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The
SHORT WAVE
Magazine

VOL. XXIX

JULY, 1971

NUMBER 5



WORLD WIDE COMMUNICATION



World-wide leading manufacturer for the Radio Amateur

Long established to give you reliable service
EXPERT FREE ADVICE DIRECT FROM THE MANUFACTURER

All Equipment available
through accredited agents

2 Great Transceivers DELIVERY IMMEDIATELY, FROM STOCK



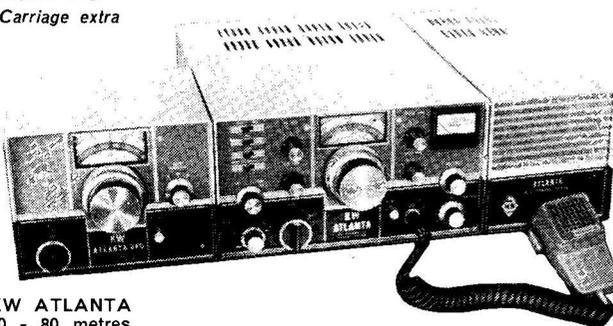
KW2000B 10-160 metres

SSB TRANSCEIVER : 180 watts
PEP 10-160 metres, complete with
A.C. P.S.U., VOX P.T.T.,
I.R.T./I.T.T.

£240

Carriage extra

- Two-speed VFO drive
- Improved VFO Read-out
- New, precise metering
- Attractive panel layout
- D.C. P.S.U. for mobile
- Break-in c.w.



KW ATLANTA
10 - 80 metres

£200

carriage extra

KW Atlanta and
A.C. P.S.U.

- Extremely good audio (crystal filters fitted)
- 500 watt PEP SSB Transceiver
- Operation on all amateur bands from 10 to 80 metres
- A.N.L. and A.L.C.
- 100 kHz Crystal Calibrator.
- Two speed VFO drive
- Built in speaker.

Both transceivers available with remote VFO unit

K. W. ELECTRONICS LIMITED

1 HEATH STREET, DARTFORD, KENT Telephone : Dartford 25574 Cables : Kaydublew Dartford

KW offers a complete range of equipment—ensure your investment in equipment pays dividends—buy KW*

*KW equipment holds its value longer—compare "trade-in" prices for 1-5 year old equipment, with other makes. Spares, for all KW equipment stocked for a minimum of 5 years—this is well worth considering.

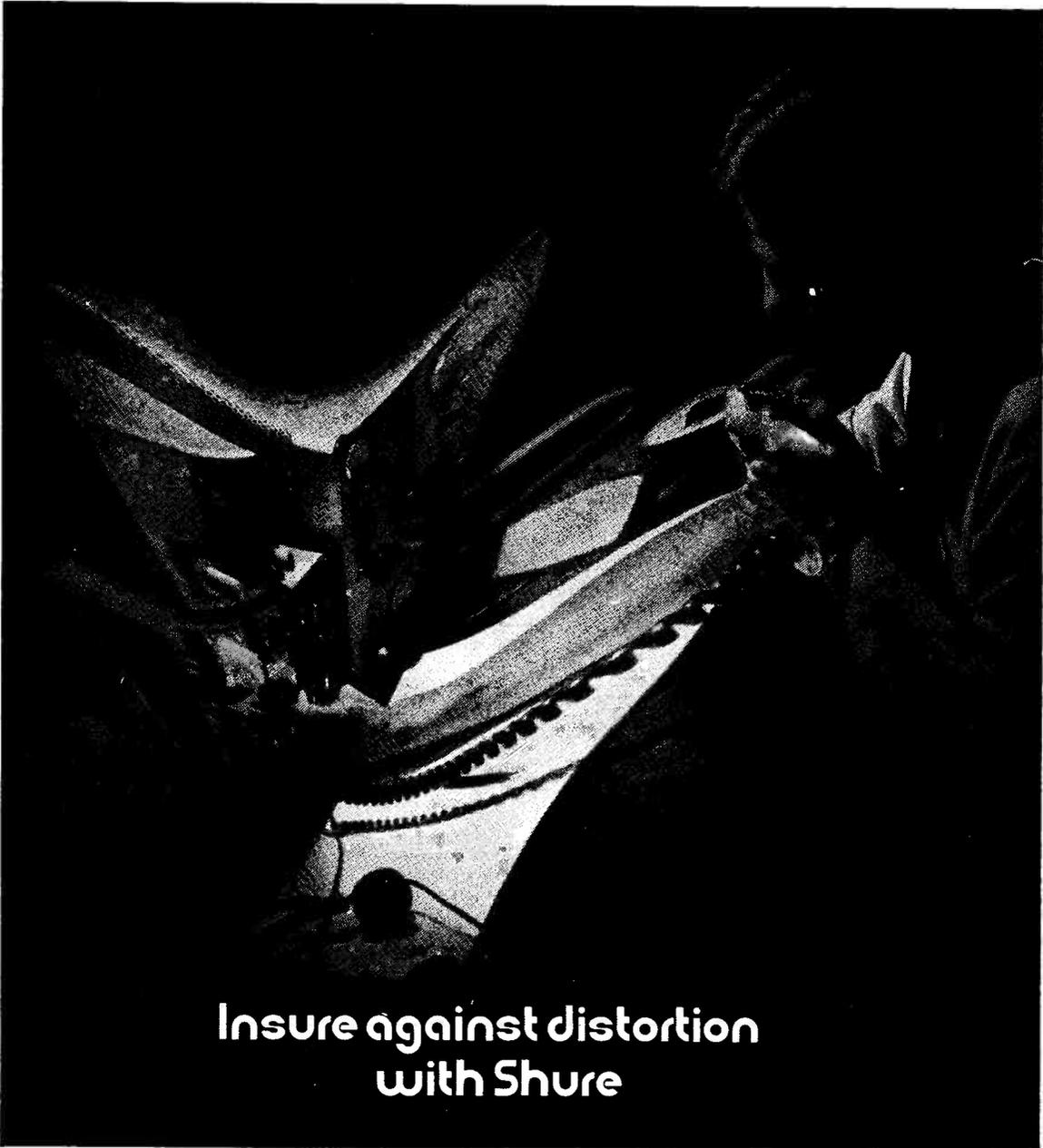
NEW KW PRODUCTS

KW202 RECEIVER, 10-160 metres SSB/AM/CW, with Mechanical Filter, built-in 'Q' Multiplier (Peak & Null), 500 kHz VFO covering all Bands. Two-Speed VFO Drive. Excellent Sig./Noise and sensitivity performance. Very attractive (similar in appearance to KW2000B). 100 kHz Crystal Calibrator price **£140** carriage extra.
KW204 TRANSMITTER, 10-160 metres SSB/AM/CW. Successor to the famous KW "Vespa"—Perfectly matches the KW202 Receiver and is similar in appearance. 180 watts p.e.p. from trustworthy 6146's. Built-in Power Supply. Provides "side tone" cw monitoring. A beautiful compact efficient unit. Price **£142** carriage extra.
KW 101—Standing-Wave-Ratio meter **£9.25***.
KW 103 SWR/Power meter 0-100 & 0-1000 watts **£12.50***. **KW 103** with Dummy Load cnd Coax Lead **£20.50***. **KW 105** Antenna Tuning System including E-Z Match, SWR Ind., Dummy Load, Antenna Switch, 5 position, **£36.00***. Also KW Trap Dipole with twin feeder and 4 other types (only the *original* Trap from KW is good enough for you). KW E-Z Match ATV, KW Low Pass Filters, KW & HZP Baluns, etc.

KW for HY-GAIN, MOSLEY, G-WHIP, POLYQUAD, WEBSTER, HUSTLER ANTENNAS. SHURE Microphones, CDR Rotators. VIBROPLEX Keys, etc.

Write for details today

EASY TERMS ON EQUIPMENT AVAILABLE OVER 12, 18 OR 24 MONTHS



Insure against distortion with Shure

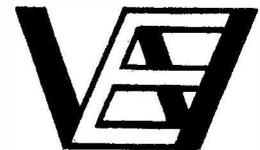
Shure Model 444—controlled magnetic microphone specially designed for radio communications applications with special response characteristic giving optimum speech intelligibility.



Please send me full information on **SWM4**
Shure Communications Microphones.
Name _____
Address _____



Shure Electronics Ltd.
84 Blackfriars Rd., London SE1. Tel: 01-928 3424



FEATURES :

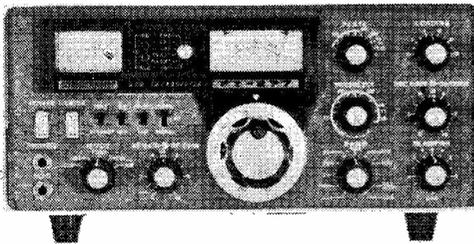
- Accurate Nixie-tube display.
- 500w. p.e.p. blower cooled.
- Built-in noise blander.
- External V.F.O. can be displayed on counter.
- Incremental receiver tuning.
- Separate A.C. or A.C./D.C. power supply units.

Send S.A.E. for specification sheet.

Price: **DIGITAL 500** with **DP 300** speaker/A.C. supply **£298** carriage paid

The **DIGITAL 500 TRANSCEIVER** is a highly advanced high power transceiver using semiconductors and tubes. There are 28 IC's and 10 Tr. in the counter unit alone. Receiver RF, Mixer and Transmitter Mixer, Driver and P.A. are tubes.

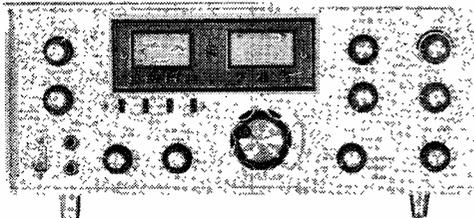
FT277



- 10 FET's, 3 IC's, 31 TR and 38 diodes.
- Highly advanced computer-type plug in modules.
- 240w. p.e.p. 3.5-30 MHz.
- 12v. D.C. and 100/240v. A.C. supplies built-in.
- Break-in C.W. keying (180w.)
- Dual gate Mosfet's for 0.3 μ V sensitivity for 10 dB S/S + N ratio.

- ★ Noise Blanker is standard.
 - ★ Built-in WWV band.
 - ★ Built-in speaker.
 - ★ 25 and 100 xtal calibrator.
 - ★ Comes complete with microphone.
- All this for our low PRICE of **£230** (carr. £2).

**AND THE FT747
(WITH JUMBO JET POWER !)**



- ★ 560w. p.e.p. input 3.5-30 MHz.
- ★ Built-in 100/240v. A.C. supply.
- ★ SSB with 1.6 : 1 filter shape factor.
- ★ Break-in CW (CW filter available).
- ★ Excellent 100 kHz dial mechanism.
- ★ Built-in WWV band and 25/100 kHz calibrators.
- ★ Sensitivity : 0.5 μ V for 20 dB S/S - N.
- ★ Excellent value at **£195** (carr. £2).

- ★ NEW AMECO (U.S.A.) Preampifier 160-6m. Suitable for transceiver use. p.o.a.
 - ★ NEW FL2500 Linear amplifier 160-10m. 2kW p.e.p. **£118** (£2 carriage).
 - ★ NEW SP101 Matching speaker available ex-stock for our FT101/277 owners, **£10**.
- NEW 160 metre conversion available for our FT747 owners or will fit for you p.o.a.

SOMMERKAMP (Yaesu) EQUIPMENT (all items EX-STOCK).

FT101/FT277	£230	DC200	£45	FT560/747	£195
FV101/FV 277	£38	FR400/500	£120	FT550/747 - CW filter	£215
SP101	£10	FR500S	£145	FL2000B	£130
FT200/250	£132	FL400/500	£130	FT2F	£80
FP200/250	£36	SP400	£10	FT50DX	£6-20
FV200/250	£38	FV400S	£38	YD844	£11
				YD846	£5

USED EQUIPMENT : KW2000A and p.s.u., **£160**. SX111, **£60**.
Osker Power Meter with plugs **£18-50** (30p). Caslon 602 Clocks, **£18-50** (30p).

CATALOGUE. Details of the items are included in our catalogue (15p)
Our showroom has all the items on display or contact **Roger, G3XF A**, on **01-845 6290** after 6 p.m.
Stephen-James Ltd., J. and A. Tweedy Ltd. and Derwent Radio also have items in stock.

WESTERN ELECTRONICS (U.K.) LTD.

THIS IS ANTENNA MONTH!

(We have good stocks but make sure that you're not the unlucky one!)

NEW

NOW A GREAT NEW WIDE BAND VERTICAL for 10-80m, self supporting HY-GAIN'S 18AVT/WB

Take the wide band, omni-directional performance of Hy-Gain's famous 14AVQ/WB, add 80 meter capability plus extra-heavy duty construction—and you have the unrivalled new 18AVT/WB. In other words, you have quite an antenna.

- Automatic switching, five band capability is accomplished through the use of three beefed-up Hy-Q traps (featuring large diameter coils that develop an exceptionally favourable L/C ratio).
- Top loading coil.
- Across-the-band performance with just one furnished setting for each band (10 through 40).
- True 1/4 wave resonance on all bands.
- SWR of 2 : 1 or less at band edges.
- Radiation pattern has an outstandingly low angle whether roof top or ground mounted.

CONSTRUCTION . . . of extra-heavy duty tapered swaged seamless aluminium tubing with full circumference, corrosion resistant compression clamps at slotted tubing joints . . . is so rugged and rigid that, although the antenna is 25ft. in height, it can be mounted without guy wires, using a 12in. double grip mast bracket, with recessed coax connector. (Delivery in August).

HY-GAIN (ex-stock, carriage extra)

Vertical :	12 AVQ 10-20m. ...	£16	LC80Q 80m. coil ...	£6-70	Hy-Tower 10-80m. ...	£90
	14 AVQ 10-40m. ...	£19	18AVT/WB 10-80 ...	£33	18v. 10-80m. ...	£10
Tri-Band Beams :	TH6DXX 10-20m. 6 ele	£85	TH3Mk3 10-20m. 3 ele	£68		
	DB10-15 10-15m. 3 ele.	£51	HYQuad 10-20m. 2 ele.	£62	TH3Jnr. 10-20m. 3 ele.	£47
Mono Band Beams :	103BA 10m. 3 ele. ...	£14-50	203BA 20m. 3 ele. ...	£67	BN86 Balun ...	£8
	153BA 15m. 3 ele. ...	£33	204BA 20m. 4 ele. ...	£69-50	LAI lightning arrester	£14-50

MOSLEY (ex-stock, carriage extra)

TA33 Jnr. ...	£31-50	Mustang ...	£38	Atlas Vertical 10-40m. ...	£19	TA32 Jnr. ...	£22
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NEWTRONICS. Hustler Mobile 10-80m. antennas in stock. Prices on application.

J. BEAMS (ex-stock, carriage extra)

2m. :	2/4Y 4 ele. ...	£2-65	2/14P 14 ele. ...	£13	2/12 6 over 6 ...	£6-15
	2/6Y 6 ele. ...	£3-20	2/10XY cross polarised... ..	£11	2/16 8 over 8 ...	£7-65
	2/8Y 8 ele. ...	£3-80	2/100v. omni/		2/HO Halo ...	£1-20
	2/10Y 10 ele. ...	£8-20	bi-directional ...	£6-50	2/HM Halo and mast ...	£1-50
70 cms.:	70/16 8 over 8 ...	£5-10	2/8 4 over 4 ...	£4-60		
			70/18P 18 ele. ...	£6-50	70/14Y 14 ele. ...	£6-45
			70/MBM/46 46 ele. ...	£9-60		

BANTEX (ex-stock, carriage extra). Fibre glass mobile vertical antennas.

BTN. 2m. 1/2 wave ...	£2-95	B5 2m. 3/8 wave ...	£4-50	Magnetic Mounts ...	£4-95
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G-WHIPS (ex-stock, carriage extra 65p).

Tri-bander 10, 15 & 20m.	£9-45	"Multimobile 71" 10, 15 & 20m.	£11-50	Base mounts ...	£1-45
LF40 40m. coil ...	£4	MM40 40m. coil ...	£4	Thread adaptor ...	25p
LF80 80m. coil ...	£4	MM80 80 m. coil ...	£4	S.A.E. for leaflet please.	
LF160 160m. coil ...	£4	MM160 160m. coil ...	£4		

Telescopic section for LF coils 70p.

W.E. QUAD. 10-20m. "boomless" type. Cast aluminium centre, bamboos, etc., £23, carriage paid.

★NEW! W.E. Trapped dipoles for 10-80m. All are fitted with resin encapsulated traps and a high quality commercial grade centre assembly with cable strain relief.

Type S. 500 watts, £11-50 Type HP for 1 kW p.e.p., £13-50.

Type P with a special copper terylene element for ease of coiling up.

Supplied with winding spools and 70ft. co-ax, £14-90.

★NEW! GEM QUAD (from Canada) 10-20m. 2 ele. fibreglass kit with balun, £65.

This may be converted to a 3 or 4 element version. Details are in catalogue.

ROTATORS (ex-stock, carriage indicated)

AR10 ...	£18 (40p)	TR44 ...	£40 (75p)	HAM-M ...	£70 (80p)
AR22R ...	£25 (65p)	HY-GAIN 400 available August	£98 (80p)		

TELOMASTS, TELETOWERS, HAM TOWERS, VERSATOWERS. See previous advertisements.

NEW 1971 CATALOGUE. You ought not to be without your copy listing towers, masts, rotators, antennas, Yaesu/Sommerkamp equipment and a host of extra items. Send 15p only (no s.a.e.).

Hours of business: Monday to Friday 9-1 p.m. 2-5.30 p.m. (Saturday by appointment)

- ★ Your 'one stop' single source of towers, mast, antennas, etc.
- ★ Money saving 'package deal' on purchase of mast, rotator & antenna.
- ★ Largest range in the U.K.



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Stockists

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**R.L. DRAKE'S
MAGNIFICENT
R-4B RECEIVER**
£240.00



Full Range of
Matching
Transmitters, Linears
and
Ancillary Accessories
in Stock.

Send S.A.E. for
Details.

FEATURES

- **PASSBAND TUNING**
- **AVC WITH FAST ATTACK AND SLOW RELEASE** for SSB or fast release for high speed break-in CW. Also AVC may be switched off.
- **NOISE BLANKER** that works on CW, SSB, and AM and **NOTCH FILTER** are built in.
- **CRYSTAL LATTICE FILTER 1st IF** prevents cross-modulation due to strong adjacent channel signals.
- **PREMIXED INJECTION**—Crystal oscillator and low frequency VFO outputs premixed.
- **RECEIVES SSB, AM, CW, and RTTY** with full RF gain, complete AVC action and accurate S-meter indication.
- **PRODUCT DETECTOR** for SSB/CW—diode detector for AM.
- **EXCELLENT OVERLOAD AND CROSS MODULATION CHARACTERISTICS**; insensitive to operation of nearby transmitters.
- **TRANSCIVE CAPABILITY**; May be used to transceive with the T-4B or T-4XB Transmitters. Illuminated dial indicator shows which VFO is being used.
- **25 kHz CALIBRATOR** embodies sophisticated design, using integrated circuits and FET's, permits working closer to band edges.
- **NEW SCRATCH-PROOF EPOXY PAINT FINISH.**

SPECIFICATIONS

Frequency Coverage: 3.5-4.0 MHz, 7.0-7.5 MHz, 14.0-14.5 MHz, 21.0-21.5 MHz and 28.5-2.90 MHz with crystals supplied. Ten accessory crystal sockets are provided for coverage of any 10 additional 500 kHz ranges between 1.5 and 30 MHz with the exception of 5.0-6.0 MHz.

Selectivity: Drake tunable passband filter provides:
0.4 kHz at 6 dB down and 2.6 kHz at 60 dB down, 1.2 kHz at 6 dB down and 4.8 kHz at 60 dB down.
2.4 kHz at 6 dB down and 8.2 kHz at 60 dB down, 4.8 kHz at 6 dB down and 25 kHz at 60 dB down.

Selectivity switching is independent of detector and AVC switching

I.F. Frequencies: First I.F., 5645 kHz crystal lattice filter; second I.F., 50 kHz tunable L/C filter.

Stability: Less than 100 cycles after warm up. Less than 100 cycles for 10% line voltage change.

Sensitivity: Less than 0.25 uv for 10 dB signal plus noise to noise on all amateur bands.

Modes of Operation: SSB, CW, AM, RTTY

Dial Calibration: Main dial calibrated 0 to 500 kHz and 500 to 1000 kHz in 25 kHz divisions. Vernier dial calibrated 0 to 25 kHz in 1 kHz divisions. **Calibration Accuracy:** Better than kHz when calibrated at nearest 100 kHz point.

AVC: Amplified delayed AVC having slow (.75 sec.) or fast (.025 sec.) discharge; less than 100 microsecond charge. AVC can also be switched off. 3 dB change in AF output with 60 dB change in RF input.

Audio Output: 1.5 watts max. and .5 watts at AVC threshold.
Audio Output Impedance: 4 ohms and hi impedance for anti-vox.

Antenna Input: Nominal 52 ohms.

Spurious Responses: Image rejection more than 60 dB. I.F. rejection more than 60 dB on ham ranges. Internal spurious responses in ham ranges less than the equivalent 1 uv signal on the antenna.

Controls and Jacks:

Front: Main tuning, AF gain, RF gain, AM-SSB/CW with slow AVC, fast AVC, or AVC off, function switch, band switch, xtal switch, passband tuning and selectivity, preselector, and notch.

Rear: Antenna jack, speaker jack, mute jack, anti-vox jack, injection jack, accessory power socket, and fuse post.

Side: Notch adjust, S-meter zero, VFO-Xtal switch, and headphone jack.

Power Consumption: 60 watts. 120/240v. A.C., 50 to 400 cycles.

Dimensions: 5½" high, 10¾" wide, cabinet depth 11⅛", overall length 12¼", weight 16 lbs.

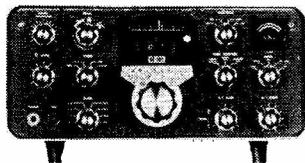
RADIO SHACK LTD.

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LONDON, NW6 3AY

Just around the corner from West Hampstead Underground Station

Telephone: 01-624 7174 Cables: Radio Shack, London, N.W.6.
Giro Account No.: 588 7151

MODEL SB-102 TRANSCEIVER KIT

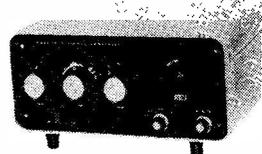


New transistorised L.M.O. — retains features of SB-101—180 watts PEP SSB—170 watts CW input 80-10 metres — requires external PSU (HP-23A or HP-13A).

Kit K/SB-102 £192 Carriage 70p

SB-200 LINEAR AMPLIFIER KIT

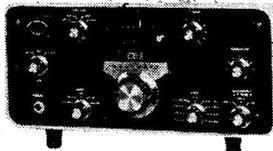
80-10 metres — 1200 watts PEP SSB input—1000 watts CW pre-tuned input — internal PSU, 120/240 VAC.



Kit K/SB-200 £115 Carriage 80p

SB-301 AMATEUR BANDS RECEIVER KIT

80-10 metres—stability less than 100 Hz per hour—visual dial accuracy less than 200 Hz—sensitivity 0.3µV for 10 dB S + N — N LSB, USB, CW, RTTY. 120/240v. A.C.



Kit K/SB-301 £125 Carriage 70p

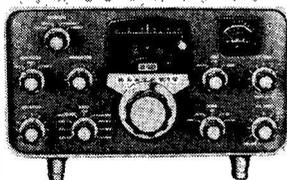
SB-220 LINEAR AMPLIFIER KIT

80 - 10 metres — 2000 watts PEP SSB input 1 kW on CW and RTTY—requires only 100 watts drive—pre-tuned pi-input—fully metered—110/240v. A.C. built in PSU.



Kit K/SB-220 £165 Carriage £1.10

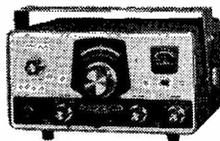
THE NEW SB-303



Solid state circuit—using 27 silicon transistors including 4 dual gate, diode protected MOSFET's plus I.C. Factory assembled solid-state Linear Master Oscillator.

Kit K/SB-303 £175 Carriage 70p

HW SERIES TRANSCEIVERS KIT

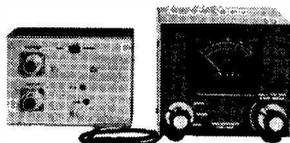


HW series Single Band Transceivers. New styling—upper or lower side-band—200 watts PEP input—choice of HW-12A (80m) or HW-32A (20m)—requires external PSU (HP-23A or HP-13A).

Kit K/HW-12A £61.50 Carriage 50p

Kit K/HW-32A £63.50 Carriage 50p

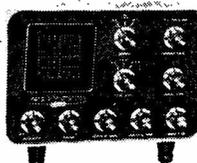
WATTMETER/SWR BRIDGE



Measures RF output from 10-2000 watts. Remote monitoring capability. Insertion SWR—less than 1.05 : 1. 200 and 2000 watts full scale. 50 ohms impedance.

Kit K/HM-102 £15.50 Carriage 30p

SB-610 SIGNAL MONITOR KIT

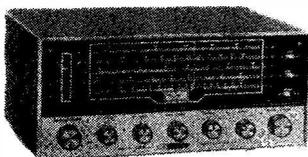


Shows quality of signals transmitted and received—160-10 metres—15 watts to 1 kW—operates with receiver IF's 100 kHz—6 MHz—120/240 operation.

Kit K/SB-610 £46 Carriage 40p

DE-LUXE SHORTWAVE, GR-54

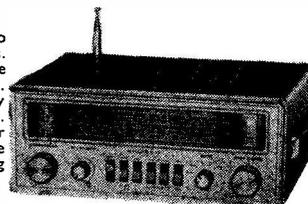
2 MHz to 30 MHz, plus 550 kHz to 1550 kHz, 180 kHz to 420 kHz. Tuned RF. Crystal filter. Product detector. AM/SSB/CW. Noise limiter. Sleek styling. Charcoal grey metal cabinet. 120-240v. A.C.



Kit K/GR-54 £53 Carriage 60p

SOLID-STATE GENERAL COVERAGE, GR-78

Tunes from 190 kHz to 30 MHz in six bands. Double conversion above 18 MHz. AM/CW/SSB. Nickel Cadmium Battery charges from 240v. A.C. or 12-15v. D.C. Modular construction. Durable charcoal and matching finish.



