rotator ...	£133·00	(£2·00)
CD bearing	£4·21	(50p)
Stolle 2010 antenna rotator ...	£46·50	(£1·50)
Stolle 2030 antenna rotator ...	£51·50	(£1·50)
Stolle alignment bearing ...	£11·25	(50p)

HY-GAIN ANTENNAS

12AVQ 10–20m. vertical 2kW	£36·62	(£1·50)
14AVQ 10–40m. vertical 2kW	£51·97	(£1·50)
18AVT/WB 10–80m. vertical 2kW	£72·45	(£2·00)
TH3 JNR 10–20 yagi 600W ...	£108·00	(£2·00)
TH3 MK3 10–20m. yagi 2kW...	£154·12	(£2·50)
BN86 balun 2kW	£13·50	(50p)

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BARCLAYCARD welcome here

Access Buy it with Access

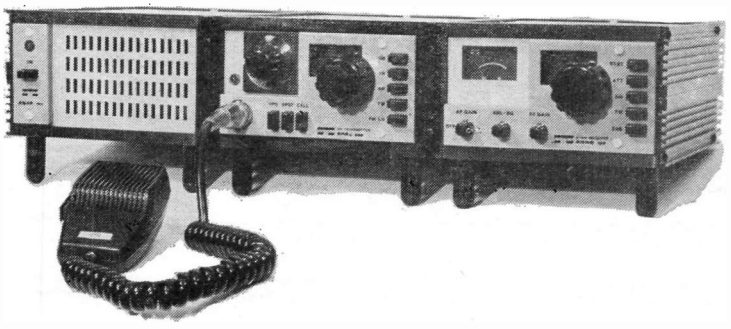
S.T.E. MILAN VHF EQUIPMENT

We enter our third year as sole distributors for the S.T.E. range in the U.K. The popularity of this equipment is growing all the time. With the kind help of the Directors of S.T.E. we have managed to keep the prices stable for the past three years. This equipment sell for about 20% in some of the ECC countries and to keep cost to the customer down we have not sold to the trade and therefore you get the benefit of lower prices. The quality of these P.C.B's are the finest we have ever seen. Following on from the ARAC 102 receiver for 28–30 MHz and 144–146 MHz fully tunable we now have the ARAC 107 28–30 and 430–440 MHz with AM FM and SSB Facilities. The base station AK20 transceiver will be soon supplied with mobile mount and also available in kit form. We also look forward to many new models from S.T.E. in the next year.

Price List (*including postage*)

ARAC 107 Receiver	£127·50
ARAC 102 Receiver	£100·00
Atal 228 Transmitter ...	£126·00
ASAP 154 AC PSU with speaker	£35·00
AR10 Receiver Module	£37·50
AA1 Audio Amplifier	£4·10
AD4 FM Discriminator	£5·00
AL8 Linear Amplifier	£27·00
AT22 Transmitter	£50·00
AR20 C.C. Receiver	£50·00
AT23 C.C. Transmitter	£36·00
AS 15 Stabilised psu D.C.... ...	£10·00
AG 10 Tone Generator	£4·50
AC2A Converter 28·30 MHz ...	£20·00
AK20 Transceiver Kit	£120·00

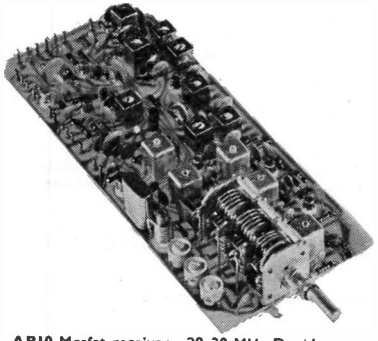
ASP 154 **ATAL 228** **ARAC 102**



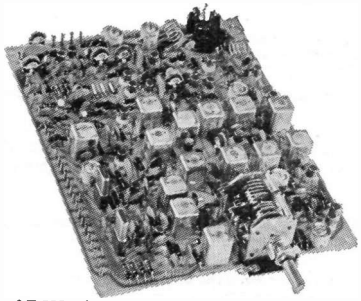
SPEAKER
AC POWER SUPPLY UNIT

144 – 146 MHz
AM FM TRANSMITTER
with Microphone

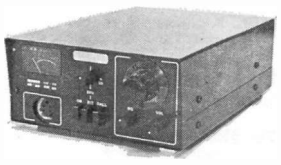
28–30 MHz 144–146 MHz
AM–FM–SSB RECEIVER



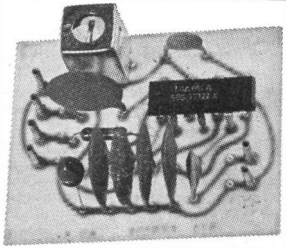
AR10 Mosfet receiver. 28–30 MHz Double conversion superhet. RF and amplifiers stages are gate protected mosfets for good sensitivity and low intermodulation. Noise limiter and squelch circuit. AM, SSB and CW reception. 12v. DC.



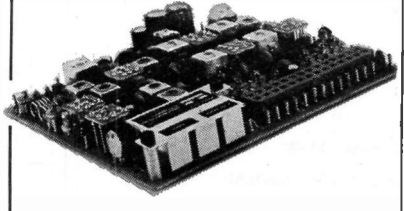
AT 222. A complete transmitter exciter unit for 144–146 MHz on AM or FM. VFO controlled or fixed channel operation. Complete with microphone pre-amp., speech processor including active audio filter. 1 watt output. FM. ·25 watt AM. Output impedance 50–75 ohm adjustable. Frequency deviation 3–10 kHz adjustable.



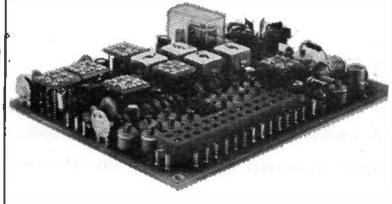
AK20, STE. Latest model from the famous STE Milan range of equipment. 12 channel operation in the 144–146 MHz range. 11–15v. DC operation. 8 watt output. Sensitivity 0·2 uv R.I.T. tone burst. Complete with microphone, and mobile bracket.
Price £174·00



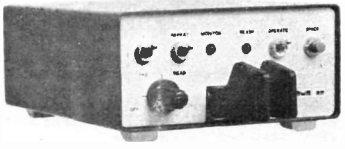
455 kHz FM Discriminator Amplifier. Limiting threshold 100uV. Amplitude modulation rejection 40dB. Audio output voltage at 1 kHz 200-300mV frequency deviation + or — 3 kHz.



AR20. 12 channel FM receiver 144-146 MHz. Input impedance 50–75 ohm. AM-FM modes. Sensitivity 0·2uV AF output 3 watts. 12v. DC operation.



AT23. 12 Channel FM Transmitter. 3 watts. 144–146 MHz. Frequency deviation 3–10 kHz adjustable. 12v. DC operated AF input sensitivity 2mV adjustable to 50 mV.



ELECTRONIC KEYERS
Jambic operation—Weighed transmission—Three memory lengths up to 1024 bits. Internal monitor. Transmitter keyed through internal relay. Silver plated contacts. 220v. AC operation. **Price £106·00**

STEPHENS-JAMES LTD.

47 WARRINGTON ROAD, LEIGH, LANCS. WN7 3EA

Please note new telephone number **0942 - 676790**

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SHORT WAVE MAGAZINE

(GB3SWM)

ISSN: 0037-4261

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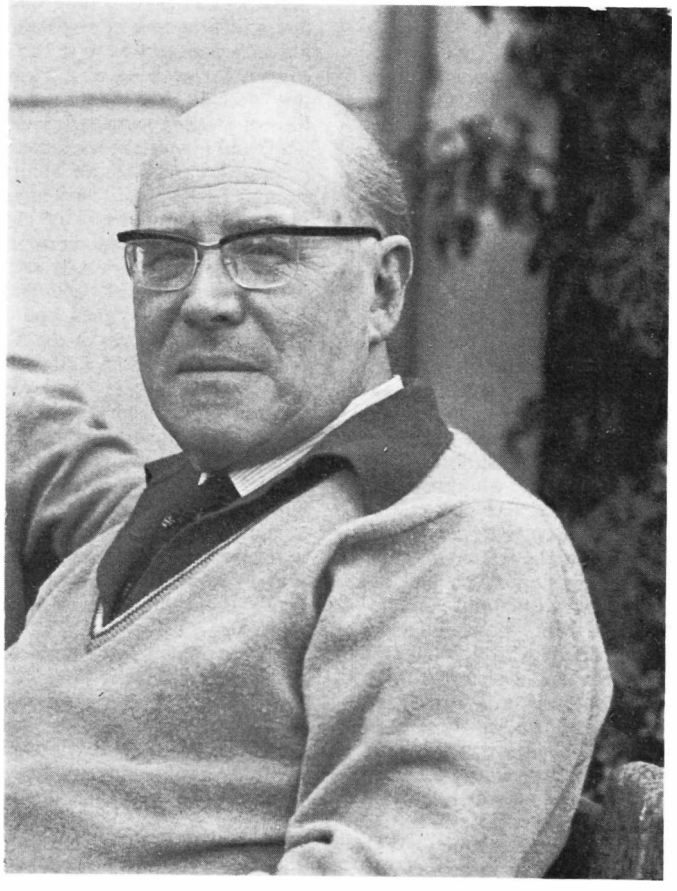
FOR THE RADIO AMATEUR AND AMATEUR RADIO

The SHORT-WAVE Magazine



The late Austin Forsyth, O.B.E., G6FO.

WORLD-WIDE COMMUNICATION

AUSTIN FORSYTH O.B.E., G6FO — Obituary

AUSTIN ("ANGUS") JAMES ESSLEMONT FORSYTH, who died on January 15, 1977, was born in London on May 11, 1907. At the age of three he moved with his parents to a tea plantation in India where his father was the local doctor; in 1914 he started as a pupil at St. Paul's, Darjeeling, where he stayed for seven years until the family returned to England in 1921. He completed his education at Victoria College, Jersey, and it was whilst there that Austin really became interested in radio communications—constructing, experimenting and making it his business to find out all there was to know about this new and fascinating subject. There were few high-spots and beacons in the country which he hadn't climbed with his gear to see who and what he could hear.

It is also a matter of interest, perhaps, that at this time he was a very fine all-round athlete and was a member of the reserve swimming team for the 1926 Olympic Games. He was first licensed in 1928, and in that same year he started his working life underground as a mining engineer in the pits of South Wales (he always had a very great regard for Wales and the Welsh in spite of entirely Irish/Scottish origins).

In 1930, G6FO and Jack Hum, G5UM, got to know one another as a result of a mutual interest in developing the then-neglected 160 metre band. They both became members of Group 10A of the Research and Experimental Section of the RSGB and gathered about them a number of like-minded transmitting amateurs whose interest was to see more activity on a band which had become virtually deserted during the great rush to the DX bands of forth and twenty metres. Their objective was to prove that 160 metres had DX possibilities that might not be altogether apparent to those who preferred the easier pickings of 7 and 14 MHz. To this end a series of trans-Atlantic tests were set up to be conducted just before dawn every day during the winter of 1931 and 1932, a long and painstaking slog which had its reward when G6FO was "first across the Pond" on 1·75 MHz from his site in Newport, Mon. (transmitter: a P650 valve in a self-excited oscillator with a 200v. DC mains supply; receiver: a one-valve detector with a one-valve audio amplifier; aerial was a ¼-wave long wire). Never will those who participated in those tests forget the bell-like note of W1DBM pinging weakly into their receivers morning after morning, followed sometime later by Signals from W1BB and ultimately others! It is well worth recording that those who got across first G6FO, and soon afterwards his neighbour G5WU at Penarth) did it with a meticulously measured 9·7 watts DC input; this was not just because they feared losing their licences by exceeding the regulation 10 watts: it was a point of honour that if it couldn't be done on the licensed power it was not worth doing at all.

G6FO was also one of the pioneers of the 56 MHz band during the 1934-35 period; with one of the first (if not the first) crystal controlled transmitters and an O-V-1 receiver he maintained regular contacts from Newport with G5JU in Bristol and G5BY in Croydon.

To his great disappointment Austin was forced to give up his mining career in 1936 owing to a lung condition (G6FO had for the last 30 years a superb cough which he always said was because his lungs were half-full of South Wales coal dust!). He moved to Appledore, North Devon, and became South Western area representative for National Benzole.

From here in North Devon the superiority of West County over-the-sea sites for trans-Atlantic working again became evident, demonstrated both by G6FO and by G6GM, the late Harold Merriman, not far away in Holsworthy, with a high-up site looking straight out over the Atlantic. Any spare moments not connected with amateur radio were occupied in his capacity as the Secretary of the Appledore Lifeboat Association (Austin had a lifelong love of ships and the sea and for him the idea of a holiday was to sail to France and back over the course of a weekend on a friend's yacht). It was during this period 1937-38 that Austin first conceived the idea of starting a magazine to cater specifically for the needs and interests of the radio amateur; he found that he possessed a considerable ability for writing and in fact several articles he had written had already been published in electronic journals of the day. Now a certain "Short Wave Magazine" had been started in 1937 by others with the same aims, but by early 1938 the Magazine was in a distinctly weak and fragile condition; the first Editor, G5GQ, resigned and Austin who felt sure he could make a success of the Magazine, took the plunge and produced his first Editorial in the March 1938 issue. That he did make a success of it is now a matter of amateur-radio history.

Another important pioneering activity for which G6FO was responsible was, in 1938, to write a series of articles for the RSGB called "The Helping Hand"; this later came out in leaflet form and did an immense amount of good in influencing people favourably towards amateur radio, not only in the technical aspect but also by encouraging common-sense in operating. Also in 1938 he assisted Scott-Farnie in the formation of the Civilian Wireless Reserve.

However, his first period as Editor of "Short Wave Magazine" was short lived for in 1939 came the Second World War. Austin (who had already been granted a Commission as a Pilot Officer in the Royal Air Force Volunteer Reserve in March 1939) felt that he could contribute something to the war effort on the signals side, put the Magazine in "mothballs" and joined-up full time in the Administration and General Duties Branch in September 1939 with immediate promotion to Flying Officer. In April 1940 he transferred to the Technical Branch (Signals) and with his move began his highly significant and effective war-time career, his knowledge and abilities being stretched to the full. His chief concerns were radio- and radar-countermeasures and he made numerous operational sorties as the "boffin with his head in the office" checking and calibrating the various devices (in several cases his own ideas) designed to try and keep one jump ahead of the enemy in this intensely competitive field. But perhaps his major contribution was as one of the team working on the

design, development and deployment of "window"—strips of aluminium foil which were dropped literally by the million to jam the enemy's radar. G6FO, who had reached the rank of Wing Commander by April 1943, served at Hq. Bomber Command from October 1941 to January 1946 and was twice Mentioned in Despatches. (As a contribution to his own effort he had married one Elizabeth Coates, a WAAF Code & Cypher Officer, in 1940).

At the end of the war, in spite of having been offered the security of a Permanent Commission, he opted to return to Civilian life and take up the reins of "Short Wave Magazine" once again. For his services during the war he was awarded the O.B.E.

From that time until the moment of his death he worked continuously and tirelessly for the furtherance of amateur radio in all its forms and for the success of the Magazine, always maintaining a firm and independent view. He gradually replaced his home-built gear with Commercial equipment—always British! Eddystone, K.W. and Raymart (although it must be admitted that he did have a Heathkit oscilloscope and a standby Hammarlund transmitter!) A particularly interesting Magazine landmark came in 1957 when, in association with J. M. Osborne, G3HMO, he produced a solar powered transistor transmitter and an actual contact was witnessed by a member of the National Physical Laboratory and the *Daily Telegraph*.

On the other side, perhaps his biggest personal loss during this long post-war period came a few years later with the very sudden death of his great friend and Magazine colleague Howard ("Tommy") Thomas, G6QB.

Austin was always most helpful to aspiring amateurs and was even willing to lend his own equipment in order to get them started. A man of strong-minded and determined character, G6FO was never afraid at any time or place to make his views on amateur radio matters perfectly clear, and vigorously promoted and defended the pursuit against all-comers. As a first-class operator himself, the maintenance of good operating standards was something on which G6FO was very sensitive; in fact he was one of those telegraphists who enjoyed the gift of talking through the finger-tips, something that comes more easily perhaps to those who are naturally articulate—as G6FO certainly was—and his writings demonstrate.

He was also a man of astonishing physical as well as mental fortitude; it is not generally known that ten years ago he suffered a severe lung haemorrhage and was given only a faint chance of surviving. Austin, however, had other ideas: deadlines for the next issue were approaching and so he called for the essential paper-work and typewriter to be brought from his office to the hospital side-ward—the issue appeared right on schedule and Austin made a full recovery.

This, then, is something of the man behind "Short Wave Magazine" for so many years—a truly dedicated man. Undoubtedly, within the amateur radio context, G6FO was one of the very few "right men at the right time" and as an epitaph there can be only one—*For The Radio Amateur and Amateur Radio.*

Austin Forsyth leaves his wife, son and daughter.

We are grateful to G2JL, G2CAV, G3HMO, G3IYX, G3VA, G5BG and G5UM for providing details of G6FO's life.

G6FO — Tributes

So world-wide has been the response to the announcement of G6FO's death—from Readers, the Trade, old friends and colleagues—that it would be absolutely impossible to reply to every letter individually as each one of them deserves. May we take this opportunity, then, to thank in print all these kind people who have written so appreciatively of his efforts for Amateur Radio over so many years, and to tell them that his family have derived enormous comfort from their words; further, as for SHORT WAVE MAGAZINE itself, if any encouragement *were* necessary to carry on then it has been received in full measure.

As '6FO always did himself, we must now of course turn our attention to the future (this issue marks the start of Volume 35), but there will be many issues of SHORT WAVE MAGAZINE before the influence of Austin Forsyth G6FO is finally lost.

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

Top Band

This is one area where things have shown up, various countries not normally to be heard appearing: YU, I, F, and a Russian. However the Russian is disowned by the UA's, although UF6CX did tell G2HKU that the Russian amateurs are pressing their authorities for Top Band privileges; and although several G's have worked I stations, *and* received their QSL's, other reports have it that none of the Italians have Top Band privileges.

G2HKU (Sheppey) opens the batting, with his normal SSB chats to PAØPN, plus CW contacts with DJ5PN, EI9J, F3AT, GD4AM, GM3CFS, HB9AJU, OL2AUT, OK5TLG / P, OK2BGW / P, OK3KFF, OK3CEG, YU1PCF and YU3EY, Gotaways including ISØLYN, ZC4ID, and 9H1CD.

A first-time report—at least as far as your scribe's weed-encrusted memory goes—is in from G3PKS (Wells), who has about 3 watts of RF out, and a simple homodyne (direct-conversion) receiver. On the morning of January 30 a listen at 0730 showed EL and W's, with of course G's chasing them; firing-up the transmitter waited until noon, at which time GM3IGW/A, GI6YM and F3AT were all taken; a fair old daylight hop from Wells, though of course the contest stations brew up some hefty signals, and the G3PKS aerial gives one the impression that it's no slouch either. And it was nice to hear that G3IGW was out on the rampage again—we haven't heard of him contesting seriously for a long time.

WIBB (Winthrop, Mass.) may not write so many Bulletins on Top Band doings as he used to, or even work so many Europeans as he used to—but the bulletins are just as packed with information as ever, and his own scoring year by year continues to rise; Stew is now at 137 countries all-time, and his first DXCC on the band has since been joined with KV4FZ at 118C, W1HGT, W8LRL 111, W4BRB 102, K1PBW, with others rumoured to be either on the mark or just held for a few laggardly QSL's. For the Spring Equinox W/VK-ZL Tests, both sides will be on the 1800-1808 kHz; W's first 2½ minutes of the five-minute period for calling, VK/ZL's the last 2½ minutes for calling, except when in QSO—this one should be of interest to we Europeans if only as listeners! On a different tack, as some sort of indicator of possibilities on this band, W1BB and others near the top of the tables seem to average about sixty countries each season. Lots more of interest in Stew's bulletin will have to wait until next time—we already, at this early stage in putting the material together, have perhaps the biggest bundle of mail since first we began this task a decade ago!

A new reporter on Top Band is G3JFF (Clanfield) who has made a considerable improvement radio-wise by moving from Horndean; he tangled with 9H1CG, EA8CR, OH2KA, OH2BFJ, F3AT, F8EX, F8DB, DL's, OK/OL's, YU3EY, GU4EON, OE5KE, EI9J, EI4BK, and all the U.K. call areas—the Gotaway list is quite impressive too, with 9D5A, VE1CD, and K1PBW.

