JUNE, 1961

RSGB BULLETIN

VOL. 36, No. 12

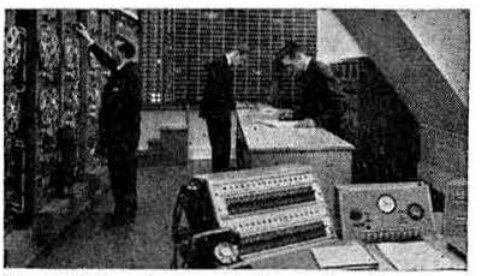
'New sounds for old'

BBC choose Emitape

The BBC Radiophonics Section, at Maida Vale, produces any kind of noise a sound or TV broadcast could ever want; sounds to menace, soothe, exhilarate . . . everything from space travel to Gooery. Their tools are natural sounds, frequency manipulation, and miles and miles of Emitape.

Here the sound of the mijwiz, an Arabian double-reed pipe, is recorded. Later, it will be treated electronically in the Radiophonics Workshop to create unusual effects.

The Radiophonics people make their effects from 'white noise'—every frequency from zero to infinity sounded simultaneously. Emitape records it unflinchingly, and it is finally edited to produce the desired result. Frequencies are flattened, sharpened, added, removed. Emitape thrives on it all to make effects as far removed from the galloping coconuts era as the Comet from Bleriot.



The BBC rely on Emitape for the great majority of their recordings. Standards must be high. One recording fault could mean dozens of complaints.

Emitape used by the BBC 9 times out of 10

EMI EMITAPE DIVISION, EMI Sales & Service Ltd, Hayes, Middlesex

ET12

Volume 36 No. 12

June 1961

2/6 Monthly

R.S.G.B. BULLETIN

CONTENTS

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AERIAL EQUIPMENT

TWIN FEEDER: 300 ohm twin ribbon feeder, similar K25, **6d.** per yard. K35B Telcon (round), **1/6** per yard. Postage **1/6** any length.

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OB2	17/6	6AK5	8/0	6L1	23/3	9D2	4/0	1487	27/10	80	9/0	DL68	15/0	ECL80	9/0	EZ80	7/0	PCC85	9/6	SP61	3/6	UF80	10/6
OZ4GT	5/0	6AL5	4/0	6L6G	8/0	10C1	13/0	19AQ5	10/6	83	15/0	DL92	7/0	ECL82	10/6	EZ81	7/0	PCC88	18/0	SU25	26/6	UF85	9/0
1A5	6/0	6AM6	4/6	6L7GT	7/6	10C2	26/6	19H1	10/0	85A2	25/0	DL94	7/6	ECL83	19/3	FC4	15/0	PCC89	11/6	T41	9/0	UF86	17/11
1A7GT	12/0	6AQ5	7/6	6L18	13/0	10F1	26/6	20D1	15/3	150B2	15/0	DL96	8/6	EF22	14/0	FW4/800	8/6	PCF80	8/0	TP25	15/0	UF89	9/0
1C5	12/6	6AT6	7/0	6N7	8/0	10F2	26/6	20F2	26/6	185BT	33/2	DLS10	10/6	EF36	4/0	GZ30	9/0	PCF82	10/6	U12/14	8/6	UL41	9/0
1D6	10/6	6AU6	10/0	6P25	12/6	10P14	19/3	20L1	26/6	807	7/6	DM70	7/6	EF37A	8/0	GZ32	10/0	PCF86	15/0	U16	10/0	UL44	26/6
1G6	17/6	6B8	4/6	6P28	26/6	10P13	15/0	20P1	26/6	956	3/0	EA50	2/0	EF39	5/6	GZ34	14/0	PCL82	10/0	U18/20	8/6	UL46	14/6
1H5GT	10/6	6BA6	7/6	6Q7G	6/6	11E3	15/0	20P3	23/3	4033L	12/6	EA76	9/6	EF40	15/0	HL2	7/6	PCL83	10/6	U19	36/0	UL84	8/6
1L4	3/6	6BE6	6/0	6R7G	10/0	12A6	5/0	20P4	26/6	5763	12/6	EABC80	9/0	EF41	9/0	HL23DD	7/6	PCL84	12/6	U22	8/0	UY21	16/7
1LD5	5/0	6BG6G	23/3	6SA7GT	8/6	12AC6	15/3	20P5	23/3	7193	5/0	EAC91	4/6	EF42	10/6	HN309	24/7	PEN25	4/6	U25	17/11	UY41	7/6
1LN5	5/0	6BH6	8/0	6SC7	7/6	12AD6	17/3	25A6G	10/6	7475	7/8	EAF42	9/0	EF50(A)	7/0	HVR2	20/0	PEN45	19/6	U26	10/0	UY85	7/0
1N5GT	10/6	6BJ6	6/0	6SG7GT	8/0	12AE6	13/11	25L6	10/0	9002	5/6	EB34	2/6	EF50(E)	5/0	HVR2A	6/0	PEN46	7/6	U31	9/6	VP4	16/0
1R5	6/6	6BQ7A	15/0	6SH7	8/0	12AH7	8/0	25Y5	10/0	9006	6/0	EB41	8/6	EF54	5/0	KF35	8/6	PL33	19/3	U33	26/6	VP13C	7/0
1S4	9/0	6BR7	23/3	6SJ7	8/0	12AH8	12/6	25Y5G	10/0	AC6PEN	7/6	EB91	4/0	EF73	10/6	KL35	8/6	PL36	12/0	U35	26/6	VP23	6/6
1S5	6/0	6BW6	8/6	6SK7GT	6/0	12AT6	7/6	25Z4G	9/6	ATP4	5/0	EBC33	5/0	EF80	6/0	KT2	5/0	PL38	26/6	U37	26/6	VP41	6/0
1T4	3/6	6BW7	6/0	6SL7GT	6/6	12AT7	6/0	25Z5	9/6	AZ31	10/0	EBC41	8/6	EF85	6/0	KT33C	10/0	PL81	10/6	U50	6/6	VR105	8/0
1U5	6/0	6C4	5/0	6SN7GT	5/6	12AU7	6/6	25Z6G	10/0	B36	15/0	EBC81	8/0	EF86	10/6	KT36	29/10	PL82	7/6	U52	6/6	VR150	7/6
2X2	4/6	6C5	6/6	6SQ7GT	9/0	12AX7	7/6	27SU	19/11	BL63	7/6	EBF80	9/0	EF89	9/0	KT41	23/3	PL83	9/0	U76	6/0	VT61A	5/0
3A4	6/0	6C6	6/6	6SS7	8/0	12BA6	8/0	28D7	7/0	CBL31	23/3	EBF83		EF91	4/6	KT44	12/6	PL84	12/8	U78	5/0	VT501	5/0
3A5	10/6	6CD6G	36/6	6U4GT	12/6	12BE6	9/0	30C1	8/0	CCH35	23/3		13/11	EF92	4/6	KT63	7/0	PX4	10/6	U251	14/0	W76	5/6
3B7	12/6	6CH6	9/0	6U5G	7/6	12BH7	21/3	30F5	6/0	CK506	6/6	EBF89	9/6	EF97	13/3	KT66	15/0	PY31	16/7	U403	16/7	W81M	6/0
3D6	5/0	6D6	6/6	6U7G	8/6	12E1	30/0	30FL1	10/0	CL33	19/3	EBL31	23/3	EF98	13/3	KT88	24/0	PY32	12/6	U404	8/6	X61(c)	12/6
3Q4	7/6	6E5	12/6	6V6G	7/0	12J5GT	4/6	30L1	8/0	CV63	10/6	EC52	5/6	EK32	8/6	KTW61	6/6	PY80	7/6	U801	29/10	X65	12/6
3Q5GT	9/6	6F1	26/6	6X4	5/0	12J7GT	9/6	30L15	11/6	CY31	11/0	EC54	6/0	EL32	5/0	KTW62	7/6	PY81	8/6	UABC80	9/0	X66	12/6
3S4	7/0	6F6G	7/0	6X5GT	6/0	12K5	17/11	30P12	7/6	D77	4/0	EC70	12/6	EL33	12/6	KTW63	6/6	PY82	7/0	UAF42	9/6	X76(M)	14/0
3V4	7/6	6F12	4/6	6/30L2	10/0	12K7GT	5/6	30PL1	10/6	DAC32	10/6	ECC32	5/6	EL38	26/6	KTZ41	8/0	PY83	8/6	UB41	12/0	X78	23/3
5R4GY	17/6	6F13	11/6	7B7	8/6	12K8	14/0	30PL13	16/6	DAF91	6/0	ECC33	8/6	EL41	9/0	KTZ63	7/6	PZ30	19/11	UBC41	8/6	X79	23/3
5U4G	6/6	6G6	6/6	7C5	8/0	12Q7GT	5/0	33A/158M		DAF96	8/6	ECC34	24/7	EL42	10/6	L63	6/0	QP25	14/6	UBF80	9/0	XD(1.5)	6/6
5V4G	10/0	6H6GT	3/0	7C6	8/0	12SA7	8/6		30/0	DF66	15/0	ECC35	8/6	EL81	16/7	MHD4	12/6	QS150/15		UBF89	9/6	XFG1	18/0
5Y3	6/6	6J5	5/0	7H7	8/0	12SC7	8/6	35A5	21/3	DF91	3/6	ECC40	23/3	EL84	7/6	MHL4	7/6		10/6	UCC85	9/0	XFY12	9/6
5Z3	19/11	6J6	5/6	7R7	12/6	12SG7	7/0	35L6GT	9/6	DF96	8/6	ECC81	6/0	EL91	5/0	MHLD6	12/6	RG1-240A		UCH42	9/6	XFY34	17/6
5Z4G	9/0	6J7G	6/0	7S7	9/6	12SH7	8/6	35W4	7/6	DF97	9/0	ECC82	6/6	EL95	10/6	MU14	8/0		45/0	UCH81	9/6	XH(1.5)	6/6
6A7	10/6	6K7G	5/0	7V7	8/6	12SJ7	8/6	35Z3	10/6	DH63(C)	6/6	ECC83	7/6	EM34	9/6	N37	23/3	RK34	7/6	UCL82	11/6	Y63	7/6
6A8	9/0	6K8G	6/6	7Y4	7/6	12SK7	6/0	35Z4GT	6/0	DH76	5/0	ECC84	9/0	EM80	9/0	N78	19/11	S130	22/6	UCL83	19/3	Z66	17/6
6AC7	4/0	6K25	19/11	8D2	3/6	12SQ7	11/6	35Z5GT	9/0	DH77	7/0	ECC85	8/6	EM81	9/0	N339	15/0	SP41	3/6	UF41	9/0	Z77	4/6
						12SR7	8/6	43	10/0	DK40	21/3	ECC88	18/0	EN31	37/0								
								50C5	10/0	DK91	6/6	ECF80	10/6	EY51	9/0								
								50L6GT	9/6	DK92	9/0	ECF82	10/6	EY86	9/0								
								72	4/6	DK96	8/6	ECH35	6/6	EZ35	6/0								
								77	8/0	DL33	9/6	ECH42	9/0	EZ40	7/0								

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with MOSLEY AERIALS

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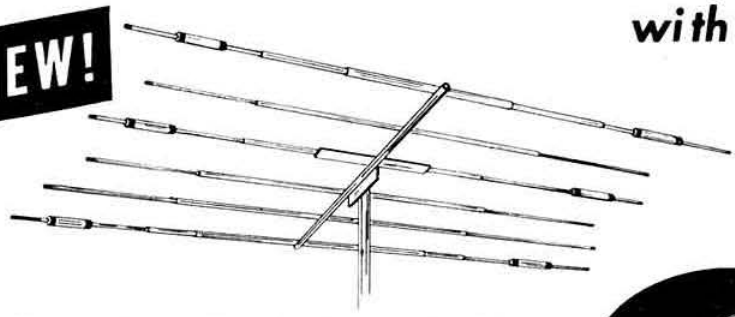
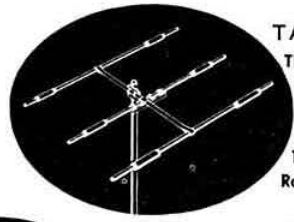
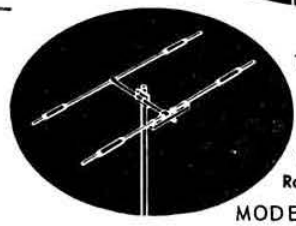


The Three Band Beam that will give your signal that DX punch . . . for 10, 15 and 20 metres. Maximum legal amateur power. Low SWR with high gain and front-to-back ratio. Fully rust and corrosion proof.

MODEL TA-36



TA-33 Jr.
Three-element rotary beam aerial.
10-15-20M.
Rated to 300W.

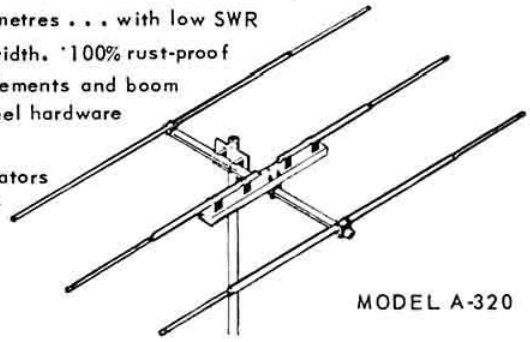


Two-element rotary beam aerial.
10-15-20M.
Rated to 300W.

MODEL TA-32 Jr.

COMMAND YOUR BAND
with a MOSLEY POWERMASTER AERIAL

For 10, 15 or 20 metres . . . with low SWR over entire bandwidth. 100% rust-proof
. . . aluminium elements and boom
. . . stainless steel hardware
. . . high impact polystyrene insulators
. . . all the finest
. . . all built to last!



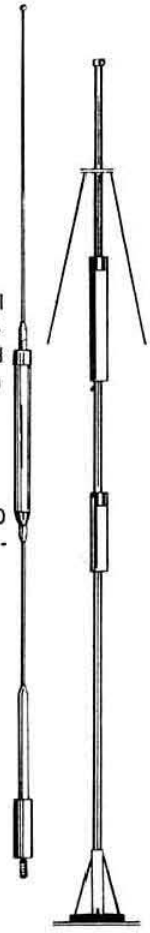
MODEL A-320

3 Band Mobile Whip Aerial for 10, 15 and 20 metre bands. Use with standard base loading coils for 40 and 80 metre operation.

MODEL MA-3

Vertical Aerial, 10 thru 40 no bandswitching is necessary.

MODEL V-4-6



V-4-6

new! 7-Band SWL/DX Dipole Kit
for 11·13·16·19·25·31·49 meters

Here's a low cost 7-band receiving dipole aerial kit that will pick up those hard-to-get DX stations. Everything included . . . just attach the wires and you're on the air! Weatherproof traps enclosed in Poly-Chem for stable all-weather performance.

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Complete with
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100 ft. of 75 ohm twin lead

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Current Comment

discusses topics of the day

Operating Practices

READING features such as *The Month on the Air* in this and other Amateur Radio magazines, listening on the bands and personal experience on the air, all provide evidence of the strange ways in which the Amateur Spirit motivates some operators at the present time. On the DX bands, pile-ups on the frequencies of stations which find their way into such listings as *DXotic Showcase* have been going on for many a year despite the oft-repeated request to call off the DX station's operating frequency. A particularly unpleasant habit is the tendency of some to call a sought-after station without actually hearing it first in the sublimely optimistic hope that they will be chosen for a reply from the screaming, howling, discordant babel that all too often greets the operator of a station in a " rare " location when he switches to receive. Some amateurs faced with such a situation have tried to deal with the baying crowds calling them, displaying a tolerance and patience of an extremely high order; others have quickly given up the fight and closed down prematurely. Either way, the number of contacts made has been less than it might have been and Amateur Radio has been the poorer.

This may sound like an attack on DX men but it is not: luckily it applies to a very few who seem to have no conception of the meaning of the Amateur Spirit. To quote article one of *The Amateur's Code* which appears in every edition of the A.R.R.L. *Radio Amateur's Handbook*, " The amateur is gentlemanly . . . he never knowingly uses the air for his own amusement in such a way as to lesson the pleasure of others." And so the vast majority are. They realize that the enjoyment of Amateur Radio as a hobby is enhanced by sharing it with others.

Bad manners on the air, as in day to day life, are quite simply lack of courtesy. But the DX frequencies are not the only place where a little more respect for other people would make our bands more pleasant. Who, for instance, has not suffered the annoyance of the " break-break " brigade who seem to think that modern techniques such as the v.f.o. and voice control make breaking into any QSO without invitation fair game. For those who doubt it, the fact remains that most amateurs enjoy person-to-person QSOs more than multiways for the simple reason that no one likes to have to wait to say his piece while four or five or more people transmit. Of course there are times when breaking into a QSO already in progress is justified but to do it as a matter of course is to be lacking in courtesy.

Another strange habit currently in vogue is the persistent omission of the national prefix in call-signs. This occurs from time to time on all amateur bands but is most prevalent on the domestic ones and is all the more difficult to understand when the average amateur's pride in his call-sign is considered. Indeed, most of us are better known by call than by name in the world of Amateur Radio. Why then do some operators use abbreviated call-signs on the air or even forget them altogether and use first names instead? Quite what the reasons are we have no idea but we do know that to listen to a station for a long time and get no clue as to its identity can be a most annoying experience. In the very worst cases call-signs are omitted altogether. Not only is this a lack of courtesy to other operators but is also a direct contravention of the terms of the Amateur (Sound) Licence. Unlike amateurs in some other countries, we are under no obligation to send the call-sign at fixed intervals of time provided it is sent at the beginning and end of each transmission (at a speed not exceeding 12 w.p.m. if c.w. is in use). But on one point the Licence is adamant: no abbreviated form of the call-sign may be used. That includes the national prefix letter or letters whether the contact is an international one or whether it is on the purely domestic bands.

The operating standards of British amateurs are amongst the highest in the world. A little more courtesy on the air will help to maintain our pre-eminent position.

J.A.R.

Two Metre N.B.F.M. Transmitter

By C. D. ABBOTT (G6TA)*

ALTHOUGH TVI is fairly difficult to overcome when using the h.f. bands, most amateurs generally discover that on 144 Mc/s the problem is easily solved by avoiding either 36 or 48 Mc/s stages in the multiplier chain, depending on the frequency of the local TV station. Unfortunately the use of amplitude modulation on this band often causes

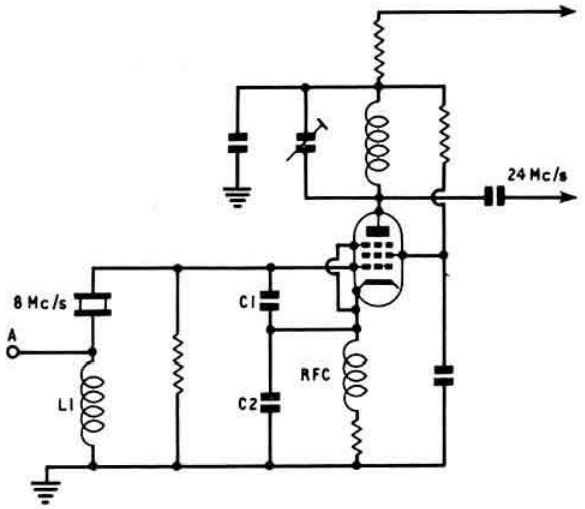


Fig. 1. Basic circuit showing method of producing n.b.f.m. using a crystal oscillator. A reactance valve modulated at audio frequencies, such as is shown in Fig. 2, is connected at point A.

trouble to nearby tape recorders, hi-fi amplifiers, record players and even deaf-aids. Although all these forms of interference can be cured the writer found that the time spent in appeasing neighbours, getting them to agree to modification of their equipment and then actually curing the trouble, meant that the time left for enjoying Amateur Radio was reduced to a negligible amount.†

The use of n.b.f.m. completely overcame all the difficulties mentioned above, and this method of transmission has been employed at the writer's station for the past two years.

It is unfortunate that very few amateur receivers are equipped with discriminators for the proper reception of f.m. signals and about an S point of signal strength is therefore usually sacrificed by having to tune to the side of the receiver's response curve. This is off-set, however, by the reduced cost of building and maintaining a higher power transmitter: an 80 watt n.b.f.m. rig is considerably cheaper than a 20 watt unit with a suitable anode-and-screen high level modulator. On the other hand if the distant receiver is equipped for n.b.f.m. the signal-to-noise ratio obtained will be far better than when a.m. is used. Experiments carried out over a 100 mile path between London and Birmingham have amply confirmed this.

Although many articles have appeared showing methods of frequency modulating v.f.o.'s the method to be described of obtaining n.b.f.m. with crystal control has not, as far as is known, been given in any of the usual text-books.

The basic circuit (Fig. 1) produces a 24 Mc/s output from an 8 Mc/s crystal. It will be appreciated that it is the normal Colpitts type, already employed at the great majority of 2m stations, with the simple addition of the coil L1. This inductance is such that when tuned with the shunt capacitance of the crystal and holder in series with C1, C2 and the input capacitance of the valve, it resonates at approximately 9 Mc/s. The frequency should be checked with a g.d.o. By listening to the eighteenth harmonic on a 144 Mc/s receiver it will be noticed that if an iron dust core is introduced into L1 the frequency will fall slowly at first and then more rapidly until the harmonic has dropped about 1 Mc/s when oscillation will cease.

From the foregoing it will be seen that the frequency of the output depends, within certain limits, on the susceptance of L1; by changing this at audio frequency n.b.f.m. can be produced. To do this a reactance valve is introduced across the coil.

Circuit Description

Fig. 2 shows the microphone amplifier and reactance valve and Fig. 3 the r.f. stages of the transmitter. From this it will be seen that many 144 Mc/s transmitters currently in use could be modified for n.b.f.m. by the addition of only two valves and their associated components in the matter of a few hours.

In Fig. 2, V1 is a 12AX7 and V2 a 6AC7. It will be noticed that the latter is bypassed for r.f. and audio frequencies. V3, V4 and V5 (Fig. 3) are all EF91's and their anode circuits are tuned by air-spaced trimmers to 24, 72 and 144 Mc/s respectively. V6 is a QV04/7 buffer amplifier which provides ample drive for the QQV06/40A final. M1 is a 0-5 mA meter and

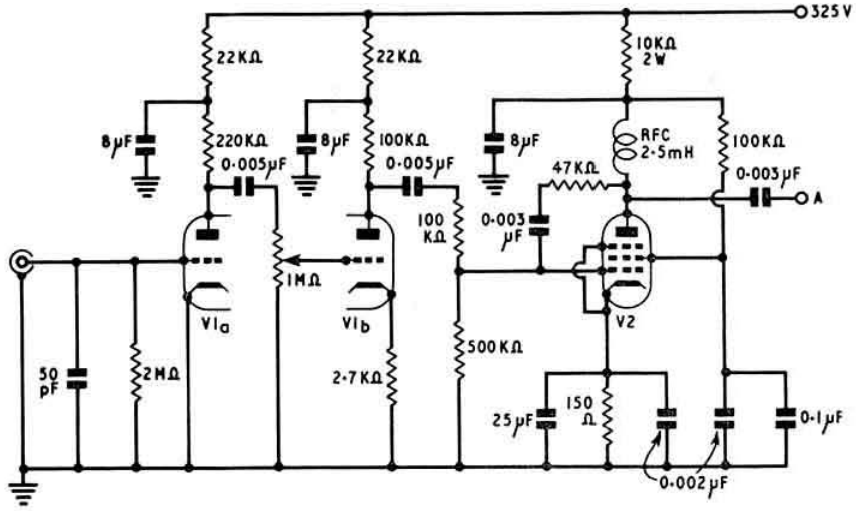


Fig. 2. Speech amplifier (V1a, b) and reactance valve V2.

* *13 Belltrees Grove, Streatham, London, S.W.16.*

† It should be noted that the Post Office does not hold the amateur responsible for interference to the types of equipment listed. —EDITOR.

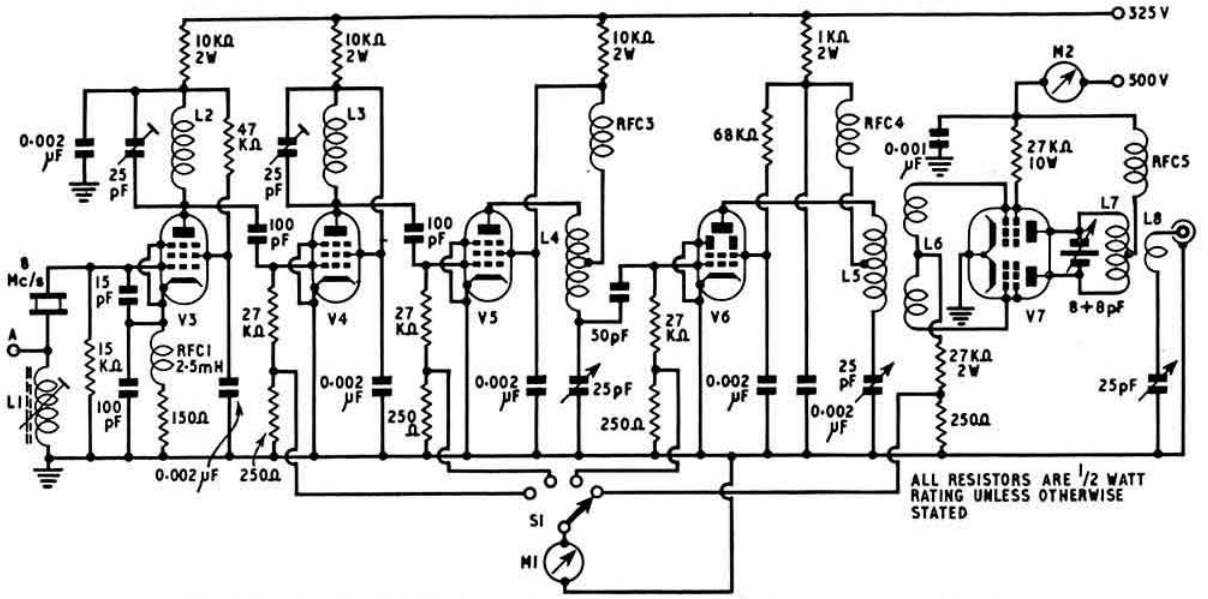


Fig. 3. R.f. stages of the n.b.f.m. transmitter described in the text. Point A is connected to point A in Fig. 2.

is normally switched to read final grid drive. M2 has a f.s.d. of 250 mA. No neutralizing of the final is necessary and no screen bypass capacitor should be used. Although not essential, the addition of a cathode follower, consisting of a 6C4 with a 1500 ohm cathode resistor, a 2 Megohm grid resistor and a 0·01 μF coupling capacitor, between V1b and V2 gives better tonal quality especially when heard on a normal receiver.

Details of all the coils are given in Table 1. As the size of L1 depends largely on the make of crystal and holder it may be necessary to increase or decrease the winding by a few turns.

Construction

It is not intended to give a detailed constructional description as most amateurs prefer to incorporate their own ideas but normal v.h.f. technique, using very short leads and non-inductive decoupling capacitors, should be employed. The whole transmitter, with the exception of the 500 volt power supply, is built on a 16 in. × 10 in. × 2 in. chassis. A cut-out screen about 4 in. × 3 in. is placed across the valve-holder for V6 and soldered to pin 1, the central spigot, pin 5 and the chassis. V7 is mounted vertically through a clearance hole and its holder is sunk so that its screening disc is level with the top of the chassis. To avoid any chance of instability V1 and its associated components should be very carefully screened from the rest of the transmitter and the heater and h.t. leads to it decoupled with 0·005 disc ceramic capacitors.

Provision should be made for tuning the anodes of V6 and V7 from the front of the panel as these will have to be adjusted for any large change of frequency. The rotor of the 8 + 8 pF p.a. tuning capacitor is not earthed.

Table 1

L1, 35 turns 36 s.w.g. enam. on ¼ in. Aladdin former with iron dust core.
L2, 16 turns 24 s.w.g. enam. on ⅜ in. diam. former.
L3, 5 turns 16 s.w.g. enam. ½ in. internal diam. self-supporting and spaced to be about ⅜ in. long.
L4, 5½ turns 16 s.w.g. enam. ½ in. internal diam. as L3 but centre tapped.
L5, similar to L4.
L6, 2 plus 2 turns 16 s.w.g. enam. each 7/16 in. internal diam. and separated by about ⅜ in. so that they can be coupled very tightly to L5.
L7, 2 turns ⅛ in. diam. silver plated copper tube 1⅜ in. internal diam. centre tapped.
L8, 1 turn 16 s.w.g. enam. 1 in. internal diam.
RFC3, RFC4, RFC5, 19 in. 30 s.w.g. enam. close wound on ¼ in. diam. polystyrene former.