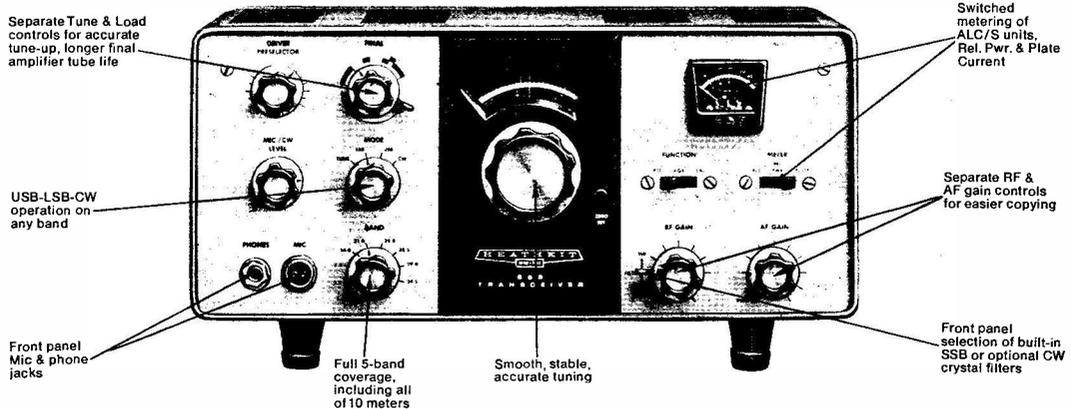
Kit K/GR-78 £65 Carriage 40p



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THIS IS THE RIG

High performance and reliability at a price that you can afford
HEATHKIT HW-101



Compare the specifications

RECEIVER—Sensitivity : Less than $\cdot 3$ microvolt for 10 dB signal-plus-noise to noise ratio for SSB operation. SSB Selectivity : 2.1 kHz minimum at 6 dB down, 7 kHz minimum at 60 dB down. [CW Selectivity : 400 Hz minimum at 6 dB down. 2.0 kHz maximum at 60 dB down]. Image and IF rejection better than 50 dB. **TRANSMITTER**—D.C. Power Input : SSB, 180 watts PEP. CW, 170 watts. RF Power Output : 100 watts on 80 15 metres ; 80 watts on 10 metres. Output Impedance : 50 ohm to 75 ohm. Oscillator Feedthrough or Mixer Products : 55 dB below rated output. Harmonic Radiation : 45 dB below rated output. Transmit-Receive Operation : SSB, PTT or VOX, CW, provided by operating VOX from a keyed tone, using grid-block keying. Unwanted Sideband Suppression : 45 dB down from single-tone input at 1000 Hz reference. Third Order Distortion : 30 dB down from two-tone input. **GENERAL**—Frequency Stability : Less than 100 Hz per hour drift after 30 minutes warmup. Less than 100 Hz for $\pm 10\%$ Voltage variations. Modes of Operation : Selectable upper or lower sideband and CW. Dial Calibration : 5 kHz divisions. Calibration : 100 kHz crystal. Bandspread : $35\frac{1}{2}$ revolutions for 500 kHz. Power Requirements : 700 to 850 volts at 250 mA 300 volts at 150 mA. —115 volts at 10 mA 12 volts A.C./D.C. at 4.76 amps. Kit HW-101 **£125.00** carr. 60p. Optional extra CW filter SBA-301-1 **£11.00** carr. 20p.

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Please send me specification sheets for models

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GLOUCESTER, GL2-6EE

56/7

AMATEUR ELECTRONICS G3FIK

TRIO, KW, YAESU MUSEN EQUIPMENT. Excellent demonstration facilities for the caller. Before purchasing we offer you the opportunity of air testing both new and used equipment and would stress that this is completely without obligation on your part. We have a continual changing stock of first class used gear, all of which is in tested condition before being offered for sale. At the time of going to press we again URGENTLY REQUIRE used equipment of all types, either in part-exchange or for direct cash purchase. The only proviso we make is that the equipment offered, irrespective of its price range or capability, is in the type of condition that we can offer with confidence to our customers. In other words, in the condition that you yourself, were you buying, would accept.

	£		£
TRIO JR-599 RECEIVER. A very recent example of this new model offered in absolutely new condition and with 3 months guarantee	165.00	NATIONAL NCX-5 TRANSCEIVER. Mechanical digital read-out in this Mark II version, a first-class rig in very nice condition	205.00
HALLCRAFTERS SR-500 TORNADO TRANSCEIVER. 500 watts PEP on 80, 40 and 20. This is a first-class example of Hallcrafters engineering with excellent performance, particularly with regard to the receiver section, beautiful condition	135.00	NATIONAL NC-190 RECEIVER. Beautiful condition without a mark	46.00
HAMMARLUND SP-600 JX RECEIVER. Just arrived. A very smart set with matt silver front panel less case	90.00	TRIO TS-500 TRANSCEIVER. Fully air tested 3 months guarantee first-class appearance	130.00
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TS-510 SSB TRANSCEIVER

- Receive and Transmit Frequencies: 3.5MHz-29.7MHz
- Receive Sensitivity: 0.5 μ V. S/N ratio of 10dB at 2.5MHz-21MHz
- 1.5 μ V. S/N ratio of 10dB at 28MHz
- DIMENSIONS: 13"(W), 7"(H), 13-5/8"(D).

VFO-5D

VARIABLE FREQUENCY OSCILLATOR

- Frequency Range: 3.5MHz-29.7MHz
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- DIMENSIONS: 7-7/8"(W), 8-21/32"(H), 7-9/16"(D)

PS-510 POWER SUPPLY AND SPEAKER

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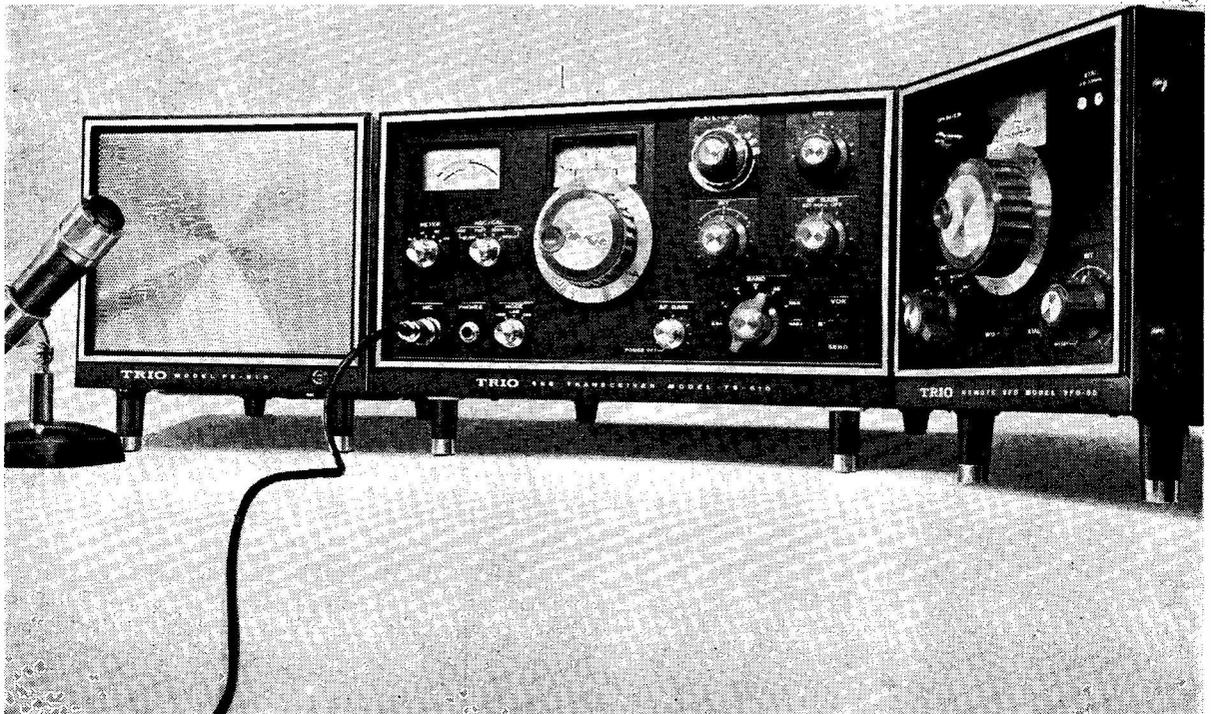
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G3LRB

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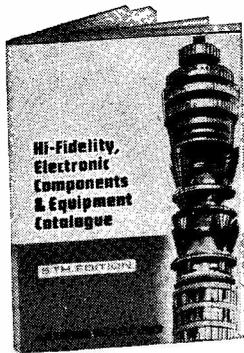
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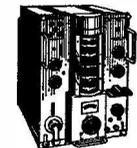
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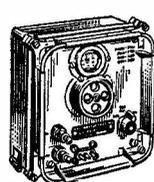


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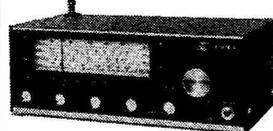
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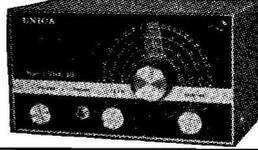
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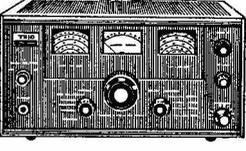
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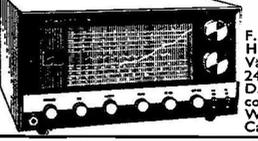
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SHORT WAVE MAGAZINE

(GB3SWM)

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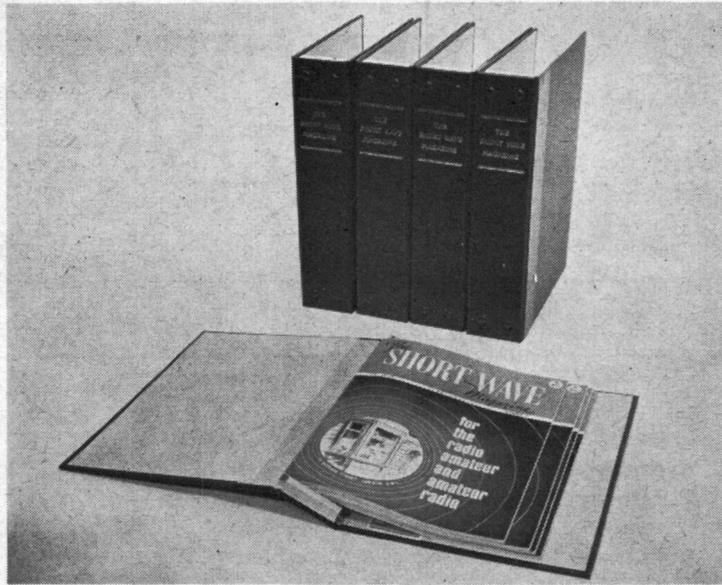
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The SHORT-WAVE Magazine

E D I T O R I A L

Divided *The pattern of Amateur Radio as we know it today is gradually taking a different—and a somewhat unexpected—form from that we have known in the past and with which most of us have grown up.*

There are now two distinct bodies of U.K. licensed amateurs—those free to rove round all bands, and those who are confined to the VHF's, meaning in the main two metres. There is no harm in this nor are the G8/3's (of whom the numbers increase steadily) to be regarded as in any way peculiar.

But what it does mean is that, for the first time in the long history of Amateur Radio, we have a large and active body of amateurs who, because they are VHF specialists, really know nothing about Amateur Radio in the wider sense because they are confined to a comparatively narrow and restricted field of activity in the operating context.

There is no harm in this, either—it is just a newly-developing situation that has to be recognised and understood. And, of course, there is nothing (except the Morse Test!) to prevent a G8/3 breaking out of his confinement and becoming a G4/3, as indeed many are doing.

What is rather difficult to understand is why the Morse Test is regarded as such a barrier. Nowadays, there are far more aids to learning Morse than ever there were before, while in the early days there were none at all. Nevertheless, great numbers of amateurs qualified by being entirely self-taught. And to them, a "good fist" was a matter of pride, something to be striven for and developed.

*Aus Tin Forth,
G6FO.*

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

THIS is the time of year when many of us think about skywires and do a spot of routine maintenance to poles, beams and rotators. One could justifiably add a suggestion that the station equipment could well be "gone over" at the same time, when bands are in the summer doldrums and the weather inhibits outdoor activities. For instance, it is surprising how a slow falling-off in receiver sensitivity, can go unnoticed, or a loss of emission in PA valves.

Your conductor was prompted to this remark by his going through his own gear recently, and finding quite startling evidence of things which were not all they seemed to be. In the event, the receiver is now both steadier in frequency and a bit more sensitive, and the PA valves have been replaced—the latter in fact gave no indications of sickness, but were pulled out and checked as part of a routine test. When the results were compared with those obtained from the same test a year ago and recorded in the note-book kept for the purpose, it was clear they needed replacement if SSB was going to be used, and would soon need to be replaced if CW output was not to fall. The sensitivity drop was caused by nothing more difficult than a slightly leaky decoupling capacitor. The point here is that to carry out such a quick check involves no more than putting the PA valves on a valve tester and taking the rig out of its case to measure the volts with respect to chassis at each pin of each valve, according to the maker's schedule to be found in the manual, noting these and repeating them at reasonable intervals for comparison. Any slow decline in a component, not enough to make one think the rig is u/s, will show up as a change in voltage at some point or other. If a particular voltage reading is down and others are OK, all one needs to do is to check the few components round that pin, and replace as necessary. The whole

routine can be carried out on all the station gear in about an evening, and one ends up with the knowledge that at least things are as they should be at the feeder end of the aerial.

* * *

By and large, things have been pretty much as one would expect, with summer conditions putting a damper on Ten and Fifteen, Twenty carrying the bulk of the traffic—and the QRM!—Eighty and Forty well into the static season, and Top Band a law unto itself, with people working DX in spite of noise that would deafen the ears of anyone not utterly devoted to 1.8 MHz.

Eighty and Forty

If you can sort 'em out on either of these two, you can say you have a selective receiver, a good aerial and either a good noise-limiter or earmuffs! Lack of any of these was not to be worried about by G3ZAY, as Martin's dipoles collapsed and the pressure of the exam-work prevented any serious attempts at rectification.

G2DC (Ringwood) finds the shorter nights are reducing the amount of DX about, although W's are usually to be found on 3.5 MHz after midnight, plus a very active 8P6DR; on 7 MHz it can be extremely lively at times, particularly in the period 0600-0700z when most W's and South Americans can be heard. The G2DC key raised UL7GW, 8P6DR, W1-5, W8-0 and VE1-3 on *Eighty*, while *Forty* came up with CN8AF, several PY's, 8P6DR, W1-0, VE1-3.

Old Timers in particular who have worked *Eighty* and *Forty* CW will be interested to know that ZL3GQ has been in the U.K. for some months now, with the call G3ZTN, and has done some operating from G5YC, the Club station of Imperial College, London. Back home ZL3GQ has an 80-metre dipole, with ATU's to adapt it to all bands 10-160 metres, the latter by using it as a top-loaded vertical. There are Quads for 10-15-20m. and to round it off, the beam

tower is shunt-fed as an 80-metre vertical. No wonder Peter is such a good signal into U.K.! Incidentally, it might be mentioned in passing that ZL3GQ landed 5BDXCC Number 34, which was in fact the first for Oceania and the Southern Hemisphere.

G2HKU (Sheppey) seems a little bit bolshie about something—his list mentions CW on *Eighty* with YO4ASG/MM, while, *Forty* CW accounted for CO2BB, PY7ND and UF5FAO; PJ2CW, YV1KZ and YV5CUZ were raised on Sideband.

Top Band Clip

As far as your conductor is concerned, Top Band yielded the got-away-of-the-month, in the form of 4U1ITU, heard on CW, calling CQ one evening, pretty weakly, but one would have thought workable. His CQ produced no takers—so G3KFE called him. This procedure produced a most deafening silence—4U1ITU had sunk without trace.

For W4WFL/1, Top Band CW with his 25 watts to an L-network and 25 feet of wire hanging from a third storey window provided all his Amateur Radio activity, with lots of very pleasant QSO's out to the 500 or 600 mile mark. However, Morgan is threatening to try the HF bands again with 50 watts into a Joystick to see what develops.

At G2HKU, operations have been conducted on both CW and SSB, the former yielding PA0CC, PA0INA, OK2RGA and GM3HJB, while SSB produced QSO's with PA0PN, GW3VKL/P, GC3APA.

A puzzled letter comes in from G3ZUF (Woking) who says he worked a station signing HB9AVQ/MM on the pirate radio ship *Mebo*, which was recently reported afire. However, Robert heard a net on *Eighty* discussing this station and quoting it as HP9AVQ. Hence, he wants to know what the call really was, and where to send a QSL card. One would think the most likely address is that to which the

DJ requests are sent—but one would also have serious doubts as to whether the operator on the ship had a legitimate amateur call anyway.

Is anyone wanting Carmarthen or Montgomeryshire? If so, look out for GW4ABC/P, the Thornbury Club on a DX-pedition to those parts from August 6-10, operating Top Band. G3XSJ offers this information on behalf of the members, and so presumably sked requests or whatever should be sent to him—*QTHR*.

QSL Addresses

Lots of 'em this time, and the first one is that of the chap who has of late been DA2YX/DA2YY, Sgt. Ryan, of 229 Signal Sqn. He is starting a long journey on June 26, to become Sean Ryan, VK6JR, c/o 12 Munyard Way, Morley, 6062, Western Australia, and a civilian at last. Friends in Tipperary, England, Hong Kong and Singapore who may be wondering what has become of him, please take note, and save him an awful lot of letter-writing!

Prefix hunters who may have hooked WZ6SNI, St. Nicholas Island, off the coast of California, can send their QSL's to WA6WWC; this from W4WFL/1, who adds that the operation was over the weekend May 15. Also from W4WFL/1 comes news that VE3DLC has had to give up QSL manager chores for all his clients. Thus, effective forthwith, VE3GMT will take over 6Y5GB, 8R1U, 8P6AH, 8P6CB, VP2GBG, VP2GBH, VP2DAN, 8P6BX and 8P6BN. VE2DCY handles cards for ET3DS. But henceforth QSL *direct* to these stations: 5Z4KL, HI8XPM, VP1TM and VP1FW. SM5BGK will be handling YA1OS cards while the latter is in Afghanistan. Cards for LU2E should be sent to LU2DKG; KD2UMP via W2RSJ; CT/AA via WA3HUP (a new QSL manager); TJ1AR via R.E.F.; L/IFT via LX1JH; DL0SD/LX to DL8HC; and WA6NFC will be looking after the paperwork for XW8DK.

Now to G3NOF, who offers us VP2VV, to POB 207, Tortola; 5H3LZ, to G3USY; MP4BIX via Bureau, or MP4BBA; KC6WS, via W3FDP; KD4ITU to W3ZA; IA5BGJ to I1BGJ; 5Y3GT to F6AMG; MP4MBB to G3LQP, who

is also dealing with 5X5NA; 8R1Q to Mahaica, East Coast Demerara; and 7X2OM to P.O.B. 2, Algiers.

Still with QSL addresses, we have from G2HKU—KG4EQ, to W4PKS, 9Y4HR to P.O. Box 767, Port-of-Spain, Trinidad. G3ZAY has some to offer as well, among them being VQ9RK to W9VNG; 9X5WJ to W1MIJ; KB6CT, Federal Electric Corp., A.P.O. San Francisco 96401; XW8BP to DL7FT; VS9MT to G3LQP; 5W1AM to W7YBX; ZF1WF to K4CDZ; TN8BK to Box 123, Brazzaville; and VP1TB, to Box 212, Belize City, British Honduras.

Twenty Metres

At the time of writing, the band could well be positively crawling with DX; but with an S8 rain-static noise level nothing much further afield than Russia has been breaking through. And, to put it no higher, listening to Il's working UK's is something of a bore after thirty minutes.

Jack, G2DC, comments on the periods of the day—particularly noon to tea-time—when the short-skip predominates; and also on the very noticeable suddenness of changes in conditions of late. Very true, and at times a bit of a nuisance. CW netted EL2CB, EP2CC, CE8AA, MP4BIM, PZ1AH, PY1-8, UA0ZI,

VK2-8, VU2TS, ZL1-4, and 9Q5KP. For SSB there were QSO's with ET3USA, KL7HDB, KS6CY, KW6AA, VK2-8, VR4EE, VE6AJD, VE7LB, VE7BD, VE8RCS, YS1FEA, ZK1CD, ZM7AG and 5W1AU—but not a ZK2 or C21, countries wanted for which the SSB operation was mounted. Such is the luck.

A 14 MHz operator who likes SSB and has a garden too small to put a beam in might be said to have the dice loaded against him—but DX can be worked nevertheless, as G3OJV (Hockley, Essex) can show. He rustled up a report of RS-59+10 dB from VK6 with his vertical one morning in April, and for the rest, there was the ZL4 worked at 0045z, and such as CT2AK, FC6ABP, IM0KH, HK3CEC, KZ5ES, LU3MBL, PZ1AK, PY4AP, VK2-7, VK5PB/M, VE6-8, VP1TB, VP2GAR, YN1KT, ZF1WF, ZL's assorted, 5N2ABG, 5N2AAJ, 6Y5GA, 6Y5SR and 9HZBX.

G3DCS (Ipswich) has now got a KW-2000 in the shack and, using the Joystick, is still raising the stuff. CW on Twenty produced contacts with most W call areas, the usual EU's, 9L1ITU, UA9GW and PY2FCA.

His old SWL aerial, namely a 110-foot end-fed at about 20 feet, was put into use by G3ZXZ (Wake-



In this interesting picture are, left to right: W2BGN, W2SAW, W2GB, W4ZM, G8VG (holding Tx) and W2ICE. The occasion was during the recent U.S. visit of G8VG—see p.215, June—when, at a special meeting of the Antique Wireless Association at Holborn, N.Y., he presented an R.A.F.-type spark Tx of 1916 vintage to W2GB, president of the A.W.A. The association possesses many interesting and valuable relics of the early days of wireless.

field) for his only foray on 20 metres, early one morning. Surprisingly to him, Martin's AM raised both VP2VI and VK5EB, to make the effort to get up early seem well worth while.

Twenty for G3NOF has been notable for the amount of short-skip about on the band, and the general dullness of conditions. Heard but not worked were FL8HM, JY1, KC6WS, KS6CY, UW0IN and VR6TC, the latter at 0700z. QSO's were made with DU1DBT, EA9EJ, EI0DMF, ET3ZU, FP8CT, G3UBK/MM, IM0KH, MP4MBB, PZ1AX, UH8AE, TI2GI, VK's, WA6CEB at 2150, W2GHK/VP9, VU2US, ZS6AM, 5H3MV, 5Z4GK, 5Z4MI, 7X2OM, 8R1Q, 9K2AL, 9Q5CO, 9U5CR, 9V1OI, 9V1OX and 9V1QQ.

A try with both modes is usually made by G2HKU, which meant that his SSB reached KG4EQ, VP9AX

and, of course, ZL3SE as ever. Over to the other mode, and here there were sessions with VK2NS, VK8HA and 9G1DL to be entered in the log.

A little bit of collaboration with an SWL can often be useful, avers G3ZAY (Petts Wood), who frequently gets a tip-off from his local Bob Treacher. Martin worked HV3SJ, 9M2CP, VP1TB, CX7AP and an assortment of W's, VK's, ZL's, not to mention hearing DX6GI in the Philippines, VR6TC, and ZK1CD (who worked about six G's on the day) although the G3ZAY signal could not make it off the end of his dipole.

By way of G3ZAY, UA9VB advises that UA9VH/JT1 will be leaving Ulan-Bator in July, but will be on 14190 kHz around 2300z until then. His departure leaves JT1AN, who only speaks Russian, and a rather inactive JT1AG using SSB, although CW will still be

available when JT1AI and JT1KAA are on.

The list this time from W6AM (Long Beach) covers mostly 14 MHz SSB—meaning VR5LT, VU9KV (QSL *via* W6KNH) IP1MOL, OH2BH, LZ1KAA, ZM7AG, VK9LV (on CW), YB8AAN, YB0AAF, OH2BM (who was waiting for ZA5Z, of whom more anon.) VK4CGB knocking off 80 stations in 40 minutes as a practice for the Mellish Reef activity, and DU7ER.

Here and There

Probably some readers at least are at this point wondering when a mention of Albania will crop up, or of Mellish Reef.

To deal with the Albanian situation first: The OH2BH show was a busted flush, apparently because some official advised that there was no need to enter the gear on the Customs declaration form! The Finnish Ambassador in Romania had to be called in to sort things out and it is fortunate that somebody didn't get about 10 years Albanian hard labour! At that time there was a suggestion that last year's ZA2RPS effort was also unauthorised. But a few days ago ZA2RPS came up as promised, although DL7FT himself had returned to Berlin as his vacation was over. It was said that three other operators were on and would be there till June 15; both G2FYT and GW3AHN have had 14 MHz contacts. However, a check over the bands as this was going down showed no signs either of ZA2RPS or of a pile-up looking for him, on either Twenty or Fifteen. (It is known that ZA QSL cards even post-marked Tiranë can be suspect—they could so easily be posted by legitimate visitors from outside the country. The point for all interested to remember is that Albania just does not permit Amateur Radio operation at all. Any AT-station working on Albanian territory would be illegitimate and subject to the direst penalties, even if the operation were genuine from the Amateur Radio point of view. And it is possible that there has been in the past some pirate operation from ZA.—*Editor*).

As for Mellish Reef, the VK7AZ yacht were said to be scheduled to arrive at Willis Is. on June 11,

SIX-BAND DX TABLE

(All-Time Post War)

Station	Countries	28 MHz	21 MHz	14 MHz	7 MHz	3.5 MHz	1.8 MHz
ZL3GQ	285	146	164	245	178	127	5
W6AM	349	149	161	349	145	119	7
G2DC	338	181	311	329	169	116	20
G3IGW	212	129	153	169	136	107	47
G3DO	339	213	250	332	90	83	9
G3YDX	148	85	83	72	81	76	17
G3NOF	320	206	231	310	38	67	4
G3KMA	262	210	205	193	145	64	11
9H1BL	202	117	129	143	74	57	8
G3PQF	175	119	53	107	85	56	13
G3LZQ	265	140	156	215	72	38	8
G3RJB	177	80	58	164	60	37	8
G3VLX	67	7	14	34	20	33	19
G3ZEM	110	—	—	108	28	32	13
G3XAP	122	44	75	53	77	31	13
G3DCS	130	26	82	77	28	24	10
G3ZCC	39	10	8	21	18	23	16
G3IDG	131	77	97	55	27	18	12

Note: Placings this month are based on the "3.5 MHz" column. Claims must be made at least every three months to retain a place.

stopping there for a few hours before pressing on to the main objective, Mellish Reef. If time permits, they will stop off at Willis on the return journey. The callsigns will be VK9NP/W for Willis Is. and VK9NP/M for Mellish Reef—both these spots being about 200 miles off the coast of Queensland.

