

BVWS bulletin

volume 24 number 2 Summer 1999 www.bvws.org.uk



The Vintage Wireless Museum

23 Rosendale Road, West Dulwich London SE21 8DS
Telephone 0181 670 3667

Proprietor: Gerald Wells. Please make appointments beforehand



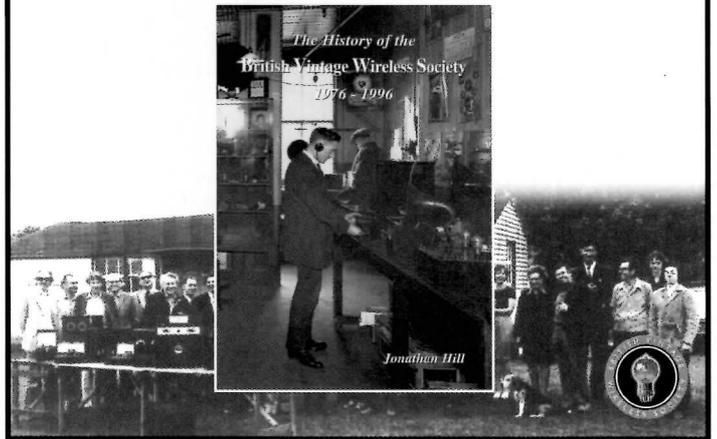
The History of the BVWS

available now

Large Format
176 pages, 250 photos
Free to BVWS members

(£4 postage in the UK)
available from Mike Barker, 59 Dunsford Close,
Hillside Park, Swindon. Wilts SN1 4PW

1 copy free per member
additional copies at £5 each + p&p
available at all BVWS meetings



Radio Bygones



The leading vintage wireless magazine

INCLUDING IN THE FEB/MAR '99 ISSUE ...

- Japanese military radio of WWII
- The Murphy A100
- Hullo Lympe! Croydon calling
- More on the Sinclair 'Micromatic'
- Rejuvenation of a 1933 Kingsford Console radio
- A visit to the Irish Museum of Radio, Cork
- Fixed Radio Service in the Netherlands - Part 2

PLUS ALL THE REGULAR FEATURES ...

- News and events in the world of vintage wireless
- 'Can you help?' - readers' queries and requests
- 'Feedback' - readers' letters
- RB Bookshelf - mail-order book service
- Readers' adverts - the ones that work!

**Annual subscription (6 issues) £18.50 in the UK
£19.50 to Europe**

£23.75 the rest of the world, by airmail

Or send £3.00 or a US\$5 Bill for a sample copy

Please make all cheques payable to G C Arnold Partners

**G C Arnold Partners (B3), 9 Wetherby Close, Broadstone,
Dorset BH18 8JB, England. Telephone/FAX: 01202 658474**

NATIONAL VINTAGE COMMUNICATIONS FAIR

MAKE A NOTE IN YOUR DIARY NOW!

NEC Hall 11 • 10.30 - 4pm
Sunday 24th October 1999

VINTAGE RADIOS • CRYSTAL SETS
EARLY 1920s VALVE RECEIVERS
HORN LOUDSPEAKERS • TRANSISTORS
VALVES & COMPONENTS • EARLY TVS
VINTAGE HI-FI/CLASSIC AUDIO
TELEPHONES • KIOSKS • GPO ITEMS
GRAMOPHONES • RECORDS (78s to CDs)
SCIENTIFIC INSTRUMENTS plus all
ELECTRICAL & MECHANICAL
ANTIQUES and COLLECTABLES

STALL BOOKINGS/DETAILS:

Sunrise Press, 13 Belmont Road, Exeter, Devon EX1 2HF.
Telephone: (01392) 411565 E.mail sunpress@eurobell.co.uk
Web <http://www.angelfire.com/tx/sunpress/index.html>

NVCF sponsors and supports the
British Association for the Advancement of Science & the
British Vintage Wireless Society

BVWS Committee**Chairman:**

Mike Barker,
59 Dunsford Close,
Swindon. Wilts SN1 4PW
Tel: 01793 541634

Bulletin Editor:

Carl Glover,
c/o Runciter Corporation,
33 Rangers Square,
London
SE10 8HR
Tel/Fax: 0181 469 2904

Treasurer: Jeff Borinsky,

3 Woodberry Grove,
London,
N12 0DN
Tel: 0181 343 8121

Events Co-ordinator:

Steve Sidaway
Tel: 0181 943 1249

Membership Secretary:

Mike Barker,
59 Dunsford Close,
Swindon. Wilts SN1 4PW
Tel: 01793 541634

Members' Advertisements:

Ian Higginbottom,
5 Templewood,
Ealing,
London W13 8BA
Tel/Fax: 0181 998 1594

Committee Secretary

Guy Peskett
13 Warneford Road
Oxford
Oxon
OX4 1LT
Tel: 01865 247971

From the chair

Bulletin of the British Vintage
Wireless Society
Volume 24 No.2 Summer 1999

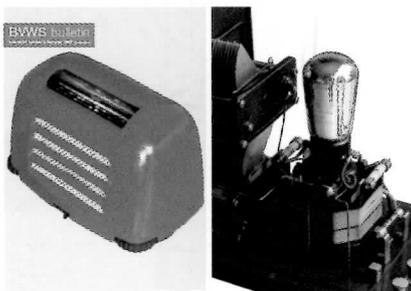
www.bvws.org.uk

Copyright: No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means without the prior permission of the publishers, The British Vintage Wireless Society. Copyright may also be the property of contributors.
©1999 British Vintage Wireless Society

Separations by Cutting Edge
Printed by Apollo

Honorary Members:

Gordon Bussey | Dr A.R. Constable
Ray Herbert | Jonathan Hill
David Read | Gerald Wells



Front Cover: KB FB10 'Toaster' in red bakelite.
Rear cover: Detail of BTH-Mazda twin stage valve set.

Front cover photography by Carl Glover
Rear cover photography by Mark Groep
Graphic Design by Carl Glover

Assistance by Robert Chesters, Ian Liston-Smith and Ian MacWhirter

Contents

- 1 KB FB10
- 2 Advertisements
- 3 A £10 bargain
- 8 History of GEC and the Marconi-Osram valve
- 9 The Wayfarer's Tale
- 10 Pat Leggatt estate auction at Christies
- 11 Transistor Radio Auction
- 12 Harpenden Auction and AGM
- 13 Vintage Radio and the Internet
- 14 Collecting old Wireless for the Blind Sets
- 17 Vacuous Thoughts
- 18 The BTH-Mazda Twin stage Valve
- 20 Odeon Styling
- 24 Using a radio with a digital read-out as an alignment aid
- 25 A Big Breakfast for the BVWS Only just in
- 26 Triode valves in Radio Receivers part two
- 30 Knobs to you too!
- 31 Book reviews
- 32 Collectors Luck?
- 34 Letters
- 36 BVWS Minutes
- 37 Back issues, Advertisements
- 38 News & meetings, Advertisements
- 39 Advertisements
- 40 BTH-Mazda Twin stage Valve

I start my term as Chairman, with enthusiasm for the year ahead. It was great to start with the delivery of Jonathan Hill's publication 'History of the British Vintage Wireless Society' at another busy Harpenden auction. I am very glad to report that We now have extra help in the field of publications from two well-known members, Robert Chesters, Ian Liston-Smith and Ian MacWhirter. This will take a lot of the pressure involved in producing the bulletin off Carl's busy shoulders, leaving him more time for the Bulletin design and development. You will find Both Ians' contact details here in the bulletin. On a more sombre note. I was saddened to hear of the passing of Duncan Neale. A long standing member of the Society. Duncan always had a smile for everyone. I always enjoyed his wit and banter at the meetings. I will miss him.



Distribution of the new Publication 'History of the British Vintage Wireless Society'

If you haven't already got your copy by attending this years BVWS affiliated meetings copies be available by post at a cost of £4 to cover p&p. They are available from me at the usual address. The members Handbook for this year has been revised and now lists members interests and other useful information. Later this year we will be re-publishing the long awaited BVWS Posters and they will be available at all

meetings. It is hoped to also re-publish a lot of Norman Jackson's excellent drawings, many of which appeared as Bulletin front covers, and some which have never been seen, although this may not appear until next year. The Summer Harpenden on the 6th June will see the Resurrection of the Restoration Contest. Details of this can be got from Steve Sidaway. This years September Harpenden will see a new feature where we will be holding a Workshop session in the small hall, where Servicing and restoration questions will be answered by Gerry Wells and other experts. A repair session will be held, where fault finding will be carried out and minor repairs 'on the spot' will be done, although if you are bringing something along it would be better to let us know in advance as to what the item is, so that spares and information specific to the item can be on hand.

Australian adventure

Recently on Holiday 'Down Under' in Melbourne, Australia I decided to take the opportunity to visit

Right: the premises of 'Resurrection Radio', Melbourne, Australia, which Mike Barker decided to visit whilst on holiday in the area.

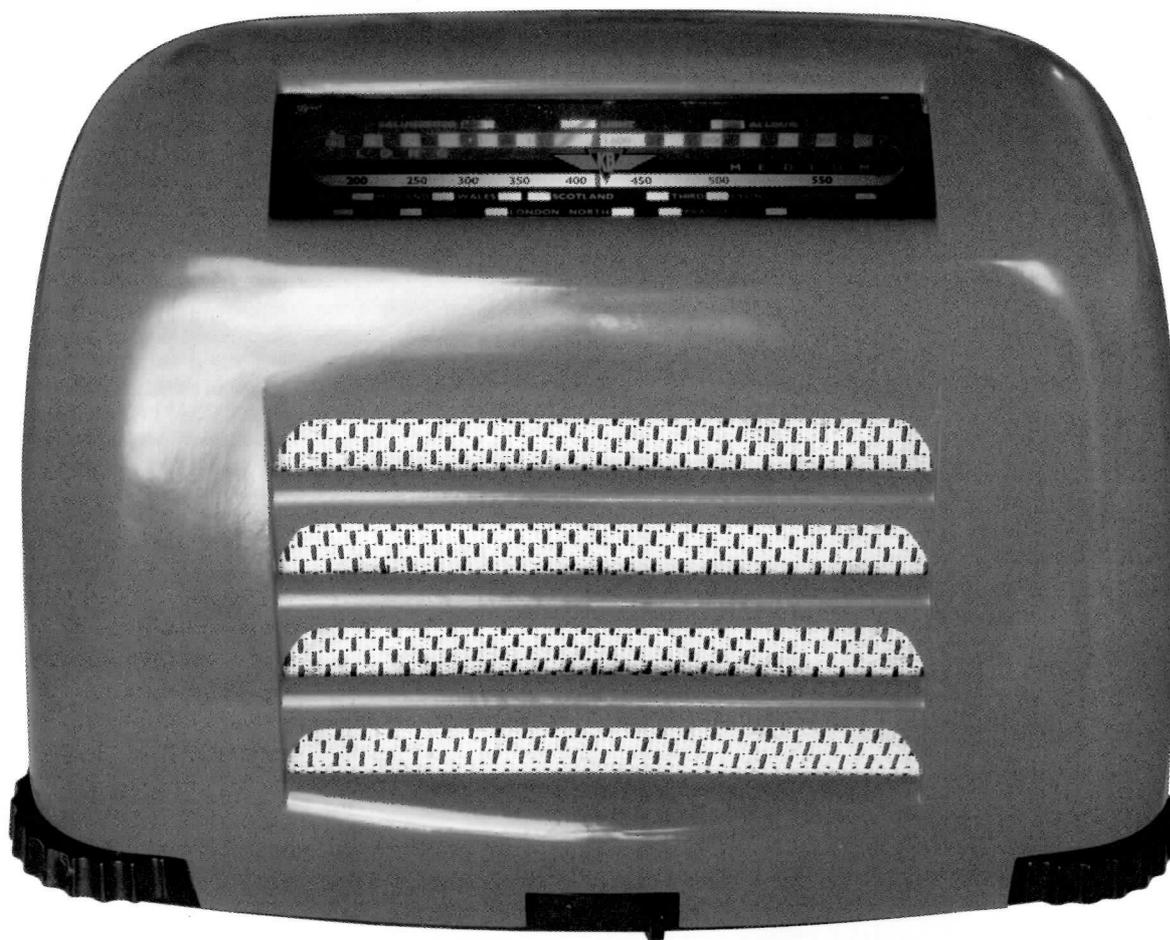
Below: The workshop of 'Resurrection Radio'.



A £10 Bargain

by Ian Liston-Smith, photography by Carl Glover

I was recently lucky enough to buy another minor classic from the vintage radio era: a Kolster Brandes FB10. This particular LW/MW model is not particularly attractive, but it is quite popular amongst collectors - known to many as the 'toaster' due to its shape. I found it hidden on the floor behind some musty 1960's encyclopaedias in an 'Antiques & Collectibles' emporium by the Thames. I picked it up and closely examined it for damage. The cream coloured case was a bit dirty but had no cracks or burns, the dial was in perfect condition, and the set even had a mains lead - with plug! The asking price was only £10. Trying not to look too eager, I handed over the money without haggling!



When I opened it up at home the chassis was very grubby, but the only work carried out in its past seemed to be a replacement HT smoothing capacitor. The dial cord was also broken, but that was an easy matter to replace, or so I thought...

I tested the valves, but all were low to very low emission. The 6BE6 also suffered from poor heater-cathode insulation. Nevertheless, I put the set on my variac and over the period of an hour or so, slowly wound it up to the full 240 volts. Even at 150 volts, it was showing signs of life. And at full mains voltage, while not exactly 'lively' it was clear that there was nothing seriously wrong that a change of valves and capacitors would not put right.

Being one of those who shamelessly remove all the wax paper capacitors, I set about the task in hand. A couple of Hunts capacitors were also spotted and

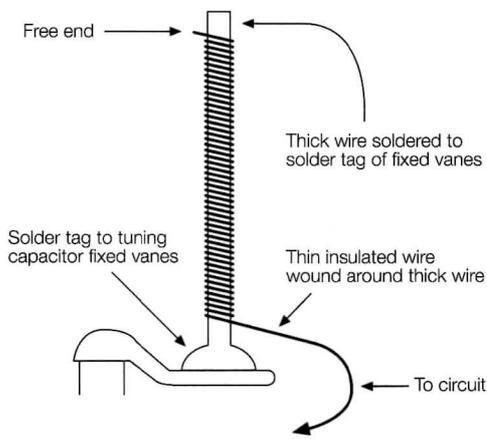
mercilessly eliminated from the chassis too. Although these capacitors usually look fine, they can cause nasty problems! In my experience their meanest trick is to go low in capacity from say a marked 0.01 μ F to an actual few hundred pF. While generally not being sufficient to prevent a circuit from operating completely, such a change in value can cause inexplicably low gain or instability in a stage.

In the early days of my vintage radio interest, my first experience of Hunts capacitors caused both these faults in an Ultra Troubadour. To make matters worse, the instability disappeared when any meter or scope probes came close to the chassis. I therefore have the deepest suspicion and dislike for these nasty capacitors.

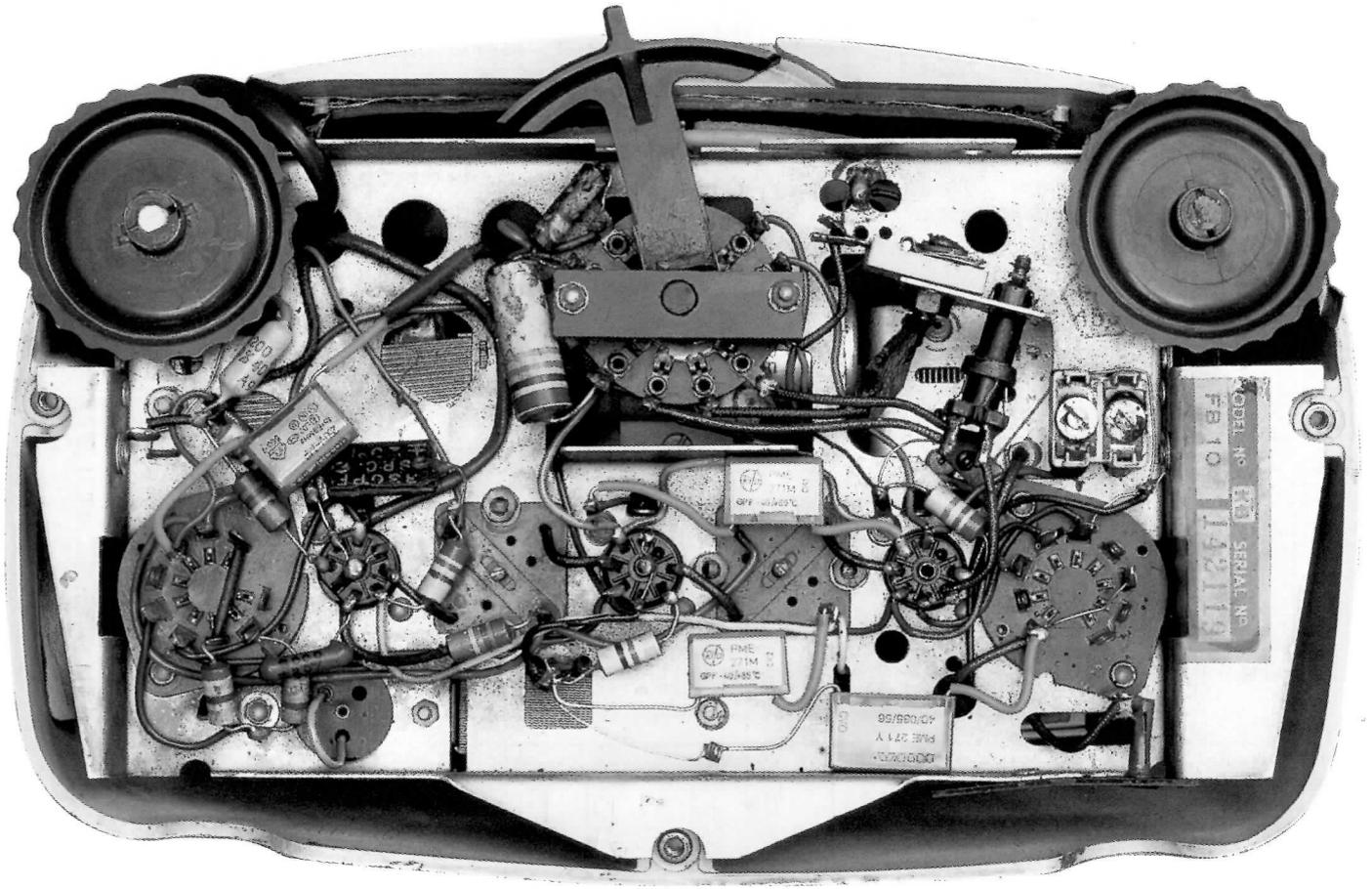
Once the new capacitors were all in place, other minor faults on the FB10 chassis were cleared. These included the re-

heating of any doubtful looking original soldering and repairing a broken wire to the dial bulb. The dial illumination on this model is a slightly unusual arrangement in that it is attached to the pointer and moves with it up and down the scale. Unfortunately, the wires seemed not to have been chosen for their flexibility and so one had broken away from the bulb holder after years of 'to-ing and fro-ing'. A new set of valves was also added and the DC voltages were checked and found satisfactory.

Back to that dial cord... They can be a bit awkward as many readers will know, but with experience one gets a feel for them. Referring to Trader Sheet 969 the stringing on the FB10 chassis did not look any trickier than average. However this did not turn out to be the case. The Trader sketch was adequate, but once correctly strung the pointer just did not budge. The cord merely



Above: Trimmer capacitor used in KB FB10



slipped round the control spindle. There is a significant amount of drag on the dial cord path since it pulls not only the pointer, but the bulb, its holder and wires. To make matters worse, the FB10 has no little pulleys to ease the passage of the cord, just fixed guide posts. All this contrived to prevent the pointer from moving at all.

Even after polishing the guides, greasing the pointer rail and lubricating the capacitor bearings, it was still barely moving. I considered roughening up the surface of the control spindle with a file to give more grip to the cord and greasing the three guide posts. However, I was reluctant to do this as it shouldn't really be necessary. Presumably it was not required when the set was new. The problem with putting grease on the guides is that it can creep along the cord so that it no longer grips where it should, ie. - at the control spindle. But against my better

judgement I did it anyway and roughened the spindle and this did the trick. Perhaps the original cord was waxed, although what remained of it looked like normal dial drive cord.

So now to the re-alignment. The FB10 has an IF of 422 kHz, so I was unable to use the wobblator as this was just outside its range. As it happened this was not a problem as age had only slightly affected the tuning of the IF stages and they just needed a slight tweak with the aid of a signal generator. Unfortunately sensitivity was still rather low, particularly at the high frequency end of medium wave so this suggested that the aerial circuits alignment needed attention.

The trimmers used in this set were not the conventional compression types, but those which consist of thin insulated wire spiralled for about half an inch or so around another much thicker one (see diagram). The surface

area between the two wires forms the capacitance.

These must be cheap to make, but are difficult to adjust as you cannot easily add more wire, and although they can be unwound to reduce their capacitance, if too much wire is disturbed, it won't go back readily. Fortunately I had a couple of conventional 40 pF trimmers that were soldered in place of the original types. When these were properly adjusted, sensitivity and calibration were significantly improved - and if anyone has cause to inspect the inside of the set, they look as if they might have always been there.

During the alignment process however, the radio had bouts of serious acoustic feedback—howling suddenly for no apparent reason. One reason was the fact that the loudspeaker was mounted tightly against the chassis. I placed a small rubber grommet on

"TRADER" SERVICE SHEET

969

KOLSTER - BRANDES FB10

CHARACTERISTIC of the "occasional" type of receiver, the K-B FB10 is a 4-valve (plus rectifier) 2-band superhet midget with a self-contained aerial. An unusual midget feature is the use of a mains auto-transformer, which avoids the generation of a considerable amount of heat. The receiver is designed to operate from A.C. mains of 200-250 V, 50 c/s, and the consumption is quoted at 40 W.

Release date and original price: September 1950; £8 17s. 1d. Purchase tax extra.

COMPONENTS AND VALUES

CAPACITORS		Values	Locations
C1	Aerial coupling ...	0.001µF	G5
C2	L.W. trimmer ...	70pF	F3
C3	1st I.F. trans. tuning	88pF	B2
C4	L.W. tracker ...	440pF	F4
C5	M.W. tracker ...	550pF	G3
C6	L.W. trimmer ...	120pF	F4
C7	V2 cath. by-pass	0.05µF	F4
C8	A.G.C. decoupling	0.1µF	F5
C9	2nd I.F. trans. tuning	88pF	B2
C10	I.F. by-pass ...	330pF	E4
C11	I.T. decoupling ...	0.1pF	E5
C12	A.F. coupling	0.01µF	D4
C13	A.F. coupling	0.003µF	D4
C14	H.T. smoothing	32µF	B1
C15	H.T. smoothing	32µF	B1
C16	Tone correction ...	0.03µF	E3
C17	Mains R.F. ...	0.1µF	C1
C18	M.W. aerial trim	60pF	A1
C19	Aerial tuning ...	60pF	A1
C20	M.W. osc. trimmer	60pF	A1
C21	Oscillator tuning	---	A1
C22			
C23			

* Electrolytic. † Variable. ‡ Pre-set.

RESISTORS		Values (ohms)	Location
R1	V1 osc. C.G. ...	22 k.	G4
R2	Osc. stabiliser ...	220	G4
R3	V2 G.B. ...	47	F4
R4	A.G.C. decoup. ...	2.2 M	E4
R5	Volume control ...	500 k	C1
R6	V3 C.G. ...	10 M	D4
R7	V3 grid stopper ...	220 k.	D4
R8	V3 anode load ...	220 k.	E5
R9	V4 C.G. ...	470 k.	D5
R10	} H.T. smoothing {	* 5.9 k.	E3
R11		† 1.8 k.	E3
R12	V4 G.B. ...	240	D5
R13	V5 surge limiter ...	† 113	C2

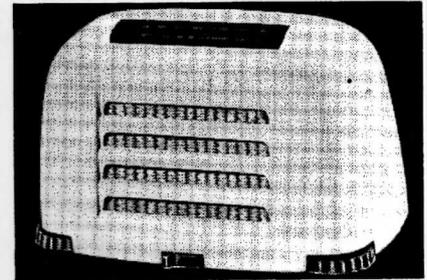
* Comprising two 8,200 ohms resistors in parallel in series with a 1,800 ohms resistor. † Comprising 150 ohms and a 470 ohms resistor in parallel.

OTHER COMPONENTS		Approx. Values (ohms)	Locations
L1	Aerial coupling ...	Very low	B2
L2	Frame aerial ...	Very low	B2
L3	L.W. loading coil	11.0	A2
L4	Osc. coil, total ...	7.0	G3
L5	} 1st I.F. {	20.0	B2
L6		trans. { Pri.	20.0
L7	} 2nd I.F. {	20.0	B2
L8		trans. { Sec.	20.0
L9	Speech coil ...	3.0	B1
T1	} Primary, total ...	400.0	B2
T2		Secondary ...	Very low
S1-S5	Mains trans., total	153.0	C1
S6, S7	Waveband switches	—	F3
	Mains sw., g'd. R5	—	C1

CIRCUIT DESCRIPTION

Tuned frame aerial input by L2, C21 for M.W., or with loading coil L3 for L.W. Provision for the connection of an external aerial via C1 and L1. First valve (V1, Brimar 6BE6) is a heptode operating as frequency changer with electron coupling.

A single oscillator coil L4, tuned by C23, is used for M.W. and L.W. bands, but it is tapped via S4 for waveband



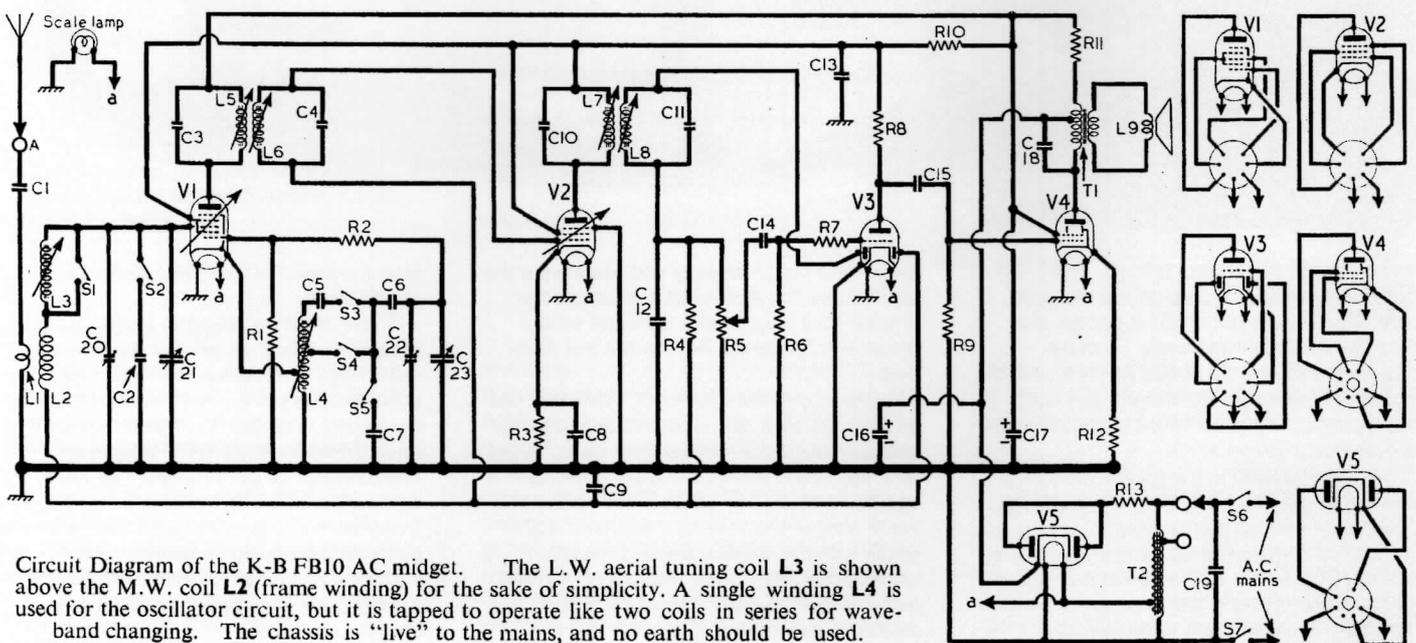
switching, only the lower section being for M.W. A second tapping, to V1 cathode, provides reaction coupling.

