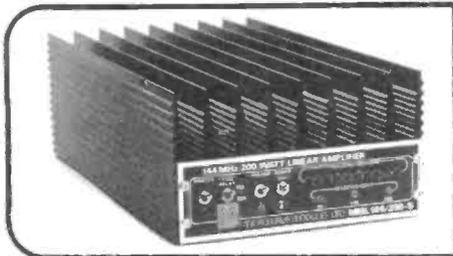




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MML144/200-S: 144 MHz 200 WATT LINEAR AMPLIFIER **NEW!**



FEATURES

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- ★ Linear All Mode Operation
- ★ Suitable for 3, 10 & 25 watt Transceivers
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FEATURES

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

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 Output frequency range : 28-30 MHz
 Typical gain : 20 dB minimum
 Noise figure : 2 dB
 3rd order intercept point : + 19 dBm (output)

Image rejection : 60 dB
 Input/output impedance : 50 ohm
 Power requirements : 13.8V at 75 mA
 Power connector : 5 pin DIN socket
 RF connectors : SO239 or BNC, please specify

Size : 110 x 60 x 31 mm (4% x 2% x 1 1/4")

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1296 MHz GaASFET PREAMPLIFIER — MMG1296 **NEW!**

This GaASFET 1296 MHz preamplifier is constructed on high-quality Teflon glass-fibre pcb and includes a microstripline filter which provides excellent rejection to mixer image frequencies and out of band signals. It has a power gain of 15dB and a noise figure of 1.2dB. The power requirements are 13.8V at 35mA and the unit is fitted with 50ohm type N sockets.



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(GB3SWM)

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Editor: **PAUL ESSERY, G3KFE/G3SWM**

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TR9130 TWO METRE ALL MODE TRANSCEIVER

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

TR9130..... £458.72 inc vat.



TS780 DUAL BAND BASE STATION TRANSCEIVER

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

TS780..... £850.00 inc vat.



TR7930 TWO METRE FM MOBILE TRANSCEIVER

Those who have used or owned a Trio TR7800 will know what I mean when I say that Trio, with the introduction of the TR7930 have improved on the unimprovable. The Trio TR7930 improves on the TR7800 by giving a green floodlight liquid crystal display, extra memory channels, both timed and carrier scan hold, selectable priority frequency and correct mode selection (simplex or repeater). The most significant change is the liquid crystal display, but closely following this must be the ability to omit specific memory channels when scanning and the programmable scan between user designated frequencies.

TR7930..... £323.30 inc vat



R2000 GENERAL COVERAGE RECEIVER

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

R2000..... £436.75 inc vat.



TS930S HF TRANSCEIVER WITH GENERAL COVERAGE RECEIVE FACILITIES

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

TS930S..... £1195.00 inc vat.



TR2500/TR3500 HANDHELD TRANSCEIVERS

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

TR2500..... £246.36 inc vat.

TR3500..... £265.85 inc vat.



TS530SP HF AMATEUR BAND TRANSCEIVER

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

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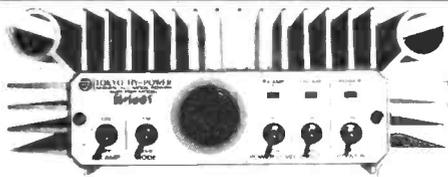
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Keyboard entry
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TOKYO HY-POWER

HL-160V VHF 160W linear £244.52 inc.



FEATURE: 160W output achieved with a pair of rugged MRF247 transistors. Drive requirement as low as 10W or 3W from hand-held. Selectable hi/lo output. Newly designed effective heat sink and high reliability one board construction.
SPECIFICATION: Freq. Band: 144-148MHZ (or 150-160MHZ), Mode: FM SSB CW, Supply Voltage: DC 13.8V neg. ground, 12-23A, Output: 160W, RF Input: 1-15W (or 0.5-3W), Receive Pre-amp: 12 dB gain with low-noise 2SK125 JFET, In/Out Connectors: SO-239 (50 ohm), Built-in Circuitry: COX, remote-control terminal, hi/lo output select, output power meter, reverse polarity protection, Dimension: 218W x 82H x 299D (m/m), Weight: 3.5 kgs

HL-82V VHF 85W linear

HL-160V25 25W input New model now in stock £209.73 inc.

FEATURE: A compact 144MHz band (or 154MHz for commercial use) amp. with receive preamp and power output meter
SPECIFICATION: Freq. Band: 144-148MHZ (or 150-160MHZ), Mode: FM SSB CW, Supply Voltage: DC 13.8V neg. ground, 13A max., Output: 35-85W, RF Input: 2-12W, In/Out Connectors: SO-239 (50 ohm), Built-in Circuitry: COX, remote control terminal, receive preamp (MOS FET 12dB gain), output power meter, output select (hi/lo), reverse polarity protection, Dimension: 152W x 92H x 217D (m/m), Weight: 1.8 kgs



£144.50 inc.

HL-90U UHF 90W linear £263.59 inc.

FEATURE: 80W output achieved with a pair of rugged 2SC2783 transistors. Drive requirement as low as 10W. Selectable hi/lo output. Newly designed effective heat sink, and state of the art low-noise GaAs FET (3SK97) RX preamp
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HL-45U UHF 45W linear £152.77 inc.



FEATURE: A compact 430MHz band linear amp with low-noise MOS FET receive preamp.
SPECIFICATION: Freq. Band: 430-440MHZ (or 450-465MHZ), Mode: FM SSB CW, Supply Voltage: DC 13.8V neg. ground, 5-7A, Output: 10-45W, RF input: 2-15W, In/Out Connectors: SO-239 (50 ohm), Built-in Circuitry: COX, receive preamp (12dB gain min.) reverse polarity protection, Dimension: 124W x 68H x 170D (m/m), Weight: 1.25 kgs

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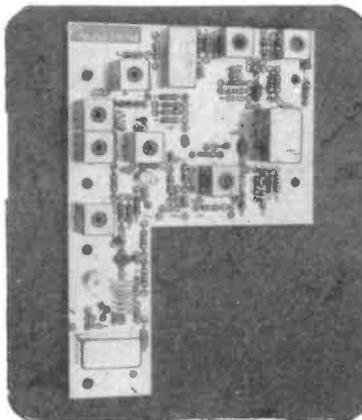


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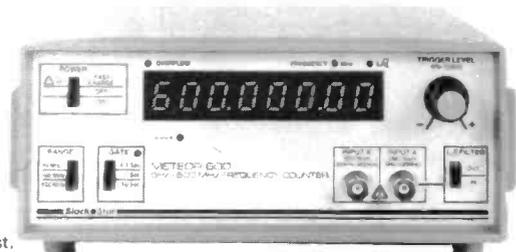
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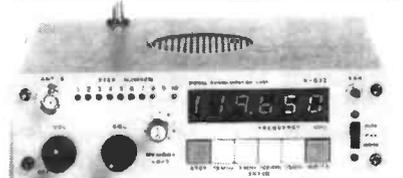
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VHF BANDS

NORMAN FITCH, G3FPK

Canaries on Seventy

WHAT is believed to be the first QSO on 432 MHz *via* tropo between the Canary Islands and the British Isles took place on July 4 at 1749 GMT between EA8XS (SO73d) and Philip Hockings, G8ZDS, (XK64a) from Camborne in Cornwall. The distance is 2,613 kms. RS51 reports were exchanged. Later, about 1900, Dave Whitbread, G4WIQ, (ex-G6EQM) worked Salvador. On July 5, EA8XS was again on the band and, at 2108, worked Dick Madigan, EI9Q, (WM65d) for the first EI/EA8 QSO on 432 MHz tropo, a QRB of 2,771 kms. The first EA8/GW contact was made by Sheldon Hands, GW8ELR (XL26g) at 2110, also a QRB of 2,771 kms. At 2226, Reg Woolley, GW8VHI, (YL32f) made it to EA8XS at 2,787 kms. which, at the time of editing, would seem to be the new 432 MHz tropo. DX record. Congratulations to all concerned.

Awards News

Another overseas reader has joined the 144 MHz Squares Century Club. Gerald Nenner, DL8FBD, (EK75f) from Rodgau, was awarded certificate number 39 on June 15 along with a sticker for 125 as he has 135 squares confirmed. Originally licensed as DG7FZ, the new call came on March 24 this year. Gerald runs 170w to a 16-ele, *Yagi*, 10m. *a.g.l.* and uses a BF981 preamplifier on receive. The QTH is 130m. *a.s.l.* 104 QSOs were on tropo, 15 *via Es*, 11 *via Ar* and 5 on MS. There were 131 SSB contacts and two each on CW and FM modes.

José Ma^a Gené EA3LL, 144 MHz QTHCC certificate holder no. 14, has submitted more confirmations to bring his score to 258 out of 300 worked. His stickers for 225 and 250 were dated July 4. His 53 new ones comprised 10 tropo, 3 *E-M-E*, and 20 each *via Es* and MS. There were 26 SSB and 27 CW QSOs.

Two more readers have joined the 144 MHz VHF Century Club, husband and wife team of Diana, G1DMS, and Laurie, G6XLL, Segal, from Cricklewood in North London. Both certificates were issued on June 25, No. 366 to Diana and

no. 367 to Laurie. Their station details appeared on page 236 last month. Diana was licensed on Feb. 3 this year and says she got her licence by accident as she only went with Laurie to college to give him moral support, really. Her geographical knowledge of the British Isles has improved since getting interested in the WAB programme. Laurie's first 2m. QSO was at 1750 on Aug. 12, 1983 and both operate on 70cms. using a *Yaesu* FT-726R running 10w to a 21-ele. *Yagi*.

DX-Peditions

Some further news from Martin Daft, G6ABU, concerning the Derbyshire Hills Contest Group's expedition to WL square commencing the evening of Aug. 3. EI2CA has visited the area and recommends a site in WL02j (IO61DW) as access to the previously proposed one was difficult. Call sign for the 2m. tropo, CW MS and SSB MS will be EI2VPX/P. On 70cm. tropo SSB only, EI3VPB/P, and on 23cm. and 13cm., SSB only, EI3VPC/P. No call sign available yet for 10 GHz operation, and another EI2V call is awaited for 20m. VHF net and 4m. use, and for any CW QSOs on SHF. Time permitting, some operation on 2m., 70cm. and 10 GHz from WM and VM squares is possible. All stations contacted will be sent a QSL and it is hoped to have them printed before departure. QSL manager for incoming cards will be G6ABU whose home telephone no. is Nottingham (0602) 289122.

Your scribe spoke recently to Dave Johnson, G4DHF, about his group's trip to XS80d which commenced on July 23 and continues to Aug. 4. They have booked a cottage in XR09 for the duration and should be on the 20m. and 80m. VHF nets using the call GM4ODA/P for arranging instant skeds. On 2m. GM4DHF/P on 144.215 for SSB tropo and 144.028 MHz for CW MS operation. GM4SIV/P, the club call of the *Five Bells Contest Group*, should be on 432.215 MHz. Dave suggested some operation from YT square might be possible.

Contest Notes

Eddi Ramm, DK3UZ, forwarded the results of the March 17 432 MHz *AGCW-DL* contest which attracted a paltry total of 15 entries in the three classes. The highest number of QSOs made by any station was just 18. The last event is the 144 MHz one on Sept. 22; details next issue.

The 432 MHz CW contest on April 8 was poorly supported too, with just 19 entries. The winner was G3UVR with 298 pts., G3LCH/P coming second with 286 and G4NDG/P third with 269, according to the GB2RS news on June 17.

Coming attractions are the 432 MHz Low Power contest on Aug. 4, 1700 – 2300 with Tx output 10w *p.e.p.* maximum. Radial ring scoring multiplied by total of

counties and countries worked. Next day, 0900 – 1700 is the 144 MHz QRP event with Tx output 25w *p.e.p.* maximum. Again radial ring-times-multiplier scoring. In both contests, the county code letters or full name must be exchanged. These are two section events, fixed and All-other.

To promote 13cm. activity, a new event is the 1,296/2,320 MHz contest on Aug. 19, from 0900 – 1700. Scoring at one point *per* kilometre with RSGB Rule 8b to be used when they compile the final table. This is an Open and All-other contest.

Sept. 1/2 sees the 144 MHz Trophy and SWL contest, 1400 – 1400, a Single-op. and All-other event. Radial ring scoring for the RSGB affair, and on pt./*per* km. for the concurrent IARU version.

Satellites

Little news about current satellite activity. Steve Reading, G4LZD, (Devon) is the only reader to mention the Soviet RS "birds," the downlinks of which are in the 29.4 to 29.5 MHz region of the 10m. band. He complains about the increasing terrestrial FM activity which interferes with reception. This problem is exacerbated by the ready availability of converted CB transceivers covering 29.3 to 29.7 MHz which cannot detect SSB and CW signals no doubt.

G4LZD is now up to 29 countries *via RS-5 to 8*. CW on June 21 through *RS-6* produced QSOs with VE2LI, KE0Y (Iowa), UA1ZCL and TF3XUU/8. June 23 was some kind of Soviet celebration day when all four satellites were QRV. Steve has also worked RS3A and SV1DO.

Adrian Chamberlain, G4ROA, (Coventry) is getting better telemetry copy from *UOSAT-2* now that its attitude is being corrected and hopes the time/date stamp will have been reset by now. He took his gear into the garden during recent good weather and operated through 0-10 working JA1KSO, UB5MGW and lots of Ds and PAs. Adrian has realised why he gets better signals in and out of 0-10 when it is poised over the Caribbean region: there are no QRO merchants in the Atlantic Ocean to clobber it! When in range of the European "alligators," the 22 dB attenuator pad comes in — and that is a lot of attenuation in a receiver.

Alex Scott, GM8BDX, (Borders) operates through 0-10 when it is between SE and NE. Reg Woolley, GW8VHI, (W. Glam.) is now up to 59 countries with no antenna elevation. On June 1/2 he lists VP2ESE, UB5MGW, CX7BZ, PY6ASV and VP2EME, and many JAs in May.

Concerning whether the amateur bands are the appropriate place for the operation of University-type research satellites. Dave Sellars, G3PBV, (Devon) thinks that 137 MHz would be more suitable. He states; — "I understand that University authorities do not like it (UOSAT?) to be referred to as an amateur satellite."

The latest issue of *AMSAT-UK's*

journal Oscar News, June 1984, carries news of the *AMSAT Phase 3G* satellite which could be launched during an ARIANE 4 test firing from Kourou in 1986/7. The main difference from *0-10* is that the apogee motor will be a simple hydrogen type, the gas being produced when required by water electrolysis using current from the spacecraft's power supply. From safety and cost aspects, this is an ideal solution, the drawback being the very low thrust of four Newtons — about one pound. This means it will take about a year to drive the spacecraft into the planned 57° inclination orbit.

The cost of the project is estimated as one million DM — about £270,000 — of which half has been financed by *AMSAT-DL*. The group hopes the rest of the cash can be raised by donations over the next three years. Meanwhile, construction has commenced in a special "clean room" which *AMSAT-DL* has at its disposal.

Oscar News no. 47 also carried an item about the Japanese amateur satellite, *JAS-1*, due for launch on Feb. 4 next year. A circular orbit at 1,500 kms. altitude, 50° inclination is suggested, resulting in seven consecutive passes, averaging 20 minutes, daily for amateurs in "modest" latitudes. The micro-computer in-house unit (IHU) in *JAS-1* provides the basis for the *PACSAT* facility. This is described as a "flying mailbox" being a packet radio, storage and forwarding system. The *JAMSAT* group has mostly completed radiation testing of the NMOS and CMOS hardware, the former chips surviving 5,000 RADS unscathed.

Repeater News

Robin Waitt, GM6LJE, Secretary of the *Anglo-Scottish Repeater Group*, wrote on June 22 to report that the VHF relay GB3EV, R4, at Appleby, Cumbria, was operating at reduced power pending the arrival of replacement parts for its dead PA stage. This group is also responsible for GB3AS, R1, at Caldbeck and for the UHF relay GB3CA, RB13, in north Carlisle. It publishes a newsletter and further details can be obtained from GM6LJE at Orchard Cottage, Canonbie, Dumfriesshire, DG14 0RZ.

Six Metres

The big news this month concerns Dennis Robinson, GJ3YHU, who, between 2230 on June 30 through 0100 the next morning worked 47 North American stations in eight U.S. states and one Canadian province. This follows a big *Es* opening to Iberia in the early evening of the 30th on 2m. The maximum distance inland he worked was about 300 miles and signals varied from S1 to S9-plus, many of the *Ws* running just 10w to a dipole antenna. Dave Sellars, G3PBV, (Devon) monitored some of it and heard eight U.S. stations very weakly near Newton Abbot, the best being W1GKE. The *Ws* were

copying ZB2VHF but it faded when GJ3YHU came up. This fits the usual pattern of *Es* "clouds" drifting northwards in our hemisphere. G3PBV suggests the propagation mode was double-hop *Es*.

Brian Bower, G3COJ, (Bucks.) reports that GW3LDH has now taken over as secretary of the *U.K. 6m. Group* and is getting things moving again. Brian worked W6JKV/OX on June 24 when he appeared on his week long expedition to Greenland. G5KW, GW3MHW, G3NOX, G4CUT and GW3LDH also worked him. When he was in Newfoundland on June 19, W6JKV heard the Anglesey beacon, GB3SIX, at good strength on a hand-held transceiver.

Kevin Piper, G8TGM, (W. Sussex) was monitoring the band on June 30 from 1533 to 1555 and heard ZB2BL working crossband 6m. to 4m. Derrick Dance, GM4CXP, (Borders) heard Jim's SSB on the same day at S9 at 1545 on 50.038 MHz and shortly after ZB2VHF when ZB2BL started up on 70 MHz. This beacon was peaking S9 again between 2028 and 2055 at GM4CXP.

John Baker, GW3MHW, (XM60d) now has a new QTH in Dyfed and hopes to put up some VHF antennas soon. He contacted EI0RTS at 2308 on June 26 for his 11th country on 6m. The Irish licence was a special one for three weeks from 0000 to 1800 daily. John copied 5B4CY on 50.501 MHz for half an hour from 0710 on May 24, peaking S9, G2AOK (Gloucs.) receiving it a little later. Stations further north heard nothing. GW3MHW has contacted 30 of the 39 permit holders and on June 2 he worked GM3WOJ via SSB MS. In a letter dated June 29, Dave Lewis, GW4HBK, (Gwent) said he had not heard W6JKV/OX or EI0RTS. On June 8, he worked SM6PU crossband 6m./10m. and G4CG 6m./4m.

Four Metres

Tim Raven, G4ARI, (Leics.) worked ZB2BL during the June 30 *Es*, his sole addition to the Annual Table total for the band. Roger Greengrass, G4NRG, (Essex) worked ZB2BL on June 17 on SSB for the first time and again on the 30th. On the 26th, GU3HFN was another new country and square. Martyn Jones, G4TIF, (Warks.) added G4VOZ (Leics.) to his county total on the 4th. On the 30th, at 1700, he heard Spanish stations on FM Band 2 and at 1720, heard ZB2VHF for the first time.

Arthur Breese, GD2HDZ, took part in the contest on June 3 and worked six more counties for the table, including G4ADV/P in Cornwall and GM4JLD in Strathclyde region, also a new 1984 country. GM4CXP has only receive capability at present and heard ZB2BL at S9 at 1605 on June 30, and half an hour later, ZB2VHF at S7 on 70.120 MHz. GW3MHW is back on the band using a pair of *Eimac* 35-T valves. He tried TZ40s

QTH LOCATOR SQUARES TABLE

Station	23cm.	70cm.	2m.	Total
OZ1EKI	—	116	345	461
G31MY	—	91	358	449
G3VYF	—	117	307	424
G3POI	—	—	422	422
G14ICD	4	116	232	352
G3JXN	68	108	165	341
EA3LL	3	32	300	335
G4JE	—	—	317	317
DK3UZ	—	—	317	317
G3PBV	35	101	172	308
G8KBQ	22	96	188	306
G4NQC	59	81	164	304
G3XDY	54	101	149	304
G3COJ	40	91	165	296
G3UVR	17	79	196	292
LA8AK	25	62	200	287
G8TFI	51	109	126	286
SP2DX	—	—	280	280
GJ8KNV	12	76	191	279
G3BW	7	36	234	277
G4ERG	—	16	260	276
G4MCU	8	77	183	268
G8VR	2	24	241	267
GW3NRY	—	48	219	267
G4TIF	—	82	160	242
G8PNN	42	77	122	241
G4DEZ	—	—	241	241
GJ8BT	20	35	182	237
G4KUX	—	36	200	236
G8ATK	23	82	129	234
G8FUO	39	105	88	232
G8HHI	20	77	135	232
GM4COK	—	28	204	232
G8ULU	31	85	115	231
9H1BT	—	11	210	221
G4BWG	—	64	152	216
GW4TTU	10	43	162	215
GW4EA1	—	—	214	214
G6DER	23	66	116	205
G4OAE	—	31	174	205
G4ERX	7	61	132	200
G3FPK	—	—	200	200
GM4CXP	—	27	172	199
G4STO	29	48	113	190
G4FRE	37	100	51	188
G4NBS	14	77	94	185
G8FMK	35	68	80	183
G4HFO	—	69	112	181
G6ECM	—	—	181	181
GW8UCQ	1	66	110	177
G3BDQ	—	—	177	177
G8KAX	35	57	82	174
G6CMV	1	29	142	172
G4RGK	1	48	122	171
G6ADH	—	35	135	170
G4MUT	—	68	101	169
G8LFB	—	—	168	168
G8TGM	—	—	166	166
G8SRL	—	53	106	159
GD2HDZ	13	50	91	154
G8WPL	—	56	97	153
G6HKS	—	—	150	150
G4TJX	—	59	90	149
G6MGL	—	32	117	149
G4FRX	—	59	89	148
G4ROA	21	58	63	142
GW3CXY	9	32	101	142
GM4IPK	—	—	139	139
G6DZH	—	48	88	136
G4MEJ	—	—	135	135
G4MJC	—	12	120	132
G4NRG	—	33	99	132
G4MWD	—	1	120	121
G8ZDS	—	23	95	118
G4DOL	—	—	117	117
G4SFY	—	—	116	116
G4GHA	—	2	110	112
G6JNS	1	3	106	110
G4RSN	2	23	84	109
G1EZF	2	29	78	109
G4BVY	9	100	—	109
GM8YPI	—	13	96	109
G6DFT	—	—	108	108
G4CQM	—	48	55	103
GW8VHI	—	33	70	103
G8VFE	—	—	97	97
G14OMK	—	—	96	96
G8RWG	—	—	92	92
G4IGO	—	—	86	86
G8XTJ	—	—	76	76
G6AJE	—	—	74	74
G6XLL	—	21	52	73
G6CSY	15	25	30	70
G6NWF	—	—	67	67
G6PFR	—	13	50	63
GM8BDX	6	22	27	55
G4LZD	—	—	55	55
G4UYL	—	—	54	54
G6XSU	—	38	—	38

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

but although good at 50 MHz, they proved poor on 70 MHz. John has started nightly skeds with G2AOK on 70.21 MHz at 1900. He is on 3.718 MHz at 0830 local time for

making 4m. skeds. Recent contacts include G4OUW, G3ENY, G3ZTZ and G3PWK. GW4HBK's June QSOs were G3YZU, G3PBM, G4TSN, G3YJX, G4PBP, G4CG, G3CUN and GW4IOI, plus contest stations. On June 8, Dave worked OZ9QV crossband to 10m. On the 17th, a crossband test with DK1PZ, who was getting MS reception on 4m., was unsuccessful.