G2NJ (Peterborough) was one of many who commented sadly on the passing of G6FO. Nick worked F3AT, who is located at Auxerre, and of course had lots chasing him; G2NJ reckoned this was the first F station to be on Top Band since pre-War. An interesting QRP signal was the one from G3URU, about 1·3 watts *input* to an invisible aerial made of 30 gauge enamelled wire, at a height of around twenty feet and with a couple of bends to obtain the desired half wave.

A new reporter on Top Band—or anywhere else for that matter—is G4EOK, the call of the club station of RNARS aboard HMS Belfast in the Pool of London, where the rig is the Bridge Wireless Office, where they have a FT-101, plus a KW Viceroy/Racal RA17 combination to play with, the aerials being a trap dipole, and 215 feet of end-fed aerial strung between the masts. The main operator has been G3HZL, but G3KP, G3LIK, G3LRE, G3PED, G3PZP, G3ZQS, G4BZW, G4CJY, G4CPY, G6BJ have also had a significant hand in the game. Since November the score has been: ZC4IO, IK4AMO, ELON/MM off Miami, KV4FZ, YU1PCF, YU1BCD, YU1NPZ, YV1OB, YU3EY, YU3TFB, F3AT, F8DB, F8EX, 4X4NJ, 9D5A, 9H1CG, all W call areas with the exception of the Elusive Sevens, VE1-3, VE7, VO1, with Gotaways in the form of ST2AY, VS6DO, PJ2VD, and VP9. This mark you, on *Top Band*!

Nice to hear from G2BY (Wroxall, I.o.W.) again, Bert having given all the bands a bit of a tweak. By and large, the bands were pretty indifferent at Wroxall, with the Top Band activity being the odd contact with mainland G's, and one turn-out at 0300 which yielded—nothing!

Back to G2NJ for a later letter in which Nick pokes gentle fun at the characters calling 4U1ITU on the evening of February 4, by, apparently, sending 4U1IX! That's one advantage of an iambic-mode keyer, it either sends perfect characters or complete gibberish, while the old pump-handle can send everything from Morse as Morse meant it, right through mildly individual and slightly wacky through to the pure-bred Martian Morse; and yet we are still optimistically trying to copy it, while the guy on the receiving end of the el-bug knows *instantly* when Master loses the initiative to the machine!

Interjection

Which is to say how nice it is to see another copy of Geoff Watts' DX News Sheet. Geoff is going to stick to his intention to only handle copies for the G's; but if any of his fans from overseas—and there were so many of these before that they well out numbered the G's—can come to an arrangement whereby a G station receives an extra copy and forwards one on to the DX station, (which in effect removes from Geoff the hours of toil which caused his breakdown in health), then Geoff will be only too pleased. And, of

course, there is the Prefix List which he does for 35p to the U.K. of five IRC's for overseas airmail; this latter is *very* useful indeed. Nice to have you back aboard, Geoff.

Eighty

This old greyboard must admit that although he has SSB on the band, it is somewhat of a penance if anything in the DX line is to be sought. Like the Irishman's name for King Kong—Begorrah. On the other hand the CW portion is often quite pleasant, the more so during the daylight hours, and when working the QRP lads who have, of necessity to be better operators than average. Let us look, for instance, at F9UO, who is in a high-rise block some 20 KM south of Paris, and never ceases to amaze everyone with his QRP and Joystick. Rene has a rather neat idea with his log-keeping; he uses a black pen for Eighty, blue one for Forty, and a red one, for Twenty, of which more anon. Looking at the story on Eighty, we see F9UO not only working the usual ones, but also getting over to VE3ATF, and hooking GJ2LU; but it must be said that quite clearly the F9UO heart is on 14 MHz.

This seems as good a time to mention the White Rose Award as any; stations in Europe need fifty points, DX thirty points, obtained by way of ten points for the club calls G3XEP and G8LVQ (either/or), five points for working any member of the White Rose Radio Society, or three points for working a station in Yorkshire. It is understood that in order to cope with the expected trade, the members will be on about 3710 kHz depending on the QRM, from 1700z for around 2½ hours; later they hope to set up shop on Twenty in a similar fashion. The Award Manager is Diana Hughes, G4EZI—QTHR.

Returning to our main theme, we have another letter from Leeds, this one from G3DNF. Gordon had a very good run in the Winter DL/AGCW contest, but says he understands that G4BUE at least was ahead of him, despite the G3DNF effort being the best ever. That's life, but frustrating!

Next comes G3RJV (Calverton), who remarks that he worked ZL4HX with QRP at both ends, with the ZL reporting 59 on SSB; of course, there has to have been a snag, and it was that ZL4HX was on leave from his religious activities and at the time of the QSO was in the very next village, of Woodborough! It seems that ZL4HX is a keen QRP buff with a hand-held rig at one watt of SSB, and the Plessey SL-series of IC's, used to a throw-out dipole about twelve feet high which netted good SSB reports all over England and to GD.

Our next reporter is himself rare DX. A4XGZ (Salalah) has WB4NND as his QSL Manager, who is OK in the current call book. Tony will be at his present spot for the next two years, and will give all bands from Eighty right through to Ten a whirl as the conditions prompt. His speciality, at the moment at least, is to be on from 2200z right through to 0400z on Eighty, Thursday and Friday evenings. Looking at the logs, Tony seems to have given all the European countries a fair crack at the whip, albeit one does notice the odd diversion, such as the snapping-up of AP2KS, W's on occasion, EA8CR, and such-like, when they appear on the scene. It seems from Tony's latest letter that the next step in the game is to acquire a Linear—which should help to persuade Tony's own DX to bend an ear in his direction as well as making life a bit simpler for we Europeans trying to work him.

G2BY worked a few G's, and also got up and tried in the wee sma' hours, but to no avail—on the night he turned out, even 20 dB of attenuation in the front end could only yield a nice loud sharsh!

G4EDG (Newton Abbot) is nothing if not an optimist; on the other hand, Steve mentioned the pessimist Stateside who claims he has a "diode antenna"—signals can get in to the receiver, but no RF will go out to the desired spots! G4EDG comments on how much better the receiver is when an attenuator is used up front instead of just turning down the RF gain—between the receiver feed he has 470 ohms in series with the inner of the coaxial feeder into the receiver and 56 ohms right across the coaxial pins of the receiver as his simplest-possible attenuator. CW gave him C31FR, HC2SL, JA6LZG, KV4CI, N6DX (California), N8AA (Ohio), VE7AON, VK3MR, W6PVB, W6PM, and SSB countered with PY3APH, VP2DAD, and XE1KB.

Eighty aboard H.M.S. Belfast has been a matter of sixty-one countries hooked since November 1, among them ZC4IO, W, VE, UA9, UL4, KP4, HK, 9Y4, OX, UF6, YV, 7X4AM, VK3MR and VK3XB.

Forty

G3PKS (Wells) notes that plenty of DX has been heard around the "peak" times of sunset and sunrise, while W1ZW added a boost to morale at about 2000z one evening. The Aerial, G3PKS explains, is a Peculiar Pyramid—it comprises an Eighty-metre Windom and a Forty-metre Windom, back-to-back in the shape of a pyramid, the centre pole being at 33 feet, and right beside the shack which was deliberately located at the best place with reference to the available *air-space*. The single wire feeders of each Windom are led down together in the form of a three-inch spaced open-wire line to the shack where a Z-match tunes 3·5 to 28 MHz very nicely, the feeders being strapped for Top Band operation.

G5FF is at the moment using the call FØAYC, with QRP to an HW7 unmodified; aerials include, for 7 MHz an ungrounded quarter-wave fifteen feed in the air; he is right under Mt. Agel, atop which hill are the aerials of Radio Monte Carlo—this can by the sound of things be a bit of a nuisance. However, Arthur is of the opinion that the band is just as good as ever it was, saving for the QRO and QRM. If you would like a contact, FOAYC is to be found from 0900 to 1000z on either 7020 or 14070, looking for the QRP chaps.

Forty for G3DNF seems to have been very largely a matter of Europeans, mainly worked over the contest weekend January 15/16. The log shows Gordon making QSO's from 160 through to 15 metres for a claimed score of 3758.

F9UO largely treated Forty as a place for local working; one must admit to a feeling that Forty is not really a good place for QRP working, if only because of the QRO BC stations all around the band who mean the high noise level has to be combated by the use of attenuation

of sufficient degree to wipe out all but the "big" signals; which means that the time to work DX on Forty with QRP is the peak time, at sunset or sunrise—and this is easier said than done!

Forty is the usual stamping-ground of G2BY but he found it a bit of a task to get out early enough for the good stuff; 0830z was managed, and this was good enough to make the grade to ZL, HI, W and JA on CW.

G4EDG's CW activities on Forty seem to have been lucrative in DX terms, with EA8LK, HI8MOG, JA's, KV4CI, PJ8KG, PT7AC, UI8ADB, UM8MBQ, UJ8JCL, UA0BBN, VK3MR, VP1KS, VP5CI, VU2GW, 3V8BF, and 6W8EX.

G4EOK, at H.M.S. Belfast didn't seem enormously keen on 7 MHz; they only note ZC4IO and a CX as being worthy of note since November 1 last year.

G3JFF (Clanfield, Hants.) is now setting up shop at the new place which is about five miles away from his earlier home at Horndean. Forty metres was rather bedevilled by the Pestilence thing from Russia (of which more anon), not to mention the broadcasters in "exclusive amateur" territory—are they, we wonder, *amateur* broadcasters? We wonder, because their efforts are often so amateurish! Nevertheless Mike stuck to his guns, and patience was rewarded PYØZAE on Trindade Is. for a new country, PYØFOC, PYØRO both on Fernado de Noronha, 7X4AN, YV4BBT, LU6ABX, PJ2VD, HI8MOG, PY7PO, for as nice a collection as could be desired.

Now Twenty

Where all the action tends to be, regrettably when one thinks of the number of kHz not being used below 30 MHz although allocated to us. Still, at least we haven't any repeaters on the band! And, it is interesting to notice, more 14 MHz reporters than for a long time.

G3RCA (Wigan) has noted the "close for a bit then re-open" effect on Twenty, pretty obviously, as his QSO's are nearly all in the daytime —morning, lunchtime, teatime—save for the odd late one. Looking at the early-morning ones, we see SSB with 5T5KJ, OE8PRK/YK, EP2NC, FKØTX, AP5HQ, 7X5AS, YJ8RD, KX6BS, JY6ZZ, KG6RI, HL9TS, 9K2EH, TU2FL/M, 7XØBI, KG6JIA, KG6JIG, and CX2DH. Lunch-hour activity knocked off A9XBE, while the afternoon came up with FR7BE, FR7AI/E, 3B8CN, FO8DO, TR8BA, 7X2ARA, FO8EI, FR7BL, FR7AW, 5T5JD, TR8MM, S79DF, ZS3KC, A2CBN, FR7AD, FR7ZW, FRØCYZ, HR3JJR, YBØACB, VU7ANI, OX3KS, VP2DQ, VP2DAC, XE1SAN, VP5DLH, HKØLE, ZS3LK, VU2UK, OX3GW, FMØCOO, 3B8CS; and the evening times did the trick to HI8XPDOZ3DK/5T5, leaving the rest to be filled up by VK6, VK7, JA's, UAO, FL, and the regular sked with 5N2ESH.

Our next reporter is GI4DAV (Carrickfergus), who has a W3DZZ aerial at twenty-five feet, fed with 180 watts; David assures us that the absence of reports from GI for a long time does not mean there is no activity; in his own case, Twenty was the one that came across with CW contacts to WB4MQO, G3TZL/MM in the Med., W7ULC (Oregon), 3Y3CC, WB5DQJ, KP4DQP, W1, W2, W3 and WBOMLU (N. Dakota) —this last at 2030z!

Next G2HKU; Ted had his usual sked with ZL1VN, ZL3SE, ZL1AAE, ZL1BQJ, and UF6CX, all SSB, plus CW contacts with PY7CPB, and PY7PO.

G5ACW (Hillindon) found precisely the opposite of the usual "dead band if you have a visitor" situation; he and his twin junior ops are all licensed, and while son Roland was telling the YL reporter from the local paper what it was all about, Jim was idly tuning round for something interesting and tripped over VKØTB just signing with an F6. A quick call, and back the VK came. The YL reporter was quite shaken, and certainly the result was a very good write-up in the local paper, complete with a picture covering most of the top of a page, from which we gather that the rig is a mix of commercial, modified stuff, and home-brew. Seems VKØTB runs full power to a two-element beam, and as a result of this interesting contact—rare DX in any man's language—a regular sked is being run—14250 or 14320 kHz around 1600z on Saturdays and Sundays, until the ship comes to pick up the whole expedition from Casey Base around March 7. Incidentally, VKOTB has VK3ADD as QSL Manager, David Brain, 40 Ann Street, Dandenong, Victoria, Australia.

A4XGZ next. Tony's first log, covering the early part of January, did not copy all that well, but looking through it we glean that on Twenty as on Eighty, G's were snapped up whenever they were to be had on SSB, perhaps the prize catch being S8AAA—although there are rumblings that this one was possibly a Phoney. Tony will no doubt be pleased to receive a QSL for that one, or to work the S8AA which is understood to be coming on the band ere long. From a place like that, given time and inclination to operate, it would probably be difficult not to work DX—but the pile-ups must pall after a while.

G3PKS was a little taken back when he worked PY1RO/O, who then proceeded on his merry way without announcing his whereabouts —Rolf was in Fernando de Noronha at the crucial time, and for the record, while PY1RO has been out of his usual Top Band environment of late, he still tries the band when he can, producing a trickle of Top Band ones on Fernando de Norohha, and, of course a very flood of contacts on higher bands.

We have already mentioned that F9UO and his Joystick plus QRP managed to get over the Pond on Eighty; thus it will come as no surprise to see the very first contact on the very first page is a W on Twenty! There are several pages of log copies, and we see that F9UO made WAC—indeed it would have been umpteen WAC's but for a slight dearth of African contacts, although the ones in the log showed good signal reports in both directions.

Like the curate's egg, Twenty has been good—in parts. This is the considered opinion of G2BY, who found the mornings good to JA and ZL and the late afternoons good to W6, W7 and ZS in the late afternoons plus VR3AH (Christmas Is.), W7NW, XE10E, VE7DDH, FMØCOO, HL9VA, FY7YE, VP9HT, CO2BB, and the usual East Coast W's and JA's.

The G4EOK gang at H.M.S.

Belfast note they have worked 9Y4, KP4, PY, 4X4, UL7, VK, PY1RO/O, ZS, 9L1CD, and ZD8RR during their evening sessions in the Bridge Wireless Office.

This is the band for DX avers G3JFF, provided you have a knife to carve your way through the European QRM; Mike did so quite successfully to EP2VW, PY1RO/Ø, YBØACT, W6, W7, UAØ, FY7YE, ZS6OS, D2AAI, KL7MF, 5Z4IN and VK, ZL, JA.

Fifteen

Served it's notice that it wanted a mention on your scribe by leading his old eye from one band-report to the next in G3JFF's 14 MHz line! However, it is very much of a daytime band, and of late it has been up and down like the proverbial yo-yo. G4EAN (Nottingham) mentions a couple of W's and a couple of UA's, adding somewhat wistfully "I usually leave my operating to the weekend, and then something *always* crops up!"

GI4DAV keyed on this band to find ZS50V, WB4QJZ, WA4SCL, 4Z4NUT, WA4VSB, 9L1CD, SM6DJI/MM, in the Red Sea, the aerial at GI4DAV on this band being a 5/8 wave vertical at ground-level.

A4XGZ's logs make this old scribe go green with envy, he of course attracting DX to himself by virtue of the DX'y call he himself sports; so we look, not so much for the exotic, which is there in plenty, as the, to us, run-of-the-mill prefixes which say he is getting into our neck of the woods—and of that there is no doubt whatever, a single call producing a string of QSO's until Tony has to get out from under on that frequency and start again.

G3CED shows just three Russians on the band, the farthest one being a UK6—but work just keeps on interfering!

At G2BY, the band was definitely a bit umpty—but Bert does not give up easily and completed QSO's on CW with ZS1IWA, W5FGO/MM, JA8UI / MM, JA4VLU / MM, PYØZAE, JX3P, W6, W7, and a few JA's; some of these were caught during openings which were hardly long enough for the proverbial rubber-stamp contact!

On the other hand G3JFF says it often *sounded* dead but would suddenly come to a spurt of activity; Mike worked LU5EIO, PJ8KG, 9J2BO, ZS6OS, ZS6BNH, EP2GJ, and 6W8EX, *plus* the local club net on Sunday evenings.

Ten?

Not really very popular generally, most people tending to write it off completely—but even a fruitless CQ or two would serve to give an impression of activity to those who would swipe it from us! On the other hand, there have been odd moments when, for a few moments the band has opened to DX, and people have been there to take advantage of them. G2BY for example, notes a five-minute hearing of 3B8MS on the morning of January 22 at 1015z.

G2ADZ (Chessington) comes up with an all-ten metre report; he recalls being jimmy-in-the-middle when G6FO and G5BY were doing their five-metre thing, receiving on both five metres and later two metres with a straight receiver. Now he looks at Ten more than most, and his account of the period from November-end to date shows lots of openings to Europe, plus FG7XA, PYØZAE, 9G1JN, 4X4FU, SV1IW, ZC4IO, 4Z4LM all worked, plus hearings of EA7TL, EA8FF, 9H1CH, 4X4WB; and of course quite a lot of openings to Europe by VHF-type propagational modes.

G3PKS had a couple of ten-minute CQ calls on the band brought forth a UA4AE from Volvograd at 579 but before the QSO was ended the Russian signal had sunk without trace.

G3JFF found a few local G stations, and also the local club net trying out Ten in case their 21 MHz spot is swamped by DX in the summer!

Comments

CR6IK, as he used to be, is now in Portugal again, and is a subscriber; he lost all his gear, left in Angola when the troubles were on, and is now studying-up on RTTY. Let's hope Wil has better luck this time, and enjoys reading his Short Wave Magazine.

Somehow, the letter from GM3RFR (Baltasound) managed to get itself under a paper-clip when it should have been being reported; so Sam gets a bit of room all to himself! GM3RFR is still pursuing his lonely road of DX-ing with five watts p.e.p. input, the score at the time of his letter being 58 countries worked. For the period in question Sam found DL, SM, PAØ, OH and LA on 7 MHz, DL, I, UB5, UA2, ON, OH, 4J3, YU, VO, FP8, EA8, LA, GM and OE all on 14 MHz; and YU, I, LZ, F, G, 4Z4, and 7X2 on 21 MHz.

G3PKS is very much of a home-brew merchant; and he has a recommendation that a couple of nail-files make a great improvement on the traditional bits of hacksaw-blade for a keyer paddle; which sounds to this writer to be a very definite bright idea, to be adopted on his own keyer in the near future.

G2BJY mentions working G6ZY/CN/M a couple of times; G6ZY must be all but part of the furniture there now in CN-land with his /M gear working the DX—which prompts your scribe to think it is about time he moved all his gear into the car for a quick look at the bands on the way to and from the salt-mine.

Back to the W1BB Bulletin, and Stew says this will be remembered on Top Band as the "Year of the Super-Stations." K1PBW and K6SE lead the way, each with phased verticals for the transmitter, and Beverages for the receiver; KV4FZ is almost in the middle of the sea, and has a 350-foot tower at command, plus many kinds of receiving aerials, *including underwater ones*, not to mention the quiet location which is the greatest boon a Top Band operator can hope for.

Let's now turn to the West Coast DX Bulletin, that regular indicator of what's afoot in the world of the Californian Kilowatts. The question of the status of Southern Sudan is still taxing the minds of those who rule on what is and what is not suitable for DXCC country status; they still have not ruled on this one since Bill Rindone was there back in the summer of 1976. And when this is perhaps the hottest news around at the moment, you realise how many people are holding fire on their DX-pedition thoughts until the sunspot cycle lifts band conditions at least a little.

Finale

That's it for this time. Deadline for next time is March 8. That is, to arrive, first post, at SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts., AL6 9EQ (and of course be marked CDXN).

DESIGN FOR A TELESCOPIC TILT-OVER MAST

L. METCALFE, G3TPA

AFTER operating on two metres exclusively for some time, an SSB rig for the HF bands was obtained, and not unnaturally my thoughts turned to the need for a suitable antenna for Twenty and Fifteen metres, plus a suitable mast or tower for support. A glance through the advertising pages of SHORT WAVE MAGAZINE soon made me realise that a commercial tower was too costly an item, and since the light alloy mast which had supported my 4-4 Two-metre beam was too flimsy for an HF band antenna, I decided to try the DIY approach.

The requirements were:—

(*a*) A height of 35-40 feet.
(*b*) Strong enough to support the antenna.
(*c*) Able to telescope and tilt over, in order to facilitate maintenance, but particularly to get it down quickly because of the not infrequent gales which are a feature of the Pennine area.
(*d*) Not needing more than two persons to erect or lower.