Alignment

L1 should be temporarily shorted and with the 500 volt supply disconnected the various tuned circuits should be adjusted for maximum grid drive to the following stages. The four positions of the switch for M1 should read approximately 1, 1, 1 and 4 mA respectively. H.t. should next be applied to the p.a. stage and its anode capacitor resonated; the coupling between L7 and L8 should be adjusted so that V7 draws about 190 mA when the output is fed into a suitable load.

H.t. should now be disconnected from all the valves except V1, V2 and V3 and the exact frequency of the signal noted on a 144 Mc/s receiver. The short on L1 is then removed and its iron dust core adjusted so that the operating frequency is 35 kc/s lower than that previously noted. The transmitter is now ready for use and the required amount of deviation may be controlled by the audio gain control in the grid circuit of V1b. Deviation will be found to be slightly greater on the lower sideband but on an f.m. receiver no distortion will be noticed. In the case of ordinary receivers the " choice " of deviation width is sometimes an advantage.

Conclusion

Two points should be borne in mind. First—the transmitter described can, of course, be used for a.m. if required. The deviation control is turned to zero and the output of a suitable modulator connected in series with the 500 volt h.t. supply to the p.a. If it is essential to transmit on the present frequency a little etching or grinding of the existing crystal will be necessary to counteract the drop of 35 kc/s.

TECHNICAL TOPICS By PAT HAWKER (G3VA)

Fact or Fiction? . High Gain Phase Splitters . Audio Compression
Squelch Circuits . Simplest S.S.B. . Diodes are Different
Product Detectors . Keys and Keyers II

RECENTLY a noticeable spirit of technical interest and experimentation has come back to the high frequency bands. Only a few years ago it seemed that all new developments were centred on the very high frequencies. Now all bands from 160 metres down have much to offer. Several reasons could be advanced to account for this marked change: the fantastic success of transistor research; the new interest in receiver construction; and the fertile fields of s.s.b./d.s.b. which are so profoundly influencing the outlook even of those who retain their carriers. Perhaps also it would not be too fanciful to suggest that the feeling is abroad that a new space age of communications is dawning.

But there are dangers as well as great advantages in the current interest in technical innovation. We need to keep a clear eye on where we are heading and whether we are really advancing or, like Alice, just running faster and faster to keep in the same place. One danger is the growth of technical myths which may in the end stultify progress rather than encourage it. An example from the recent past was the strong advocacy of series-turned oscillator circuits which tended to obscure the equally valid advantages of parallel tuned circuits. It is intended as no attack on the very real advantages of s.s.b. to suggest that one must nevertheless be wary of accepting too uncritically some of the claims made on its behalf. Most of the published analyses of the power advantages of s.s.b. over a.m. and d.s.b., for instance, are inevitably based on sine wave inputs and accurately represent the power situation in such conditions; but our vocal chords produce sounds, except when we whistle, far removed from the sine wave. The real efficiency of any telephony transmitter thus depends appreciably on the actual voice characteristics of the individual operator—or the synthetic characteristics produced by peak clipping, filtering, compression and other tricks of the audio trade. Darwin, presumably, would propound that, by the survival of the fittest, we shall eventually breed a race of amateurs speaking in square-wave pulses! The a.m. operator who looks with envy at the transmission gain of s.s.b. should not forget that he may be better placed to produce an improvement of the same general order by means of peak clipping. Then again, before writing off the d.s.b. system, it is well worth re-reading W2CRR's letter in *QST* (May 1957) in which he—as the originator of the modern d.s.b. system—was able to put up a case (though possibly with his tongue in his cheek) for claiming a 10db power advantage of d.s.b. over s.s.b. G2DAF has recently shown very clearly that the oft-quoted 9db s.s.b. advantage over a.m. is not always realized in practice, and is by no means the prime benefit of s.s.b.

Similarly, the development of simple measuring instruments has tended to make some amateurs unduly sensitive to optimum performance figures that may in fact have relatively little real communications value. Many a.m. amateurs would today hesitate to anode modulate a 100 watt transmitter with an a.f. amplifier giving a maximum output in the region of 30 watts. Yet, as W5EHC reminds us in *CQ* (March, 1961), 31·6 watts of audio would give 80 per cent. modulation and few listeners could even detect, under communications conditions, the 2db difference in speech level from 100 per cent. modulation. Again, since the introduction of simple s.w.r. meters much time may be wasted in seeking unity s.w.r. with little or no practical effect on transmission line losses.

In so many matters relating to signal levels it is vital to remember that the ear has a roughly logarithmic and not a linear response: 200 watts looks on paper so much more QRO than the legal limit of 150 watts but represents a signal improvement of less than 1·4db. It would require extremely acute ears to detect the difference on an amateur band.

The logarithmic basis of aural perception means that radio transmitters and aerials are widely tolerant of incorrect adjustment—provided always that the error is on the right side. Under-modulation, unless very severe, will usually go unnoticed, but it needs only a little a.m. overmodulation, s.s.b. splatter or other form of spurious transmission to cause interference out of all proportion to the actual degree of error. Although one of the keenest of s.s.b. advocates, G2IG recently voiced (in an R.S.G.B. lecture) the belief that an s.s.b. transmitter can be adjusted correctly *only* with the aid of an oscilloscope. Whether you agree with this or not, it is worth remembering that the use of new systems almost always brings new responsibilities in avoiding causing harmful interference to others.

High Gain Phase Splitters

The development of two-channel audio systems for stereo reproduction has put a premium on the use of high gain audio amplifiers and phase splitters. With the low output of many high fidelity pick-ups it is clearly an economic advantage (and doubly so with stereo) to amplify the signals in as few stages as possible. Incidentally this also makes it easier to apply negative feedback because of the reduction in phase shift. Many of the same considerations apply to speech amplifiers for use with low output microphones, and it may therefore be useful to draw attention to some circuit arrangements now attracting interest in hi-fi circles. They could be of interest to operators wishing to change to a better quality microphone without fitting an additional stage in the speech amplifier.

The gain of a pentode is governed to a great extent by the value of the load into which it operates. With conventional *R–C* coupled stages there is a practical limit to the value of the load resistor because the d.c. voltage drop will bring the anode voltage well below the screen potential. This means that in practice the stage gains realized are often far below what is theoretically possible. One way of increasing voltage amplification is to operate the valve under " starvation " condition with an extremely low screen voltage which permits the load resistor to be raised considerably. The screen potential may be obtained from the cathode of the succeeding stage, sometimes in conjunction with a positive feedback loop.

An example of a 20 watt amplifier using this system appeared in *Hi-Fi News* (March, 1961), and the voltage amplifier/phase splitter part of the circuit is shown in Fig. 1. The sensitivity for 20 watts output from the pair of EL34 output valves is given as 400 mV but this could be considerably improved upon for communication purposes by reducing the amount of negative feedback.

Another way of achieving high gain is the use of a voltage amplifier in conjunction with a " bootstrap follower " phase

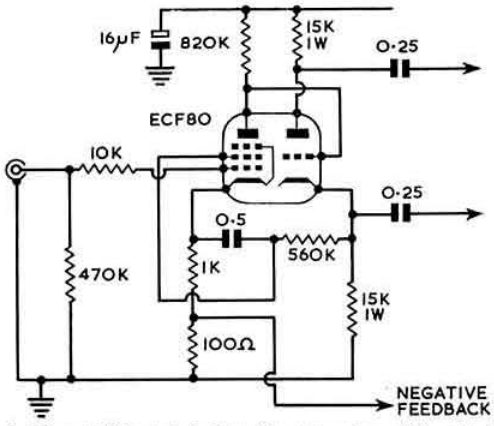


Fig. 1. Phase splitter using starvation current conditions to obtain high gain in the pentode section.

splitter. This type of phase splitter was originally developed by E. Jeffery, A.M.I.E.E. in 1947 and has recently been revived in a number of circuits: see for example " Low Cost Stereo Amplifier," *Wireless World*, April/May 1961. The basic form of this circuit is shown in Fig. 2. It provides for a far higher voltage gain to be achieved than with any of the customary amplifier/phase splitter arrangements. The reason for this is that the effective impedance of the load presented to the first pentode is many times the value of the sum of the resistors through which the direct anode current must pass. In the circuit shown the effective load on V1 is claimed to be about 6 Megohms and the voltage gain from the input terminals with 300 volts h.t. is put at over 3000.

Audio Compression

For many years, some commercial transmitters and public address amplifiers have incorporated circuits providing what is variously termed automatic level control (a.l.c.), automatic modulation control, audio compression, and " vogad " (voice-operated gain adjustment device). Basically these systems amount to an a.f. automatic volume control to hold the output of the modulator reasonably level for fairly wide variations of input; they thus eliminate the need for constant close speaking and can also be adjusted to make it impossible to over-modulate the transmitter. Almost all

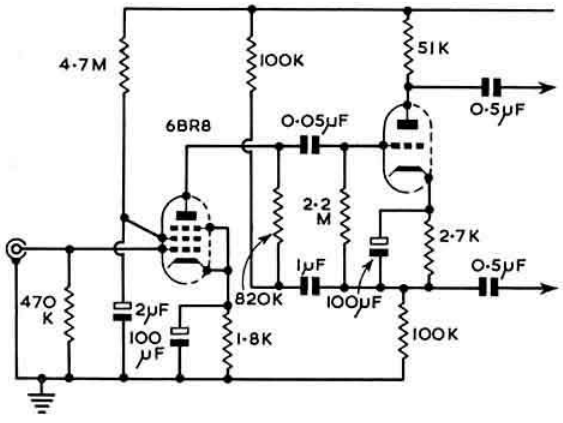


Fig. 2. The high gain Jeffery bootstrap follower phase splitter. In high fidelity work negative feedback is applied to the cathode of the pentode section.

systems rectify a small portion of the modulator output and use the negative d.c. potential obtained to control the gain of an early stage in the amplifier. As in receiver a.g.c. practice, the diode filter should have a time-constant of about the correct order; too long a time constant will cause the compression to last too long; too small a one would render the control action fast enough to cut out normal variations in speech volume.

An example of an a.l.c. circuit used on a small v.h.f. commercial transmitter (from *V.H.F. Radio Manual* by P. R. Keller) is shown in Fig. 3. Part of the audio output is coupled to the rectifier valve, V2, producing a negative bias applied to a variable slope valve, V1, in the early part of the speech amplifier. The point at which the diode conducts is determined by the setting of the potentiometer R1.

Where such circuits are used in conjunction with heavy speech clipping it is desirable that the control voltage for the a.l.c. system should be taken before clipping; with low level clipping it is possible to use a separate a.l.c. amplifier stage. Basically similar circuits are finding their way into amateur equipment (for example the new American Clegg Zeus transmitter for 50 and 144 Mc/s). An a.l.c. system forms part of the " Omnivox " control unit developed by W4PFQ (G.E. *Ham News*, January/February issue, 1961) along with

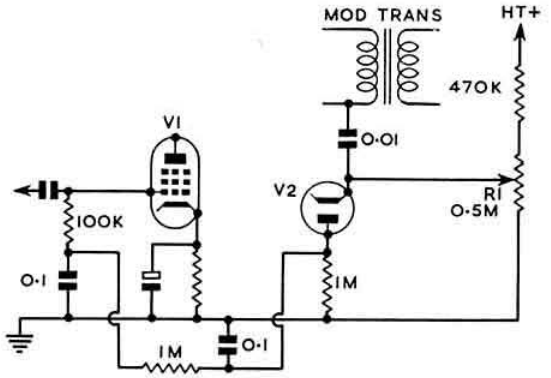


Fig. 3. Basic automatic level control arrangement to provide audio compression in a transmitter.

VOX and phone-patching circuits. A three-stage audio compression unit using transistors and including some peak clipping was described by W3LYP in *QST* (June 1959). Unlike severe audio clipping, compression appears to offer no special problems to the s.s.b. operator.

A high power modulator incorporating volume compression was described a few years ago by G3BTM (BULLETIN, October, 1956†). In this example the automatic control bias was applied to the suppressor grid of the 6SJ7 first voltage amplifier.

Squelch Circuits

With conventional two-way " simplex " communication, squelch circuits which mute the receiver in the absence of an incoming signal are of limited value. However, they are very useful for monitoring a particular frequency without the accompanying receiver noise and are also of value in conjunction with mobile and s.s.b. The very effective TNS circuit was described by G2AHL in *Mobile Column* (BULLETIN, March 1956) but some alternative circuits have been turning up recently. For instance the elaborate modification of a surplus Super-Pro receiver described by W6FHB (*CQ*, April 1961) includes an adaptation of the " codan " squelch circuit (see for example, *QST*, June 1957) using a twin-triode valve: Fig. 4. In the absence of a signal V1a

† This issue is out of print.—EDITOR

conducts and the anode current flowing through the 330K resistor causes a potential drop which is applied as negative bias to V1b. When a signal is tuned in, negative voltage derived from the receiver's a.g.c. line is applied to the grid of V1a reducing its anode current and thus permitting V1b to conduct. The switch puts the squelch circuit out of action. The threshold level at which squelching occurs can be adjusted by the 1·5 K ohms variable resistor.

A simple add-on transistor squelch circuit by W0WOM also comes from the April issue of *CQ*, see Fig. 5, and can be incorporated in almost any receiver. In the absence of a

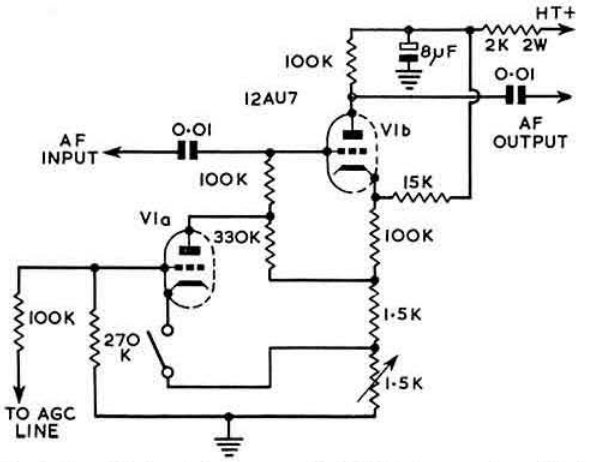


Fig. 4. Squelch circuit incorporated by W6FHB in a much modified Super-Pro.

negative potential on the receiver's a.g.c. line, the transistor acts as a short circuit across the a.f. signal path, due to the presence of a small adjustable standing positive voltage on the base. When this voltage is " bucked " by the negative a.g.c. potential the transistor changes to present a high impedance across the a.f. line and lets the signals through to the a.f. output stage. The resistor R4 isolates the receiver's a.g.c. line and its value must be determined experimentally; W0WOM says that the correct value may fall anywhere between about 22K and several Megohms.

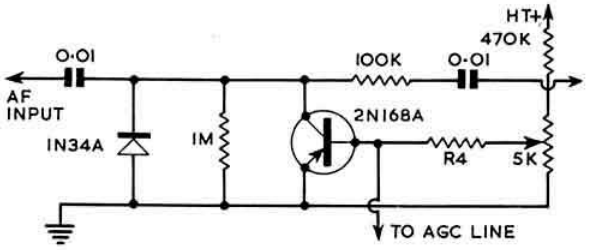


Fig. 5. W0WOM's transistor squelch switch for use in almost any receiver. Practically any a.f. transistor should prove suitable.

Keys and Keyers II

Such is the rate of progress that the potted history of Morse keys in the April *T.T.* already requires bringing up to date. Along has come (*QST*, May, 1961) a practical " Codamite key " having some 43 tiny push puttons arranged in standard typewriter keyboard layout. Just press the button and out comes a correctly formed Morse letter. But as the device requires ten transistors, three four-layer diodes, five Zener diodes, 27 ordinary diodes and a special 10-bit magnetic-core shift register, it looks as though most of us will just have to struggle along with the old pump-handles.

In connection with G3OIT's ingenious semi-automatic electronic key (*T.T.*, April), G3LST has pointed out that the suggested method of break-in operation could damage the high-speed relay contacts and possibly the receiver. In fact G3OIT is using heavy duty contacts on a QRP transmitter, so he has not run into any trouble, but other users might find it advisable to connect the key in some other manner.

Simplest S.S.B.

Ever since the introduction of amateur s.s.b. in 1948, simpler and yet simpler designs have been appearing. But surely the ultimate in this direction is the 7 watt 3·5 Mc/s " Two Tube S.S.B. Phasing Rig " by W1HIE in *The Sidebander* (February, 1961) brought to our attention by G2BVN. The phasing networks in this little rig are of the simplest fixed type with wide tolerance components and would be unsuitable for use with a wide range microphone. But with the restricted range of a carbon microphone it is claimed that it puts out a reasonably clean signal with sideband suppression varying from about 30db at 1200 c/s to 15db at 500 c/s.

The transmitter uses one half of a 12BH7 double triode as a crystal oscillator with the other half as the single stage a.f. amplifier. Four crystal diodes are used in the balanced

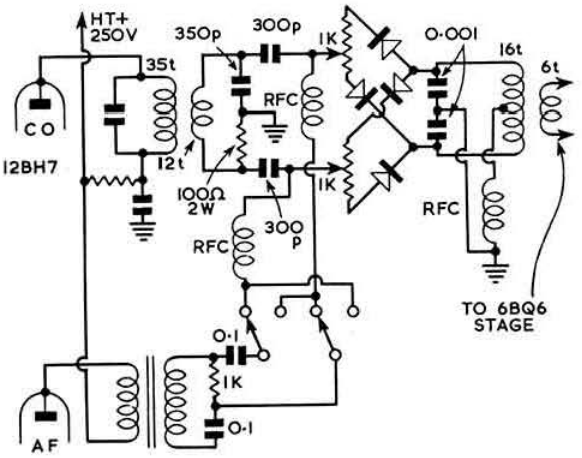


Fig. 6. The heart of W1HIE's two-valve complete s.s.b. transmitter. 1N38 or other matched diodes can be used in the balanced modulator. Phasing network values are for 3·5 Mc/s. 1000 ohm carbon potentiometers should be used for balancing. The a.f. modulation transformer should have a 600 ohm impedance output winding (ARC5 receiver output transformer).

modulator and drive a 6BQ6 output valve. Fig. 6 shows the heart of the unit, including both phasing networks. It is important to keep the oscillator output from bypassing the balanced modulator and leaking into the subsequent tuned circuits. Not even the designer makes any great claims for this rig but suggests that at least it may help some to " get their feet wet " in s.s.b.!

Diodes are Different

Several references have already been made in *Technical Topics* to the high efficiency of silicon rectifiers with the consequent low running heat which make them very attractive for receiver or v.f.o. power packs. Unfortunately, at present, silicon rectifiers tend to have rather low peak inverse voltage ratings coupled with a susceptibility to voltage surges. To overcome the low p.i.v. (usually 400 volts) it is often necessary to connect several of these silicon diodes in series.

A recent article in *Electronics World* (April 1961) draws timely attention to the need to take certain precautions when operating these diodes in this manner. These include: the need to include a protective surge resistor when using capacitor-input smoothing filters; the advisability of fusing the supply since such diodes are more inclined to short- than to open-circuit with consequent danger to the transformer; the need always to include equalizing resistors across series-connected diodes because of the wide variation found in back resistance; and the necessity even with these relatively low temperature devices to include adequate ventilation. Fig. 7 shows some of these precautions in a typical 350 volt power pack.

Although silicon diodes are not at present the cheapest

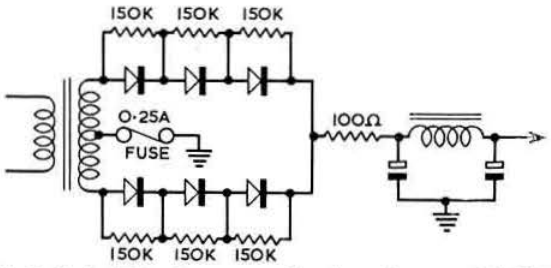


Fig. 7. Typical 350 volt power supply using series connected silicon diodes illustrating some of the precautions discussed in the text

form of rectifier they are likely to be used in increasing quantities here as in the United States. It is interesting to note that their low forward resistance enables them to be used in half-wave cascade voltage doubler circuits (see *T.T.* December 1960) with sufficiently good voltage regulation for their application to high fidelity amplifiers and other sensitive equipment. Such a power circuit is in fact used in the *Hi-Fi News* design already referred to, the author (R. Williamson) going so far as to suggest that in a few years time all other types of rectifiers will be obsolete.

Product Detectors

The conventional product detector circuits using twin triodes or 6BE6 mixer valves are well known, but the ECH81 design shown in Fig. 8 may be new to some. This combined product detector/b.f.o. appeared in *Electron* (June 1960) and a basically similar one was described in *CQ-OE* in March 1961. The Colpitts b.f.o. circuit does not require a tapped coil.

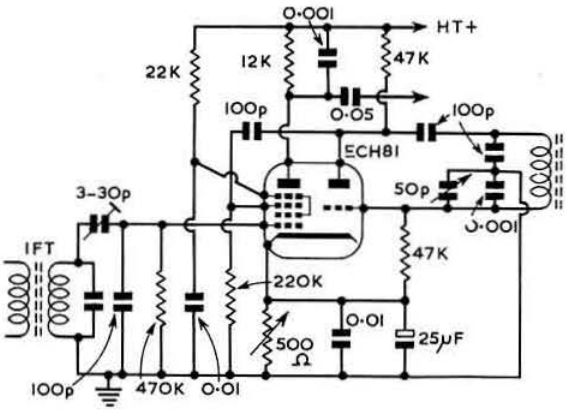


Fig. 8. ECH81 single-valve product detector.

Relatively few designs have appeared using balanced product detectors although the merits of these were described in *QST* by W6QYT as long ago as April 1948. An interesting use of this approach but for t.r.f. receivers is described by W2WBI in *QST* (May, 1961). By means of a well-balanced product detector using two 6SB7Y valves (two 6SA7 are also said to work well) it is claimed that regardless of the poor selectivity ahead of the detector a relatively simple s.s.b./c.w. t.r.f. receiver for 3·5/7 Mc/s can have a selectivity controlled almost entirely by its audio pass band and can have high freedom from blocking. Because a separate heterodyne oscillator is used on which fine tuning is carried out, it is claimed that calibration and stability of a high order are possible. The two mixer valves are connected with their signal grids in push-push and their audio output and injection oscillator grid in push-pull. The only signals present in the signal input circuits effectively detected are those that beat with the local oscillator, permitting the selectivity to be determined by an audio filter. W2WBI reports that even very strong signals adjacent to a weak signal appear only in the form of a slight background hash.

Here and There

A dodge for stripping 300 ohm ribbon feeder comes from K2OHT via *Radio-Electronics*: apply a match at the farthest point at which insulation is to be removed; then when the heat has softened the insulation, quickly pull or slide it off the wires with a pair of pliers or a piece of cloth. . . . To read indistinct valve type numbers on old glass valves try wiping them with a soft cloth and breathing on the letters. . . . An experimental Philco micro-alloy diffused-base transistor gives a 14db gain at 1000 Mc/s and will oscillate up to 5000 Mc/s. . . . Ever thought of putting out a CQ on 450,000,000 Mc/s? Optical masers (lasers) have been used for communications on frequencies of this order. . . . A " woofer " for an outdoor stero sound system in Japan is 19·5 ft. high, 8 ft. wide, 13·6 ft. deep and weighs 5,000 lb.

Retrospect—No. 4

The last of a series of edited extracts from the record of the Development of Wireless Telegraphy published in the 1922 edition of the " Year Book of Wireless Telegraphy and Telephony."

1886

A. E. Dolbear of Tufts College, Boston, U.S.A., patented a plan for establishing wireless communication by means of two elevated insulated plates but there is no evidence that the method proposed by him, did, or could, effect the transmission of signals between stations separated by any distance.

1887

In the same year as Heinrich Rudolph Hertz discovered the progressive propagation of electro-magnetic action through space, A. W. Heaviside established communication by telephonic speech between the surface of the earth and the subterranean galleries of the Broomhill Collieries, 350 ft. deep, by laying above and below ground two complete metallic circuits each about 2¼ miles in length and parallel to each other.

1889

Elihu Thompson suggested that electric waves were particularly suitable for the transmission of signals through fogs and material objects and Oliver (later Sir Oliver) Lodge observed a " coherer " action between two metal balls.

Simplified Design Procedures for Pi-Network Tank Circuits

By G. C. FOX, A.M.I.E.E. (G3AEX)*

THE design data presented in this article enables the circuit constants for pi-network tank circuits to be obtained with a minimum of calculation from a series of four charts, the capacitances being given in picofarads and the inductances in microhenrys for the amateur bands from 1·8 to 30 Mc/s. The values of C and L are calculated for a loaded Q of 12, giving a fair compromise between harmonic reduction and circuit efficiency. The dimensions and number of turns on the coil to give the required inductance may be obtained from a fifth chart which is a reprint of that in the *R.S.G.B. Amateur Radio Handbook*. Examples illustrating the use of the charts to calculate pi-section tank circuits for low and high power p.a. stages are given in Appendix 1.

The L and C charts are based upon equations from an analysis of the pi-network with its source and load resistances (Fig. 1a) in terms of the equivalent parallel tuned circuit

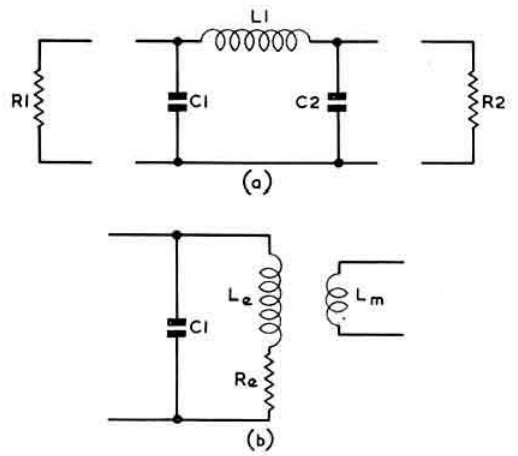


Fig. 1. Circuit of the pi-network showing components referred to in the text.

and coupling coil (Fig. 1b). The equations are given in Appendix 2 for those wishing to calculate pi-network parameters for frequencies differing from those given. They are also required for the calculation of interstage pi-coupling networks. The charts do not permit the design of interstage networks without considerable calculation which would defeat the object of the present article. However, interstage networks may be designed using the basic equations from which the charts are drawn. It should be noted that in many cases it will be necessary to design round a loaded Q greater than 12 as the circuit capacitances will tend to be greater than the values calculated on the basis of a loaded Q of 12, particularly on the higher frequency amateur bands. The use of a higher loaded Q value will increase the circuit losses which must be allowed for in determining the power output required from the driver stage.

Before using the charts it is necessary to determine the value of $R1$, the load resistance for the p.a. valve. For amateur requirements a sufficiently accurate figure can be obtained by a simple calculation using the known values of h.t. voltage and anode current to the p.a. and assuming a figure for the p.a. anode efficiency and power output. The peak r.f. voltage at the anode of a class C amplifier may be assumed to be 0·8 Vb where Vb is the d.c. h.t. voltage,

$$\text{i.e.} \quad V_{peak} = 0{\cdot}8\ Vb \qquad \ldots (1)$$

Also, assuming the p.a. valve efficiency to be 70 per cent (a reasonable estimate at the frequencies under consideration), we have

$$P_{out} = 0{\cdot}7P_{in} \qquad \ldots (2)$$

where P_{in} = power input in watts, given by $Vb \times Ia$, with Vb in volts and Ia in amperes. (The efficiency will be reduced to about 50 per cent and 30 per cent for doubler and tripler stages respectively.)

$$\text{Hence,} \qquad R1 = \frac{(V_{peak})^2}{2P_{out}} \text{ ohms} \qquad \ldots (3)$$

The output of the pi-network is usually required to match into the characteristic impedance of the coaxial cable carrying the r.f. to the aerial or other load and typical values of 50 ohms and 72 ohms for $R2$ have been selected when compiling the charts. For interstage pi-coupling networks, e.g. coupling from the anode of a buffer stage to the grid of a p.a. stage, the value of $R2$ will be given by the input impedance of the following stage. A close approximation to the required value of $R2$ under these conditions is given by $R2 = (P_{drive} \times 622 \times 10^3/I^2)$ ohms $\ldots (4)$ where P_{drive} = drive power required by the driven valve in watts and I = d.c. grid current in milliamps.

These values may be taken from the valve manufacturers' data.

If an undecoupled shunt grid resistor is used to obtain the operating bias for the driven valve, its resistance will appear in parallel with $R2$ as calculated from equation (4) and modify its value if comparable with it. There will also be an additional power loss in the grid resistor whether decoupled or not, equal to $Ig^2_{(d.c.)}\ Rg$, which must be supplied to the driver stage in addition to the r.f. circuit losses. This power loss will also be present when a separate bias supply is used and in this instance is equal to $Ig_{(d.c.)}\ Vg_{(d.c.)}$ (Ig in amperes, Vg in volts).

