

R.S.G.B.



BULLETIN

EDDYSTONE MODEL '840' AC/DC COMMUNICATIONS RECEIVER



The New Model "840," illustrated above, possesses full Communication facilities and operates from either A.C. or D.C. mains 100/110 and 220/250 volts.

- Seven valve superheterodyne with R.F. stage.
- Frequency coverage 30 Mc/s to 480 kc/s.
- Gear driven tuning with 140/1 reduction.
- Mechanical bandspread. Accurate re-setting.
- B.F.O. and noise limiter.
- Internal loud-speaker. Headphones jack.
- Robust diecast construction. Rustproofed steel case.
- Suitable for tropical service.
- Weight 30lbs. Size 16 $\frac{1}{4}$ "x10 $\frac{1}{2}$ "x8 $\frac{3}{4}$ " high.

List Price (in U.K.) £45

Exempt from Purchase Tax

PLEASE WRITE FOR FULL SPECIFICATION TO THE MANUFACTURERS:

STRATTON & CO. LTD., EDDYSTONE WORKS, BIRMINGHAM, 31

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

VOLUME 29 No. 10

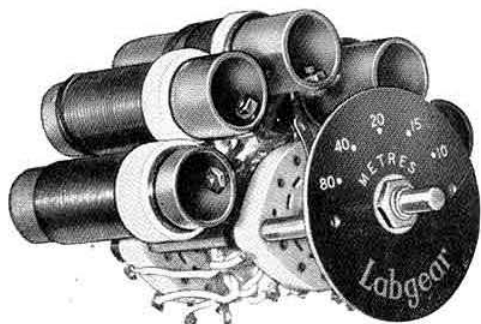
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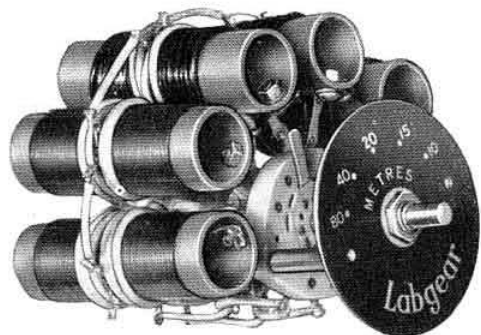
APRIL 1954

5-BAND SWITCHED COIL TURRETS

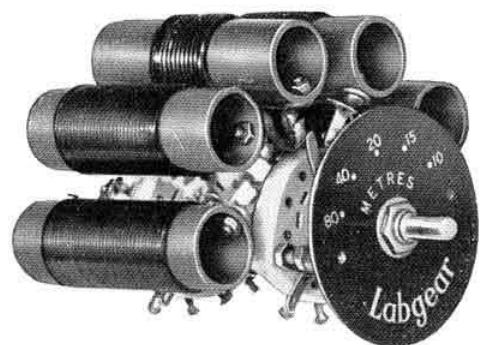
3.5, 7, 14, 21, 28 Mc/s
50 Watts Rating. Ceramic Switch Wafers



Model E 5023 for single ended circuits with end link coupling. Use 100pf max. tuning condenser. Price 54/-+1/6 for postage and packing.



Model E 5023/A for push-pull circuits with centre link coupling. Use 75+75pf max. split stator condenser. Price 54/-+1/6 for postage and packing.



Model E 5023/B for Pi-network circuits. Condensers dependent on conditions. 160pf max. suggested for input and 1000pf (500pf 2-gang) for output. Price 54/-+1/6 for postage and packing.

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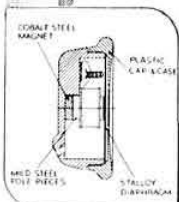


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6 V	M.C.	2 1/2"	Projection	10/-
15 V (50c)	M.I.	2 1/2"	Flush	12/6
20 V	M.C.	2 1/2"	Square	7/6
150 V	M.C.	2 1/2"	Flush	10/-
300 V (50c)	A.C.	Projection 5" Dial		50/-

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1 A	M.C.	2 1/2"	Projection	10/-
3 A	T/C	2 1/2"	Square	6/-
6 A	T/C	2 1/2"	Flush	7/6
15 A	M.I. (50c/s)	2 1/2"	Projection	21/-
20 A	M.I. (50c/s)	2 1/2"	Flush Mtg.	12/6
30 A	M.C.	2"	Square	7/6
250 mA	T/C	2"	Square	6/-

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500 µA	M.C.	2"	Round	15/-
1 mA	M.C.	2"	Square	17/6
1 mA	M.C.	2 1/2"	Flush	22/6
5 mA	M.C.	2"	Square	7/6
10 mA	M.C.	2 1/2"	Flush	10/-
30 mA	M.C.	2"	Round	7/6
30 mA	M.C.	2 1/2"	Flush	10/-
50 mA	M.C.	2"	Square	7/6
150 mA	M.C.	2"	Square	7/6
200 mA	M.C.	2 1/2"	Flush	10/-
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G.E.C.	1 mA Meter Rect.-			11/6

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(Well-known Manufacturer)	
600-ft. Reels	10/-
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RF 25, 40-50 Mc/s.	19/6 "
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All Brand New with Valves.

No. 38 "WALKIE-TALKIE" TRANS-RECEIVER, complete with throat mike, phones, junction box and aerial rods in canvas bag. Freq. range 7.4 to 9 Mc/s. Range approx. 5 miles. All units are as new and tested before despatch. £4 10s. 0d.

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10 6AM6 Valves		£4 "
6K8C, 6K7G, 6Q7G, 5Z4G, 6V6G (or KT61)		37/6 "
1R5, 1S5, 1T4, 1S4 or (3S4 or 3V4)		30/- "
TP25, HL23/DD, VP23, PEN25 (or QP25)		25/- "
6K8C, 6K7G, 6Q7G, 25A6G, 25Z5 (or 25Z6G)		37/6 "
12K8GT, 12K7GT, 12Q7GT, 35Z4CT, 35L6GT (or 50L6GT)		37/6 "
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PX25s Match Pairs		25/- "
PX25, KT66, GU50		12/6 Ea.

PYE 45 Mc/s STRIP, TYPE 3583 UNITS

Size 15in. x 8in. x 2in. Complete with 45 Mc/s Pye Strip, 12 valves, 10 EF50, EB34 and EA50, volume controls and hosts of Resistors and Condensers. Sound and vision can be incorporated on this chassis with minimum space. New condition. Modification data supplied. Price £5. Carriage paid.

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Morse tapper and 4 V buzzer complete on baseboard, with provision for battery. Brand new, 5/6 post paid, or complete with battery and headphones, 15/-, post paid.

INDICATOR UNIT TYPE 182A

Unit contains VCR517C Cathode Ray Gun, tube, complete with Mu-metal screen, 3 EF50, 4 SP61 and 1 5U4G valves, 9 wire-wound volume controls and quantity of resistors and condensers. Suitable either for basis of television (full picture guaranteed) or Oscilloscope. Offered Brand New (less relay) in original packing case at 67/6, plus 5/- carriage.

INDICATOR UNIT TYPE SLC5

This Unit is ideal for conversion for a "Scope" Unit or basis for Midget Television. It contains C/R Tube type ACR10 (VCR193A) complete with holder and cradle, also earthing clip, 1-VR66, 2-VR65, 24 µF, 550 V wkg. condenser, potentiometers and a varied assortment of resistors and condensers. Packed in wooden transit cases. The C/R Tube will be tested before despatch. Dimensions 8 1/2in. x 6 1/2in. x 11 1/2in. 45/-

62A INDICATOR UNIT

Containing 12-EF50, 4-SP61, 3-EA50, 2-EB34, Muirhead Drive. 69/6, carriage 5/-.
W/W vol. controls, resistors, etc. Double-deck chassis in absolutely new condition.

CONTROL UNIT TYPE 426

Complete with 4 Red. EF50, 2-SP61, EB34, 2-EA50. 2-single .0005 condensers. W/W vol. controls, etc., 35/-, carr. 2/6.

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Ideal for Tape Recorders and Amplifiers, 8/6, post free.

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6F6G	8/6	Syl)	10/-
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6SC7	7/6	PX25	12/6
6SH7M	7/6	KT33C	10/-
6SK7GT	7/6	KT66	12/6
6SL7GT	9/-	GU50	12/6
6SN7GT	9/-	XP (2 V)	4/-
6SC7	10/-	XH (1.5)	4/-
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7H7	8/6	7475 (V570)	7/6
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Transceivers: ARC1, ARC3, SCR522, TCS, BC800, RT1/APN2.

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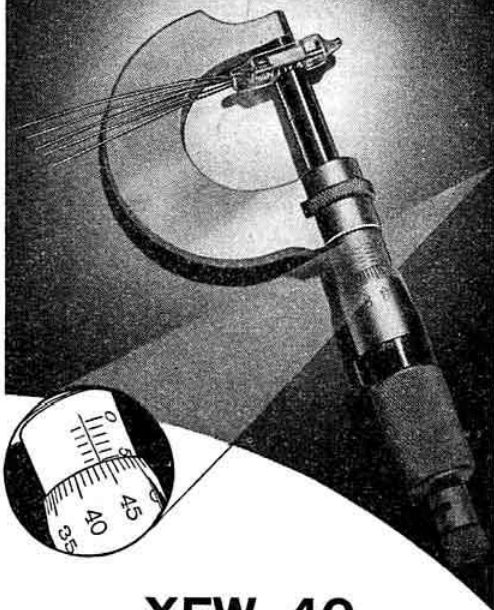
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H.T. Supply Voltage	-	-	22.5 V
Anode Load	-	-	1 to 2 MΩ
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The maximum cross-section is only 8mm. by 6mm. with a glass length of 27.0mm.

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I.F.F. RECEIVER R3109.

Ref.: 10DB/506.

Contains: Motor Generator, input 24 V, 1.8 A d.c., output 480 V, .04 A d.c., with a gearbox operating a switching mechanism to detune the receiver at time intervals.
Plus: 4/VR65A (SP41), 2/VR92 (EA50), 2/CV6 (Det.20) Valves, etc. Metal case, dim.: 12 x 12 x 8 in. Wgt. 24 lb.
Ask for R/H961A **19/6** Each Carr. Paid

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Channel checking unit working on 49-100 metres. Contains 5/VR91 (EP50), 1/6K8, 1/VR55 (EBC33), 1/VR53 (EF39) Valves. Thermal switch breaking at 85 deg. F., etc., in metal case 8 1/2 x 7 x 10 in.
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Range 150-200 Mc/s.
Contains: 1 Transformer, prim.: 85 mH, sec.: 155 mH, 5 coils in cans; 3/965 or 956 acorn valves, 4 acorn valve bases, 9 I.O. valve bases, 1 25µF miniature tuning condenser with knob and coupling, 4 co-ax. sockets. On metal chassis size 8 x 13 x 5 in. Wgt. 8 1/2 lb.
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AERIAL SYSTEM TYPE 62

U.H.F. Aerial on streamlined moulding with VR92 (EA50) untuned detector stage. Overall dim.: 13 x 4 1/2 x 2 1/2 in. Aerial 22.5 cm.
Ask for R/H496 **3/6** Each Post 3d. Extra

CHOKE. Adm. Patt. 1800, 20 H. 300 mA. Test volts 3,000. Weight 14 lb. Dimensions 6 1/2 x 4 1/2 x 4 1/2 in.
Ask for R/H45 **15/-** Each Post 1/6 Extra

POWER UNIT TYPE 266 in Transit Case
Input 80 V, 1.5 kg/s a.c. Outputs h.t. 120 V d.c., bias 5 and 9 V, 1.2 V, smoothed and stabilised. Complete with 5U4G valve, VS110 stabiliser, 12 V 1 A metal rectifier, etc., etc., in attractive metal case with handles. Dim.: 11 x 9 1/2 x 7 1/2 in.
Ask for R/E870 **22/6** Each Carr. Paid

DRIVER TRANSFORMER for ET-4336

Ref.: No. 110K/117 part XT-3202. Centre-tapped primary, inductance 3.4 Henries. Two secondaries, inductance 14 Henries each. Ratio whole pri. to one sec. 1-2 approx. Dim.: ht. 4 1/2 x 3 1/2 x 5 1/2 in. Wgt. 6 1/2 lb. 4-hole fixing.
Ask for R/E562 **18/6** Each Post Paid

MAINS TRANSFORMER

Primary 0-230-250 V a.c. 50 c/s. Sec. 6.3 V 5 A, 0-210 V 14 mA, 0-460 V 200 mA. Size 5 1/2 x 5 x 4 1/2 in., or 5 x 4 1/2 x 4 in.
Ask for R/E527 **13/6** Each Post 1/6 Extra

RECEIVER UNIT TYPE 25. Ref. 10P/1L, part of TR1196. Range 4.3-6.7 Mc/s.
Ask for R/H299 **35/-** Each Post Paid

ROTARY CONVERTOR TYPE 195.

Input 24 V d.c. Output 230 V a.c. 100 Watts.
Ask for R/H914 **£5/19/6** Each Carr. Paid

TEST SET SE2 PATTERN No. W5799.

Brand New.
Contains: Wavemeter, oscillator and noise generator working on frequency of 180-220 Mc/s. Valves 1/6KX, 1/655, 1/L63, 2/EA50, 1/EC52, 1/E1468. Mains transformer 80 V, 180 V, 230 V, 50-2,000 c/s, 1 0-500 microamp meter. All sections are separately screened with their own brass boxes, which are silver plated. Complete with leads and attenuator in wood case. Grey finish. Size: 20 x 10 x 11 in. Wgt. 55 1/2 lb. Calibration chart on lid of box.
Ask for R/H937 **£3/19/6** Each Carr. Paid

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Contains 4 h.f. chokes and 4 tubular condensers 0.1µF 250 V d.c. carrying 5 A (2 sets on each lead), each choke and condenser separately screened in compartments of aluminium alloy box 4 1/2 x 4 x 2 in. 4-hole fixing.
Ask for R/H907 **2/6** Each Post 1/- Extra

SUPPLY UNIT RECTIFIER for

No. 43 Transmitter.
Ex. Cdn. Army in original wood case. Input 110 V a.c. 50/60 c/s, 1.7 kVA. Output (h.t.1) 2,100 V, .375 mA, (h.t.2) 500 V 400 mA, plus h.t. lines, 450 V, 265 V, also 353 V regulated and neg. bias 250 V, 150 V, 60 V. Making 5 complete power supplies all fed via double choke condenser. Input circuits. Valves are 4/866A/866, 5Z3, 6SJ7, 2/6A5, VR150/30 (Stab.), and 1V (Time Delay). The complete unit, mounted in metal case with lid shock mounted. Dim.: 2'6" x 1'6" x 1'. Finish olive drab. Wgt. 420 lb.
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Ratio Discriminator Transformer

10.7 Mc/s Ref. RDT.1.

A 10.7 Mc/s transformer for use in ratio discriminator type circuits. Can size 1 1/2 in. square x 2 1/2 in. high. Secondary winding of bifilar construction. Iron dust core tuning, polystyrene former and silver mica condensers. Price 12/6 ea.

Phase Discriminator Transformer

10.7 Mc/s Ref. PDT.1.

A miniature 10.7 Mc/s transformer for use in frequency modulation detector circuits where the limiter/Foster-Seeley type of circuit is employed. Designed for carrier deviation of ± 75 kc/s. Qk-1.5. Wound on black bakelite former, complete with iron dust slugs and two 6 B.A. threaded fixing holes on .532 in. centres. Screening can: 1 1/2 in. x 1 3/16 in. square. Price 9/- ea.

I.F. Transformer

IFT.11/10.7

A miniature i.f. transformer of nominal frequency 10.7 Mc/s. The transformer is primarily intended for the i.f. stages of frequency modulation receivers and converters. The Q of each winding is 90 and the coupling critical. Construction and dimensions as PDT.1. Price 6/- ea.

I.F. Transformer

IFT.11/10.7/11

As above but with secondary tap for limiter input circuits. Price 6/- ea.

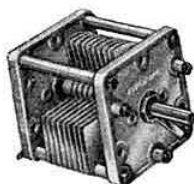
Full constructional details for building an F.M. Feeder unit are given in our TECHNICAL BULLETIN (DTB.8).
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TRANSMITTING TYPES. Series 831/836 have double ceramic end plates, 2½" square and double bearings. Soldered brass vanes, silver plated. They will withstand the quoted R.M.S. voltages at 50 c/s for one minute without flashing over.

	Cat. No.	Capacity	Spacing	Volts	Price
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	836	100 μ F max.	.080"	2500	£1:10:0
SPLIT-STATOR	831	25 \times 25 μ F max.	.080"	2500 per sect.	£1:9:0
	832	50 \times 50 μ F max.	.080"	2500 per sect.	£1:15:0
	833	100 \times 100 μ F max.	.080"	2500 per sect.	£2:12:6
DIFFERENTIAL	834	100 \times 100 μ F max.	.080"	2500 per sect.	£2:11:6

TRANSMITTING TYPES. Series 815/817 of similar construction, but with single ceramic end plate 2" square, making the condensers useful where space is limited. The three types are single section.

	Cat. No.	Capacity	Spacing	Volts	Price
	815	60 μ F max.	.048"	1600	16:0
	816	175 μ F max.	.024"	1200	17:6
	817	250 μ F max.	.024"	1200	£1:0:0



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Cat. No. 552	Split-Stator	25 \times 25 μ F.	180° rotation.	13:9d.
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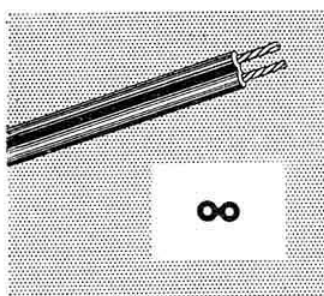
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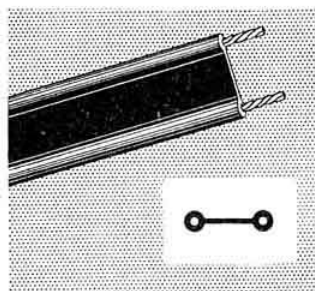
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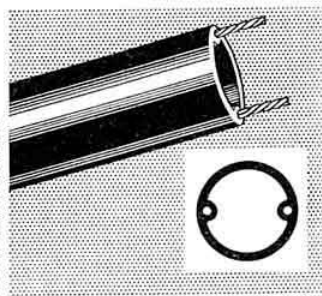
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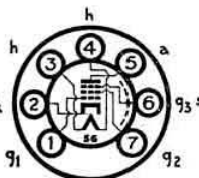
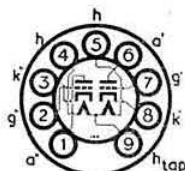
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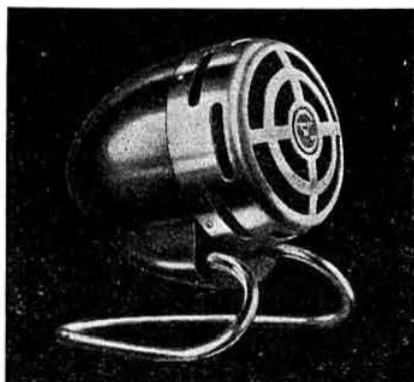
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R.S.G.B. BULLETIN



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Contents

Vol. 29. No. 10.

APRIL, 1954.

Current Comment (Editorial)	-	-	-	441
Council Proceedings	-	-	-	442
A Quarter Century Back	-	-	-	443
The Month on the Air	-	-	-	444
by S. A. Herbert (G3ATU)	-	-	-	444
Slow Morse Practice Transmissions	-	-	-	446
Around the V.H.F.s	-	-	-	447
by W. H. Allen, M.B.E. (G2UJ)	-	-	-	447
TVI Can Be Cured!	-	-	-	449
by Harry Whalley, M.Sc., A.M.Brit.I.R.E. (G2HW)	-	-	-	449
G2WJ/T—An Amateur Television Transmitter on 436 Mc/s	-	-	-	455
by Ralph and Jeremy Royle	-	-	-	455
A Converter for 14, 21 and 28 Mc/s	-	-	-	458
by J. W. Elliott (G2AHT)	-	-	-	458
Compensating for Low Mains Voltage	-	-	-	460
by Basil Davis, M.I.E.E. (G2BZ)	-	-	-	460
An Experimental Transistor Transmitter for 3.5 Mc/s. Operation	-	-	-	461
by C. G. Bunbury (B.R.S. 20100)	-	-	-	461
CQ Single Sideband	-	-	-	462
by H. F. Knott (G3CU)	-	-	-	462
Radio Amateur Emergency Network	-	-	-	464
The Social Side	-	-	-	466
Bristol in September	-	-	-	468
The Aries Radio Research Voyage	-	-	-	468
Contest Rules and Results	-	-	-	469
Regional and Club News	-	-	-	472
Representation	-	-	-	473
Silent Keys	-	-	-	473
Forthcoming Events	-	-	-	474
New Books	-	-	-	475
Letters to the Editor	-	-	-	476

R.S.G.B. BULLETIN

Published on or about the 15th of each month as its Official Journal by the Radio Society of Great Britain and issued free to Members.

Editor:

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NEW RUSKIN HOUSE, LITTLE RUSSELL STREET, LONDON, W.C.1.

Telephone: HOLborn 7373

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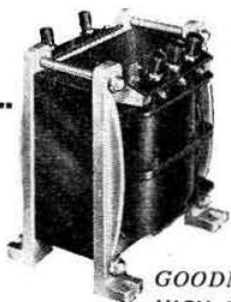
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Current

Comment...



1954—*Mirabilis*? *

THERE is a traditional patriotic song—deriving, we believe, from British naval successes in the eighteenth century (its theme is "Hearts of Oak")—that has in its second line a phrase about "adding something more to this wonderful year."

The sentiment has been very much in one's mind these last few weeks and months, in observing the way that British Amateur Radio has been shaping since 1954 opened. Every sign exists that this may indeed be a "wonderful year," even though, to be prudent, one should not say so until December 31 is safely past and gone!

Whimsicalities aside, there are indeed solid grounds for the hope.

Already, the President has reminded us that it would be a very good thing if the movement put "radio politics" behind it and addressed itself to matters more urgent or more interesting that lie ahead. With the difficult question of Articles of Association and subscription now surmounted this *desideratum* is well within reach.

Not long after he had given this advice a development occurred which came into the category of "matters more urgent and interesting" and that was the removal of the "brick wall" on the 80 metre band—the irritating 50 kc/s of blank space in the centre of the allocation which were denied British amateurs. Perhaps not many of the scores of operators who swam joyously into the new pool—where the brick wall had been!—gave a thought to the protracted negotiations between Society and Post Office that had led to the release of this further valuable block of frequencies. In any case no one expects them to go on bended knee to give thanks for the new concession. But the conclusion will not have escaped the more perceptive that here yet again was a demonstration of the value of a strong National Society in stating the amateur case to the Authorities.

There will, of course, be no resting on laurels in respect of the success with the shared 3.5 to 3.8 Mc/s band. There are still many other battles to fight—but those extra 50 kc/s certainly do "add something more to this wonderful year."

Later on two more big events will be looming up to shed their lustre on 1954.

One of them is the proposal that the Society shall return to the National Radio Exhibition. This is a question with much to be said for and against; and it was only after the "pros" were seen to outweigh the "contras" very substantially that the Council decided to go ahead and book space in this year's National Show. The hundreds of amateurs who yearly visit Earls Court and regret the sparse Amateur Radio content there, will assuredly greet this decision with much satisfaction.

The second big event, closely following the Radio Show, will be the National Convention at Bristol. Every Amateur Radio Convention is in its way a celebration, both personal as man meets man, and National in the sense that the thoughts of the entire movement are upon it during the few days it lasts. It will certainly be a celebration *this* year, if only as the expression of satisfaction at difficulties overcome and hopes achieved. It will be deserving of success for two other reasons. One is the accessibility of its beautiful city to most parts of the country, with the consequent promise of a great throng of visitors. The other is the reputation held by the Amateur Radio population of the district for being—if one may be permitted the colloquialism—"100 per cent. hams." Their successes in National Field Day, their enthusiasm for and loyalty to the Society at all times, and their generally positive and dynamic outlook, make them worthy custodians—and hosts—for the great social event which is Convention.

These, then, are but three of the things that help make 1954 a year of promise. And there are still those equally important "fixed feasts" of National Field Day and the November Amateur Radio Exhibition to come as well, not to mention the smaller local events which are going on all the time and without which the larger ones would suffer from the malnutrition engendered by lack of enthusiasm.

An outstanding feature is common to them all: *the individual member will be the most important participant at every one of them.* Without his approval and active interest in them, none of them would flourish to any extent worth mentioning. Let's watch 1954 as it rolls by, and see just how actively they *do* flourish.—J.H.

New Amateur Licences

JUST before this issue closed for press it became known at Headquarters that the G.P.O. intend to start issuing the new amateur licences on June 1, 1954, at the latest.

The new licences are to be known as:

- The Amateur Sound Licence
- The Amateur Sound-Mobile Licence
- The Amateur Television Licence

The terms of the new Sound and Sound-Mobile Licences are set out in a supplement to this issue. The terms of the new Television Licence will be published later.

In conveying the above-mentioned information to the Society the G.P.O. expressed regret that they were not yet in a position to state what the new fees will be.

There has not been sufficient time this month to review the new licences but members, generally, will we feel sure, quickly appreciate the liberal outlook which is reflected in the terms of the various documents.—J.C.

* "Annus Mirabilis"—or "the year of miracles"—an expression used in an epic poem by Dryden (1667).

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 Tuesday, February 16th, 1954, at 6 p.m.

Present.—The President (Mr. Arthur O. Milne in the Chair), Messrs. I. D. Auchterlonie, H. A. Bartlett, L. Cooper, C. H. L. Edwards, D. A. Findlay, A. C. Gee, R. H. Hammans, F. Hicks-Arnold, J. H. Hum, L. E. Newnham, N. F. O'Brien, R. L. Varney, and John Clarricoats, (General Secretary).

Membership

Resolved (a) to elect 44 Corporate Members and 9 Associates; (b) to grant Corporate Membership to 5 Associates; (c) to grant Life Membership to Mr. G. G. Livesey, G2LX.

Application for Affiliation

Resolved to grant affiliation to the Barnsley and District Amateur Radio Club.

Convention

Resolved to reserve accommodation for Convention functions at the Royal West of England Academy.

The President, Executive Vice President and General Secretary reported upon their recent meeting in Bristol with the members of the Convention Organising Committee.

Amateur Radio Exhibition

Resolved to invite Mr. P. A. Thorogood, G4KD, to act as Manager of the Eighth Amateur Radio Exhibition.

National Radio Show

Resolved to advise the Director of the Radio Industry Council that the Society is prepared to hire approximately 440 sq. ft. of floor space at the 1954 National Radio Show, Earls Court, at a nominal charge.

Change of Name

It was reported that the Board of Trade had approved the proposal to change the name of the Society.

Memorandum and Articles of Association

Resolved to accept an estimate from South London Press, Ltd., for printing 2,000 copies of the Memorandum and Articles of Association at a cost of £18 18s.

Conference with the Regional Representatives

It was reported that arrangements had been made to hold a Conference with the Regional Representatives at the Kingsley Hotel, London, W.C.1, on Saturday, April 24th, 1954.