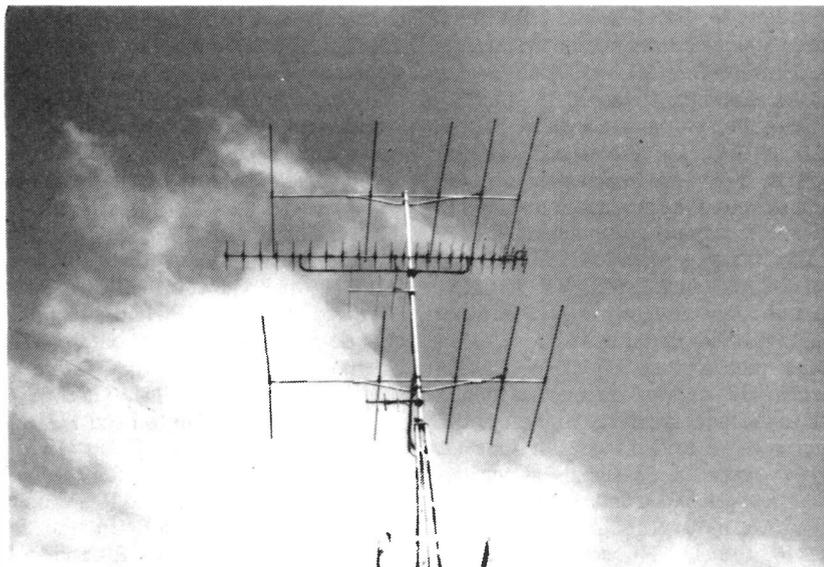
Two Metres

Ladies first, and congratulations to June Charles, ex-G6WXX, who passed her morse test on June 8 and got her Class A licence, G4YIR, on the 19th. She has heard some *Es* from Colchester but no QSOs so far. Welcome to Sue Frost, G4WGY, (London S.E.24) who got her G4 ticket on Jan. 24, uses CW, and enters our Annual Ladder with 41 stations contacted so far. Sue now has a beam up instead of a vertical colinear and advises, "Look out, lads!"

EA3LL from Reus (AB) has written again and was in on the May 5 DX. José reckons it was MS and not *Es* that provided the many long distance QSOs reported by many operators all over Europe. He worked OZ6BL (FP) at 1037 that day. On May 18, between 1740 and 1831, he had QSOs with I3TIQ (GF) and 6 YUs in HF, HG, IG and JF squares *via* what F8SH describes as FAI mode. At 1911 on May 19, YU7QED (KF) was worked this way and on June 8, HG8CE (KE) and YU2SZZ (IG) between 1729 and 1735. On June 9, at 1737-1829, IV3HWT (GF) and 7 YUs in GF, HG, IF and JF were contacted. On June 13 and 14 there was tropo propagation to 9H and IS0, while on the 15th, EA3LL worked EB8QC (SN) at 1204 *via Es*. José was not on for the June 8 *Es* when EA1 to 7 areas worked into YU, YO, LZ, SP, OE, OK, HG and UB5.

The June 8 *Es* event was very widespread. LA1JU, one of the operators of LA1K, told your scribe that LA5MK (FX) had some *Es* QSOs. LA6QBA had about 150 contacts including UD6DFO (YA) and 4X4AS (RR). OY5NS and a portable OY station worked into HG, YO and YU. Paul Galea, 9H1BT, (HV) worked 125 stations and made the first 9H/LA QSO with LA9DI (FT). The previous day he worked into UB5 and UO5.

Mick Allmark, G1EZF, (Leeds) only had 3w available on June 8/9, so only worked SP6BTN (KM) on the 8th *via Es*. However in a tropo. lift on the 9th he contacted HB9ACA (DG) and Fs in AL, BH, CG, CH and DH squares. He thinks he may have worked EA3ADW (BB) at 1750 on June 9 but is unsure if the EA got his call correct. During the QRP Contest on June 17, there was *Es* propagation on and off all day but only IOAKP (GB) was winkled out of the QRM. A weak *Aurora* was heard on the 18th but GM3JIJ was not worked. On June 30, Mick enjoyed two



This is the 5-over-5 6m. antenna system of Jeremy Royle, G3NOX, which was installed at the end of April; the Yagis are by the well-known French firm Tonna. The first Sporadic-E QSO in 1984 was with ZB2BL in Gibraltar at 1440 GMT on April 23 with S9-plus signals each way.

hours of *Es* to Iberia, contacting EA7s AKS (WX), DGS (WZ), XD and CEC in XX, AJX (YX) and PZ (WZ), plus EA1MO (XB), CT1WW (WB), CT1QP (VY) and CT1NT (WA). He heard EA8AAE (RO) whom he called but the Canary Is. station was working Italians. The QRB would be around 3,000 kms. A nice one on July 1 was EI5EZ/P in VP70b.

John Heys, G3BDQ, (E. Sussex) missed the June 8 *Es* but did operate in the latter part of the June 30 event, coming on at 1825. He got CT1s AYC, QP and BZT in VY, ALF in VZ and AEX in VB to make it 177 squares on 2m. He mentioned one G6 who was spelling out his lengthy QTH and name *three* times phonetically to a CT1, and a G station who was telling a CT1 to get off the calling frequency. These incidents are obviously the result of inexperience of the Mercurial nature of *Es* propagation.

G3PBV found the June 8 *Es* frustrating as he seemed to be right at the far end of things. UC2AAB was heard on SSB at 1742 and UA3LAW (PO) on CW at 1755. Other Russians were heard till 2028 up to S9, but no QSOs for Dave. Better luck on the 30th, though when 10 QSOs were concluded in ten minutes from 1728. HB9s MED and POM (EG), IW3s ESG, EYG and YEG, and I3FGX in FF, YU2NDV and IV3HWT in GF and YT3V in HF. At 1902 an opening to Spain started but Devon was too near the reflecting area for any QSOs. *Via* tropo, G3PBV worked EB1MS/P (XC) at 1850 on July 3. This chap speaks little, if any English so is difficult to understand and he often gets call signs wrong, too.

Tim Raven, G4ARI, (Leics.) added UC2 in the June 8 *Es*, and CT and EA on the 30th. HB9RSO was a new 1984 country

on tropo on June 9. Peter Atkins, G4DOL, (Dorset) also got HB9RSO, plus Ds in DK and EJ on the 9th, and on the 17th, GM4RPO/P (YO) who was running 2½w. EI3VDI/P (WL) was a new square on the 24th at 0752. *Via Es*, Peter worked 9H1BT (HV) at 0852, and I8MIB (IY) at 1205 on June 17. ISOISJ (EZ) was heard at 0930. 9H1CD (HV) was worked on the 25th. Henry was S9 for 10 seconds and had disappeared in 25. On the 30th, I4MKN (GE) and I3FGX (FF) were contacted around 1715, but the later *Es* to Iberia went over Weymouth. He remarks on the strong *Es* backscatter signals from GI4OPH and northern Gs in this event.

Tim Charles, G4EZA, (Surrey) lists his best June 8 DX as RB5AOB (QL) at 1958, and on the 30th, CT1WB (VB), in which opening 17 different CTs were logged. G4LZD worked UC2AA (NN) and RC2WBR (NP) on CW in the June 8 *Es*, but the 30th June affair was far too near Steve in Dartmouth for him to work anything. On June 10, he had a tropo QSO with EI6BLB/P (WM) and on the 21st with EI3VDI/P (WL).

Ken Osborne, G4IGO, (Somerset) is now QRV again on MS and recently completed skeds with LA1K (FX), SM0HAX (JT), I3s LGP and TJQ (GF), SM6EAN (FR), Y27BL (GL), EA6FB (AY), SM6AFH/6 (FS), SM4KWZ (HT), YU2JL (HD), YU2CCB (IF), HG8CE (KG) and DL7YS (GM) all on CW, with I2FAK (EF) on SSB. In the June 8 *Es*, the first definite signal was UC2AAB at 1735 and he worked several of the Russians, including UA3LAW (PO) at 1758, on CW. There was a gap between 1815 and 1854, then at 1903, Ken contacted UA3LAW on SSB. Last station heard was UC2AAB at 2028.

On June 30, G4IGO heard GWs in YL square calling an IM0, but the first station heard in YK07f was I5LN (FD) at 1724. Up to 1744, Ken heard/worked 15 Is in EF, FD, FE, FF, GD and GE, plus YU2JL (HD) at 1739. He also heard GI4OPH (XO) at 1744 *via* backscatter at 125° azimuth before the propagation altered to Iberia. 16 stations were heard, CT4PI (VZ38j) being worked at 1759, between 1745 and 1903, in VZ, WB, WX, XB, XX, XA and YX squares, also GI4OPH again at 1855 *via* backscatter at 180°.

Ken reports that EA7CPW (YX12) worked 114 stations between 1730 and 1905 in the more northerly W, X, Y and Z squares in the British Isles. On June 17, G4IGO recorded *Es* signals at various times between 0823 and 1450, and the period 0900 to 1015 brought snatches from 9H, I6 and I7. He complains about stations who sit on the calling frequency discussing what they are hearing, so preventing others making contacts.

Jon Stow, G4MCU, (Essex) picks out his best Russian DX of June 8 as RP2PED, (MP), RC2WBR (NP) and RB5AO (QL) for three new squares, the last a new country, too. On June 17 at 1214, 9H1BT was worked on SSB, then on the 30th, Jon managed CT1s ZX (VY), WW (WB) and AWO (VZ) for three more new squares and another country. Tropo on the 9th brought I2FAK at 0944 and I1KTC, also in EF, at 1028, both SSB. Terry Hackwill, G4MUT, (Berks.) only got I8TUS (IZ) at 1245 on June 8, but none of the Russians in the evening due to QRM. On the 30th, the EA/CT *Es* favoured the more northerly squares.

Roger Greengrass, G4NRG, (Essex) reports tropo QSOs with DL and LA on June 8, with OZ on the 9th and with F6HYE/P (DG) on the 17th, while he contacted UC2AAB on the 8th, some 9H1s on the 17th, and two CT1s on the 30th, *via Es* mode. Mark Turner G4PCS, (Beds.) heard 9H1BT at 0835 on the 17th, then worked I8DVJ (HA23a) and IK8DYD at 1012. Dave Dibley, G4RGK, (Bucks.) missed the 18s at midday on the 8th but did work five Russians later on CW. He was appalled at the chaos and poor operating on SSB, though. G4ROA was in the end of the Russian opening on the 8th and only got RC2AA (NN).

Rod Burman, G4RSN, (Surrey) was due to move QTH on July 17 and wrote about the *Es* to Iberia on June 30, in particular the *very* selective nature of it; DX at S9-plus a few miles away, yet inaudible with him. Your scribe knows the feeling. He noticed many Gs had backscatter flutter on their signals and that Spanish TV on Band I channel 4 faded out *before* the 2m. signals from Spain did. Ray Baker, G4SFY, (Norfolk) sent in another very neat report showing a number of Russians worked on June 8 on SSB and CW, plus tropo QSOs to LA and D. HB9HB was copied all day on the 9th but no Swiss

amateurs were heard. Ray worked some GMs in XR, YQ and YR in an *Ar* event at 1815 on the 18th.

In order not to occupy the whole of this issue with VHF Bands material, the individual reporting of the *Es* events of June 8 and 30 will be summarised. Kevin Piper, G8TGM, (W. Sussex) reports I8, IT9 and 9H1 QSOs on the 8th. Those making Russian contacts that day included G4TIF; Mick Cuckoo, G6ECM, (Kent); Richard Mason, G6HKS, (Cams.); Laurie Segal, G6XLL, (London); John Lemay, G8KAX, (Essex); G8TGM and Kelvin Weaver, GW4TTU, (Gwent).

In the June 30 affair to I and YU, those reporting QSOs include Philip Hocking, G8ZDS, (Cornwall); Roy Webb, GW3CBY, (W. Glam.) and Reg Woolley, GW8VHI, (W. Glam.). In the later opening to Iberia, QSOs to EA and/or CT were made by G4TIF; Keith Hewitt, G6DER, (S. Yorks.); G6ECM; Gordon Emmerson, G8PNN, (Northumberland); G8TGM; Don Hughes, G8WPL, (Gtr. Mchstr.); Derrick Dance, GM4CXP, (Borders) and GW8VHI.

Continuing with the individual reports on other modes, G4TIF worked EI6BLB/P (Wicklow) on June 9 and EI9Q (Waterford) on the 18th on tropo. Welcome to Paul Smith, G4TON, from Caistor, Lincs. who enters the Annual CW Ladder. He runs a *Yaesu* FT-77 plus transverter with a 10-ele. *Yagi* at 25ft. *a.g.l.* He reports good CW activity in his area, but hopes the Ladder will not be made, "... into a kind of contest ...". No, Paul, when G4ARI suggested it, the idea was, and still is, to encourage more CW activity, especially among the newer Class A licensees.

G6DER remarks on the high activity in this year's WAB Contest on June 24 in which Keith had 223 QSOs. G6ECM lists seven HBs in DG, DH and EH and I2FAK (EF) and I2FHW (EE) worked *via* tropo on June 9, 0900-1100. Mick worked the two Frenchmen, EI3VDI/P and EI3VOJ/P in WL01f (Co. Cork) on the 18th. QSLs go to F1HDF. G6HKS's station comprises a *Yaesu* FT-290R, BF981 *muTek* preamp. and home built 4CX250B amplifier, with 16-ele. *Yagi*. Richard lists French and Swiss tropo QSOs on June 9 but I2FAK was too weak to work.

Glenn Bates, G6HFF, (Bolton) is well sited for working to EI. On June 16, he worked EI4ALE/P (VN78h) in Galway and EI4FC (VM49c) in Tipperary. Counties Meath and Kildare were added in the month, also. Robert Hamer, G6NVQ, (Lancs.) worked another nine countries, plus Guernsey in June, including GM4RCN (YQ) in rarish Central Region. He asks for details of club awards to be sent to him by any club secretaries who read this column as this information seems hard to acquire.

G6XLL took part in the WAB contest

and made 164 QSOs, thus adding some new squares to his tally. G8KAX runs 150w to a 9-ele. *Yagi* at 26ft, the new QTH in Chelmsford being 110ft. *a.s.l.* John has bad TVI to the southwest, though. G8PNN took part in the *Practical Wireless* QRP contest on June 17 which provided Gordon with 11 more counties and another country for the 1984 table. G8TGM has been using SSB MS and did not complete with HG8CE (KG) on June 7, but did with EA6FB (AY). Nil heard from YU3TS — 4th sked — Y22ML and EB7NK, but I2FAK was copied from EF on the 8th. *Via* tropo on the 8th, Kevin worked OZs in EQ and FQ, and DLs in EN and EO. In the 9H Falcon contest, he scored over 36,000 points.

G8WPL now has a 17-ele. *Yagi* aloft and has added GM3JIJ (WS) and DL5LAH (EO) for new squares. John Fitzgerald, G8XTJ was one of many who worked the *40th Anniversary of D-Day* station FOIMY/P on Utah Beach. Best DX on tropo on the 8th was DC4OS (EM). He heard LA1BM/M (CT47c) from 1800 for about half an hour before the Russian *Es* started. In the WAB contest, 70 stations were worked.

John Eden, GM6LXN, (YS22f) from Thurso in Caithness, is a new contributor who worked many PA, D and ON stations on tropo on June 8. He points out that the distance is similar to that from the south English coast to Italy, to put it into perspective. Much of his DX-ing is *via AR* mode and on the 19th he worked EI8EF (VO), G3BW (YO), G4KLX (ZN), G4KUX (ZO) and G8ECI (AN) on SSB, at QTE 35° from 1800.

GW4TTU, with GW5NF, G8TFI and G4VXE, operated from YL24j in the *Practical Wireless* QRP contest, using an *FT290R* and four 9-ele. *Yagis* at 32ft. They made 478 QSOs in 41 squares. Between 0640 and 1000 on June 9, Kelvin from home worked lots of stations on CW in the B, C, D, E and F rows of squares. He is now QRV on CW MS at 800 *l.p.m.* and hopes to get on in the *Perseids*. On June 30, he completed with OK2PEW (IJ), the next day bringing completed QSOs with Y27BL/A (GL), OZ1IUK (GQ) and PA3CIM/P/OE6 (HH).

Some final notes about the June 8 *Es*.

ANNUAL CW LADDER

Station	4m.	2m.	70cm	μWave	Points
GW4TTU	—	197	38	9	244
G4ARI	15	177	—	—	192
G4SFY	—	186	—	—	186
G4NOZ	—	120	—	—	120
G4TON	—	85	2	—	87
G4VXE	—	51	9	—	60
G4EZA	—	52	—	—	52
G4LZD	—	51	—	—	51
G4SGO	—	43	1	—	44
G4WGY	—	41	—	—	41
G2DHY	8	25	—	—	33
G3FPK	—	21	—	—	21
GM4CXP	—	21	—	—	21
GU4HUY	—	13	—	—	13

No. of different stations worked since Jan. 1.

ANNUAL VHF/UHF TABLE

January to December 1984

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		23 CENTIMETRES		TOTAL Points
	Counties	Countries	Counties	Countries	Counties	Countries	Counties	Countries	
GW4TTU	—	—	89	29	39	10	11	4	182
G6DER	—	—	61	17	52	11	13	5	159
G1EZF	—	—	78	18	47	9	3	1	156
G4TIF	20	3	59	15	37	3	—	—	137
G4ROA	—	—	50	11	42	5	18	4	130
GD2HDZ	31	4	49	6	33	5	3	2	128
G8PNN	—	—	42	12	35	10	14	8	121
G6XLL	—	—	61	13	38	4	—	—	116
G4ARI	19	3	70	18	—	—	—	—	110
GW8UCQ	—	—	50	12	34	8	—	—	104
G3BW	16	2	43	13	17	6	7	3	97
G4MUT	27	2	32	8	23	3	—	—	95
G4VXE	—	—	57	8	25	3	—	—	93
GW3CBY	6	3	50	11	17	4	5	2	91
G6ECM	—	—	71	20	—	—	—	—	91
G3FPK	—	—	70	17	—	—	—	—	87
G6MGL	—	—	42	7	27	7	—	—	83
G4NRG	22	4	22	14	17	3	—	—	82
G4XKR	—	—	41	7	23	4	—	—	75
G6HFF	—	—	51	7	13	4	—	—	75
G6NVQ	—	—	60	7	—	—	—	—	67
G8KAX	—	—	35	11	15	4	—	—	65
G8TFI	—	—	—	—	47	10	5	3	65
G6AJE	—	—	55	9	—	—	—	—	64
G4LZD	—	—	49	12	—	—	—	—	61
G4SFY	—	—	42	13	—	—	—	—	55
G8XTJ	—	—	42	9	—	—	—	—	51
G4YIR	—	—	42	8	—	—	—	—	50
G8VFW	—	—	41	9	—	—	—	—	50
G8RWG	—	—	39	6	—	—	—	—	45
G6XSU	—	—	—	—	31	6	—	—	37
G8FMK	—	—	3	1	21	2	7	2	36
GM4CXP	—	—	20	7	6	2	—	—	35
GW4HBK	14	3	6	3	7	2	—	—	35
G4EZA	—	—	24	8	—	—	—	—	32
GU4HUY	—	—	26	5	—	—	—	—	31
G2DHV	4	1	17	2	3	1	—	—	28
GW3MHW	16	2	—	—	—	—	—	—	18
G6CSY	—	—	6	1	4	1	—	—	12

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

While more southerly stations were working into Russia, the northern ones were contacting Polish stations. Dave Dodd, G6DOX, (Cumbria) lists SP5s EPT and IWV (KM) and Neil Clarke, G8VFW, (W. Yorks.) worked SP2DDV (IN). In the period 1720-1804, GM6LXN, the most northerly reader to report, worked SP9, OK2 and OK3, and YO6. Squares included JJ, JK KI, LI and MG. UB5DAA (LI22f) and UB5DWF (LI34a) were the last ones worked at 2028. On June 17, G6DOX worked IIMXI and I2FHW in EE and I5WHC (FD) between 1413 and 1418 and G8VFW heard some Is in EE, EF, and FE.

Late tropo news concerns July 4/5 when EA8XS (SO73d) was worked. On the 4th, Salvador contacted G6LEW and G8ZDS in Cornwall and the following day, GW8VHI at 2147, GW3NYY at 2213 and GW8TVX (XL30d) at 2235. EA8XS is also reported to have worked OK2BFH (JJ) in the June 30 Es, a QRB of about 3,750 kms., not a record for the mode, but a mighty long way, nevertheless.

Seventy Centimetres

Tropo propagation was up on June 9 and G1EZF mentions QSOs with F6GCT (BI), F1GNQ (AI), F1FDW (CG) and HB9MIN/P (DH). G4NRG and G4ROA also worked the Swiss station. G6HFF reports good conditions to the west. Glenn added Co. Down and Derbyshire to his

Annual Table score but wrote that the "low spot of the month" was when he came home to find his wife, G6MML, working EI9EH in Dublin.

From G6XLL's computer print-out, the more distant successes include GW8KQW/P (Powys) on June 10, EI3VDI/P (Co. Cork/WL) on the 23rd, and GU3EJL (Alderney) on the 24th. G8PNN only added three more counties, all on the 10th, G3UHF/P (Derbys.), G5UM (Leics.) and GW8KQW/P. G8ZDS confirms the band has been quite good and Philip added AM, YK, YM and ZL squares in the June 10 contest, and YN and WL since. GD2HDZ added six counties and GM for a new 1984 country in the contest, while on the 26th, Arthur got G6GER (Cleveland) and G8HPW (Tyne & Wear).

GJ4ICD worked his 116th square on June 24, EI3VDI/P in WL. GW8VHI worked EI3VOJ/P on the 16th and GW4TTU got 'VDI/P on the 21st. Kelvin notes 14 squares worked in the month:— BK, CM, CN, DH, DK, DL, DM, DN, EI, EO, FH, FN, XO and ZJ, plus WL.

Twenty-three Centimetres

G1EZF is not QRV at present but Mick hopes to build some gear soon. G3PBV finds he can work stations at 250-300 kms.

in flat conditions using his 5ft. dish. Dave had 21 QSOs in the June 9 contest, averaging 220 kms., best DX being F6DZK at 465 kms. and F1DED at 464. Most of the London stations were worked but conditions northwards were poor. His "contact of the month" was with G3HHD (ZO) at 442 kms. on CW, with Terry using 2w. to four 23-ele. Yagis.

G4MCU runs 2w on the band and Jon lists having worked PA0GUS/P (CN) and PA0PLY (CM) on June 2; G4NVA/P and G3UHF/P (ZN) and G4JTJ/P (ZM) on the 9th; PA3BPC and PA0RDY (CM) on the 19th and G8TFI (YL) on the 26th. G4ROA got to HB9MIN/P on the 9th in the lift and added another four counties for his annual score the same day. G6DER added SM6HYG (FS) for a new country and square but did not give the date.

June was a good month for G8PNN on the band. Gordon's log shows 32 QSOs on June 9, mostly with D, ON and PA stations. On the 10th, G3APY in Notts. was an all-time new county. GJ4ICD is now fully operational on 23cm. and, under flat conditions, has worked G3JXN, G3OSS, G3PBV, G6RDX, GJ8SBT, GU2FRO and GU8FBO. Geoff now uses a 26-ele. *Quad Loop Yagi* antenna and is currently working on a QRO PA stage.

GU2FRO is on Sark, a separate county for our table, and has been worked by G3JXN in London. On June 9, GW4TTU used CW to contact DK1KR (FN04g) at 1005 getting an RST429 report. Kelvin also worked stations in AL, AM, CM and ZL. PE1CKK (CM) was heard on SSB.

Final Miscellany

George Haylock, G2DHV, (Kent) has a 10 GHz "EXE" dish working on a G3JVL, lightweight support. G8WPL advises that from Sept. 29 for 28 days, GB8HCC will be QRV on 2m. and 70cm. SSB. It is a special event station concerned with a new building for the Heaton Chapel Church. GM8BDX has suggested the adoption of specific calling channels between 144.240 and 144.350 MHz to ease the congestion on 144.300 during lift conditions. Alex's idea is that Midlands stations would call on '280, SE England stations on '260, etc. To your scribe, this seems like a return to the old idea, in the days of crystal controlled rigs, to a zonal band plan which the *Short Wave Magazine* invented. Readers' comments are sought.

Deadlines

Quite an eventful month. With the *Perseids* meteor shower due to peak on Aug. 12, there is much to anticipate. The September issue deadline is Aug. 8 and the following one is Sept. 5. Please make sure to note these dates. Everything to:— "VHF Bands", SHORT WAVE MAGAZINE, 34 High Street, WELWYN, Herts. AL6 9EQ. 73 de G3FPK.

DX Antennas for the Lower Bands

AERIALS THAT WORK!

A. P. ASHTON, G3XAP

THIS article was prompted by a comment in "Communication and DX News" where G2BON asked for an article on low band antennas that were suitable for gardens of 150 to 200ft. He asked that the antennas described should be proven successes and not just "text book lifts".