Having determined the values of $R1$ and $R2$, the method of using the charts is as follows:

(i) Obtain the value of $C1$ in pF from Chart 1.
(ii) Obtain the value of $C2$ in pF from Chart 2.
(iii) Obtain the value of the equivalent inductance Le in μH from Chart 3.
(iv) Obtain the value of the reflected inductance Lr in μH from Chart 4.
(v) Add the value of Le and Lr together to give the total inductance $L1$.
(vi) Determine the diameter and number of turns on the coils to give the inductance $L1$ from Chart 5, using the following method:

(a) Fix values for turns per inch of winding and also for the diameter of the coil. Where the inductance is to be constructed from heavy wire or tubing the outside diameter of the resulting inductance should be used. When hexagonal section coil former stock is to be used the effective diameter will be 90 per cent of the diameter across opposite corners.
(b) Divide the inductance in microhenrys by the square of the number of turns per inch to obtain the " one turn coil " inductance Lo in microhenrys.
(c) Enter Chart 5 from the right hand side, at the value of Lo obtained from (a), to the appropriate D

(*Continued on page 565*)

* *Member, Technical Development Sub-Committee, 66 Homemead Road, Bickley, Kent.*

CHART No. 1

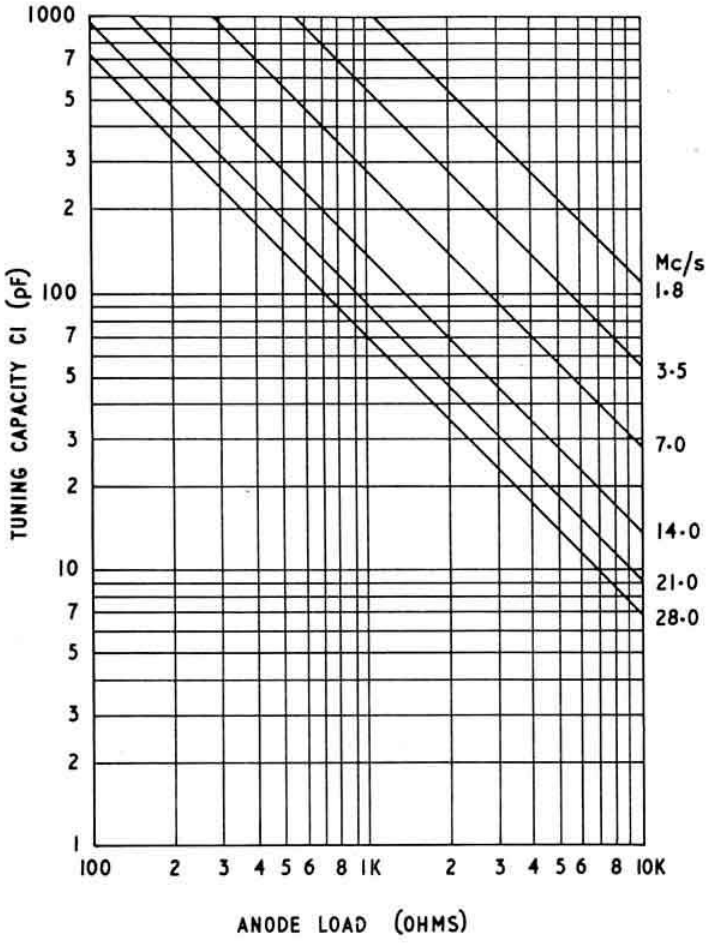


CHART No. 2

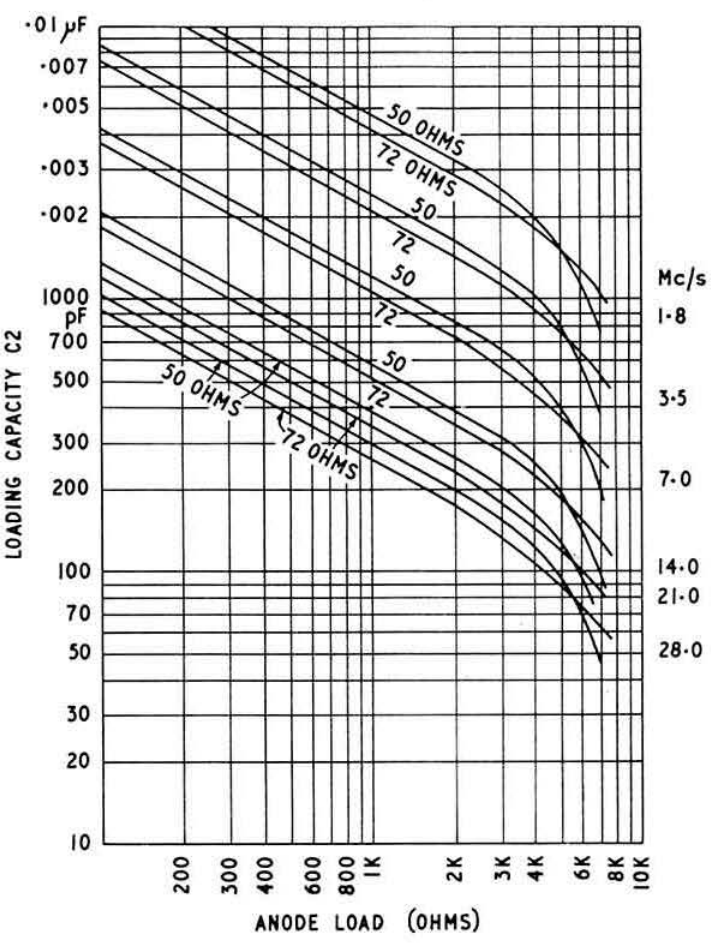


CHART No. 3

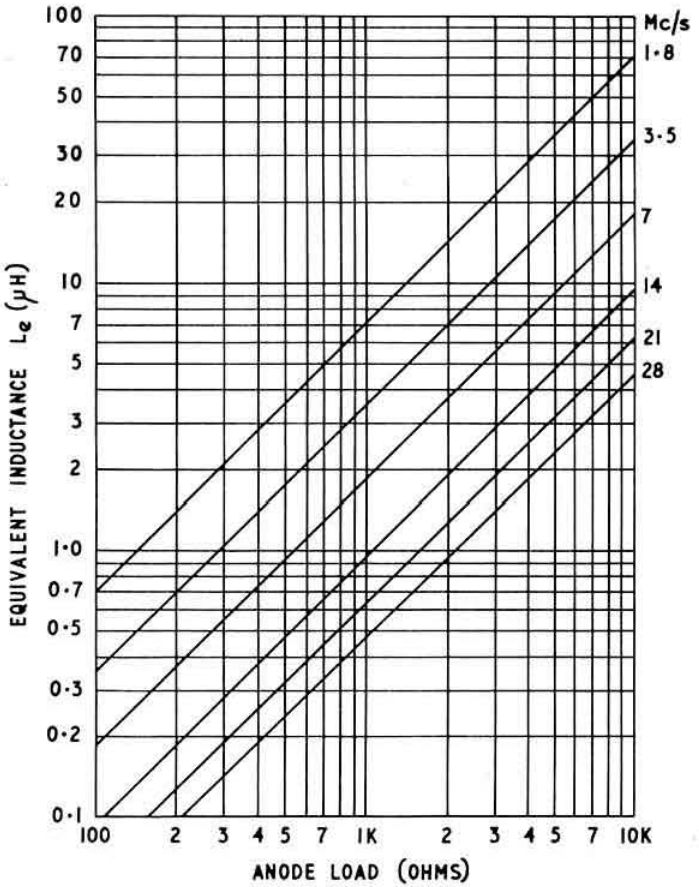
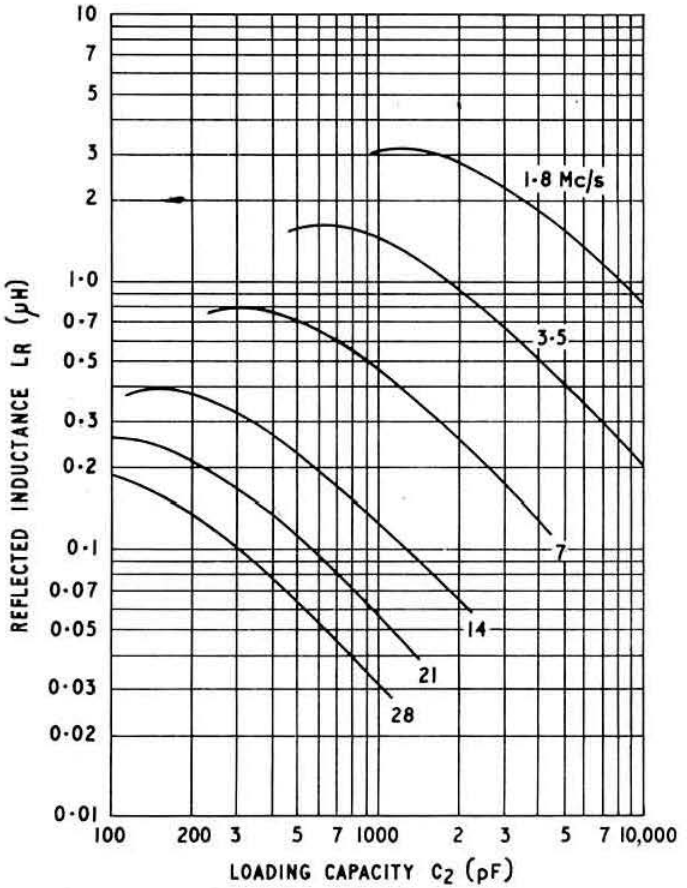


CHART No. 4



curve, and read off the length of the required coil in inches at the bottom of the chart. When interpolating the chart, remember that Log-Log axes are used.

Appendix 1

Examples of calculations using the Curves and Design Data

Example 1. Design a pi-network tank circuit for a 160m p.a. operating at 300 volts h.t. and 10 watts input, and feeding a 70 ohm coaxial line.

(*a*) To determine *R1*.

$V_{peak} = 0{\cdot}8Vb = 0{\cdot}8 \times 300 = 240$ volts.

$P_{out} = 0{\cdot}7P_{in} = 0{\cdot}7 \times 10 = 7$ watts.

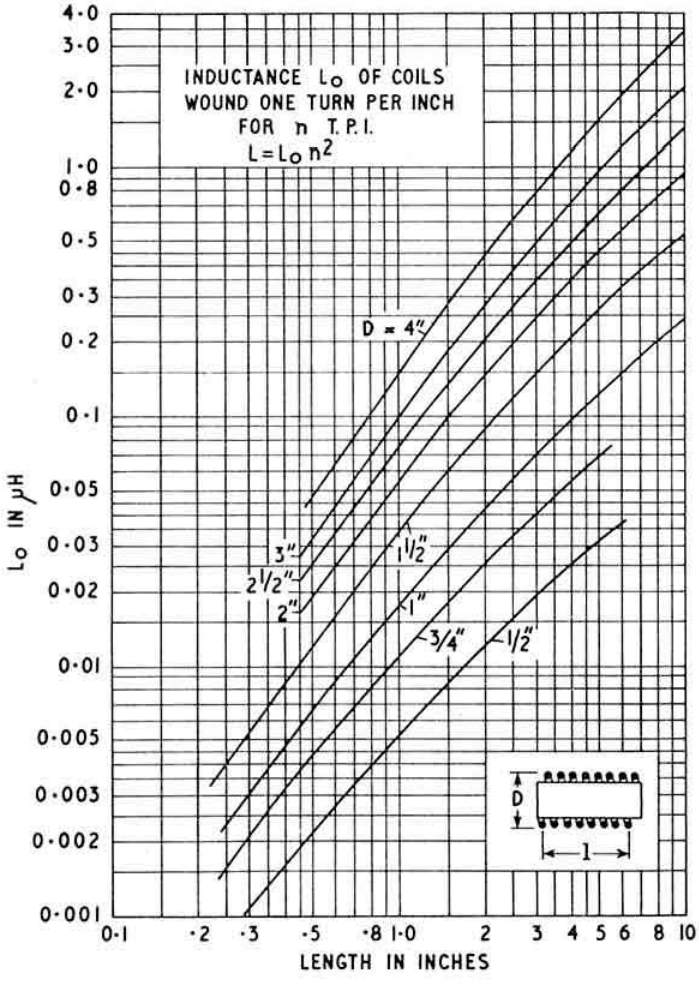
$$R1 = \frac{(V_{peak})^2}{2P_{out}} = \frac{240^2}{14} = \frac{2{\cdot}4^2 \times 10^4}{1{\cdot}4 \times 10} = 4120 \text{ ohms approx.}$$

(*b*) To determine *C1*.
From Chart No. 1. Enter chart at 4120 ohms along the bottom edge, and read off *C1 = 270* pF at the left hand edge using the 1·8 Mc/s curve.

(*c*) To determine *C2*.
From Chart No. 2. Enter at 4120 ohms along the bottom edge, and read off *C2 = 1700* pF approximately at the left hand edge using the 72 ohm curve for 1·8 Mc/s.

(*d*) To determine *L1*.

CHART No. 5



(*i*) Find *Le* from Chart No. 3. Enter chart at 4120 ohms along the bottom edge, and read off *Le* = 30 μH at the left hand edge, using the 1·8 Mc/s curve.

(*ii*) Find *Lr* from Chart No. 4. Enter chart at *C2 = 1700* pF along the bottom edge, and read off *Lr* = 2·95 μH at the left hand edge, using the 1·8 Mc/s curve.

(*iii*) Add *Le* to *Lr*; L1 = 30 + 2·95 = *32·95* μH.

(*e*) To determine suitable dimensions for *L1*.
For maximum *Q* the length of the coil should be approximately the same as its diameter, i.e. $\left\{1 < \frac{l}{d} < 1{\cdot}5\right\}$. 16 s.w.g. enamel and rayon insulated wire is selected as a good compromise between ease of winding and largest possible conductor diameter. 16 s.w.g. enamel and rayon winds 14·5 turns/inch closewound.

(*i*) To determine *Lo*.

$$Lo = \frac{\text{inductance in microhenrys}}{(\text{turns/inch})^2} = \frac{33}{(14{\cdot}5)^2} = \frac{33}{210} = 0{\cdot}157 \ \mu\text{H}$$

(*ii*) To determine winding length and diameter.
Enter Chart 5 from the right-hand edge of *Lo* = 0·157 μH. Read off length of coil = 2·2 in. along the bottom edge of the chart, using the *D* = 2 in. curve. The *D* = 2 curve has been selected because it gives the optimum shape factor referred to above.

(*iii*) To determine the number of turns on the coil.
The length of the coil is 2·2 in. and the turns/inch 14·5. The number of turns is therefore 2·2 × 14·5 = 32 turns.

Example 2. Design a pi-network tank circuit for an 80m p.a. operating at 750 volts h.t. and 150 watts input and feeding a 72 ohm coaxial line.

(*a*) To determine *R1*.

$V_{peak} = 0{\cdot}8Vb = 0{\cdot}8 \times 750 = 600$ volts.

$P_{out} = 0{\cdot}7\ P_{in} = 0{\cdot}7 \times 150 = 105$ watts.

$$R1 = \frac{(V_{peak})^2}{2P_{out}} = \frac{600^2}{210} = \frac{6{\cdot}0 \times 10^4}{2{\cdot}1 \times 10^2} = 1715 \text{ ohms approx.}$$

(*b*) To determine *C1*.
From Chart No. 1. Enter chart at 1715 ohms along the bottom edge, and read off *C1 = 320* pF at the left hand edge using the 3·5 Mc/s curves.

(*c*) To determine *C2*.
From Chart No. 2. Enter chart at 1715 ohms along the bottom edge and read off *C2 = 1500* pF at the left hand edge using the 72 ohm curve for 3·5 Mc/s.

(*d*) To determine *L1*.

(*i*) Find *Le* from Chart No 3. Enter chart at 1715 ohms along the bottom edge, and read off *Le* = 6·2 μH at the left hand edge, using the 3·5 Mc/s curve.

(*ii*) Find *Lr* = 1·2 μH at the left hand using the 3·5 Mc/s curve.

(*iii*) Add *Le* to *Lr*; L1 = 6·2 + 1·2 = *7·4 μH.*

(*e*) To determine suitable dimensions for *L1*.

(*i*) 16 s.w.g. enamel will be suitable here as the winding will not be close wound. A spaced winding of 8 turns/inch will be taken as a basis for calculation.
Again, for maximum *Q*, $1 < \frac{l}{d} < 1{\cdot}5$, ($l/d$ = length/diameter).

(*ii*) To determine *Lo*.

$$Lo = \frac{L1}{(\text{t.p.i.})^2} = \frac{7{\cdot}4}{64} = 0{\cdot}116 \ \mu\text{H}.$$

(*iii*) To determine the number of turns on the coil.
Assuming a 1¾ in. dia. former, this gives a winding length of 2 in. (Chart 5). Since the coil is to be wound at 8 turns per inch, a total of 16 turns will be required.

(*Continued on page 567*)

W.S.46 for Amateur Use

By DAVID NOBLE (G3MAW*) and DAVID M. PRATT (G3KEP)†

THE W.S. 46 walkie-talkie, available on the " surplus " market at a very reasonable price, has the advantage that it is suitable, without modification, for amateur use on the 40/80m bands on 'phone and m.c.w.

The transmitter and receiver are both crystal controlled with a common aerial coil which is tuned by the external " aerial trim." knob on the top panel of the unit. No r.f. stage is provided. Four plug-in coils are available, two of which are suitable for amateur use (3·6 to 4·3 Mc/s and 6·4 to 7·6 Mc/s). The unit can be tuned to three spot frequencies, any one of which may be selected by means of a single switch. Any three frequencies in the band required may be obtained by plugging in appropriate crystals and adjusting the internal preset trimmers provided. Two crystals are required for each channel. The frequency of the local oscillator is controlled by the receiver crystal and its anode coil is arranged so that any crystal within the given range will oscillate when plugged in; no retuning of the anode circuit is required.

The receiver i.f. is 1550 kc/s and crystals must be chosen such that there is a difference of 1550 kc/s between the receiver and transmitter crystals. On the 80m range the local oscillator crystal is 1550 kc/s *above* the signal frequency but on all other ranges it is on the i.f. *below* the signal frequency.

Circuit

The receiver consists of a crystal controlled frequency changer using a ARTP2 triode-pentode with a Pierce oscillator circuit, the input grid being connected to the transmitter anode circuit. Two i.f. amplifier stages are provided using ARP12 valves (V2, V3). The second stage is used in a reflex circuit as the a.f. output valve,

* " *Heather Bank*," *Hillings Lane, Menston, Ilkley, Yorks.*

† " *Glenluce*," *Lyndale Road, Eldwick, Bingley, Yorks.*

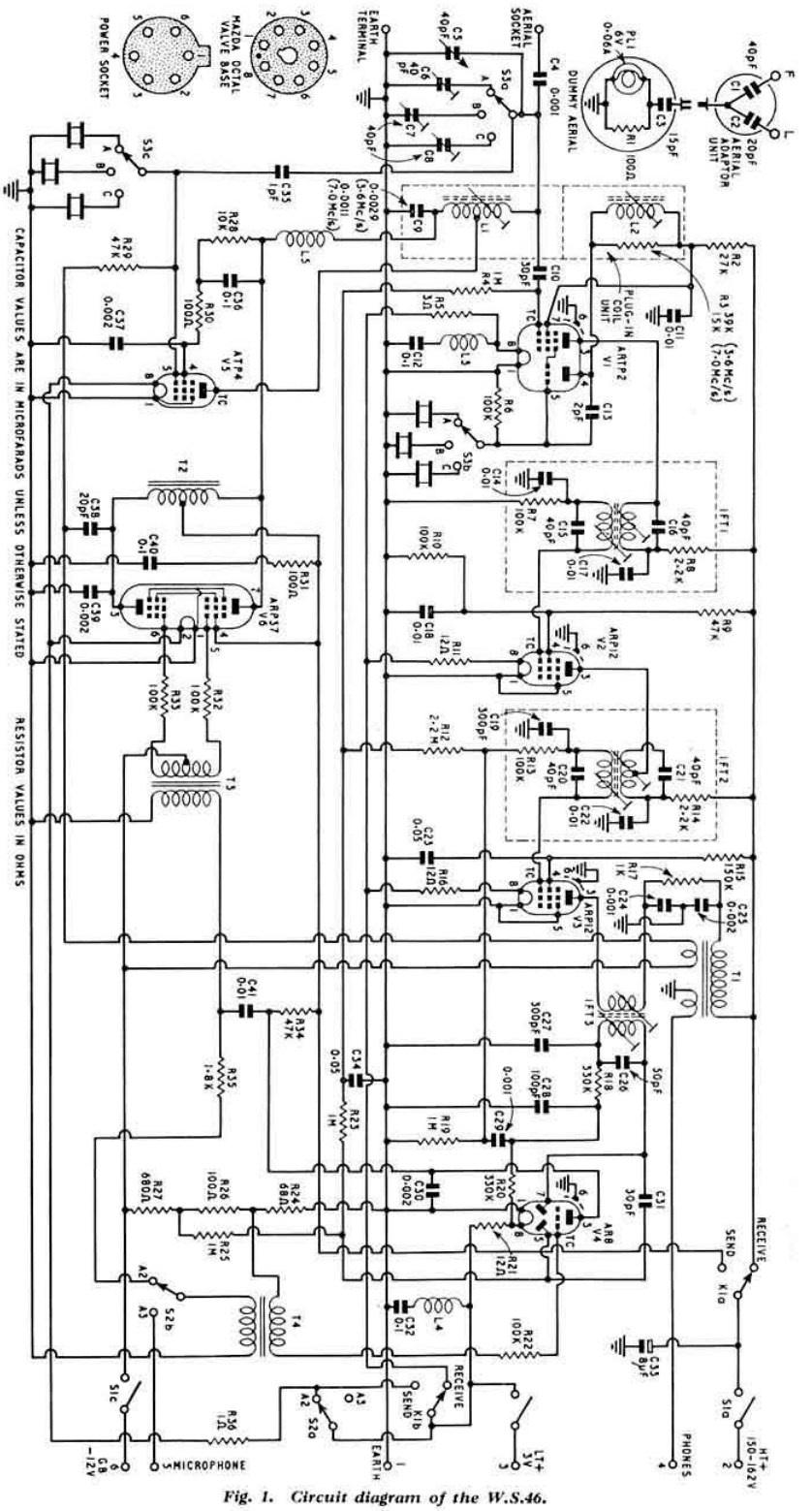
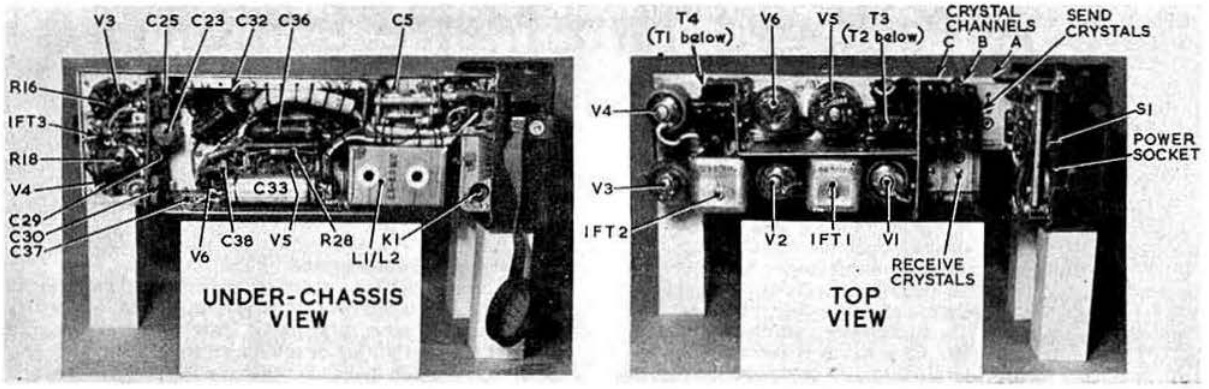


Fig. 1. Circuit diagram of the W.S.46.



The locations of the principal components are shown in these two views of the unit.

detection being provided by a diode of the AR8 (V4). The other diode is used for a.v.c. while the triode section is used as the m.c.w. oscillator and as the driver to the ARP37 push-pull modulator valve. The transmitter itself employs a ATP4 in a modulated crystal oscillator circuit.

Change-over Switching

When the unit is operated on m.c.w., the transmitter heaters are switched on, both on send and on receive, and the send/receive button is used as the Morse key. On telephony, however, the send/receive button switches the heater supply to the valves in use. Due to the extra heater supply when receiving m.c.w., current drain is greater and for long receiving periods while using m.c.w. it is advisable to return the emission switch to the " R.T." position.

Modulation

Anode and screen modulation of the p.a. is used, the microphone being a magnetic throat type. Originally, the unit used " Microphone and receiver head-gear assembly No. 5," but different types of microphone may be tried in order to obtain better speech quality.

Aerial

The unit is primarily designed for use with a 8 ft. vertical whip aerial which is plugged directly into the set. An aerial adapter is provided, however, so that other types of aerials may be used. A 16 ft. vertical wire may be connected to terminal " F " of the adapter unit, or a quarter wave wire may be used if connected to terminal " L " of the unit.

So that it can be ascertained that the unit is working correctly before actual radiation is attempted, a dummy aerial with indicator bulb is fitted to the top panel of the set.

Battery Supplies

A type 18 Set battery is suitable for use with this equipment, which requires an l.t. supply of 3 volts with —12 volts grid bias and 162 volts for h.t. If the battery carrier and attached junction box is available, then the type 18 Set battery can be plugged in directly. For readers who wish to use this equipment but who do not possess the junction box, circuit information is given in Fig. 1 to enable a suitable junction box to be constructed.

Simplified Pi-network Design Procedures

(Continued from page 565)

If a multiband tank coil is required it will be necessary to calculate the values of *C1*, *C2* and *L1* for each frequency. The dimensions of the coil are determined for the lowest frequency band, thus giving the total inductance required. Calculation of the position of the taps for the other bands is then made by determining the number of turns required for each value of inductance using the same wire size, turn spacing and former diameter. The taps are then made at the required number of turns. To avoid spurious resonances the unused portion of the coil should be short circuited when using the tappings.

Appendix 2

Referring to Fig. 1(a), the p.a. valve sees a resistive load *R1* when the pi-network is terminated with a resistive load *R2*, and tuned to the operating frequency *f*. For the purposes of calculating the circuit constants, the pi-network may be replaced by the parallel tuned circuit of Fig. 1(b), in which *C1* has the same value as Fig. 1(a), and *Le* and *Re* represent the equivalent inductance and resistance of L1 in series with *C2* and *R2* in parallel. *Re* is the sum of the r.f. resistance of the inductance *L1 plus* the transformed resistance of the load and coupling coil coupled into the tuned circuit by the coupling coil *Lm*. *Le* is the self-inductance of *L1 minus Lr*, the inductance coupled into the tuned circuit from *Lm*.

Analysis of the circuit of Fig. 1(b) leads to six equations from which Charts 1-4 were prepared by substitution of the appropriate values. The steps leading to the final equations have been omitted as it is thought that they would not add to the value of the article for the reader who wishes to design a pi-tank circuit.

$$C_1 = \frac{Qe}{\omega R_1} \quad \ldots \text{(5) Chart 1}$$

where $\omega = 2\pi f$ and $Qe = 12$

$$X_{C_2} = R_2 \left\{ \frac{R_1}{R_2} \left| Qe^2 + 1 - \frac{R_1}{R_2} \right. \right\}^{\frac{1}{2}} \quad \ldots \text{(6a)}$$

whence $C2 = 1/\omega X_{C_2}$ ... (6b) Chart 2

$$Le = \frac{R_1}{\omega Qe} \quad \ldots \text{(7) Chart 3}$$

$$Lr = R_2^2 C_2 (1 + \omega^2 R_2^2 C_2^2) \quad \ldots \text{(8) Chart 4}$$

$$L1 = Le + Lr \quad \ldots \text{(9)}$$

It should be noted that substitution in the equation will give values of *L1*, *C1* and *C2* in Henrys and Farads respectively.

* * *

Acknowledgment is made to Standard Telephones and Cables Ltd. for permission to use data produced by the Valva Application Engineering Department of the Company in the preparation of this article.