Honorary Members

In accordance with the requirements of the Articles of Association, a ballot was conducted for the election to Honorary Membership of Mr. F. J. H. Charman, B.E.M., and Mr. R. H. Klein. The General Secretary was appointed teller.

The General Secretary reported that all Members of the Council had voted in favour of the proposal made at the last meeting by Mr. Cooper.

It was thereupon

Resolved, unanimously, to elect Mr. Frederick John Henry Charman, B.E.M., and Mr. Rene Henri Klein to Honorary Membership of the Society.

Legal Charges

It was reported that the Society's legal advisers had submitted an account in the sum of £157 10s., plus £3 10s. for disbursements, for professional services in connection with the revised Articles of Association and associated matters, and a further account in the sum of £9 18s. for professional services and disbursements in con-

nection with the General Secretary's new Service Agreement.

Resolved to settle immediately the Accounts submitted by the Society's legal advisers for professional services in connection with the Articles of Association, etc., and the General Secretary's Service Agreement.

Rare Drugs

It was agreed to publish a statement in the BULLETIN warning members of the risks they take when passing on messages asking for rare drugs to be sent to places abroad. (The statement appeared last month.—Ed.)

Certificates

Resolved to accept an estimate from Bradbury Wilkinson & Co., Ltd., for supplying 250 certificates at a cost of £10 2s. 2d. (The certificates are for presentation to successful entrants in Society Contests.)

Cash Account

Resolved to accept and adopt the Cash Account for January, 1954, as submitted by the General Secretary.

REPORTS OF COMMITTEES

Radio Amateur Emergency Network

Resolved to receive, and adopt as a Report, the Minutes of a Meeting of the Committee held on February 6th, 1954. The Report dealt with, inter-alia, the election of the Chairman (Mr. W. J. Ridley, G2AJF), and Honorary Secretary, (Mr. C. L. Fenton, G3ABB), the appointment of ten further Emergency Communication Officers, emergency equipment, and various matters of policy. It was reported that more than 300 members had registered for service with the Network and that 26 E.C.O.s had already been appointed and were in office.

Technical Committee

It was reported that a Meeting of the Committee had been held on February 11th, 1954, at which meeting a number of important recommendations had been adopted for submission to the Council. Unfortunately, there had not been sufficient time to issue full Minutes prior to the present meeting. Five of the recommendations related to the Headquarters' station.

Resolved that consideration of those Recommendations which relate to the Headquarters' station be deferred until the next meeting.

Resolved to authorise the Secretary to arrange for the purchase of not more than six transistors at a cost of £1 10s. each for the use of members of the Technical Committee for experimental purposes.

Consideration was given to proposals put forward by Mr. C. Douglas Abbott, G6TA, of Balham, London, S.W., to the effect that the Society should use its best endeavours to persuade the G.P.O. and the Radio Industry Council to arrange for the new London television station to operate on sound and vision frequencies 3 Mc/s higher than those at present in use at Alexandra Palace. Mr. Abbott contended that if his proposals were accepted by the authorities concerned many of the present TVI difficulties encountered by amateurs living in the area covered by the London station would disappear, because the new frequencies would not be in harmonic relationship with the 14 Mc/s amateur band.

After a lengthy debate it was agreed to write to the G.P.O. and R.I.C. stressing the technical advantages of the proposal. It was further agreed that the letter should draw attention to the fact that (a) with the move to Crystal Palace, the vast majority of television receivers at present adjusted to receive the Alexandra Palace transmissions will, in any case, require to be modified, (b) the proposal, if adopted, might alleviate the work of the G.P.O. inspectors who, at present, spend many thousands of hours each year attempting to clear up 14 Mc/s harmonic troubles.

The meeting terminated at 9.25 p.m.

R.S.G.B. Call Book

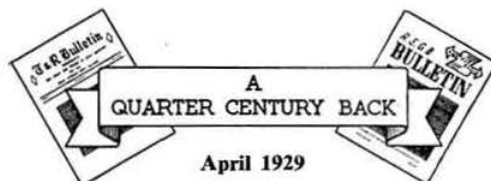
FOR some years the Editor of the *R.S.G.B. Amateur Radio Call Book* has been endeavouring to obtain the consent of the holders of any of the undermentioned callsigns to the insertion of their names and addresses in the *R.S.G.B. Call Book*. It would be most helpful, therefore, if any member who has knowledge of the licensees involved, or who is aware that the licences are cancelled, would write to Mr. J. P. P. Tyndall, G2QI, 174 The Drive, Ilford, Essex, giving information.

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GM2DAB	GM6FD	GM3ASY	GM3CQS
GM2DWW	GM6FN	GM3AUE	GM3CSO
GM2FVH	GM6IJ	GM3AVS	GM3CVQ
GM3BZ	GM6IN	GM3BFU	GM3CXE
GM3DD	GM6KZ	GM3BIB	GM3DIF
GM3JY	GM6VI	GM3BXD	GM3DIN
GM3LU	GM6YK	GM3CDB	GM3DJF
GM3NI	GM8FT	GM3CDI	GM3DKW
GM3RL	GM8HP	GM3CEA	GM3DMI
GM3SF	GM8LA	GM3CEJ	GM3DMX
GM3SW	GM8NW	GM3CGA	GM3DNV
GM3TD	GM8VL	GM3CIT	GM3DOU
GM5XQ	GM3ACL	GM3CIY	GM3DRU

It is thought that the following callsigns, all of which appear in the current edition of the *Call Book*, may have been cancelled. The purpose of this paragraph is to give notice that the Editor of the *Call Book* intends to have these callsigns deleted unless the licensee requests otherwise by the end of May, 1954. It should not, however, be assumed from the above that the calls have been cancelled until they fail to appear in the *Call Book*.

G3CAJ	G3CEN	G3CJV	GD3BZE
G3CAO	G3CFM	G3CKS	GI3BOO
G3CAW	G3CFZ	G3CKU	GI3BTE
G3CBF	G3CGY	G3CKV	GI3BVR
G3CBG	G3CHF	G3CLT	GM3BDM
G3CBI	G3CHQ	G3CLX	GM3BFD
G3CBJ	G3CIE	G3CMG	GM3BQU
G3CBM	G3CIK	G3CMI	GM3BST
G3CBP	G3CJA	G3CMP	GM3BVO
G3CBT	G3CJB	G3CMY	GM3CAD
G3CCB	G3CJG	G3CNI	GW3BOS
G3CCO	G3CJJ	G3CNJ	GW3BRI
G3CDR	G3CJK	G3CNW	GW3BUX
G3CDZ	G3CJP	G3CNX	GW3BZH
G3CEM	G3CJS	G3CPB	GW3CAY

Mention the Bulletin
when writing to advertisers



EDITORIAL attention was directed to the importance of Contact Bureau and to the need for members to make known the results of their experiments. T. Palmer Allen, G16YW, who had done much to establish the Bureau as "the foremost organisation of its kind in the world" announced his resignation as Honorary Organiser owing to pressure of private business.

Under the title "Some Experiments on 30,000 kc/s and above", Eric Megaw, G6MU, made an important contribution to the existing knowledge of ultra-high frequency communication. A Mullard SW50 valve had produced efficiencies of 40-50 per cent. on frequencies between 25 and 55 Mc/s. Anode voltages up to 1200 had been used at frequencies around 30 Mc/s with inputs up to 80 watts.

T. A. Crowley introduced an article on "The Photo-Electric Effect" with the comment that "Though at the moment television is not so much to the front as it was even some months ago, it is recognised as being the direction from which the next 'big-push' in wireless will arrive."

G. P. Anderson, G2QY, asked, as a contributor to Contact Bureau, "How can grid excitation be measured continuously and cheaply?" The reply dealt at length with the merits and demerits of the Moullin voltmeter, the neon lamp without series resistance and the peak voltmeter.

"Efficiency in Chemical Rectifiers" was the subject of an article by Maurice Gibson (2BAA).

R. L. Varney (2ARV)—now G5RV—described "Some Experiments upon Zincite Oscillators." "The main object of this method (of obtaining h.f. oscillations by using a piece of natural zincite crystal in a suitable circuit) is to transmit messages through the ether using an almost infinitesimal power." Jack Hum, G5UM, had co-operated in the experiments.

The Correspondence columns carried a letter from Kenyon Secretan ("Sec. Seldoms Sleeps") urging the Editor to do all in his power to persuade amateurs from mutilating the recently revised international "Q" signs. He recommended that the "very objectionable OB and OM should be dropped entirely."

A report appeared on the Second Northern District Conventionette held at the Queens Hotel, Leeds, on March 23, 1929. Among the topics discussed were "Should area notes be abandoned?"; "Should the 7 Mc/s band be split as suggested by A.R.R.L.?"; "Should 7 Mc/s phone be permitted?"; "How shall signal strengths be given over the air?"; "What attitude should be adopted towards non-members of the Society?"; "Are Conventionettes worth while?"

J. W. Mathews, G6LL, was reported to have made the first contact between the U.K. and Canada on 28 Mc/s.

THE MONTH

DATE TIME	FREQ.	STATION CALLED	CALLED BY	STATION HEARD OR WORKED		IF QSO RESULTED		REMARKS
				R	S	MY SIGS	TIME OF ENDING QSO	
				R <td>S <td>R <td>S <td></td> </td></td></td>	S <td>R <td>S <td></td> </td></td>	R <td>S <td></td> </td>	S <td></td>	

ON THE AIR

By S. A. HERBERT (G3ATU)*

The Coming of Spring

TO the great satisfaction of 20 m enthusiasts, the band now stays open later at night and has been known to produce some nice DX at odd times during the daytime as well, especially from Eastern Asia and the South Pacific. The pace is slackening somewhat on the l.f. bands, but DX is still there, despite the increased static.

Some Rare Stuff

Several choice calls have been in evidence during the past few weeks. First of note were EA9DE(EA2CA) and EA9DF, both of whom operated from Rio de Oro for about ten days. '9DE used phone and c.w., mostly on 14 and 21 Mc/s; whilst '9DF appears to have stuck to c.w. "Crowd control" was good from both stations with the result that many people collected a new country. ZC3AB was intermittently active on phone and c.w. but pressure of business left him little time for Amateur Radio. By now, he has probably left Christmas Is. Let us hope his replacement takes out a ZC3 call!

W0NWX during a QSO with G3ATU confirmed his intention to operate as FO8AJ from Clipperton Is. from March 26 to 29, inclusive.

Although much of the above information can now be regarded as past history, it is nice to know that JZ0KF (who prefers c.w.) is still about. In fact he has been heard producing a markedly positive reaction around 14080 kc/s during certain early afternoons!

Those in need of Zanzibar, Cormoro Is. or Aldabra, should delay their holidays until May! ST2UU expects to set out for VQ1 in late April. After operating from there, he will try to get across to Comoro and thence to VQ7. The lesson of VQ6UU ought to ensure that only the completely clueless will answer anywhere near the frequency in use.

Twenty Metres

The improved conditions are reflected in an increase in the number of reports for this band. G3JWW (Harlow), with 86 countries worked, has W.B.E. and W.A.C. and is hot on the trail of bigger game. He netted OD5AV, EL2X, KV4AA, PY, OQ5, 4X4, MD5 on c.w., but he was unlucky with CE3AG, CR4AD, VU2RC, MP4BBL, KA6, ET2, Y12AM and CO2OE. G3FBN (Harrow) worked G3AAT/OX, who had just received some copies of the BULLETIN, dropped to him—by arrangement with Headquarters—by parachute! '3AAT wishes us to correct an error in the January M.O.T.A.—his input is 50 watts and not 250 as stated.

P. M. Crawford (Darlington) rang the bell by logging CE0AA on 14100 phone. This turned out

to be a test transmission from the permanent station, CE0AC, using only 40 watts. VS1ES, FK, FP and EC, SU1AD, CO2OZ, PJ2AF, FL8UU, M1B, MP4QAH, CR4AK and ZL4AQ (2010) were heard also on phone; other DX included ZD4BQ, CS3AC and W4GXY/KP4 all on c.w. R. Goodman (Edgware) has rebuilt his one-valve receiver, which continues to pull in all sorts of phone DX. The latest list—EA9DE, CR5AE, CR6BX, CX2CO, FB8BC (1820), VP5EK, KV4, KZ5AA, ZL and ZD4AX—proves that it is working. He would like to hear from anyone who has used an EF54 in an 0-V-0. B.R.S. 19771 (Worthing) naturally happy at adding both EA9DE and 9DF to the log, pressed on with AP2C, KA8AB, MP4BBL, VP2AD, VS6CL, 6CG, ZS7D, ZP5GB and some UA9s, all on c.w. plus EA9DE, ST2NW, VS9GV and the elusive UC2KAB on phone. R. Civil (Plymouth) heard CT2AG, VP3HAG, HR1FM, KZ5AA, CO2BK, PJ2AF, VO2L and CR4AM on phone.

B.R.S. 20104 (S. Harrow) who concentrated on c.w., heard UA9KKB calling CQ DX! VU2KV (0845), HZ1UU, ZD4AB (0800), VS9AS, FL8AB (Djbouti), KR6OE and VP8AA (Grahamland-1930). Rumour has it that MP4QAT is working from an island in the Gulf of Oman. VU8AA is reputed to be on 14080 kc/s (where would he be, we wonder?). '20104 who recommends VS9AS for a reliable frequency check on his 14000, 14030, 14060 and 14090 c.c. transmissions remarks that things would be easier for everyone if everyone



Members of the Last Ditch DX'ers Club of Memphis, Tennessee. From left to right (standing): W4LRO, W4FC, W4GD, W4CQ; (seated): W4FCF, W4DQH, W4ALM, and W4GPA. They find the Bulletin useful in keeping up-to-date with DX news around the Commonwealth

* Roker House, St. George's Terrace, Sunderland.

would listen before transmitting, tune up on a dummy load and then keep off the frequencies used by the rare ones. **A1257** (Bexley), with the aid of a stand-by aerial, logged OQ0DZ, FF8AP, ZE4JA, EA9AR, MD5DO, PY7BE and ZL4LZ as his best.

B.R.S. 19894 (Stockport) dug out c.w. DX, in the shape of HS1D, JZ0KF (S4 at 0835), HZ1UU, VP8AJ (2000), CE, CX and CP, EA0AB and three which puzzle him: ZC6UNJ (Jerusalem), who is quite in order; 415AX, which sounds like someone testing a bug key, and ZX1AB heard during the ARRL c.w. Contest. (G3ATU heard him, too, giving his QTH as Nicobar Is. and explaining that the call was a temporary one. He was RST577c; hmm!). '19894 who heard phone from 457FG, ZE6JJ and VS6CL, comments on the consistent punch from ZL2BE, who has space enough for 5,000 ft. of wire. **H. J. Hill** (Whitley Bay) considers that anyone complaining about DX this month should be shaken up! He was one of the lucky ones to hear ZD9AB, calling CQ around 14380 kc/s at 1900. A strange one—LY3CDE—was heard working a W3; other phones logged were CT3AG, 3AN, EA9DE, G3AAT/OX, VK5JW, VP1CA, VP2DL (Dominica), VP3LF, VQ5EK, FM7WN, ZD2RRW, ZS5MP, CM9AA, W7MBX and VP9BVA. **B.R.S. 19864** (Ormskirk) also heard ZD9AB, who was S9 at 1820, while working ZS5PG. He uses 450 watts to a rhombic. **B.R.S. 18017** (Warwick) did well to hear FB8BI, as well as HS1D, VP7NP (1230), VU2JV (Orissa), LB8YB (Jan Mayen), EA9DE, JA5AB, UN1AS and IKAA, plus ZA1AC (14025-1710; working YU), all on c.w. A3 pickings were EA9AR, '9AT, '9AZ, JA1AU, PJ2AQ, YI2AM (still a strong signal on a dipole; the Vee succumbed to a sand storm!), VQ5DZ and FR7ZA (14325). **A. G. Edwards** (N. Finchley), with his HRO running off a rotary converter logged ZD9AB, W7ADS, VS2DB, ZD4BQ and W4PMP/VO2.

B.R.S. 7594 (Yeovil) found mornings poor, but conditions good in the afternoons, especially for S-East Asia. His phone list includes CR4AC, CR6, CR7AF, 7BB, EA9DE, FB8BC (14100-1810), FF8s, FR7ZA, KA2BS, 2IM, 3LR, eight OQs, MP4ABW, VQ8AR (14132-1750), VS1 and 2, W7DND, five ZD4s, ZD9AB, ZS3B, 3AB, 3BC, 3F, 8D and 3A2AH. **G3CMH** (Yeovil A.R.C.) worked EA9DE, CT2AG, CS3AC, KA2BS, OD5AJ, OX3GA, PY, VE3RCS, VS2DV, XZ2KN, 3A2AH and ZS3BC on phone and some Ws on the key. **B.R.S. 20106** (Petts Wood) logged the Rio EA9DE, VP3HAG, EL2P, VQ5CB, FM7WN, VE7ZM and many others from the phone end, with CE3, CX5CO, 6AD, VU2RC (0855), VP8AJ, VP2AD (1940), VP4LZ, HK4DP, LU7ZM (Deception Is. we imagine?), AP2C and DI9AA (2100) on the key. **G3ATU** heard XE1N on c.w. (RST 339-14025), engaged in a long conversation with the inaudible XE2CC. F18AT was heard at 1500 (Box 572, Saigon). ZL1AH was logged calling HL1AH on c.w. early one morning. SM5ARP, worked recently, confirms his trip to Monaco in May. He is 3A2AW. HB9JJ (3A2BB), will probably be there too, with designs on Top Band work. Both CR9AF and DU7SV have been good signals on c.w., around 1500.

One-Sixty Metres.

County-chasers will be happy to know that activity is scheduled for more rare spots as follows. **G5PP** (Coventry), who has already done so much to put the "good" ones on the active list, writes that he and G3IWF will be operating GW5PP/P and GW3IWF/P from Radnor, Montgomery and Brecon during Easter weekend,

Radio Amateurs' Examination Revision Sheets

COMPREHENSIVE revision sheets, for the use of candidates who are preparing to take the City and Guilds of London Institute Radio Amateurs' Examination in May, are available from Headquarters, price 1s. per set, post free.

The revision sheets were prepared by B. W. F. Mainprize, B.Sc.(Eng.), A.M.I.E.E. (G5MP), who contributed the Model Questions and Answers series to Volume 28 of the R.S.G.B. Bulletin.

April 17, 18 and 19. Both stations are solo efforts and a rota will be worked out so that each of the three counties will be on the air for two nights out of the three. Operation will be mostly from 5 or 6 p.m. until midnight, or later if conditions are good, but one station may be active each morning from 9 to 10 a.m. **G3IYW** (Bristol) writes with the news that together with G3GMN, G3EUK and G3JMY, he will be operating GW3GMN/P from the counties of Carmarthen, Cardigan and Pembroke during the same weekend, so the fun should be fast and furious. Good hunting and good weather to them all.

G2HKU (Sheerness) plied the key and grabbed GM3HRZ (Moray), GM3JFG (Ross), G13JEX (Belfast), GC3EBK (Guernsey), OK1UQ and OK3KAB. He also heard OH3PP. ZC4CA told him that he and ZC4JA were now the only ZC4s active on Top Band. '4CA has worked SUIFA on the band who is "under-cover," but QSLs. 'HKU hears that OY3IGO and LA5T are active, but has no details. DL7AH is on 3520 kc/s nightly, after 2200 and listens on 1820 kc/s for cross-band QSOs.

B.R.S. 20106 is still pulling in real DX during the early hours. On February 28, KP4KD, W1BB and VE1EA were heard, March 6 produced only W1VDB, but the next morning VE1EA, W2GGL, W2WC and KP4KD were there, the KP4 and VP4LZ again being audible on March 14. **G3ATU** heard HA8KOW (RST349) battling it out with Scheveningen Radio on 1760 kc/s at 1900. The HA was calling CQ. Incidentally, an occasional G is to be heard well below 1800 kc/s. Be warned—our activity should be confined to the band 1800 to 2000 kc/s!

Eighty Metre DX

Some of the keen types continue to demonstrate what can be done on eighty. **R. Goodman's** 0-V-0 pulled in phone from CN8, FA8PP, VP4BV (2255), VP9L, KV4BB, BD, KZ5WZ and W0TNI (2230). His band score is 12 zones and 46 countries! **B.R.S. 20106** heard ZD4AB, KZ5DE, KG4AU (0653), PY4NT and ZLs, and DL7BA calling HS1D at 2300, all on c.w. **G3JWW** worked W3EEB, 3KUN and 3BVN (on forty, this station has a four-element fixed beam!).

Forty Metre DX

G3FXB (Southwick) is going great guns on c.w., working such choice ones as W6DFY, 6RW (long path, at 1500), ZD4, VP2AD, 2GRO, 5SC, 6CDI, VS6CG, VK6 (1600 and 2200), OD5XX, ZE, VS9AS, 4S7XG, ZS, VQ3EO, ST2AR, VU2EJ (0200), VP4LZ and EL2X (0030). **G2HKU** heard the EL2 at 0700, through the usual QRM. **B.R.S. 19771** got ST2UO, KZ5CR and HH3DL on c.w., while **H. J. Hill** had ZB2A and TA3AA for two new ones on phone. **G3IRU** (Sutton) is having fun with ten watts to a "highly experimental" two-element beam. First results were

rather poor, due to an r.f. leak, but FF8, PY, W and VE were heard. When the fault was repaired, a 589 report resulted from YU, so DX is on the way. **B.R.S. 20106** unearthed EL2X, VP5SC, CX1KB, VP8AW, CR6AI, EA9DE, VK, ZL, KG4, VSIFE (1625), OA4C, ZS3K, UA9KWA and lesser DX from the c.w. end. **G3JWW** worked VP8AX, EA9DE, PY, VP6UN and EA6AU, but was unlucky with YV5DE, CX1KB, HK1TH, KZ5, YI1TR, PJ, ZE, VP3YG, VQ2GW, ZD4AB, CM5KD, and an FF8.

Fifteen Metres

This band keeps showing signs of activity at weekends and **B.R.S. 7594** extracted CE2AY, CR4AE, 6AB, CT3AN, EA9DE, EL2X, FF8, LU, OQ5, SU1KB, TI2RC, VK2ID (1207), VQ2, 4, VS9AS, ZS3 and ZS9G on phone, while **G3CMH** worked the EA9, 5A2 and PY. **R. Goodman** also picked up the EA, ZS9G (1353), ZS3E, YI and ZB2A. **B.R.S. 19771** had the EA9, EL2X and ZS9G.

News From Overseas

B.E.R.S.195 sends some useful information. Currently active are VK1DY and VK1PG on Heard Is., VK1AC on Macquarrie and VK1EG down in MacRobertson Land. He knows nothing about VK1BM mentioned in January *M.O.T.A.*, but thinks the call may be a recent issue. ZK2AB stayed on Niue after all. The successor to ZK2AA, now ZL1BA, is believed to be ready to start amateur operation. ZL1BA may eventually go to ZM6. '195 hears VR3D on 7 and 14 c.w. and phone. QSL to Roy Baty, Cable Station, Fanning Is. VR4AB, active on 14 c.w. around 1000, is Dr. Holt, Munda, Br. Solomon Is. Through the good offices of FK8AO, QSL cards have been organised for FW8AB (Wallis Is.) and will soon be mailed. During the Royal visit to Fiji, VR2s AS, BZ, CT, CG, CS and CX were praised by the

authorities for good communications by Amateur Radio channels. ZM6AK is now ZL1FT, but ex-ZL2AAB is in Samoa and hopes to be active. '195 is baffled by recent reference to VK9YY/FK8; 'YY is in Lae, New Guinea. Christmas Is. (Pacific) is in the Palmyra, Fanning Is. chain, not Gilbert Is., as stated. He passes on the sad news that Bob Hanley, ex-ZK1BC, together with his wife and son, were killed in the New Zealand railway smash on Christmas Eve.

G2MI reports that cards have arrived from HS1D, who is W5HBQ, ex-TA3FAS. His address is M/Sgt. J. D. Fry, MAAG Box "B," APO 74, c/o P.M., San Francisco. **G3JU** (ex-VU7JU/V59AA) is S. G. Abbott, 35 Spinney Crescent, Dunstable. SU1AD can be QSLd via W3BHD. **G3DHF**, constantly passing through Malta, operates ZB1DHF.

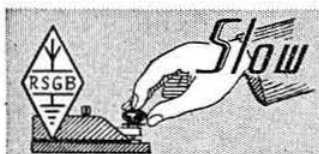
F8RS (Calais) is congratulated on earning the first c.w. C.D.M. Certificate (issued by A.R.I.). He says that two new countries can be counted for the D.U.F. Certificate. 5A2FA operates c.w. on 80 and 40 from Fezzan and FA9VN is counted as Sahara. A Met. base is to be set up on Tromelin Islet, north of Mauritius. Two official stations will be with the party, due to land in April or May. FB8BK has volunteered to make the trip during October.

The R.S.G.B. QSL Bureau

The Bureau still is, and will continue to be, in the capable hands of our President, Arthur Milne, G2MI. G3ATU has been getting numbers of cards for onwards transmission and although delighted to forward them, suggests that quicker service will result if they are sent to 29 Kechill Gardens, Bromley, Kent!

* * *

Thank you for your support this month. Reports for the next issue should arrive by April 20. Good hunting and 73.



Slow Morse Practice Transmissions

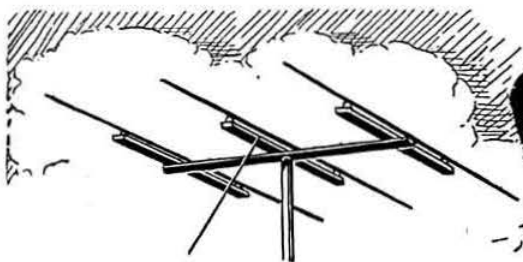
The following slow Morse transmissions, sponsored by the Society, are intended to assist those who aspire to obtain an amateur transmitting licence. More volunteers are still required for parts of the British Isles not already covered, particularly in the London Area. Stations listed who find themselves unable to continue transmissions should immediately notify the organiser, Mr. C. H. L. Edwards, A.M.I.E.E. (C8TL), 10 Chepstow Crescent, Newbury Park, Ilford, Essex.

† Alternately.