Having used a wooden tripod for my cameras for some years, I decided to base the design of the mast on the extending leg action of the tripod.

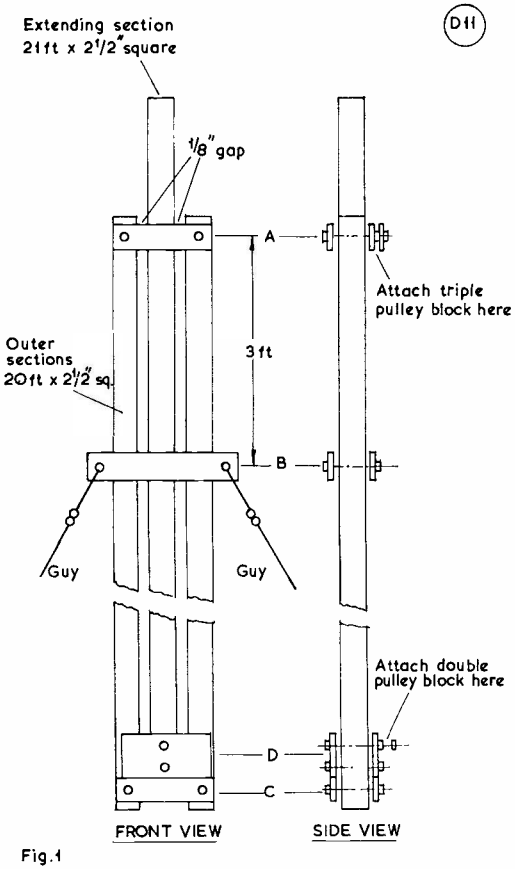


Fig.1

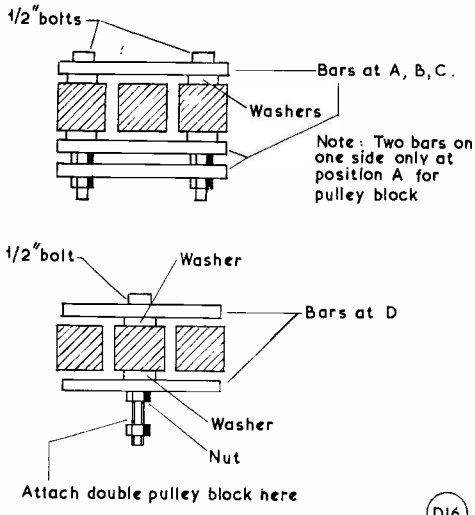


Fig. 2 PLAN OF MAST SECTION

Three sections of 2½in. square timber were bought from the local timber yard, two of 20 feet length and one of 21 feet long. The two shorter ones form the lower half of the mast, and are fixed, while the longer section slides between them, and is raised and lowered U-boat periscope fashion, by a winch, to the required height. The outer sections are spaced by 2i-nch strips of metal ¼in. thick, drilled with ½in. holes at each end and spaced to allow ⅛in. or $\frac{3}{16}$in. space between the centre secton and the outer ones to allow free movement. (See Figs. 1 and 2).

Pully blocks are attached at the top of the fixed section and bottom of the extending section, and used in conjunction with a winch and the use of poly-propylene rope, the whole is used to raise and lower the extension. The brackets for this winch are bolted to the outer sides of the fixed section and also incorporate the pivot point to enable the whole mast to be tilted over to the horizontal position. (See Figs. 3 and 4.)

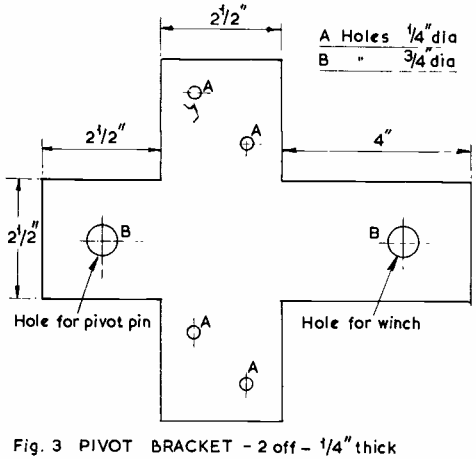


Fig. 3 PIVOT BRACKET - 2 off - ¼" thick

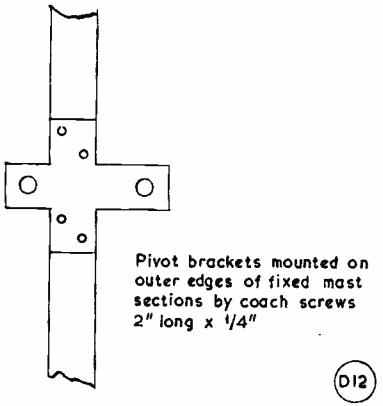


Fig. 4

A Tabernacle of 6in. x 3in. timber of suitable length, and spaced by more strips of 2in. x ¼in. metal is sunk into the ground and firmly fixed into a bed of cement or concrete. The whole mast is mounted in the tabernacle at the pivot point, and a second winch bolted to the tabernacle is used to raise and lower the mast between the horizontal and vertical positions. A suitable stop pin ¾in. dia. prevents the mast going beyond the vertical position, and a hinged bar drops into position behind the mast to prevent it falling when the tension on the winch is released. (See Fig. 6.)

Guy-wires may be used if required, either at position "B" in Fig. 1, which would probably be best if a quad antenna was used, whereas position "A" would be all right for a Yagi.

During construction care should be taken to ensure holes drilled in the wood are accurate and run at right angles through the work. The timber should be "*TANALIZED*," a process of wood preserving, which will be carried out by the timber merchant if required at slight extra cost, before delivery.

You should also ensure that the mast sections are

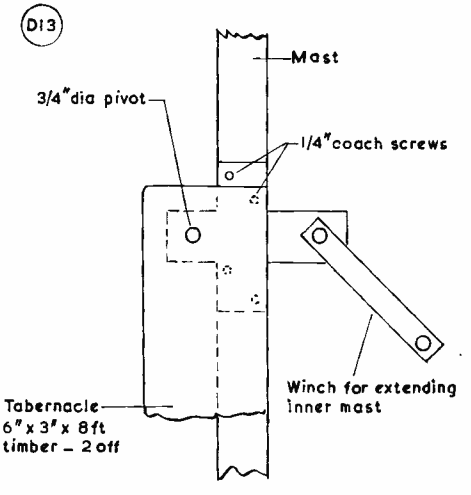


Fig. 5 TOP SECTION OF TABERNACLE & METHOD OF PIVOTING MAST.

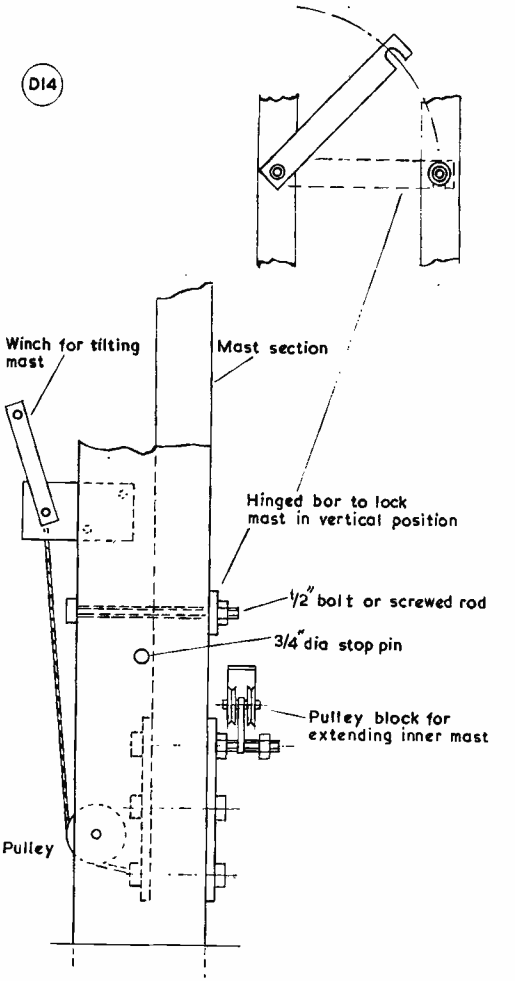


Fig.6 END VIEW OF LOWER HALF OF TABERNACLE

as straight as possible, selecting them yourself if the merchant will allow.

All metal work should be painted with a good outdoor paint and varnished, and should be examined periodically for rust or corrosion.

The dimensions in this design may be modified to one's own requirements, as may the design itself. I submit it only as a practical design which I have found suitable to my requirements in particular, and which other readers may find of interest. One item which I did not mention is a method of locking the centre mast section in position when it is raised. Perhaps some reader might incorporate it in his own version of this mast.

I usually wind the mast up to operate on the air, and wind it down again when the station is closed down. This ensures the mast is not exposed to the winds longer than necessary, and does not become something of a "permanent landmark," which could with the passing of time, be viewed with a jaundiced eye by officialdom and unsympathetic neighbours.

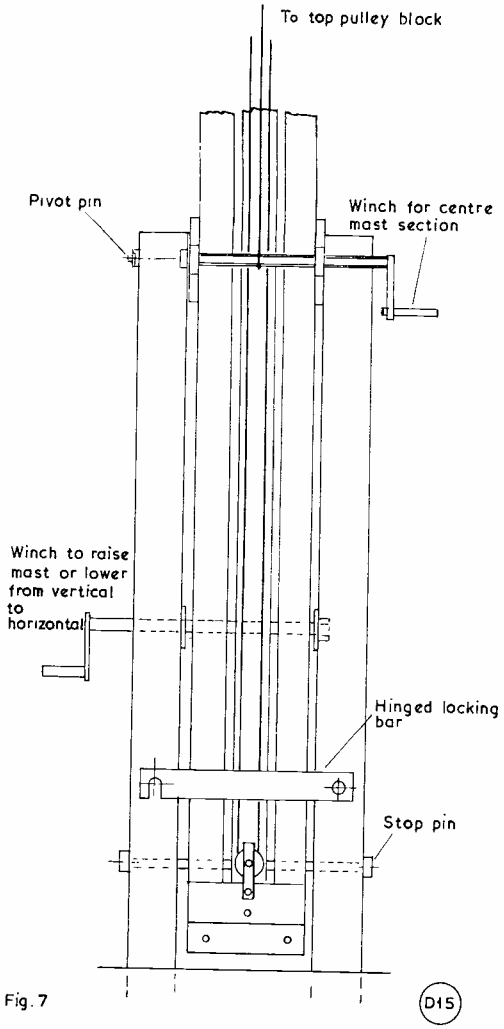


Fig. 7

There it is then. If you can afford a Strumech 60-footer and super-beam—O.K. If you can't, but want a mast for under £30, you might give this effort of mine a try.

Stolen

David Andrews G4CWB, reports to us the theft from his car in Reading of a Trio TR-2200G (s/n 230247) and a VB-2200 (s/n 060961); would anyone coming across this equipment please contact their local Police.

RADIO AMATEUR LICENCES

From January 1, 1977, the Home Office will be issuing four new types of radio amateur licence which will replace all existing amateur licences when they become due for renewal.

The new Amateur Licence A (full facilities) and B (having certain limitations) will include all those facilities available to holders of the existing Amateur (Sound) Licences A or B, and will also include operation from a vehicle, or vessel other than at sea, or as a pedestrian; facsimile, amateur television, slow scan television, data on amateur bands 144-146 MHz and above, as well as double sideband suppressed carrier operation will also be included; and Emergency County Planning Officers will be added to the categories able to call upon Raynet (emergency communications).

The purposes of the new-style licences are:

(1) to give more flexibility to British radio amateurs, so that they may pursue their hobby without having to make special application for several of the above facilities at present needing separate licences or authorities;

(2) to enable the Home Office to deal with the increase in applications for amateur licences and regulatory work over the next few years with the minimum of delay.

Existing facilities authorised by a total of 20 licences and special authorities will thus be contained (with a few exceptions) in the new Amateur Licence A or B; and for Aliens combined fixed and mobile facilities in the Amateur Licence C or D. The new fee for all UK amateur licences will be £5·50.

MOBILE RALLY SEASON—1977

The following lists details of events received so far. **April 3,** White Rose Rally, Lawnswood School, Leeds, junction A660/A6110, opening noon, with talk-ins on two-metres FM by G8LVQ on S22, and on eighty-metres SSB by G3XEP on 3·7 MHz, free parking, Trade stands etc. **April 17,** North Midlands Mobile Radio Rally, Drayton Manor Park, nr. Tamworth, Staffs., talk-ins on two-metres, seventy-centimetres and 160-metres, all usual events. **May 1,** Spalding Tulip-Time Rally, Gleed Boys School, Halmer Gardens, Spalding. **May 22,** Barry College of Further Education Radio Society, Barry Rugby Football Ground, Merthyr Dyfan Road, Barry, talk-in on two-metres by GW3VKL on S20 and *via* GB3BC on R6, Trade stands, bar, etc. **July 10,** Upton Radio Rally, Hill High School, Upton-on-Severn. **July 24,** Anglian Mobile Rally, Stanway School, Colchester.

We would be glad to have reports and pictures covering these events—address to Editor, "Mobile Scene" Short Wave Magazine, 34 High Street, Welwyn, Herts. AL6 9EQ—also details of other Rally events.

April issue will appear on Friday, March 25th.

NOTES ON POWER SUPPLY DESIGN USING THREE TERMINAL REGULATORS

P. BURNETT (G4BLL)

MOST readers will, by now, have noticed the Three Terminal Integrated Circuit Voltage Regulators making their appearance in low voltage (0-24v. positive and negative) power supplies. They simplify considerably the task of obtaining a well regulated output voltage (or current) and replace the many discrete components which would otherwise be required.

The range of regulators to be discussed will give maximum output currents (Io) of 100mA. to 3 amps at the specified output voltage (Vo) and are available in a variety of packages from small signal transistor TO39 or TO92, 14-pin DIP, TO220 (flat plastic), to the familiar TO3 power transistor package.

The future trend in voltage regulation is towards the use of several of these low current fixed voltage devices placed strategically throughout the circuit eg. one device per card (p.c. board). This method exhibits the following advantages:

(*1*) Smaller packages possible.
(*2*) Little or no heat sinking required.
(*3*) Elimination of bulky high power regulators or the equivalent circuit using discrete components.
(*4*) Elimination of common impedance paths and associated by passing or decoupling capacitors.
(*5*) Elimination of voltage drops due to connectors and long interconnecting leads.

The basic three terminal regulator circuit is shown in fig. 1, the stabilising capacitor C2 is only required if the regulator is located more than two inches from the filter capacitor C1. C2 may be a 0·22 μF disc ceramic (not easy to obtain) or 2·2 μF (or larger) solid tantalum or 22 μF (or larger) aluminium electrolytic. The difference in values necessary is due to the higher effective series resistance exhibited by each type of capacitor. C3 is added to give improved transient response and ripple rejection but is mandatory in certain cases to ensure stable operation.

The design of a supply giving the following outputs will be discussed:

$\pm$ 12 volts at 600mA. (Up to a max. 1 amp.)
$\pm$ 5 volts at 2½ amps. (Up to a max. 3 amps.)

as these are the voltages commonly required for analogue and digital IC devices, but the same design criteria can be adapted for any other voltage required; eg, the writer also required an output of —8 volts at 500mA to feed the input line buffers (AM2521) of a slow to fast scan converter.

The initial step is to determine the type of regulator and package to use. In the case of the $\pm$ 5volt supply the choice was simple as there is (at the time of writing) only one range generally available which will give these voltages at the required current and they are the LM323 3 amp 5 volt positive and LM345 3 amp 5 volt negative regulators in the TO3 package. For the sake of uniformity

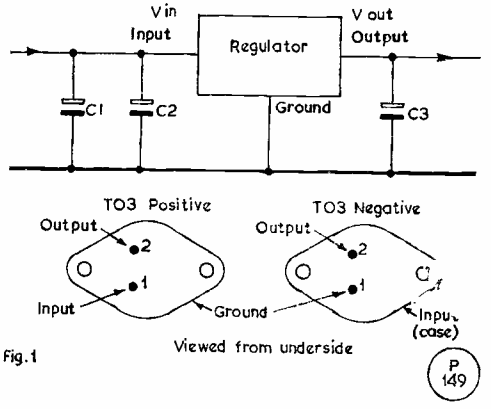


Fig.1

External circuit with TO3 base connections for regulutor.

the TO3 package was also chosen for the $\pm$ 12 volt supplies (LM340K 1 amp 12 volt positive and LM320K 1 amp 12 volt negative) and the —8 volt supply (LM320-8 1 amp 8 volt negative) although the TO220 flat plastic package also giving one amp output could have been used. The TO3 positive regulators may be bolted direct to the heat sink as the case is grounded. The negative regulators require to be insulated as the case now forms the input terminal. To ensure maximum heat dissipation use silicon grease between the making surfaces of the regulator, mica washer and heat sink. It was also found that the negative regulators required a 4·7 μF solid tantalum capacitor across the output to ensure stable operation.

The next step is to determine the type and size of heat sink to employ to maintain the junction temperature (Tj) of the device below the specified maximum. Under short circuit conditions the internal thermal protection circuits will limit the junction temperature but extended operation under these conditions could adversly affect the reliability of operation. In general, use a heat sink with a thermal resistance of at least 4·7°C/watt unless the regulator is being run well within its capabilities when a large heat sink will not be required.

We can now determine the input voltage (Vin) requirements and whether half wave, full wave or bridge rectification is to be employed. Normally the nominal input voltage to the regulator is between two to fifteen volts higher than Vo. However, these devices should not be operated close to the "dropout voltage" (the difference between the input and output voltages at which regulation will not be maintained for any further reduction in input voltage) as the ripple on the filter output may cause the regulator input voltage to drop below the threshold value. Neither should an input voltage close to maximum be used as the maximum available output current will not be realised. As a practical guide Table I gives the "preferred" transformer output voltages. They are readily available from standard transformers.

It is not proposed to consider the use of half wave rectification as this gives poor transformer utilisation,

high ripple and a high value filter capacitor requirement (approximately four times higher than the value required for full wave circuits). Also integrally packaged bridge rectifiers are available in a wide range of voltages (piv) and currents and at quite modest prices.

Neither is it necessary to use a choke input filter circuit as the family of regulators under discussion will cope adequately with the ripple output from a capacitor filter circuit. To keep ripple to an absolute minimum use a high value electrolytic 5000 μF to 15,000 μF allowing for a commercial tolerance of —50%. Also note that the case may not be isolated from the negative terminal and in negative supplies the capacitor will need to be insulated from the chassis mounting. The final circuit is shown in Fig. 2.)

It is sincerely hoped that readers will have found this short discussion of interest, the use of formula has been "deliberately avoided" but those who wish to probe deeper into the subject and to prove the values given or determine the parameters for themselves are referred to a booklet entitled "Voltage Regulator Handbook" published by National Semiconductors.

Table 1

Vo	Transformer Vsec.
12v.	15v. or 17v.
8v.	12v.
5v.	9v.

Table of Values

Fig. 2. Circuit of Power Supply

Capacitors

C1, C2 = 0·01μF 1000v. DC wkg.
C3, C4 = 15000 μF 16v. DC wkg. (High Ripple Rating)
C5, C6 = 2·2 μF 40v. DC wkg. (Solid Tant.)
C7 = 0·01 μF disc ceramic
C8 = 4·7 μF 40v. DC wkg. (Solid Tant.)

Regulators

Reg. 1 = LM323K (+5v. 3 amp)
Reg. 2 = LM345K (—5v. 3 amp)

Miscellaneous

Rect. 1 = 100 p.i.v. 10 amp
T1 = 9v-0-9v 50VA per section
S1 = D.P.S.T. 250v.

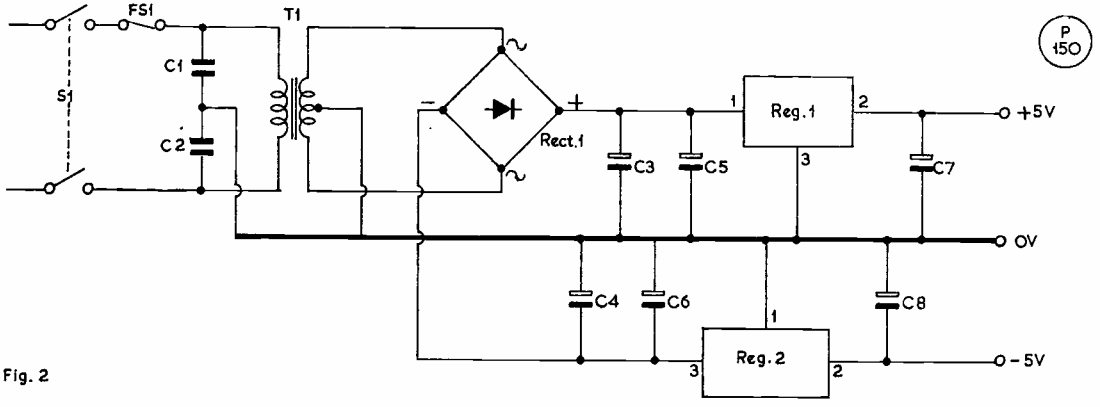


Fig. 2

Circuit for the 5-volt supplies; the same is equally applicable to the 12v. and 8v. supplies, utilizing the appropriate transformer, bridge rectifier and regulators.