Talking of VK9's, anyone looking for VR4—yes, no misprint!—should recall that Bougainville counts as VR4 and VK3UV/9 is there, with a Swan 350, albeit his beam was damaged in transit.

A letter from G3YRR (Cleethorpes) contrasts the attitude of some stations at DX in their willingness to make a QSO, with others who, even though the pile-up is minimal, persist in taking callers by rota, and slanging those who do not meet their wishes and have not the time to stick around for hours on the off-chance that the DX might get round to their prefix. A good point, this, as although there are some fearsome pile-ups at times when such methods of selection are essential to clear the back-log (where a genuine DX-pedition is concerned) there are also many run-of-the-mill DX stations who have no need for such tactics, but use them as a means of inflating their wretched *ego!*

Still pursuing his aerial interests, G3DCS is at work on a 15-metre version of a DRRR aerial—sometimes known as the Hula-Hoop—a design of radiator which, for Ten, could easily go on the roof-rack of a car and only projects a few inches, although performing as a vertical aerial, with the characteristics one expects from a ground-plane. It will be very interesting to see how this pans out.

G2NJ (Peterborough) is still after the /MM stations, and must by now have amassed a fair old collection of them. His latest catches include SM5EJ/MM, several QSO's with G5NX/LA/MM on m.v. *Torrens*, the last one being on June 5, when the ship was off Cape Blanco, Mauretania. Incidentally, the name *Torrens* is in its own right famous, having once been that a ship which was one of the last survivors of the age of sail to be in commercial trade.

The "Fifth International Convention of Radioamateurs" is down for September 22-25 in Bilbao; the



Here we see HB9AMY Iele Fillippis, P.O. Box 768, CH6901, Lugano 1, TI, when he was portable as HBØAMY, using a KW-2000A transceiver up in the clouds locally.

idea is to gather as many enthusiasts as care to make the trip, for a three-day programme of interesting events; details of the programme, and reservation forms, can be obtained from J. H. Shankland, GM8FM, 28 Craigmount Crescent, Edinburgh EH12-8DG.

Over October 9-10, ZS3KC and ZS3XQ will have a DX-pedition with a difference; they are going to operate from Cape Cross, where Deigo Cao planted his cross in 1482 to establish the southern point of Africa. Operating SSB on 7070, 14200, 21280 and 28600 kHz, and CW on 7020, 14050, 21050, and 28050 kHz. No rag-chewing, and all QSL's will be *via* Bureaux.

IRTS Region 1 are "having a ball" from Dalkey Island, off the East coast of EI, over the weekend July 30, August 2, using EIØDI with petrol-generator supplies, on all bands 3.5-30 MHz, and dishing out a special QSL to confirm the contacts.

The final results of the "Second

World RTTY Championship", drawn from the results of operation over five contests, shows a goodly list of RTTY operators, 203 transmitting and twelve SWL's. GB2SM prove their station to be "not just a pretty face" by being the leading G, at 30th place, out of nine U.K. transmitting entries. Of the twelve SWL's, two were British entries. To these three stations our congratulations. BARTG handled the event this year, and have nominated IKG as handsome winner, the sponsors being the Italian *CQ Elettronica Magazine*.

Ten Metres

A tired band, as far as DX is concerned. We are very quickly reaching the sort of situation of a sunspot minimum where the 28-29.7 MHz area is devoid of good signals; and with the pressure on to carve out chunks of our bands for broadcasting, citizens, and whatever, it behoves us to find a way of occupying the band. There are various



Wolfgang Renner holds a DL call and is at present on an assignment in Afghanistan, signing YA1RG. He has recently been married to Miss Hannelore Muller and their QTH is P.O. Box 279, Kabul. Good luck to them!

interesting possibilities—transferring all the Sunday-morning traffic on Top Band to Ten, which would be much nicer, quieter and less of a problem with BCI and QRM, as well as helping the flat-dweller with his aerial. DX-ers who hunt in pairs could crystal-control on the same frequency, fit squelch circuits, and use the band for their inter-communication instead of the land-line—and so on, remembering also that very good local ranges, with high signal level, can be expected on Ten Metres. TVI will become progressively easier as the UHF-only sets come into use, though front-end overload will be a problem with transistor TV tuners.

As to the DX situation generally, conditions have been poor, says G3NOF, who found very little even on the North-South path, but there were some short-skip openings at times. QSO's made were with HV3SJ, ZS1MR, 9J2DT and 9J2RQ.

Over at G2DC, Jack heard nothing of any real interest, apart from a few Africans, 9J2, 9L1 and some Eastern Europeans. No-one else even mentions the band!

Now Fifteen

A ground-plane and Heath HW-100 are in use by GW3ZFI (Newport, Mon.), who seems to have been

quite active and successful. SSB was the favoured method, and it succeeded in raising CE3CZ, HC2JE, HH9DL, KP4DDO, KV4FZ, KZ5JW, LU5XE, TR8MR, UW0SW, WA40VP/8R1, ZS3CJ, 4X4QS, 4Z4HF, 6W8DY, 9Y4T, VE and all but the 7th W call area, for a very good first-report collection indeed.

G3ZAY found conditions very "summery", with JA's coming through strongly by 0800z or even earlier, occasionally accompanied on some days by a guard of honour from the Central Pacific, while on others there was just nothing till mid-afternoon. One evening's listen-round threw up several JA's and a KR6, at 1800z. ZF1WF, W7TNA/MM, 7P8AZ, 5H3LV, ZE6JL, 5X5NA, TN8BK, VS9MF, VS9MB, VQ9RK, KZ5JW, KS6DR, JA's and Europeans were all booked in on Sideband, while KR6JU and 9N1JK were gotaways.

The necessity to scratch around under the upper layers of junk to unearth the DX is stressed by CW

enthusiast G3ZXZ. All the same, Martin dug up TI2YSM, EA8GR, CR6FA, TY1ABE, ZS6JK, KZ5BB, 9Y4VU, KV4CI, HI8DAF, YV1AD, PY2, PY5, PY7's, JA's and all W call areas except W6. In spite of the DX bias toward SSB, the AM in the G3ZXZ shack managed to hook with G5CP/W2 and SV0WI.

At G3OJV, as already mentioned, most of the activity was on Twenty, but a few odd checks on Fifteen were not entirely unproductive, yielding as they did EP2BQ, VU7BEO, ZS6OY, 5H3LV and 9G1BY.

On the other hand, G3DCS seems to put most of his eggs in the 21 MHz basket, CW hatchings being in the form of most W call areas, VE, 6W8GE, PY2BGA, PY2FCJ, 8P6DR, KZ5BB, K4CI, 4Z4HF, KP4BBN, PY1CWR and HV3SJ, and the SSB ones W's plus CX3BH.

G3NOF has a very poor view of the band conditions this month, and Fifteen is no exception. A few JA's were heard on the long path around 0900, but were very weak; some South and North Americans signals appeared in the evenings. A gotaway was VU2HLU, but MP4BIX and ZC4RAF were booked in despite the restrictions on his operating time generated by the local TV sets.

G2DC is not quite so caustic as G3NOF—he simply describes 15m. as "unpredictable," but the sentiment is there, particularly when Jack notes that not even W's could be raised on some days! However, CW QSO's were obtained with CX7AP, EL2CB, KZ5BB, KV4CI, KR8GN, KR8RG, OD5LX, PY1-8, TY1ABE, TR8CQ, UA0YT (Tannu Tuva), ZD5X, 6W8GE, 7P8AB, 8P6DR, 9L1ITU and 9Y4VU, to lighten the gloom a little.

Sign-Off

So there 'tis, once again, marking a period of five years since first your conductor took up this task. Time certainly flies, and it will do so even faster for most correspondents around deadline-time! However, it is necessary for your news to arrive by **July 12**, addressed simply CDXXN, SHORT WAVE MAGAZINE, BUCKINGHAM, if your scribe is to make his deadline. For future months we have, all Mondays, August 9, September 6, and October 11. 73 de G3KFE.

TOP BAND COUNTIES LADDER

Station	Confirmed	Worked
<i>Phone and CW</i>		
G2DF	98	98
G3ADH	98	98
G3VLX	98	98
G2NJ	98	98
G2HKU	98	98
G13WSS	97	98
G3YMH	69	93
G3KFE	66	87
G3LXD	64	83
G3XIV	?	63
<i>Phone only</i>		
G2NJ	98	98
G3PQF	98	98
G3XDY	72	89
G13WSS	67	83
G2HKU	50	51

(Failure to report for three months entails deletion from this Table. Claims may be made at any time. Six months of "Nil" reports will also result in deletion.)

THE MOBILE SCENE

More Rally Events Notified

THE next two months or so will see the climax of the Rally season, with many events scheduled, at centres all over the country.

In sum, this represents a considerable effort in terms of planning and organisation, undertaken as a labour of love by those concerned—we hope that their efforts will be rewarded not only by large attendances but also that the prayer of every Rally organiser will be answered—for a fine, warm day for their event.

RALLY CALENDAR

June 27: Echelford Amateur Radio Society Mobile Rally at Hanworth Air Park, about three miles south-east of Heathrow (London A/P), between Sunbury and Richmond. Talk-in will be given on 2-80-160m., signing GB3HCW. As the occasion is a large local carnival, there will be many attractions of family interest, with refreshments and a licensed bar available on site. Further details from: A. G. Wheeler, G3RHF, 32 Feltham Hill Road, Ashford (55265), Middlesex.

June 27: Anglian Mobile Rally, at the Suffolk Show Ground, Ipswich, organised by the Colchester and Ipswich Radio Clubs, working together. This has become a very popular Rally event. Overnight caravan parking will be available; and there will be all the usual Rally attractions, with refreshments obtainable on site. Rally details: D. W. A. Thomas,

G3ZLN, 9 Burlington Road, Ipswich (55200), Suffolk.

June 27: Annual Mobile Rally at Longleat House, near Warminster, Wilts.—always a very well-attended event in particularly attractive surroundings, with the great house, the home of the Marquis of Bath, fronted by a lake and standing in a magnificent park. And of course, there are the Lions! There will be trade stands, a bring-and-buy stall and a raffle. This year there will also be facilities for over-night camping, and a caravan park. Talk-in stations, opening at 10.0 a.m., are to be G6YB/P, 1924 kHz; G3JMY/P, 70-425 MHz; and G3TAD/P, 144-350 MHz. Further details: B. Croker, G3ULJ.

July 4: Annual South Shields Mobile Rally at Redwell County Secondary School, Prince Edward Road, South Shields, Co. Durham—a half-mile inland from Marsden on the B.1300, and about that distance from the beach. There will be talk-in stations on 2m. and 160m., also trade stands, raffles and competitions, all as in previous years, with ample free parking space. Information from: F. Harrison, 42 Woodlands Road, Cleadon, Sunderland, Co. Durham.

July 4: Cornish Amateur Radio Club Mobile Rally, at Truro Rugby Club ground, with talk-in stations offering contacts on 2-4-160m., on the air from 10.0 a.m. Refreshments and bar available on site. Full details and a local sketch map from: J. Farrar, G3UCQ, Elm Cottage, Ventonleague, Hayle, Cornwall.

July 11: The Worcester & District Amateur Radio Club Rally, this year at Hill County Secondary School,



On May 16, the annual Northern Mobile Rally, now a well-established event, was held up in Leeds, the venue this year being the Moor Grange County Secondary School. This photograph of the mid-afternoon crowd and the scene in the hall well reflects the interest there is in trade stands on these Rally occasions.



When this "Seven" came out of the Austin Works nearly 40 years ago, nobody could possibly have imagined that one day it would be driven to the Northern Mobile Rally carrying a halo and a two-metre /M rig. The little car is owned by G8BAG (Spennymoor, Co. Durham) and is in excellent condition all round.

Upton-on-Severn, Worcs., out near the beautiful Malvern Hills, opening at 11.0 a.m., with talk-in to be given on 2-4-160m. Free entry, light refreshments at reasonable prices, with trade stands, a crystal exchange and frequency measuring service and other interesting attractions. Further details from: G. Spink, G3WUI, 1 Belvoir Bank, Malvern (3088), Worcs., WR14-4LY.

July 18: Scarborough Amateur Radio Society Mobile Rally, at Burniston Barracks, Scarboro', on the A.165, with talk-in by G4BP/A on 1980 kHz and G3NRS on 145.8 MHz. Ample space and indoor accommodation, with trade stands, a bring-and-buy stall and a raffle. The beach, Zoo and Scarborough's "Marine-land" are adjacent, in themselves considerable family attractions. Details from: A. C. Dunn, G2ACD, QTHR.

July 24: Basingstoke Amateur Radio Club at Le Court Fête, near Liss, Hants., off the B.3006 to Alton, running a station in aid of the Cheshire Homes Amateur Radio Network Fund (CHARN), with RAIBC members present. Station to be operated on HF bands and two metres. Mobiles will find plenty of attractions for all the family, with ample parking. Details from: P. Sterry, G3CBU, Ashley, Orchard Road, Basingstoke, Hants.

July 25: White Rose Mobile Rally, at Alderton Girls High School, Leeds 17—an all-indoor event, with

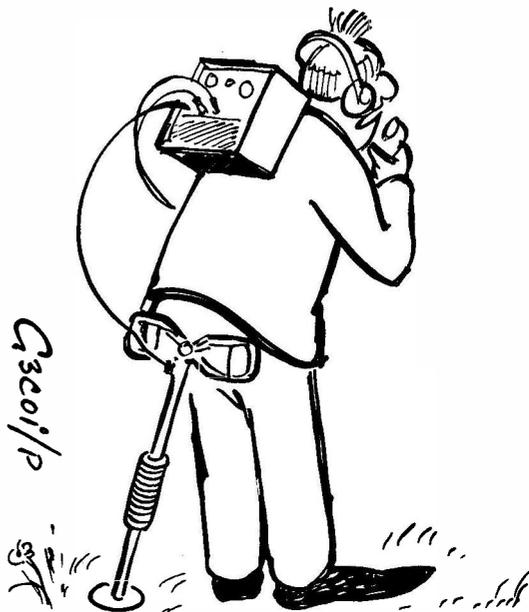
plenty of parking space, talk-in on 2m. and Top Band, trade stands, and refreshments obtainable on site. Enquiries to: K. Wells, G3WIX, QTHR, or R. Short, G3YEE, QTHR. (Tel. Bradford 664220).

July 25: Wessex Amateur Radio group annual mobile picnic at Stoney Cross Airfield, New Forest, as in previous years. Details: G. A. Moore, G8BBN, 15 Stanfield Road, Winton, Bournemouth, Hants, BH9-2NL.

August 15: Torbay Amateur Radio Society Rally at the Newton Abbot Rugby Club ground, on the Exeter-Newton Abbot road, opposite the race-course. Talk-in by G3NJA/A, 1880 kHz, and on two metres by GB3TMR, also operating on the HF bands. Indoor facilities, refreshments on the ground and competitions for everyone.—L. H. Webber, G3GDW, 43 Lime Tree Walk, Newton Abbot, Devon.

August 15: The 14th Derby Mobile Rally, at Rykneld Schools, as in previous years. Further information from: T. Darn, G3FGY, 1 Sandham Lane, Ripley, Derbs., DE5-3HE.

August 22: Annual mobile picnic organised by Bromsgrove & District Amateur Radio Club, in the grounds of Avoncroft Building Museum, near Bromsgrove, at the intersection of the B.4091-A.38, Droitwich to Bromsgrove. The Museum itself is of great interest and there is an admittance charge. Talk-in will be given by G3VGG on Top Band and on two metres by G2CLN.—J. Dufrane, 44 Hazelton Road, Marlbrook, Bromsgrove, Works.



" . . . Well, OM, the mobile rig here is a bit unusual . . . "

KATSUMI CW MONITOR AND ELECTRONIC KEYS

INTERESTING ANCILLARIES FOR THE CW OPERATOR

THESE notes will serve to review a couple of rather useful accessories for the average amateur station—the Katsumi AT-8 CW Monitor and the same maker's EK-9X Electronic Keyer.

To deal with the CW Monitor first: This is a minibox-type enclosure, on the front panel of which is mounted a small speaker, volume-control with On-Off switch and a sub-miniature jack-plug labelled "Phone." At the back are the key connections and the three arms of a change-over socket, with another subminiature jack socket, again clearly marked as being for connection of an outboard six-volt supply, positive earthed. The other control is a pre-set resistor to adjust the pitch to a suitable level. Inside, each soldered joint has been not just inspected, but coated with a dab of stain to make it clear that the particular joint has indeed been looked at. The label on the inside of the lid is a complete circuit of the unit.

In addition to the external battery provision there is also a battery-clip, and a polythene moulding into which four penlite cells can be nested (if one does not wish to use the equivalent 6v. battery in the PP series).

Operationally, the Monitor is small and neat; the sound coming out of the speaker can be pitched to suit one's preference, and should an incoming signal by chance be exactly the same pitch it is exceedingly unlikely that it will also have the same *timbre*. The AT-8 output is definitely not sine-wave, but nonetheless it is pleasant to the ear, and easy to listen to. In terms of

volume, there is enough to use the unit at the Club for a small group doing CW practice, and more than enough for shack use.

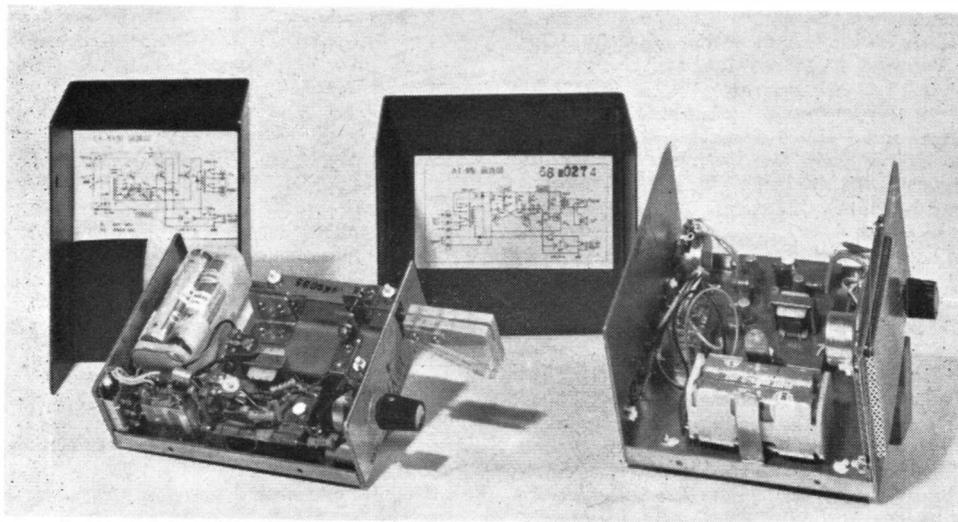
The Keyer Unit

Turning to the EK-9X keyer, here we find on the front a speed-control combined with On-Off switch, and the paddle itself. At the rear, four terminals, two marked for connection to the monitor and the other pair for the transmitter, a switch labelled "Bug-Auto," and another sub-miniature socket, again for an external six-volt supply.

At the sort of price that these two units sell at from Lowe Electronics (the importers of Katsumi equipment) one cannot expect very much in the way of elegance in the paddle and its mechanics—and, indeed, there is nothing in the way of rebound springs or special contacts at all. However, the outside appearance is quite handsome, and it has to be admitted that, once one has come to grips with the basics of driving *any* el-bug keyer, any errors that occur in the outgoing Morse will certainly be due to the operator. Speeds range from very slow indeed—good for Morse classes, to show what correctly proportioned slow Morse sounds like, right through to a speed that your correspondent has never dared approach.

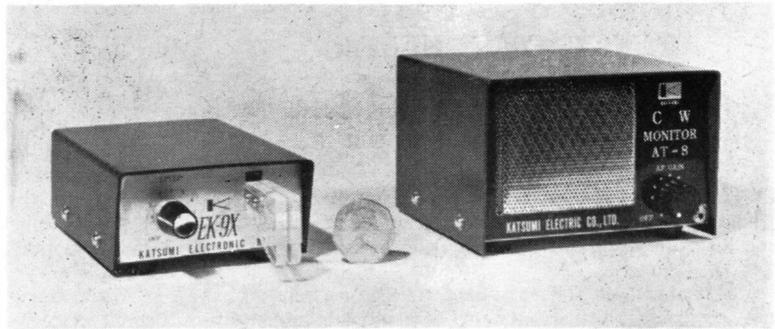
As for the circuitry, again it has to be expected that it will be of the simplest at the price. However, once the two pots, inside have been set to give the correct spacing and proportions, they can be forgotten. At any setting of the speed control, the dot, dash and space ratios are as they were when first set up.

The relay, in both units, is of that neat, small, enclosed type, which was pioneered by Siemens but has since been pirated by just about every other relay-making firm, and it comes in quickly and cleanly, with no excessive noise on "make" or "release" in either unit. Judging by the performance the operate and release



Exploded views of the CW Monitor and Electronic Keyer discussed in the text.

The Katsumi Keyer and CW Monitor units—see text. The coin is a 50p piece for size comparison.



times must be all but equal, which is not uncommon with this type of relay. Contacts are rated reasonably, although they could hardly be expected to drive a cathode-keyed 813—they certainly cope quite happily with anything in the way of normal voltages and currents; and both the Monitor and the Keyer itself are of equal capability, implying that if the two units are coupled, one of the contacts can be used for driving the transmitter, and the other for, say, muting the receiver.

Aesthetically, both units are quite acceptable in themselves, although for some reason the Monitor has a maroon case and black panel, while the Keyer is in a black case and has a silver panel, which does not help to promote a “marque” image.

One thing that has been mentioned, but not discussed in detail, is the provision of the “bug-auto” switch on

the Keyer. This means that for those who find difficulty in going straight to el-bug working there is a half-way house, as it were. The writer has never used the bug position since buying the unit. He already has a good bug-key which can be brought into play at will and has been learning to operate fully el-bug, by listening to the note from the Monitor when driven by the key.

For your correspondent, these units have brought him back to the pleasure of CW operating again after the years had taken toll of his waning skill (which is praise enough in itself!). Other CW operators, known to be choosy about their gear, are all in praise of these units as being low in power consumption, and as cheap as anyone can possibly expect consistent with the standard of performance one can realise from them, either in double-harness or individually.

FOREIGN SUBSCRIPTION RATES

—And a Footnote

We are often asked, from parts overseas, to quote the annual sub. rate for *SHORT WAVE MAGAZINE*. For a few representative countries, these work out at: For France, Fr.33.20; Australia and New Zealand, \$5.50, Aus. or N.Z.; South Africa, R4.40; Italy, 3,750 lire; Portugal, Es.163; Switzerland, 26.50 Swiss Fr.; Holland, Fl.21.70; Germany West, Dm. 21.70. These rates are all post free by surface mail. The U.K. subscription is £2.50 (£2.75 first-class, internal only) and for the United States and Canada, \$7.00. Rates for any country in the world, payable in that country's currency, can be quoted on request if that currency is convertible to sterling.

It would be a pleasant surprise to get a request from, say, a UA3 in Moscow asking us to give him a quote in roubles—which, of course, we could do but for him it would hardly be necessary. The reason for this is that the 100's, or it might even be thousands, of readers we already have in Russia get the *Magazine* by the iniquitous system of internal circulation through their public libraries, operating the photostat service for which subscribers over there pay, but which of course benefits us not at all! In fact, we are plagued by a load of correspondence invariably prefaced “Dear Friend”. We are not unique in this respect. All foreign periodicals, particularly those having a scientific bent, are subject to the same sort of treatment—in Russia, it is apparently what “library” means.

THE PROFESSIONAL LISTS

Though the Legal boys are not responding as well as we had expected—see p.166, May for details about this ploy—we have a few more to add to the Medical List, which now stands as follows:

- Dr. Ian Sykes, MA, MB, B.Chir (Cantab),
DRCOG, *G3OWY* (Stinchcombe, Glos.)
- Dr. W. S. Hossack, MB, Ch.B., DRCOG,
GM3UBJ (Macduff, Banffshire)
- Dr. D. P. Nicholls, MB, Ch.B (Manc.),
G3ZVZ (Manchester)
- Dr. E. J. B. McArthur, MB, Ch.B, VU
Manc., DRCOG, *G3VVA* (Upton, Birkenhead—group practice)
- Dr. Allan J. M. Campbell, MD, MRCP,
GM3VAR (Paisley, Renfrewshire)
- Dr. D. M. H. Cogman, MD, BS (Lond.),
FRCPath, *G3ZOZ* (London)
- Dr. K. W. B. Rostrom, MA, MB, DOMS,
FRCS, *G3YVT* (St. Ives, Cornwall)

To start the Legal List, Neil Glover, LL.B., G3AAV, has identified himself as a solicitor—he is actually Dean of the Faculty of Law, University of Leeds. We know that there are a great many lawyers (including at least one Judge) who hold AT-station licences—but of course we publish only such details as are sent in on the understanding that they may appear in print under one or other of the professional-list headings. Just a note to: Medical/Legal List, c/o Editor, *SHORT WAVE MAGAZINE*, BUCKINGHAM, will suffice.

MONITOR AND TUNE-UP UNIT

FOR AM/CW TRANSMITTERS

A. J. GOFF (G8DKL)

THE author felt it would be a good thing to have some means of monitoring the RF output of an AM transmitter, and also an indication that the modulator was functioning. The circuit shown here was designed to fulfil these requirements, the unit also being useful as an indicator during tuning up the transmitter.

A diode detector arrangement was installed in the transmitter, as shown in Fig. 1. Resistor R1 provides a high-impedance tap on the transmitter output and is soldered directly to the output socket to keep the leads short.

The monitor unit was constructed in a small aluminium box remote from the transmitter, the connection being made by a short length of coaxial cable.

DC from the diode is fed to Tr1 base so causing collector current to flow and give a deflection on the meter, the deflection being proportional to the RF output power of the transmitter. Tr1 also amplifies the audio signal from the modulation, this appearing at its collector. A voltage-doubler rectifier produces a DC voltage which varies in sympathy with the modulation, this being fed to Tr2 base. The emitter-to-collector resistance of Tr2 varies with the modulation and so causes additional current to flow in the meter.

R1 is adjusted so that the unmodulated carrier gives half-scale deflection of the meter. The modulation now causes the meter to peak up to about three-quarters of full-scale deflection.