B.S.T.	Call	kc/s	Town
Sundays			
09.00	G3LP	1850	Cheltenham
09.30	G3BKE	1900	Newcastle-on-Tyne
10.00	G6MH	1990	Southend-on-Sea
11.00	G2FXA	1900	Stockton-on-Tees
11.00	G3GZA	1837.5	Bristol
12.00	G15UR	1860	Belfast
14.00	G5AM	1900	Witnesham, Ipswich
21.00	G2FIX	1812	Nr. Salisbury
Mondays			
19.00	G3NC	1825	Swindon
21.00	G3BLN	1900	Bournemouth
21.00	G3FSM	1900	Brentwood
22.15	G2BRH	1900	Ilford
22.30	G8TL	1900	Ilford
Tuesdays			
18.30	G2FXA	1900	Stockton-on-Tees
18.30	G3JMP	1875	Bristol
20.30	G3GDZ	1905	Kingsbury, N.W.9
21.00	G3EFA	1855	Southport
21.30	G3DBP	1915	Nottingham
Wednesdays			
19.00	G3GZA	1837.5	Bristol

B.S.T.	Call	kc/s	Town
Wednesdays (contd.)			
22.30	G3FBA	1910	Bath
22.00	G2BND	1918	Dalston
Thursdays			
19.00	G3NC	1825	Swindon
20.00†	G2CPS	1910	Hull, Yorks.
	G2CNX		
	G3GWT		
22.30	G3OB	1803	Manchester
22.30	G3ADZ	1940	Southsea
23.00	G3LA	1915	Brentwood
Fridays			
19.00	G3BLN	1900	Bournemouth
19.00	GW3HJR	1900	Caerphilly, South Wales
20.00	G3CSG	1870	Wirral
20.30	G3IMP	1920	Romford
Saturdays			
13.00	G2FXA	1900	Stockton-on-Tees

MEMBERS USING THIS SERVICE ARE REQUESTED TO SEND LISTENER REPORTS TO THE STATIONS CONCERNED.



AROUND THE V.H.F.'s

By W. H. ALLEN, M.B.E. (G2UJ)*

ALTHOUGH the amazing v.h.f. conditions experienced in February and March last year have not been repeated this year, the 2 m band showed some moderate openings. A pleasant feature has been the appearance of a number of new stations—and the reappearance of many of those who had forsaken the band for several months. Some Continental contacts have been made and there are indications that the First R.S.G.B. Two Metre Field Day should be well supported on May 9.

Two Metre Report from Scotland

Activity in Central Scotland has recently been good although there has not been the encouragement of a major opening. On March 14, for example, there were 12 GM stations audible in Dunfermline. Among those worked by GM3EGW between February 1 and March 16 were G2FO, 5BD, 5YV, G13GQB, G15AJ and the following GMS: 2BUD, 3BBW, BDA, DDE, DIQ, ENJ, FGJ, FYB, HYX, INK, NG, 4HX, QV, 5VG, YW, 6SR, WL, ZV, 8AH. GM2CHN was heard.

The GM3EGW-G5BD sked. has been maintained throughout the winter and out of 23 attempts made in February only once was there no trace of 5BD's signal. On one other day contact was made but lost immediately. On the remaining 21 occasions signals were at least good enough for reports to be exchanged. From March 1 to 16 a smaller proportion of good contacts was possible, the final tally being 8 out of 16. On four occasions contact was lost after identification had been made. The best evenings were February 3, 4, 11, 12, 15, 16, 17 and 21. Occasionally the signals from G5BD and other distant stations suffered from the type of fading termed "scintillation" when noticed on 70 cm. This appears as a rapid fade in which a c.w. dash is heard as two or three dots or, when the flutter is more intense, produces signals of the "W6 on 20" variety with a hollow ringing sound.

On March 11, during a QSO with G5YV, it was noticed that aerial directivity was considerably more pronounced than usual. There was a warm front near Leeds at the time and it seems likely that this produced a more efficient form of propagation with less reliance upon random reflections, causing scatter of signals, which is probably the normal procedure over this path. At the time G5YV was RST54/79, whereas G5BD, a few minutes later, was at best RST239 with fading to inaudibility.

On March 17 the band opened late in the evening and ON4BZ was worked at 0025 G.M.T. on the 18th after being audible in Dunfermline since 2250 G.M.T. His 'phone was RS57 while GM3EGW was a full S9 in Brussels. Thinking the occasion too good to miss, operation continued until 0230 G.M.T. and the following stations were added to the log: G8OU (RST229), 2FJR (56), 3GJZ (459), 5UD (569). G5MA (339) was

heard but not worked. G2XV was worked at 0005 G.M.T. who thought the S7 signal from GM could only be a pirate. He was happily convinced to the contrary! G5YV was receiving the Scottish station at well over S9 on 'phone throughout.

There should be at least four portables in operation in Scotland during the May 9 Field Day: GM3FGJ (Edinburgh), GM4QV (Falkirk) and two others from sites near Glasgow and Dunfermline respectively.

Other 2 Metre News

G3WW (Wimbleton, Cambs.) was active to good purpose on March 16/17 when he worked G3FIH (Bath) and later had an hour's chat with G5YV. At both ends the S meters were hard up against the stops! G3EPW (Bury, Lancs.)—who is getting out very well to the south—G3BT (7 miles s.w. of Derby)—using an indoor aerial—3IRA—on n.b.f.m.—6XH, 3DA (Liverpool) and GW3GWA (Wrexham) were also worked. After midnight came contacts with G3IWI (Liverpool), 2DUS (Baldock, Herts.) and finally G5MA, who was putting in a splendid signal with the aid of his new 150 watt p.a. G2PU, 5DS, 5JO and 8OU were all heard at RS59 with 5BD RS57 off the back of the beam. G2DUS told G3WW that he is raising his 70 cm stack from 20 to 60 feet. On the following evening G3WW had contacts with G3FUV (Hinckley, Leics.), 2FZU (Derby), 3EJO (Erdington, Birmingham), 3GCK (York), 6XX (Goole, Yorks.) RS57 off the back of his beam and receiving 'WW at RS58, GW3GWA, 6FK (Wolverhampton), 8DM (Faringdon, Berks.) and 3AGR (Streatham). Also active that evening were G2HCG, PU, WJ, XV, 3BKQ, EEL, FAN, GGI, GHO, IIT, IOO, IRA, 4PV, 5UD and 6RH.

G5YV worked PA0EP at 2000 G.M.T. on March 17. G3WW heard PA0FC while 3BK heard two PA0 and four ON stations. G6XX (Goole, Yorks.) worked G3FUM and G5TZ/A on the 11th and found the evening of the 15th good for the Midlands.

G2AHP (Perivale, Middx.) worked G3IOO and 5YV and heard GW2ADZ on March 9. Other stations worked recently included G3DJX, IKC (a new station in Chiswick), 6CB, who is testing n.b.f.m., and 6FO.

G5BD (Mablethorpe, Lincs.) recalls that back in 1948 a thick fog coincided with the best conditions ever experienced for contacts with Birmingham and district on 5 metres. On February 16 there was another dense fog which produced the best 2 m signals yet heard from Birmingham. A four-way contact was enjoyed with G2AK, FXK and NV. G5BD has a new TVI-proof transmitter in operation employing a 12AT7, 5763, QV04-7, and an 829B running at an input of 70 watts.

According to G5MR (Hythe, Kent) there was a good opening to France from the south coast on February 21 and for most of this country on the following day. G5MR intends to take part in the "Lofty Sites" contest to be organised by R.E.F. on April 19 although he will be operating from

* 32 Earl's Road, Tunbridge Wells, Kent.

home, which is near to sea-level. Frequency 145.152 Mc/s and 100 watts of either 'phone or c.w. to a 4-over-4 w/s beam.

Returning to 2 m after an absence of several months, **G3DO** (Sutton Coldfield) installed a new feeder and refurbished his 16-element stack. On March 14 he worked **G3FUM**, **GVC**, **GVF**, **5TZ/A** and **6OU**, all in Hampshire and varying in strength from S7 to a good S9. Conditions were good again on March 15/16 and contacts were obtained with **G2AHL** (Guildford), **FTL** (Spondon, Derby), **PU** (Cambridge), **3AGR** (London, S.W.), **BII** (Beaconsfield, Bucks.), **CCP** (Shrivenham, Wilts.), **EPW**, **GHS** (New Malden, Sy.), **IER** (Cheltenham), **IRA**, **5BD**, **5JO** (Cambridge), **5LK** (Reigate) and **6XH** (Chorley Wood, Herts.).

Those who enjoy listening to the excellent signal from **G5TZ/A** in the south of the Isle of Wight may like to know that only a modest 30 watts or so is in use on 144.549 Mc/s but the site is no less than 840 ft. above sea level and the aerial a 24-element stack. On the receiving side two e.g.t.s feed a 6J6 mixer stage with another 6J6 as oscillator followed by an Eddystone 680 on 31 Mc/s.

G5NF, who now has a 50 watt p.a. in operation, has worked several French stations recently. **G2JF** (Wye, nr. Ashford, Kent), well known for his work on Top Band, is on 2 m with a fixed 6-element stack firing north and south. **G3GJJ** (Redhill, Sy.) runs 12 watts to an SCR522 on 144.89 Mc/s with a 3-element Yagi.

A "lazy H" beam with wide spaced reflectors is giving better results than the previous "ZL Special" at **G2CZS** (Chelmsford). A newcomer to the band, **G3INU** (Clacton), has a pair of 7193s taking 18 watts in his p.a. stage. **G3ANB** (Brightlingsea) worked **PA0FC** on 2 m on March 17. **G3WP**, in the same town, and **G3HSM** (Clacton) are also active, while **G3JFR** is a new call in Basingstoke, Hants.

G2AHL (Guildford) heard **G3EPW** (Bury, Lancs.) S7/8 on 'phone on March 16 and worked **G3DO** on the previous day at S6/9, receiving a similar report. He also worked **G5TZ/A** on March 21 who was later in contact with **GC2CNC**. It is reported that **GD3UB** (Isle of Man) has been heard on 2 m.

G5MA will be operating as **GW5MA/P** from Tenby, Pembroke, on April 17 and 18.

The Five Band Club Dinner

More than 70 v.h.f. enthusiasts from some 16 counties were present at this event held in Cheltenham on March 13. Harry Wilson, **EI2W**, Past President of the International V.H.F. Society, presented the Irish V.H.F. Trophy to Bob Munday, **G5MA**, for his many portable sorties which have done so much to foster interest in the 2 m band. Later in the evening **G2HCG** spoke of a new method which he has evolved for feeding an array of skeleton slot elements and reflectors.

During his visit to Cheltenham **G3WW**, who contributes this report, examined **G5MA**'s new 150 watt p.a. with p.p. 826s and the portable station which has been heard from so many different parts of the U.K. He also saw a well constructed transmitter-receiver made by **G5BM** for 2 m portable work.

Fact or Fiction?

Why is it more difficult to modulate a v.h.f. carrier fully than one of lower frequency? The experts say that, all things being equal, a given audio power will produce a precisely similar depth of modulation whatever the frequency of the carrier. On the face of it, there appears no reason for querying this seemingly obvious fact—

until one tries 'phone on 2 m or 70 cm. Then, for some reason which many v.h.f. operators would like to know, the transmission is reported undermodulated despite the fact that the audio power available would more than "fill" the carrier on a lower frequency band.

Those who operated on 5 m may remember that the same tale of woe was common then, and we have heard that those who try 'phone on 10 m after operating successfully on the 20 and 40 m bands, have experienced much the same sort of effect. Lack of grid drive is one possible explanation, but surely all those who have noticed the effect do not suffer from this elementary defect in their transmitters. It must, we suggest, be tied up with p.a. operating conditions but which and why? We look forward to letters of enlightenment on this point.

LONDON U.H.F. GROUP

will meet at the Bedford Corner Hotel, Bayley Street, Tottenham Court Road, at 7.30 p.m. on May 6, 1954.
All u.h.f. enthusiasts welcome.

London Area 70 cm Activity

G2RD submits the following list of stations heard during the period from February 22 to March 21: **G2DD**, **HDJ**, **HDY**, **RD**, **WJ**, **3EOH**, **FP**, **GDR**, **IRW**, **JQN**, **MI**, **4KD**, **RO**, **5CD**, **DS**, **DT**, **RD**, **6NF**, **8KZ**, **SK**, **PE1PL**.

G3JQN (Selhurst, S. London) made his first QSO ever on the 70 cm band. **PA0FB** and **PA0PN** will shortly be back on the band and listening for British stations. **G2DD** heard **PE1PL** on March 1 and 12 and made contact with that station on the 19th but signal strength was disappointing. **G2RD** now has a sked. with this Dutch station at 0800 G.M.T. on Mondays, Wednesdays and Fridays; **PE1PL** calls first for five minutes.

GW2ADZ has little to report beyond a contact with **G2BVW** at 90 miles. During the course of the QSO 'BVW said he had a collection of light-house valves which, when tested in his r.f. stage, varied in noise factor from 3.5 to 18 db. Looks a bit chancy if you only have one to choose from! It may explain, however, why some people find a lighthouse r.f. stage an advantage on 70 cm while others consider the converter better without it. Active 70 cm stations known to **GW2ADZ** are **G2FNV**, **XV**, **3IOO**, **6YU** and **8KL**.

G8PX (Oxford) got his new 70 cm transmitter running with a Mullard QQV06-40 in the final just at the time of the cold spell a few weeks ago. After a week in a cold shack one of the anode seals of the '06-40 was found to have fractured. The same week 'PX heard of two EF50s and a c.r.t. which had all suffered a similar fate. Evidently with pressed glass construction, intense cold—or heat—is not to be recommended!

G2XV (Cambridge) is active on 70 cm on Sundays between 1100 and 1300 B.S.T.

* * *

Thanks to the much better response from correspondents during the past month this feature has been able to return to a more respectable size. Please keep up the good work and send reports for the May issue to arrive by April 20.

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TVI Can Be Cured!

Logical Methods of Preventing Interference to Television Broadcasts

By HARRY WHALLEY, M.Sc., A.M.Brit.I.R.E. (G2HW)*

There is no reason why any amateur station should close down during television transmissions provided the well-tried methods so clearly described here are adopted and a little care and attention given to ensuring operation in accordance with sound engineering practice. As the author says: "If you can read, you can cure TVI." Here is the way.

ALTHOUGH amateur transmitters are responsible for only a small fraction of the total amount of interference to television reception there is no doubt that TVI is still one of the major problems facing Amateur Radio today. From the amateur viewpoint, the causes of TVI may be grouped as follows:

- (1) Inadequate selectivity in the television receiver.
- (2) External cross-modulation.
- (3) Harmonic radiation from transmitters.

Receiver Selectivity

Inadequate selectivity is undoubtedly a design fault and the problem will only be completely solved when television receiver designers fully appreciate an axiom long recognised in other branches of radio, i.e., that the worth of a receiver is judged not only by what it will receive, but also by what it will not! To hasten this state of affairs it is the duty of every amateur to ensure that all cases of inadequate television receiver selectivity are brought to the notice of the offending manufacturer.



There is no doubt that some designers are unacquainted with the Amateur Radio service and hence do not consider in their designs the precautions necessary to protect their receivers from relatively strong signals in the amateur bands. It is obvious that such receiver faults can only be cured at the receiver. This necessitates the co-operation of the complainant and possibly that of the local G.P.O. engineers. The majority of such cases can be cured by installing suitable high-pass filters.¹ A number of manufacturers will supply filters for their receivers, while general purpose filters are commercially available. As the fault lies in the receiver, the filter should only be supplied free of charge by the amateur in exceptional circumstances.

External Cross-Modulation

While cross-modulation due to rectifier action not associated with either the receiver or transmitter is well known, it is not intended to discuss it here.[†] However, Seybold² has shown that

external cross-modulation cannot be completely ignored, and the effect should not be overlooked in stubborn cases.

Harmonic Interference

Harmonic radiation from transmitters is the direct responsibility of the amateur and it is the object of this article to discuss methods of harmonic reduction. Before proceeding with the discussion, however, it will be as well to clarify our ideas as to the order of harmonic reduction required. By international agreement harmonics from transmitters using less than 2 kW shall be not less than 40 db down on the fundamental. It is important to note that this is a *minimum* requirement.

As harmonics can only be suppressed at the transmitter, individual harmonics may be, and often are, suppressed to a much greater degree to meet the requirements of other services which may be experiencing interference. Just as the Amateur Radio service has occasion to request special measures to suppress commercial transmitter harmonics in an amateur band, so television receiver owners are entitled to request amateurs to apply special measures to reduce their harmonics to a lower level than that required by international regulation. It is the writer's opinion that harmonics in the TV channels should be reduced until it can be shown that no interference is being caused by transmitter harmonics. There is a great deal of evidence that this state of affairs can be achieved even in fringe areas.

Screening

Probably the most important single factor in the reduction of unwanted emissions is the use of screening. It is essential that there should be a thorough understanding of the principles involved when screening is employed otherwise much labour and material may be wasted.³ Many practical examples of good screening techniques have been published.^{1,2}

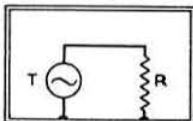


Fig. 1.
Perfect screening. T represents the transmitter and R its load.

Let Fig. 1 represent a perfect screening box containing a battery operated transmitter T and a suitable load resistance R. By definition there will be no detectable r.f. energy outside the box. Thus, while there will be no TVI, the arrangement is of little practical value unless some means can be provided whereby R (which may be an aerial) can be placed outside the box. Fig. 2 shows how this can be achieved. The transmitter is now connected via screened plugs and sockets, screened cable and a screened filter to the external load. The load receives r.f. power from the transmitter at the wanted frequency whilst the low-pass filter effectively stops the transmission of any r.f. energy at television frequencies.

While the arrangement shown in Fig. 2 will enable a carrier to be radiated without harmonics

* Interference from external non-linear devices is the subject of a forthcoming BULLETIN article.—ED.

* 2 Park Road, Sale, Cheshire.

there still remains the problems of applying speech input, keying and probably a mains supply to feed a power pack instead of the battery supply originally specified. These problems are really one, i.e., that of feeding into the box a necessary supply and at the same time preventing r.f. energy emerging from the box along the leads.

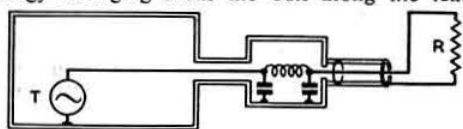


Fig. 2.—Elimination of harmonics by the use of a low-pass filter.

In all cases of leads leaving a screening box it is necessary to ensure that the r.f. potential of the leads is that of the outside of the box. Fig. 3 shows two methods of achieving this result, the filter shown at B usually being more effective than the one at A.

As there is often a direct connection via the supply mains between the transmitter and neighbouring television receivers, it is obvious that a mains filter at the transmitter is highly desirable. The filter should, preferably, be effective at amateur frequencies as well as at the television frequencies although this may not be essential. From the TVI point of view, microphone and key leads need only be filtered for television frequencies. However, it is often useful to make the microphone lead filter effective at the carrier frequency in order to prevent "howling," due to r.f. feedback into the modulator input.

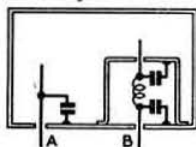


Fig. 3.
Methods of preventing the escape of r.f. energy along supply leads. B is preferable.

The condensers used to tie down the leads (at r.f.) to the screening box should have as low a reactance as possible. This would mean the largest possible capacity were it not for two important points. The first is the effect of the capacity on the actual supply to be fed via the leads in question. It is inadvisable to use condensers larger than $0.005 \mu\text{F}$ between live a.c. mains and frame (especially if the earthing arrangements are high resistance) because the 50 c/s current flowing through the condensers may be dangerous to life. A suggested method of mounting is shown in Fig. 4. Too large a capacity by-passing microphone leads can cause serious loss of the higher audio frequencies, while excessive capacity directly across a key may cause the contacts to weld—condensers of the order of 1 to $4 \mu\text{F}$ used in key thump filters always have a discharge current limiting resistor in series to prevent this occurring.

The second point is that the larger the condenser, the greater is the stray series inductance; it is only too easy to reach a state of affairs where the inductive reactance of the condenser leads exceeds the capacitive reactance. The ideal is to choose a condenser such that the lead inductance series tunes the capacity to the TV frequency, thus achieving a very low impedance indeed.⁶ The resonant frequency of the condenser may be determined by soldering it to copper sheet (to represent the chassis) in a position and with lead lengths which simulate those to be used in practice. The resonant frequency of the loop so formed is then measured using a grid dip oscillator.⁷ If the resonant frequency is well on the h.f. side of the television channel in question

then the lead inductance is quite low and the condenser will probably be satisfactory. However, a condenser which series-tunes to a television channel near the centre of the television band will probably give better results over the whole of the band. In practice, providing mica-disc or disc ceramic types of condensers are used, values between $0.0005 \mu\text{F}$ and $0.001 \mu\text{F}$ will give satisfactory performance.

Suitable chokes for lead filtering may be made by winding approximately one quarter wavelength of wire on a former between $\frac{1}{4}$ and 1 in. in diameter. The formers may be made from wooden dowel rod, pencils, plastic knitting needles and high value insulated carbon resistors. The actual length of wire is not very critical, but the gauge should be chosen bearing in mind the current to be carried.

The screening box itself should, preferably, be made from sheet brass or aluminium, although quite good results can be obtained using fine mesh metal gauze. The latter may be advantageous when there is considerable heat generated within the box. There should be not less than $\frac{1}{2}$ in. overlap at every joint and bolted joints should have the bolts not more than 3 in. apart. It is not always essential to shield meter holes but, when necessary, the meters can be mounted in screened enclosures (with the leads by-passed to the enclosure) or, alternatively, the meters can be viewed through metal gauze.

Transmitters built according to the above principles can, and will, give TVI-proof operation irrespective of the transmitter circuit details and the amount of harmonic output produced in the various stages. Realisation of this fact partly accounts for the growing popularity of the self-contained "table-top" type of transmitter. Nevertheless it will be appreciated that circuit refinements and layout techniques which will reduce the level of harmonics generated will simplify the general problem and reduce the amount of filtering required at the various outlets.

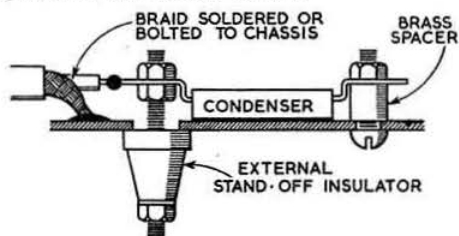


Fig. 4.—Method of feeding h.t. into a unit using standard moulded case mica condensers for by-passing.

Harmonic Reduction

As all transmitters have stages working in Class B or Class C, harmonics of the desired output frequency are bound to be produced. Nevertheless, the magnitude of these harmonics is, to a large extent, controllable. The design of r.f. power amplifiers and frequency multipliers has been adequately covered elsewhere.⁸ Unwanted harmonics will be minimised by ensuring first that no stage has more driving power than is absolutely essential to provide the necessary output and second by using tank circuits with sufficiently high Q (high selectivity) to avoid passing on unwanted frequencies to the next stage.

As frequency multipliers are, by their very nature, potent harmonic generators, it is obvious that multiplication should take place at the lowest possible power level. The necessary drive for the output stage can then be built up in a driver stage, which should preferably be operated in Class B

to ensure high power gain and relatively low harmonic output. This driver stage should operate as an amplifier on all bands to minimise unwanted harmonics at the p.a. grid.

It is desirable that the driver stage be fitted with some means of varying the power output and hence the amount of drive power applied to the final stage grid. The control may be a potentiometer from which the driver screen grid potential is derived. This is a very effective method and provides panel control of drive which may be used to set the p.a. grid current each time the transmitter waveband is changed.

When adjusting a telegraphy transmitter the driving power should be reduced until the aerial current just commences to fall. The p.a. grid current should then be noted and thereafter never exceeded. In anode modulated telephony greater driving power will be required and, in this case, the p.a. grid current should be increased until there is no evidence of positive peak flattening, as observed by good "upward modulation" or, preferably, by the use of a cathode ray oscilloscope. Again, the grid current should be logged and not exceeded under normal operating conditions.



Use of a Faraday screen is desirable.....

Interstage Couplings

A correctly loaded r.f. stage or frequency multiplier will produce at its anode an r.f. peak voltage of the order of 80% of the applied h.t. voltage. Examination of the makers' recommended drive conditions for the driven stage often shows, in the case of low power stages, that appreciably less voltage than this is really required. It follows that for good efficiency a step-down transformer is desirable between the driver stage anode and the driven stage grid. This can be achieved by either tapping down the grid lead to the driver tank coil or by choosing a suitable value for the coupling condenser.

It will be observed that, as the grid is tapped down, or as the coupling condenser is reduced in value, the driver feed current will fall and initially the driven stage grid current will rise. There naturally comes a point when further tapping down or reduction in coupling condenser value will reduce the grid current. Varying the coupling condenser is the simplest method of matching the driver stage to the following grid impedance and the final condenser value chosen is often very much smaller than the conventional values. When using the tapped coil method it is desirable to check (with a grid dip meter) the frequency of the circuit formed by the driven stage grid-earth capacity and the inductance between tap and earth. It is possible for this circuit to cause parasitic oscillations, or, if the resonant frequency lies in the television channel, to enhance a harmonic which the system, as a whole, is trying to reduce. The use of such impedance matching techniques will allow of greater tank circuit selectivity (due to reduced grid current damping), reduced input to the multiplier stage and prevent excessive drive voltage being applied to the following stage.

Probably the most useful interstage coupling system is the wide-band coupler. This component, devised originally for operational ease, will always

give extra selectivity to reject unwanted frequencies because of the band-pass characteristic of the two coupled circuits. Constructional details of wide-band couplers have been published⁹ and complete units are commercially available.

Conventional link coupling used to couple separate exciter and p.a. units has similar advantages to the wide-band coupler. If the coupling between the two circuits is weak, as is often the case, then even greater harmonic reduction will be possible than with wide-band coupled circuits. It is important that the grid tank circuit has sufficient capacity¹⁰ to maintain a grid circuit Q of the order of 12 so that the grid driving voltage will be reasonably sinusoidal in spite of the grid current damping alternate half-cycles.

P. A. Tank Circuits

In order to achieve high efficiency, transmitter p.a. stages are nearly always operated in Class C. It therefore follows that, even though the drive voltage may be perfectly sinusoidal, the p.a. anode current will have an appreciable harmonic content. It is the purpose of the tank circuit to couple the valve to the load and at the same time provide sufficient selectivity to attenuate all unwanted harmonics. A low tank circuit Q makes for high efficiency but poor harmonic rejection and vice versa. It is common practice to compromise, using Q values of the order of 12. For any given p.a. operating condition the tank circuit Q is determined by the L/C ratio and, knowing the h.t. voltage and d.c. anode current required by the stage the correct value of capacity to be used for any amateur band can be determined from published charts.¹¹ It is very important that the correct value of tuning capacity be used.

A tank circuit with a Q of 12 may well be insufficient, in itself, to reduce p.a. harmonics to a low enough level, hence the need for low-pass filters and aerial tuning units between the transmitter and the aerial. What benefit the tank circuit can give may not be achieved in practice if stray capacity coupling exists between tank coil and output circuits. Thus it is usually necessary to use a Faraday screen between tank coil and coupling coil. The manufacture of Faraday screens is rather difficult, but comparable results can be obtained by using a link coil made from coaxial cable.^{12,16}

A pi-network tank circuit^{13,14} can give very much greater attenuation of harmonics than conventional tuned circuits, but to reap the full benefit of this circuit it must be properly designed and adjusted. Pi-network tank circuits are used for two main reasons. The first is that it is a very convenient way of matching a load to a valve and the second is that it can reduce the harmonic output from the transmitter. *It does not seem to be generally realised that the two do not automatically go together.*

The network is often used for matching the transmitter to a random length of wire and for this purpose it is ideal, but, used in this manner, its value as a harmonic reducing device may be quite negligible. The expected harmonic reduction will only be obtained when the network is designed to suit the impedance transformation required and when positive steps have been taken to see that the correct terminating resistance is, in fact, provided. There is little point in designing a pi-network tank circuit to work into, say, 75 ohms, if no attempt is made to ensure that the aerial (via its tuning unit, if used) really does "look like" 75 ohms. It is a very simple matter, using a standing-wave ratio bridge, to adjust the aerial tuning unit so that when "looking

into" its coaxial feed cable the transmitter "sees" 75 ohms. Providing one already owns a sensitive microammeter, a s.w.r. bridge can be made for a few shillings.¹⁵ The microammeter can be jacked into the bridge unit when required, so there is no need to tie up permanently what is probably the only really sensitive instrument in the station.