The author has used the 160, 80 and 40-metre bands extensively for DX working from a garden somewhat smaller than the size quoted above, and has experimented with many different antenna types with some success. It is hoped that readers will accept a 1.8 MHz WAC (with 9 watts input) and 250 countries worked on 7 MHz and 180 countries worked on 3.5 MHz (with 150 watts input) as sufficient qualification for my answering G2BON's request.

Antenna Height

The point to be appreciated when considering antennas for the lower frequencies is that any antenna erected by an amateur operator is likely to be positioned at a height that is low in terms of wavelengths. As an illustration of this point, let us assume that we have a horizontal antenna which is 70ft. above the ground (and this is high in amateur terms) — this translates to $\lambda/8$ on 1.8 MHz, $\lambda/4$ on 3.5 MHz and $\lambda/2$ on 7 MHz. To fully appreciate the significance of these heights, consideration of Fig. 1 will give an idea of the sort of radiation angles that can be expected from such an antenna. It will be noted that this antenna will radiate most of its energy straight upwards when it is used on 1.8 or 3.5 MHz, and it is only when we get up to 7 MHz that its radiation angle is becoming low enough to be of use for *consistent* DX working — about 30°. To achieve this 30° angle with a horizontal antenna we need to erect it at least 140ft. from the ground on 3.5 MHz, and 280ft. from the ground on 1.8 MHz. Horizontal antennas at heights lower than these *will* work DX, but their performance will tend to be unpredictable and they will not be consistent "DX performers".

With the possible exception of 7 MHz, therefore, we need to look for an approach other than erecting a horizontal antenna at great height in order to achieve the sort of angle of radiation consistent with reliable DX performance. One method of introducing some low angle radiation into a simple antenna is to erect a half-wave dipole in the so-called "inverted V" configuration.

Inverted-V Dipoles

A large number of successful "low band DX-ers" use the inverted-V dipole which, as its name implies, is a dipole with its centre at a height somewhat greater than its ends. Fig. 2 shows the configuration and it will be noted that it takes the form of two sloping, top-fed quarter-wave wires. Although the author has seen no published information on directivity, radiation angles, etc., for this device, he has worked with scaled down versions on 28 MHz, and various tests have indicated that maximum low angle radiation occurs in the direction of the wires; this is contrary to the conventional horizontal dipole from which maximum radiation occurs at right angles to the wire. Because the ends are brought down close to the ground and the antenna is no longer in a 'straight line' configuration, the inverted-V dipole will resonate at

a lower frequency than a horizontal dipole of the same length, and will have a lower feed impedance. It is not possible to give an accurate formula for the length since this is influenced by several factors such as:

- (1) The angle of slope of the two halves of the antenna.
- (2) The mean height of the device from the ground.
- (3) The material from which the centre support is made.

It is suggested that the antenna should be constructed about 1 or 2% longer than would be expected for a horizontal dipole for the same frequency, and the ends trimmed until it resonates at the desired point in the band. The material from which the centre support is made is an important factor, and wood is preferable to metal for this purpose — especially if the antenna is to be fed with balanced feeder. A good compromise is to have the top 5 to 10ft. of the mast constructed from wood, the major part being of metal tubing, as this enables us to keep the twin feeder away from the metal section of the mast, and also keeps the high current (and hence the maximum radiating) section of the antenna a few feet away from the metal.

If an SWR bridge is used to "tune" the dipole, it should be realised that an indicated VSWR of 1:1 will not necessarily indicate resonance! In fact it is most unlikely that a VSWR of 1:1 will be achieved at resonance and even then only by accident. The author would recommend that a noise bridge is either built, bought, begged, borrowed or stolen for the purpose of tuning the antenna, and that VSWR's of higher than about 2:1 are dealt with by use of a matching unit at the transmitter end of the feeder. VSWR's of 2:1, or below, with a resonant antenna are of no consequence at the frequencies in question and may safely be ignored.

The span required for a 1.8 MHz inverted-V dipole will be rather greater than the 150 – 200ft. mentioned earlier, and it may therefore be necessary to bend the ends of the dipole in order to accommodate it on the site. This is an acceptable practice but it is recommended that:

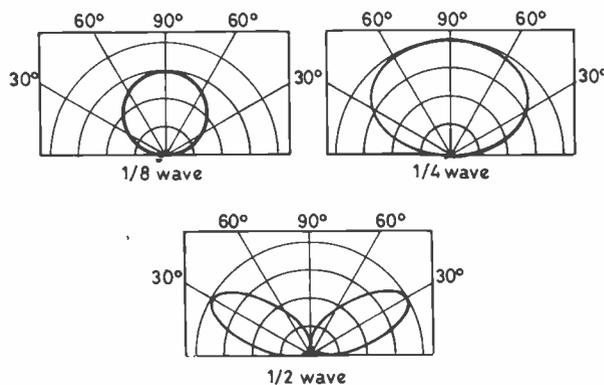


Fig. 1 Vertical Plane radiation patterns for horizontal half wave antennae at various heights.

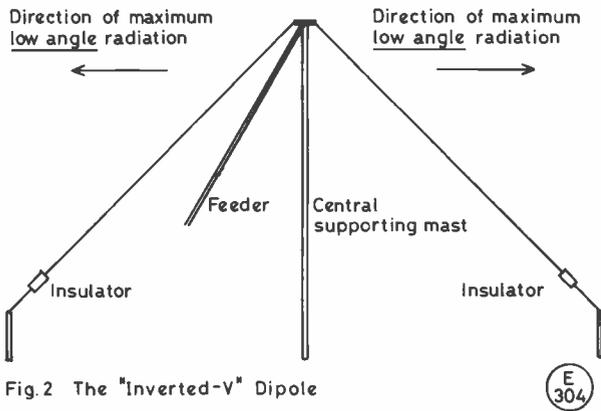


Fig.2 The "Inverted-V" Dipole

- (1) Both legs of the dipole are bent at the same point and to the same angle in order to maintain symmetry.
- (2) Rather than bend the ends 'inwards' to run directly under the main part of the antenna, they should be bent to run at 90° to the antenna's main direction — this will prevent the reflection of radiation upwards at very high angles.

Vertical Antennas

At the sort of height that the average amateur is able to erect his low band antenna, perhaps the most effective way to obtain radiation at reasonably low angles is to use a vertical antenna, or one that has its high current portion in a vertical rather than a horizontal portion of the device. At 7 MHz, a quarter-wave vertical antenna poses no great constructional problems, being only 33ft. in height, but with 3.5 and 1.8 MHz the situation is not quite so straightforward, quarter-wave devices being respectively 66 and 135ft. in height!

Considering 7 MHz first, as it is not too difficult to erect verticals of lengths more than 33ft., it is recommended that consideration be given to making the antenna slightly over a quarter-wave in length. This has two effects: firstly, it raises the area of maximum current up slightly from the ground and, secondly, it raises the feed impedance — and by picking the correct length, an impedance of 50 or 75 ohms can be achieved, making a perfect match for our coaxial feeder. Because such an 'extended' vertical will no longer be resonant, we must insert a variable capacitor in series with the feeder; this removes the reactance and restores the system to a resonant condition. Fig. 3 shows the antenna which, for a 50-ohm feed impedance requires a length of 37ft. 6ins., and for 75-ohms, 41ft. 6ins. The variable capacitor should be about 200 to 250pF maximum value, and, since we are in a low impedance area of the antenna, very wide-spaced devices are not normally required, although flash-over may be experienced with very close-spaced components.

Resonating the antenna is simple since it is practicable to insert an SWR bridge right at the feed point and false readings due to the effect of the feeder will not be obtained. The variable capacitor is adjusted until a minimum VSWR is achieved, and the author has found that with the antenna lengths quoted, VSWR's of below 1.2:1 are always obtained. If a high voltage variable is not available, the resonating can be carried out with low power and a close-spaced capacitor, the capacitance required for resonance then being measured; this value is provided by making up a combination of high voltage ceramic or mica capacitors which are then fastened permanently into position and waterproofed.

With verticals for 1.8 or 3.5 MHz, we can consider loading lengths of less than a quarter-wave in order to obtain resonance, and the most common method employed is to insert an inductance somewhere along the antenna's length. Some years ago the author carried out a very extensive investigation into the effects that a loading coil had on a vertical antenna's performance, the vertical tested being successively base, centre

and top loaded. However, the results showed that inductive loading of vertical antennas yielded results that were always poorer than those obtained by a technique which the author chooses to refer to as 'linear loading'. Basically, this technique involves taking the antenna vertically upwards for the greatest possible length and then continuing in another direction — finishing up with an inverted-L! This technique was covered in a previous article², and a typical inverted-L antenna is depicted in Fig. 4; this antenna can also be 'extended' in the same way as that discussed with the vertical in order to improve feeder VSWR and raise the point of maximum current some distance from the ground. Using antennas of this type, the author obtained a 1.8 MHz with a genuine 9 watts DC input, details being described in two separate articles.^{3,4}

The author uses a vertical section constructed of suitably guyed 2in. diameter scaffold pole with the loading wire consisting of heavy gauge, multi-strand, PVC insulated wire, the length of this wire being trimmed to achieve resonance. (With 'extended' devices, the variable capacitor is adjusted to achieve resonance). For the self-resonant device, the combined length of the vertical plus the loading wire should be around 70ft. for 3.5 MHz and 140ft. for 1.8 MHz — these lengths are somewhat greater than are required for a pure quarter-wave vertical, the extra length being necessitated by the capacitance that exists between the vertical section and the loading wire. With the 'extended' inverted-L's the total length should be 79ft. for 3.5 MHz and 158ft. for 1.8 MHz if 50-ohm feeder is used, and 88ft. and 176ft. for a 75-ohm system. It is stressed that the constructor should strive to make the vertical section of the antenna as long as possible (although having said this, a PY station was worked from G3XAP with a self-resonant inverted-L on 1.8 MHz the vertical section of which was only 35ft. — the report received by G3XAP was 579 with 9 watts input!)

The author can practically guarantee good results on 1.8 or 3.5 MHz with inverted-L antennas of the type described, provided that the reader accepts two things. Firstly, the fact that a vertical or inverted-L antenna will tend to be very noisy on reception because much man-made RF noise tends to be vertically polarised and such noise seems to abound on residential sites. It may often be found that although the vertical will almost certainly radiate a far stronger signal to DX locations than a low, horizontally polarised antenna, the latter device may sometimes receive DX signals better since it will often pick up far less noise than a vertical and, although the received DX signal will be weaker on the horizontal device, the signal to noise ratio may be far higher. The second point that must be appreciated by the reader is of far greater significance, and this is that unless he is prepared to provide a good earth system for his vertical or inverted-L antenna he is, quite frankly, wasting his time! A potentially superb DX antenna can be rendered practically useless by failure to recognise this requirement, and the author is convinced that the vast majority of complaints regarding poor performance by vertical antennas are a reflection on the ground system used rather than the vertical itself.

The purpose of the ground system is twofold — it provides a 'return circuit' for the RF current we are feeding into the antenna and it also provides a 'reflective mat' for radiation that is directed

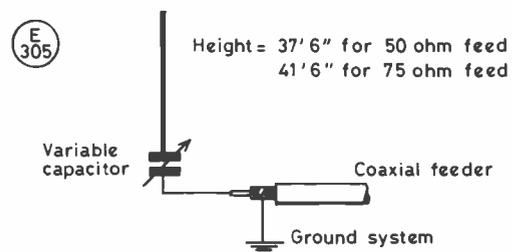


Fig.3 An "extended" vertical antenna for 7MHz

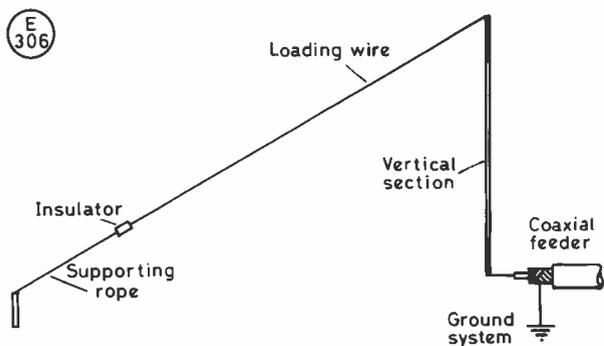


Fig.4 An "Inverted-L" antenna

downwards from the antenna. The first point is easily satisfied in that two or three quarter-wave radials will ensure that a suitable earth return is provided — this is evidenced by the acceptable efficiency of VHF ground plane antennas that use this principle. To provide the ideal reflective mat, however, is not so simple as this would entail a very large number of radials of length somewhat greater than the normal quarter-wave. The effect of an efficient reflective mat can be appreciated by the very high signal strength with which many /MM signals are received — the sea acting as an efficient reflector. The effect of poor ground reflection is that the low angle radiation from the antenna is attenuated to a much higher degree than the high angle radiation — this is known as the "Brewster Effect" and is depicted in Fig. 5. There is no way in which an amateur can provide a system that is anywhere near to being a perfect ground; nevertheless he must accept that the DX performance of his vertical is directly related to the effort that he is prepared to put into providing an efficient ground.

The author's 160-metre DX antenna had a ground system consisting of over 90 radials, eight of which were resonant quarter-waves and two of which were somewhat longer than this! The efficiency of the system may be gauged by the fact that North and South America and Asia were worked on 1.8 MHz with an inverted-L mounted over this ground system and with a transmitter input of only 4.5 watts! Without the real desire to achieve above-average results it is difficult to find the motivation to provide such an extensive radial system, and so it is up to the individual himself to decide how much effort to put in, which in turn will determine how successful he will be.

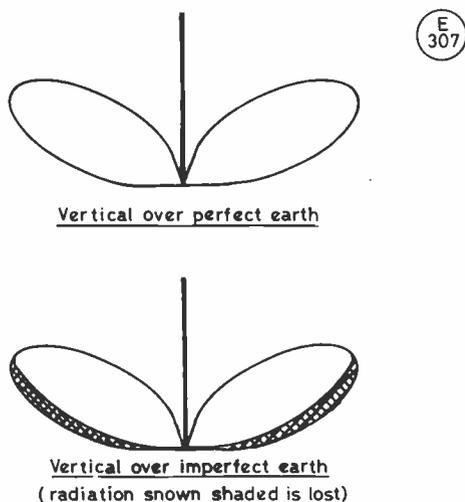


Fig.5 The "Brewster Effect" - the vertical plane radiation patterns of vertical antennae over perfect and imperfect earth systems.

The G3XAP Directional Antenna

The author has also spent some time trying to develop an antenna for the lower bands which displays some directivity and gain and he has described a device that achieves this^{4, 5}. Basically this antenna is an inverted-L, but instead of having a total length which resonates the device as a quarter-wave, it is a three-quarter wave, and considerable DX gain is achieved in the direction indicated in Fig. 6. The loading wire should slope away from the vertical section, and it is the interaction between the radiation from this 'top fed sloping wire' and from the vertical which gives the antenna its directivity. On 1.8 MHz the device will be somewhat too large for most locations, but it is a possibility on 3.5 MHz for those amateurs who have an available span of around 140 to 150ft. For 7 MHz the vertical section should be around 35ft., because if the sloping wire is reduced to much under a half-wave in length, directivity and DX gain appear to suffer.

The first prototype of this antenna was constructed for 3.5 MHz and had a vertical section of 60ft. — the sloping wire thus being a little over a half-wave in length, and the first QSO was with a station in Malta on SSB. The Maltese station was working G stations with signal reports varying between 5-6 and 5-9. At first the Maltese operator believed G3XAP to be a pirate operating close to him because the G3XAP signal was holding his

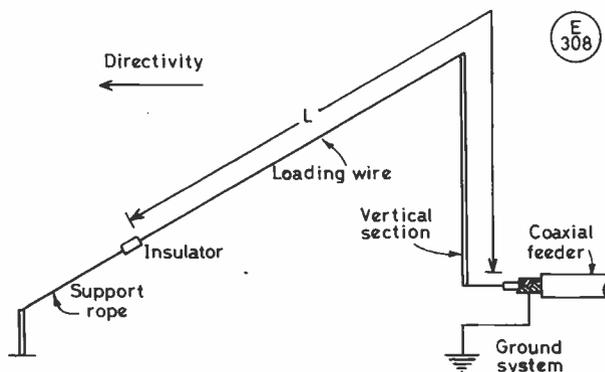


Fig.6 The G3XAP Directional antenna for the lower bands.

'S' meter needle "on the pin" at S9 + 50dB! Many W stations were also worked, G3XAP's poorest signal report being an S7 from a station in W0 — the power used for these contacts was around 150 watts p.e.p. input. It was necessary, however, to change the direction of the sloping wire in order to "point it" in the direction of interest, and this is a disadvantage of the device since, on most sites, the antenna would need to be erected as a unidirectional device. Fortunately the author had the required space, and over 100 countries were worked on 3.5 MHz in under two weeks! On 7 MHz the antenna will be more easily accommodated and any reader wishing for consistent DX results on this band will find the device to be very potent!

Because this antenna is resonated as a three-quarter wave rather than a quarter-wave, its feed impedance is somewhat higher and when resonated it will be found that the VSWR on a 50-ohm feeder will be very low — the prototype discussed above was about 1.15:1.

Loop Antennas

Perusal of the standard texts shows that one method of lowering angles of radiation from horizontal antennas is to "stack" them vertically one above the other, but a disadvantage of this approach is that feeding them can be difficult. The feed impedances of two stacked dipoles close to the ground will differ considerably which means that unless we insert matching devices at their feed-points, we will supply different amounts of power to each antenna and this can detract from the desired vertical plane radiation pattern. However, if we stack two half-wave dipoles

vertically, a quarter-wave apart, and bend their ends so that they meet, we end up with a square, each side being a quarter-wave in length — Fig. 7 shows this technique. Since it is the low current portions of the two half-waves which were bent, the actual distortion which the bending introduces into the radiation pattern is minimised and we have the advantage of now having only one feed point to consider. The square is better known as the Quad Loop, and when such a device is used at low heights, the angle of its major radiation lobes is somewhat lower than those of a single half-wave horizontal antenna erected at the same height. However, when we are considering the lower frequencies, sheer size once again becomes a problem and compromise is usually necessary, although on 7 MHz the problem is less acute since it is possible to mount the top horizontal wire at a height of 40ft. and still have the bottom wire reasonably clear of the ground.

The device is usually supported by ropes secured to appropriate support points, and a suitable method is seen in Fig. 8. With 3.5 and 1.8 MHz the ideal square shape usually has to be dispensed with and the loop will take the form of a rectangle with its horizontal sides somewhat longer than its vertical sides, but, provided that the total length of wire is kept to a wavelength, the antenna still functions well and will be superior to a single horizontal half-wave device. The length of wire required for loop antennas is 143ft. for 7 MHz, 280ft. for 3.5 MHz and 560ft. for 1.8 MHz. The author has direct experience of a 3.5 MHz loop antenna which had vertical sides of 40ft. and horizontals of 100ft., the bottom wire being only about 5ft. from the ground, and he can say that with regard to the working of DX stations it was superb!

It has the advantage over a vertical or inverted-L of being a very “quiet” antenna on reception, but has the disadvantage of being bidirectional and displays very deep nulls in the two directions in the plane of the vertical wires, maximum radiation being through the plane of the loop — *i.e.* vertically into and out of the page in Fig. 8. It also has the very significant advantage of not requiring a ground system (although, of course, any HF antenna is influenced by the conductivity of the ground over which it is mounted). A full-wave loop antenna has a feed impedance of between 80 and 140 ohms, the actual figure being influenced by the height at which it is erected, the conductivity of the ground beneath it and the ratio of lengths of horizontal and vertical sides (its Aspect Ratio). For no-compromise results, an open wire feeder is recommended, with a suitable matching unit in the stack capable of dealing with twin feeder, and this method has the advantage that the loop can be used on any band in much the same way as a dipole with open wire feeder. Coaxial feed should be avoided unless a balun and a matching unit are fitted at the feed point.

A compromise feed method for single band operation is to assume that the feed impedance is around 110 ohms (mid way between the two figures quoted above) and to use a quarter-wave of twin feeder which will transform the impedance down to 51 ohms at its input end (the twin feeder used being 75-ohm). A 1:1 balun can be inserted at the input end of the twin feeder, enabling 50-ohm coaxial cable to run from here to the transmitter/receiver. This was the system used on the 3.5 MHz loop mentioned above, and the VSWR on the 50-ohm coax was about 1.5:1, which is insignificant. 75-ohm twin feeder has a Velocity Factor of 0.66 to

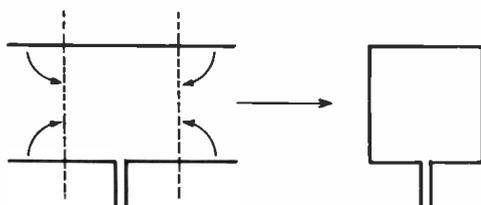


Fig. 7 Bending two stacked half wave antennae to form a Quad Loop

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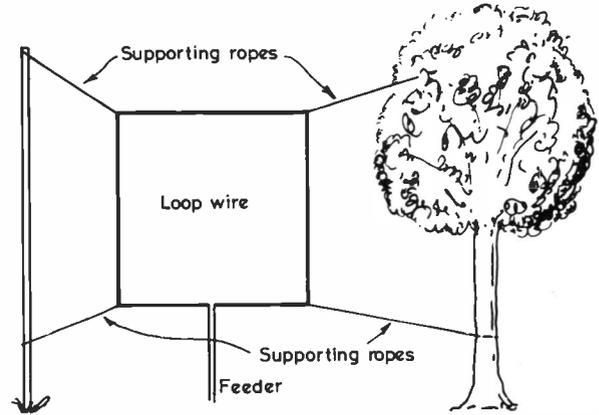


Fig. 8 A typical Loop installation, making use of a convenient tree, plus a single mast.

E 310

0.75, depending on its type, which means that a quarter-wave transformer will be up to 25ft. long on 7 MHz, 50ft. on 3.5MHz and 100ft. on 1.8 MHz; this last figure may be too long to make this approach of value on 1.8 MHz, and an alternative may need to be found.

Sloping Antennas

Much success has been achieved on the lower frequencies using sloping antennas, and many outstanding signals from North America are a result of this technique. The directional antenna mentioned earlier can be described as a “top fed sloping wire fed by a vertical section”, and the author has noted that if the loading wire is horizontal rather than sloping, the gain disappears! An inverted-V dipole can similarly be described as “two top fed sloping quarter-waves”, and it is known that low angle radiation occurs in the direction of the slope with antennas of this type. It is not unreasonable to assume, therefore, that the action of sloping a wire does give rise to radiation at angles somewhat lower than those achieved with horizontal antennas erected at the same height. Some experimental work has been carried out on sloping dipoles for 28 MHz at G3XAP, these antennas being compared at DX with both quarter-wave ground mounted verticals, and horizontal half-wave dipoles. As with any HF antenna comparison, results were not conclusive, but indicated that for DX working results from the “slopers” lay somewhere between the results for the other two types. Therefore if the reader is deterred by the amount of spade work necessary to provide a decent ground system for a vertical or inverted-L, the sloper does provide a good alternative, although, as with some of the other devices discussed, it does have the disadvantage of being substantially unidirectional in terms of low angle radiation.

An ideal angle for a sloping antenna is about 45°, but this instantly poses problems in that if the antenna is a half-wave dipole, this necessitates a mast 47ft. tall for a 7 MHz device, 95ft. tall for 3.5 MHz and 190ft. for 1.8 MHz. However, acceptable results will be achieved even if a shallow slope is all that can be obtained, but the obvious rule is to support the antenna at as great a height as possible. A 1.8 MHz sloping dipole used by the author was supported on a 60ft. mast and sloping towards W/VE and many transatlantic QSOs were made with comparative ease; this probably would not have been the case had the antenna been a horizontal half-wave dipole at 60ft.

Summary

It is apparent that although it is possible to construct antennas for DX work on the lower bands, they often need to be compromised because of their physical size, although this obviously applies less to 7 MHz than it does to 3.5 and 1.8 MHz. In terms of actual results achieved the author favours vertical or inverted-L antennas partly because they are substantially

omnidirectional, but also because he has had considerably more success with antennas of this type than with the others discussed. The need to provide an efficient ground system is a disadvantage, as is the fact that such antennas can be incredibly noisy for reception.