Second valve (V2, Brimar 6BA6) is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings C3, L5, L6, C4 and C10, L7, L8, C11.

Intermediate frequency 422 kc/s.

Diode signal detector is part of double diode triode valve (V3, Brimar 6AT6). Audio frequency component in rectified output is developed across manual volume control R5, which is also the diode load, and passed via coupling capacitor C14 and stopper R7 to grid of triode section, which acts as A.F. amplifier. I.F. filtering by C12. The D.C. potential across R5 is fed back via decoupling resistor R4 to the F.C. and the I.F. stages, giving automatic volume control. The A.G.C. line is connected to the second diode, which prevents it from acquiring a positive potential.

Resistance-capacitance coupling by R8, C15 and R9 between V3 triode and beam pentode output valve (V4, Brimar 6V6GT). Fixed tone correction in



Circuit Diagram of the K-B FB10 AC midget. The L.W. aerial tuning coil L3 is shown above the M.W. coil L2 (frame winding) for the sake of simplicity. A single winding L4 is used for the oscillator circuit, but it is tapped to operate like two coils in series for waveband changing. The chassis is "live" to the mains, and no earth should be used.

Circuit Description Continued

anode circuit by C18. A measure of negative feed-back is introduced in the output stage by the omission of the usual cathode by-pass capacitor.

H.T. current is supplied by I.H.C. rectifying valve (V5, Brimar 6X5GT), which is fed from the same heater tapping on the autotransformer T2 as the rest of the valves. Smoothing by R10, R11 and electrolytic capacitors C16, C17. Residual hum is neutralised by passing H.T. current to the early stages through part of the output transformer T1 primary winding.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver while it was operating from mains of 230 V. The receiver was tuned to about 200 m., and the volume control was at maximum, but there was no signal input.

Voltage measurements were made with an Avo Electronic Testmeter, which introduces no appreciable voltage drop, and allowances must be made for other meters. Currents were measured at points of low potential, but it was necessary to shunt the meter leads with a 0.1µF capacitor while measuring V1 screen voltage.

Valve	Anode		Screen		Cath
	V	mA	V	mA	
V1 6BE6	205	2.5	100	2.8*	—
V2 6BA6	100	7.6	100	3.4	0.5
V3 6AT6	55	0.18	—	—	—
V4 6V6GT	235	34.0	205	3.0	9.0
V5 6X5GT	225†	—	—	—	250.0

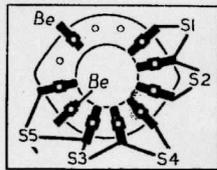
* By-pass meter with 0.1µF capacitor when taking this reading. † Each anode A.C.

DISMANTLING THE SET

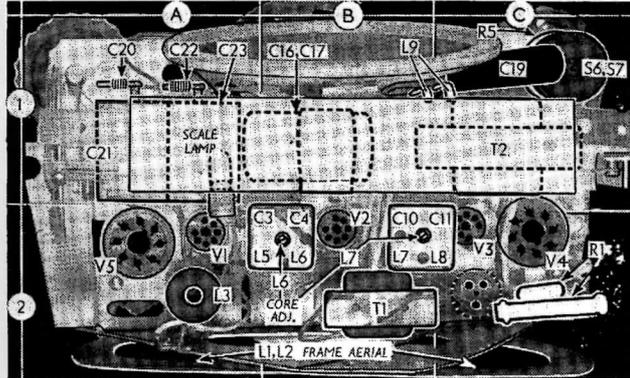
Removing Chassis.—Remove the three 4BA bolts with washers securing the chassis and black base cover to the carrying case, and withdraw chassis.

When replacing, lay the carrying case face-downwards on the bench, position the chassis in the case and replace the base cover with the semi-circular projections at the top and the rubber feet outside.

Removing Speaker.—Remove white scale backing plate by springing its two fixing brackets slightly towards each other; remove the 4BA nut and bolt with shake-proof washer holding bracket at top of speaker to metal strip supporting cursor carriage; unsolder speaker leads and pivot speaker



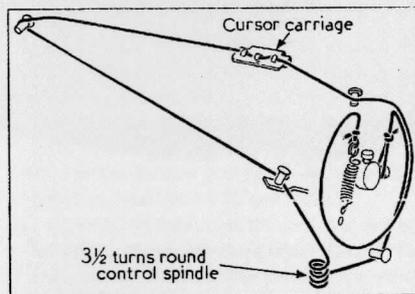
Right. Plan view of the chassis, with the speaker and frame windings in position. C20 and C22 are made of wire. Above. Diagram of the waveband switch unit, as seen in the under-chassis view below.



forward to disengage it from the lower chassis clip. *When replacing,* the speech coil tags should be at the top right-hand corner, viewed from rear of chassis.

GENERAL NOTES

Switches.—S1—S5 are the waveband switches, ganged in a rotary unit beneath the chassis. The unit is indicated in our under-chassis view, and shown in detail in the diagram



Sketch of the tuning drive system, as seen from front with gang at maximum.

inset on the left of our plan view. Here it is drawn in the same position as it occupies in the underside view.

On M.W. (control lever to the left, moving switch rotor anti-clockwise as seen in our diagram) S1 and S4 close; on L.W., S2, S3 and S5 close.

S6, S7 are the Q.M.B. mains switches, ganged with the manual volume control R5. **Oscillator Coil L4.**—This is a single wind-

ing tapped for M.W. operation and for reaction coupling. The total D.C. resistance is 7 ohms, of which the upper section in our diagram accounts for 4 ohms and the lower section 3 ohms. The cathode tapping is something less than 1 ohm up the lower winding.

Scale Lamp.—This has a clear tubular bulb and an M.E.S. base. It is rated at 6.5 V. 0.3A. Its holder rides on the cursor carriage.

Chassis Divergencies.—In the makers' manual, V2 cathode is taken directly to Chassis. R3 and C8 have been added to the circuit since it was printed. R10 may be a single resistor of about 6,000 ohms or it may be made up of two or more resistors. In our chassis it was made up of two 8,200 ohm resistors in parallel, connected in series with one of 1,800 ohms. In the same way, R13 in our sample was made up of a 150 ohm and a 470 ohm resistor connected in parallel.

Drive Cord Replacement.—About four feet of high quality flax fishing line, plaited and waxed, is required for a new drive cord. It is run as shown in the sketch (col. 2) where the complete system is shown as it would be seen from the front right-hand corner of the chassis when the gang is at maximum capacitance.

A start is made by looping the end over one of the boss screws on the gang drum, so that the cord can be pulled against the gang stop to keep it taut. The cord runs over four smooth guide posts, no pulleys being used.

CIRCUIT ALIGNMENT

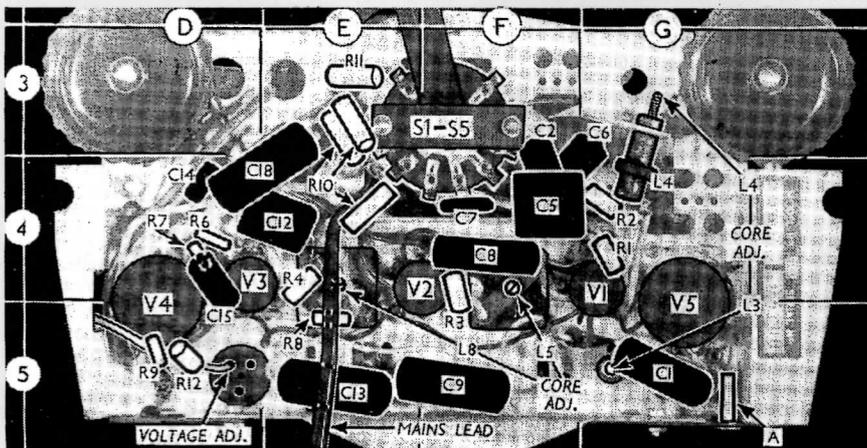
To gain access to the core and trimmer adjustments, the chassis should be removed from its carrying case, and as the tuning scale remains in the case alignment points are marked on the white celluloid scale backing plate.

I.F. Stages.—Switch set to M.W., turn volume control to maximum and gang to minimum, and connect signal generator, via a 0.1 µF capacitor in each lead, to control grid (pin 7) of V1 and chassis. Feed in a 422 kc/s. (710.8 m) signal and adjust the cores of L8, L7, L6 and L5 (location references E4, B2 and F4), in that order, for maximum output, reducing the input as the circuits come into line to avoid A.C.C. action. Repeat these adjustments.

R.F. and Oscillator Stages.—Check that with the gang at maximum capacitance, the cursor coincides with the mark at the right hand end of the white celluloid scale backing plate. C20 and C22 are trimmed by adjusting the amount of wire with which they are wound, although very small changes can be made by sliding the outer wire along the inner. Transfer "live" signal generator lead to aerial socket and replace its 0.1µF capacitor with one of 200 pF.

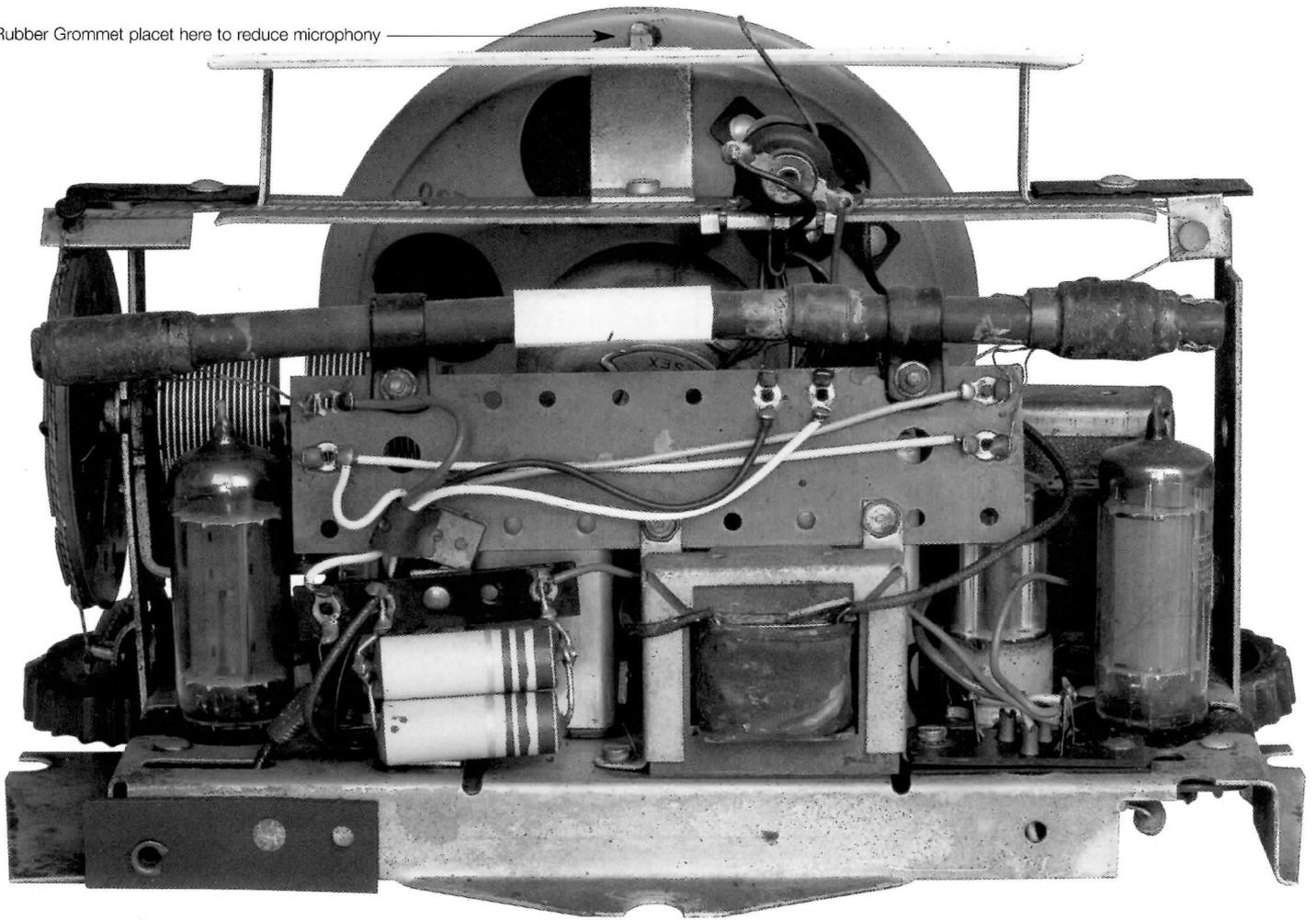
M.W.—Switch set to M.W., tune to the 500 m. alignment mark on scale backing plate, (right centre), feed in a 500 m. (600 kc/s.) signal and adjust the core of L4 (G3) for maximum output. Tune to the 214.3 m. alignment mark (extreme left), feed in a 214.3 m. (1,400 kc/s.) signal, and adjust C22, C20 (A1) for maximum output. Repeat these adjustments.

L.W.—Switch set to L.W., tune to the 1,714 m. mark (left centre), feed in a 1,714 m. (175 kc/s.) signal and adjust the core of L3 (G5) for maximum output.



Under-chassis view. A detailed diagram of the S1-S5 switch unit appears beside our plan view.

Rubber Grommet placet here to reduce microphony



the mounting lugs between the chassis and speaker which improved things significantly, but at high volume it returned, particularly now that the radio's sensitivity had been improved. As is usually the case, the real reason turned out to be a one of the valves; the (new!) 6BE6 was highly microphonic so had to be replaced.

I washed the case and knobs, repainted the card insert which sits at the top of the case on the opposite side to the dial and replaced the tatty speaker cloth. The dial was also carefully cleaned and now the little FB10 looks as if it had just come out of the box. I have no reason to believe that it doesn't work as good as new either.

A final note regarding safety. Anyone

familiar with the FB10 will know that although it is not particularly elegant, it is reasonably well built. It has a strong case and a thick plastic base-plate.

The set uses an auto transformer rather than a resistive mains dropper, and is therefore still a 'live chassis' design. Care should be taken to ensure that the chassis locates properly around the three raised sections of the cabinet moulding to isolate the fixing screws from the live chassis.

it was a generally enjoyable model to work on and now looks and works like new. It's been a very long time since I picked up such a good set so cheaply - a real bargain at only £10!

New book: 'History of GEC and the Marconi Osram Valve'

By Fin. Stewart,
"Cockerdale" 380 Bulga Rd, Wingham
N.S.W. 2429, Australia 02/65530328

This new book on radio valve history follows on the heels of the second edition of the popular "Illustrated History of Philips Radio Valves to 1935" by the same author. It gives an idea of the growth of one of the largest electrical companies in the world in the first part and details the introduction of one of the most

important products made by the company - the Marconi Osram valve - first developed in World War One, in the second part. There are many photographs and illustrations of early valves and other products made by the company, particularly in the field of radio, as well as copies of early advertisements. Also valve tables are listed including British Government types, European equivalents and the Canadian "Empire" series.

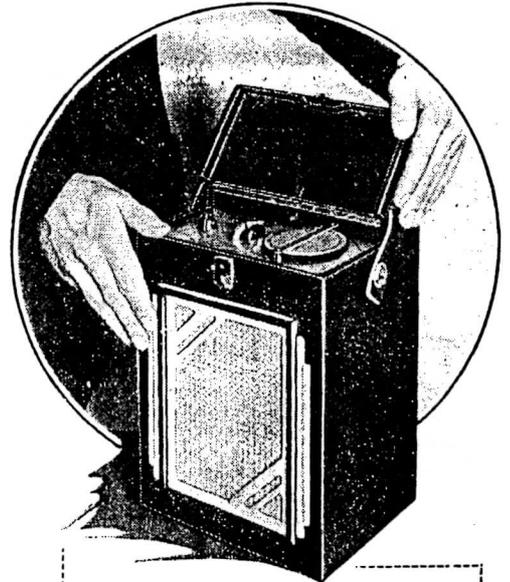
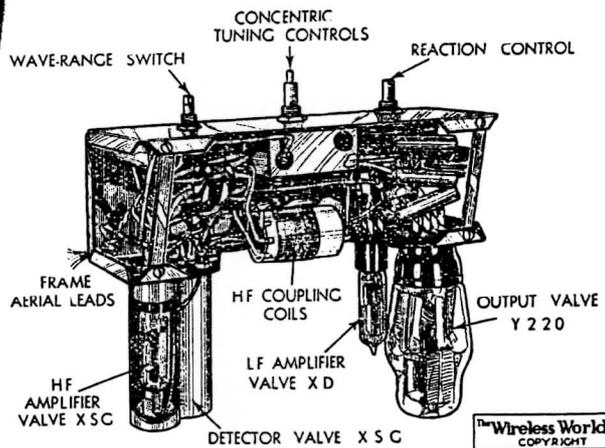
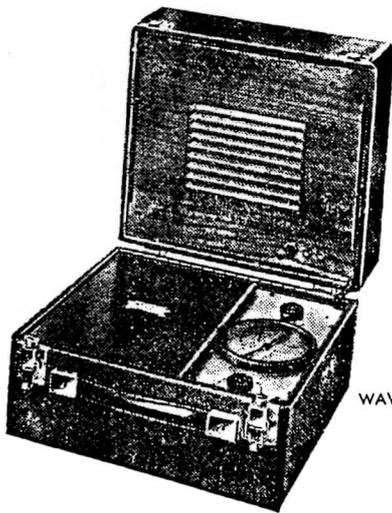
All in all 132 pages of fascinating reading for any radio historian.

Available from the author at the above address \$22 including postage (Overseas air mail \$25).

The Wayfarer's Tale

by Geoffrey Dixon-Nuttall

The first "Wayfarer" portable appeared in 1935, when it was reviewed by "Wireless World". This was a typical portable of the time, but it was much smaller than usual, being about 8 X 9 X 5. This was at a time when the next smallest, the Roberts M4B, was "less than a foot cube". The size was achieved by cutting down the HT battery to a special type of 70 volts, and also by using three of the miniature Hivac valves, the output valve being a normal pentode. A miniature one was made by Hivac, but perhaps it wasn't good enough. Tuning was by solid dielectric capacitors with concentric knobs, and a moving iron speaker was used; a bit crude, but good value at 5 guineas. This set was marketed by London Electrical Appliances in the Old Kent Road, or later at 62, Glengall Rd., SE 15.



FEATURES.— *Circuit.*— Screened-grid RF amplifier—triode grid detector with reaction—triode AF amplifier—tetrode output valve. *Controls.*—(1) Tuning. (2) Volume (reaction). (3) Wave-range and on-off switch. **Price.**— 7 guineas. **Makers.**— London Electric Appliances Ltd., 62, Glengall Road, Old Kent Road, London, S.E.15.

There seems to have been an association between Wayfarer and Hivac, because the next model, the "Major" ("Radio Radio" fig. 552), used the Z 220 Harries output valve, made by Hivac. (Did anyone else use it?). This was actually a tetrode, and Mr. Harries got cross with Wireless World when they listed it as a pentode. This valve had pentode characteristics as the spacing between the anode and the screen was "critical", in fact very large. (I came across one the other day.) I imagine the only advantage of this was that it avoided paying royalty on the pentode patent. All the valves in the "Major" were standard size, this time.

The "Major" seems to have been a success, and judging by the number still around, was made in quantity. It was a pretty little thing, with a lid and lock. A cunning device in the form of a locking bar ensured that the back was locked when the lid was, so nobody could steal the batteries.

This set still keeps turning up, which is surprising as the special batteries disappeared years ago, and were certainly not available post-war. Apart from the special

HT battery the accumulator was an odd little thing which lay down under the speaker. The HT battery had no sockets but brass strips made contact with others in the cabinet. (If one was being a purist, it could be said that a 70 volt battery is impossible; probably 69 volts in fact.) Even the bias battery was special, being a special 4.5 volt type. All the sets I have met have had the battery leads extended to reach more normal batteries outside the cabinet, so it must have been thought worth the effort.

This set was offered in seven colours, but they are usually black. I have even met one in French polish! It has also turned up with the name "Melba" printed on the dial, instead of Wayfarer.

This set was an improvement on the original, as it not only had ganged tuning but a moving coil speaker, but the price had gone up to seven guineas.

In 1937 the latest "Wayfarer" was actually on the Hivac stand at Radiolympia. It was now a suitcase type called the "Grand", using three Hivac miniatures and the pentode.

I know very little about this set, in fact it

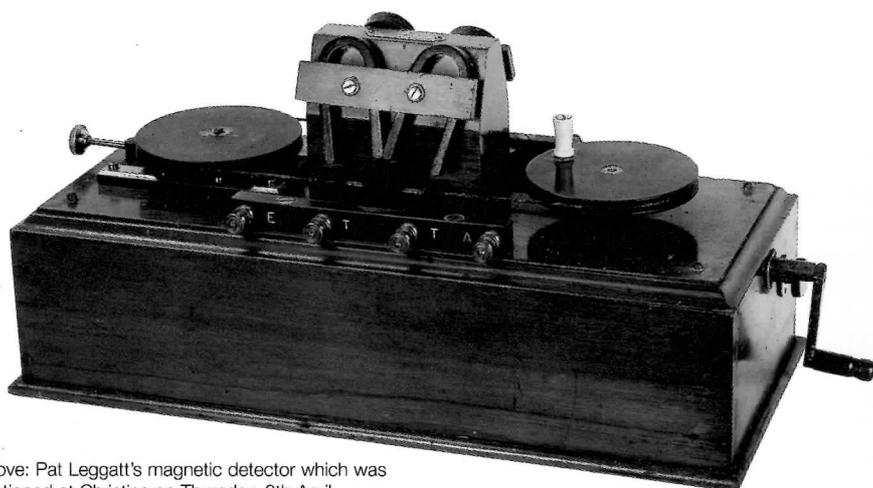
seems that not many were made. In the "Wireless World" 1938 guide to portables the makers were given as "Gambrell Communications, Broomhill Rd., SW18.", but it is stated that the set was marketed by Hivac. (The firm of Gambrell are chiefly notable for making the first mains set.) The Wayfarers used the same circuit, a four valve TRF with a screen grid RF stage. It seems that disaster then struck, as in the same magazine for the following month appeared a small ad. announcing that Gambrell and Wayfarer service could be carried out "by the original employees" at McKinlay Electric Manufacturing Co., 75 Upper Richmond Rd., SW 15.

So who actually made it? The chassis is nicely made and the cabinet is attractive, and it sold well. It may in fact have been too cheap; portables are fiddly things to make, and they may have misjudged the labour costs. Probably dealers didn't like stocking the special batteries.

Anyway, as I said they are attractive little things, and make an interesting addition to anybody's collection.

Pat Leggatt estate auction at Christies

Market place report - by David Read



Above: Pat Leggatt's magnetic detector which was auctioned at Christies on Thursday, 8th April

Right: Pat Leggatt



Pat Leggatt's Will revealed that with the exception of some archive material bequeathed to the British Vintage Wireless Society, his collection of wirelesses and wireless related items was to be auctioned by Christie's at South Kensington. Christopher Proudfoot, the Director in charge of the general field of Mechanical Music, Scientific Instruments and Wireless, has perhaps the best experience in the country to be the Auctioneer of such an important collection, so there is no doubt that the venue was well chosen. Most of the serious viewing was done on Wednesday April 7th the day before the auction and not surprisingly it had a BVWS feel about it. Not only were many members present to look for opportunities, but much of the equipment was familiar since Pat had often exhibited items, and had also acquired a good proportion of his collection at Harpenden or other meetings of the Society.

Even casual viewing of Pat's stuff would reveal that he was not interested, by and large, in original condition. For instance many of the items on view had open circuit LF transformers and Pat had wired in R.C. coupling capacitors and resistors, and used modern wire terminating in DIN plugs for power supplies. Pat would argue, correctly I believe, that such things could easily be removed, thus returning the set to how it was (if that was what Conservators wanted). One also needs to remember that he was an expert historian placing circuits in their historical context, and would often change things to show that later ideas worked better. When exhibiting equipment Pat provided technical explanations along with the item name on the caption. His views were therefore 'visible' through the caption and many such captions were still attached to the items to be auctioned. An example will show what I mean: Lot 118 was an early Westinghouse Aeriola 1 valve set engraved 'Licenced for amateur and experimental use only'. Pat's caption was still with the set and read 'The receiver is variometer tuned with no shunt condenser, relying on aerial

capacitance and strays for resonance'. I did not open the set to discover whether Pat had provided a shunt condenser, but I know that he was quite happy to do such modifications on appropriate occasions to demonstrate his point! Museum Curators would of course faint with horror at such alterations, but I favoured Pat's marvellous ability to explain technical matters to laymen and use his equipment to further his role as a teacher.

Pat's major interest in placing the technical side of a set in its historical context also went hand in hand with a lack of any strong interest in the visual or aesthetic qualities associated with cabinets. He did not, therefore, generally nitpick over the condition of a set he wanted, and there is no doubt he should have looked after his stuff rather better than he did, because the general condition of his collection was in danger through how it was stored. In this respect, his shed was not always waterproof and some of his collection had deteriorated because of damp. He was conscious of this (indeed Alan P. Carter often chivvied him about it) but he never quite got round to fixing the roof properly.

Having said this, there were also items in fine condition and the foregoing remarks are not criticisms of the man, far from it. The essence of Pat was that he disliked the elevation of form over substance and was fond of saying 'fine words butter no parsnips'. We should remember that he did not buy wireless items because of an interest in their value or with resale in mind. Nevertheless, it can't be denied that at the viewing most of us thought that prices would not be high because people are indeed very fussy about original and good condition before digging too deeply into their pockets.

But auctions are famous for being unpredictable and on the day of the sale the sentiments at viewing were proved wrong. Prices were high enough to cause most of the experienced dealers not to buy, in spite of having the contacts to move the stuff on, both here and abroad. Surprisingly, one collector/dealer - not normally active in pre-

broadcast and 20s equipment - bought almost everything that made over £500 and some of the prices were very high indeed. £9000 was the hammer price for the Magnetic Detector and £9000 for the Marconi Balanced Crystal Receiver (not a Pat Leggatt item). Perhaps this is understandable as these are famous and exceptional objects but other items also did well. The Marconiphone V2 receiver - a benchmark in vintage wireless prices - made £1000 and a Fellophone Super Two receiver and amplifier also made £1000 for the pair. These high value items were actually in very nice condition but more surprising was the £700 made for the Fleming oscillation valve, not only open circuit but mostly broken away from its ES base. I remember this item at Harpenden not much more than a year ago, where Pat bought it for £350 at which time the base was still good. Other high points were: a crystal/valve receiver by Walters Electrical complete with GPO registration ticket - £950; an MCR 1 miniature communication receiver - £400; an Edison Bell Crystal Set and Note Magnifier - £750; a Cosmos Radiophone Type VS 2 with A4 Amplifier in an oak case - £850; a Sterling Anodion Type R2283 - £800; a Sterling Anodion Four Type R - £1900; an Adey 4 Portable with patent key - £220; a Marconiphone Type 81 - £950; a Burndept Ethodyne Superhet with 7 valves and frame aerial - £950; an AJS Type F6 Receiver - £1100; a Mark III Tuner - £2000.

The Pat Leggatt Collection comprised 105 lots in all and the highlights shown above are only a small selection from a fascinating mixture ranging over everything from books through wavemeters to radios and valves, with most of the equipment being from the early period. Just a few radio items in this auction were not Pat's, and looking completely out of place amongst his early equipment was an Ekco A22 in its black circular bakelite case. Unfortunately there was a small crack (thought not obvious) beneath the case. It made £380.