With any type of tank circuit it is essential that there be a low impedance path between p.a. anode and earth for harmonics in the television band. It therefore follows that the tuning condenser should have a low self-inductance and be connected to anode and earth *via* low inductance leads. When this condition cannot be easily realised it often helps to fit an auxiliary condenser (20 μ F to 50 μ F, depending on the transmitter frequency) between anode and cathode. This condenser can be designed to have low inductance and should preferably be a coaxial type. Vacuum condensers are usually very suitable because of their small physical size and low self-inductance. A few inches of polythene insulated coaxial cable often proves both cheap and effective as a coaxial condenser.

Wiring

Any transmitter must be designed with two frequencies in mind, *i.e.*, the working frequency and the frequency of the unwanted harmonic. By-passing and decoupling circuits should be constructed as if the transmitter were being built for use at 40 to 60 Mc/s rather than for the lower frequency amateur bands. Parts should be arranged so that the by-pass condensers can be used with the shortest possible leads. The value and type of condensers should be chosen, bearing in mind the considerations mentioned above in connection with filter condensers. All wiring, other than actual r.f. wiring, should be carried out in screened cable with condensers tying the inner conductor to the outer at each end of the run.⁶ The outer sheath should be well bonded to earth and the cable should have a "lossy" insulating material, such as rubber or p.v.c. In this way the cable not only behaves as a low inductance by-pass condenser but also as a "lossy" transmission line which attenuates any r.f. energy which attempts to travel along it.

Wiring carrying r.f. should be carried out using short heavy conductors; copper ribbon can be used with advantage for the p.a. wiring, and will appreciably lower the inductance of the connecting leads as well as reducing the impedance to harmonics. It will also raise the frequency of parasitic tuned circuits and thus help to stabilise the amplifier. A suitable conductor would be $\frac{1}{4}$ in. by 0.005 in., this having low inductance and yet being quite flexible.

Low Pass Filters

It has already been mentioned that a shielded low-pass filter installed in the coaxial cable between the transmitter and the aerial tuning unit will effectively prevent harmonics reaching the aerial. Ample information exists on the design and installation of such filters,¹⁶ whilst a number of constructional articles have been published.^{17, 18} Suitable filters are also commercially available.

Such filters are designed to work into a given impedance and, as in the case of the pi-network tank circuit, it is necessary to ensure that the filter "sees" the correct load. Thus if the standard coaxial cable used at the station has a characteristic impedance of 75 ohms, both the transmitter and the filter must be designed to work into 75 ohms and the aerial tuning unit adjusted accordingly. The usual low pass filters will give

appreciable attenuation of harmonics even when incorrectly terminated, but under these circumstances it may be difficult to load the transmitter properly. If the transmitter can be loaded then there is a very real danger of damaging the filter components, due to flash-over or break down of the condensers.

The filter can only attenuate harmonics present on the inside of the coaxial cable. There will be no reduction of harmonic currents flowing to the aerial on the outer sheath. These currents can only flow if the p.a. screening has not been correctly carried out or if the coaxial cable is not connected by suitably screened coaxial plugs and sockets.

Treatment of Existing Transmitters

On receiving a complaint of TVI it is necessary to approach the problem in a logical manner. The first step is to try the effect of a shielded high-pass filter as close to the aerial socket of the receiver as possible. This filter should have plug and socket connectors to suit the type of feeder used by the receiver. Local TVI Committees will usually be prepared to loan suitable filters for test purposes. If the filter removes the interference, then the trouble lies in the receiver and nothing can be done at the transmitter to alleviate matters.



*Screening
always helps*

If the interference persists in spite of the filter it should not be assumed that the transmitter is at fault until enquiries have been made about other television receivers located up to the same distance from the transmitter. It may well be found that, while most receivers are interference free, receivers of a certain make or type experience interference and do not respond to filter treatment. This may occur as a result of incorrect aerial installation or peculiarities in the receiver input circuits which do not allow the filter a proper chance to function correctly. Again this is not the fault of the transmitter. If, however, most receivers in the neighbourhood suffer from TVI then it is almost certain that the transmitter is generating harmonics in the television band. Once it has been established that transmitter harmonics are the cause of the trouble then some form of harmonic indicator¹⁹ will prove a useful tool; it may be possible to borrow such an instrument from the local TVI Committee.

In most investigations there comes a time when the normal harmonic indicator is no longer sensitive enough, in which case the obvious instrument to use is a television receiver. Given a choice, the receiver should be of the t.r.f. type with a loose coupled input circuit. It should be fitted with a high pass filter at the aerial input and with filters in the mains leads. These precautions are legitimate and often necessary as the receiver may be used in close proximity to the transmitter and might otherwise suffer cross modulation from the transmitter fundamental frequency. In cases where a harmonic indicator is no longer sensitive enough and a suitable TV receiver is unobtainable (there is a limit to what a TVI Committee can supply) the local G.P.O. engineers should be asked to make a check with their own test equipment which is very sensitive.

Much has been written about the reduction of harmonic radiations from existing transmitters.^{20, 21}

and, although transmitters differ widely, the techniques employed can be applied with advantage to most equipments. It may well happen that the interference due to harmonics is only slight, and if this is the case very appreciable improvement may be brought about by increasing the value of the tuning capacity in the p.a. anode and grid circuits and by shortening the leads to all p.a. bypass condensers. A series LC circuit connected across the coaxial output socket of the transmitter and tuned to the TV channel often makes a marked improvement by effectively short circuiting the transmitter output as regards the unwanted harmonic. Either the inductance or the capacity (about 30 μF is suitable) may be varied. The circuit should be tuned for minimum interference to television reception and so arranged that it can be adjusted with the screening in place. If a hole in the screening is required it should be no larger than necessary to enable the trimming tool to be inserted. Wherever possible the use of harmonic traps in anode and grid leads should be avoided as these tend to encourage parasitic oscillations.

If these measures fail then a dummy aerial should be substituted for the usual transmitting aerial. The dummy aerial may be a standard electric lamp of suitable wattage, impedance matched if necessary by the aerial tuner, and adjusted so that the transmitter is running at normal input. If, under these conditions, the interference ceases, then harmonics were being radiated from the transmitting aerial and a low pass filter between the transmitter and the aerial should effect a cure. If the installation of a filter makes little difference then the screening and the coaxial connectors should be overhauled as it is almost certain that harmonics are reaching the aerial *via* the outer sheath of the cable. Before proceeding further it is desirable to repeat the test with the mains leads filtered at the transmitter, as mains borne interference may be increased when the aerial is connected due to the aerial, transmitter and mains system acting as a Marconi-type aerial.

If the TVI persists when the transmitter is operating with a dummy aerial then radiation must be taking place from the wiring *i.e.* the shielding is inadequate. All separate units, such as the v.f.o., exciter and p.a. stage, must be shielded and r.f. interconnecting leads made up from coaxial cable with screened plugs and sockets. All other leads leaving a unit must be bypassed to the screening box. The harmonic indicator will prove very useful for checking the effectiveness of such bypassing. The amount of lead filtering required may be reduced if use is made of screened multicore wire for interconnecting leads, provided that the cable screen is well bonded to the screening boxes at each end. The ideal method is to use screened multipin connectors suitable for the cable being used. It may be helpful to fit a simple lowpass filter in the r.f. output leads of the v.f.o. and exciter units.

It will be apparent that the multiple unit type of transmitter allows so many opportunities for r.f. leakage that it may prove easier, in the long run, to rebuild the transmitter in a more compact form.

Spurious Emissions

While not strictly due to harmonic radiation, it is not out of place at this point to mention other forms of TVI due to spurious emissions from the transmitter. If interference is only present during the transmission of speech it is probably caused by overmodulation of the transmitter and is due to the wide bandwidth radiated in this condition. The effect should be of very short range and the

cure, in most cases, is obvious. If, in spite of correct p.a. adjustment and reduced audio gain, the trouble still persists, then r.f. parasitic oscillations, particularly in the modulator stage, should be suspected. The latter are most easily traced by the use of a cathode ray oscilloscope as they often occur only during a small fraction of an audio cycle. Leakage inductance due to poor coupling between the windings of the modulation transformer is another cause of oscillation on peaks. With tetrode modulators the use of grid and screen-grid stoppers will usually effect a cure. The trouble is not usually so prevalent with Class B triode modulators, but when it does occur grid stoppers cannot be used. The oscillation is usually of the tuned anode tuned grid type and can be prevented by shortening the grid leads and lengthening the anode leads (by fitting u.h.f. chokes if necessary) so that the anode circuit is tuned to a lower frequency than the grid, thus making oscillation impossible.

Interference Due To Keying

Key clicks can cause interference to both sound and vision. The cure is to fit a key click filter. It is unfortunate that most published transmitter designs do not include suitable filters. It is often mentioned that one may be fitted if necessary, but the implication is that it won't be! A suitable circuit is shown in Fig. 5. It should be noted that (1) the open circuit voltage across the key contacts will be approximately equal to the peak r.f. drive voltage applied to the grid;

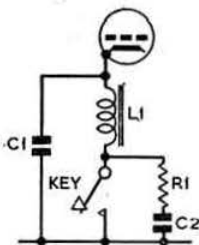


Fig. 5.—Key click filter suitable for valves of the 807 class. C1, 0.001 μF (cathode r.f. by-pass condenser); C2, 1 to 2 μF (adjust to suppress click at "break"); L1, 1 to 5 H (adjust to suppress click at "make") and R1, 200 to 1,000 ohms (adjust to suppress spark at "make").

(2) a resistor (1,000 to 5,000 ohms) may be connected across L1 to lower the effective inductance. If the stage is anode modulated, it may be possible to omit L1 as the inductance of the modulation transformer will serve to slow the rise of current at "make." In this case, a resistor of about 20,000 ohms should be connected across the transformer secondary to reduce the back e.m.f. at "break." Unless the modulation transformer is used in this manner it should be shorted out on c.w.

A key click filter is an integral part of a telegraph transmitter and is necessary to round off the sharp corners of the signal envelope at make and break in order to keep the transmitted band-width within reasonable limits. As this involves starting and stopping the current flow relatively slowly it is obvious that it is quite impossible to achieve clickless and chirpless keying of a v.f.o. at one and the same time. If it is really necessary to have break-in facilities (it usually isn't!) then the job should be done properly—there is far more to it than just keying the oscillator. When a 150 watt telegraph transmitter is correctly keyed it will be possible for a neighbouring amateur to receive quite weak signals without interfering clicks within 5 kc/s of the transmitter frequency at 250 yards

range. When this condition is achieved (and it can be, easily) there should be no interference to local TV receivers. If, nevertheless, there is still slight interference at make and/or break the trouble is almost certainly due to what might be termed "switching clicks." These are very local and may not be noticed further away than the next house. They are due to the actual make and break of current at the key and may be radiated from the key leads even though the transmitter waveform may be perfect. The condition may be aggravated when keying via highly inductive relays. It can be recognised by keying the transmitter with no r.f. drive applied in which case any clicks are obviously not being radiated via the normal channels. These clicks can be cured by small mica condensers of the order of 0.001 to 0.005 μ F (and possibly r.f. chokes) connected at the key itself. The clicks may be ignored if (a) there is no local interference and (b) the operator does not object to hearing them in his own receiver. It is very important to recognise the difference between very local switching clicks and clicks radiated due to the unsatisfactory shape of the r.f. envelope. If, in spite of all precautions the click type of interference persists, then intermittent parasitic oscillations in the r.f. stages of the transmitter should be suspected.



Conclusion

No one article can offer a complete solution to the TVI problem, but an attempt has been made here to cover the broad aspect of harmonic suppression. A comprehensive bibliography is appended from which more detailed information can be obtained and it is sincerely hoped that the articles quoted will be studied. When tackling a case of TVI it is, in the writer's opinion, essential to study all the available literature on the subject. The results of such a study are usually very illuminating.

It will be discovered that there is no excuse for self pity. You are not breaking new ground—your fellow amateurs have been successfully working on this problem for years and far worse cases than yours have been cured. All the relevant information exists: *if you can read, you can cure TVI!* Complete suppression of harmonics does not present a challenge to the amateur—it merely requires that 1954 transmitters be built using 1954 knowledge. Move with the times!

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TELEVISION INTERFERENCE TECHNICAL DATA SUPPLEMENT



CONTAINS a comprehensive list of television receivers which have come on to the market since the R.S.G.B. publication, *Television Interference*, appeared in 1951.

LISTS the intermediate, oscillator and image frequencies of 348 different receivers now in current production.

RADIO SOCIETY OF GREAT BRITAIN,
NEW RUSKIN HOUSE, LITTLE RUSSELL ST.,
LONDON, W.C.1.

G2WJ/T

An Amateur Television Transmitter on 436 Mc/s

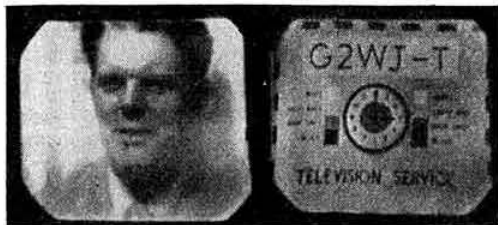
By RALPH and JEREMY ROYLE*

Thirty years ago Ralph Royle (G2WJ) was helping to pioneer short-wave Amateur Radio communication. Today he and his son Jeremy are helping to pioneer centimetric Amateur Television. Here is the story of their brilliant achievements.

THE design and construction of an Amateur Television transmitter, including the waveform generator, live camera, electronic controlled power supplies and associated equipment for operation in the 70 cm band, is not a task to be lightly undertaken: in fact, it is one which calls for team work rather than the "lone hand."

When the P.M.G. decided to permit amateur TV on 70 cm the authors of this article felt that here was a problem that ought to be tackled and one that was a challenge rather like the pioneer work that was done on the short wave bands thirty odd years ago. The prime mover in the plan (Jeremy Royle) had been working on closed circuit telestill scanners for some time, with much success. Considerable encouragement to the idea was given by the acquisition of a Pye photicon camera tube from Cathodean Ltd. who gave valuable help and advice.

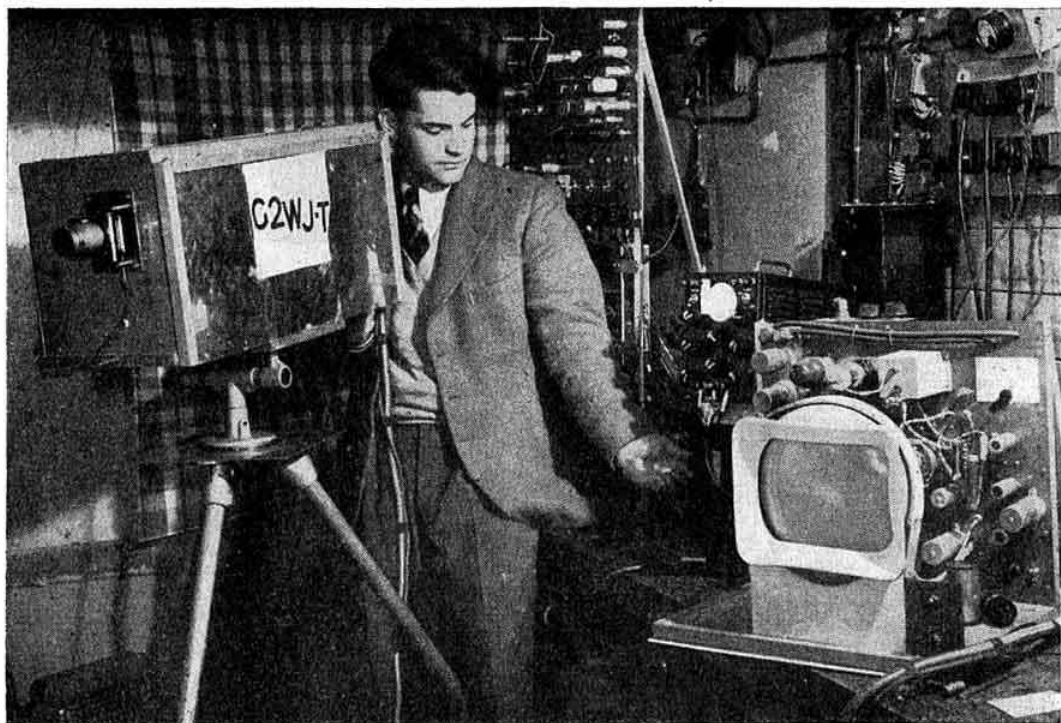
* Haydens End, Great Canfield, near Dunmow, Essex.



These untouched pictures were taken off the end of a tube at G3GDR, Abbots Langley—a distance of 31 miles from G2WJ/T

[The design and construction of all the television equipment was undertaken by Jeremy whilst the 436 Mc/s transmitter and aerial was made by Ralph Royle—Ed.]

Some early trials were carried out in September, 1952, using a small flying spot scanner and a very simple pulse generator and a grid modulated CV53 earthed grid triode p.a. driven from another CV53 acting as a doubler from a crystal controlled exciter on 218 Mc/s. This small transmitter gave an output of approximately 2 watts peak white and some interesting results were obtained over distances up to one mile. With the arrival of the Pye camera tube it was decided to discontinue these experiments and proceed at once with the construction of the camera and properly designed



Camera, camera chain and monitor at G2WJ/T

[Photo, courtesy "Daily Mirror"]

waveform, shading and keystone generators and electronically controlled power supplies.

By July, 1953, this work was completed and it was decided to carry out some tests using the CV53 transmitter. To our great surprise, pictures from the live camera were received by Mr. L. V. Dent, G3GDR (Abbots Langley, near Watford, Herts), over a distance of 31 miles. This first transmission of live pictures took place under good propagation conditions. When it was found later that good results could only be obtained under such conditions, it was decided to cease these experiments and to proceed with the construction of a relatively high power transmitter and modulator.

The work was eventually completed and on February 5, 1954, the new transmitter, running with a "peak white" power of 20 watts, was put on the air with the live camera. Good pictures were at once reported by G3GDR. Since then, a great

well as a relay protection circuit for the tube, should either of the scans fail. A special head amplifier is mounted close to the tube, its output being about 0.1 volt into 75 ohms. A Pye circuit specially designed to correct for the varying output impedance of the camera tube is used.

The time bases, keystone correction, scan failure protection unit and "s" corrector are mounted on a chassis at the rear of the camera. The entire unit is connected by plugs to the tube and head amplifier and can be withdrawn very easily for maintenance. The lens is an F3.1, 4 in. focal length type. A single 2 kW lamp is sufficient for indoor lighting.

The camera tripod was made from Gascoigne tubing and angle pieces with a brass plate at the top to form the bearing. Vertical movement of the camera is made possible by other joint pieces which are fixed to the bottom of the camera and to the main horizontal bearings.

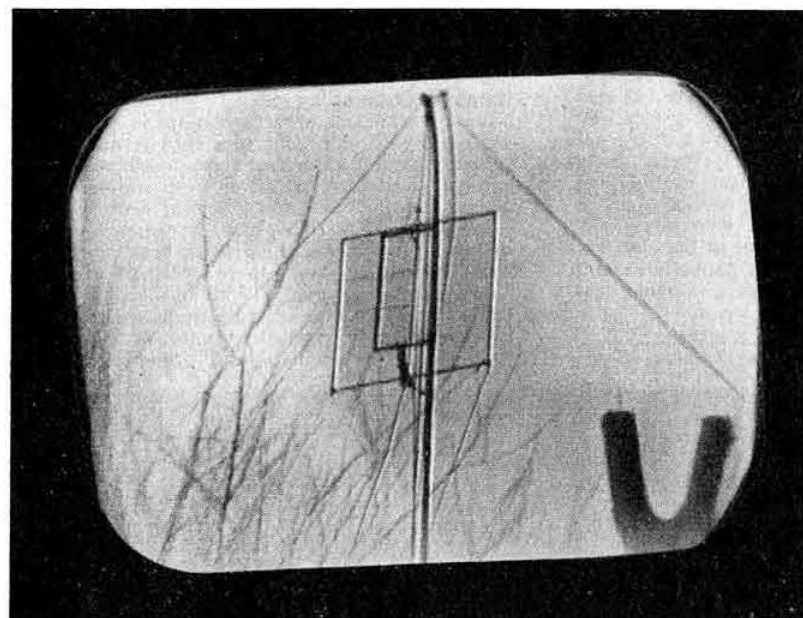
Camera Control Unit

The camera control unit is housed in a rack and contains the shading generator, line amplifier, power control and video sync mixer, waveform generator and power supplies.

The video signal from the camera is first amplified from the 0.1 volt level by three frequency compensated stages. The signal is clamped to black level by a very short time constant circuit which also

Picture taken from monitor whilst transmitter was on the air. The aerial shown was radiating the picture!

[Photo, courtesy "Daily Mirror"]



number of tests have been carried out under varying propagation conditions and on every occasion G3GDR has reported good results. It would appear that over this particular 31 mile path reliable television can be transmitted with this power.

The sound channel at present employed is 145.66 Mc/s whilst the video is transmitted on 436 Mc/s. The transmissions take place simultaneously. The 144 Mc/s band was chosen for the sound because it was felt that many amateurs would probably hear the transmissions and be encouraged to look on 436 Mc/s for the video.

Vision Apparatus at G2WJ/T

The Camera

The camera in use employs a high velocity image iconoscope type of tube known as a Photicon. It differs from the standard iconoscope in that it contains an image section which increases its sensitivity considerably and makes it a practical proposition for the amateur.

The camera itself contains the line and frame time bases and keystone correction circuits as

removes a.c. hum and all frequencies below 10125 kc/s, i.e. line frequency. The a.c. hum comes from various sources, the main ones being cross modulation, stray pickup and the use of unbalanced a.c. lighting in the studio.

The signal is then amplified by a valve which has its own anode in parallel with two other stages. The other valves mix in shading and blanking signals. The signal then passes into a lift circuit which enables one to "sit" the video signal on black level.

The signal is again amplified and passed along 75 ohm cable to the video sync mixer. Complete monitoring and control of the video-sync ratio is provided. A switch on the chassis enables the monitor to be connected to (1) plain video from the camera; (2) video and sync—after mixing; (3) the r.f. monitor on the transmitter. The output from the unit is at the standard distribution level of 1 volt, the composite signal being fed via coaxial cable to the modulator.

A crystal probe in the transmission line to the aerial permits the outgoing picture to be moni-

tored. The signal from the crystal diode is amplified and fed along 75 ohm cable to the main camera control unit switch. Thus, at the turn of this switch, the quality of the transmitted signal can be compared with the modulator input as well as the video sync ratio, which is the B.B.C. standard of 30% sync and 70% video.

The Waveform Generator

By far the most complicated unit is the waveform generator. At the time it was built, very little information was available and its development was the result of much work with an oscilloscope and the station monitor! The unit as it



Test card taken from monitor whilst transmitter was on the air.
[Photo Courtesy "Daily Mirror,"]

now stands produces the standard pattern, except that the waveform is not interlaced because a frequency divider has not yet been built. For the time being, a 100 kc/s crystal is used to control the line frequency and this works well. The waveform radiated contains half-line pulses as in B.B.C. transmissions. Every effort has been made to approach the standard waveform as nearly as possible so that ordinary commercial television receivers can lock properly to the transmissions. Calibration of pulse widths is carried out by measuring the width of the B.B.C. pulses on the picture monitor and then adjusting the pulse widths at G2WJ/T to match.

The Shading Generator

The shading generator produces various shading signals at line and frame frequency and is necessary in order to counteract the shading signals produced by the camera tube. It produces waveforms known as tilt and bend. The unit can be switched off when sufficient lighting is available. It can also be used as a pattern generator by adjusting the frequency of the sawtooth generator to produce a number of horizontal and vertical bars. The output is of sawtooth shape and is used for setting up the transmitter.

The Modulator

A low power modulator, previously used with the low power transmitter, is at present in use. This unit comprises EF50-6AG7-6AG7 cathode follower, the output being developed across a 3300 ohm resistor and d.c. coupled to the grids of the QV06-40 p.a. valve. D.C. restoration is carried out at the end of the cathode follower by an EA50 diode.

The bandwidth of this modulator is about 2 Mc/s but a new one, which will produce a greater

swing over a bandwidth of 3 Mc/s, is under construction. This will also contain a waveform monitor for use in the transmitting room.

The 436 Mc/s Transmitter and Aerial System

The transmitter employs two Mullard QV06-40 double tetrode valves, one as a tripler from a 145 Mc/s exciter and the other as a straight grid-modulated power amplifier.

The 145 Mc/s crystal controlled exciter gives more than sufficient output to drive the QV06-40 tripler to its maximum ratings. The final QV06-40 is air cooled using a small motor blower. The exciter and tripler are run from a common power supply but the final modulated stage works from a special constant impedance network power supply, an idea suggested by H. A. M. Clark (G6OT), to save the high cost of an electronically stabilised unit. The screen of the power amplifier is kept at a constant voltage by means of a VS68 Stabilivolt.

The aerial at present in use consists of eight half-wave elements stacked and backed by a wire mesh reflector. The coaxial transmission line is matched to the aerial by means of a 1/4-wave transformer and a balun.

Transmission Schedules

Transmissions to G3GDR, bearing west from Great Canfield, take place every Saturday evening between 1800 and 1900 G.M.T. All transmissions are constantly monitored. Reception reports will be very much appreciated. Incidentally the operators at G2WJ/T will be pleased to beam in any other direction on request.

Acknowledgments

Considerable praise is due to Mr. Dent for his skill, patience and co-operation and it is hoped that he will publish details of the receiver which was designed specially for the tests.

The authors also wish to record their thanks for the help and advice they have received from Ian Walters of Ely, H. A. M. Clark (G6OT), C. E. Newton (G2FKZ) and many other members whose brains have been used in designing the equipment that has put G2WJ/T on 436 Mc/s.

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London Lecture Meeting

MORE than 50 members attended the Ordinary Meeting of the Society held at the Institution of Electrical Engineers, Savoy Place, London, S.W.1, on Friday, March 26, 1954, when Mr. G. P. Thwaites, B.Sc.(Eng.), A.M.I.E.E. (Standard Telephones and Cables Ltd.) gave a most interesting and instructive lecture on "Trustworthy Valves and Their Manufacture." The Chair was taken initially by the President and later, in the absence of Mr. Milne, by Vice-President H. A. M. Clark, B.Sc.(Eng.), M.I.E.E. (G6OT).