PHOTOGRAPHS ALWAYS WANTED

Readers are reminded that we are always glad to have good photographs of Amateur Radio interest for general illustration in SHORT WAVE MAGAZINE. Though colour prints can sometimes be satisfactorily reproduced black-and-white, we much prefer the latter in the original. Except that we cannot conveniently make use of photographs that are either very small or very large, size is not of great importance as this is in any case determined to our requirements in the block-making process. What *is* important is that the picture should be clear and sharp with fully descriptive notes—and this description should *not* be written on the back of the print itself, but on a separate piece of paper lightly attached to the photograph. Payment is made for all pictures used, immediately on publication.

Send to: Editorial Dept., SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ

BEGINNER'S GUIDE TO OSCAR

N. A. S. FITCH (G3FPK)

ATTITUDES to the amateur satellite programme vary from those of the devotees, who seldom use any other mode, to those of the fraternity who declare that *any* artificial aid to communication is cheating and is to be deplored. In between there are those, like the author, who enjoy the challenge of communicating through orbiting transponders from time to time, especially when UHF/VHF conditions are flat, and those who are keen to "have a go" but who do not know how to get started. This article is intended for this last group. Brief History.

Oscar 1, the first Orbiting Satellite Carrying Amateur Radio, was launched on December 12, 1961 and lasted 20 days. Its 1000 milliwatt transmitter on 144·98 MHz ground out "Hi" in morse. *Oscar 2* lasted 18 days after its launch on June 2, 1962 and consisted of another "Hi" beacon on 144·99 MHz. The first amateur communication satellite was *Oscar 3* which was launched on March 9, 1965. It lasted 15 days, receiving signals on 144·1 MHz, relaying them on 145·9 MHz but was only partially successful. *Oscar 4* was put into orbit on December 21, 1965 and lasted three months. It received signals on 144·1 MHz, relaying them on 431·938 MHz but was not very successful, either. The *Australis Oscar 5* was launched on January 23, 1970 and was the first amateur satellite to be ground controlled. It lasted two months but only carried beacons on 144·05 and 29·45 MHz.

What is an Oscar?

Oscar 6 and *Oscar 7* are the two active amateur satellites currently operational and they orbit the Earth near enough every 115 minutes at a height of approximately 1470 kms. They consist of small packages containing solar panels, batteries, receivers and transmitters with appropriate aerials. The batteries are charged *via* the solar cells each time the satellites come into sunlight. They receive signals in part of one amateur band and re-transmit them in part of another. Unlike single frequency, terrestrial repeaters, they will transpose linearly any type of narrow band signal, such as CW, SSB, TRRY, SS/TV, NBFM and AM, although the first four are recommended. Oscar 6 and 7 can be fully commanded from several ground stations.

Where to Listen

Both satellites can be heard in the 10 metre band, *Oscar 6* between 29·45 and 29·55 MHz, *Oscar 7* from 29·40 to 29·50 MHz. *Oscar 7* can also be received in the 2 metre band between 145·925 and 145·975 MHz. The majority of signals heard will be CW and SSB but there is a little RTTY and SS/TV activity. Both satellites continuously transmit telemetry in the form of code groups on CW plus RTTY on *Oscar 7*. More of this later.

Orbit Information

The simplest way to understand *Oscar* orbits is to imagine you are out in space observing the Earth, rotating on its axis from west to east, with the north pole at the top as in Figure 1. If you could detect an object as small as a satellite, you would see it coming from behind the Earth, over the Antarctic region proceeding northwards, passing the equator then disappearing over the north polar region. This part of the orbit is known as *the ascending node*. The remaining half of the orbit, when the satellite travels from north to south, is called *the descending node*.

You would have noticed that the orbit is tilted anticlockwise or is *retrograde* in space parlance. The satellites never go right over the poles and the most northerly or southerly latitude *Oscar 6* would reach is 78°-24′. For *Oscar 7* it is 78°-18′. In round figures, an orbit of either satellite takes 115 minutes during which time the Earth will have rotated eastwards by 28¾ degrees. (The Earth rotates one quarter of a degree per minute.)

An orbit commences when a satellite crosses the equator travelling north and all orbit predictions relate to this time in Universal Clock Time (UCT) and the degrees west of the Greenwich meridian where it occurs. This method of stating longitude often confuses the uninitiated more used to degrees east and west of Greenwich, but it is really quite simple. Up to 180°W there is no problem. After that, 230°W is equivalent to 130°E; 305°W to 55°E and so on.

Where to get Orbit Details

The orbits of *Oscar 6* and *7* are highly stable so it is possible to issue accurate predictions of the times of equatorial crossings and corresponding longitudes of every orbit for a year ahead. Probably the best known of these predictions is the W6PAJ Claendar which is available through AMSAT-UK. (Ref. 1). Alternatively, prodictions for the week ahead can be obtained from the Sunday news bulletins over GB2RS, from the 80 metre AMSAT net at 1015 local time on 3780 kHz or from the London area VHF net on 144·28 MHz at 1930 local time, both on Sundays.

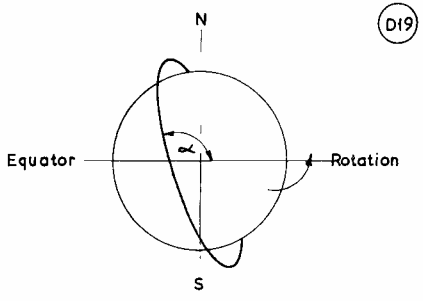
The first orbit of the day is called *the reference orbit* and will obviously occur in the first 115 minutes of the day. These are always out of range of the U.K. The data given in Table 1 will enable future orbits to be calculated with great accuracy, given any reference orbit information. For daily use, it is quite accurate enough to add multiples of 115 minutes and 28¾° to the reference orbit to derive data for each orbit subsequently within range.

How to Use the Predictions

Having looked up or calculated the basic data for an orbit, they have to be turned into beam headings, aquisition of signal (AOS) and loss of signal (LOS) times for your particular location. Numerous ingenious ways of deriving such information have been published. (Refs. 2 & 3).

The Receiving System

The reception of the 10 metre signals relayed by *Oscar 6* and *7* differs from normal reception from distant ground stations in that it is basically line of sight. Furthermore, it is likely that only a few *milliwatts* is being radiated by the satellite per station. The performance of many amateur band LF/HF receivers and transceivers falls off in the 10 metre band, particularly at the high end. Consequently, a simple preamplifier to provide 10-20



α is the angle of inclination

Fig.1 OSCAR ORBIT VIEWED FROM SPACE

dB gain will bring about a dramatic improvement in reception. A circuit successfully used by the author is shown in Figure 2. The components are mounted along a short strip of five tracks of *Veroboard* with the toroidal coils mounted at either end at right angles to each other. As most dual gate MOSFET devices tend to oscillate at UHF, the ferrite bead over Gate 2 lead should nst be omitted.

A simple dipole or ground plane aerial will enable good signals to be heard from the nearer passes but for serious "DX" work at horizon distances, a low angle beam of some kind should be considered, mounted in the clear above the local noise blanket. Simple and compact beams with good gain for their size are the *HB9CV* and *ZL-Special* designs. A compressed version of the latter was described in Reference 4; it measured only 3·58 x 1·07 metres overall. To cope with the nearly overhead passes, a fixed dipole running east-west is sufficient since the satellites will be travelling north-south south-or north on such orbits.

Most VHF operators will have some kind of beam for the 2 metre band, consequently, reception of the downlink signals from *Oscar 7* on mode "B" should be quite good provided the beam is correctly aimed. Again, for high passes, a dipole or crossed dipoles mounted above a ground plane give good results.

The Transmitting System

Dealing first with *Oscar 6* and *Oscar 7*, mode "A" the *maximum* e.r.p's at 3200 kms. slant range are 80 and 100 watts respectively. This means that a 150 DC input CW transmitter or an SSB TX using a QQV06-40A PA stage at 200 watts p.e.p. input should be quite sufficient just feeding crossed dipoles. However, it has been frequently proved quite possible to "get in" with less than one watt to a dipole, *provided* everyone keeps to QRP. The author has found that, when beaming west and northwest towards the U.S.A. at weekends, when usage is highest, 20-25 watts into a 10 element Yagi is more than adequate at extreme range in normal conditions.

To eliminate the need for tracking, it is better to run high power to dipoles than lower power to a beam. In any case, for optimum results, a beam should be capable of being elevated but this is often not practical due to the extra expense and mechanical limitations. However, generating high power costs more money and the gear take up more space so one must decide which route to take.

TABLE 1

SATELLITE PARAMETERS

Satellite	Oscar 6	Oscar 7
Period (mins.)	114·99441	114·94513
Longitude progression per orbit	28·75015°W	28·73707°W
Retrograde inclination	101·6015°	101·7010°

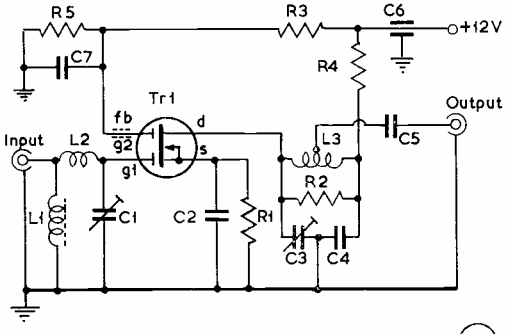


Fig.2 29MHz PREAMPLIFIER D20

Table of Values

C1, C3	= 20μμF trimmer	R2	= 2,200 ohms
C2, C4,		R3	= 100,000 ohms
C5, C7	= ·01 μF disc	R4	= 120 ohms
C6	= ·001μF feed through	R5	= 47,000 ohms
		Tr1	= 40673
R1	= 150 ohms	FB	= Ferrite bead

TABLE OF COIL DATA

L1 = 22μH RF Choke.
L2 = 22 turns 24g. enamelled on iron powder toroid T50-6.
L3 = 19 turns 24g. enam on T50-6 core tapped 6 turns from "cold" end.

Secondly, dealing with *Oscar 7*, mode "B," a 70 cm. TX is required and the recommended *maximum* e.r.p. at 3200 kms. slant range is 100 watts. Here again though, experience has shown that the spacecraft's receiver is sensitive enough to pick up and retransmit very low power signals, *provided* the QRO merchants keep off. Most amateurs who use mode "B" will have gear for 2 metres and 70 cms. already, including rotatable beams for both bands on one mast. Such a set up is ideal for satellite communication over the longer distances when the elevation is low, expecially if crossed Yagis are used enabling different polarisations to be selected for best results. For reliable communication *via* the overhead passes, dipoles for transmission and reception are convenient.

Polarisation

The aerial polarisations for *Oscar 7* are given in Table 2. Satisfactory results will be obtained with linear polarisation but fading will be more trouble-some at times.

TABLE 2

AERIAL POLARISATIONS — OSCAR 7

System	Polarisation
2/10m. repeater uplink	Left hand circular
2/10m. repeater downlink	Linear
70cm./2m. repeater uplink	Right hand circular
70cm./2m. repeater downlink	Right hand circular
435·1 MHz beacon	Left hand circular
2304·1 MHz beacon	Right hand circular

N.B. These polarisations are for the northern hemisphere only.

Band Plans

As with other amateur allocations, there are band plans for the orderly use of the space sections of the 2 and 10 metre down link bands and these are shown in Table 3.

TABLE 3

SATELLITE BAND PLANS

Satellite	Band (MHz)	Modes
Oscar 6	29·450 — 29·510	SSB
	29·490 — 29·550	CW
Oscar 7 Mode "A"	29·400 — 29·445	SSB, RTTY, SS/TV
	29·445 — 29·455	All modes
	29·455 — 29·495*	CW only
Oscar 7 Mode "B"	145·925 — 145·950	SSB
	145·945 — 145·955	All modes
	145·955 — 145·975	CW

* The top 5 kHz should not be used but kept as a guard band for the beacon on 29·502 MHz.

Range of Communication

For a station at sea level in the British Isles, the horizon distance to the satellites is about 4550 kms. equivalent to a ground distance of 3950 kms. It follows that the maximum ground range is twice the latter, or 7900 kms. However, this range can be exceeded considerably when there is anomalous propagation on the 2 metre, 70 cm. and/or 10 metre bands. For example, a tropospheric duct will enable a VHF or UHF signal to be received by the satellites when they are below your horizon. For instance, G3IOR has worked W6CG over a ground distance of 9570 kms. The normal 7900 kms. distance brings within range of London such places as Salt Lake City and Seattle in the U.S.A. Lusaka in Africa, St. Helena in the South Atlantic and Goa and Lhasa in Asia.

Telemetry and Codestore

It is hoped that the foregoing will have enables a newcomer to amateur satellite communication to understand the subject sufficiently to at least calculate when and where to listen for *Oscar 6* and *7*. Short wave listeners will be able to hear many countries *via* satellite and it is interesting to copy down the telemetry or TLM sent down continuously on the beacon frequencies.

The CW TLM consists of 24 three-figure groups which, when decoded (Ref. 5) give details of such parameters as battery voltage, current and temperature, the power output of the transponders, etc. The TLM is an essential feature of the satellites as it enables the ground control stations to take appropriate action if excessive battery current is being drawn or the PA stage of the TX is getting overheated, for example.

On *Oscar 6*, the TLM is on 29·45 MHz the CW only code groups being transmitted at either 10 or 20 w.p.m. On *Oscar 7* mode "A" the beacon is on 29·502 MHz and on mode "B," 145·972 MHz and it is sometimes transmitted on RTTY on which it transmits 60 channels of information. On certain occasions the TLM is not transmitted but instead, messages are loaded into the beacon TX from ground command stations and radiated from the satellites. Such "Codestore" messages have included Christmas, New Year and Birthday greetings and urgent instructions to other ground command stations and users.

Special report forms for TLM reception are available from AMSAT-USA (Ref. 6) and records of the TLM are of great use to the organisation as they give valuable clues to any odd behaviour, such as erratic mode switching on *Oscar 7*.

Practical Communication

Undoubtedly the most common misuse of the satellites is the use of far too much power. Particularly on the 2/10 metre modes, this seems to be due to rather inferior receiving systems employed by some operators. This causes these stations to run a lot of power before they can find their own signal. The downlink sensitivity required is 0·1 microvolt for 5 dB over the noise and this will enable weak signals to be heard.

There are few amateurs fortunate enough not to be troubles with RF interference from switched mode power supplies and line timebase oscillators in TV sets, faulty domestic thermostats and sundry industrial and other "funny noises." Much of this interference can be dealt with by a good noise *blanker* as opposed to a noise limiter. Circuits worthy of consideration are noted in References 7 and 8 if your receiver is deficient in this respect.

To illustrate how to communicate through an amateur satellite, let us take a step-by-step example for *Oscar 7* in mode "A."

(1) From the W6PAJ calendar or other publication of broadcast data, check when a convenient orbit will occur.

(2) Tune up your 2 metre TX in the 145·85-146·95 MHz segment before the calculated AOS time.

(3) If your transmit and/or receive aerials are rotatable point them in the direction from whence the satellite will come over the horizon.

(4) Set up your receiver to cover the 29·4-29·5 MHz part of the 10 metre band and make sure the RX is *not* muted when the TX is on.

(5) Next, listen for the TLM which is nominally on 29·502 MHz. However, remember that the satellite is travelling towards you at an orbital velocity of about 4½ miles per *second*, causing a Doppler shift upwards in frequency of up to 700 Hz.

(6) Having established that the satellite is within range and functioning, you should hear a number of mainly SSB and CW signals as you tune across the band 29·4-29·5 MHz so the next goal is to find out if your signal is being received by the satellite. Whet you must *not* do is to transmit a powerful carrier, swishing your VFO across 2 metres trying to hear yourself. This is very anti-social and unfortunately all too prevalent.

You can quickly calculate where your signal ought to be within a few kilohertz on 10 metres. For example, if you transmit on 145·900 MHz, right in the middle of the uplink band, your 10 metre signal would be near the middle of the downlink band, i.e. 29·450 MHz. Similarly, a signal on 145·925 MHz would be found near 29·475 MHz. Figure 3(a) should make this relationship clear. Again, due to the Doppler effect, you should tune up to 4 to 5 kHz higher, if the satellite is approaching, or lower if it is receding from you.

(7) If you put out a "CQ" call, monitoring your own signal on 10 metres, be prepared for someone breaking in; that's the beauty of satellite working, it is the ultimate in break-in operation. Some CW stations are crystal controlled so you should tune around in case anyone is answering elsewhere in the band. Once contact is established, a QSO would proceed in the usual way.

(8) If you generate the required e.r.p. by a low power TX feeding a gainy beam, do not forget in your initial enthusiasm to turn the aerial from time to time. A convenient approach is to turn the array in increements equal to the half power beamwidth, say 45° for an 8 element Yagi. At extreme range, accurate aiming is important.

Oscar 7 Mode "B"

So much for a mode "A." For mode "B" you must be able to transmit between 432·125 and 432·175 MHz, reception being nominally 145·975—145·925 MHz. To minimise the Doppler shift, which gets more pronounced as the frequencies increase, the spacecraft's downlink band is *inverted*. This means that if you *increase* your 70 cm. transmit frequency by 10 kHz, your received frequency on 2 metres will *decrease* by the same amount. Figure 3(b) should make this clearer. Furthermore, this inversion means that an upper sideband signal on 70 cm. will become a lower sideband signal on 2 metres. Apart from these points, the procedure for mode "B" operation is very similar to that for mode "A" except that Doppler shifts will be much more pronounced.

Funding the Satellite Programme

As with terrestrial repeaters, the orbiting repeaters have to be designed, built, tested, launched and subsequently controlled from ground command stations. All this takes a great deal of time and money. It is only right that those who regularly use amateur satellites should contribute something towards the programme. Membership of AMSAT-UK is open to anyone. There is a minimum subscription of £3·00 for the 1977 year but extra donations are always welcomed. "Oscar News" is the publication which keeps members in touch concerning past achievements, present activities and future plans. The secretary's particulars are given in reference 9.

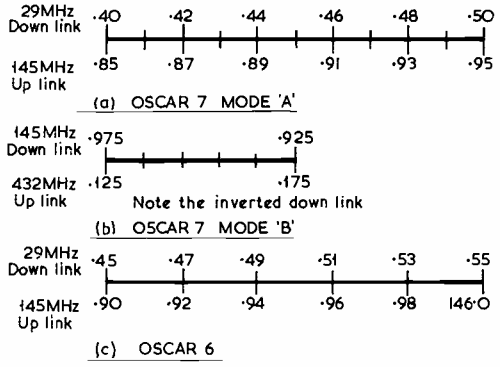


Fig.3. Relationship between Up link and Down link Bands for OSCAR 6 and OSCAR 7. See text concerning effects of Doppler shift

(D21)

Conclusions

It is hoped that this article will have persuaded those who have been thinking about satellite operation for some time to take the plunge. It really isn't all that mysterious or complicated. As to the future, *Oscar 8* is due for launch later this year and will carry another 145/29 MHz transponder—like *Oscar 6*—and a 145/435 MHz one for the first time. In late 1979, it is planned to launch the most ambitious amateur satellite yet into a highly elliptical orbit enabling far greater ranges to be achieved. Progress on these projects will be covered in our "VHF Bands" feature.

References

1. "1977 Orbital Predictions for Amsat-Oscar 6 and Amsat-Oscar 7" by W6PAJ. Available from AMSAT-UK price £1·50 to members, £3·00 to non-members of AMSAT from Pat Gowen, 17 Heath Crescent, Hellesdon, Norwich, NR6 6XD. Send large s.a.e. with 11½p stamp.
2. "Keeping Track of Oscar, Part 4" by Browning. Radio Communication, April, 1972, pp. 212-215.
3. "Oscar, Where Art Thou?" by Fitch. Short Wave Magazine, May, 1976, pp. 160-161.
4. "ZL-Special Compressed for 10m." Short Wave Magazine September, 1972, pp. 412-413.
5. Telemetry decoding formulae are given in the W6PAJ calendar.
6. AMSAT-USA, P.O. Box 27, Washington, DC, 20044, U.S.A.
7. "Valve type Noise Blanker for use at 29 MHz." ARRL, "Radio Amateur's VHF Manual," 3rd edition, pp. 63-64.
8. "Solid State Noise Blanker" by K4DHC. Ham Radio" February, 1973, pp. 38-41.
9. Current Operating Schedules: 0-6—Mondays, Thursdays and Saturdays, *ascending* orbits and Sunday morning *descending* orbits; 0-7—Mode "A" on *odd* days of the Julian calendar, Mode "B" on *even* days. Wednesdays reserved for special experiments sanctioned by AMSAT-USA.