Resistor R4 limits the meter current to 1 mA so

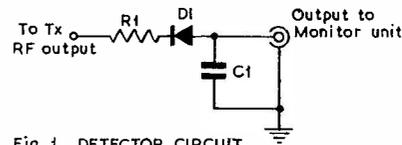


Fig. 1 DETECTOR CIRCUIT

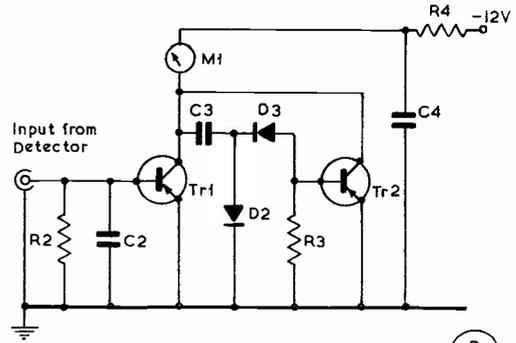


Fig. 2 MONITOR UNIT

Fig. 1. The detector circuit, in which C1 is .01 μ F disc ceramic; R1, 68K; and D1, OA81. In Fig. 2, the monitor unit, C2 is .001 μ F, disc ceramic; C3, 0.22 μ F; C4, 0.1 μ F; R2, 27K; R3, 68K; R4, 12K; D2, D3, OA81; Tr1, Tr2, OC45; and M1, 0-1 mA m/c meter.

preventing damage to it should one of the transistors develop a short-circuit.

Power for the unit can be taken from the transmitter relay supply if this is about 12 volts negative. If this is not possible then the circuit can be operated with a small battery, as current drain is less than 1 mA and only occurs during actual transmission periods.

This simple circuit then provides a reliable means of monitoring the transmitter during periods of transmission and during tuning up.

PLAY IT SAFE

From time to time we feel impelled to remind all readers that in much of today's radio equipment the voltages involved can be lethal. The utmost care must be taken in handling apparatus—remembering that there is a well-authenticated case of a voltage as low as 60v. DC having proved fatal. The obvious precautions to take are that all mains connections should be made strictly N, L, E—that there must be one main switch to knock power off the whole station, and every member of the family should know where that switch is and what it is for—all apparatus should be earthed, using a ground connection separate from the "mains earth"—when connecting up gear for the first time, put the earth connection on *before* you do anything else—all PSU's should be fused correctly, *e.g.*, don't put in a 5-amp. cartridge if 3 amps. is the rated value—and all exposed HT points in a power pack should be adequately protected by insulated connectors, with the PSU itself in an earthed metal box. If you simply *have* to make internal adjustments to the rig with power on, use one hand only and insulated tools.

Since the advent of Laser kits for experimental purposes in school laboratories and similar situations, it is

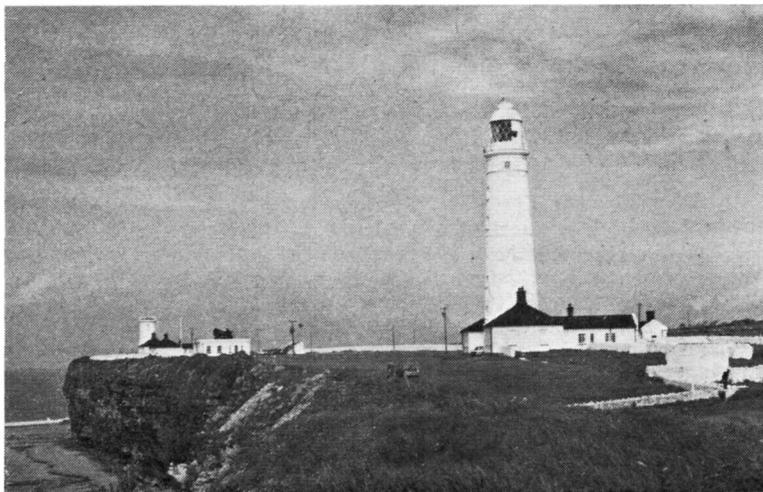
important to remember that even a low-intensity laser beam can be very dangerous—not only can it cut into human tissue but if looked at directly can cause immediate and total blindness.

So, when handling any apparatus involving these hazards, Take It Easy and give yourself time to do whatever job it is with Safety as the prime consideration.

YOU MIGHT BE ABLE TO HELP

There are 140 licensed U.K. amateurs who are listed either as blind or totally incapacitated. And in the same case, there are more than 220 keen SWL's. There could be one or two of these in your district, who would dearly love to know of your interest in them, and to have a visit. The way to find out if you can help is to write to: Mrs. Frances Woolley, G3LWY, hon. secretary, Radio Amateur Invalid & Bedfast Club, 331 Wigan Lane, Wigan, Lancs., asking for addresses within your radius of action. As her labour for the R.A.I.B.C. is entirely voluntary, keep it short and enclose not only an s.a.e. but also a card or whatever on which she can jot down the details when she has had time to consult her register. Who knows—you could make some very interesting and fruitful personal contacts.

Nash Point Lighthouse, Glam., until recently the site for all the GW3UUZ operations. He has since been posted to The Skerries, North Wales, and is awaiting permission to operate from there.



GW3UUZ, NASH POINT

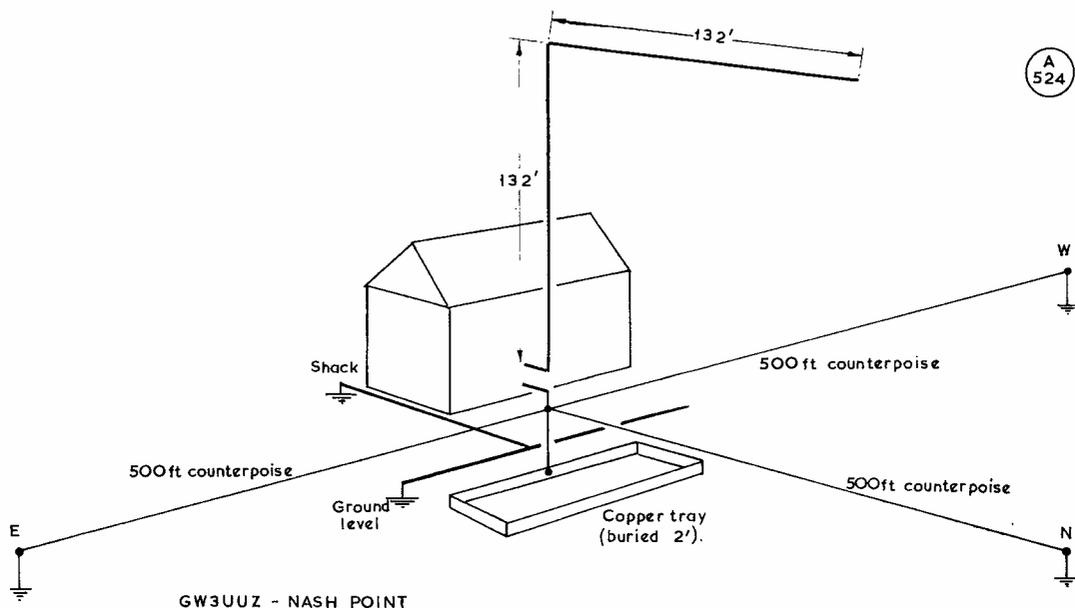
For years, those who operate Top Band—particularly during MCC—have wondered how it is that GW3UUZ has been able to put out such a colossal signal. The picture and the sketch show why.

To start with, meticulous attention is paid to the radiating system—which, of course, includes the earthing layout. It will be seen from the sketch that the aerial itself for Top Band is a half-wave-L and that the current antinode comes at the highest point in the run—this being where it ought to be and just as important as the ground-connection arrangements. The sketch below also shows how much care has been taken with this

part of the system.

Of course, the location is near-ideal from the radio amateur point of view. There are very few of us who could possibly hope to enjoy similar facilities—a site in the clear, with a sea getaway over at least a 180° sector, out of the noise zone, offering high supports for antennae, with plenty of unobstructed space, and a soil structure that makes for the perfect earth.

It is much to the credit of GW3UUZ that, during his service at Nash Point Lighthouse, he has made the most of his opportunities, the result being the signal that so many of us have admired on Top Band.



AN RF NOISE-BRIDGE AND ITS USES

ANTENNAE MEASUREMENTS TO
ENSURE ACCURATE MATCHING
AND LOADING — READING
OFF IMPEDANCE VALUES —
FINDING AERIAL RESONANCE —
BALUN EVALUATION —
SWR READINGS

R. L. GLAISHER (G6LX)

THE Radio-Frequency Bridge is a versatile measuring instrument that can be used to check, evaluate and adjust aerial systems, matching arrangements, transmission lines and other similar circuit elements. Operating on principles different from the reflectometer and fixed-impedance SWR bridges, the RF measuring bridge will provide factual information about the resonant frequency, radiation resistance and other key parameters of an aerial and its associated electrical factors. In use it can be a great time saver as it eliminates much of the guesswork that is inherent in amateur aerial work. Although there are a number of professional RF impedance and reactance bridges, in general these instruments are much too expensive for amateur use. Additionally, they are not always suited to "active" type measurement techniques, where the bridge is used "on-line" to tune and adjust aerials *in situ*.

The Antennascope

The problem attracted the attention of Scherer, W2AEF, who felt that there was a need for a device that could be directly connected to the feedpoint of an aerial and show if the aerial was in tune and correctly matched to the feedline. Using a modified Wheatstone Bridge configuration driven by a grid-dip meter, he developed a simple aerial test bridge, which was small enough to be used for "active" measurements. The circuit of the bridge, which W2AEF calls the "Antennascope", is shown in Fig. 1. It will be seen that the bridge has an integral diode voltmeter to show when it is in balance.

Whilst the Antennascope is capable of most kinds of aerial measurements, it is not always an easy instrument to use, as the drive from the GDO has to be optimised at the frequency of interest. As the bridge and the null indicator are untuned, the bridge operating frequency is determined by the tuning of the GDO, and if the measurements are to be useful the calibration has to be accurate to within 20 kHz. For some kinds of measurement, it is necessary to adjust the bridge and GDO together (and perhaps also vary the coupling to keep the drive constant at different frequencies). Such a procedure seems to require more hands than an octopus has tentacles and can be highly frustrating, particularly when the bridge is being used to check a beam at the top of a tower and one hand is needed for self protection!

The Noise-Bridge

As will be seen from the block diagrams in Figs. 2A and 2B, it is possible to use the bridge "other way round", by driving it from an untuned signal source, and using a tuned *null* indicator to provide the frequency information. This kind of arrangement greatly simplifies matters as it removes all the problems associated with the use of the GDO. As a normal receiver can be used as the null detector, there is no limitation about the location of the bridge in relation to the detector, as they can be coupled together *via* any length of coaxial cable as required.

The writer first heard of the "noise-bridge" during a discussion with the late Jack Ruddock, G8TS, in 1957. After using a simple bridge driven by a GDO, he had replaced the bridge indicator with a transistor TRF receiver and had fitted a thermionic noise diode in place of the GDO. Although the system worked very well, it was cumbersome as three sets of batteries were required for the noise valve and receiver.

Quite independently of the ideas of G8TS, several versions of the noise-bridge have been described by workers in the U.S.A. These have all used a semiconductor diode operating in an unstable mode to generate a wideband source of "white noise." The drive is amplified and applied to the bridge *via* a special toroidal transformer having a flat response combined with unbalance-to-balance coupling over a wide frequency range. Most home-built versions of the noise-driven unit use a conventional bridge circuit with either a variable resistance or condenser in the measuring arm of the bridge. A typical bridge of this type was developed

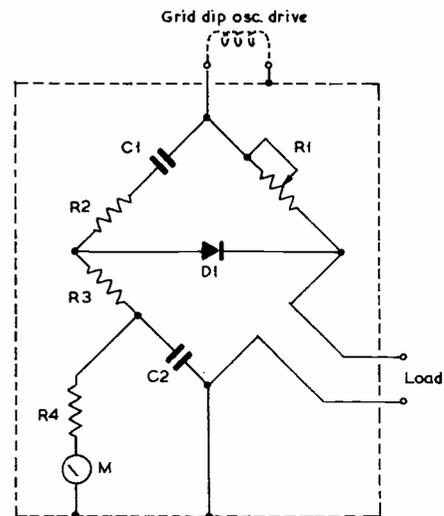


Fig. 1: Antennascope

Fig. 1. Circuit of the Antennascope. Values are: C1, C2, 500 μ F or near but matched to within 1%; R1, 100-ohm non-inductive potentiometer, carbon type, w/wound not suitable; R2, R3, 100-ohm non-inductive carbon, matched to within 1%, actual value not critical; R4, 1K $\frac{1}{2}$ -watt carbon; D1, OA81 or similar diode; Meter, 0-200 microamp.

by WB2EGZ and described in *Ham Radio* for December 1970. As will be seen from Fig. 3, a zener diode is used to drive two untuned transistor noise-amplifiers which are coupled through a wideband balun to the bridge circuit. The null detector used with the bridge is a standard communications receiver that will tune the frequencies required.

The "Omega-T" Noise Bridge

A further development of the noise-bridge technique is used in a commercially made bridge manufactured by the Omega-T Systems Corporation of Richardson, Texas. This uses a carefully balanced quadrafilair-wound balun to combine the functions of the coupling transformer with the bridge itself (Fig. 4). As will be seen from the photograph this results in a compact unit of $2\frac{1}{4} \times 3\frac{1}{4} \times 3$ in. which is very convenient to use and gives excellent results.

In operation the bridge is connected to the receiver (null-detector) through coax. It is not necessary to pre-balance the bridge, as is required with the Antennascope. The load (aerial or component under test) is connected to the bridge and the impedance dial set to mid-scale (50 ohms). The receiver is then tuned over the frequency range for which the aerial is designed, looking for a null or a reduction in the noise output. Once this is found, the impedance dial is adjusted until the deepest null is obtained. By very minor retuning of the receiver and a further slight readjustment of the impedance dial, a complete null is possible. This corresponds to the bridge being in balance, and the resonant frequency and the radiation resistance of the aerial can be read off directly by reference to the receiver tuning dial and the impedance setting of the bridge. At the point-of-balance the bridge has a high resolution factor (0.5 ohm or less), and will give better than 30 dB of discrimination. As will be appreciated, this gives a very sharp null, and a very small movement of the impedance dial at, or near, the point of bridge balance will result in a large change of noise output.

In common with the Antennascope and other simple RF bridges, the noise-bridge will not measure reactance, nor show if any reactance present is positive or negative. Although at first sight this may appear to be a limitation, it is not as serious as it sounds, as for normal amateur aerial work reactance measurements are more likely to confuse, rather than help! If a large amount of reactance is present, it may be difficult, or impossible, to get a complete null on the noise-bridge (or Antennascope), and this kind of indication is usually sufficient to enable the necessary remedial steps to be taken to cancel, or reduce, the reactive component by the use of stubs or other similar devices.

The output from the noise generator and amplifiers in the Omega-T unit is more than sufficient over the whole of the operational frequency range fully to mask any unwanted signals being picked up on the receiver. This ensures that there is little chance of false indications, even if a local amateur happens to park on the test frequency (as recently happened while the writer was using the bridge).

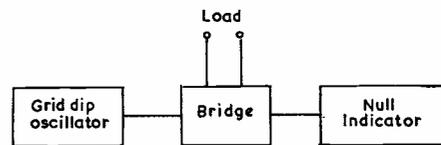


Fig. 2A: Antennascope

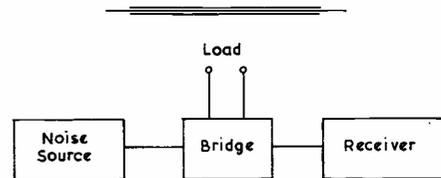


Fig. 2B: Noise Bridge

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The Omega-T unit has a measuring range from zero to 100 ohms, which is less than that of the Antennascope. As it stands, the range is adequate for use with 50 and 70 ohm coaxial and balanced feedlines. Later in this article, it will be shown how a quarter-wave line can be used in conjunction with the bridge to extend the measuring range to much higher impedances.

Two different models of the Omega-T noise-bridge are available from the U.K. importers (Radio Shack Ltd., 182 Broadhurst Gardens, London, N.W.6). The HF model, which operates from 0.5 to 100 MHz, is the TE 7-01 (£13.50), and the extended range unit (TE 7-02) will work to 300 MHz and costs £19.50. The HF model is fitted with American phono-type sockets for the load and receiver connections, while the VHF unit has the better BNC (UG-88/U) type coaxial sockets. The TE 7-01 used by the writer has been modified by fitting standard Belling and Lee coaxial sockets in place of the "unreliable" phono sockets.

Practical Applications

The noise-bridge can be used for a wide range of "active" and "passive" measurements and tests. Although the bridge is unbalanced with respect to the load connections, it can be used isolated from earth without modification to measure balanced loads.

The use of the bridge for general aerial work is made more convenient if a few simple accessories are provided. The first, useful for a variety of applications, is a very short length of coaxial cable fitted with crocodile clips at one end and a coaxial plug at the other. The croc. clips should be good quality with strong springs, as they may have to support the whole bridge while hanging at the feedpoint of an aerial in the air.

It is also helpful if a set of cables be made up to certain specific electrical lengths. For example, it is sometimes easier to keep the bridge on the ground when measuring a dipole or similar wire aerial which cannot be reached. This requires a feedline of exactly a half-wave (or multiple thereof) between the aerial and the bridge. A line of an electrical quarter-wave in length is

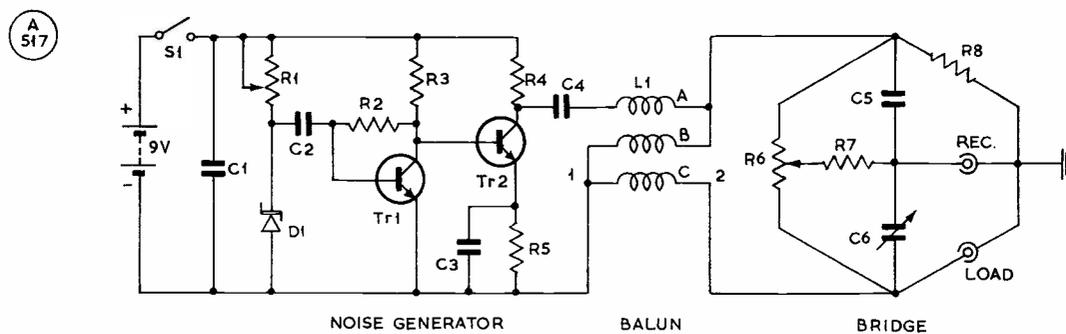


Fig. 3 WB2EGZ NOISE BRIDGE

Table of Values

Fig. 3. Noise Bridge Circuit

C1 = .001 μ F	R3 = 470 ohms
C2, C4 = 470 μ μ F	R4 = 47 ohms
C3 = 390 μ μ F	R5 = 390 ohms
C5 = 10 μ μ F, 5% s/m	R6 = 100-ohm pot.
C6 = 3-30 μ μ F, trimmer	R7, R8 = 50 ohms
R1 = 2.5K potentiometer for noise o/p adjustment	D1 = Zener diode, 1N753 or equiv. see Fig. 3A.
R2 = 33,000 ohms	

Notes: All resistors rated $\frac{1}{2}$ -watt. R6 to be best quality non-inductive carbon. R7, R8, high stability 1% carbon. C5 is 5% silver-mica and C6 can be Philips-type trimmer condenser.

also needed for certain kinds of measurements.

Whilst it is possible to calculate the length of such lines (if the velocity factor of the cable is known), it is perhaps a useful starting point to show how the bridge can be used to check and adjust the length of open-wire and coaxial lines, at any required operating frequency.

Quarter-Wave Lines: A line of this electrical length will always reflect to its input terminals a geometric inversion, based upon the line impedance, of what is connected across its output terminals. Thus if one end of the line is short-circuited, the other end will be a virtual open-circuit, and *vice-versa*. It is this characteristic that can be used to check and adjust the length of quarter-wave line sections with the noise-bridge.

The line is cut slightly over the electrical length (taking account of the velocity factor if known), and connected to the load socket of the bridge (Fig. 6A). The bridge is switched on and the impedance dial set to minimum resistance (*zero* ohms). The receiver is connected *via* a length of coaxial line (any length) to the bridge, and tuned to the frequency required. If the line is exactly an electrical quarter-wave at the test frequency (most unlikely), a null will be indicated by a substantial reduction of receiver noise. If this happens, then the bridge is in balance and no further work need be done. A failure to obtain a null at the test frequency shows that the line is of the wrong electrical length, and the receiver should be tuned until a null is found. If (as is most likely) the null is at a lower frequency, the line is too long, and it can be progressively shortened (a few inches at a time),

until the null corresponds with the desired operating frequency. If the null is found to be higher than the required frequency, the line has been cut too short, and it is necessary to start again.

On occasion it may be necessary to measure impedances that are above the range of the bridge. A quarter-wave length of line is a convenient method of transforming this higher impedance to a more usable value. The characteristic impedance of the required matching section (linear transformer), can be calculated from the formulae: $Zl = \sqrt{Zi \times Zo}$ (where Zl = line impedance, Zi = input impedance and Zo = output impedance). Thus, to measure a load of 2000 ohms, a quarter-wave line of 300 ohms will transform this down to 45 ohms, which is within the range of the bridge (Fig. 6B).

It is possible to check the characteristic impedance of a quarter-wave line by using the bridge. To do this, a non-inductive terminating resistance is connected across the open end of the line, and the receiver is set on frequency. The impedance dial on the bridge is adjusted until a null is detected on the receiver. By using the previous formulae, it is possible to calculate the impedance of the line. For example, if the terminating resistance is 5000 ohms and the bridge nulls at 50 ohms, the line has a characteristic impedance of 500 ohms. ($\sqrt{50 \times 5000} = 500$).

Half-Wave Lines: As a line of this electrical length (or a

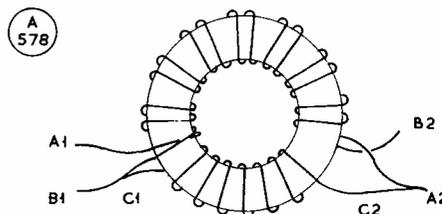


Fig. 3A Balun details

Fig. 3A. Balun details, see text. Windings A, B: No. 26g. enam. twisted 3 turns to the inch before winding on toroid; nine turns of the twisted pair are used. Winding C: Nine turns 26g. enam., continuing A, B, winding direction and connecting A2 to B1. Toroid is 0.375in. o.d., suitable for upper frequency limit of 100 MHz.

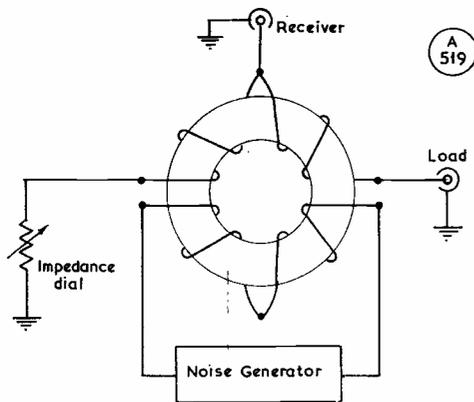


Fig. 4

Fig. 4. Combined quadrafilair-wound coupling and balun bridge, as used in the Omega-T circuitry—see text.

multiple thereof), will reflect its own terminating impedance, the length of the line can be checked in more or less the same way as for the quarter-wave line. To do this, the line is terminated by a short-circuit—thus, when the length is correct, the receiver will show a null at the desired frequency, with the bridge impedance set at zero ohms (Fig. 6C).

Both the quarter and half-wave lines are used as coupling or matching sections for some of the aerial tests described below.

Low-Impedance Centre-Fed Aerials: If the centre of the aerial can be reached (e.g. a beam mounted on a tower which can be climbed, etc.), the bridge can be connected directly at the feedpoint in place of the transmission line



Commercial version of a Noise Bridge — the Omega-T, which is contained within about 3 inches cube. It is obtainable from Radio Shack, Ltd.

(Fig. 7A). The receiver is set roughly on frequency and the impedance dial on the bridge adjusted for a null in received noise. If the null is incomplete, the receiver tuning and impedance settings are altered until a full and deep null is obtained. The resonant frequency and radiation resistance can then be read off the dial settings. If the aerial parameters are incorrect the bridge can be left in circuit, and the lengths and matching arrangements optimised as required. An aerial of the trap multi-band type will provide separate nulls for each of the separate resonant frequencies.

It is often more convenient to keep the bridge on the ground and measure the aerial at its normal operating height. In such cases the bridge can be connected to the aerial through a feedline (of any impedance) cut to an exact electrical half-wave, or a multiple of a half-wave, using the procedure previously described (Fig. 7B).

It should be noted that some spurious nulls may be obtained when the bridge is being used to measure the parameters of the driven element of a Yagi or Cubical-Quad beam. These unwanted responses occur at the resonant frequency of the reflector (and director) and will be about 4–6% lower (or higher) in frequency than the driven element null.

Long-Wire Aerials: If the aerial is a resonant length (so-many half-waves), the bridge can be connected at

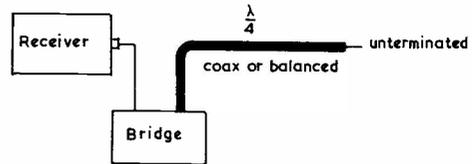


Fig. 6A Adjustment of $\lambda/4$ lines

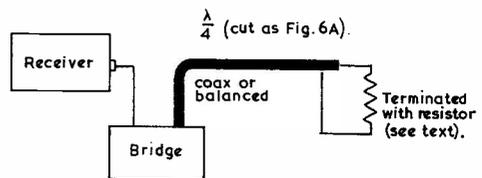


Fig. 6B Measurement of Transformation ratio of coaxial and balanced lines.

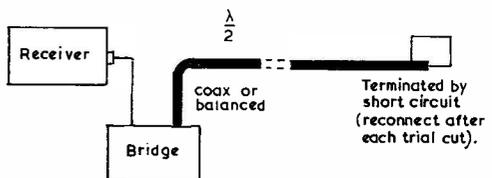


Fig. 6C Adjustment of $\lambda/2$ lines

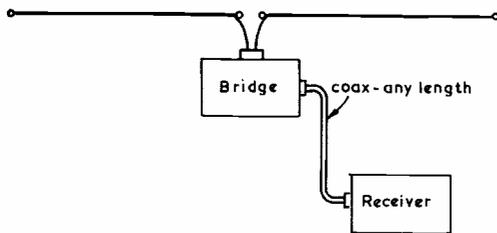


Fig. 7A. Direct measurement at feed point of aerial

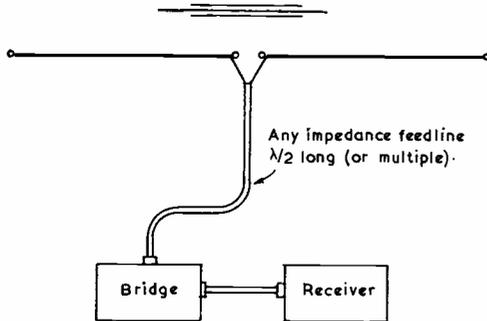


Fig. 7B Remote measurement of balanced aerial

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any point of maximum current, and measurements made in the same way as the low-impedance centre-fed aerials already described (Fig. 8A). If the aerial is centre-fed with tuned open-wire line, it is necessary to connect the bridge to the feedpoint via a matching section which will step-down the centre impedance to within the measuring range of the bridge (Fig. 8B). The same arrangement is used to check other types of aerial that are fed at high impedance, or with tuned open-wire lines.