A Packaged Two Metre Station

Part 2

By GEORGE STOREY (G3HTC)*

THE power unit for portable or mobile use on a 12 volt supply employs two rotary transformers (Fig. 8). The first, MG1, provides the receiver h.t. and the other, MG2, the h.t. for the output stages of the transmitter and the modulator. MG2 is rated at only 490V 65 mA but is run under intermittent ratings to provide 310V at 175 mA as is done in at least one widely used item of commercial equipment. While some misgivings were present about running it under these conditions when the equipment was first constructed, extensive operation under amateur conditions, principally as a mobile rally talk-in station, has failed to show any weakness or inability of the transformer to cope with extended operating periods. The switches S3, S4 for controlling the power unit located on the transmitter control heavy duty contactors C/1, E/1 and D/1 instead of switching the l.t. feeds to the generators and heaters directly. The contact D1 is arranged to switch on the transmitter filaments and connect the transmit/receive relays A/2 and E/1 to the 12 volt supply, thus preventing the rotary converter MG2 from being run in the unloaded condition, in which event the high off load voltage produced by it might damage certain of the capacitors in the modulator.

A transistorized power supply would be more economical in terms of battery consumption and it is proposed to build such a unit at a later date.

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Transmitter Construction

As it is unlikely that anyone will wish to build a " Chinese copy " of the equipment it is not proposed to give full dimensioned chassis drawings. Instead layout diagrams showing the positioning of the major components are given to serve as a guide by which other models can be made.

The transmitter layout is shown in Fig. 9, of which the upper part is an underneath view and the lower part a top view. It is built on a chassis 16 in. × 5½ in. × 2½ in. deep, the material being 18 s.w.g. tin-plated steel sheet instead of the more usual aluminium. The steel sheet is normally obtainable from industrial tool and metal suppliers. The advantage of this material is that it enables short earth connections to be made to it by soldering directly on to the chassis. This feature is particularly important in connection with the feedthrough capacitors C14, C15, C22 and C44 since most currently available types are of the solder-in variety.

It will be seen that the r.f. section of the transmitter is built in line since this is one of the most effective means of minimizing unwanted feedback. The coils L1, L2 and L3 are wound on coil formers in screened cans of the kind extensively used in television receivers. Manufacturers of these coil formers screening cans and accessories are Aladdin, Haynes and Neosid. Each coil is adjustable by an iron dust slug, even L2 and L3 which are tuned by the adjustable capacitors C10 and C17. With the coils L1 and L2 as specified, and provided the components associated with V1 and V2 are kept close to the chassis and the by-pass capacitors in

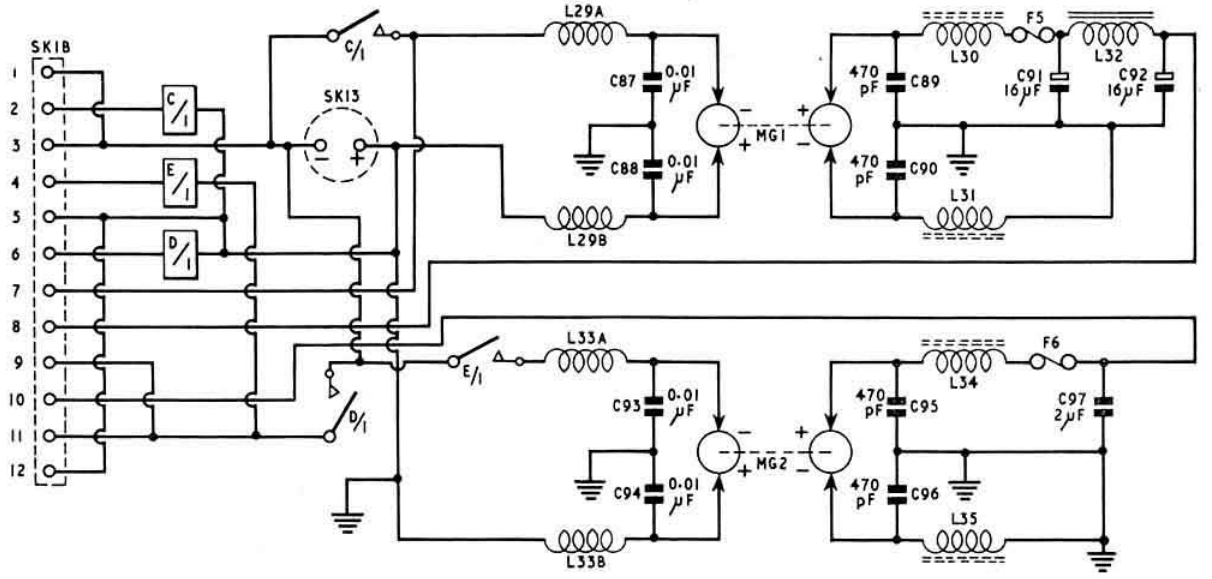


Fig. 8. Portable or mobile power supplies using rotary converters. MG1, 11·5V. input, output 250V. 120 mA (type HT31); MG2, 11·5V. input, output 490V, 65 mA (type HT32).

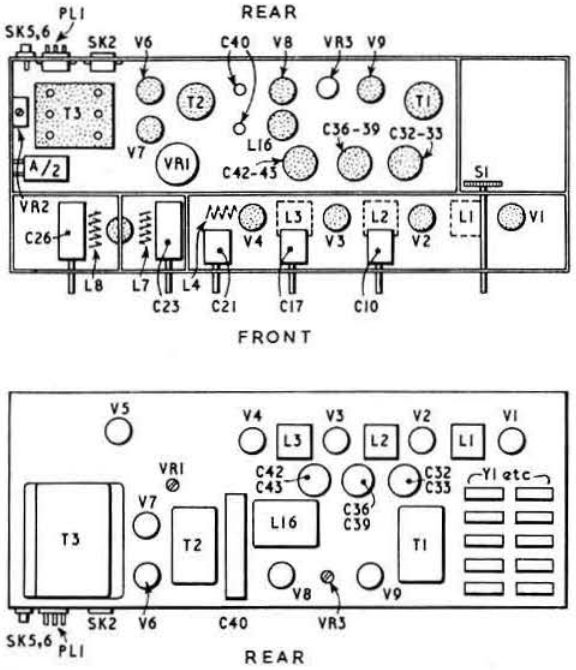


Fig 9. Layout of the transmitter. The chassis measures 16 in. by 5½ in. by 2½ in. deep.

these stages have short leads, no screening between V1 and V2 should be necessary. The valveholders for V1, V2 and V3 can be of nylon loaded phenol formaldehyde but those for V4 and V5 should be of p.t.f.e. if at all possible. The rotors of the variable capacitors C10, C17 and C21 should be connected directly to the cathode pins of V2, V3 and V4 respectively by means of heavy gauge conductors. The copper braid of co-axial cable makes a suitably heavy gauge conductor.

The valves V4 and V5 are separated by a screen as are the input and output circuits of V5. This latter screen is made to approach the valveholder as closely as possible and is soldered to the spigot. The two grid and anode pins of V5 are arranged to be symmetrically placed relative to the variable capacitors C23, C24 so that the connections between them can be made by leads of equal length to preserve the balance of the circuit. To allow convenient electrical and mechanical connections to C23 and C26 they should be of the twin-gang type and *not* butterfly. A suitable capacitor for these positions is available on the surplus market and is believed to be currently manufactured by Polar. Alternatively, the type C808 or U101/S-S made by Jackson Bros. may be used.

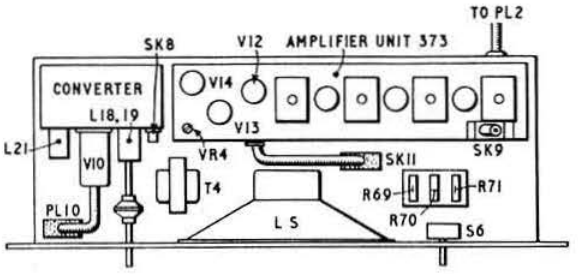


Fig. 10. The receiver chassis is of similar dimensions to that for the transmitter but is only 1 in. deep.

The layout of the remainder of the transmitter is self-explanatory with the possible exception of the adjustable resistor VR2. This component is mounted on a bracket secured to the end wall of the chassis and the components C28, CR1 and L10 associated with it are supported on a small tag strip secured by one of the bolts holding the bracket to the chassis side wall. The rectifier CR1 has one end connected directly to the centre terminal of socket SK5 and the feedthrough capacitor C29 is soldered to a convenient part of the bracket.

Receiver Construction

The receiver units, shown in Fig. 10, are also supported on a chassis 16 in. × 5½ in. but only 1 in. deep. The layout will be clearly evident from the drawing, but one feature which will need to be considered by a constructor is that the capacitors C81 and C82 must not be too large physically if they are to be fitted underneath the shallow chassis.

Fig. 11 is a side view of Fig. 10 showing the mounting of the converter unit and the arrangement of the tuning drive between it and the front panel. Note the bracket between the top of the converter unit and front panel to give added rigidity and which, for clarity, is not shown in Fig. 10. For the same reason the insulated flexible coupler in the tuning drive between the converter unit and front panel shown in Fig. 10 is omitted from Fig. 11, as is the transformer T4.

The converter unit shown in Fig. 12a is built on the lid of a medium size Eddystone diecast box, the remainder of the box simply being used as a screened cover for the underside of the lid. All the tuning coils with the exception of L25 are wound on screened formers of the kind used for L1, L2 and L3 in the transmitter. The screen between V10 and V11 is arranged to fit closely in the box when the lid is in position in order to be as effective as possible. The valveholders for V10 and V11 should be of p.t.f.e. The fixing bolt for the tuning capacitor C61 is isolated from earth by insulating washers between it and the lid of the box. Fig. 12b shows the relative positioning of the valveholder for V11, the capacitors C60 and C61 and the oscillator coil L25.

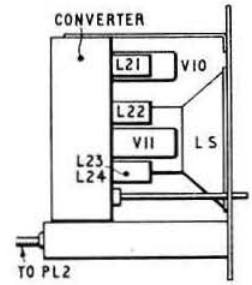


Fig. 11. A sideview of the receiver chassis showing the mounting of the converter unit and the arrangement of the tuning drive.

In modifying the Amplifier Unit 373 the most important point to bear in mind is that component space is very restricted indeed and the new components required must be chosen with that in mind. It is a tight squeeze to get them all in but it can be done! All that is required is a little thought as to where to put each part and a little more patience in getting it there. Finally, when the Amplifier Unit is mounted on the receiver chassis make sure that holes are provided through which a trimming tool can be inserted to adjust the lower cores of the i.f. transformers, otherwise they cannot be adjusted when the unit is bolted down on to the chassis.

The transmitter and receiver are both mounted on panels of ⅛ in. thick aluminium 19 in. wide by 7¼ in. high. The two units when completed may be mounted together in a wooden carrying case as shown in the photograph. The case is

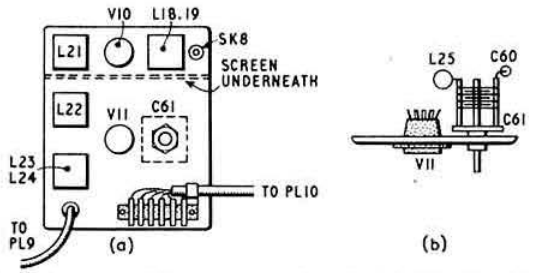


Fig. 12. (a) Layout of the converter unit on the lid of the diecast box. (b) Relative positioning of the valveholders for V11, the capacitors C60 and C61 and the oscillator coil L25.

provided with a detachable lid and a carrying handle to facilitate its transport.

The power units are both constructed on aluminium chassis 12 in. × 8 in. × 2½ in. No description of their construction is given since it is perfectly straightforward and should present no problems.

Alignment

After completion, the usual routine checks for wrong connections should be made. If all is well the receiver may be switched on and a signal generator connected to socket SK9 instead of the output plug PL9 of the converter unit. The signal generator frequency should be set to 9·72 Mc/s and the output level set to the lowest that will give an audible output from the loudspeaker with the audio gain control VR4 and the volume control S6 at their maximum output settings. A low resistance (100 ohms) 0-1 mA meter is connected to the terminals " − " and " + " on the Amplifier Unit in parallel with the resistor R55. The slugs in the i.f. transformers are then adjusted for maximum meter reading, the output setting of the signal generator being reduced as necessary to maintain the lowest observable indication on the meter.

When the i.f. stages have been aligned satisfactorily the signal generator should be disconnected and the converter, mechanically disconnected from the chassis and without its cover in position, connected to the Amplifier Unit by inserting the plug PL9 into socket SK9. The signal generator may then be connected to the grid of the mixer V11A and L23 adjusted for maximum meter reading.

If the signal generator covers the 144 Mc/s band it should be connected next to the aerial socket SK8 and set to 145 Mc/s. With the capacitor C61 set at half-mesh the turns of L25 are opened out or closed up until an output signal from the receiver is heard. If a grid dip oscillator covering the required frequency range is available it will facilitate adjustment of L25 so that the oscillator is on either the low or high side of the signal frequency. There is no preference for the oscillator to be on one side or the other of the signal frequency for, with it on the low side second channel interference from the aircraft band around 123–127 Mc/s may be experienced while with it on the high side similar interference may be experienced from stations in the high business radio band around 163–167 Mc/s. It is suggested that the choice be made after considering the relative activity in these bands in the areas where the receiver is most frequently to be used. When the oscillator has been set up as desired the coils L18, L21 and L22 should be adjusted for maximum meter reading at 145·4 Mc/s for optimum coverage of the 2m band. Clearly if there is one section of the band where reception is required to be as effective as possible these coils should be adjusted accordingly.

If a signal generator is not available it is suggested that the alignment of the converter be left until the transmitter has been adjusted when the signal from it with the switch S2 in the " TEST OSCILLATOR " position will act as a substitute signal source. In this case the signal from the transmitter is adjusted to be received at a setting of the tuning capacitor C61 differing from half-mesh in a sense and by an amount corresponding to the sense and amount of difference between 145 Mc/s and the transmitter frequency.

When the above adjustments are complete the receiver is reassembled after which it is ready for use. A slight change in the resonant frequency of the oscillator will be noticed after this but it is of no great consequence since the dial can be made to fit the tuning range of C61 simply by adjustment of the flexible coupler between it and the dial.

Having aligned the receiver the transmitter should next be adjusted. In the first instance the switch S2 should be turned to the " TEST OSCILLATOR " position and the meter switch S5 turned to position A. The oscillator coil L1 should then be tuned for maximum reading which will only be the barest movement of the needle of M1. Switch S5 to position B, set C2 to half-mesh and adjust L2 for maximum reading. Next switch S5 to position C and with C17 at half-mesh adjust L3 for maximum reading. Both maxima should be about 0·4 mA or more.

To align the later stages move the switch S2 back to its normal position and switch to transmit by actuating the transmit/receive switch " T/R " on the microphone handset. With S5 in position D adjust C21 and C23 for maximum reading. For optimum operation of V5 the meter should read 0·4 mA; adjust the coupling between L6 and L7 until this reading is obtained. With the transmitter connected to a dummy load or a suitable aerial, switch S5 to position E and adjust C26 for maximum reading. Depending upon the characteristics of the dummy load or aerial and the lengths of lead between L9 and SK5 the meter reading may be high or low; adjust VR2 until a suitable reading, for example 0·5 mA, is obtained. The coupling between L8 and L9 should, in most cases, be adjusted to maximum, but check that the voltage drop across R21 does not exceed 140 volts. If it does adjust VR1 and/or loosen the coupling between L8 and L9 until the voltage drop is reduced to between 140 and 100 volts. Revert to the receive condition and the alignment is complete except for the adjustment of the modulator gain control VR3 to achieve the desired modulation level.

Results

The unit has been used for fixed, portable and mobile operation and as a mobile rally talk-in station. Several operators have commented on the clarity of reception from the receiver and the absence of a high background noise when no signals are being received. Fixed stations up to 60 miles away have been received without difficulty on a simple dipole aerial when in use as a mobile station. Reports on the signal from the transmitter have all commented on the excellence of the modulation and the ease with which it can be read at very low signal levels. This is due primarily to the tailoring of the frequency response of the modulator and the use of a communications type microphone. The versatility, portability, and good performance of this station will ensure its continued use at G3HTC wherever located.

Universities and Technical Colleges Radio Club Organization

A MEETING is to be held in London during the weekend of July 1-2 to inaugurate a body to represent the universities and technical colleges in the field of Amateur Radio. The programme will include a theatre visit on the Saturday night. A special conference station with a GB3 call-sign will be in operation.

All interested radio societies are asked to contact M. A. Rowlands, Nottingham University Radio Society, The University, Nottingham, as soon as possible.

The MONTH ON THE AIR

A CHRONICLE OF EVENTS ON THE HF AMATEUR BANDS

By R. F. STEVENS (G2BVN)*

CONDITIONS during the past month have been mainly in accordance with the predicted pattern. There have been some good openings on 21 Mc/s and quite an amount of DX has been heard from the South and East, but 14 Mc/s has provided the most consistent signals, and on some days there has been activity for twenty hours out of the twenty-four. It is obvious that in the months ahead many more stations will be operating on 14 Mc/s, the interference problem will become more acute, and, if the present trend continues, this will affect mainly c.w. and s.s.b. operation.

In so far as single sideband is concerned the position has deteriorated fast since March 1960 when the top 50 kc/s became available to W/K stations. Having got this far c.w. operators will probably point out that they have had to cope with this situation for many years on the low end of the band, and the s.s.b. operators had better sharpen up somewhat! It is a matter of fact that c.w. operators have dealt capably with the QRM problem, but whether this is due the narrower bandwidths employed or superior technique cannot be stated. It is also a fact that the W/K QRM on the upper portion is now intolerable, and it is again urged that DX stations should operate in the segment 14,100 to 14,140 kc/s. This suggestion was made in the April 1960 issue of the BULLETIN, but met with very little response; now, however, a number of prominent Commonwealth stations are in favour of the idea, and VE3AYE of the Ontario DX Association is circulating a letter on the subject which merits careful reading.

The practical advantages of the scheme have been amply demonstrated by the activities of ZD1ES, ZD3P, VP7BV and UG6KAA, all of whom have operated around 14,120 kc/s. Further, the transmitter now being used in the various U.S.S.R. countries, will in future, have a crystal position of 14,125 kc/s. The last Board Meeting of the A.R.R.L. urged that U.S. amateurs keep the top fifteen kilocycles of the 14 Mc/s band open for DX stations using s.s.b., but it is felt that this *recommendation* will have very little restraining effect on the avid DX'er. The real answer is surely to use the frequencies between 14,000 and 14,140 kc/s and also to persuade DXpedition stations to include facilities for operation on these frequencies.

News from Overseas

VE3JAM will be operating from the **Canadian National Jamboree** from July 6 to 15, and also during the Fourth Jamboree-on-the-air during the weekend October 21 and 22. The Boy Scouts International Bureau station will be located in Ottawa, and will use the following frequencies: 3,750, 7,210, 14,195, 21,195 and 28,490 kc/s. The Bureau will issue a special QSL card for all contacts. The organizer of the British section of the Jamboree is G3BHK, and stations who intend to participate should give advance notice of their intentions.

MP4TAN (ex-6O2AB) hopes to be active on 7 and 14 Mc/s until transit damage to his gear is repaired, and his new address will be found in *QTH Corner*.

The Radio Society of East Africa, in the person of VQ4HE, advises the following current calls for **Uganda**: VQ5s AU, BU, DB, DES, EK, FS, GF, GJ, GY, IB, IF, IG and IH. The only circumstances in which a call other than these can be considered as genuine is if the holder of a current VQ4 licence should operate from Uganda, when the prefix only will be altered, e.g. if VQ4RF should operate from Uganda the call used would be VQ5RF.

VS9AAC mentions a slight change in his address, which will be found in *QTH Corner*, and also that a new station **VS9ADD** should be active from Aden shortly.

In addition to the changes mentioned last month the prefix **TR8** has been allotted to the Republic of **Gabon** (G3GPE).

The logs for **HC4IE, HC4IM** and **VQ4AQ** (1960/61) are now held by **W2CTN** who will be pleased to verify contacts upon receipt of QSL and reply postage. (G3HDB).

There is a possibility that St. Paul Island, one of the Pribilof Group, may qualify as a separate DXCC country, as it is administered by the U.S. Federal Government and not by the state of Alaska. **KL7DNE** is now active on 14 Mc/s from this location.

B.R.S. 22704 hopes to be operating from Qu'aiti State, East Aden Protectorate, in the near future on 7 and 14 Mc/s c.w. and a.m. At the time of writing the call-sign is not known, but G contacts will have priority.

VQ4RF, one of the best known operators in Kenya, has made over 41,000 QSOs, written 20,000 QSLs, QSO'd no less than 11,000 W/K and 1,700 U.K. stations, in the process of which 1,237 pages of log were filled. Where a station is worked for the first time a QSL is automatically sent, a practice which could well be emulated by some of the less QSL-conscious DX stations.

The accompanying list of **EP stations** was sent by Hal, EP1AD, now on his way back to the U.S.A. where he will sign K4ORQ. QSL cards should be sent to this QTH which

Frank Peacock operating MP4BDC in Bahrain. The equipment includes a K.W. Electronics Vanguard transmitter, a Geloso converter feeding into an R107 receiver, a two-band cubical quad for 21 and 28 Mc/s and a 7 Mc/s dipole. So far 102 countries have been worked. MP4BDC is usually on 21 Mc/s from 11.00-18.00 G.M.T. looking for G contacts.

Please send all reports to R.S.G.B. Headquarters to arrive not later than June 20.

EP Stations

EP2AF	R. Sanderson, U.S. Embassy, APO, 205, N.Y., N.Y., U.S.A. (QSL Manager).
EP2AG	G. Buchanan, J. A. Jones Constr. Co. P.O. Box 1836, Teheran, Iran.
EP2AJ	J. Hannon, Gulf Distr, Eng., APO 205, N.Y.
EP2AP	J. Heay, USOM-CAAG, APO 205, N.Y.
EP2AQ	Florence Heay, as last.
EP2AR	I. Koutchesfahany, Ave. Soraya 64, Teheran.
EP2AT	M/Sgt. R. Leffert, Armish MAAG, AAG, APO 205, N.Y.
EP2AY	L. Rundlett, P.O. Box 5043, Beirut, Lebanon.
EP3HS	H. Schmidt, Standard Electric, P.O. Box 709, Teheran.
EP3RO	C. Glade, Standard Electric, P.O. Box 709, Teheran.
EP2BB	W. Jochimsen, U.S. Consulate, APO 205, N.Y.
EP2BC	SFC G. Stracke, U.S. Army Hospital, APO 205, N.Y.
EP2BD	Iain Dunbar, 51265 ICEPC, Kharg Island, via Abadan, S. Iran.
EP2BE	A. Alseus, Diawild Trading Co., Saraye Omid, Teheran.
EQ2AT	Cmdr. F. Borsody, USOM-Public Safety, APO 205, N.Y. (or via W2AYN).
EP1AA	Dr. M. H. Masud, P.O. Box 951, Teheran.

is correct in the *Call Book*. Frank, EQ2AT, EP5X etc, departs for Korea duty on June 10.

ZD6GA (ex-G3KKN) has commenced s.s.b. operation from Nyasaland using a KW Viceroy transmitter and a Minimitter MR44 receiver with a 3 element beam for 14 Mc/s, on which band operation will take place usually from 18.00 to 20.00. Operation on 28 and 21 Mc/s is planned for the future. The address for ZD6GA will be found in *QTH Corner*. Activity from ZD6PR (ex-G3IRQ) on s.s.b. may be expected soon.

DXpeditions

F9GK and F9OQ intend to operate as **PX1GK** and **PX1OQ** during the period July 15 to August 15.

After providing s.s.b. activity from Armenia under the call **UG6KAA**, UQ2AN intends to follow up by operation from Azerbaijan (UD6). Signals from UG6 were well received in the U.K. having regard to the power of only 30 watts p.e.p.

A trip to Rockall Island is contemplated by ex-5N2PJB, and any helpful information or comments would be welcomed and can be passed via G2BVN.

The operation from Portuguese Timor (**CR10AA**) had not materialized at the time of writing, but it is still hoped that this will be possible, although no firm dates are yet available. It is impossible to sift the large amount of " reliable," yet conflicting, information on this trip.

IS1 will be represented on s.s.b. for two weeks by **I1RIF** probably during the beginning of July.

DXCC News

Malpelo Island (HK0) has been accepted as a new country and cards may be submitted for credit after August 1, 1961.

The A.R.R.L. has stated that **Tuva** will *not* be granted separate country status. Tuva is classified as an Autonomous Region which is a subdivision of a Soviet Socialist Republic.

Contests

Results of the **1960 CQ World Wide DX Contest** (c.w. section) have been received from W1WY, and these show that the two leading stations in the All Band, Single Operator Section scored over the million mark, UA9DN netting 1,114,695 and 7G1A 1,041,755, both very creditable performances. Although the logs received showed the best return yet (1,000 from 107 countries), there was a very poor response from the U.K. **G4CP** rated third highest in Europe on 28 Mc/s with a score of 35,760. The following stations were placed in the Top Ten: ST2AR (4th), VQ4DT (5th) and ZD2JKO (6th), all with scores exceeding the half million mark. Congratulations are offered to the operators concerned.

The **1961 VK-ZL Contest** will take place during the twenty-four hours beginning 10.00 September 30. Operation will be on c.w. only. There is a Receiving Section of this contest, and further details will be provided later.

Sven Elfving of Ornskoldsvik, Sweden, is the secretary of the Polar Bears Radio Club and editor of **The DX'er**, *which now enjoys world-wide circulation as a first rate DX magazine. Sven concentrates his listening on the three l.f. bands using long wire aerials, and may be heard during the weekends from the club station SL3ZO.*

Awards

The Taiwan American Radio Club announce the **BV Award** which can be claimed by operators who contact two separate BV stations. Asian stations must make four BV contacts, which in all cases must be after January 1, 1961. A certified extract of the station log is needed, and the contacts for the basic certificate must be of the same emission type. Three IRC should be enclosed with each application which should go to: The Secretary, Taiwan American Radio Club, Box 24, USTDC, APO 63, San Francisco, Calif., U.S.A.

Operators who contact the first two nuclear powered amateur radio stations **KG1CC** and **KL7WAI** may claim the award offered by The Certificate Director, USAERG, Fort Belvoir, Va., U.S.A. There will be a third nuclear powered station KC4USV, and when this goes into operation it will be necessary to contact all three stations to claim the award. The QTH of KG1CC is Camp Century, APO 23, New York City, U.S.A.

W1WDD is offering a Silver Trophy and $50 cash to the operator providing him with the hundredth confirmation for the **Empire DX Award.** The present score is 95/98 and amongst the areas outstanding are AP, VK1, VP8, VR1, VR6, ZD6 and 4S7.

In connection with the Empire DX Award and other R.S.G.B. awards for contacts with Commonwealth areas, it should be noted that the effective date for valid contacts with the areas forming the Union of South Africa is before June 1, 1961. This is one of the several alterations now effective and a new Commonwealth Countries List is therefore in preparation and will be available shortly.

The recently announced **" United States of America Counties Award "** (USA-CA) is a comprehensive award embracing every county in the U.S.A. There are seven classes to this award, and normally QSL cards will not be required. A record book will be available to facilitate the recording of the data necessary to claim the certificate. *CQ Magazine* is sponsoring this claim and the custodian is " Mr. Certificate," Clif Evans (K6BX).

For those soon to make application for the awards named:

WPX claims from European stations can go to **F9IL**, the Certificate Manager of R.E.F.

WAZ claims go to **W2DEC**, who is now issuing these with a s.s.b. endorsement.

Worked 100, etc. **s.s.b.** certificate claims from the U.K. may be sent to **G2BVN**, from whom the application forms are available on receipt of a s.a.e.

DX Briefs

Kure Island (a separate DXCC country) is soon to have permanent representation on the amateur bands, a member of the signals staff having recently passed the amateur examination.

VR6TC is active from Pitcairn Is., on c.w. and a.m. generally between 05.00 and 09.00.

VK9AM now active from Nauru Is. on 21 Mc/s a.m. is ex-VK3AMK.

UA1KED continues active from **Franz Josef Land,** although the signals have not been well heard in Europe. S.s.b. activity has commenced but the resulting pile up ended in a rapid QRT.

PK2SPT and **PK2HT** (Gambong) have been reported worked from Europe on 21 Mc/s a.m. between 13.00 and 17.00

VS9MB recently worked a number of stations when using a frequency of 14,300 kc/s, but the type of emission was a.m. notwithstanding several subsequent statements (not from VS9MB) to the contrary.

Rumanian s.s.b. activity is increased by the appearance of **YO3ZA**, and from Korea **HM1AJ** and **HL9KS** have been worked using this mode.

W9FJY, who is doing an excellent job as QSL Manager for **ZD7SA**, asks for patience owing to the long delay sometimes experienced in obtaining confirmation of contacts. Please also enclose return postage with outward bound QSLs.