Antennas of the dipole and loop type are quieter on reception, do not require extensive ground systems and have electrical efficiencies somewhat higher than those normally achieved with verticals.

G2BON's request in "CDXN" was for "proven successes" — G3XAP has worked DX with all of the types discussed above and each is, therefore, a proven success in that sense of the word, but it

is up to each individual to weigh up the pros and cons of each device in order to choose the one that suits him best.

The only thing that the author *can* guarantee is that no matter which antenna is chosen, its construction and evaluation will provide much enjoyment, much frustration and, more important, much knowledge. "The best school is the deep end".

References:

- (1) E. P. Essery, G3KFE, *Short Wave Magazine*, May 1984.
- (2) A. P. Ashton, G3XAP, *Radio Communication*, Dec. 1973.
- (3) A. P. Ashton, G3XAP, *Short Wave Magazine*, July 1977.
- (4) A. P. Ashton, G3XAP, *Radio Communication*, Nov. 1977.

Windspeed to Wind Force

AN AID TO CHOOSING A BEAM AND ROTATOR

D. J. REYNOLDS, G3ZPF

This article is effectively a continuation of the one in the June 1984 issue of "S.W.M.", entitled "Assessment of Local Windspeed".

It is assumed that the reader has already read that article, and has a copy to hand.

Wind Loads for Any Speed

As previously stated, from determination of local windspeed for a specified QTH it is possible with the further guidance of CP3: Chap. 5: Part 2 (henceforth referred to as the "Code") to convert said wind speed into a force. At first glance this might be

thought only to be of use to those actually building their own tower, but in fact the information can be of use to the rush-out-and-buy-one brigade too.

Aerials are often advertised as having a certain windload at a stated windspeed, which is fine if that coincides with the local windspeed at your QTH, but what if it does not? If you are lucky the "wind area" will also be stated, from which it will be possible to determine wind load at any speed. If you are not so lucky then you will have to work it out from the lengths and the diameters of the elements, which is a relatively simple task given that the dimensions are stated.

Although this article will primarily be concerned with the wind loads on beam elements, the procedures are directly applicable to tubular towers too. Applying the techniques to lattice masts is not so easy, but fortunately most towers used in this country are made in this country, so the makers should be able to advise you of the headload of their towers for *any* windspeed... if they can't/won't then go elsewhere; and the author does not think it likely that homebrew towers will be of the lattice type, as tubular ones are so much easier to fabricate with limited facilities for the heights likely to be attained by most amateurs.

With aerials the story is quite different, as most of them are not made in this country, and the importers may have little or no information on their strength other than that quoted in the sales literature. With the vast majority of verticals (which can also be checked out simply) information is often limited to "does not require guys for most situations", which hardly inspires confidence.

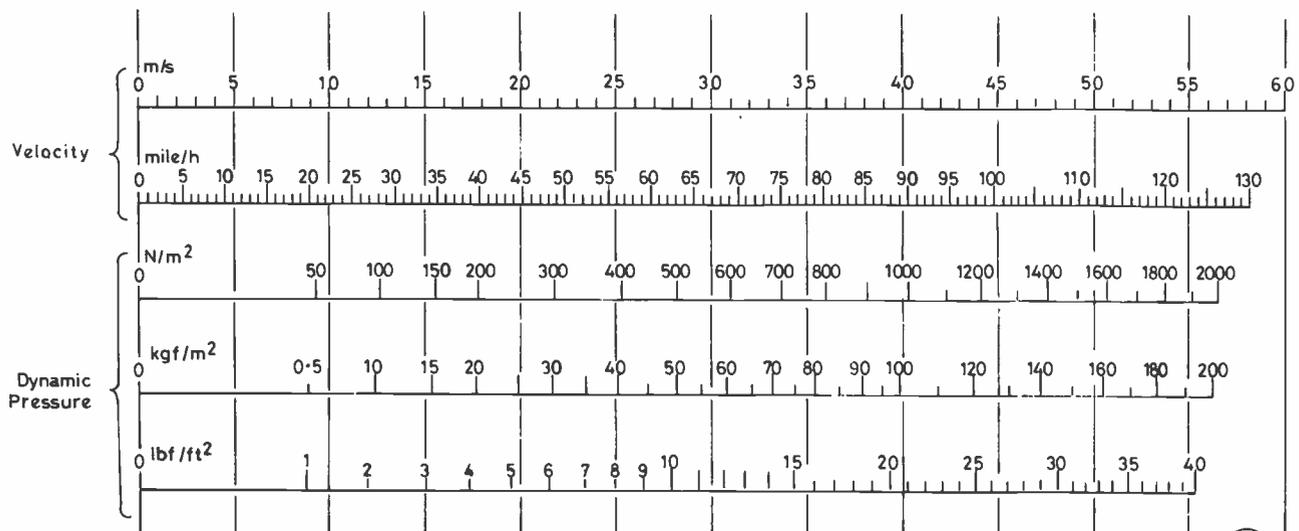


Fig.1 CONVERSION CHART FOR WIND SPEED AND DYNAMIC PRESSURE

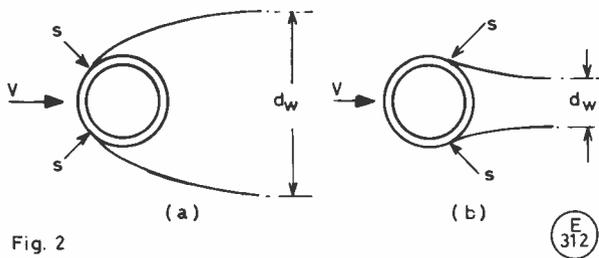


Fig. 2

Fig. 2a. Airflow around circular section, showing wake in sub-critical flow conditions. Fig. 2b, as Fig. 2a but showing super-critical flow conditions. Note the reduced width of the wake and the shift in position of the separation point.

Dynamic Wind Pressure

Section 6 of the Code gives the formula for deriving wind pressure from windspeed as:

$$q = k \times V^2$$

where q is the wind pressure, V is the design windspeed, and k is a coefficient whose value is as follows:

- $k = 0.613$ in S.I. units (i.e. V in metres/sec and q in Newtons/m²)
- $k = 0.0625$ in technical units (i.e. V in m/s and q in kgf/m²)
- $k = 0.00256$ in imperial units (i.e. V in mph and q in lbf/ft²)

Fortunately for those without a mathematical bent, Fig. 1 gives a graphical interpretation of the above formula for each set of units and is taken from the Code.

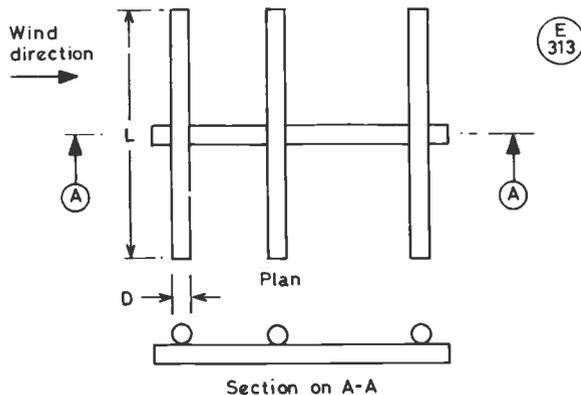


Fig. 3 Plan and section of typical 3-element monoband array. (Diameters of the elements exaggerated for clarity).

Since for both beams and towers the most-used sections will be circular, appendix G of the Code is the next section of relevance which gives the wind force on a circular member as:

$$F = C_f \times A_e \times q$$

where q = dynamic wind pressure, A_e = effective area normal to the wind, and C_f = force coefficient.

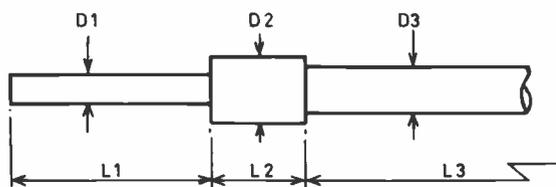


Fig. 4 Half of one element of a trapped beam. (Diameters exaggerated for clarity).

We have already determined q , and A_e will be relatively straightforward to derive, being dependent on tube length and diameter, but what about this C_f ?

For most shapes the force coefficient would be defined as a constant over the whole range of windspeeds, but for circular sections it will vary depending on the way that the wind flows around it. For the sake of simplicity it will be convenient to take the worst case of C_f , which comes out as a figure of 1.2, although some readers may prefer to use the graph in appendix G of the Code.

The variation in force coefficient, for those who like technicalities, is all to do with a non-dimensional parameter called the Reynolds number (no relation) which is derived from the velocity and kinematic viscosity of the wind. So there! To try and explain in a non-technical way, consider Fig. 2a and Fig. 2b which show the 'wake' of the airstream around a circular section at low and high windspeeds. At low speeds the wake is broad (d_w) and the point at which the airstream "breaks" from the section is toward the front(s); but above what is termed the critical speed, the wake narrows dramatically, and the separation point moves around to the rear of the section. The critical speed is dependent upon the windspeed, the diameter of the section, and the smoothness of the section's surface. At the critical speed the force coefficient drops sharply, corresponding to the dip in the graph shown in the Code, and then starts to rise again.

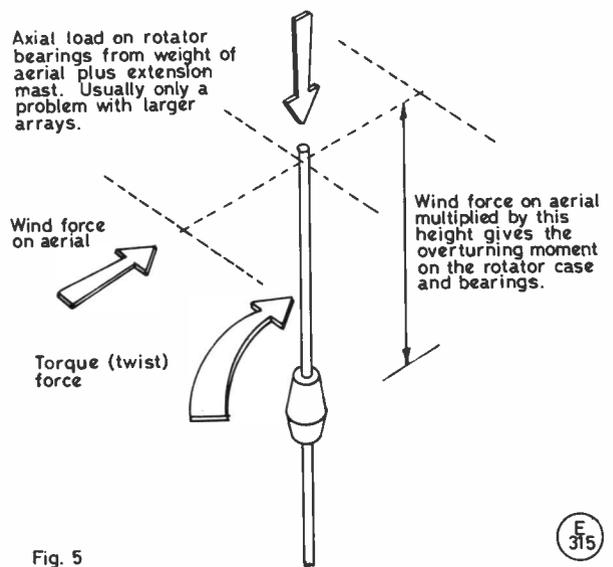


Fig. 5

Fig. 5. The forces on a 'free' rotator. Wind forces on the aerial multiplied by the height above the centre of the rotator gives the overturning moment on the rotator bearings. When choosing a rotator, a factor of safety should be allowed if the makers quote a maximum overturning moment rather than a safe overturning moment. See text for a discussion of torque — but again safety factors should be applied if necessary.

The figure of 1.2 for C_f is for a circular section of infinite length, and to allow for 'end-effect' of sections of finite length yet another coefficient is needed, although fortunately the length-to-diameter ratios of most elements mean that it can be taken as 1.

Effective Wind Area

Consider Fig. 3 which shows the plan view of a 3-ele monoband HF beam, together with a section parallel to the boom. The

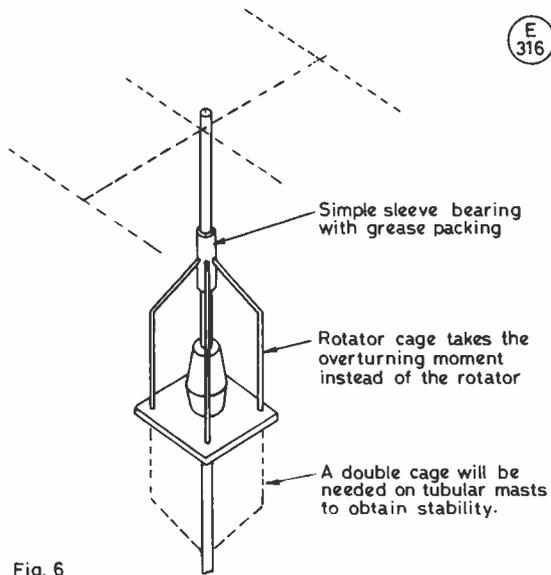


Fig. 6

Fig. 6. It is good practice to 'cage' a rotator, especially if there is a significant height between the rotator and aerial. On lattice masts there is usually a flat top to fix the cage to, but on tubular masts a double-cage is needed to stabilise the assembly.

proportions have been exaggerated to aid clarity. With the wind broadside onto the elements, the wind area will be $D \times L$ for each element, giving a total wind area of $3 \times D \times L$ for the entire array. Purists will scream that this will only be true of HF arrays where the large physical separation of the elements prevents the upwind one partially shielding the others. For VHF arrays accurate information is often available, and even if the windload at one windspeed is quoted it is possible to 'backtrack' mathematically to find effective area and hence windload at any speed.

No mention has been made of traps, which are inevitably of a larger diameter than the element, but it is a simple matter to allow for these, as shown in Fig. 4, which represents half of one element with a trap part-way along. The total area for a 3-ele array would thus be: $6[(L_1 \times D_1) + (L_2 \times D_2) + (L_3 \times D_3)]$.

In practice, each element in an HF array will be slightly different in length, so the more fastidious may wish to work each out separately, and then add the results.

Torque on Rotators

The foregoing gives the required windload for only two out of the three conditions that must be met, namely that of the load at the head of the tower, and the overturning moment on the body of a 'free' rotator (Fig. 5). The third case to be considered is the required torque resistance of a rotator, but before moving onto that it seems a suitable point to warn against mounting a rotator as shown in Fig. 5. It is better to take the trouble to use a 'cage' to take out any overturning moment on your rotator; the slight extra cost involved in using a cage will be far less than replacing rotators which have their bearings worn, or cases cracked from excessive overturning moments. Manufacturers often quote a 'safe' overturning moment, but it is far better to have none at all if you wish to use your rotator for any length of time. See Fig. 6.

With wind force on the entire array, any twisting effect will be balanced, assuming the array is supported at its centre of gravity, but it is necessary to consider the case of the 'edge' of a wind gust catching just half of the array (Fig. 7). In the case of long boom VHF/UHF arrays, Fig. 8 might be a worse case.

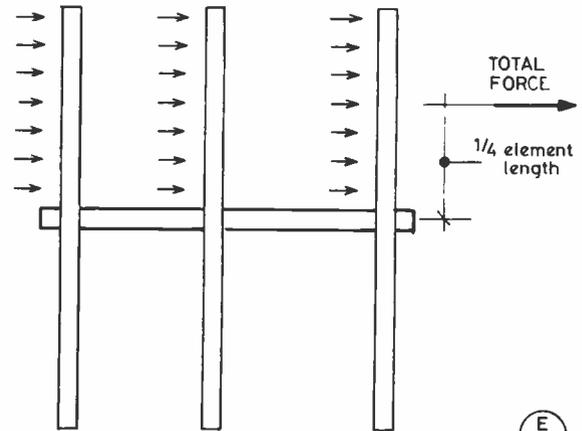


Fig. 7

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Fig. 7. When the wind force acts over all the aerial, any twisting force on the rotator is effectively zero. To obtain the maximum twist effect consider the case where the edge of a wind gust loads half the aerial, as shown. Multiply the windload on half the aerial by a quarter of an element length to find the torque on the rotator.

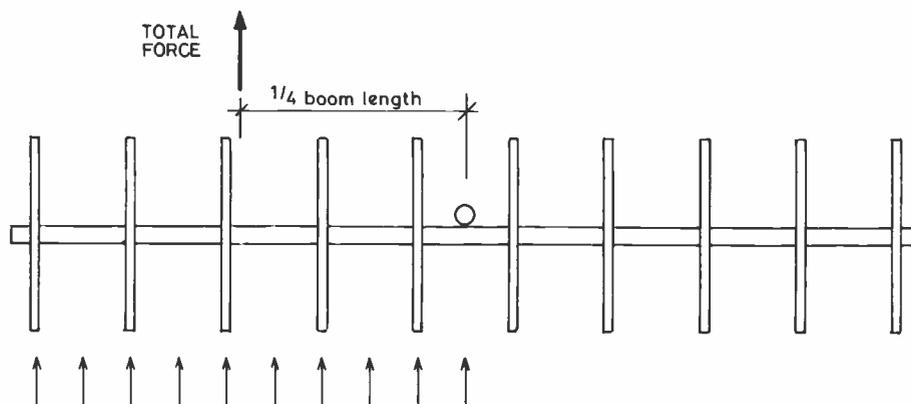


Fig. 8

E 318

Fig. 8. With long boom VHF/UHF arrays, the sideload on the boom plus any boom support arms may be the worst case.

Summary of Procedure

In case readers are feeling rather lost in coefficients, the design procedure is outlined below, including the initial determination of local windspeed, for which you will need the previous article.

(1) *Determine Basic Windspeed* from the map shown in the previous article, for your particular QTH. Interpolate between the wind speed contours where necessary.

(2) *Multiply by the Topography Factor* which you get from Table 1 in the previous article.

(3) *Multiply by the Ground Roughness/Height Factor* obtained from Fig. 2 in the previous article, and the resulting figure is the "Design Wind Speed" for your QTH.

(4) *Determine the Dynamic Wind Pressure* from $q = kV^2$, taking care with your units, or read it off Fig. 1 from this article.

(5) *Calculate the Effective Area* for both 'full load' and torque conditions, as shown previously.

(6) *Obtain the Wind Force* from $F = C_f \times A_e \times q$ using a figure of 1.2 for C_f , unless you have a copy of the Code and are happy with maths.

(7) *Determine Torque Moments* by multiplying the wind force by the distance from the centre of the rotator to the line of action of force.

Going Further

From the information determined so far, it is possible to find the speed at which the elements of a beam, or the stem of a vertical will collapse. This involves knowing the diameter and wall thickness together with the tensile properties of the material used. At this point the information is of use to those designing their own mast beam, or vertical, but in cases where the only information is that a vertical "should not require guys in most cases" it would still be of help to purchasers of commercial equipment. As it involves an introduction to section properties, bending moments, and another Code of Practice it will have to wait for a subsequent article.

Conclusion

Hopefully readers will find help rather than confusion here, and an insight into what to ask about when choosing a substantial set-up. The author will be happy to assist on points of a general nature relating to this article, on receipt of an *s.a.e.* but the suitability of specific products for a job must be left to the reader to decide from such information supplied by the dealers, coupled with the guidelines laid down here.

Acknowledgement:

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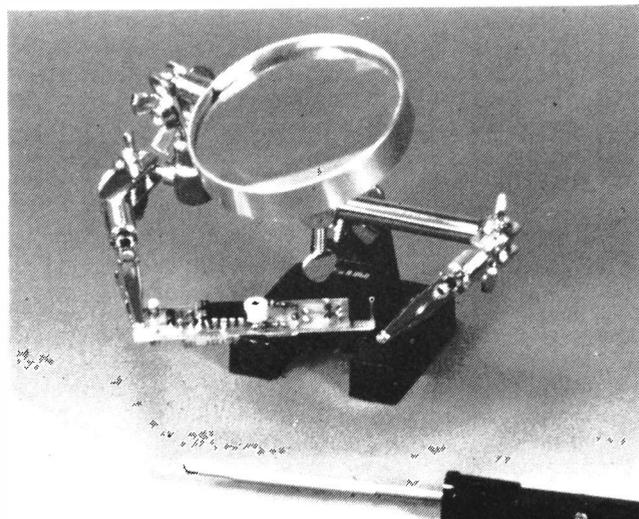
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BOOK REVIEWS . . .

TWO Newnes Technical Books have been received for review in the "Beginner's Guide to . . ." series. **The Beginner's Guide to Radio** was first published in 1955 and has just appeared in its ninth edition. In his preface, author Gordon J. King, G4VJV, writes, "The plan has been to start at square one and to progress to the present art of high quality radio reception, so that the book can be regarded as complete within itself."

The book begins with Electricity and Magnetism, a sort of refresher course on what should have been learned — and probably forgotten — at school. It is followed by chapters on radio signals, propagation and reception and transmitter and receiver principles. Succeeding sections deal with the "hardware," *i.e.* the components used in radio work, including a short chapter on integrated circuits. This latest edition now includes a chapter on Citizen's Band Radio. The format is of pocket book proportions, 185 × 123mm., with soft, glossy covers and has 266 pages. It is adequately illustrated with excellent photographs and drawings and costs £5.10 including postage and packing.

The second Newnes book is **The Beginner's Guide to Integrated Circuits** which was first published in 1977. This is the second edition and author Ian Sinclair states he aimed this volume at ". . . the comparative newcomer to electronics who is about to make the transition from transistor circuits to integrated circuits. . ." He takes the reader logically from the description of an IC, through the production, on to simple voltage amplifier and digital IC circuits, thence to microprocessor chips. Later chapters describe domestic and specialised uses of these devices and there is a short section on practical construction. This book is the same format as the "Radio" one with 194 pages, again excellently illustrated. It costs £5.00 including postage and packing. Both titles are available from Publications Dept., *Short Wave Magazine*, 34 High Street, Welwyn, Herts. AL6 9EQ.



For those who find themselves short-handed (and long-sighted) in the workshop, *Litesold* has an essential little device called the "Helping Hands". Supported on a solid, cast base, this tool consists of a 115mm. long support bar fitted with two croc. clips and a 5-dioptre lens. The bar, clips and lens are all mounted on adjustable ball-joints and can be set to any required position to hold parts and assemblies for cleaning, adjusting, soldering etc., while giving a clear, magnified view. The "Helping Hands" costs £7.45 inc. VAT and postage, and is available direct from *Light Soldering Developments Ltd.*, Spencer Place, 97-99 Gloucester Road, Croydon, Surrey CR0 2DN (tel: 01-689 0574, telex 8811945).

All Change in Moscow!

AN UP-DATE ON THE NEW RUSSIAN CALLSIGNS

N. S. CAWTHORNE, G3TXF

Prefix Change

As well as the UK prefix for clubs, the novice prefixes of EY and EZ that could until recently be heard on 160m. have also been abolished. There is now a new wider ranging set of normal prefixes for all of the republics other than the Russian SFSR referred to above. The first letter R as well as U will now be in regular use, and no longer restricted to 1.8 MHz/2.8 MHz/VHF licensees and special calls as was the case in the past. Individual calls like RA3DX and RC2AA are now being heard regularly on the bands.

ON May 1st, 1984, there was a quiet revolution in Russia. A new amateur radio callsign system was introduced. The April issue of *S. W. M.* carried an article describing oblast hunting and explaining how to identify oblasts (administrative regions) from Russian callsigns.

This follow-up article is to up-date the information given in the April issue and to bring it into line with the new USSR callsign structure that has been in operation since 1st May 1984.

Club Calls

The most significant change is the abolition of the UK prefix for club stations, which was introduced in the early seventies to identify all club stations. From 1st May club stations are identified by two means. Where the last two letters of a three-letter suffix are in the series WA-ZZ, then the station is a club station; individual stations with three-letter suffixes will have the last two letters in the series AA-VZ. This sounds complicated, but it is very easy to get used to!

The second method of identifying a club call applies only to the Russian SFSR, which consists of the areas commonly known as UA1, UA2, UA3, UA4, UA6, UA9 and UA0. In these areas club stations will also be recognizable by their UZ prefix. The well known contest station UK9AAN is now UZ9AYA. The immediate advantage of abolishing the UK prefix for club stations is that the republic of the club station is now more easily recognized. Previously with clubs using the UK2, UK6, UK7 and UK8 prefixes it was necessary to "decode" the oblast identifier before being able to say which republic the club station was in. For example, with the club station UK8QAC, the oblast identifier "8Q" had to be used to determine that this club station was in UM8. With the abolition of the UK prefix, this will no longer be necessary, because "M" will form part of the club call prefix.

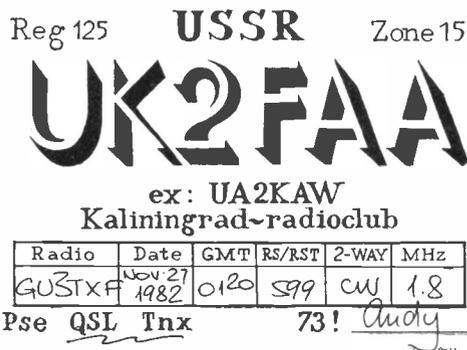


Fig. 1. With the new USSR callsign system, club stations will no longer use the UK prefix. On 1st May UK2FAA became UZ2FWA. Club stations in the USSR changed their calls previously in the early seventies. The station illustrated will have been: UA2KAW, UK2FAA and UZ2FWA all in the space of a few years!