Very Low-Impedance Aerials: The radiation resistance of shortened and loaded aerials (e.g., mobile whips) may be less than 10 ohms. It is sometimes difficult to obtain a satisfactory null at these low impedances and it can be advantageous to make the measurement at a higher impedance setting of the bridge. This can be done by "building-out" the load with a series resistance (Fig. 9). For example, if a 47-ohm resistor is used and the bridge reads 55 ohms at the null point, the actual load impedance is 8 ohms.

Vertical Aerials: The characteristics of a vertical aerial or ground-plane can be checked by connecting the bridge between the base of the aerial and the earth system (or the radials). Short verticals as used for mobile operation, are usually very low impedance and the load may have to be built-out with a series resistance before a satisfactory null can be obtained.

Baluns and Aerial Tuning Units: The input impedance, transformation ratio and frequency response of wide-band baluns can be checked by terminating the output connection of the balun with a non-inductive resistance

(70 or 300 ohm as applicable), and measuring the input impedance over the frequency range required. Single-band bridge baluns, aerial tuning units and low/high pass filters may be measured in exactly the same way. Provided that the receiver (null-detector) will tune to the TV frequencies, the noise-bridge is a very convenient tool to optimise the rejection frequencies of filters, stubs and other devices used for TVI applications.

Measurement of SWR: Simple instruments such as the noise-bridge do not have the capability of separating the resistive and reactive components that are present on a mismatched feedline. Provided the aerial is fed by a half-wave line (or multiple of a half-wave), the SWR on a line can be accurately calculated by measuring the impedance at the transmitter end of the line. For example, if the aerial is fed with 50-ohm cable and the measured impedance is 70 ohms, the SWR will be

$$\frac{70}{50} = 1.4 : 1$$
. The same arrangement can be used if the measured impedance is lower than that of the feedline. Thus if the bridge shows the null to be at 20 ohms, the SWR will be $\frac{50}{20}$ (or 2.5 : 1).

Other Uses

Whilst the noise-bridge is essentially an aerial instrument, it can be used for many other measurements of

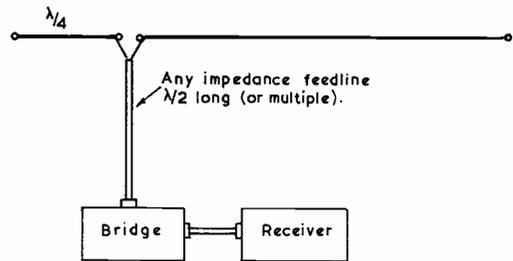


Fig. 8A. Measurement of long-wire aerial at current point

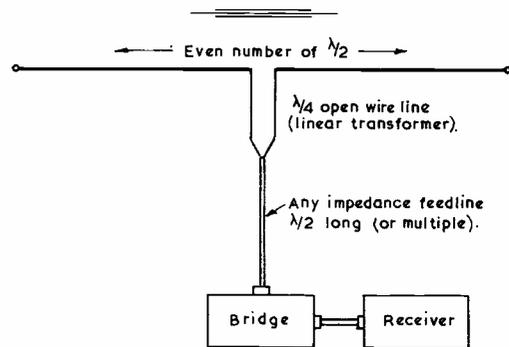


Fig. 8B Measurement of long-wire aerial at voltage point

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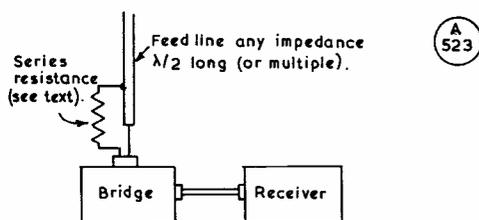


Fig. 9 Measurement of very low impedances

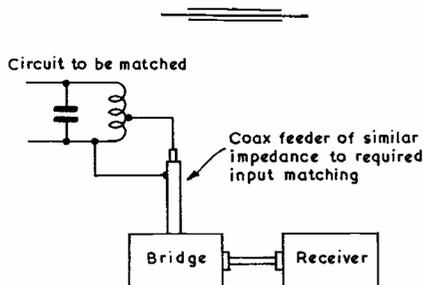


Fig. 10. Adjustment of receiver input circuits. (The same arrangement can be used with link coupling and/or balanced lines).

impedance at radio frequencies. It is a convenient means of determining the optimum input matching for receivers and converters (Fig. 10). It will measure series resonant circuits (within the 0 to 100 ohm range) and perform a number of other useful functions such as adjustment of π -networks, inter-stage couplings and many other tests that are not possible with other types of amateur test gear.

POINTS OF INTEREST

At the latest count, in the Class A/B categories together, there were 16,433 U.K. licences in issue. Of these, just over 3,000 were licensed /M, in both grades, about 400 being for VHF mobile.

* * *

When sending in a notice for our Small Advertisement section—see pp.312-317 this issue—should you be doubtful about what it ought to cost (rates are given in the heading note on p.312) you can send in a blank cheque which we fill in for the correct charge. (Oh, yes, many readers do this—and find they are better off than working it out for themselves!) For your own protection, endorse the cheque “not over £2” or some such reasonable amount. We will notify what is filled in when acknowledging acceptance of your advertisement.

* * *

Readers newly licensed or having recently changed their address are reminded that they should let us know as soon as possible for appearance in our regular “New QTH” page and in the quarterly issue of the international *Radio Amateur Call Book* in preparation. If you send in the information, we take all the necessary action.

MORE ABOUT SATELLITE RECEPTION

MAKING THE W_x PICTURE FROM THE SIGNAL

Part III

J. M. OSBORNE, M.A., F.Inst.P (G3HMO)

This is the continuation of the two previous articles on this subject, in SHORT WAVE MAGAZINE for February-March, 1971, which should be read for continuity.—Editor.

A BRIEF description of the sound of the signals was given in Part I. This concluding part will describe in more detail the nature of these signals and how pictures can be resolved.

Picture Coverage

From some 1400 km. up the satellite camera takes pictures around 2000 km. square every few minutes, thus giving complete coverage with overlapping pictures. Successive orbits give overlap at the sides of the pictures so that the user can obtain cloud information for the whole of his part of the world in the course of two or three successive orbits, with up to five pictures (normally three) per orbit.

APT Camera and Modulation

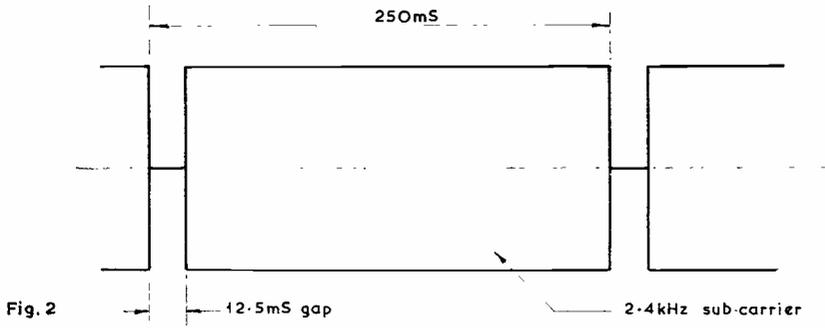
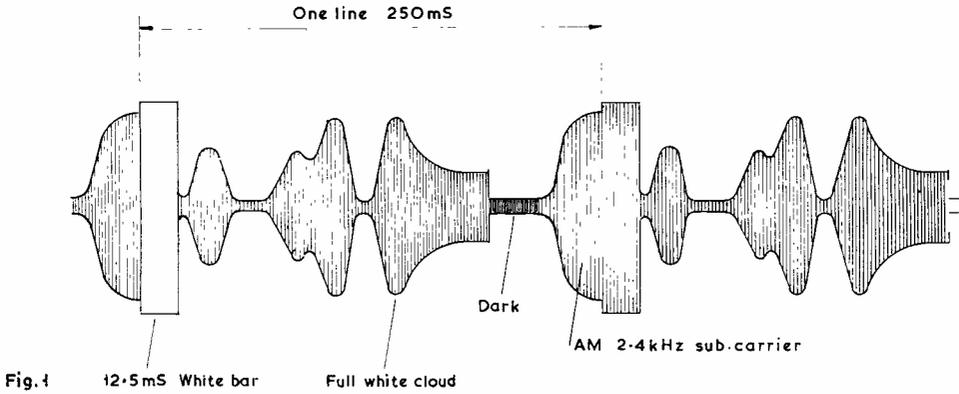
Different types of camera are used by satellites for APT (Automatic Picture Transmission) but for reception the effect is the same—a slow-scan picture of 600 or 800 lines sent at 4 lines per second. The modulation of the carrier with picture information is at first sight rather involved. The VHF carrier is frequency modulated with a 2.4 kHz subcarrier. The amplitude of the 2.4 kHz subcarrier is modulated with picture information. What is heard on a monitor speaker is this single high-frequency audio note varying in strength, the whiter the picture element the louder the whistle. Of course, the receiver must have a discriminator to detect the FM, preceded by a broadband IF of, say, 50 kHz bandwidth.

The reason for using FM is to make the picture information independent of carrier strength. Since the range of the satellite during a transit varies from 4000 km. to 1400 km. and since the polar diagrams and polarisation of transmitting and receiving aeriars, as well as tracking accuracy, all affect the received carrier strength, amplitude modulation would be useless.

A typical line of picture information as displayed on a CRO is shown in Fig. 1. A line takes one quarter of a second, of which 5% is used as full white identifying the edge of the picture. Each line is very similar to adjacent lines, as in normal television.

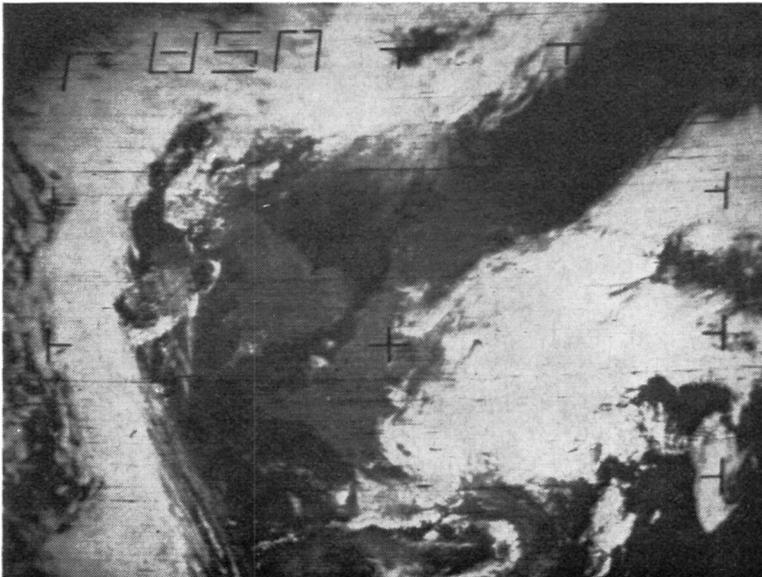
Making the Picture

The standard commercial procedure for resolving APT pictures is a mechanical one and a home-made



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Fig. 1. Typical line from a picture sent by an APT weather satellite—see text. The full white edge of the picture lasts 12.5 mS, the remainder of the 250 mS being cloud-cover information. Fig. 2. The phasing signal which precedes the sending of a picture. This is for the purpose of getting the 4-cycle line time-base in step with the picture transmission.



This picture was taken from Essa-8 at about 1030z on 3 May 71. The outline of the U.K. and N.W. Europe (around the centre cross-line) can be picked out quite readily by careful inspection and then the dark areas of the North Sea and Bay of Biscay fall into place. Cloud shows up as full white.

version was described some years ago by G3BST in SHORT WAVE MAGAZINE for April-June, 1959. My view is that for the radio amateur, electronics is easier than mechanics. I favour a CRT presentation recorded by normal photography. A raster of exactly 4 Hz line frequency (see later) is swept down once by a very slow (200 sec.) single shot frame timebase. The spot brightness is controlled by the amplitude of the audio signal. A 35 mm. camera with a close-up lens focussed on the CRT face is left with the shutter open (and the room in darkness!) during the scan. The film is developed and printed subsequently in the usual way.

Synchronisation

Only the line-frequency has to be synchronised as the frame can be started manually at the beginning of a picture and reset at the end. However, this is the most difficult part of the whole process as there is no line synchronising signal during the picture transmission. The full white picture edge in Fig. 1 can be used to confirm that synchronising is correct but as its amplitude is not different from the full white of a cloud that could occur anywhere in the line it cannot be used for generating a sync. signal. Hence the ground station has to generate its own 4 Hz sync. pulses. There is a phasing signal which is used to start the pulse generator at the beginning of a line but the generator then has to run for 200 seconds with no significant slip.

This is a tall order because an error of one part in 800 would cause one complete line-slip in a single picture. The white edge of the picture would then appear as a diagonal bar across the picture. An accuracy 100 times better than this is needed to give acceptable results. The simplest approach is to use a crystal oscillator at 100 kHz

followed by a chain of dividers to give 4 Hz. A maintained tuning fork at a lower frequency can be used with a reduction in the number of dividing stages.

A 300 Hz warning tone lasting 3 seconds is sent by the satellite transmitter to announce that a picture is being taken and is about to be sent. Then follows 5 seconds of phasing as shown in Fig. 2. In comparison with the line from Fig. 1 it will be seen that full-white is sent chopped at 4 Hz intervals, these gaps corresponding to the white picture edge. This full-white signal is used to bias off the dividers so that counting starts on the arrival of a gap. The bias-off circuit is automatically disabled as counting starts. Subsequent pulses at 4 Hz from the divider then correspond to the start of each line. These pulses then trigger the line timebase in the usual way, flyback taking place during the 12.5 mS. white edge of the picture.

The Tube

Any picture tube can be used provided that (a) The spot size is small enough to resolve 800 lines, and (b) The user can provide suitable slow timebases and an EHT supply for the tube. These requirements are stringent. For example, a very small amount of hum at 50 Hz in the timebase or EHT, or a stray magnetic field from a mains transformer, can seriously degrade the picture with hum bars.

The Camera

A rigid mount is required for the camera at such a distance from the tube that the image of the screen just fills the frame on the film. The close-up lens can be a converging lens (such as a weakly magnifying spectacle lens) of focal length equal to the camera-to-screen

Wx satellite photograph showing almost complete cloud cover (and ice formation) over Northern Europe. The cross-line is centred on Norway and slightly to the left of this mark is a clear area of the North Sea off the tongue of the Lofoten Islands. This and the other picture were taken with a Polaroid camera directly off the tube face.



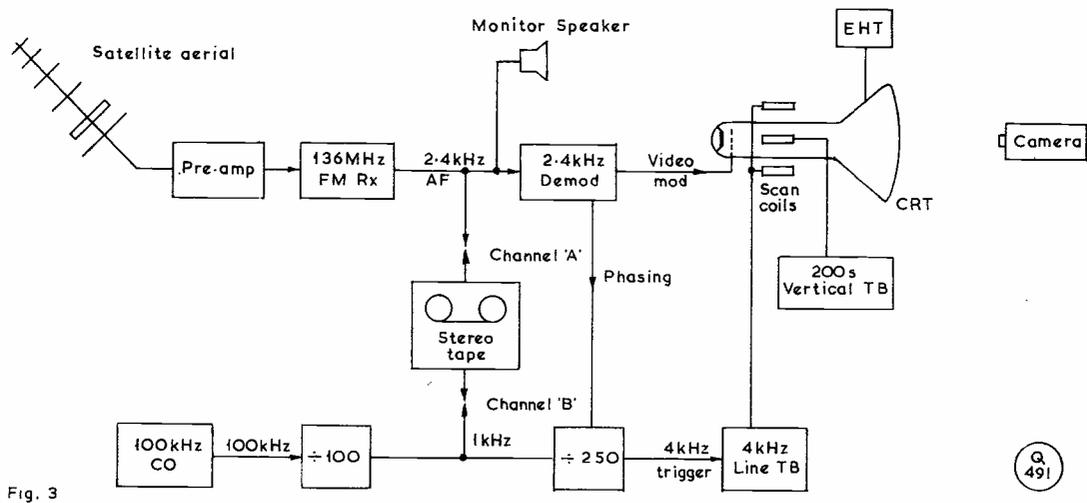


Fig. 3

Fig. 3. Block diagram to show the layout of units for reception of Weather Satellite pictures.

distance. With such a lens the screen will be in focus when the camera is set on infinity. The aperture should be at or near maximum (2 to 2.8) when using normal film such as "Plus X". Of course, trial runs and adjustments are needed to get sharp correctly exposed pictures.

A Polaroid camera is ideal as it gives instant pictures but the running cost is high. At nearly 20p per picture it could cost £1 for each transit.

Recording

The audio signal can be put on tape and the pictures made subsequently on playback. However, synchronising information must be put on the tape to cope with variations in tape speed between "record" and "playback", wow, tape stretch and so on. A stereo recorder is needed and for good results both it and the tape used should be of high quality.

The synchronising technique used is to take a suitable audio frequency out of the divider chain (say 1 Hz) and get this on one channel while recording the signal on the other. During playback this frequency is fed back into the divider at the same point, with the crystal oscillator off, thus generating a 4 Hz sync. signal which compensates for tape errors.

The Complete System

The block diagram at Fig. 3 shows the interconnection of the various units. Once the basic system is operational a programme of improvements can be started, e.g. AFC on the receiver to take care of Doppler shift; powered aerial tracking; modifications for taking night time infra-red pictures at 0.8 Hz line frequency; modification for taking weather charts from normal ground Met. stations, and so on and so on.

Conclusion

While the taking and making of pictures from Weather Satellites is a fascinating hobby it should not be undertaken lightly. Each individual step is well within the grasp of any keen amateur wanting to make a success of it. The main problem is one of achieving a high state of reliability in individual stages so that ultimately "all systems go" at the same time! That takes patience and perseverance.

It should be noted that—referring to the detail in Table II on p.18 of the March issue—the only Wx satellites still operating are *Ito*s 2 (now called *Noah 1*) and *Essa 8*. The information given there pertaining to these two satellites is, of course, still valid. There are changes of this sort going on from time to time and as satellites "die out" replacements are put into orbit.

Finally, the writer would like to acknowledge much help as to transit times and associated data from the very active and successful satellite group at The Grammar School, Kettering, Northants., in particular G. Perry and D. Slater, G3FOZ. Their assistance enabled the Westminster School group to get off to a good start on this project.

CORRECTING A MISCONCEPTION

Not long ago, a reader wrote in to complain that we had "reduced the size of the *Magazine*". He is quite wrong. We have produced an issue of 64 pages—and sometimes more—regularly every month for years now. The *Magazine* feels and looks a bit thinner because since last January we have been using a more economical method of binding—this only to reduce the cost of production so that we can keep the cover price down. The situation was explained in the January '71 Editorial.

VHF BANDS

A. H. DORMER, G3DAH

HAVING been out of the country for the last part of May, your scribe is in no position to report from personal observation on the propagation conditions on the VHF bands recently. However, it would seem that the excitement of the April aurora gave way to a certain amount of lethargy on the part of VHF operators, and that conditions with few exceptions were pretty patchy.

The May 432 MHz contest was characterised by poor propagation accompanied by, and probably caused by, the area of low pressure over the British Isles at the time. QSO's with stations in Norfolk elicited the depressing information that ten contacts could be reckoned as a pretty good tally, and the South Coast stations report similar totals. The boys in the London area were faring rather better as far as the number of contacts was concerned, but ranges were low and QSB very tiresome. In the North, G8AWS of Wirral in Cheshire reports conditions much the same, and although his score of 90 contacts was two better than he achieved in the corresponding event last year, the final score was down as most of them were short haul, the best DX being with G3KEQ in Surrey. For G3OHH in Mow Cop, they appeared normal with best DX to GD2HDZ, but this seems to be exceptional. Very few EU contacts were made, although it

has since been learned that a goodly number of PAØ stations were active. Over in the Isle of Man, GD2HDZ has only 13 contacts in 13 hours of operating, and that with his attractive callsign, toc! So this event was one that 'DAH really didn't regret missing.

Four metres showed some possibilities, but generally little advantage seems to have been taken of them. 9H1BL in Malta was copying BBC/TV on several occasions towards the end of May and the beginning of June, and has recorded signals from G2DN and G3VPS and from the Sussex beacon on 70 MHz. Several other G stations were heard but due to gabbled callsigns and poor modulation, A1 says that he could not identify them, and makes a plea for more CW. The Maltese station monitors Four regularly, and when he observes an opening to the U.K. he goes to HF and calls G for crossband QSO's. Frequencies are 28-200, 21-150 and 14-150 MHz, so anyone interested might like to keep a check on those bands. No reports have been received of *Es* activity on this band to coincide with that on Two and, in the South of the country, the two beacons have been below normal strength and activity appeared low.

Two metres showed a few slight lifts during the middle of May—the 14/15th produced some good North/South GDX and towards the end of the month Paul Widger and the GM8AGU expedition seemed to be getting down into the South reasonably well. Slight auroral effects were observed on Two and Four on May 17, but were very weak and short-lived.

70 cm. was also "up" over May 13-15 with OZ9SW a good signal in many parts of the country, although regretfully, it must be admitted that his signals appeared to be going right over the top of Herne Bay, in spite of some valiant efforts by G8BQG of Rickmansworth to assist. G8AWS reports a lift on May 31 also, when he worked EI, GI and GD at good strengths. Conditions on this band were also good over the nights of June 1/2 and June 3/4, with PAØ at 5 & 9 in the South, OZ and DL contacts made, and the new Dutch beacon was pounding in at 5 & 9+ for most of the time. (For further information on this

beacon, see under the "Beacon News" heading).

* * *

Undoubtedly, however, the great event of May was the Sporadic-E opening on Monday 24th which, occurring in the late afternoon and early evening as it did, gave many operators their first chance of a contact with *Italian* stations! Reports vary in their estimates of the duration of the opening, but 1700-1900 local seems about right. Although this rare occurrence did not compare with the great opening of July 4, 1965, when not only Italian stations, but also those in Roumania and Bulgaria were available, signal strengths were very high, and reports have been coming in of working the Italians mobile and with indoor beams. G8CFZ (St. Leonards, Sussex) also reports a 5 & 7/8 contact at 1745z with YU2RBN, who subsequently worked GW3LXI in Pembroke, which is very nice going, and gives some idea of the extent of the coverage. It is also understood that HG was worked from this country. The understatement of all time must be the one from an operator in the South who was heard to comment that he thought that there must be a bit of a lift on! Characteristic deep fading was a prominent feature of this opening, a phenomenon which will be familiar to those who work ten metres regularly.

Perhaps a typical experience is that of GD2HDZ in Laxey, and extracts from his letter are quoted verbatim. "By some extraordinary stroke of good fortune, I chanced to switch on the two-metre Rx at 1715z, which is something I seldom do, and was considerably taken aback to hear several stations at good strength gabbling away in Italian, and presumably working each other. After a minute or so of mental confusion, it finally dawned on me that they really *were* Italians on two metres and not some inexplicable form of break-through, and that this must be a manifestation of Sporadic-E propagation about which I had read so much, but never really believed anyway! Gathering my wits, I switched on the Tx and after waiting for what seemed an eternity for it to warm up, I selected an apparently clear channel around 144.46 MHz, crossed

my fingers and called CQ DX. To my great satisfaction, I6ZAU in Ancona (1700 kms) came back and reports of 5 & 9 with some QSB were exchanged. I hope I may safely claim this as a GD/1 "First" on Two. (You may—Ed.)

"After a short break to alert GD3FOC by telephone, further contacts were made with I1BBK in Albana, Padua, and with I4PVU, Rimini, before the shutters came down at 1813z. Unfortunately, in spite of the moral support and able assistance of Tom Douglas, G3BA, who was staying with him, FOC was unlucky, as the Italians were not tuning the SSB channel. The gnashing of teeth in Castletown could be heard quite distinctly in Laxey! In all, I heard, I suppose, about 15 Italian stations at workable strength, but no YU's. I have the impression that the opening commenced about 1715z but I could be wrong, and it would be interesting to find out whether any earlier contacts were made."

The occurrence has also provoked a letter from a subscriber in Italy, who reports that he, I1RGA, and I1ZBU, both in Salerno, are active on Two every day from 2030z onwards on 144-620 MHz and 144-720 MHz, and are looking for G contacts. This seems a little late for *Es* working, but as they are proposing to operate /P over the July 4/5 Contest from a mountain top at over 5000ft. with 50 watts and a 2 x 11 beam, a QSO on extended tropo. cannot be ruled out.

If readers would care to write in with details of their experiences, a further survey of this welcome event will be included in next month's "VHF Bands."

While on the subject of this Sporadic-E opening, it might be of some advantage to newcomers to outline, without going into great detail, the mechanism involved in this type of propagation. Under certain conditions, the origin of which may be connected with auroral phenomena, intense patches of ionisation develop in the E-layer some 50 miles or so above the surface of the earth, and this can lead to the reflection of VHF signals, regularly as high as 50-60 MHz, but less frequently up to 144 MHz, as we have just seen. The height of the

layer at the time, and the density of the ionisation, determine the ranges over which communication is possible in this mode. On 50 MHz, this might be typically of the order of 400-1200 miles, but as ionisation may develop simultaneously in several areas, multiple-hop propagation becomes possible, giving ranges as high as 2500 miles. Unfortunately, although the results of Sporadic-E ionisation are now well-known, it is virtually impossible to predict their occurrence, although the months of May, June and July, and times just after noon and again in the early evening, seem to be the most productive. There is a shorter season in December and January.

It is satisfying to record that this effect was first observed and made use of by amateurs, as was auroral propagation at VHF, and that the

records of five-metre amateur activity between the wars has been of considerable scientific benefit.

Although, as mentioned, it is virtually impossible to predict with any accuracy the likelihood of Sporadic-E occurring at two metres, one can get some idea of the possibility, if not probability, by observing signals on the four-metre band. For example, if ZB2 is coming through, it is possible that there might be some activity on two metres also. Similarly, for those who can monitor the ten-metre band, a shortening of the skip there may be a pointer to *Es* possibilities on the higher frequencies. It's all a bit chancy, but it's fun when it happens.