• • • SWL • • •

SHORT WAVE LISTENER FEATURE

By *Justin Cooper*

THIS time round your conductor has a heavy heart indeed, as have all of us who have a direct working connection with the Magazine. Quite apart from the void in terms of the Amateur Radio scene, we are all finding out as we continue our various tasks just how fine an organiser G6FO was—G3KFE and the writer had, over the years, got to the state where a phone call every three months was about all the contact needed, the rest being catered for in the course of writing a covering letter and posting the copy; G6FO was a real *professional* in every sense of the word. Perhaps the only thing that could upset him was to see anything disorganised, whether a group or an individual.

However, the show must go on, and we now turn to the letters; and here of course we are somewhat light on mail, possibly due to late arrival of some January copies which seem to have dropped into a void for several days in a manner as yet unexplained. All we *can* say is that they were due to be out on January 7, and in fact we at this end were a week late on that, which was a reflection of the sudden action-stations call once we realised we had a problem; so that hang-up between printer delivering and newsagents receiving was a double disaster. However, with fingers duly crossed, your scribe can say that as he writes this, a copy of the February issue is at his side just as though everything were normal, it being due to arrive in this morning's post, and the intention is most definitely that this is the way we are going to continue.

Last couple of times, we have muttered on about the receiver, and detailed some at least of the important points; and on re-reading these, we begin to imagine that we could well be putting lots of potential SWL's right off at the thought of the price they would have to pay for a receiver. But, it's not quite like that, really. The most important component is the bit between the headphones, and the little grey computer inside, which marshals all our resources into the exercise of turning the electrical signals on the aerial into letters written in the log or on the scratch-pad which have meaning. Many moons ago, we were thinking, the Editor and your J.C., that some sort of series could be worked up, based on an imaginary new chum and his adventures between the start and the time of his first QSO as a licensed amateur. One of the results of this exercise was the purchase of a CR70, which when all is said and done is a pretty basic sort of receiver—and it is quite amazing how many prefixes have been picked out on this little box, which we switch on every so often, just to remind ourselves how lucky we are to be able to use first class gear all the times we want to. And, we contend, it's the finest way to start—struggle with a simple, basic, home-brew receiver using transistors or valves until you can firstly get the best performance out of it, and secondly use its performance in the manner calculated to get the best results. And, we would add a rider to the effect that if you have the wish to keep your skills at an absolute peak, never fail to keep a simple receiver in the shack and at regular intervals use it; also, *whether you like the mode or not*, listen to the CW ends of the bands. The object of this last is not to try and make you like CW if you don't, but to sharpen up your realisation of the mental processes involved in copying a signal through heavy QRM. Watch a skilled CW operator adjust his beat note within the narrow pass band, such that, for example, in QRM, he will often so adjust the BFO that the beat note is very low in frequency; he may not realise this but what he thus does is to increase the percentage difference between the wanted and unwanted signal; consider two beat notes, one at 850 Hz unwanted, t'other at 800 Hz and rare DX you've been waiting for for years. None to easy with the simple receiver, or the expensive one for that matter, to copy the wanted one and neglect the unwanted. However, take the beat note down as low as the speaker or phones will stand; at 50 Hz beat note for the wanted one, the QRM signal has become 100 Hz, and instead of a few per cent difference in the beat notes there is now a 2:1 difference, which makes the copy as easy as pie. The same *sort* of tricks are as applicable to SSB as CW operators and SWL's, though of course the precise how and why is not quite so obvious; for example one recalls years ago logging for an old fellow in one of the contests; there was a terrible heterodyne whistle on one signal, which made it all but uncopiable to J.C., while the old chap not only worked him but then took on a string of others, while on the same frequency and with the same QRM—and it was a long time before we realised that the only difference between our reception was simply *age*—the whistle annoying the writer was quite inaudible to the Old-Timer, because his ears just did not respond that high in frequency!

New Chums

S. Hammond (Solihull) has managed to become one of the gang who mistake *prefixes* for *callsigns*, so we are sure he won't mind if we take this opportunity to explain the make-up of an amateur radio callsign. Consider the G stations; say, G3SWM. In this case the callsign and the prefix are a little mixed, insofar as the prefix is G3, and the callsign 3SWM; but that's the way it is wherever you have more than one possible number in the middle of a complete callsign, such as G3AAA and G4AAA. The number may also be an indication of location, as for example in Russia and America; W1AAA will be up in the Maine/Connecticut neck of the woods, but W6AAA would be in California. What it boils down to is that you must collect one G3, one G4, one GM3, one GM4, and so on, until you have a total of 200, or 500, depending on which Table you are entering. And it you think it's hard, let us just say that a good week-end at the receiver will net the required 200 and probably show representatives of all six continents!

Another one with doubts was *J. Grice (Castleford)*

who took the trouble to write in and offer a proposed log layout for comment; and about all we can say is that if *everyone* submitted logs as neatly as readers Hammond and Grice, old J.C. would be in Paradise!

A. Dimmick (*Glasgow*) is a lucky chap with a father taking the R.A.E. after a career as a ships Radio Officer; which explains why at 15 years old, Alan can copy CW with the best, although he has concentrated on listening to SSB with the shack KW2000B.

Now to *Banbury*, where *S. W. Allsopp* resides; the interest first started back in 1962, when Stuart was about ten years old. By twelve, he had his own receiver, a Murphy "all-band" BC set with which he discovered 7 and 14 MHz, and later, with accumulating technical know-how tweaked the medium wave down to Top Band. When this box gave out, there was a gap for a couple of years before an AR88D became the shack pride-and-joy, which added Eighty, Fifteen and Ten to the scene. However, that had in its turn to go, after which there was a hiatus of umpteen years, marriage, house-buying (and doubtless the paint-pots which always seem to accompany houses!), in which the interest was sustained by seeing the odd copy of the Magazine; last November there was an 888A going in the Small-Ads, in Banbury, and in need of a good new master—enough said! So far, it has produced lots of interesting signals from around the world, and the next step is to replace the present bit of wire by a properly organised dipole.

HPX LADDER

(*All-Time Post War*)

SWL	PREFIXES
PHONE ONLY	
K. Kyezor (Irchester)	1687
W. Bingham (Carrickfergus)	1621
S. Foster (Lincoln)	1596
R. Shilvock (Kingswinford)	1552
R. Carter (Blackburn)	1431
J. Fitzgerald (Gt. Missenden)	1412
B. Hughes (Worcester)	1382
M. J. Quinton (Wotton-under-Edge)	1314
P. C. Jane (East Looe)	1313
K. A. Whiteley (Castleford)	1297
A. W. Nielson (Glasgow)	1217
M. Cuckoo (Herne Bay)	1214
H. A. Londesborough (Swanland)	1177
J. H. Sparkes (Trowbridge)	1073
E. W. Robinson (Bury St. Edmunds)	1052
Mrs. J. B. Jane (East Looe)	1028
M. C.P. Bennett (Darchet)	1024
H. M. Graham (Harefield)	937
P. Barker (Sunderland)	917
M. Rodgers (Harwood)	847

SWL	PREFIXES
PHONE ONLY	
G. F. Gullis (Ogbourne St. George)	847
W. H. Symth (Hartlepool)	840
B. T. Mackness (Dagenham)	816
C. K. Verstage (Old Basing)	800
L. Gibson (Barrow-in-Furness)	741
P. Rooney (Liverpool)	725
D. Taylor (Harborne)	714
S. Budd (Worthing)	714
J. Aspinall (Leeds)	661
M. Gibson (Barrow-in-Furness)	631
M. Law (Chesterfield)	605
S. T. Bowen (Kippax)	545
CW ONLY	
A. Glass (Plymouth)	1240
N. A. Phelps (Devizes)	1258
H. A. Londesborough (Swanland)	969
A. F. Roberts (Kidderminster)	465
T. Grimbleby (Hull)	400

Minimum starting entry 500 for Phone, 200 for CW. Listings in accordance with HPX Rules and only include recent claims.

P. Ramsay (*Stevenston, Ayrshire*) is another one in a bit of a twist over the HPX rules, he having sent in a starter with but 73 prefixes on it, heard on 3·5 and 7 MHz phone. That leaves quite a way to go for the magic 200 which gets you into the listings, but it will no doubt come given time; meanwhile Peter is hunting round for all the American States; the aerial is a helical vertical, all-same G3KHC's article in the January issue.

R. Montgomery (*Lisburn, Co. Antrim*) reports on an opening he noticed on *Ten* from 1300 to 1435z on December 19 1976. The "starting-gun" was to hear GW4BLE breaking in on the Seventycems converter, after which gentle hint the Elan beam was turned South, the 28 MHz band properly tuned, and all Europe and down into North Africa heard; it is interesting to note that the beam heading for *all* the stuff heard was South, even though, for example, UA6 was among the loggings.

Help!

W. Morrison (*South Belmont, Ayr*) has an R1392 plus the N234 PSU, plus the Handbook for the rather similar P. 104. However, they lack the vital cable between the receiver and the PSU, and details of the crystals needed. J.C. has written to reply, recommending joining the local club; but if anyone has the know-how to help reader Morrison get on the air, it would be much appreciated—contact them direct at 35 Burnbank, South Belmont, Ayr.

Other Reports

As we have already commented, thin on the ground through so many probably not "getting their reminder" for this piece due to the problems already discussed. *A. Gascoigne* (*Hitchin*) had a few queries on the HPX List, which we have resolved; his station comprises SMC-73, Veritone CR-150, and a Pye T190, with a couple of end-fed wires to pick up the signals.

J. Aspinall (*Leeds*) didn't get any takers to the request for "gen" on his SX-17, so he has lashed out on a Trio R-300; no doubt when he has had it a little longer, Joe will indicate how the two receivers seem to compare.

Another taciturn type is *D. Taylor* (*Harborne*) who confines himself to a very neatly-written list, which is largely bumped up by the current crop of assorted IK prefixes.

One of the both-modes merchants is *H. A. Londesborough* (*Swanland*) who is over the "ton" on Phone and all but at the same level on CW.

And, talking of CW, *N. A. Phelps* (*Devizes*) who has knocked one off his claimed score—presumably a logging mishap. However, OM Phelps has J.C. with all his sails flat aback over "GJ3DVC." It *must* be a typing error for certain, but, of course, Murphy's Law says that the 1977 Call Book doesn't have any answers to the puzzle, for nothing in the G?3DVC line was there to be seen, while the earlier edition had already been consigned to the WPB. So—until next time, J.C. will have to exercise his soul in patience!

M. Gibson (*Barrow-in-Furness*) is one of the taciturn types—just a list of new prefixes heard—and, like so many others, quite a proportion of his new crop were IK's, Italian stations celebrating fifty years life of their nations Society, ARI.

Taciturnity is also a characteristic of *R. Shilvock* (*Kingswinford*); his list, though is of interest in that when first your J.C. took over this piece, it was the custom to "retire" at 1000 prefixes. Now of course, there are several stations over the 1500 mark on SSB, and several over the thousand mark on CW. Additionally it is interesting to note that ten years ago the total of 'possibles" was around the 1400 prefixes mark, but now the number is far higher, probably nearer two

ANNUAL HPX LADDER

(Starting date January 1, 1976)

SWL	PREFIXES	SWL	PREFIXES
G. Ridgeway (Ardleigh)	499	R. R. Williams (Borehamwood)	350
D. W. Waddell (Herne Bay)	443	R. Ramsey (Stevenston)	312
L. West (Langley)	414	P. Polanyk (Coventry)	300
P. Wells (Colne)	403	A. Dimmick (Glasgow)	220

Starting score 200, in accordance with HPX Rules. Table closed December 31, 1976, new Table starts January 1, 1977. Both 1976 and 1977 lists will be shown in May "SWL."

thousand. Times change!

M. Rodgers (*Harwood*) has been a bit out of it by way of his University studies during term-time but when Christmas came, the break was used to give the receiver a run and so keep himeslf in the Ladder.

Not only has he moved his address, but *P. Barker* (*Sunderland*) seems also to have changed his handwriting! Anyway, as usual there were some interesting snippets in his letter; he notes that QST carries a comment that the WT call your scribe gave the thumbs-down to not long ago was in fact genuine while FCC searched for some lost examination papers. One thought we British had a near monopoly of bumbledon, but if this is true, the FCC staff ought to be hung drawn and quartered —where is the right in giving a licence until the licencee has been shown to have the technical knowledge? It would be interesting now to speculate what FCC will do if the exam paper is found and the chap in question is marked as a failure—do they take his ticket back, or let him go on? If the latter, then we are talking of licensed piracy! On a different tack, the old home-brew slow-scan TV monitor has been replaced by a Robot 70c, with which Paul is delighted; and his slow-scan score is now 123 prefixes seen and 47 countries. Not a bad score, at that!

Next on the list we come to *K. Kyezor* (*Irchester*) who remarks that in the week prior to his letter, he had on several occasions noted the "echo" effect on W station, but on looking at the band (14 MHz) a couple of hours later found it dead to all but the Europeans. The echo effect, of course, is just that; the signal is first heard, and then again 1/7 second later, by which time the wave has done a complete circle of the globe, implying that, in the case of W's, the echo has been 1½ times round the world!

B. F. Hughes (*Worcester*) found himself with a same-day deadline when he got his copy, and so his threatened complete recheck of the list has had to be postponed—but with a current claim of 1382, a complete recheck would be quite a mammoth task! On a different tack, Bernard is quite chuffed with his FRG-7, which he has been using to a large extent on Eighty.

Sometimes your conductor's old brain becomes a mite fuddled; and it did so this time over the question of the GU and GJ prefixes, mentioned earlier; of course he should have recalled that these are now used for Jersey and Guernsey, in place of the old GC, as a study of the "small print" in the 1977 G Call Book makes quite clear. However, it took the station receiver to jolt the little grey cells into operation!

Next on the list we have *M. Cuckoo* (*Herne Bay*) who of late years seems to have joined the ranks of the quiet ones—again this time he has just his Table entry to take in.

B. T. Mackness (*Dagenham*) was feeling pretty despondent about the bands last time, but even though he didn't find much in the way of new stuff, he has noticed how the proportion of spots in Cycle 21 and Cycle 20 is changing month by month, giving a pretty fair indication that by the end of 1977 things will be on the upturn. The really good openings are associated on the one hand with plenty of sunspots, and on the other with the quiet geo-magnetic field conditions; the difference between "Normal" and "High Normal" conditions being often the difference between a given solar flux in conjunction with a quietening in the geo-magnetic field as indicated by the A number pushed out by the observatories.

K. Whiteley (*Castleford*) found himself a bit pushed for time this month, but his list contains two GU's—odd that so far no-one has included GU *and* GJ in a list.

L. Gibson (*Barrow-in-Furness*) notes that over the past couple of years his QSL return has gone up—doubtless as a result of studying the requirements of the recipient—and in this context, Les reckons that Forty is good hunting territory; among the murk and QRM one can find stations who probebly have no idea they are being received at DX. For example, your scribe recalls two lads in Coventry nattering on Forty between their two shacks—a matter of a hundred yards apart. Imagine their surprise to receive reports from a VK SWL who listened to them night after night!

P. Rooney writes from *Worcester College Oxford* to let us know he is still alive and kicking; but althoug there has been no lack of the desired success in exams, there also has been no lack of the hard work, which will of course get harder as the time for Finals looms up. Even then, there will be no let-up, as a six-month course in Chester is required for professional examinations; it all means mid 1978 before the Rooney spare time is available for the receiver, to any degree.

G. Ridgeway (*Ardleigh*) closes his 1976 list, and makes a first claim for 1977's Table, at 347 prefixes, accumulated over fifteen days of spare time; and since he ended 1976 at 499 prefixes, Graham says 1977 *has* to be the year when he gets onto the All-Time Ladder! In fact, your J.C. is prepared to take a small bet that Graham could in fact by studying his log, make an all-time entry right now, if he could but spare the paper and the time.

That blasted woodpecker-noise is still around says *R. Carter*, although at the time of his letter it seemed to have dropped as low as 7 MHz and to be being heard only on alternate days. Anyway, in *Blackburn* they are made of tough stuff; Ben reckons that if you close your ears to it you can still winkle the odd signal out from under. On the line of doubtful starters, a station was noted twice on Eighty signing ML8DU, both times around the 2330z mark—does anyone else have any information on this one, or on the UZ6CL often to be heard on Forty in the afternoons? Personally, J.C. would hazard a guess that the first one is a phoney, and the second very likely OK.

R. G. Williams (*Borehamwood*) has Trio 9R59 and HA230 receivers, with a Heath SW-717 as the back-up; the aerial is an indoor dipole, feeding through an FET pre-amp and an ATU, with which has scratched up a

1976 final score of 350 prefixes.

T. Scrimshaw (*Birmingham*) is still scratching along at getting the TCS receiver on the go—one would have thought by now someone would have come up with the needed information to help Tim—his address is 69 Pamela Road, Northfield, Birmingham 31. On a different tack, Tim is scratching up the components for the active filter mentioned in the June 1976 issue of this Magazine, and apropos this wants to know how op-amps work. A Good Question! Well now, the name is really Operational Amplifier, and it can best be summed up as a block of gain; this block has an output which, in the absence of input signal, tends to "sit" midway between the positive and negative supply rails, which in their turn have their common terminal grounded. Round at the input end, there are *two* input terminals, one of which is "inverting," and one "non-inverting" the phrase here referring to the phase relationship of the terminal to the signal at the output. There are usually facilities for ensuring that with zero input the output can be trimmed exactly to where it belongs while in addition there are usually some frequency-compensation facilities which have to be added externally. Having the two possible inputs, which by their very nature are in anti-phase with each other and phase-related with the output, all sorts of interesting things can be done with them. A useful little book on the subject is "Elements of Linear Microcircuits," by T. D. Towers, which looks at the theory and practice of the little beasties.

In conclusion we have a couple of letters to deal with which, to put it mildly, should have seen the light of day earlier! The culprit, need you ask, is the joke of a filing system your old J.C. has used for years, and which, to be fair to it, has never let him down before.

A. C. Geer (*Odstock*) says he is "only an SWL" but having been playing with wireless since before 1920, and building all the "trick circuits" of the day, Armstrong, Flewelling, Scott-Taggart, Cossor, Austin is now going to get stuck in to the R.A.E. stuff and get his licence—and as we have said before in this piece, it is a great pleasure to hear of an Old-Timer actually sitting down and having a go rather than letting the brain run to seed. As Tony Buzon points out, the actual loss of brain power through life is probably less than ten per cent, and even that could be largely attributed to rustiness in the techniques rather than in the loss of power pure and simple. Again, one hears of people who "cannot remember" things as they get older—any actor learning his lines can disprove this boary old myth. Again, take a look at the sort of conventional notes taken by the average student—around ninety per cent of what he writes is redundant material, just used to connect and inter-relate the *key* words; the key words therefore are the only ones which need to be down, provided they are correlated with the other key words. Buzon has it all in a book, by BBC Publications, at £1·20 paperback; and any OT with R.A.E. ideas in his head would do well to buy a copy, and adopt the methods used, both to speed up the learning, and most of all, to *improve the retention* of what has been learned.

J. White (*London E.1*) raised in his letter, pretty well all the novice-listener's early questions in one go! However, to answer his thirst for the real "gen" needs a certain basic hint of "propagation" which we haven't mentioned in this piece since long-ago time. Now, in essence, the long-range signals heard between ten metres and the medium wave band are heard by the "sky wave"; this means the signal leaves the aerial and goes up into the blue sky, through various ionised layers of atmosphere, until it gets to the "F layer" which is about the highest and thinnest atmosphere to be ionised. There it is refracted, just like the rays of light when a pencil is placed in a bowl of water make the pencil appear to bend at the interface between air and water; light waves and radio waves being but the same sort of animals of different wavelengths. Now, our radio wave is hitting the layer at a very glancing angle which means the refraction turns the wave gently down at a similarly glancing angle and sends it back down to earth again. OK so far; but, as we have indicated, there are several layers of ionised air below the F region, notably D and E layers, which are *absorbers of RF*, and these latter *attenuate* signals passing through them, the effect being greatest at low frequencies and least at higher frequencies. Still with us? Right, now for the punch-line, which is to comment that all the ionised layers are thus because of the action of the sun's rays, which in turn are affected in some mysterious way with the presence of sunspots. Thus, in the daytime each layer is at its strongest; at night the lower ones just disappear for all practical purposes, and the F layer also weakens, and recombines if it has split into two during the day. So—what it all adds up to, essentially is that the higher frequencies will tend to be daylight only efforts, while the low ones are night-time only. Forty and Twenty tend more toward daylight-only at the trough of the sunspot cycle, and night-time bands at the peak of the cycle—which can be summarised as saying that 7 and 14 MHz are well worth a look-see at any time when they are showing signs of life.