W3KVQ is the QSL Manager for TU2AL (ex-FF4AL) and return postage should be enclosed if a direct reply is desired.

Band Reports

Only one report of DX activity on **1·8 Mc/s** has been received, B.R.S.20317 noting a QSO between VE1ZZ and GC3LXQ/A on 1,822 kc/s early one morning when no other North American stations were audible. Little of interest has been heard during the evening hours. A point worthy of notice by Top Band operators is that harmonics have been reported between 3·6 and 4·0 Mc/s at good strengths.

Little of note has been heard on **3·5 Mc/s** the band having been dead for DX by 06.00 on most days. W/K stations have been heard between 01.00 and 06.00, with HK3AH and VP9G at 05.00. The two Russian contests produced quite an amount of activity, and it is pointed out that the number following the RST and sent by U stations is the Oblast number, and could be useful for operators trying for the Worked 100 Oblasts Award. UM8BA was heard at 04.00 working into the U.S.A., and UM8KAF calling unanswered CQs at 23.00 on 3501 kc/s. B.R.S.20317 logged a new one in UA9KOA in Zone 18, and during the last Russian contest logged 13 UA9 stations between 23.00 and midnight. From several sources two disturbing facts are reported: (i) in their enthusiasm to work Continental stations some U.K. operators are zero beating on to frequencies which are outside the low edge of the band, and (ii) a number of U.K. stations have been logged in the segment 7100 to 7150 kc/s. It is pointed out that from May 1 the available frequencies in this band are between 7000 and 7100 kc/s.

DXotic Showcase

21 Mc/s c.w.:	CR5AR, 11; FB8XX, 12; FR7ZD, 15; ZD3P, 16; ZS3D, 21; 7G1A, 17.
21 Mc/s a.m.:	AP2MR, 11; CR4AX, 20; VS9MB, 18; XW8AL, 15; 5U7AH, 17.
14 Mc/s c.w.:	FM7WP, 20; JT1AC, 15; JZ0PH, 14; KH6PC/VR1, 20; UA1KED, 16; ZD7SA, 07; ZK1AK, 07; 7G1A, 15.
14 Mc/s s.s.b.:	DU7SV, 17; UG6KAA, 22; UJ8AG, 17; VK9RO, 08; VR6AC, 06; ZD1ES, 22.

(Times in G.M.T.)

QTH Corner

EL8D	American Embassy, Monrovia, Liberia.
FA3VU	L. Banton, 97, rue Michelet, Algiers.
FM7WP	via W2CTN.
HL9KS	via K4TGA
HM1AP	Box 162, Seoul, Korea.
KG6AAY	Amateur Radio Club, Navy 926, F.P.O. San Francisco, U.S.A.
KL7DMU	P.O. Box 1036, Kodiak, Alaska.
KL7DND	USCG, Loran Stn., Sitinak Is., Alaska.
MP4QAI	Box 1, Doha, Qatar.
MP4TAN	Sgt. D. F. Higgins, R. Signals, Trucial Oman Scouts, B.F.P.O. 64.
TN8AT	P.O. Box 108, Brazzaville, Tchad Republic.
VP8BV	RCA, San Salvador, c/o Patrick Air Force Base, Florida, U.S.A. (or W4OIA).
VR6TC	via W4TAJ
VS9AAC	J/T. A. Cake, Block One, Middle Annexe, R.A.F. Khormaksar, B.F.P.O. 69.
XZ2BB	P.O. Box 449, Rangoon, Burma.
ZD6GA	G. Armstrong, P.O. Box 16, Mzuzu, Nyasaland.
3A2CM	via K4TWK.
5U7AH	J. Leroux, Direction des Postes et Telecom., Niamey, Niger. Rep.
9K4A	(not W/K) OD5CT, Box 5043, Beirut, Lebanon.
9M2GV	P.O. Box 5000, Muar, Fed. of Malaya.

* * *

R.S.G.B. QSL Bureau; G2MI, Bromley, Kent, England.

Conditions on **7 Mc/s** appear to be deteriorating and few VK or ZL stations have been heard in the mornings, and the strength of the North Americans has dropped, and now peaks around 05.00, although W6AY/7 (Nevada) was logged at 06.30 by B.R.S.20317. Other DX loggings have been: VP9AK (22.13), VK5KO (21.45), JA6ACZ (21.00), KV4CI (21.30) and VS1FZ (23.16).

Generally there has always been something of interest on **14 Mc/s** with c.w. and s.s.b. as the predominant modes. During the early morning period the low end has yielded many KL7 and KH6 stations, with KH6DLD an outstanding signal. There have also been several South American operators obviously foregoing their beauty sleep, including HP1SB (06.30), OA4HK (06.45), and CEs (07.00). ZD7SA has also been heard on several days around 07.30. An unusual one in 4W1AA has been heard in Europe at times around 10.30, but his *bona fides* have not yet been established. UA1KED in Franz Josef Land has been heard at various times from 08.00 to 23.00, but generally signals have not been good. Around noon would appear to be the best time for U.K. contacts. Zone 23 representation has been available in the shape of JT1AC worked at 15.00 and Netherlands New Guinea has made a welcome reappearance in JZ0PH (14.00). The later afternoon hours have often produced signals from the nearer Pacific and Asian countries, including 4S7EC (16.30), VS9ARW (16.50), DU7SV (17.15), 9M2s (17.00), and VU2SL (17.30). From c.w. we turn to a.m. on which mode VR1G has been heard weakly around 07.00, and apparently has not yet made any U.K. contacts. CR4AX from the Cape Verde Is. has been worked at 20.00, also on a.m. The s.s.b. activity has followed the general pattern already outlined, with the addition that signals from KR6, KG6, KW6 and BV have been heard during the period 15.00 to 17.00 from the Tadzhik S.S.R. UJ8AG has put in an outstanding signal for most of the day, peaking around 17.00, and UG6KAA has also been well heard between 17.00 and 22.00. The later evening hours are usually monopolized by North American signals, although there have been openings to the Antarctic area with VP8CC (19.20), VP8DM and VP8CX (S. Shetlands, 20.00) and VP8EG (S. Orkneys, 20.30), making appearances on c.w. From Somalia, 6O1LB, and 6O1MT on c.w. and 6O1DRS on s.s.b. have been heard between 18.00 and 22.00 but usually have been busy with W/K QSOs.

In contrast to the above, **21 Mc/s** has provided a considerable amount of a.m. activity mostly between 10.00 and

17.00. These signals have come from Asia and Africa with very little from the Pacific area, except KG6 (12.00) and VK9PJ (10.00). Other areas reported are: VS9ABH (11.00), EP2AG (12.00), 6W8AF (13.00), VS1DN (14.00), VS6EK (15.00), XW8AL (15.00), TT8AG (17.15), 5U7AH (17.30) and CR5AR (20.00). A puzzling feature of this band is the almost total lack of s.s.b. activity from DX countries who seem to prefer the heavier QRM of 14 Mc/s. YA1BW has been active on c.w., 16.00 to 17.00, but QSLs have been noticeable by their absence. A number of DX stations appear to follow the *modus operandi* of one reported by B.R.S.20104, "1 QSL 100 per cent—mostly!"

The **28 Mc/s** band has produced nothing in the way of exotic DX but is still open on the Southerly path and capable of producing good signals from the African continent. The best time for U.K. QSOs is in the period 14.00 to 16.00 when strong signals have been heard.

Following the several **W.A.C.** claims of last month G2GM mentions a 99 minute period commencing at 08.55 during the 1961 B.E.R.U. Contest when he worked ZL1HY, VE4JB, ZB1FA, ZC4IP, 5N2DCP and VP3MC.

* * *

Your conductor will be pleased to receive news items, and information on band conditions, and any late news regarding DXpeditions, which can be transmitted in the weekly news bulletins from GB2RS. Thanks are offered to the correspondents who have written during the past month and acknowledgements are made to the *DX'press* and the *West Gulf DX Club Bulletin.*

Please send all correspondence to arrive at R.S.G.B. Headquarters not later than June 20.

Institution of Electronics Exhibition

THE sixteenth annual Electronics, Instruments and Components Exhibition and Convention of the Institution of Electronics will be held at the College of Science and Technology, Manchester 1, from July 6–12 excluding Sunday, July 9. Tickets may be obtained by sending a stamped addressed envelope to W. Birtwistle, General Secretary, The Institution of Electronics, 78 Shaw Road, Rochdale.

CONTESTS DIARY

June 17–18	– 70 Mc/s Contest
June 18	– Oxford D/F Qualifying Event (See page 583)
June 25	– D/F Qualifying Event (Wessex) (See page 583)
July 2	– Second 144 Mc/s Field Day* (See page 583)
July 9	– D/F Qualifying Event (High Wycombe) (See page 583)
July 16	– Second 420 Mc/s Open Contest (See page 583)
July 16	– Swiss National Mountain Day
August 19-20	– Scandinavian V.H.F. Contest
September 2-3	– I.A.R.U. Region 1 V.H.F. Contest
September 10	– D/F National Final
September 17	– Low Power Field Day
September 30-October 1	– VK-ZL Contest (telephony).
October 7-8	– VK-ZL Contest (c.w.)
October 8	– R.A.E.N. Rally
October 28-29	– CQ WW DX (telephony)
November 11-12-	Second 1·8 Mc/s Contest
November 25-26-	CQ WW DX (c.w.)
December 2-3	– R.S.G.B. 21/28 Mc/s Telephony Contest R.S.G.B. 21/28 Mc/s Telephony Receiving Contest
December 3	– OK DX Contest

**To coincide with dates of I.A.R.U. Region 1 v.h.f. contests.*

INTERNATIONAL MOBILE RALLY

United States Air Force Base at R.A.F. Station, Barford St. John, Oxon

SUNDAY, JUNE 18, 1961

Attractions include a concert of popular music by the U.S. Third Air Force Band, a Fashion Competition, a Fancy Dress Contest for children, a raffle and prizes for mobile stations which conform most closely to the A.R.M.S. Safety standards. Visits to the Transmitter Hall on the Base. Light Refreshments available. British Red Cross volunteers will be in attendance to help with younger children.

RALLY STATIONS

160m—G3NMS/A **2m—G3HGE/A**

Organized by the Amateur Radio Mobile Society

LONGLEAT MOBILE RALLY

Longleat House, near Warminster, Wiltshire

(between Frome and Warminster on the A362 road).

SUNDAY, JUNE 25, 1961

Attractions will include Morris Dancing displays, a free draw, competitions and a DX balloon race. Prizes and certificates will be awarded for (*a*) the mobile travelling the greatest distance *to and from* home on the day of the event, (*b*) the longest distance mobile-to-control contacts on 1·8 Mc/s and 144 Mc/s, (*c*) the highest field strength from a selected site in the grounds, (*d*) the winner of the concours d'elegance. Prizes will be presented by Lord Bath at 4.15 p.m.

Unlimited accommodation for cars in reserved Rally Car Park situated in one of the most delightful settings on the Longleat Estate. Ample catering facilities in the restaurant in Longleat House—no prior booking necessary. Grounds open from 10 a.m. to 6 p.m. Admission to rally 1/-.

RALLY STATIONS

1900 kc/s—G3CHW/A **144·15 Mc/s—G3GYQ/A**

will be in operation from 10 a.m.

Organized by City and County of Bristol R.S.G.B. Group

SOUTH SHIELDS MOBILE RALLY

Bents Park Recreation Ground, South Foreshore, South Shields

SUNDAY, JULY 9, 1961

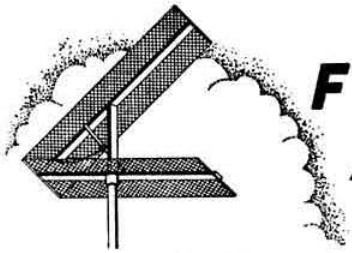
Light refreshments will be available on the site and at the nearby beach. Visitors requiring lunch should write to D. Forster (G3KZZ), 41 Marlborough Street, South Shields, in advance. Rally competitions will commence at 2 p.m.

RALLY STATIONS

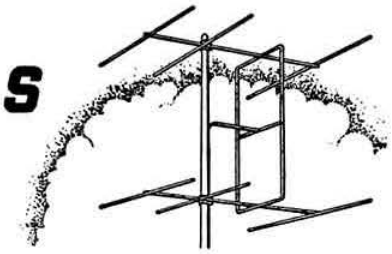
1980 kc/s—G3KZZ/A **3600 kc/s—G3DDI/A**

Organized by South Shields and District Amateur Radio Club

Mr. E. L. Gardiner (G6GR), a Past President of the R.S.G.B., explaining the application of the Amateur Radio Mobile Society's Safety Recommendations to representatives of the local police at Cheltenham Mobile Rally on May 7, 1961. Others in the picture are Mr. W. E. Bartholomew (G8CK) and Mrs. Sylvia Margolis (XYL of G3NMR). (Photo by G3NMR)



FOUR METRES AND DOWN



YU1CW and G3GOP/P set New European 144 Mc/s Record

By F. G. LAMBETH (G2AIW)*

IT has been said that there is nothing new under the sun, but this certainly seems to be proved untrue from time to time on the v.h.f./u.h.f. bands. Nearly all the "impossibilities" have been achieved and the latest one is the QSO which took place on May 7, 1961, during the First 144 Mc/s Field Day, between G3GOP/P (5m east of Ludlow) and YU1CW (Belgrade) at 13·45–13·58 G.M.T. This sporadic *E* event was borne out by a listener (A. P. Ball, of Hutton, Brentwood, Essex) who has sent a detailed report of the reception of Yugoslav f.m. stations in Belgrade, Novi Sad and Sarajevo between approximately 88/95 Mc/s.

G3GOP says he first heard YU1CW at 13.45 on about 144·1 Mc/s, and thought at first that it was breakthrough on i.f., but having discounted this, he was astounded to hear the YU station go over for "G3GO?/P" which he correctly assumed was his station. The QSO was characterized by slow fading and sudden fade-outs but was nevertheless complete. It has been confirmed by the Yugoslav society, S.R.J. Further corroborative evidence was received from GW3LJP (nr. Llandrindod Wells, Radnor) who heard the YU but could not raise him, but also heard OZ3NH for short periods. It is possible that YU1AD was also heard for a short time. GW3JZG/P at a site about 3m n.w. of Rhayader (Radnor), heard YU1CW working G3GOP/P and also OZ3NH but unfortunately neither station was worked. G3JZG also reports that G3GZM (Tenbury Wells, Worcs.) heard the YU/G QSO. The strange part about these events is that there was no apparent reason why they should have happened, but there is no doubt that they did! Congratulations to all concerned. Incidentally, the contact sets a new European 144 Mc/s record of 1,171 miles.

G3GOP/P used a receiver with the following line-up: 6AK5 r.f., 6AK5 triode mixer and 12AT7 tunable oscillator, three 9003 i.f. stages (5·5 Mc/s), EAC91 detector, 6C4 audio and silicon diode noise limiter. The transmitter comprised an EF91 crystal oscillator, EL91 tripler, EL91 doubler and QV04–7 p.a. modulated by a 12AX7 and pair of 6V6Gs.

The reports of f.m. stations in Yugoslavia noted above are as follows:

Radio Belgrade	94·5 Mc/s	15 microvolt peaking
Novi Sad 1	90·5 Mc/s	15 microvolt peaking
Novi Sad 2	87·7 Mc/s	10 microvolt peaking
Sarejevo	95·7 Mc/s	10 microvolt peaking

G2CIW (Northfield, Birmingham) also heard YU1CW on the great day.

International V.H.F./U.H.F. Convention

The Seventh International V.H.F./U.H.F. Convention, held at the Kingsley Hotel, London on May 27, was a great success with a record attendance.

Lectures on "Parametric Amplifiers" were given by Messrs. Russell and Dyott of G.E.C. and on "Satellite Communication" by Dr. J. A. Saxton, Deputy Director of the Radio Research Station, Slough, whilst Arnold Mynett (G3HBW) gave a very interesting talk on "Meteor Scatter Propagation" to an audience of nearly 130.

The Exhibition was up to the usual high standard, prizes being awarded to F3SK, G3KPT and G3JMA in that order for their very excellent entries.

The Convention Dinner was attended by 103, with the President, Major-Gen. E. Cole (G2EC) in the chair. Among those present were Harry Wilson (EI2W) (President and V.H.F. Manager of I.R.T.S.), F3SK, F8MX, HB9RG, OZ7QQ, GC2FZC, GM3DIQ, GM6IZ and many Gs from all parts of the country. The Home Counties contingent was also very strong this year. After the Toasts the President was pleased to present the first *Four Metres and Down* Certificate to Arnold Mynett (G3HBW). Mr. Wilson presented the International V.H.F. Society's Trophy to Geoff Stone (G3FZL) for his work in co-ordinating amateur activities during the I.G.Y. and the Millan Trophy to Hans Lauber (HB9RG) for his work on meteor scatter. A very good day was completed by the raffle, with Meg. Mills (G3ACC) drawing the lucky numbers.

G4LX's Auroral Report

The results in April were worse than in March, and not a single report on auroral propagation was received from U.K. stations. Only in Sweden was any aurora noticed. SM6PU had a short session on April 14, when he worked SM3AKW, SM4COK, SM5BIU and SM7ZN. This opening was of the two-phase pattern, and during the second phase between 23.00 and midnight, OZ7IGY and OZ9OR were heard in Sweden. A further short opening occurred at 16.00 **G.M.T.** on April 15 when SM3AKW was heard but not worked.

Meteor Scatter

G3LTF had skeds on April 19-23 with SM3AKW who heard a fair amount including S8 pings and one burst "AKW de G3LTF" and one of "3LTF." They will continue tests in further meteor showers.

DL3FM reports that DL3YBA and OH1NL made contact by meteor scatter propagation on May 17, 1961. The QSO, the first between DL and OH, lasted for 3½ hours.

Band Planning

G3BW is not very impressed by the remarks last month on band planning and net operation and says: "Is there anything more comparable to a Mother's Union Meeting than a group of amateurs queueing up waiting their turn to speak—yet all the time underneath them may be G3BW or GM3FYB trying to do the very thing that the band was allocated for, i.e. to establish and study reliable propagation

* *R.S.G.B. V.H.F. Manager, 21 Bridge Way, Whitton, Twickenham, Middlesex.*

possibilities under all conditions. The net should not operate in the exclusive upper part of the band—it should operate in its *correct zone*." G3BW says that he, among others, has had to change crystals (12 Mc/s and expensive) twice to conform with the Band Plan, and if the "apparently unused" frequencies include 145·8/146 Mc/s he would take a dim view of the need to change again.

G3OHD (Petts Wood, Kent) says it must be recognized that there are two distinct modes of working (DX and local), and it is probably true that most of us like to work one or the other or both from time to time but there are a few who deliberately restrict their operation to one mode to the exclusion of the other. The existing Band Plan is heavily biased in favour of DX working and some rearrangement may be desirable in the interest of equity. G3OHD thinks the logical way to deal with this is to allocate one part of the band to DX working and the remainder to local working. His suggestion is an equal division into 1000 kc/s for each mode, subject to revision after a couple of years' experience. If the local portion were split 500 kc/s at each end of the band this would increase the apparent occupaton and encourage more people to tune over the whole of the band. The use of the system would entail the possession of two crystals as DX would be sought in the DX Zone. with reversion to local working if no DX resulted. The two 500 kc/s local sections would be available to all stations regardless of QTH, but the 1000 kc/s in the middle (neatly marked off at the lower end by GB3VHF) would be apportioned between regions in much the same way as now.

G3BLP (Woldingham) says the anonymous contributor appears to have got his ideas a bit mixed. Firstly the areas of silence which he mentions are well occupied, which could easily be proved. If local nets are required why not let them operate within the section of the band already allocated (i.e. correct zone). In general G3BLP thinks that introducing the netting principle on 2m is retrograde since it tends to lead to the chaos heard on the DX bands, due to the nature of the band in which the weak signals can be very very weak and the locals so very very strong. The parochial attitude expressed is to be deprecated: " If people wish to work in this way they can always go back to 160m."

Two Metre News and Views

GW3LJP has had a wonderful time on 2m since January 1, having worked five countries (including OZ4ZH confirmed) and 36 counties—all that remains is to get the cards for the *Four Metres and Down* junior award! All this has been done with 15 watts to a 7-element Yagi plus a G2IQ tunable converter into an R208 at 11·5 Mc/s. The site is 720 ft. a.s.l. but is screened to the east by Radnor Forest.

G3GUD (Oadby, Leics) has been back on 2m for a year, and is not impressed by the operating standards of a minority which he considers to be extremely poor. On one occasion recently a prewar licensee did not mention his call once during a complete QSO, while quite a few operators seem ashamed of the " G " prefix and use it rarely.

G3OJY (nr. Farnham, Surrey) worked 30 counties during the 144 Mc/s Open Contest in March, all on phone, and has already obtained his VHFCC.

G3ABZ (Maidstone) reports after a very long time and says that he is now active on 2m. The transmitter runs 17 watts to a QQV03/20A. The first QSO was S9 with G3KMP (Hastings). F3NG was worked at S8 on May 13 and although the conditions were good around this time it shows what simple gear will do especially as the aerials are at the moment of doubtful value. This is being remedied, however, and a fair amount of attention will probably be paid to 2m.

G3OHD (Petts Wood) has recently replaced his indoor dipole by an outdoor 4-over-4 slot fed beam. This has produced the expected increase in signal strengths and coupled with a good spell of conditions has enabled contacts to be made with F8GH (nr. Beauvais) and G3NBQ (Coventry) and to hear F3LG, G6GN (Bristol), G2BHN (Yeovil), G3OBD/M (Purbeck Hills), G4QL (nr. Portsmouth), G3OTJ (nr. Mablethorpe) and G2FNW (Melton Mowbray). The great electricity failure of May 15 spoiled possible QSOs with some of them.

G3BW (Whitehaven) came back on 2m in January, and has since worked 32 counties. Although forced to go QRT for a long time, G3BW is again trying to keep Cumberland on the v.h.f. map and has a new 8-over-8 slot up to approximately 40 ft. A new 417A converter is on the stocks. With an all-time list of counties at 75, G3BW is still looking for Cornwall and Sussex.

G3HWR and **G3LAR** will be portable/mobile in Norfolk on June 24/5.

G3LTF (Galleywood) found conditions poor during the First 144 Mc/s Field Day. The PAs hardly showed up and instead of the usual dozen only one was worked (PA0EZ). DL1LB was worked on May 13, whilst GM3EGW was worked 559 (tropo) and GM3FYB called.

The good conditions frequently occurring in the early morning (mentioned in connection with GB3VHF observations last month), have prompted **G3MTI** (Malvern) (144·44 Mc/s) to call for short signal reports, commencing at 07.000 B.S.T. to the N.E., and beaming clockwise on the sub-cardinal points at 5 minute intervals.

OH0NC (Aaland Islands) worked his first SM in May, and says (via SM5MN) that OH0NC (144·444 and 144·915), OH0NB (144·72), OH0AZ (144·445 and 144·72), OH0NI (144·124) and OH0RJ (QRG unknown) will be active on 2m this summer.

SM6PU (Malsryd) heard G3KE? on about 144·34 Mc/s on sporadic *E* day, May 7, at R1/4 S1/5 with very much fading. The whole call was not received. At 12.27 G.M.T. the G station called CQ DX and at 12.30 he made a QSO and faded out very rapidly. During this time SM6PU received very strong equatorial scatter signals from Italian v.h.f. f.m. stations. By the way, the auroral report last month was from SM6PU, but this was unfortunately not stated at the time.

G3MWZ (Southwold) sends some interesting news regarding UR2BU and v.h.f. in Estonia generally. UR2BU has worked 45 different 2m station in UR, OH, UQ, and SM and holds the distance record for the U.S.S.R., having worked SM6QP at about 550 miles. All the Swedish stations were worked by aurora (more than 20) and the UQ and OH by tropo, although Finland was also worked by aurora. A great limitation on v.h.f. in Estonia is the power allowed—only 5 watts! At present the following are active: UR2BT (144·350), UR2BU (144·180), UR2GK, UR2CQ and UR2-RDE between 144·0/144·2 Mc/s.

GI3OFT (Belfast) reports that conditions in Northern Ireland have been poor during the last month. They were perhaps at their lowest during the First 144 Mc/s Field Day. GI3FHN/P was operating at 1,000 ft. a.s.l. and GI3OFT/A from a caravan at 350 a.s.l. but only 16 stations were logged all day, seven being GIs. Others heard and/or worked included G3JZN, G3JYP, G3BW, G3BA, GM3GUO/P GW3KYT/P and GW2HIY. Perhaps the exceptionally high static noise (at times S8/9) due to a rapid succession of

R.S.G.B. V.H.F. BEACON STATION GB3VHF

The frequency of the Society's v.h.f. beacon transmitter at Wrotham Hill, Kent, when measured by the B.B.C. Frequency Checking Station, was as follows (nominal frequency 144·50 Mc/s):

Date	Time	Error
May 9, 1961	12.20 G.M.T.	360 c/s low
May 16, 1961	11.49 G.M.T.	430 c/s low
May 23, 1961	15.37 G.M.T.	300 c/s low
May 30, 1961	13.25 G.M.T.	270 c/s low

The station is in operation from 06.30–23.59 B.S.T. daily but may be on for the full 24 hours for test purposes from time to time.

squalls contributed to such poor results. Latterly, however, conditions have improved somewhat, with three way phone QSOs between GI3FJA (now QRO with 60 watts), G3CCH and G3MED, all at S8/9. Incidentally GI3FJA may be the first GI on 2m s.s.b.—the project is well in hand. GI3ONF (Portadown) is now running 30 watts and is shortly replacing his 5 element beam with a 4-over-4 slot Yagi. GI3OFT himself is temporarily QRT whilst finishing off the engineering and erection of a fully auto-rotable 8-over-8 slot Yagi, but hopes to be on again by the time this issue is published.

GM2FHH (Aberdeen) reports that GM2DRD (Forfar) has again been active and GM6RI is building gear. GM6IZ is shortly putting up a 6-over-6 slot, so things are moving up there! GM2FHH has been hearing G3ILD on s.s.b. and G5YV on c.w. (May 12) and has called both without success. Len says this redresses the balance a little for the time when he has been called without results!

New GM calls on the band (according to *The Lothian Radio Amateur*) include GM2TW (Redding, nr. Falkirk), 145·92 Mc/s, GM4JG (Falkirk), and GM3JWS (Edinburgh). GM3LAV has been /M in various counties recently and has worked well down into G. GM3FYB (Dunfermline) heard GB3VHF on March 7.

GM3GUI (Friockheim) found conditions generally very poor between April 1 and May 10, only GM2FHH and latterly GM3FSD being heard nightly (21.30/22.30 G.M.T.). On April 14 at 16.45 aurora was evident, and at 16.55 GB3VHF (broken carrier) was heard at 53A. GM3KGJ was heard calling CQA and was worked at 17.25 at 57A. At this time GB3VHF was 55A (keyed). On May 5 there were more auroral signs but no signals on 2m while on May 4, G3BW was heard calling CQ-GM at 21.41. During the contest on May 7 conditions were extremely poor, only GM3LAV/M being worked, with two other GMs heard. From May 10-16 tropo conditions improved, and many G stations were heard, with G5YV worked on the 10th and 11th, G3KJX on the 10th, G3LRP (11th and 16th), G3BA (15th) and G3LRP and G3CCH (16th). Between May 10/15 a number of GM stations were noted—GM2FHH, GM2DRD, GM3BCD, GM3DDE, GM3EGW, GM3FGJ, GM3FYB, GM3KPD, GM3LCP, GM4HR, GM4QV and GM6XW. The beam bearing for the aurora was 030°.

Four Metres

G3LZN (Rowington, Warwick) has been on 4m since before last Christmas, and from the beginning of 1961 the following have been worked: G3EHY (a stalwart nearly every Sunday morning), G3MNQ, regular skeds Sunday mornings and Monday evenings but lately missed a bit—a poor path over 30 miles; G3KPT (now QRT); G3GXM—a very good signal; G3CLW—a regular appearance on Sunday mornings; G8DT—a good signal (with 10m beam!); G3NUE worked, G3MVF heard (both in Worcester) and G5CP/A, near Chesterfield, recently worked over a poor path. G3LZH was worked earlier on and it is hoped to resume later. The general activity on 4m is definitely picking up with the approaching summer. More activity would be very pleasing on this very interesting band.

GM2FHH (Aberdeen) had a good QSO with GM3FGJ (both QRGs 70·200 Mc/s) at midnight on May 14 with very little fading and several S points better for the same power and with simpler aerials than 144 Mc/s. Equipment at GM2FHH comprises an ECC84 cascode, ECF82 mixer-cathode follower, 12AT7 Squier oscillator doubler with the overtone oscillator on 23·2 Mc/s.