Republic Identification

Table 1 lists the key letter that is used to identify the republic. The key letter is always the second letter of the callsign, no matter whether the first letter is a U or an R; both RC2AA and UC1AWZ are in the Byelo-Russian republic. The significant change to note here is that the number in the callsign no longer has any significance in identifying the republic. As seen from Table the second letter B or T identifies the Ukraine; thus RB7GA is in the Ukraine. The "7" in this call is not significant as a republic identifier. The writer stumbled across this station in the recent

Table 1. Under the new USSR callsign system it is the second letter of the callsign that is used to identify the republic. This now applies equally to club stations as well as to individual stations. Except for the Russian SFSR, the number in the callsign is no longer significant for identification of the republic.

Identifying Letter	USSR Republic	Formerly	Examples of callsigns
A-N-V-W-Z	Russian SFSR	UA1-2-3-4 UA6-9-0	RA3DX, UN1NA, RW3DA UZ6HWW, RV9FF, UA0BL
B-T-Y	Ukraine	UB5	UT4UJ, RT5UB, RB7GA
C	Byelo-Russia	UC2	RC2AA, UC1AWZ
D	Azerbaijan	UD6	UD6DHC, UD7DWZ, UD6DFY
F	Georgia	UF6	UF6CR, UF6QQ
G	Armenia	UG6	UG6GDR, UG6GAE
H	Turkoman	UH8	UH8EWW
I	Uzbek	UI8	UI8SAI, UI8IBB, UI9AWX
J	Tadzhik	UJ8	UJ8JAS, UJ8AS
L	Kazakh	UL7	UL7MWW, UL8GWW, RL8PYL
M	Kirghiz	UM8	UM8MAH, UM9QWC
O	Moldavia	UO5	UO5OB, UO5OCI, UO5OGR
P	Lithuania	UP2	UP1BZA, UP1BWO, UP2BEX
Q	Latvia	UQ2	UQ1GWE, UQ2GDR, UQ2ON
R	Estonia	UR2	UR1RWX, UR2RJJ, UR2RND

(E-K-S-U-X not used)

Table 2. List of the reallocated oblasts 184 and 185 and the new oblasts 186-191. The six new oblasts are city areas within previous oblast areas as identified above. The original oblasts from which the city oblasts came are still separate oblasts. Six existing oblasts have now each been split into two. See text for an explanation of how the oblast-identifier now works.

New Oblast	Oblast Identifier	Oblast Location	Previously part of Oblast
184	UI-Q	Navoy	UI8LN — reallocated
185	UM-T	Talas	UM8PN — reallocated
186	UT-U	Kiev city	065 UB5U now UB-U
187	UT-J	Sevastpol city	067 UB5J now UB-J
188	UC-A	Minsk city	009 ex-UC2A now UC-C
189	UI-A	Tashkent city	053 ex-UI8A now UI-B
190	UL-G	Alma Ata city	018 ex-UL7G now UL-Q
191	UH-A	Ashkabad city	043 UH8H now UH-H

CQ-M contest, and was convinced for some while that it was an UL7, even though the oblast number sent was an UB5 oblast!

Under the new system it is important to remember that apart from the Russian SFSR the number in the callsign no longer has any significance as a republic identifier.

The advantage of this new system is that it releases a large number of potential new callsigns. In the course of time we shall probably be hearing all the prefixes in the ranges RB1-RB0 and UB1-UB0 just from the Ukraine alone!

Oblast Identification

The basic oblast identification system has not changed significantly, but there are several points that should be noted.

For all republics other than Russian SFSR (UA1, UA2, UA3, UA4, UA6, UA9, UA0) it is now the letter before the number and the first letter after the number in the call that together positively identify the oblast. Previously it was the number in the callsign and the first letter of the callsign after the number. See Table 1 on page 88 of April *Short Wave Magazine*.

For the Russian SFSR it is still the number in the callsign (*i.e.* 1, 2, 3, 4, 6, 9 or 0) in combination with the first letter of the suffix that identifies the oblast. For example UA1NA is still identified as being in oblast 136 from the "1N" combination in the callsign.

New Oblasts

Six new oblasts have been created and two deleted under the new system. The new oblasts created are all city areas, where the

amateur radio population is probably outgrowing the callsign blocks available.

The six cities involved are Kiev in the Ukraine (UB5), Sevastpol in the Crimea (UB5), Minsk in Byelo-Russia (UC2), Tashkent in Uzbek (UI8), Alma-Ata in Kazakh (UL7) and Ashkabad in Turkoman (UH8). The new oblast numbers for these cities are shown in Table 2.

The Arctic and Antarctic oblasts of 171 and 172 have now been deleted.

The highest oblast number is now 191. There are a total of seven deletions (11, 32, 35, 61, 65, 171 and 172), which leaves a total of 184 current oblasts.

Old-Time Callsigns

The older individual callsigns have not been changed. UI8BI, regularly heard in contests was in oblast 053, but is now in the new Tashkent city oblast of 189. These older callsigns were not always immediately identifiable as to oblast under the old system and are still not under the new. Many new two-letter individual calls using both the U and the R first letter have appeared on the bands over the past few weeks since the introduction of the new callsign system. The newly issued two-letter individual calls do appear to be "oblast identifiable".

Oblasts 184 and 185

The very rare oblasts 184 and 185 have been allocated new callsign blocks as shown in Table 2. Previously both these oblasts shared oblast identification letters with other oblasts.

CQ-M Contest

The CQ-M Contest held annually on the second weekend in May was a very lively affair this year, with all the new Russian callsigns and prefixes coming on the air *en masse* for the first time. Operating as G3TXF on CW for 21 hours of the 24-hour multimode contest, 116 different oblasts were contacted including five of the six new ones. Most of the new callsign examples in Table 2 were those heard during this year's CQ-M contest.

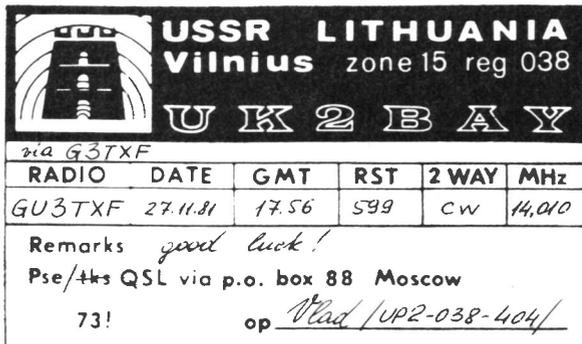


Fig. 2. The abolition of the UK prefix will make it easier to identify the USSR republic for club stations. In the past it was necessary to know that UK2B and UK2P were both in UP2. With the new system USSR club stations will have the republic letter in the prefix: *e.g.* UPIBWO.

Acknowledgements

Data to produce this up-date was drawn from various sources including the RSGB's *DX Newsheet*, K1KI's *USSR Tidbits*, Geoff Watts as well as from some of the USSR stations contacted during the recent CQ-M Contest.

The "Dover" Frequency Meter, Part 1

A 100 Hz TO 600 MHz COUNTER WITH READY-MADE PCB'S AVAILABLE IF REQUIRED

IAN KEYSER, G3ROO

price bracket, is full decimal point placing, meaning that there is a decimal point every three figures and these points shift to suit the prescaler range and timebase gate period in use. This feature has not only the advantage of easy readability, but means that switching is far simpler avoiding mistakes and expensive, complicated switches.

The Prescaler/Counter PCB

This board contains all the counting and prescaling circuitry and therefore can be used as a counter in its own right. The counter section of the circuit uses the famous 10 MHz chip from Intersil, the 7216C. Anyone wishing to have more information on this device should obtain a copy of the data sheet from Intersil or

Table of Values

Fig. 1

R1, R8, R17,	C4 = 22 pF cer. disc
R19, R20 = 10K, 1/4 w	C16 = 39 pF cer. disc
R2 = 1M, 1/4 w	C18, C19 = 68 pF cer. disc
R3, R6, R7,	C20 = 1000 µF, 15V elec.
R9, R11, R15 = 470R, 1/4 w	CV1 = 3-50 pF min. var.
R4 = 68R, 1/4 w	X1 = HC25 or HC18
R5 = 2K7, 1/4 w	TR1 = 2N3819
R10 = 10R, 1/4 w	TR2, TR3 = BSX20
R12 = 680R, 1/4 w	IC1 = 7404
R13 = 150R, 1/4 w	IC2, IC3 = 74H00
R14 = 100R, 1/4 w	IC4 = RS8680B
R16 = 100K, 1/4 w	IC5 = 74LS196
R18 = 22M, 1/4 w (2 x 10M suitable)	IC6 = 7420
IC1, C2, C5 to C15, C17,	IC7 = ICM7216C
C21 = 0.01 µF cer. plate	D1 to D5 = 1N4148
C3 = 22 µF tant. bead	Display = two RS 587-024

WHEN it was decided that a frequency counter would be the club project I, as usual, put my big foot in it and suggested that I constructed the prototype. After several discussion periods a basic outline of what was required evolved. The final (loose) specification was for a 100 Hz to 600 MHz counter with commercially produced PCB's to make construction as simple as possible. Also to this end, design could be a little more complex to reduce the 'off PCB' wiring to a minimum.

A feature that is lacking in many designs, especially in the lower

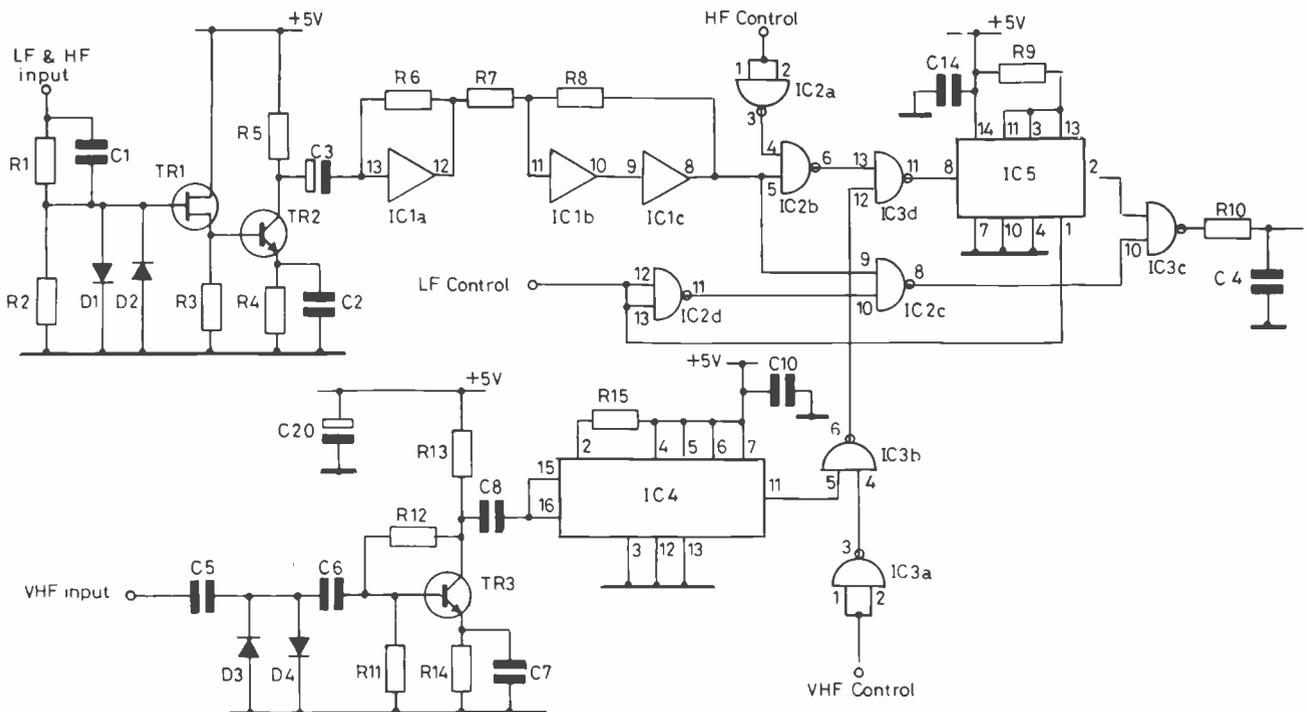


Fig.1 THE 'DOVER' FREQUENCY METER PRESCALER/COUNTER CIRCUIT DIAGRAM

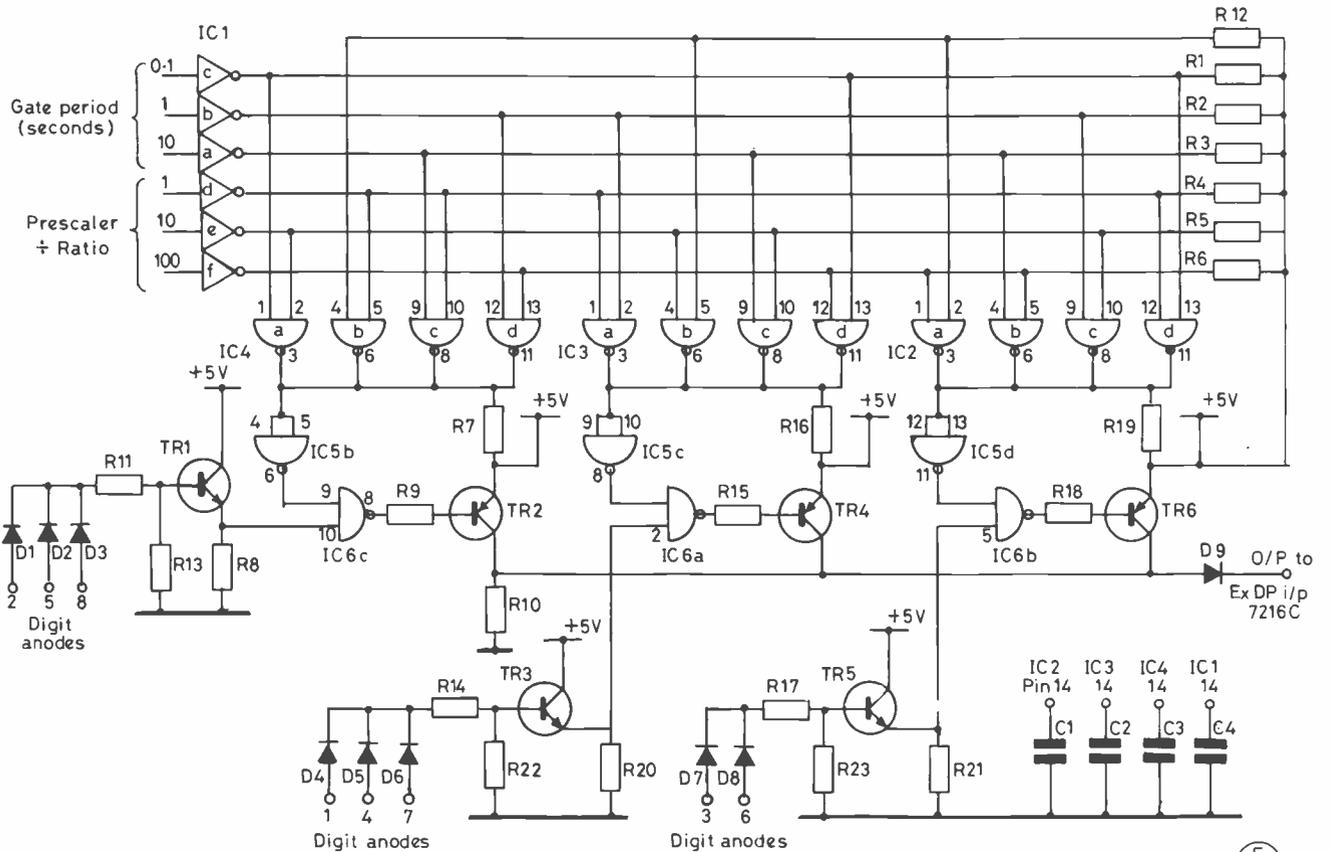


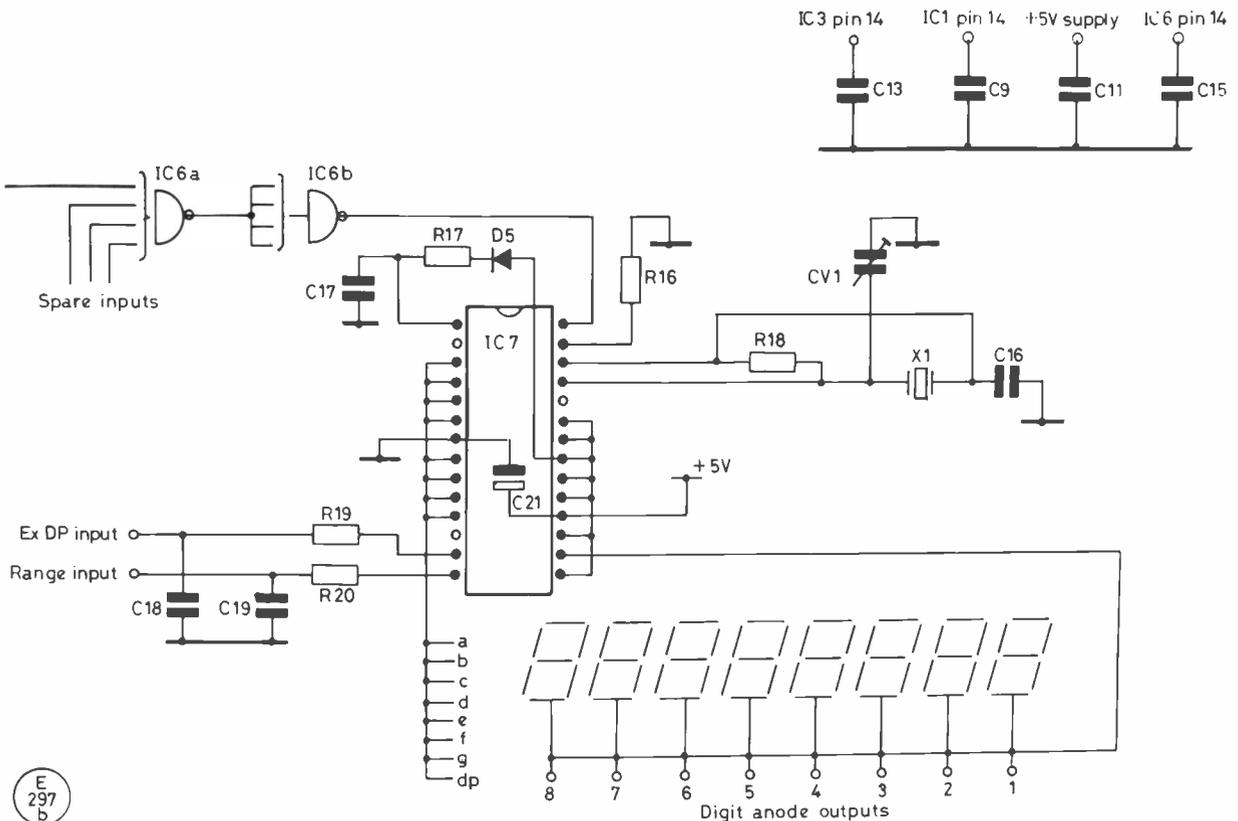
Fig. 2 DECIMAL POINT CONTROL CIRCUIT DIAGRAM

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from one of the suppliers, as it is far too extensive to cover in this article.

Fig. 1 shows the input circuit plus the logic control circuitry to

steer the outputs from the amplifiers/dividers to the output of the prescaler section on the junction of R10 and C4; this output is fed to the input of the 7216C counter.



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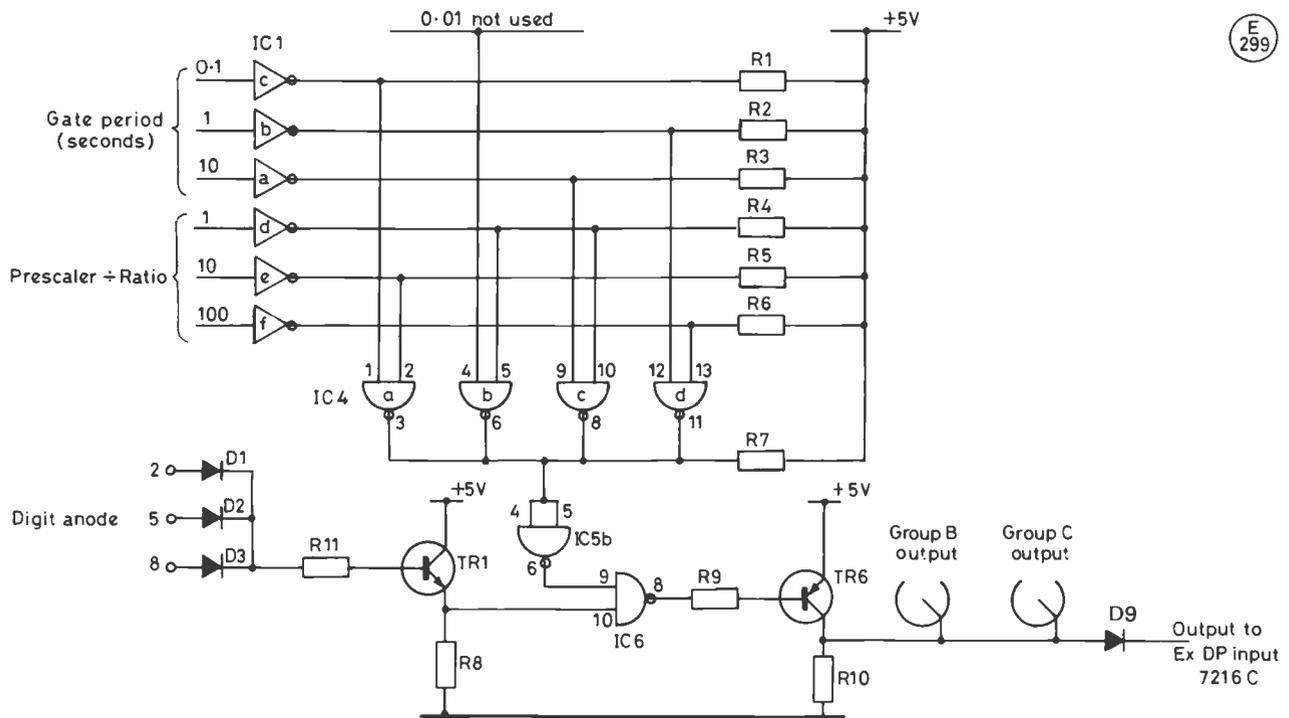


Fig. 3 GROUP A DECIMAL POINT SELECTION CIRCUIT DIAGRAM

Table of Values
Fig. 2

R1 to R7, R12, R16, R19 = 3K3, ¼w	TR1, TR3, TR5 = BC108 or similar
R8, R20, R21 = 470R, ¼w	TR2, TR4, TR6 = BCY72 or similar PNP
R9, R15, R18 = 10K, ¼w	D1 to D9 = 1N4148
R10 = 1K, ¼w	IC1 = 7405
R11, R14, R17 = 33K, ¼w	IC2, IC3, IC4 = 7403
R13, R22, R23 = 100K, ¼w	IC5, IC6 = 7400
C1 to C4 = 0.01 µF cer. plate	

This design could have been simplified somewhat, but in doing so would have increased the complexity of the 'off PCB' wiring. There are two inputs, one common for the LF and HF inputs, and the second for the VHF input. On the club models these have been switched onto one socket, but to avoid this two sockets could be included on the front panel instead. For this description we will trace through the LF/HF input first and then follow with the VHF input.

The incoming signal (100 Hz to 30 MHz minimum) is fed *via* the protection circuitry of R1, C1, D1 and D2 to the gate of the input amplifier. This is a source follower to enable a high input impedance, and to match to the input of the amplifier TR2. The amplifier signal is fed to one section of a HEX inverter (IC1, 7405) for further amplification and then into two other stages for signal shaping. The signal is now TTL compatible and can be fed into TTL gates.