The cycle described above is of course over-simplified, and in addition it is overlaid by smaller cycles; we have already talked about a daily and an eleven-year effect, and to that we can add a monthly effort, and a seasonal one, these last being effects of the posture of Sun and Earth to each other rather than fundamental effects.

What it boils down to is that even if your receiver has some stations marked on the dial, you may not be able to pick them up just by turning the set on; but *if* they are operating at the right time, and *if* you listen at the right time, there is a sporting chance you may pick the station up. But, of course, just as we amateurs have a series of bands, so has a BC station a set of frequencies, and to maintain his services he will have to change from one to another round the clock; and like the broadcaster, so it is with the amateur, picking the band to suit his needs and for which he may have gear in the station, or even in the amateur case for pure preference.

Finale

So there it is for another month. Because of the hiccup we have had in distribution, it has been decided that in next "SWL" we will run the final 1976 and the first 1977 entries side by side, to give everyone a chance to put in their finals for 1976; and of course the All-Time Post War table will also appear. So, for the next piece, your deadline is March 24, addressed to "SWL," SHORT WAVE MAGAZINE, 34 HIGH STREET, WELWYN, HERTS., AL6 9EQ.

VHF BANDS

NORMAN FITCH, G3FPK

Television

IT is not often that there is any A/TV news to report in this column since the practitioners of the art rarely correspond. So it makes a change to be able to review *Amateur Television*, a booklet published in October last year by the British Amateur Television Club.

Amateur Television is edited by Mr. A. Hughes from contributions by several authors and comprises ten chapters. The first one, "Background," is a brief history of the club founded in 1949, compiled by Don Reid and is followed by a short piece on aerials and reception by Cyril Chivers. Chapter 3, "Transmitting," by J. J. Rose, discusses the special requirements for a TV TX's PA stage and presents circuits for screen grid and control grid modulation. For those possessing a 2m. TX, the circuit and layout of a two-stage tripler is included. Ideas on operating techniques are briefly dealt with in the next chapter by J. Wood. The section on licences has become a little out of date as there is now no need for a separate TV licence. However, the requirements for frequency measurement, monitoring, etc., are still necessary.

The sixth chapter, "Picture Sources" by J. Lawrence, is very well written and copiously illustrated with circuit diagrams, layout drawings and waveform pictures and is the real meat of this booklet. It is followed by "Monitors" by B. Summers which covers the modification of the domestic TV set for use as a monitor. J. J. Rose is the author of the 8th chapter on recording and deals with the subject narratively and with block diagrams. No manual on A/TV would be complete without reference to SS/TV and C. Grant Dixon is the author of this chapter of 15 pages and it is very well written and illustrated with numerous circuit diagrams. The final chapter by Nigel Walker deals with colour TV by the NTSC and PAL systems.

Amateur Television is professionally printed in A5 format on 90 g.s.m. bond containing 112 pages. Being offset litho produced by photographic reduction of normal typewriter script, the text is very small and rather "thin." Whilst there is no list of contents, nor an index, the chapter headings are bold. The diagrams vary from excellent to decidedly amateurish and some that run up and down the page have to be viewed from the left, others from the right. As one would expect, much of the booklet comprises previously published material from the club's journal, "CQ-TV" which probably accounts for the non-uniformity of component identification; e.g., 2·2K and 2K2. But these are rather carping criticisms of a very useful publication which any A/TV enthusiast is bound to want. It is available from BATC at "White Orchard," 65 Showell Lane, Penn, Wolverhampton, W. Midlands at £1·75. The editor and contributors are to be congratulated for a very fine effort.

North Atlantic Project

In the column last November, mention was made of the *North Atlantic Project*. Serge Canivenc, F8SH, who is IARU Region 1, VHF *Sporadic-E* co-ordinator, has just sent along the very latest information on *Project VESNA* (VHF E's over North Atlantic). Permission has been obtained from C.N.E.T. to use the laboratory at the top of the water tower in the Long Lines Department area in the Lannion industrial estate. Permission is now being sought to use part of the upper platform for installation of the aerials for 50 MHz and for 28, 144, 435 MHz and maybe 10 GHz later on. The crystal for the 50 MHz Tx has been received.

Serge reports excellent trans-atlantic cooperation in *Project VESNA* with Ray Clark, K5ZMS, Secretary of the Six-Metre International Radio Klub, SMIRK! Transmission of reports will be made on a weekly basis. F8SH is preparing a report for publication in *Radio REF* this April and promises to keep your scribe informed on the progress of test transmissions on 50 MHz from Lannion. These are planned to start on April 15 in time for the beginning of the *E's* season a month later. It is hoped that many readers will participate in *Project VESNA* Anyone with 6m. receiving capability should contact F8SH whose address is:—6 Rue do Pont-Hélé, F-22700 Perros-Guirec, France.

Beacons

Dealing firstly with overseas beacons, F8SH writes that a 6m. beacon is operational continuously from Costa Rica on 50·080 MHz signing TI2NA but he did not mention any further details. This could be a useful one during the *E's* season. G3POI mentioned two "private" Dutch beacons. PAØJTA on 144·135 MHz, running 50 watts, mainly evenings and weekends when the licensee is home, and on 70 cms., PAØCBR on 432·075 MHz. In a 40m. QSO on January 14 with G3COJ, CT2BS said that his 2m. beacon is now back at his house being modified from one watt to 15 watts. During last summer's *E's* season, it was operating from a TV station but will resume from his house this year on a QRG to be advised, hopefully in the beacon band. Despite reports of a CT2BB beacon, CT2BS says there is no such thing. David Jarrell is very enthusiastic about achieving a 2m. contact with the British Isles. (He has heard BBC Radio 2 on VHF FM). Your scribe would not be at all surprised if this does come about in 1977 as the distance is similar to those over which many worked *via E's* last summer.

On the home front, GB3NEE, the Durham beacon, is operating again on 144·127 MHz with 3 watts *e.r.p.* to a pair of 5-ele. Yagis beaming simultaneously 135° and 315° at 360m. a.s.l. This to be increased by 10 dB soon. On 23 cms., the Dunstable Downs beacon, GB3DD, has had slight aerial changes made. Currently on 1296·05 MHz, the new QRG will be 1296·89 MHz. The Emley Moor beacon is now licensed, callsign GB3MLE, for 1296·93 MHz and should soon be on with 100 watts *e.r.p.* the Yagi beaming 120°. Our thanks to G3COJ for this information.

VHFCC Award

The only VHFCC Certificate

awarded this month goes to John White, GW8IQC, from Newport in Gwent. His no. 275 was for 2m. operation. John was licensed in February, 1974, after several years' "apprenticeship" as an *s.w.l.* The first station consisted of a *Standard* C826B and a pair of crossed dipoles. About 20 months ago, he graduated to a *Trio* TS-700 and 5-ele. Yagi at 18ft., the QTH being 75ft. a.s.l. with a good take-off east and south, poor to the west and non-existent to the north.

Contests

The 144 MHz Fixed contest last December 5 was won by GW8JHL/A with a total of 1625 points from 246 QSO's. Runner up was G8HCL with 1146 points from 230 contacts. There were 72 entries compared with 110 the previous year when the contest was a two-fold affair with a section for non-SSB participants. (Acknowledgments to RSGB News Bulletin Service, GB2RS).

By the time this issue appears, the 144 MHz Open contest will be upon us the weekend of March 5/6 from 1600 to 1600 GMT. The published rules include 4b, which is all entries lumped together; *e.g.*, fixed, portable, -/A and mobile. G3SEK, to whom entries should be sent, confirms this should be 4*a*. *i.e.* separate Fixed and Portable sections. The 432 MHz Open contest is scheduled for Mareh 20, followed by the 70 MHz Open event on April 2/3.

The Tables

This month sees the start of the 1977, Three Band Annual VHF Table. Since it covers a period of only four weeks of rather flat conditions, there are not many entries. For the benefit of new readers, just send in your accumulated totals of counties and countries worked on 4m., 2m. and 70 cms. when you write to "VHF Bands." It seems that some are still using the older counties such as Middlesex, Huntingdon, etc., but it is the present day English, Northern Irish and Welsh counties and the Scottish regions which are the basis of this table, *plus* all the Irish Republic counties. One of the best maps to buy is the "British Isles County Map" from *Geographia Ltd.* which shows the newest counties superimposed on the old ones. Incidentally, this map is ideal for drawing the 50 kms. radial rings around your QTH for contest scoring covering all the British Isles.

The 23 cms. All Time Table has not been published for some time due to lack of space so it is being included this time based upon your latest claims. The QTH squares Table had to be omitted last month too, but there has not been much movement in it due to the lack of any real auroral and tropospheric openings. Please note that all these tables are based upon what you have worked, whether confirmed or not, and that no QSL cards should be sent.

Scottish News

Jack Wilson, GM6XI (Edinburgh) has sent one of his periodic, concise reports covering activity North of the Border. The main news is that, at a meeting in Motherwell on January 14, a properly constituted Central Scotland FM Group was formed with GM3KMG as Chairman and a "top line" committee behind him. The new group wasted no time as GB3CS came on the air on January 30 with one watt *e.r.p.*, proof of the competence of the new management. Except for parts of Edinburgh, coverage is excellent. Jack reports that so far, behaviour is excellent and that no doubt, coverage will improve when a higher powered TX and new aerial are installed. GM6XI is off the 70 cms. band at the moment due to aerial failure so that *Oscar 7* has one less client.

Meteor Scatter and E-M-E

Doug Parker, G4DZU (Leeds) has launched four 14-ele. *Parabeams* for 2m. and not unnaturally, is quite loud wherever he is beaming. He had arranged an E-M-E sked with Reinhard Koch, DK1KO, in FN12g for 0600 on Feb. 6 preceded by a possible *tropo.* contact. Unfortunately, neither came off but Doug did hear an SM calling "CQ M/B" on *tropo.*

Dennis Boniface, G4DSC (Ripon, N. Yorks.) now has a 4CX250B amplifier going at full legal input on CW with digital keyers on the way. His results so far are 8 complete QSO's out of 33 attempts, a not insignificant performance considering the limitations of the QTH in a valley, 100ft. a.s.l. As to results, Dennis summarises the *Geminids* as a "washout" with EA, YU and I skeds no good at all and that with UC2AAB hopeless with nothing heard at all in two tests. The successes claimed are SM2CKR (KX12g) and SMØFFS (JT51f). The *Quadrantids* were better but tests with SM3FGL and I4PWL on Jan. 2 failed to come off, although OE5JFL (GI48h) was worked next day. The sked with YU2RQG was marred by QRM from the OE5JFL/EI9V test. Tests on the 4th with SM3BIU and DJ5MS failed although Dennis received 44 pings and 17 short bursts from the German between 0600 and 0800. However, DJ5MS was successfully contacted

THREE BAND ANNUAL VHF TABLE
January to December 1677

Station	FOUR METRES Counties	FOUR METRES Countries	TWO METRES Counties	TWO METRES Countries	70 CENTIMETRES Counties	70 CENTIMETRES Countries	TOTAL Points
G3FPK	—	—	53	8	—	—	61
G8HQJ	—	—	31	6	15	2	54
G4FOR	—	—	43	10	—	—	53
G8GML	—	—	38	2	11	1	52
G3FIJ	19	1	19	6	5	1	51
GM4CXP	5	2	30	6	1	1	45
G4FCD	—	—	35	5	—	—	40
G4DEZ	—	—	31	4	—	—	35
G8ITS	—	—	23	3	—	—	26
G4ERX	—	—	18	5	—	—	23
G8JHX	—	—	17	2	—	—	19
GD2HDZ	1	1	4	2	6	2	16

in GI15e by random MS on Jan. 9 between 0600 and 0825 in just two bursts at 0759 and 0818GMT. G4DSC monitors *Radio Gdansk* on 70·31 MHz and, on the morning of Jan. 3, he was not getting pings so much as one long burst, giving almost continuous reception.

Four Metres

Graham Badger, G3OHC (Sutton Coldfield), took part in the 4m. CW contest on Jan. 23 and bemoans the very poor conditions. The highest serial number he heard was 14! He concludes that many participants gave up early. From the Borders Region, Derrick Dance, GM4CXP, reckons that the contest was "a real challenge as it coincided with 'super punk' conditions!" He only had *five* contacts despite trying hard, *viz;* GM4DIJ (Edinburgh), G3JYP (Appleby), GM3ZXE/P (Tayside), G4AEQ (Mchstr.) and G8KB near Sheffield. *Gotaways* were G3OHH, G3WRA, G3XWZ and GM4BVD. To exemplify the sub-standard conditions, Derrick normally hears the GB3SU beacon RST 319/429 but for most of the contest, it was inaudible.

Two Metres

"*Aurora*—fact not fiction!" is how GM4CXP's letter starts referring to the first genuine such event heard in these latitudes this winter. The happening lasted from about 2030 to 0053 GMT on the night of Jan. 30 for the GM operators. Derrick was first alerted to it at 2050 when GM8FFX was heard calling, "CQ Aurora." The latter had been hearing GM4CXP aurorally when Derrick was working G3BOC/M and beaming SSW. The *aurora* was coming and going quite a bit and the best signals occurred between 2125 and 0053 GMT. The following stations were worked *via* the QTF or beam headings indicated:—

2130	GM3JFG	XR40c	045°
2259	LA2PT	FT13b	045°
2320	GM3DZB	YR44j	045°
2327	GM4BVD	YQ43e	045°
2334	SM3FGL	IV53g	022°
2341	SMØFUO	IT69j	040°
2348	LA2PT		045°
0002	SM4FXH	GU70j	000°

each station

The best DX heard was SM3COL (IW06f) at RST 58A at 0030. Apart from the *aurora*, stations have been worked in the south of England under weak signal conditions.

TWENTY-THREE CENTIMETRE ALL-TIME TABLE

Station	Counties	Countries	Total
G4BEL	38	10	48
G3DAH	28	8	36
G3JXN	28	5	33
G4BYV	20	9	29
G3NHE	24	5	29
G3COJ	19	8	27
G4ALN	20	5	25
G3JVL	21	4	25
G6NB	19	4	23
G3OBD	20	3	23
G8ARM	20	2	22
G8EOP	11	5	16
GD2HDZ	9	5	14
G5DF	13	1	14
G8AOD	11	2	13
G8FMK	12	1	13
G8AII	7	2	9
G8ABH	7	1	8
G8FJG	7	1	8
G8GNZ	4	2	6
G4DKX	5	1	6
G2AXI	4	1	5
G8GML	4	1	5
G8IFT	3	1	4

Clive Penna, G3POI (Kent), only heard one station in this *aurora*, LA3UU in FT11d at 2312. This was followed by a partial contact 7 mins. later and a proper one at 2341. Clive found the QTF very sharp at 010°. He reports that SM2CKR (KX12g) found it necessary to beam quite far east for this event. Although advised by GM8FFX earlier in the evening of a very bright, visual *aurora* in Aberdeen, careful monitoring from G3FPK at intervals during the evening failed to reveal any auroral signals so it seems that London and the south of England was on the fringe of this one.

It is always a pleasure to welcome new correspondents to this feature. R. A. Elliott, G4ERX, from Hutton in Essex, in his first letter, mentions using a borrowed *Trio* TX599/JR599 combination with a *Europa-B* transverter since Christmas using his own 10-ele. crossed Yagi. As a "new boy" to 2m. SSB, he asks, "Would stations *please* QSY off the calling frequency after establishing contact, and would stations please listen on their own frequency after completing a QSO and before turning their aerials round?". Could not agree more, OM. G4ERX's own equipment comprises an *FT-101E* transceiver with a 2m. transverter on the stocks, plus a variety of gear for both 2m. and 70 cms., AM and FM.

John Nelson (Hammersmith), whose fine quality SSB signal was mentioned last month, has revoked the old G8HAL call for G4FRX. He took the morse test at Cullercoats Radio and says that the staff could not have been more helpful. The officer in charge sends the best CW from a straight key that John has ever heard. The "A" licence was taken out primarily so that the decided advantages of CW can be realised on 2m. G4FRX runs 150 watts of CW and is always listening for stations to the north and north-west.

SWL Glen Sweeney reports that there were periods when the band seemed open but nobody around to take advantage of it. He wonders if they are all on FM? Glen would like to hear more *non*-channalised FM, more multi-mode contacts and more AM and CW activity. From his Nottingham QTH, two countries and nine counties have been heard this year but the Annual 3-Band Table is only for transmitting amateurs, Glen.

Arthur Breese, GD2HDZ (Laxey), reckons conditions can't get much worse. The date of his letter is that of the *aurora* so perhaps he "scored" in that? He mentions that U.K. stamps are *not* valid in the Isle of Man so those about to send stamped envelopes should, instead, send *loose* stamps—or IRC's if they are that rich! If anyone was to ask your scribe what he thought of conditions so far this year, he would be tempted to reply, "Rubbish!" However, the only English county *not* so far worked—apart from the Scillies—is Northumberland. Upon reflection, although all distant signals have been down, much of the time it has been possible to work quite long distances *if* one is prepared to

dig for the DX and struggle a bit. It seems that far too many folk give up all too easily unless there is a "lift" on. Surely we should seize upon rotten conditions to see what *can* be achieved rather than throw in the towel without even trying?

Incidentally it is when conditions appear flat that the calling frequency should be kept well clear. All too often lately, a local QSO has been in progress either on it or very near it, just because the participants couldn't hear any distant stations, thus denying those who could the chance of establishing a contact.

Before concluding this section, and there are no 70 cms. reports to follow, did any reader hear any auroral signals from 1600-1900 GMT on Jan. 9? The GB2RS news bulletin the following Sunday reported that south coast stations had worked a number of SM's but so far no confirmation of this has been forthcoming. Furthermore, G3USF reported normal, low *gamma* readings for this period.

Satellite News

For the past three months *Oscar 6* has been exposed to maximum sunlight so battery temperatures of 58°C. have been recorded, far too high for *NiCads*. The Surrey *0-6* commanding is now very reliable and is keeping a very close eye on the telemetry. Although the battery temperature has fallen rapidly, there is very little charge going in so *0-6* might be taken out of regular service any time and only switched on for special purposes, such as inter-satellite tests due on Feb. 9-11.

The second of the *0-6* QRP days on Jan. 19 was quite successful. Your scribe, using an old *Pye* "Ranger" running about five watts output to an *indoor* 3-ele. Yagi got RST559 from W2GFF on orbit no. 19494. Unfortunately, some strong QRP? stations had very deaf receivers! They did not hear genuine QRP stations replying to their "CQ" calls. During the third QRP day on Feb. 2, G3IOR got his signals back from overhead when only running 100 *milliwatts* and worked a couple of keen-eared types.

Oscar 7 was due to be in Mode "B" at least until Feb. 15 after which it was hoped to resume normal, alternate "A" / "B" operation. G3IOR reports *0-7* being in Mode "C" quite a bit, recently, that is, in the quarter power mode 70 cms./2m., presumably due to low battery voltage. Persistent use of high power on the 70 cms. uplink will result in more Mode "C" days: the remedy should be obvious. Sad to report, it is not only certain continental stations who use far too much *e.r.p.* One G8*** was heard with a signal so loud that it was calculated he must have been radiating several *kilowatts* at *0-7*. Selfish behaviour of this sort will merely result in the premature demise of the transponder for everyone.

Anyone fancy an expenses paid trip to the U.S.A.? AMSAT-USE urgently seeks a volunteer to assist with the *mechanical* construction of *Oscar 8* and the Phase 3 programme. The sting is that it is travel expenses paid, not salary, apparently. Anybody interested should contact Perry Klein, W3PK, at AMSAT, P.O. Box 27, Washington, D.C., 20044, U.S.A.