A vote of thanks to the lecturer was proposed by Vice-President J. W. Mathews, Assoc. Brit.I.R.E. (G6LL).

A Converter for 14, 21 and 28 Mc/s

By J. W. ELLIOTT (G2AHT)*

MANY general coverage communications receivers, because of the compromise inherent in their design, suffer from one or more of the following shortcomings when operated on the higher frequency ranges: the presence of images in cases where the usual i.f. in the region of 460 kc/s is employed; insufficient sensitivity; and inadequate bandwidth.

From the amateur point of view, these deficiencies are serious, and as the station receiver at G2AHT was found to suffer from all three it was decided to resolve the problem by using the receiver, so far as the 14, 21 and 28 Mc/s bands were concerned, as an i.f./a.f. amplifier in conjunction with the converter which is the subject of this article.

General Design

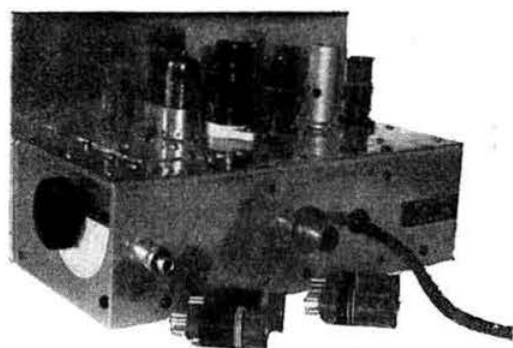
The circuit comprises three separately tuned stages—r.f. amplifier, mixer and local oscillator. Coils wound on Eddystone miniature plug-in threaded formers are used in the first and second stages whilst for reasons referred to later a fixed coil with a variable bandset condenser is employed in the oscillator. Separate tuning controls are no great inconvenience, as those for the r.f. and mixer stages are used only to peak the signal, and, of course, the tracking problems associated with ganged tuning do not arise.

Signal frequencies are heterodyned to 3 Mc/s (thereby ensuring adequate image rejection on the highest range covered by the converter), and then fed via 72 ohm co-axial cable to the main receiver.

Circuit

The 6AM6 miniature high-slope pentode, used as the r.f. amplifier (V1), is operated at maximum gain to maintain a good signal-to-noise ratio, whilst its grid circuit in the interests of sensitivity is coupled fairly tightly to the aerial. It will be seen from the circuit diagram (Fig. 1) that the anode and screen by-pass condensers, which were originally earthed to the chassis, are returned direct to the cathode, a step found necessary in order to cure the slight instability which was experienced at certain settings of the r.f. tuning condenser.

* 73 Pinewood Drive, Bletchley, Bucks.



Rear view of the 14, 21 and 28 Mc/s converter. The valves (from left to right) are the oscillator, mixer and r.f. amplifier respectively.

A 6AC7 is used as the mixer (V2), the 3 Mc/s component in its anode circuit being developed across L3. Although the oscillator voltage is injected into the control grid of this valve, "pulling" of the oscillator, when peaking the mixer tuning condenser, cannot be detected on telephony, whilst on c.w. it amounts only to a very slight variation in pitch of the received note.

The local oscillator stage, which employs a triode-connected Mazda 6F1 in a feed-back circuit, is fed from a 150 volt stabilised supply. A 6F1 was used because several were available; a 6AM6 or equivalent, with appropriate valveholder, would serve equally well. Originally, plug-in coils of the type used in the r.f. and mixer stages were also used in this part of the circuit, but it was found that tiny changes of contact resistance made consistently accurate calibration of the main tuning scale impossible. Accordingly, the plug-in coils were replaced by a single fixed coil which, in conjunction with a 100 μ F variable bandset condenser, is arranged to tune from 17 to 25 Mc/s, i.e., from 3 Mc/s on the high side of signal frequency at 14 Mc/s to the same amount on the low side at 28 Mc/s. By also setting the oscillator 3 Mc/s lower than signal frequency on 21 Mc/s, the lengths of the main

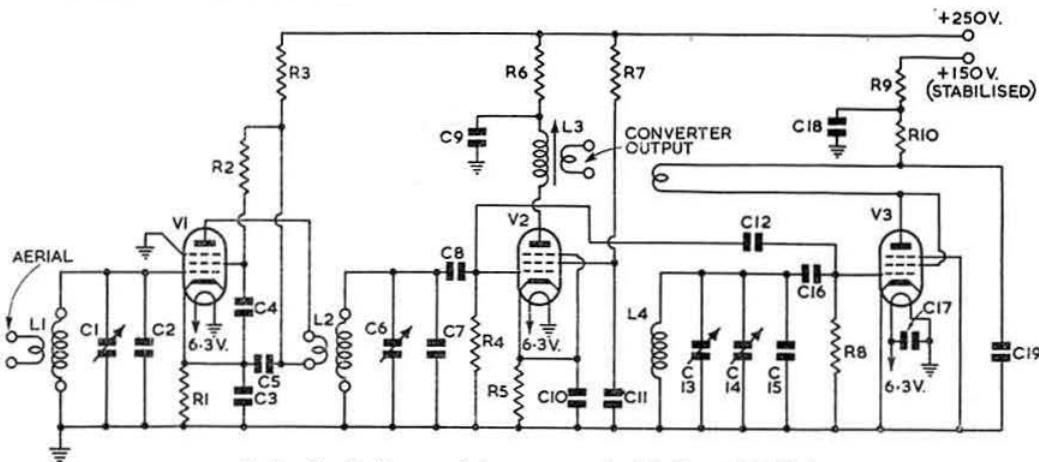


Fig 1—Circuit diagram of the converter for 14, 21 and 28 Mc/s

tuning scale for this band and for 14 Mc/s are roughly equalised, an advantage which will be referred to again later.

Measurement of the rectified oscillator grid current shows an increase of 30 per cent. over the range 17 to 27 Mc/s, but the conversion conductance of the 6AC7 mixer does not appear to be unduly affected by the corresponding variation in injection voltage.

Construction

The converter is built on a 10in. by 5in. by 3in. 16 gauge aluminium chassis.

The components associated with the grid of V1 are isolated from those of the anode by a screen across the valveholder. As pins 1, 2, 3 and 4 are on the grid side, it is necessary to drill a small hole in the screen for the connection returning the anode and screen-grid by-pass condensers to cathode. A similar screen divides the mixer and oscillator stages in order that any

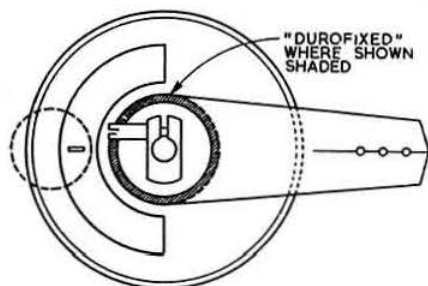
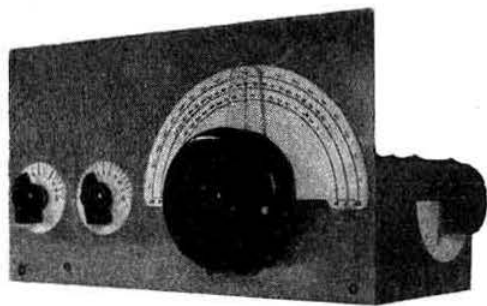


Fig. 2.—Method of fixing the perspex cursor to the Muirhead drive with Durofix. The perspex is cut away at the centre to clear the fixing nut on C13.

coupling between them, other than that intended, shall be reduced to a minimum. To provide the additional mechanical rigidity, which is a contributory factor to oscillator stability, the lip of this screen is extended well into the oscillator compartment along the underside of the chassis. Above the chassis, the r.f. and mixer coils are shielded from each other by the screening can on V1, and are separated by nearly three diameters. V2 and V3 are self-shielding and no additional screening has been found necessary.

As the front-view photograph shows, the slow motion drive fitted to C13 is the well-known Muirhead type fitted with a perspex cursor secured by Durofix to the inner face of the drive. The arrangement is illustrated in Fig. 2. To facilitate initial calibration by pin-pricks, three small holes are drilled through the cursor to register with the

three tuning scales. C14 is also fitted with a slow-motion drive (a miniature epicyclic) as the tuning is very critical. A small cursor, cut from a piece of celluloid, is fixed to the geared-down sleeve of the drive.



Front view of the converter showing the Muirhead dial with perspex cursor

Operation

When the wiring has been checked, the converter, with the 14 Mc/s coils in position, is connected to a suitable source of supply and coupled to the receiver via the co-axial cable. The main receiver is tuned to 3 Mc/s with its b.f.o. switched on and set to zero. After allowing about ten minutes for both units to settle down, the converter, with C13 at mid-scale, is loosely coupled to the output of a frequency meter set up on 14,175 kc/s, i.e., the centre of the 14 Mc/s band. C14 is then carefully tuned to zero beat from the low frequency end and the position of its cursor marked on the bandset scale. This is the reference point for the 14 Mc/s band. Next, the frequency meter is set to 14,000 kc/s and C13 tuned to zero beat, thus giving the band edge, which is marked on the tuning scale. C1, C6 and L3 are then peaked for maximum noise after which the main tuning scale may be calibrated to suit the individual operator. The procedure is repeated, with the frequency meter appropriately set up, for the 21 and 28 Mc/s bands except that it is not necessary to adjust L3 again. As a guide, it is found that the reference point for the 14 Mc/s band occurs at approximately 40 degrees from full mesh of C14; those for 21 and 28 Mc/s at approximately 65 and 160 degrees respectively.

In normal use, bandsetting after coil changing is most accurately achieved by setting C13 to the l.f. band-edge in each case and tuning C14 to zero beat against the appropriate harmonic of a 1 Mc/s crystal calibrator.

It is advisable to provide some means of cutting h.t. to the r.f. stage in order to prevent

Components List for Fig. 1

C1, 6, 13	10 μ F variable
C2, 7	15 μ F
C3, 4, 5	0.01 μ F
C8	30 μ F
C9, 10, 11, 17, 18, 19	1,000 μ F
C12	2 μ F
C14	100 μ F variable
C15	20 μ F
C16	50 μ F
L1, 2	14 Mc/s: 17 turns s.w.g. enam. (Coupling winding 3 turns, 30 s.w.g. d.c.c.)
	21 Mc/s: 9 turns 20 s.w.g. enam. (Coupling winding 2 turns, 30 s.w.g. d.c.c.)
	28 Mc/s: 6½ turns 20 s.w.g. enam. (Coupling winding 2 turns 30 s.w.g. d.c.c.)
L3	3 Mc/s i.f. transformer

R1	160 ohms
R2, 3	5,000 ohms
R4	1 Megohm
R5	6,800 ohms
R6, 9	1,000 ohms
R7	470,000 ohms
R8	50,000 ohms
R10	500 ohms
	All resistors ½ watt

L4 5½ turns 20 s.w.g. enam. ½ in. long on ½ in. diam. former. (Feedback winding 2 turns 24 s.w.g. enam.)
Note: L1 couplings interwound at earthy end of grid winding. L2 and L4 couplings wound adjacent to earthy end of grid winding.

damage to the 6AM6 through excessive screen dissipation when the mixer coil is removed from its socket. As an alternative, a resistor of 100,000 ohms may be wired across the primary of L2 at the coil socket. At G2AHT a relay in parallel with a switch is used to remove h.t. from both the r.f. and mixer stages on "transmit," leaving the local oscillator running to maintain stability.

As the converter now stands, the 14 and 21 Mc/s bands each occupy approximately 105 degrees, and the 28 Mc/s band up to 29.9 Mc/s, almost 180 degrees, of the main tuning scale. If C13 is the bolted type and it is not desired to cover so large a portion of the 28 Mc/s band, then by the removal of a vane and judicious use of spacing washers, its capacity may be reduced in fine steps to give an increase in the spread of the two lower frequency bands to any desired extent.

Results

The converter, on all bands, has proved a very satisfactory answer to the points mentioned earlier and whilst no measured performance figures are available the improvement over the unaided receiver is most marked, as the direct comparison of any signal shows. In the matter of ease of tuning and accuracy of calibration (due to the fact that a small amount of oscillator drift can be corrected by the bandset condenser) the converter scores heavily.

Compensating for Low Mains Voltage

By Basil Davis, M.I.E.E., M.Brit.I.R.E. (G2BZ)

LOW mains voltage is a common complaint at the present time and although this does not cause very much difficulty so far as h.t. supplies are concerned, it may well have a serious effect on heater voltages.

The difficulty can be overcome by using a "Variac" or a tapped auto transformer but these methods are cumbersome and somewhat expensive. Many transformers have tapped primaries so that an appropriate tapping may be selected but some have untapped primaries designed for 230 volts input only. In the method to be described, this disadvantage is overcome by winding extra primary turns in the small space between the finished windings and the core in order to provide tapings for varying mains voltages.

It is first necessary to determine the turns-per-volt ratio by winding on approximately 6 turns. The number of turns is then adjusted to give a reading of exactly 1 volt on a testmeter. From this, the number of turns required for the expected mains voltage drop (say 20 to 30) can be calculated.

The wire used for the auxiliary winding should be capable of carrying the full primary current of the transformer, which can be easily calculated. Alternatively, the correct wire gauge can be determined by inspecting the ends of the original winding.

When the new winding has been wound on to the transformer, it should be connected in series with the primary the "wrong" way round, i.e., so that it reduces the primary impedance, so increasing the secondary output voltages. Correct operation can be checked with the aid of a testmeter. The auxiliary winding may be tapped to

provide more exact control. If the original primary winding is tapped at points to match 200 to 250 volts, the new winding can be connected to any of these tapings—the results being proportional.

It is most important that the wire used for the additional winding should be well insulated from the core of the transformer. Cotton, paper or silk covered enamel wire is recommended. Special care should be taken to see that the insulation is not damaged at the time the wire is threaded through the confined space between the existing windings and the core laminations.

New Valves

A NUMBER of new valves have recently been announced by Mullard Ltd. The PCC84 double triode is specifically designed for use as a cascode amplifier in the v.h.f. broadcast band (Band II) and the competitive television band (Band III). An interesting feature of this valve is that the cathode surface is curved to the same degree as the grid wires so that the grid is equidistant from the cathode over the entire emitting area. This enables a high slope to be achieved with a reasonably large grid-cathode clearance. The PCF80 triode pentode frequency changer has been developed to provide a simple high performance valve capable of operating at frequencies up to 200 Mc/s. The two sections are screened from one another.

Another novel-based valve, now available from the same company, is the EL85 output pentode which has a heater rating of 6.3 V, 0.2 A. The maximum cathode rating is 35 mA. The anode dissipation is 6 watts and the valve is suitable for use as an audio amplifier or as an r.f. amplifier up to 120 Mc/s. As a class A amplifier it will deliver an output of 2.8 watts with an h.t. supply of 225 V and an anode current of 26 mA. In r.f. service, its output is 2 watts at 100 Mc/s.

Several new valves have recently been added to the Osram range. The Z219 is a high slope (7.4 mA/V) r.f. pentode on the B9A (novel) base. The heater is rated at 6.3 V, 0.3 A. The U43 is a miniature high voltage e.h.t. rectifier of the wire-in type, with an indirectly heated cathode, and heater consumption of 90 mA at 6.3 V. Another rectifier is the U709 full wave indirectly heated type for which the maximum r.m.s. input voltage is 350 and the rectified current 150 mA. The valve has a 6.3 V, 0.95 A heater, and a B9A base.

Other additions to the range are B7G equivalents of 6.3 V American types. The X727/6BE6 is a heptode frequency changer with a conversion conductance of 0.425 mA/V; the W727/6BA6 is a variable- μ r.f. pentode with a mutual conductance of 4.4 mA/V while the N727/6AQ5 is a beam tetrode with a maximum audio output of 4.5 watts.

Around the Trade

THE trend of increased size of television receiver screens and the angle of scan in cathode ray tubes has created fresh problems in line time-base circuitry. In this connection, The Telegraph Condenser Co. Ltd. is now producing small tubular ceramic condensers capable of handling the very high pulse voltages being specified by designers. These condensers are also most suitable for use as pulse feed condensers in radar transmitters and receivers. The tubular bodies are made of low permittivity ceramic with thicker walls than the standard radio condenser and a thick coating of wax affords protection against moisture.

An Experimental Transistor Transmitter for 3.5 Mc/s Operation

Details of the design in use at G3CMH

By C. C. BANBURY (B.R.S. 20100)*

Brief details of a 90-mile QSO between G3CMH (Yeovil Amateur Radio Club) and G3CAZ (Hazlemere, Surrey) were published in the March, 1954, issue of the R.S.G.B. Bulletin. In this article, the author describes the transistor transmitter which he designed and which was used at G3CMH during this outstanding contact.

THE low power transmitter to be described in this article uses an experimental type of point-contact transistor in a simple crystal oscillator circuit.

The Circuit

The circuit arrangement is shown in Fig. 1. The variable resistor VR1 controls the emitter bias, which for the transistor used was about 2.5 mA off load. VR2 controls the collector voltage (approximately -10 volts); the collector current being about 6 mA depending on the actual emitter bias. R2 is the load resistor.

It should be appreciated that at this stage of development there is plenty of scope for experiment with the values of components used in transistor circuits, as different types of transistor require different biasing conditions.

A milliammeter in series with VR1 may be used to measure the emitter current (I_e) and a voltmeter between collector and earth to measure the collector voltage (V_c). The collector current (I_c) can be measured by a milliammeter in series with VR2.

No definite layout is suggested but all wiring should be kept as short and connections made as direct as possible. Because excessive heat seriously affects the characteristics of transistors a pair of pliers should always be used to hold the leads whilst soldering them into position.

Setting up the transmitter

With the batteries connected, VR2 should be adjusted until a reading of -10 volts appears on the collector voltmeter. VR1 is then advanced until oscillation commences. A receiver, with its b.f.o. on, and tuned to the crystal frequency of the transmitter, will serve as a good indicator of oscillation. If the circuit cannot be made to oscillate, VR2 should be re-adjusted and VR1 varied as before. If the circuit still refuses to oscillate, the trouble is probably due to the transistor; many of the normal types at present available will not oscillate at 3.5 Mc/s. The transistor used in the original design was capable of generating very strong harmonics up to the 28 Mc/s band.

The transistor oscillated satisfactorily with inputs up to 100 mW, but it was found that overheating caused the note to become unstable after a few minutes. It should be noted that the connections to the batteries are the reverse of those in a thermionic valve circuit.

Tuning and Aerial Adjustment

When the circuit is oscillating, the tuning unit (C3, L1) should be connected to the collector. If oscillation then stops, VR1 must be re-adjusted slightly. The best point for the connection of the aerial will be found by experiment. (On the original transmitter it was connected to the collector end of L1.) C3 can then be adjusted until a rise in the emitter current is indicated. A suitable r.f. indicating device, such as that shown in Fig. 2, will now be found very useful. If placed near the transmitter aerial, it will give some idea of the power being transferred. The aerial should then be tapped down L1 for maximum reading on the r.f. indicator.

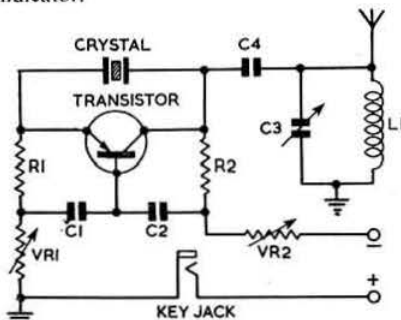


Fig. 1.—Circuit diagram of the 3.5 Mc/s transistor transmitter. C1, C2, 0.01 μ F; C3, 200 μ F variable; C4, 0.006 μ F; R1, 3,000 ohms; R2, 3,300 ohms; VR1, VR2, 100,000 ohms variable; L1, to tune to crystal frequency with C3.

After the aerial has been tuned, VR1 and VR2 may have to be adjusted in order to obtain the most stable note and also to eliminate key-clicks.

The aerial used with the transmitter for the contact with G3CAZ was a 274 ft. long VS1AA.

The circuit described here is only one of many which may be used. Although good results have so far been achieved, many more hours of patient experimenting will be needed before the performance desired by the writer is obtained.

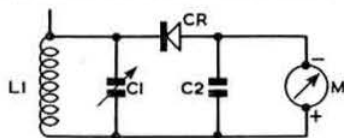


Fig. 2.—Simple r.f. indicator. C1, 200 μ F variable; C2, 0.002 μ F; CR, germanium diode; M, 0-500 μ A meter. L1, to tune to required frequency with C1.

144 Mc/s FIELD DAY

The rules for the 144 Mc/s Field Day, to be held on May 9, 1954, were published on page 327 of the January, 1954, issue of the R.S.G.B. Bulletin.

* Highway, Stoke-under-Ham, Somerset.

CQ

SINGLE SIDEBAND



FROM Ireland comes news that EI2W worked G3GKA (Letchworth) on March 9, 1954, for the first EI-G two-way single sideband contact. Although using only 3 watts peak input to a W2UNJ type phase-shift exciter directly coupled to an aerial, EI2W's signals were received well in the U.K. Crystal control is at present in use but a v.f.o. will be installed shortly. A power amplifier is in the design stage. EI4E has built a crystal filter exciter and a linear amplifier.

G2IG (Orpington) recently made some quite notable DX contacts on 14 Mc/s. On February 27, he worked ZS6KD for the first ZS-G two-way single sideband QSO. This was followed on March 13 by similar contacts with AP2CR and ZL2GL, the contact with the latter station lasting more than 2½ hours! The equipment used by G2IG comprised a phasing type exciter, generating the sideband on the transmitted frequency, and driving a pair of 808s in class B with an indicated power in-

G3GZB and G3DWQ are putting the finishing touches to their equipment.

Several new stations have appeared on 3.5 Mc/s of late and activity has been good generally. G3HHG is back again after a short period of rebuilding.

G3AUB having converted his AR88 receiver for s.s.b. reception by installing a bandpass crystal filter finds that the response curve has good adjacent-channel rejection with a bandwidth of approximately 2.7 kc/s at 6db down. The bandpass filter is a great improvement over the normal filter circuit installed by the manufacturers, so much so that G3AUB can now receive either of two s.s.b. stations using the same reference carrier frequency (but opposite sidebands) without mutual interference. Incidentally crystal filters for reception purposes have become a popular topic and a good deal of time and experiment is being devoted to the production of circuits. G3HJK (Manchester), although not yet operational, has installed an a.f. sideband receiver adaptor as a first step.

G2MF (Sheffield) uses a multi-phase exciter on 3.5 and 14 Mc/s, running 10 watts peak. On 14 Mc/s he has worked ZL2BE and maintains a daily schedule with ZD4BF on about 14120 kc/s. The v.f.o. in use by G2MF is somewhat unusual in that a.g.c. is incorporated to maintain constant output over the operating range. A.G.C. bias is obtained by amplifying a small portion of the output, rectifying it, and feeding the resulting negative voltage back to the grid of the oscillator valve. The oscillator is designed around an earthed anode Colpitts circuit. On the receiving side, a "signal slicer" has been installed to provide selectable sideband facilities.

By H. F. KNOTT (G3CU)*

put of 60 watts (about 150 watts peak). The aerial was a long wire.

S.s.b. activity on Top Band is increasing in the London area. With G8RC (Brentwood) active for more than two years and G3CU making an occasional appearance, other stations have been encouraged to try the system. G3GBN and G3FD (Southgate) and G8SK (Enfield) all have filter type drivers using bandpass crystal filter arrangements in the region of 450 kc/s. These stations may be heard most evenings on or about 1900 kc/s.

* 5 Kevington Drive, St. Paul's Cray, Orpington, Kent.

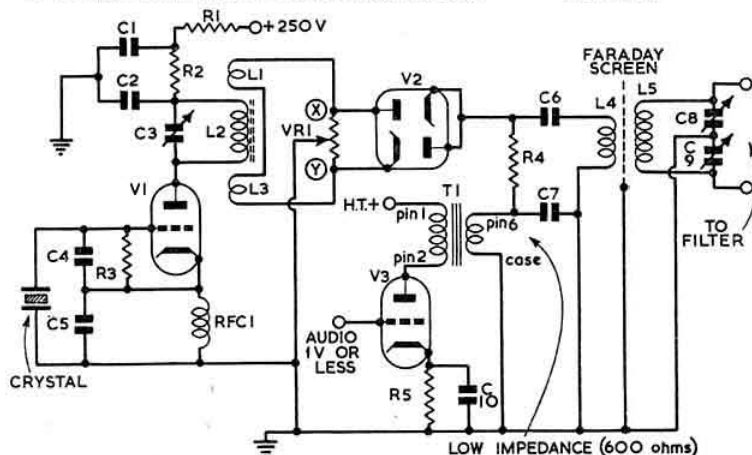


Fig. 1.—G3ESV's diode modulator suitable for filter type exciters. C1, 32 μ F; C2, 6, 0.1 μ F; C3, 150 μ F; C4, 45 μ F; C5, 330 μ F; C7, 0.001 μ F; C8, 9, 120 μ F (100 μ F + 20 μ F variable); C10, 25 μ F; L1, 3, 50 turns, 28 s.w.g., d.s.c. (scramble wound, see text and Fig 2); L2, 5, single pie from Wearite type 552 i.f. transformer; L4, 50 turns (scramble wound); R1, 22,000 ohms; R2, 5,000 ohms; R3, 250,000 ohms; R4, 5, 1,000 ohms; T1, output transformer (anode to 600 ohm line type, ex-BC453B); V1, 3, 6J5 or 6C4; V2, 6AL5; VR1, 1,000 ohms.

With some regret we learn that John Hills (G2AW) has left for India on business. A keen experimenter and ardent s.s.b. operator, John will be missed from the 3.5 Mc/s nets. We hope he will be successful in obtaining a VU2 call.

Single Sideband Contest?

With the increase in the number of stations using single sideband, it was to be expected that the inevitable question of contests, field days and tests would arise. The idea of such an event appears to have originated from DL4IE who suggests that a "conference" of s.s.b. enthusiasts may prove a better method of getting s.s.b. stations together. Perhaps one of the international contests could be arranged

to have a special single sideband section. On the other hand, possibly a special event might be organised. Suggestions on these lines will be welcome. If sufficient interest is shown, the Society's Contests Committee would no doubt be prepared to organise a suitable event.

Diode Modulator

As an alternative to the usual twin triode balanced modulator, a pair of diodes may be conveniently used. Fig. 1 shows a complete modulator circuit with a final a.f. stage and crystal oscillator. For simplicity germanium diodes—which were used originally—cannot be bettered, but thermal drift (which has the effect of spoiling balance) is an almost insuperable problem unless the diodes are run at a very low output. Unfortunately low output adversely affects linearity because a greater proportion of r.f. signal is required in relation to the a.f. modulating signal. The miniature 6AL5, however, does not suffer from these snags and still allows use of what is perhaps the simplest of all balanced modulator circuits.

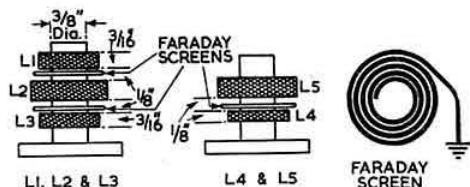


Fig. 2.—Arrangement of the coils and details of the Faraday screens.