A word about NAND gates for those who do not understand them. In simple words they are building blocks with two inputs in a high, or logic 1 state (near the supply voltage), and the output is normally in a low, or logic 0 state. If either input is pulled to a logic 0 state the output will change to a logic 1 state; when this has occurred it does not matter what happens to the other input. In other words, the output will only be in logic 0 state when *both* inputs are at logic 1.

If we feed the signal from the input amplifier into one input of a NAND gate and keep the other input in logic 1, the signal will appear at the output but inverted. If the unused input is then taken to logic 0 the output will be held in a logic 1 state and the signal will disappear. This is what happens in IC2a and IC2b. The signal is fed to one input of IC2b and the other input is held at logic 0 by the output of IC2a, and so no signal can pass through IC2b. If we now take the two inputs of IC2a to logic 0, the output goes to logic 1, allowing the signal to pass through IC2b. That describes the action in the HF mode.

The output signal from the shaping circuit is also fed to one input of IC2c which you will note is controlled in the LF mode by IC2d. The signal can be steered to either pin 6 or 8 of IC2 depending on which control pin is at logic 0. Continuing with the LF control at logic 0, the input signal is steered to the input of IC3c, and provided the other input on pin 9 is held high the signal will pass without any prescaling to the output *via* the low pass filter of R10 and C4. We ensure that the output of IC5 is held high by holding pin 1 of this device at logic 0 when in the LF mode.

If we now select the HF mode and allow the LF control to go to logic 1, IC2c output goes high allowing the input on pin 9 of IC3 to pass to the output. Also with the HF control at logic 0, the input signal can pass through IC2b and IC3d to the input of the HF divide-by-ten stage, IC5. The HF input signal up to 30 MHz (min.) is now divided by ten and the resulting signal is passed *via* IC3c to the output. This divider is also used in the VHF mode when the input signal is divided by 100.

The VHF input signal is amplified by TR3 and fed into the 600 MHz divider, IC4. The resulting signal is passed by IC3b and IC3d to the input of the HF divider, IC5. The resulting signal (up to 6 MHz) is then passed to the counter chip in the same way as the HF signal.

This circuit is fairly complicated, but by the use of two very cheap integrated circuits, very neat control over the signal path is achieved and as a bonus one HF divider which would have been required in the VHF prescaler stages is saved.

(to be continued)

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

The Mail

STARTING with Ten, and here we have to say that there is a definite need for us to do something about the intruders: 28.305, 28.295, 28.285 MHz and in the CW area 28.005, 28.010 and 28.015 MHz are always heavily used, even swapping details of their addresses over the air. The change in the law which will put some power in the hands of the authorities and the slapping-down of some of these pests as a result, is much to be welcomed — when it happens! Meantime, a *strong* effort is required to make them go away — and these frequencies seem quite ideal for aerial measurements. G4OBK (Chorley) noted the band as being pretty flat otherwise, and deplores the lack of activity.

G6QQ (Hoveton) didn't find a lot on the band. He worked a few Europeans in the course of a regular scan through it, but only one outside; this being CE1BDW.

G3NOF (Yeovil) found the band very poor for DX; a YB was heard one afternoon, and on June 15 there was an opening to HP and 9Y4, plus spells of short-skip to Europe, and long dead-band spells. The only QSO noted is the one with 9Y4BA.

G4HZW (Knutsford) was operating for part of the month as GM4HZW/P — of which more elsewhere — but still found some use for the band from home. His SSB got out to 5Z4DJ, UH8HDE, TR8AMO, LU5DL, and GM3YBI/P, plus most European countries on Spor-E propagation. Tony also noted the bottom end of the band positively *swarming* with EU-based 'woodentops' and spent some time sending CW on top of them until they got the message and went back into their own patches.

G2DHV (Sidcup) stayed on FM and noted a good QSO with EA3CTE, but also comments that the EA3 was complaining of QRM "from the local breakers". On a quite different tack, the ten-metre beam which was difficult to tune up on the band has developed into a very effective 21 MHz beam, apparently by magic — your scribe could do with that sort of spell!

Top Band

G4AKY (Newport, Essex) is definitely back on the band; the writer, G3TVW and G4AKY had a three-way at the top of the band ten days ago to swap 59 reports over what is a very difficult path. The G4AKY temporary aerial is about seventy feet long; some fifty feet out from the house form a flat-top at twenty feet high,

dropping down to ground at the far end — it divides into three at the point where it begins to drop to ground, and each of these ends is grounded by way of wires soldered to pet-food tin cans pushed into the ground. To this is added one quarter-wave radial wire lying on the ground, and a couple of 20-foot aluminium scaffolding poles are also attached to the earth system. Not a very promising set-up but it was putting in a very strong signal to the writer. Thus Dave set out to try it in earnest, and this is what happened: CW accounted for PA0BUD, PA0AUV, GM3PFQ, 4U1ITU, EI0CZ, SM7ALC, seven OK/OL stations, I1MXI, I2UIY, IK1EQF, DL1PM, SP3LPR, SP4EEZ, VE1BVL, RA3DOX, UZ3UWG, UC1CWD, RB4IOZ, UA3UEW, PT2KT (Brasilia), DF5SM/IS0, LZ2CJ, OZ8AE/OY, DL6YE/LX, and UL7MAN; giving four of the six continents worked in a month at a bad time of the year for the band and with a most unpromising aerial system.

G4AAW (Maidstone) finally raised South America by way of LU9EIE, and remarks on what a patient man he is — no less than six overs before he could get the call sign right. Also worked were SV0AA/9 in Crete, OZ5DL/OY, OZ8AE/OY, ZB2EO during NFD, AA1K, K1ZM, W1RR, K2EK, VE1ZZ, and VG1ASJ. Gotaways included CX8DT, CP8HD, HZ1AB, and OD5LX.

G2HKU (Minster) says he has been so busy since retirement that he doesn't understand how he ever found time to work — and that doesn't take into account the garden! However, Top Band saw the usual SSB with PA0PN, plus CW to UA2FJ, EI2CA, GM3PFQ, GM3ZRT, and 4X4NJ.

G3BDQ (Hastings) had a short holiday in London for the first part of the month. One foray on Top Band was at 0300 on July 1; very noisy and lots of static crashes, plus European signals. He tried calling CQ DX PY/YV several times only to be called eventually by AA1K: a short QSO and then he went back to bed. Next time out, in August, and then again in September, the counterpoises and the rest will come out for an airing.

G4OBK has been getting up at around 0345 clock, and most times found PY and LU were audible. The idea was to stick around till 0500, then back to bed for an hour before up to go to work at 0615 — which is a bit expensive in matchsticks to keep the eyes open at work! Gotaways were CX8DT and ZS5BH, but on the

other hand an envelope with PY1BVY's QSL was very welcome, and it contained a note that Ron is arranging a DX-pedition to Trinidad Is. in December this year, to include activity on Top Band. Phil worked I2AY, 4U1ITU, VE1ZZ, OE7CKI, LU9EIE for a new country, OZ5DL/OY, LU9EIE again, PY1BVY, K1ZM and K2EK. This makes the G4OBK countries score now 62 worked and 53 confirmed.

Eighty

First let's look at the report from G4KKI (Swinton) who, after ten years as a Royal Signals radio-op is now back in civilian life, driving a truck and taking his pleasure in home-brew and QRP — obviously one of Rev. Dobbs' converts! At the moment Bill has a rig operational on Eighty; a 3.5 MHz VFO, buffer and driver into a BTF39 PA at 750 milliwatts output; then there is an outboard 'pair of boots' comprising a pair of 2SC1969 ex-CB transistors, with an output usually of three watts but capable of eight. For Forty there was a home-brew rig also, but that has succumbed to the rebuilding urges of G4KKI at the time of writing. There is a Lowe SRX-30 general coverage receiver (that's to show Bill doesn't actually *object* to commercial gear!) with all the ancillaries such as power supplies, power meter, VSWR indicator, ATU and so forth being of the G4KKI-special breed. That's a bit more like amateur radio used to be. For the weekends, Bill is searching for a box-kite, and while looking for this is trying his hand with a sled kite, for some /P forays. Anyone out there know of a box-kite in need of a good home? — it would make a difference to G4KKI as he is very stuck for aerial-farming space at home. Early morning sessions have been with G3NSA, G8JR, G2MJ, G3FPB who had ten watts, and G4FEJ; afternoons brought in a QSO with G2NJ for the first time, and last thing before bed was the time to find LA5AA. Next month we understand the 7 MHz rig will be operational again, and that should be interesting as the home station aerial at G4KKI is probably at its best on that band, and past results tend to confirm this.

It was QRP all the way for G2HKU on Eighty, with his four watts of CW getting out to DJ0OS, GM4SID, and GM4TVB.

G3NOF remarks how the presence of the GB stations can liven things up on the LF bands; he was tempted on to Eighty by all the D-Day commemorations, and mentions as pleasing the GB4BLC QSO from Southampton. On a different tack altogether, Don notes the presence of

G3BDQ in this piece, and recalls how as SWL McLean, he was able to meet G3BDQ back in 1947 and be taken to visit Tommy, G6QB, who was for so many years (until 1966) the conductor of this feature.

More QRP, this time from G4SXE (Rolleston) who says he worked ON5VC for the only non-G QSO with his two watts, but had a wonderful month for ragchews, with such as G3DHE, G2HW and G3JHC, the latter pair both being from Sale. Another QSO was with G4SBU, Brian, running two watts.

Finally, G2NJ (Peterborough) who notes with pleasure that G2CNN was out /A again, towards the end of June when he was at Battlesbridge in Essex for a few days. After a return to the home QTH in Norfolk, G2CNN/A was due to become audible from Brill, near Thame. G4RIZ and G2NJ had a last QSO from the G4GUM (Sevenoaks School) station, on June 9; this is because G4RIZ is going to Germany to continue his studies, and he hopes to get a German call. Among the /P signals, G3LSW/P was at a caravan rally at Daventry, while G4BXW/P was in North London.

Forty

No doubt about it, this was the 'biggie' — largely as a result of the D-Day celebrations.

Right through the wall of EU QRM, G3BDQ managed a completed QSO with BV0JA, who was a 579 signal when he was not buried under the QRM; but the QRM was such that it took a while for John to tumble to the fact that the BV was calling him; this at 2014z was quite a QSO. But there were also others, such as ZS6BUX and VK3DSV, both worked in the same hour of the same evening as the BV. PA3BXM/HB0 and JA0BCO were also successfully hooked.

While G4KK1 had his QRP rig operational on Forty it was, he reports, doing nicely thank you, with plenty of QSOs all over Europe, and so Bill is quite eager to get the modified rig back on the band for a comparison.

G6QQ (Hoveton) had a sleepless night, and went out to the shack for a while; twenty was performing but they wouldn't come back, so David decided to give Forty a whirl and was surprised at the results. KS3L, ZL2MM, PY4APR, VK3MR, CM3HG, K2EK, W2QN, WA2ALP and KY2P, were all added to the lists, while HC4WA also came back but was not a completed QSO — the QRM overwhelmed it. As G6QQ remarks, it is a *help* if you have a directive aerial on this band — and G6QQ hasn't!

G4NOZ (Colchester) reckons forty was most notable for the appearance of the various commemorative stations, and notes one in particular as being very much in demand, GB4ANL which was put on from Paignton by the Devon and Cornwall

Police. Les also notes the reappearance in good numbers of the SPs, and of Antarctica — the latter in the form of 4K1A on June 25, doing a roaring trade from all over Europe and down to the Mediterranean, with 9H1EU particularly strong amongst the pack.

G3NOF went on the band — as did so many others — to work the D-Day stations and sorted himself out QSOs with GB4ANL (Torbay), GB4DD (R.A.F. West Drayton), GB4DDA (Gosport), F0IMT/P (Utah Beach), F0IMY (Utah Beach), FV0PAX (Caen), TK6JUN (Utah Beach), for a nice little collection.

G4HZW spent an enjoyable week at Loch Garten Nature Reserve as a volunteer warden for the eleventh year. He took along the TS-820 and strung up a 7 MHz dipole at twenty feet between a couple of pine trees. He found a very good location — no TV timebases or any sort of QRN, and so worked loads of Gs at very good strength, heard lots of DX but only worked a couple: thus it was SSB with PP7HS, PY7BOV, UM8EWW worked, and CE, LU, FM7, OA, HK, VK7, VK2, ZL, YV, RL0 and 4K1GAG were all heard but not hooked.

New Bands

Only two reports, both on 10 MHz. G2HKU keyed with N4FNG, W1PXA, OZ1HET, and Y24DO. G4OBK checked the band four times, to find and work HB9ACM, N2ERQ and KA4VXT.

Farewell

With sorrow we hear of the death of Arthur Kerford-Byrnes, G6AB, of Holland-on-Sea, in hospital on June 13. At the end he was unable to speak or hear, and tapped out his last words to G2HKU on to the latter's hand. Apart from his contributions to magazines for which he was well-known, he was a keen operator on the LF bands, and did much to encourage SWLs. In pre-war days he was a member of the RNV(W)R, and served his country throughout the war, mainly on Atlantic convoy duties as a Communications Officer. He was a fine artist, an expert in Heraldry, and a member of RAIBC and RNARS. We know of many readers who will be deeply saddened by his passing, and he will be sorely missed.

Here and There

All sorts of things to note here. Firstly some advance warning of a new category in the CQ WW DX Contest this autumn: team contesting. A team comprises any five radio amateurs each operating the contest in the single-op category; a person can only be on one team for one mode. The team score is the sum of the individual team member scores, and CW and SSB teams are totally separate. A team member's score is still eligible to be entered

as a personal score for a specified radio club. Awards to the top five teams. A list of the team's members to be received by CQ before October 15 for SSB, and November 15 for CW (two weeks before the contest, therefore) addressed to CQ Magazine, Team Contest, 76 North Broadway, Hicksville, NY11801, U.S.A. After the contest, send the list of the team member's scores plus the total claimed score before the normal contest deadlines. One assumes that this means that each team member will submit his own contest log.

The EDXC CW contest takes in the weekend August 11/12, and the SSB section on September 8/9. A new rule this year allows U.S.A. states to count as multipliers; the other main one is the requirement for a dupe sheet on any band on which 200 or more contacts are made. Logs should be sent to: DARC, PO Box 1328, D-8950, Kaufbeuren, West Germany, attention WAEDC Contest Committee.

August 25/26 is the weekend for the All-Asian contest CW leg, rules being the same as for the SSB leg in June. Logs to reach the committee by November 30, addressed to JARL, PO Box 377, Tokyo Central, Japan.

"CDXN" deadlines for the next three months:

September issue—August 9th
October issue—September 6th
November issue—October 4th

Please be sure to note these dates

Now to look at the other news. The place for this is DXNS in U.K., or TDXB from the States. Looking at the DXNS first, we notice that one of the editors, G3ZAY, and G3CWI, who is ex-VP8ANT, are both going to Lord Howe Is., and by the time you get to read this they should have given lots of people a QSO.

T31AT has been quite active from Central Kiribati, and we hear of at least one QSO with G on Forty.

Those looking for Pitcairn should note that VR6KY has regular skeds twice weekly with her QSL Manager, NE5C, and that this results in a very fast QSL route — twelve days from the QSO is being reported by various folk. VR6TC is also noted as being around on occasion.

Turning to IS1CK, we hear that DU1CK has run out of QSLs for this operation, so producing a hang-up. G4DUW/DU1 also says that IRCs aren't a lot of use in DU as they are being discontinued there; so dollar bills are easier to handle.

If you come across IK0CAK/OX he is on from a position about 72°N 25°W in Scoresby Land, all in the cause of propagation research. So — if you work him he will, we assume, be more than grateful for a QSL with any extra useful data you may have on it. The QSL route is to IOJAJ.

Lots of people have been getting all het-up over 4U1UP, the 'University of Peace' set up in Costa Rica by UN — personally we don't see how this, any more than the other UN enclaves, will get a DXCC rating.

Turning to *The DX Bulletin*, we note with some glee the 3W8AG asking for QSLs "via the Bureau" — is there a QSL Bureau in Vietnam? Vietnam Slim for sure!

However, one place where Slim was *not* was Mt. Athos, where the buzz reaches us that that DJ5CQ operation was all tickety-boo.

If you are athirst for a Spratly QSO and card, you look to be in for a wait; we get the impression that the DU1CK operation proposed and in the pipeline is looking a bit fraught — the pipe is very long and someone's welded a plug over the end. The diplomatic temperature there is going ever upwards, even if the piracy isn't!

More changes in the DXCC listings; the old country of Baker Howland and American Phoenix Is. is dead, and replaced by the new one of Baker and Howland. The reason is that the British Phoenix Is. have now become Central Kiribati.

We hear that a big wind has clouted Tristan da Cunha, and the aerials are mostly down — certainly those of ZD9BV and ZD9YL.

21 MHz

G2DHV returned to the band and heard VU1ITU, 9V1TL, some PP6, PP7, PP8 PT8 and PT9 stations for Brazil, and 4N2ZF — pretty obviously a Russian call but where from the writer knows not.

Conditions weren't too good says G3NOF; Don heard nothing from VK and ZL, the North Americans only for short periods around 2200z. Some JAs were noted between 1000-1300z, followed by YB, 9V1, 9M2 up to 1500z, Africans were best between 1600-1800z and there were some South Americans around 2200z. Early in June, Don managed to miss BY1QH, and BY8AA. Contacts were made with A24SC, BV0YL, C3BAV, CT7FAP/AM (the first /AM operation from Portugal), FH8CB, FP8DF, FR7ZB, FR7ZH, H44IA, HZ1AB, J27RDD, JAs, OZ5DL/OY, RL8PYL, TL8CK, UA4HFG/U8M, UF6CR, UM8MK, UM8MU, VR6KY, VQ9BC, W4MAT/SV9, XU1SS, Z21BP, ZC4AM, ZS6ABM, ZS6CDJ, 3D8DB, 4U1ITU, 5N3RTF, 5Z4DU, 9J2JN, 9M2CO, 9M2DC, and 9Y4BA. There was an unusual opening on June 14, around 2245,



Helmut Baumert, DL1QT, operating at his Bad Endbach QTH. DL1QT has been on the air since 1932, and is ex-D4DTC/D4BOC/D4FIB; among several awards he has WAS on four bands. His daughter, Susanne, is licensed as DL4BAY. photo: Geoff Watts

when VR6KY was a good signal along with VK7GK and HK, W3, W4, W5 and W9.

Not a lot to report says G4NOZ, who tripped over TA1SU quite late on June 13, and VE1PG immediately afterwards, both with good signals.

SSB on 21 MHz brought some pay-dirt to G6QQ; David worked A71AD, EL8E, CP5CW, PY2VK, VP2MDG, ZP5RFN, J28RDD, YV5JEA, PT2JW, and VP2MDG for a second time.

For G4OBK it was mainly Europeans on this band, but PY2MKL, WA4NTM, and K6DDO were all brought to book on CW.

Just one CW contact is reported by that busy man G2HKU — Ted was attracted to 7SK0AC and raised it. Sounds a bit like a circuit reference on a PCB connector!

Twenty

We slipped up last time out about the G4SXE power level; Brian does not run a QRO two watts on this band, but a more reasonable one watt — but he still managed CW QSOs with CT1BWY, F6HYI, PA0DHV, I3EVF, SM5BRG, and EA3GF.

An interesting report from G3BDQ on his contacts with JA4AC and W4JFE/7 in Oregon; both were first heard on the longwire aerial, but for once the vertical gave a better signal — much lower QRM from EU and, which is more important, the W7 reckoned that band was just opening to him, and that always seems to be the time when the verticals score. Others included SV0CR, YU3GL/5B4, U18LBA, and 4U0VIC.

Turning to G2HKU, we find Ted mainly on CW; at full chat he radiated to D2CCC, VE7YU, LU4US, and I2DMK/ID8; QRP CW was also enough to raise D2CCC. On

SSB the QRO was useful for ZL3FV and T77C, but again a reduction to four watts was enough for T77C.

G6QQ seems to have been a trifle unlucky with 14 MHz; the only contact he mentions is an SSB one with N7AYF.

Twenty is always the place to keep an eye on if you are in the upper echelons of the DXCC list, as is G3NOF; Don heard no Pacific stations in the mornings, and the VKs were very poor. VR6TC was heard on most Sundays around 0745 on 14145 kHz. In the evenings T31AT and T30DB were several times noted short-path at 1800z; for an hour either side of this some SE Asian stations were to be noted. Later in the evenings the band was often good to North and South America. SSB contacts were made with CT2CQ, CT2FJ, FM7WD, HK0HEU, J28DX, J37CB, J39BS, JY5ZM, KC2TU/TF, OE8AJK/YK, OH1LW/OH0, OX3ZM, OZ5DL/OY, T31AT, for country number 341, T77C, TI2J, UA0QEP (Zone 19), VKs, V2AZM, V85GF, VS5MK/OD5, XE1WAC, XT2BR, Z21AO, 4U1UP (Costa Rica), 5B4HK, 5X5GK, 6Y5EE, 8Q7BZ, and 9L1SL.

Finale

And that, my friends, winds down the curtain for another month. If you have had your holidays, commiserations; if you've got them to come, good luck with the weather; and if you've not even thought about 'em — good DX!

Deadline date for the arrival of your letters for the September issue is **August 9th**, addressed, as always, to your scribe, "CDXN", SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ.

• • • "Practically Yours" • • •

with GLEN ROSS, G8MWR

Gain Blocks

THERE are many reasons for requiring more gain for a particular application. Maybe you have a 'scope that suits you from a frequency response point of view but is woefully short on sensitivity. Some of the earlier Heathkit 'scopes and most of those found as "rally surplus" come into this group. Perhaps you have a good AC voltmeter but want to be able to read down into the millivolt levels. Probably the most common requirement is to get the sensitivity of some of the earlier scanning receivers up to a more acceptable level.

As is now so common in all areas of electronics, that which used to take many dedicated components to build can now be bought as an integrated circuit — and that is the case with the present requirement. These ICs vary in their specification but one of the most versatile is the RS Components type RS560C. It can be set up to have high gain, wide bandwidth or low noise figure and these parameters can be set to your own requirements. They are also ideal in another respect . . . they are cheap!

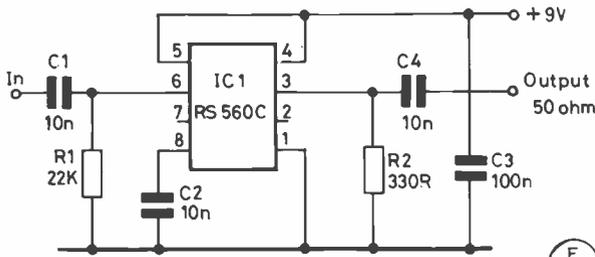


Fig. 1

E 319

Applications

The circuit in Fig. 1 is for a general purpose amplifier with an output impedance of 50-ohms; it runs on a 9 volt supply at a current consumption of about 36 milliamps. The gain of the circuit is 10dB and the frequency response is sensibly flat from 3 to 300 MHz. Maximum input level is 300 millivolt peak-to-peak and the maximum output is 1.7 volts peak-to-peak into the 50-ohm load. This could even be used as a QRP output stage. To modify this unit for 50-ohms in and out use the circuit of Fig. 2; this will result in a gain of about 15dB falling to 10dB at 200 MHz. Note that the supply voltage is now 6 volts. This circuit will provide an output of 5 milliwatts at 200 MHz.

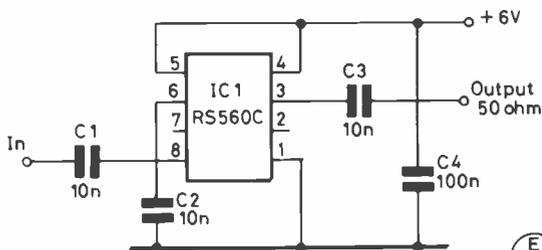
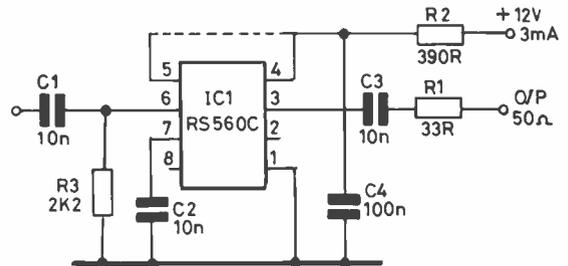


Fig. 2

E 320

The circuit of Fig. 3 is for a broad-band low noise amplifier. The response is sensibly flat right up to 150MHz with a gain which can be switched between 13 or 23dB and it provides a noise figure of 2.5dB across this range. Just the thing for that old scanner!