QTH LOCATOR SQUARES TABLE

Station	23 cm.	70 cm.	2 m.	Total
G8FUF	1	79	172	252
G3POI	—	—	169	169
G4BWG	—	23	110	133
G3JXN	16	50	66	132
G3CHN	—	—	130	130
GM4CXP	—	21	107	128
G3COJ	15	49	63	127
G3FPK	—	—	124	124
G4BAH	—	32	92	124
G3OHC	—	26	91	117
9H1CD	—	2	110	112
G4CDF	—	—	109	109
G8GML	1	34	74	109
G8HVY	—	10	92	102
G3XCS	—	14	82	96
G2AXI	1	34	59	94
G4DKX	2	23	66	91
G8IWA	—	17	74	91
G8BKR	1	6	79	86
G6UW	—	—	85	85
G8EOP	8	36	38	82
G3FIJ	—	25	54	79
G8HHI	—	7	71	78
GD2HDZ	8	24	45	77
G8GII	—	11	62	73
G3BW	—	21	47	68
GJ8AAZ	—	11	54	65
G8KLN	—	1	62	63
G8JJR	—	—	63	63
G4CIK	—	—	62	62
G8HAF	—	—	61	61
G3KPU	—	—	60	60
G8KSP	—	—	60	60
G4AEZ	—	15	44	59
G8KKX	—	—	59	59
G8IFT	5	16	35	56
OZ9IY	—	—	53	53
GD3YEO	—	—	52	52
G8LHT	—	—	48	48
GW8HVP	—	—	48	48
G8ITS	—	1	43	44
G8JEF	—	—	44	44
G4EYL	—	—	41	41
G8JAH	—	1	35	36
G8LLG	—	1	24	25
G4CIK/A	—	1	23	24
G8JAJ	—	—	24	24
G8JKA	—	—	21	21

Starting Date January 1, 1975. No satellite or repeater QSO's. Table in order of grand totals this month.

DX Notes

From G3POI comes news that DB5NA is planning a trip to the Aland Islands, OHØ, dates to be announced. This would take in JU and/or KU squares. For the peak of the *E's* season, LZ1AB plans to operate portable from NC59d at the end of June and beginning of July. Both SM7CRO and SM7EWG are in IR14f and are QRV on 2m. SMØBYC plans to operate from MZ square as SM2BYC in the summer. There is just a tiny bit of Sweden in that square around Haparanda only 80 kms from the Arctic Circle.

Deadlines

If your contributions to this issue have been missed out, it is likely copy was not re-mailed from Buckingham in time. Readers will appreciate the sad reason for this. Please send all your future contributions to: "VHF Bands," SHORT WAVE MAGAZINE, 34 High Street, WELWYN, Herts., AL6 9EQ. Deadline for April is March 4 and for May, April 6. *73 de G3FPK.*

THE MONTH WITH THE CLUBS

By *"Club Secretary"*

(Deadline for April issue: March 4)

ONE feels rather diffident at commenting on the death of G6FO in this piece; however the readership of SHORT WAVE MAGAZINE may have seen him, we on the part-time staff saw a man who did his utmost to smooth our path to the meeting of deadlines, and did his utmost for our hobby in so many ways. There were those who feared him; but their fear was of their own divising, in that they instinctively knew that he had sized them up for what they were, or are—and that his assessment did not agree with their own.

However, "Clubs" must go on, and it is our first duty to mention the howler we perpetrated in setting the reader deadline last time round; just one complete week adrift in the wrong direction from your scribe's point of view, though doubtless in the right one for many Hon. Secs.! They'll all go in, though, somehow; and for the record, let us say that the "Clubs" reader deadline is to arrive twenty-one days before the issue date, which in its turn is always set for the last Friday of the month preceding—thus the March issue is due to appear on February 25, the April one on March 25, and so on; just work back three weeks from the date so found and that's your arrival deadline; the post time has then to be taken into account, to give your posting deadline. The only time this essential rule goes overboard is with the January issue, which has to be prepared in the light of the long Christmas break now favoured, the generally increasing delays in the mails as the festive post builds up; all these factors work in one direction, while the fact that for this one month it is now impossible to issue on our due date, so we have to go back to the first Friday in January for the issue. However, we'll sort out that when we get a bit nearer the date!

But, of course, in essence, the message is that you can go on sending your reports, knowing full well that they will go on appearing—and we would add that our policy on Clubs reports is that we accept them from any club or group; our only restriction is that we will not become involved in inter-club rivalry to the extent of taking sides—in such cases we confine ourselves to giving each group its mention.

The Mail

Here we can commence with **Radio Fraternity Lodge No. 8040,** who write to advise that the new Master is G3BEZ, while the Secretary is G8TY; if you would know more, G8TY's address is in the Panel on p.00.

As you will have guessed from our opening paragraph we are taking them as they fall from the clip; and it is **Wirral** for our first visit. They have Hq. at the Sports Centre, Grange Road West, Birkenhead, and they can be found there on the first and third Wednesdays in each month; March 2 for Part four of the G8IVW Semi-conductor Saga, in which the gang are to be introduced to the FET; and March 16, for which the activity has yet to be decided.

Down south now, to **Basingstoke** with lots of plans for the coming year being laid; but, most unusually for him their Hon. Sec. forgot to mention dates or venue! Thus, if you want to look in on the lads, you will have to get in touch first with G3CBU, whose address appears in the appropriate line of the Panel.

Farnborough have their club contest for both the transmitters and the SWL's over the weekend March 5/6; then there follows the monthly meeting at the Railway Enthusiasts Club, for a lecture on Weather Rockets and Satellites. The venue mentioned is in Hawley Lane, Farnborough.

The Big Day for **Sutton & Cheam** this month is on Saturday, March 19, for the Annual Dinner and Dance; all the gen, and the tickets, from Bob Tillin, G3MES, who is doing the donkey-work on this special "do." Turning to the more humdrum matter of the normal routine, we see—that there just isn't much "normal" this month! From March 16-19 they will be manning a stand at the Wallington Hobbies Exhibition organised by the Rotary Club. Callsign not known yet, but there will be stations operational on HF and VHF, and, it is hoped, talk-in facilities. Before all this, there is the informal get-together at Rays Social Club, while the "formal" drops right in the middle of the busy period, on March 17, for G8AAI to talk about Amateur Television, at Sutton College of Liberal Arts, Cheam Road, Sutton.

Way down in the West Country now, to **Cornish,** who foregather at the SWEB Clubroom, Pool, Camborne each month. On March 3, the subject is Electrical Safety in the Home, the speaker being G3XFL.

The Scout Hut, Occupation Road, is the home of **Peterborough** Radio and Electronics Society; they have a Junk Sale on Friday, March 18, for which the start is set at 7.30.

There are two dates for **Cheltenham** (RSGB Group) in March—the normal effort on March 3, and another one on March 18 (a Friday) when they join with the GCHQ gang to listen to Dr. B. Marsh of Coventry talking about Aurora and Radio. Both these dates are reserved at the group Hq., the Old Bakery, Chester Walk, Cheltenham.

It is still a question of every Friday *except* the third one, for **York**—and, says the Hon. Sec., what a problem it is to recall which is the blank date each month! This month the address has changed, in that the club is now called the United Services Club, 61 Micklegate, York—it used to be known as the British Legion.

Now we have the Radio Amateur Invalid and Bedfast Club, better known to all and sundry as **RAIBC.** In the current issue of their "Radial," your scribe was highly amused at the "Christmas Dinner for a Harassed Ham," one course of which was Special Bamboo Power Pack Pie (in Black Box)! If you know of anyone eligible for full membership, you should put him in touch with the Hon. Sec.—see Panel—and if you can possible do so, join yourself as a supporter.

"CQ TV" is the title of the magazine put out by the **BATC** chaps, who are of course bound in the common interest of transmitting pictures, either in the normal way or by Slow-Scan. Details from the Hon. Sec.—see Panel.

Southdown will be at the Victoria Hotel, Latimer Road on March 7, to hear G8AAI giving his well-known talk on Amateur TV. Looking rather further into the

future, we must advise you all to contact the Hon. Sec. for the details of the venue for future dates—there is a change of Hq. in the offing we gather.

Cray Valley will be in session on March 3, at the United Reformed Church Hall, 1 Court Road, Eltham, on March 3 for another of their famed Junk Sales; and on 17th there will be the informal, at the same address.

Passing on to **Reigate** we see their Hq. address is the Constitutional Centre, Warwick Road, Redhill, and the booked date is March 15 at 2000 sharp; the speaker will be G3GVV and his theme the work of the IARU in the context of the World Administrative Radio Conference in 1979. March 1 is set down for their Natter Nite, at the Marquis of Granby, Hooley Lane, Redhill.

Our next is a group who are part of the **Royal Navy** club; they are based on HMS *Belfast*, and as most people will know, the *Belfast* is moored as a floating museum in the Pool of London, almost opposite the Tower. They have their normal club activities, but in addition they will be operational from the ship between April 8-17—the Easter period. For more details on the group, contact the Hon. Sec.—see Panel.

At **Verulam** they have a regular place at the Market Hall, St. Albans on the fourth Thursday in each month; March 24 for a Film Show. The informals take place at the R.A.F.A. Hq., Victoria Street, St. Albans, on the second Thursday in each month.

The Brains Trust is revived—shades of Prof. Joad! This version is all to do with Amateur Radio, and was the programmed item for the **Surrey** group, on February 2. It is a scheme for self-entertainment that could well be used by any club with a hole in their programme. Looking on to March at T.S. Terra Nova, 34 The Waldrons, Croydon, where they will foregather on March 2—the programme being as yet not announced; there is another meeting in their programme each month, but as there appears to be a misprint in the Newsletter now to hand, we feel it best for you to refer to the Hon. Sec. at the address in the Panel.

The **Association of Sheffield** clubs produce a common newsletter and hold joint meetings on occasion; from the latest copy of the Newsletter we hear that the *University* club has revived, holding lunchtime meetings at the Red Deer off Mappin street at lunchtime on Wednesdays; while the **Polytechnic** lads have Thursday evenings in their shack on the third floor of the Phoenix in Charles Street. The **Sheffield** club are based on the Sheaf House Hotel, Bramall Lane—details from the Hon. Sec.—while the **Worksop** group are in session every Thursday evening at the Anchor Inn.

At **Melton Mowbray** things have been overshadowed by the recent death of their member G3FDF—a founder and at one time Hon. Sec. of the club there. The suggestion has been made that a trophy be purchased and named in his memory, and at the time of writing thoughts were being turned to the precise way in which the honour of holding the Trophy could be decided each year. Turning to the group meeting, the next one will be on March 18, by a member of the Wireless World staff, telling them about production of a magazine. The venue, as usual will be the St. John Ambulance Hall, Asfordby Hill, Melton Mowbray.

It seems quite a while since we last heard from **Shefford,** who were at one time as regular as clockwork with their reports; however, they assure us, they are still very much alive and kicking, still in the Church Hall, Ampthill, Shefford (this must be one of the easiest club addresses in the country to find), and still on a weekly basis. March 3 is set aside for a planning session for Field Day, and a spot of inventory checking for good measure, and on 10th they have their favourite "mini-lectures" programme. March 17 is down for a Quiz by G3EUS, and on 24th there will be a Junk Sale; rounding off the month on March 31, there will be an exhibition/demonstration/discussion on members equipment. A final comment by the Hon. Sec. indicates that they are open to have their arms twisted by hopefuls wishing to give them a talk; and he also adds that if there is anyone who would like to attend but cannot for want of transport, will they please get in touch with him and he will see if anything can be done. The address for this generous offer is to be found in the Panel.

Our next stop is up at **Chester** where the group are based on the Chester YMCA, where they get together on the 2nd, 3rd and 4th Tuesdays in each month. Since they have just gone through an AGM, the new committee is at the time of writing still fixing up the programme of events, for the latest on which we have to refer you to the Hon. Sec. in the address shown in the Panel.

Last month saw **Wakefield** indulging in a spot of self-criticism through answers to a questionnaire; this month they have March 1 for a Ragchew session, and 15th given over to a talk by G3TDZ; all of course at Ings Road School, Wakefield.

Over now to **Bishops Stortford,** where the problem of an Hon. Sec. was solved at the AGM by electing two of them! It might have resolved their problem but it added one for us, so your scribe tossed a penny for which one to include on his card-index. As to the club, they continue to foregather at the British Legion in Windhill; 7.30 in the bar for a nominal start, up in the Committee Room at 8. Adequate parking exists on the left as you go up the hill, and as for finding the gang—straight through the outside door, through the double doors into the bar and listen for radio talk! And, if you are too late to find them in the bar, then straight up the stairs and turn right at the top into the Committee Room.

More than once your scribe has commented on the way clubs with YL members always manage to lumber the ladies with a task; this fate has befallen **White Rose's** G4EZI, who is custodian for the White Rose Award. As for the Club, they have their own place at 83 Town Street, Armley, Leeds 12, where they are "at home" every week on Wednesday evening.

Still in that general area, we come to **Northern Heights,** at the Peat Pitts Inn, Ogden, Halifax, on alternate Wednesdays; but the Newsletter omits details of the goings-on (or should it be "goings-off" up there?) at each meeting. This being so we must pass you on to the Hon. Sec.—see Panel.

The **Wessex (Bournemouth/Poole)** group have now moved to their new venue at the Dolphin Hotel in Holdenhurst Road, where they will be in session on March 4 and 18; on the first date G5HD will be talking about VHF contest planning while on the later date the theme will be the SWL's, with some attention also being paid to those who are interested in CW operation.

Our next stop is with **East Lancs.** from whom we have not heard for years—but the handwriting on the report is much more familiar having been last heard of from 5N2-land. Eric is now G4DGR, and his QTH is shown in the Panel, under East Lancs. He tells us that the venue is the YMCA in Blackburn, on the first Thursday in each month; the March date shows a Junk Sale, with April for a Quiz evening—East Lancs. v. Preston with Bury setting the questions.

Stourbridge are to lose their Newsletter Editor this month—after a slightly shaky start a year ago he was beginning to really swing; and he can be proud of his record of coming out on time. What a pity he has had to give up; but studies and career must always come before one's hobbies, and we hope there is someone to carry on. The informal is on March 1 at the "Shrubbery Cottage," Health Lane, Kingswinford (what a delightful name for a pub—wonder what his history of it is?—Ed.) while the formal session is March 21 for the Annual General Meeting.

Acton, Brentford & Chiswick have their place at the Chiswick Trades and Social Club, 66 High Road, Chiswick, London E.4. The booking is once monthly, and for this time we see they have G3CCD talking about his new TH3 Mk. 3 beam and the results he is getting from it.

While any Thursday evening will find radio amateurs and SWL's heading for the Spencer Dallington Community Centre, Tintern Avenue, off Gladstone Road, **Northampton,** March 3 sees them entertaining G3ZVI of Garex, while both 10th and 17th are devoted to RTTY talks in which time it is hoped to cover the whole business; and on March 31 there will be a Test Equipment Evening, with some rather advanced stuff available—but bring your own, as it might help someone else!

Moving along a bit we next come to **Wolverhampton,** who notify that as of last October, the Hon. Sec. has changed to G8EDG—see Panel. However, although he does not mention any of the club activities we have the Hq. address, sensibly part of the letterheading: Neachells Cottage, Stockwell End, Tettenhall, Wolverhampton WV6 9PH, where we know they have a regular session each week—but for the rest we have to refer you to the new Hon. Sec. at the address in the Panel.

At **Swindon,** the Hq. is at the Coldharbour public house, Blunsdon, and on March 2 and 16th they will be rolling up in force, says the Hon. Sec., although at the time of writing he could not give firm indications as to what was going to happen on those dates, he being still, doubtless, in negotiation.

Crystal Palace have the third Saturday, which means 19th, at Emmanuel Church Hall, Barry Road, Peckham, and will this time be having a talk on RTTY by G3YKB.

Silverthorn's G2HR is not too well at the moment, and under observation in Chingford Hospital at the time of their letter—we hope Eric is soon back in action, as he has been a mainstay for the group for as long as your scribe can recall, either as Editor, as Hon. Sec., as R.A.E. lecturer, or whatever. Looking at the group, they are based on Friday Hill House, Simmons Lane, Chingford, where they will be found every Friday evening in one of the best set-ups for miles round, with shack, lecture room, snack-bar down below and all the mod. cons.

On to **Harrow** where big things seem to be happening; the AGM has thrown up a new Hon. Sec., and in addition they have moved Hq. to the Roxeth Community Centre, Scott Crescent, West Harrow, Middx.

Down West again, to **Yeovil,** where they have every Thursday; details from the Hon. Sec. as to the venue, but we can say that G8AVR has the first, third and last dates in March for talks respectively titled "Speak to me only with your PI's—How to bring your computer to life" on to "Big fleas and little fleas—the progress of miniaturisation," and finally "The computer under the stars, 1984": on March 10 G3MYM talks about QSL Card design, and on March 24 there is a trip out to the Control Tower at R.A.E. Yeovilton.

Having had a fine Wine and Cheese Party last month, the **Bangor** lads are back at the Redcliff Hotel on Friday, March 4, for a talk on the development of the Electricity Supply Industry in Northern Ireland.

Microwaves will be the topic for **Milton Keynes** on March 14, with G3WKL doing the honours on this interesting subject; the spot to aim for is the Loval Hall, Silver Street, Newport Pagnell. Looking onwards a little their *April* date falls at a time when the Lovat Hall is closed for the Easter Monday; so there will instead be a Social Evening in the Rose and Crown, which is also in Silver Street.

A.R.M.S. are of course the group for the Mobile types, whether licensed or SWL; their M.C.A. is the /M equivalent of DXCC, and it is interesting to notice that the leader has 262 countries confirmed—which isn't a bad score from a home station chasing countries, at that! The name and address of the Hon. Sec. appear in the Panel.

Then there is the **G-QRP Club**—which we now believe could well shed its "G" as it has become so international in its membership, with over 250 on the books now, a very fine newsletter with lots of interest for the technical types, as well as the operating-only gang. Well worth the cost of a subscription.

Worthing lads have a base at the Adult Education Centre, Union Place, Worthing, every Tuesday evening, the kick-off being set for 8 p.m. On March 8 there is a Construction Contest, and on 15th a Ragchew evening; March 22 is down for a talk on Construction Techniques. Any further details may be obtained by dropping a line to the Hon. Sec. at the address in the Panel.

Up at **Nottingham,** things are also on a weekly basis. March 3 is down for a Forum—a popular item with the group but one that has never been described to us. On 10th, there is to be a talk on RTTY by A. Pollock, with an Activity Night on 17th. "The one that got away" comes in for consideration on March 24, referring in this context to the home-brew gear that *didn't* work (!); and on 31st there is a Junk Sale. Whilst that is it for March, perhaps we should mention that April 7 is the date set for the AGM.

New Clubs

Our first stop in this group is the **Kent Coast** set-up, based on the Grosvenor Court Hotel, First Avenue, Eastern Esplanade, Cliftonville, Margate. It is here you go on March 10, when G8DHJ will be talking about the transmission and reception of Colour TV.

Our second stop is in **Ormskirk;** here the position

at the moment is that the group get together in each other's homes, taking it in turn to be host, to a full assortment of A and B licensees and SWL's—and they say they could do with a few more members! This sounds good, but of course it means that it is only courteous to get in touch with the Hon. Sec.—see Panel—before planning a visit.

Old friends are back again at **Hull** in more ways than one; the group itself used to be regular reporters to this piece, and the new Hon. Sec.—see Panel—used to write to CDXN regularly before he went on an extended trip to ZS-land, from which he has evidently returned for a while.

No messing about with the **Derby** scribe; if you took just one word out of his offering, you would lose some useful information! For March he sees things as: March 2 for a Surplus Sale, and a Night on the Air on 9th; then the all-important AGM comes up on March 16. On March 23, instead of the normal meeting, everybody goes off to a lecture by Dr. Saxton, given at St. Helens House. Finally there is March 30, for a "Technical Topics" evening.

Now we have **Aberdeen,** who have recently been modulating Radio Aberdeen, and getting mentions in various publications, certainly seem to be livening things up in their part of the woods. March 4 is a Junk Sale, while on 11th, GM3ZBE will be giving a simple explanation of SSB, AM, and FM. March 18 sees Bill Williams talking about recent building projects, and on 25th, J. Gall is to talk over the problems he ran into and overcame in building a counter. All these are in the hall at the rear of 91 Crown Street, Aberdeen; if you are going down Crown Street, take the second on the left; the entrance to the hall is at a blue door in the lane on the right-hand side. On an entirely different tack, the club included with the newsletter, minutes of a meeting of the Central Scotland FM group held at Wrangholm Hall in Motherwell, called by the Mid-Lanark group. If these minutes are to be taken as a correct record of what transpired, then there is a moral to be drawn. It seems the repeater license had been held since May 1976, and the existing committee could not promise the repeater would be operational within even two years—a new committee was then elected and the machine was testing on the air within six days and fully operational within fourteen days from the date the new committee was elected to office. The moral to be drawn from this is clear to all clubs sitting at their AGM's and voting people into office for the next year, and it is very simply this. There is no good whatever in electing someone just because he is too soft-hearted to refuse to take on a task that is beyond him, and if you do, the club, just like a company, will die of inanition. If this happens, *don't* blame the chap you shotgunned into office because you have asked of him more than he can give. A democratic organisation, like any other, requires someone to *lead;* and leading people often means you have to be dictatorial if the enterprise is to be a success; if the dictator is benevolent, you have a happy group of people, if he is motivated by selfishness you have the "dictatorship" against which the Second World War was fought. That was was won, in the event, because this country at that time had a man who was a tougher dictator than the one in Germany, and at the same time was motivated by the best interests of the world at large rather than pure selfishness taken to the point of Hitler's mania.