On May 5 GM3GUI heard unreadable phone (they appeared to be German) signals on the band.

U.H.F. News

G3JWQ (Ripley, Derbys) found conditions very poor for the First 420 Mc/s Contest although Midlands activity was very good. Only "old faithful" G2XV was working at a distance, and G2HDJ heard. G3JWQ thinks that some S. Wales and Bristol receivers could do with "hotting up" as there have been some good signals which could not be turned into QSOs! **G2CIW** (Northfield) worked G3ILX (Barrow) on phone on May 10.

G3NOX/T (Saffron Walden) reports as best DX DL3FR (Essen) who was worked during a recent opening, when OH4HN, OH4HC, F9LD, G2CIW, G3HAZ and several other Midlanders were worked, all on phone. Activity on the band is definitely increasing and it is now possible to raise somebody on any evening without making a sked. On the TV side, further relays have been carried out between Ely (Cambs) and Watford. G3NOX/T is always looking for a Continental station to take his pictures and with this in mind can instantly change to negative modulation.

On May 15, G3LGJ (Castle Bromwich) received TV pictures from G3NOX/T at a distance of 95 miles. This is a new record for Amateur TV. Although the 70cm signals were subject to deep fading, the pictures were fully readable on peaks.

G2XV (Cambridge) referring to the vexed question of "Who hears me when I don't hear them?" says he had a similar experience with G2HDJ, who was called *eleven* times without result in the Contest. Gerry hopes to resume the 70cm schedule with G5QA (Exeter), when Herb recovers from his operation, and would be glad if any other station on the path would join in. This sked is Monday, Wednesday, Friday 20.45/21.05 G.M.T. G5QA is on 434·244 and G2XV on 435·170 Mc/s.

G5QA (Exeter) who is getting about again, mentions 2m and 70cm skeds with GW3ATM which are still continuing, and says G3OIM/T (nr. Chepstow) should be on 70cm by now.

G3LTF (Galleywood) worked F9LD at 59 (frequency 435·3 Mc/s) on April 18. On the 23rd conditions were miserable for the 420 Mc/s Contest and to cap it all there was a faulty relay on the receiving side—apologies to G5NF, G3BEX and all the others who called to no avail! In all 20 stations were worked with G3MPS the best DX, and G3OUO/T for a new one. From the 11th onwards conditions were good on 70cm most of the time. On May 12 F2ZD (Paris) received 589 c.w. signals from G3LTF but regretted no transmitter for 70cm. During a duplex test with PA0WAR on 70cm-to-2m G3LTF was received 5/3 3/0. On May 16 during another test with PA0WAR G3LTF was very weak. G2FNW was worked 59/59. On May 17 G3LHA, G2CIW were worked and G3KPT called to no avail!

G3LQR/T (Dedham, Essex) came on the band just before Christmas 1960 and was on during the good conditions of February, when G2CIW, G3KPB/P (Hereford), G3HAZ, some London stations and ON4HN, ON4ZK, ON4HC were worked and DL3FR heard. More recently F9LD (Lille) was worked. The present frequency used by G3LQR/T is 435·3 Mc/s.

G3LRG has been working on 1296 Mc/s gear for moon reflection experiments for two years and now has a 12 ft. dish.

Net Directory

Leaders of nets are asked to advise G2AIW of the frequencies used and times of operation for listing in this feature.

Project Oscar

A.R.R.L. has granted its endorsement to the activities of the Project Oscar Association (*QST*, April). The League will support by disseminating information both technical and operational to amateurs throughout the world.

Single Sideband

By G. R. B. THORNLEY (G2DAF)*

MANY amateurs who have decided to build the G2DAF Communication Receiver, described in the March and April issues of the BULLETIN, have obtained supplies of the Sickles Type SA-2612-A i.f. transformers used in the original design. In consequence, the writer has received a number of requests for information in regard to the tuning range that is available, and in view of the unusual arrangement of the upper core adjustment, the correct trimming procedure.

Tuning Procedure for Sickles SA-2612-A Transformers

Both windings are resonated with an adjustable dust core, and both cover approximately the same tuning range. Due to the high L/C ratio the stray circuit capacity has a marked effect on the range that can be covered. The resonating capacity of the top winding is 60 pF and the bottom winding 75 pF. In practice there will be the additional stray circuit capacity—usually of some value between 5 and 10 pF, and as these are the conditions under which the transformer will be used the frequency ranges are given for each winding for the resonating capacity itself, and for the resonating capacitor plus 5 pF and plus 10 pF.

Top Winding	*Capacity*	*Frequency Range*
(Resonating	60 pF	435 to 585 kc/s
capacity	65 pF	425 to 565 kc/s
60 pF.)	70 pF	415 to 545 kc/s
Bottom Winding	*Capacity*	*Frequency Range*
(Resonating	75 pF	420 to 610 kc/s
capacity	80 pF	400 to 585 kc/s
75 pF.)	85 pF	385 to 565 kc/s

The bottom core is attached to the usual screwed brass rod and the trimming procedure is normal—unscrewing the rod withdraws the core from the coil and the frequency goes higher; screw in and the frequency goes lower. In the case of the top core this has a non-standard mechanical arrangement and the dust core is a hollow cylinder $\frac{5}{8}$ in. long cemented to a screwed brass sleeve $\frac{5}{16}$ in. in diameter and $\frac{3}{4}$ in. long, threaded with approximately 34 turns per inch. The dust core is positioned mid-way within the pie winding when the brass sleeve is screwed in four turns from the full out position and this is the lowest frequency tuning point. To *increase* frequency the sleeve is screwed further in, and at 15 turns in from the full out position the winding is resonant at its *highest* frequency. Note that this is the opposite to the usual procedure where clockwise rotation of the adjusting screw lowers the frequency. Finally a word of warning: do not screw in the core more than 15 turns—if you do go beyond the limit of the threaded bush (18 turns) it will drop through into the centre of the coil former.

Receiver Bias Supply

There have been a number of queries in regard to a suitable alternative mains transformer for a source of negative bias supply, either for a receiver, or for muting purposes. Small mains transformers can be obtained from Radiospares Ltd., either listed as a " Standard Filament Transformer " or as a " C.R.T. Transformer," with 200/250 volt 50 c/s primary and a single 12 or 13 volt secondary. The secondary is connected across the common receiver or transmitter 6·3 volt heater line and the primary will then give approximately 100 volts output to feed the bias rectifier valve.

How Silly Can You Get?

" You are S9 + 40db, OM! " How often do we hear this report on the amateur bands. Unfortunately far too often! If the reporting station were a novice it could be excusable on the grounds that he did not know any better. However, listening on any of the bands will show that many of the worst offenders are experienced operators who should know better, with call-signs issued ten or more years ago.

In the BULLETIN of August 1960 in Part 2 of *Communication Receiver Design Considerations* the writer made the following comment, " Very few aspects of Amateur Radio have occasioned so much criticism and so many derogatory remarks as S meters and S meter reports. When all signals are S9 but some are more S9 than others the whole thing becomes childishly impossible. This is a great pity! There is nothing wrong with the S meter—the fault is with the way in which it is used. The often heard report of S9 + 40db really indicates that the man giving it has no conception whatsoever of the meaning of S points and decibels." To take this subject a little further it is suggested that the following observations are worthy of serious consideration.

If a transmitting station receives a report of S9 + 40db, the report really means that he is running 40db more power than is necessary to transmit a S9 signal. Now 40db is a power ratio of 10,000 to 1, therefore the transmitting station could reduce his power—in the case of a U.K. station running at his licensed maximum of 600 watts p.e.p. input—to 0·06 watt p.e.p. (in the case of the 150 watt a.m. station to 0·015 watt) and he would still be S9.

Inter-G 10 Metre Contacts

In the May issue of the BULLETIN G2BVN made a plea for increasing use of the 28 Mc/s band for shorthaul contacts now that the band is no longer open for long distance working and with the approaching sunspot minima is likely to see diminished DX activity for a number of years to come.

For a longtime 80m has been the traditional band for inter-G contacts; however, that part of the band from 3·7 to 3·8 Mc/s generally used by the sideband operators is badly cut up by the high power commercial transmissions and there are many occasions when operation is difficult even with a modern highly selective communication receiver. During the months to come the static level is likely to rise and the combination of QRM and QRN is likely to make reception—to say the least—rather unpleasant.

On 10m there is 1700 kc/s of band space available, no commercial activity and negligible static. The higher frequency makes aerial construction particularly easy. A quarter wave ground plane including the radials would not present any problem and the necessary space for erection would be available at the majority of stations. This type of array would radiate a stronger ground wave than a beam and would be omni-directional. All modern s.s.b. transmitters cover the 10m band so the only effort at the transmitter is switching over and tuning up.

From reports and comments already received it would appear that the general opinion is that the maximum range for consistent contacts is likely to be about 50 miles. If this is so, then the 10m band would not replace 80m for British Isles coverage. However, in the history of radio communications there have been many occasions when a so called useless band of frequencies has been explored by amateurs and found to have much greater possibilities than was at first considered possible.

The writer would be interested to have comments on this subject from other single sideband operators and would be willing to maintain regular schedules and carry out a series of tests and experiments particularly from the view point of evaluating the most satisfactory type of aerial system.

The quiet background noise plus the improved signal-to-noise ratio of a selectable sideband receiver and the power gain at the transmitter gives the single sideband worker a considerable advantage and this advantage could be exploited fully on a band where man-made interference and adjacent channel splatter would be very low.

* *5 Janice Drive, Fulwood, Preston, Lancashire.*

Society News

Blackpool Regional Meeting

THE weekend of April 22–23 saw the holiday traffic to Blackpool swelled by an influx of amateurs from most parts of Northern England, together with a few from "foreign parts." On the Saturday afternoon the mobile treasure hunt organized by G6DN of the South Manchester Group was well attended, and in spite of heavy rain, all competitors, including the Headquarters representatives, were able to complete the course. G3FIM/M was adjudged the winner. An informal dinner arranged by G3JLF completed the day.

Sunday dawned bright and the sunshine drew amateurs from their shacks so that by lunchtime the Imperial Hotel was besieged by about 150 amateurs, XYLs and harmonics. In spite of the fact that only 85 bookings had been received, the hotel rallied to the extra demand and after a slight delay all were accommodated.

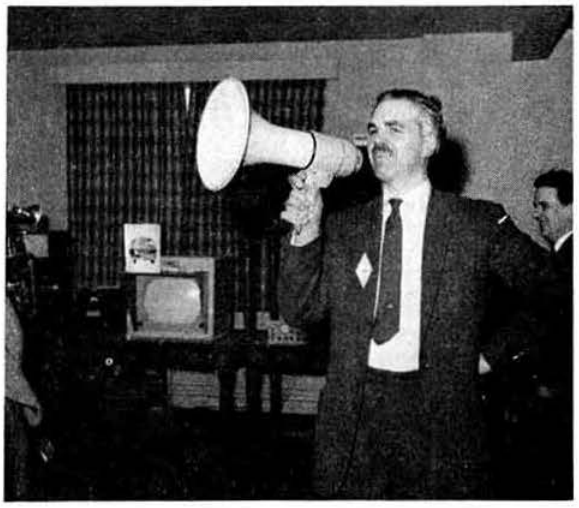
After the toasts, the Region 1 Representative, Basil O'Brien (G2AMV), presented the trophies for Region 1 Field Day and for the highest placed Region 1 group in National Field Day to the Wirral Group. In return, Mr. O'Brien was presented with a bedside automatic tea-making machine as a token of the Region's appreciation of his 10 years' service as R.R.

During the business meeting Council Members R. C. Hills (G3HRH) and P. H. Wade (G2BPJ) and the General Secretary, John Clarricoats, O.B.E. (G6CL), commented on Society matters and answered questions on a variety of subjects.

After tea, members returned to participate in the raffles, first for vouchers and then for the fine selection of equipment, books, valves and components donated by manufacturers and firms throughout the country.

To round off a most enjoyable day G. R. B. Thornley (G2DAF) gave an interesting demonstration of the s.s.b. transmitter and receiver which have been described in the BULLETIN. Apart from showing how two separate nets could operate on the same (carrier) frequency without mutual interference, his ready identification of other stations without the need to wait for call-signs will have disposed of the criticism that "the stuff is so garbled that you can't tell who is talking."

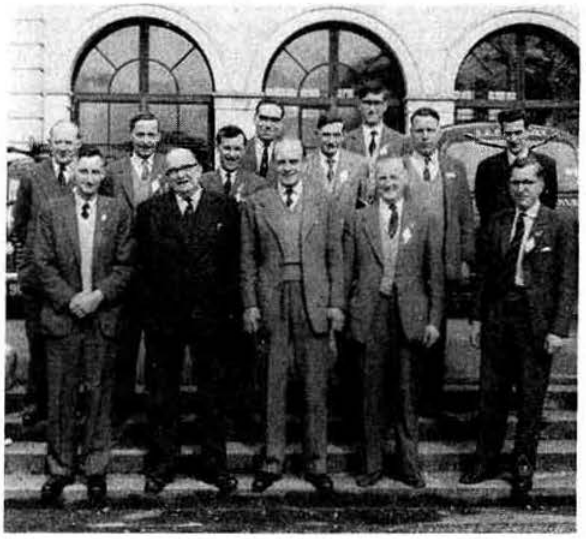
Demonstrations of Hallicrafters s.s.b. and other equipment were given by James Scott Ltd. of Glasgow, and a wide range of cabinets and other metalwork were exhibited by E. J. Philpott's Metalworks Ltd. of Loughborough.—H.F.



Tom Douglas (G3BA), President of the Midland Amateur Radio Society and one of the prime movers behind the North Midlands Mobile Rally at Trentham Gardens on April 30, 1961.
(Photo by Holloway Studio, Birmingham)

North Midlands Mobile Rally and Region 3 Meeting

THE North Midlands Mobile Rally at Trentham Gardens, near Stoke-on-Trent, on April 30, 1961, again attracted a very large attendance. More than 2,000 people (including members of the public) visited the Rally Exhibition while of the 350 cars in the special parks nearly 250 were equipped for mobile operation.



This group picture taken at Trentham Gardens on Sunday, April 30, 1961, venue of the North Midlands Mobile Rally and Regional Meeting, shows the President of the R.S.G.B. (Major-General Eric Cole, G2EC), centre front row, with members of the Council, Regional, County and District Representatives. The Region 3 Representative (Alec Higgins, G8GF) is on the right and the General Secretary on the left of the President. The Stoke-on-Trent T.R. (Vic Reynolds, G3COJ) is next to G6CL.
(Photo by Holloway Studio, Birmingham)

The R.S.G.B. Region 3 Meeting held during the afternoon, at which the Council was represented by the President (Major-General E. Cole, C.B., C.B.E., G2EC), Messrs. R. C. Hills (G3HRH), F. K. Parker (G3FUR) and the General Secretary (John Clarricoats, O.B.E., G6CL), was well attended. Other activities included a high speed Morse contest (won by C. J. Morris, G3ABG), a film show arranged by the Slade Radio Society, a mobile safety competition and a Grand Raffle.

The talk-in stations at Trentham were G3GBU/A on Top Band and G3MAR/A on 2m. In addition, three outstations, G2AMN, G3HVI and G3OGD, all on 160m, helped to guide visiting mobiles.

The Rally was organized by the Midland Amateur Radio Society and the Stoke-on-Trent Amateur Radio Society. A sound and colour film record was made by the M.A.R.S. Film Unit and Grant Dixon of the British Amateur Television Club.

Mullard Award Presentation in Cornwall

ON behalf of Mullard Ltd., Mr. C. W. Andrews (G2TP) will present the Mullard Award to Miss Enid Bottomley (G3OHB) and Mr. Graham Thomas (G3OGT) at St. Teresa's Home, Long Rock, Penzance, on Sunday, July 9, 1961, in the presence of Group Capt. Leonard Cheshire, V.C., and Major-General E. S. Cole, C.B., C.B.E. (G2EC).

In connection with the ceremony, it is proposed to hold a picnic in the grounds of St. Teresa's to which all local radio amateurs and their families will be welcome. Further details may be obtained from J. Watson (G3AET), 24 St. Johns Terrace, Devoran, near Truro.

Mr. John Clarricoats, O.B.E. (G6CL)

MEMBERS will be sorry to learn that Mr. Clarricoats has been in hospital since May 16. The General Secretary wishes to thank all those who have written to express good wishes for a speedy recovery. He hopes to be out of hospital by the middle of June.

R.S.G.B. QSL Bureau

MEMBERS are asked to send to the Bureau envelopes bearing the appropriate prefix in addition to their normal envelopes if they work /P or /M in other prefix zones of the U.K.

For example, if G2MI is operating as GM2MI/M then envelopes for that call-sign should be sent to the Bureau. So many amateurs are now working outside their normal prefix zones on a temporarily basis that it is quite impossible for the Bureau staff to remember them all.

Granfield Trophy

HOWARD WATON (G3GGJ), Honorary Secretary, Cambridge & District Radio Society, has been awarded the Granfield Trophy for 1961 in recognition of his work for the R.S.G.B. and in particular for the part he played in organizing the National Convention in Cambridge last year. The Award was made by the Region 5 Representative (Mr. T. A. T. Davies, G2ALL) at the April meeting of the Cambridge & District Radio Society in the presence of the donor (Mr. Stan. Granfield, G5BQ).

The Trophy was originally donated as a DX award for competition between members of the prewar R.S.G.B. District 8, when G5BQ was the D.R., but since the war it has been awarded to to the Region 5 member who has done outstanding work for Amateur Radio during the previous year.

Radio Amateurs' Examination

THE question paper set by the City and Guilds of London Institute for the Radio Amateurs' Examination on May 6, 1960, was as follows:

Eight questions in all are to be attempted, as under:

Both questions in Part I (which are compulsory) and six others from Part II. Failure in either part will carry with it failure in the examination as a whole. Logarithm tables are supplied: slide rules may be used.

Part I

Both questions must be attempted in this part.

1. What conditions are laid down by the amateur transmitting licence as regards:

(*a*) the avoidance of interference with other amateur stations and any other wireless telegraphy
and (*b*) the control and measurement of the frequency of transmissions? (*15 marks*)

2. Explain what is meant by over-modulation of a radiotelephony transmitter. What are the indications that a transmitter is being over-modulated, and what are the effects of over-modulation on:

(*a*) the transmission from the station concerned
and (*b*) transmissions from stations transmitting on adjacent channels? (*15 marks*)

Part II

3. Draw a circuit diagram of the power amplifier stage of a transmitter for use in the amateur bands between 3 Mc/s and 30 Mc/s. Sketch the layout of the tank circuit and describe the construction of the coils and capacitors of which it is composed. (*10 marks*)

4. What are the factors which limit the flow of anode current in a thermionic valve? Explain how the anode current in a triode valve is controlled by the potential of the grid with respect to the cathode. (*10 marks*)

5. Describe two methods of coupling a circuit carrying alternating current at radio frequency with another similar circuit. Illustrate your answer with practical examples. (*10 marks*)

6. Describe and explain a method of modulation suitable for use in an amateur telephony transmitter. (*10 marks*)

7. A coil whose inductance is 10 henrys is connected in series with a capacitors of 10 micro-farad across a 240 volt, 50 c/s a.c. supply. What is the potential difference between the terminals of:

(*a*) the inductor
and (*b*) the capacitor?
(Disregard any resistance of the coil.) (*10 marks*)

8. Describe the propagation of electro-magnetic waves from a simple vertical aerial. (*10 marks*)

9. Draw a block diagram of a complete transmitter capable of transmitting c.w. or telephony in the 14, 21 and 28 Mc/s bands. Explain the functions of each stage of the equipment. (*10 marks*)

10. Describe with the aid of diagrams a power unit suitable for supplying anode and heater power to a receiver. Explain the need for smoothing of the anode supply. (*10 marks*)

Examiners' Comments

Although the majority of failures were the result of a general inadequacy in all questions attempted, there were an appreciable number who failed in Part I only.

Many candidates who failed did so because of inadequate and superficial treatment of the questions. Diagrams and definitions alone are insufficient when descriptions and explanations are asked for.

The following comments are made on individual questions:

Question 1. Far too many candidates failed to give sufficient attention to a study of the licence conditions.

Question 2. Generally quite well done. A number of candidates treated the question too lightly, giving only very brief and inadequate notes. Some confusion evidenced as to the practical effects of over-modulation on a transmission.

Question 3. The circuit diagrams were generally well done, but many candidates omitted to sketch the layout, and descriptions of the coils and capacitors were too brief.

Question 4. Comparatively few candidates were able to give a simple description of the action of the control grid in a triode.

Question 5. Too many candidates merely quoted two practical examples.

Question 6. Quite well done by most candidates. The main cause of criticism was superficial treatment.

Question 7. The chief causes of difficulty were:

(*a*) Use of long and involved methods of calculation and
(*b*) failure to appreciate the method of calculating the total impedance in an a.c. circuit.

Many candidates had no difficulty with this question.

Question 8. This question seemed to cause most difficulty. In general the treatment was weak and only a comparatively small number of candidates gave good answers.

Question 9. Generally well done, but in many cases insufficient detail was shown on the block diagram and the notes were too brief.

Question 10. Generally well done.

The total number of candidates who took the Examination was 1,333 (59 overseas). Of the home entrants 699 (54·9 per cent) passed and 575 (45·1 per cent) failed. These figures compare with 59·6 per cent and 40·4 per cent for 1959 and 72·3 per cent and 27·7 per cent for 1948.

Eddystone Transistor Communications Receiver

A COMPLETELY transistorized communication receiver with a frequency range of 500 kc/s–30 Mc/s in six bands was a particularly interesting exhibit on the Stratton & Co. Ltd. stand at the Radio and Electronic Component Show held in London from May 30–June 2.

The receiver, which has an i.f. of 465 kc/s and incorporates a bandpass crystal filter, operates from a 12 volt d.c. supply and draws 35mA when quiescent, 65mA at 50mW output and 210mA at 1W output. It is designed for 75 ohm aerial input and uses 12 transistors and six diodes.

Accommodation Offered

ABOUT three months ago Mr. L. W. Skipper (G4LS), 148 Boston Manor Road, Brentford, Middlesex, was bereaved by the loss of his wife. As he has no relatives, he is somewhat lonely. In a note to Headquarters Mr. Skipper enquired whether any married members of the Society would like to take up accommodation at his home in return for a little help in the house. He can offer a nice bedroom, lounge, kitchen, bathroom, etc., all furnished at a reasonable rent.

Alternatively Mr. Skipper is willing to move into the home of another member in any part of the country provided he is able to continue his transmitting activities.

Mr. Geoffrey Parr, M.I.E.E.

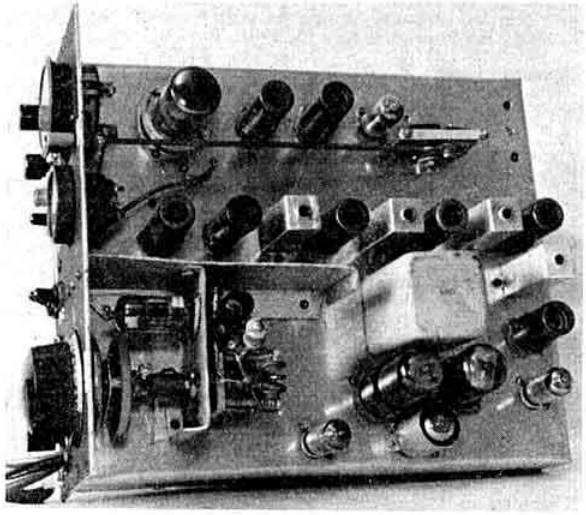
IT is with deep regret that we record the sudden death of Mr. Geoffrey Parr, M.I.E.E., on May 30, 1961. Until recently Mr. Parr was Hon. Secretary of The Television Society and Editor of *The Journal of the Television Society*.

International Plastics Exhibition

LORD HAILSHAM, Minister of Science, will open Interplas 61 at Olympia, London, at 12 noon on June 21. After the opening ceremony the Minister will tour the exhibition.

Broadcast Receiving Licences

DURING March the number of combined television and sound licences throughout Great Britain and Northern Ireland increased by 81,255 bringing the total to 11,267,741. Sound only licences total 3,908,984, including 474,478 for sets fitted in cars.



The small transmitter-receiver used by G3GOP/P for his record breaking 144 Mc/s contact with YU1CW on May 7, 1961. *For more details, see page 575.*

Council Proceedings

Résumé of the Minutes of the Proceedings at a meeting of the Council of the Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1, on Monday, April 17, 1961, at 6 p.m.

Present: The President (Major-General E. S. Cole in the Chair), Messrs. N. Caws, C. H. L. Edwards, R. C. Hills, E. G. Ingram, J. D. Kay, A. O. Milne, L. E. Newnham, F. K. Parker, F. A. Russell, G. M. C. Stone, P. H. Wade, E. W. Yeomanson (Members of the Council), and John Clarricoats (General Secretary).

Apologies for absence were submitted on behalf of Messrs. K. E. S. Ellis, R. L. Smith-Rose and A. C. Williams.

* * *

Cambridge Convention

The Honorary Treasurer submitted a comprehensive financial statement which showed that due to very poor attendances the loss on the Convention had amounted to £194 12s. 8d.

Mr. Caws stated that he would refer specifically to the financial aspects of the Convention in his Annual Report to the membership.

News Bulletin Service

It was reported that the name of Mr. Menteith (GM3IWU) had been added to the list of members authorized to read R.S.G.B. News Bulletins.

R.S.G.B. Radio Hobbies Exhibition

It was reported that Mr. P. A. Thorogood had made a substantial contribution to the Society in respect to the 1960 R.S.G.B. Radio Hobbies Exhibition.

R.S.G.B. QSL Bureau

It was reported that a member who wished to remain anonymous had once again made a donation of £5 to the R.S.G.B. QSL Bureau.

Membership

Resolved (i) to elect 56 Corporate members and 33 Associates; (ii) to grant Corporate membership to six Associates who had applied for transfer.

Applications for Affiliation

Resolved to grant affiliation to: British Amateur Radio Teleprinter Group, Brownhill Secondary Boys School Amateur Radio Club, 254 Signal Squadron (Aden) Amateur Radio Club.

Amateur Radio Handbook

Consideration was given to a further progress report submitted by Mr. Rouse.

Horace Freeman Trophy

A draft set of rules for the *Horace Freeman Trophy* were accepted and adopted. (The rules were published in the May 1961, issue of the BULLETIN.—EDITOR.)

O.R.M.'s

The Council took note that there does not, at present, appear to be any general demand in the London Region for an O.R.M. due presumably to the successful manner in which local activities are organized.

Resolved to authorize Mr. D. W. R. Macadie to arrange an O.R.M. in Prestwick, Ayrshire, on Sunday, September 10, 1961.

Guide to Amateur Radio

The Secretary reported that due to increasing demand stocks of the eighth edition of *A Guide to Amateur Radio* had fallen to a low level.

Resolve to authorize the Secretary to accept (if considered to be reasonable) an estimate from Bentley & Co. (Printers) Ltd., for printing 5,000 copies of a new edition of *A Guide to Amateur Radio*.

Reports of Committees

The Minutes of meetings of the following Committees were submitted as Reports:

R.A.E.N. March 11, Finance and Staff (Articles of Association), March 19, Membership and Representation, March 20; V.H.F., March 27; Exhibition, April 12; Contests, April 13.

Resolved (i) to receive the Reports; (ii) to accept various recommendations contained in the Reports.

During the discussion on the Report of the Membership and Representation Committee it was agreed to reconsider a proposal to form a Junior Associate Section in six months' time. In connection with a proposal that the office of County (District) Representative be dispensed with as from January 1, 1963, Messrs. Edwards, Hills, Stone and Yeomanson asked to be recorded as voting against the recommendation which was adopted by six votes to four with two abstentions.

It was agreed to defer consideration of the Recommendations of the Finance and Staff Committee until a comprehensive Report on the Articles of Association is submitted. The views of individual members were noted.

Arising from consideration of the Report of the V.H.F. Committee the procedure for handling claims for the *Four Metres and Down* certificate was approved.

Unlicensed Operation

In reply to a question the Secretary stated that he had reason to believe that the person alleged to have used the call GB3JS was due to be prosecuted by the G.P.O. for interfering with the R.S.G.B. News Bulletin service.

It was agreed to enquire from the G.P.O. whether the Society could make brief mention of successful prosecutions in future R.S.G.B. News Bulletins.

The meeting terminated at 9.40 p.m.

R.S.G.B. Bulletin

IN some copies of the May issue of the Bulletin the photographic reproduction was not up to our usual standard. For this we wish to extend our apologies to the advertisers concerned and to thank them for their helpful attitude in this matter.