Dotted track (if present) reduces gain to 13dB, otherwise it is 23dB

Fig. 3

E 321

Remember that all these circuits are "wide open" and if the full frequency response is not needed they should have suitable tuned circuits or filters incorporated. If the circuit is only required to operate over a small frequency range a simple series tuned circuit placed in series with the output will usually suffice.

Construction

Very little can be said here as the construction will depend very much on the requirements of the individual constructor; however some guidelines can be offered. The units should be built on double-sided PCB with one surface used as an earth plane. All decoupling capacitors should be mounted as close to the pins as

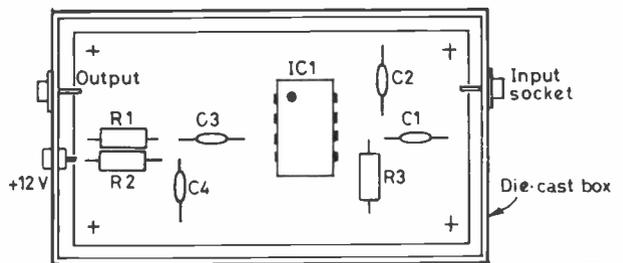


Fig. 4 Possible "build" suggestion based on Fig. 3

E 322

possible and should be disc ceramics of good quality. The required supply voltages may be obtained from a 12 volt line via a resistor and decoupling capacitor. If a Zener diode is used it *must* have a 1nF disc capacitor connected straight across it to bypass the RF noise generated in these devices. There is no point in making a high-gain low noise amp and then building a noise generator into it. A noise generator — now there is an idea! Perhaps next month?

Your comments and ideas are still arriving and are most welcome. Please send them to S.W.M., or direct to me at 81 Ringwood Highway, Coventry CV2 2GT.

An Audio Frequency Keying Monitor

SIMPLE AND USEFUL

P. C. COLE, G3JFS

THE small unit to be described is a self-contained AF oscillator circuit designed for use as a CW keying monitor that could be used with a variety of transmitters having different keying arrangements. Like all good home-brew projects it has also filled other needs in the shack, including use as a Morse practise oscillator, a general purpose AF source for signal tracing and the modulation of an HF marker oscillator.

Circuit Description

Fig. 1(a) shows the circuit of the monitor unit as built; all quite simple and needing but a brief description. TR1 is a unijunction transistor connected as a free-running oscillator which produces a sawtooth waveform of about 700 Hz across C1. This gives a rather harsh-sounding tone to the output of the monitor—but this is in fact the sort of note that many keen CW operators prefer as they find it less fatiguing when used for long operating sessions than the pure tone of a sinewave oscillator. R1, C1 determine the frequency of oscillation so the value of these components may be changed if a different note is preferred—increased R or C will lower the note and *vice versa*.

The sawtooth from across C1 is then coupled to TR2 which is a small signal type silicon NPN transistor connected as a common emitter amplifier to give a few milliwatts of AF power output. Despite this low power level, when using the specified balanced armature 'loudspeaker', there is more than enough sound output

for use in a relatively quiet indoor shack. Some extra output could of course be obtained by using a more efficient transducer with accurate matching. However the additional expense is hardly warranted for such a simple design as this, and it would be more realistic to use a much larger amplifier when operating in a noisy location.

For normal operation the keying contacts of the monitor may



"I wonder if he's a chief whip. . . .?"

Table of Values Fig. 1

R1 = 390K	TR1 = 2N2160 or any similar UJT
R2 = 68R	TR2, TR3 = 2S104 or similar small signal silicon NPN transistor
R3, R4 = 56K	D1 = OA90 or similar
R5 = 15K	RFC = 1 mH RF choke
R6 = 4K7	LS1 = medium impedance balanced armature insert from old Pye hand mic.
RV1 = 1K log. pot.	J1 = min. closed circuit jack socket
C1 = 0.047 μ F	SW1 = single-pole on/off switch
C2, C5 = 0.1 μ F	By1 = PP3 battery or similar
C3 = 0.1 μ F d/c	
C4 = 0.001 μ F d/c	

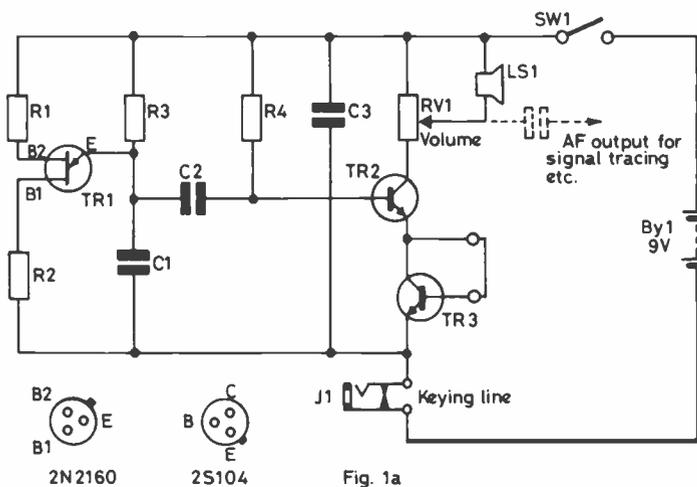


Fig. 1a

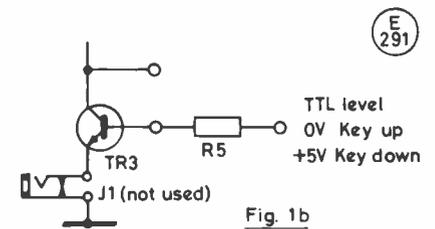


Fig. 1b

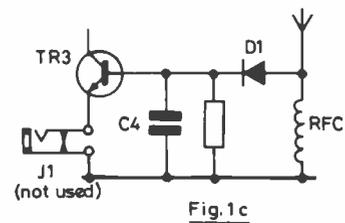


Fig. 1c

Fig. 1 MONITOR UNIT CIRCUIT DIAGRAM Showing the connections for normal use such as with a transmitter having a cathode keyed buffer amplifier. Other possible arrangements for keying the monitor are shown in Fig. 1b and 1c.

On this occasion he did. He harked members' (and the visitors') minds back to that meeting when blows were almost exchanged and blood nearly boiled (well it got as far as 209 degrees F) because those present were exactly divided in the great debate about whether or not the HF bands were played out. Then there was that hilarious occasion when Ethelbald thought a forthcoming meeting was to be about Maritime Mobile because he had heard something said on the weekly 70cm. net about High Seas. Everyone else knew it was to be about Eye Sees, meaning ICs, added Mister Chairperson.

He reminded the OMs (and YFs and YLs) present of a further funny facet of that particular meeting: the IC lecture-man who rolled up in a company car so swish that it could have contained a year's output of Silicon Valley had pleased the members by leaving for each one of them a present of a sample 16-leg beastie. But "present" was a misnomer: the beasties would not work when the members tried them out at home. "You may recall", added Mister Chairperson with a chuckle, "that Pin 15 had been neatly snipped from each of them".

"Ah, well, it was mildly educational" interjected The Man at The Club: "That was probably the first time a lot of our members had ever seen an IC at close quarters . . . they are too scared to open their Japanese black boxes and take a look inside".

A distinct rise of the ambient psychological temperature in the clubroom could be detected as the barbed shaft launched by TMC found a few targets. Silencing the dissident murmur with a lift of his hand, Mister Chairperson observed that it was about time he stopped reminiscing and that the comment made by TMC could serve as a useful first contribution to the evening's discussions. Now what had the rest of them to say? After all, it was *their* evening and anything went on Anything Goes night.

Favourite Targets

Taking the hint, Virginibus leaped quickly on to his high horse to charge into his favourite target, repeaters, Politely the meeting indicated that they had heard it all before. Equally politely Virginibus went QRT.

Now came the turn of the horny-handed son of Morse to boom forth his conviction that a man who didn't use The Code was "only half a ham". This really set *felinis domesticus* among the avians, marked by roars of dissent from the two score Class-B persons present who averred that they got on quite well without Morse, thank you very much. One of them went so far as to say that anybody who could put up with all that telegraphy racket on the so-called HF bands and all those formula QSOs with foreign bodies need his head examining (use of present participle mandatory).

"And they call them Class-A operators!" came the ruminative voice of Highly Technical Gent who, as was his wont, was occupying the back seat where the exhaust from his calabash pipe would offend the fewest numbers. He as a dedicated Class-B licensee begged to suggest that in electronic terms a Class-B system was much more efficient than a Class-A one.

With riotous assembly evidently imminent Mister Chairperson felt it to be time to cool it a bit. Could the chums turn to some other subjects so they they might by the end of the evening feel they had covered a lot of them?

Until now Old Fangler, sitting a couple of rows back, had kept his counsel and remained resolutely QRT. Older members knew he had a habit of waiting — and then wading. This he now proceeded to do.

"I heard somebody say 'formula QSOs' just now" was his opening gambit: "Whoever said they happen on the HF bands quite forgot that they are just as rife on the VHF bands — and not always with those foreign bodies I heard someone disdainfully refer to."

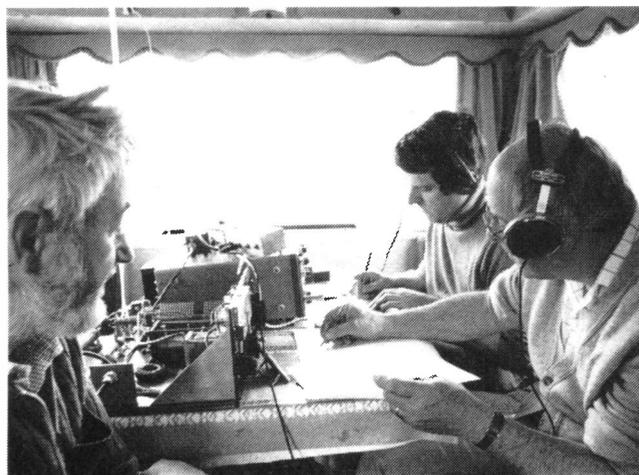
"Good stuff, Old Fangler!" roared Ethelbald in his best football terrace voice, S9-plus from somewhere halfway back in the crowded clubroom: "*Gissome more!*" You could almost hear his italics.

Old Fangler looked diffident. He reminded his hearers they they had just closed down Virginibus on account of his prejudiced remarks about repeaters which they had all heard before; he didn't, he said, feel very keen about uttering further prejudiced remarks about operating practices which, again, most present must have heard many a time and oft.

"P'raps we have, Old Fangler", soothed Mister Chairperson, adding that always in any club there were many members who *hadn't* heard it all before, who might have been absent last time operating practice was discussed, who might indeed be new members, perhaps among that flock of ex-CB operators keen to learn as much as they could now that they were *real* radio amateurs. "Yes, let's here what you have to say."

Old Fangler allowing himself to be persuaded went on to utter a rather extraordinary sentence:

"When I was driving up here, there, I was surprised to see, there, a DHSS van standing outside the next building to our clubroom here, there, and I wondered what was going on, there. I



During NFD this year, Thames Valley Amateur Radio Transmitters Society operated from the comfort and 'all mod cons' of a luxury caravan parked in a lush meadow of G3OGP's farm. Left to right: G3LHN, G3OGP and G3BPM. photo: G3JNB

approached the driver, there, and asked him, there. He told me, there, that he and his mate, there, had come up to their storeroom here, there, to collect four score of floor mops for use in the hospital down town, there."

"H'm, I think I understand what he's on about", murmured TMC.

"Very interesting, O-F. Pray proceed", invited Mister C.

Old Fangler proffered thanks to Mister Chairperson and said he *would* proceed . . . he hadn't quite finished what he wanted to say.

"Before we came up to tonight's meeting" he went on, "We asked our wife Glutina if she would like to accompany us to the Anything Goes meeting . . . we should be home by eleven o'clock, we told her."

("Our wife? Do I detect bigamy?") whispered Mister Moneybags to TMC in the next seat.)

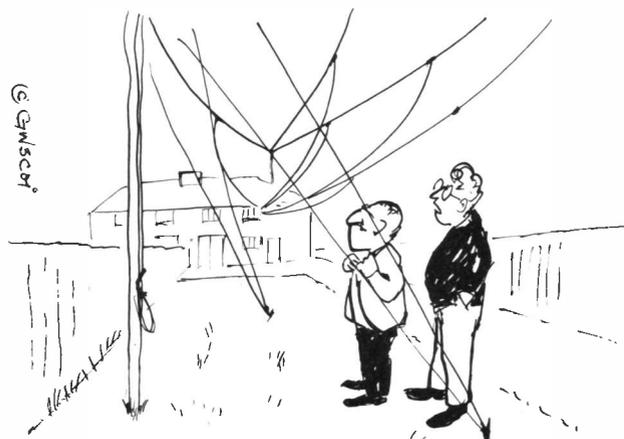
It appeared that Glutina's reaction had been a sharp one, to say the least: "What's all this *we* stuff? *You* can go if you like but

include me out" she had replied, evoking the grump from Old Fangler that, "Ah well, then, we'll have to go on our own".

"Not *we*, Old Fangler, just *you*" Glutina was alleged to have retorted: "And you can take your royal plural along with you, too!"

A Newer Voice Was Heard

As Old Fangler sat down the silence in the clubroom was such that you could have heard an 8BA nut drop. Then came a voice from somewhere near the back of the room not far from Highly Tech Gent's customary position. But it didn't belong to HTG. Nor did it sound wreathed in smoke.



"The reason I don't have a Yagi is because I think they're unsightly."

"Ah, welcome Mister Wuntyme Corkbeer!" said Mister Chairperson: "We don't often have the privilege of a contribution from you to our debates . . . now's your chance."

To many members Wuntyme Corkbeer was a bit of an enigma. He had belonged to the club for no more than a few months, saying little but listening a lot as he hovered around the conversing knots of OMs and YFs/YLs that formed up around the teabar after meetings.

Part of the enigma was his peculiar name. "Wuntyme" sounded redolent of the 11m (eleventh millenium) period of medieval jousting in the lists. Few members could bring themselves to address him by his first name. One who had tried a few months back was Virginibus. He had blushed somewhat when he had tried to address the then new member as "Wuntyme" and said he would use his initials instead. He blushed more than somewhat when in the split second he realised the *faux pas* he had made.

By now Wuntyme was on his feet keen to have a go in "Anything Goes":

"I've listened with great interest to what Old Fangler has been saying in his allegorical way" was his opening gambit, and he went on:

"I know exactly what O-F has been hinting at and that's to stop us using the word 'there' as a punctuation point when we are

talking on the air. And he doesn't like to hear an operator say 'We' when 'I' is intended. D'you know, Mister Chairperson and members, these things don't bother me at all!"

"Oh, but they bother a lot of other people" interjected TMC affably.

"Me too!" came an S9 comment from Ethelbald half way down the room: "I'm a 'me' not a 'we'."

Wuntyme Corkbeer refused to be ruffled. In his few months with the club he had learned to enjoy its lifestyle of candid comment among members, yet never a hard thought, word or deed, even though at times mayhem seemed not far off. So he felt quite confident, he said, in asserting that amateur radio anyway used such artificial and stylized forms of conversation that to say "We" and "There" was no more objectionable than the use of the Q-code on telephony.

"Amen to that . . . see you further down the dog, as the big flea said to the lesser flea" came from Highly Technical Gent between puffs at his smoking saxophone.

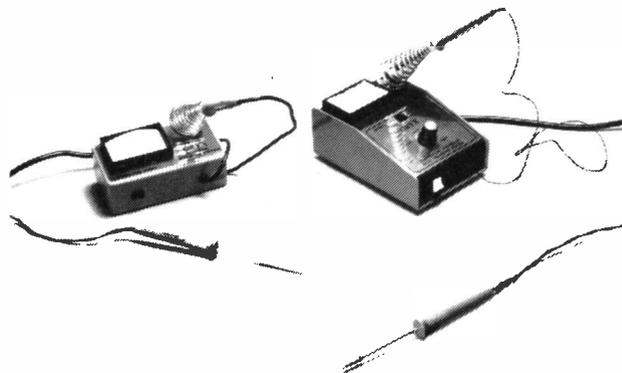
To these observations Mister Money Bags found himself totally opposed. Putting on his poshest pin-striped pontifical tone of voice he gave it as his opinion that exchanges between radio amateurs over the air should be in as plain-English as you would use over the landline telephone, or come to that, in face-to-face conversation.

("That would be one way of eliminating all the Q-code talk" murmured HTG between puffs).

It was time for Mister Chairperson to hint discreetly that, as so often happened at the annual "Ack George" the trend of discussion seemed to be running along several different and not always parallel tracks, and wasn't it nearly time for tea? (Cheers from the assembled multitude.) But a final-final thought had just occurred to him, he said: Wouldn't "Operating Practices" make a really marvellous starter to next season's calendar of meetings!

Gripping the elbow of Virginibus to steer him towards the tempting tintinnabulation of the teacups TMC said: "Time for the cup that cheers, young man — and please try this time to keep off the subject of the Boston Tea Party!"

Virginibus with a grin replied: "We'll do our best, we will, there!"



Greenwood Electronics has introduced a new range of miniature low voltage soldering irons, the Oryx Micro Series, specially designed for intricate circuit work. The range includes 5, 6, 9, 11, 12, 18 and 25 watt models, and operating voltages of 6, 12, 24 and 50 volts. A power supply station stand and cleaning facility, with optional variable temperature unit, is also available. Full information is obtainable from Greenwood Electronics, Portman Road, Reading, Berks. RG3 1NE (tel: 0734-595844).

CLUBS ROUNDUP

By "Club Secretary"

The Clip

ABERGAVENNY & NEVILL HALL is in residence every Thursday evening at Pen-y-Fal Hospital, Abergavenny, over Male Ward 2. On August 4 they will be operating GB2PYF for the Hospital Fete.

August 21 is the date for **Acton, Brentford & Chiswick**, when they will learn about the real radar experts—the bees. This will be given by G3XPC, at Chiswick Town Hall, High Road, Chiswick, London W4.

The great outdoors will beckon for **Axe Vale** on August 3 when they have a 144 MHz Foxhunt. Presumably this will start at the usual time—7.30 p.m.—from the Cavalier Hotel in West Street, Axminster, which is the club Hq. If you miss them, though, there is always September 7, when the talk will be "Your RSGB."

September 7 will be the first meeting of the new season for **Bangor** in GI. This will be the AGM and of course everyone is asked to attend. Find them at the Sands Hotel on Bangor's sea-front, the start being at 8 p.m.

For details of the **Barking** events we have to refer you to the Hon. Sec.—see Panel. However, we can say that this very active club has something going on at the Westbury School Hq most evenings.

Now we head for **Basingstoke**, which means the "Swan Inn", and the second Tuesday of each month. This Hq is in Sherbourne St. John, a nearby village. More details from the Hon. Sec.—see Panel for the needful.

Turning to **Bishops Stortford** we find them on the third Monday of the month at the British Legion club in Windhill; there is also an informal on the first Thursday of each month at the "Nags Head," Dunmow Road. For August it is traditionally all-informal, to get up to date with the year's jokes.

Braintree has its place at the Community Association Centre in Victoria Street, next door to the bus station in the centre of the town. Here they are to be found on the first and third Monday evenings; August 6 is live operating, and August 20 a computer evening.

B.A.R.T.G. covers the interests of all who operate in the RTTY mode, whether they do it mechanically or electronically—details from the Hon. Sec.—see Panel for his vital statistics.

Up at **Bury** the Mosses Community Centre is the place, each Tuesday evening—for the latest details we must pass you over to the Hon. Sec. at the address in the Secretaries Panel.

At **Cambridge** we have a letter from the Hon. Sec. of the **Repeater Group**—for details of the group and all it does in this area, contact the Hon. Sec.—see Panel. Incidentally we think this club's newsletter is one of the neatest productions to come our way for a long time, and interesting with it, even to someone who is not a repeater addict.

August 3 is quiz night at **Cheltenham**; Stanton Room, Charlton Kings Library, Cheltenham, the venue. August 17 is the date for the informal natter, and there is a hint that a treasure hunt or rally might be fixed up if weather permits. Details from the Hon. Sec.—see Panel.

Cheshunt make a thing of their evenings out /P on Baas Hill Common, which this month occur on August 1 and 29th. Natter nights at Hq are on 8th and 22nd, and an equipment evening is

marked on the calendar for August 15. The Hq as always is at Church Room, Church Lane, Wormley.

Fernleigh Centre, 40 North Street, **Chichester**, on the first Tuesday and third Thursday, gives shelter to the club meetings; this means August 7 and 16th.

A new reporter is **Chiltern DX Club** and their letter is, in the main, to advise of the operation of the GK0JFK station at the John F. Kennedy Memorial site at Runnymede during the Olympic Games. They will be active over the period Friday, August 3 to Sunday, August 5. For details of the other club activities, contact the Hon. Sec.—see Panel.

The August 2 meeting of the **Cornish** club will be on early radio and TV, and will be given by G3VWK, at the Church Hall, Treleigh, on the old Redruth by-pass. The general rule is to have a meeting on the first Thursday of each month.

At **Crawley**, the main meetings are at Trinity United Reformed Church, Ifield, with the informals at members' homes; however, for the latest dates and details we must refer you to the Hon. Sec.—see Panel.

On Saturday evening, August 18, the **Crystal Palace** group has an informal evening with test equipment; this takes place at All Saints Parish Room, Upper Norwood, London SE19, which lies at the junction of Beulah Hill and Church Road, opposite the IBA mast.

For details of the local meetings of the **Dartford Heath D/F** club, we must refer you to the Hon. Sec. The problem here is that at this time of the year their main activity is entering other club's D/F hunts with a view to places in the National Final!

Derby has its place on the top floor of 119 Green Lane, Derby, where they are to be found every Wednesday evening—details on the programme from the Hon. Sec. at the address in the Panel.

Every Monday evening seems to be the routine at **Dudley**, where the venue is the Allied Centre, Greenman Alley, off Tower Street.

Deadlines for "Clubs" for the next three months—

September issue—July 27th

October issue—August 31st

November issue—September 28th

December issue—October 26th

Please be sure to note these dates!

Our only information on **East Kent** is that they have had to cancel, for reasons outside their control, their August mobile rally; for all the details of the club we refer you to the Hon. Sec.—see Panel.

It's the second and fourth Thursday for **Edgware**, at 145 Orange Hill Road, Burnt Oak, Edgware. However in the current newsletter we only see mention of August 23, for the SSB NFD briefing.

At **Exeter** you can find the troops at the Community Centre, St. Davids Hill, Exeter, on August 13, when the Constructional Contest will be in contention—there is a cup to be won. More details from the Hon. Sec.—see Panel.

Fylde means a visit to the Kite Club at Blackpool Airport, of which they are members, and which is their Hq. They foregather on first and third Tuesdays; August 7 will be a talk on RTTY by G4RSA, and on August 21 they have the informal.

August 19 is the date for the **Glenrothes** lot, and the venue is Provosts Land, Leslie, Fife, where they will have films and then a forward planning session.