Finally, it may be noted that the ionisation responsible for Sporadic-E propagation is sometimes sparse and scattered, and that only localised

THREE BAND ANNUAL VHF TABLE

January to December, 1971

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		TOTAL pts.
	Counties	Countries	Counties	Countries	Counties	Countries	
G3COJ	32	3	57	—	28	6	140
G3OHH	38	5	43	4	18	3	111
G3DAH	18	2	53	9	18	2	102
GD2HDZ	19	4	38	6	15	3	85
G2AXI	24	3	39	4	8	2	80
G3ZYC	36	4	—	—	33	6	79
G8BCA	—	—	41	6	21	3	71
G5DF	—	—	42	4	19	1	66
G3IAR	31	3	21	4	—	—	59
EI6AS	15	5	30	6	1	1	58
G8BWW	—	—	32	5	6	4	47
G8BKR	—	—	32	4	8	2	46
G3FIJ	—	—	34	6	1	1	42
G3EKP	18	5	11	4	—	—	38
G8CVD	—	—	32	5	—	—	37
G8CBU	—	—	34	3	—	—	37
GM3EOJ	—	—	18	10	3	1	32
G8AUN	—	—	26	2	1	1	30
G2JF	—	—	26	4	—	—	30
G8ECO	—	—	23	2	—	—	25
G8APZ	—	—	—	—	16	2	18
G8CYN	—	—	13	2	—	—	15

Just a reminder that the Tables go through to December 31, 1971. The Three-Band Annual Tables show claims to date for the year commencing January 1, 1971. Claims should be sent to SHORT WAVE MAGAZINE, BUCKINGHAM.

openings then result, while at other times the ionisation may cover an area several hundreds of miles across. This means that because you may be hearing the Italian stations, it by no means follows that you will also hear the Spanish or Southern French if you turn the beam that way. It is also unlikely that you will hear stations *en route*—in the case we are considering, there appear to have been few, if any, contacts with the German stations, for example, unless there is, at the same time, a high and extensive temperature inversion resulting in coincident extended tropospheric propagation.

The VFO

The comments last month about the *misuse* of VFO's were underlined by the indiscriminate use of this popular tool during the Spor-E openings and also during the GM8AGU/GM3JFG expedition at the end of May and beginning of June. As already mentioned, your scribe was not available on May 24, but is very ready to accept the comments made by GD2HDZ, as follows. "A number of Italians were greatly inconvenienced by numerous G's calling simultaneously on their frequencies". The QRM on the GM8AGU channel on both the SSB and the AM frequencies had to be heard to be believed—it went on even when they announced that they were tuning from the HF end down, and even when they had changed mode.

A lot of this nonsense can be put down to inexperience, one supposes, but it is worth pointing out that sitting on the DX station's channel and blasting out long calls is *not* the way to win friends and influence people, as anyone used to the HF bands can confirm. The operator most likely to succeed is the one who calls a few kHz away from the frequency, keeps his call short, and does *not* call blind. On-channel calling under these circumstances can only lead to chaos and high blood pressure for both the DX and the local operators. Please be considerate of others.

Beacon News

The GB3LER beacon will shortly be operative on 50.1 MHz, night-time only at present, and this, with Meldrum, will be a useful

indicator of 70 MHz propagation and auroral possibilities on Two and Four.

For those who can tune outside the usual bands, G3TMQ gives the following list of VOR (Aircraft navigational aids) transmitters, reception of which could be a useful pointer to two-metre propagation. Cambrai, 117.6, *CMB*; Luxembourg, 114.4, *LXU*; Amsterdam, 113.3, *SPY*; Dortmund, 112.7, *DOM*; Chartres, 115.2, *CHW*; and Dinard, 114.3, *DIN*. All frequencies in MHz.

These beacons work 24 hours a day, and represent a general coverage of the nearer Continental areas.

A welcome newcomer to the 70 cm. band is the new Dutch beacon, PA0VD, sited at Schevingen on the North Sea coast. At present transmissions are intermittent on 432.13 MHz and it is understood that this frequency may be varied if QRM with and from TV is experienced. Ultimately, continuous operation is planned. Few details are available at the time of writing, but reported output power is 35 watts, and that the antenna is a pair of crossed dipoles. The signal consists of the callsign repeated twice and a long dash. Certainly, the signals being received in Herne Bay indicate that this will be a most useful pointer to propagation to the East. On the night of June 1 for example, PA0VD was at 5 & 9, GB3GEC at 5 & 7 and GB3SC at 5 & 5 at 2150z, so the beam was turned to the East and four consecutive contacts with PA0 resulted from the one CQ call. An interesting sideline here is that *all* the PA0 were VFO controlled, *all* called within a few kHz of the calling frequency, and *all* were on NBFM. So was G3DAH!

A new French beacon located in the area of Belfort, Dept 90, QRA Locator BH35, is reported to be coming into service shortly; callsign F7THF, frequency *circa* 145.985 MHz, output about 5 watts; and beam heading North-West. The transmitter will carry coded pressure, temperature and humidity readings among other information. F2XP is reported as the beacon keeper, and more details will be published as they become available.

It now appears that GB3LDN, the Shooters Hill, Kent, 23 cm.

beacon, will not be in operation until much later in the year, but efforts are being made to prepare it in time for the September contest. G3JHM and the South Coast VHF Group are working on another beacon which will have approximately 1 watt output to an automatically rotating antenna, and which will be located on the South Coast.

Finally, there are plans to install gear for 70 cm. and 23 cm. at the Durham two-metre beacon site. When all these arrangements are complete, the U.K. should have the best VHF/UHF beacon coverage in Europe.

DX-Peditions

Here is one not to be missed! An expedition to the Channel Islands which will include Alderney, Guernsey, Sark, *Herm and Jethou!* It is being mounted by G8BEJ, G3XTZ and G8AXZ. Details are as follows: July 6-8, *Alderney*; July 9, *Guernsey*; July 10-13, *Sark*; July 13-15, *Herm*; and July 16-18, *Jethou*. Sked times are 7 p.m. to midnight, except July 9 which will be a free-for-all with no skeds arranged, and given good conditions, the team is prepared to rag-chew after midnight. The usual convention for mode of operation will be followed, *i.e.*, first 15 minutes SSB, second 15 minutes CW, and last half-hour AM. They will operate SSB and CW on 145.4 MHz, listening at the low end for CW calls, and AM on either 145 or 145.5. Callsign for AM and SSB will be GC8DIZ/P and for CW GC3XCH/P, both calls belonging to the Farnborough & District Radio Society. The equipment will consist of a 4CX250B linear on all modes, with about 250 watts p.e.p. SSB and 150 watts of AM and CW. The antenna is 2 x 10-ele. at 50ft. and the Rx a dual-gate Mosfet converter into a Racal RA17.

The sites have all been finalised with the exception of that on Herm, but it is understood that there should be no difficulty once they get there, and obviously they will check it out before they set off. While the Jethou site is firm, operation from there is very dependent on the weather. There is no real landing stage, and if the sea is very rough it will be impossible to get the gear off-loaded—particularly the generator.

Skeds may be arranged with G8AXZ, *QTHR*.

The GM8AGU/GM3JFG expedition proved to be a great success, and gave many operators the chance to notch up some of the rarer GM locations. In all, 16 different counties were visited, and in spite of some poorish conditions, useful DX QSO's were made from them all. In the South, the strongest signals were those from Banff on the last night of the trip, when their SSB was at the 5 & 9 mark for much of the time. It is hoped to include further details in a forthcoming issue. Meanwhile, congratulations and thanks to the team.

* * *

The Amateur Radio Club of Nottingham will be operating a two-metre station from Wollaton Park during the Nottingham Festival, July 10-25. Callsign is GB2FON and special QSL cards will be issued. The Ovingham and District Amateur Radio Club (Northumberland) are holding a mobile Foxhunt on August 1 from 2 p.m. onwards. Frequency of the fox is given as 145.1 MHz, and prizes are offered to transmitting and receiving competitors. Details from G8BGU, *QTHR*, on receipt of s.a.e.

* * *

Forthcoming contests are the 144 MHz Open on July 4/5, which is combined with the Listeners contest, and the 432 MHz event, also combined with an SWL event, on July 18.

The South Bucks. VHF Club meet again on July 6 at 8 p.m. for a talk on test equipment, and on August 3 for a rag-chew. Location is Bassetbury Manor, High Wycombe. Details G3XBP, *QTHR*.

News Items

G8BUJ reports a net active in the Portsmouth/Isle of Wight area which sounds a friendly sort of set-up. The difference between this and the many other nets which one comes across from time to time, is that it operates on two metres at lunch times. The frequency seems a little

variable, between 144.19 and 144.22 MHz, but look for the following callsigns and you are assured of a welcome: G3VLY, G8DUB, G8AHM, G3RXB/A and G8BUJ. Call on net frequency if possible, or if you cannot, drop a line to any of the above-mentioned operators and fix a sked.

G8CVD (Nuneaton), who has been putting a very good signal into the South recently, expects to be off the air for the next three years as he is QSY to Saudi Arabia. He wishes, through this Column, to thank all those who have made his life pleasant and interesting on Two, and hopes that when he returns he will have a full ticket. Those who have heard Clive's signal may be interested to know that he is doing a write-up of his Tx which it is hoped will appear shortly in the Magazine. *Bon voyage*, Clive.

G8BGQ (Rickmansworth, Herts.) is now running full power on two-metre SSB, and is making some very useful contacts, some of the more exotic *via* the Cuxhaven translator, DJ9CRA. He is also active on 70 cm. with SSB and 46 elements. G2JF expects to have his new tower up by the time this appears in print. This is a home-constructed job, is wind-up and tip-over, and will carry the two-metre and 70 cm. beams up at 50ft. or so. Northern stations who have not been getting the customary rock-crusher from Jim these last few months may take heart, as the tower will now hoist the antennae up above a bank of trees which screen the new QTH to the North, and what with the full power on again and NBFM, Jim should be as copyable as ever. Those who have heard/worked FØIC recently, may care to know that this is the French call of G8BJP (Westgate, Kent) who has been off on another trip around the Boulogne area with the yacht *Witchcraft*—see *SHORT WAVE MAGAZINE*, November, 1968.

Peter Blair, G3LTF, discussing the auroral openings in April, gives some details of his contact with UR2CQ. It took place on April 14 at 2345z and lasted five minutes. He gave Peter 57A and

received 55A. His antenna heading for Chelmsford was 60° West of North, as it was for the GM's, but for SP2RO it had swung round to 60° East of North. '3LTF took his signal on a TIS34 converter and a ten-ele. beam on a heading of 055°. UR2CQ used a 10-ele. beam, 3.6 metres long, from QRA locator MS44f (for those who didn't get it). To prevent a surge of blood to the head, details will not be given of the other British stations heard by UR2CQ! Also on from Estonia during the auroral opening of April 21 was UR2BZ, with whom G3LQR is known to have had a QSO.

When thinking of G3LTF one cannot but associate his call with EME and MS work, and here is some further news about his activity in that sphere. On May 5 he worked W2NFA on 1296 MHz EME to repeat a QSO they had some 2½ years ago, just before the 23 cm. contact with WB6IOM. He has another sked with him lined up, and also with a W9 who is already in the EME business, since he has now reached the stage when he can copy his own Moon echoes. Next project is UK/VK on 432 MHz EME. The far end has a 30ft. dish, so it should be just about on.

* * *

The steady increase in the number of amateur transmitting licences issued is not by any means confined to the U.K. We have already referred to the new French and German calls being heard, and now the Belgian authorities have started the issues in the ON6 series, having exhausted the ON4 and ON5 sequence. Holders are restricted to CW operation for the first 12 months; have a look for ON6QQ, who has a nice fist on two metres.

Deadline

Deadline for the next issue is **July 10**, and the address for news, views, claims and comments is:—“VHF Bands”, *SHORT WAVE MAGAZINE*, BUCKINGHAM, Bucks. Cheers for now, and 73 de G3DAH.

“Short Wave Magazine” covers the whole field of Amateur Radio and should be obtainable to order through any newsagent.



SHORT WAVE LISTENER FEATURE

INTERFERENCE INTO THE RECEIVER— SWL's WHO HAVE GRADUATED —TECHNICAL POINTS OF INTEREST— LISTENERS COMING ON—NEWS, GOSSIP AND THE TABLES UP-TO-DATE

By *Justin Cooper*

A TOPIC we have not discussed in this piece for long enough is that of interference, from the SWL point of view. Occasionally, it is a case of TVI produced by a receiver such as an HRO—for which a standard cure appears in the post-war editions of the *RSGB Handbook*, and does the trick quite nicely. Occasionally it is an odd case, generated by a receiver of a type normally free from TVI problems—then, you are looking for a “silly” cause, like a dry joint in the oscillator circuit.

Far more often it arises in the form of interference to one's own reception by noises generated outside the receiver. Here, the interference can be divided into two categories: That which can be cured at source, and that which for one reason or another must be dealt with in the receiver. Looking at the former, one can define it almost as what gets into the receiver by way of the aerial, and so a first step to proving it is to see if the QRM is still there when the aerial is unplugged. Assuming it is, see if it can be heard on a transistor portable and if it can, use the portable's directive ferrite rod aerial as a D/F receiver to try and locate the source. To find the source area pretty accurately is to remove two-thirds of the problem. If it turns out to be on industrial property, a polite letter pointing out that interference tests indicate it to be on their ground will often do the trick. For most interference sources there is a cure “direct from the book.” The transistor portable is a valuable arbiter in case of doubt; and the ones to keep an eye open for are electric drills, thyristor speed controllers used with model railways and such, or hairdryers and the like. These often escape notice when first talking to the owner of the offending apparatus. On the LF bands there is the TV/Rx line-timebase harmonic problem as the prime amongst those curable at the receiving station; almost invariably some improvement to the arrangements for earthing will reduce the timebase noise and boost incoming signals as well.

Cross-modulation also comes under the heading of “QRM curable at the Rx”, with an *attenuator*, adjustable from a maximum to zero attenuation to suit the need of the moment. Mains-borne interference is definable by pulling out the aerial and terminating in the correct resistance; such interference will be unabated or may even sound worse, and can be attacked with a standard filter taken from the *Handbook*. If both these sources of incoming noise have been dealt with, you are getting to the point where it seems likely that the pick-up of QRM on the set wiring is the cause—IF breakthrough, RF pick-up on the audio, and so on, for which again

one can usually find a standard cure.

But last of our classes, one can safely say, is the type of interference which can not, for one reason or another, be put into one of the foregoing categories—in which case the cure is to deal as may be with the stuff you *can* trace, and when you are down to the puzzle one only, to use patience in conjunction with the transistor portable and a pocketful of suppressors.

Graduation

Quite a crop of new calls appears in the mail this time. *C. J. Deacon (East Ham)* writes to say that he has taken out G8EUB and will soon be active on Two Metres, although his interest in SWL'ing on the DX bands is still alive. Chris uses an amateur-bands-only modification of the old R.107 receiver for this activity, in conjunction with a 40ft. end-fed aerial.

J. Lee (Nuneaton) is pleased to report that he is now G4AEH on Top Band with a Codar A.T.5. Jim says he hopes to hook up with your old J.C. sometime—but he didn't realise that in fact J.C. called him on one occasion and did not succeed in raising him—he preferred the attraction of a more DX'y caller!

Another one who didn't come back to your conductor was G4AAQ (Sharlston Common) who was once known to us as *P. N. Butterfield*. He mentions that SWL reports on his signals on 80 or 40 would be appreciated, and acknowledged by QSL.

G. Dover (Nottingham) has become G4AFJ, although at the time of his letter he had only aired it from the Club station on 3.5 MHz SSB. However, a Top Band AM/CW rig is on the stocks and Geoff should soon be in circulation.

Congratulations are due to these chaps, all regular followers of this piece, with the hope that they may have years of enjoyment from their stations.

Technical

D. Shepherd (Kingswinford), having moved to what he reckons is a better location, wants an opinion on vertical aerials. What can we say, saving only that we use one? However, it has to be emphasised that the vital thing with these verticals is the earthing (or radial) system. For the proof of that, just recall the crashing great signal, from a *genuine* ten watts, put out on Top Band by the vertical at GW3UUZ with no trouble at all—the lighthouse location resulted in a near-perfect earth for many wavelengths in every direction, and a listen to Andy's receiver was a revelation in what a

and then hear a faint echo of the same signal, as though it had travelled a great distance. If you think you have heard an LDE, as they are called, you should make a report to: *O. G. Villard, W6QYT, Radio-Science Laboratory, Stanford University, Stanford, CA, 94305, U.S.A.* Give name and call, the date and time in GMT, band, the operating mode (SSB, AM, CW), estimate as accurately as you can the delay time, and how long the phenomenon was audible, whether the LDE was on your own or someone else's signal, your location, and what you heard being delayed, in the exact words. If you can get a tape-recording of it, so much the better—and if you can get someone else to listen to it, by making a quick phone call, better still. This is a serious scientific study, of one of the things where amateurs can play a significant part in the research, and hoaxes are just not wanted. All reports will be acknowledged by W6QYT or one of the members of his team.

* * *

Those two transistor portables which did duty as his only receiver have been pensioned off by *J. Fitzgerald (Gt. Missenden)* in favour of a Trio 9R59DS—something John has been threatening to do ever since your J.C. has been the writer of this piece. The new box has raised a grave problem, though, in that John just does not know which band to choose, after all the years confined to the LF allocations.

After that surprise, in comes another one—all three members of the Hyder family reporting in the same month! *T. W. Hyder* is now out of hospital and back to his shack at *Hythe, Southampton*. He has a long list, as do *Michael* and sister *Lynne*, which seems to suggest that as soon as Dad was OK they all dashed to the rig to make up for lost time!

Quite an interesting point crops up in the letter from *R. Carter (Blackburn)* who thinks that when the weather locally is in a state of high pressure, the DX is better, fading out as the pressure drops on the barometer. One would doubt whether the pressure *locally* has much effect on the DX bands, although it certainly is a factor to be reckoned with by the VHF chaps in their search for anomalous propagation. However, it would be of some considerable interest to SWL Carter's listening to try to establish, by careful observation, a definite correlation between the barometer and the DX over a period of months at a time.

New Entries

R. Philpot (Shenfield) runs a CR-70A to an aerial which comprises a twelve-foot whip mounted on a mast 20ft. high, fed to an ATU in the shack. The logging has been done very clearly, and shows that Robin is mainly an evening listener, but is not averse to a session in the late hours or first thing in the morning (the best time, by far, if you can get up!)

Another fat list comes in from *J. H. Sparkes (Trowbridge)* who started with a one-valve kit last November, progressing to his present 9R59DS in March; it has an East-West 70ft. wire as its "inhaler."

It's a case of "straight into the ATPW and no messing about" for *I. Forse (Saltash)*, a member of the local Club and a forcing-ground for so many good SWL's.

Certainly, Ian doesn't seem to have missed much of the available DX with his B.40A receiver.

R. Impey (Brentwood) started his amateur-band listening as a result of hearing a local amateur breaking through into the IF stages of the BC set. Connecting an aerial yielded five others, no less, all Top Band locals. Now, an HA-600 Lafayette transistorised receiver does the work; a receiver which, with his bias against valves, appeals to SWL Impey technically as well as operationally. A Good Point this—if for any reason you dislike the way a circuit works "on paper," no matter how well it works on the air, you will never give it credit for what it *can* do!

Out of the mouths of babes and sucklings . . . Thus we find words of great wisdom from a new SWL in his first letter to this piece, *Z. Parmigniani (Stockport)*. After discussing all the help given to him in correspondence on tape by our old friend *E. Parker (Hove)*, goes on to say that he feels he must really get down to the techniques of *listening* because "what's the use of a transmitter if you can't operate a receiver properly!" Right to the top of the class, Zorro.

Rest of the Mail

Sad to say, *K. C. Webb (Slough)* has had so many commitments that he has had to remain static. In the shack the CR-70A is "now absent," albeit the old CR-45 is still giving good service. Looking to the future, K.C.W. sees a move of his home to the Bracknell area, and a larger garden for aerials (*and* gardening!).

After a spell where each short listen-round produced additions to the score, *Rev. L. J. Turner (Dudley)* found his luck changing for the worse; one of the local Club members had a Biblical mis-quotation to cover it: "The skip falls with the righteous." One suspects G3HGI of this! Incidentally, the present total has been reached using only the built-in aerial on the receiver, so a considerable improvement should be possible when a wire can be hung out.

One bad one appears in the list from *H. Wright (Pontefract)* on CW, namely a "ZA2V," giving QTH as Tirane, keying on Fifteen. So far as is known there is no *resident* activity in Albania, and there has been no active DX-pedition since last year. (And see CDXN. Ed.)

In a letter which otherwise would have contained only the table amendments, *T. Rootsey (Ilford)* admits to a remarkable concentrated spasm of listening, no less than 173 hours, to lift his score from 576 to 714, this taking no account of the additional time on the paperwork. The result shows that at his level in the Table one needs 0.8 new prefixes per hour actually spent on the receiver. It would be interesting to compare this with the ratio produced by, say, Stew Foster at the 1200 prefixes mark.

Having mentioned him, his letter comes to the top of the pile; *S. Foster of Lincoln*, no less. Stew has fixed himself up with 33 new ones during the last couple of months, in the hope of regaining his old spot at the top of the Table. These were mainly prefixes picked up in the WPX Contest, DX-peditions here and there, and the "infilling" of the rarer European ones, not to mention a 5Z4/MM and an SV4, made from a WA4 call signing /SV, all in accordance with the rules.

Martin East, 41 Avenue Close, Avenue Road, St. John's Wood, London, N.W.8 has a most attractive and interesting SWL layout. His main receiver is a Collins 51S-1, with a 55G-1 preselector (which it should scarcely need!), giving reception in all modes, with digital read-out to 1 kHz on the main dial. The second Rx is a Trio JR-310, covering all amateur bands. An ATU selects any of three antennae, which include a K.W. trap dipole, erected on the roof of a block of flats. Martin, a retired estate agent and property man, is not only a very keen SWL with a lot of fine equipment but is also, needless to say, now working for his AT-station permit.



An early letter this time from *H. M. Graham (Harefield)* explains his recent absence as being due to the postal hold-up. However, H.M.G. is still in there collecting both new prefixes and new countries at about the same rate of knots as usual, and he has the odd weirdie to offer. Has anyone any knowledge of a station signing "ZR3UY" and claiming to be in Zanzibar? In the absence of any definite evidence to the contrary, it must receive the "thumbs down" signal and an ignominious drop into the waste-basket. *Ten* yielded a new country for that band with a CO; *Fifteen* produced CR4BC, HC1ARE, JY9AB (an all-time new country), VS9MB for the mere trouble of switching-on, and another new one in the shape of IE1PUG. Old faithful, *Twenty* was not left behind, with a UAØ in Zone 18, 9V10X, VE8RX, VP8HZ on Saunders Is., VU2 and 3V8, the latter being pleasing in that 3V8's are rarities at the Graham aerial terminals.

M. J. Quintin (Wotton-u-Edge) seems to have unearthed an odd one, in the person of "KD2UMP" heard on April 1 (!) and giving his QSL manager as W2RSJ. Another exercise, in more ways than one, has been to climb up into the roof-space and find up there room for a 14 MHz dipole. Once it has been put up and tuned, it will be interesting to see how Mike compares it to the Joystick.

Now to *P. Harris (Surbiton)* who, as will be noted by the sharp-eyed ones, has changed his address yet again. Not only that, but he has become the proud owner of a Heathkit RA-1, and has been using it to make a starting total from his new QTH of 229 in ten operating sessions, using 28 and 21 MHz dipoles on a common feeder for the three HF bands.

No doubt about it, these Trio receivers are very popular; *T. Grimbleby (R.A.F. Digby)* has bought one for his private use, instead of having to traipse over to the Club shack and its RA-17 every time he wants to

listen. Certainly, his CW list seems to indicate the new box is doing well enough.

K. Plumridge (Swaythling) wrote early in the morning before setting off to work—keen type! Keith reckons his two high spots of the recent past where QSL's—one from JY1 and another from TI9CF, both for new countries confirmed. The TI9 was particularly welcome insofar as the Plumridge aerial system is not really adequate in its owner's eyes for DX-hunting on Eighty, where TI9CF was in fact received.

An odd one crops up in the *T. George (Penzance)* list, in the shape of a 4V4; he was giving his prefix phonetically, so there was no mistaking the letter, and he gave all the impression of being in Israel. However, it *could* have been a 5V4 or 5Z4 miscopied, albeit on the face of it this is unlikely.

On to *P. Goff (Towcester)* was listening on Eighty on April 22, and heard G3IWC being subjected to a certain amount of rudery by a pirate; apparently, the idea was for G3IWC to keep him talking while others did the D/F work. One only hopes the offender is run to earth and that someone socks him in the eye.

G. S. Taylor (Rugeley) has been somewhat out of it this last few months, what with a lot of decorating, alterations to the house, and such, which has left but little time for listening. However, a few new ones have been added, and are shown in the Tables for this time.

Somehow we misquoted the score of *S. Wessely (Sheffield)* giving 274 instead of 247, last time out—sorry! Simon received his first QSL during the period under review, from OK1KW, who added his JT1AA card for good measure and additional interest—a generous way of rewarding SWL enthusiasm.

An interesting QSO overheard by *H. Alford (Burnham-on-Sea)* was that between ZL5AX and VE8BB at 0600 one morning—the Arctic and Antarctic talking to each other, with both ends audible in the U.K. These early-

morning stints are a favourite with SWL Alford now he is retired and can adjust his living arrangements, as far as time goes, to suit himself.

A local move of home has occurred for *E. W. Robinson (Bury St. Edmunds)* from the bottom of the valley to about as high as it is possible to get in that delightful town. It is hoped that this will result in a large improvement in the way of hearing the elusive DX from which the E.W.R. aerial has for so long been screened.

N. Hembrey (Northiam) has received his first QSL from a Russian station, and with it there is a letter in Russian—so a translation is needed. Anyone care to offer (*via J.C.*)

Now, we hear again from the *Singletons, John and Shelagh*, whose son is now 18 months and beginning to cut firmly into their listening time—so much, so indeed, that John has to take him to the park to give Shelagh time for the receiver. John sounded mildly unhappy about the recent R.A.E. paper—on the other hand, J.C. thought it was a fair one this time, with a good balance. It must be admitted that one's outlook changes markedly once the Exam. has been passed. One always recalls a certain now-licensed amateur talking to your scribe, complaining bitterly how unfair the paper was—but he passed, and a year later was to be heard encouraging another member of the Club, saying how easy and how fair it was!

An SX-24 has fallen into the hands of *A. Judge (Bishops Stortford)* and given him a look at 21 and 28 MHz for the first time. Good old receivers, these—with the SX-28, two of the best Hallicrafters models of the pre-War period and still capable of much today. However, all must be secondary to examinations—even if one of his masters does report to "SWL," it won't get Tony off the hook!

Those new Italian prefixes were covered in CDXN last month—see p.213, June—and so should not be any problem to SWL's. But it should be noted that the basic type of II call is still an option, so one may find II's mixed in with the others! These, along with the odd things generated by the PY's in the WPX contest, are all OK to be taken into the lists. Indeed, this has already been done by most, including *R. A. Treacher (Eltham)*.