Transistor Radio Auction, Shaftesbury, Sunday 28th March

by Jonathan Hill

Left: the scene viewed from above of the 700 or so transistor radios making up the auction at Chapman, Moore and Mugford, Shaftesbury, Dorset.



fig. 1

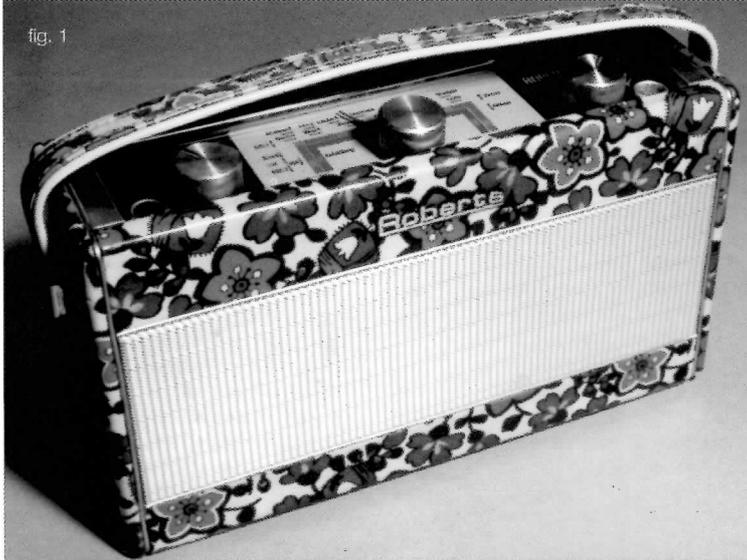


fig. 2

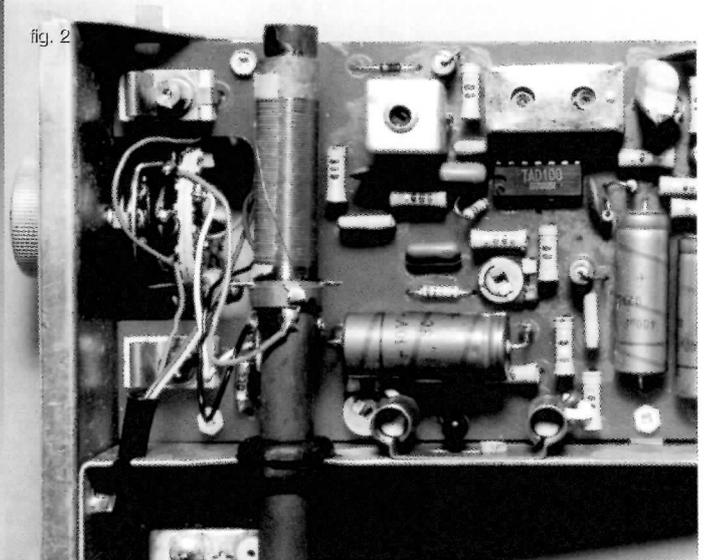


fig. 3



fig. 4



This was the first auction to be held in this country entirely devoted to transistor radios, and I know before it got underway that the auctioneers were expressing a little nervous apprehension about such an untried and pioneering event. The sale was conducted by the Shaftesbury firm of Chapman, Moore & Mugford, already well known to those of us in the south of England for their interest in wireless, and comprised over 700 transistor radios divided up into 421 lots, all taken from the late Phil Savage's collection. The sale began at 12 noon and by the time I got there about half an hour before the kick-off, around 60 people were already taking up their positions in the saleroom. All the lots were assembled on tables lining the sides and the centre of the auction room - it was an

astonishing sight and a tribute to the efforts of one man's obsession (or should I say, a part of his efforts, for Phil Savage's valve radio collection has still to be sold).

Most of the major British transistor radio manufacturers were represented here with comprehensive selections of Hackers, Dynatrons, Roberts, and Ever Readys etc. While many lots went for between £10 and £20 (eg. a Roberts RIC1 @£12, a Dynatron TP33 @ £10 and a Hacker Autocrat @ £8), the better sets did produce better prices of course, and one, the Hacker Herald, Model RP10, (the first model off Hacker's production line in 1960), eventually going for £76 after some fairly aggressive bidding.

In my catalogue, I had pencilled in three sets I was particularly interested in buying for

my collection and I am pleased to say I was lucky enough to acquire them - much to my relief, none of the 'heavyweights' of the transistor collecting world had turned up to the auction, so I had a relatively clear field. Lot 256 @£140, was a 1968 Roberts RIC1, the first British radio to employ an integrated circuit. Why I wanted this particular set was that it was one of those rare 'sixties specials' - covered in a hippy-style shiny floral fabric which, like another one I have in a Paisley patterned fabric, was available only from Harrods Department Store in London (fig.1). The microchip used in the circuit of this set was a TAD100 (fig.2), and this housed 11 transistors and 11 resistors incorporating mixer, oscillator, IF amplifier, ACG and audio pre-amplifier stages, all fitting snugly into a

7mm x 18mm shell. In addition, a 'regular' OC44/45 was used as the audio driver, with an AC187 and an AC188 as the complementary output pair.

Lot 307 (@ £24), was a Trancel Six, Model TR-60 (fig.3) - a 6-transistor shirt-pocket set in wonderful condition, complete with its display box, earphone, leather case and instructions. This was made under the Trancel label by Toshiba in the early 1960s and I don't think it had ever been used.

Probably the highlight of the auction for me was Lot 298, a Regency TR-1 which I bought for £135. This was in a mottled green case and came with its original presentation

box and sales leaflets and looked from the outside to be in mint condition.... until you shook it that is, for everything was loose inside and part of the loudspeaker was missing. However, a little note I later found in the box written in Phil Savage's handwriting revealed that in 1955, at a time when Britain was yet to produce its first transistor radio, Sir George Doughty (of Doughty Technical Developments*, an electronic design firm in the south of England), had specially imported the set from America and in the privacy of his laboratory, had stripped it right down for analysis in the hope of discovering if it was possible to make a similar set. This little

piece of industrial espionage didn't bear fruit, but the set was saved, its story recorded and its place in history assured!

All-in-all, a most enjoyable sale, and well-done to Messrs. Chapman, Moore and Mugford for their courage and foresight, and also to the auctioneer who made a brave and at times amusing attempt to battle his way through endless tongue-twisting model numbers and manufacturers' names.

*Does anyone have any further details about Sir George Doughty or his design



Harpenden auction and AGM, Sunday 7th March, 1999

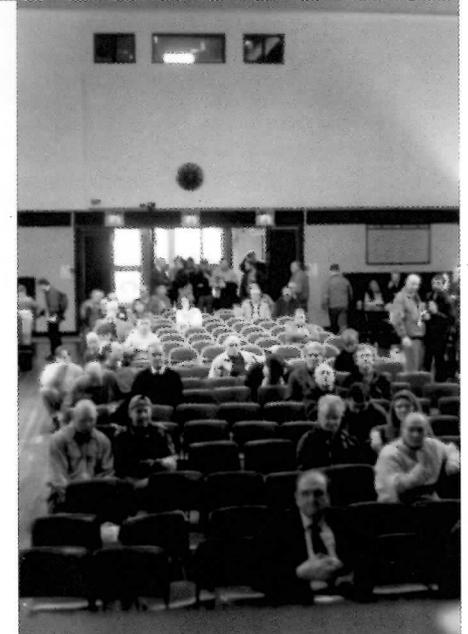
The Eric Morecambe Memorial Hall, hosted the first Harpenden BVWS meeting of 1999; attracting a large amount of members hopeful in returning home with a new 'project' freshly acquired from the day's busy auction.

This meeting was the first time where Jonathan Hill's astonishingly comprehensive 'History of the BVWS' was made freely available to BVWS members, it made quite an impact upon the visitors.

The AGM went by smoothly and heralded the departure of David Read from an active role on the BVWS Committee. Mike Barker now officially occupies the position of

Chairman of the Committee.

Notable items in the auction included a slightly damaged Champion 'Venus', a BTH three valve receiver, a J. Rigaut Crystal Set, an Emerson Midget, a damaged Ekco AC64, a Defiant M900, a pair of Ekco 'trees', an AJS Symphony 3, a Philips 830 B Superinductance, an Ekco AC74, a Pye model V2 bakelite television, a GEC 'handbag', a Philips 630, a Musicmaster cathedral, a KB 'Masterpiece' and a Crosley 'Super Buddy Boy'. There is definitely a thinning of twenties sets appearing in the Harpenden auctions and this can possibly be attributed to the fact that most equipment from this time is happily displayed in collections with no aims toward reselling.



Vintage Radio and the Internet

by Ian Liston-Smith. ian@wireless-sparkes.freemove.co.uk



I expect it has been said before, but it is still true - there is something incongruous about using the latest communications technology to collect information about vintage radio.

As the Internet has become cheaper and more accessible, it was suggested that the Bulletin could do with a good page showing some of the best vintage radio websites from around the world. This is what I have attempted to do with this article. But I shall also briefly cover vintage radio email lists and newsgroups.

It is not possible to compile a complete list of all relevant websites, as there are literally hundreds covering every aspect of vintage radio communication. Neither can such a list ever be complete, as new ones appear almost daily whilst others disappear.

I have included those containing more than just a few pictures and concentrated on British sites, giving them a brief description of what can be found at each one.

The names and URLs of a broad spectrum of overseas vintage radio sites then follow. Most of these are full of detail and many contain links to related websites. A number of the US sites also have Real Audio files of their old radio shows.

All the URLs worked when I compiled this list in April and were cut and pasted from the pages to avoid typing errors. If you know of any good sites which I have overlooked, please email the URLs to me at the address above with a brief description of the site.

British Vintage Radio Sites

The British Vintage Wireless Society

www.bvws.org.uk/
This has information about the society, lists the contents of a number of recent Bulletins and other BVWS publications, etc. Not much content yet as the site is under construction, but like many web pages, it is put together by volunteers so it will take time to develop. I know that there is no shortage of ideas of what could be added to the pages eventually.

Send information to Mike Barker at Murphymad@aol.com regarding any suppliers of parts, services, information, etc., relating to vintage radio that you know of - from whatever source. These will then be added to the BVWS site.

Vintage Radio Repair and Restoration

www.vintage-radio.com/
This is part of Paul Stennings website and covers just about every aspect of vintage radio from

describing the functions of various components, explaining valve numbering to giving pages of extremely useful technical information for those who wish to restore their own radios to full working order. There are also pictures and descriptions of many sets. The site is so extensive that Paul has also provided the web site as a single downloadable ZIP file, so it can be viewed at leisure off line.

The Vintage Radio Emporium

www.radio.mcmail.com/
A nicely laid out site with a good contents page. Also has an items for sale and wanted section.

Vintage Radios UK

www.valve.demon.co.uk/
Another British site containing information on valves and resources section listing suppliers of vintage radio books and magazines and other items of interest.

Mr Transistor

ourworld.compuserve.com/homepages/Andrew_Wylie/
History of the development with some pictures and descriptions of early transistors.

Radio & Bakelite Resources in the UK and Worldwide

www.accessone.com/~philn/worldsrc.htm
This site does not devote itself entirely to radio, but I include it because it has an excellent list of UK component suppliers, particularly of valves and contact information for vintage radio societies from around the world.

National Vintage Communications Fair

www.angelfire.com/tx/sunpress/index.html
Information on the venue, the range of items offered for sale with dates, times and admission charges.

Peters Vintage Radio Daze!

web.ukonline.co.uk/p.foden/index.htm
Tips on vintage radio repair, descriptions of restoration and some very nice photographs. Also has a good list of links. Includes a virtual tour of the On the Air Broadcasting Museum.

Savoy Hill Publications

freespace.virgin.net/tudor.gwilliam-rees/
The site of the well known supplier of service manuals.

Alan Lord Vintage Radio Collection

www.dundeeccol.ac.uk/Sections/CS/Staff/al_radio/
An interesting gallery of restored British sets and a short description of each with some clear photographs.

The website of Enrico Tedeschi

www.ndirect.co.uk/~e.tedeschi/

Best described by himself:

We will look at the hobby of radio collecting more from the social side of the history of Electronics in general and of the radio in particular, but we'd like to discuss and appreciate the commercial side and the design of electronics products through the ages as well.

Bobs Home Page

www.the-thompson-family.freemove.co.uk/topsite/radio/radiosframe.htm
Shows an interesting collection of portable sets, most of which are transistor with brief details of each.

405 Alive

www.surflink.co.uk/users/arthurdungate/405alive.htm
The site for those interested in 405 line television, early programmes and the restoration of early TV sets.

A selection from abroad:

The Michigan Antique Radio Club

www.antiqueradios.com/
Contains links to 450 vintage radio related sites.

Claudio's Homepage

www.iac.net/~syscon/claudio1.html

The Virtual Radio and Phono Museum

perso.wanadoo.fr/jif/eindex.htm

The Radio Museum Rottenburg

www.rolaa.de/sehensw/radio/radio_e.htm

Museum of Radio and Technology

oak.cats.ohiou.edu/~postr/MRT/

Bellingham Antique Radio Museum

www.antique-radio.org/

The Broadcast Archive

www.olddradio.com/

Phils Old Radios (USA)

www.antiqueradio.org/

Elwins Radio Pages

www.elwins-radiopage.demon.nl/

Antique Car Radio

www.antiquecarradio.com/

Radio Netherlands Antique and Old Time Radio

www.rnw.nl/realradio/links/html/antique_index.html

The Museum of Television and Radio

www.mtr.org/

The Radio History Society

www.radiohistory.org/

Collecting old Wirele

by Maurice Stedman, photography by Philip R. Wragg

It all started several years ago, when the British Wireless for the Blind Fund asked me if I could repair an old two-valve set circa 1929, which was one of the first issued by the Fund. That set was described in BVWS Bulletin Vol. 15 No. 4 dated December 1990. Soon after that, Robert Hawes (the Editor at the time) acquired a different, single valve model for headphone listening issued in 1932, which he described in BVWS Bulletin Vol. 18 No. 4. That set was subsequently donated to the Fund and so a collection of old sets for their archives was initiated.



Through the auspices of the BVWS, eight more sets have become available, of which seven have been restored to working order and one is awaiting attention as both the chassis and cabinet are in poor condition. All will be returned to the British Wireless for the Blind Fund in due course. Brief details of each are given here.

Magnum E301 circa 1929
3 valve TRF battery set 0V2 for separate LS. Circuit very basic with two transformer coupled AF stages.

One of the original large black braille knobs was missing. This was replaced by a replica made by Gerald Wells.

The set was kindly donated by Gerald Wells.

Magnum B1522 circa 1931
2 valve battery set 0V1 for separate LS or headphones.

Cabinet was severely damaged by woodworm and had to be rebuilt: only the lid and internal partitions are original.

Circuit very basic. Faulty intervalve transformer bore the date 21/4/31 on the windings bobbin.

Magnum 3L64 circa 1935
3 valve TRF battery set 0V2 with integral LS. Loudspeaker is by Goodmans (Clerkenwell) Ltd., EC1 and dated 18 Sep 1935.

Magnum 3B6875 circa 1938
3 valve TRF battery set 1V1 with integral LS.

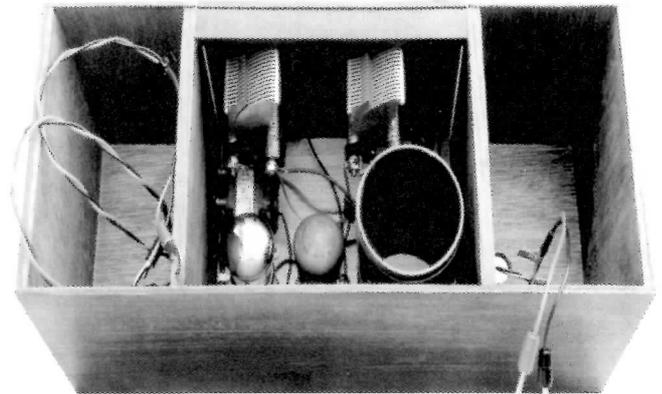
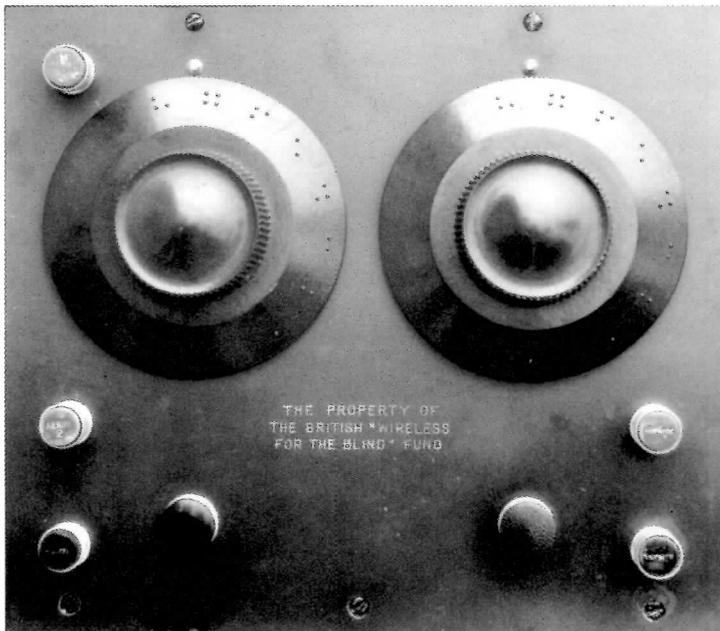
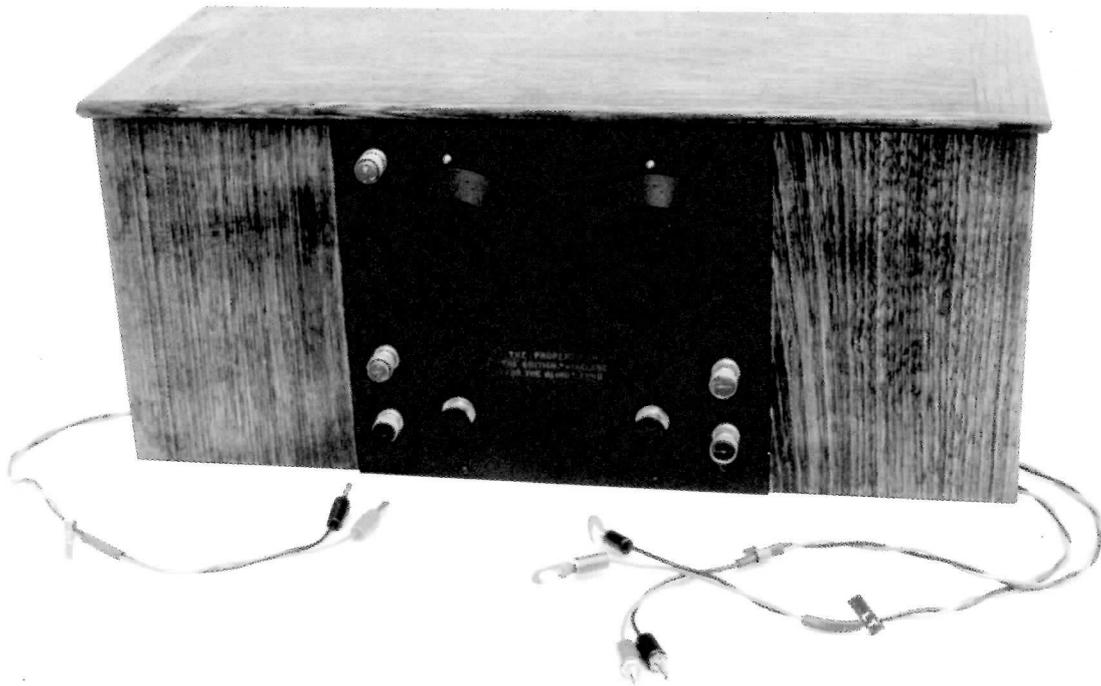
Loudspeaker is by Goodmans (Wembley) Ltd., dated 4 Nov 1938.

Magnum 2L8590 circa 1938
2 valve battery set 0V1 with integral LS. Supplied in original Burne Jones carton. Loudspeaker is by Goodmans (Wembley) Ltd. dated 1938.

This set had the semicircular scale missing and so it was necessary to make one, copying from another set and using a photocopy of the scale to ensure accurate punching from behind of the braille characters.

Magnum 3AS1691 circa 1939 (not illustrated)
3 valve AC mains superhet, plus rectifier, with

ess for the Blind sets



Page 14: Maurice Stedman with his collection of Wireless for the Blind sets which are being returned to the Fund's archives.

This page: Magnum B1522 circa 1931. 2 valve battery set 0V1 for separate LS or headphones. Left: detail of B1522 showing ebonite frontispiece.

mains energised LS.

Magnum 10238 circa 1943

3 valve TRF battery set 1V1 with integral LS. Circuit diagram has a note about the use of wartime components.

The set was kindly donated by Gerald Wells.

Magnum 3A777 circa 1938 (not illustrated)

Loudspeaker is 8" Goodmans dated 28 June 1938 new back to be made with safety contacts.

All these sets were made by Burne Jones and Co. Ltd. of Borough High Street, London SE1 and some have their 'Magnum' trade mark. It has been possible to date some

approximately by a date stamp on their loudspeakers, both Goodmans and Plessey. It has not been possible to identify any clear pattern in the Burne Jones system of numbering.

The technology of these sets is somewhat behind the times for this period; there is only one superhet, dated 1939. Construction ranges from Ebonite panel with baseboard for separate loudspeaker to steel chassis in wooden cabinet with moving coil loudspeaker. Dial arrangements are simple, with large black braille knob and/or braille semicircular scale.

Faults encountered were fairly typical, such as low value or leaky capacitors, resistors out of tolerance, open-circuit

transformer windings, dirty switch contacts, failed valves, mechanical misalignment of tuning capacitors and perished wiring. Some cabinets needed considerable repair and restoration.

Power supplies used for testing the battery sets were: for HT a standard Ekco battery eliminator; for LT and GB a power supply as described in my article in BVWS Bulletin Vol. 19 No. 2 (wrongly titled) built into an old Ekco eliminator case. They make a complementary pair.

This has been an interesting project and I feel that there may be other models from the same era which have survived. I hope that BVWS members will continue to look out for them for me.

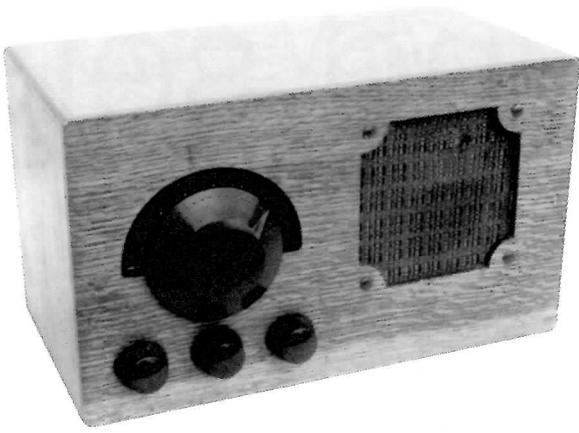


fig.1

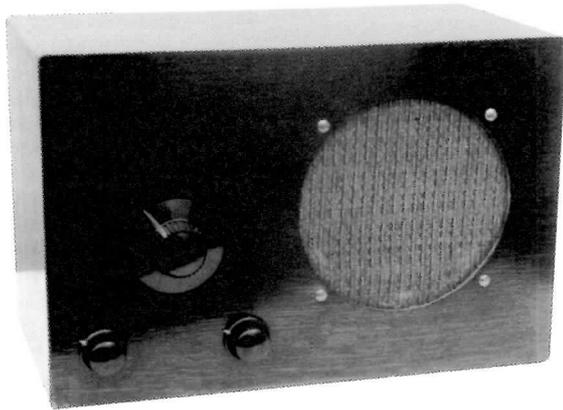
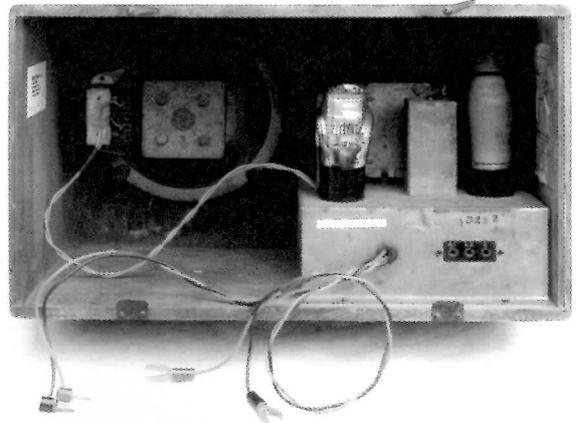


fig.2



fig.3

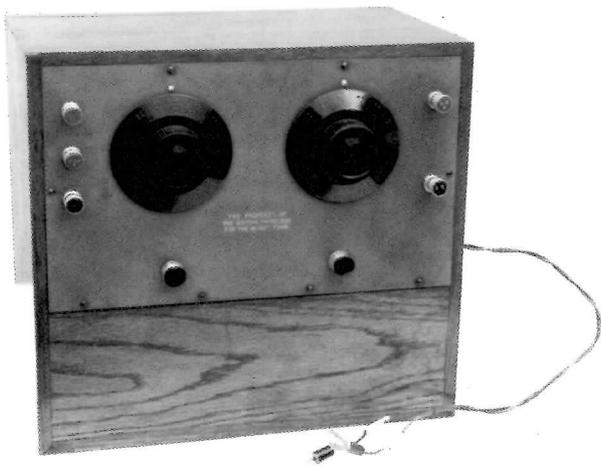
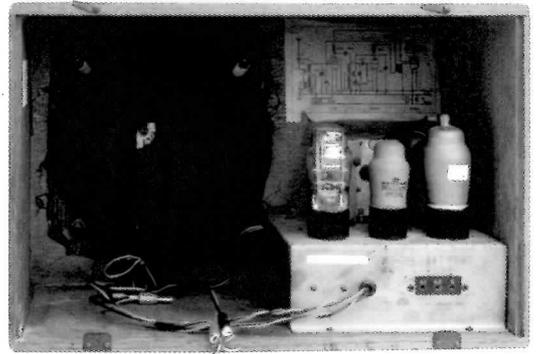


fig.4

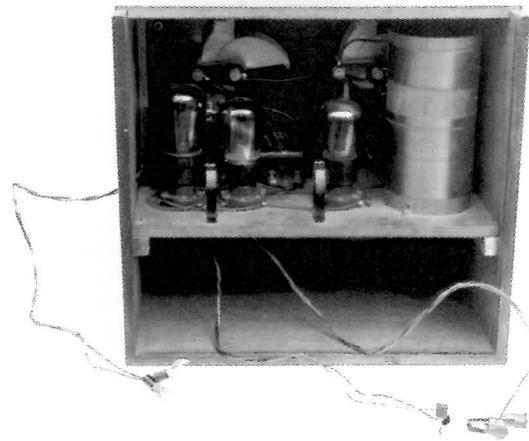


fig.1: Magnum 10238 circa 1943 front and back
 fig.2: Magnum 2L8590 circa 1938 front and back
 fig.3: Magnum 3B6875 circa 1938 front and back
 fig.4: Magnum E301 circa 1929 front and back
 fig.5: Magnum 3L64 circa 1935 front and back

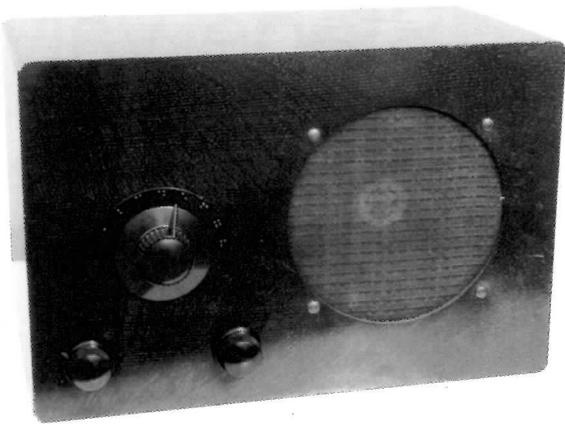


fig.5



Vacuous Thoughts

A light-hearted look at why a vacuum isn't what it might seem by Ian Macwhirter

Transistors work at atmospheric pressure, so why is it that radio valves need a vacuum for effective operation? The earliest experimenters started when studying why it was that an already evacuated lamp bulb after long use grew dark on the surface. The vacuum was there simply because lamp bulb makers knew that in air, a filament raised to incandescence promptly burns out in the atmospheric oxygen.

It still won't do to try with an inert gas in the valve at atmospheric pressure. Assuming we could put enough current into the filament so that it was incandescent enough to boil off electrons but not itself melt, electrons that might escape the filament would simply collide with the gas and maybe none would reach the anode.