The diagrams are self explanatory but the construction of the coils, shown in Fig 2, calls for some comment. L1 and L3, wound symmetrically on either side of L2, consist of 50 turns each of 28 s.w.g. double silk covered wire. This arrangement provides about 2 volts r.m.s from either side of

VR1 to earth. A 30 μ F trimmer may be needed between either point X or point Y to earth for perfect balance. Although a Faraday screen is not shown between L2 and L1/3 in the circuit diagram it is worth installing. The screen should consist of a flat spiral of 22 s.w.g. cotton covered wire glued to the outside faces of L1 and L3, as shown in Fig. 2. The formers for the coils can be either Aladdin or Neosid $\frac{1}{8}$ in. diameter types with the dust-iron cores set midway down the formers. Tuning is carried out by a 150 μ F compression trimmer.

L2, one pie of a Wearite type 552 i.f. transformer or similar i.f. coil, may be conveniently removed from its original former by applying moderate heat to the retaining wax. L5 is the remaining i.f. coil, condenser and metal can with a suitable additional coil (L4, 50 turns) scramble wound adjacent to it. Here again a Faraday screen should be fitted between the two coils. It is surprising how much better balance becomes, with a consequent improvement in carrier suppression, when a Faraday screen is used between primary and secondary. With the 552 type coil it may be found that the condensers across L5 are insufficient to tune to the required frequency. If this is so, a fixed capacitor may be connected across the coil. A minimum amount of capacity should be used, however (not more than 200 μ F overall), otherwise the response characteristic of the filter may be adversely affected.

It is essential that the smoothing of the h.t. supply to the crystal oscillator stage should be good. Hum can be very serious if h.t. is insufficiently smoothed and carrier balance good. The audio output transformer T1 may be any anode-to-600 ohm line type. A suitable surplus item is the output transformer from the BC453B receiver.

* * *

The writer will be pleased to receive details of TR switch arrangements suitable for voice controlled operation.

Top Band Transistor Transmitter

TONY COCKLE (G3IEE), whose transistor transmitter was described in the March issue of the BULLETIN, reports that the Mullard OC51 has been found to give greater output than the OC50 and is a more reliable oscillator. No component values need alteration when the OC51 is substituted for the OC50 in the circuit published.

Reports of RST339 have been received on the transmissions at a distance of 30 miles and contacts are now being made regularly without prior arrangement. The transmitter operates on 1875 kc/s.

Bob Ford, AC3SS and AC4RF

THE many friends of Bob Ford will be interested to learn that a missionary, recently released by the Communists, met him in a prison camp outside Chungking. According to the London Evening News Mr. Ford is accused of having taken part in the poisoning of a high Tibetan lama after being the radio operator to the Tibetan Government.

Amateur Station at Bloemfontein Agricultural Show

THE Bloemfontein Branch of the South African Radio League will be operating an Amateur Radio station on phone and c.w. in the 3.5, 7, 14 and 21 Mc/s bands under the call-sign ZS4CAS from the Central Agricultural Show, Bloemfontein, during the period May 4 to 8, 1954.

R.S.G.B. BULLETIN, April, 1954.

Third Annual "OZ-CCA" Contest

THE third "OZ Cross Country" Contest, organised by the Danish Society E.D.R., will commence at 2100 G.M.T. on Saturday, May 1, 1954, and end at 2100 G.M.T. on Sunday, May 2, 1954. From 0001 G.M.T. to 0700 G.M.T. on May 2, Danish stations will not work Europeans for contest points.

Telegraphy and telephony contacts with Danish stations on all bands from 3.5 to 28 Mc/s will score one point each and contacts on 144 Mc/s two points each. An entrant's final score will be the total points scored multiplied by the number of OZ districts worked. Contestants must exchange a code group consisting of the RST (or RSM) report followed by a three-figure serial number starting at 001 for the first contact. Entries, addressed to the Traffic Department, E.D.R., Post Office Box 335, Aalborg, Denmark, must be post-marked not later than June 1, 1954.

"Television Interference"

MR. PHILIP S. RAND (WIDBM), of the Remington-Rand Laboratory of Advanced Research, has generously donated to the Society 500 copies of the Third Edition of his book *Television Interference* for distribution to members. Orders, which must be accompanied by a remittance for 1/6 to cover import charges, postage and incidental expenses, will be dealt with in strict rotation.



Radio Amateur Emergency Network

AN excellent example of the way in which R.A.E.N. can be introduced to local organisations was provided by the meeting held in the **Hornsea Primary School** on February 28 and organised by Lt.-Col. Arthur Dunn (G2ACD). Among those present were the Chairman and Clerk to Hornsea Council, the Medical Officer of Health, the Divisional President of the British Red Cross, the County Organiser of the W.V.S., Councillor Chipperfield (East Riding C.C.), Det. Inspector Bennett (representing the Chief Constable, East Riding County Police), and the Chief Welfare Officer, East Riding C.C. Sixteen members of the R.A.E.N. were present at the meeting.

Earlier in February the **Hornsea** group were alerted by the police who had received a "red" flood warning. It says much for the way this group is organised that within a few minutes all stations were operational.

The **Hull** group were also warned and watch was maintained until the "all clear" was given. From experience gained during this alert, 2m was found to be the most satisfactory band for use in the area. The **Scarborough Amateur Radio Club** has decided to support the **Hornsea** group and has voted a sum of money to be spent on improving equipment.

Another group interested in the possibilities of 2m operation is **Wirral**. Some members, however, consider that 10m has similar possibilities with less complex gear and tests are to be made on both bands. G2AMV has demonstrated his transportable station, powered by either emergency or mains supplies, and is now building a 3.5

and 28 Mc/s p.a. for mains operation in the high power control station. Efforts are being made to interest amateurs in the **Liverpool** area and it is hoped that a group will be formed in that city soon.

G3FZW (E.C.O., **Lichfield**) visited Tamworth recently and is giving a talk on R.A.E.N. at Stourbridge on May 4. G3JGM has had an article on R.A.E.N. published in the *Birmingham Post*. The **Tops C.W. Club** has given the Network some useful publicity in its magazine *QMF*. G3ELZ (E.C.O., **Grimsby**) who hopes to do more good work at the Wolverhampton "Topsfest" this month, maintains contact with G3DQ of Flamborough Head using his R.A.E.N. portable station. He finds a large-scale map showing the positions of stations in the group very useful.

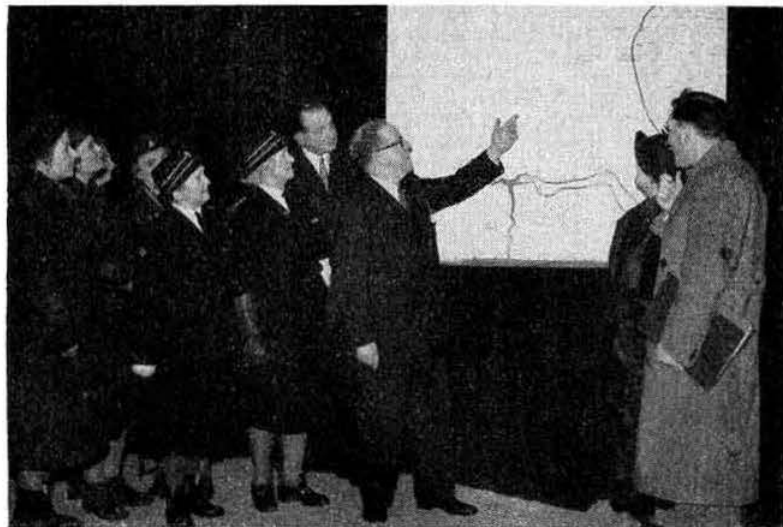
The **Holt** (Norfolk) group holds practice nets on 3.5 Mc/s each week. The E.C.O. (G3HRK) suggests that 3650 kc/s should be made an official distress calling frequency. R.A.E.N. members in **Weston-super-Mare** hold exercises on 3530 kc/s at 2000 on the second Tuesday in each month and find that operating procedure needs careful practice. A liaison committee has been appointed to contact other organisations. G3BTU is the E.C.O. for **Retford**. Present plans are to have a main control station (semi-mobile) on 3.5 and 28 Mc/s with a petrol-electric generator and at least one fully mobile (car) outstation with as many 28 Mc/s walkie-talkie stations as possible. The mobile station would act as a local control in the disaster area for the walkie-talkies, working back to main control as a relay station.

Associate Member D. S. Froome (39 Manor Way, **Egham**) is trying to awaken interest in his area. G3GBF is forming a group in the **South Tyne** area and asks all interested to contact him at "Overacres," St. John's Avenue, **Hebburn-on-Tyne** (Telephone 32510). G6UC reports that **Berwick-on-Tweed** is making good progress; efforts are at present concentrated on the production of portable equipment for 3.5 and 28 Mc/s. The **South Wigston** (Leicester) group, under G3GXZ, are building 2m equipment but

they also intend to carry out 10m tests shortly. At **Barrow-in-Furness**, G3HQU is due to talk about R.A.E.N. to the local club. **Chelmsford** group is to carry out tests on 2m shortly, following the very useful I.F. tests with G8TL/P whose equipment is scheduled for description in an early issue of the **BULLETIN**.

From **Scotland** GM3HLQ reports on some interesting tests with an Army 22 set. Operating from a site 1,000 ft. a.s.l. near Paisley, stations were worked from the North of Scotland down through the country to Northern Ireland.

More good news comes from Northern Ireland, where groups are being formed in the **Bushmills** and **Ballymena** areas.



At a meeting held in Hornsea, East Yorks. on February 28, Lt.-Col. Arthur Dunn (G2ACD), explained to civic leaders how the R.A.E.N. will function in the event of an emergency. In this picture Lt.-Col. Dunn is shown with representatives of the W.V.S., B.R.C. and other local organisations. Network members attended from long distances.

Both groups are being helped by GI3BHX, E.C.O. for Armoy. As a result of conversations between GI2DZG and EI3L (Hon. Secretary, I.R.T.S.), Belfast group has promised co-operation when an emergency service is set up in Eire. It is understood that the Irish Post Office favours the proposal to set up such a network under the auspices of the Irish Radio Transmitters' Society.

Volunteers Still Required

Volunteers of all grades are required from various parts of the country, particularly from Scotland, London, Manchester, the South Coast and West Country. Registration forms may be obtained from the Hon. Secretary (G3ABB, 40 Fourth Avenue, Chelmsford, Essex), from E.C.O.s or direct from R.S.G.B. Headquarters.



The new and very attractive R.A.E.N. bar brooch, now available from Headquarters.

Practice Nets and Reports

It is known that regular practice nets are held in many parts of the country but details of times and frequencies are not known to the Hon. Secretary to whom E.C.O.s are invited to send details. E.C.O.s are also urged to send regular activity reports direct to G3ABB to arrive not later than the 15th of the month. Reports should be submitted—typed, if possible—separately from other correspondence in order to facilitate the preparation of this column.

Hon. Secretary on Holiday

G3ABB will be on holiday from April 16 to 24 and will not therefore be able to reply to correspondence during that period.

New E.C.O.s

The following have been appointed E.C.O.s:

- F. J. Wadman (G2GK), 106 Warbro Road, Babbacombe, Torquay.
- W. D. Heath (G3ABS), 4 Dalton Terrace, Derby Dale, Huddersfield.
- D. G. Thompson (G3AHS), 14 Gable Road, Mirehouse, Whitehaven, Cumberland.
- K. T. Whithorn (G3BDS), 34 Tybridge Street, Worcester.
- R. E. Sperry (G3BJC), 133 Birmingham Road, Allesley, Coventry.
- J. E. Swayne (G3BLE), 12 Oxford Hill, Witney, Oxon.
- M. White (G3BTU), 39 Trent Street, Retford, Notts.
- L. N. Goldsbrough (G3ERB), 54 Kings Road, Bebington, Cheshire.
- S. Oake (G3GBF), "Overacres," St. John's Avenue, Hebburn-on-Tyne.
- E. B. Grist (G3GJX), (Flat) 102 Cowley Road, Oxford.
- F. H. Dewick (G3HIU), 47 Gloucester Road, Wolverton, Bucks.
- M. D. Holmes (G3JMC), 53 Clare Road, Tankerton, Kent.
- S. T. Crowther (G3JMF), 91 Passage Road, Westbury-on-Trym, Bristol.
- W. C. Holley (G5TN), Waverley, Worlbury Hill, Weston-super-Mare.
- T. Kennedy (G6UC), 22/24 Main Street, Spittal, Berwick-on-Tweed.
- B. Gale (G3EBK), "Myberne," Jerbourg, St. Martins, Guernsey, C.I.

- W. E. Caghey (GI2DZG), 35 Gilnahirk Park, Cherryvalley, Belfast.
- O. M. Derrick (GM3OM), 261 Main Street, Larbert, Stirlingshire.
- Capt. C. R. Mountjoy, M.M. (GW3ASW), "Pant Villa," Cwmbach, Aberdare, Glam.
- V. C. Morgan (GW3FRK), "Hafan," Comins Coch, Aberystwyth, Cards.
- R. R. Morrison (GM5ST), c/o Royal Infirmary, 84 Castle Street, Glasgow, C.4.

Acting E.C.O.

The following is acting as an E.C.O. until his appointment has been confirmed by the R.A.E.N. Committee:

- G. J. Fowle, c/o 15 Stone Road, Wyke Regis, Weymouth, Dorset.

Resignations

The following E.C.O.s have resigned:—

- W. J. Ridley (G2AJF), Gablehays Lodge, Springfield, Chelmsford. (Mr. Ridley is now Chairman of the R.A.E.N. Committee).
- E. H. Trowell (G2HKU), 4a Clyde Avenue, Sheerness, Kent.
- W. F. Fitzgerald (G3DCA), 23 Pembroke Grove, Manchester 13.

Dutch Amateur Emergency Network

FROM PA0XE comes news that the Netherlands licence issuing authority has sanctioned the use, by Dutch amateurs, of one frequency, namely, 1845 kc/s, for emergency tests and drills.

Mystery

THE following advertisement appeared recently in the Personal column of a national daily:—"Amateur Radio—will anyone who heard transmissions calling Middlesex-Edinburgh starting at 4.20 a.m. between 3rd-17th February, please write. . . ."

"Pop" Edge

Mr. H. Edge, G6GD, known to hundreds of members during the war as "Pop," has recently moved from Altrincham, Cheshire, to Cor-y-Llwyn, Glyn Cerriog, Wrexham, where he will operate as GW6GD.

Emergency Network Badges and Car Plaques



LAPEL

**Chromium-Plated
on a Deep Red
Background.
Attractive and
Distinctive.**



CALLSIGN

	Prices:
LAPEL - -	1/6 (By Post 1/9)
BROOCH - -	1/6 (By Post 1/9)
CALLSIGN - -	5/- (By Post 5/3)
CAR PLAQUE - -	5/- (By Post 5/6)

R.S.G.B. HEADQUARTERS,
NEW RUSKIN HOUSE, LITTLE RUSSELL ST.,
LONDON, W.C.1.

The Social Side

Thanet Radio Society Annual Dinner

THE President of the R.S.G.B. and Mrs. Milne, the General Secretary and Mrs. Clarricoats, Council Member R. H. Hammans, G2IG and Mrs. Hammans, together with the V.H.F. Editor, W. H. Allen, G2UJ, were among the many visitors who attended the Annual Dinner of the Thanet Radio Society held at the San Clu Hotel, Ramsgate, Kent, on Saturday, March 6, 1954.

The President of the Society (Mr. G. A. Chapman, G2IC) who presided, had the support of Mr. W. E. Nutton, G6NU, President of the Medway Amateur Receiving and Transmitting Society, and Mr. L. King, G4IB, C.R. for Kent.



During the Thanet Radio Society Dinner Mrs. Chapman, wife of the President, presented a specially made cake to "Early-Bird" Ernie Dolman, G2DCG, of Margate, in appreciation of his culinary activities during the 1953 N.F.D. event. The miniature frying pan contained tiny rashers of bacon and mushrooms. The cake was made by Mr. and Mrs. Dean of Ash, near Canterbury.

A feature of the function was a novel competition in which those present were invited to submit a model or drawing illustrating the theme "The Frustrated Ham" (or XYL). First prize, by popular vote, was awarded to Mr. G. Partidge (G3CED) for his cleverly designed animated drawing showing what might happen to a neighbour's television picture when the key is pressed next door! Second prize went to G4IB for his model of roof tops festooned with television aerials through which a frustrated ham was obliged to descend by parachute!

There was an attendance of seventy at this happy occasion, the organisation of which was in the capable hands of the Chairman of the Society, Mr. Norman Cramp, B.R.S.16756 of Ramsgate and a small Committee.

City and Guilds Radio Society

IT was announced at the Annual Dinner of the Society held at the College on March 8, 1954, that Mr. Harry Faulkner, C.M.G., M.I.E.E.—Director of the Telecommunication Engineering and Manufacturing Association and until his recent retirement Deputy Engineer-in-Chief of the Post Office—had accepted an invitation to become President of the Society for the forthcoming academic year. Prior to the Dinner the President (Mr. Paul Adorian, M.I.E.E., M.Brit.I.R.E.) addressed the Society on the History and Development of Broadcasting.

Among the guests present at the Dinner were

Mr. C. E. Emery, Managing Director, E.M.I. Sales and Service Ltd.; Mr. John Clarricoats, General Secretary, R.S.G.B.; Mr. T. E. Goldup, Director of Mullard Ltd.; Dr. Willis Jackson, Director of Education and Research, Metropolitan Vickers; Mr. J. A. Smale, Chief Engineer, Cable and Wireless Ltd.; Mr. C. E. Strong, Chief Radio Engineer, Standard Telephones & Cables Ltd., and Dr. R. L. Smith-Rose, Director of Radio Research, D.S.I.R.

The Student Chairman for the current academic year is Mr. R. N. Grubb, G3FNL, whose experiments in connection with Amateur Television are well known to R.S.G.B. Members. During the dinner Mr. Grubb and Mr. Paul Sollom, G3BGL, received premiums which had been awarded to them for outstanding contributions to a recent Exhibition organised by the City and Guilds Radio Society. Mr. Sollom exhibited the three dimensional aerial models which were a feature at the R.S.G.B. Amateur Radio Exhibition last November.

The Honorary Secretary is Mr. D. L. Saunders. Mr. D. P. Robinson is responsible for arranging visits.

Sutton and Cheam Radio Society Annual Dinner

THE President of R.S.G.B. (Arthur O. Milne, G2MI), the Immediate Past President (Leslie Cooper, G5LC), Past President and Honorary Member Frederick Charman, B.E.M. (G6CJ), Council Member Frank Hicks-Arnold (G6MB), London R.R. Fred Lambeth (G2AIW), and the General Secretary (John Clarricoats, G6CL), were among the many well known personalities present at the Sixth Annual Dinner and Ladies Festival of the Sutton and Cheam Radio Society held at Wilson's Restaurant, Sutton, Surrey, on Saturday, March 13, 1954.

The Chair was taken by the President of the Society (Stanley Vanstone, G2AYC), who had the support of Wing Commander W. E. Dunn, O.B.E. (G2LR) and Leslie Seaton (G3HSH), Vice Presidents; Reg Pearson (G4DH), Chairman; Mick Mitchell (G8DF), Vice Chairman; F. J. Harris (G2BOF), Hon. Secretary; A. W. Munden (G3BHR), Hon. Treasurer; and Roy Scott (G2CZH), Sutton and Cheam T.R.

To mark the occasion each lady received a set of combs made by the London Association for the Blind. Table prizes were boxes of chocolates.

Toast List

A toast to the visitors was proposed by Mr. Vanstone to which Mr. Cooper, in his capacity as President of the Thames Valley Society, replied. Mr. Clarricoats proposed a toast to the Sutton and Cheam Society and Mr. Dunn replied. Mr. Lankshear, B.Sc. (B.R.S. 19701), welcomed the Ladies and Mrs. Lucy Milne replied.

During the evening the Cullen Cup was awarded to the Thames Valley Society (Reg. Pearson making the presentation) for their success in the Cullen Cup Inter-Society Contest—and the "QRP 200 Cup" to Jack Harris, G2BOF (John Whitehead, Hon. Secretary QRP Society making the presentation) for his success in a QRP Society contest.

From the hands of Mrs. Vanstone, Ron Harvey (G2FSA) and Mick Mitchell (G8DF) received prizes which they had won in a constructional competition.

First class entertainment was provided by the Cliff Bridges Trio and by the "Duke of Ashted" (otherwise G4DH) who received able support from the Sutton and Cheam Songsters in a topical number which brought the house down. Valuable prizes were drawn for in a raffle which received excellent support from an attendance of nearly 100 members and their ladies.

Sutton and Cheam, like Thames Valley, can always be relied upon to put on a really first-class Ladies Evening, for which full credit must be given to Stan Vanstone and Les Seaton as leaders of a grand team.

London Members' Luncheon Club

DR. T. E. HUNT, VESTM, Regina, Canada, Mr. D. D. Grieve, VQ4BY and Mrs. Grieve (Nyeri, Kenya) and Mr. Jon Adama, PA0FB, Den Haag, Holland, were cordially welcomed by the Chairman (Stanley Vanstone, G2AYC) at the meeting of the London Members' Luncheon Club held on Friday, March 19, 1954. Also present were Fred Hamer, GW8BW and Mrs. Hamer, attending their last Amateur Radio function in England prior to leaving for Canada.



High jinks at the Sutton and Cheam Radio Society Dinner.

At a brief Annual General Meeting held after the Luncheon Mr. Vanstone was re-elected Chairman (for the fourth time). Mr. Clem Jardine and Miss May Gadsden were also re-elected Hon. Treasurer and Hon. Secretary respectively.

The club will meet again on April 23 and May 21. Reservations should be telephoned to Miss Gadsden (HOL 7373) at least one day before the luncheon.

Visitors to London are assured of a warm welcome.

Continental Holiday

MEMBERS with their ladies and friends who would like to spend a fortnight abroad this summer are invited to join a party which is to leave England on July 24th.

Arrangements for the trip are in the capable hands of Messrs. E. R. Martin, G6MN, and R. E. G. Copp, G2DUV.

Interested members are urged to write without delay to Mr. Martin at Castlemount, Worksop, Notts. Early reservations are necessary in order to secure the most advantageous party-travel and hotel rates.

Dr. Gee to Join Scientific Expedition

MEMBERS will be interested to hear that Council Member Arthur C. Gee (G2UK) has been asked by Dr. R. d'E. Atkinson, of the Royal Observatory, Greenwich, to join the party of British astronomers who will be going to observe the total eclipse of the Sun in the Baltic on June 30 of this year.

Dr. Gee was invited to join the expedition primarily because of his radio activities. Very accurate time checks are necessary for the project and these are to be provided by radio from Rugby.

The team will be away from England for about a month from early in June until July as considerable time will be taken in setting up the equipment. The location will probably be on the island of Oland off the east coast of Sweden. No transmitting equipment for amateur band use is proposed, although Dr. Gee hopes to locate an SM1 amateur from whose station he will be able to keep in touch with the U.K. As he says: "It is very nice to find that the services of an amateur radio operator are being used once again on a scientific expedition."

Holiday Exchange

UNIVERSITY student Enrico Croce (11BJG), Parco Margherita 28/6, Naples, age 25, wishes to contact an English radio amateur, preferably also a student, who would like to spend a holiday in Naples and who would then offer similar facilities in London.

Microplankton for V.H.F. ?

You will be more likely to get very short shrift than very short waves, but before experimenting with this new technique you will be well advised to study them with the aid of the electron-microscope at Bristol during **Convention on September 17, 18 and 19.**

Bristol in September . . .

National Convention

"A NATIONAL CONVENTION is to be held . . ."

Seven prosaic words which appear at infrequent intervals in these pages to herald another of those time-honoured functions which tradition has cast into a happy mould of specialised junketing for radio amateurs.

This year the scene for Convention is set for the first time in the West Country. Almost before the last leaves of Autumn, 1953, were swept away, plans were being laid in preparation for the event which will take place when the young green shoots just appearing will have in turn lived their span and begun to change to Autumn gold. And with 1954 little more than three months old, those plans have already been developed and expanded to embrace the 101 problems which have to be met and overcome in the behind-the-scenes arrangements which are essential if such an event is to run smoothly and without apparent effort.

The West Country is very conscious of the honour implied in the request that it should be host to this most important event in the R.S.G.B. calendar—and the West Country is determined that its reputation for a warm-hearted welcome will be upheld to the limit on this occasion.

The post-war history of the Society has been marked by the considerable amount of very necessary domestic business which has intermingled with its main activities. It can, at last, safely be said that this phase is now past and the membership can once more—as in the days of old—get down to the "serious" business of enjoying one of the finest of all leisure pastimes. And at Bristol in September the accent will be on the more pleasant aspects of Amateur Radio, with business kept to an absolute minimum.

Every effort is being made to cater for the multitude of tastes that are bound to be repre-

sented at such a gathering, from the highly technical—such as the latest developments and demonstrations in electro-encephalography, the electron-microscope, stereoscopic sound reproduction and television techniques—to the visits to local industries, including the huge plant of the Bristol Aeroplane Company (home of the "Britannia" aircraft and the now defunct "Brabazon"), the enormous acreage of the W. D. and H. O. Wills' tobacco company and the West Region studios and transmitting stations of the B.B.C. and the G.P.O.

The ladies are not being forgotten in the arrangements, and trips through the scenic grandeur and history-soaked places of interest that abound in the locality will be included in the programme.

Running parallel with these items, and carefully timed to allow each visitor to participate in his own chosen diversion, will be the social get-togethers which have always been the mark of successful Conventions, the highlight of which will be a Convention Dinner to be held in Bristol's renowned Victoria Rooms.

Nor must mention be forgotten of the Amateur Radio Exhibition, with its "sideshows" of specially equipped sound cinema and working amateur TV, to be staged in the truly magnificent setting of the Royal West of England Academy.

This is a brief outline of the fare that will be offered for the enjoyment of every R.S.G.B. member on September 17, 18 and 19. In succeeding issues, as the intricate arrangements become more closely knit together, the programme will be dealt with in finer detail, until the time arrives when firm bookings must be asked for.

Remember then, when the leaves are "on the turn" and Convention time is with us once more, that the schedule is with Bristol . . . in September . . .

The Aries Radio Research Voyage

THE *M.Y. Aries*, callsign GRVM (formerly the Padstow, Cornwall, lifeboat) with a crew of four is due to leave Kingston-on-Thames on May 22, 1954, on a voyage to Kingston, N.Y., U.S.A., during which a series of tests of low powered m.f., h.f. and v.h.f. equipment, including the Pye 619 and PTC117 sets (which are intended for use by the Royal Navy), will be conducted under restricted and somewhat primitive conditions.

Transmissions from the vessel will be limited to brief test signals at irregular intervals throughout the twenty-four hours. Naval wireless stations will be called at various times and they will reply by giving brief reception reports. Telegraphy will be employed principally but R.N.V.(W.)R. Headquarters in London (call-sign "Chrysanthemum") will be called regularly on telephony at 1130 and 1730 G.M.T. each day using the call-sign "Aries R for Roger." At 1930 G.M.T. daily, the yacht will call "Steadfast," the R.N.V.R. Sea Cadet station at Kingston-on-Thames. "Steadfast" will also be used as the general call for all R.N.V.(W.)R. stations.