Scotland is well to the fore this month—our next letter is from the newly-formed **Edinburgh** and District gang, who are based on Hq. at the City Observatory, Catton Hill, where they foregather every Tuesday evening; it is requested that should you wish to look in on them you contact the Hon. Sec. at the address in the Panel.

At **Southgate** the Newsletter cover has received a face-lift; but it still doesn't tell us that they get together at the Scout Hut, Wilson Street, on the second Thursday in each month—lucky we happen to know that much, even if the crystal ball doesn't tell what will actually happen! But, never mind, the Hon. Sec. will be delighted to tell you—get in touch with him at the address in the Panel.

Torbay next, and the Annual Dinner and Dance on Saturday, March 12, at the Templestone Hotel, Torquay. As for the regular meeting, that is down for Saturday March 26, subject to be arranged, at Hq., Bath Lane, rear of 94 Belgrave Road, Torquay.

A new variation on Murphy's Law is expounded by the scribe at **Edgware,** who claims that all deadlines expire two days before you thought they did! However, be managed to get in (by the skin of his teeth!) with the information that March 10 and 24 are the dates, and the venue the usual one at the Community Centre, 145 Orange Hill Road, Burnt Oak, Edgware.

Now a couple of Brummies come to the top, sent in by the same scribe—which leads us to hope the clubs split the savings in postage fifty-fifty! **South Birmingham** first; the shack is open every Friday evening for a Construction-and-Natter Night, and on Wednesday, March 2 there will be either a Film Show *or* a Test Equipment lecture by G4ELO. Hq. is at Hampstead House, Fairfax Road, West Heath, Birmingham B31.

The other group is **Midland** who have March 1 and 29 at Brasshouse Centre, off Broad Street, for Construction Nights; plus March 15 when G8AMD and G8FTU will be talking about 70 cm. Repeaters, at the University of Aston, Gosta Green.

Sign-Off

We have already discussed the routine for locating your deadline in the preamble to this piece, at March 4 arrival, latest, addressed to your Club Secretary, SHORT WAVE MAGAZINE, 34 High Street, WELWYN, Herts., AL6 9EQ.

See you all next month!

Late Flash

Just as this piece was being finished, a telephone call reached your conductor from Welwyn, to let us know that last time round we "got it wrong" as to the **Surrey** club routine—giving only one of their two dates for the month and placing that on the wrong day. Since they took the trouble to ring us and point this out, we read between the lines that someone turned up on the wrong night and found no meeting; and that is a situation which is not very pleasant either for the club itself or the visitor or potential member who was unlucky. We can only hang our heads in shame, and say we try never to slip-up like this; and we hope the potential member will not blame the club officials who are among the most regular and reliable reporters to this feature. Sorry, chaps.

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READERS

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Manuals: A.510, CT-436, Mercury, CT-218, 770, R.1475, £2. B.40, CR-150/3, BC-348, £1.75. Many others. — Brooks, 5 Farrant House, Winstanley Road, London SW11 2EJ.

Selling: 'G3ZVC' SSB transceiver with preselector and IC's for PA, £45. AM-25T Vanguard with control cables, £20; AM-25B Vanguard with cables, £10; both working on two-metres. Channelmaster rotator, £20. — Taylor, 11 Minehead Street, Leicester. (Tel: Leicester 854241).

Selling: Trio R-300 with manual, Joystick VFA and ATU, five months old, **mint,** £100 cash. — Ring Shuttleworth, 061-643 3196.

Wanted: Heathkit Mohican Rx with handbook, and suitable mains PSU. Handbook or any information on ex-Army Rx Selective Carrier No.2 Mk.II, Cat. No. YB-05377. Any books on amateur radio astronomy. Details and price please. — Roberts, 9 High Street, Bala, Gwynedd LL23 7AG.

For sale: Henpecked amateur going QRT: IC-210, £170. EC-10 Mk.II, £100. Both mint condition. (London). — Box No. 5564, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts AL6 9EQ.

Selling: Drake R4-B with speaker, 15 crystals, spare set of new valves and manual, mint, £215; includes Beyer dynamic earphones, Joystick and Joymatch III tuner. Buyer collects. — Harman, 3 Moreton Court, 212 Dover Road, Walmer, Kent. (Tel: Deal 64398).

Sale: Radiospares mains isolating transformer 200/250v. at 200vA., £10. Large de-luxe roller coaster, all ceramic, silver-plated wire, £9. Both brand new, unused. Postage extra. **Wanted:** R.C.A. AR8516L, must be in first class condition. Details and price please. (Lancs.). — Box No. 5565, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts AL6 9EQ.

For sale: Liner-430, as new, few hours use only, £225. Sony Trinitron Secam TV, 819/625, VHF F2-F12, UHF 21-69, as new, £130. — Ring Lewis, Coventry 711199.

Wanted: Bradley CT-471C multimeter. Handbook for Manson HD-180A frequency standard. VHF receiver covering 30-180 MHz. Details and price please. — Passfield, 30 Greenleaf Close, Tulse Hill, London S.W.2. (Tel: 01-674 5825).

Wanted: Transceiver, preferably K.W. Must be in excellent condition, will collect within reasonable distance. Details and price please. — Harlow, G3SHL, QTHR. (Tel: Leicester 402013).

For sale: Liner-2 with PA-3 pre-amp. and QM70 70cm. transverter, £155. Must go together — bargain to get going on both bands. — Coomber, G8JXL, QTHR. (Tel: 01-886 6843 after 7 p.m.).

Selling: Drake SSR-1 general coverage receiver, as new, £160 cash. Buyer collects. — Ring Richards, Bodmin 3738 (Cornwall).

Offering: Codar AT-5 transmitter with Codar mains unit. Labgear LG-50 transmitter. Both in excellent condition. Offers? — Critchley, 9 Abbey Close, Penkridge, Stafford.

Selling: UHF radio/transmitter performance tester, £10. Type 51 wave form generator, £8. Mobile Pye Cambridge VHF Tx/Rx, working on 2m., with microphone, £35. BCC VHF base station transmitter, £6. AC-mains stabilised PSU, will drive many ex-govt. equipments, £1.50. Carriage extra, s.a.e. with enquiries. — Hayward, Sunnyfields, Lighthouse Road, St. Margarets Bay, Dover, Kent.

For sale: Drake R4-C, as new in carton, with manual, only bench tested, all 10 and 160m. xtals, extra 1-5 filter, £350. Hy-Gain Model 400 rotor and control box, unused, £80. Wanted: Collins 75S-3B and 32-S3 spare parts. — Box No. 5559, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts. AL6 9EQ.

Selling: Heathkit GC-1U Mohican general coverage receiver, £26.50. Two-metre converter, IF 4 MHz, with pre-amp. and 3-element beam, £22.50. 70 cm. converter, IF 144 MHz, with pre-amp. and 4-over-4 beam, £22.50. Post paid. — Jenkins, 15 Tiltstone Avenue, Eton Wick, Berks.

Wanted: KW-500 or KW-600 linear amplifier. Details and price please. — Ring Acton, G3MBJ, Burton-on-Trent 63767.

April issue: Due to appear March 25th. Single copies at 45p post free will be sent by first-class mail for orders received by Wednesday, March 23rd, as available. — Circulation Dept. Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts AL6 9EQ.

Wanted: Copies of 'Ham Radio' Oct. 1971, Nov. 1972, July 1974, Feb., June, Sept., 1975. State price. — Barnett, Post Box 10, Evesham, Worcs.

Selling: Yaesu FRG-7 with Eddystone active-antenna, ideal for flat or where outdoor antenna impossible, accurate spot-on tuning, cost together £192, will sell separately. Joystick SWL antenna with tuner, £18. Hitachi stereo radio recorder Model No. TRK-5190K, 4-band, mono/stereo/auto/manual recording, mixing facilities, accurate radio section, ideal for recording enthusiast, cost £125. All gear new Nov./Dec. '76. Offers? Genuine sale, cash needed. (London). — Box No. 5560, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts AL6 9EQ.

For sale: Belcom FS-1007P, 16-channel, auto-scan, base transceiver, with five repeater and nine popular simplex, auto tone-burst and narrow filter fitted by importers, 3 months old, as new, £170. **Panda ATU,** 80-10m., £45. **Heath HW-12A** 80-metre SSB transceiver, with HP-13 DC power supply, £85. — de Bono, G3NJK, QTHR. (Tel: 0533-774477).

Sale: Lowe monitor Rx, five channels fitted, unused, £35 or near offer. — Ring Fulcher, Norwich 55236, evenings.

Sale: KW-204, used sparingly, but with minor fault in tone osc./mic. amp. section, and slightly marked case, hence only £140. Trio JR-310 with Top Band, narrow filter, calibrator and full 28-30 MHz, £70. IC-22A, fitted eleven channels, little used and in excellent condition, £120. — Elliott, G3ZOG. (Tel: Sunderland (0783) 280080).

Wanted: AR88LF receiver in first class condition, positively no modifications. Details and price please. — Ring Glover, Farnworth 75345 (Lancs.) after 6 p.m.

Selling: Trio TR-7200G, transmit unused, original packing, with mount, mic., manual, ¼-wave aerial and 16 crystals, £160 or near offer. — Ring Saxby, 0521-41572.

Sale: FT-DX500 transceiver, excellent condition, £220 or near offer. **Liner-2** with pre-amp., also 'FB' rig, £120 or near offer. — Macleod, GM4DZX, QTHR. (Tel: 041-959 4455).

For sale: Yaesu FR-50B Rx, 80-10m., boxed with manual, little used, perfect, £75. — Ring Salt, G8LVE, 0279-20478 (Harlow), evenings.

Selling: Yaesu FRG-7, new condition, in makers' box. with handbook, used very little, £135. (London). — Box No. 5561, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts AL6 9EQ.

For sale: Drake SSR-1 Rx, boxed, in original condition, used approx. 10 hours, best offer over £170 secures. — Ferguson, 16 Erracht Road, Inverness IV2 4RE.

Selling: Heathkit Type GD-1U valve GDO, £7. Eagle TT-144 dynamic transistor tester, £3. Grampian DP4/H 50K microphone, £7. Avo EM-272 electronic multirange meter, £20. All in 'as new' condition and post-paid. — Marshall, G4BJF, QTHR. (Tel: Loughborough 63324).

Sale: Ex-Admiralty Marconi CR-100/B.28 receiver, working, with manual, £40 or near offer. Buyer collects. — Ring Parker, Drayton 368 evenings (Abingdon).

For sale: Lafayette HA-350 amateur-bands Rx, coverage 10-80 metres, with calibrator, CW filter and manual, £55. Katsumi CW filter, £5. BC-221-0 frequency meter, 125 kHz to 20 MHz, with original charts and mains PSU, £22. TS-174/U frequency meter, 20-250 MHz, with original charts and mains PSU, £32. All in very good condition. Buyers collect. — Ring Saunders, Newbury 49395 evenings.

For sale: G-Whip Multimobile 71, basemount, 10-20 metres, mint condition, £15 inc. post/packing. — Smye, G4DMN, QTHR. (Tel: 051-336 2386).

Selling: Yaesu GRG-7 general coverage receiver, new, boxed, £140. Hamgear Preselector PM-IID, £11. Solid-state AC/DC radio phonograph, £15. Codar MB-6, with manual, mint condition, £15. Toshiba AC/DC cassette recorder, £16. Joystick aerial and tuner, £17. — Hosanee, 4 College House, Hydestile Hospital, Godalming, Surrey.

Sale: HW-100 with PSU, speaker, K.W. SWR unit and K.W. E-Zee Match, £130 cash. — Ring Ward, Stevenage 59362 after 6 p.m.

Wanted: Brokendown Collins 75-S1, 75-S3 and 32-S3 for spares, or 'S'-Line spares. Details and price please. — Box No. 5562, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts AL6 9EQ.

Wanted: FR-101DD or similar; also quality receiver and/or converters covering 100-200 MHz. Cash waiting. — Ring Stark, Accrington (0254) 32155/35947.

Wanted: For collection of German W.W.II military radio equipment: wireless sets, receivers, transmitters, accessories. Details and price please. (Belgium). — Box No. 5563, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts AL6 9EQ.

Selling: Icom IC-22A, 11-channel, tone-burst, £125. S.T.E. Arac 102 2-metre Rx, £50. Hustler mobile 2m. colinear, £15. 12v./5A. battery, £5. — Ring Knowles, 051-525 2574.

Wanted: Back-copies of I.E.R.E. Journal; also VHF receivers covering 50-250 MHz. — Hughes, 11 Henley Road, Ludlow, Salop.

Sale: KW-2000A, with mains PSU, mobile PSU, Shure mic., spare 6146's, leads and manual, £180 or near offer. — Buckley, G3VLX, QTHR. (Tel: Orpington 26584).

Wanted: BC-348 or similar wide-band coverage Rx, with amateur/trawler/MW. Reasonable price paid. — Roberts, 71 Gibbins Road, Selly Oak, Birmingham.

Selling: Heath IB-1100 frequency counter with IB-102 scaler to approx. 180 MHz, mint condition, with manuals, £85. — Ring Callaway, G4FIG (QTHR as G81KY), Lancing 62134, Sussex.

Wanted: Atlas transceiver; also good 2m. transceiver. — Hunter, G4EBJ, Holme Lea, Maryport Road, Maryport (2543), Cumbria CA15 7EE.

For sale: VHF/UHF power transistors/valves: 2N5707, £5; 2N5641, £5; BLY90, £14; QQVO3-10, £3; 4CX250B, £10. Send s.a.e. for other goodies. Or will **part-exchange** the above for general coverage Rx (e.g. AR88, Eddystone etc.). — Mourao, 31 Chaucer Way, Colchester, Essex. (Tel: Welwyn Garden City 23434 ext. 3403, working hours).

For sale: Extendable lattice aerial, 25-ft. approx. Buyer to dismantle. Offers? — Parker, 46 Abingdon Road, Drayton (368), Abingdon.

Sale: Telford TC-10 Mk.II all-mode Tx, £60. Or **exchange** for linear amp. suitable for Liner-2. — Tester, G8KPJ, (Tel: Lewes 2254, daytime).

Selling: BC-221 frequency meter with original charts, £16 plus £2 carr. R.C.A. mains transformer, input 200/250v. 50Hz, output 2300-1750-0-1750-2300v. at 750mA., £16 plus £3 carr. Tetrode QY3/125 (4/125A), £4 plus £1 carr. — Bottomley, G6TZ, QTHR. (Tel: Coventry 468388).

Sale: Kokusai 455 kHz filter Type MF455-15K (one carrier crystal), £12; suitable for 'G2DAF', K.W. Tx's etc. Crystals 9 MHz and 12.5 MHz, £1.10 each. — Parsons, 46 Beaumont Rise, Fareham, Hants.

Sale: Tech 20D RF signal generator (120 kHz to 500 MHz) and Tech 65-VTVM, both brand new, with combined holding rack, cases and receipt (cost £68.50 last November), sell for £52. (Sussex). — Box No. 5555, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts AL6 9EQ.

Offering: AR88LF with product detector, new RF stage and other mods; 2m. converter, with case, S-meter and manual; also Pye Reporter radio-telephone, needs PSU. — Ault, 23 Newton Street, West Bromwich.

For sale: Eddystone 840C general coverage Rx, mint condition, with manual, £50 or near offer. — Ring Newlands, Tonbridge 359291 (Kent).

Exchange: GR-78 receiver, compact, one micro-volt sensitivity, 190 kHz to 30 MHz in six bands, 5 watt AF output, mains or 12v. external supply FOR AR88D. Please write or call. — Peters, 9 Hospital Road, Arlesey, Beds.

Wanted: R.1116, R.208, R.106, R.109 and National 1-10A; also wireless Sets No.22 xtal, No.9, No.11, No.52 complete or Tx only, No.58 or accessories, scrap No.22 with variometer, No.22 power unit, and aerial tuning unit for Tx No.12. Any other interesting ex-govt. equipment? — Morriss, Pippingford Park, Nutley, Sussex. (Tel: 082-571 2205).

Wanted: External microphone for Standard C146A. — Ilbury, G3MMW? QTHR. (Tel: 0252-512451).

Selling: 'Realistic' DX-160 general coverage receiver, one year old, £70. Buyer collects. — Ring Wanklyn, 021-429 3918.

QTH for sale: 17 miles N. of London at Broxbourne, Herts.: 6 years old, centrally heated, 3-bed semi-detached with thro' lounge, kitchen, downstairs cloak-room, integral garage including shack; roof-mounted TA-33 with BN86 balun, mast, guys, rotator and feeder, £17,250.—Ring Ludwell, G3ZZQ, Hoddesdon 64896.

For sale: Heathkit HW-32A Tx/Rx with AC/PSU, GH-12A microphone, crystal calibrator and speaker, £60. Eddystone 840C receiver, £30. The above in excellent condition; prefer buyers inspect and collect, or carriage at cost. — Gordon, G4AQJ, 46 Waltham Crescent, Nuneaton, Warks. (Tel: 0682-68510).

Sale: FT-101B transceiver with CW filter, spare PA tubes, handbook and all accessories, £320. (London). — Box No. 5556, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts AL6 9EQ.

Sale: AR88D, one of the original models, immaculate condition, with S-meter, xtal calibrator, two speakers, and set of spare valves. Offers over £75. (Norfolk). — Box No. 5557, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts AL6 9EQ.

Selling: Liner-2 with pre-amp., stabilised power supply, mic., mobile whip, as new, £130. — Ring Berkeley, Weybridge 40842.

Sale: Heathkit DX-100U transmitter and Heathkit RA-1 receiver, both in good order and with manuals, £25 each or £40 the pair. Buyer collects. — Foote, G4FOH, 20 The Furlongs, Needingworth, Huntingdon. (Tel: Slepe 8580).

Active VHF amateur, responsible professional person, seeks share in flat or single bedsitter within easy reach of London; must be good VHF location. — Nelson, G8HAL/G4FRX, QTHR. (Tel: 01-602 5855).

Wanted: Several NR-56 2m. Rx's, 2200G transceiver, Microwave Modules 432/28 MHz converter. Parcels to friends' address in Dover. — Vanden Bussche, ON6WR, 8 Van Iseghemlaan, 8400 Ostend, Belgium.

Selling: Zenith 80 2¼-sq. SLR camera, complete with two backs, filters, meter etc. (similar to Hasselblad). Yaesu-Musen YO-100 monitor 'scope, complete and boxed; Belcom autoscan VHF/FM transceiver; Belcom AF/RF signal generator; Electronic digital and Kenwood clocks; Redifon TT-10 transistor T.U.'s. All new and unused. s.a.e. essential for reply. (Northants.) — Box No. 5558, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts AL6 9EQ.

For sale: KW-2000 transceiver with AC/PSU, £95. — Wilson, G3PNH, QTHR. (Tel: Chippenham 3548).

Wanted: Communications receiver in good condition. Or would exchange perfect Philips stereo system; or three very old radios, complete but needing attention. Cash adjustment if necessary. — Ring Williams, Sunderland (0783) 42905, evenings.

Sale: Liner-2, mint, £130; 'Cambridge' AM-10D, AM/FM, fitted 145.00, 145.20, 145.50, 145.55 and R7, £45; EC-10, £30; Two-metre converter for Heathkit SB-300 receiver, £8; Transformer, 350-0-350v. at 150mA., 6.3v. at 4A., £3; Lear Jet radio and 8-track cartridge player, £20. — Croft, G8CJM, QTHR. (Tel: Medway 47280).

For sale: Belcom FS-1007P 16-channel auto-scan base transceiver, with six simplex channels and narrow filter, 4 months old, hardly used, £120 or near offer. — Ring Devine, 0924-825025.

Wanted: Three Electroniques wide-band couplers Type WBC for 1.8 MHz. Your price paid. — Mackintosh, GM31AA, QTHR.

Sale: Atlas 210X with portable PS-200 AC supply, mint, £440. Would consider **exchange** for VHF rig, FT-221R, TS-700G, FR-101D etc., in sound condition. Shure 444T, new, £15. — Kenneford, 2 Mill Lane, Shoreham, Sussex. (Tel: 01-632 5314, daytime).

Sale: Barlow-Wadley XCR-30 Mk.II, new 1.12.76, £100. — Cockerell, 3 Blakehall Street, Preston, Lancs. PR1 4XP.

Selling: K.W. Vespa Mk.II, 160/10m., SSB/AM/CW, 6LQ6 PA, PSU, excellent condition, £80. Cowl-Gill motor, 12/24v., ideal for beam rotation, virtually unused, £10. — Newton, G4AHI, QTHR. (Tel: Rayleigh 4195).

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