Were we to reduce the pressure of the gas to a low enough level that not too many collisions occurred between electrons emitted from the filament and gas, we would, if the gas was inert such as helium, be able to measure the kind of characteristics we know and reducing the gas pressure even further we would have a reliable device. I say inert meaning a gas that will not combine with, or be absorbed by or otherwise poison the filament.

But how much vacuum is required and doesn't a vacuum mean just that, no gas?

Air molecules at normal atmospheric pressure don't fill the space at all, for approximately only 1 millionth (1×10^{-6}) of the space is occupied by oxygen and nitrogen molecules (ref. 1). But they are busy, at room temperature they are rushing about at up to 1000 miles per hour. In the great void between the molecules there is indeed real vacuum - a nothingness, pure aether as it was once fashionable to think.

When we compress air, all we do is to reduce the space between the molecules by putting in more of them, (we cannot compress the molecules) and conversely as we evacuate a valve all we do is to increase the space between the molecules by taking some out. In a nice hard radio valve there will remain perhaps as many as 1 thousand

million (10^6) molecules of inert gas per cubic centimetre of space in the bulb (ref. 2). Some vacuum! But the residual pressure is low enough for good thermionic properties to be measured. Turner (ref. 3) wrote of the perfect vacuum as perfect in the sense that residual gas was so reduced that it had no sensible effect in the normal operation of the tubes

We need to be familiar with a few units of measurement. Atmospheric pressure, to be pedantic, that at sea level at 20°C air temperature, will support a mercury column of about 760 mm in height. Sometimes called barometric pressure. The mercury capillary column stands this high because the pressure of this narrow column balances the pressure of the air outside on the mercury reservoir. Were the air pressure to drop to that found in type R valves, the column will fall until the height of the column descends to within about one millionth (10^{-6}) mm Hg of the level of the mercury reservoir, if we could but see it!

Those of us brought up with the old centimetre, gram, second units of measurement will be happy enough with mm Hg, (Hg being the symbol for mercury) but readers might also recall the unit Torr, after Torricelli whose work in 1643 first started what we now call vacuum physics, which equals 1 mm Hg. So atmospheric pressure is 760 mm Hg or 760 Torr. A radio valve might have a gas pressure of between 10^{-6} to 10^{-7} Torr. Younger readers might be more familiar with the pressure unit Pascal or Newton/sq. m. I am sufficiently old that I had to look up the conversions and for those who are bothered enough, 1 Pascal = 7.5×10^{-3} Torr. But enough of that.

In the period from WW1 to the early 1930s, vacuum pumping became progressively better and pressure just about good enough for a hard valve in WW1 which resulted in around 10^{-6} mm Hg improved by an order of magnitude some 10 years later. Now in the 1990s, it is possible with modern pumps to get down to 10^{-11} mm Hg.

Residual gas in a radio valve has always been a problem and electrons, accelerated as they are towards the anode, crash into the residual gas and ionise it. The negatively charged ions are accelerated towards and bombard the anode and may do no real harm in a small receiving valve aside from heating the anode a little, but the positive ions accelerate to the filament and quite simply smash it to bits. End of valve!

Readers are assuredly familiar with valve testers many of which have a gas button which can detect as little as a few μA reverse grid current. A positive grid current may represent little problem. If a precious type R valve, or other tungsten filament valve, does show reverse grid current, there is no cure, keep the filament at just below normal voltage (measure it, don't guess) to create a good space charge and make the anode voltage as low as possible to avoid the creation of high speed positive ions which are mechanically destructive to the filament. In the above, I have ignored considerations of grid current caused by leakage.

The development of the getter, to get or clean up the gas residue and trap it safely and the use of better pumps in the early 20s allowed vacua of around 10^{-7} mm Hg to be obtained. Morecroft said, in 1921, even with a 'well pumped' tungsten valve there was

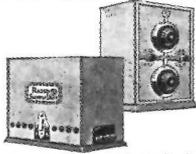
The BTH-Mazda Two-Stage Valve

by Ian Higginbottom, photography by Mark Groep and Tim Voore

December 1928, 1928 THE WIRELESS WORLD 19

A CHRISTMAS OPPORTUNITY

You are doubtless considering the question of Christmas Gifts. Here are four solutions of the problem. Each of the four items has been specially reduced in price for the Christmas Season. Take advantage of this reduction and make a presentation this year that will give immediate and permanent delight.



PRICE REDUCTIONS

Prices are given, but if descriptions of these items, each one will do, all done by clipping out it, and each is a useful and desirable gift reflecting the special sense of the season.

Two Stage Receiver

A receiver with two stages of amplification. It has a large speaker and is a very useful and desirable gift. Price £24 0 0.

8 M. A. Elmhorst

A receiver with 8 M. A. valves. It has a large speaker and is a very useful and desirable gift. Price £23 14 0.

10 M. A. Elmhorst

A receiver with 10 M. A. valves. It has a large speaker and is a very useful and desirable gift. Price £25 0 0.

Three Stage Receiver

A receiver with three stages of amplification. It has a large speaker and is a very useful and desirable gift. Price £26 0 0.

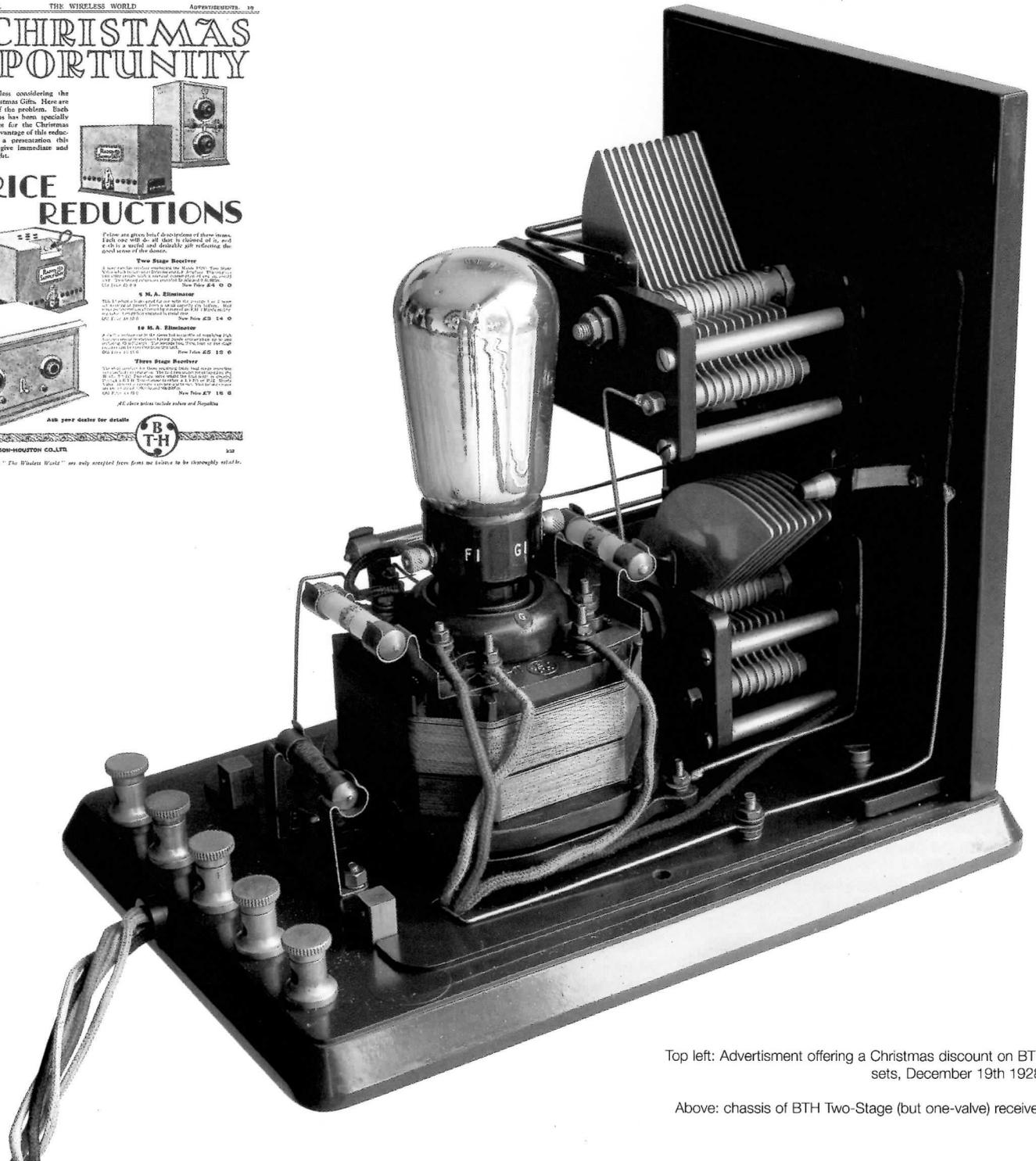
All above prices include valves and fittings.

Ask your dealer for details.



THE BRITISH THOMPSON-HOUSTON CO. LTD.

Advertisements for "The Wireless World" are only accepted from firms known to be thoroughly reliable.



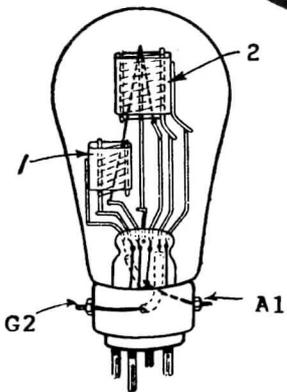
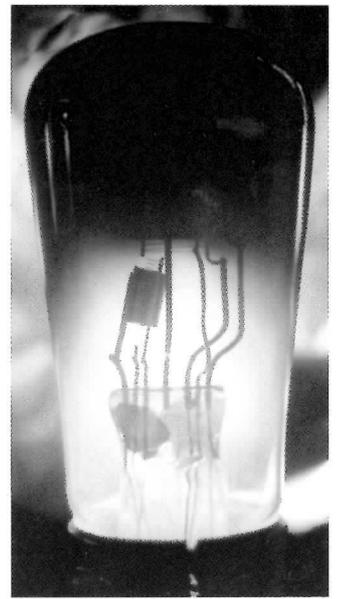
Top left: Advertisement offering a Christmas discount on BTH sets, December 19th 1928.

Above: chassis of BTH Two-Stage (but one-valve) receiver.

To extend the account of some multiple valves given by David Read in our previous issue, the unique BTS 215 is worth describing. As the drawing shows, two conventional triodes mounted in one envelope were made to share separate sections of the same filament. This was an inverted V with one leg longer than the other. The doubled part of the filament at the apex of the V, which therefore had the greater emission, served the audio output stage whilst the bottom half of the single longer leg

served the detector. As the type no. shows, the valve used 0.15A at 2v. The only possible reason for its existence would have been to conserve filament current at a time when accumulator charging was still regarded by most people as an unwelcome nuisance. Any such saving must have been largely offset by the cost of this complex valve, but admittedly I have not seen a price quoted for it, presumably because it was only used commercially in BTH receivers and was not sold separately.

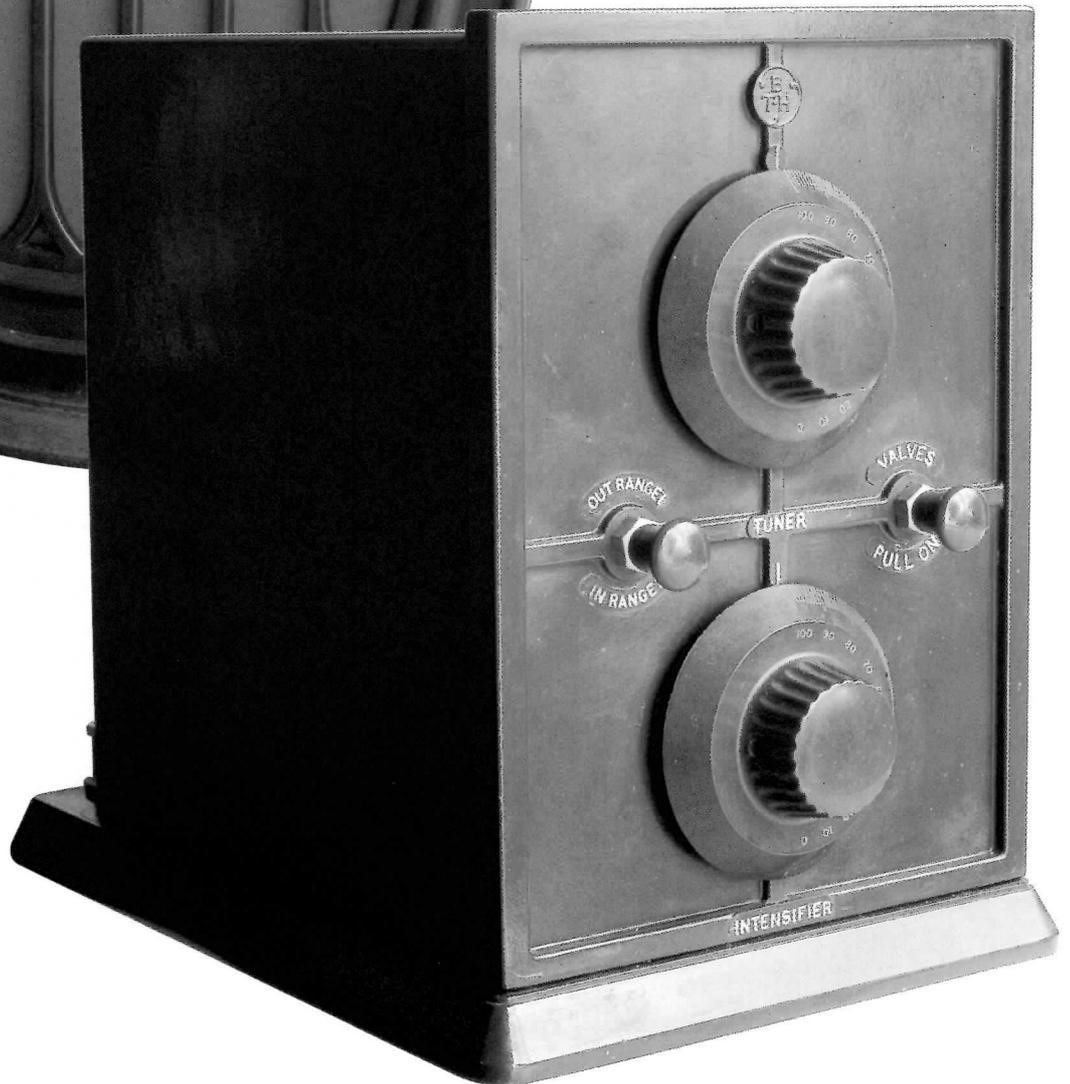
The BTS 215 was the key feature of the BTH Two-Stage (but one-valve) receiver given special mention by Wireless World in their Olympia show report of 26 September 1928. The design is an ingenious example of bakelite moulding. The valve sits in a bakelite holder resembling those used in the BTH Resistor Three of 1927, but modified to support the aerial and reaction windings (medium and long wave) and clips for the resistors and tubular capacitors (all made by Ediswan) of the interstage coupling. By this



Above: Diagram showing structure of BTH Two-Stage valve.

Top Right: BTH Two-Stage valve in action.

Right: BTH Two-Stage set with BTH speaker.



time Ediswan was owned by BTH. All was housed in a compact bakelite cabinet but there were Three-Stage and Five-Stage receivers in conventional wooden boxes. The former had an extra output stage whereas the latter had in addition two (2!) screened-grid (SG207) HF stages before the detector. One of our Members once had the Three-Stage set (lacking the valve!) but I have never heard of a surviving Five-Stage receiver, or seen it illustrated for that matter.

It seems curious that British Thomson-

Houston should have produced these clever but gimmicky designs just when they were about to give up making domestic wireless sets after their merger with Metrovick in the autumn of 1928 to form Associated Electrical Industries. The latest mention I can find of the BTH range is in the accompanying 'Christmas Opportunities' advertisement of 19 December 1928 which shows both Two-Stage and Three-Stage versions, but not alas the elusive Five-Stage model. The price mark-down of around 20 percent suggests

an attempt to clear remaining stocks. Thereafter, no further battery sets appear to have been made by BTH, though their DC-mains receiver was being marketed in 1929 by Ediswan, their subsidiary company, along with some other BTH products such as loudspeakers.

Odeon Styling

by Robert Chesters, photography by Robert Chesters

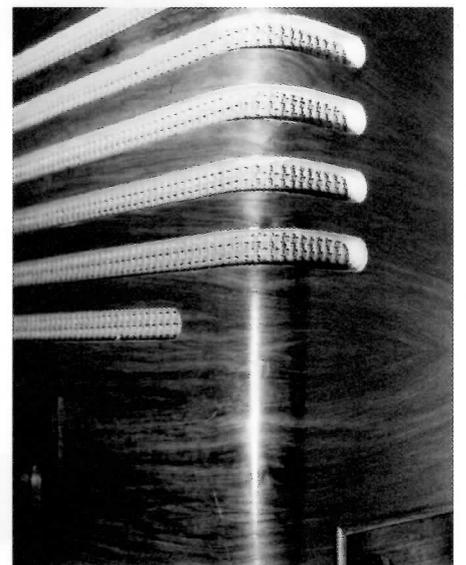
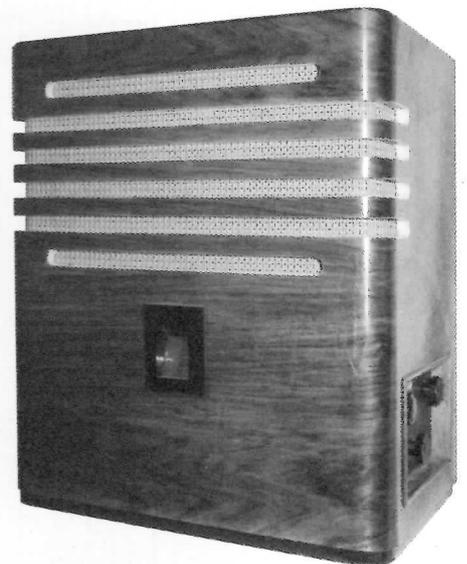


Radio does not exist in a cultural vacuum. As it developed, the things around it influenced it; in the male dominated laboratory it was a panel of instruments in need of constant adjustment and in the more female centred domestic environment it adopted the guise of contemporary furnishings. Because of its' roots in science it tended to look to other fashionable scientific inventions for its stylistic appearance. This has led to a range of unusual speaker and wireless cabinet designs, including interesting camera type objects and "airplane" dials, but most particularly striking is the influence of Art Deco cinema architecture.

A certain type of radio cabinet has been referred to for some time as possessing "Odeon Style" and so I have decided to give this often-banded term a little consideration. There are many different radios that could quite legitimately be called Odeon Style, but I have chosen to focus upon several that I believe to be either the best or particularly worth a little thought. Before I begin, I will apologise to all those who are fans of the Ferranti tombstone series; the Lancastria, Parva and 145, to name but a few, are all excellent examples of the Odeon genre. However, due to my own idiosyncrasies I am going to all but ignore them for the moment. The sets that I have chosen to illustrate the style are the Ekco AC97, the GEC Compact 3 and Mains 3, an AirKing bakelite midget

and, perhaps surprisingly, the R.I. Airflo.

This radio, pictured above, is perhaps not the wireless that comes most irresistibly to mind when one mentions the term Odeon Style, but it is probably one of the best and most subtle examples. Being a bent plywood cabinet it is very much the "odd man out" amongst the sets that I will be looking at. Interestingly enough, the bent plywood effect is only skin deep so to speak. Wrapping a plywood sheet around a conventionally joined cabinet frame creates the effect; this being made of flat sections linked by curved corner slats. Compared with Alvar Alto's bent plywood three legged stools, which utilise the innate strength of the material (only the ends of his chair legs where the bending is going on are actually laminated). To draw a



Left-hand page:

Top left: The Odeon Cinema Northgate Street, Chester looking south-west from upper Northgate Street

Top: The R.I. Airflo 1934 & 46

Above: Detail of above showing curve of speaker fret.

Right-hand page:

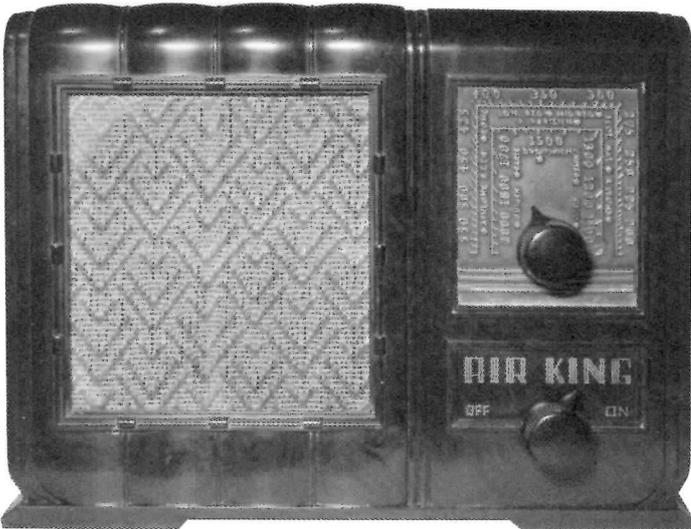
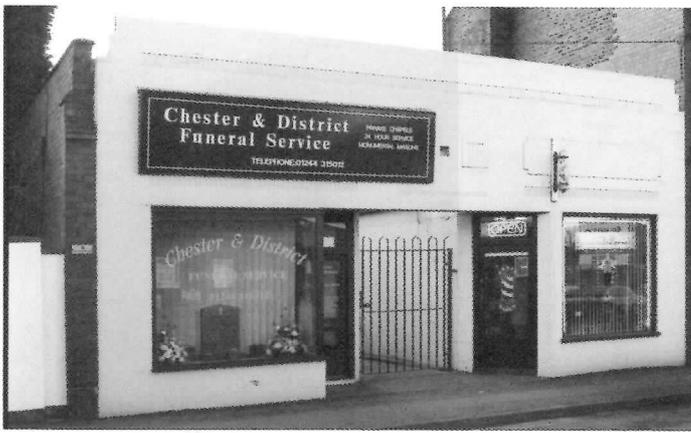
Top left: Chester and District Funeral Service Boughton, Chester

Middle Left: Mid 1930s AirKing midget set

Bottom Left: Detail of the Boughton frontage.

Top Right: Ekco AC97 of 1936 Black and ivory version

Bottom Right: Odeon Cinema Northgate St., Chester



comparison; it would be rather like wrapping plywood around a standard turned wooden dowel and then calling it bent plywood.

Anyway, the point is that the designer of the Airflo uses bent plywood more as a fashionable allusion toward modernity than as a useful and effective material of construction. Similarly, the speaker grill is heavily reminiscent of the curved windows, walls and recessed lighting effects of the art deco cinemas. In the picture of the Odeon cinema in Chester it can be seen that the architect, Robert Bullivant, has accentuated the curve of the building by incorporating horizontal ridges in the brickwork that run the length of the wall. This also serves to allow air to flow along these ridges creating a streamlined effect also very popular in the

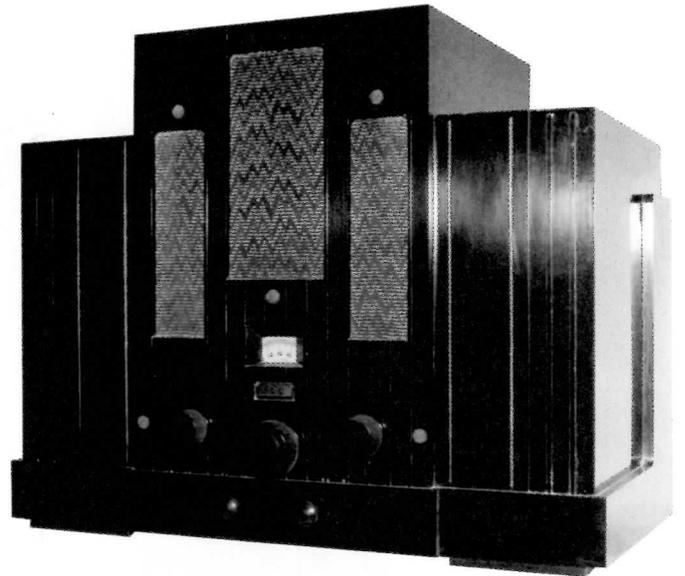
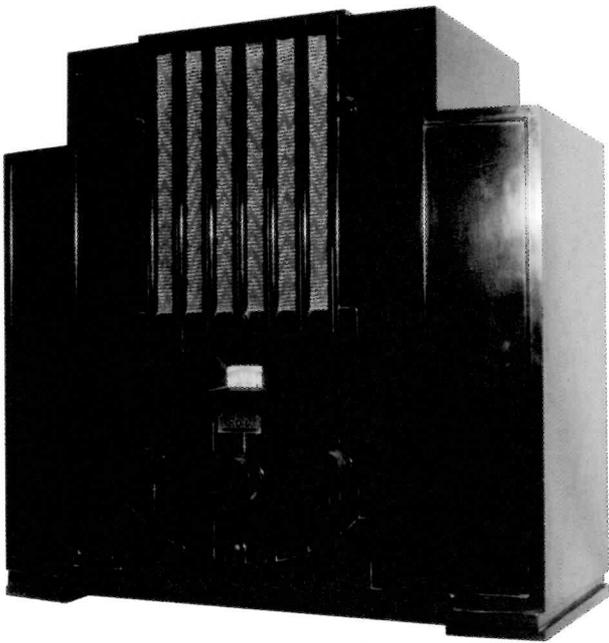
1930's and 40's. This streamlining can also be seen reflected in the sweep of the speaker grill of the Airflo.

Although these radios are often said to be architectural in style, at least that is what I am saying at the moment, this should not be confused with the pretence of being dwellings (although one might derive some innocent pleasure from the belief that little people are living inside your radio set producing programming). Rather they are taking elements of the appearance of the building's exterior or interior and using them to create a vocabulary with which to produce a modern appliance for the fashion conscious inter-war home.

Seen in the above pictures this little AirKing bakelite midset of the mid to late

thirties is not the height of Odeon style but the subtly stepped edges of the cabinet compare well with the building above and below. Neither is of ostentatious appearance but they possess a gentle touch of 30s style that can be easily overlooked in the rush to preserve only the most eye-catchingly important. This particular version of the AirKing has a very attractive dial that is reminiscent of Art Deco elevators (that's "lifts" in Britain); imagine how many floors this building would have had. In the pictures on the right can be seen the frontage of the Odeon cinema and the Ekco AC97.

The frontage of the cinema has two "skyscraper" type towers incorporated into it. These are accentuated and lent the illusion of a little extra height by vertical ridges in the



Left-hand page:

Top left: GEC AC/DC Mains 3
 Top right: GEC Compact 3 battery set
 Bottom : ABC Cinema, Love St., Chester

Right-hand page:

Photograph taken in the late 1930's of the interior of the Odeon Cinema Northgate St., Chester

brickwork similar to the streamlining already covered, after all, the architect would want to be sure that should the wind blow upon his monument then it should flow straight off. These towers serve no practical purpose; it does not increase the useful space available without occupying any extra ground or help to support the building. Skyscrapers were stepped for reasons of zoning regulations concerning loading requirements. Initially, architects envisaged them as sheer faces of glass, as Corbusier said of an unfinished steel framed building "all that remains is to glaze it". The radios and buildings that aped the skyscraper had no such reason for these steps. However, the look works and the public bought it.

Although not as rare in brown as the GEC skyscraper, the Ekco AC97 is, in my opinion, the most striking of all the British Odeon Style sets. For my way of thinking the only radio that can touch a black and ivory

version is the green Harold Van Doren designed AirKing, which with its water fall style ribbing is truly a monumental little bit of deco to be reckoned with.