Silent Keys

H. J. POLLARD (G5PO)

It is with very deep regret that we record the death, at the age of 60, of Mr. Bert Pollard (G5PO) of Bebington, Cheshire. Although he had been in indifferent health for some time, his death on February 20, 1960, after a short illness, came as a great shock to all his friends in the Merseyside area. Licensed for many years, his recent activities were confined to operation on 1·8 Mc/s phone and 3·5 Mc/s c.w.

Our deepest sympathy is extended to his widow and daughter in their great loss. G3ERB

RONALD GEOFFREY SCUTT (G3IBI)

It is with great sorrow we record the sudden death on February 27, 1961, of Ronald Geoffrey Scutt (G3IBI). A keen 2 and 40m operator, he had his last QSO the day before his death.

Mr. Scutt was R.A.E.N. Deputy County Controller for Hampshire and a keen supporter of the Society's scientific activities, particularly during the I.G.Y. His death at the early age of 33 came as a great shock to his many friends, particularly those in the Southampton area, who will miss his cheery voice on the air.

To his widow and two young sons we express our deepest sympathy at this sad time. G.A.A.

Representation

Vacancy

Mr. D. W. Davies (G3MWD) has resigned as representative for the town of Danbury, Essex. Nominations in the prescribed form for his successor should be sent to reach the General Secretary not later than July 15, 1961.

Change of Address

The address of Mr. J. Anthony (G3KQF), representative for the town of Derby, is now 10 Manor Road, Borrowash, Derby.

GB2RS SCHEDULE

R.S.G.B. News Bulletins are transmitted on Sundays in accordance with the following schedule:

Frequency	Time	Location of Station
3600 kc/s	9.30 a.m.	South East England
	10 a.m.	Severn Area
	10.30 a.m.	North Midlands
	11 a.m.	North East England
	11.30 a.m.	South West Scotland
	12.00	North East Scotland
145·55 Mc/s	11.15 a.m.	Beaming south-east from Leeds
	11.30 a.m.	Beaming south-west from Leeds
	11.45 a.m.	Beaming north from Leeds
145·3—145·4 Mc/s	12 noon	Beaming north from South East England
	12.15 p.m.	Beaming west from South East England

News items for inclusion in the bulletins should reach Headquarters not later than first post on the Thursday preceding transmission. Reports from Affiliated Societies and from non-affiliated societies in process of formation will be welcome.

CONTEST NEWS

RESULTS — REPORTS — RULES

B.E.R.U. Contests 1961

THE leading entrants in the various sections of the B.E.R.U. Contests 1961 were as follows: *High Power Section*—ZC4IP, G5WP, G3FPQ, VE2WW, G5DQ, G5R1; *Low Power Section*—G3IDC, ZS4MG, VQ3HD, G2DU, VK7SM, G3GNS; *Receiving Section*—B.R.S.20317, B.R.S. 15822, B.R.S.6604, B.R.S.21624, B.R.S.19965, B.R.S.18461. (*All subject to re-scrutiny*).

London D/F Event

THE London D/F Qualifying Event, organized by Clifton Amateur Radio Society and held on April 30, 1961, was won by C. Hatfull, G3HZI (Clifton A.R.S.) who found the hidden transmitter at 2.29 p.m. followed by E. Mollart B.R.S.10977 (Oxford and District A.R.S.) at 2.31 and O. Harding (Rugby) at 2.59, only one minute ahead of G. T. Peck, B.R.S.15402 (High Wycombe).

The hidden transmitter, G3GHN/P, operated by G3FVG assisted by N. Moore, was located on high ground at Hayes Common, 8 miles from the start at Eynsford. The starter was R. Poppi assisted by A. Roles. The Contests Committee was represented by D. A. Findlay, D.F.C. (G3BZG) and M. Harrington (B.R.S.20249).

South Manchester D/F Qualifying Event

COMPETITORS from as far afield as Buckinghamshire Derby, Rugby, Birmingham and Wallasey took part in the D/F Qualifying Event on May 14, 1961, organized by the South Manchester Radio Club. The R.S.G.B. was represented by the Region 1 Representative, Basil O'Brien (G2AMV).

The hidden transmitter, approximately 11 miles from the start, was found by J. J. Grant (Rugby) in 60 minutes, followed by T. C. Reynolds (Rubgy) in 65 minutes and P. M. Williams (Birmingham) in 71 minutes.

The Region 1 Trophy was won by A. Brennan (Manchester), the only competitor from the North West to find the station.

D/F Qualifying Events

DETAILS of forthcoming D/F Qualifying Events are as follows:

HIGH WYCOMBE

Sunday, July 9
Organizer: G. T. Peck, Ernest Turner Electrical Instruments Ltd., High Wycombe, Bucks.
Frequency: 1874 kc/s.
Call-sign: G3FAS/P.
Map: Ordnance Survey, New Popular Edition, Sheet 159.
Assembly Point: Winter Hill, 1½ miles east of Marlow (N.G.R. 871862).
Assembly Time: 13.00 B.S.T.
Entries and Tea: Intending competitors should notify the Organizer as soon as possible stating the number in their party requiring tea.

WESSEX

Sunday, June 25
Organizer: H. J. Fenn (B.R.S.2515), 6 Church Street, Great Bedwyn, Marlborough, Wiltshire.
Frequency: 1875 kc/s.
Call-sign: G3LLK/P.
Map: Ordnance Survey, New Popular Edition, Sheet No. 157.
Assembly Point: N.G.R. 028986.
Assembly Time: 13.00 B.S.T.
Entries and Tea: Intending competitors should notify the Organizer not later than first post on Friday, June 23. The venue for tea will be notified to competitors at the time of the event.

Oxford D/F Qualifying Event

THE Oxford D/F Qualifying Event, originally arranged for June 10, will now take place on June 18, 1961. Other details may be found on page 534 of the May issue of the BULLETIN.

Second 144 Mc/s Field Day 1961

R.S.G.B. members throughout Europe are invited to take part in this contest, the details of which are as shown below. Contestants are recommended to operate in accordance with the British Isles Two Metre Band Plan.

When: 10.00 G.M.T. to 19.00 G.M.T. on Sunday, July 2, 1961.
Eligible Entrants: All fully paid-up members of the R.S.G.B. resident in Europe. Multi-operator entries will be accepted provided only one call-sign is used.
Power Supplies: Power for any part of the station shall not be derived from supply mains.
Contacts: May be made on either A1, A3, A3a or F3 with an input not exceeding 25 watts to any stage in the transmitter.
Scoring: Points will be scored on the basis of one point per mile for contacts with fixed stations and two points per mile for contacts with other portables or mobiles.
Contest Exchanges: RST or RS reports followed by the band identification letter A and the contact number and location (e.g. RST559A001 5NE Luton). This location must be identifiable on the 10 mile to the inch Ordnance Survey Map.
Logs: (*a*) Must be tabulated in columns headed (in this order) " Date/Time (G.M.T.)," " Call-sign of station contacted," " My report on his signals and serial number sent," " His report on my signals and serial number received," " Location of station contacted as received," " Distance," " Points claimed."
(*b*) The cover sheet must be made out in accordance with R.S.G.B. Contests Rule 5 and the declaration signed. The National Grid Full Six Figure Reference and the location of the station as transmitted must be given.
(*c*) Entries must be postmarked not later than **Monday, July 17, 1961.**
Awards: At the discretion of the Council a **miniature cup** will be awarded to the winner and **certificates of merit** to the runner-up and to the non-transmitting member submitting the best check log in the opinion of the Contests Committee.
The General Rules for R.S.G.B. Contests published on page 341 of the January 1961 issue of the *Bulletin* apply to the contest.

Second 420 Mc/s Open Contest 1961

MEMBERS taking part in this contest are recommended to operate in accordance with the British Isles Seventy Centimetre Band Plan.

When: 09.00 G.M.T. to 23.00 G.M.T. on Sunday, July 16, 1961.
Station Locations: Stations may be operated from more than one site but the National Grid Full Six Figure reference must be recorded in the log for each location in the case of entries from G, GD, GM and GW. In all other cases, entrants must show latitude and longitude.
Eligible Entrants: All fully paid-up members of the R.S.G.B. resident in Europe. Multiple-operator entries will be accepted provided only one call-sign is used.
Contacts: May be made on either A1, A3, A3a or F3.
Scoring: Points will be scored on the basis of one point per mile.
Contest Exchanges: RST (RS) reports followed by the band identification letter B and the contact number and location (e.g. RST559B001 5NE Wigan). This location must be identifiable on the 10 mile to the inch Ordnance Survey Map.
Logs: (*a*) Must be tabulated in columns headed (in this order) " Date/Time (G.M.T.)," " Call-sign of station contacted," " My report on his signals and serial number sent," "His report on my signals and serial number received," " Location of station contacted as received," " Points claimed."
Logs must show clearly when station locations are changed.
(*b*) The cover sheet must be made out in accordance with R.S.G.B. Contests Rule 5 and the declaration signed. The location of the station as transmitted must be given on the cover sheet.
(*c*) Entries must be postmarked not later than **Monday, July 31, 1961.**
Awards: At the discretion of the Council, a **miniature cup** will be awarded to the winner and **certificates of merit** to the runner-up and to the non-transmitting member submitting the best check log in the opinion of the Contests Committee.
The General Rules for R.S.G.B. Contests published on page 341 of the January 1961 issue of the *Bulletin* apply to this contest.

Grafton Radio Society Contest

THE leading entrants in the Top Band Contest organized by the Grafton Radio Society and held on April 8 and 15, 1961, were as follows: *Members' Section*—G3KRH (106 points), G3RX (81), G3KQZ (70); *Open Section*—G3MXJ (133 points), G3NFV (127), G3ERN (123).

Letters to the Editor . . .

Neither the Editor nor the Council of the Radio Society of Great Britain can accept responsibility for views expressed by correspondents. Letters for inclusion in this feature should be concise and preferably not more than 200 words in length.

The Late Gerry Marcuse (G2NM)

DEAR SIR,—As a very old friend of the late Gerald Marcuse, I should like to write a few words of appreciation. I first met him at the end of the First World War in 1919 in a QSO on " spark," and found that we lived only four or five miles apart. This was rapidly followed by a personal meeting at his house in Coombe Dingle, Westbury, Bristol where Gerry had a spark transmitter and crystal receiver in the attic of his house, and a good aerial in the garden.

He had recently come to Bristol at the request of his father, Mr. Eugen Marcuse, to look after a business which had been taken over by Mr. Marcuse.

Gerry Marcuse had been apprenticed to the firm of Ruston Hornsby and was, largely by training, an engineer. His father had sent him for a world voyage as a young man, and he had a vivid memory of the places he visited, and the people he had met. I think that this probably gave him that faculty which he always had of making friends easily.

In Bristol we soon contacted a number of other well-known amateurs and amongst them such early " Old Timers " as Commander B. Hippisley (G2CW) of Ston Easton Park, Somerset, and Wilcox (G2FL) known as WUX of Warminster, because of his original call letters. Both these stations, like myself, had been active before 1914.

Gerry's stay in Bristol was to be short lived, as he soon had to return to London to help his father who was growing old. The next few years saw him living at Caterham, and busy on the Corn Exchange, and at his office in Mincing Lane. I used to visit him at both these places, and derived much amusement at seeing his obvious boredom at having to spend so much time buying and selling corn when he would have liked to be " on the air." At Caterham in a very short space of time he had a really magnificent station, and he was very fortunate in getting a great deal of help from leading firm's such as Mullard and Marconi Co. The " football sized " valves with their filaments lit were an inspiring sight. Across the other side of Caterham Park lived a friend, P. W. S. Valentine, whose house possessed a very fine music room, and in a short time this was turned into a studio, and it was from here that the famous first Empire broadcasts were sent.

Gerry had a wonderful record book containing telegrams and letters from all over the world which he had received telling of the reception of his transmissions, and he used to love to tell how the Japanese had notified the G.P.O. of the reception of signals which had emanated from G2NM and how the G.P.O. had told him that if he had used more than his allotted power, he could forget about it and that they were prepared to give him a full kilowatt if he asked for it. It would be a good thing if the R.S.G.B. could obtain this book for a permanent historical record.

He was always a tremendous enthusiast, and additionally had a great personal charm, attracting and keeping very many friends, many of whom came especially from overseas to stay with him. I have just returned from a visit to EA4CK in Madrid whom I first met at Caterham in 1922/3.

Gerry was very courageous as for some time his health was slowly declining. I went with him to the Coronation Review at Spithead and noticed then that his physical powers had deteriorated a lot. Shortly after, in addition to diabetes which he had already developed, he was troubled by arthritis in his feet and had the greatest difficulty in getting about. He had to give up going to sea and sell his boat, but he soon found a new outlet for his energies in mobile operating, and just twelve months ago we stayed together at Lynmouth, and had a mobile holiday.

His attitude to life was very philosophic. He used to say, " I can't grumble, I have had a wonderful life and marvellous health, and I have enjoyed every minute of it."

I last worked him two days before he died, and on that occasion it was only too apparent that he was going down hill rapidly. His voice, normally bright and alert, was slow and laboured, and he was obviously speaking with great difficulty.

We shall miss him on the air on the regular " skeds " on Saturday and Sunday mornings and at the Old Timers' dinners.

May he rest in peace.

Yours faithfully,
ALAN W. FAWCETT (G2HQ), M.B., F.R.C.S.

Sheffield.

Amateur Radio and the Cheshire Homes

DEAR SIR,—The news published in the April issue that the Mullard Award for 1960 is to be made to G3OGT and G3OHB, patients at St. Teresa's in Cornwall, will, I am sure, be greatly welcomed. You and your readers may like to know that there are licensed amateurs in two other Cheshire Homes, namely G3KQK at Ampthill in Bedfordshire, and G3OPY at Staunton Harold in Leicestershire. The assistance given by local amateurs in all these cases is typical of the hobby.

Group-Captain Cheshire is keen to see Amateur Radio developed in other Homes in this country and overseas, leading perhaps to regular local and international nets. May I, therefore, make an appeal for more local help, which initially can only be an effort to spark off an interest in Amateur Radio? In the U.K. there are Homes at Liss, Hants; Penzance, Cornwall; Bromley, Kent; East Preston, Sussex; Ampthill Park, Beds; Ashby-de-la-Zouch, Leicestershire; Alne, York; Sowerby Bridge, Yorks; Spalding, Lincs; Wimbledon; Colchester, Essex; Dorchester; Chippenham, Wilts; Littleborough, Lancs. Overseas there are Homes in Bombay, West Bengal, Dehra Dun, South India, Bihar, New Delhi, Singapore.

Local amateurs who are willing to help should, as a first step, get in touch with the Matron of the nearest home.

Yours faithfully,
Sunninghill, Berks. G. S. SAMWAYS (G6OH).

Net Operation on Two Metres

DEAR SIR,—After reading the remarks on net operation in *Four Metres and Down* in the May BULLETIN, I am moved, for the first time, incidentally, to write to the Society in a protesting vein!

I submit that there is absolutely no case for out-of-zone Net operation on 2m.

The original reasons for the British Isles Two Metre Band Plan were not merely those stated but also to avoid severe interference to weak, distant stations by very strong, local ones. This is necessary because the range of signal strengths to be encountered on the v.h.f. bands is much greater than that experienced on the lower frequencies, which enjoy widespread ionospheric propagation. Some typical 144 Mc/s signal voltages, measured across a 75 ohm feeder, are as follows:

Very strong local signal	10 mV
Average local signal	500 μV
Weak local signal	20 μV
Weakest usable signal for routine communication	0·08 μV

The last-mentioned gives a signal-to-noise ratio of 3db in a bandwidth of 1 kc/s, the receiver noise-factor being a 4db. Such a signal-to-noise ratio is adequate for copying c.w. signals from local net stations would probably fall in the range 100 μV to 10 mV which are, respectively, 60 and 100db stronger than the wanted weak signal. The former signal could be rejected completely if more than 20 or 30 kc/s off-tune but, even with the best receiver design available, the latter signal would preclude weak-signal working within about 80 to 100 kc/s of itself, which represents almost the whole width of one Zone. However, stronger local signals would suffer far less interference. These results are very well borne out in practice! One local station operating in a " distant-station " Zone can easily cover the whole Zone with interference, without incorrect transmitter adjustment.

The point has been made that a net could be closed down in the presence of legitimate DX stations in the Zone. In view of the foregoing, it would seem rather unlikely that any such stations would ever be detected if a net were in progress at the time. In fact, severe interference was caused on several occasions last year by a local net to a well-equipped northern DXpedition whose operators had taken the trouble to provide themselves with Zone 9 crystals. Surely the southern zones, containing 850 kc/s in all, are wide enough to include southern nets, thus avoiding this kind of trouble!

There can be no objection to using the lower shared megacycle provided only that the well-known service spot-frequences are

avoided. If this precaution is observed, stations may occupy a channel for the whole day and night as well, if so desired. The very well-sited GB3VHF beacon transmitter would not be operating on 144·5 Mc/s if this were not the case.

Finally, it would seem that no-one has yet thought it worth while to invite the opinions of the people whose Zone frequencies are to be " shared " in this way. Perhaps stations in the northern part of the British Isles who have recently been put to so much trouble in moving to the opposite end of the band, to conform with the new Plan, would not take kindly to the suggestion. I, for one, would greatly sympathize with them if they did object! The Band Plan principle has worked well on 2m: let us not sacrifice it so easily!

Yours faithfully,

Bushey Heath, Herts. ARNOLD L. MYNETT, B.SC. (G3HBW)

Piracy

DEAR SIR,—Though not a transmitting amateur myself I am in full agreement with G3LCK's letter in the February BULLETIN concerning the sale of ex-Government transmitting sets.

I have noticed on a number of occasions friends of mine who have bought a WS18 or 38 and then proceeded to go happily on the air with it. In many cases, however, they knew that a special licence was necessary but thought that an ordinary broadcast receiving licence was in order.

I consider this to be the fault of the shopkeepers who sell this equipment to the unsuspecting customer. I agree with G3LCK when he says the law should be amended; in the meantime a little more publicity, in the National Press, of pirating would help.

In addition I would also add on this subject that as the sets mentioned are still in use in the Army the likelihood of them being eradicated is very slight. The 18 and 38 sets are used for inter-platoon work and the 19 set for inter-unit nets. The latter, by the way, have special frequencies. From my own practical experiences I have never known any 18 or 38 set to work properly over a distance of more than two miles.

Yours faithfully,

Faversham, Kent. J. S. ALDERTON (A.2230).

Christmas Island Amateur Radio Activity

DEAR SIR,—In reply to G8ML's letter in the March BULLETIN on *Recent Activity on Christmas Island*, may I draw his attention to the fourth word of the first sentence of the article—" recommenced."

Yours faithfully,

Brampton, Hunts. A. G. GODFREY (G3DAF).

A Plea for Effective Maritime Mobile Operation

DEAR SIR,—Browsing through recent issues of the BULLETIN, I notice there is some interest in a proposal for third party traffic handling. This I am all for *providing it is limited to c.w.* but before the lucky amateurs at home are given something new to play with, please do not forget that there are many others who are unable to get on the air at all or only on very rare occasions. For reasons best known to themselves the powers-that-be at the G.P.O. refuse to grant Maritime Mobile facilities to British amateurs serving at sea on British registered ships yet those same amateurs continue to pay their home licence fees. As they are considered competent to handle the commercial and safety traffic for an ocean-going ship it seems unlikely that they would abuse the facilities of a /MM licence. For all that they seem to be either forgotten or ignored. So if there is to be a drive for anything at all, please let it be to get *effective* Maritime Mobile operation approved. Incidentally, commercial operators might be just the right people to provide a successful nucleus for projected traffic nets.

In regard to operating procedures, why do c.w. operators not make more and proper use of the Q codes?

Yours faithfully,

M/V Atlantic City, ANTHONY P. BULL (G3ICB)
Aden, April 19, 1961. (Radio Officer).

COPY DEADLINE

TO enable the R.S.G.B. BULLETIN to be printed in time for bulk postings to take place by not later than the 14th day of the month, the closing date for editorial copy, the 22nd day of the preceding month, must be strictly adhered to. Society Representatives and Club Secretaries will greatly assist the Editorial staff by posting copy to reach Headquarters by not later than the 20th of the month whenever possible.

Copy received after the 22nd day of the month will be held over for future use if still topical.

R.A.E.N. Notes and News

By E. ARNOLD MATTHEWS (G3FZW)*

A SUCCESSFUL meeting of R.A.E.N. officers from East Anglia, the Home Counties and South-East England and members of the R.A.E.N. Committee was held at Marconi College, Chelmsford on May 14. Among the 27 persons present were the county controllers from Norfolk, Suffolk and Kent, supported by area controllers from Surrey, Sussex and Essex. Committee members present were Dr. Gee, who took the chair, Messrs. C. L. Fenton, C. H. L. Edwards, E. W. Yeomanson and E. A. Matthews.

After Dr. Gee's opening remarks Mr. Edwards welcomed those present to Chelmsford. Group leaders then gave their activity reports, from which it appears that the area represented has a total of some 400 members with well over 50 mobile stations, many portables and active liaison with at least one user service in each of the counties concerned. In most cases liaison extends to all three authorized users. Most of the counties have been divided into sections based on possible operational requirements, an exception being London which maintains an excellent station at B.R.C.S. H.Q. All the groups have active contact with their neighbouring R.A.E.N. Groups, while several have tried and tested arrangements for the rapid establishment of stations in various county user services' HQs.

Mr. Fenton, as E.C.T.R. Route Manager, reviewed the progress of the trunk routes in detail and explained the method of operation used for monthly exercises. Difficulties encountered were discussed and some suggestions concerning the form of exercise messages were adopted. The need for fuller use of the inter-county v.h.f. frequency (144·12 Mc/s) was stressed.

A short discussion on message handling problems and use of the current recommended form (F. Sigs. 52) was followed by a review of financial matters.

Mr. Matthews dealt with the basic organization of the Network and the collation of the various decisions, rules and regulations affecting R.A.E.N. which the Society, the R.A.E.N. Committee, the Post Office and the User Services had made from time to time. The rights and obligations of individual members, the local officers and the Society were set out, and officers were given advice on the general trend of user services' policy regarding R.A.E.N. in addition to methods of group administration. It was evident from the discussion which followed that this paper was well received and there was a large majority in favour of a recommendation that the text be made available to members.

In conclusion, thanks are due to Marconi's W.T. Co. Ltd. for making the meeting place available, to Mrs. Edwards who acted as scribe and to G3KPJ and G3MWD who acted as " talk-in " stations for mobiles.

Personnel

The following have resigned their appointments as Area Controllers: H. S. Mason (G3HSM), J. Browne (G4XC) and R. J. Lang (G3KAY).

A. L. Rogers (G2FQD) of Wodehouse Terrace, Falmouth, Cornwall, has been appointed an Acting Area Controller.

F. Robins, G3GVM, (A.C., Worthing) has moved to " Marigolds," 4 Broadview Gardens, High Salvington, Worthing, Sussex.

J. R. Brindley, G3DML, (C.C., Staffordshire) has moved to 40 Milehouse Lane, Newcastle, Staffs.

As from June 28 the address of G. A. Allcock G3ION (C.C., Hampshire and member of the R.A.E.N. Committee) will be " Woodlands," Bassett Green Close, Bassett, Southampton.

* *1 Shortbutts Lane, Lichfield, Staffs.*

Forthcoming Events

Details for inclusion in this feature should be sent to the appropriate Regional Representatives by the 18th of the month preceding publication. T.R.s and club secretaries are reminded that the information submitted must include the date, time and venue of the meeting and, whenever possible, details of the lecture or other event being arranged. Regional Representatives are requested to set out the copy, preferably typed double spaced, in the style used below. Standing instructions for more than three months ahead cannot be accepted.

DATES FOR YOUR DIARY

June 18.—A.R.M.S. Rally at Barford St. John, near Banbury.
June 25.—Longleat Mobile Rally.
July 8-9.—South Birmingham Night Rally.
July 9.—South Shields Mobile Rally.
August 12-13.—Derby Mobile Rally and Hamfest.
August 23-September 2.—National Radio and Television Show, London.
August 27.—Stamford Rally Fest at Burghley Park, near Stamford.
September 3.—G6UT's "Ham Party."
September 10.—Region 11 O.R.M.
September 10.—National Mobile Rally at Woburn Abbey.
September 16.—Region 10 O.R.M. at Cardiff.
September 17.—Lincoln Mobile Rally and Hamfest.
October 1.—Region 17 O.R.M. at Newbury.
October 21-22.—Scout Jamboree-on-the-Air.
November 22-25.—R.S.G.B. International Radio Hobbies Exhibition, London.

REGION 1

Ainsdale (A.R.C.).—Wednesdays, 8 p.m., 37 Hawthorne Grove, Southport.
Blackburn.—Fridays, 8 p.m., West View Hotel, Revidge Road.
Blackpool (B. & F.A.R.S.).—Tuesdays, 8 p.m., Squires Gate Holiday Camp.
Bury (B.R.S.).—July 11 (Discussion), 8 p.m., Knowsley Hotel, Kay Gardens.
Chester.—Tuesdays, 8 p.m., Y.M.C.A.
Liverpool (L. & D.A.R.S.).—Tuesdays, 8 p.m., Gladstone Mission Hall, Queens Drive, Stoneycroft.
Macclesfield.—June 27, July 11, 25, 42 Jordongate.
Manchester (M. & D.A.R.S.).—Wednesdays, 7.30 p.m., King George VI Club, North Road, Moston, Manchester, 10. **(S.M.R.C.).**—Fridays, 7.30 p.m., Fallowfield Bowling and Lawn Tennis Club, 81 Wellington Road, Fallowfield 14.
Morecambe.—July 5, 125 Regent Road.
Preston.—June 27, July 11, St Paul's School, Pole Street.
Southport (S.R.S.).—Thursdays, 8 p.m., The Esplanade.
Stockport (S.R.S.).—June 21 (Sale of Surplus Gear), July 5 (Junior Members' Evening), July 19 ("Transistors" by I. MacArthur, G3NUQ), 8 p.m. The Blossoms Hotel, Buxton Road.
Wirral (W.A.R.S.).—June 21, July 5, 19, 7.45 p.m., The Castle Hotel, Ivy Street, Birkenhead.

REGION 2

Barnsley.—June 23 ("Electronics in Industry"—Film), July 14 (Mobile Equipment), 7.30 p.m., King George Hotel, Peel St.
Bradford (B.A.R.S.).—June 27, visit to Leeds and Bradford Airport, Yeadon. July 11 (informal), July 25 ("Audio Amplifier Design and Construction," by P. J. Barowitz, G3LZW), 7.30 p.m., Cambridge House, 66 Little Horton Lane, Bradford 5.
Halifax (H. & D.R.S.).—June 20 (Informal), July 4 (Junk Sale), 7.30 p.m., "Beehive & Cross Keys," King Cross Lane, Halifax. **(Northern Heights A.R.C.).**—June 28 (Ragchew), July 12, 7.45 p.m., Sportsman Inn, Ogden, Halifax.
Scarborough (S.A.R.S.).—Thursdays, 7.30 p.m., Chapman's Yard, North Street, Scarborough.

REGION 3

Birmingham (Bournville).—June 16, July 7, 7.30 p.m., Cadburys, Bournville. **(M.A.R.S.).**—June 20, 7.30 p.m., Midland Institute, Paradise Street, Birmingham. **(Slade).**—June 30 ("Portable Electric Tools" by Messrs. Bridges), 7.45 p.m., The Church House, High St. Erdington. **(South).**—June 15, 7.30 p.m., Friends Meeting House, Moseley Road, Birmingham.
Cannock Chase.—July 6, 7.45 p.m., Bridgetown Inn, Walsall Road, Cannock.
Stourbridge & District.—July 4 (R.S.G.B. Tape or Film), 7.45 p.m., Foley College, Stourbridge.
Sutton Coalfield.—July 13 ("CD Radio" by V. Sutton), 7.30 p.m., 92 The Parade, Sutton Coldfield.
Wolverhampton.—July 3 (A.G.M.), 8 p.m., Neachells Cottage, Stockwell End, Tettenhall.