J. R. Cowan (Rochford) is still not quite there in his attempt to reach the ATPW List starter of 500, albeit only 13 more are needed. But like Tony Judge, and many others, those examinations have to be taken first, and all priority must be given to them.

Now to old-timer *A. W. Nielson*, who adds a further crop to his already high score. This time there is no mention of receiver troubles, or any more about the aerial falling off—sounds as though SWL Nielson has startled all the *Glasgow* chaps as well as us down here by mending the receiver and putting the aerial back up!

Last time we heard from *P. L. King (Isle of Wight)* he had been shipped off to the Caribbean area. Now he is back, and brings his total up to date by adding the ones from last November to the April and May crop.

A short letter from *M. Williams (Sleaford)* is something a little unusual—but Maurice finds time for a few well-chosen words regarding the wolf-pack who blotted out VU7US with their own calls and bad operating.

A most interesting comment from *R. P. Scase (Leatherhead, Sy.)* anent the world-cruising trimaran

NEW HPX LADDER

(Starting January 1, 1971)

SWL	PREFIXES	SWL	PREFIXES
PHONE ONLY		PHONE ONLY	
T. George (Penzance)	471	D. A. Shepherd	
K. C. Webb (Slough)	471	(Brierley Hill)	271
J. H. Sparkes (Trowbridge)	456	T. Thornton (Wargrave)	268
S. Wesseley (Sheffield)	439	R. Impey (Brentwood)	249
P. Goff (Towcester)	420	W. M. Bell (Bristol)	249
J. V. Parker		R. Philpot (Shenfield)	240
(Newcastle-on-Tyne)	400	P. Reeves (Burton-on-Trent)	235
K. Plumridge		Z. Parmigiani (Stockport)	230
(Southampton)	359	J. W. Jarvis	
Miss L. Hyder		(Rickmansworth)	229
(Southampton)	353	P. Harris (Lincoln)	229
Rev. L. J. Turner (Dudley)	352	K. A. Hastie (Jedburgh)	224
S. Rawlings (Twyford)	345	M. Gawthorpe (Hull)	210
W. B. Taunton (Meopham)	331	S. Emlyn-Jones	
H. R. Goodwin (Streetly)	302	(Tunbridge Wells)	206

Listings include only recent claims. Starting score 200. Rules as for HPX, given on p.46 March. DX Zone Map and latest Prefix List 85p post free from Publications Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

Chamaru, mentioned recently in CDXN: R.P.S. has been able to find W7TNA/MM on her 14 MHz schedules and to report her position regularly to her Yarmouth designer, Erick Manners. R.P.S. remarks that this exercise has "provided me with some of my most enjoyable hours of listening and reporting since I first started SWL'ing, 35 years ago".

W. B. Taunton (Meopham, Kent) was an SWL back in the days before Hitler's War and served in R.A.F. Signals during it. But after demobilisation, for twenty-five years he dropped all interest in radio. In February a Trio 9R-59D was set to work, with a 14 MHz dipole hung up in the loft and, with the latest copy of SHGR T WAVE MAGAZINE, after an interval of thirty years all the old interest came flooding back.

Mobile operation is the main interest of *J. W. Jarvis (Rickmansworth)* and his method of building up a whip coil is certainly novel—he uses the tube of an old plastic bicycle-pump as the former, with the whip top screwed into the threaded end, a dowel jammed in the other, and a wire run down to the bottom, to a capacitor to resonate the system.

Your long letters have filled the space, so we have to acknowledge short notes and Table scores from *H. Glass, Plymouth*; *S. Proud, Letterston*; *T. Thornton, Wargrave*; *B. Hughes, Worcester*; *K. A. Hastie, Jedburgh*; *W. Moncrieff, Hampton*; *M. Marsden, Ilford*; *H. R. Goodwin, Streetly*; *J. G. Ayton, Sunderland*; *R. Shilvock, Lye*; *E. Parker, Hove*; *P. Reeves, Burton-on-Trent*; *G. Proud, Letterston*; *J. Dunnett, Leighton Buzzard*; *R. Bence, Cardiff*; and *P. Scragg, Stockport*.

Signing Off

Our deadline for next time must be **July 19**, addressed as always, "SWL," SHORT WAVE MAGAZINE, BUCKINGHAM. Till next time, good hunting—and pse keep it on one side of the paper!

SPECIALLY ON THE AIR

We are asked by Cyril Turner, G8NL, 56 Sunny Bower, Tottington, Bury, Lancs., BL8-3HL, to say that, as U.K. QSL manager for stations operating under the special GB callsigns, he would be glad if those responsible for originating QSL's on behalf of these stations would include a supply of s.a.e.'s with each batch of cards. The reason for this is that very often return-cards and other QSL's for these operations cannot be delivered because no return-s.a.e. is available. G8NL says that he has "hundreds of cards unclaimed (some of great DX interest)" where either (a) The GB-addressee has not provided return-envelopes, or (b) The owner of the suffix-call issued by the Ministry has no connection with the GB operation for which his call-letters were considered appropriate—therefore, of course, he himself is unable to respond even if eventually QSL's for his suffix do reach him.

Accordingly, those using Bureau facilities for GB-station purposes should not only send a supply of s.a.e.'s for the return-cards but also make sure the envelopes are clearly marked with the GB callsign in full.

Our own contention always has been that for GB operations the QSL procedure should be direct, both ways, and regarded as part of the chore, with adequate return postage provided by the operator wanting the GB card. It is for this particular reason that we always give the QTH of the contact man for QSL's in connection with each GB-operation we publish under the "Specially on The Air" heading. On the other hand, normal Bureau procedure would be perfectly satisfactory provided this essential point regarding return-envelopes is not overlooked.

Since it can be a reasonable estimate that something like 10,000 QSL cards will circulate as a result of the GB-operations listed here, it is clear that the situation needs taking in hand—and we wish G8NL well with his part in these labours!

GB2RNS, June 29-July 1: Arranged by Norfolk Amateur Radio Club for the Royal Norfolk Show, Norwich, to be on the air 24 hours a day. Visitors will be very welcome at Stand 414.—J. L. Lockwood G3XLL, 29 Coppice Avenue, Hellesdon, Norwich, NOR.49M.

G3SFG/P, July 8-10: At the Finchley Carnival, Victoria Park, London, N.3, with operation on 2-4-80-160m., mainly AM.—A. V. Edwards, G3MBL, 244 Ballards Lane, London, N.12.

GB3CSS, July 10: For the Civil Service Show, Cheltenham, on 1875 kHz and two metres for visitors and mobile talk-in. Admission 8p, to Sports Ground, Tewkesbury Road, junction A.4019-B.4063.—S. E. Janes, G2FWA, Hillside, Bushcomb Lane, Woodmancote, Cheltenham, Glos.

GB3BMS, July 10: For the Garden Party of the North London Group of Baptist Churches, Muswell Hill, N.10. Bands to be worked, at various times, 10-15-20m., on two HW-100's, to be despatched later to the Congo for missionary operation. Special QSL to be issued and skeds invited.—T. F. Weatherley,

G3WDI/GB3BMS, 34 Landrock Road, London, N.8-9HL.

GB3QE, July 10: Arranged by the South Birmingham Radio Society for the Queen Elizabeth Hospital, Birmingham Open Day, operating on 160m. and the HF bands. A special QSL card will be issued for the occasion.—R. J. Thompson, 23 Fox Hill, Selly Oak, Birmingham, 29.

G3YIK, July 10: Station to be run by Stratford-on-Avon & District Amateur Radio Club in connection with the Shakespeare's School fête, operating on 20-80-160m., CW/SSB, 1300-1700z. Illustrated QSL card for all contacts and reports.—J. Morgan, G3YIK, 21 Quiney's Road, Stratford-on-Avon, Warks.

GW3YIH/P, July 10: Organised by the Rhyl & District Amateur Radio Club in support of a Charity Garden Party at Pengwern Hall, Rhuddlan, Flints., operating any band 15-160m. as conditions serve and contacts offer.—F. A. Cobb, GW3YIH, Mon Reve, Towyn Way, Abergele, Denbighshire.

GB2FON, July 10-25: Operating from "Nottingham Festival '71" at Wollaton Park, for the second year, working 160m. AM/CW, 10-80m. CW/SSB and two-metre AM. Simultaneous operation on all bands, evenings and weekends, and daily subject to operator availability, with a separate SWL station. Site can be found by locating a large aerial system. Specially-designed QSL card to be issued for the operation.—Amateur Radio Club of Nottingham, G3EKW, Sherwood Community Centre, Mansfield Road, Nottingham.

G3ZXZ/A, July 14: From Normanton (Yorkshire) Grammar School, for the school's fête and open day, operating 10-80m. CW/SSB, 2m. AM and 70 cm. AM and A/TV, signing also G4AAQ/A, G6AAS/T/A for amateur TV, and G3EGE/A for 2m. talk-in. Skeds, and visitors to the fête, would be very welcome.—D. J. Lockwood, Sharlston Common, Wakefield, Yorkshire. (Tel. Crofton 458).

GB2SS, July 24-25: Station to be established by South-down Amateur Radio Society for the Polegate, Sussex, Steam Engine Rally, working all bands 2m. to 160m., with talk-in to the ground on 1975 kHz, 70-26 MHz and 145-00 MHz. Admittance charge will go to local charities. Special QSL cards for stations worked and SWL reports received.—P. Hayes, G3POQ, 78 Hawthylands Road, Hailsham (3876), Sussex.

GB3ESP, July 31-August 7: For the 56th Universal Esperanto Congress, London, operating CW/SSB on 10-80m., 0800-2100z daily. Skeds welcomed, particularly with Esperantists, by arrangement, stating date, time, frequency and mode preferred.—W. Farrar, G3ESP, Wentwood View, Ackworth, Pontefract, Yorkshire.

GB3TSE, August 3-7: At the Tyneside Summer Exhibition, Newcastle-on-Tyne, to be laid on by the Tyneside Amateur Radio Society.—G. Lowdon, 21 Winifred Gardens, Wallsend, Northumberland.

THE MONTH WITH THE CLUBS

By "*Club Secretary*"

(Deadline for August issue: July 9)

(Please address all reports for this feature to "*Club Secretary*," SHORT WAVE MAGAZINE, Buckingham.)

READERS will notice a slight change in the presentation of this piece. Roughly one-third of the reports have been taken into the tabular "Short Notices" section, the Clubs concerned having been selected at random from the pile of letters.

The reason for this is very simple: Just shortage of space, to a degree which recently has resulted in the necessity for a swing of the Editorial axe on much of the text, in order to fit the allocated area. This is not as we would want it—better a "Short Notice" than none at all, and the space so saved will enable us to look a little more closely at matters of interest in the Club context generally. Naturally the selection of Clubs for "Short Notices" will be rotated.

National Clubs

And a revival of an old-established one to start our rounds with, namely the **Royal Marines** group. Not surprisingly, the Club centres on Portsmouth, the Hq. being the Royal Marine Barracks at Eastney, where they have a get-together every Wednesday evening for members and visitors, a particular welcome being kept for ex-RM SWL's or licensed amateurs, or members of the R.N.

Talking of the **Royal Navy**, the very next piece of paper comes in from them; they seem to be booming, as is the trade for their QRQ runs on the first Tuesday in each month, 1900 GMT on 3520 kHz or near, covering speeds from 20 to 45 w.p.m., with a certificate for each speed. This is not to mention various other activities and services, or the interesting and amusing *Newsletter*.

R.A.I.B.C. come next; initials for **Radio Amateur Invalid and Bedfast Club**, and a worthy organisation for our support. Invalid and blind members are scattered all over the country, and so "representatives" are equally wanted all over the country. There are many ways in which you can help, from taping *Radial*, the club newsletter for blind members, to helping put up an aerial or rig a station for someone, to just taking a member for a run or visiting him occasionally.

The object of **A.R.M.S.** is to provide a Club for the mobile enthusiast, wherever he may be, and information pertaining to this aspect of Amateur Radio. This it does well, mainly by way of *Mobile News* each month.

Our next one is "national" in a sense somewhat different from those already discussed. It is the **Nigerian Amateur Radio Society**, which unites past and present 5N2 call owners and SWL's as well as serving the purpose of a National Society. Their regular *Newsletter* always seems to strike just the right balance between the parochial and national which makes for good reading.

South and East

Around the Hampton Court area of the **Thames Valley**, the locals get together at the Three Pigeons, Portsmouth Road, Long Ditton, which is their Hq. On July 7, G3JXA will be speaking about "Radio Beacons and other Noises." For August 4, an informal is planned.

Maidenhead is another group that dispenses with any formal programme this month, because of the onset of holidays and consequent lower attendances. They may still be found, though, by looking, on July 5 or July 20, in at the Victory Hall, Cox Green, Maidenhead.

Yet another one with no specific plan is **Welwyn**, whose Hq. is at the Welwyn Civic Centre; however, they retain their booking for July 9, and will be, no doubt, just as happy having a good old natter.

Sad to say, after all the good work that went into it, the **Cheshunt** lads and their station set-up at the local Leisure Activities Exhibition could not be mentioned, as they missed the deadline last time round. For the group's "vital statistics," contact the hon. sec., his address as Panel, p.306.

Now to **Bedford**, in their Hq. at the Dolphin, Broadway, Bedford, each Thursday evening. No question of not organising a lecture or something interesting here—July 1 is down to G3UQR, who is to do an Aerial Demonstration; on the 8th everyone is to bring along Filters and check their performance, followed on July 15 by G3SOA on Colour Television, and, on July 23, G3XKB, who will be dealing with Matching Networks. That leaves only July 30, which will be devoted to a Quiz.

A change of meeting-night is notified for **Paddington**; the lads will now be converging on Beauchamp Lodge Settlement, 2 Warwick Place, London, W.2, on Wednesdays of each week. For further information on the scope and range of the club, contact G8AWV, as Panel.

The lecture to the **Acton, Brentford and Chiswick** group on July 20 should be of great interest, as G3CCD will be describing the results he has been obtaining from tests on his All-Band Ground-Plane aerial. Kick-off at 7.30 p.m. sharp, at Chiswick Trades and Social Club, 66 High Road, Chiswick, London, W.4.

Sutton and Cheam have their meeting on the third Tuesday in every month, the venue being at The Harrow in Cheam. Since the AGM is the latest recent event to be reported, naturally we must give the new committee time to sort out a programme—so we must refer you to the hon. secretary, G2DMR, recently returned to this part of the world after many years.

Our letter from **Winchester** this time refers only to the cancellation of the proposed Mobile Event owing to a shortage of available operators on the day nominated, and its replacement by an exhibition station, as last year. Thus for all the July data, we refer you to hon. sec. G3MCL, address in the Panel, p.306.

Normally, one can expect the meetings of the **Guildford** chaps to be timed to the second and fourth Fridays in any given month, but this pattern is on occasion changed for some good reason. July 9 is down for a Junk Sale, but no details were available for July 23 at the time of writing.

Verulam would appear to have their next date on July 21 at the Town Hall, St. Albans, apart from their informal sessions at Salisbury Hall, London Colney. However, there is a slight element of doubt in your scribe's mind about this date, so it would be as well to check with G3YHY (as Panel) before making your arrangements to visit them.

Mid-Sussex have planned an early, and interesting, start to the month, by assembling on July 1, at Marle Place, Leylands Road, Burgess Hill, to hear their member G3SYS giving a talk, illustrated with slides, on Radio Astronomy. On a different tack, they now have their long-awaited permission for an aerial tower, the total height of which should see the beam elements up at fifty feet.

Well down South now, to **Fareham**, who have a berth at Portchester Community Centre—they once said "Follow the feeders inside to find us!"—so they ought to be easy enough to locate on the afternoon of July 4, when they start a Treasure Hunt at Winchester Hill. At Hq. on July 11, G3HQT will beguile their Sunday evening with a talk on the El-Bug. Winter programmes will be planned on July 18, and on July 25 comes a talk by G3YOM on Simple Transistory.

Chineham House, Shakespeare Road, Popley is the address of the **Basingstoke** group Hq. July 3 is down for an informal, and July 17 for G3MPS to talk on Amateur TV; but certainly the main event of the month is on July 24, when the club will be taking part in the Le Court Fête, at Le Court, two miles north of Liss on the East side of B3006 to Alton. Opening is at 2.30, by Cliff Michelmores, and the object of the exercise to help the Cheshire Homes. It is understood that quite a lot of RAIBC people are hoping to be there, too.

"One of the regulars" sums up our approach to the next letter. **Shefford** seldom miss, although they have had several secretaries since your conductor has been writing this piece—clearly, someone keeps things going, and that of course is the hall-mark of a well-run Club, as Shefford most definitely are. Every Thursday evening sees a collection of cars outside the Church Hall in Amptill Road, and people hurrying inside to get in on the best spots. July 1 is a members' discussion, to plan for the future, as well as filling in a bit of time with an Any-Questions session. The week after is again an all-club discussion, this time on VHF/NFD, after which a Junk Sale—no connection, we hope! July 15 sees them off on a D/F Hunt, and on July 22 G3XTQ will talk on Transistors for 144 MHz. This leaves July 29, when G3EUS will be discussing Fault-Finding on the Station Receiver.

SHORT CLUB NOTICES

CLUB NAME	HEADQUARTERS LOCATION	MEETING DAY MONTHLY
Bishops Stortford:	British Legion Club, Windhill.	3rd Monday
Bromsgrove:	Royal Oak, Marlbrook.	2nd Friday
Chippenham:	Boys High School	Tuesdays
Coventry:	121 St. Nicholas Street, Radford Road	Fridays
Cray Valley:	Church Hall, 1 Court Road London, S.E.9	1st and 3rd Tuesdays
Crystal Palace:	Emmanuel Church Hall, Barry Road, London, S.E.22	July 17
Derby:	Room 4, 119 Green Lane	Wednesdays
Echelford:	The Hall, St. Martins Court, Kingston Crescent, Ashford, Middlesex.	June 14, June 24
Kingston:	Penguin Lodge, Brighton Road, Surbiton	2nd Wednesday
Norfolk:	Brickmakers Arms, Sprowston Road	Mondays
North Kent:	<i>Not quoted</i>	2nd and 4th Thursday
Nuneaton:	<i>Not quoted</i>	1st Friday and Wednesday 12 days after
Plymouth:	Virginia House, Bretonside	1st and 3rd Tuesdays
Saltash:	Burraton Toc-H, Saltash	July 2/16
Solihull:	Manor House, High Street, Solihull	July 20
Southgate:	Civil Defence Hut, opp. Arnos Grove Tube station	2nd Thursday
South Manchester:	Sale Moor Community Centre, Norris Road, Sale	Fridays
<i>do. (VHF Sec.)</i>	Greeba, Shady Lane, Manchester 23	Mondays
Yeovil:	Youth Centre, 31 The Park	Thursdays

N.B.—In each case, secretary's address appears in Panel p.306.

Crawley will be at Trinity Congregational Church Hall, Ifield, on July 28 for a lecture on an Amateur Radio subject by a visitor from Mullard, Ltd., and on August 14 they will be mounting a live-station exhibition, signing G3WSC, at The Martlets, Crawley, running SSB over 10-80m.

Over at **Wymondham**, Norfolk, following successful participation in the local "Expo-'71" event, when GB3WYM was kept going on 15-20m., it is hoped to organise a new Club in the town, where there is quite a high level of Amateur Radio activity and interest. To this end, G8CVJ (address as Panel), would be very glad to hear from anyone who might like to join.

The Midlands

In addition to bookings on the second and fourth Wednesday in every month, **Oxford** will be having another D/F event towards the Collier Cup on July 9, organised by G3PMI, and starting from Brill Hill.

Sad news indeed from **Lincoln**, whose place at Sobraon Barracks was broken into, and their Codar

A.T.5 and its power supply stolen, resulting in them giving up the use of this as their Hq. Until something in the way of a new place can be fixed up, they will be getting together *chez* G3TJO by courtesy of Irene. This being the case, if you are thinking of joining, or visiting a club meeting, it would be courteous to get in touch with the hon. secretary beforehand.

Although they are remarkable always that they are small, in fact Mansfield have no fewer than three new G4/3 calls among the members who meet at the New Inn, Westgate, Mansfield, on the first Friday of each month. A "useful member" is the pro. at the local golf-club, which means they had the use of possibly one of the best possible NFD sites, 600ft. a.s.l., in the county.

A treat is in store for Midland on July 20, in that they are hoping to have a lecture by the Eddystone people, at their Hq. in the Midland Institute, Margaret Street. The *Newsletter* contained an interesting article by

G3XGP, concerning his buy of a bargain bag of 50 "2N706" transistors. *Caveat emptor* must still apply here as in any other transaction—Bill had one out of the 61 in the pack which met the 2N706 spec. and a dozen which, by stretching a point, could be claimed to be showing transistor action! This made it a pretty high-priced "bargain".

On now to locals **South Birmingham**, who have a place at Hampstead House, Fairfax Road, West Heath, on the first Wednesday in every month. A special-activity station they are running is of interest—on July 10 they will be setting up shop as GB3QE at the Queen Elizabeth Hospital Open Day.

Crafty fellows are on the committee at **Hereford**—they have coupled a business meeting at Hq. on June 18 with a Junk Sale to make sure the chaps turn up! However, it means we have no up-to-date story on the July doings—but this can be resolved by a phone call to the

Names and Addresses of Club Secretaries reporting in this issue :

- ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, London, W3-8LB.
 AINSDALE: N. Horrocks, G2CUZ, 34 Sandbrook Road, Ainsdale, Southport (77604), Lancs.
 A.R.M.S.: N. A. S. Fitch, G3FPK, 40 Eskdale Gardens, Purley, Surrey, CR2-1EZ.
 BASINGSTOKE: P. Sherry, G3CBU, Ashley, Orchard Road, Salisbury Gardens, Basingstoke, Hants.
 BEDFORD: J. Bennett, G3FWA, 47 Ibbett Close, Kemston (2427), Bedford.
 BISHOPS STORTFORD: A. Stanley, G3WUR, 43 Havers Lane, Bishops Stortford (57251), Herts.
 BROMSGROVE: J. Dufrane, 44 Hazelton Road, Marlbrook, Bromsgrove.
 CHELTENHAM (Group): S. E. Janes, G2FWA, Hillside, Bushcomb Lane, Woodmancote, Cheltenham, Glos.
 CHESHUNT: A. F. Webb, 3 Roseneath Walk, Enfield, Middx.
 CHIPPENHAM: P. J. Tuck, 186 St. Ediths Marsh, Bromham (274), Chippenham, Wilts.
 CORNISH: J. Farrar, Elm Cottage, Ventonleague, Hayle.
 COVENTRY: C. Jaynes, 20 Belgrave Road, Wyken, Coventry, CV2-5AY.
 CRAWLEY: J. Graham, G3TR, The Willows, Church Road, Lowfield Heath, Crawley (27021), Sussex.
 CRAY VALLEY: P. F. Vella, G3WVP, 78 Hurst, Sidcup, Kent.
 CRYSTAL PALACE: G. M. C. Stone, G3FZL, 11 Liphook Crescent, London, S.E.23 (01-699 6940).
 DERBY: F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby (21931), DE3-7GE.
 ECHELFORD: R. Hewes, G3TDR, 24 Brightside Avenue, Laleham-on-Thames, Middlesex (Staines 56513).
 FAREHAM: G. G. Bulleyment, G3XIV, 42 The Fairway, Portchester, Fareham, Hants.
 GUILDFORD: P. J. Hopwood, G8CQM, 27 Woodruff Avenue, Burpham, Guildford (68929), Surrey.
 HEREFORD: S. Jesson, 181 Kings Acre Road, Hereford (3237).
 HULL: Mrs. M. E. Longson, 4 Chester Road, Wold Road, Hull, HU5-5QE.
 KINGSTON: R. S. Babbs, G3GVU, 28 Grove Lane, Kingston-on-Thames (2801), Surrey.
 LINCOLN: G. O'Connor, 61 Steep Hill, Lincoln (24113).
 MAIDENHEAD: E. C. Palmer, G3FVC, 37 Headington Road, Maidenhead (20107), Berks.
 MANSFIELD: F. N. F. Bewley, G8HX, 116 Westfield Lane, Mansfield (25208), Notts.
 MIDHERTS: H. R. Thornton, G3PKV, 43 Fordwich Road, Welwyn Garden City (23162), Herts.
 MIDLAND: N. Gutteridge, G8BHE, 14 Metchley Drive, Harborne, Birmingham, 17 (021-622 2323).
 MID-SUSSEX: E. J. Lettis, G3RXJ, 87 Meadow Lane, Burgess Hill (3552), Sussex.
 NIGERIA: E. A. Lomax, 5N2ABG, P.O. Box 68 Kaduna, Nigeria.
 NORFOLK: J. L. Lockwood, 29 Coppice Avenue, Hellesdon, Norwich (48685), NOR-82R.
 NORTH DEVON: H. Hughes, G4CG, Crinnis, High Wall, Sticklepath, Barnstaple.
 NORTHERN HEIGHTS: A. Robinson, G3MDW, Candy Cabin, Ogden, Halifax (44329).
 NORTH KENT: L. Randall, G4ACQ, 118 Brook Street, Erith (40800), Kent.
 NORTH LEEDS: T. Brown, G8CJS, 12 Hollin Hill Drive, Leeds, LS8-2PW.
 NOTTINGHAM: M. R. Harris, G3VUI, 20 Durham Crescent, Bulwell, Nottingham SM6-9AH.
 NUNEATON: D. W. Smith, 2 Niton Road, Weddington, Nuneaton, Warwickshire.
 OVINGHAM: M. Stott, G8BGU, 27 Dene Garth, Ovingham, Prudhoe, Northumberland.
 OXFORD: D. R. Ward, 2 Lincoln Road, Oxford (47771), OX1-4TB.
 PADDINGTON: M. A. Pawley, G8AWV, 52 Sumatra Road, West Hampstead, London, N.W.6.
 PLYMOUTH: S. E. Martin, 32 East Park Avenue, Mutley, Plymouth.
 R.A.I.B.C.: Mrs. F. Woolley, G3LWY, 331 Wigan Lane, Wigan, Lancs.
 ROYAL MARINES: G. G. Bulleyment, G3XIV, 42 The Fairway, Portchester, Fareham, Hants.
 ROYAL NAVY: CRS M. Matthews, G3JFF, HMS Mercury, Leydene, Hants.
 SALTASH: I. A. Ennis, G3XWA, 19 Coombe Road, Saltash, Cornwall, PL12-4ER.
 SHEFFORD: A. Sullivan, G2DGF, 12 Glebe Road, Letchworth, Herts.
 SOLIHULL: J. Burnie, G8BYM, 12 Buryfield Road, Solihull, Warwickshire (021-705 4565).
 SOUTH BIRMINGHAM: R. J. Thompson, 23 Fox Hill, Selly Oak, Birmingham, 29.
 SOUTHGATE: A. F. Hydes, G3XSV, 6 Glenbrook North, Cotswold Way, Enfield (01-363 8747).
 SOUTH MANCHESTER: D. Holland, G3WFT, 7 Alcester Road, Sale, Cheshire M33-3GV.
 STAR (Leeds): *Hon. secretary's name/OTH wanted.*
 SUTTON & CHEAM: J. Komdorffter, G2DMR, 19 Park Road, Banstead.
 THAMES VALLEY: C. B. S. Seaman, G3ATF, 40 Park Road, Ashford, Middlesex.
 THORNBURY: K. R. Brooks, G3XSJ, 72 Nicholls Lane, Winterbourne, Gloucestershire.
 TYNESIDE: G. Lowdon, 21 Winifred Gardens, Wallsend, Northumberland.
 VERULAM: H. Young, G3YHY, 93 Leaford Crescent, Watford, Herts, WD2-5JQ.
 WEST OF SCOTLAND: K. McDermott, GM3SSB, 22 Fettercairn Avenue, Glasgow, W.5.
 WHITE ROSE: R. Short, G3YEE, 10 Tyersal Grove, Bradford 4 (664-220), Yorkshire.
 WINCHESTER: P. Simpkins, G3MCL, Flowerdown House, Harestock, Winchester.
 WIRRAL: A. Fisher, G3WSD, 34 Glenmore Road, Oxtou, Birkenhead (652-5078).
 WYMONDHAM: P. F. Exeter, G8CVJ, 4 Ash Close, Finnerde Gardens, Wymondham, Norfolk.
 YEOWIL: D. McLean, G3NOF, 9 Cedar Grove, Yeovil, Somerset.

secretary, as in Panel opposite.