However, my subject today is the British Odeon set and specifically the AC97. Here we see the beautifully sweeping lines of the black and ivory version (I have never heard of any reliably corroborated non-standard versions, but if you've got a green one please send a photo). This set has various interesting stylistic features. Foremost is the slender, rising tuning scale surmounted by the magic eye tuning indicator. This was the first year that Ekco used the magic eye on a domestic set and the sales literature made much of the feature. For some the AC97 is a cyclops, although if I were to have to do heroic battle against a radio it would not be the AC97. To me it is a skyscraper, proclaiming its neon message from on high. Jesse Collins, like the architect who designed

the Odeon cinema, has placed ridges on the sides of the cabinet. In this instance it is a reference to both streamlining and a heat sink. What is most un-architectural about this set is the elegantly curved top edge at the front of the set. This would be entirely unsuitable for a building but most appropriate for a plastic radio cabinet that needs to be released from its mould. This is offset by the awkward ridges on the sides, which would possibly make extraction difficult, although these break up the surface of the cabinet which otherwise would be very straight and smooth, there being no surface decoration. This has been treated differently in the case of the GEC skyscrapers, the Compact 3 and the Mains 3.

Both the Mains 3 AC/DC TRF and the Compact 3 battery TRF follow the same design philosophy in terms of appearance. Although they were cheap, basic radios their looks speak volumes about the stylistic



aspirations of their times. Neither of these wirelesses has to be the shape that they are. The battery set is the more logical, it needing to house both an accumulator and a high tension battery, oh yes and of course, tucked away in the corner, the chassis itself. The width of the cabinet allows for these to be all out of the way rather than sticking out at the back. There is still no practical reason to make the set look like a little skyscraper. This is what is known as architectonics i.e. pretending to be architecture.

Stylistically speaking, this radio is a real joy. The speaker fret reflects the overall shape of the set and is made up of three "windows" arranged in steps, fitted with cloth that has a jagged "electricity" pattern reinforcing the fact that it is a modern appliance. It is very different in appearance to the mains version although they are clearly intended to appeal to the same market. Technically these radios are pathetic although one has to admire the economies involved.

The Universal 3 is in fact only a one-valve receiver. It employs an Osram U30 rectifier, an H30 detector and a catkin N30 output pentode. All of these valves are pretty obscure and it is rare to find a GEC "Skyscraper" with all of its original valves, or at least the correct line-up. Of course if you are ever brave enough to peek into the back of one of these (dropping it will be costly) you will notice that there is also a barreter - this is not a valve, more a sort of light bulb that just gets hot.

Why am I saying that it is just a one valver when there are at least two in the previous paragraph? Obviously, the only valve that actually relates to radio reception is the detector; the rest of the circuit is either power supply or amplification. So, there we have it, a one-valve receiver. Personally I adore TRFs of the 30's, mainly because I enjoy the participation involved in the receiving experience. Rather than it simply being a case of switch on and play, it is a game of turn on, tune and oscillate. If one uses a good aerial and sets the wireless up properly then quite reasonable results can be obtained. Don't book tickets for a sweep around Europe however. Personally I am interested in all these radios from the point of view of how they look. Yes, that's right, I am

prepared to fork out for an old radio just because it's "pretty".

Also pictured here is the ABC cinema, which is now a bar. One can see that it also has a similar skyscraper tower to the Odeon as seen on previous pages. Again the walls possess streamlined ridges which can be seen at the top of the curved wall. The GEC radios both have similar ridges on the surface of the cabinets emphasising the shape of the silhouette. These lines can also be compared with the friezes on the panelled walls of many art deco public and private buildings. This fulfils many different functions but I think most interestingly it is offering a person who may not be able to afford to totally redecorate their home in the new style of the 30's or perhaps did not wish to, the opportunity to be fashionable.

In the last twenty years or so cinemas have received an even rougher ride than old wirelesses, which at least have dedicated enthusiasts who can squirrel them away until others realise that they were well worth keeping. With the advent of the multiplex and the fall in attendance since the advent of television and particularly the domestic video machine the cinema has had to be adapted and so many of the fabulous interiors have gone forever. I find this a tremendous sadness, as it is my memory of going to the Saturday moving picture shows in the 1970's, when the cinemas still had most of their original interiors, that has encouraged and fed my interest in collecting old wirelesses. I invariably look at a radio and picture it in the foyer or on the set of a "film noir" being operated by Sam Spade, even though the stars I saw were Anthony Newley, Oliver Reed and Keith Chegwin (I was far too young to watch Carry On films).

In the above picture is the original interior of the Odeon Cinema on Northgate Street, Chester, the way I remember it. The curved ceiling is strongly reminiscent of the curve of the AC97, the porthole windows evoke its speaker opening, the recessed lighting recalls the Ritz Airflo and the panelled walls speak of so many different furnishings and radios of the 30's. It also possesses the lines of the GECs, framing the cinema screen.

Collecting radios is not just about whipping out the insides, stripping down the chassis, then losing all the components and

having to rebuild it all from scratch, or, worse still "improving" on the original design through some horrendous bodge job. It can, as I am sure everyone will have heard, be a way of acquiring a significant insight into some of the finest achievements of designers and the contemporary concerns of our past.

These radios reflected the contemporary aspirations toward a fashionable modernity found in skyscrapers and the enormously popular cinemas. Although few cinemas themselves were skyscrapers the key elements of vertical lines, stepped exterior and interior detailing and rounded, sweeping walls spoke a similar architectural language; aiming to associate the cinema with modernity as exemplified by buildings such as the Empire State or the Chrysler building. The radios that took up residence in the most fashionable homes also looked toward the skylines of Manhattan and Chicago for their references. So, why not save yourself a journey and have your own thirties horizon at home by collecting Radio Style.

List of sources:

Art Deco	Bevis Hillier
Art Deco	Richard Striner. Booth-Clibborn editions
In the Art Deco Style	Klein - McClelland - Haslam
The Odeon, Chester	Mercia Cinema Society
Radio Radio	Jonathon Hill
Radio Art	Robert Hawes
Bakelite	Patrick Cook, Catherine Slessor and Gad Sassower.
20th Century Society newsletters	20th Century Society
Design and the Public Good	Serge Chermayeff
The City of Tomorrow	Le Corbusier
Ekco Programme 1936-37	E.K. Cole, Southend
Ekco Programme 1937-38	E.K. Cole, Southend

Using a Radio with a Digital Read-out as an Alignment Aid

By Ian Liston-Smith

Aligning the short-wave band of a vintage radio can be a frustrating business. The main problem being trying not to peak the aerial and mixer circuits on the image signal, especially at the high frequency end of the short-wave band. These difficulties are obviously not insurmountable, as they were (usually) aligned perfectly well in the factories. But in this article I describe a method which I have found saves time in the workshop, with the particular advantage that it gets round the image problem - if you have or can borrow a short-wave radio with digital frequency read-out. This is then used to measure the frequency of the valve radio's local oscillator.

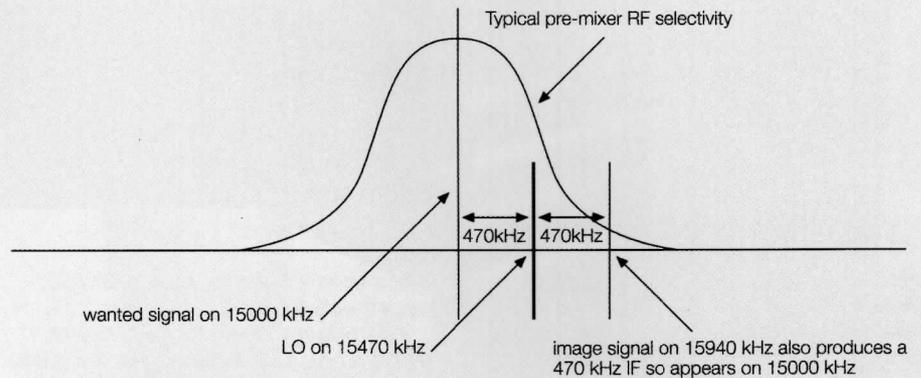
A modern short-wave radio of this type will enable you to carry out the alignment easily. Due to their design, most such radios do not themselves create image signals internally. A model which covers the full short-wave spectrum, not just the broadcast bands, is preferred as will be seen later.

I always go on to re-align a valve set using the service sheet instructions once all the faults are cleared and the pointer datum mark checked. In my experience, rare is the set of forty or fifty years that does not benefit from a thorough IF and RF re-alignment. When the short-wave section is to be aligned, this typical example shows the general principle which I use:

- Switch the valve set on and allow it to warm up for ten minutes or so.
- Assuming that you have an RF signal generator (if not - see later), set it to the required frequency. In this case we'll say the service sheet requires a 15000 kHz (20 metres) generator signal.
- Use the digital radio to set the generator's frequency if necessary, by placing it near the output lead. This is usually much more accurate than relying on the RF generator's own calibration unless it has its own frequency counter.
- Loosely couple the generator output to the valve radio with a short length of wire.
- Set the digital radio to 15000 kHz plus the IF of the valve radio e.g. 15470 kHz.
- On the valve set, move the pointer to the 20 metre mark.
- Adjust the valve radio's short-wave oscillator trimmer until you hear the signal generator from its speaker, coinciding with the local oscillator of the valve radio appearing on the digital radio.
- You will now have the valve local oscillator set to 15470 kHz, and with an IF of 470 kHz, the 15000 kHz signal is properly tuned in. If, while adjusting the oscillator trimmer, you hear the generator signal on the valve radio, without the simultaneous appearance of the valve local

The generation of the image signal in a radio with poor RF selectivity.

For anyone not entirely familiar with the concept of image signals, here is a brief description of how they are generated: The radio is tuned to 15000 kHz. • The local oscillator is running at 15470 kHz. • If pre-mixer selectivity is poor, a strong signal on 15940 kHz [$15000 + (2 \times 470)$] will also be audible on 15000 kHz. Thus the image signal also appears below its true frequency by twice the IF.



oscillator on the digital radio, you have found an image or other spurious response which should be ignored.

- Peaking of the aerial and mixer circuits can now be done, repeating the entire process at the low end of the band as necessary until correct alignment is achieved.

This technique can of course be used at other frequencies on other bands, but it is only at the high end of the short-wave band that image signals tend to be bad enough to be confusing during alignment.

The reason for having full short-wave coverage on the digital radio is so that it will cover the local oscillator frequencies which are likely to fall outside the normal broadcast bands. (I have assumed here that the local oscillator of the set being worked on is above the signal frequency as this is usually the case. But in those rare domestic sets where it is below, the method works just as well.)

For the most accurate alignment, I clip a 'scope probe to the AGC line and adjust all relevant stages for maximum negative voltage. But if you don't have a 'scope, then a multimeter on a low AC volts range across the speaker is almost as good, providing that the generator is modulated with some audio tone. But you must keep the generator's level below the AGC threshold so the sound continues to increase in volume as the sensitivity improves with better alignment.

If you do not have a signal generator, the digital radio will allow you to determine the frequencies of broadcast stations and use them as calibration signals. However, bear in mind that on short-wave, any signal which you select is likely to be broadcast on more than one frequency, although usually on different bands:

- For example, you find a suitable signal on say 15325 kHz on the digital radio. ($300/15.325\text{MHz} = 19.6$ metres).
- On the valve radio you find it appears in three places, twice in the 20 m band (one being an

image for the sake of this example) and once in the 25 m band.

- Providing the calibration is not too far out, it should be obvious that the 25 m band signal is a real broadcast in parallel with the one on 20 m and can be ignored.
- Tune the digital radio to 15795 kHz ($15325 + 470$)
- Tune the valve radio until its pointer is reading 19.6 metres.
- Adjust the oscillator trimmer until you can hear the short-wave broadcast on the valve radio, and the valve radio's oscillator on the digital radio.
- The usual peaking up of the aerial and mixer sections can now be done, using the technique to alternate with stations in the lower part of the band until no more improvements are possible.

When put into words it sounds quite complicated, but I hope it is clear enough. The short-wave bands of the majority of these domestic sets were not much more than novelty selling points and were of limited use. In fact such was the design of many of these radios that even if the band was wrongly aligned on the image, you'd probably be hard pressed to notice!

Incidentally, a frequency counter is of course very useful in the workshop, but it has its limitations. For example, connecting it to any part of the local oscillator of a set being worked on will significantly pull its frequency, making alignment almost impossible. Hence the use of another radio to measure the local oscillator frequency without any connection to it.

A radio with digital read-out can therefore be considered a very useful piece of test equipment to measure the frequency of any RF oscillator.



A Big Breakfast for the BVWS

by Carl Glover

The fifteenth of March 1999 will forever be etched on my mind as the day I had to wake up earlier than one needs to get to the NEC in order to get a choice wireless. Two days previously Mike Barker had rung me up at work to see if I was at all busy at quarter past seven on Monday morning. I replied (rather foolishly) that I was in fact free.

"Good" he replied, "we need a trio of BVWS members for 'The Big Breakfast' who are doing a small piece on the BVWS, a cab will be picking you up at 5.30". Help.

Lo and behold, on Monday at 5.30 am a cab also containing Gerry Wells took us through the twilight streets of London's East End to a run-down warehouse district where 'The Big Breakfast' studios currently reside.

We were shown into an ante-room with a semi-comatose Mike Barker propping up a small table. We were collectively introduced to a startlingly lively researcher who informed us what questions were going to be asked and who-was-going-to-be-asked certain questions. Phew!

We were then led into a room filled with similar 'victims' which had lots of food and drink inside. From what we could see on the monitor the programme was already running and not before long we were in the tiny studio that 'The Big Breakfast' was filmed in.

To describe the show as 'chaotic' is doing it an injustice, it's madness personified, mainly thanks to the presenter Johnny Vaughn and the camera crew.

At about 7.30 the presenter asked us a series of mainly humorous questions which were mainly tackled by Gerry. Mike was asked about two questions and I only got two myself. We were used as background material for the next bunch of guests, fed and whisked off home. What a morning and I still had to get to work on time!



Top left: Mike Barker informing Johnny Vaughn what a potential BVWS member could expect through their letterbox. (Note Fada 'bullet' on mantelpiece and Addison A2A on large footstool.

Top Right: Mike, Gerry and Carl trying not to look too nervous.

Centre left: Gerry talking about the (members only)

Vintage Wireless Museum in West Dulwich.

Centre right: Mike talking about the wonderful world of wireless.

Lower left: presenter Johnny Vaughn enthusing about the quality of BVWS material.

Lower right: Carl telling the potential wireless collector to 'join the society'.

Only Just In by Harold Page

Our business was a very personal one so many of the customers were individually known to me or my family. Even when the business grew in size, as it had to in order to survive, I tried to foster this personal touch in the belief that if you take good care of the customers, they would be your cheapest form of advertising. In any organisation things sometimes do go wrong, but if complaints are handled correctly, very often even adversity can be turned to advantage. My golden rule to my staff was that if any accident or misfortune occurred I was to be told immediately. I could then swiftly contact the customer, apologise, and take whatever action I considered appropriate. I took a very poor view of being attacked by an aggrieved customer on a matter as yet unknown to myself.

One such occurrence was when one of the engineers was laying a coaxial extension in the loft of a new and prestigious luxury bungalow which was to be occupied for the first time on the following day. The usually sure-footed worker slipped and put his foot through the surprisingly thin plaster-board, making a large hole appear over the client's

new double bed. It couldn't have been more accurate had it been rehearsed. The customers were so shocked that they hardly said a word. The builders, still working next door came to our rescue immediately and did a marvellous recovery job. I phoned our florist who delivered an enormous bouquet of flowers with my personal letter of apology. The lady's heart melted. Whenever she telephoned thereafter she always announced herself as "the lady with the flowers". Even after almost ten years in retirement, I occasionally meet the couple who give me a knowing smile, still remembering our fiver well spent on Public Relations.

A Field Service Engineer took delivery of a long awaited Ford 5 cwt. van. His first call was to a country customer some 12 miles distant. Although an appointment had been made, the customer was out. He waited for about 20 minutes, left the 'out when called' card and set out for his next call. About a mile along the narrow road he saw a car coming quite fast. He drove on to the sloping verge to let it through. The oncoming car squeezed alongside, but, although our driver had stopped, the van slowly slid sideways on

the mud, locking it to the other vehicle by the door handle. The only possible thing each driver could do was to roll down the windows. To add to the embarrassment, it was the customer speeding to get home in a brand new Rover 3 litre, for which he had waited some two years. The van driver used his radio to report the incident to base and call for help. The two cars were carefully parted without damage. I went immediately into our "apology with flowers" routine. So good was the florist's service that the flowers arrived before the client and our engineer returned to the house.

An even more amusing incident came in the form of a telephone call from our aerial erector Bob. He and his son used to prance about on roof tops like a pair of monkeys. This was not one of Bob's good days. He phoned me, somewhat hesitantly, to say, "Sorry, but I've just poked my ladder through Mrs. Goddard's greenhouse... *Don't worry, Sir, It didn't go very far in*" The glass was soon reinstated. All the staff teased poor old Bob for many a month, and the client enjoyed her flowers, not from her own greenhouse on this occasion.

Triode Valves in Radio Receivers or 'Valves, and the Juice to give Them' 1922 to 1930 part 2

by Ian MacWhirter.

5. Testing Valves

Users are cautioned that although many valve types were retained for as long as a decade (e.g., Mullard PM4), the characteristics of the early examples were inferior to the later ones. For example, the anode impedance r_a of the Mullard PM4 fell from around 15k in 1925 to 4k by 1932 and the maximum permissible V_a rose from 100V to 150V, probably as a result of improving evacuation and filament design giving a denser space charge. (Refs. 64, 65, 66). See Table 1. Another example, but of shorter production life, was the M-O DE6 whose r_a fell from 13k in 1924 to 10k in 1925. See Table 2.

Hence it follows that early valves when tested in valve testers using the readily available mid 1930s valve data, may appear to be poor or faulty specimens even though the sample may be representative of period 'average production'. That concept itself

and even the immediately obvious physical characteristics can be misleading. For example Mullard had abandoned the top exhaust as early as 1925 for the new PM series, but Metro-Vick retained the allegedly early 'pip' until 1928/29. Much would have depended upon the volume of the production levels, the investment in new plant and the pressure from the set makers and trade to dispense with the fragile pip top. It is suspected that makers ran parallel production lines; older valve classes made on the old plant using top exhaust and newer types on newer plant not only with bakelite caps, but bottom pinch exhausted. (Ref 66b).

A better guide to valve dating, hence to be able to use the valve references given with this text, is to be derived from examination of the type of cap fitted and how the lead out wires are soldered to the pins. A supplement may be prepared to provide this data in detail; pro-tem, valves from the major manufacturers with metal caps were current

one in, it seems, about 1930. However, makers' advertisements were either incorrect or showed inconsistencies in technology between valve types, e.g., 'Osram' advertising bakelite caps and hollow pins with lead out soldered at the ends on a DE2 in April 1926, yet a July 1926 advertisement for a DE5 still showed split pins and the lead outs soldered at the cap/pin junction.

Valve tables published from time to time in the journals also provide makers' recommended maximum voltages, once the sample has been dated. Take care, the maximum H.T. permissible of earlier production was generally lower than later production and today's sample may be marginally soft but modern valve testers are able to check that via onset of grid current when a high resistance is temporarily switched in. (Group refs. 66c).

References:

- 64. Wireless World, 4 November, 1925. P.628.
- 65. Wireless World, 6 April, 1927. Valve Data Sheet.

Fig 7: Grid current clipping of applied signal shown on static characteristic, assuming a finite source impedance to the grid circuit.

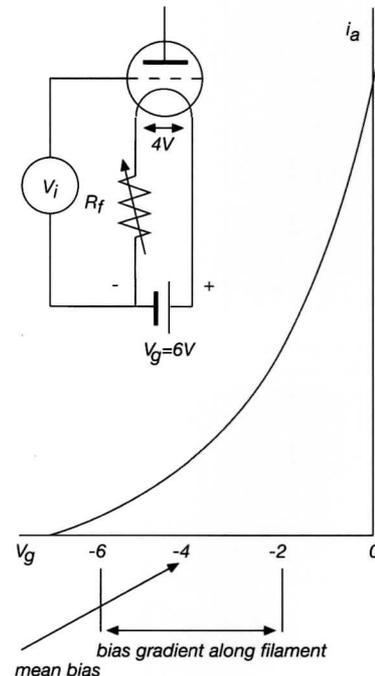
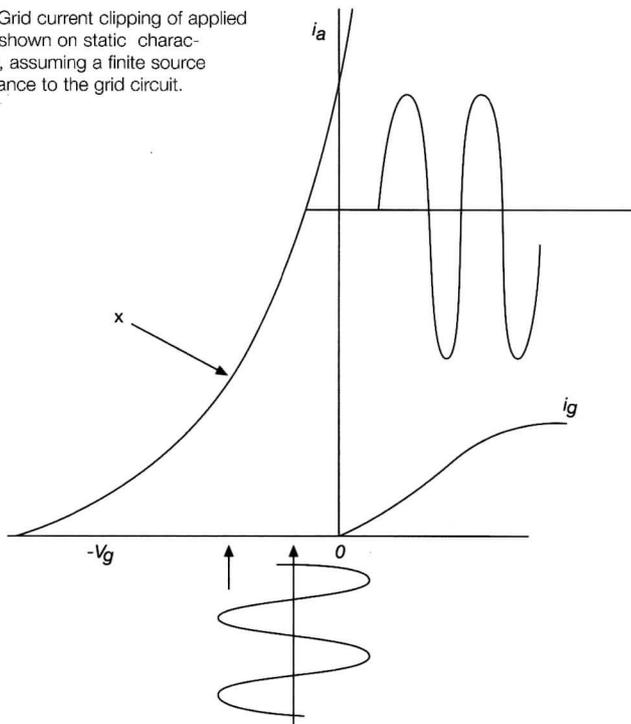


Fig 8: Creation of automatic negative grid bias.

creates problems: reports suggest there was variability between "good" valves within even a production batch, Dr. Smith-Rose (N.P.L.) making the point in 1924 "...it is rare that a batch of valves can be obtained, all specimens of which having anything like identical properties". (Ref. 66a).

Identification of the production year of a valve is not describable in a single paragraph

until 1925/26, bakelite caps with the lead outs soldered to the outside of the pins were common on M-O valves to about 1927. Mullard in introducing the PM4 used a cap that was unchanged until 1930, except that the moulded anode finding line was not filled in white after 1928 and one must rely upon the cap band to provide the filament data. The cap itself was then changed to a smaller

66. Period Valve Catalogues, 1932.

66c Group references:

- Wireless World, 30 September, 1925. P. 426. "Valve Data". The "PW" Valve Experimenter's Handbook.
- "Popular Wireless" Valve Guide, 10 October, 1925.
- Wireless World, 30 September, 1925. Valve Data. P. 426. The Wireless Magazine, June 1925. "Which Valve Shall I Use?". P. 580.
- Popular Wireless, 17 April, 1925. Valve Guide. Pps 325/6. Popular Wireless, 24 April, 1925. Valve Guide. P. 365. Popular Wireless, 1 May, 1925. Valve Guide.

Pps 398, 434.
 Popular Wireless, 25 December, 1926. Valve Guide. P. 1062. Popular Wireless, 1 January, 1927. Valve Guide. P. 1119. Popular Wireless, 8 January, 1927. Valve Guide. P. 1158.
 Popular Wireless, 22 January, 1927. Valve Guide. P. 1271. Popular Wireless, 29 January, 1927. Valve Guide. P. 1328. Popular Wireless, 5 February, 1927. Valve Guide. P. 1376.
 Popular Wireless, 19 February, 1927. Valve Guide. P. 1491. Popular Wireless, 26 February, 1927. Valve Guide. P. 1544 Popular Wireless, 12 March, 1927. Valve Guide. P. 36.
 Wireless World, 6 April, 1927. Valve Data Sheet. "Practical Radio Construction and Repairing". Moyer & Wostrel. McGraw Hill, 1927. PPs 56 & 57. {U.S. Valves} Wireless World, 29 August, 1928. Valve Data. Pps. 263 - 267. The Radio Amateurs Handbook, 1928. P. 78. {U.S. Valves}
 Wireless World, 4 December, 1929. Valve Data Sheet.

66b. "The Wireless Catalogue", The Edison Swan Electric Co., 1926.

66a. Wireless World, 5 March, 1924. (Pt. 1) "The Measurement of Low-Frequency Amplification". R.L. Smith-Rose. Pps 699-702.

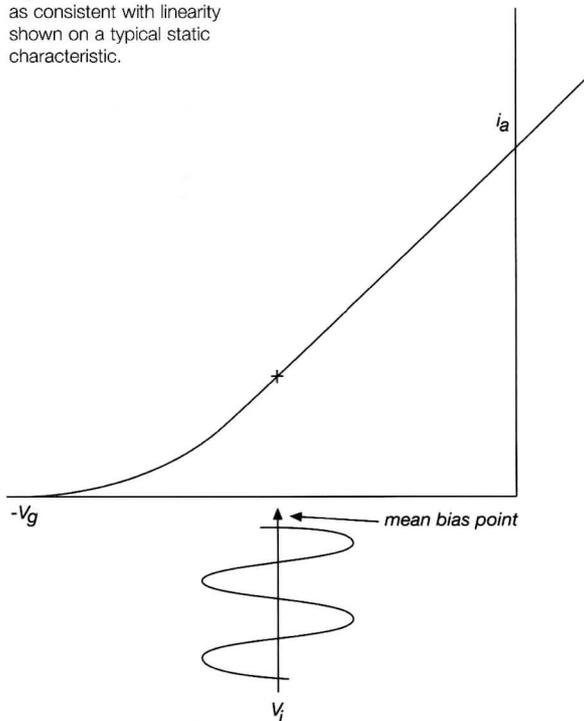
6. Operational Considerations

Suggested bias and anode voltages for the various receiver stages are published in valve manufacturers' literature and elsewhere (Ref. 67). This text takes the information to the stage of explanation of typical amateur use.

6.1 L.F. Stages

A significant difference between LF and HF amplifiers for the early experimenter was the greatly increased signal grid swing which had to be allowed for in second and final L.F. stages. The inference from the journals is that creating L.F. power i.e., acoustic power was a cumulative process over two or more

Fig 9: Mean bias set as low as consistent with linearity shown on a typical static characteristic.



stages. Also, the matching of load impedance with the output valve had little theoretical explanation for the amateur until 1930. (Ref. 67a). Text books published more advanced theory, but it seems unlikely this affected the home experimental approach to his engineering.

Amateurs were told often enough in the journals to use "plenty of H.T. and plenty of grid bias". But, in the period to 1930, lack of

popular references suggests there was too little understanding amongst these experimenters of dynamic characteristics. Professionals and contributing writers in amateur publications clearly understood about dynamic characteristics and the clearest reference yet found showing a professional's reluctance to complicate for his readers the understanding of how to set HT and grid bias in power stages dates from 1925. (Ref. 67b). In this, the writer says "*I have been asked to tell you how to adjust your grid bias for good reproduction, but I wonder how many of you know what the object of grid bias is...*" (my italics). Then the key sentences "*It should be noted that in all cases the values obtained from the maker's static characteristic curves are the minimum values of grid bias to use. For reasons which cannot be dealt with in this short article it is often possible to work lower down the curve than is evident from the ordinary characteristic curve. In other words, it would be more convenient in practice if we could adjust our grid bias with a knowledge of the working characteristic.*" (His italics). Clearly he understood.

Elsewhere, other writers in the better journals commented upon loudspeaker reproduction but failed to introduce dynamic operating conditions. (Ref. 67c).

Smith-Rose in 1924 commented "The history of the development of amplifiers is largely an account of progress by the trial and error method, although in many cases this has been guided by sound scientific principles". (Ref. 67d). It was he who, most surprisingly, went on to speak of biasing L.F. amplifiers by reference to the static charac-

teristic. Barrell in one of a series of articles on valve use (Ref. 67e) referred clearly to the effect of a resistive load upon slope and curvature but curiously failed to point to the lengthening of the grid base which a necessary increase in H.T. would have caused. (Ref. 67f).