The frequencies to be used are as follows: *Telegraphy and Telephony (1100 to 2100 G.M.T.):* 2325, 2695, 3660, 3670, 4455, 4880, 5320 and 8160 kc/s. *Telegraphy only (24 hours a day):* 4178,

6267 and 8356 kc/s; (0600-2200) 12534 kc/s.

Contact with weather ships and aircraft will be made on 118.1 and 121.5 Mc/s.

The yacht is scheduled to reach New York on June 12 and to leave again on June 26. During the return voyage, which is expected to last until July 17, further tests will be carried out.

The radio officer on the voyage will be Sub-Lieut. E. Skelton (C.M.G.), R.N.V.R. (G3JOQ). Much of the watchkeeping at "Steadfast" will be undertaken by members of the Kingston and District Amateur Radio Society.

Reports on transmissions from the yacht will be appreciated and should be addressed to Sub-Lieut. Skelton at "Steadfast" S.C. H.Q., Thames Side, Kingston-on-Thames.

Sound Recording Exhibition

THE Sixth Private Exhibition of sound recording, reproducing and audio frequency equipment, organised by the British Sound Recording Association, will be held at the Waldorf Hotel, Aldwych, London, W.C.2, on May 22 and 23, 1954. Admission will be by catalogue, price 1/6 at the door, or by post (after May 8), price 1/8 post paid, from the Hon. Secretary, B.S.R.A., R. W. Lowden, "Wayford," Napoleon Avenue, Farnborough, Hants.

Contest Rules and Results

A New Event—420 Mc/s Contest

ON a number of occasions during the past two years the Contests Committee has considered the possibility of organising a contest on 420 Mc/s, in addition to the annual Tests. As a result of requests recently received from members of the Society, an experimental contest has now been arranged.

Rules

1. The Contest is open to fully paid-up members of the R.S.G.B. resident in Europe.
2. Contacts may be made on telephony, c.w. or m.c.w.
3. Entrants must operate in accordance with the terms of their transmitting licences.
4. The station must be operated from the same site for the duration of the event. The National Grid Full Six-figure Reference must be given in all entries from G, GD, GM and GW. In all other cases, entries must show the latitude and longitude of the station location.
5. Only one contact with a specific station will count for points.
6. Contacts with unlicensed stations will not be permitted to count for points. Proof of contact may be required.
7. Entries should be written on lined foolscap or quarto paper, or typed on plain paper, and must be set out in the form shown below:

420 Mc/s CONTEST,
May 22-23, 1954

Name..... Call Sign.....
Home Address..... Claimed Score.....
Site of Station (if different from above).....
National Grid Full Six-figure Reference (or latitude and longitude—see Rule 4).....
Transmitter.....
Receiver.....
Aerial System(s).....

Time G.M.T.	Call sign of station worked	My report on his signals	His report on my signals	Location	Estimated distance (miles)	Leave blank
1905	G6XYZ	559	469	Oxford	50	
1912	G8AAA	579	579	Bedford	45	
1922	G6ZYX	58f	57f	Edware	10	
Claimed score.....						

Declaration: I declare that my station was operated strictly in accordance with the rules and spirit of the contest, and I agree that the ruling of the Council of the R.S.G.B. will be final in all cases of dispute.

Signed.....

8. The event will start at 1900 G.M.T. on Saturday, May 22, and finish at 1900 G.M.T. on Sunday, May 23, 1954.
9. An exchange of RST or RS reports as well as location will be required before points for the contact may be claimed.
10. For each contact, points may be claimed equal to the number of miles between the two stations.
11. Entries should be addressed to the Hon. Secretary, R.S.G.B. Contests Committee, New Ruskin House, Little Russell Street, London, W.C.1, and must bear a postmark not later than Monday, May 31, 1954.

Two Metre Open Contest, 1954

RULES for this Contest remain the same as last year, with the exception that Rule 1 has been amended to permit entry by all R.S.G.B. members in Europe.

Rules

1. The Contest is open to fully paid-up members of the R.S.G.B. resident in Europe.
2. Only the entrant will be permitted to operate his station during the event.
3. Contacts may be made on telephony, c.w. or m.c.w.

R.S.G.B. BULLETIN, April, 1954.

4. An entrant must operate in accordance with the terms of his licence.

5. The station must be operated from the same site for the duration of the event. The National Grid Full Six-figure Reference must be given in all entries from G, GD, GM and GW. In all other cases, entries must show the latitude and longitude of the station location.

6. Only one contact with a specific station will count for points.

7. Contacts with unlicensed stations will not be permitted to count for points. Proof of contact may be required.

8. Entries should be written on lined foolscap or quarto paper, or typed on plain paper, and must be set out in the form shown below:

TWO METRE OPEN CONTEST,
July 3-4, 1954

Name..... Call Sign.....
Home Address..... Claimed Score.....
Site of Station (if different from above).....
National Grid Full Six-figure Reference (or latitude and longitude—see Rule 5 above).....
Transmitter..... Aerial system.....
Receiver.....

Time G.M.T.	Call sign of station worked	My report on his signals	His report on my signals	Location	Estimated distance (miles)	Leave blank
1705	G3—	579	569	Oxford	40	
1710	G2—	559	459	Bedford	55	
1718	E12—	569	549	Dublin	200	
Claimed score.....						

Declaration: I declare that my station was operated strictly in accordance with the rules and spirit of the contest, and I agree that the ruling of the Council of the R.S.G.B. shall be final in all cases of dispute.

Signed.....

9. The event will start at 1700 G.M.T. on Saturday, July 3, and finish at 1900 G.M.T. on Sunday, July 4, 1954.

10. An exchange of RST or RS reports as well as location will be required before points for the contact may be claimed.

11. For each contact, points may be claimed equal to the number of miles between the two stations.

12. Entries should be addressed to the Hon. Secretary, R.S.G.B. Contests Committee, New Ruskin House, Little Russell Street, London, W.C.1, England, and must bear a postmark not later than Monday, July 11, 1954.

13. The Mitchell-Milling Trophy will be awarded to the winning entrant. A Certificate of Merit will be awarded to the entrant placed second.

R.S.G.B. Direction Finding Field Days, 1954

DETAILS of the first two Qualifying Events in the 1954 series are as follows:—

Sunday, May 2:

Organiser: T. A. Griffin, 11 Attleboro Lane, Water Orton, Nr. Birmingham. (Telephone: Castle Bromwich 2996.)

Call Sign: G3JBN/P.

Frequency: 1899.5 kc/s.

Assembly Point: Road junction, leading to Orgreave Hall (King's Bromley to Alrewas Road), N.G.R. 43/147158.

Map: Ordnance Survey, New Popular Edition, Sheet 120.

Assembly Time: 1330 B.S.T.

Intending competitors should notify the Organiser by Monday, April 26, stating the number in their party requiring tea, which will be at Tranters Cafe, Main Street, Alrewas, at 5.15 p.m.

* * *

Sunday, May 23:

Organiser: N. Potter (G3GNC), 47 Derby Road, Fallowfield, Manchester, 14.

Call Sign: G3FVA/P.

Frequency: 1820 kc/s.

Assembly Point: Ladybarn House Boys Club, Mauldeth Road, Manchester, 14. N.G.R. 33/855933.

Map: Ordnance Survey, New Popular Edition, Sheet 101.

Assembly Time: 1315 B.S.T.

Intending competitors should notify the Organiser by Monday, May 17, stating the number in their party requiring tea.

These qualifying events will be run in accordance with the Rules published on page 328 of the January, 1954, issue of the BULLETIN.

Affiliated Societies Contest, 1954

REPETING their success of last year, the Stourbridge and District Radio Society are again winners of the Edgware "Ace-of-Clubs" Trophy.

The alteration in the rules this year, requiring prior notice of intention to participate in the contest, effectively stopped the gap which caused such a leak in some of the claimed scores last year. It is worthy of mention that, generally speaking, more points were lost this year by the c.w. than the 'phone stations. Who said that c.w. was a more suitable *lingua franca* through QRM than 'phone?

The Committee have been fairly generous in judging this contest, which has produced the usual crop of careless errors that unfortunately seem to mar contests in which a group, rather than an individual, entry is made. Errors included failure to record contacts at all, failure to claim the full number of points for inter-society contacts (in spite of the printed list of participating stations), and unsigned contacts. Although in themselves insufficient to make much difference in placings based on claimed scores, only four of the twenty-seven entries submitted remained unaltered when checking had been completed. All these little "carelessnesses" are a great hindrance when judging—the judges can only resolve that which is put before them; even so,

quite often they had to use deduction quite worthy of recognition by the C.I.D.!

Conditions generally throughout the period of the contest were poor. The only comments received with the logs other than on conditions were two rather emphatic declarations from societies that they would not compete in a 'phone contest on Top Band again!

G3DJJ and G3IRM are thanked for their check logs.

First Top Band Contest, 1954

A GAIN the number of logs received for a Top Band Contest has fallen, despite better conditions and higher activity than in the November, 1953, contest. The Contests Committee feels that the short period allowed for submission of entries after the contest may account in some measure for this drop, but an additional week for entries would in many instances result in a delay of an extra month before results could appear in the BULLETIN, due to the difficulty of completing the task of checking and judging in time to meet the printers' closing date.

Leading Stations

J. Banner, GW3ZV (Rhigos, Glam.), wins the contest at his first serious attempt, although he has operated in a number of previous contests and submitted check logs. He used a 3-stage transmitter with an LS50 P.A. feeding power to a four (yes, FOUR!) wavelength long wire, off-centre fed, and an ex-Army R.201 receiver.

Second and third positions go to J. N. Walker, G5JU (Birmingham) and J. C. Foster, G2JF (Wye, Kent), respectively. It is worthy of note that G2JF did not contact any stations outside Europe in maintaining his regular place among the leaders.

Comments

A number of suggestions were made concerning the length of the contest, and these will be considered when the rules for the next event are prepared.

Results—Affiliated Societies Contest, 1954

Posn.	Name of Society	Telegraphy		Telephony		Total points
		Call sign	Points	Call sign	Points	
1	Stourbridge & District A.R.S.	G3BMY	307	G3CLG	294	601
2	Medway Amateur Rec. & T.S.	G2CBA	300	G2CBA	266	566
3	Surrey Radio Contact Club	G3BFP	278	G3BFP	260	538
*	Harlow & District Radio Society	G3ERN	262	G3ERN	269	531
4	Courtaulds Amateur Radio Group	G3CQD/A	275	G3CQD/A	255	530
5	Salisbury & District S.W. Club	G3FKF/A	267	G3FKF/A	260	527
6	Sutton & Cheam Radio Society	G2AYC	276	G2AYC	240	516
7	Gravesend Amateur Radio Society	G3GRS	294	G3GRS	220	514
8	R.A.F. Amateur Radio Society	G8FC	296	G8FC	216	512
9	Sheffield Amateur Radio Club	G4JW	263	G4JW	246	511
10	Coventry Amateur Radio Society	G2ASF	290	G2ASF	203	493
11	Thanet Radio Society	G3DOE	243	G3DOE	233	476
12	Cheltenham Amateur Radio Society	G3GPW	273	G3GPW	167	440
13	West Kent Amateur Radio Society	G4IB	233	G4IB	191	424
14	R.A.F. St. Athan Amateur Radio Society	GW3CKB	189	GW3CKB	191	380
15	Leicester Radio Society	G3AFZ	207	G3AFZ	166	373
16	Nottingham University Radio Society	G3DBP	223	G3DBP	149	372
17	Vickers-Armstrongs (Weybridge)	G3IVW	219	G3IVW	146	365
18	Southend & District Radio Society	G2BHA	203	G2BHA	158	361
19	Ariel Radio Group (B.B.C. Club)	G3GDT	183	G3GDT	148	331
20	Wirral Amateur Radio Society	G2AMV	181	G2AMV	119	300
21	Scarborough Amateur Radio Society	G4BP	176	G4BP	112	288
22	Edgware & District Radio Society	G3ASR/A	230	G3ASR/A	53	283
23	Lowestoft & Beccles A.R. Society	G3ETP	192	G2UK	84	276
24	Torbay Amateur Radio Society	G3GDW	189	G3GDW	24	213
25	Ravensbourne Amateur Radio Club	G3HEV	181	G3HEV/A	21	202
26	York Amateur Radio Society	G3HWW	110	G3HWW	63	173

* Disqualified—late entry—checked score shown.

Results: First Top Band Contest, 1954

Position	Call sign	Points	Scoring contacts	Position	Call sign	Points	Scoring contacts
1	GW3ZV	230	184	34	GM6IZ	90	84
2	G5JU	179	152	35	G4CM	89	85
3	G2JF	164	154	36	G3HIW	88	88
4	G6BQ	157	136	37	G2ZZ	81	78
	G3BMY	157	147		G3FZC	81	76
6	G5LR	148	135	†	G3IRL	78	78
7	G3US	146	142	39	G3HTI	78	76
8	G5TN	145	139	40	G3BHR	77	77
	G5PP	145	139		G3FVW	77	75
10	G8GF	140	136	42	G6JJ	76	76
*	G3HVX	140	130	43	G3IWC	75	71
11	G3IEW	139	125	44	GM8MJ	74	70
12	G6VC	136	125	45	G5VU	70	58
13	G5MR	129	116	46	G2BJN	68	66
	G5TO	129	123	†	G3IPL	68	68
15	G3HXI	128	126	47	G3GDW	67	67
16	G3IGZ	126	122	48	G3JMY	66	63
17	G3BKE	121	116	49	G2AOL	65	65
18	G3ABG	120	112	50	G3JKO	63	61
19	G5JL	116	105	51	G2KK	61	57
	GM3IGW	116	108	52	G3GOX	57	57
21	G3GZB	113	105	53	G2KP	56	56
22	G3FRV	112	108	*	G3HDQ	55	51
23	G5MP/A	111	104	54	G8KU	50	48
	G3HQQ	111	107	55	G3JFT	49	47
25	G5LH	110	107	56	G5AO	48	48
26	G3FCL	107	102	57	G3IYT	46	46
27	G6UT	106	102	58	G5UM	45	45
28	G3JML	100	99	59	G3HTE	44	44
29	G3DGN	99	99	60	G6NK	42	40
30	G3DTG	97	97	61	G3JFY	42	40
31	G2BXC	95	91	62	G3COD	33	33
32	G3IND	93	91	64	G4XC	28	26
33	G3JAM	92	85	65	G2DHV	12	12
				66	G6CB	11	11

An unusually large number of Transatlantic contacts were made this time, and these have aroused considerable (and welcome) comment on the scoring system.

To those who complain of the clash between the last few hours of the contest and the Transatlantic Tests, it is pointed out that this was not intentional, as the Committee was unaware of the proposed dates for the Tests when the rules for the contest were prepared for publication. It is a matter of opinion as to which group of operators benefited most from the clash!

Stations outside Europe heard or worked during the contest included CN2AO, K2ANR, KP4KD, KV4AA, 4BB, W1BB, 1BMW, 1LYV, 1VDB, 1ZL, 2GGL, 2JIL, 2PP, 2WC, 3EIS and ZC6BB (claiming to be in Haifa). HB9CM and HB9T were active, also a member of OKs—a check log from OK1HI listed 84 British stations contacted during the contest.

Check logs were received from G2AYG, 2HKU, 2IM, 3BWR, 3GKZ, 3HKC, 3VW, GM4FK, GI6YW, GW3HJR and OK1HI.

* Disqualified—late entry.

† Disqualified—no declaration.

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New Valves

STANDARD Telephones and Cables Ltd. have announced two interesting additions to the Brimar range of valves, which are expressly intended for use in television tuners for Band III. The PCC84/7AN7—a double triode with separate cathodes and internal shielding between the units—has a slope of 6 mA/V at the low anode figure of 90 volts. The PCF82/9U8 is a triode-pentode, with separate cathodes, designed for mixer-oscillator service. The slope of the triode section (8 mA/V) is such that it permits the required oscillator voltage to be obtained with minimum generation of oscillator harmonics and a low value of oscillator grid current. The pentode section has high input impedance; its anode-to-grid capacity is 0.006 μ F.

Affiliated Societies

THE following are additions to the list of Affiliated Societies published in the July, 1953, issue of the BULLETIN:

Bourneville Radio Society, c/o Cadbury Bros. Ltd., Bourneville, Birmingham 30.

Radio Society, University College of Leicester, University Road, Leicester.

The address of the Hon. Secretary of the **Midland Amateur Radio Society** is now G. W. C. Smith, 84 Woodlands Road, Sparkhill, Birmingham 11.

D.U.F. Certificates

MEMBERS are asked to note that claims for the D.U.F. certificates, issued by the French Society, should be sent direct to R.E.F., Boite Postale 42-01, Paris 8, and not via Headquarters.

Contests Diary

1954

- May 2 - - - D/F Qualifying* (Slade/Rugby)
- May 9 - - - 144 Mc/s Field Day (No. 1)†
- May 22-23 - 420 Mc/s Contest††
- May 23 - - - D/F Qualifying (South Manchester)*
- June 12-13 - National Field Day†
- June 20 - - - D/F Qualifying (High Wycombe/Oxford)*
- July 3-4 - - - 144 Mc/s Open
- July 11 - - - D/F Qualifying (Peterborough)*
- August 8 - - - D/F Qualifying (Salisbury)*
- August 15 - - - 144 Mc/s Field Day (No. 2)
- August 29 - - - D/F Qualifying (Romford/Southend)*
- September 5 - Low Power Field Day
- September 12 - D/F National Final*
- September 12 - 420 Mc/s
- October 2-3 - Low Power
- November 13-14 "Top Band" (No. 2)

* For rules, see page 328, R.S.G.B. BULLETIN, January, 1954.

† For rules, see page 327, R.S.G.B. BULLETIN, January, 1954.

†† For rules, see page 179, R.S.G.B. BULLETIN, October, 1953.

††† For rules, see page 469.

Regional and Club News

BRIGHTON AND DISTRICT RADIO CLUB—Talks on "Radio Mathematics" by E. Bannister and Morse instruction classes are regular features of the meetings held on Tuesday evenings at the "Eagle Inn," Gloucester Road, Brighton. The club station (G3EVE) is now active on 3.5 Mc/s and Top Band using c.w. and 'phone. *Hon. Secretary:* T. J. Huggett, 15 Waverley Crescent, Brighton.

BRISTOL—There was an attendance of 155 at the March meeting when B. R. Bettridge (The General Electric Co. Ltd.) delivered a lecture on "Transistors." A transistor-operated radio receiver with push-pull transistor output and oscillators was demonstrated. On April 30, Louis Varney, A.M.I.E.E. (G5RV) will talk about "TVI Problems."

BRITISH AMATEUR TELEVISION CLUB—At a meeting to be held at the Marconi College, Arbour Lane, Chelmsford, on April 28 at 7.45 p.m., Marconi Image Orthicon cameras will be demonstrated in the course of a lecture. R.S.G.B. members will be welcome. *Hon. Secretary:* M. Barlow (G3CVO), 29 Loftin Way, Chelmsford.

BRITISH TWO-CALL CLUB—Major J. M. Drudge-Coates (DL2RO) and Major D. A. MacDonnell (G8DK) have been elected *President* and *Vice-President* respectively. Membership now totals 124 in 16 countries and is open to all those who have held Amateur Radio licences in two or more countries. *Hon. Secretary:* G. V. Haylock (G2DHW), 63 Lewisham Hill, London, S.E.26.

CHELTENHAM—Arrangements for N.F.D. were discussed at the March meeting, when G3BCC announced that a private room at the Great Western Hotel, Clarence Street, is available for future meetings.

CHISLEHURST & SIDCUP—Meetings are now held on the second Wednesday of each month at "Seven Stars," High Street, Footscray. On April 14 there was a demonstration of German and Japanese surplus radio equipment. *Town Representative:* Alan Swindon (G3ANK), 135 Station Road, Sidcup, Kent.

Regional and Club News

Contributions to this feature should be topical, concise, and typed—using double spacing—and sent to reach Headquarters by not later than the 20th of the month preceding publication.

Items for inclusion in "Forthcoming Events" should be sent to reach Regional Representatives not later than the 18th of the month preceding publication.

COVENTRY AMATEUR RADIO SOCIETY—Among the guests at the Society's Annual Dinner on March 5 were Garnett Lapworth (G6DL) and D. Hall, *President* and *Hon. Secretary* respectively of the Midland Amateur Radio Society, and W. Chilvers, *President* of the Slade Society. Fred Miles (G5ML), *President* of C.A.R.S., was in the Chair. On April 26 at 7.30 p.m., at 9 Queen's Road, Coventry, J. Whitby (G3HDB) will describe a home-constructed Top Band receiver. *Hon. Secretary:* K. Lines (G3FOH), 142 Shorncliffe Road, Coventry.

GRAFTON RADIO SOCIETY—There was an attendance of 180 at the Islington Central Library on Friday, March 19, to view the new Mullard film, "The Manufacture of Radio Valves," and to participate in a technical discussion on "Valves and their Applications." Mr. Gardner, Technical/Commercial Liaison, Entertainment Valve Dept. of Mullard Ltd., was guest speaker. Leslie Cooper, G5LC (Immediate Past *President*, R.S.G.B.), C. H. L. Edwards, G8TL (*Hon. Secretary*, R.S.G.B.), and John Clarricoats, G6CL (General

Secretary) were among the many well-known personalities present. The chair was taken by John H. Clarke, G2AAN (*President* of the Society) who had the support of L. A. Kippin, G8PL (Chairman) and A. W. H. Wennell, G2CJN (*Hon. Secretary*). W. H. Jennings, G2AHH, a Founder Member of the Grafton Society, was also present.

LANCASTER & DISTRICT AMATEUR RADIO SOCIETY—Recent meetings have been devoted to a lecture and demonstration of an electronic organ by B. Archer (G2CGQ) and a talk on Audio Amplification by F. B. Kyle. Excellent publicity is being given the Society by the local press. *Hon. Secretary:* A. O. Ellesen (G3FJO), 10 Seymour Avenue, Heysham, Lancashire.

LEEDS & DISTRICT AMATEUR RADIO SOCIETY—Meetings are held at the Swarthmore Education Centre on Wednesdays at 7.30 p.m. Members are to visit the Skelton Grange Power Station on April 21 (meet at the power station at 7 p.m.). A. R. Sugden will lecture on "Disc Recording" on April 28, whilst "The Uses of Test Gear" will be the subject for a talk on May 5. *Hon. Secretary:* B. A. Payne, 454 Kirkstall Road, Leeds 4.

LEICESTER RADIO SOCIETY—On March 1, in the course of his second lecture on Transistors, C. L. Wright, B.Sc.(Eng.), dealt with the practical applications of transistor equipment for the amateur. On March 29, R. Weston (G2BVW) gave a talk on and demonstrated 70 cm equipment. A Direction Finding Field Day is to be held on May 16. *Hon. Secretary:* W. N. Wiberley, 21 Pauline Avenue, Belgrave, Leicester.

LINCOLN SHORT WAVE CLUB—A Hamfest is to be held at the Technical College, Lincoln, on May 23, commencing at 1.30 p.m. Tickets can be obtained from R. H. Draper (G4BU), 116 Portland Street, Lincoln. The club meets on the first Wednesday in the month at the College.

MEDWAY AMATEUR RECEIVING AND TRANSMITTING SOCIETY—As from April 26, meetings will be held every fortnight at the Society's new headquarters at the "Services Rendered Club," 14 High Street, Brompton, Chatham. The club station will soon be active again under

the callsign G2FJA. *Hon. Secretary:* D. H. Brett, 14 Connaught Road, Chatham.

NORWICH & DISTRICT RADIO CLUB—During a recent QSO Jon Adama (PA0FB) told G2UX that he would be attending a wedding in Norwich. On his arrival Jon found that a full programme had been arranged for him which included a meeting with the Lord Mayor of Norwich. He also visited the Club where he met several amateurs with whom he had had contacts in the past including an old 2m friend in G3VM.

NORWOOD & DISTRICT—At the meeting on March 20, the General Secretary lectured on "International Radio Conferences." At the A.G.M. the 1952 Committee Trophy (a silver cup) was presented to Ron Reed (G2RX) for his work in connection with the 1953 N.F.D. The meeting on April 17 will be devoted to a "general rag-chew." Details of Morse classes may be obtained from Don Hill, 9 Addington Grove, S.E.26.

QRP SOCIETY—The "Student Adoption Scheme" for novices has recently been re-organised and full details can be obtained from the *Hon. Secretary:* J. Whitehead, 92 Rydens Avenue, Walton-on-Thames, Surrey.

RAVENSBORNE AMATEUR RADIO CLUB—The Club is holding an exhibition of home constructed equipment at Durham Hill School (Science Room), Downham, Kent, on May 8, commencing at 4 p.m. The club station (G3HEV) will be in operation. Meetings are held at the school on Wednesdays at 8 p.m. *Hon. Secretary:* W. H. J. Wilshaw, 4 Station Road, Bromley, Kent.

ROTHERHAM RADIO CLUB—Meetings are now held in the Rotherham Photographic Society's room at 11 The Crofts, Moorgate Street at 7.30 p.m. on the first and third Wednesdays in each month. *Hon. Secretary:* N. Barringer, 19 North Road, Rotherham.

SOUTH MANCHESTER RADIO CLUB—Harry Whalley (G2HW) will discuss "Transmitter and Receiver Testing" at the meeting on April 23. "Tuned Line Oscillators" is to be the subject of the talk by G. Kenyon (G3HMF) on May 7. A recent discussion on aerial systems proved most successful; other clubs are recommended to try this controversial subject. *Hon. Secretary:* M. Barnsley (G3HZM), 17 Cross Street, Bradford, Manchester 11.

SOUTHEND & DISTRICT RADIO SOCIETY—The Society's Hamfest will be held at the London Hotel on April 24. G. T. Peck recently lectured on "The Radio Control of Models." *Hon. Secretary:* J. H. Barrance, M.B.E. (G3BUJ), 49 Swanage Road, Southend-on-Sea.

STOURBRIDGE & DISTRICT AMATEUR RADIO SOCIETY—At the A.G.M. the following were elected: *President:* J. Timbrell (G6OD); *Chairman:* W. H. Higgins (G8GF); *Vice-Chairman:* C. D. Barlow (G3HG); *Hon.*



At the Derby and District Amateur Radio Society's Annual Dinner, the G5YY Trophy was presented to T. Darn, G3FCY (right). W. A. Mead (G5YY), who has donated the trophy for annual award, is in the centre of the picture. To the left is B. Dare (G3JFT) who received a Certificate of Merit.
[Photo courtesy "Derbyshire Advertiser"]

Treasurer: J. Hogg (G2OG); **Hon. Secretary:** F. Meredith, 26 Gibbings Road, Wollaston, Stourbridge; **Committee Members:** F. A. Bills (G3CLG), T. Cashmore (G3BMY), A. K. Davies and N. Wooldridge. The "Timbrell" Senior Trophy was presented to F. A. Bills (G3CLG) and the Junior Trophy to F. Meredith.