Wirral seem to have had a fire during the two-metre portable contest, but at the time of writing were still going strong on NFD, to show they don't care! As for such mundane things as meetings, we note July 7 as the date for G8BQQ to talk about the conversion of the Pye "Cambridge" for Two. This is at Harding House, Park Road West, Birkenhead. The venue for the July 21 date is not known, as it is hoped to organise a Foxhunt on that evening.

At **Nottingham** there has been an AGM and some new faces brought on to the committee. The main activity for July will be the Wollaton Park "Festival of Nottingham" affair, where they will be running GB2FON from July 10-28. Any other information about this lively group can be obtained through G3VUI—see Panel.

Westerly

This area seems to be entirely on holiday or caring for holiday-makers, or something—it is a thin clip indeed this time.

North Devon first, where they get together at the home of the hon. secretary, G4CG—see Panel. July 14 is down for a lecture and July 28 for a ragchew—but the lads are flexible enough to alter the programme, if not the dates, at the proverbial drop of a hat. High Wall is not too easy to find—if you are coming in on the road from Bideford, just as you start to drop into Barnstaple proper, the right-hand side of the road looks up at a high wall. Above this High Wall is the place you are seeking—not, be it noted, the Sticklepath on the maps, down Okehampton way.

Although we have the venue—The Chantry, Thornbury, Glos.—we have no dates for the **Thornbury** Club meetings. However, they seem to like trotting off on mini-DX-peditions, putting on demonstration stations, and having lectures, so if you are in the area why not get in touch with G3XSJ, as Panel.

Looking at the **Cornish** newsletter *Link*, we find the Camborne meeting down for July 1, at the SWEB Clubroom, Pool, Camborne; this one will be "earth systems" by G3VWK—a very important subject, as all the Big Signals know only too well! Then on July 4 all Cornish amateurs and SWL's, not to mention the visitors, will be streaming to Truro Rugby Football Club ground for the annual Mobile Rally in those parts.

The **Cheltenham** group will have GB3CSS on the air for the Civil Service Show at the Tewkesbury Road Sports Ground, on July 10—and we are assured that the station will *not* be manned only by civil servants!

Northerly Parts

The members of the **White Rose** Radio Society can be found on any Wednesday evening in the White Horse Hotel, Armley Town Street, and most of the time this month will be taken up by arrangements for the White Rose Mobile Rally on July 25. Incidentally, there are hints in the hon. secretary's letter this time of a "permanent" Hq., where a Club station and other similar facilities could be organised.

Only a short note this month from G3MDW on the events at **Northern Heights**. The syllabus for the year is

still being arranged, but we can say that there will be the usual pattern of Wednesday evening sessions at the Peat Pitts Inn, Ogden, Halifax, plus all sorts of other interesting things—contact the hon. secretary.

Now to **West Scotland**, pleased to be moving into their own place at 81 Virginia Street, Glasgow, where they have a gathering every Friday. In the very near future there will be a Club station, which they hope to activate on other evenings as well. Look them up—they go out of their way to welcome visitors and new members.

A group that pays attention to the SWL members by having an "SWL Night" at least once a month is **Hull**, to be found on Fridays at 592 Hessle Road, Hull. For July, we see G3RDM talking about Aerials and ATU's on the 2nd, with a Construction Evening following on the 9th. July 16 is down to G3AGX, dealing with Mosfets on 144 MHz, and July 23 to G3PQY who will look at that all-embracing question of Winding Coils—a good subject on which there is a dearth of *practical* knowledge even among the professionals. This leaves us with July 30; and as indicated earlier this one is for the SWL's.

From **Tyneside**, we hear that they meet regularly at the Community Centre, Vine Street, Wallsend, where they have their own accommodation, weekly on Mondays, while on July 18 they have an organised outing to Scarborough; on the 12th, the meeting is to be a visit to the local Radio Newcastle.

We also have a report this time from the **Ovingham** & District Amateur Radio Club, who are running a Foxhunt on August 1, with the Tx signing G8BGU on 145.10 MHz—this will involve an omni-directional aerial, but the 25w. input will radiate sufficient power for the signal to be well heard at the three check-points at Hexham, Morpeth and Newcastle, using only a super-regen. Rx with a dipole.

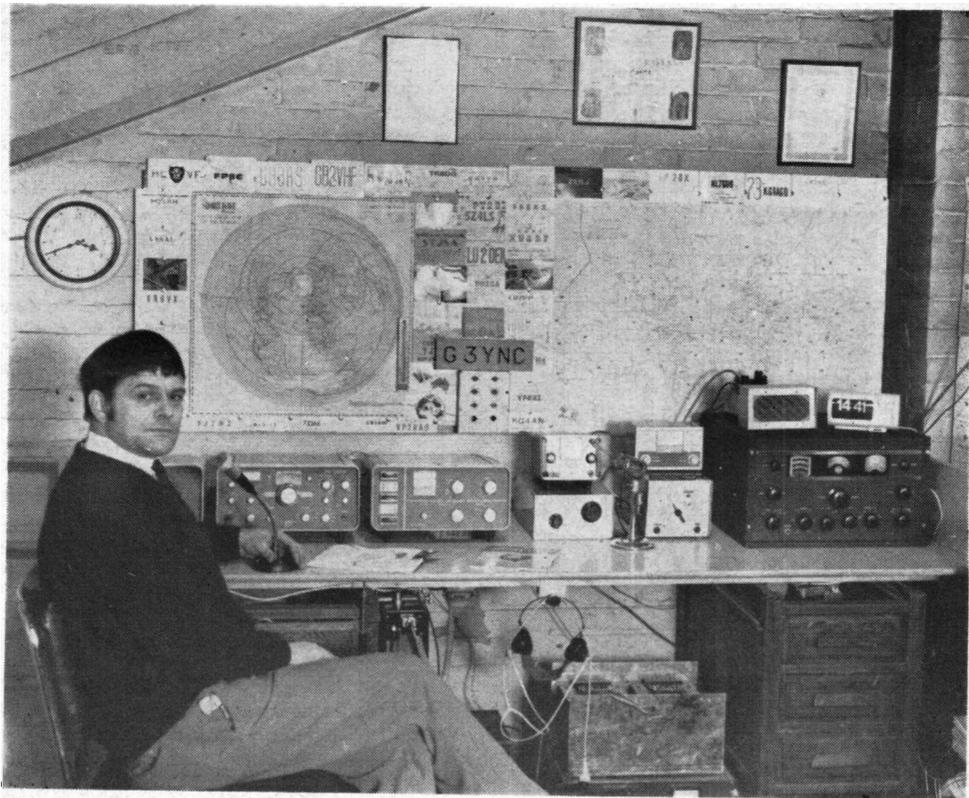
One of the **Leeds** groups is the Star Short-Wave Club, meeting at the Star & Garter, Bramley Town Street, every Wednesday at 8.0 p.m., with on-the-air activity on two metres and Top Band on alternate occasions. They also have tape-slide lectures, featuring members' stations. Visitors and prospective members are always welcome.

Signature

So there it is; we hope you will like the new format as you get used to it, and that you will help us to make it interesting. This you can do in several ways. First, make *quite sure* you give all the details to fill in the columns of the "Short Notices" section—these are important either way. Secondly, if you have something happening which you would specially like reported, then let us know in your letter; if space permits we'll mention it—no promises!

As now the material is going to take a bit longer to prepare, it is even more important to be sure your report arrives on or before the deadline, addressed as always to "Club Secretary," SHORT WAVE MAGAZINE, BUCKINGHAM. And that deadline is **July 9** for the August issue and **August 6** for September. In each case your programme news and dates should cover the month of issue, *not* the month in which the reports are sent up!

And it won't be long before MCC is round again!



THE OTHER MAN'S STATION

G3YNC

G3YNC, first licensed in February 1969 as G8CIS, got his full ticket in June '69, the operator being 38-year-old John Adams, pictured here in his main station at Harringay Greyhound Racing Stadium, North London, where his job is chief maintenance engineer. John is interested in all bands Top to two metres and is operational on all but 4 metres—the same goes for his home QTH at 12 Cromwell Road, Walthamstow, London, E.17.

A family man with interests in /P working but lacking the precious time, he did manage to join with G3SVK for their mammoth GM tour in April 1970, when they covered 13 counties in 15 days.

His interest in Amateur Radio was aroused in 1967, when a young member of his staff showed him a copy of *SHORT WAVE MAGAZINE*—and the bug bit, hard and deep. Indeed, of all his hobbies and activities—which include model aeronautics (in which he achieved championship honours) and ten years as a trials-and-scrambles rider—G3YNC says that Amateur Radio has been of the most lasting interest. Though the work-QTH station shows mainly commercial equipment, at home the VHF side is

all home-built.

G3YNC is also an active member of the Gilwell Park Amateur Radio Group at the International Scout Training Ground near London, where they put on many demonstration stations throughout the summer season under the callsign GB3GP, the other Club calls being G3WGP and G3YGP.

A project in hand is the design and construction of a contra-rotating mast system for independent rotation of the tri-band Quad and the two-metre Parabeam at the Gilwell Park station. At Harringay, the antennae are, of course, on the roof of the Stadium, giving not only height but excellent accessibility. G3YNC has a Cubical Quad at 60ft. for 10-15m., an 8-element beam for two metres mounted on the boom of the Quad and a folded dipole for 80m. which can be used Marconi-fashion on Top Band, this latter array being at a height of 75ft.

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- EI4CF**, N. T. Foley, Senior House, St. Patrick's College, Maynooth, Co. Kildare.
- EI0CF**, F. O'Connor, 163 Errigal Road, Drimnagh, Dublin 12.
- G3YHL**, T. D. Bridgman, 26 Saxon Way, Witney, Oxon, OX8 7ES.
- G3ZOR**, J. H. Robertson, 31 Lynton Road, Burnham-on-Sea, Somerset. (Tel. *Burnham-on-Sea* 2333.)
- GM3ZTA**, W. Currie, 33 Langholm Street, Yoker, Glasgow, W.4.
- G3ZZG**, F. D. Vowles, 38 The Rowlands, Biggleswade, Beds. (Tel. *Biggleswade* 2688.)
- GW4AAU**, W. T. Bowen, 2 Powys Drive, Eastbrook, Dinas Powis, Glam., CF6 4LN. (Tel. *Dinas Powis* 2044.)
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THE TWO BEST SELLING RECEIVERS!

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XTALS! XTALS! XTALS!

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Tel. DEVORAN 862575 **CORNWALL**

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SALE: Two new 5CP1 CRT's, £1.75 each. Advance Type A.38 aluminium die-cast six-position rotary signal generator attenuator, £4.20.—Ring McCallum, East Horsley 4376.

SELLING: Heathkit HW-32 Transceiver with recent mods., compact PSU and microphone, £45 or near offer.—Ledger, G3UBL, 872 Kenton Lane, Harrow Weald, Middlesex.

OFFERING: Labgear LG.300, £25; also PSU/Modulator, built in cabinets, Variac control, £20. R.C.A. AR88LF, £25. VFO unit comprising BC-221 with buffer amplifier, output at 3.5 MHz, in cabinet, £25. Reasonable offers considered.—Martin, 151 Park Road, Bingley, Yorkshire.

BEST OFFERS For: Grey console and filing cabinet; Minimitter five-band converter; Gramplan dynamic DP4 microphone; Nombrex signal generator; box of junk, £5; 10 Dubilier 400 mF 350v. condensers, new. All as new.—Nash, G3BES, 60 Tisbury Road, Hove 3, Sussex.

WANTED: Canadian 52 Set transmitter, less PSU, but manual appreciated. £10 offered for specimen in working order.—Heslop, 4 Willow Close, Brandon, Co. Durham.

FOR SALE: K.W. Viceroy Mk. II CW/SSB Tx, coverage 10 to 80 metres, 180 watts p.e.p., with PSU, handbook and new set of valves, £50.—Whittington, G3UQD, 18A Botwell Lane, Hayes, Middlesex. (Tel. 01-561 7044.)

SELLING: National HRO Junior, overhauled, with many new components, S-meter, four coil packs and PSU, £10. TCS receiver, in excellent condition, with PSU, £10. HRO GC coils, 75p.; 20-metre bandspread, £1.25. Exchanges considered, send s.a.e.—Bretherton, 9 Commercial Road, Chorley, Lancs., PR7-1EU.

DISPOSING: TU5-7-8-9B units, £3 each. BCC69F on two metres, £10. Codar A.T.5, T.28, AC/DC PSU's, control unit, Webster "Bandspanner" whip, microphone, etc., £40 the lot. Marconi VSWR meter and coupler, price £6. Xtal, 100 kHz, £1. Xtal, 1 MHz, £1. Jason FM and TV tuner, £2. New 4CX250B with new Eimac base, £8. Various wide-space transmitting condensers, Vespa Mk. I mains xformer, new, £3. Transistor tuner for 70 cm., covers 430 to 470 MHz, £4. Webster "Bandspanner" tunable 2m. whip, new, £6. PSU Type 139 (10K482) for Type 30 signal generator, new, £2. New QV06-40A, £3; QV03-20A, £2. AC/PSU with built-in speaker, for HW-12A, £15. LM-13, slight fault, with calibration book, £9. VCR-193A, 75p. Four-metre "Reporter," £3; 4m. "Ranger," £6. Collect or add postage.—Haycock, 178 Parkstreet Lane, Bricket Wood, St. Albans, Herts. (Tel: Parkstreet 3638).

CW OPERATORS! At last, at £25, a realistically priced quality twin-paddle el-bug. The Danish Quali-Fi MSK-4 has dot memory, self-completion, etc., for squeeze or conventional operation. Send s.a.e. for details.—Cook, G5XB, Little Orchard, Gallops Tree Common, Reading, Berks.

SELLING: Eddystone EC-10 receiver in mint condition, £40. Hartley double-beam 'scope, in working order, £15.—Maclachan, G3TYT, QTHR, or Tel: Penkridge 2464 (Staffs).

OFFERING: Eddystone 940 receiver, with plinth speaker and headphones, new October 1969, in excellent condition, £110 or near offer.—Buchanan, 54 Whitehurst, Bearsden, Glasgow, Scotland.

SALE: K.W. Viceroy Mk. III CW/SSB Tx, with extra half-lattice filter, 6146B's in PA, in excellent condition, with manual, £75 or near offer—will deliver to 50 miles, or buyer collects.—Davis, G3IUZ, QTHR, or Tel: 058-27 3007 (Herts.)

TELECOMMS G3SED

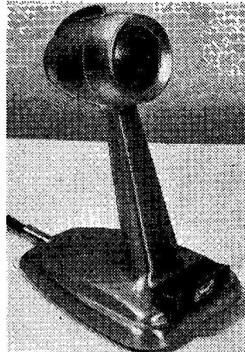
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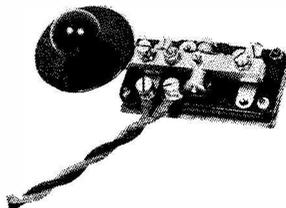


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(These receivers are in stock at time of going to press)
CTS4 VALVE VOLTMETERS. Measures A.C. volts up to 200 MHz. D.C./A.C. ranges: 2.4v., 4.8v., 24v., 48v., 240v., 480v. Resistance ranges: 1K, 10K, 100K, 1M, 10M. Each unit has been individually re-calibrated and tested. Unit supplied with battery case, less batteries at £8. P. and p. 60p.

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Halsen extra coils	£3.85	50 misc. transistors	27p
Antex 15w. solder iron	£1.60	50 misc. diodes	12p
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Codar PR 30	£7.50	S.C.R. manual	67p
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		I.C. applications	£1.25

Wanted : We are always pleased to hear about your trade-in equipment and are looking for good KW, Eddystone, and TW items in particular. We can offer cash, or radio equipment in part exchange. Wanted. "Radio and TV servicing" 1960 onwards, any quantity. H.P. on any items over £25 in value. One third deposit and up to two years to pay. Payments may be by Post Office Giro. You may also place your orders by Giro. Our account number 64 041 0006.

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Paros 80-20M	£90.00	Pye 4 channel rx	£4.00
Trio 9R59De	£35.00	GCRE Diversity switch	£3.00
Codar AT5	£14.00	Codar PR30X	£7.00
Pye base receiver low	£5.00	KW2000A	£160.00
Hallcrafters SX 111	£70.00	Drake 2B with G mult.	£80.00
Trio JR5005e	£55.00	Swan 350 and p.s.u.	£130.00
Codar T28	£12.00	Labgear LG300	£30.00
Hallcrafters S214	£35.00	Hacker Helmsman	£25.00
TS510 as new	£160.00	Eddystone 840A	£35.00
Star SR550	£30.00	Eddystone EA12	£130.00
Eagle Rx 80	£25.00	Eddystone 940	£120.00
Trio JR 310 mini	£45.00	Codar CR70A	£18.00
Pye base receiver hi band	£5.00	Heath RG 1	£27.00
Bootmount ranger (3-10)	£5.00	Heath 5in. scope	£30.00
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BEREAVEMENT Forces sale of Eddystone 840C receiver and headphones (original cost £76). Offers? Buyer collects Manchester area.—Ring Darlington, 061-224 6837.

WANTED: Pye F27AM, Cambridge, Bantams, Westminster, Motaphone. Also wanted, working and unmodified Walkie-Talkies on either 27 or 28.5 MHz.—Kates, G3PHS, QTHR, Caterham (Surrey) 46692.

FOR SALE: R.C.A. AR88LF receiver, complete with matching speaker and Hosiden stereo headphones, price £35.—Ring Bourne, Treffgarne 660 (Pembrokeshire).

OFFERING: CR-150 receiver with PSU and pre-selector, in fair condition and good working order, £25 or near offer.—Willson, 146 Hithercroft Road, Downley, High Wycombe (22715), Bucks.

SALE: 19 Set with mains PSU, Type 38 Set with PSU, Type 38 Set with PSU, Type 16 control unit, head-set with microphone, aerial variometer Mk. III/3, Morse key, case of spare valves, etc., with all leads, £20 The Lot.—(Tel: 01-960 1143), Sayle, 55 Oakworth Road, North Kensington, London, W10-6DF.

SELLING: Sphinx SSB Tx, at £50 or near offer. AM/CW Tx, 150 watts, £15 or offer. Class-D Wavemeter, £5.—Ring Leicester 825884, after 6.0 p.m.

EXCHANGE or SELL: Trio 9R59DE receiver, modified PSU, separate RF and IF gain controls, stabiliser stage, with 1 MHz xtal marker—Exchange for Eddystone S.640 Rx, with cash adjustment, or would sell. Offers, please.—Ring Lindes, East Grinstead 23950.

FOR SALE: Eddystone 840C receiver in mint condition, with manual, £45 or near offer. Prefer buyer to test and collect, or will deliver to about 50 miles, otherwise carriage extra.—Miller, 38 Beatrice Road, Shirley, Southampton (71634), Hants.

FOR SALE: Honda Generator, 1500E, new and unused, £115. KW-2000B, little used, £200. Eddystone EA-12 receiver, mint condition, £115; and EC-10, complete with PSU, as new, £40. Type AR-44 rotator, with desk control, £20. TH4 Thunderbird 4-element beam for 10-15.20 metres, tri-band, £20. E.M.I. TR51D professional tape recorder, £45.—Everley, G3PPK, QTHR, or ring 01-573 0496 office hours, or Uxbridge, Middlesex, 36989, evenings.

SALE: R.C.A. AR88D, immaculate laboratory specimen, with manual, trim tools (never been taken out) and spare valves. Price £65, buyer collects South-East London.—Ring Howard, 01-693 8775, after 6 p.m.

DIRECT EXCHANGE: Have Leak stereo 70-Plus amplifier, new and boxed. Want a T.W. Communicator for two metres, or R.216 Rx. Direct swap.—Smith, G8BEN, QTHR, or ring Whittlesey (Cambs.) 2499, evenings.

SALE: Complete Drake Station: TR4 all-band AM/CW/SSB Transceiver, with auxiliaries AC4, MS4, Shure 444, bug key, SWR meter, etc., all perfect, price £285.—Carling, 16 Corona Road Cambridge.

WOULD Those Concerned please note that in future all advertisements involving sale of transmitting equipment must be accompanied by the owner's call-sign. This is in everyone's interest. In the case of Box No. notices, the c/s should be quoted in the covering letter.—Small Advertisement Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

EXCHANGE or SELL: Solartron CT.316 Oscilloscope, DC to 8 MHz, in excellent condition — on offer, or would Exchange for 9R-59DE or similar.— Ellis, 13A Lower Edgeborough Road, Guildford, Surrey.

SALE: R.C.A. AR88LF receiver, with S-meter, £30. Tiger Type 100B AM/CW transmitter, QRO rig 10 to 80m. (10 watts on Top Band), £35. Both items immaculate and in perfect operating order. — Ring Morgan, G3MEM, 073525 3701 (near Reading).

SALE: Heathkit DX-40U, with VF-1U VFO and internal Ae./Rx switching, also Eddystone 740 Rx — both £40, will separate. — Ring Macauley, G4ABX, Wythal 2509 (Birmingham).

CLEARING Shack: Creed 75 Teleprinter, with perforator, no transmit contacts, £30; Creed 7B teleprinter fitted with 230v. AC synchronous motor, £30; Teletype TT4 teleprinter for 45 bauds, £20; Creed tape perforator Type 7P/N3, £4; signal generator Type TF-144G, with spares case, £12; Creed 7B main frame keyboard and carriage, also quantity of parts all suitable for spares, lot £5; Marconi PSU for HR-22 receiver, £5.—Phillips, 155 Franklands Village, Haywards Heath (50265), Sussex.

WANTED: National HRO-50T1, -60T1 receivers and manuals for either; also HRO-5T tuning assembly. **FOR SALE:** B 40 Model C, new with manual, etc., £38. Zenith BC-221 frequency meter, brand new, £23. High-band "Ranger", transistor PSU, new, £15. Also 6-40A, brand new, boxed, £4.50. All items carriage extra (North-West Area). — Box No. X001, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

MUST SELL: Telomast, 50ft., with guys, all under year old (cost £20), price £12.50, buyer collects. Also large box of assorted items, £1. Off to Cornwall, so must dispose.—Lovell, G3YMP, 42 Southwall Road, Deal, Kent.

WANTED: CR-100 receiver. **SELLING:** Hallicrafters SX-28 receiver, coverage 550 kHz to 40 MHz, with mains auto-transformer, £10. Marconi CR-150/4, 1.5 to 30 MHz, with PSU and handbook, £10. — Ring Tew, 01-648 5895 (London).

SHACK Clearance: Marconi TF-144G signal generator, with all cables, VLF coils, spare turret and manual, £16. CT-82 noise factor meter, as new, with all cables, £7.50. Stabilised PSU, 2.5 kV at 15 mA — offers? B.29 VLF Rx, ideal for Rugby, Droitwich and other L/W stations, £5. B.44 Mk. III unmodified, £6. New 4-element 4-metre J-Beam, £3.

WANTED: ATU No 5 (for C12), ATU No. 12 (R210), also C11, C13 Sets for ACF signal platoon. —Jackson, 38 Haslemere Road, Thornton Heath, Surrey. (Tel: 01-689 2727.)

WANTED: Information on the Minimitter X-20 aerial array; any gen. can be photo-copied and returned. **DISPOSING:** For KW-2000 owners, spare valves, most brand new, 14 in all (none for PA), dial lamp and mic. plug for KW-2000B, £2.50. Linear, dismantled for rebuild but project terminated with Viceroy cabinet, most parts, relays, etc., 4CX250B plus spare, £14. German Papst-make 1/20th h.p. 110v. AC silent running motor, reversible, FB job, £1.50. Nombrex signal generator, Model 27, in mint condition, £7. Beeson & Robinson coax relay with UHF plugs and two spares, £1.50. Meters for 12.24v. operation: 0.50v. 2 1/2in. round, DC, 75p; also 0.150 mA, 75p, both Ferranti; 0.1 mA. 2 1/2in. round, 75p; miniature 1 1/2in. square, calibrated 0.0.5 kV, unknown FSD, 50p. Post extra on all items except linear. prefer buyer to collect or deliver to reasonable distance.—Jones, GW3TMP, 3 Bryn Clyd, Leeswood, Mold, Flintshire, North Wales.

WANTED: Labgear LG-50 Tx, also Labgear Top-bander, must be in FB condition, will collect within 50 miles of South Yorkshire.—Box No. 5016, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

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JR599 (160/2m.)	£185.00
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Filters, Mic's, etc. Codar AT5, T28. RQ10, PR30, p.s.u., etc.

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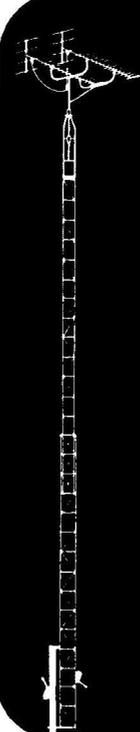
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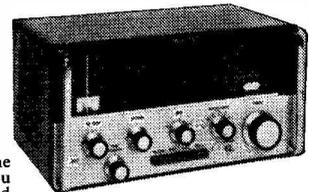
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