Electrode voltages are set so that variations in anode current i_a are propor-

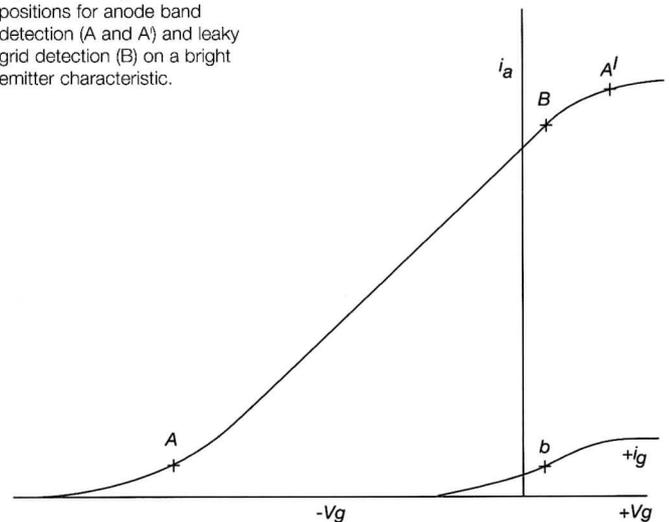
tional to variations in grid voltage V_g . The position of the working point on the straight part of the mutual characteristic is significant. Figure 7 shows that if positive half cycles of the signal took the valve into grid current, the corresponding change in anode current could be non-linear. With a finite grid source impedance, as is usually the case, grid current limiting would cause severe distortion.

Too great a bias would set the valve in the region of bottom bend curvature and the swing in anode current would again be a non-linear representation of the signal. Correct bias is set to avoid either grid current or anode current saturation, but not so much as to take the signal into the bottom bend. The shape of a typical dynamic characteristic is similar but of lower slope and straighter. The use of increased H.T. supply to overcome the "d.c. loss" resulting from the resistive component of the anode load created an extension to the grid base (i.e., the value of grid bias causing cut-off) compared with the static curve, hence grid bias would generally be somewhat higher than implied from the static curve.

For a given anode voltage V_a , filament voltage V_f has to be high enough to avoid emission saturation. Early recommendations in 1924 to amateurs pointed to the risk of damaging the valve but the bias point guidance was vague "in practice, therefore, apply a moderately high anode voltage and then adjust the negative bias until the clearest speech is obtained". (Ref. 68).

Use of an H.T. of up to 100 volts on R type valves is also found in 1923 literature (Refs. 69, 75) but applied to the L.F. stages only.

Fig 10: Showing bias positions for anode band detection (A and A') and leaky grid detection (B) on a bright emitter characteristic.



Other recommendations were scarcely more specific; for example (from 1923) in order to use type R bright filament valves to "full capacity", use an anode voltage V_a of up to 120 volts with a "few grid cells" for fixed bias to avoid anode current saturation. Saturation is also avoided by running the filament voltage V_f somewhat higher than that necessary for H.F. and detector stages. (Ref.

69). Another limitation in permissible anode voltage V_a used was the insulation resistance of inter-valve transformers; a transformer with poor insulation could result in a significant loss of negative bias to the following stage.

In later years, the recommendations became more helpful if not actually quantified; one such in referring to the DE5 valve in 1927 says "always use as much bias on the grid as is possible without weakening signals or introducing distortion ... reduces the steady direct anode current ... important when ordinary H.T. batteries are used ...". (Ref. 70).

The creation of self grid bias for bright valves was well enough known in World War I (Ref. 71) and this was recommended for 1923 amateur broadcast receivers. (Ref. 72). However, the writer has seen many circuits and L.F. amplifiers in which negative bias by auto or battery means was not employed.

Figure 8 illustrates the creation of a form of auto bias by returning the grid circuit to filament negative. The grid being returned to the negative side of the filament battery ensured that it was negative with respect to the whole length of the filament surface. Thus bias was not constant along the length of the filament and the mean value increased as R_f increased or as V_b increased. In general, stages biased this way were LF amplifiers of 1917-1923 design using R type bright emitters and with an H.T. common with the rest of the receiver of around 60 volts. (Refs. 73, 74). The professionals deprecated such use of free or auto-bias because it depended upon the setting point of the filament rheostat.

The advantages of such self-bias, indeed of any bias method, included the absence of grid current in that this avoided any 'demagnetisation' or back e.m.f. into the primary circuit of a preceding audio transformer.

It was not until the introduction of the indirectly heated cathode, which created a unipotential emitter, that the disadvantage of a bias variable along the filament length was eliminated.

When using 4 volt high filament current type R valves in L.F. stages with automatic bias, a 6 volt accumulator was commonly used (Ref. 76). This created a bias by means of the voltage drop of the rheostat and would be sufficient to set the whole of the filament length positive with respect to the grid. If a 4 volt accumulator is used, the use of separate grid bias may be required to avoid distortion caused by grid current. (Ref. 77). This would be exacerbated by the use of low H.T. as shown in Figure 6, I_g being in inverse proportion to V_a . In receiver designs from 1923 onwards, separate grid bias was increasingly used to position the mean anode current I_a as low on the straight part of the mutual characteristic as was compatible with the grid swing remaining on the straight part. (Fig. 7). This conserved H.T. battery life and the life of the valve.

One recommendation as late as 1927 avoided commitment to the use of a specific grid bias source when anode voltages were below some 60 to 80 volts. It says "we sometimes do not trouble to provide any bias other than is obtained by completing the grid circuit to the negative side of the filament circuit because we find that additional bias does not bring any noticeable improvement in signals." (Ref. 78).

Today it is all too easy to create a grid

swing far in excess of the design intent on account of the much higher signals applied to the detector. Overloading is best corrected by reducing the signal to the aerial terminal.

Auto bias from the filament rheostat was not a practical possibility for the lower current valves, particularly those of the 60 mA class and this was possibly one reason for the practice to fall out of use. (Ref. 79).

On the selection of V_a : this had to be sufficiently high so that the internal impedance r_a reached its low plateau, see Fig. 5. (in part 1, p.17). This would ensure the most uniform low frequency gain (against frequency) when the anode was loaded with the primary of an L.F. transformer of the early or later cheaper types where the primary inductance may have been as low as 5H.

For output stages, the anode voltage V_a should generally lie between 60 and 100 volts, grid bias being essential for anything over 60 volts. Anode voltages below 60 volts are unlikely to be satisfactory for loudspeaker output. When low H.T. values had to be used, valves designed for the purpose were available by 1927, for example, the AP 412 LF four electrode valve. (Ref. 80).

Early power valves such as the B4, DE5 and DE5a with fairly low impedance r_a were available, but they generally required a large grid swing to drive them. (Ref. 81).

Table 1 illustrates one example of the improvements in a valve type which survived many years under the same name and class (oxide coated filament). Tables 1 and 2 also show that as the yearly value of r_a dropped, the mutual conductance (μ/r_a) increased, which would have resulted in a shortening of the grid base with a useful improvement in sensitivity. Hence the bias required for the earlier examples would normally be bigger and care should be taken not to under-bias valves known to be early production examples.

	1925	1927	1928	1929	1932
μ	8.00	7.00	7	8.00	8.00
r_a (ohms)	15k	7k	7k	4.45k	4k
V_a (max.)	100V	-	125V	150V	150V

Table 1. Yearly reduction of r_a for Mullard PM4 valve and the increase in permissible V_a resulting from improved evacuation.

	1924	1925
μ	3.90	5.50
r_a	13k	10k

Table 2 Reduction of r_a for M-O DE6 valve.

As may be inferred from Figure 5, the use of a sufficiently high anode voltage to achieve the minimum value of anode impedance, also resulted in the greatest voltage amplification. In the case of power valves there was a steady reduction in the r_a of production valves as manufacturing techniques improved for ensuring close spaced electrodes and better emission. The records imply improvements as single annual increments, but the reality was one of continuous improvement.

The following 1925 advice on the selection of a valve for L.F. use illustrates the 'circuit first, valve later' approach:-

- (1) Early Stages, Transformer Coupled. Highest μ consistent with R_a not being greater than the 20,000 to 30,000 ohms limit.
- (2) Early Stages, Resistance or Choke coupled. Choose a high μ value.
- (3) Last Stage. (a) Choose so that the normal straight portion of the characteristic can be obtained of sufficient length, without an

unduly high H.T. battery. (b) The above requirement generally calls for a low R_a value. R_a must not be greater, and may be less than the load impedance. (c) With the above limitations $\mu^2/4R_a$ should be a maximum." (Ref. 81a).

6.2 The Detector Stage

The correct electrode potentials here depend upon the type of detector. Figure 10, shows the principal working points for good detection on a bright emitter characteristic (positive grid current when the grid was slightly negative).

Bias point A near the bottom bend is selected for 'anode bottom bend' detection, often but not always achieved without the use of series grid condenser and grid leak. In World War 1 and for some time later it was customary to return the grid of French S type valves to the slider of a potentiometer across the filament battery to select a compromise between the point of greatest curvature and reasonable slope. In later years, certainly during the active promotion of anode bend detection by Wireless World in the 1927/29 period, it was possible to use fixed bias, probably on account of the tighter tolerances to which valves were then made and their generally improved characteristics. Curiously, this variable bias feature re-appeared as a panel control in one quality kit set as late as 1931 (Ref. 107).

Valves which had characteristics specially suited for this bottom bend detection included the M-O Q and QX types which would already be operating at the best point with the grid returned to the negative terminal of the filament battery, with about 4 volts across the filament and some 50 to 100 volts on the anode.

Adjustment for best results was sometimes recommended in the early 1920s by variation of anode voltage which, as Figure 6 shows, would have the effect of bodily sliding the mutual characteristic over the selected (or fixed) bias point. (Refs. 82, 83). Others recommended optimising anode voltage in conjunction with keeping filament voltage at the lowest satisfactory value with bright emitters and the high filament current versions of the dull emitters.

Bias point A1 (Fig. 10) also gives anode bend detection with the advantage of a higher slope of the mutual characteristic, but loses the advantage of zero grid current damping on the preceding tuned circuit afforded by bias point A.

Readers who follow through designs published by Wireless World in the 1920s and into the turn of the decade will recall that the publisher favoured anode bend detection mainly on the grounds of quality; obviously there were other advantages such as low loading upon preceding tuned circuits. Wireless World abandoned this support at the decade, it is thought due to the deeper modulation of transmitter carriers increasing the distortion of the rectified signal. This potential for distortion was made known by Pearson to amateurs as early as 1923 (Ref. 81b) and he also made the point about the conveniently small degree of modulation used by the BBC at the time.

In the mid 1920s it was common to follow an anode bend detector with resistance-capacity coupling to the first L.F. stage. This was desirable because, operated at the bottom bend, the anode impedance r_a is as much as five times greater than normal, as shown in Figure 5. If a valve with unusually

large anode impedance was followed by a transformer coupling, and especially if the transformer was a poor one with low primary inductance, the L.F. response could suffer badly. This possibly did not matter in the early days of broadcasting when the transmission itself was allegedly bass deficient (Ref. 106), but by the turn of the decade it did. (Ref. 84). An excellent reference from 1925 explains the reason for using low ratio transformers in the first stage on account of compromise in transformer design resulting in indifferent primary impedance; lower ratio transformers are less likely to suffer from this. (Ref. 84a). Another in 1925 recommends choke capacity coupling (Ref 84b).

Bias point B was selected for detection with a series grid condenser and leak and was normally obtained with the leak returned to the positive lead of the filament battery, but this polarity choice was not strictly necessary for bright emitter valves if anode voltage V_a was kept sufficiently low to enhance the grid current I_g . Figs. 6 and 9 refer.

Actual positive bias would be needed for dull emitter valves for which grid current did not start to flow until grid voltage V_g was some 0.5V positive. It was reported in 1924 that trouble in the detector stage experienced by amateurs when using dull emitter valves was sometimes due to the grid being returned to the negative lead of the filament battery in circuits which followed earlier practice for bright valves. (Ref. 82).

Too high an anode voltage would have resulted in unsatisfactory control of reaction, making the stage break suddenly into oscillation, that is, with a 'ploppy' sound. Also, too high an anode voltage tended to increase the amount of reaction hysteresis i.e., an excessive difference in position of the reaction knob between start and cessation of oscillation. (Ref. 86).

Best results required biasing the valve to where the I_g/V_g curvature was greatest. Although directly plotted curves such as in Figure 6 show that the magnitude of grid current I_g was an inverse function of anode voltage V_a , it does not allow the point of greatest curvature to be easily identified. As far as the author can tell, the use of derived curves e.g., the rate of change of I_g with V_g were used by only the most advanced of engineers. For example, (Ref. 86a).

Figure 10 shows the characteristic of an oxide filament valve (positive grid current only when the grid is positive). It is seen that the position on the I_g/V_g curve is readily varied by exploiting the gradient of grid bias available across the filament length and varying the applied filament voltage.

Additionally, best results meant operating the valve with a steep slope around point B on the mutual characteristic which implied a moderately high anode voltage V_a and high emission current to avoid saturation. The inevitable conflicts meant that filament control was also used to help to achieve best results because leaky grid detection normally used reaction to try and compensate for the damping losses incurred by the grid current. Hence selection of anode voltage V_a was necessary to ensure smooth reaction control.

A concise 1922 recommendation for adjusting a grid leak detector reads "the grid potential should be adjusted (probably by returning the leak to a potentiometer across the filament battery) so that input signals will cause the largest possible filament grid current to flow, and the anode potential and

filament current should be chosen so that the steepest portion of the anode current grid voltage curve will be utilised. The latter adjustments may also be made to give a steep grid current grid voltage curve. Maximum signal strength will then be secured. Using hard valves, the grid leak and condenser method of rectification gives results superior to any other. Adjustment based upon conclusions reached after a study of the static characteristic curves will not be far wrong". (Ref. 88).

The 'largest possible grid current' in the reference has to be tempered in that excessive current is one cause of 'ploppy' reaction: in the case of 3V 0.06A dry cell valves run from a 4V accumulator via a 30Ω rheostat, (a practice much used but is to be deprecated), the grid return is better made to the negative lead of the accumulator. (Ref. 89).

1925 advice on the selection of a valve said: "(a) Choose a valve having a very sharp bend to the characteristic which is to be used - i.e., a bend occurring over as small a grid voltage range as possible. (b) For transformer coupling, keep r_a as low as possible, consistent with (a). (c) Unless very expert, do not use a soft valve." Then... "If the above method of selection results in several valves still being left in, a final choice may be made by applying the following analysis, weight being given to each consideration in the order given. (a) Select the valves so that between the whole group a minimum number of different filament voltages are necessary. (b) Select so that between the whole group a minimum number of different plate voltages are necessary. (c) Consider any advantages which may attach to particular methods of mounting and to size. (d) Consider the risk of mechanical breakage, and consider the fact that overrunning is far more detrimental to the life of dull emitters than to the life of bright valves. The former, however, often have initially longer lives than the latter". (Ref. 89a).

The author finds the above extract not entirely clear, despite the pedigrees of the writers, and it must have confused many an experimenter in 1925.

Not all designers of early broadcast receivers used hard valves for detectors; the relatively "soft" Dutch valve was used with an anode voltage of around 30 volts. The filament current was often varied until the onset of a hissing noise was heard (excessive ion current) and then backed down a little together with empirical variation in anode voltage to produce the most satisfactory result. In the USA in 1922 some allegedly hard valves were marginally soft which necessitated more critical setting of filament current. (Ref. 87).

6.3 H.F. Stages

In the earliest designs, up to the development in 1923 by Alan Hazeltine of the neutralised triode H.F. stage (Ref. 90) and a number similar design by John Scott-Taggart (Ref. 91a), the valve could not always be operated high up on the straight part of the mutual characteristic. At such a point the amplification would be such that the feedback through the valve capacity would result in self-oscillation. The onset of oscillation also depended upon the L/CR ratio of associated tuned circuits, hence the onset of oscillation depended upon the tuning position. Tuned to the longest wavelengths, greatest H.F. gain required a high anode voltage V_a and high filament voltage V_f to achieve a higher slope on the mutual charac-

teristic than is required when tuning to the shorter wave-lengths. Figure 6 refers (part 1, p22). When re-tuned to the shorter wave-lengths, the gain had to be cut back.

1919 practice included the returning of the grid to a potentiometer across the filament battery and biasing the valve near to cut-off, thus lowering the stage gain and maintaining stability. (Ref. 91). It was agreed at that time to be better practice to bias back and hence economise on H.T. drain, probably very important for field equipment in army service.

In 1919 designs with an H.T. battery rail common to H.F. and detector stages, one recommendation was to set the H.T. for highest detector sensitivity and restore the amplifying properties of the H.F. stage by running the filament voltage V_f at a high value. (Ref. 92). Stability would then be controlled by negative bias control of the H.F. stage as described.

If the applied R.F. signal was large, biasing the H.F. stage back would produce considerable rectification and distortion would result. This may be the reason why by 1922 the circuit was drawn the same, but the bias was set to move the valve into grid current and consequential damping of the preceding tuned circuit would reduce the gain below instability. At least one valve type - the Mullard H.F. 'red ring' bright valve was advertised in 1924 as having "the correct amount of positive grid current". (Ref. 93). Damping of the H.F. stage anode tuned circuit to reduce gain and assist stability using the load of leaky grid detectors was sometimes augmented with the use of variable grid leaks; this practice was found in the 1923-25 period prior to the use of neutralised H.F. stages. (Ref. 94, 95).

In some 1923 circuits the bias was achieved in a fairly primitive way with the grid returned directly to the filament battery positive side (Ref. 96), but other circuits used a potentiometer control. (Ref. 97).

In the case of the positively biased H.F. stage, any significant reduction in applied filament voltage V_f will result in depletion of the space charge and corresponding rise in anode impedance r_a , see Figure 5. Depending upon the L/CR ratio or 'Q' of the associated tuned circuit, the reduction in anode loading may cause the valve to go into self-oscillation necessitating further positive grid bias. A rise in r_a by reducing V_f which produced self-oscillation was found even without deliberate use of reaction in the detector stage which followed a tuned anode H.F. stage, one 1922 reference saying "particularly is this the case with an R type valve when the filament is not at its maximum brightness". (Ref. 98). This is perhaps the reason for various references to dimming the filament of the H.F. stage to result in an increase in gain.

Should oxide coated valves be used to replace the original bright valves, then it is possible the forward bias available is insufficient to send the valve into grid current. (Fig. 6) and together with the much higher stage gain obtainable with later valves, the expected stabilisation will not occur.

Following the introduction of neutralised triode H.F. stages, and for that matter the introduction of the screened grid valve in 1927, stability became more a problem of component layout and grid current control was abandoned. Filament current control was retained by some designers to alter the gain of H.F. circuits well into the early 1930s.

1925 advice on the selection of a valve

said:- "(1) Short-Wave Working. Without a specific circuit about which to talk, it is possible only to generalise on the choice of a H.F. valve, and, beyond the generalisation given, the final determination of the best valve can only be a matter of trial and error. (a) Choose a valve having a medium or low μ (say, about 8). (b) Choose a hard valve having low inter-electrode capacity. Note. - In circuits containing devices for the neutralisation of inter-electrode capacity (such as the neutrodyne), a higher μ may be used. (2) Long Wave and Intermediate Frequency Working. - Here inter-electrode capacity is of less importance provided the design of the H.F. stage is satisfactory and does not encourage oscillation. A valve of high μ may therefore be chosen, which will give large amplification. (Ref. 81a).

References:

67. Bulletin of the British Vintage Wireless Society, Vol. 5, Nos. 2 and 3, September, 1980 and December, 1980.
- 67a. Wireless World, 28 May, 1930. "Matching Valve and Loud Speaker". A.L.M. Sowerby. Pps. 548-551
- 67b. Wireless Constructor, November 1925. "How to Adjust Your Grid-Bias". P. 76.
- 67c. Wireless World, 1 April, 1925. "Good Quality in L.S. Reproduction". Pps 247-250.
- 67d. Wireless world, 5 March, 1924. (Pt. 1). "The Measurement of Low-Frequency Amplification". R.L. Smith-Rose. Pps 699-702.
- 67e. "The Principles Underlying the Operation of the Thermionic Valve". Barrell, Wireless World, 16 January, 1924. P491 et seq., 23 January, 1924, P.528 et seq., 30 January, 1924, P.565 et seq., 6 February, 1924, P.592 et seq., 13 February, 1924, P.617 et seq., 27 February, 1924, P.676 et seq., 5

- March, 1924, P.710 et seq., 19 March, 1924, P.765 et seq., 26 March, 1924, P.797 et seq.
- 67f. Wireless World, 26 March, 1924. Barrell. Pps 797-799.
68. Wireless World, 26 March, 1924. P.798.
69. Wireless World, 3 February, 1923, "Refinements in Receiving Circuits". Pps. 601, 602.
70. Wireless World, 14 September, 1927, article on grid bias. P.333.
71. As 2. P.103.
72. Modern Wireless, June 1923. "L.F. Amplifiers and Their Uses", by J. Scott-Taggart. P.337 et seq.
73. Modern Wireless, July, 1923. "Two Valve Sets", by J. Scott-Taggart. P.404.
74. As 2. P.103.
75. Modern Wireless, September, 1923, "A Three Valve All Concert Receiver", by P.W. Harris. P.572 et seq.
76. Modern Wireless, September, 1923, "From Crystals to Valves", by J. Scott-Taggart. P.580.
77. Wireless World, 17 February, 1923, answer to a reader's letter. P.679.
78. As 70.
79. Popular Wireless, 5 December, 1925, "Automatic Grid Bias". P.801.
80. Wireless World, 6 July, 1927, reply to a reader's letter. P.29.
81. Wireless World, 4 September, 1929. "Power Valve Output", by F.E. Henderson. P.219 et seq.
- 81a. Wireless World, 7 October, 1925. "The Selection of a Valve". Kipping and Blumlein. P. 478.
- 81b. Wireless World, 12 September, 1923. "Distortion in Valve Receiving Circuits". Pps 789 - 793.
82. Wireless World, 5 March, 1924. P.711.
83. As 6. Pps. 89, 90, 114.
84. Wireless Magazine, December 1928, "A One-Knob Screened-Grid Valve Set". P.418.
- 84a. Wireless World, 10 June, 1925. Readers Problems: "L.F. Transformers - High or Low Ratio". Pps 95-96.
- 84b. Wireless World, 30 September, 1925. "Coupling L.F. Valves to a Detector of High Impedance". P. 444.

85. As 82. P.721.
86. As 80. P.30.
- 86a. "Wireless Principles and Practice", L.S. Palmer, Longmans Green, 1928. Ch. IX. P.296. or 1936 Ed. Ch IX. P.312.
87. Wireless World, 25 November, 1922, "Critical Tuning Devices". P.256.
88. Wireless World, 18 November, 1922, "Signal Rectification". P.228.
89. As 86.
90. Proceedings of the Radio Club of America, Vol. 2, No. 8, 1923. "TRF Amplification with Neutralisation of Capacity Coupling", by L.A. Hazeltine.
91. As 2. P.265.
- 91a. Wireless World, 18 August, 1926. "Who Neutralised First?". P. 207
92. As 2. P.63.
93. Modern Wireless, November, 1924. P.651.
94. Modern Wireless, September, 1923. P.602.
95. More Practical Valve Circuits, J. Scott-Taggart, The Radio Press, 1923. P.18.
96. As 95, ST127 circuit. Pgs. 138, 139.
97. Wireless Constructor, September, 1926. P.1011.
98. Wireless World, 28 October, 1922, "Experimental Station Design". P.130.
106. Popular Wireless, 7th December, 1929, "Captain P.P. Eckersley's Query Counter", P.726.
107. Wireless World, 11th March, 1931, "Ferranti Screened Grid Three", Pps.272-274.

Knobs to you too!

by Gary N Tempest

A repair to a Vidor 'My Lady Anne' CN430 A/C Battery Portable.



I recently acquired one of these in truly amazing condition. It's almost 'new out of the box'. Apparently a lot of its life has been spent covered up in a loft. Consequently, the vinyl covering (or is it rexine?) is still bright and vibrant. It is now working after replacing the usual capacitors and repair of the knob for the wavechange/OFF switch.

This is one of those plastic 'nasties' with a spring clip around a flimsy slotted shank. The knob pushes on and the shank has a moulded flat side and a spring strip which tensions it in place. Anyone who has tried to remove one of these knows the sweat that breaks out as you gingerly try to prise it off. This is best done carefully with a 'blunt instrument' from underneath. If there is no access then several pieces of soft string can be slid under the knob. In my case there was no problem in getting it off as the shaft was just a crumbling collection of pieces inside the spring clip!

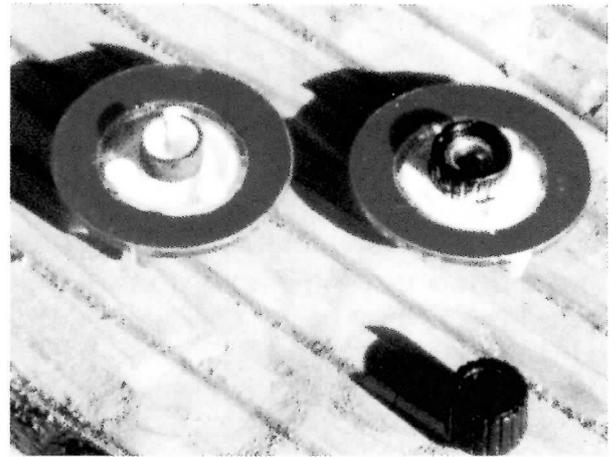
The knob was originally made in two parts. The main body is in clear plastic with a flange which is then silk-screened with 'L', 'M', 'OFF' etc. This is then covered with red paint to match the livery of the radio. The centre boss of the knob is in white plastic. This has the nasty shank moulded to it. It secures to the main part by plastic pins, which pass through 3 holes, and are heated and 'turned over'. My repair was to cut away all vestiges of the shank with a pair of side cutters. Then I carefully pared out the hole, using a craft knife, in the main part of the knob, where the shank had passed through, to accept another knob. This knob was a Radiospares (581-868) 1/4 inch sub-miniature type (Dia 14mm, H 11mm) with grub screw. Fortunately on this radio it is possible to get at the screw from below the sheet metal top-plate. Of course where you can get at the screw does not line up with the flat on the shaft! In retrospect this may not matter. Let's say the knob slips:

well you just tighten it up again. Being keen I decided to create a 'flat' in the knob. I drilled and tapped a 4BA hole almost exactly opposite the grub screw. Then I put in a roundhead screw! (many times). The idea here was to keep filing the screw down until when fully in it formed a 'flat'. Be careful if you try this, don't over tighten the screw otherwise you can crack the plastic of the surrogate knob.

Creating an artificial flat may make this idea applicable to other radios where you can't get at the grub screw. You could even remove the grub screw and re-tap this. If you file down the length of the roundhead

screw in very small increments, you can make the knob an interference fit and it will stay on even though there is no spring strip.

Finally, I fitted the surrogate knob. I had to file a little off the top such that when the original knob was pushed onto it, it was the right height above the front panel. Now for the 'glue up'. Generally Super-glue (Cyanoacrylate) seems to work best for plastic and a generous amount was applied to the fitted knob. Then the original knob in the correct orientation was pushed into position. The result appears to be very strong, certainly equal to the unbroken original.



Book reviews

The Bill Smith Chronicles

by Bill Smith

For those not familiar with the writings of Bill Smith, he has been regularly contributing a lighthearted column for Chas Miller's 'The Radiophile' documenting his days as a wireless repairman in Scotland and briefly the Midlands. The stories are in a similar vein to Harold Page's reminiscences about his wireless shop in Norwich printed in the BVWS Bulletin, though I daresay that Bill has been writing his articles for a while longer.

Bill's writing is informal and dare I say it — fun. I enjoyed reading this little book as it taught me a bit about life in Scotland before, during and after the Second World War, as well as what it was like repairing radios at the time.

The book promises a second volume. I hope this happens as Bill has quite a readable, unpretentious style.

To obtain copies of this book please send a cheque for £6.00 (postage is free!) made out to 'W. Smith' at 11b Marischal Street, Peterhead, Aberdeenshire AB42 1BS.

The Magic of Sony

by Enrico Tedeschi

Another of Enrico's self-published books, this time about Sony, his favourite manufacturer of transistor radios (and much more). This volume however goes much further than transistor sets; it covers almost every consumer product brought out by Sony since its humble beginnings.

Due to Enrico working within a rather slim budget, the book is spiral bound and printed by being run out from his computer (which isn't too different from the one the BVWS Bulletin is printed on) and painstakingly assembled by him, I'd hate to think how much time is consumed in doing this but I guess he is rewarded in sales.

To obtain copies of this book please send a cheque for £12.50 (which includes £2.50 for postage) made out to 'Enrico Tedeschi' at 54 Easthill Drive, Portslade, Brighton, East Sussex, BN41 2FD.