REGION 4

Derby (D. & D.A.R.S.).—June 21, 28, July 5 (Surplus Sale), July 12 (D/F Practice), July 16 (Derby v. Burton-on-Trent D/F Challenge), 7.30 p.m., Room No. 4, 119 Green Lane, Derby. **(D.S.W. Exp. Soc.).**—Fridays, 7.30 p.m., Sundays, 10.30 a.m., Nunsfield House, Boulton Lane, Alvaston, Derby.
Grantham (G. & D.A.R.S.).—Mondays, 7.30 p.m., Club Room (rear of Manners Arms), London Road, Grantham.
Grimsby (A.R.S.).—June 22, July 6, 8 p.m., R.A.F.A. Headquarters, Abbey Drive West, Grimsby.
Leicester (L.R.S.).—Mondays, 7.30 p.m. (Morse Tuition, 7.30—8.30 p.m.), Club Rooms, Old Hall Farm, Braunstone Lane, Leicester.
Lincoln (L.S.W.C.).—June 21 ("Single Sideband" by F. Travis, G3BCA), July 5 (Hamfest Discussion), 7.30 p.m., Room No. 19, Lincoln Technical College.
Nottingham (A.R.C.N.).—June 15 (R.S.G.B. Night), June 22 (Morse Practice for S.W.L.'s), Tuesday and Thursday, 7.30 p.m., Community Centre, Woodthorpe House, Mansfield Road, Nottingham.
Northampton (N.S.W.C.).—Thursdays, 7 p.m., Allen's Pram Works, 8 Duke Street, Northampton.
Peterborough (P. & D.A.R.S.).—July 7, 7 p.m., Peterborough Technical College.
Retford & Worksop (N.N.R.S.).—Tuesdays (Construction and Beginners), Thursdays, 7.30 p.m., Club Rooms, Victoria Hall, Eastgate, Worksop, Notts.

REGION 5

Cambridge (C. & D. A.R.C.).—June 30 ("Single Sideband"), 7.45 p.m., "Jolly Waterman," Chesterton Road, Cambridge.

REGION 6

Cheltenham.—First Thursday in each month, 8 p.m., Great Western Hotel, Clarence Street.
High Wycombe (Chiltern A.R.C.).—June 29, 8 p.m., British Legion Hall, St. Mary Street.
Stroud.—Wednesdays, 8 p.m., Subscription Rooms, Stroud.
Wolverton (W.D.R.C.).—Fridays, 7.30 p.m., Science and Arts Institute, Church Street.

REGION 7

Acton, Brentford and Chiswick.—June 20 ("Discussion on N.F.D."), 7.30 p.m., A.E.U. Rooms, 66 High Road, Chiswick.
Barnet (B. & D.R.C.).—June 27 ("V.H.F. Equipment," by T. H. A. Withers, G3HGE), 8 p.m., Red Lion Hotel, Barnet.
Bexleyheath (N.K.R.S.).—June 22, July 13, 8 p.m., Congregational Hall, Bexleyheath (nr. Clock Tower).
Croydon (S.R.C.C.).—July 11, 7.30 p.m., "Blacksmith Arms," South End, Croydon.
Dorking (D. & D.R.S.).—Second and fourth Tuesday each month, 8 p.m., Star and Garter Hotel, Dorking.
Ealing.—Sundays, 11 a.m., A.B.C. Restaurant, Ealing Broadway, W.5.
East Ham.—June 27 and fortnightly, 8 p.m., 12 Leigh Road, East Ham.
East Molesey (T.V.A.R.T.S.).—July 5, 8 p.m., Carnarvon Castle Hotel, Hampton Court.
Enfield and District.—June 22, 7.30 p.m., George Spicer School, Southbury Road, Enfield.
Harlow and District.—Tuesdays, 7.30 p.m., rear of G3ERN (G. E. Read), High Street, Harlow.
Holloway (G.R.S.).—Mondays, Tuesdays and Wednesdays (R.A.E. and Morse), 7 p.m., Fridays (Club) 7.30 p.m., Montem School, Hornsey Road, Holloway, N.7.
Ilford.—Thursdays, 8 p.m., 579 High Road, Ilford (near Seven Kings Station).
Kingston.—Lectures alternate Thursdays, Theory and Morse Classes weekly, 7.45 p.m., Y.M.C.A. Eden Street, Kingston (Morse at 2, Sunray Avenue, Tolworth). June 15 (Surplus Gear Sale).

LONDON MEMBERS' LUNCHEON CLUB

will meet at the Bedford Corner Hotel, Bayley Street, Tottenham Court Road,

at 12.30 p.m. on Friday, June 16, July 21 and August 18, 1961

Telephone table reservations to HOL 7373 prior to day of luncheon. Visiting amateurs especially welcome.

New Cross (C.A.R.S.).—Fridays, 7.30 p.m., Sundays, 11.30 a.m., Wednesdays (Morse Practice), 8 p.m., 225 New Cross Road, London, S.E.14.
Norwood and South London (C.P. & D.R.C.).—First Tuesday in each month at G3IIR or G3FZL QTH and third Saturday each month, 8 p.m., Windermere House Annexe, Westow Street, Crystal Palace. June 17 ("Junk Sale").
Paddington (P. & D.A.R.S.).—Wednesdays, 7.30 p.m., Beauchamp Lodge, 2 Warwick Crescent, W.2.
Romford (R. & D.R.S.).—Tuesdays, 8.15 p.m., R.A.F.A. House, 18 Carlton Road, Romford.
Sutton and Cheam (S. & C.R.S.).—Every Third Tuesday, June 20 (Inquest on N.F.D.), The Harrow, High Street, Cheam.
Welwyn Garden City.—July 13 (Sausage and Mash Supper), 8 p.m., Club Cottage, Burnham Green (G8LM/P in operation).

REGION 8

Crawley (C.A.R.C.).—June 28, 8 p.m., West Green Centre, Crawley. July 12 (Informal), for details contact G3FRV.
Tunbridge Wells (W.K.A.R.S.).—June 23 (Informal), July 7 ("Tape Recorders"), July 21 (D/F Contest), 7.30 p.m., Kent County Council Adult Centre, Culverden House, Culverden Park Road, Tunbridge Wells.

REGION 9

Bath.—June 26, 7.30 p.m., Committee Room, Bath Technical College.
Bideford.—First Thursday in each month, 7.30 p.m., alternately at T. G. Ward (G2FKO), 38 Clovelly Road (Phone Bideford 964) and D. H. Jones (G3BO), Rosebank, Westcombe (Phone Bideford 550).
Bristol.—June 16 ("Modern Amateur Equipment," Discussion and Demonstration of locally built equipment), 7.15 p.m., Carwardines Restaurant, Baldwin Street, Bristol, 1. June 25, Longleat Mobile Rally.
Exeter.—Second Thursday in each month, 8 p.m., Y.M.C.A., St. David's Hill, Exeter.
Falmouth.—First Wednesday on each month, Y.M.C.A., Falmouth.
Plymouth (P.R.C.).—Tuesdays, 7.30 p.m., Virginia House Settlement, St. Andrews Cross.
Weston-super-Mare.—First Tuesday in each month, 7.15 p.m., Technical College, Lower Church Road, Weston-super-Mare.
Yeovil (Y.A.R.C.).—Wednesdays, 7.30 p.m., Grove House. Preston Road, Yeovil.

(Continued on page 587)

REGION 10

Cardiff.—July 10 (Quiz), 7.30 p.m., Territorial Centre, Park Street.
Penarth.—Last Monday in each month, 7.30 p.m., R.A.F.A. Club, Windsor Road, Penarth.
Port Talbot (P.T.R.C.).—July 11, 7.30 p.m., Rail and Transport Club and Institute, Station Road, Port Talbot.

REGION 13

Edinburgh (L.R.S.).—June 22 (A.G.M.), 7.30 p.m., Y.M.C.A., 14 St. Andrew Street, Edinburgh, 2.

REGION 14

Glasgow.—Second Friday in each month, 7.30 p.m., Woodside Halls, Clarendon Street, N.W. (near St. George's Cross Underground).
Motherwell.—Third Friday in each month, 7.30 p.m., Carfin Hall, Motherwell.
Prestwick.—Third Sunday in each month, 7.15 p.m., Royal Hotel, Prestwick.

REGION 16

Chelmsford.—First Tuesday in each month, 7.30 p.m., Marconi College, Arbour Lane, Chelmsford.

REGION 17

Portsmouth.—Tuesdays, 7.30 p.m., Scarrs, 183A Albert Road, Portsmouth.
Southampton.—First Saturday in each month, 7 p.m., Prospect House (back of Gas Board showrooms), Above Bar.

Regional and Club News

Bristol.—There was an attendance of 65 at the May meeting to hear G. A. Bird (G4ZU) describe the "Birdcage" rotary beam aerial. The Mullard Film Show on May 5 was so successful that a repeat performance was due to be held on June 2. *Hon. Secretary:* R. L. Shaddick (B.R.S. 19727), 2 Shanklin Drive, Filton, Bristol.

British Two-Call Club.—Major D. W. J. Haylock (G3ADZ) and Air Commodore E. C. Poole (VE3OJ) have been elected President and Vice-President respectively for 1961. Details of membership may be obtained from the *Hon. Secretary:* G. V. Haylock (G2DHV), 28 Longlands Road, Sidcup, Kent.

Clifton Amateur Radio Society.—The first D/F Contest of 1961 on 3·5 Mc/s resulted in a tie between teams led by P. Bailey and P. Imber. Three other teams failed to find G3GHN/P located in a wood 3 miles from the start. On May 20, T. Withers (G3HGE) demonstrated TW v.h.f. equipment. *Hon. Secretary:* C. H. Bullivant (G3DIC), 25 St Fillans Road, London, S.E.6.

Crystal Palace and District Radio Club.—On May 20, R. Reed (G2RX) gave a talk on his three-year visit to New Zealand. A Junk Sale is arranged for June 17. *Hon. Secretary:* G. M. C. Stone (G3FZL), 10 Liphook Crescent, Forest Hill, London, S.E.23.

Cornish Radio and Television Club.—At the May meeting G3OCB gave a talk on "Building a Receiver." A welcome visitor was 9G1ON who described life in Ghana. *Hon. Secretary:* W. J. Gilbert, 7 Poltair Road, Penryn, Cornwall.

Crawley Amateur Radio Club.—Members will be taking items of their equipment to the meeting at West Green Centre, Crawley, on June 28, when there will be an informal discussion. Plans are being made for participation in the Second 144 Mc/s Field Day next month and for an outdoor meeting in August. *Hon. Secretary:* R. G. B. Vaughan (G3FRV), 9 Hawkins Road, Tilgate, Crawley.

Falkirk.—With the help of the local Education Authority a new venue has been obtained at Comely Park School, Falkirk, where meetings are held on the second and last Thursday in each month. Visitors will be most welcome. *Town Representative:* A. Grassam (GM3NVT) 5 Bantaskine Gardens, Falkirk.

Guildford and District Radio Society.—At the A.G.M. in April, a review of the year's progress was given by Arthur Carrington (G3EWE) and a financial report by Mike Marlow (G3IAF), retiring *Hon. Treasurer* who has been succeeded by D. Tillier. Committee members elected were G3EWE, G3FZC, G3OXI and Roy Doe. Mrs. Eve Bennett having retired, the *Hon. Secretary* is now John R. Baker, 35 Banders Rise, Merrow, Guildford.

Halifax and District Amateur Radio Society.—At the A.G.M. the following were elected: *Chairman:* R. Goodall (G3ONQ); *Hon. Secretary/Treasurer:* G. Sunter, 24 Booth Fold, Luddenden Foot, Halifax; *Minute Secretary:* M. Whitaker. Meetings are held at the "Beehive and Cross Keys," Kings Cross Lane, Halifax, on the first and third Tuesdays in each month and a Top Band net at 9 p.m. on Sundays and Wednesdays.

Harrow, Radio Society of. The Annual Constructional Contest for the Pykett Cup was won by C. Jacob, a young S.W.L. member, with a grid dip oscillator. The society was due to take part in N.F.D. from a site in Pinner, and a report on N.F.D. is to be given with colour slides on June 23. *Hon. Secretary:* S. C. J. Phillips, 131 Belmont Road, Harrow Weald.

Northern Heights Amateur Radio Society.—Recent events have included a talk by G3FQH on s.s.b. A ragchew is arranged for June 28 and a Junk Sale for July 12. *Hon. Secretary:* A. Robinson (G3MDW), Candy Cabin, Ogden, Halifax.

Plymouth Radio Club.—At the A.G.M. last month the following were elected: *President:* Harold Jones (G5ZT); *Vice-Presidents:* Lt.-Cmdr. E. Diggle (G3LSD), Cyril Teale (G3JYB), Alan Baker (G3KFN); *Chairman:* E. Fallon; *Hon. Secretary and Vice-Chairman:* R. Hooper, 2 Chestnut Road, Peverell, Plymouth; *Hon. Treasurer:* J. Fallon. For the second year running the Ernie Hillyard Trophy and the G5ZT Trophy were presented to John Fallon. The retiring Chairman, Cyril Teale (G3JYB), is moving to Cornwall.

Reading Amateur Radio Club.—At the April meeting the club-room was packed to hear Mr. Kirkpatrick of G.P.O. Headquarters and Mr. Horsnell of the G.P.O., Reading, talk about licensing conditions. On June 24 at 7.30 p.m. at Palmer Hall, West Street, G3NNF will give a lecture on l.f. aerials for confined spaces. *Hon. Secretary:* R. G. Nash (G3EJA), 9 Holybrook Road, Reading.

Reigate Amateur Transmitting Society:—On June 17, G3FRV is to give a talk on s.s.b. at The Tower, Redhill, commencing at 7.30 p.m. An informal meeting will be held at the same venue on July 6, while a meeting for junior members is being arranged for July 1 at the home of G3BBR, 2 Hazel Road, Woodhatch *Hon. Secretary:* F. D. Thom (G3NKT), 12 Willow Road, Redhill.

Research-G.E.C. Amateur Radio Society.—The society is active on Top Band and 4m under the call-sign G5FK. Equipment is being built for 2m. *Hon. Secretary:* H. W. Rees (G3HWR), Research-G.E.C. Amateur Radio Society, East Lane, Wembley.

Rotherham Radio Club.—During the last two months lectures have been given on RTTY (G3MBQ) and causes of TVI (G3HFD) and preparations made for N.F.D. for which a new site was to be used. The club will be moving to a new QTH in July when G3OAM will be functioning on each club night, mainly on c.w. As from July the meetings will be held on the first and third Wednesday in the month. Visitors are always welcome, especially newcomers. *Hon. Secretary:* S. J. Scarborough, 25 Crawshaw Avenue, Beauchief, Sheffield, 8.

Southend and District Radio Society.—On May 19 the equipment to be used for N.F.D. was demonstrated and final arrangements made. The following day the Annual Social and Dance was held and was extremely well attended. During the function the Pocock and Hudson Cups were presented to A. Parks (G3NFZ) and M. Wright for their entries in the recent Home Constructed Equipment Competition. Details of fortnightly meetings may be obtained from the *Hon. Secretary:* Mrs. P. M. C. Collop, 53 Beddell Avenue, Westcliffe-on-Sea.

Stevenage and District Amateur Radio Club.—On July 1–2, the club will be operating G3JLA/P in 144·72 Mc/s in Huntingdonshire. G3FAU/P will be active on Top Band. *Hon. Secretary:* A. E. Latham, 138 Broadwater Crescent, Stevenage.

Wanstead, Woodford and District Radio Club.—Prospective members of both the senior and junior sections may obtain details of the club's activities from the *Hon. Secretary:* J. Seaman, 67 Beattyville Gardens, Ilford.

GB2LS at Liverpool Show

LIVERPOOL and District Amateur Radio Society will be operating GB2LS on all bands from 2–160m from 22.00 B.S.T. on July 12 to 19.00 B.S.T. on July 15 in connection with the Liverpool Show. All contacts will be acknowledged by special QSL card. The Show will be open on July 13, 14 and 15.

The Society's Amateur Radio Exhibition will include, in addition to GB2LS, home-built and commercial equipment. Visitors will be most welcome and a special watch will be kept for mobiles. Further information may be obtained from H. James (G3MCN), 448 East Prescot Road, Knotty Ash, Liverpool 14.

Can You Help?

● James Murdock (B.R.S.23344), 8 Cumming Drive, Glasgow, S.2, who requires the handbook for the DST100 receiver?

CLASSIFIED ADVERTISEMENTS

ADVERTISEMENT RATES. Members' Private Advertisements 3d. per word, minimum charge **5s. Trade Advertisements 9d. per word,** minimum charge **12s.** All capitals **1s.** per word, minimum charge **18s.** Write clearly. No responsibility accepted for errors. Use of Box number **1s. 6d.** extra. Send copy to **Sawell & Sons Ltd., 4 Ludgate Circus, London, E.C.4.**

OFFICIAL APPOINTMENTS

ANTARCTICA

Vacancies exist for WIRELESS OPERATOR MECHANICS to serve with the FALKLAND ISLANDS DEPENDENCIES SURVEY in the Antarctic for 2 years. Salary is at the basic rate of £500 a year. Whilst in the Antarctic everything is provided free of charge including quarters, food, clothing, cigarettes, etc. Generous cash payment on completion of service.

Candidates, between 20 and 30 years of age and single must be able to transmit and receive morse at 20 w.p.m. (plain language or code) and be capable of elementary maintenance of wireless transmitting and receiving equipment.

Successful candidates will be required to leave U.K. in October/November.

Apply to CROWN AGENTS, 4, Millbank, London, S.W.1, for application form and further particulars, stating age, name, brief details of qualifications and experience and quoting reference M2A/51277/RC.

BROADCASTING ENGINEER (TRAINING)

Required by the GOVERNMENT OF UGANDA Information Department. Appointment on contract for one tour of 21-27 months in first instance. Commencing salary according to age and experience in scale rising to £1,956 a year. Gratuity at rate of 25 per cent of total emoluments. Outfit allowance, £30. Free passages. Liberal leave on full salary.

Candidates must have teaching experience, ability to give theoretical instruction in telecommunication subjects and practical instruction in maintenance and operation of medium power broadcasting transmitters, studio control and recording equipment.

Apply to CROWN AGENTS, 4 Millbank, London, S.W.1, for application form and further particulars, stating age, name, brief details of qualifications and experience and quoting reference M2A/50941/RC.

The Traffic and Safety Division of the Road Research Laboratory, Langley, Bucks., requires ASSISTANT EXPERIMENTAL OFFICERS for the following posts:

Traffic Section—Design, construction and maintenance of electronic and electro-mechanical equipment, for research into traffic problems; collection and analysis of data.

Statistics and Planning Section—Carrying out traffic surveys, analysing results, abstracting and classifying records; operation of punched card equipment.

Computer Group—Work with an electronic digital computer.

Vehicles Section—Experiments on the performance and safety aspects of cars and motor cycles, including crash tests with actual vehicles, and Laboratory tests on components and accessories.

Lighting and Road Users Section—Assist in experiments on lighting; design of crash barriers.

Qualifications—Minimum G.C.E. (A) level in two Science or Maths. subjects. Over 22, Pass degree, H.N.C. or equivalent expected.

Interim Salary Scales—£458 per annum at age 18, rising to £983, with prospects of promotion to Experimental Officer (Salary Scale: £1,087–£1,336). The Laboratory will be moving to new accommodation at Crowthorne, near Bracknell, in Berkshire, in two to three years' time. Application form and further information from Director, Road Research Laboratory, Harmondsworth, West Drayton, Middlesex. Tel.: Skyport 1421. Closing date July 12, 1961.

OFFICIAL APPOINTMENTS (continued)

ELECTRONIC ENGINEER with knowledge of control systems required by Hydraulics Research Station (D.S.I.R.), Wallingford, Berks., for design and development of control equipment for hydraulic models and research facilities. Post offers opportunities to work on interesting and novel control problems. Pass degree, H.N.C. or equivalent expected. Appointment either as Assistant Experimental Officer (interim salary range £625 (age 22), £776 (age 26)—£957) or Experimental Officer (interim range £1,057 to £1,296) depending on age and experience. Leave: A.E.O. 18 days p.a., E.O. 22 days p.a. Favourable housing prospects for married officers. Application forms and further information from the Director, Hydraulics Research Station not later than July 15, 1961, quoting reference 6E.

THE PORT OF LONDON AUTHORITY have a vacancy for a RADIO TECHNICIAN, rate of pay 314s. 7d. per 42-hour, 5-day week. The position will be based at Gravesend. Canteen facilities available. Applicants should have a sound basic knowledge of electronics and experience in the installation and servicing of V.H.F., A.M. and F.M. radio telecommunication equipment. A knowledge of basic radar and ability to drive a motor vehicle would be advantageous. Age range 25 to 35 years. The successful applicant will be eligible for appointment to the Established Staff after completion of six months satisfactory service and would then be required to become a member of the Authority's Superannuation Scheme. Applications, giving age and details of experience, to the Establishment Officer, Port of London Authority, Trinity Square, E.C.3.

SITUATIONS VACANT

ELECTRONIC TEST ENGINEERS AND TESTERS

Light Engineering Company in the Midlands is requiring the above for the testing of Electronic Equipment on Government Contracts and Commercial Television.

Applicants with a knowledge of this type of testing, and wishing to obtain well-paid positions, should apply stating qualifications and experience to the Personnel Manager, Box No. O.7015, c/o R.S.G.B. BULLETIN, 4 Ludgate Circus, London, E.C.4.

RADIO—Radio Mechanics (civilian) with good knowledge of theory of radio communication and ability to drive, required at London Fire Brigade Headquarters. Practical experience of installation, maintenance and repair of V.H.F. radio communication installations essential. Experience in the use of transistors an advantage. Pay 287s. 5-day, 42 hour week. Electrical contracting industry conditions. Prospects permanency with superannuation. Canteen. Write Chief Officer (R/1147/6), London Fire Brigade, Albert Embankment, S.E.1, by June 20, stating age and experience.

VACANCIES exist in a Government Department at Boreham Wood, Herts, for ASSEMBLERS and WIREMEN of RADIO EQUIPMENT. Previous career experience is not essential and amateurs would be considered for training. Industrial Civil Service status, embracing superior paid leave, non-contributory sick scheme, and other advantageous conditions. Rate of pay, 200s. 8d.—250s. 8d. according to individual merit. Permanent pensionable posts after qualifying period.—Box No. M.7011, c/o R.S.G.B. BULLETIN, 4 Ludgate Circus, London, E.C.4.

BRITISH EMPIRE CANCER CAMPAIGN

A Graduate Electrical or Electronics Engineer, age about 25 to 30, is required to collaborate in the development and experimental use of an electron linear accelerator, 3cm microwave spectroscope, and other experimental equipment which is being used to study the chemical and biological effects of microsecond pulses of radiation. Salary in accordance with qualifications and experience. Apply in writing to the Director, Research Unit in Radiobiology, Mount Vernon Hospital, Northwood, Middlesex.

SITUATIONS VACANT (continued)

D.S.I.R. requires ASSISTANT EXPERIMENTAL OFFICER/ EXPERIMENTAL OFFICER at Radio Research Station, Ditton Park, Slough, Bucks. to prepare abstracts of scientific and technical articles on radio research and development. Quals.: G.C.E. " A " level in 2 science or maths. subjects. Over 22, pass degree, H.N.C. or equivalent preferably in Physics or Electrical Engineering generally expected. Experience in radio research development, or communication, ability to read technical papers in French, German or Russian an advantage. Salary: A.E.O. £450 10s. (age 18)—£776 (age 26)—£957. E.O. £1,057-£1,296. Forms from Ministry of Labour, Technical and Scientific Register (K), 26, King Street, London, S.W.1, quoting A.104/1A.

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Applicants should write to the Manufacturing Manager, giving details of qualifications and experience.

WANTED

WANTED FOR CASH.—Good clean communication receivers and s.s.b. equipment. Please state price.—Short Wave (Hull) Radio, 30-32 Princes Avenue, Hull. (Telephone 18953).

WANTED.—All types of communication receivers, test equipment, tape recorders, amplifiers, etc. Prompt cash payment.—Details to R. T. & I. Service, 254 Grove Green Road, Leytonstone, London, E.11. (LEYton 4986).

HRO RECEIVER COILS wanted.—G5GC, "The Ridings," Empress Avenue, Farnborough, Hants.

WANTED: SERVICE MANUAL, containing circuit, details and operation for Marconi set Type H.18. Cash terms to: OZ9AJ, A. Jørgensen, Falck, Give, Denmark.

WANTED.—Someone with facilities for crystal grinding, to re-grind six crystals between 7 and 9·5 Mc/s. (10X and FT241 types). Maximum frequency shift per crystal about 20 kc/s and tolerance of plus/minus 2 kc/s, acceptable. Will pay any reasonable price for this work.—Box No. P.7019, c/o R.S.G.B. BULLETIN, 4 Ludgate Circus, London, E.C.4.

WANTED ELECTRONIC KEY full details of type please.—Dodd, G3MLY, 36 Blenheim Street, Princes Avenue, Hull, Yorkshire.

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Applications for enrolment should be made as soon as possible. Late enrolments may be considered up to September 11, 1961. Officers possessing the P.M.G. 2nd Class or both 1st and 2nd Class Certificates may join the course at appropriate points to complete their qualifications.

For further particulars apply to the Principal.

FOR SALE—PRIVATE

AR88D p.v.c. wired good condition £37 10s. Home built copy LG300 complete but needs 6·3v., 350v., 1,000v. PSU, includes NBFM and sequence keying £18.—G2FDF, 106 Liberty Lane, Addlestone, Surrey.

G2DAF RX, set (20) new valves £8. Holder and cans 15s. Xtals channel 48, 49, 10s. each. 100 kc/s 15s. 6400, 6500, 6550, 6625, 8300, 8375, 8425, 8500 £2. (8), bases 1s. Modern Q5er see " BULLETIN " Nov. '54. Complete kit including metalwork 45s.—Olley, 157 Wanstead Park Road, Ilford, Essex.

HALLICRAFTER SX 100, Woden s/d transformer, 10 in. 3 ohm speaker, purchased mid-March 1961, £120. Prefer buyer views and collects by appointment. Emigrating to ZL Land.—Couldwell, Lockram House Cottage, Nr. Mortimer, Berks.

SALE—Lack of Space—Pye PCR-2, 7-tube super, int. pwr. pack. immaculate £10. 3 r.f. units modified for h.f. bands, FB tuning dials etc. and 1 unmodified RF.24. Very cheap. Phone: GROsvenor 3534, 6.30 to 7.30.

AR77E, 540 kc/s–30 Mc/s. FB condition. Overhauled, £27.—9 Barston Road, Quinton, Birmingham 32.

EDDYSTONE 888A, perfect condition, with matching speaker and S-meter, £80.—GM3LAV, 9 Wilfrid Terrace, Edinburgh 8. (Tel.: ABB. 3030).

BULLETINS, November 1948 to December 1960 complete, except April and October 1951. Offers.—Westwood, 46 George Street, Oxford.

GOING SSB.—Tiger TR200/HF transmitter (QY3–65 final) for sale £100. Delivered free in England, Wales and Scotland.—Box No. P.7017, c/o R.S.G.B. BULLETIN, 4 Ludgate Circus, London, E.C.4.

G2XV offers cascode crystal controlled converters, ready for use, with valves, crystal, and built-in " AC " power supply, output 15–17 Mc/s, also another similar, but 17·4–19·4 Mc/s, £8 each.—Jeapes, 165 Cambridge Road, Great Shelford, Cambridge.

ONE EDDYSTONE 640 RX, perfect, £23. 1 B2 TX/RX with power pack, working, £10. 5, 813 valves, £2/10/- each or £10 the lot. Telephone TUL. 6947, write G3ST, 27 New Park Road, London, S.W.2.

SALE, KW Vanguard 80/10 metres. Excellent condition. Buyer collects. London area. £35.—Box No. P.7018, c/o R.S.G.B. BULLETIN, 4 Ludgate Circus, London, E.C.4.

LABGEAR L.G. 300 transmitter with companion power unit/modulator, as new, £80.—G5VM, " Compton," Hampton-in-Arden, Warwickshire.

K.W. VANGUARD TX 10-80.—£36. G4ZU Minibeam 21–28 Mc/s, £9. Both well kept. Seller going VHF. Transport arranged London area.—Jones, 26 Monkhams Lane, Woodford Green, Essex. (Buc. 2708).

FOR SALE. DX100U as new £50. R1224 £5. UM3 transformer £2 10 0. 2500 CT, 400 ma transformer £4. GW3ITD, Rhoslwyn, Llanybyther, Carms., S. Wales.

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METALWORK.—All types of cabinets, chassis, racks, etc., to your own specifications.—Philpott's Metalworks Ltd. (G4BI), Chapman Street, Loughborough.

SPECIAL OFFER.—Professional Recording Tape (P.V.C.), brand new, original seal, 1,200 ft. (7 in. spool). Surplus to requirements, 21s. per reel. P. & P., 1s. 6d. per reel extra or £6 for 6 post free.—Apply Olympic Sound Studios. Carton Street, W.1.

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DON'T FORGET.—Stamford Rallyfest August 27th, Burghley Park, Stamford. Details apply G3KWC, D. Page, 57 Queens Street, Stamford, Lincs.

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