Now the **G-QRP Club** where the members are interested in low power operating and home-brewing of equipment; both interests

Names and Addresses of Club Secretaries reporting in this issue:

- ABERGAVENTNY: D. F. Jones, GW3SSY, 80 Craesonen Parc, Abergavenny, Gwent NP7 6PE. (0873 78674)
- ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, Acton, London W3 8LB. (01-992 3778)
- AXE VALE: R. H. Newland, G3VW, 'Ham House', Lyme Road, Uplyme, Lyme Regis, Dorset.
- BANGOR: S. Mackay, G4OCK, 11 Dellmount Park, Bangor BT20 4UA. (Bangor 54049)
- BARKING: R. Woodbury, G6YZV, Barking Radio Club, Westbury Recreation Centre, Westbury School, Ripple Road, Barking IG11 7PT.
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- BRAINTREE: Mrs. P. Penny, G6TAF, 13 Newnham Close, Braintree, Essex. (0376 26487)
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- CORNISH: S. Rodda, G4PEM, Cliff Hotel, Penrose Terrace, Penzance TR18 2HH. (Penzance 3948)
- CRAWLEY: D. L. Hill, G4IQM, 14 The Garrones, Worth, Crawley, W. Sussex RH10 4YT. (Crawley 882641)
- CRYSTAL PALACE: G. M. C. Stone, G3FZL, 11 Liphook Crescent, London SE23 3BN. (01-699 6940)
- DARTFORD HEATH D/F: A. R. Burchmore, G4BWV, 49 School Lane, Horton Kirby, Dartford, Kent DA4 9DQ.
- DERBY: Mrs. J. Shardlow, G4EYM, 19 Portreath Drive, Darley Abbey, Derby DE3 2BJ. (0332 556875)
- DUDLEY: Mrs. C. Wilding, G4SQP, 92 Ravenhill Drive, Codsall, Wolverhampton, W. Midlands WV8 1BW. (Codsall 5636)
- EAST KENT: S. Alexander, G6LZG, 66 Downs Road, Canterbury, Kent. (Canterbury 68913)
- EDGWARE: J. Cobley, G4RMD, 4 Briars Close, Hatfield, Herts. (Hatfield 64342)
- EXETER: R. Tipper, G4KXR, 11 Chancel Court, Chancel Lane, Pinhoe, Exeter. (Exeter 68065)
- FYLDE: H. Fenton, G8GG, 5 Cromer Road, St. Annes, Lytham St. Annes, Lancs. FY8 3HD.
- GLENROTHES: A. Givens, GM3YOR, 41 Veronica Crescent, Kirkcaldy, Fife KY1 2LH. (Kirkcaldy 200335)
- G-QRP CLUB: G. C. Dobbs, G3RJV, 17 Aspen Drive, Chelmsley Wood, Birmingham B37. (021-770 5918)
- GREATER PETERBOROUGH: F. Brisley, G4NRJ, 27 Lady Lodge Drive, Orton Longueville, Peterborough. (0733 231848)
- HARLOW: Mrs. P. Bell, G4KVR, 11 Ram Gorse, Harlow, Essex.
- HARROW: D. Atkins, G8XBZ, 25 Maxwell Close, Rickmansworth, Herts. (0923 779942)
- HASTINGS: D. Shirley, G4NVQ, 93 Alfred Road, Hastings, Sussex. (Hastings 420608)
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- HEREFORD: F. E. G. Cox, G3WRQ, 35 Thompson Place, Hereford. (Hereford 54064)
- HORNSEA: N. A. Bedford, G4NHP, 39 Hamilton Road, Bridlington, Yorks. YO15 3HP.
- INVERNESS: D. E. Jones, GM4SXD, Beacham, Farr, Inverness, IV1 2XF. (Farr 08083) 240)
- IPSWICH: J. Tootill, G4IFF, 76 Fircroft Road, Ipswich, Suffolk IP1 6PX. (0473 44047)
- I.R.T.S.: S. Nolan, EI7CD, 68 Ratoath Estate, Ratoath Road, Dublin 7.
- LEITH (Nautical College): Ms. S. Beech, GM4SGB, c/o Halls of Residence, Leith Nautical College, 24 Milton Road East, Edinburgh EH15 2PP.
- LINCOLN: Mrs. P. G. Rose, G4STO, Pinchbeck Farmhouse, Mill Lane, Sturton-by-Stow, Lincoln LN1 2AS. (Gainsborough 788356)
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- MIDLAND: N. Gutteridge, G8BHE, 68 Max Road, Quinton, Birmingham B32 1LB. (021-422 9787)
- NENE VALLEY: L. Parker, G4PLJ, 128 Northampton Road, Wellingborough, Northants NN8 3PJ.
- NORTH DEVON: H. G. Hughes, G4CG, Crinnis, High Wall, Sticklepath, Barnstaple, Devon EX31 2DP.
- R.A.I.B.C. Mrs. F. Woolley, G3LWY, 9 Rannoch Court, Adelaide Road, Surbiton KT6 4TE.
- REIGATE: C. S. Barnes, G8FEE, 25 Hartswood Avenue, Woodhatch, Reigate, Surrey RH2 8ET.
- ROYAL NAVY: M. Puttick, G3LIK, 21 Sandyfield Crescent, Cowplain, Portsmouth, Hants. PO8 8SQ. (Waterlooville 55880)
- SEFTON: M. Webb, G6ICR, 33 Belle Vue Road, Gateacre, Liverpool L25 2QD. (051-487 0756)
- SOUTH BRISTOL: L. Baker, G4RZY, 62 Court Farm Road, Whitchurch, Bristol, Avon BS14 0EG.
- SOUTHDOWN: T. Rawlance, G4MVN, 18 Royal Sussex Crescent, Eastbourne.
- SOUTHGATE: R. Snary, G4OBE, 12 Borden Avenue, Enfield, Middx. EN1 2BZ.
- SOUTH MANCHESTER: D. Holland, G3WFT, 32 Woodville Road, Sale, Greater Manchester. (061-973 1837)
- STOCKTON: J. A. Walker, G6NRY, 7 Widdrington Court, Stockton-on-Tees, Cleveland TS19 8UF.
- SURREY: R. Howells, G4FFY, 7 Betchworth Close, Sutton, Surrey SM1 4NR. (01-642 9871)
- SUTTON & CHEAM: J. Korndorffer, G2DMR, 19 Park Road, Banstead, Surrey.
- THANET: I. B. Gane, G4NEF, 17 Penshurst Road, Ramsgate, Kent. (Thanet 54154)
- TORBAY: Mrs. M. Rider, 7 Kingston Close, Kingskerswell, TQ12 5EW.
- TODMORDEN: Ms. J. Gamble, G6MDB, 283 Halifax Road, Todmorden, Lancs. OL14 5SQ.
- VALE OF WHITE HORSE: J. White, G3SEK, 52 Abingdon Road, Drayton, Abingdon, Berks. (0235 31559)
- VERULAM: H. Clayton-Smith, G4JKS, 115 Marshalswick Lane, St. Albans, Herts. (St. Albans 59318)
- WELLAND VALLEY: A. Faint, G4TZY, 33 Fairway, Market Harborough, Leics. LE16 9QL. (0858 62827)
- WORTHING: E. Sandaver, G4KIT, 33 North Farm Road, Lancing, BN15 9BT. (0903 766318)
- YEOVIL: E. Godfrey, G3GC, Dorset Reach, 60 Chilton Grove, Yeovil, Somerset BA21 4AW. (0935 75533)
- YORK: K. R. Cass, G3WVO, 4 Heworth Village, York.

are catered for, in particular by the newsletter *Sprat* — no prizes for guessing how its name is derived! Details from the Hon. Sec. — see Panel.

August 23 is a special meeting at **Greater Peterborough**, with details to be advised; thus we have to refer you to the Hon. Sec. for the details of what happens on this date, and where.

Next we come to **Harlow**, which is based on Mark Hall Barn, First Avenue, Harlow, Essex, and have weekly gatherings there. All the details from the Hon. Sec. — see Panel.

At **Harrow** the form is to meet every Friday at Harrow Arts Centre, High Road, Harrow Weald; all the meetings in August are informals, and either in the Roxeth or the Belmont Room. Among the excellent articles in the newsletter we notice one from Stephanie, G6PFZ, on getting XYLs interested in amateur radio.

Hastings have lots of meetings: the third Wednesday in the month is the main meeting, at West Hill Community Centre, while on Tuesdays and Fridays they are to be found at Ashdown Farm Community Centre, the latter being the weekly chat night.

The **Havering** programme shows a change to the meeting on August 1, which was still to be finalised when they wrote; August 8 and 29 are informal, and on August 15 the speaker will be

rummaging in his (mental) junk-box, saying "I'm sure I had one somewhere!" Finally August 22, which is a pre-contest briefing and informal. Venue is Fairkytes Arts Centre, Billet Lane, Hornchurch.

Hereford has an "Outside QSO Party" at Westhope Hill on August 3, but has yet to finalise the details for August 17, which we assume will be taken at County Control, Civil Defence Hq, Gaol Street, Hereford.

Hornsea is at The Mill, Mill House, Atwick Road, Hornsea, every Wednesday evening, and tries to have something set up for every meeting; however, it seems to be a blank calendar for August which probably means they do as so many clubs do in August — run informals for the few at home and relax!

The Hq of the **Inverness** club is now at Planefield Road, Inverness, where they get together every Thursday evening. More details from the Hon. Sec. — see Panel for his details.

It's all planning for **Ipswich**; on August 8 for their Carnival entry, on August 11 the actual Carnival station, then on August 29 the planning for SSB NFD. All are at the "Rose & Crown," 77 Norwich Road, at the junction with Bramford Road.

I.R.T.S. is the Irish national society; anything you want to

know about clubs in Eire, and how to join them, is almost certainly obtainable from the I.R.T.S. Hon. Sec. — *See Panel* for his details.

As far as **Leith Nautical College** is concerned, there will be no meetings until the end of September when the terms starts again. Doubtless we shall hear something of the new term from the Hon. Sec. — *see Panel* — in due course.

It's the second and fourth Wednesday of the month at **Lincoln**, with the remaining Wednesday evenings at the same venue used for RAE and Morse classes. All are at the City Engineers' Club, Central Depot, Waterside South, Lincoln. More details from the Hon. Sec.

August 3 sees a talk at **Medway** on satellite working by G8XLH, and on 17th the same person will demonstrate operation through a satellite; both talks are at an unspecified venue; back to the Hon. Sec. — *see Panel!*

The **Midland** club has gone from strength to strength since the days of the Digbeth Institute, and now has some 217 paid-up members, who congregate at the club Hq, 294A Broad Street, Birmingham; August 21 is a special discussion.

At the "Dolben Arms" pub, Finedon, near Wellingborough, the members of the **Nene Valley** crowd foregather each week. August 1, 22 and September 5 are all natter sessions, and on August 8 G8AFN will talk about the solar factual data. He is followed by G4ENB, who will talk about SS/TV, both colour and B/W; and on August 29, G4BAO will talk about Six Metres.

It is always the fourth Wednesday for the **North Devon** chaps; on the even months they are at Pilton Community Centre, Barnstaple, and on the odd ones it is Bideford Community College, Abbotsham Road, Bideford.

The **R.A.I.B.C.** full members are invalid or blind; the supporter and representative members are those who find the time, one way or another, to be available if required to help out in the matter of raising funds, putting up aerials, reading the magazine on to tape, or whatever. Details from the Hon. Sec. — *see Panel*.

Turning to **Reigate** we see the Hq is still at the Constitutional and Conservative Centre, Warwick Road, Redhill, Surrey, where the group is to be found on the third Tuesday of each month.

The **Royal Navy** club is open to all those who are present or retired members of RN or MN, or of foreign navies. Details from the Hon. Sec. — *see Panel*.

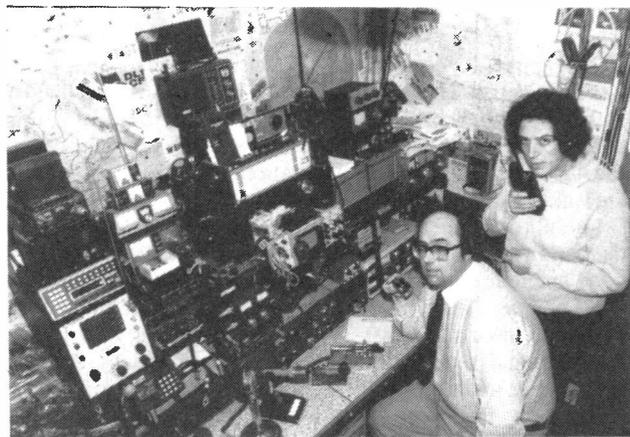
The **Sefton** club has itself a problem; they have been asked to run a special-event station at the International Garden Festival between the beginning of June and mid-October, with GB1IGF, GB2IGF and GB6IGF as the calls. They reckon on some 6000 QSOs, all to be QSL'ed, and would appreciate any help or sponsorship in their task. Details from the Hon. Sec. — *see Panel*. As for the club, they are in session on alternate Wednesdays at the Walton Prison Officers Club, Hornby Place, Walton, Liverpool.

Every Wednesday evening the **South Bristol** club members head for the Whitchurch Folk House, East Dundry Road, Whitchurch, Bristol; August 1 is a talk on digital techniques, and August 8 a "Pocketfone Rally". August 15 is VHF CW activity night, and on 22nd the club VHF DX contest ends. August 29 is a QRO activity night and on September 5 they have the AGM.

At **Southdown** there seems to be a hint of a change of Hq in the wind; perhaps therefore it would be wise to check with the Hon. Sec. — *see Panel* for his address — before turning up on the first Monday of the month at Chaseley Home for Disabled Ex-Servicemen, Southcliffe, Eastbourne.

Now for **Southgate** the big thing is the Mayor's Appeal; both Mayor and Mayoress of Enfield are radio amateurs, and it is intended to use this to help the Appeal. For details of all the club activities, contact the Hon. Sec. — *see Panel*.

The **South Manchester** doings are as follows: August 3 a Top Band D/F hunt, followed on 5th by their own heat of the RSGB national event. August 10 is a "QRO Miscellany" by G2HW; all still to be finalised for the rest of the month. The Hq is, as ever, at Sale Moor Community Centre, Norris Road, Sale.



Shown here are John and Sylvia Jackson, G3TZZ and G8SZZ, who as well as being one of the increasing number of husband-and-wife radio amateur 'teams', also just happen to be Mayor and Mayoress of the London Borough of Enfield. Early next year Southgate A.R.C. will be operating special event station GB4EMC (Enfield Mayoral Charities) to assist them in raising funds for charity. *photo: G4OBE*

Stockton write to say they are based at Billingham Community Centre; the activity seems mainly to be operating the club station. For the rest of the details, try the Hon. Sec. — *see Panel*.

Surrey seems to have a barbecue on August 6, but whether it is under G4DDY's control or at his home isn't quite clear — perhaps a phone call to the Hon. Sec. is indicated.

Sutton & Cheam mentions a meeting on August 13 with the Coulsdon club — an away return quiz. That seems to be about all for August!

It's the second and fourth Tuesday of each month for **Thanet**, at the Grosvenor Club, Grosvenor Place, Margate.

Every Friday the **Torbay** gang have their informal at Bath Lane, rear of 94 Belgrave Road, Torquay; in addition they have a formal once a month at the same venue. The big event this time is the Torbay Rally, of which details have already appeared.

Now **Todmorden** where they have a natter session on August 6; no venue given so we must refer you to the Hon. Sec. for more information.

The regular sessions of the **Vale of White Horse** club are on the first and third Tuesday of each month, at the Landsdown Club, Milton Trading Estate, Didcot, 7.30 for 8 p.m. Details of what is to happen at the August meetings are not given.

At the R.A.F. Association Hq, New Kent Road, St. Albans, you will find the **Verulam** club, on the second and fourth Tuesday of the month; August 28 is the club's Annual Junk Sale.

New Club

This one is called the **Welland Valley**; the venue is Welland Park Community College, Market Harborough, on Monday evenings. At the time of their letter they had only had time for a couple of meetings so doubtless they are working on a programme — details from Hon. Sec. at the address in the Panel.

A new slate of officers has taken over at **West Kent** and we have to refer enquiries to the Hon. Sec. — *see Panel*.

On the first and third Wednesday of each month, the **Wirral** club has its meetings at the Guide Hut, Westbourne Road, West Kirby — the only snag is, no one will tell us *which* Wirral club it is!

Wisbech has a place at the "Five Bells", Parson Drove, every other Thursday evening. Details from the Hon. Sec.

Over to New Street, **Worcester**. Here, in the Oddfellows Club on August 6, they have the video of W5LFL in the Shuttle; in the same street is the "Old Pheasant" where they have their informal on 20th.

Change of Hq

This applies to **Worthing** which seems to have made a move to Lancing Parish Hall, South Street, Lancing, where they will gather every Wednesday evening. This spot has plenty of parking, and lies to the east of Worthing, between the sea front road and the A27, and handy for Lancing station. New members or visitors are welcome.

Useful topics are a part of good radio clubs; **Yeovil** has such a discussion on August 2, the subject being the effective operation of an amateur radio station. August 9 sees G3MYM instilling the art of making a simple short-wave receiver, and on 16th he tackles harmonic mixing. August 23 sees him discussing how to fit an amateur band into 180 degrees of bandwidth. Finally, August 30 is the natter night.

It's every Friday at **York**, at the United Services Club, 61 Micklegate, York—and, if the letters are anything to go by, a very nice bunch of members to be visited!

Finis

The bottom of the pile again, and once more we have to remind you of deadlines—they're in the 'box'—and those dates are for arrival, addressed to "Club Secretary", **SHORT WAVE MAGAZINE**, 34 High Street, Welwyn, Herts. AL6 9EQ. And, please make sure you send *all* the required primary information about your club!

Rallies

August 26, B.A.R.T.G. Rally, Sandown Park Racecourse, Esher, Surrey, 10.30 a.m. to 5 p.m., B.A.R.T.G. TU kits, etc., on sale, trade stands, refreshments, ample parking, talk-in on S22. More details from Ted Batts, G8LWY, 01-549 8253. **September 9, Telford Mobile Rally**, Telford Shopping Centre, Telford, Shropshire, doors open 11 a.m., 80 stands, restaurant, family attractions, free parking and admission. Details from G8DIR (0743-64273), G8UGL (0952-584173), or G3UKV (0952-55416); all QTHR.

Scottish Convention

This year's **Scottish Amateur Radio Convention** on **September 8** will again be held in Cardonald College, Glasgow. As well as trade stands and bring-and-buy, there will be lectures by Rev. George Dobbs, G3RJV, Chris Bartram, G4DGU, of *MuTek Ltd.*, and the HADRABS contest group. Facilities include extensive car parks, bar and restaurant. Demonstration stations will be on the air, and talk-in will be provided on S22 and the GL repeater on RB14. Doors open at 11 a.m., admission £1.00. The Convention is organised by the West of Scotland A.R.S., and more details are available from Ian McGarvie, GM4JDU, on 050581-2708.

COURSES FOR THE R.A.E., 1984-85 — a first listing

Abergavenny: Abergavenny and Nevill Hall A.R.C., course commences Sept. 11th. Full details from tutor, D. Jones, GW3SSY (tel: 0873-78674).

Borehamwood: De Havilland College, Elstree Way, Borehamwood, Herts. (01-953 6024), Tuesdays, 7-9 p.m., enrolment Sept. 10/11th 2-8 p.m., course commences Sept. 18th, lecturer G. L. Benbow, G3HB. Full details from the College.

Bradford: Bradford & Ilkley Community College, Great Horton Road, Bradford BD7 1AY (0274-753111), starting September, enrolment begins Sept. 11th. Contact tutor, P. Nurse, at the College for details.

Derby: Derby College of F.E., Wilmorton, Derby DE2 8UG (0332-73012), commencing Sept. 19th, enrolment Sept. 10/11th. For further details, contact the course tutor, F. Whitehead, G4MLL, at the College.

Farnborough (Hants.): The Wavell School, Lynchford Road, Farnborough, Hants., commencing Sept. 17th. Ring 0252-518305 for enrolment details.

Hemel Hempstead: Dacorum College, Marlowes, Hemel Hempstead (0442-63771), Wednesdays, 6.30-9 p.m. (and Tuesdays, 6.30-9 p.m. if there is enough demand), starts Sept. 26th, enrolment Sept. 10th. Course tutor, C. B. Burke, B.Sc., G3VOZ. Further details from the College.

Leamington Spa: Mid-Warks. College of F.E., (Dept. of Eng.), Warwick New Road, Leamington Spa CV32 5JE, course begins in September, enrolment Sept. 6/7th. For more details contact Mr. C. Evans at the College, on 0926-311711 ext. 258.

London (Chingford): Friday Hill House, Simmons Lane, Chingford, London E.4, Thursdays, 7.30 p.m., commences Sept. 13th, enrolment on first night; tutor Alan Foss, G8EAY. Further details from the above address, or ring 01-529 3380.

London (Hackney): De Beavor Evening Institute, Tottenham Road, Dalston, London N.1, Wednesdays, 7.30 p.m., begins Sept. 24th, enrolment week commencing Sept. 17th, 7-9 p.m. Course tutor T. C. Clark, G4BZW, QTHR (01-249 1843).

London (Hendon): Williams Building, Hendon College of F.E., The Burroughs, London NW4 4BT, Tuesdays, 7.15-9.15 p.m., enrolment Sept. 12th 2-8 p.m.; tutor Tony Essex, G8WCX.

London (Paddington): Paddington College, 25 Paddington Green, London W2 1NB, classes twice weekly commencing September, enrolment Sept. 10/11/12th, 1-4 p.m. and 6-8 p.m. Course tutors David Peace, G4KKM, and David Hunt, G6MFR. For more information contact David Peace at the College, on 01-402 6221 ext. 54.

Loughborough: Loughborough Technical College (Dept. of Elec. Eng.), Radmoor, Loughborough, Leics. LE11 3BT (0509-215831), Tuesdays, 6-7 p.m. (Morse) and 7-9 p.m. (Theory), commencing Sept. 11th. Course fee £7.30 (Morse) and £15.90 (Theory). Tutor Doug Doughty, G3FLS.

Manchester (Swinton): Pendlebury High School, Cromwell Road, Swinton, Mondays, 7.30 p.m., instructor P. Whatmough, G4HYE; also Morse class, Tuesdays, 7.30 p.m., instructor W. Stevenson, G4KKI. Full details from G4HYE (061-794 3706), or from Swinton A. E. Centre (061-794 5798).

Nottingham: Arnold and Carlton College of F.E., Digby Avenue, Mapperley, Nottingham NG3 6DR (0602-876503), Wednesdays, 7 p.m., commencing Sept. 19th, for May exam.; crash course for December exam. Thursdays at 6.30 p.m., commencing Sept. 20th. The College also offers other Radio Courses. Enrolment for all classes Sept. 11/12th, 2-8 p.m. Contact the College for further information.

Slough: Langley College of F.E., Station Road, Langley, Slough SL3 8BY (0753-49222), Thursdays, 5.30-7 p.m. (Operating Techniques), Thursdays, 7-8.30 p.m. (Morse), Wednesdays, 7-9 p.m. (Theory), enrolment Sept. 11th, 12-8 p.m. and Sept. 12th, 12.30-8 p.m. Further details from the tutor, A. J. Parcell, G8BIX, at the College.

Walsall: Walsall College of Technology, St. Paul's Street, Walsall WS1 1XN, enrolment Sept. 4/6/10th, course fee £22. Further information from course tutor, Frank Fear, on Aldridge 52706.

Welwyn Garden City: De Havilland College, Applecroft Centre, Applecroft Road, Welwyn Garden City, Herts., Thursdays, 7-9 p.m., commencing Sept. 20th, enrolment Sept. 10/11th, 2-8 p.m. at De Havilland College, The Campus, W.G.C. (tel: W.G.C. 26318/31344).

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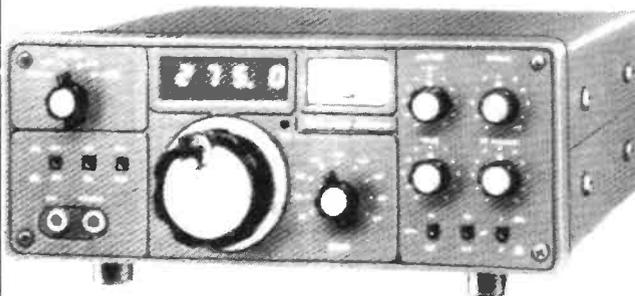
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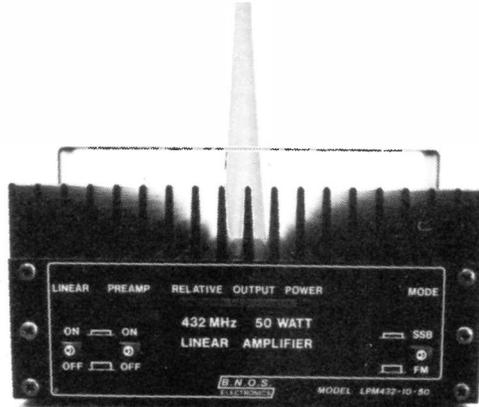
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