The History of the British Vintage Wireless Society

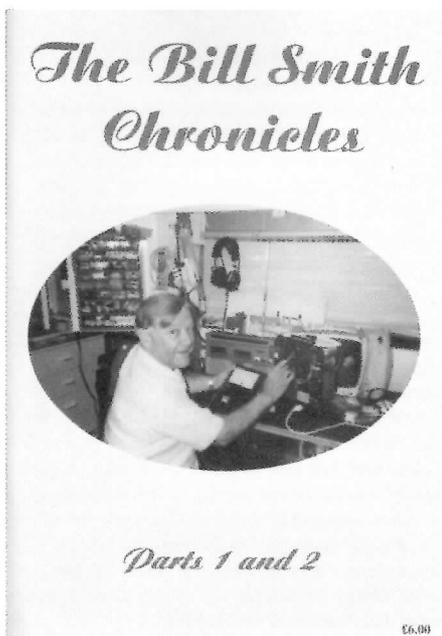
by Jonathan Hill

Even with the privilege of being on the BVWS

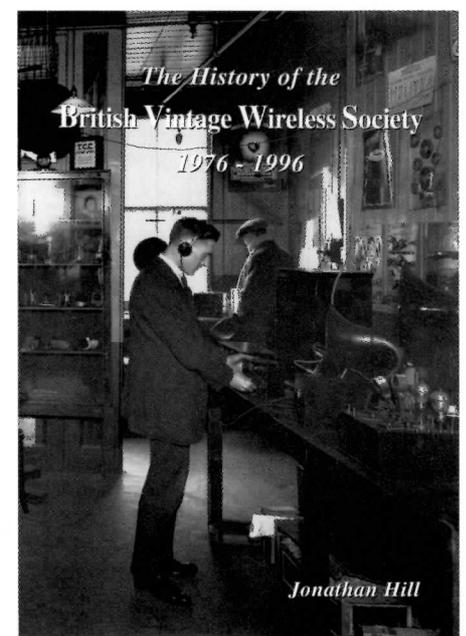
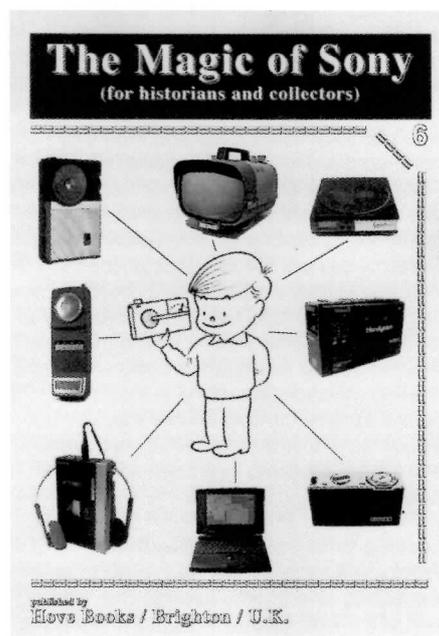
committee for the past five years I was not aware of the scale and effort of Jonathan's project documenting the history of our society. All that was known at the time was that it was taking a bit longer than previously envisaged. You can see why.

Packed with 176 pages and 250 photographs this book goes beyond the call of duty. It recalls the days of collecting wireless before the days of the Society and how it all began in an ordinary house in Ealing, right up to the 20th anniversary. A large section of the book features the exhibition at Harpenden, illustrating the pieces that were on display. The book even lists all the different constitutions that the Society has had over the years. Indispensable. It makes one proud to be in a society with such dedicated members.

One (among many!) of the amazing facts about this useful tome is that it is free to members. It can be acquired at any BVWS related swapmeet or a cheque/postal order for £4 to cover postage and packing from Mike Barker, 59 Dunsford Close, Swindon, Wilts SN1 4PW. Tel: 01793 541634. Additional copies can be purchased for £5. truly a bargain!



£6.00



Collector's Luck?

Serious collectors don't rely on luck, argues Andy Emmerson

How is it that dealers manage to offer interesting material even when the market seems to have dried up? And how come they constantly turn up much tastier stock than you ever encounter? Is it luck? Certainly not! Do they have some secret system? You bet they do!



No such thing as luck

Why then is it that some collectors seem to have far more luck than you do in finding rarities? Do items just fall into their lap? Are they very fortunate people and if so, did they have to sell their soul to the devil to have this luck? Nothing of the sort, luck doesn't come into it at all.

So what's the secret? In both cases it's a mixture of hard work, perseverance and determination. Don't underestimate the hard work bit either. As Abraham Lincoln said, "Things may come to those who wait, but only the things left by those who hustle." If you're serious about your hobby - and you must be if you're reading this - you're going to have to follow the rules if you want to make things come your way.

Dealers know this very well. They are not amateurs and what motivates them is the survival instinct; if they don't keep on turning up tasty merchandise they won't live. 'Big gun' collectors know this as well. For them it's a matter of pride, sometimes even a way of life. Chance plays very little part in finding new treasures for any of these people. Real life isn't that glamorous or capricious.

Chance, if it has any role at all, favours the prepared mind, as American author Don Lancaster says. Another favourite saying of mine runs: The reason why some people don't recognise opportunity is because it often comes disguised as hard work.

In other words, you have to be systematic. Dealers and serious collectors work damn hard at tracking down the rarities and you can be absolutely sure that if they just sat at home and visited the occasional swapmeet, nothing exciting would ever come along! And now, hold onto your hat, their secrets are

about to be revealed...

Experience Tells

One of the reasons dealers always seem to have stock is that in the main, they have been at this game a long time. The stock they sell today may have been bought ten years ago (pause for accusations of hoarding and claims of "Look at the value of the stuff today and I bet they bought it for a song then"). Actually this argument doesn't stand up to a moment's scrutiny. If every dealer bought his stock ten years ago he'd be bankrupt by now. The money laid out would have earned far more money in the bank, not to mention the cost of storing all this stock in the dry somewhere. No, what dealers sell today they probably bought last month and any other suggestion is plain stupidity.

"Ah, but they have a chain of contacts who sell them stuff cheap and then they ramp up the price to sell to collectors." Really? Please point me in the direction of this army of people who deliberately sell quantities of merchandise at below its value. Certainly dealers sell at higher prices than they buy in, but wouldn't you? They too have mortgages and food bills to pay, probably a lot of petrol bills as well for all the travelling they do buying stock. No, if dealers manage to keep merchandise rolling in they must have a system - and of course they do. But it's not really a secret. It's called hard work and involves looking in the not-so-obvious places.

Looking Where No-one Else Does

Provincial furniture sales have already been mentioned as a good source of nice sets at low, low prices. Charity shops and domestic

boot sales are another. You may not have the time to visit these outlets but they do reap occasional rewards. Even smart antique shops may be pleased to offload what they consider rubbish. A musical box shop in London was very pleased to sell a pre-war mirror-lid television for a couple of hundred pounds, whilst a lucky punter spotted a pre-war TV in a antique shop near Reading. The television, an HMV 5"-screen table set, was marked up at £100. "You know that's not its true value," said the punter. "Oh well, go on, you can have it for £75!" said the shopkeeper. Exit rapidly one very satisfied punter, having acquired a highly desirable piece of merchandise at a tenth or less of its market value.

The Almost Obvious

Are there any traditional radio and TV shops in your area, the independent dealer sort? If they have been in business for 30 years or more, it's quite possible they have an old-fashioned workshop with plenty of period testgear, components and service literature. Sooner or later the owner thinks of retiring and then has to sell off all the stock for a song. If approached properly, some of these people would willingly consider turning out their 'old junk' to an enthusiastic collector, especially if there's a penny or two to be made from it. These dealers may even have old showcards or flags in the loft and you'll never find out unless you ask. Some unsold Baird Televisors turned up in the basement of a Yorkshire dealer quite recently and I myself have been asked to help clear out a long established dealership when the premises were being sold. And yes, there were some forty-year old sets in the attic.

Almost Obvious Again

Do you attend amateur radio rallies? If not, why not? Perhaps you have an aversion to the secret language of ham radio, its odd expressions (CQ, CQ) and apparently stuffy on-the-air parlance (73, Old Man and all that).

If so, more fool you - this is just a smokescreen to keep out the CB radio users (sorry, no offence intended if you're a CBer). Every weekend throughout the spring, summer and autumn there is one or more amateur radio rally held in Britain; most are on Sundays but a few are two-day affairs. All are advertised in the events calendars of magazines such as Practical Wireless and Ham Radio Today, and each one of these rallies has a number of traders dealing in all kinds of surplus electronics (not just radio-related) - including vintage parts, books and sometime sets. Virtually all rallies have a flea market area and a bring-and-buy stand, a few rallies are entirely devoted to car boot sales (Luton in May, Rugby Truckstop in July for instance). You can always pick up components at a fraction of shop prices at these rallies, often old radios, TVs, hi-fi gear and telephones as well. What a treasure trove!

Almost Obvious 3

Don't neglect 'normal' car boot sales either. In Summer 1994 a collector of television sets was visiting a Sunday morning boot sale and happened to see a pre-war Murphy television worth at least £1,000. "That looks interesting," he said, which pleased the vendor no end as he admitted this was the third week he had brought the set along. "How much do you want for it?" was the next question and the reply was "Would £20 be too much?"

Another collector decided to place a want ad in his local free newspaper; all it said was 'WANTED: very old television set'. Within two weeks he had been offered a pre-war Marconi 702 for £20 and a Pye V150 for £70.

All three of these sets must have been worth between £500 and £1,500 so the two collectors certainly got a bargain. But were they lucky? Not really, they got out and looked for the sets and the beauty is that you can try their methods as well!

Almost obvious yet again

Several 'serious' collectors tell me they despair of finding anything new at the established swapmeets; virtually everything on offer has been picked over previously and really amounts to the rejects of dealers and other collectors. They are also tired of seeing well-disguised items cobbled from bitsa this and bitsa that, not to mention downright fakes and traps for the unwary. In fact some discerning collectors have virtually given up attending the 'mainstream' events laid on for specialist collectors.

What they really want is to tap truly undiscovered material at source, before the 'usual suspects' and wheeler-dealers have snapped up the choice items and added their mark-up on the rest. Their answer is to escape from the mainstream and hunt where the competition is less intense. A lot more legwork is involved but the pickings can be rich. What we are talking about is antique fairs - not the little village hall affairs (although these have yielded treasures in their time) but the mammoth provincial affairs held over a weekend or bank holiday at country fairgrounds. Many of these fairs are so large that they take several hours or even a whole day to walk around, and many 'big'

collectors rate them highly. These fairs are where the trade buyers come, although they do their deals on the first day of the show, when anyone without a recognised trade card has to pay a premium price to enter. The best deals are done in the first hour ... and also in the very last hour when you can drive tough bargains with traders who don't want to take all their stock home.

You can find out where and when these fairs are held by reading the specialist magazines (you can find them in any large newsagent) and the money you spend on these magazines is a good investment. These magazines have readers' sales and wants advertisements, which also represent a fascinating new approach to trawling the market. These publications also list the vast number of collectibles fairs held on the Continent. These fairs are larger and better organised than the average British swapmeet; they are also more commercial. Most capital cities on the Continent also have proper flea market precincts, which to many British visitors are a complete revelation.

The Not-so Obvious

Autojumbles. Do you visit them? Do you even know what they are? You should do. These are the automobile equivalent of the vintage radio swapmeet or boot sale, and a surprisingly large amount of radio material turns up at them. Not just car radios either. Before the war many garages and cycle shops sold radios or handled accumulator acid and the folks who go round clearing out defunct garages and cycle shops are turning up nice enamel advertising signs and all sorts of other radio-related goodies. Remember where you read this tip and thank me for it next time you get lucky!

Council rubbish dumps, or Civic Amenity Facilities, as we are supposed to call them these days. In this throwaway era a lot of very tasty merchandise gets dumped at these tips, which is why nearly all of them now have a resident 'totter' who pays the council for 'exclusive salvage rights'. This means anything dumped there is his and even if you spot something before he does, you still have to pay him. No matter though; if you want it, you'll probably buy it from him for far less than anywhere else. One dealer in the south of England confided that he obtains the bulk of his stock from rubbish dumps and he has standing contracts with the resident totters at each of them. That doesn't mean you cannot outbid him, however; just have some cards printed with your name, phone number and what you collect, then hand them out. The treasures will soon start rolling in!

Phooley!

Is that it? Were you hoping for something more dramatic? Perhaps you can't spare the time to attend furniture sales during the week or you can't be bothered to track down and attend all these autojumbles and ham radio jamborees. Oh dear, you probably weren't cut out to be a big-time collector. OK one more secret to come out.

Go for it if you're really serious

You now know luck doesn't play any major part in finding gear - but you can still go out and beat the opposition at their own game if you're prepared to put as much effort into it as they do. This means being systematic, having spies everywhere. Tell your relatives, friends and neighbours that you collect old

radios, televisions, telephones or whatever. Make a bore of yourself. Also, visit every last charity and antique shop in the district and tell them to give you a call if anything unusual comes in. Have some cards printed saying 'My name is Fred Bloggs and I collect Old Radios. Top Prices Paid, All Phone Calls Returned, Commission Paid for Good Leads'. Scatter the cards like confetti and see what turns up. What goes round comes round, they say.

Put a regular free ad in your local newspapers and in the papers for local towns. Be like a well-known collector in Nottingham and put display ads in papers and magazines with illustrations of the sets you are looking for and the prices you will pay. Of course, placing all those ads costs money but the system obviously works for him and what's more, it must pay for itself many times over.

Make yourself known as a collector. Write articles for county magazines, invite the local paper and radio station to interview you about your interesting hobby, establish yourself as a name in our hobby's specialist magazines.

All this will cost time and money, lots of it. It will definitely pay off, although not in the short term. But don't ever say other people get all the goodies if you're not prepared to put yourself out to the extent that they do.

It's all so easy

Yes, it's amazing - or is it? Strange that you don't see many vintage radio (television/hi-fi/telephone) dealers driving around in Rolls Royces. Honestly, if you want to get rich quick, forget this business - your money will earn better interest in the bank. The other thing is that as a dealer, not only do you have to know the value of everything, you also have to know what it will sell for. The scarcest set in the world has no commercial value if nobody recognises it for what it is (and your hyping it may not help!). These days fashionability plays a major role in the equation; art déco sets, bakelite, catalin and other plastics are the rage at present. In ten years' time we may be hallowing the 'Continental' look of the 1950s, with ivory knobs, gold trim and high-gloss lacquer woodwork - who knows?

Finally, never belittle the acquired experience of an expert; it counts for a lot. Surely it was only in jest when Jonathan Hill printed Michael's Law of Antiques?

- i. Every mature antique dealer is surrounded by his mistakes.
- ii. The quality of one's purchase is often inversely proportional to the distance travelled in order to acquire it.
- iii. You have to be a considerable expert on a subject in order to realise just how little you know.

On the other hand, perhaps not.

Adapted from the author's book ELECTRONIC CLASSICS, published by Newnes (ISBN 0-7506-3788-9).

Letters

Dear Editor,

As one who is interested in all aspects of the Theremin I was pleased to see an article in a recent bulletin entitled *The Theremin or Electronde* (?). However, the writer went on to describe neither an R.C.A. model Theremin nor an Electronde and it is the purpose of this tailpiece to throw some light on a highly obscure but interesting electronic musical instrument which I believe to be the first of its kind to be commercially available in this country.

The Electronde introduced in the summer of 1933 by Martin Taubmann, a Theremin player, was a good effort at producing a Theremin-type instrument but easier to play. Pitch was changed by moving the right hand in the vicinity of the antenna, as with the Theremin but volume was varied by a foot pedal and a remote push button switch held in the other hand enabled the performer to make gaps between notes thereby avoiding glissandi when not required. Also, unlike the Theremin the Electronde contained only two Longwave oscillators, no volume oscillator, or L.F. amplifier. The output of 1100 metres was plugged into the aerial socket of a wireless set which had to be tuned to that wavelength on the Longwave band in order to hear the music.

Following a series of concerts given by Martin Taubmann in various parts of Europe the makers: Electronic Music Development Co. Ltd, at that time based at 16a, Whyteleafe Road, Purley, Surrey, gave a demonstration of the Electronde at the Connaught Rooms in Covent Garden, London, in the summer of 1933. Soon after this event they sent 100 or so instruments out to musicians around the country for their opinions! This was followed by a 250 strong audience demonstration at Hampstead Public Library on November 2nd. The concert entitled, *Music From The Air* was introduced by Mr Barton Chapple the well known champion of Baird's work. Martin Taubmann played about eight pieces with piano accompaniment including the famous *Le Cygnes*.

The Electronic Music Development Co., Ltd. moved to larger premises at 52, Bunhill Row, London, E.C.1. and to coincide with the marketing of the Electronde on June 1st 1934 which incidentally sold for £8/8s. Taubmann appeared on *Children's Hour* and *In Town Tonight* and recorded the Electronde on HMV B8019 and B8020 and on Columbia DB 1767. The makers also produced a self-contained instrument incorporating a tone-colour control for the more ambitious amateur.

If anyone owns an Electronde I would very much like to see it, also information on the manufacturers, the recordings and anything on Martin Taubmann its champion. For those interested here is a list of my source material; *RADIO PICTORIAL*. June 1st, 1934, pg 22; *WIRELESS WORLD*. July 14th 1933, pg 25 & October 27th, pg 342; *WIRELESS MAGAZINE*. August 1933, pg 86 & December, pg 522. *AMATEUR WIRELESS*. December 2nd 1933 & July 15th 1933 and the *HAMPSTEAD EXPRESS*. November 11th, 1933.

David H. Butler.

Dear Editor,

Please, please, please, Geoff Sutcliffe and Paul Stewart (volume 23, numbers 3 and 4), stop all correspondence on the subject of Ekco AD37 receivers - it causes me too much pain! A few years ago, I acquired such a set as an 'under-appreciated' (ie. low priced) Ekco - mine was black, in excellent condition and I liked it very much. We later moved from London to Sydney and faced the dilemma of how best to pack my modest collection of radios. The better ones were taken away for packing by a professional removal firm (as used by a famous West End auction house). A week later I received a phone call: "Mr Narborough, we have very bad news..." - my AD37 had fallen to the ground and was well beyond any hope of repair - but it would be fully paid for and weren't they lucky it wasn't a Ming vase? You can best imagine my response. Now roll forward a few months, to the grand unpacking in Sydney. There was another nasty surprise in store for us - one of the "professionally" packed radios, a KB-FB10, didn't work and had a crack in its previously-mint case. The fact that the crack had been glued back together again suggested that the "professionals" had damaged this radio too, prior to packing, and had attempted to hide the damage until I was on the other side of the world. All of our self-packed radios made it here without any damage at all.

So, Geoff and Paul, I can personally guarantee that the humble AD37 is that little bit rarer than previously, one prime example having been recently smashed. Turning briefly to Simon Wade's comments in volume 23 number 4 concerning shipping of radios, my experience was that a carefully packed radio is fairly safe from damage during international transit, but I would strongly recommend that you never let any radio that you care about out of your sight unless it is properly packed. My radios were damaged after they left our flat but before they were packed - how I wish I had insisted that they be packed on my premises rather than allowing them to depart loose, in the back of a van.

I must also take this opportunity to congratulate you for an excellent publication, which is a credit to all involved in its production.

Mark Narborough

Dear Editor

Repairing valves - 1

I have bought a number of old battery valves in which the grid lead is fractured where it enters the pinch. It becomes clear enough when a filament is found to be intact, plenty of emission, but no grid control.

Why always the grid lead, is unknown. The lead is generally repairable, but it is very fiddling and only the patient or the desperate should attempt it. Remove the valve cap by (i) unsoldering the lead-through wires and using a solder sucker or a proprietary solder absorber such as *Plato Wick*, then (ii) remove the cap. If it is still cemented, soften this with methylated spirits. Clean out the inside of the valve stem with meths and using a cotton bud. Using an eye glass inspect the fracture in the stem. Generally it will look corroded. Soften the corrosion by pouring in household ammonia liquid and leaving for a few minutes. Rinse thoroughly with de-ionised

water and/or meths. Use a bodkin or other finely pointed device to scrape off residual corrosion from the exposed lead in the stem, to do this the use of an eye glass is essential. Ensure it looks really clean i.e., shiny. Make up a new lead out wire using an equivalent gauge copper wire, it is unlikely the old one will be long enough. Butt the new lead against the fracture and dab on *Loctite Glass Bond* in a couple of places: to do this requires the eyeglass, three hands and patience beyond belief, but it is helped if tiny blobs of *Plasticene* are used to hold the new lead out along the inside of the glass stem. Expose to UV, but make sure the gel adhesive does not run onto the abutted join. Check the bond is good. Using a minute artists brush, dab on a conducting paint, just enough and no more to cover the abutted join. Conducting paint with a high silver content sold for repairing printed circuit boards is satisfactory. Aluminium paint is non-conductive. Taking care to restore the leads to the correct pins, slip on the cap and secure with a dab of *Loctite* on the shiny face of the old cement. Re-solder the leads to the valve pins. Test and pour yourself a stiff short, you earned it.

Repairing valves - 2

1930's h.f. valves were often metallised. In production at Ediswan and Cossor, valves after capping passed and rotated before a jet which expelled liquid zinc. This stuck to the bulb by cooling, solidifying and contracting. Often the bond to the glass fails and the metallising falls away.

An effective conductive replacement is possible. The result is not beautiful and the makers print is lost, but is effective at h.f. as a screen. Visit a cathode ray tube re-gunning factory and from them obtain a quantity of 'dag' which is a colloidal aqueous suspension of graphite. Remove the residue of the old zinc coating and clean both the bulb and the connecting wire looping the bulb. Shake the dag and do that part out of doors in case of accident. Paint on several very thin coats of dag ensuring the connecting wire is covered, but try not to let the dag run below the rim of the valve cap. After drying, paint the dag any colour that you feel matches the original. Note: dag needs constant shaking. It's difficult to store it without all the colloid sinking to the bottom.

Ian MacWhirter

Dear Editor

I was interested in the article from Mr. Donachie, whose views are diametrically opposite to mine. He thinks he collects radios; he does not, he is actually collecting twentieth-century art.

Suppose somebody were to find an interesting and unusual cabinet, and then suppose he were to make a dummy chassis out of bits of old toaster and a valve or two. Mr. Donachie would no doubt like to add it to his collection, and it would make him happy, but suppose at some future date a friend were to point out that the chassis was actually a collection of scrap metal. Would he feel cheated? And, if so, why?

I do not in any way wish to insult him; we are all slightly mad, anyway, in our different ways. But surely a radio is a functioning article, not just a box.

This is slightly unfair, but suppose again somebody were to show you his vintage

Bentley, shining in its garage, and to the question "how does it go?" reply "I don't know, I've never tried?"; would that not be a little unexpected?

Consider the sort of radio that I would call "Veteran" rather than "Vintage". The late and much lamented Pat Leggatt was a collector of these, and it was always impressive to see him attach a clip and switch on, and as the bright emitters shone to frightening brilliance the set would play just as it had when new. In a dead state all these sets are identical mahogany boxes, and very uncollectable. To Mr Donachie they are all valueless.

I am all for discouraging the "Ham-fisted" from tinkering with an antique. but there are plenty of us around with experience who, said he modestly, are capable of getting the thing to go without leaving any traces that it has been interfered with. How does Mr. Donachie know that his sets have not been "Got at" by some ham-fisted person in the past?

Again, I do not wish to hurt Mr. Donachie's feelings, but I feel he is missing a lot. In fact, I find the chassis considerably more interesting than the cabinet; as I said, we are all slightly mad.

Yours sincerely,
Geoffrey Dixon-Nuttall

Dear Editor

Having now read the article by Frazer Donachie 'To restore or not to restore' I say 'what a load of codswallop!' I have yet to meet up with any of my many BVWS friends who go to meetings who do not restore and as for mum cleaning off the station markings, well I ask you?

I would suggest that Frazer has a word with our chairman, Mike and let him

demonstrate how a restoration should be done. To bring a rustbucket of a set back from the scrapheap and restore it to a fine working and delightful looking receiver is a joy that Frazer will probably not know.

Think again Frazer, forget the financial angle. There is so much more to restoration, and speaking as someone who came into wireless retailing way back in 1934 I still love it all.

Yours respectfully
Frank Hawkins

Dear Editor,

Part 1 of my article 'Triode Valves in Radio Receivers' contains some typos that make nonsense of one part. I apologise to you and to the Membership.

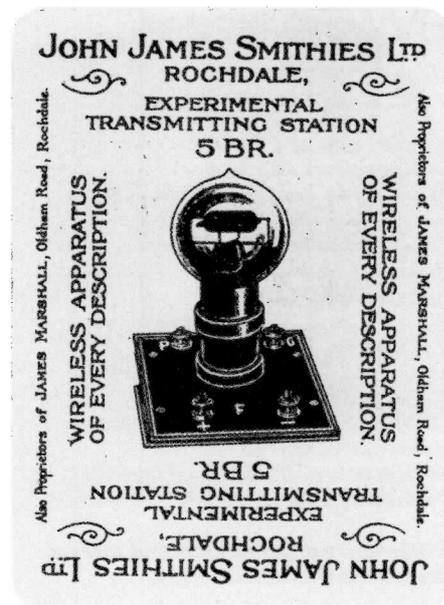
Page 17, column 2 of the Spring 1999 issue of the Bulletin gives a number of vacua figures. The exponents are shown wrongly. For 10.4 to 10.6 mm Hg please read 10⁻⁴ to 10⁻⁶ mm Hg

Yours sincerely,
Ian Macwhirter
ianmacwhirter@msn.com

Dear Editor

Recently I was delighted to acquire an intact pack of playing cards advertising 'Experimental Transmitting Station 5BR, Rochdale. I wonder if any members know of or have had any associations with the enterprise?

Congratulations on the high standard of the Bulletin: the balance between technical content and social history is spot on. The production quality is excellent and the individual members who contribute are



making an invaluable source of reference.

Best wishes,
John W Pye

Dear Editor

Re. my recent plea for information on Smith Radiomobile car radios, I am indebted to Mr Douglas Ward of Banbury for his prompt reply. His material enabled me to complete my book, 'the Bill Smith Chronicles', which has now been published... Thanks again Doug!

Bill Smith

Vintage Radio and the Internet continued from page 13

100 Years of Radio
www.alpcom.it/hamradio/

Antique Radio Page
members.aol.com/djadamson/arp.html

Australian Vintage Radio
www.clients.tas.webnet.com.au/homepages/pauledgr/

The Crystal Set Society
www.midnightscience.com/

Historical Radio Society of Australia
goanna.cs.rmit.edu.au/~dnl/hrsa.html

Antique Radio in Brazil
www.bn.com.br/radios-antigos/frameusa.htm

Norwegian Historical Radio Society
nrhf.no/nrhf-eng.html

Welcome at the Radio Museum Rottenburg an der Laaber
www.rolaa.de/sehensw/radio/radio_e.htm

Piets Old Radios
home.wxs.nl/~piethoen/home.html

Wumpuss Old Radio World
www.snafu.de/~wumpus/index.html

The London Vintage Radio Club, Ontario, Canada
www.geocities.com/Athens/Troy/9935/

Walters Radio Flier Homepage

www.geocities.com/Paris/6483/

Antique Radio
www.terracom.net/~john_b/antique.htm

Airwaves - Waynes Vintage Radios
www.execulink.com/~michiels/

John Jenkins Vintage Radio Collection
www.halcyon.com/johnj/radios/

Radio Nostalgia
www.radionostalgia.net/index1.html

Mailing Lists
A mailing list is a list of e-mail addresses of people interested in the same subject. When a list subscriber sends a message, it goes to everyone on the list.

UK Vintage Radio
This is the list for British vintage radio enthusiasts, concerned with all aspects of vintage radio restoration techniques, spares, publications, buying and selling, etc.

To send and receive messages from this list, send an email to: uk.vintage.radio.request@vintageradio.org.uk Put the word subscribe in the subject or message body.

I also found two other lists:

Old Tube Radios (USA based)
The primary purpose of this list is to help each other with the restoration and use of tube (valve) based communications equipment. You can mail a request for an info file to the server address:

listproc@theporch.com
Put the words info boatanchors in the mail message.