TORRBY AMATEUR RADIO SOCIETY.—At the March meeting, G2GK gave details of the frequencies in use by the local R.A.E.N. group. Later G4RJ described the aerial system (2 half-waves in or out of phase) which is to be used by one of the local Groups during N.F.D. At the meeting to be held on April 17 members are being asked to take surplus equipment with them for sale in aid of the Society's funds. **Hon. Secretary:** L. H. Webber (G3GDW), 43 Lime Tree Walk, Newton Abbot.

WELWYN GARDEN CITY.—The group was privileged to have W. H. Allen, M.B.E., G2UJ (V.H.F. Editor), Clem Jardine, G5DJ and J. W. Mathews, G6LL, as judges for the first Constructors' Competition for the "G3EPK Cup." The winner was Gerald Gibbs (G3AAZ) for a miniature table top television receiver intended to stand alongside the transmitter as a TVI monitor. Nearly 20 items were submitted in all. The accompanying picture shows Mr. Allen presenting the trophy to G3AAZ. ("Hertfordshire Mercury" photo.)



WEST KENT AMATEUR RADIO SOCIETY.—The Society took part in the Tunbridge Wells Hobbies Exhibition on April 8, 9 and 10. An amateur station was active on Top Band, 7 and 144 Mc/s. **Hon. Secretary:** L. S. King (G4IB), Glenisla, Maidstone Road, Pembury, Kent.

WEST LANCs. RADIO SOCIETY.—At the A.G.M. the following officers were elected: **President:** T. Searle; **Hon. Treasurer:** F. Claby; **Hon. Secretary:** S. Turner (5 Balf Street, Seaford, Liverpool 21). The Society meets at 8 p.m. on Tuesdays over Gordon's Sweetshop, St. Johns Road, Waterloo.

YORK AMATEUR RADIO SOCIETY.—Recent activities have included a talk and demonstration on 2 m converters by G3GCX, a lecture on grid dip oscillators by G6XM and a film show arranged by G3GDE. On April 28 the **Hon. Secretary:** G. F. Nottingham (G3DTA), 51 Carr Lane, Acomb, York, will give a talk on "A simple battery portable station."

REPRESENTATION

The following is an amendment to the list of County Representatives published in the December, 1952, issue:

Region 3—Worcestershire

N. T. Harper (G4MI), 33 Vicarage Road, Ambicote, Stourbridge.

The following are additions to the list of Town Representatives published in the December, 1953, issue:—

Region 1—Lancashire East

Darwen-Blackburn

J. E. Whittle (G3EKP), 2 Church Terrace, Darwen.

Region 2—Co. Durham

South Shields

T. L. Peterson (G6VG), 3 Bellevue Terrace

Yorkshire East

Hull

R. C. Parnaby (G2DPA), 32 Cartwright Lane, Beverley.

Region 3—Staffordshire

Walsall

N. W. Austin (G2FQR), 99 Becot Road.

Warwickshire

Rugby

C. H. Walker (G3AZT), 34 Westfield Road.

Worcestershire

Malvern

F. E. Wingfield (G2AO)*, 4 Davenham Close.

*Temporary appointment only.

Region 4—Lincolnshire

Lincoln

G. C. Newby (G3EBH), St. Minver, Sudbrooke Lane, Nettleham.

Region 5—Bedfordshire

Luton

F. W. Tyler (G3CGQ), 94 Alexandra Avenue.

Essex

Southend-on-Sea

P. N. Hollis (B.R.S. 18826), 143 Lymington Avenue, Leigh-on-Sea.

Region 5—Hertfordshire

Baldock

N. F. Wilshire (G3CEU), 56 Chilvers Bank.

Region 6—Berkshire

Reading

A. W. Wright (G8KJ), Sonning Dairy, Sonning.

Region 7—London East

Romford

W. F. Jeffery (G3FKJ), 94 Gubbins Lane, Harold Wood.

London, South-East

Lewisham Area

F. W. Gibbs (B.R.S. 20159), 85 Reigate Road, Downham, Bromley, Kent.

London, South-West

Kingston-on-Thames

R. F. Penfold (G3DHZ), 90 Surbiton Road.

London West

Ealing

R. E. G. Caws (G3BRL), 34 Greystoke Lodge, Hanger Lane, W.5.

Watford

R. T. Youens (G2HAR), 104 Baldwins Lane, Croxley Green, Rickmansworth, Herts.

Region 12—Morayshire

Elgin & Fochabers

R. Innes (GM3HXT), 40 Castle Street, Fochabers.

Region 14—Ayrshire

Ardrossan area

D. Kerr (B.R.S. 13310), 9 McKellar Avenue.

Vacancies

Mr. E. A. Hayward (G2UH) has resigned as Representative for the County of Somerset and Mr. J. W. Swinnerton (G2YS) as Representative for the town of Chester.

Nominations for their successors should be made in the prescribed form and sent to reach the General Secretary by not later than May 31, 1954.

Silent Keys

It is with deep regret that we record the passing of Albert Groom, G2QX, on February 24, 1954.

Active in the field of Amateur Radio for very many years, Mr. Groom had been a member of the Society since about 1930, except for a war-time break. His inimitable style, especially on Top Band, will linger with us for a long time, and many who knew him well will miss his voice on the air.

Sincere condolences are offered to those he left behind. J.A.P.

It is with great sorrow that we record the death of Stanley Leech, G2LK, of Beeston, Nottingham, after a grave affliction bravely endured.

Stan was well known to a wide circle in and around Manchester, where he was engaged in Police radio. Although an original member of the R.N.W.A.R., he found himself in the R.A.F. doing a valuable job at home and overseas until the end of the war. He resumed his connection with Home Office radio for a while until attracted to the radio industry, where he held an appointment in the Nottingham area.

Always full of enthusiasm and a fine operator, his call sign was soon a familiar one in post-war DX contests. He will be sadly missed by a group of old-timers who were privileged to sponsor him from early B.R.S. beginnings. To his wife Ruth and her young family, we tender our deepest sympathy in their most grievous loss. J.C.

With deep sorrow we record the death, on March 21, 1954, of Mr. Frederick Taylor (B.R.S. 4249), of Tottenham, London, N.15. Well-known to a wide circle of North London amateurs, Fred will be especially remembered for his cheerful smile and his willingness at all times to participate in the activities of the Society. He was a keen short-wave listener on all bands and he took a great interest in home-constructed tape and disc recorders. He had been a member of the Society since 1941. His passing will be regretted by all who knew him.

Deepest sympathy is extended to his wife and his close friends. W.T.L.

Forthcoming Events

REGION 1

Barrow.—Mondays, 7.30 p.m., Castle House, Walney Island, Barrow-in-Furness.
Bury.—May 13, 7.30 p.m., 52 The Drive, Seedfield, Bury.
Chester (C. & D.A.R.S.).—Tuesdays, 7.30 p.m., Tarran Hut, Y.M.C.A., Chester.
Crosby.—Tuesdays, 8 p.m., over Gordon's Sweetshop, St. John's Road, Waterloo.
Isle of Man.—May 5, Broadway House, Douglas.
Lancaster.—May 5, 7.30 p.m., George Hotel, Torrisholme.
Liverpool.—April 17, May 1, 15, 3 p.m., Larkhill Mansion House, West Derby.
Manchester (M. & D.R.S.).—May 3, 7.30 p.m., Brunswick Hotel, Piccadilly, Manchester.
Preston.—April 23, May 7, Belle Vue Hotel, New Hall Lane, Preston.
Rochdale.—Fridays, 7.45 p.m., 1 Law Street, Sudden.
South Manchester.—Fridays, 7.45 p.m., Ladybarn House, Mauldeth Road, Manchester 14.
Southport.—Thursdays, 8 p.m., Y.M.C.A., off Eastbank Street, Southport.
Stockport.—April 14, 28, 8 p.m., Blossoms Hotel, Buxton Road, Stockport.
Warrington.—April 20, May 4, 18, 7.30 p.m., King's Head Hotel, Winwick Street, Warrington.
West Cumberland.—May 6, 7 p.m., Kells Community Centre, Whitehaven.
Wirral (W.A.R.S.).—April 21, May 5, 19, 7.45 p.m., Y.M.C.A., Whetstone Lane, Birkenhead.

REGION 2

Barnsley.—April 23, 7.30 p.m., King George Hotel, Peel Street, May 13, Visit to M.R.G.
Bradford.—April 27, May 11, 7.30 p.m., Cambridge House, 66 Little Horton Lane.
Catterick.—Wednesdays, 7 p.m., Loos Lines, Catterick Camp.
Darlington.—Thursdays, 7.30 p.m., 129 Woodlands Road.
Doncaster.—May 12, 7.30 p.m., Y.M.C.A., Cleveland Street.
Gateshead.—Mondays, 7.30 p.m., Mechanics' Institute, 7 Whitehall Road.
Hull.—April 27, May 11, 7.30 p.m., "Rampant Horse," Paisley Street.
Leeds.—Wednesdays, 7.30 p.m., Swarthmore Educational Centre, 3 Woodhouse Square.
Middlesbrough.—Thursdays, 7.30 p.m., Joe Walton's Boys' Club, Feversham Street.
Newcastle-upon-Tyne (N.E.A.T.S.).—May 4, 7.30 p.m., Barras Bridge Hotel, Sandford Road.
Pontefract (P.A.T.G.).—April 29, May 13, 8 p.m., "Fox Inn," Knottingley Road.
Rotherham.—Wednesdays, 7 p.m., "Cutlers' Arms," Westgate.
Scarborough.—Thursdays, 7.30 p.m., B.R. Rifle Club, West Parade Road.
Sheffield.—April 28, 8 p.m., "Dog and Partridge," Trippet Lane, May 12, 8 p.m., Albreda Works, Lydgate Lane.
Slaithwaite.—Fridays, 7.30 p.m., 3 Dartmouth Street.
Spenborough.—April 21, May 5, 7.30 p.m., Temperance Hall, Cleckheaton.
York.—Wednesdays, 7.30 p.m., Club Rooms, Y.A.R.S., Fetter Lane.

REGION 3

Birmingham (South).—May 3, 7.30 p.m., Friends Hall, Watford Road, Cotteridge. (M.A.R.S.).—May 18, 6.45 p.m., Imperial Hotel, Birmingham.
Coventry.—May 28, 7.30 p.m., Priory High School, Wheatley Street. (C.A.R.S.). May 10, 24, 7.30 p.m., 9 Queens Road.
Kenilworth, Warwick, Leamington.—May 20, 7.30 p.m., Dalehouse Lane.
Malvern.—May 3, 8 p.m., "Foley Arms."
Stoke-on-Trent.—May 26, 8 p.m., "Lion's Head," John Street, Hanley.
Stourbridge (S. & D.A.R.S.).—May 4, 8 p.m., King Edward VI School.
Wolverhampton.—May 10, 24, 31, 8 p.m., Stockwell End, Tetterhall.
Wrekin.—May 3, 8 p.m., Wrekin Service Club, Roseway, Wellington.

REGION 4

Alvaston.—Tuesdays, Thursdays, 7.30 p.m., Sundays, 10.30 a.m., Nunsfield House, Boulton Lane, Alvaston, Nr. Derby.
Chesterfield.—Tuesdays, 7.30 p.m., Bradbury Hall, Chatsworth Road.
Derby (D. & D.A.R.S.).—Wednesdays, 7.30 p.m., Derby College of Arts & Crafts, Sub-basement, Green Lane.
Leicester (L.R.S.).—April 26, May 3, 17, 7.30 p.m., "Holly Bush Hotel," Belgrave Gate.
Lincoln (L.S.W.C.).—April 14, 28, May 12, 7.30 p.m., Technical College, Cathedral Street.

Mansfield (M. & D.A.R.S.).—April 14, May 12, 7.30 p.m., Denman's Head Hotel, Market Place, Sutton-in-Ashfield.
Newark.—May 2, 16, 7 p.m., Northern Hotel, Appleton Gate, Newark.
Northampton (N.S.W.C.).—Fridays, 7 p.m., May 7, 6 p.m., Club Room, 8 Duke Street.
Nottingham.—May 21, 7.30 p.m., Sherwood Community Centre, opposite Woodthorpe Drive, Sherwood.
Peterborough.—May 5, 7.30 p.m., New Inn, New England, Peterborough.
Workshop.—May 3, 7 p.m., King Edward Hotel.

REGION 5

Chelmsford.—May 4, 7.30 p.m., Marconi College, Arbour Lane.
Lowestoft & Beccles (L. & B.A.R.C.).—April 28, May 12, 7.30 p.m., Y.M.C.A., Lowestoft.

REGION 6

Cheltenham.—May 6, 8 p.m., Great Western Hotel, Clarence Street.
Gloucester (G.R.C.).—Thursdays 7.30 p.m., The Cedars, 83 Hucclecote Road.
Oxford (O. & D.A.R.S.).—April 28, May 12, 7.30 p.m., Club Room, "Magdalen Arms," Iffley Road, Oxford.
Portsmouth.—Tuesdays, 7.30 p.m., Signals Club Room, Royal Marine Barracks, Eastney.
Southampton.—May 1, 7 p.m., 1 Prospect Place.
Stroud.—Wednesdays, 7.30 p.m., Subscription Rooms.

REGION 7

Acton, Brentford & Chiswick.—Tuesdays, 7.30 p.m., A.E.U. Rooms, 66 Chiswick High Road, W.4.
Barnes, Putney & Richmond.—May 7, 7.30 p.m., 337 Upper Richmond Road, S.W.14.
Bexleyheath (N.K.R.S.).—April 22, May 13, 7.30 p.m., Congregational Hall, Chapel Road, Bexleyheath.
Bromley (N.W.K.A.R.S.).—May 7, 8 p.m., "Shortlands Tavern," Station Road, Shortlands.
Chingford.—May 11, 8 p.m., Venue from G4GA (SIL 5635) or B.R.S.19765 (SIL 6055).
Croydon.—April 13, 7.30 p.m., "Blacksmith Arms," 1 South End, Croydon.
Dorking.—Tuesdays, 7.30 p.m., 5 London Road.
Dulwich & New Cross.—May 4, 7.45 p.m., "Walmer Castle," Peckham High Street, H. F. Knott—Single Side Band.
Ealing.—Sundays, 11 a.m., A.B.C. Restaurant, Ealing Broadway, W.5.
East Ham.—Tuesdays, 8 p.m., April 27, May 11, 57 Leigh Road.
East London District.—April 25, 3 p.m., Brains Trust, Town Hall, Ilford.
East Molesey (T.V.A.R.T.S.).—May 5, 8 p.m., Carnarvon Castle Hotel.
Finsbury Park.—April 20, 7.30 p.m., 164 Albion Road, Stoke Newington, N.16.
Guildford & Woking.—April 25, 3 p.m., Royal Arms Hotel, North Street, Guildford. "Electronic Keying."
Hayes & Uxbridge.—April 26, May 10, 7.30 p.m., Hillingdon Primary School, Uxbridge Road.
Hendon & Edgware (E. & D.R.S.).—Wednesdays, 8 p.m., 22 Goodwyn Avenue, Mill Hill, N.W.7.
Ilford.—Thursdays, 8 p.m., G2BRH, 579 High Road.
Kingston (K. & D.R.S.).—Alternate Wednesdays, 7.45 p.m., Penrhyn House, Penrhyn Road.
Lewisham (R.A.R.C.).—Wednesdays, 8 p.m., Durham Hill School, Downham.
Norwood.—April 17, 7.30 p.m., Windermere House, Weston Street, Crystal Palace.
Southgate & Finchley.—May 13, 7.30 p.m., Arnos School, Wilmer Way.
Sutton & Cheam (S. & C.R.S.).—April 20, May 18, "The Harrow," Cheam Village, Surrey.
Welwyn Garden City.—May 4, 38 Elmwood, Welwyn Garden City. "A New Look at Radio Construction," by G. A. C. Watts (Murphy Radio Electronics Laboratory).

REGION 8

Brighton.—T.R. at home, Wednesdays, 7.30 p.m., 27 Warren Avenue, Woodingdean. (B.D.R.C.).—Tuesdays, 7.30 p.m., Eagle Arms, Gloucester Road.
Chatham (M.A.R.T.S.).—April 26, May 10, 24, 7.30 p.m., "Services Rendered Club," 14 High Street, Brompton, Chatham. (Note—New Address).
Hastings (H. & D.R.C.).—April 20, May 4, 18, 7.30 p.m., Saxons Cafe, Denmark Place.
Isle of Thanet (I.O.T.R.S.).—Fridays, 7.30 p.m., Hilderstone House, Broadstairs.
Maidstone (M.K.A.R.S.).—Tuesdays, 7.30 p.m., Elms School, London Road.
Worthing (W. & D.R.C.).—May 10, 7.30 p.m., Adult Education Centre.

(Continued on page 475)

New Books

THE RADIO AMATEUR'S HANDBOOK. (Thirty-first Edition, 1954). By the Headquarters Staff of the A.R.R.L. 800 pages and 1,250 illustrations. Price 31/-, post free from R.S.G.B. Headquarters. Immediate delivery.

The mixture is "as before" but with a number of new ingredients. The section on negative resistance oscillators has been replaced by a short descriptive note on crystal diodes, junction and point-contact transistors. The receiver section is unchanged, materially, and the only general coverage receiver described is the single-valve "blooper" with regeneration to the aerial circuit, which has survived another edition. There is then a jump to a two-band five-valve superhet, after which come descriptions of some excellent converters and auxiliary receiving apparatus. There is also an account of a very modern i.f. amplifier with 20 selective circuits, some of which are staggered — and one is not surprised. It is the opinion of the present writer that the constructional side of receivers lacks a description of a general purpose design suitable for the main amateur bands, capable of being built at home. There must be many amateurs who, by interest or force of financial circumstances, wish to build their own receivers.

New items in the transmitter section include a one-valve two-band job for the novice (*QST* Nov., 1953), a rather more advanced design which uses a 6BL7GT as co-pa/fd, and a 35 watt for 3.5 Mc/s, and 7 Mc/s. There is also a 75 watt job to cover from 3.5 to 28 Mc/s, and a 6146 multi-band p.a. for 90 watts, which can be used with a frequency multiplier and v.f.o. (described separately) in a band-switched 80 watt transmitter.

The chapter on modulators is improved and includes several new items. There is a little more information on balanced modulators, and some useful new linear amplifier data. A section on ground-plane aerial design is welcome. A new c.c. converter, a low-noise pre-amplifier for 144 Mc/s, and a c.c. 432 Mc/s converter, keep the v.h.f. section up-to-date. There are a number of additions to the mobile equipment section, whilst the TVI chapter has been revised "in the light of increased u.h.f. activity and imminent color-television." Incidentally this chapter is of immediate interest to British amateurs in view of television and broadcast developments in the U.K.

Transistors have now reached the "Tube Tables" in 42 types: the highest output is 50 milliwatts.

The present edition is a worthy successor in a noble line.

T.P.A.

RADIO CONTROL FOR MODEL SHIPS, BOATS AND AIRCRAFT. By F. C. Judd, G2BCX. 140 pages, fully illustrated. Page size 8½ in. x 5½ in. Published by Data Publications, Ltd. Art board cover, thread sewn 8/6. Cloth bound, gold lettering 11/6.

The purpose of this important new book is to encourage and help those already enjoying Radio Control to achieve an even higher standard of efficiency and reliability. Without doubt it will also arouse the interest of many other radio enthusiasts who may perhaps have felt that constructing and installing radio equipment in a model would prove a hazardous task.

The book deals with the theory of transmitters, receivers, servo-mechanisms, aeriels and frequency measuring equipment and at the same time covers the practical aspect very fully. Particular attention is paid to the numerous details which are so often left to the imagination.

The production of this book, which fills what has been obvious for a long time—a serious gap in the field of radio literature devoted to the remote control of models, reaches a standard few book publishers can equal, let alone surpass.

ZB1EP

With reference to the Silent Key tribute to ZB1EP published in our last issue, we now learn from Sgt. Eric Briggs, G3JUU, who is stationed on Malta, G.C., that it was Sgt. Henderson and not Sgt. Wilson who lost his life when an R.A.F. Shackleton aircraft crashed into the sea off Gozo on February 12, 1954. Sgt. Henderson was, we understand, the holder of the call ZB1EP.

In publishing this correction it is necessary to explain that the information upon which the tribute was based gave the name of the person deceased as Sgt. Wilson.

Correction

In the list of New Members published in the February, 1954, issue of the R.S.G.B. Bulletin, Mr. J. D. Davenport (Associate Member) was inadvertently listed as Miss J. D. Davenport.

Recorded Lecture Library

All applications to borrow recorded lecture tapes should be addressed to Mr. C. H. L. Edwards, A.M.I.E.E., 10 Chepstow Crescent, Newbury Park, Ilford, Essex.

R.S.G.B. BULLETIN, April, 1954.

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FORTHCOMING EVENTS.—(Continued from page 474).

REGION 9

Bristol.—April 30, 7.15 p.m., Carwardine's Restaurant, Baldwin Street, Bristol 1. "TVI Problems," Louis Varney, A.M.I.E.E. (GSRV).

Exeter.—May 7, 7 p.m., Y.M.C.A., St. David's Hill.

North Devon.—May 6, 7.30 p.m., Rose of Torridge Cafe, The Quay, Bideford.

Penzance.—May 6, "Railway Hotel."

Plymouth.—April 17, May 15, 7 p.m., Tothill Community Centre, Tothill Park, Knighton Road, St. Jude's.

Torquay.—April 17, May 15, 7.30 p.m., Y.M.C.A., Castle Road.

West Cornwall (W.C.R.C.).—April 15, May 6, "Fifteen Balls," Penryn, near Falmouth.

Weston-super-Mare.—May 4, 7.30 p.m., Y.M.C.A.

Yeovil.—Wednesdays, 7.30 p.m., Grove House, Preston Road.

REGION 10

Cardiff.—May 10, 7.30 p.m., "The British Volunteer," The Hayes, Cardiff.

Neath & Port Talbot.—May 12, 7.30 p.m., "Royal Dock Hotel," Briton Ferry.

REGION 13

Dunfermline.—Mondays and Thursdays, 7.30 p.m., behind 34 Viewfield Terrace, Dunfermline.

Edinburgh (L.R.S.).—April 15, 29, May 13, 7.30 p.m., 25 Charlotte Square, Edinburgh.

REGION 14

Falkirk.—April 30, May 14, 7.30 p.m., The Temperance Cafe, High Street Falkirk.

Glasgow.—April 28, 7 p.m., Institute of Shipbuilders and Engineers, 39 Elmbank Crescent, Glasgow, C.2.

Prestwick.—April 17, 7 p.m., Royal Hotel.



P. Gowen, G3IOR (left) and D. C. Money, G3HKD, with the light beam apparatus they built for the Amateur Radio and Model Aircraft Exhibition held in Norwich from April 6 to 10. The light transmitter on the right is modulated by pieces of polarised glass operated from telephone ear pieces.



The Editor does not necessarily endorse the views and opinions expressed by contributors to this feature.

Development of the Short Waves.

The Amateurs Were First

DEAR SIR,—In the January, 1954, issue of the BULLETIN a note appeared concerning a B.B.C. programme celebrating the 21st Anniversary of the Empire (short-wave) Service. The note drew attention to the omission during the broadcast of any reference to Mr. Gerald Marcuse's work, as an amateur, in pioneering short-wave broadcasting to the Empire.

What seems to have been overlooked, however, is that, in the same programme, Sir Noel Ashbridge stated the long-range properties of short waves were "discovered" by Marconi and Franklin. It is generally accepted that this discovery was made by amateurs.

Old-timers will remember that after the First World War, amateurs in the U.K. began by using wavelengths around 1,000 metres. Later they were moved down to about 400 metres and later still to 200 metres. The amateurs were always given the wavelengths no one else wanted. Why? Because these wavelengths were considered by the commercial interests to be useless, except for very short ranges. At that time the triode valve was becoming popular and the use of c.w. together with regenerative receivers produced results which suggested that longer ranges than had been obtained with earlier systems might be possible.

During the winter of 1921, after the failure of the first transatlantic tests a year earlier, the A.R.R.L. took a bold step and sent Mr. Paul Godley to the U.K. He was equipped with the best receivers then available and at a coast camp in Scotland [Ardrrossan, Ed.] succeeded in receiving [on December 11, 1921.—Ed.] signals from U.S. amateurs. This set the amateur world "alight" and there followed shortly afterwards a number of two-way transatlantic contacts. Many British, French and U.S. amateurs took part in these pioneer experiments which demonstrated that short-wave signals were capable of spanning the Atlantic. A few months later, world-wide contacts on short waves were taking place.

A paper delivered by Marconi on the 25th of July, 1924, caused much controversy at the time. Although published long after the amateur results mentioned above had been fully documented, he claimed that the long distance properties of short waves were already known to him and his colleagues. It is interesting to note that a well-known periodical said of this claim at the time, "professional research, if it was done, was done for the advancement of one commercial organisation, not for the good of wireless. It might be patented, it might be used secretly, it might be buried to avoid making obsolete large stations designed for long waves. Curious things do happen in that way."

These discoveries by amateurs opened the way for short-wave long distance broadcasting and many U.S. stations, such as KDKA (Pittsburg), were heard regularly over here.

Around 1923, the Netherlands began an overseas service, and five years later (1928), after much pressure, the Postmaster-General gave permission for Gerald Marcuse's notable experiments in Empire broadcasting. Incidentally, Capt. P. P. Eckersley, then Chief Engineer of the B.B.C., had opposed short-wave broadcasting on the grounds of "waiting for perfection"! And that statement is fully documented!! The B.B.C. service was started in December, 1932.

It seems strange that if Marconi's claim was sound, other countries followed up the amateurs' discoveries so quickly, while five years later our authorities were still so doubtful of the usefulness of the short waves that they preferred to wait for perfection.

Yours faithfully,

J. W. C. CROPPER (G3BY).

Waterloo, Ashton-under-Lyne, Lancs.

Due to pressure on our space a number of letters to the Editor have been unavoidably held over from this issue.

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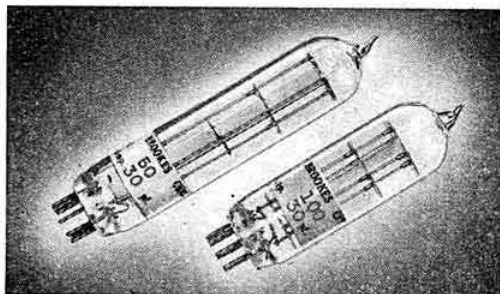
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BC348E, 230 a.c., 6AK5 r.f., n.l., FL8 filter, "S" meter, handbook, £16. Quick sale.—GW3GXD, 1 Dillwyn Gardens, Bridgend, Glam. (996)

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EXCHANGE AND MART SECTION

(Continued from page 479)

20, 15 and 10 metres at 40 watts with fully stabilised power supply using 5 6V6s, 2 VR150 and 6AC7, £16. Buyer collects.—Phone LEY 7572. G3GXV, 256 Grove Green Road, Leytonstone, London, E.11. (968)

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