The Old Radio Mailing List (USA based)
<http://www.lofcom.com/nostalgia/maillist.phtml> The page at this address describes how to join. This particular list discusses the Old-Time Radio Era, between World War I and 1962.

Newsgroups
Newsgroups are public discussions that anyone with newsreader software can subscribe to and participate in. You read what other members have written and can post a reply if you choose.

There is no British based vintage radio newsgroup yet. The following are US based, but still worth looking at from time to time as there is quite a lot of content from the UK and Europe:

rec.antiques.radio+phono
rec.audio.tubes
alt.binaries.sounds.radio.oldtime
alt.radio.oldtime

For those with access, the internet will develop rapidly with more and more information becoming available. Keep an eye on the BVWS pages where, in the coming months, important vintage radio sites and up to date information regarding suppliers of parts and services will be posted.

BVWS Minutes

Minutes of BVWS Committee meeting held at 5 Templewood Ealing on Thursday 28 January 1999 at 7.30 pm

Present:- Mike Barker (in the chair), David Read, Carl Glover, Ian Higginbottom, Jeff Borinsky, Guy Peskett

1. Apologies: Steve Sidaway,

2. Minutes of last meeting
The minutes of the meeting held on 8th November 1998 were approved.
Matters arising, discussion of minute 7 deferred until item 5 below.

3. MB reported that assuming full renewal the membership stands at 1242.

4. CG reported that the Bulletin was 80% complete.

5. Ways of recruiting a Membership Secretary and an Editorial Panel Chairman for 1999-2000 were discussed. GP tabled a letter intended to be sent to individual members asking them to consider standing for Membership Secretary. A number of improvements were suggested. It was

reported that Geoffrey Dixon-Nuttall, David Read, Ian McWhirter, and Ian Higginbottom had agreed to serve on the editorial panel (constitutionally a sub-committee) but did not feel able to chair it.

6. IH reported that the Newsletter was "nearly full" and would be closed on Wednesday 3 February. A number of improvements in the arrangements were discussed. It was agreed that

(i) Newsletters would be delivered to the mailing team at the latest possible time and the need for security emphasised.

(ii) That advertisements for the sale of expensive or highly sought after items would be particularly carefully edited to ensure that potential buyers are not misled.

(iii) A reminder that the Society requires fair dealing will be incorporated in the masthead.

7. DR reported that the corporation tax for the year 1997/98 had been paid. A discussion ensued of a paper circulated by DR concerning the "History of the BVWS" a book commissioned from Jonathan Hill to mark the twentieth anniversary of the founding of the Society. This is now reported complete and comprising 176 pages and 250 pictures. Jonathan will show a version to those committee members attending the Portishead meeting on 31 Jan. A quotation of £9031 (inc VAT) had been received for 1500

copies which subject to favourable reaction from the meeting at Portishead the Committee agreed to accept.

The question of distribution was discussed. It was agreed that copies of the History would be available for collection by members at all events or supplied by mail at the cost of postage and packing. Additional copies will be available for purchase. Advertisements will appear in the Bulletin and will be placed in other journals seen by members.

8. Two confidential items were discussed

9. AOB

(i) MB proposed Jonathan Hill be made an Honorary member. MB will approach Jonathan and write the citation.

(ii) CG reported that the reproduction of Norman Jackson's posters had been delayed due to pressure of work.

(iii) SS had requested guidance on the level of stall fees at Harpenden given the rising costs of the Hall and services provided. Following discussion the committee recommended that the stall fee be raised by £3.

10. The next meeting will be the AGM. The meeting closed at 11.25 pm.

From the Chair continued

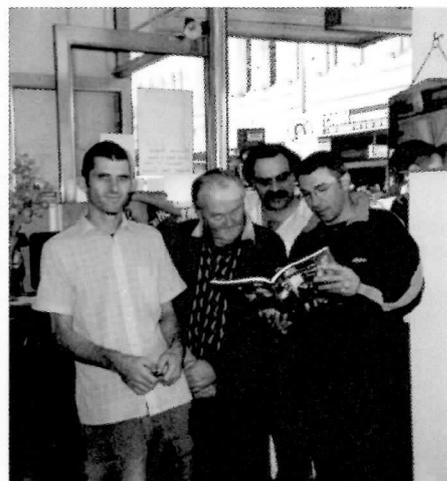
Resurrection Radio and deliver their copy of the 'History of the BVWS'. I met with John Walters, Kent Martin and Charles Doroszlay who took the time to show me around. The business is owned by BVWS member, Arthur Courtney. Who was unfortunately not in the day I visited. After a cup of tea and a chat I was shown around the stores and workshops, full of many Console radios and other treasures, and where repairs were under way. A few facts I learnt were Stereo radio broadcasts were originally on AM, and FM stereo was as recent as the 1970's. Television is broadcast on VHF due to very long distances and the television service did not start in that area until the mid 1950's. I left the guys that afternoon busy with orders and repairs and headed for the Sunshine, a cold Lager and the beach.

NVCF in Birmingham

A great day was had by everyone on the BVWS stall at the recent NVCF organised by Jonathan Hill. We enrolled 36 new members on the day and gave out 126 copies of 'The History of the BVWS' to members. The day was made perfect when I spotted a Murphy V114 1946 Television receiver in excellent condition, at a members stall. Of course the temptation was far too great, and now it sits proudly in place amongst the other Murphys. I plan to have the V114 on display and running at Wootton Bassett if time permits.

Don't forget the Garden Party at Gerry's on the 5th of June. I hope to see many of you there for another excellent Summer event.

Mike Barker



Above: Admiring the 'History of the BVWS' book in Australia

Vacuous Thoughts continued

appreciable reverse grid current even when the grid was negative and was exacerbated by higher anode voltages (ref. 4).

It would be fascinating to know to what vacuum today's reproduction type R valves are made. It is possible that if they are pumped excessively hard, their characteristics will not replicate those of the originals. Does any reader know more?

The performance of reproduction valves such as KT66 made today might, conversely, be scarcely affected if the vacuum achieved was higher than that by M-O in the 1940s and 50s.

So where does this leave us? Hopefully understanding that a high vacuum is still pretty gassy, but not gassy enough to cause

problems. It leaves me wondering how it is that after some 70 years these old valves still retain vacuum enough - the glass bulb isn't a solid at all but a supercooled liquid and may hold water vapour, the electrodes were always known to hold occluded gas which can escape if there is too much heat generated and the lead through seals in the glass pinch are a source of air leakage. Coupled with that, what gas there is can poison a filament coating. I wonder how long the surviving examples will continue to operate before the glass crystallises, as it will, and the bulb implodes. I take some comfort from the estimate given by Kaye (ref. 5) that if a tiny hole were made in an evacuated lamp bulb such as to allow 1

million molecules of air to re-enter each second, it would take one hundred million years for the bulb to be re-filled.

References:

1. Theory of Thermionic Vacuum Tubes, E.L. Chaffee, McGraw Hill, 1933, p.20 where the reference is to hydrogen molecules.
2. Principles of Radio Communication, J.H. Morecroft, John Wiley & Sons, Inc., 1921. The figure used is derived from Morecrofts own estimate, see footnote, p. 391.
3. Wireless, L.B. Turner, Cambridge University Press, 1931, p.172.
4. See 2 above, p.399.
5. High Vacua, G.W.C. Kaye, Longmans Green, 1927, p6.

Don't forget

September Harpenden

Sunday 5th September 1999



TUDOR GWILLIAM-REES Savoy Hill Publications

Vintage service data & manuals for:

Radio, HiFi, Communications, Military,
Television, Cinema, &
Domestic Appliances up to the 1970s

FREE PAMPHLETS ON:

- ☐ Military & Communications
- ☐ HiFi & Audio
- ☐ Valve manuals
- ☐ Vintage Wholesaler catalogues
- ☐ Test Equipment
- ☐ Radio & Television Receivers

Publishers of the *Antique Wireless Newsheet*,
free sample upon request

SAE PLEASE to:

**Tudor Gwilliam-Rees, 50 Meddon Street,
Bideford, The Little White Town, Devon EX39 2EQ**

Tel & Fax: 01237 - 424280

E.Mail: tudor.gwilliam-rees@virgin.net

Website: <http://freespace.virgin.net/tudor.gwilliam-rees>

MAIL ORDER ONLY

Back issues

Vol 10 Numbers 2, 3 & 4 Inc. The
KB Masterpiece, Extinct Species
"A Monster Defiant".

Vol 11 Numbers 1, 2, 3, 4 Inc. BTH
VR3 (1924) receiver, Marconi's 1897
tests, Origin of the term 'Radio',
Baird or Jenkins first with TV?

Vol 12 Numbers 1, 2, 3, 4 Inc. the

Emor Globe, The Fultograph, Ekco
Coloured Cabinets.

Vol 13 Numbers 1, 2, 3 Inc. Direct
action tuning, The Philips 2514,
Noctovision.

Vol 14 Numbers 1, 2, 3, 4 Inc.
Cable broadcasting in the 1930's,
The story of the Screen Grid.

Vol 15 Numbers 2, 3, 4 Inc. The
wartime Civilian Receiver, Coherers
in action, Vintage Vision.

Vol 16 Numbers 1, 2, 3, 4 Inc. The
Stenode, The Philips 2511, Inside

the Round Ekco's.

Vol 17 Numbers 1, 3, 4, 5, 6 Inc.
Wattless Mains Droppers, The First
Philips set, Receiver Techniques.

Vol 18 Numbers 3, 4, 5 Inc. The
First Transistor radio, The AVO
Valve tester, The way it was.

Vol 19 Numbers 1, 2, 3, 4, 5, 6 Inc.
The Birth of the Transistor, Super
Inductance and all that, reflex
circuits, A Murphy Radio display,
restoration.

Vol 20 Numbers 1, 2, 4, 5, 6 Inc.
Radio Instruments Ltd., Japanese
shirt pocket radios, Philco 'peoples
set', notes on piano-keys, the story
of Pilot Radio, the Ever Ready
company from the inside, the
Cambridge international, the AWA
Radiolette, this Murphy tunes itself!

Vol 21 Numbers 1, 2, 3, 4 Inc.
Marconi in postcards, the Defiant
M900, GPO registration No.s,
Personal portables, the
transmission of time signals by
wireless, the Ekco A23, historic
equipment from the early marine
era, the birth pains of radio, inside
the BM20, plastics, Ferdinand
Braun, pioneer of wireless
telegraphy, that was the weekend
that was, the first bakelite radios,

BVWS - the first five years, the
world of cathedrals, Pam 710.

Vol 22 Numbers 1, 2, 3, 4 inc.
Another AD65 story, the
Marconiphone P20B & P17B,
listening in, communication *with*
wires, the story of Sudbury radio
supply, French collection, Zenith
Trans-oceanics, Farnham show,
Alba's baby, the first Murphy
television receiver, AJS receivers,
Fellows Magneto Company, Ekco
RS3, Black Propaganda.

Vol 23 Number 1 inc. Sonora
Sonorette, Bush SUG3, RNAS
Transmitter type 52b, North
American 'Woodies'.

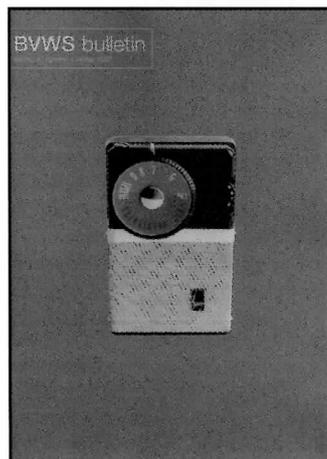
Supplements:

- 1 'The story of Burndep't'.
- 2 'WW 1927 data sheet'
- 3 'Seeing by wireless' the story of Baird
Television
- 4 reproduction Marconi catalogue

Earlier Bulletins and supplements are
priced at £2:00 each + postage. Bulletins
from volume 21 onwards are priced at
£2.50 each. + postage.

Postage:

for individual bulletins add 50p, for 2-5
bulletins add £1, for 6 or more add an
extra 20p each. 23 Rosendale Road,
West Dulwich London SE21 8DS
Telephone 0181 670 3667. Cheques to
be made payable to 'The Vintage
Wireless Museum'.



News and Meetings

Harpenden Restoration Contest

At the 6th June Harpenden swapmeet there will be a restoration contest. All receivers must be demonstratable, working and checked-in at reception in the entrance of the Harpenden Hall. Free membership and special prizes will be awarded to the winner and runners-up.

'Gwefra Gwifrau' Wireless in Wales

A small collection of domestic radio receivers from the 1920s and 1930s will be on show at Denbigh Library, North Wales, from 12th March until the end of June 1999. The radios will be part of an exhibition depicting a concise view of the history of broadcasting in Wales up until the outbreak of war in 1939. It is hoped that this will eventually be part of a permanent display at Canolfan Iaith Clwyd (Clwyd Language Centre) also in Denbigh.

For further information please contact:

Rose McMahon Curator and Research Officer
Denbighshire Records Office, Rhuthun. Tel. 01824703648

David Jones, Canolfan Iaith Clwyd, Pwll y Grawys, Denbigh LL16 3LF.
Tel. 01745813402

Wootton Bassett meetings

Mike Barker will be organising a swapmeet on **4th July** and **5th December**.

Harpenden meetings

There will be a swapmeet and restoration contest (see above) on Sunday the **6th June** hosts a swapmeet. Autumn is heralded with a swapmeet on **5th September**, and the year finishes with a swapmeet on the **28th of November**.

Portishead meetings

There will be a swapmeet on Sunday the **3rd of October**.

NEC Meetings

Jonathan Hill's 'National Vintage Communication Fair' meeting will occur on **October 24th**. For further details on the NVCF please refer to the advertisement on page 2.

Southborough Meetings

John Howes will be holding a Southborough swapmeet on **October 17th**. Bookings/enquiries (01892) 540022.

Shifnal Meetings

Chas Miller of 'Radiophile' fame will be holding a meeting on the **3rd October**. There will be a Sambrook "Summer Special" on **25th July**.

North American meetings

4th - 7th August: ARCI Radiofest XVIII, Elgin, Illinois. Further details to follow when known.
1st - 4th September: AWA annual meet, Rochester, New York

Gerald Wells' garden party

Gerry Wells will be having a garden party on Saturday **5th June** at the Vintage Wireless Museum, 23 Rosendale Road, West Dulwich, London SE21 8DS. Telephone 0181 670 3667.

New Articles

If you have anything interesting to say concerning Wireless, Television, Broadcasting, Collecting etc. please send it to the Editor for future publication in the BVWS Bulletin, as the Bulletin is only as interesting as the articles that comprise it. We welcome all suggestions and comments regarding the new appearance of the Bulletin and hope that it is catering to your needs as a collector / enthusiast / historian. Your article can be just a few paragraphs long as long as you think it conveys its message across to your fellow members.

Also if you have any photographic material that would look good in the Bulletin, don't hesitate to post it to the Editor. The chances are that I will definitely use it!

Please send all articles to: Carl Glover, c/o Runciter Corporation, 33 Rangers Square, London SE10 8HR.

Chevet Supplies Ltd

Dept BV 157 Dickson Road, Blackpool, Lancashire, FY1 2EU

Telephone: (01253) 751858 Fax: (01253) 302979

The Vintage Wireless Trader

Published regularly at approximately six week intervals. Now incorporates 'The Vintage Wireless Listing'. Contains hundreds of out of print, old and collectable wireless and TV books and magazines, vintage and valve communications receivers, valves and components for the short wave enthusiast and amateur as well as **subscribers wants and sales**. Send six first class stamps for one copy or £8 for the next eight issues.

New Books

Eddystone Communications Receiver Data 1950-1970. A facsimile reprint of the circuit diagrams, general description and some service notes for sets from 1950-1970. 50 pages **£9.75** incl p&p

Military Manuals

R.1155 Receiver data. 47 pages. **£11.75** including p&p
T1154 Series Transmitter Manual. 54 pages. **£14.75** inc. p&p
Wireless Set (Canadian) No 19 Mk III Technical Manual. 62 pages. **£12.50** incl. p&p
Receiver Type R107. 11 pages. **£7.50** inc. p&p.

R210 Army Communications.. 35 pages. **£9.25** including p&p
AR88D Communications Receiver Manual. 25 pages. **£9.50** inc. p&p.
Admiralty B40 Receiver. 48 pages. Facsimile reprint. **£13.50** inc. p&p.

Janes Military Communications 12th Edition 1991-1992. Now **£20** p&p **£6.50**

The Ultra-Magic Deals by BF Smith. A well researched book on Ultra codebreaking operations pooling of cryptological intelligence. 276 pages. **£11.50** p&p **£2.50**

Radar. PS. Hall. A study of military radar from Chain Home to Patriot. Numerous photos and illustrations of equipment. **£7.50.** p&p **£2.50**

Trio Model R-2000. Communications receiver. Operating notes, circuits, details etc. Approx 35 large format pages. Facsimile copy. **£9.75** including post.

Clydesdale Gov't. Surplus Wireless Catalogue. Circa 1950's. A facsimile reprint of the firms 179 page catalogue containing government surplus wireless equipment, petrol generators, ex-government photographic equipment, with photos and details of receivers, transmitters and glide path gear, etc **£11.25** including postage.

Vintage Radio Valve Line-up Guide, 1930s 1950s: This invaluable book contains the valve line-up and replacement guide for hundreds of radios, pre-war and post-war. 118 pages. **£12.50** including p&p

The authorised Biography of Sir Bernard Lovell. Includes detailed chapters on the development of wartime radar H'S and various centimetric equipment. 320 large format pages. Many illustrations. A big book. **£8.75** p&p **£2.75**

The Guinness Book of Espionage by Lloyd Marc. This unique book shines a revealing light on the furtive clandestine business of the art of spying. Traces the technical development of spying with particular emphasis on WW2. Includes photos and details of spy sets, enigma equipment and clandestine devices. 256 pages. **£12.50** p&p **£3.50**

Secret Warfare. The battle of Codes and Ciphers. One of the few books on cryptography. A detailed work with emphasis on the development of modern intelligence using codes and ciphers. Throws light on top secret strategies of deciphering including a history of codes and World War II employment. Clear concise analysis. Well illustrated with previously unpublished material. Brand new. **£5.95** including p&p

BOOKS FOR THE COLLECTOR

Old Radio Sets by J.Hill. History, photos and details. Card covers. **£2.25** p&p 75p

Old Television by A.Emmerson. History, photos and details. Card covers. **£2.25** p&p 75p

Old Telephones by A.Emmerson. History, photos and details. Card covers. **£2.25** p&p 75p

All three books for £7.00 p&p £1.50

Wireless and TV service sheets and manuals

Thousands in stock from 1930's to 1960's. SAE or telephone for quote

Valve and Vintage Components

32+32µF at 350V
Hunts electrolytics. Can type **£4** each, 2 for **£7** post free

32µF at 450V
Axial TCC electrolytics. Size 2" x 1" diameter. **£3** each. 2 for **£5** post free

32µF at 500V
Axial Hunts. Size 3" x 1" diameter. **£3.50** each. 2 for **£6** post free

50+50µF 300V
Can type. TCC electrolytics. **£3.25** each. 2 for **£6** post free

Octal valve holders
60p each. 5 for **£2.50** post free

B9A valve holders
5 for **£2** post free

B7G Valve Holders skirted. Four for **£2** post free

MES dial bulbs

6.3V .3A Box of 10. **£2.95+60p** p&p

High Voltage Caps
0.1µf 1000V wkg. Mixed dielectric 1 1/2" x 1/2" axial wire ended. **80p** each.

5 for **£3.50** inc. post.

0.068µf 800V wkg. Mylar dipped 1 1/2" x 1/2" axial wire ended. **70p** each.

5 for **£3.00** inc. post.

0.5µf 'Metalpack'. paper/foil. Wire ended. 350 V 2 1/4" x 1/2". **70p** each.

5 for **£3.00** inc. post.

0.22 1000V wkg. Mixed dielectric 1 1/2" X 3/8" **70p** each. 5 for **£3.00** inc. post.

1µf 400V wkg. Mixed dielectric 1 1/2" x 1/2" wire ended. **80p** each.

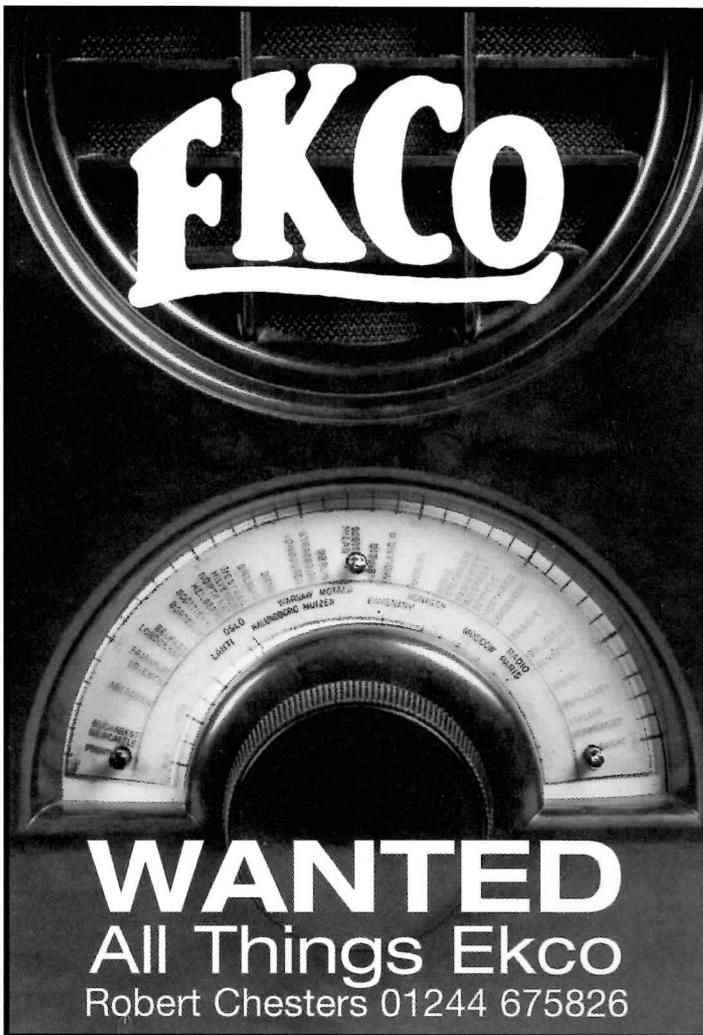
5 for **£3.50** inc. post.

MOST VALVES AVAILABLE AT LOW PRICES

Vintage, amateur radio, audio and military. SAE or phone for quote

Callers welcome to our vintage wireless shop, address above, open Tuesday, Thursday, Friday and Saturday, 10am - 6pm, other times by appointment. Pre-war and components in stock, also government surplus and valved communications receivers

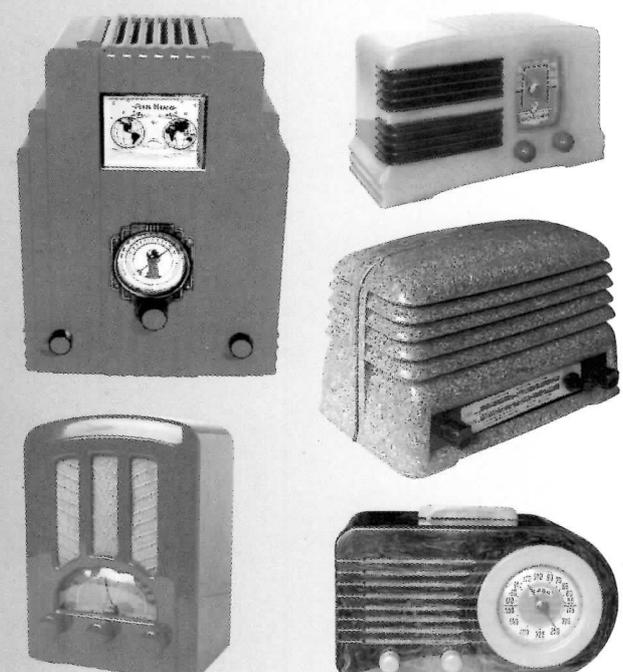




EKCO

WANTED
All Things Ekco
Robert Chesters 01244 675826

Wanted by collector



Top prices paid for
Coloured KB BM20's, Air King 'skyscraper'
Catalin Sets and Coloured Bakelites

Carl Glover c/o Runciter Corporation, 33 Rangers Square
London SE10 8HR | Tel / Fax: 0181 469 2904

Swapmeet at
Wootton Bassett
The Memorial Hall, Station Road, Wootton Bassett
(3 miles from M4 Junction 16, turn left after Town Hall)

4th July 1999
doors open at 10.30 to 4.30
It is advisable to turn up no later than 12 o'clock

£2 entry - no booking required
£12 for stall plus helper

stallholders please book by telephone or letter
phonecalls after 6pm please

Mike Barker: 59 Dunsford Close, Swindon. Wilts SN1 4PW.
Telephone 01793 536040

Swapmeet at
Portishead
3rd October 1999

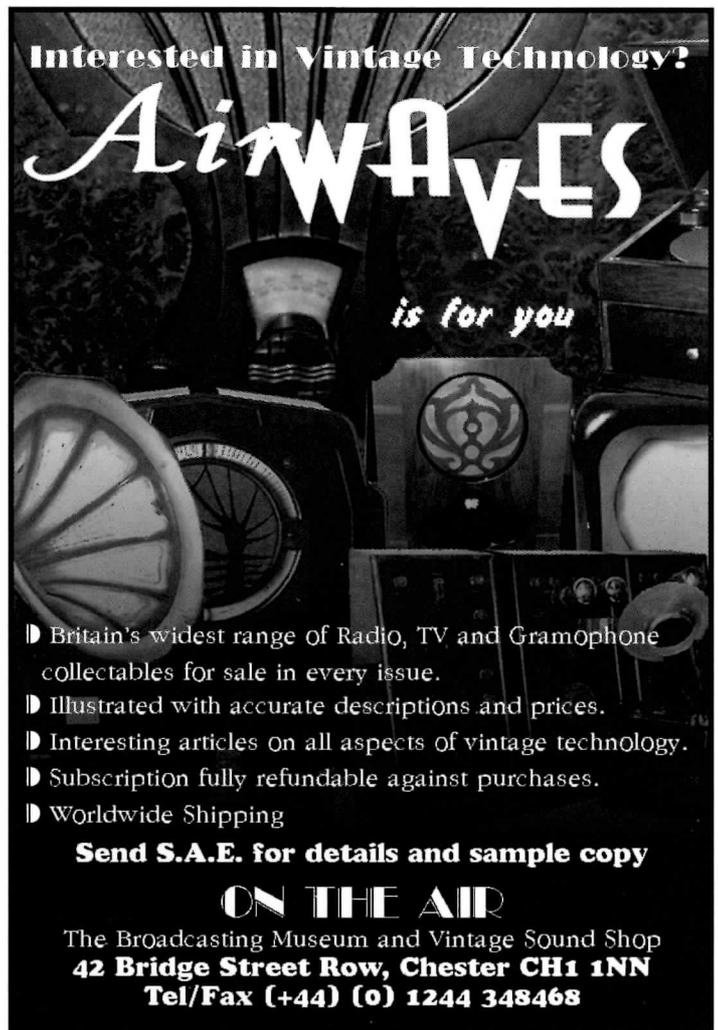
Clarence House, High Street, Portishead
doors open at 10.am
Hot meals served throughout the day • bring and buy stall
auction at 1pm

£2 entry - no booking required
£10 for stall plus helper
stallholders please book by telephone or letter

Ring Alex Woolliams for bookings on: 0117 977 6576
11 Norton Road, Knowle, Bristol, Avon BS4 2EZ

Interested in Vintage Technology?

Airwaves
is for you



- ▶ Britain's widest range of Radio, TV and Gramophone collectables for sale in every issue.
- ▶ Illustrated with accurate descriptions and prices.
- ▶ Interesting articles on all aspects of vintage technology.
- ▶ Subscription fully refundable against purchases.
- ▶ Worldwide Shipping

Send S.A.E. for details and sample copy

ON THE AIR
The Broadcasting Museum and Vintage Sound Shop
42 Bridge Street Row, Chester CH1 1NN
Tel/Fax (+44) (0) 1244 348468

